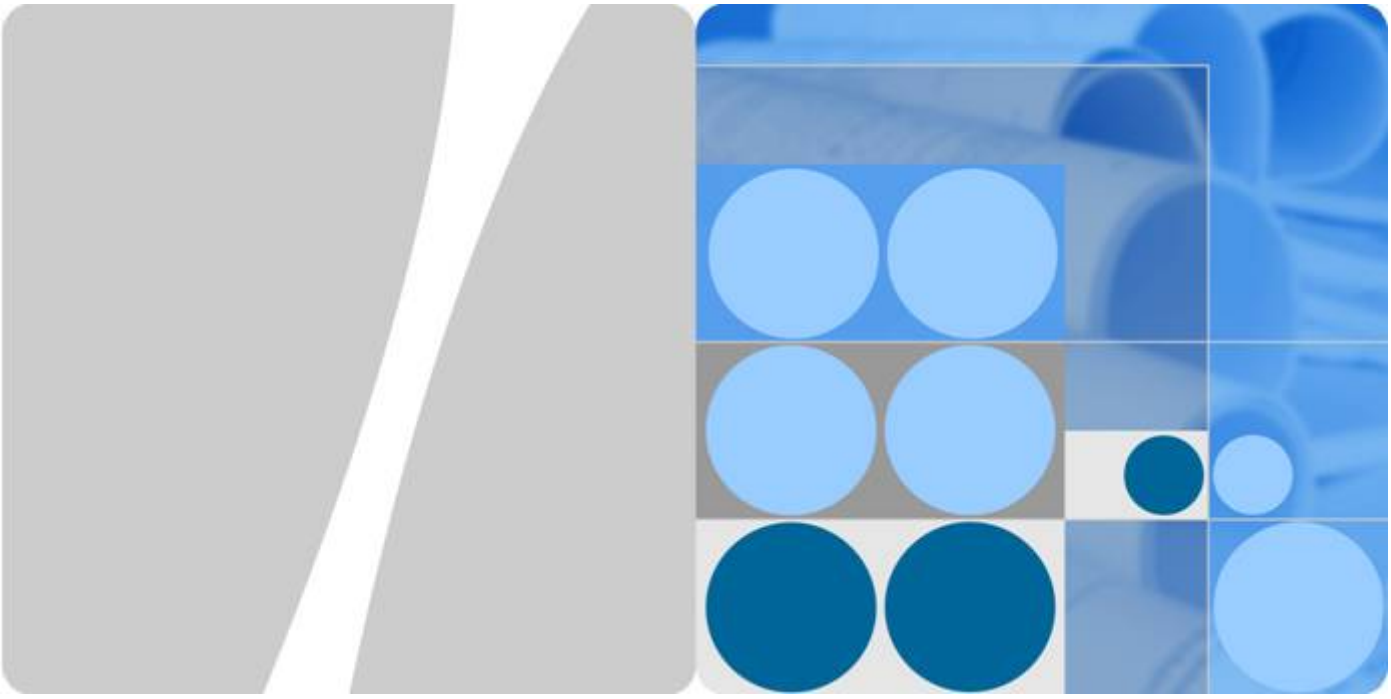

WLAN

# Product Description

Issue 04

Date 2020-03-08

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# About This Document

## Overview

This document describes the characteristics, application scenarios, hardware structure, and technical specifications of the following WLAN devices:

- WLAN access controllers (ACs)
- Wi-Fi 5 and Wi-Fi 6 access points (APs)

## Intended Audience

This document is intended for network engineers responsible for switch configuration and management. You should be familiar with basic Ethernet knowledge and have extensive experience in network deployment and management.

## Symbol Conventions

The symbols that may be found in this document are defined as follows.

| Symbol | Description |
| --- | --- |
| NOTICE | Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.<br>NOTICE is used to address practices not related to personal injury. |
| NOTE | Calls attention to important information, best practices and tips.<br>NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration. |

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# 1 Access Controllers

## About This Chapter



## 1.1 AC6003 Product Description

### 1.1.1 Product Characteristics (AC6003)

**NOTICE**

The AC6003 is a class A product. The AC6003 that is operating may cause radio interference. Customers need to take prevention measures.

Huawei AC6003-8 (AC6003 for short) is an access controller (AC) applicable to MANs and enterprise networks for wireless access. The AC6003 has a large capacity and high performance. It is highly reliable, easy to install and maintain, and features such advantages as flexible networking and energy conservation.

The AC6003 has the following features:

- Has various user policy management and authority control capabilities.

- Can be managed using the eSight, web system, or command line interface (CLI).

## Abundant Port Types

The AC6003 provides various ports to meet the requirements of all scenarios. **Table 1-1** lists the ports on the AC6003.

**Table 1-1** AC6003 port description

| Port Type | Quantity | Description |
| --- | --- | --- |
| Service port | 8 GE ports | Among the 8 electrical ports, the last two are used with two optical ports as combo interfaces. |
| Maintenance port | One RJ45 maintenance serial port | It is an RS-232 port. |
| | One USB port | The USB port is used to connect USB disks for deployment, configuration file transfer, and file upgrade. |

## Large Capacity, High Performance, Integrated Design

The AC6003 provides a large capacity and high performance, and adopts an integrated design to allow for flexible deployment.

- Large forwarding capacity: The AC6003 has 8 GE ports. It provides 20 Gbit/s switching capacity and 2 Gbit/s forwarding performance.

## Carrier-Class Reliability

The AC provides the following reliability designs, ensuring long-term operation.

- The AC supports port backup based on the Link Aggregation Control Protocol (LACP) or Multiple Spanning Tree Protocol (MSTP).
- The AC supports 1+1 hot backup.

## Easy-to-Install and Easy-to-Maintain

The AC is easy to install and maintain, simplifying network deployment.

- The AC dimensions (H x W x D) are 43.6 mm x 320 mm x 233.6 mm (1.72 in. x 12.60 in. x 9.20 in.), and the AC can be installed on a desk or in a standard IEC cabinet (19 inches).
- The built-in web system of the AC allows local GUI-based management.
- The AC can be managed by the eSight that provides various northbound interfaces.

- The AC supports the intra-board temperature probe, which monitors the operating environment of the AC in real time.

### Energy Conservation

The AC adopts the following measures to save energy:

- Low noise fans that can adjust the speed automatically are used, thus reducing noises in the system and power consumption of fans.
- The AC switches to the power saving mode when no connected device is detected on a service interface, that is, the interface is idle.
- It uses highly-integrated and energy-saving chips produced through advanced processing techniques. With the help of the intelligent device management system, the chips not only improve system performance but also greatly reduce power consumption of the entire system.

## 1.1.2 Application Scenarios (AC6003)

### 1.1.2.1 Bypass Networking

In bypass networking mode, the AC is connected to a network device (usually an aggregation switch) to manage APs.

The AC manages APs. Management flows are transmitted in CAPWAP tunnels, and data flows are forwarded to the upper layer network by the aggregation switch and do not pass through the AC.

### Tunnel Forwarding

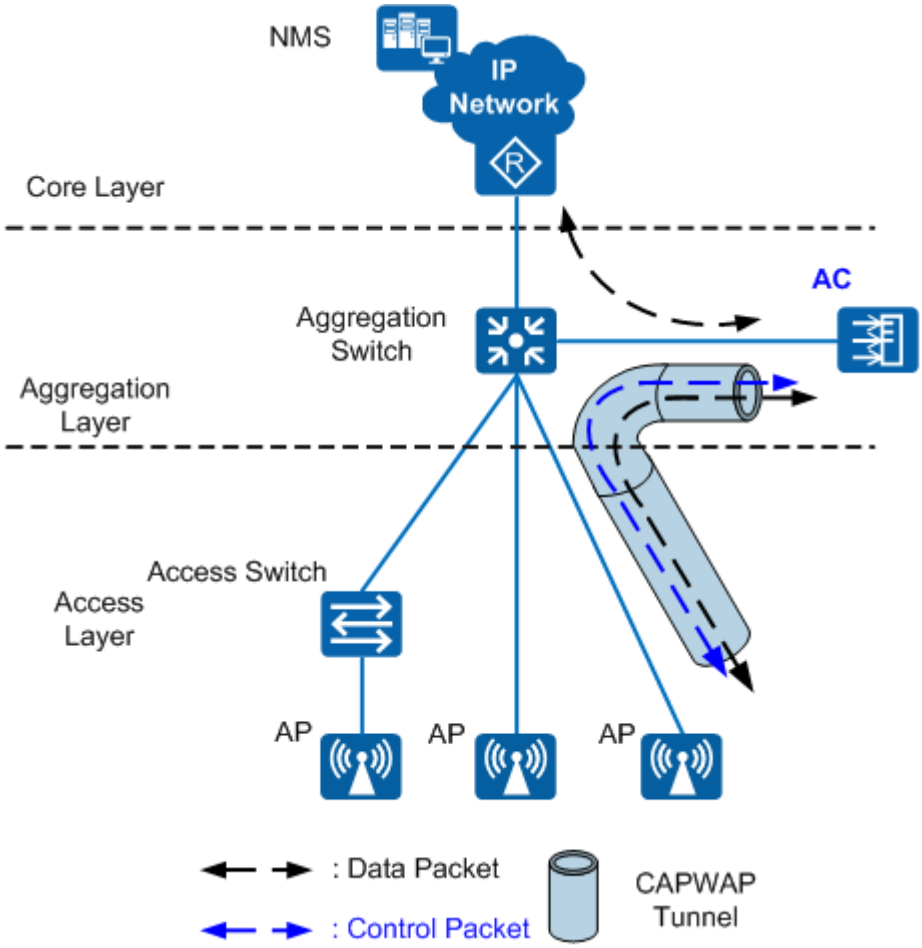
In tunnel forwarding mode, wireless data is transmitted between APs and ACs over CAPWAP tunnels.

In **Figure 1-1**, both management flows and data flows of APs are transmitted to the AC over CAPWAP tunnels, and then the AC transparently transmits these flows to the upstream device.

Tunnel forwarding is usually used to control wireless user traffic in a centralized manner. This forwarding mode facilitates device deployment and controls all wireless service data flows by aggregating traffic of all wireless users connected to APs to an AC through CAPWAP data tunnels.

**Figure 1-1** Bypass networking in tunnel forwarding mode



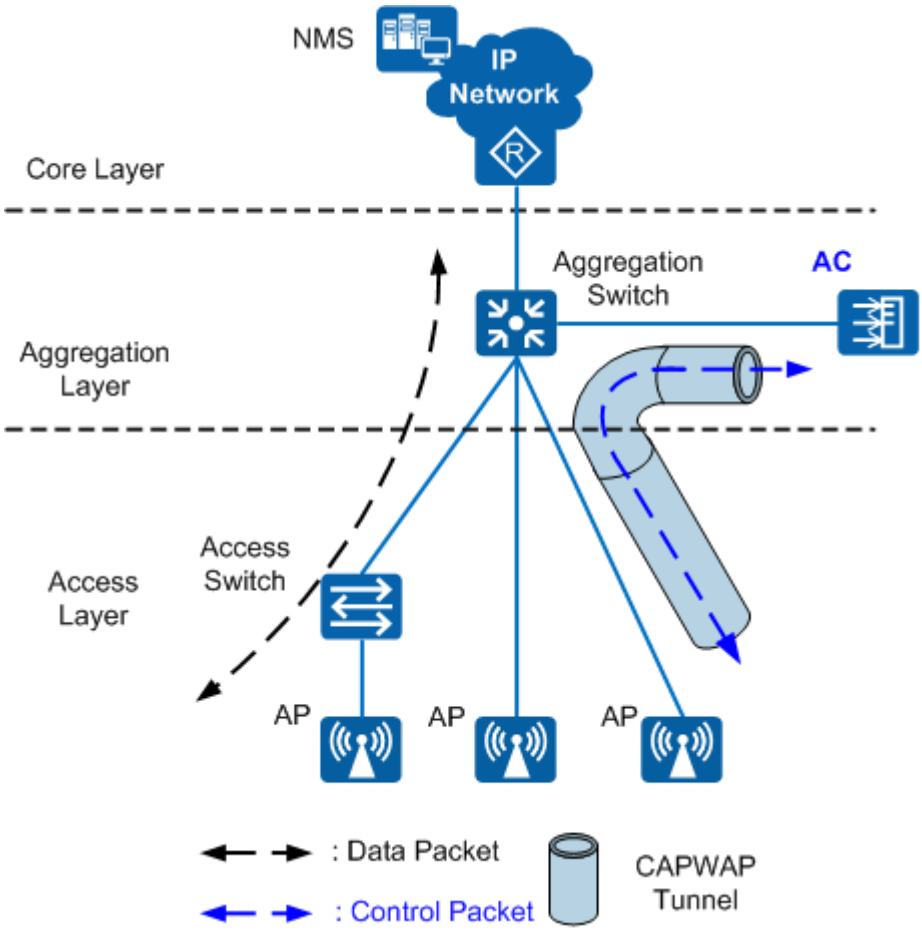

## Direct Forwarding

In direct forwarding mode, wireless data is translated from 802.3 packets into 802.11 packets, which are then forwarded by an uplink aggregation switch.

The bypass networking mode is often used on enterprise networks. Wireless data does not need to be processed by an AC, eliminating the bandwidth bottleneck and facilitating the usage of existing security policies. Therefore, this networking mode is recommended for integrated network deployment.

**Figure 1-2** Bypass networking in direct forwarding mode




- The AC only manages APs. All AP management flows (including authentication traffic) must arrive at the AC.

  Interfaces connected to the AC are reserved on the aggregation switch. The aggregation switch functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode or broadcast mode.
- Data flows from APs are forwarded by the Layer 2 switch and aggregation switch, and do not pass through the AC.

  Different service VLANs are assigned to STAs with different service set identifiers (SSIDs). The access switch and aggregation switch identify packets from these VLANs and forward these packets to the upstream device. The aggregation switch allocates IP addresses to STAs.

## Application

In bypass networking mode, the AC manages all the APs connected to the aggregation switch. This network topology applies to scenarios where APs are scattered across hot spots.

The bypass networking mode requires only a small modification to the existing network, facilitating device deployment. You can select the direct or tunnel forwarding mode according to networking requirements.

### 1.1.2.2 Inline Networking

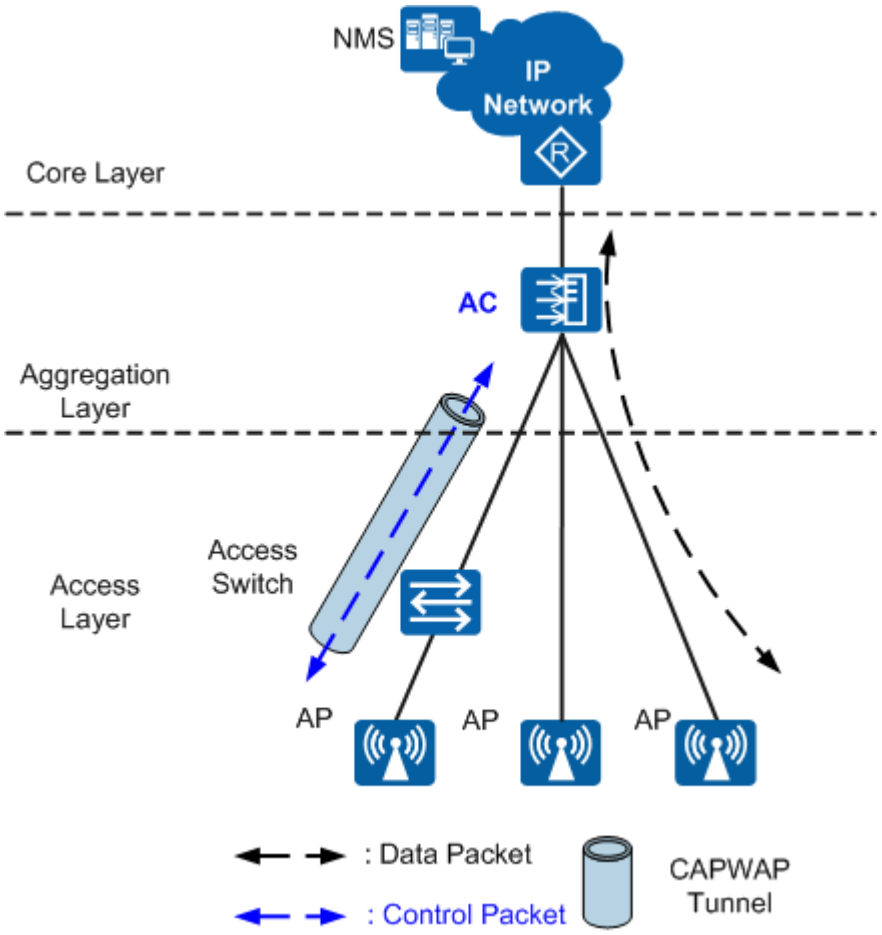
In inline networking mode, APs or access switches are directly connected to the AC. The AC also functions as an aggregation switch to forward and process APs' data and management services.

In inline networking mode, the AC sets up CAPWAP tunnels with APs to configure and manage these APs over CAPWAP tunnels. Service data of wireless users can be forwarded between APs and the AC over CAPWAP data tunnels or be directly forwarded by APs.

In inline networking mode, direct forwarding is often used so that service data can be forwarded on APs.

The AC functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode, or broadcast mode, and set up data tunnels with the AC.

**Figure 1-3** Data flows not transmitted in CAPWAP tunnels




In direct forwarding mode, only control flows are transmitted in CAPWAP tunnels, and data flows sent from APs are transparently transmitted to the upstream device by the AC, as shown in **Figure 1-3**.

When data flows are not transmitted in CAPWAP tunnels, configure management VLANs and data VLANs as follows:

- On the AC and its upstream devices, configure an AC management VLAN to transmit control flows between the AC and the NMS.
- On the switches between APs and the AC, configure AP management VLANs to transmit control flows between APs and the AC.
- On all switches between APs and the AC, configure data VLANs to differentiate WLAN data flows.

## Application

The AC provides powerful access, aggregation, and switching capabilities. Therefore, APs can directly connect to the AC. Direct forwarding is often used in inline networking mode. This networking mode simplifies the network architecture and applies to small- and medium-scale centralized WLANs.

## 1.1.2.3 Wireless Backhaul Networking

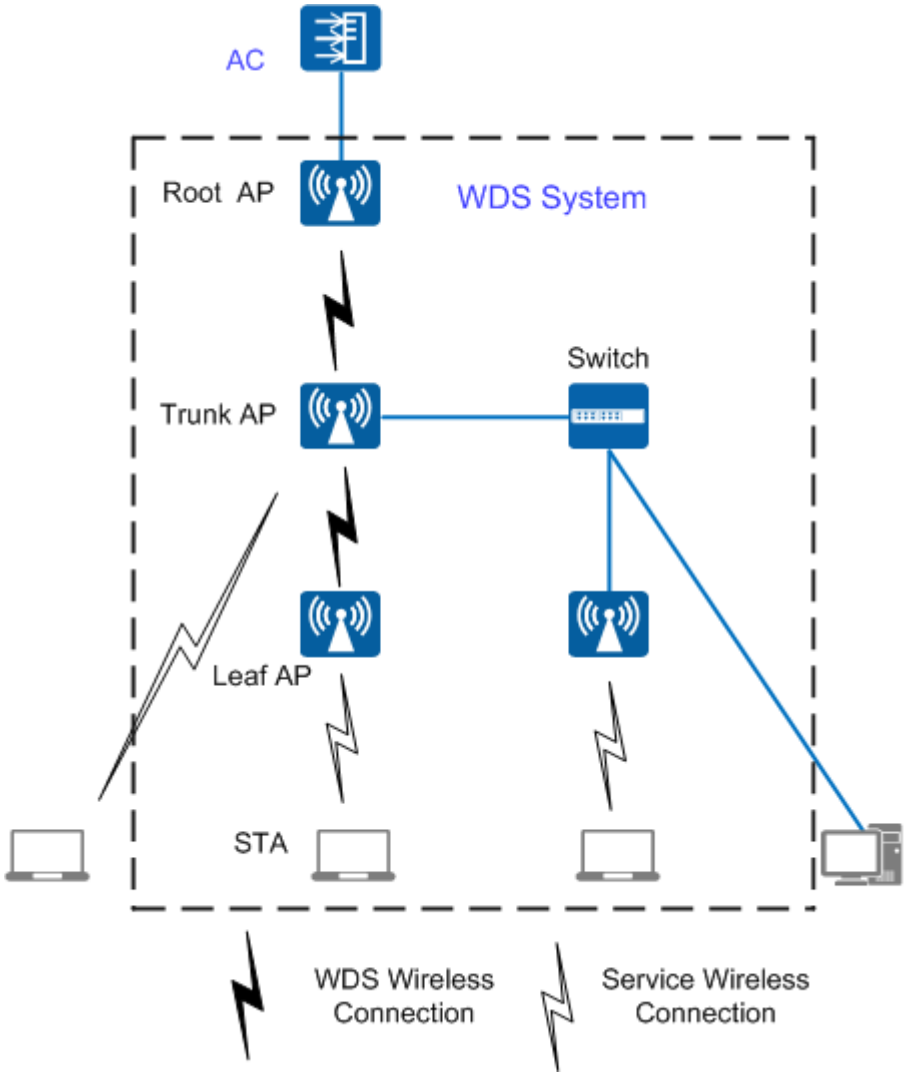
802.11 wireless technology has been widely used in home networks and enterprise networks. Users can easily access the Internet over WLANs. In this network application, APs must be connected to the existing wired network to provide network access services for wireless users. To expand the wireless coverage area, APs need to be connected using cables, switches, and power supplies. This increases network costs and prolongs network construction period. Wired deployment requirements may not be met in special circumstances. The Wireless Distribution System (WDS) or mesh technology allows APs to be connected wirelessly, facilitating WLAN construction in a complex environment.

## WDS

The WDS is a distribution system comprised of APs. The WDS connects to an AC on the network side, which is then connected to a network device such as a gateway or an aggregation switch. The WDS connects to a station (STA) or a wired network device (such as a PC) on the user side.

**Figure 1-4** WDS




On a WDS network, an AC manages the following devices:

- Root AP: connects to an AC on the wired side, and functions as a WDS master to connect to trunk APs or leaf APs.
- Trunk AP: functions as a WDS slave to connect to a root AP, connects to wired devices on the wired side, or functions as a WDS master to connect to leaf APs.
- Leaf AP: functions as a WDS slave to connect to a root AP or trunk AP or connects to STAs on the wireless side.

**NOTE**

Both the root AP and trunk AP can function as leaf APs.

The WDS networking can expand WLANs and applies to indoor wireless deployment scenarios.

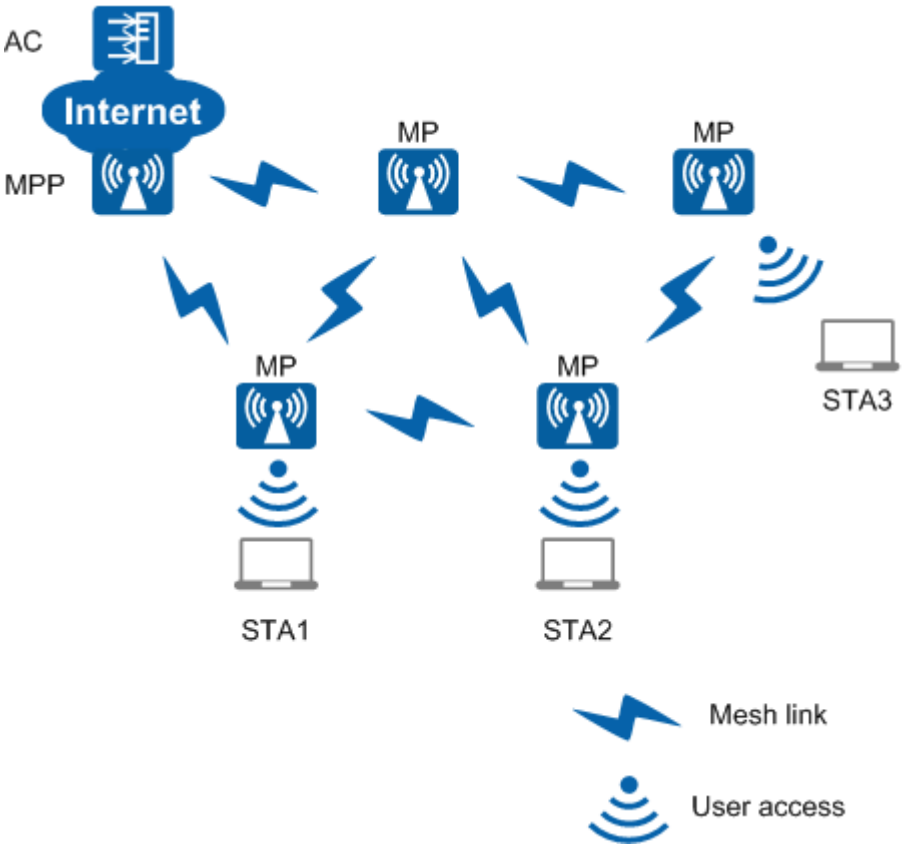
  

## WMN

Compared with a traditional WLAN, a Wireless Mesh Network (WMN) has the following advantages:

- Fast deployment: Mesh nodes can be easily installed to construct a WMN in a short time, much shorter than the construction period of a traditional WLAN.
- Dynamic coverage area expansion: As more mesh nodes are deployed on a WMN, the WMN coverage area can be rapidly expanded.
- Robustness: A WMN is a peer-to-peer network that will not be affected by the failure of a single node. If a node fails, packets are forwarded to the destination node along other paths.
- Flexible networking: An AP can directly join or leave a WMN, without the need of connections to infrastructure. This allows for flexible networking.
- Various application scenarios: Besides traditional WLAN scenarios such as enterprise networks, office networks, and campus networks, a WMN also applies to scenarios such as large-scale warehouses, docks, MANs, metro lines, and emergency communications.
- Cost-effectiveness: Only MPPs need to connect to a wired network, which minimizes the dependency of a WMN on wired devices and saves costs in wired device purchasing and cable deployment.

**Figure 1-5** WMN




Nodes on a WMN can be classified into the following types based on their functions:

- Mesh point (MP)

  A mesh-capable node that uses IEEE 802.11 MAC and physical layer protocols for wireless communication. This node supports automatic topology discovery, automatic route discovery, and data packet forwarding.

- Mesh portal point (MPP)

  An MP that connects to a WMN or another type of network. This node has the portal function and enables mesh nodes to communicate with external networks.

On a WMN, MPs are fully meshed to establish an auto-configured, and self-healing backbone WMN, and MPPs with the gateway function provide connections to the Internet. An MP provides access services and connects a STA to a WMN. A WMN uses special mesh routing protocols, which ensures high transmission quality. The WMN is applicable to scenarios that require high-bandwidth and highly stable Internet connections.

### 1.1.2.4 Dual-AC Networking

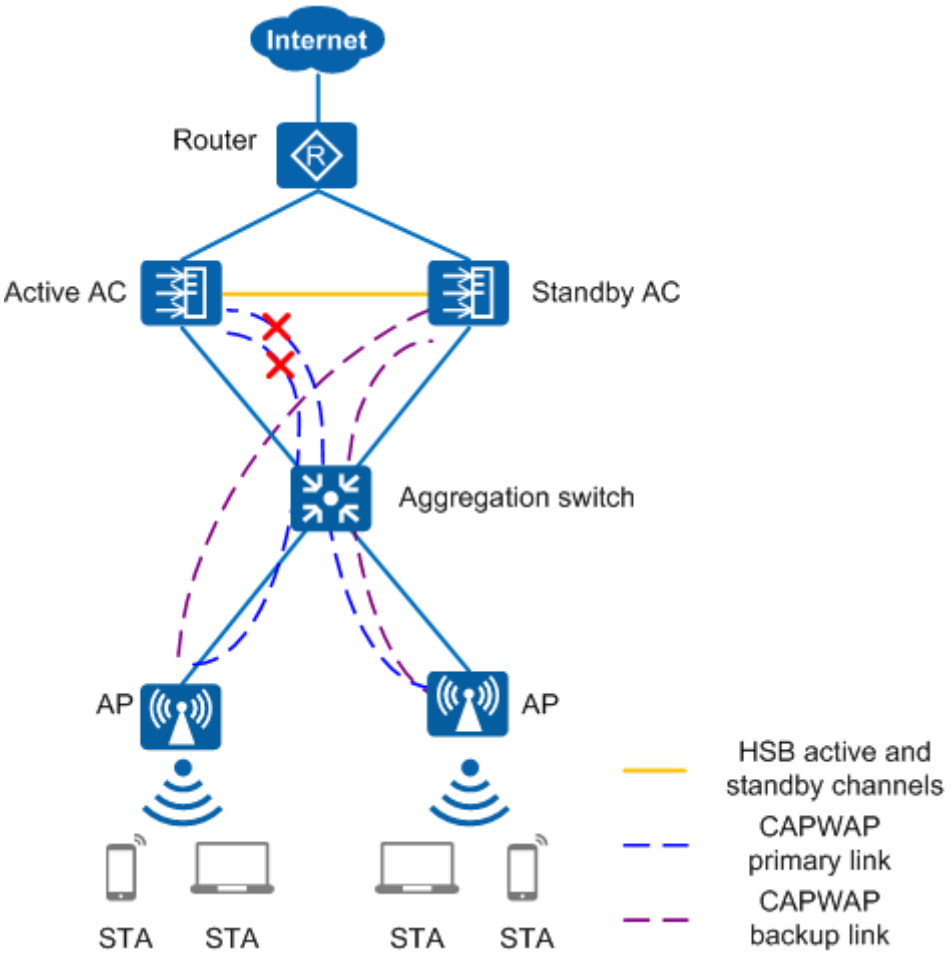
To ensure uninterrupted service forwarding, enterprises that require high reliability use active and standby ACs for networking.

Dual-AC backup can be implemented in two modes:

- HSB + dual-link backup: As shown in **Figure 1-6**, an AP establishes CAPWAP tunnels with both the active and standby ACs. The two ACs synchronize service information (such as NAC and WLAN service information) through the hot standby (HSB) function. When an AP is disconnected from the active AC, the AP notifies the standby AC of a switchover. This mode frees active and standby ACs from location restrictions and allows both ACs to be flexibly deployed. In this mode, the two ACs can implement load balancing to make efficient use of resources. However, service switching takes a relatively long time.

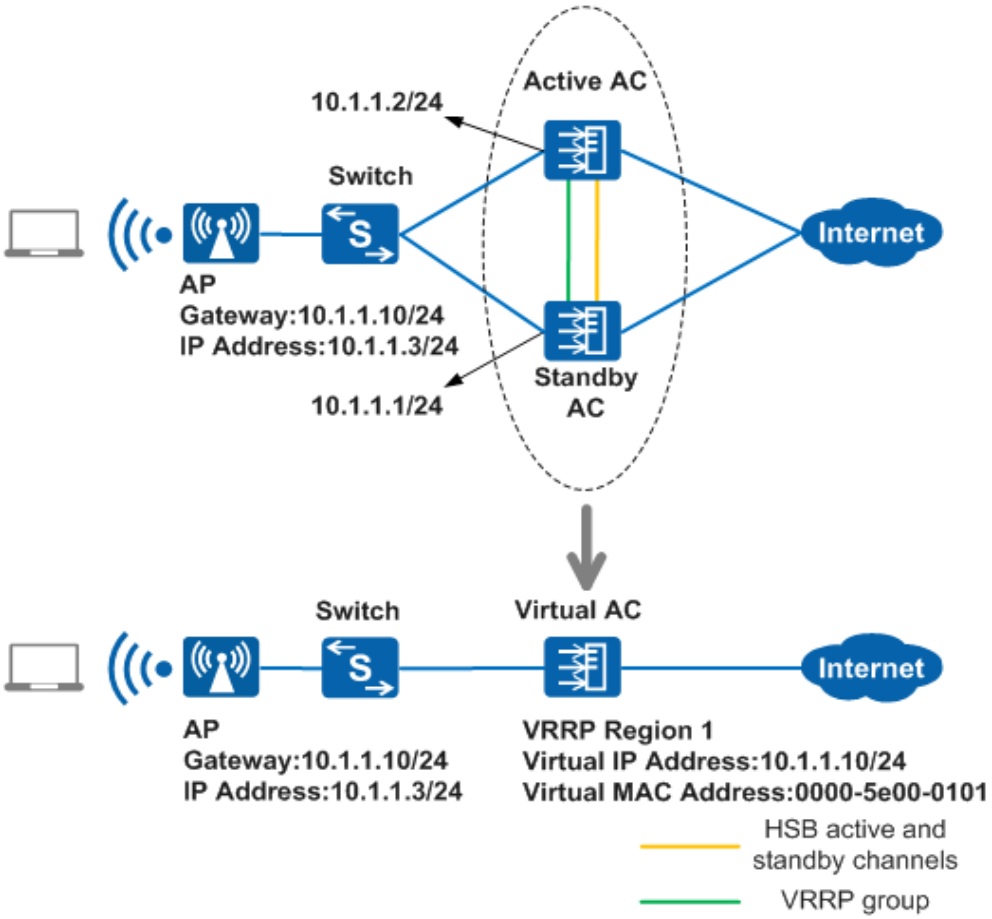
**Figure 1-6** HSB + dual-link backup networking




- HSB + VRRP: As shown in **Figure 1-7**, an AP obtains only the virtual IP address of both the active and standby ACs. The active AC backs up information including AP entries, CAPWAP link information, and user information on the standby AC. In this mode, the AP only detects the presence of one AC. The active/standby switchover is determined by the Virtual Router Redundancy Protocol (VRRP). Currently, this mode cannot be used in a VRRP multi-instance scenario. This mode restricts deployment locations of both ACs. Compared to HSB + dual-link backup, services can be switched faster in this mode.

**Figure 1-7** HSB + VRRP networking




## 1.1.2.5 Cloud AC Networking

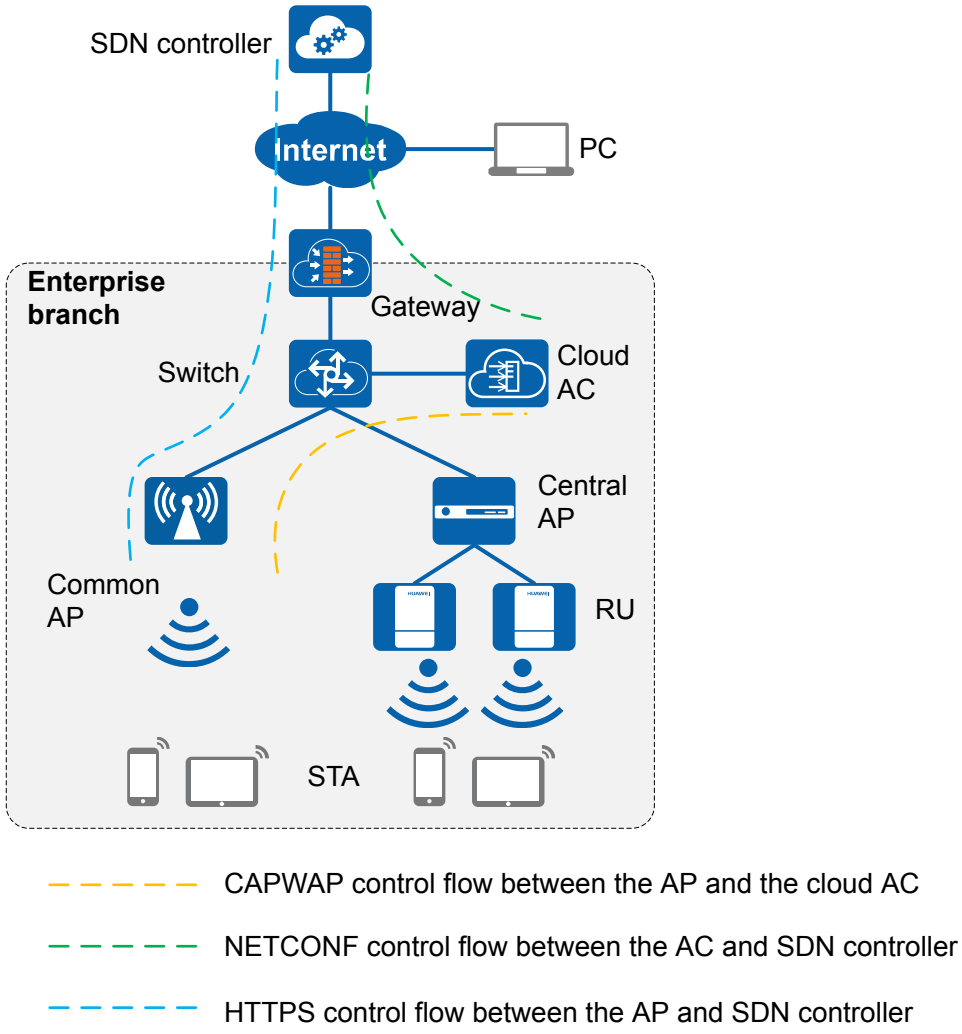
The cloud AC solution is suitable for medium- and large-sized sites with a large number of APs.

As shown in **Figure 1-8**, the AP in Fit mode registers with the AC through CAPWAP. The AC works in cloud mode and uses NETCONF to register with the SDN controller (CloudCampus@AC-Campus for ACs running V200R019C00 and earlier versions; iMaster NCE-Campus for ACs running V200R019C10 and later versions). The administrator can remotely manage the ACs and APs on the enterprise network to implement automatic WLAN deployment, service provisioning, and monitoring and O&M.

- Log in to the AC's web platform through the SDN controller to remotely configure services.
- Manage the status of ACs and APs on the SDN controller to learn about performance and service statistics in real time.

**Figure 1-8** Typical cloud AC networking diagram




## 1.1.3 Product Structure (AC6003)

### Appearance and Structure

Currently, the AC6003 series only has one model AC6003-8 (AC6003 for short).

**Figure 1-9** and **Figure 1-10** show the appearance of the AC6003.

**Figure 1-9** Appearance of the AC6003 (front view)

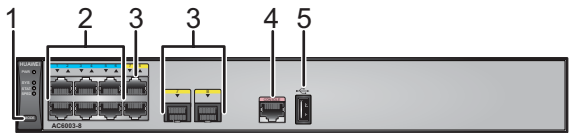
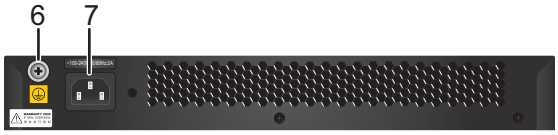


**Figure 1-10** Appearance of the AC6003 (rear view)




| No. | Description |
| --- | --- |
| 1 | MODE button: switches the working mode of service port indicators. |
| 2 | Six 10/100/1000BASE-T Ethernet electrical ports.<br>Support 10M/100M/1000M auto-sensing. |
| 3 | Two pairs of combo ports.<br>When being used as an electrical port, it supports 10M/100M/1000M auto-sensing. |
| 4 | Console port. |
| 5 | USB port. |
| 6 | Ground point. |
| 7 | AC power jack. |

## Indicator Description

Figure 1-11 shows the indicators on the AC6003 front panel.

**Figure 1-11** Indicators on the AC6003 front panel

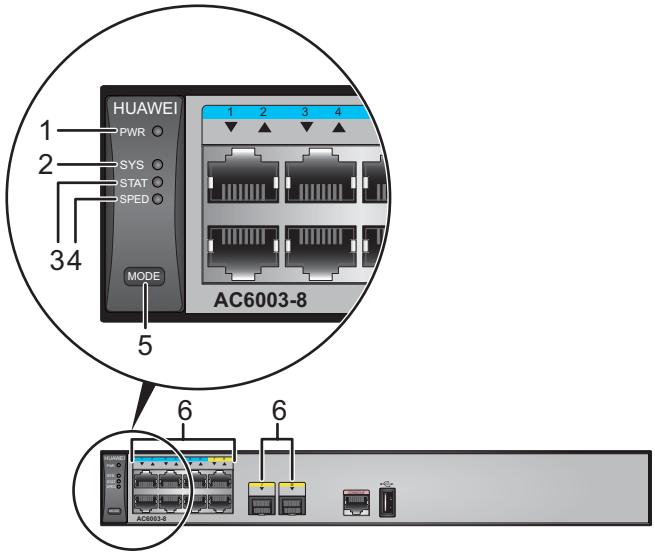


Table 1-2 describes indicators on the AC6003 front panel.

NOTE

Indicator colors may vary slightly at different temperature.

**Table 1-2** Description of indicators on the AC6003 front panel

| No. | Indicator/ Button | Status | Description |
| --- | --- | --- | --- |
| 1 | PWR: power indicator | Off | The device is powered off. |
| | | Steady green | The power supply is working properly. |
| 2 | SYS: system status indicator | Off | The system is not running. |
| | | Green | • Fast blinking: The system is starting.<br>• Slow blinking: The system is running properly. |
| | | Steady red | The system cannot start normally, or an overheat alarm or fan alarm is generated. |
| 3 | STAT: state mode indicator | Off | The state mode is not selected. |
| | | Steady green | The service port indicator works in the default mode (STAT). In this mode, the indicator indicates the port status. |
| 4 | SPED: speed mode indicator | Off | The speed mode is not selected. |
| | | Steady green | The service port indicator indicates the port speed. After 45 seconds, the service port indicator automatically restores to the default mode (STAT). |
| 5 | MODE: mode switch button | – | • When you press the button once, the SPED indicator turns green and the service port indicators indicate the speed of the ports.<br>• When you press the button for a second time, the STAT indicator turns green.<br>If you do not press the button within 45 seconds, the indicators restore to the default mode. That is, the STAT indicator turns green, and the SPED indicator is off. |

| No. | Indicator/ Button | Status | Description |
| --- | --- | --- | --- |
| 6 | Service port indicator<br>• GE electrical ports: The first indicator indicates the status of the lower left port. The indicators correspond to the ports from bottom to top and from left to right.<br>• GE optical ports: Each optical port has a corresponding indicator above it. | Meanings of service port indicators vary in different modes. For details, see **Table 1-3**. | |

**Table 1-3** Description of service port indicators in different modes

| Mode | Status | Description |
| --- | --- | --- |
| STAT | Off | No link has been established to the port or the port has been shut down. |
| | Green | • Steady on: A link has been established to the port.<br>• Blinking: The port is sending or receiving data. |
| SPED | Off | No link has been established to the port or the port has been shut down. |
| | Green | • Steady on: The port is working at 10 or 100 Mbit/s.<br>• Blinking: The port is working at 1000 Mbit/s. |

## Physical Specifications

**Table 1-4** Physical specifications

| Item | | Description |
| --- | --- | --- |
| Dimensions and weight | Dimensions (H x W x D) | 43.6 mm x 320 mm x 233.6 mm |
| | Maximum weight (standard configuration) | 2.9 kg |
| Power specifications | Maximum power consumption | 25.6 W |
| | AC input voltage | • Rated voltage range: 100 V AC to 240 V AC, 50/60 Hz<br>• Maximum voltage range: 90 V AC to 264 V AC, 47 Hz to 63 Hz |
| Environment specifications | Operating temperature and altitude | • -60 m to +1800 m: -5°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |

| Item | | Description |
| --- | --- | --- |
| | Relative humidity | 5% RH to 95% RH, noncondensing |
| | Operating altitude | -60 m to +5000 m |

### 1.1.4 Performance Specifications (AC6003)

For AC performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AC model, or query the specifications using **Info-Finder**.

## 1.2 AC6005 Product Description

### 1.2.1 Product Characteristics (AC6005)

**NOTICE**

The AC6005 is a class A product. The AC6005 that is operating may cause radio interference. Customers need to take prevention measures.

Huawei AC6005 series (AC6005 for short) is an access controller (AC) applicable to MANs and enterprise networks for wireless access. The AC6005 has a large capacity and high performance. It is highly reliable, easy to install and maintain, and features such advantages as flexible networking and energy conservation.

Huawei AC6005 series has two models: AC6005-8 and AC6005-8-PWR.

The AC6005 has the following features:

- The AC6005-8-PWR provides PoE power (15.4 W) for 8 interfaces or PoE+ power (30 W) for 4 interfaces so that APs can directly connect to these interfaces.
- Has various user policy management and authority control capabilities.
- Can be managed using the eSight, web system, or command line interface.

#### Abundant Port Types

The AC6005 provides various ports to meet the requirements of all scenarios. **Table 1-5** lists the ports on the AC6005.

**Table 1-5** AC6005 port description

| Port Type | Quantity | Description |
| --- | --- | --- |
| Service port | Eight GE ports | Among the eight electrical ports, the last two are used with two optical ports as combo interfaces. |
| Maintenance port | One RJ45 maintenance serial port | It is an RS-232 port. |
| | One USB port | The USB port is used to connect USB disks for deployment, configuration file transfer, and file upgrade. |

## Large Capacity, High Performance, Integrated Design

The AC provides a large capacity and high performance, and adopts an integrated design to allow for flexible deployment.

- Large forwarding capacity: The AC has eight GE ports. It provides 20 Gbit/s switching capacity and 4 Gbit/s forwarding performance.
- PoE: The AC supports the PoE function and can provide the maximum power on eight ports. This PoE capability can provide power to APs and other powered devices (PDs) connected to the AC.

## Carrier-Class Reliability

The AC provides the following reliability designs, ensuring long-term operation.

- The AC supports port backup based on the Link Aggregation Control Protocol (LACP) or Multiple Spanning Tree Protocol (MSTP).
- The AC supports 1+1 hot backup.

## Easy-to-Install and Easy-to-Maintain

The AC is easy to install and maintain, simplifying network deployment.

- The AC dimensions (H x W x D) are 43.6 mm x 320 mm x 233.6 mm (1.72 in. x 12.60 in. x 9.20 in.), and the AC can be installed on a desk or in a standard IEC cabinet (19 inches).
- The built-in web system of the AC allows local GUI-based management.
- The AC can be managed by the eSight that provides various northbound interfaces.
- The AC supports the intra-board temperature probe, which monitors the operating environment of the AC in real time.

### Energy Conservation

The AC adopts the following measures to save energy:

- Low noise fans that can adjust the speed automatically are used, thus reducing noises in the system and power consumption of fans.
- The AC switches to the power saving mode when no connected device is detected on a service interface, that is, the interface is idle.
- It uses highly-integrated and energy-saving chips produced through advanced processing techniques. With the help of the intelligent device management system, the chips not only improve system performance but also greatly reduce power consumption of the entire system.

## 1.2.2 Application Scenarios (AC6005)

### 1.2.2.1 Bypass Networking

In bypass networking mode, the AC is connected to a network device (usually an aggregation switch) to manage APs.

The AC manages APs. Management flows are transmitted in CAPWAP tunnels, and data flows are forwarded to the upper layer network by the aggregation switch and do not pass through the AC.

### Tunnel Forwarding

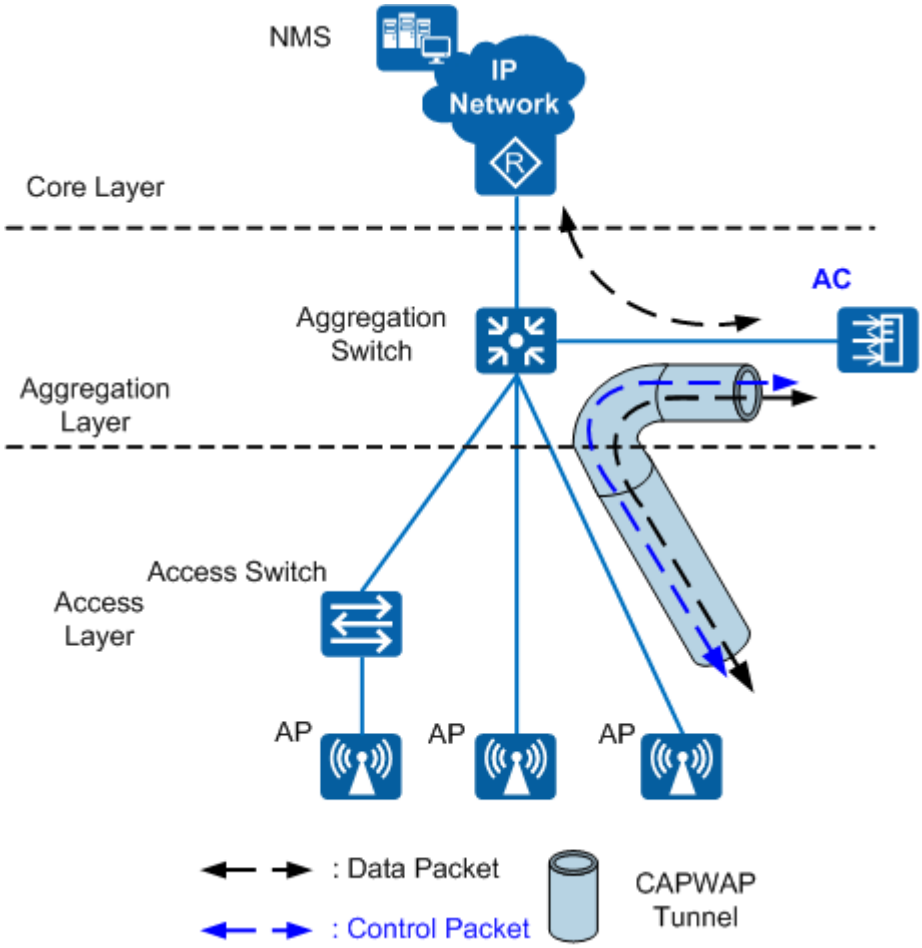
In tunnel forwarding mode, wireless data is transmitted between APs and ACs over CAPWAP tunnels.

In **Figure 1-12**, both management flows and data flows of APs are transmitted to the AC over CAPWAP tunnels, and then the AC transparently transmits these flows to the upstream device.

Tunnel forwarding is usually used to control wireless user traffic in a centralized manner. This forwarding mode facilitates device deployment and controls all wireless service data flows by aggregating traffic of all wireless users connected to APs to an AC through CAPWAP data tunnels.

**Figure 1-12** Bypass networking in tunnel forwarding mode



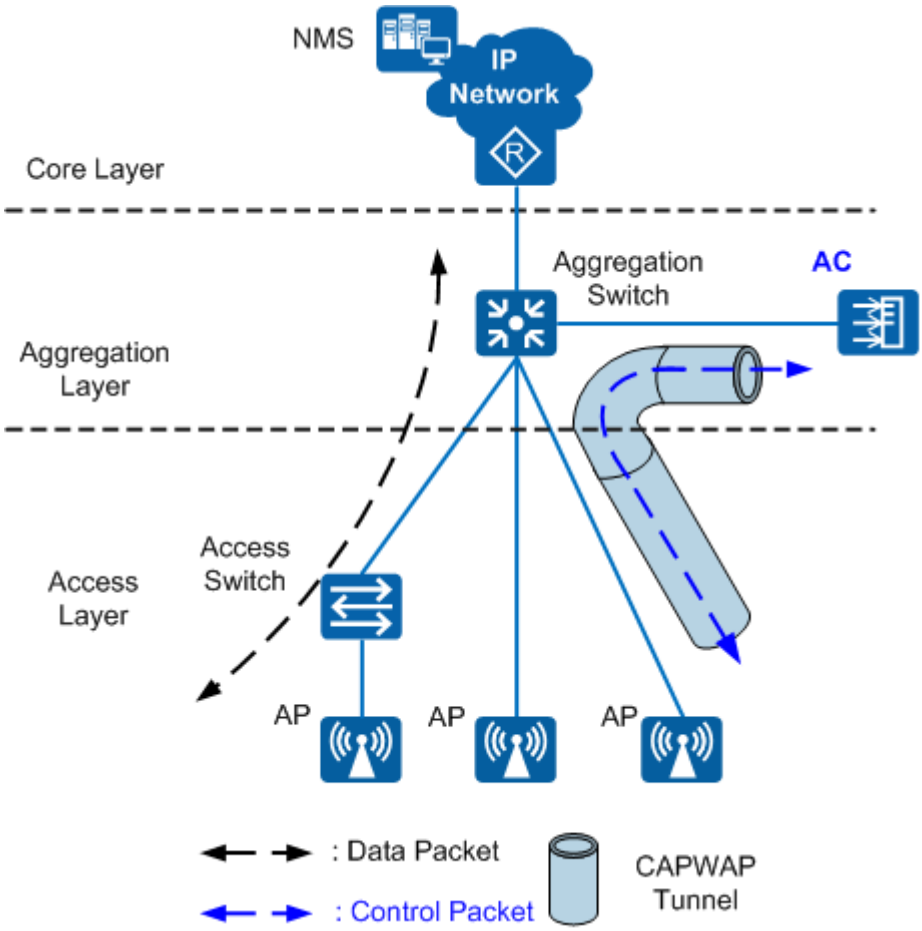

## Direct Forwarding

In direct forwarding mode, wireless data is translated from 802.3 packets into 802.11 packets, which are then forwarded by an uplink aggregation switch.

The bypass networking mode is often used on enterprise networks. Wireless data does not need to be processed by an AC, eliminating the bandwidth bottleneck and facilitating the usage of existing security policies. Therefore, this networking mode is recommended for integrated network deployment.

**Figure 1-13** Bypass networking in direct forwarding mode




- The AC only manages APs. All AP management flows (including authentication traffic) must arrive at the AC.

  Interfaces connected to the AC are reserved on the aggregation switch. The aggregation switch functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode or broadcast mode.
- Data flows from APs are forwarded by the Layer 2 switch and aggregation switch, and do not pass through the AC.

  Different service VLANs are assigned to STAs with different service set identifiers (SSIDs). The access switch and aggregation switch identify packets from these VLANs and forward these packets to the upstream device. The aggregation switch allocates IP addresses to STAs.

## Application

In bypass networking mode, the AC manages all the APs connected to the aggregation switch. This network topology applies to scenarios where APs are scattered across hot spots.

The bypass networking mode requires only a small modification to the existing network, facilitating device deployment. You can select the direct or tunnel forwarding mode according to networking requirements.

### 1.2.2.2 Inline Networking

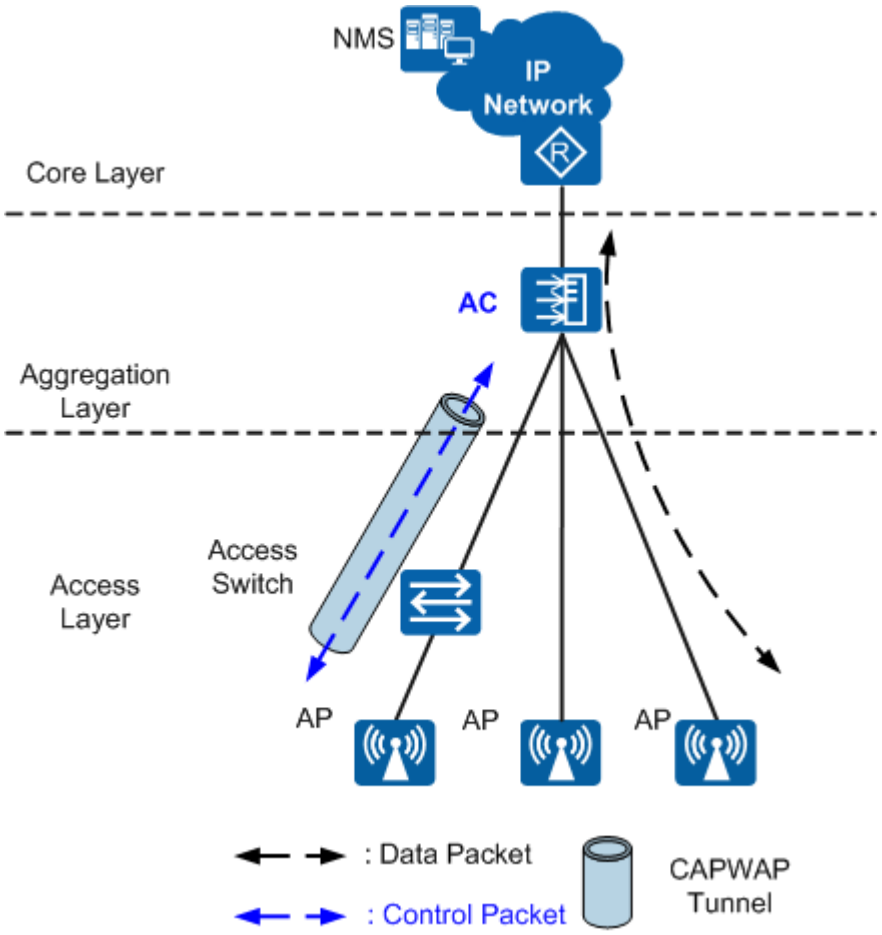
In inline networking mode, APs or access switches are directly connected to the AC. The AC also functions as an aggregation switch to forward and process APs' data and management services.

In inline networking mode, the AC sets up CAPWAP tunnels with APs to configure and manage these APs over CAPWAP tunnels. Service data of wireless users can be forwarded between APs and the AC over CAPWAP data tunnels or be directly forwarded by APs.

In inline networking mode, direct forwarding is often used so that service data can be forwarded on APs.

The AC functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode, or broadcast mode, and set up data tunnels with the AC.

**Figure 1-14** Data flows not transmitted in CAPWAP tunnels




In direct forwarding mode, only control flows are transmitted in CAPWAP tunnels, and data flows sent from APs are transparently transmitted to the upstream device by the AC, as shown in **Figure 1-14**.

When data flows are not transmitted in CAPWAP tunnels, configure management VLANs and data VLANs as follows:

- On the AC and its upstream devices, configure an AC management VLAN to transmit control flows between the AC and the NMS.
- On the switches between APs and the AC, configure AP management VLANs to transmit control flows between APs and the AC.
- On all switches between APs and the AC, configure data VLANs to differentiate WLAN data flows.

## Application

The AC provides powerful access, aggregation, and switching capabilities. Therefore, APs can directly connect to the AC. Direct forwarding is often used in inline networking mode. This networking mode simplifies the network architecture and applies to small- and medium-scale centralized WLANs.

## 1.2.2.3 Wireless Backhaul Networking

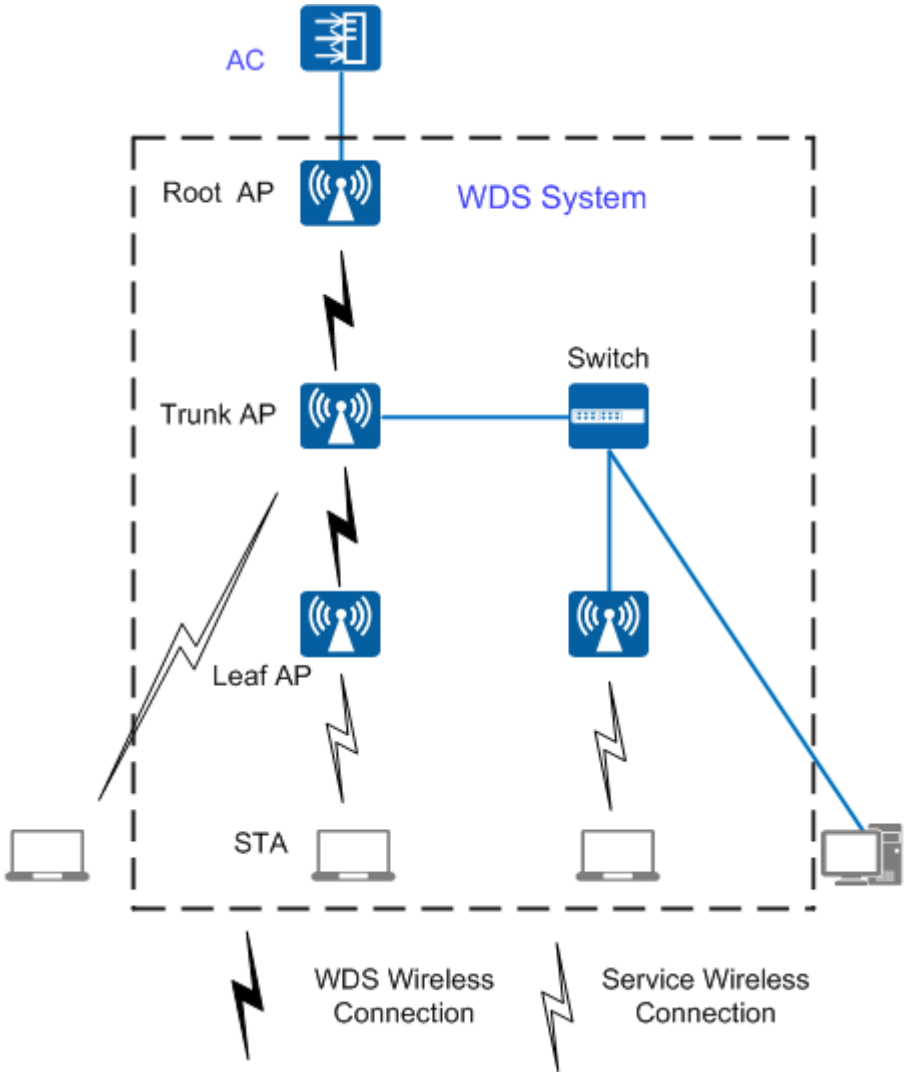
802.11 wireless technology has been widely used in home networks and enterprise networks. Users can easily access the Internet over WLANs. In this network application, APs must be connected to the existing wired network to provide network access services for wireless users. To expand the wireless coverage area, APs need to be connected using cables, switches, and power supplies. This increases network costs and prolongs network construction period. Wired deployment requirements may not be met in special circumstances. The Wireless Distribution System (WDS) or mesh technology allows APs to be connected wirelessly, facilitating WLAN construction in a complex environment.

## WDS

The WDS is a distribution system comprised of APs. The WDS connects to an AC on the network side, which is then connected to a network device such as a gateway or an aggregation switch. The WDS connects to a station (STA) or a wired network device (such as a PC) on the user side.

**Figure 1-15** WDS




On a WDS network, an AC manages the following devices:

- Root AP: connects to an AC on the wired side, and functions as a WDS master to connect to trunk APs or leaf APs.
- Trunk AP: functions as a WDS slave to connect to a root AP, connects to wired devices on the wired side, or functions as a WDS master to connect to leaf APs.
- Leaf AP: functions as a WDS slave to connect to a root AP or trunk AP or connects to STAs on the wireless side.

**NOTE**

Both the root AP and trunk AP can function as leaf APs.

The WDS networking can expand WLANs and applies to indoor wireless deployment scenarios.

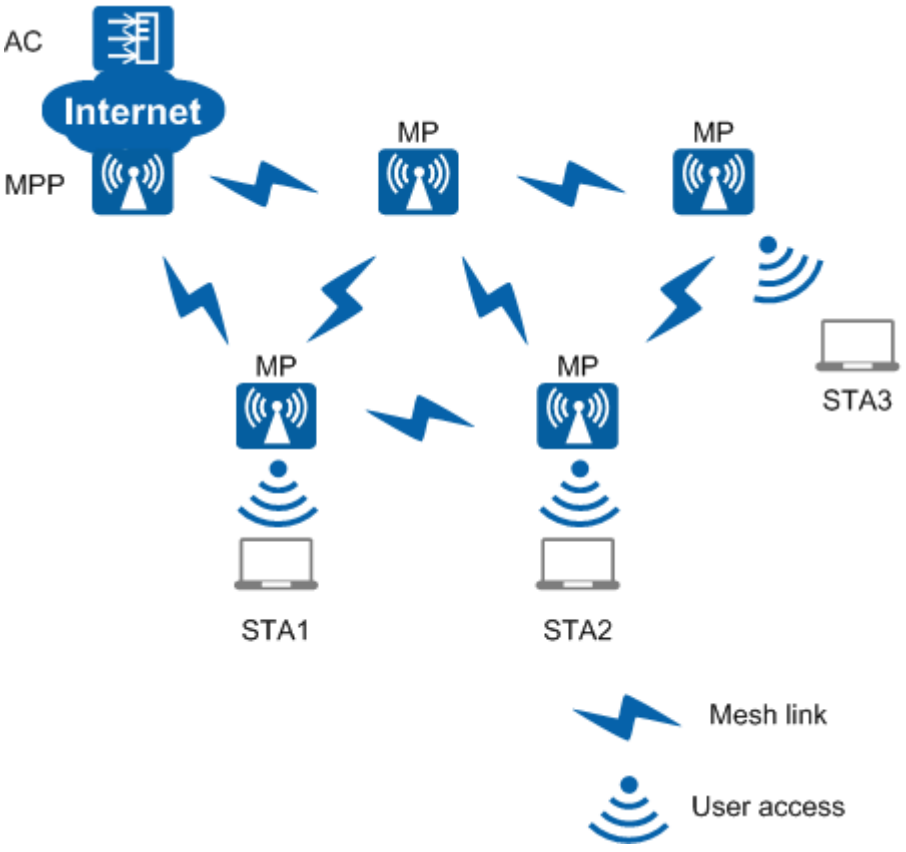
  

## WMN

Compared with a traditional WLAN, a Wireless Mesh Network (WMN) has the following advantages:

- Fast deployment: Mesh nodes can be easily installed to construct a WMN in a short time, much shorter than the construction period of a traditional WLAN.
- Dynamic coverage area expansion: As more mesh nodes are deployed on a WMN, the WMN coverage area can be rapidly expanded.
- Robustness: A WMN is a peer-to-peer network that will not be affected by the failure of a single node. If a node fails, packets are forwarded to the destination node along other paths.
- Flexible networking: An AP can directly join or leave a WMN, without the need of connections to infrastructure. This allows for flexible networking.
- Various application scenarios: Besides traditional WLAN scenarios such as enterprise networks, office networks, and campus networks, a WMN also applies to scenarios such as large-scale warehouses, docks, MANs, metro lines, and emergency communications.
- Cost-effectiveness: Only MPPs need to connect to a wired network, which minimizes the dependency of a WMN on wired devices and saves costs in wired device purchasing and cable deployment.

**Figure 1-16** WMN




Nodes on a WMN can be classified into the following types based on their functions:

- Mesh point (MP)

  A mesh-capable node that uses IEEE 802.11 MAC and physical layer protocols for wireless communication. This node supports automatic topology discovery, automatic route discovery, and data packet forwarding.

- Mesh portal point (MPP)

  An MP that connects to a WMN or another type of network. This node has the portal function and enables mesh nodes to communicate with external networks.

On a WMN, MPs are fully meshed to establish an auto-configured, and self-healing backbone WMN, and MPPs with the gateway function provide connections to the Internet. An MP provides access services and connects a STA to a WMN. A WMN uses special mesh routing protocols, which ensures high transmission quality. The WMN is applicable to scenarios that require high-bandwidth and highly stable Internet connections.

### 1.2.2.4 Dual-AC Networking

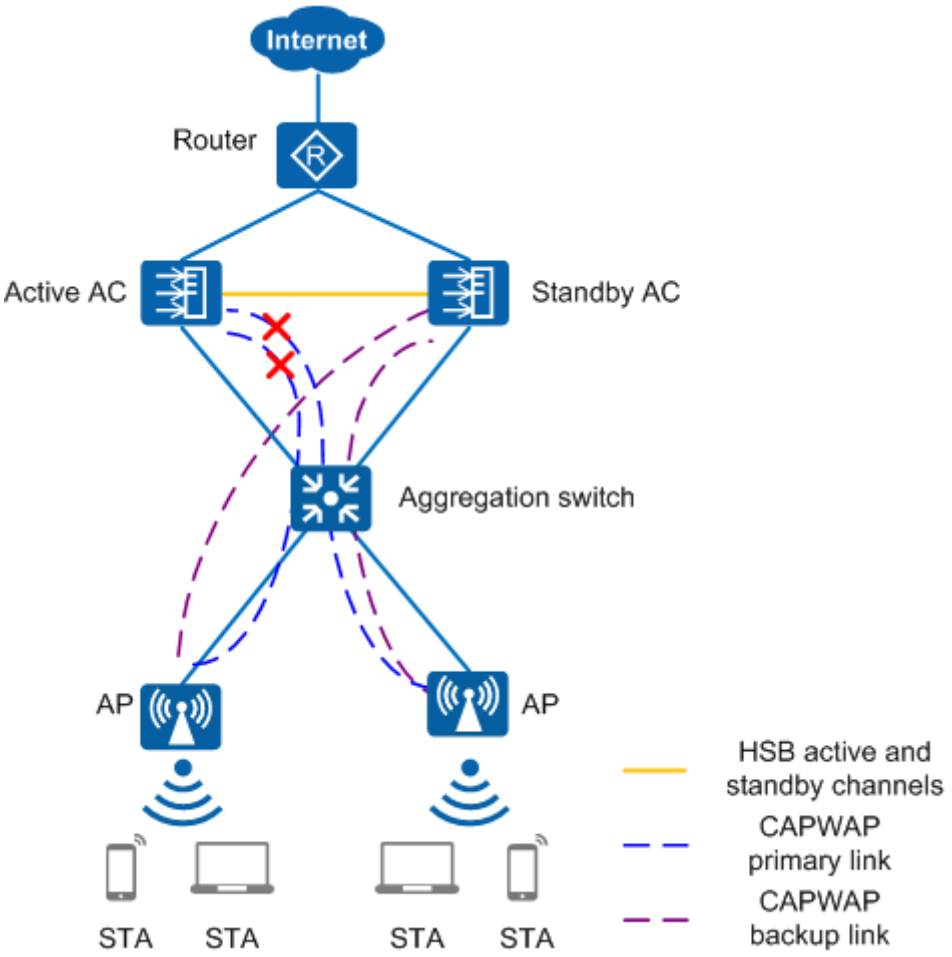
To ensure uninterrupted service forwarding, enterprises that require high reliability use active and standby ACs for networking.

Dual-AC backup can be implemented in two modes:

- HSB + dual-link backup: As shown in **Figure 1-17**, an AP establishes CAPWAP tunnels with both the active and standby ACs. The two ACs synchronize service information (such as NAC and WLAN service information) through the hot standby (HSB) function. When an AP is disconnected from the active AC, the AP notifies the standby AC of a switchover. This mode frees active and standby ACs from location restrictions and allows both ACs to be flexibly deployed. In this mode, the two ACs can implement load balancing to make efficient use of resources. However, service switching takes a relatively long time.

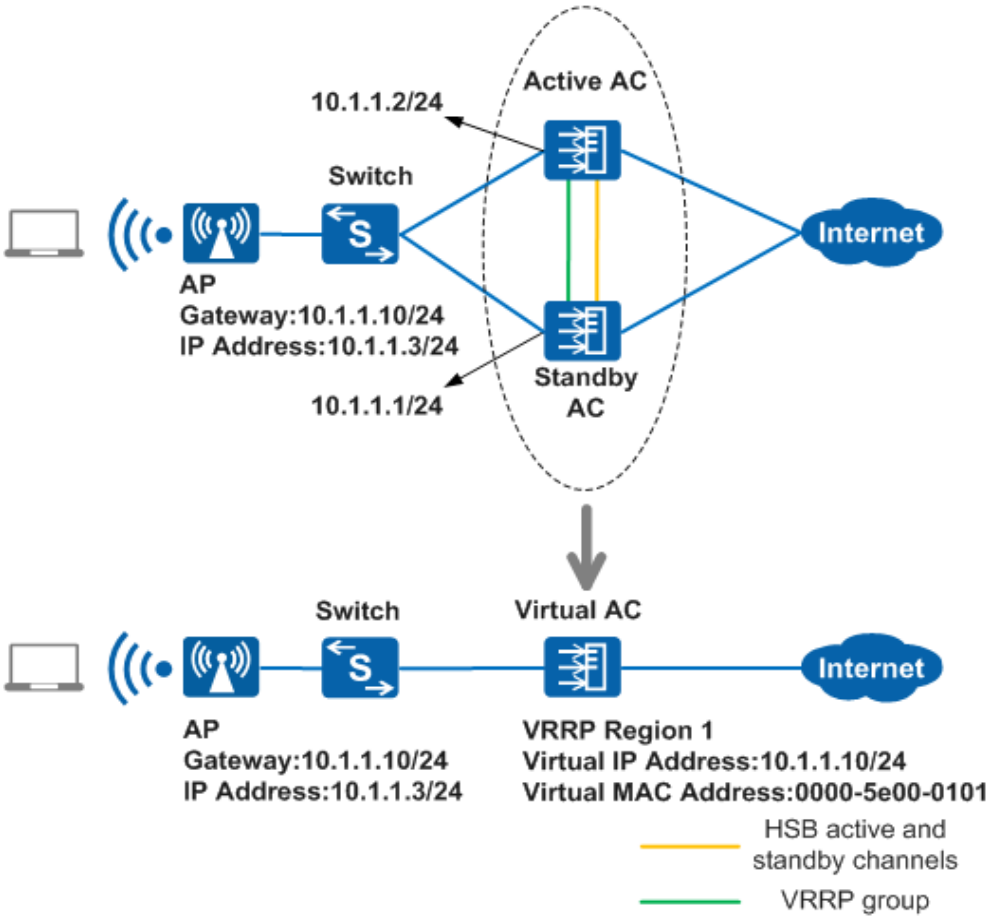
**Figure 1-17** HSB + dual-link backup networking




- HSB + VRRP: As shown in **Figure 1-18**, an AP obtains only the virtual IP address of both the active and standby ACs. The active AC backs up information including AP entries, CAPWAP link information, and user information on the standby AC. In this mode, the AP only detects the presence of one AC. The active/standby switchover is determined by the Virtual Router Redundancy Protocol (VRRP). Currently, this mode cannot be used in a VRRP multi-instance scenario. This mode restricts deployment locations of both ACs. Compared to HSB + dual-link backup, services can be switched faster in this mode.

**Figure 1-18** HSB + VRRP networking




## 1.2.2.5 Cloud AC Networking

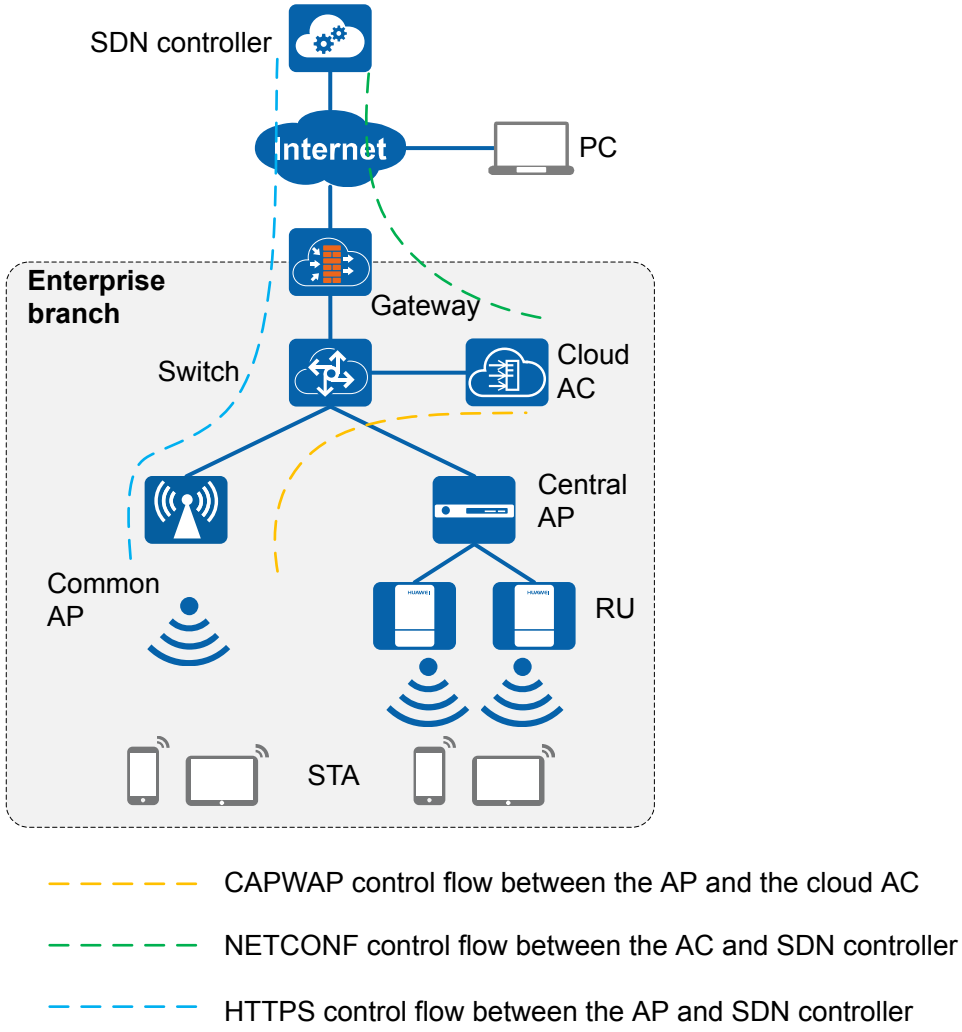
The cloud AC solution is suitable for medium- and large-sized sites with a large number of APs.

As shown in **Figure 1-19**, the AP in Fit mode registers with the AC through CAPWAP. The AC works in cloud mode and uses NETCONF to register with the SDN controller (CloudCampus@AC-Campus for ACs running V200R019C00 and earlier versions; iMaster NCE-Campus for ACs running V200R019C10 and later versions). The administrator can remotely manage the ACs and APs on the enterprise network to implement automatic WLAN deployment, service provisioning, and monitoring and O&M.

- Log in to the AC's web platform through the SDN controller to remotely configure services.
- Manage the status of ACs and APs on the SDN controller to learn about performance and service statistics in real time.

**Figure 1-19** Typical cloud AC networking diagram




## 1.2.3 Product Structure (AC6005)

### Appearance and Structure

The AC6005 series has two models: AC6005-8 and AC6005-8-PWR.

**Table 1-6** and **Table 1-7** show the appearance of the AC6005.

**Table 1-6** Appearance of the AC6005 (front view)

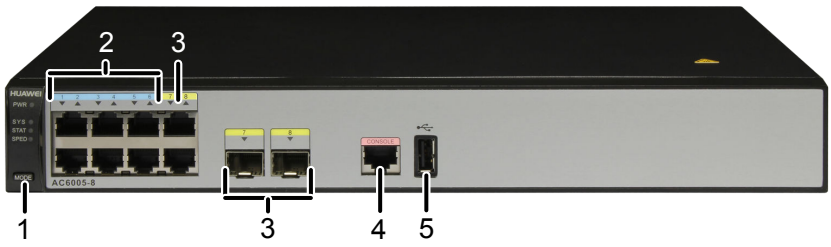
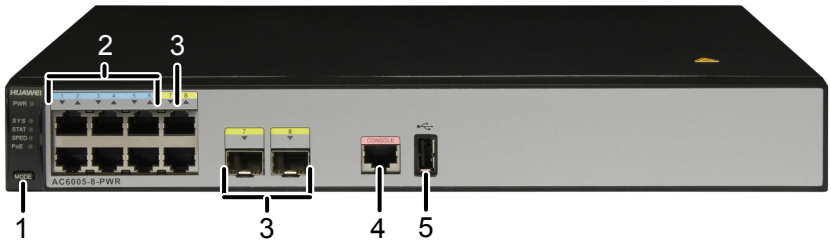
| Model | Appearance |
| --- | --- |
| AC6005-8 |  |
| AC6005-8-PWR |  |

**Table 1-7** Appearance of the AC6005 (rear view)

| Model | Appearance |
| --- | --- |
| AC6005-8 |  |
| AC6005-8-PWR |  |

| No. | Description |
| --- | --- |
| 1 | MODE button: switches the working mode of service port indicators. |
| 2 | Six 10/100/1000BASE-T Ethernet electrical ports.<br>• Support 10M/100M/1000M auto-sensing.<br>• The AC6005-8-PWR supports PoE power supply on six ports. |

| No. | Description |
| --- | --- |
| 3 | Two pairs of combo ports. When used as electrical ports:<br>• They support 10M/100M/1000M auto-sensing.<br>• The AC6005-8-PWR supports PoE power supply on two ports. |
| 4 | Console port. |
| 5 | USB port. |
| 6 | Ground point. |
| 7 | AC power jack. |

## Indicator Description

The AC6005-8-PWR has the same indicators on the front panel as the AC6005-8 except that the AC6005-8-PWR has a PoE indicator. The following uses the appearance of the AC6005-8-PWR as an example. **Figure 1-20** shows the indicators on the AC6005-8-PWR front panel.

**Figure 1-20** Indicators on the AC6005-8-PWR front panel

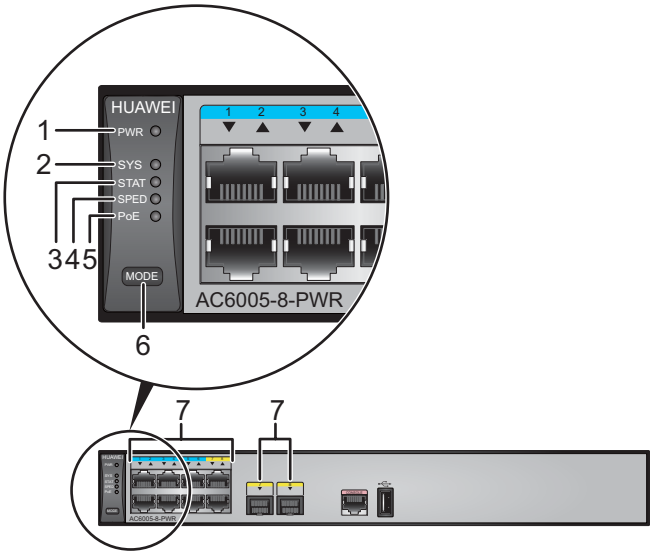



**Table 1-8** describes indicators on the AC6005 front panel.

NOTE

Indicator colors may vary slightly at different temperature.

**Table 1-8** Description of indicators on the AC6005 front panel

| No. | Indicator/ Button | Status | Description |
| --- | --- | --- | --- |
| 1 | PWR: power indicator | Off | The AC6005-8-PWR is powered off. |
| | | Steady green | The power supply is working properly. |
| | | Yellow<br>**NOTE**<br>Only the PWR indicator on the AC6005-8-PWR displays yellow. | The PoE power supply is faulty. |
| 2 | SYS: system status indicator | Off | The system is not running. |
| | | Green | • Fast blinking: The system is starting.<br>• Slow blinking: The system is running properly. |
| | | Steady red | The system cannot start normally, or an overheat alarm or fan alarm is generated. |
| 3 | STAT: state mode indicator | Off | The state mode is not selected. |
| | | Steady green | The service port indicator works in the default mode (STAT). In this mode, the indicator indicates the port status. |
| 4 | SPED: speed mode indicator | Off | The speed mode is not selected. |
| | | Steady green | The service port indicator indicates the port speed. After 45 seconds, the service port indicator automatically restores to the default mode (STAT). |
| 5 | PoE: PoE mode indicator<br>**NOTE**<br>Only the AC6005-8-PWR has this indicator. | Off | The PoE mode is not selected. |
| | | Steady green | The service port indicator indicates the PoE status of each port. After 45 seconds, the service port indicator automatically restores to the default mode (STAT). |

| No. | Indicator/ Button | Status | Description |
| --- | --- | --- | --- |
| 6 | MODE: mode switch button | – | AC6005-8-PWR:<br>● When you press the button once, the SPED indicator turns green and the service port indicators indicate the speed of the ports.<br>● When you press the button for a second time, the PoE indicator turns green and the service port indicators indicate the PoE status of the ports.<br>● When you press the button for a third time, the STAT indicator turns green.<br>AC6005-8:<br>● When you press the button once, the SPED indicator turns green and the service port indicators indicate the speed of the ports.<br>● When you press the button for a second time, the STAT indicator turns green.<br>If you do not press the button within 45 seconds, the indicators restore to the default mode. That is, the STAT indicator turns green, and the SPED and PoE indicators are off. |

| No. | Indicator/ Button | Status | Description |
| --- | --- | --- | --- |
| 7 | Service port indicator<br>• GE electrical ports: The first indicator indicates the status of the bottom left port. The indicators correspond to the ports from bottom to top and from left to right.<br>• GE optical ports: Each optical port has a corresponding indicator above it. | Meanings of service port indicators vary in different modes. For details, see **Table 1-9**. | |

**Table 1-9** Description of service port indicators in different modes

| Mode | Status | Description |
| --- | --- | --- |
| STAT | Off | No link has been established to the port or the port has been shut down. |
| | Green | • Steady on: A link has been established to the port.<br>• Blinking: The port is sending or receiving data. |
| SPED | Off | No link has been established to the port or the port has been shut down. |
| | Green | • Steady on: The port is working at 10 or 100 Mbit/s.<br>• Blinking: The port is working at 1000 Mbit/s. |
| PoE<br>**NOTE**<br>Only the AC6005-8-PWR has this mode. | Off | The port is not providing PoE power. |
| | Steady green | Steady on: The port is providing PoE power. |
| | Yellow | • Steady on: The PoE function is disabled on the port.<br>• Blinking: The port stops providing PoE power because a fault occurs, for example, an incompatible powered device (PD) is connected to the port. |

| Mode | Status | Description |
| --- | --- | --- |
| | Blinking green and yellow | The port cannot provide PoE power due to any of the following reasons:<br>• The power of the PD exceeds the power supply capability of the port or exceeds the threshold.<br>• The total power consumption of PDs has reached the maximum power of the device.<br>• The PoE power function is not enabled on the interface in manual power-management mode. |

## Physical Specifications

**Table 1-10** Physical specifications

| Item | | Description |
| --- | --- | --- |
| Dimensions and weight | Dimensions (H x W x D) | 43.6 mm x 320 mm x 233.6 mm |
| | Maximum weight (standard configuration) | • AC6005-8-PWR: 2.30 kg<br>• AC6005-8: 2.05 kg |
| Power specifications | Maximum power consumption | • AC6005-8-PWR: 163.6 W (device power consumption: 39.6 W, PoE: 124 W)<br>• AC6005-8: 25.6 W |
| | AC input voltage | • Rated voltage range: 100 V AC to 240 V AC, 50/60 Hz<br>• Maximum voltage range: 90 V AC to 264 V AC, 47 Hz to 63 Hz |
| Environment specifications | Operating temperature and altitude | • -60 m to +1800 m: -5°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |

| Item | | Description |
| --- | --- | --- |
| | Relative humidity | 5% RH to 95% RH, noncondensing |
| | Operating altitude | -60 m to +5000 m |

## 1.2.4 Performance Specifications (AC6005)

For AC performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AC model, or query the specifications using **Info-Finder**.

# 1.3 AC6605 Product Description

## 1.3.1 Product Characteristics (AC6605)

Huawei AC6605-26-PWR (AC6605 for short) is an access controller (AC) applicable to MANs and enterprise networks for wireless access. The AC6605 has a large capacity and high performance. It is highly reliable, easy to install and maintain, and features such advantages as flexible networking and energy conservation.

**NOTICE**

The AC6605 is a class A product. The AC6605 that is operating may cause radio interference. Customers need to take prevention measures.

The AC6605 has the following features:

- Has the access and aggregation functions.
- Provides PoE power (15.4 W) or PoE+ power (30 W) on 24 interfaces, and can directly connect to APs.
- Has various user policy management and authority control capabilities.
- Supports redundancy backup and hot swapping of AC or DC power supplies, ensuring long-term operation.
- Can be maintained using the eSight, web system, or command line interface.

### Abundant Port Types

The AC6605 provides various ports to meet the requirements of all scenarios. **Table 1-11** lists the ports on the AC6605.

**Table 1-11** AC6605 port description

| Port Type | Quantity | Description |
| --- | --- | --- |
| Uplink port | Two 10GE optical ports | The 10GE ports use Small Form-Factor Pluggable (SFP+) optical transceivers. |
| Service port | 24 GE ports | Among the 24 electrical ports, the last four are used with four optical ports as combo interfaces. |
| Maintenance port | One RJ45 maintenance serial port | It is an RS-232 port. |
| | One RJ45 maintenance Ethernet port | It is a 100BASE-TX port. |

## Large Capacity, High Performance, Integrated Design

The AC provides a large capacity and high performance, and adopts an integrated design to allow for flexible deployment.

- Integrated design: An AC can function as an access or aggregation device to provide wired access services and function as a management device to control STA access.
- Large switching capacity: The AC has twenty-four GE interfaces and two 10GE interfaces. It provides 128 Gbit/s switching capacity and 10 Gbit/s forwarding performance.
- PoE: The AC supports the PoE function and can provide the maximum power on 24 ports. This PoE capability can provide power to APs and other powered devices (PDs) connected to the AC.

## Carrier-Class Reliability

The AC provides the following reliability designs, ensuring long-term operation.

- The AC supports port backup based on the Link Aggregation Control Protocol (LACP) or Multiple Spanning Tree Protocol (MSTP).
- The AC supports redundant AC/DC power supplies.
- The AC supports hot swappable power supplies.
- The AC supports 1+1 hot backup.

## Easy-to-Install and Easy-to-Maintain

The AC is easy to install and maintain, simplifying network deployment.

- The AC6605 dimensions (H x W x D) are 43.6 mm x 442 mm x 420 mm (1.72 in. x 17.40 in. x 16.54 in.), and the AC6605 can be installed in a standard IEC cabinet (19 inches).

- Power supplies of the AC are hot swappable, facilitating maintenance.
- The built-in web system of the AC allows local GUI-based management.
- The AC can be managed by the eSight that provides various northbound interfaces.
- The AC supports the intra-board temperature probe, which monitors the operating environment of the AC in real time.

### Energy Conservation

The AC adopts the following measures to save energy:

- Low noise fans that can adjust the speed automatically are used, thus reducing noises in the system and power consumption of fans.
- The AC switches to the power saving mode when no connected device is detected on a service interface, that is, the interface is idle.
- It uses highly-integrated and energy-saving chips produced through advanced processing techniques. With the help of the intelligent device management system, the chips not only improve system performance but also greatly reduce power consumption of the entire system.

## 1.3.2 Application Scenarios (AC6605)

### 1.3.2.1 Bypass Networking

In bypass networking mode, the AC is connected to a network device (usually an aggregation switch) to manage APs.

The AC manages APs. Management flows are transmitted in CAPWAP tunnels, and data flows are forwarded to the upper layer network by the aggregation switch and do not pass through the AC.

### Tunnel Forwarding

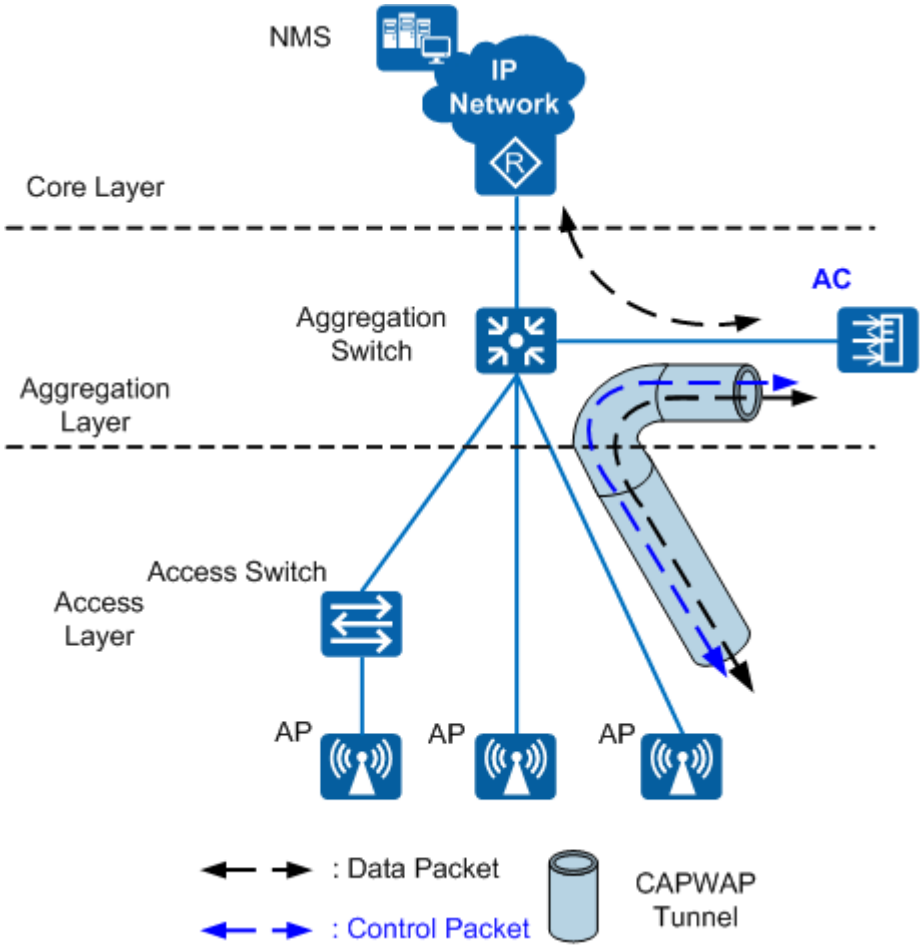
In tunnel forwarding mode, wireless data is transmitted between APs and ACs over CAPWAP tunnels.

In **Figure 1-21**, both management flows and data flows of APs are transmitted to the AC over CAPWAP tunnels, and then the AC transparently transmits these flows to the upstream device.

Tunnel forwarding is usually used to control wireless user traffic in a centralized manner. This forwarding mode facilitates device deployment and controls all wireless service data flows by aggregating traffic of all wireless users connected to APs to an AC through CAPWAP data tunnels.

**Figure 1-21** Bypass networking in tunnel forwarding mode



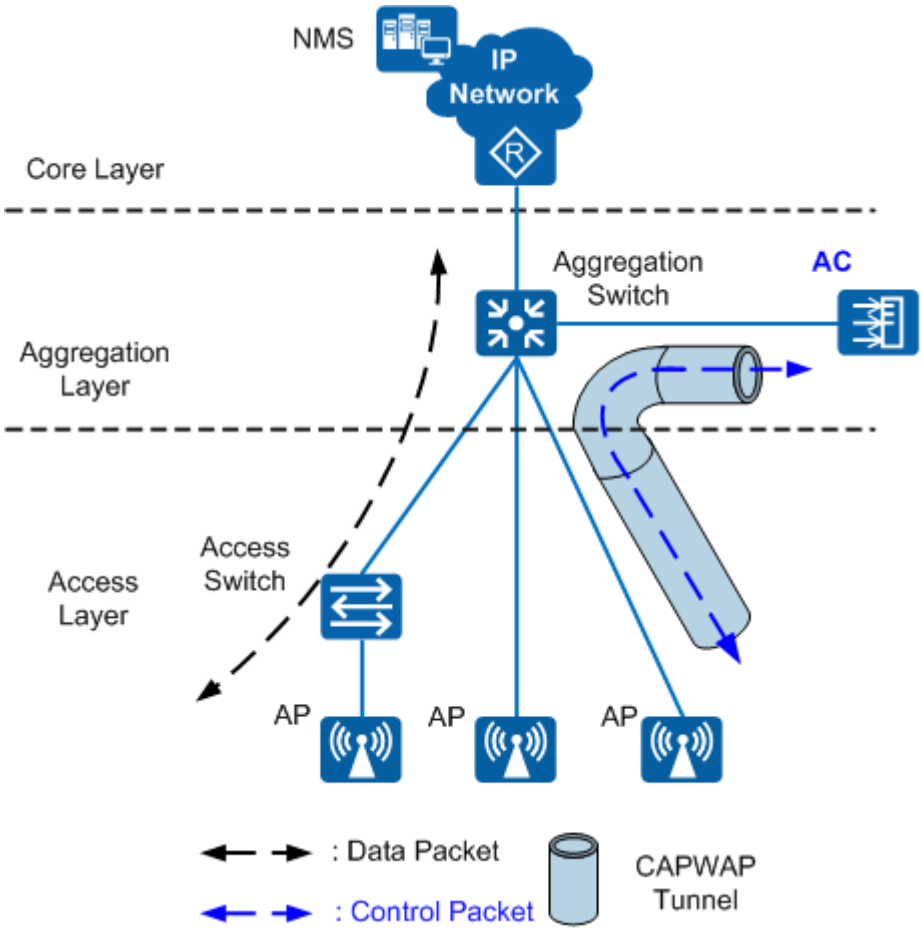

## Direct Forwarding

In direct forwarding mode, wireless data is translated from 802.3 packets into 802.11 packets, which are then forwarded by an uplink aggregation switch.

The bypass networking mode is often used on enterprise networks. Wireless data does not need to be processed by an AC, eliminating the bandwidth bottleneck and facilitating the usage of existing security policies. Therefore, this networking mode is recommended for integrated network deployment.

**Figure 1-22** Bypass networking in direct forwarding mode




- The AC only manages APs. All AP management flows (including authentication traffic) must arrive at the AC.

  Interfaces connected to the AC are reserved on the aggregation switch. The aggregation switch functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode or broadcast mode.
- Data flows from APs are forwarded by the Layer 2 switch and aggregation switch, and do not pass through the AC.

  Different service VLANs are assigned to STAs with different service set identifiers (SSIDs). The access switch and aggregation switch identify packets from these VLANs and forward these packets to the upstream device. The aggregation switch allocates IP addresses to STAs.

## Application

In bypass networking mode, the AC manages all the APs connected to the aggregation switch. This network topology applies to scenarios where APs are scattered across hot spots.

The bypass networking mode requires only a small modification to the existing network, facilitating device deployment. You can select the direct or tunnel forwarding mode according to networking requirements.

### 1.3.2.2 Inline Networking

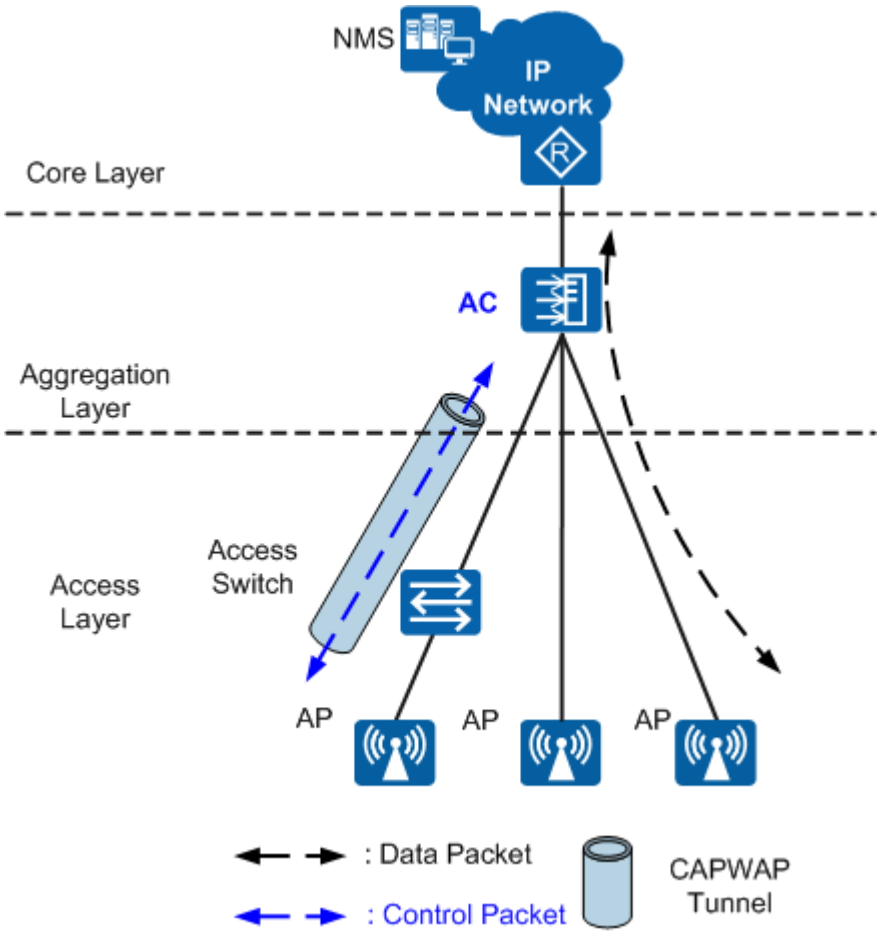
In inline networking mode, APs or access switches are directly connected to the AC. The AC also functions as an aggregation switch to forward and process APs' data and management services.

In inline networking mode, the AC sets up CAPWAP tunnels with APs to configure and manage these APs over CAPWAP tunnels. Service data of wireless users can be forwarded between APs and the AC over CAPWAP data tunnels or be directly forwarded by APs.

In inline networking mode, direct forwarding is often used so that service data can be forwarded on APs.

The AC functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode, or broadcast mode, and set up data tunnels with the AC.

**Figure 1-23** Data flows not transmitted in CAPWAP tunnels




In direct forwarding mode, only control flows are transmitted in CAPWAP tunnels, and data flows sent from APs are transparently transmitted to the upstream device by the AC, as shown in **Figure 1-23**.

When data flows are not transmitted in CAPWAP tunnels, configure management VLANs and data VLANs as follows:

- On the AC and its upstream devices, configure an AC management VLAN to transmit control flows between the AC and the NMS.
- On the switches between APs and the AC, configure AP management VLANs to transmit control flows between APs and the AC.
- On all switches between APs and the AC, configure data VLANs to differentiate WLAN data flows.

## Application

The AC provides powerful access, aggregation, and switching capabilities. Therefore, APs can directly connect to the AC. Direct forwarding is often used in inline networking mode. This networking mode simplifies the network architecture and applies to small- and medium-scale centralized WLANs.

## 1.3.2.3 Wireless Backhaul Networking

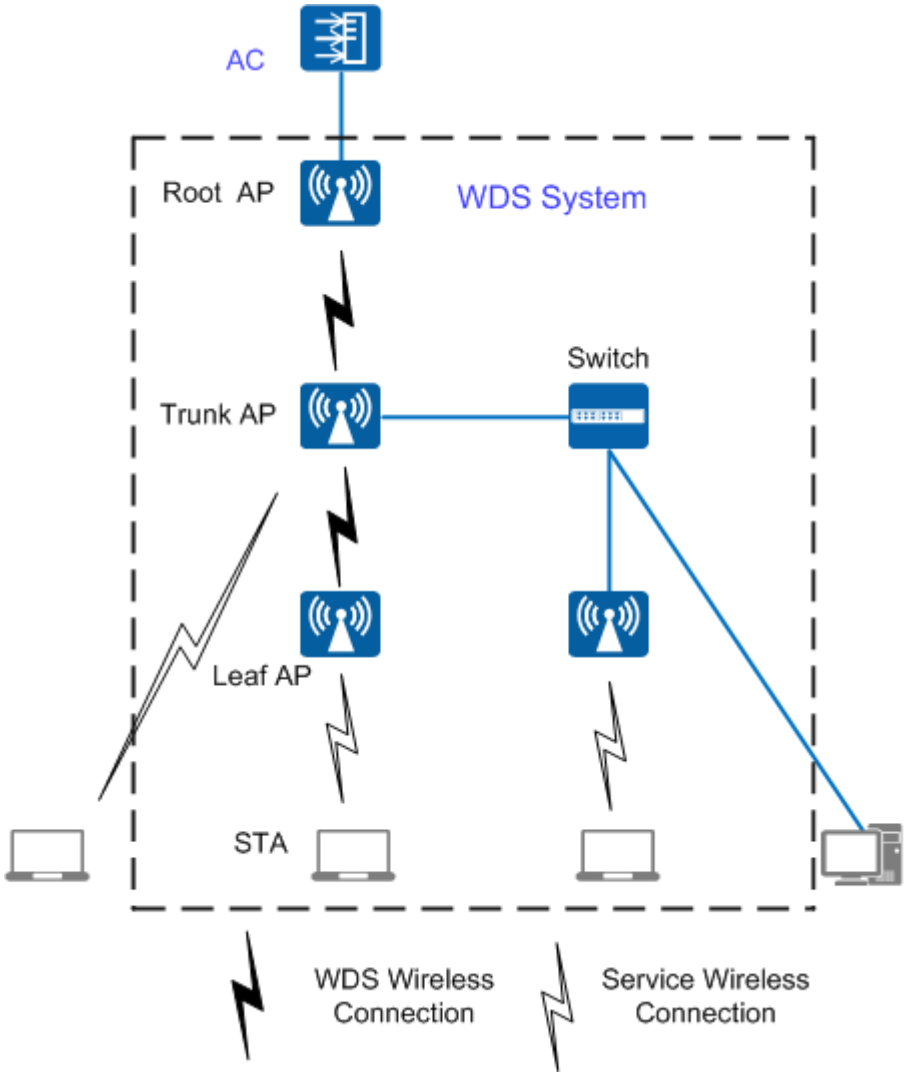
802.11 wireless technology has been widely used in home networks and enterprise networks. Users can easily access the Internet over WLANs. In this network application, APs must be connected to the existing wired network to provide network access services for wireless users. To expand the wireless coverage area, APs need to be connected using cables, switches, and power supplies. This increases network costs and prolongs network construction period. Wired deployment requirements may not be met in special circumstances. The Wireless Distribution System (WDS) or mesh technology allows APs to be connected wirelessly, facilitating WLAN construction in a complex environment.

## WDS

The WDS is a distribution system comprised of APs. The WDS connects to an AC on the network side, which is then connected to a network device such as a gateway or an aggregation switch. The WDS connects to a station (STA) or a wired network device (such as a PC) on the user side.

**Figure 1-24** WDS




On a WDS network, an AC manages the following devices:

- Root AP: connects to an AC on the wired side, and functions as a WDS master to connect to trunk APs or leaf APs.
- Trunk AP: functions as a WDS slave to connect to a root AP, connects to wired devices on the wired side, or functions as a WDS master to connect to leaf APs.
- Leaf AP: functions as a WDS slave to connect to a root AP or trunk AP or connects to STAs on the wireless side.

**NOTE**

Both the root AP and trunk AP can function as leaf APs.

The WDS networking can expand WLANs and applies to indoor wireless deployment scenarios.

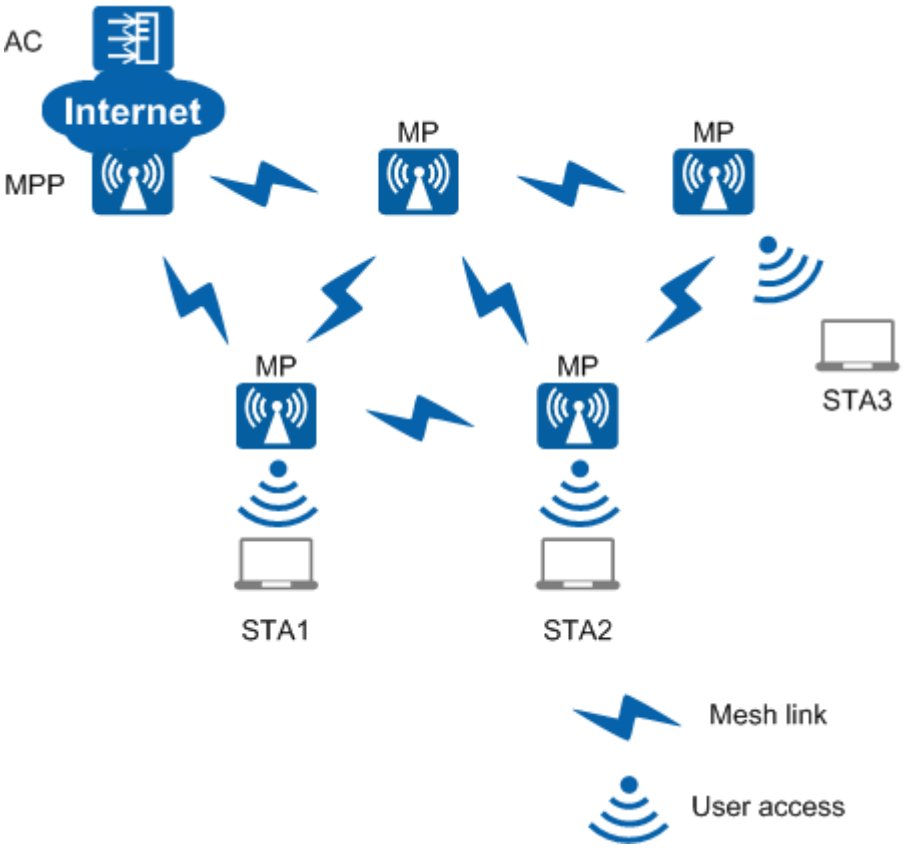
  

## WMN

Compared with a traditional WLAN, a Wireless Mesh Network (WMN) has the following advantages:

- Fast deployment: Mesh nodes can be easily installed to construct a WMN in a short time, much shorter than the construction period of a traditional WLAN.
- Dynamic coverage area expansion: As more mesh nodes are deployed on a WMN, the WMN coverage area can be rapidly expanded.
- Robustness: A WMN is a peer-to-peer network that will not be affected by the failure of a single node. If a node fails, packets are forwarded to the destination node along other paths.
- Flexible networking: An AP can directly join or leave a WMN, without the need of connections to infrastructure. This allows for flexible networking.
- Various application scenarios: Besides traditional WLAN scenarios such as enterprise networks, office networks, and campus networks, a WMN also applies to scenarios such as large-scale warehouses, docks, MANs, metro lines, and emergency communications.
- Cost-effectiveness: Only MPPs need to connect to a wired network, which minimizes the dependency of a WMN on wired devices and saves costs in wired device purchasing and cable deployment.

**Figure 1-25** WMN




Nodes on a WMN can be classified into the following types based on their functions:

- Mesh point (MP)

  A mesh-capable node that uses IEEE 802.11 MAC and physical layer protocols for wireless communication. This node supports automatic topology discovery, automatic route discovery, and data packet forwarding.

- Mesh portal point (MPP)

  An MP that connects to a WMN or another type of network. This node has the portal function and enables mesh nodes to communicate with external networks.

On a WMN, MPs are fully meshed to establish an auto-configured, and self-healing backbone WMN, and MPPs with the gateway function provide connections to the Internet. An MP provides access services and connects a STA to a WMN. A WMN uses special mesh routing protocols, which ensures high transmission quality. The WMN is applicable to scenarios that require high-bandwidth and highly stable Internet connections.

### 1.3.2.4 Dual-AC Networking

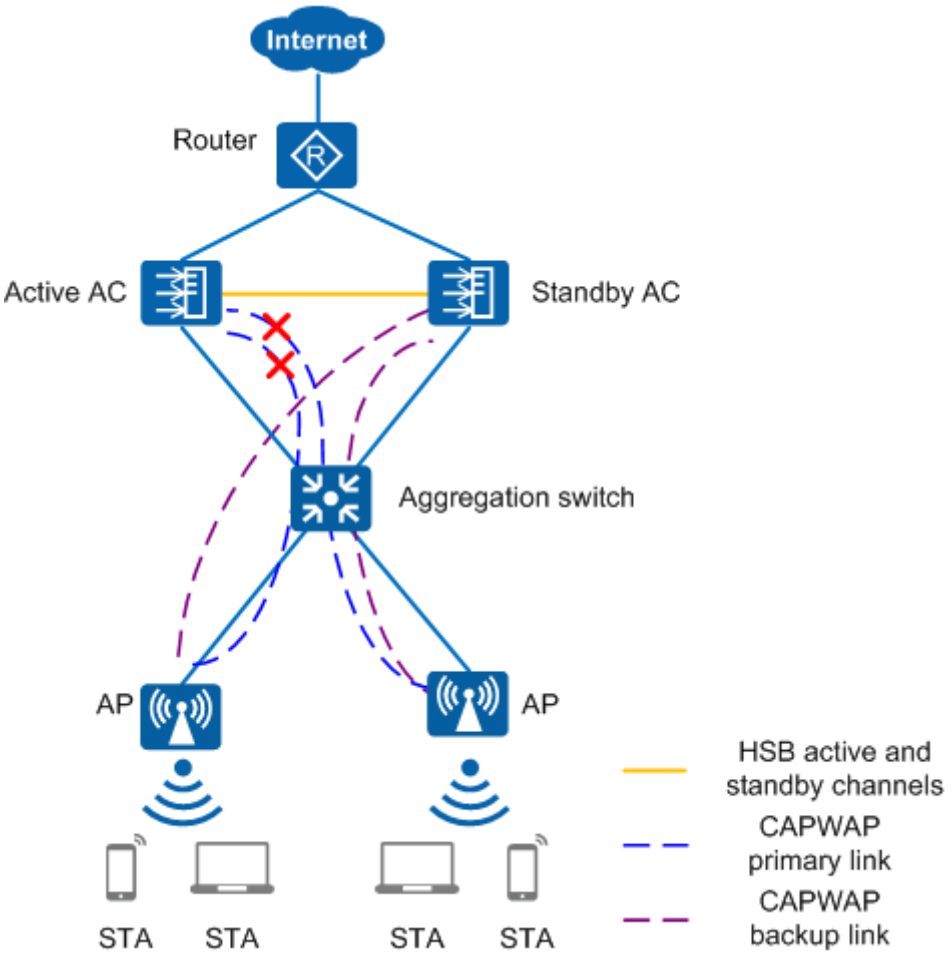
To ensure uninterrupted service forwarding, enterprises that require high reliability use active and standby ACs for networking.

Dual-AC backup can be implemented in two modes:

- HSB + dual-link backup: As shown in **Figure 1-26**, an AP establishes CAPWAP tunnels with both the active and standby ACs. The two ACs synchronize service information (such as NAC and WLAN service information) through the hot standby (HSB) function. When an AP is disconnected from the active AC, the AP notifies the standby AC of a switchover. This mode frees active and standby ACs from location restrictions and allows both ACs to be flexibly deployed. In this mode, the two ACs can implement load balancing to make efficient use of resources. However, service switching takes a relatively long time.

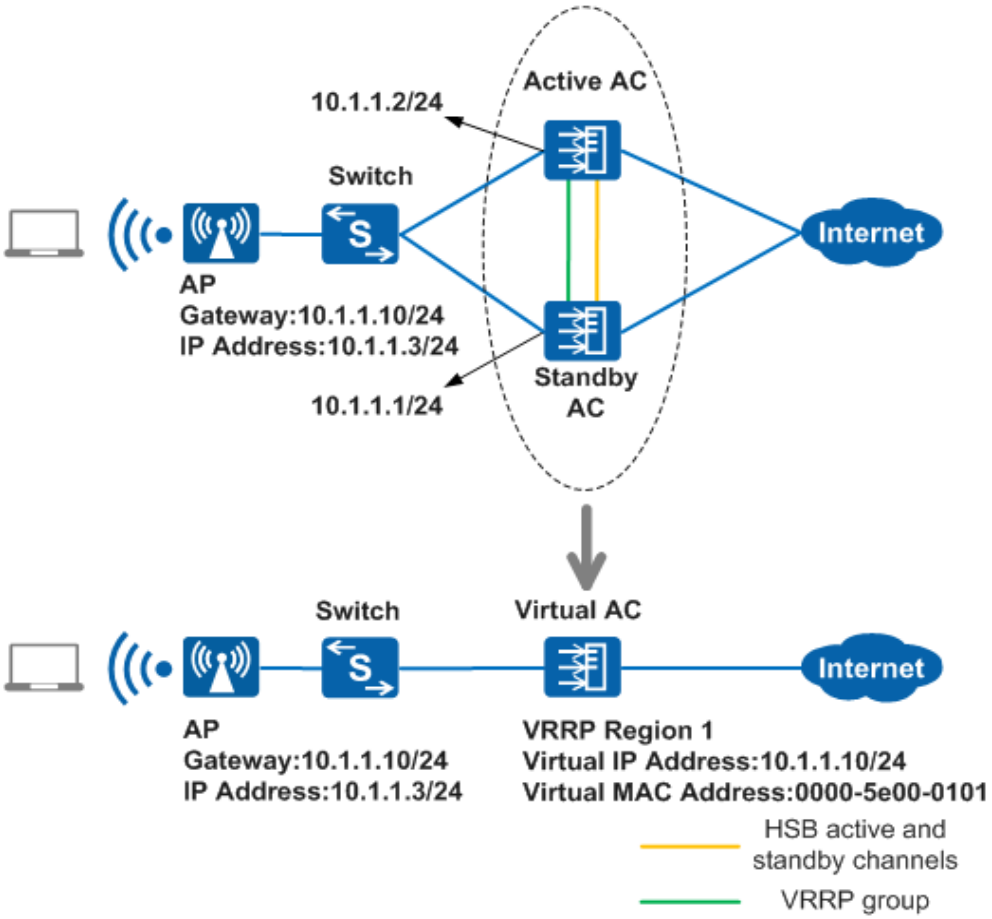
**Figure 1-26** HSB + dual-link backup networking




- HSB + VRRP: As shown in **Figure 1-27**, an AP obtains only the virtual IP address of both the active and standby ACs. The active AC backs up information including AP entries, CAPWAP link information, and user information on the standby AC. In this mode, the AP only detects the presence of one AC. The active/standby switchover is determined by the Virtual Router Redundancy Protocol (VRRP). Currently, this mode cannot be used in a VRRP multi-instance scenario. This mode restricts deployment locations of both ACs. Compared to HSB + dual-link backup, services can be switched faster in this mode.

**Figure 1-27** HSB + VRRP networking




## 1.3.2.5 Cloud AC Networking

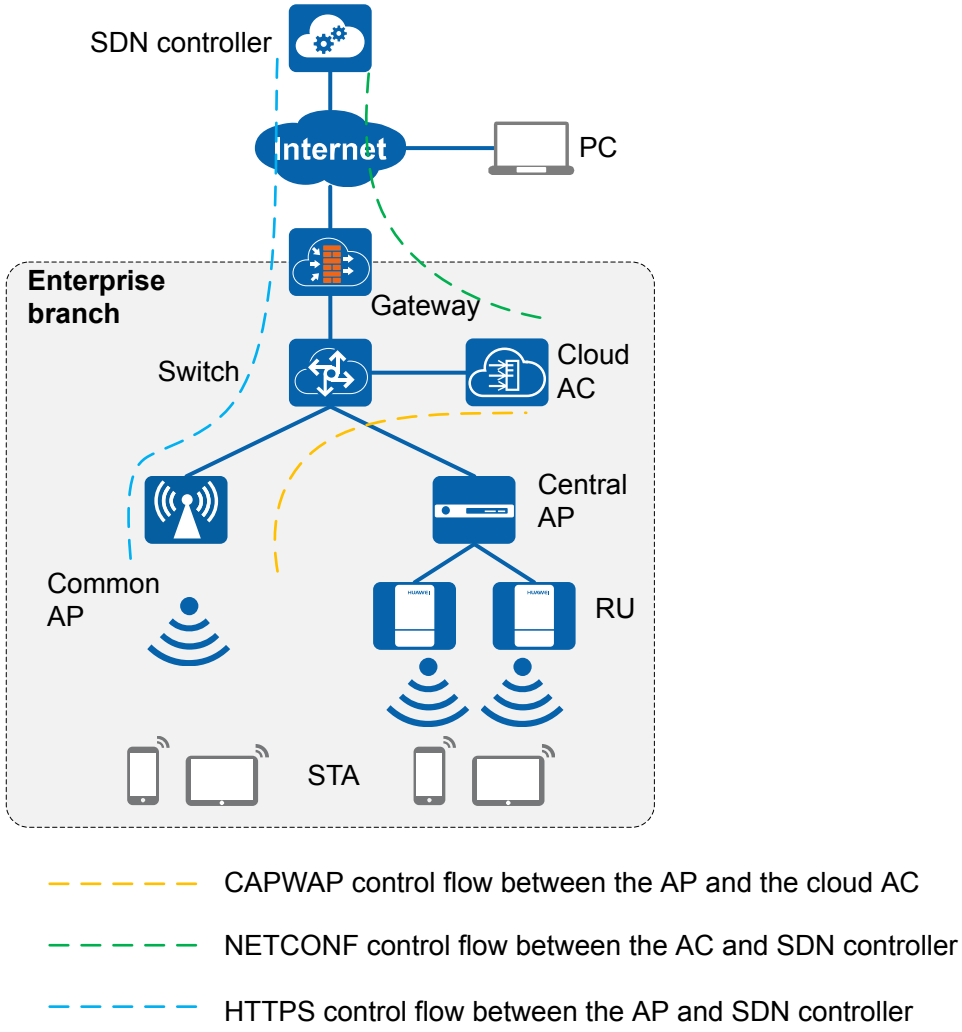
The cloud AC solution is suitable for medium- and large-sized sites with a large number of APs.

As shown in **Figure 1-28**, the AP in Fit mode registers with the AC through CAPWAP. The AC works in cloud mode and uses NETCONF to register with the SDN controller (CloudCampus@AC-Campus for ACs running V200R019C00 and earlier versions; iMaster NCE-Campus for ACs running V200R019C10 and later versions). The administrator can remotely manage the ACs and APs on the enterprise network to implement automatic WLAN deployment, service provisioning, and monitoring and O&M.

- Log in to the AC's web platform through the SDN controller to remotely configure services.
- Manage the status of ACs and APs on the SDN controller to learn about performance and service statistics in real time.

**Figure 1-28** Typical cloud AC networking diagram




## 1.3.3 Product Structure (AC6605)

### Appearance and Structure

Currently, the AC6605 series has only one model AC6605-26-PWR (AC6605 for short).

**Figure 1-29** and **Figure 1-30** show the appearance of the AC6605.

**Figure 1-29** Appearance of the AC6605 (front view)

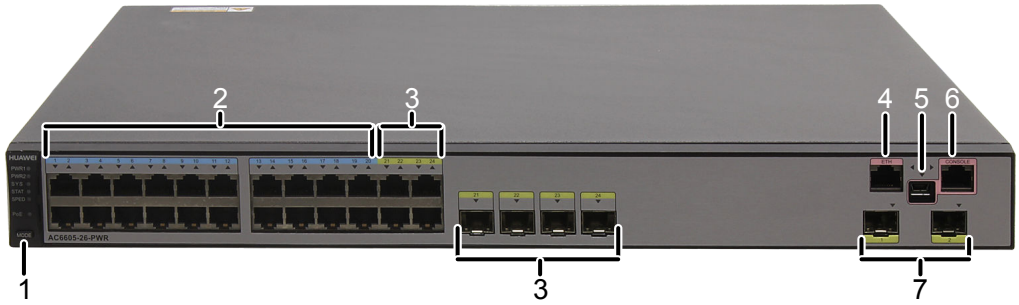



**Figure 1-30** Appearance of the AC6605 (rear view)


| No. | Description |
| --- | --- |
| 1 | MODE button: switches the working mode of service port indicators. |
| 2 | Twenty 10/100/1000BASE-T Ethernet electrical ports.<br>● Support 10M/100M/1000M auto-sensing.<br>● Support PoE power supply on 20 ports. |
| 3 | Four pairs of combo ports. When used as electrical ports:<br>● Support 10M/100M/1000M auto-sensing.<br>● Support PoE power supply on four ports. |
| 4 | ETH management port. |
| 5 | Mini USB port: Reserved. |
| 6 | Console port. |
| 7 | Two 10GE SFP+ uplink optical ports. |
| 8 | Ground point. |
| 9 | Filler panel. |
| 10 | Two slots for the power modules. The AC6605 supports three types of power modules:<br>● 150 W DC power module<br>● 150 W AC power module<br>● 500 W AC PoE power module |

## Indicator Description

Figure 1-31 shows the indicators on the AC6605 front panel.

**Figure 1-31** Indicators on the AC6605 front panel

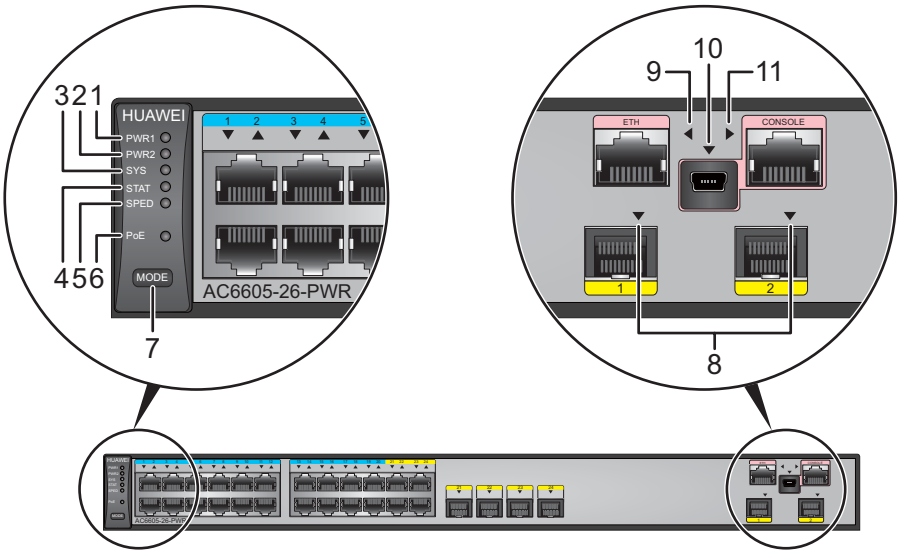



Table 1-12 describes indicators on the AC6605 front panel.

**Table 1-12** Description of indicators on the AC6605 front panel

| Number | Indicator | Color | Description |
| --- | --- | --- | --- |
| 1 | PWR1: power supply indicator | - | Off: The PWR1 slot has no power module installed, or the power module is faulty when a single power module is used. |
| | | Green | Steady on: The power module is working properly. |
| | | Yellow | Steady on: Any of the following conditions may exist:<br>• Dual power modules are installed, but not switched on.<br>• Dual power modules are installed, but receive no input power.<br>• The power modules are faulty. |
| 2 | PWR2: power supply indicator | - | Off: The PWR2 slot has no power module installed, or the power module is faulty when a single power module is used. |

| Number | Indicator | Color | Description |
| --- | --- | --- | --- |
| | | Green | Steady on: The power module is working properly. |
| | | Yellow | Steady on: Any of the following conditions may exist:<br>• Dual power modules are installed, but not switched on.<br>• Dual power modules are installed, but receive no input power.<br>• The power modules are faulty. |
| 3 | SYS: system status indicator | - | Off: The system is not running. |
| | | Green | • Fast blinking: The system is starting.<br>• Slow blinking: The system is running properly. |
| | | Yellow | • Steady on: The temperature or functions of the device become abnormal.<br>• Blinking: The device has entered the dormancy mode. |
| | | Red | Steady on: After registering, the system does not operate properly, or a fan or temperature alarm has been generated. |
| 4 | STAT: status indicator | Green | • Off: The status mode is not selected.<br>• Steady on: The service port indicators are in the status mode (default). |
| 5 | SPED: speed indicator | Green | • Off: The speed mode is not selected.<br>• Steady on: The service port indicators show the port speed. After 45 seconds, the service port indicators automatically restore to the status mode. |

| Number | Indicator | Color | Description |
| --- | --- | --- | --- |
| 6 | PoE: PoE indicator | Green | • Off: The PoE mode is not selected.<br>• Steady on: The service port indicators show the PoE status. After 45 seconds, the service port indicators automatically restore to the status mode. |
| 7 | MODE: mode switch button | - | • When you press this button once, the service port indicators change to speed mode and show the speed of service ports.<br>• When you press this button a third time, the service port indicators change to PoE mode and show the PoE status of ports.<br>• When you press this button a fourth time, the STAT indicator turns green and the service port indicators restore to the default mode.<br>If you do not press the MODE button within 45 seconds, the service port indicators restore to the default mode. In this case, the STAT indicator is steady green, the SPED and PoE indicators are off. |
| 8 | Service port indicator<br>• GE electrical ports: The ports are numbered from bottom to top and left to right, starting with 1.<br>• GE/10GE optical ports: Each port has an indicator above it. | Meanings of service port indicators vary in different modes. For details, see **Table 1-13**. | |

| Number | Indicator | Color | Description |
| --- | --- | --- | --- |
| 9 | ETH indicator | Green | • Off: No link is established on the port.<br>• Steady on: The port is connected.<br>• Blinking: The port is sending or receiving data. |
| 10 | Mini USB indicator | Green | Mini USB port: Reserved. |
| 11 | Console indicator | Green | • Off: The console port is not active.<br>• Steady on (default): The console port is active. |

**Table 1-13** Description of service port indicators in different modes

| Display Mode | Color | Description |
| --- | --- | --- |
| Status | Green | • Off: The port is not connected or has been shut down.<br>• Steady on: A link has been established to the port.<br>• Blinking: The port is sending or receiving data. |
| Speed | Green | • Off: The port is not connected or has been shut down.<br>• Steady on:<br>10M/100M/1000M port: The port is operating at 10/100 Mbit/s.<br>1000M/10GE port: The port is operating at 1000 Mbit/s.<br>• Blinking:<br>10M/100M/1000M port: The port is operating at 1000 Mbit/s.<br>1000M/10GE port: The port is operating at 10 Gbit/s. |
| PoE | - | Off: The port does not provide PoE power. |
| | Green | Steady on: The port is providing PoE power. |

| Display Mode | Color | Description |
| --- | --- | --- |
| | Yellow | • Steady on: The PoE function is disabled on the port.<br>• Blinking: A PoE fault has occurred. For example, an incompatible PD is connected to the port. |
| | Green and yellow | Blinking green and yellow alternately:<br>• The power of the PD exceeds the maximum power or power threshold of the port.<br>• The total power consumption of PDs has reached the maximum power of the device.<br>• The manual power management mode is used and the port is not enabled to provide power to the PD. |

## Physical Specifications

**Table 1-14** Physical specifications

| Item | | Description |
| --- | --- | --- |
| Dimensions and weight | Dimensions (H x W x D) | 43.6 mm x 442 mm x 420 mm |
| | Weight | • Net weight: 5.48 kg<br>• Fully configured with 150 W power modules: 7.16 kg<br>• Fully configured with 500 W power modules: 7.48 kg |
| Power specifications | Maximum power consumption | 85 W |
| | DC input voltage | • Rated voltage range: -48 V DC to -60 V DC<br>• Maximum voltage range: -36 V DC to -72 V DC |
| | AC input voltage | • Rated voltage range: 100 V AC to 240 V AC, 50/60 Hz<br>• Maximum voltage range: 90 V AC to 264 V AC, 47 Hz to 63 Hz |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature and altitude | • -60 m to +1800 m: -5°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Operating altitude of the power modules | • 150 W DC power module: 0 m to 3000 m<br>• 150 W AC power module: 0 m to 5000 m<br>• 500 W AC power module: 0 m to 5000 m |
| | Relative humidity | 5% RH to 95% RH, noncondensing |

### 1.3.4 Performance Specifications (AC6605)

For AC performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AC model, or query the specifications using **Info-Finder**.

## 1.4 AC6507S, AC6508, and AirEngine 9700S-S Product Description

### 1.4.1 Product Characteristics (AC6507S, AC6508, and AirEngine 9700S-S)

The AC6507S, AC6508, and AirEngine 9700S-S are small-capacity box wireless access controllers (ACs) for small and medium enterprises. They integrate the GE Ethernet switch function, achieving integrated access for wired and wireless users. The WLAN AC features high scalability and offers users considerable flexibility in configuring the number of managed APs. When used with Huawei's full series 802.11ax, 802.11ac and 802.11n APs, the AC6507S, AC6508, and AirEngine 9700S-S can be used to construct small and medium campus networks, enterprise office networks, wireless Metropolitan Area Networks (MANs), and hotspot coverage networks.

#### Large-capacity and high-performance design

- The AC6507S can manage up to 128 APs, provides 2 x 10GE optical interfaces and 10 x GE electrical interfaces, and supports up to 4 Gbit/s forwarding performance.
- The AC6508 can manage up to 256 APs, provides 2 x 10GE optical interfaces and 10 x GE electrical interfaces, and supports up to 6 Gbit/s forwarding performance.

- The AirEngine 9700S-S can manage up to 64 APs, provides 2 x 10GE optical interfaces and 10 x GE electrical interfaces, and supports up to 4 Gbit/s forwarding performance.

## SmartRadio for air interface optimization

- Load balancing during smart roaming: The load balancing algorithm works during smart roaming, enabling load balancing detection between APs on the network after STA roaming to adjust the STA load on each AP, improving network stability.
- Intelligent DFA technology: The dynamic frequency assignment (DFA) algorithm is used to automatically detect adjacent-channel and co-channel interference, and identify any redundant 2.4 GHz radios. Through automatic inter-AP negotiation, a redundant radio is automatically switched to another mode (dual-5G AP models support 2.4G-to-5G switchover) or is disabled to reduce 2.4 GHz co-channel interference and increase the system capacity.
- Intelligent conflict optimization technology: Dynamic enhanced distributed channel access (EDCA) and airtime scheduling algorithms are used to schedule the channel occupation time and service priority of each user. This ensures that each user is assigned a relatively equal amount of time for using channel resources and user services are scheduled in an orderly manner, improving service processing efficiency and user experience.

## Various roles

- The WLAN AC has a built-in Portal/AAA server and can provide Portal/802.1X authentication for users, protecting customer investment.

## Flexible networking

- The WLAN AC can be deployed in inline, bypass, bridge, and mesh network modes, and supports both centralized and local forwarding.
- The WLAN AC and APs can be connected across a Layer 2 or Layer 3 network. In addition, NAT can be deployed when APs are deployed on the private network and the WLAN AC is deployed on the public network.
- The WLAN AC is compatible with Huawei full-series 802.11n, 802.11ac, and 802.11ax APs and supports the hybrid networking of 802.11n, 802.11ac, and 802.11ax APs for simple scalability.

## Built-in application identification server

- Supports Layer 4 to Layer 7 application identification and can identify over 6000 applications, including common office applications and P2P download applications, such as Lync, FaceTime, YouTube, and Facebook.
- Supports application-based policy control technologies, including traffic blocking, traffic limit, and priority adjustment policies.
- Supports automatic application expansion in the application signature database.

## Comprehensive reliability design

- Supports AC 1+1 HSB, and N+1 backup, ensuring uninterrupted services.

- Supports port backup based on the Link Aggregation Control Protocol (LACP) or Multiple Spanning Tree Protocol (MSTP).
- Supports WAN authentication escape between APs and WLAN ACs. In local forwarding mode, this feature keeps existing STAs online and allows for the access of new STAs when APs are disconnected from WLAN ACs, ensuring service continuity.

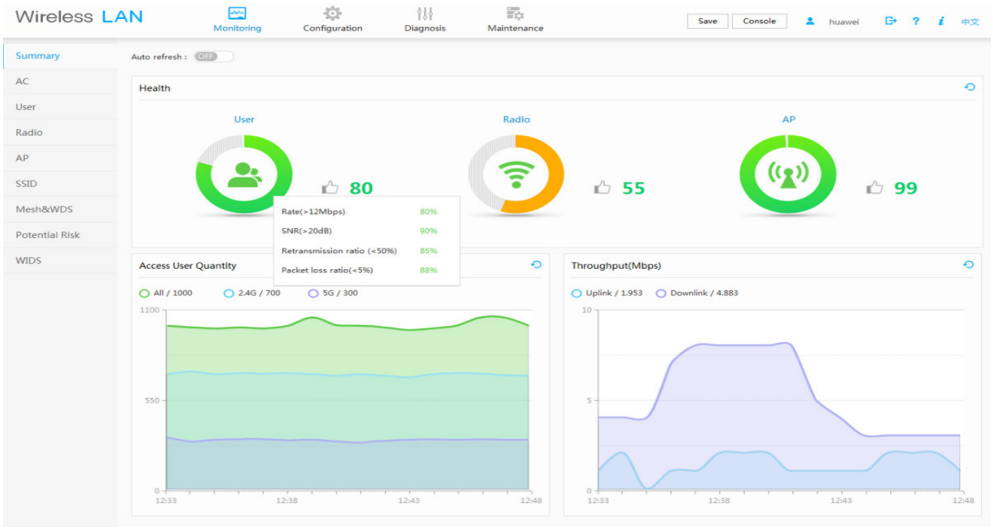
## Built-in visualized network management platform

- The AC6507S, AC6508, and AirEngine 9700S-S have a built-in web system that is easy to configure and provides comprehensive monitoring and intelligent diagnosis.

## Health-centric one-page monitoring, visualized KPIs

- One page integrates the summary and real-time statistics. KPIs are displayed in graphs, including user, radio, and AP performance, enabling users to extract useful information from the massive amount of data, while also being instantly aware of the device and network status.

**Figure 1-32** Monitoring interface

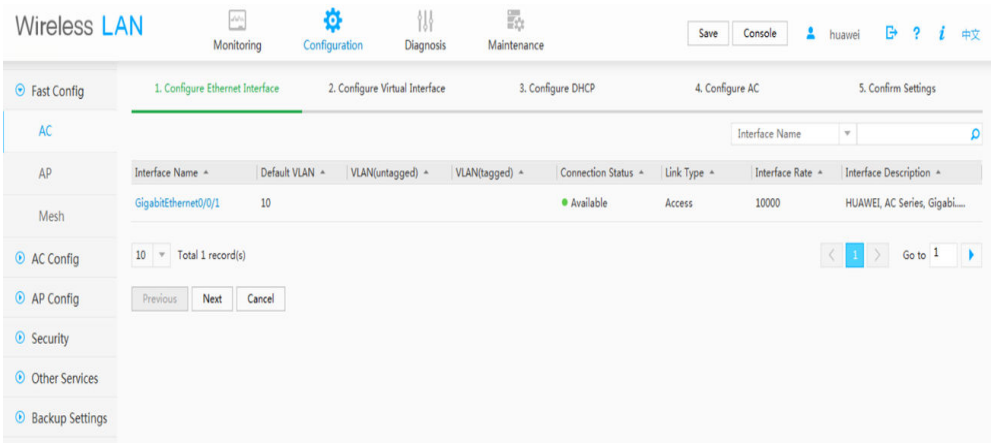



## Profile-based configuration by AP group simplifies configuration and improves efficiency

- The web system supports AP group-centric configuration and automatically selects the common parameters for users, simplifying configuration.

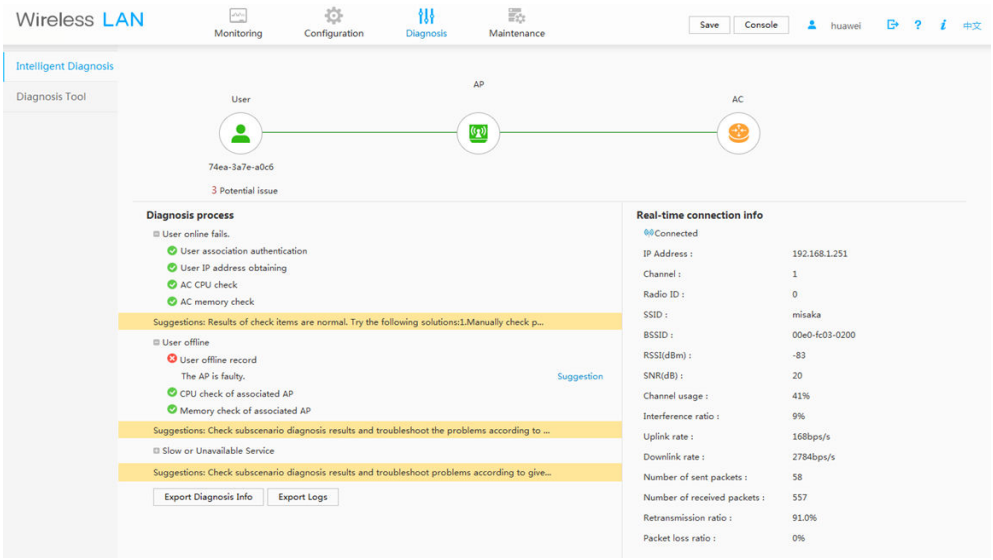
**Figure 1-33** Configuration interface




## One-click diagnosis solves 80% of common network problems.

- The web system supports real-time and periodic one-click intelligent diagnosis from the dimensions of users, APs, and WLAN ACs, and provides feasible suggestions for troubleshooting.

**Figure 1-34** Intelligent diagnosis




# 1.4.2 Application Scenarios (AC6507S, AC6508, and AirEngine 9700S-S)

## 1.4.2.1 Bypass Networking

In bypass networking mode, the AC is connected to a network device (usually an aggregation switch) to manage APs.

The AC manages APs. Management flows are transmitted in CAPWAP tunnels, and data flows are forwarded to the upper layer network by the aggregation switch and do not pass through the AC.

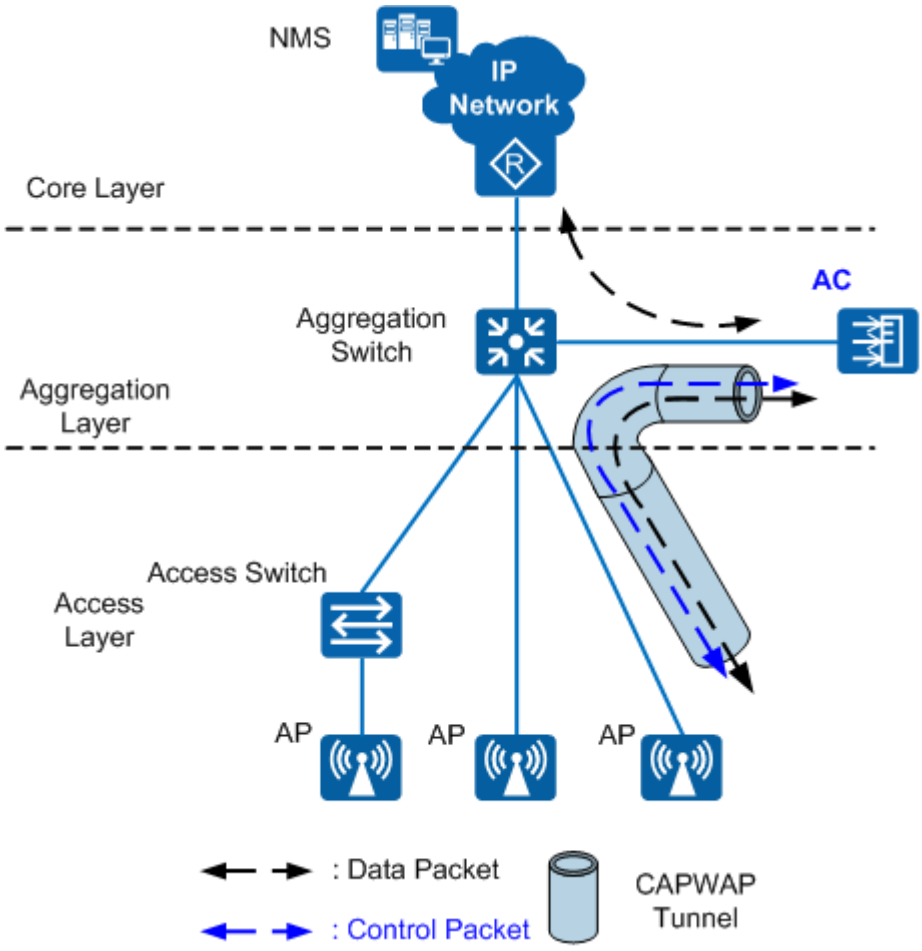
## Tunnel Forwarding

In tunnel forwarding mode, wireless data is transmitted between APs and ACs over CAPWAP tunnels.

In **Figure 1-35**, both management flows and data flows of APs are transmitted to the AC over CAPWAP tunnels, and then the AC transparently transmits these flows to the upstream device.

Tunnel forwarding is usually used to control wireless user traffic in a centralized manner. This forwarding mode facilitates device deployment and controls all wireless service data flows by aggregating traffic of all wireless users connected to APs to an AC through CAPWAP data tunnels.

**Figure 1-35** Bypass networking in tunnel forwarding mode



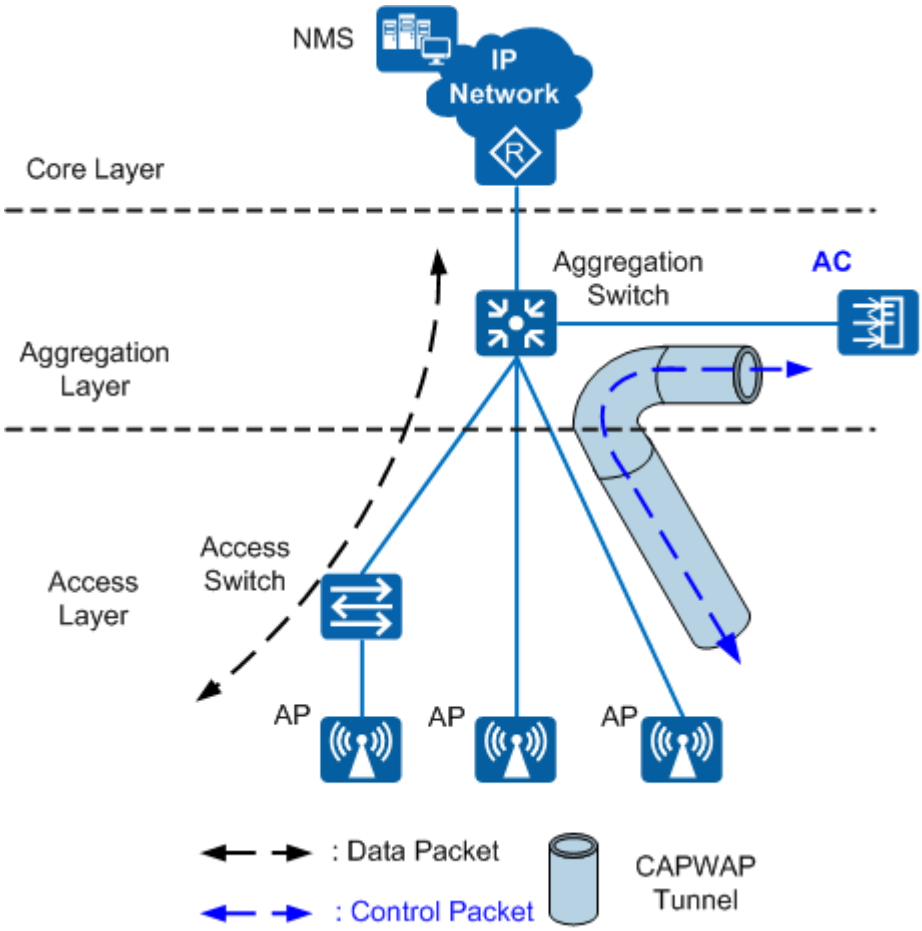

## Direct Forwarding

In direct forwarding mode, wireless data is translated from 802.3 packets into 802.11 packets, which are then forwarded by an uplink aggregation switch.

The bypass networking mode is often used on enterprise networks. Wireless data does not need to be processed by an AC, eliminating the bandwidth bottleneck and facilitating the usage of existing security policies. Therefore, this networking mode is recommended for integrated network deployment.

**Figure 1-36** Bypass networking in direct forwarding mode




- The AC only manages APs. All AP management flows (including authentication traffic) must arrive at the AC.

  Interfaces connected to the AC are reserved on the aggregation switch. The aggregation switch functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode or broadcast mode.
- Data flows from APs are forwarded by the Layer 2 switch and aggregation switch, and do not pass through the AC.

  Different service VLANs are assigned to STAs with different service set identifiers (SSIDs). The access switch and aggregation switch identify packets from these VLANs and forward these packets to the upstream device. The aggregation switch allocates IP addresses to STAs.

## Application

In bypass networking mode, the AC manages all the APs connected to the aggregation switch. This network topology applies to scenarios where APs are scattered across hot spots.

The bypass networking mode requires only a small modification to the existing network, facilitating device deployment. You can select the direct or tunnel forwarding mode according to networking requirements.

### 1.4.2.2 Inline Networking

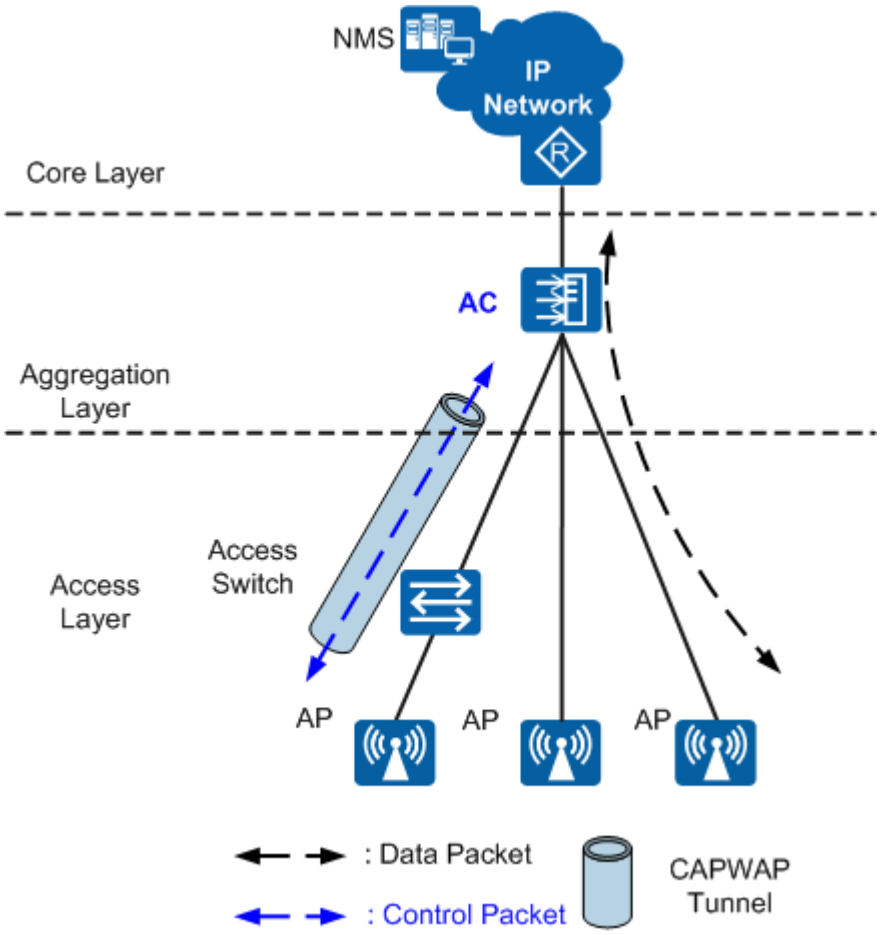
In inline networking mode, APs or access switches are directly connected to the AC. The AC also functions as an aggregation switch to forward and process APs' data and management services.

In inline networking mode, the AC sets up CAPWAP tunnels with APs to configure and manage these APs over CAPWAP tunnels. Service data of wireless users can be forwarded between APs and the AC over CAPWAP data tunnels or be directly forwarded by APs.

In inline networking mode, direct forwarding is often used so that service data can be forwarded on APs.

The AC functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode, or broadcast mode, and set up data tunnels with the AC.

**Figure 1-37** Data flows not transmitted in CAPWAP tunnels




In direct forwarding mode, only control flows are transmitted in CAPWAP tunnels, and data flows sent from APs are transparently transmitted to the upstream device by the AC, as shown in **Figure 1-37**.

When data flows are not transmitted in CAPWAP tunnels, configure management VLANs and data VLANs as follows:

- On the AC and its upstream devices, configure an AC management VLAN to transmit control flows between the AC and the NMS.
- On the switches between APs and the AC, configure AP management VLANs to transmit control flows between APs and the AC.
- On all switches between APs and the AC, configure data VLANs to differentiate WLAN data flows.

## Application

The AC provides powerful access, aggregation, and switching capabilities. Therefore, APs can directly connect to the AC. Direct forwarding is often used in inline networking mode. This networking mode simplifies the network architecture and applies to small- and medium-scale centralized WLANs.

## 1.4.2.3 Wireless Backhaul Networking

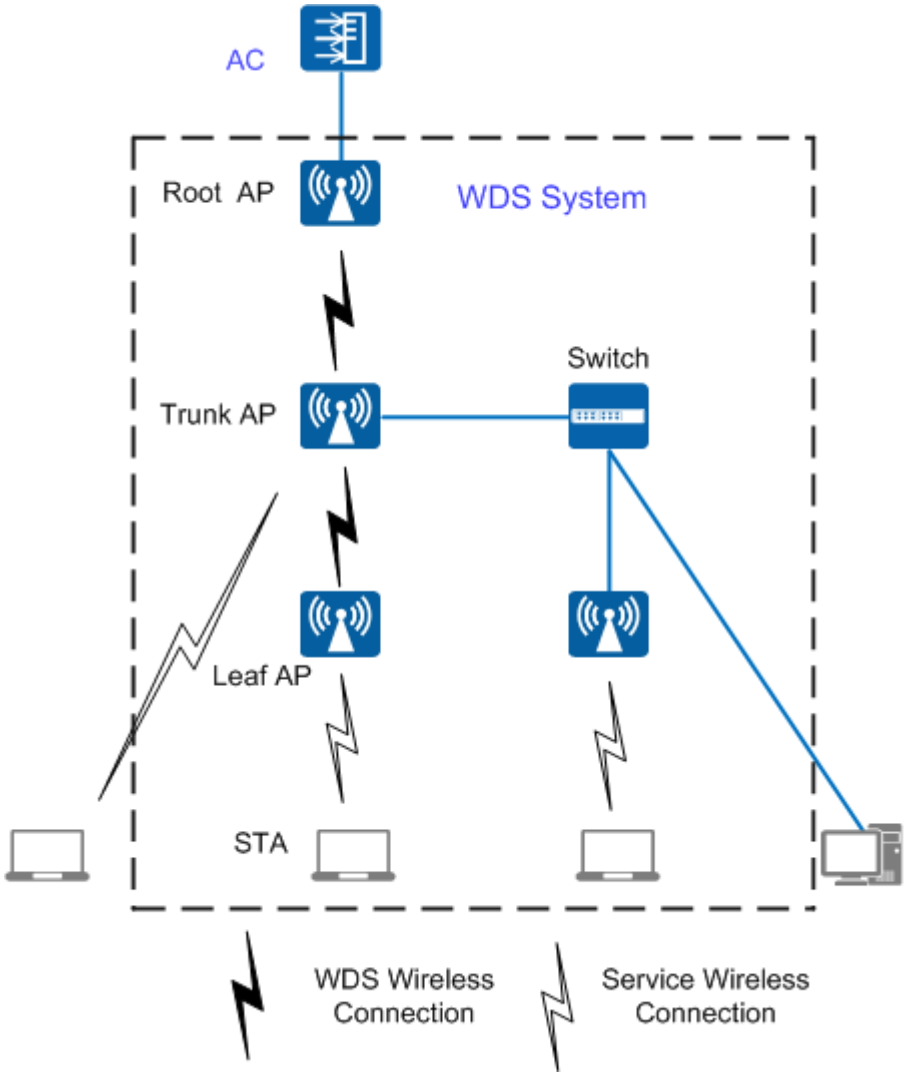
802.11 wireless technology has been widely used in home networks and enterprise networks. Users can easily access the Internet over WLANs. In this network application, APs must be connected to the existing wired network to provide network access services for wireless users. To expand the wireless coverage area, APs need to be connected using cables, switches, and power supplies. This increases network costs and prolongs network construction period. Wired deployment requirements may not be met in special circumstances. The Wireless Distribution System (WDS) or mesh technology allows APs to be connected wirelessly, facilitating WLAN construction in a complex environment.

## WDS

The WDS is a distribution system comprised of APs. The WDS connects to an AC on the network side, which is then connected to a network device such as a gateway or an aggregation switch. The WDS connects to a station (STA) or a wired network device (such as a PC) on the user side.

**Figure 1-38** WDS




On a WDS network, an AC manages the following devices:

- Root AP: connects to an AC on the wired side, and functions as a WDS master to connect to trunk APs or leaf APs.
- Trunk AP: functions as a WDS slave to connect to a root AP, connects to wired devices on the wired side, or functions as a WDS master to connect to leaf APs.
- Leaf AP: functions as a WDS slave to connect to a root AP or trunk AP or connects to STAs on the wireless side.

**NOTE**

Both the root AP and trunk AP can function as leaf APs.

The WDS networking can expand WLANs and applies to indoor wireless deployment scenarios.

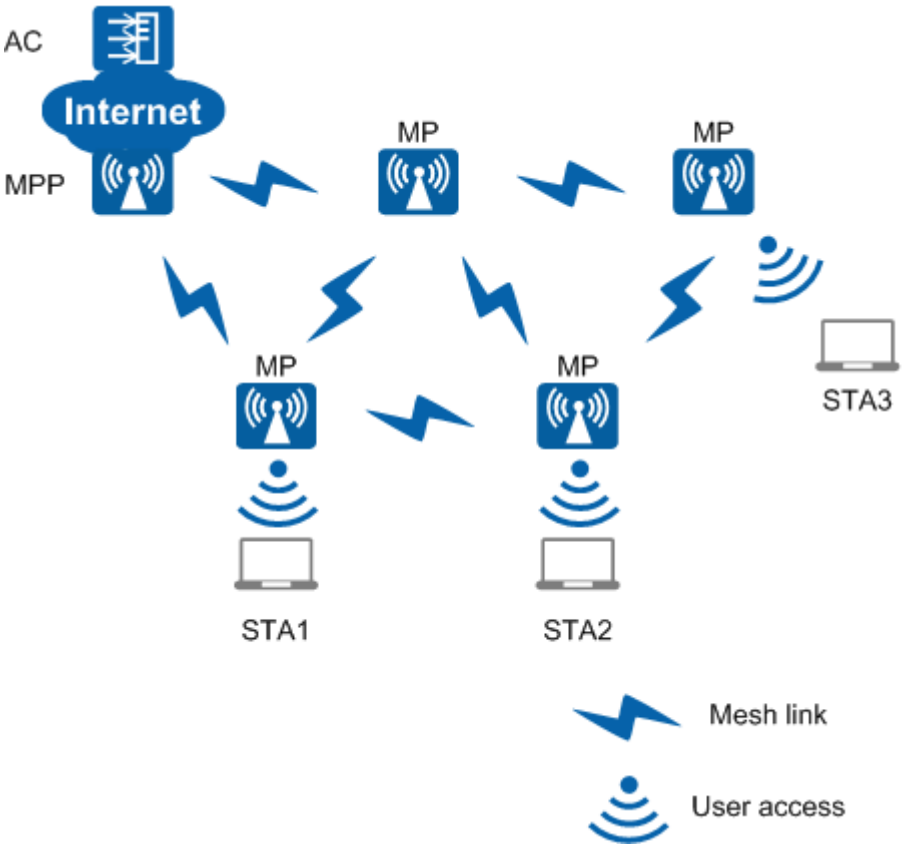
  

## WMN

Compared with a traditional WLAN, a Wireless Mesh Network (WMN) has the following advantages:

- Fast deployment: Mesh nodes can be easily installed to construct a WMN in a short time, much shorter than the construction period of a traditional WLAN.
- Dynamic coverage area expansion: As more mesh nodes are deployed on a WMN, the WMN coverage area can be rapidly expanded.
- Robustness: A WMN is a peer-to-peer network that will not be affected by the failure of a single node. If a node fails, packets are forwarded to the destination node along other paths.
- Flexible networking: An AP can directly join or leave a WMN, without the need of connections to infrastructure. This allows for flexible networking.
- Various application scenarios: Besides traditional WLAN scenarios such as enterprise networks, office networks, and campus networks, a WMN also applies to scenarios such as large-scale warehouses, docks, MANs, metro lines, and emergency communications.
- Cost-effectiveness: Only MPPs need to connect to a wired network, which minimizes the dependency of a WMN on wired devices and saves costs in wired device purchasing and cable deployment.

**Figure 1-39** WMN




Nodes on a WMN can be classified into the following types based on their functions:

- Mesh point (MP)

  A mesh-capable node that uses IEEE 802.11 MAC and physical layer protocols for wireless communication. This node supports automatic topology discovery, automatic route discovery, and data packet forwarding.

- Mesh portal point (MPP)

  An MP that connects to a WMN or another type of network. This node has the portal function and enables mesh nodes to communicate with external networks.

On a WMN, MPs are fully meshed to establish an auto-configured, and self-healing backbone WMN, and MPPs with the gateway function provide connections to the Internet. An MP provides access services and connects a STA to a WMN. A WMN uses special mesh routing protocols, which ensures high transmission quality. The WMN is applicable to scenarios that require high-bandwidth and highly stable Internet connections.

### 1.4.2.4 Dual-AC Networking

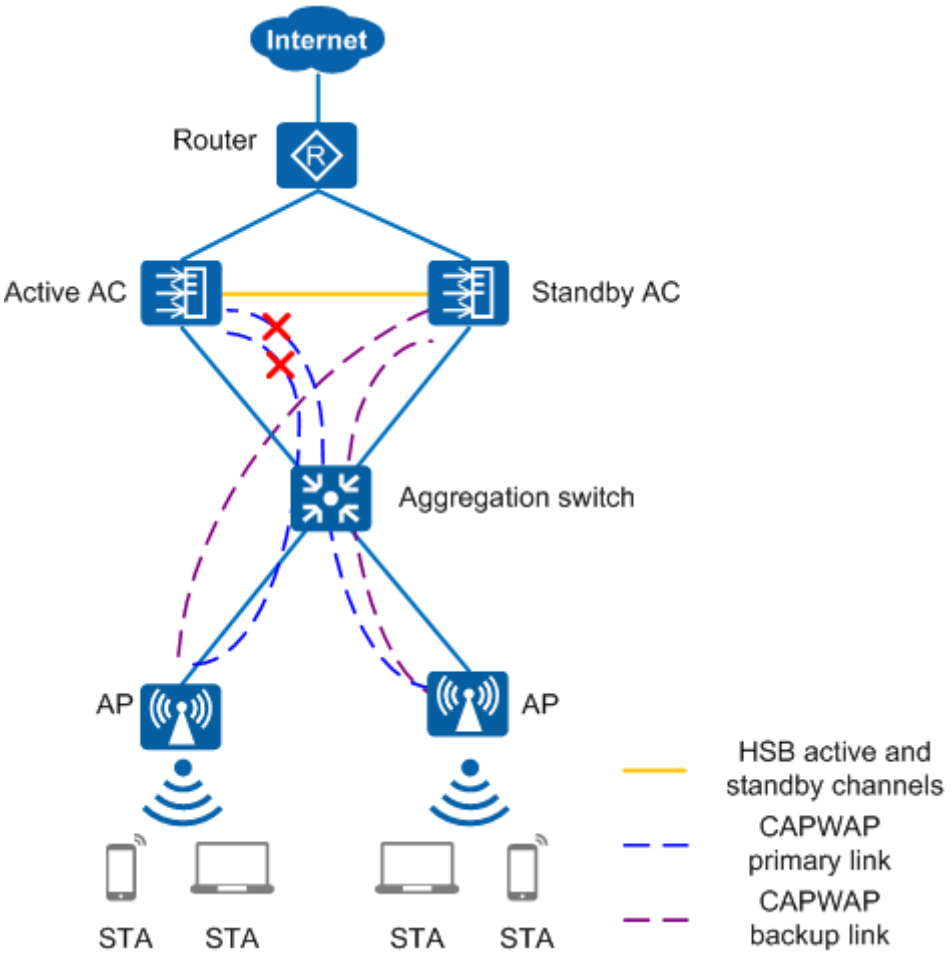
To ensure uninterrupted service forwarding, enterprises that require high reliability use active and standby ACs for networking.

Dual-AC backup can be implemented in two modes:

- HSB + dual-link backup: As shown in **Figure 1-40**, an AP establishes CAPWAP tunnels with both the active and standby ACs. The two ACs synchronize service information (such as NAC and WLAN service information) through the hot standby (HSB) function. When an AP is disconnected from the active AC, the AP notifies the standby AC of a switchover. This mode frees active and standby ACs from location restrictions and allows both ACs to be flexibly deployed. In this mode, the two ACs can implement load balancing to make efficient use of resources. However, service switching takes a relatively long time.

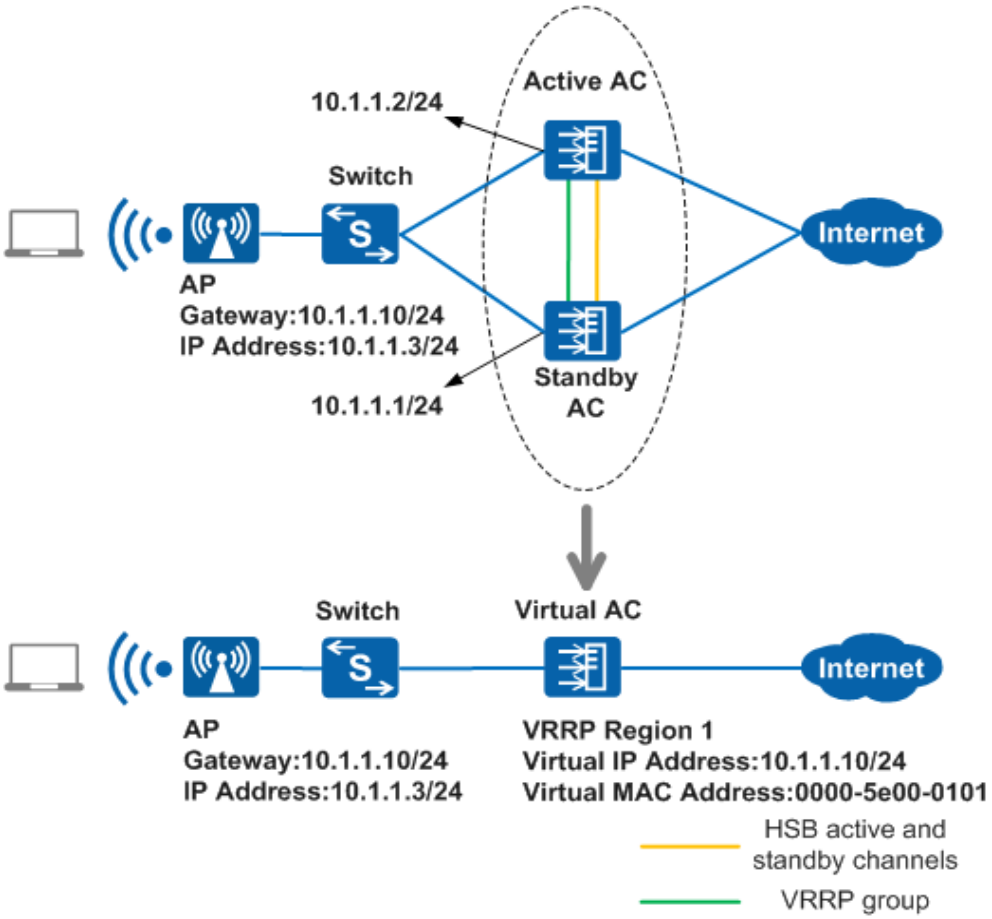
**Figure 1-40** HSB + dual-link backup networking




- HSB + VRRP: As shown in **Figure 1-41**, an AP obtains only the virtual IP address of both the active and standby ACs. The active AC backs up information including AP entries, CAPWAP link information, and user information on the standby AC. In this mode, the AP only detects the presence of one AC. The active/standby switchover is determined by the Virtual Router Redundancy Protocol (VRRP). Currently, this mode cannot be used in a VRRP multi-instance scenario. This mode restricts deployment locations of both ACs. Compared to HSB + dual-link backup, services can be switched faster in this mode.

**Figure 1-41** HSB + VRRP networking




## 1.4.2.5 Cloud AC Networking

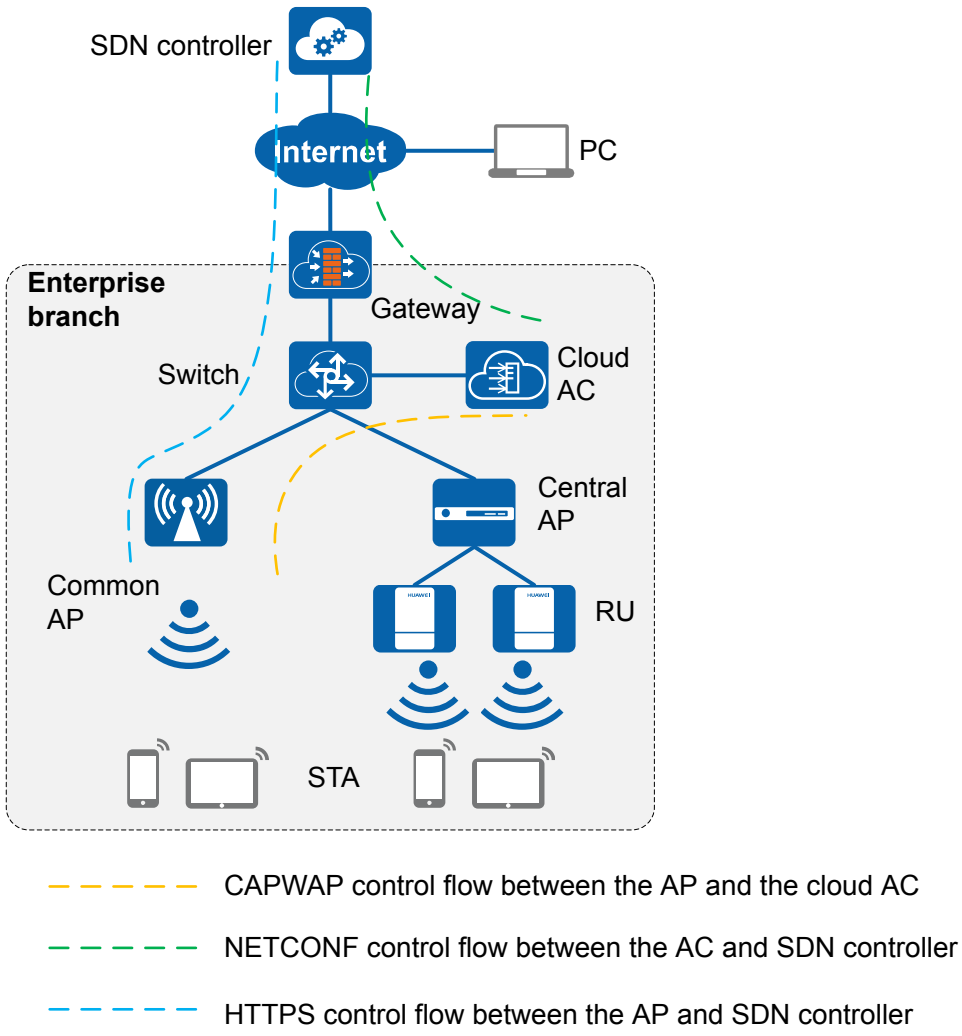
The cloud AC solution is suitable for medium- and large-sized sites with a large number of APs.

As shown in **Figure 1-42**, the AP in Fit mode registers with the AC through CAPWAP. The AC works in cloud mode and uses NETCONF to register with the SDN controller (CloudCampus@AC-Campus for ACs running V200R019C00 and earlier versions; iMaster NCE-Campus for ACs running V200R019C10 and later versions). The administrator can remotely manage the ACs and APs on the enterprise network to implement automatic WLAN deployment, service provisioning, and monitoring and O&M.

- Log in to the AC's web platform through the SDN controller to remotely configure services.
- Manage the status of ACs and APs on the SDN controller to learn about performance and service statistics in real time.

**Figure 1-42** Typical cloud AC networking diagram




## 1.4.3 Hardware Information (AC6507S, AC6508, and AirEngine 9700S-S)

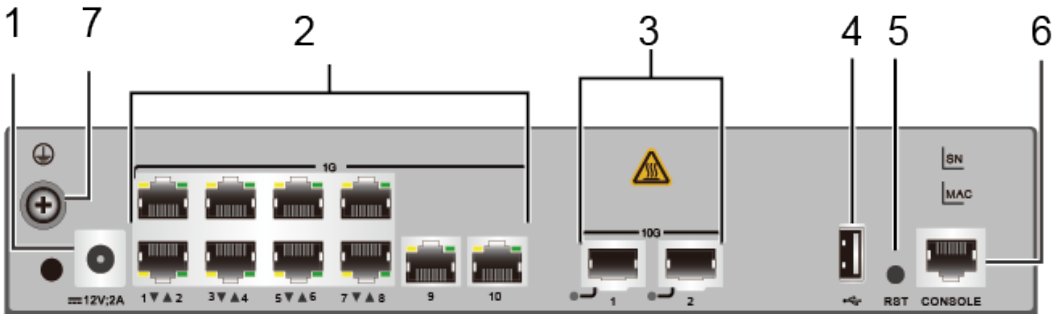
### Appearance and Structure

**Figure 1-43** and **Figure 1-44** show the appearance of the AC6508/AC6507S/AirEngine 9700S-S.

**Figure 1-43** Appearance of the AC (front view)

**Figure 1-44** Appearance of the AC (rear view)




| No. | Description |
| --- | --- |
| 1 | DC input port. |
| 2 | Ten 10/100/1000BASE-T Ethernet electrical ports. |
| 3 | Two 10GE SFP+ Ethernet optical ports. |
| 4 | USB 2.0 port. |
| 5 | Reset button.<br>• Press the reset button for no more than 3 seconds to reset the AC manually. Resetting the AC will cause service interruption. Exercise caution when using this button.<br>• Press and hold down the reset button for more than 5 seconds to restore the AC configuration. |
| 6 | Console port. |
| 7 | Ground point. |

## Indicator Description

Figure 1-45 shows the indicators on the AC6508/AC6507S/AirEngine 9700S-S front panel.

**Figure 1-45** Indicators on the AC6508/AC6507S/AirEngine 9700S-S front panel


The following table describes the indicators on the AC6508/AC6507S/AirEngine 9700S-S front panel.

| No. | Indicator | Color | Description |
| --- | --- | --- | --- |
| 1 | PWR: power supply indicator | - | Off: The system is powered off or faulty. |
| | | Green | Steady on: The power module is working properly. |
| 2 | SYS: system status indicator | - | Off: The system is not running. |
| | | Green | • Steady on: The system is powering on or restarting.<br>• Fast blinking(4 Hz): The system is starting.<br>• Slow blinking(0.5 Hz): The system is running properly. |
| | | Red | The system is faulty. |
| 3 | USB indicator | - | No USB flash drive is connected to the AC. |
| | | Green | Steady on: The USB flash drive is inserted and working properly. |
| 4 | CLOUD indicator | Green | • Off: The device is not connected or lost the connection to the Agile Controller-Campus.<br>• Steady on: The connection to the Agile Controller-Campus is normal.<br>• Fast blinking(4 Hz): The device is connecting to the Agile Controller-Campus. |

| Display Mode | Color | Description |
| --- | --- | --- |
| GE electrical service port indicator | Green | • Off: The port is not connected or has been shut down.<br>• Steady on: The port is connected. |
| | Yellow | Blinking: The port is sending or receiving data. |
| 10GE optical service port indicator | Green | • Off: The port is not connected or has been shut down.<br>• Steady on: The port is connected.<br>• Blinking: The port is sending or receiving data. |

### Physical Specifications

The following table describes the physical specifications of the AC6508, AC6507S and AirEngine 9700S-S.

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | • Basic: 43.6 mm x 250 mm x 210 mm<br>• Maximum: 43.6 mm x 250 mm x 215 mm |
| | Weight | 1.57kg |
| Power specifications | Maximum power consumption | 22.3W |
| | Power input | DC: 12 V ± 5% |
| Environment parameters | Operating temperature | • -60 m to +1800 m: 0°C to +45°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature and altitude | -60 m to +5000 m: -40°C to +70°C |
| | Relative humidity | 5% RH to 95% RH, noncondensing |

## 1.4.4 Performance Specifications (AC6507S, AC6508, and AirEngine 9700S-S)

For AC performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AC model, or query the specifications using **Info-Finder**.

# 1.5 AC6805 Product Description

## 1.5.1 Product Characteristics (AC6805)

**NOTICE**

The AC6805 is a class A product. The AC6805 that is operating may cause radio interference. Customers need to take prevention measures.

The AC6805 is a high-end wireless access controller (AC) for large enterprise campuses, enterprise branches, and school campuses. The AC6805 can manage up to 6K access points (APs) and provide 40 Gbit/s forwarding performance. It features high scalability and offers users considerable flexibility in configuring the number of managed APs. When used with Huawei's full series 802.11ax, 802.11ac,

and 802.11n APs, the AC6805 delivers an adaptable solution for large campus networks, enterprise office networks, wireless Metropolitan Area Networks (MANs), and hotspot coverage.

The AC6805 has the following features:

- Large capacity and high performance: Provides 12 x GE ports, 12 x 10 GE ports, and 2 x 40 GE ports with 40 Gbit/s forwarding capability for up to 6K managed APs.
- Flexibility: Flexible data forwarding modes, including direct forwarding and tunnel forwarding and fine-grained user rights management with user- and role-based access controls.
- Flexible O&M methods: Various network O&M methods, including eSight, web platform, and Command Line Interface (CLI).

## 1.5.2 Application Scenarios (AC6805)

### 1.5.2.1 Bypass Networking

In bypass networking mode, the AC is connected to a network device (usually an aggregation switch) to manage APs.

The AC manages APs. Management flows are transmitted in CAPWAP tunnels, and data flows are forwarded to the upper layer network by the aggregation switch and do not pass through the AC.

### Tunnel Forwarding

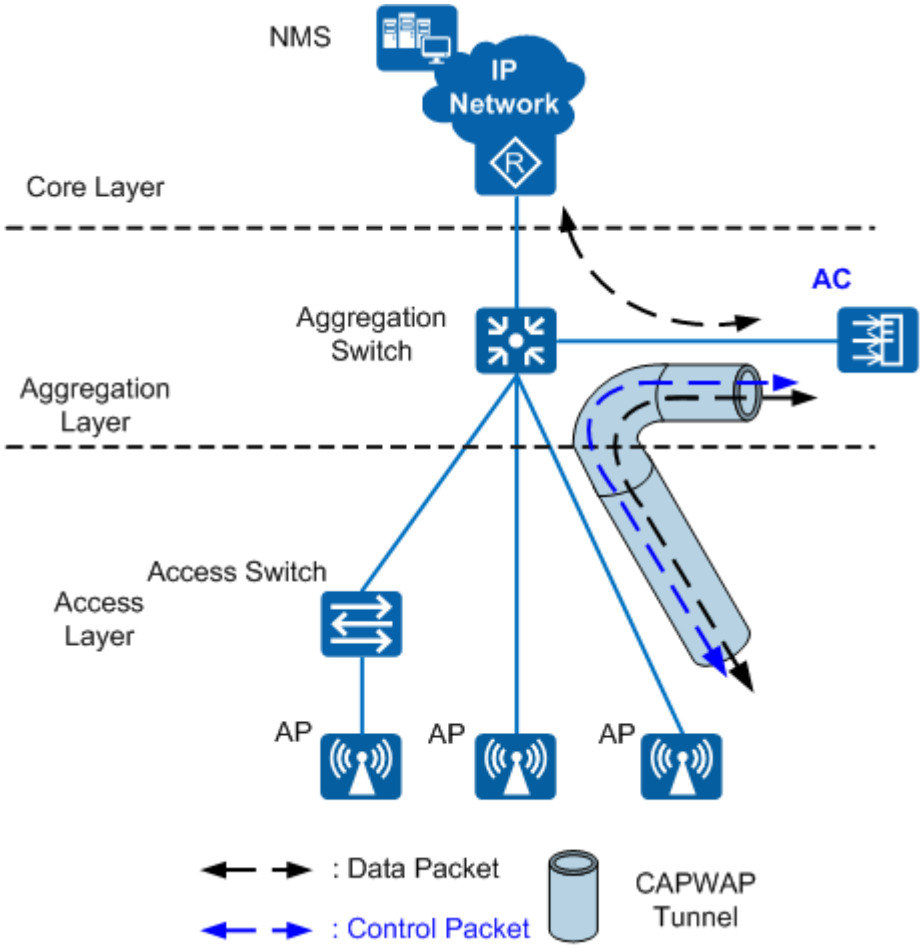
In tunnel forwarding mode, wireless data is transmitted between APs and ACs over CAPWAP tunnels.

In **Figure 1-46**, both management flows and data flows of APs are transmitted to the AC over CAPWAP tunnels, and then the AC transparently transmits these flows to the upstream device.

Tunnel forwarding is usually used to control wireless user traffic in a centralized manner. This forwarding mode facilitates device deployment and controls all wireless service data flows by aggregating traffic of all wireless users connected to APs to an AC through CAPWAP data tunnels.

**Figure 1-46** Bypass networking in tunnel forwarding mode



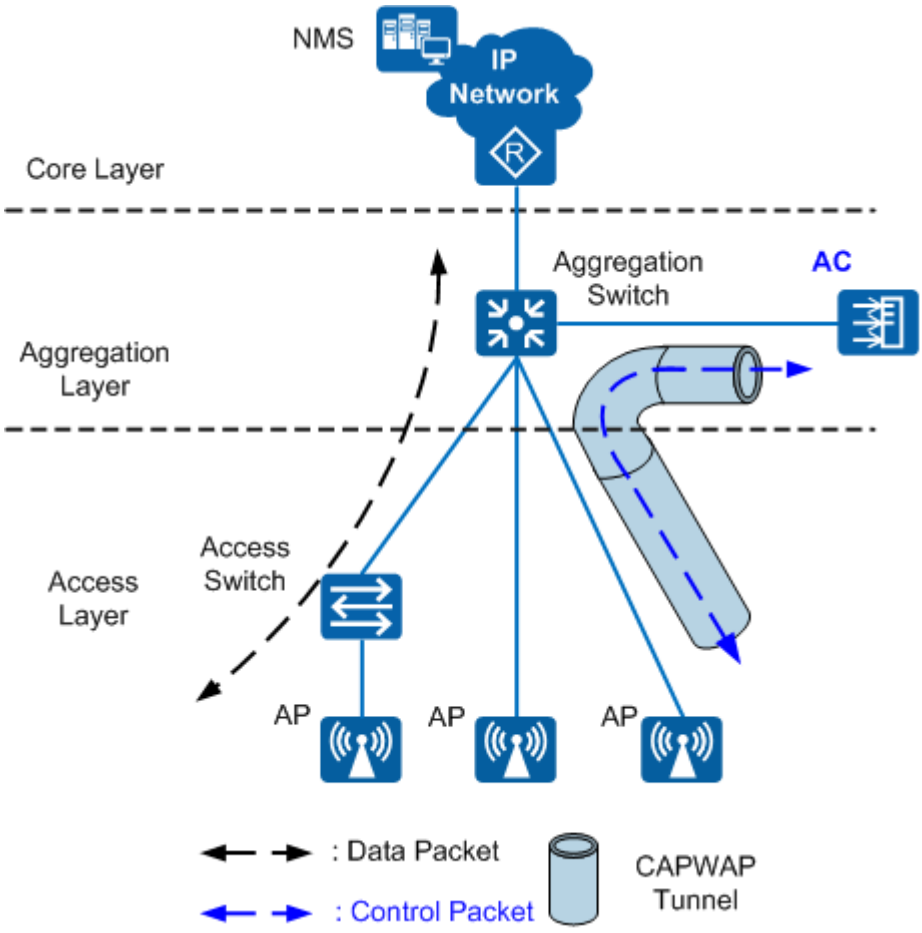

## Direct Forwarding

In direct forwarding mode, wireless data is translated from 802.3 packets into 802.11 packets, which are then forwarded by an uplink aggregation switch.

The bypass networking mode is often used on enterprise networks. Wireless data does not need to be processed by an AC, eliminating the bandwidth bottleneck and facilitating the usage of existing security policies. Therefore, this networking mode is recommended for integrated network deployment.

**Figure 1-47** Bypass networking in direct forwarding mode




- The AC only manages APs. All AP management flows (including authentication traffic) must arrive at the AC.

  Interfaces connected to the AC are reserved on the aggregation switch. The aggregation switch functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode or broadcast mode.
- Data flows from APs are forwarded by the Layer 2 switch and aggregation switch, and do not pass through the AC.

  Different service VLANs are assigned to STAs with different service set identifiers (SSIDs). The access switch and aggregation switch identify packets from these VLANs and forward these packets to the upstream device. The aggregation switch allocates IP addresses to STAs.

## Application

In bypass networking mode, the AC manages all the APs connected to the aggregation switch. This network topology applies to scenarios where APs are scattered across hot spots.

The bypass networking mode requires only a small modification to the existing network, facilitating device deployment. You can select the direct or tunnel forwarding mode according to networking requirements.

### 1.5.2.2 Inline Networking

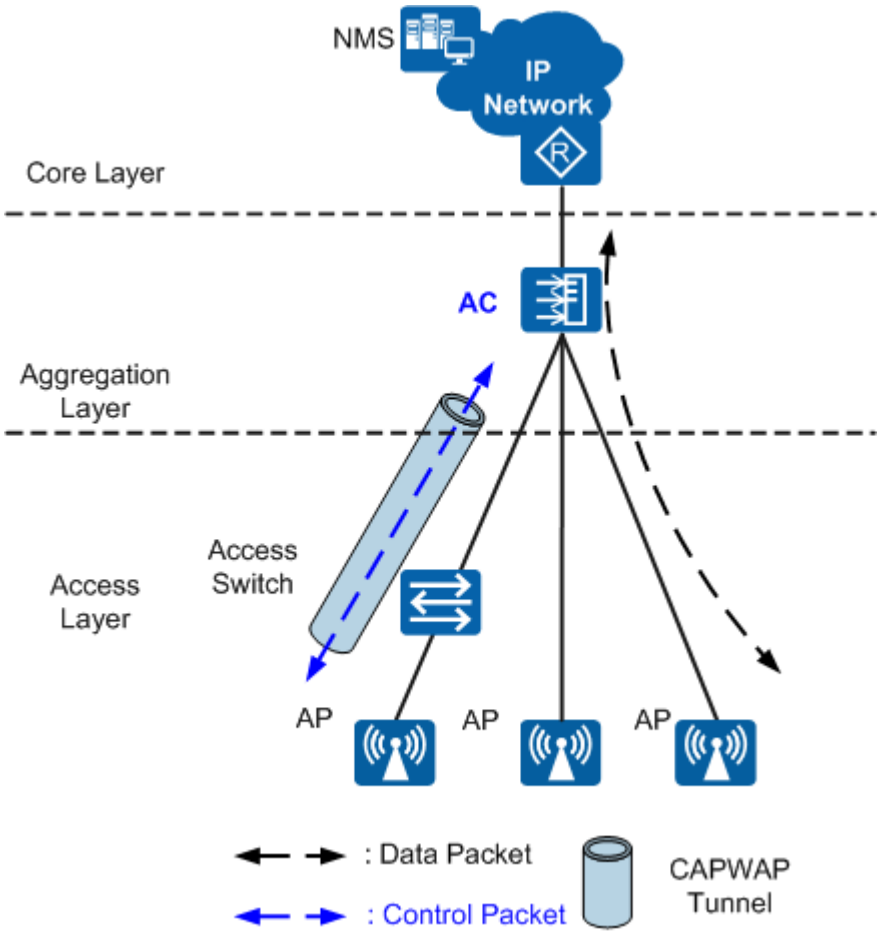
In inline networking mode, APs or access switches are directly connected to the AC. The AC also functions as an aggregation switch to forward and process APs' data and management services.

In inline networking mode, the AC sets up CAPWAP tunnels with APs to configure and manage these APs over CAPWAP tunnels. Service data of wireless users can be forwarded between APs and the AC over CAPWAP data tunnels or be directly forwarded by APs.

In inline networking mode, direct forwarding is often used so that service data can be forwarded on APs.

The AC functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode, or broadcast mode, and set up data tunnels with the AC.

**Figure 1-48** Data flows not transmitted in CAPWAP tunnels




In direct forwarding mode, only control flows are transmitted in CAPWAP tunnels, and data flows sent from APs are transparently transmitted to the upstream device by the AC, as shown in **Figure 1-48**.

When data flows are not transmitted in CAPWAP tunnels, configure management VLANs and data VLANs as follows:

- On the AC and its upstream devices, configure an AC management VLAN to transmit control flows between the AC and the NMS.
- On the switches between APs and the AC, configure AP management VLANs to transmit control flows between APs and the AC.
- On all switches between APs and the AC, configure data VLANs to differentiate WLAN data flows.

## Application

The AC provides powerful access, aggregation, and switching capabilities. Therefore, APs can directly connect to the AC. Direct forwarding is often used in inline networking mode. This networking mode simplifies the network architecture and applies to small- and medium-scale centralized WLANs.

## 1.5.2.3 Wireless Backhaul Networking

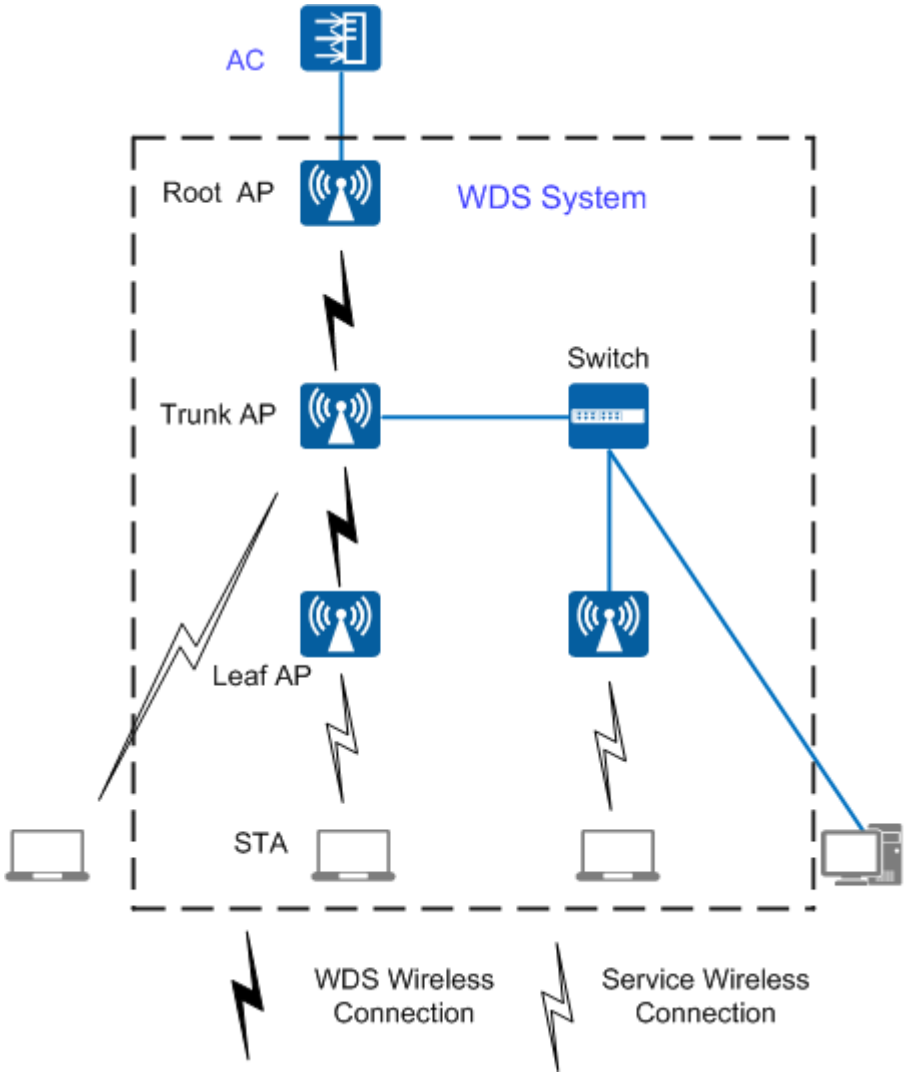
802.11 wireless technology has been widely used in home networks and enterprise networks. Users can easily access the Internet over WLANs. In this network application, APs must be connected to the existing wired network to provide network access services for wireless users. To expand the wireless coverage area, APs need to be connected using cables, switches, and power supplies. This increases network costs and prolongs network construction period. Wired deployment requirements may not be met in special circumstances. The Wireless Distribution System (WDS) or mesh technology allows APs to be connected wirelessly, facilitating WLAN construction in a complex environment.

## WDS

The WDS is a distribution system comprised of APs. The WDS connects to an AC on the network side, which is then connected to a network device such as a gateway or an aggregation switch. The WDS connects to a station (STA) or a wired network device (such as a PC) on the user side.

**Figure 1-49** WDS




On a WDS network, an AC manages the following devices:

- Root AP: connects to an AC on the wired side, and functions as a WDS master to connect to trunk APs or leaf APs.
- Trunk AP: functions as a WDS slave to connect to a root AP, connects to wired devices on the wired side, or functions as a WDS master to connect to leaf APs.
- Leaf AP: functions as a WDS slave to connect to a root AP or trunk AP or connects to STAs on the wireless side.

**NOTE**

Both the root AP and trunk AP can function as leaf APs.

The WDS networking can expand WLANs and applies to indoor wireless deployment scenarios.

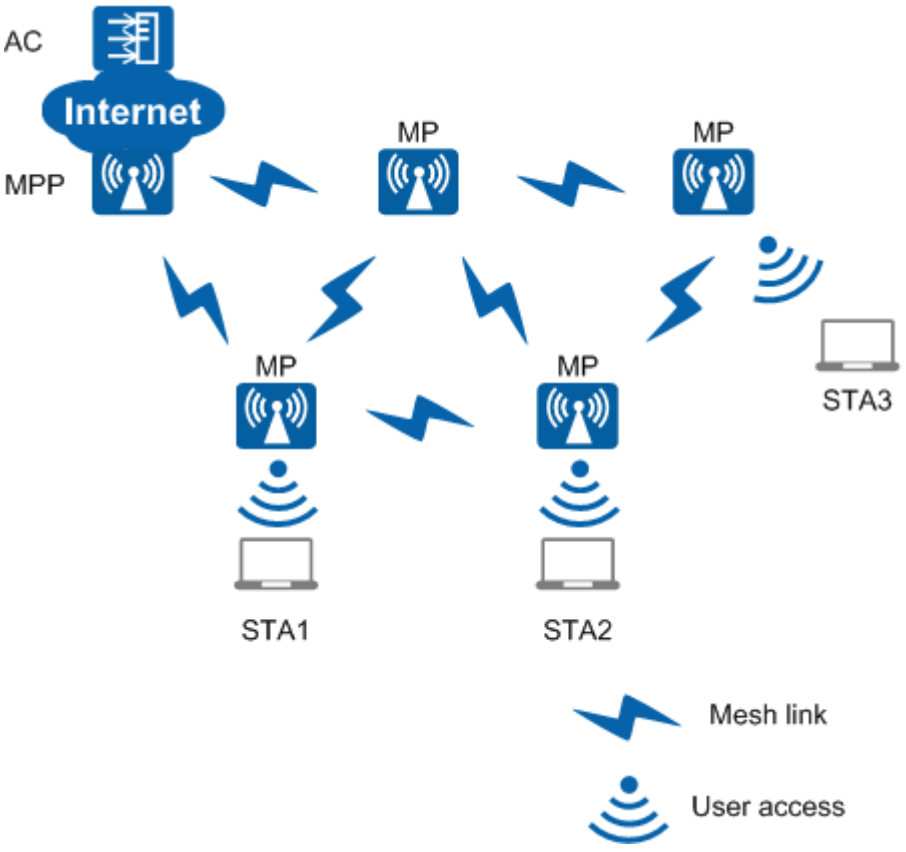
  

## WMN

Compared with a traditional WLAN, a Wireless Mesh Network (WMN) has the following advantages:

- Fast deployment: Mesh nodes can be easily installed to construct a WMN in a short time, much shorter than the construction period of a traditional WLAN.
- Dynamic coverage area expansion: As more mesh nodes are deployed on a WMN, the WMN coverage area can be rapidly expanded.
- Robustness: A WMN is a peer-to-peer network that will not be affected by the failure of a single node. If a node fails, packets are forwarded to the destination node along other paths.
- Flexible networking: An AP can directly join or leave a WMN, without the need of connections to infrastructure. This allows for flexible networking.
- Various application scenarios: Besides traditional WLAN scenarios such as enterprise networks, office networks, and campus networks, a WMN also applies to scenarios such as large-scale warehouses, docks, MANs, metro lines, and emergency communications.
- Cost-effectiveness: Only MPPs need to connect to a wired network, which minimizes the dependency of a WMN on wired devices and saves costs in wired device purchasing and cable deployment.

**Figure 1-50** WMN




Nodes on a WMN can be classified into the following types based on their functions:

- Mesh point (MP)

  A mesh-capable node that uses IEEE 802.11 MAC and physical layer protocols for wireless communication. This node supports automatic topology discovery, automatic route discovery, and data packet forwarding.

- Mesh portal point (MPP)

  An MP that connects to a WMN or another type of network. This node has the portal function and enables mesh nodes to communicate with external networks.

On a WMN, MPs are fully meshed to establish an auto-configured, and self-healing backbone WMN, and MPPs with the gateway function provide connections to the Internet. An MP provides access services and connects a STA to a WMN. A WMN uses special mesh routing protocols, which ensures high transmission quality. The WMN is applicable to scenarios that require high-bandwidth and highly stable Internet connections.

### 1.5.2.4 Dual-AC Networking

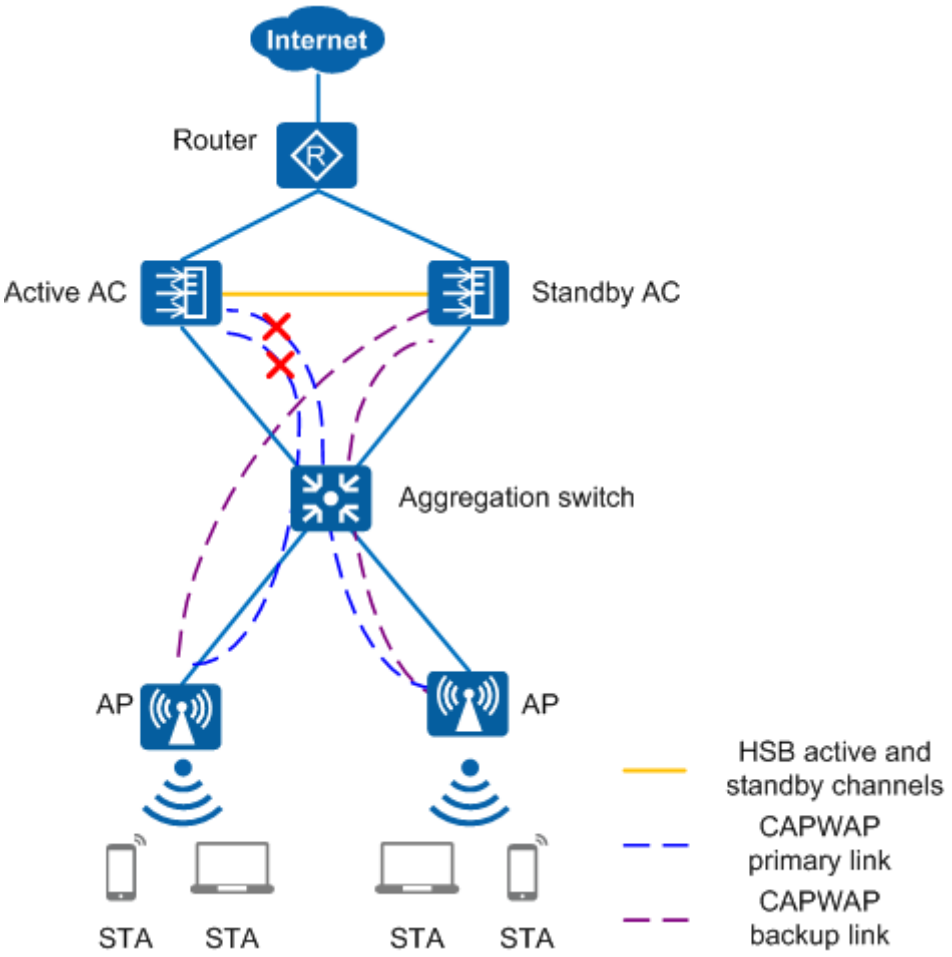
To ensure uninterrupted service forwarding, enterprises that require high reliability use active and standby ACs for networking.

Dual-AC backup can be implemented in two modes:

- HSB + dual-link backup: As shown in **Figure 1-51**, an AP establishes CAPWAP tunnels with both the active and standby ACs. The two ACs synchronize service information (such as NAC and WLAN service information) through the hot standby (HSB) function. When an AP is disconnected from the active AC, the AP notifies the standby AC of a switchover. This mode frees active and standby ACs from location restrictions and allows both ACs to be flexibly deployed. In this mode, the two ACs can implement load balancing to make efficient use of resources. However, service switching takes a relatively long time.

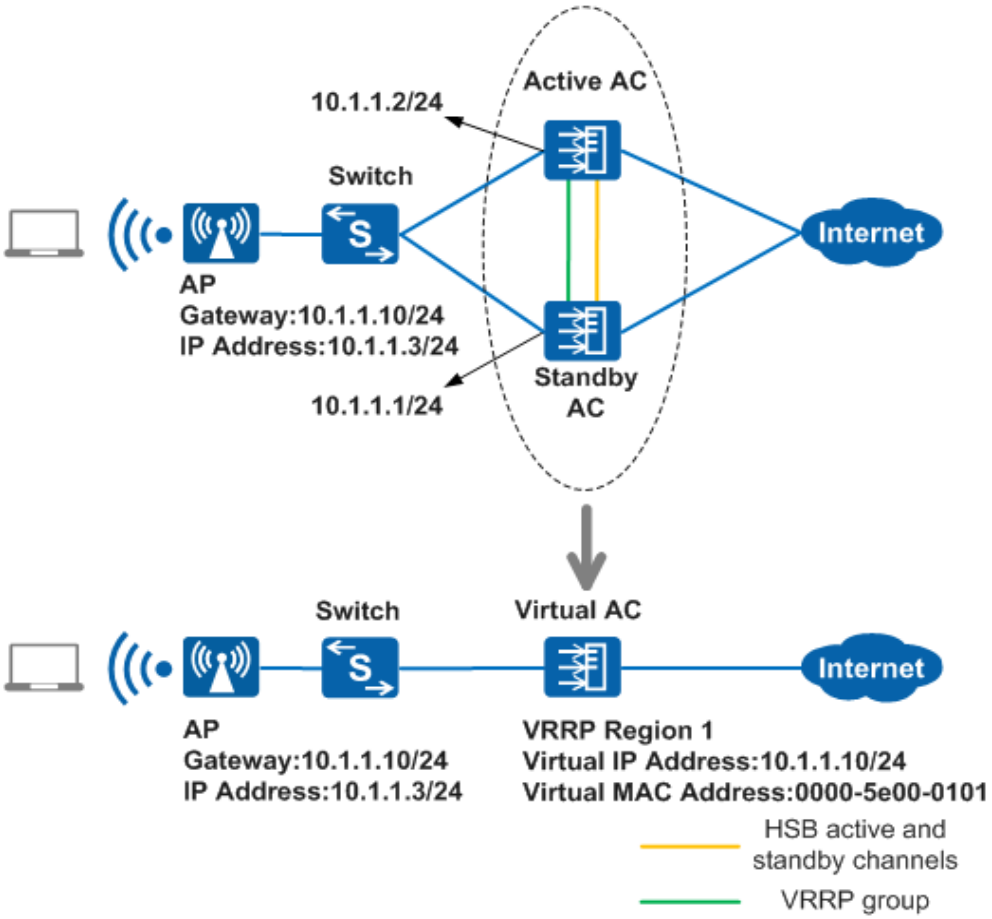
**Figure 1-51** HSB + dual-link backup networking




- HSB + VRRP: As shown in **Figure 1-52**, an AP obtains only the virtual IP address of both the active and standby ACs. The active AC backs up information including AP entries, CAPWAP link information, and user information on the standby AC. In this mode, the AP only detects the presence of one AC. The active/standby switchover is determined by the Virtual Router Redundancy Protocol (VRRP). Currently, this mode cannot be used in a VRRP multi-instance scenario. This mode restricts deployment locations of both ACs. Compared to HSB + dual-link backup, services can be switched faster in this mode.

**Figure 1-52** HSB + VRRP networking




## 1.5.2.5 Cloud AC Networking

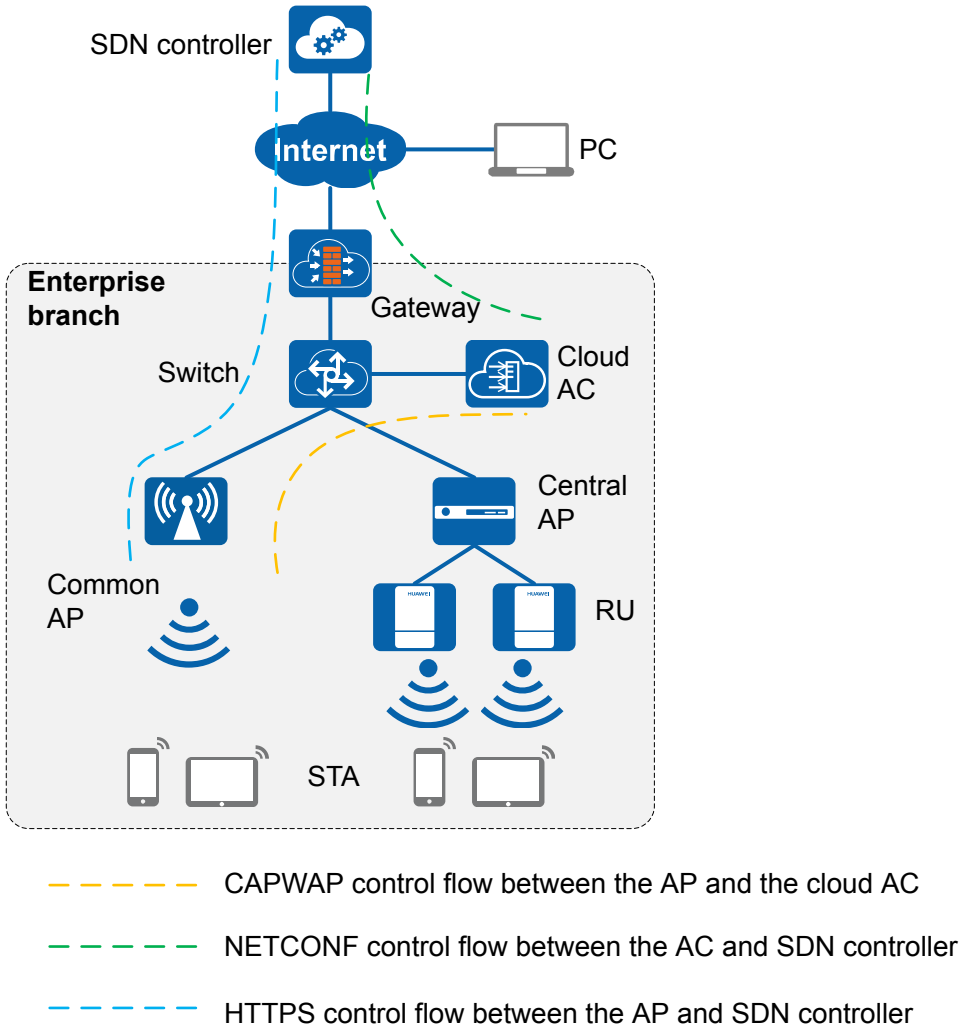
The cloud AC solution is suitable for medium- and large-sized sites with a large number of APs.

As shown in **Figure 1-53**, the AP in Fit mode registers with the AC through CAPWAP. The AC works in cloud mode and uses NETCONF to register with the SDN controller (CloudCampus@AC-Campus for ACs running V200R019C00 and earlier versions; iMaster NCE-Campus for ACs running V200R019C10 and later versions). The administrator can remotely manage the ACs and APs on the enterprise network to implement automatic WLAN deployment, service provisioning, and monitoring and O&M.

- Log in to the AC's web platform through the SDN controller to remotely configure services.
- Manage the status of ACs and APs on the SDN controller to learn about performance and service statistics in real time.

**Figure 1-53** Typical cloud AC networking diagram




## 1.5.3 Product Structure (AC6805)

### Appearance and Structure

Currently, the AC6805 series has only one model AC6805.

**Figure 1-54** and **Figure 1-55** show the appearance of the AC6805.

**Figure 1-54** Appearance of the AC6805 (front view)

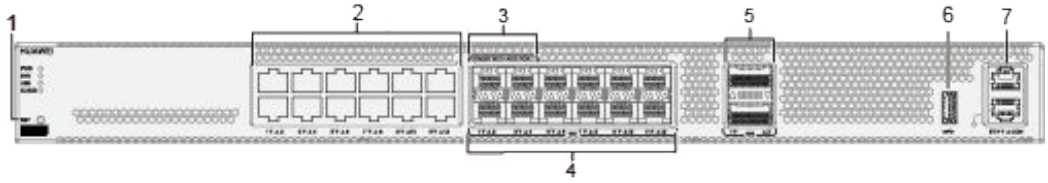
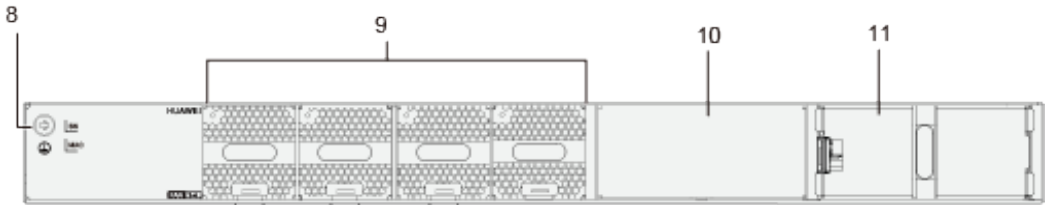


**Figure 1-55** Appearance of the AC6805 (rear view)




| No. | Description |
| --- | --- |
| 1 | Reset button.<br>• Press the reset button (for no more than 3 seconds) to reset the AC manually. Resetting the AC will cause service interruption. Exercise caution when using this button.<br>• Press and hold down the reset button (for more than 5 seconds) to restore the AC configuration. |
| 2 | Twelve 10/100/1000BASE-T Ethernet electrical ports. |
| 3 | Combo port: can be used as one 40GE QSFP+ optical port or four 10GE SFP+ optical ports. By default, the QSFP+ optical works, and SFP+ ports 1 through 4 are unavailable. When any SFP+ port is configured to work, the QSFP+ port becomes unavailable. |
| 4 | Twelve 10GE SFP+ optical ports. |
| 5 | Two 40GE QSFP+ optical ports. |
| 6 | Standard USB 3.0 port. |
| 7 | ETH management port and console port. |
| 8 | Ground point. |
| 9 | Pluggable fan module. |
| 10 | Power module slot. |
| 11 | Filler panel for the backup power module. |

## Indicator Description

**Figure 1-56** shows the indicators on the AC6805 front panel, and **Figure 1-57** shows the fan indicator.

**Figure 1-56** Indicators on the AC6805 front panel

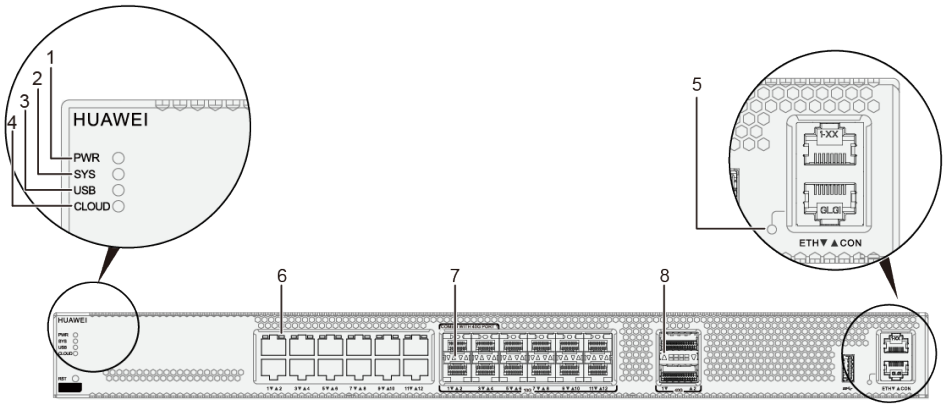



**Figure 1-57** Fan indicator on the AC6805

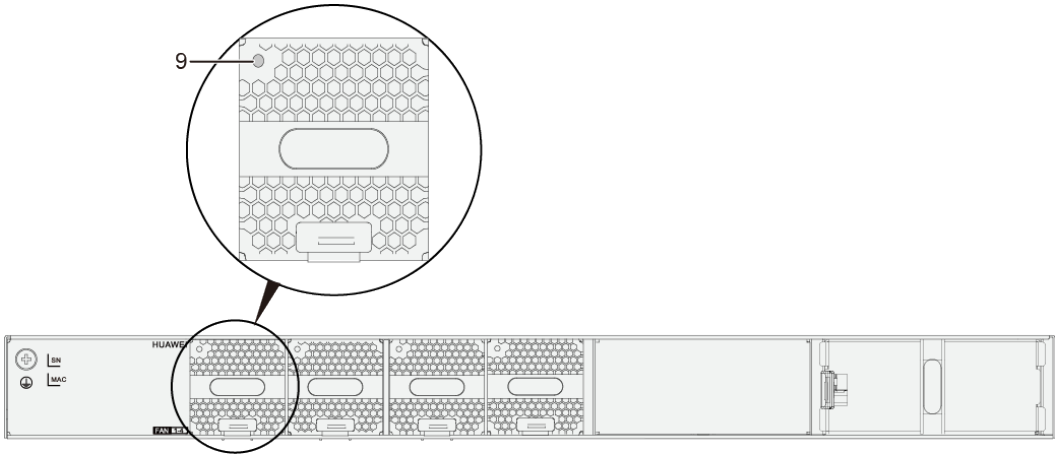



Table 1-15 describes the meanings of indicators on AC6805 front panel.

**Table 1-15** Description of indicators on the AC6805 front panel

| No. | Indicator | Color | Description |
| --- | --- | --- | --- |
| 1 | PWR: power supply indicator | - | Off: The system is powered off or faulty. |
| | | Green | Steady on: The power module is working properly. |
| 2 | SYS: system status indicator | - | Off: The system is not running. |

| No. | Indicator | Color | Description |
| --- | --- | --- | --- |
| | | Green | • Fast blinking (4 Hz): The system is starting.<br>• Slow blinking (0.5 Hz): The system is running properly.<br>• Steady on: The system is being powered on or restarted. |
| | | Red | Steady on:<br>• The system is faulty.<br>• The power module does not work properly.<br>**NOTE**<br>When the AC supports two power modules:<br>1. If only one power module is available and is running properly, the SYS indicator blinks green.<br>2. If two power modules are present in the power supply slots and one or two of them are faulty, the SYS indicator blinks red.<br>• The fan module does not work properly. |
| 3 | USB indicator | - | Off: No USB flash drive is connected to the AC. |
| | | Green | Steady on: A USB flash drive is connected and works properly. |
| 4 | CLOUD indicator | Green | • Off: The AC is not connected or lost the connection to SDN controller.<br>• Steady on: The connection to SDN controller is normal.<br>• Fast blinking (4 Hz): The AC is connecting to SDN controller. |
| 5 | ETH indicator | Green | • Off: No link is established on the ETH port.<br>• Steady on: The ETH port is connected.<br>• Blinking: The ETH port is sending or receiving data. |

| No. | Indicator | Color | Description |
| --- | --- | --- | --- |
| 6 | GE electrical service port indicator<br>(Indicators correspond to ports 1 through 12 from left to right.) | Green | • Off: No link is established on the port.<br>• Steady on: The port is connected.<br>• Blinking: The port is sending or receiving data. |
| 7 | GE/10GE optical service port indicator<br>• A down arrow indicates a lower port, while an up arrow indicates an upper port.<br>• Four indicators (arrows) are located between two ports vertically, with two yellow indicators on the left, and two green indicators on the right. | Green | • Off: No link is established on the port.<br>• Steady on: The port is connected. |
| | | Yellow | Blinking: The port is sending or receiving data. |
| 8 | 40GE optical service port indicator | Green | • Off: No link is established on the port.<br>• Steady on: The port is connected.<br>• Blinking: The port is sending or receiving data. |
| 9 | Fan indicator | - | Off: No fan module is installed. |
| | | Green | Blinking: The fan module is working properly. |
| | | Red | Blinking: The fan is not running at a proper speed or stops rotating. |

### Physical Specifications

**Table 1-16** Physical specifications

| Item | | Description |
| --- | --- | --- |
| Dimensions and weight | Dimensions (H x W x D) | • Basic: 43.6 mm x 442 mm x 420 mm<br>• Maximum: 43.6 mm x 442 mm x 444 mm |
| | Weight | 5.83 kg |
| Power specifications | Maximum power consumption | 231.7 W |
| | Rated input voltage | • AC power input: 100 V AC to 240 V AC, 50/60 Hz<br>• DC power input: -48 V DC to -60 V DC |
| Environment specifications | Operating temperature and altitude | • - 60 m to +1800 m: 0°C to +45°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature and altitude | -60 m to +5000 m: -40°C to +70°C |
| | Operating altitude of the power modules | 0 m to 5000 m |
| | Relative humidity | 5% RH to 95% RH, noncondensing |

## 1.5.4 Performance Specifications (AC6805)

For AC performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AC model, or query the specifications using **Info-Finder**.

# 1.6 AC6800V Product Description

## 1.6.1 Product Characteristics (AC6800V)

**NOTICE**

The AC6800V is a class A product. The AC6800V that is operating may cause radio interference. Customers need to take prevention measures.

Huawei AC6800V is an X86-based access controller (AC). The AC6800V has a large capacity and high performance. It is highly reliable, easy to install and maintain, and features such advantages as flexible networking and energy conservation.

NOTE

In real-world applications, the AC6800V must be deployed in redundancy mode to ensure WLAN service reliability.

The AC6800V has the following features:

- Has various user policy management and authority control capabilities.
- Can be managed using the eSight, web system, or command line interface.

## Abundant Port Types

The AC6800V hardware adopts the FusionServer 2288H V5 server and provides abundant types of ports, meeting requirements of various usage scenarios. **Table 1-17** lists the ports that the AC6800V provides.

**Table 1-17** AC6800V port description

| Port Type | Quantity | Description |
| --- | --- | --- |
| Service port | Six GE electrical ports | RJ-45 |
| | Six 10GE optical ports | SFP+ |
| Maintenance port | One RJ45 maintenance serial port | It is an RS-232 port. |
| | One RJ-45 iBMC management port | It is used to log in to the iBMC web management page but cannot be used to log in to the web page of the AC. You can log in to the web page of the AC only through the service port. |
| | Two USB 2.0 ports<br>Three USB 3.0 ports | The USB port is used to connect USB disks for deployment, configuration file transfer, and file upgrade. |

## Large Capacity, High Performance, Integrated Design

The AC provides a large capacity and high performance, and adopts an integrated design to allow for flexible deployment.

- Large forwarding capacity: The AC has six 10GE ports. It provides 60 Gbit/s forwarding capacity.

### Carrier-Class Reliability

The AC provides the following reliability designs, ensuring long-term operation.

- The AC supports port backup based on the Link Aggregation Control Protocol (LACP) or Multiple Spanning Tree Protocol (MSTP).
- The AC supports 1+1 hot backup.

### Easy-to-Install and Easy-to-Maintain

The AC is easy to install and maintain, simplifying network deployment.

- The AC dimensions (H x W x D) are 86.1 mm x 477 mm x 708 mm (3.39 in. x 18.78 in. x 27.87 in.), and the AC can be installed in a standard IEC cabinet (19 inches).
- The built-in web system of AC allows local GUI-based management.
- The AC can be managed by the eSight that provides various northbound interfaces.
- The AC supports the intra-board temperature probe, which monitors the operating environment of the AC in real time.

## 1.6.2 Application Scenarios (AC6800V)

### 1.6.2.1 Bypass Networking

In bypass networking mode, the AC is connected to a network device (usually an aggregation switch) to manage APs.

The AC manages APs. Management flows are transmitted in CAPWAP tunnels, and data flows are forwarded to the upper layer network by the aggregation switch and do not pass through the AC.

### Tunnel Forwarding

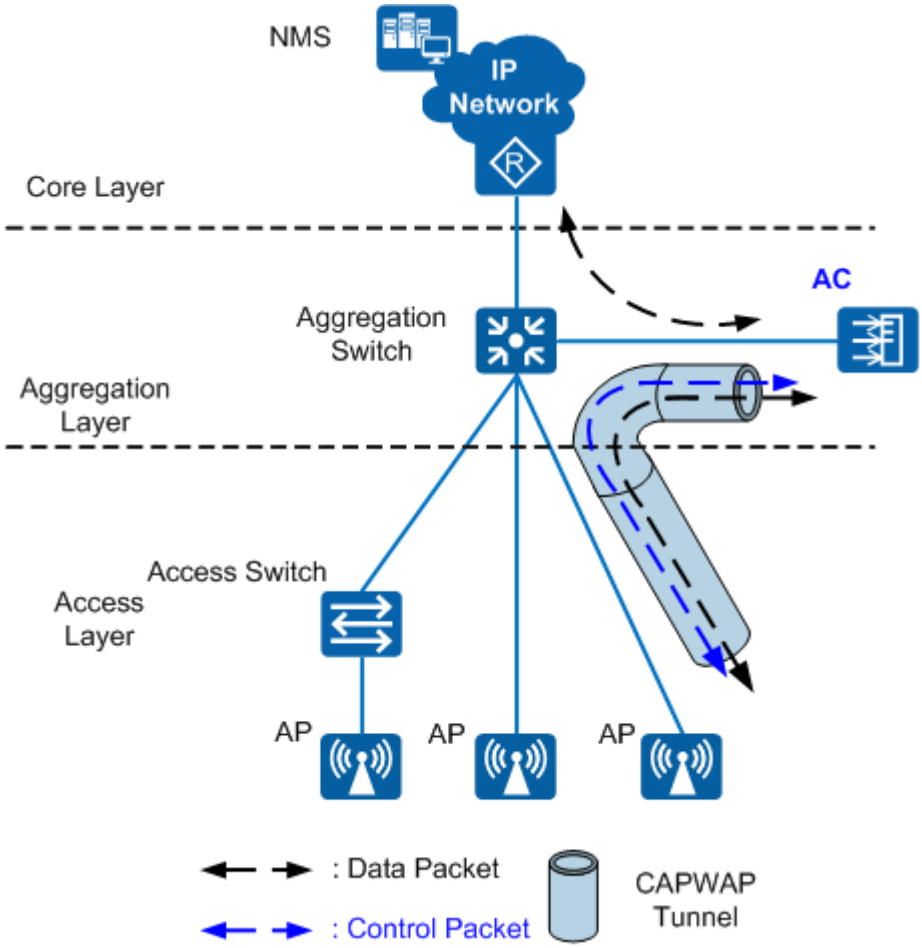
In tunnel forwarding mode, wireless data is transmitted between APs and ACs over CAPWAP tunnels.

In **Figure 1-58**, both management flows and data flows of APs are transmitted to the AC over CAPWAP tunnels, and then the AC transparently transmits these flows to the upstream device.

Tunnel forwarding is usually used to control wireless user traffic in a centralized manner. This forwarding mode facilitates device deployment and controls all wireless service data flows by aggregating traffic of all wireless users connected to APs to an AC through CAPWAP data tunnels.

**Figure 1-58** Bypass networking in tunnel forwarding mode



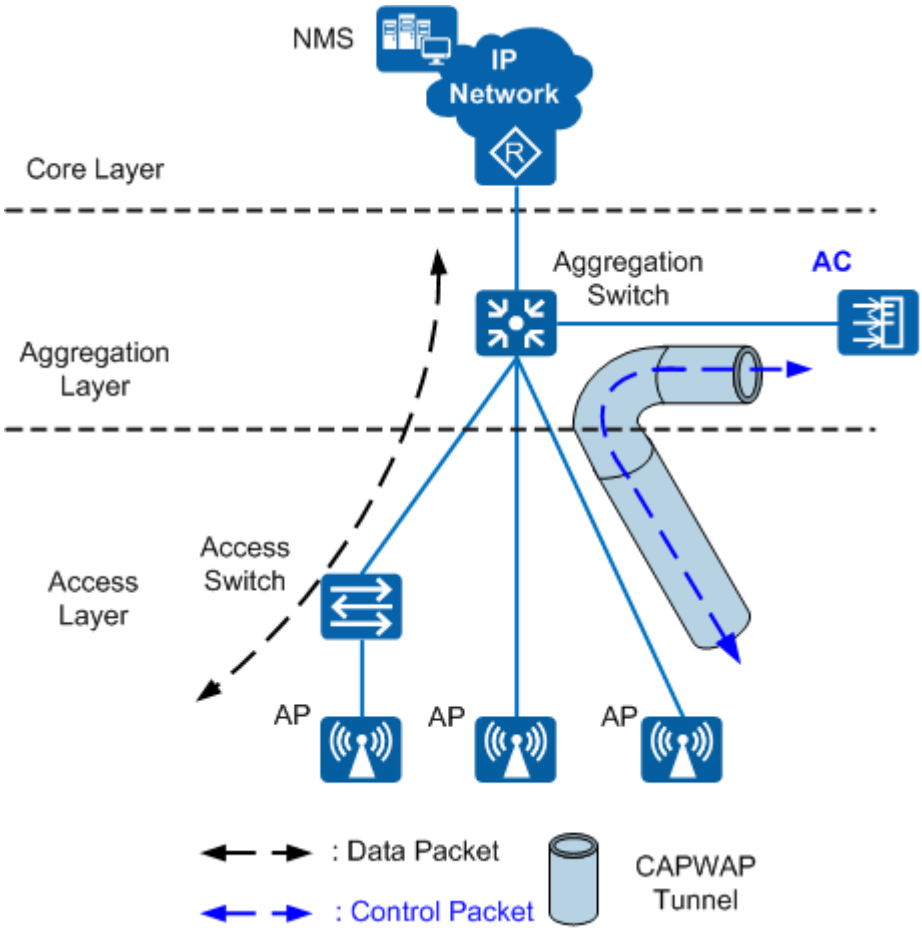

## Direct Forwarding

In direct forwarding mode, wireless data is translated from 802.3 packets into 802.11 packets, which are then forwarded by an uplink aggregation switch.

The bypass networking mode is often used on enterprise networks. Wireless data does not need to be processed by an AC, eliminating the bandwidth bottleneck and facilitating the usage of existing security policies. Therefore, this networking mode is recommended for integrated network deployment.

**Figure 1-59** Bypass networking in direct forwarding mode




- The AC only manages APs. All AP management flows (including authentication traffic) must arrive at the AC.

  Interfaces connected to the AC are reserved on the aggregation switch. The aggregation switch functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode or broadcast mode.
- Data flows from APs are forwarded by the Layer 2 switch and aggregation switch, and do not pass through the AC.

  Different service VLANs are assigned to STAs with different service set identifiers (SSIDs). The access switch and aggregation switch identify packets from these VLANs and forward these packets to the upstream device. The aggregation switch allocates IP addresses to STAs.

## Application

In bypass networking mode, the AC manages all the APs connected to the aggregation switch. This network topology applies to scenarios where APs are scattered across hot spots.

The bypass networking mode requires only a small modification to the existing network, facilitating device deployment. You can select the direct or tunnel forwarding mode according to networking requirements.

### 1.6.2.2 Inline Networking

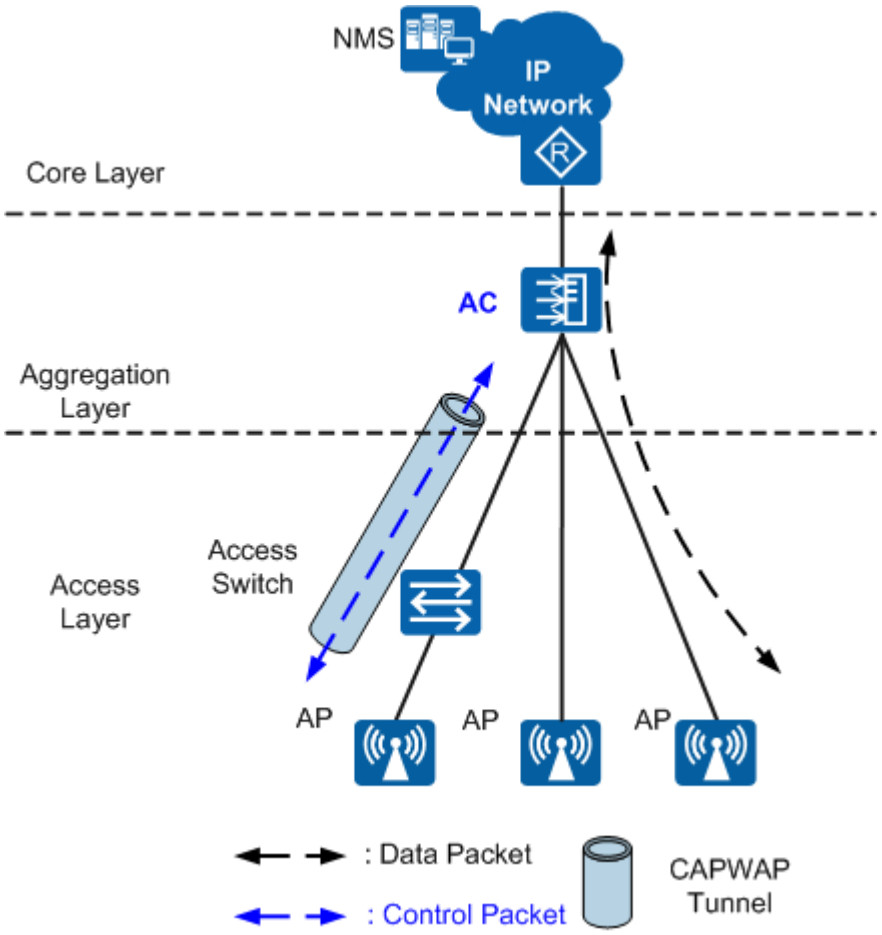
In inline networking mode, APs or access switches are directly connected to the AC. The AC also functions as an aggregation switch to forward and process APs' data and management services.

In inline networking mode, the AC sets up CAPWAP tunnels with APs to configure and manage these APs over CAPWAP tunnels. Service data of wireless users can be forwarded between APs and the AC over CAPWAP data tunnels or be directly forwarded by APs.

In inline networking mode, direct forwarding is often used so that service data can be forwarded on APs.

The AC functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode, or broadcast mode, and set up data tunnels with the AC.

**Figure 1-60** Data flows not transmitted in CAPWAP tunnels




In direct forwarding mode, only control flows are transmitted in CAPWAP tunnels, and data flows sent from APs are transparently transmitted to the upstream device by the AC, as shown in **Figure 1-60**.

When data flows are not transmitted in CAPWAP tunnels, configure management VLANs and data VLANs as follows:

- On the AC and its upstream devices, configure an AC management VLAN to transmit control flows between the AC and the NMS.
- On the switches between APs and the AC, configure AP management VLANs to transmit control flows between APs and the AC.
- On all switches between APs and the AC, configure data VLANs to differentiate WLAN data flows.

## Application

The AC provides powerful access, aggregation, and switching capabilities. Therefore, APs can directly connect to the AC. Direct forwarding is often used in inline networking mode. This networking mode simplifies the network architecture and applies to small- and medium-scale centralized WLANs.

## 1.6.2.3 Wireless Backhaul Networking

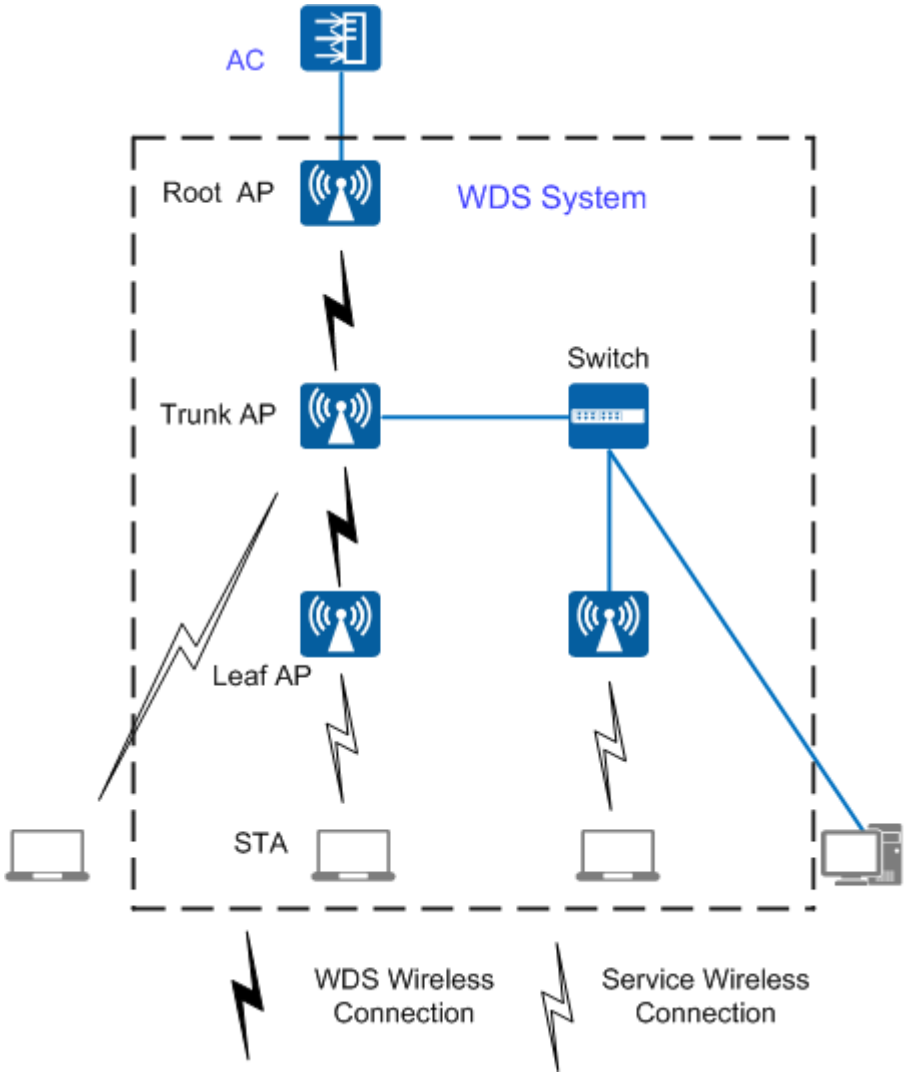
802.11 wireless technology has been widely used in home networks and enterprise networks. Users can easily access the Internet over WLANs. In this network application, APs must be connected to the existing wired network to provide network access services for wireless users. To expand the wireless coverage area, APs need to be connected using cables, switches, and power supplies. This increases network costs and prolongs network construction period. Wired deployment requirements may not be met in special circumstances. The Wireless Distribution System (WDS) or mesh technology allows APs to be connected wirelessly, facilitating WLAN construction in a complex environment.

## WDS

The WDS is a distribution system comprised of APs. The WDS connects to an AC on the network side, which is then connected to a network device such as a gateway or an aggregation switch. The WDS connects to a station (STA) or a wired network device (such as a PC) on the user side.

**Figure 1-61** WDS




On a WDS network, an AC manages the following devices:

- Root AP: connects to an AC on the wired side, and functions as a WDS master to connect to trunk APs or leaf APs.
- Trunk AP: functions as a WDS slave to connect to a root AP, connects to wired devices on the wired side, or functions as a WDS master to connect to leaf APs.
- Leaf AP: functions as a WDS slave to connect to a root AP or trunk AP or connects to STAs on the wireless side.

**NOTE**

Both the root AP and trunk AP can function as leaf APs.

The WDS networking can expand WLANs and applies to indoor wireless deployment scenarios.

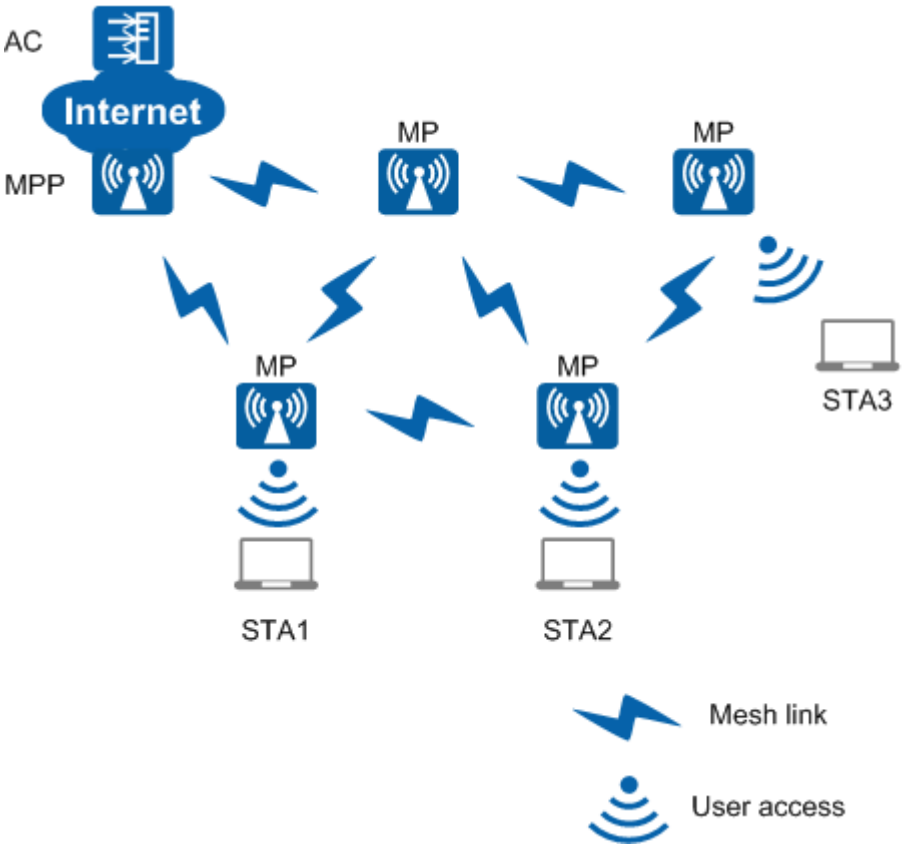
  

## WMN

Compared with a traditional WLAN, a Wireless Mesh Network (WMN) has the following advantages:

- Fast deployment: Mesh nodes can be easily installed to construct a WMN in a short time, much shorter than the construction period of a traditional WLAN.
- Dynamic coverage area expansion: As more mesh nodes are deployed on a WMN, the WMN coverage area can be rapidly expanded.
- Robustness: A WMN is a peer-to-peer network that will not be affected by the failure of a single node. If a node fails, packets are forwarded to the destination node along other paths.
- Flexible networking: An AP can directly join or leave a WMN, without the need of connections to infrastructure. This allows for flexible networking.
- Various application scenarios: Besides traditional WLAN scenarios such as enterprise networks, office networks, and campus networks, a WMN also applies to scenarios such as large-scale warehouses, docks, MANs, metro lines, and emergency communications.
- Cost-effectiveness: Only MPPs need to connect to a wired network, which minimizes the dependency of a WMN on wired devices and saves costs in wired device purchasing and cable deployment.

**Figure 1-62** WMN




Nodes on a WMN can be classified into the following types based on their functions:

- Mesh point (MP)

  A mesh-capable node that uses IEEE 802.11 MAC and physical layer protocols for wireless communication. This node supports automatic topology discovery, automatic route discovery, and data packet forwarding.

- Mesh portal point (MPP)

  An MP that connects to a WMN or another type of network. This node has the portal function and enables mesh nodes to communicate with external networks.

On a WMN, MPs are fully meshed to establish an auto-configured, and self-healing backbone WMN, and MPPs with the gateway function provide connections to the Internet. An MP provides access services and connects a STA to a WMN. A WMN uses special mesh routing protocols, which ensures high transmission quality. The WMN is applicable to scenarios that require high-bandwidth and highly stable Internet connections.

### 1.6.2.4 Dual-AC Networking

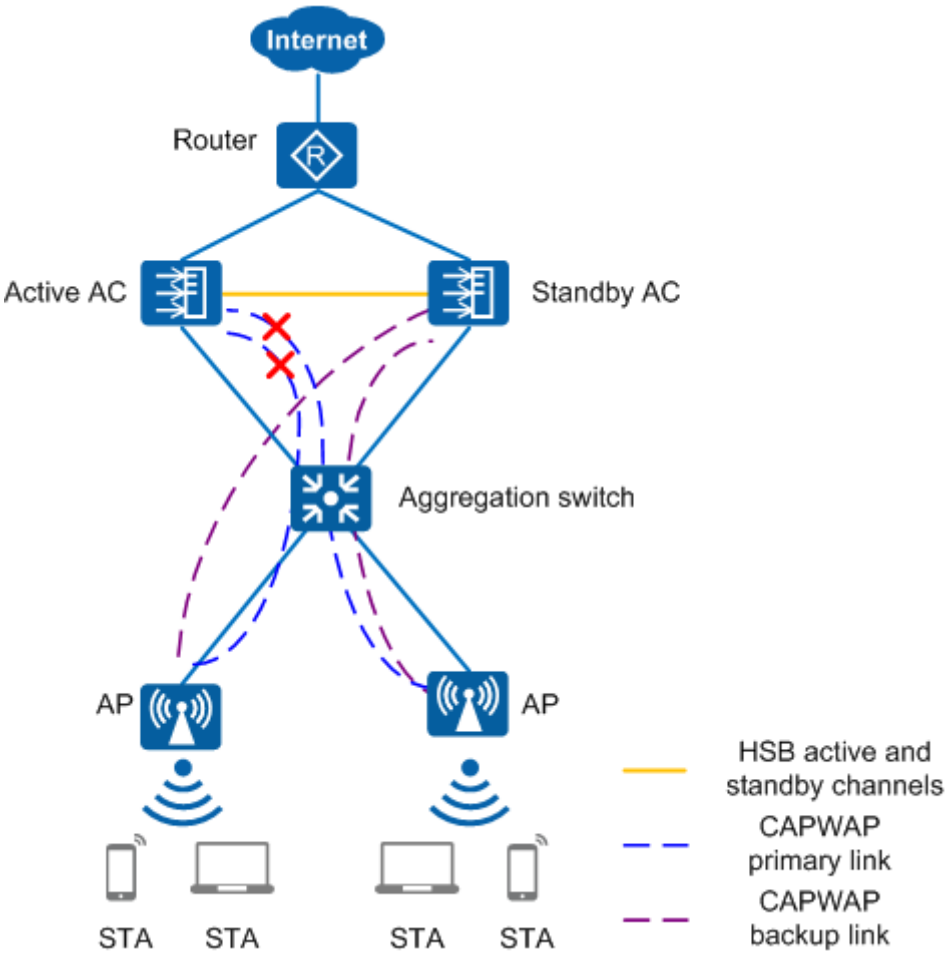
To ensure uninterrupted service forwarding, enterprises that require high reliability use active and standby ACs for networking.

Dual-AC backup can be implemented in two modes:

- HSB + dual-link backup: As shown in **Figure 1-63**, an AP establishes CAPWAP tunnels with both the active and standby ACs. The two ACs synchronize service information (such as NAC and WLAN service information) through the hot standby (HSB) function. When an AP is disconnected from the active AC, the AP notifies the standby AC of a switchover. This mode frees active and standby ACs from location restrictions and allows both ACs to be flexibly deployed. In this mode, the two ACs can implement load balancing to make efficient use of resources. However, service switching takes a relatively long time.

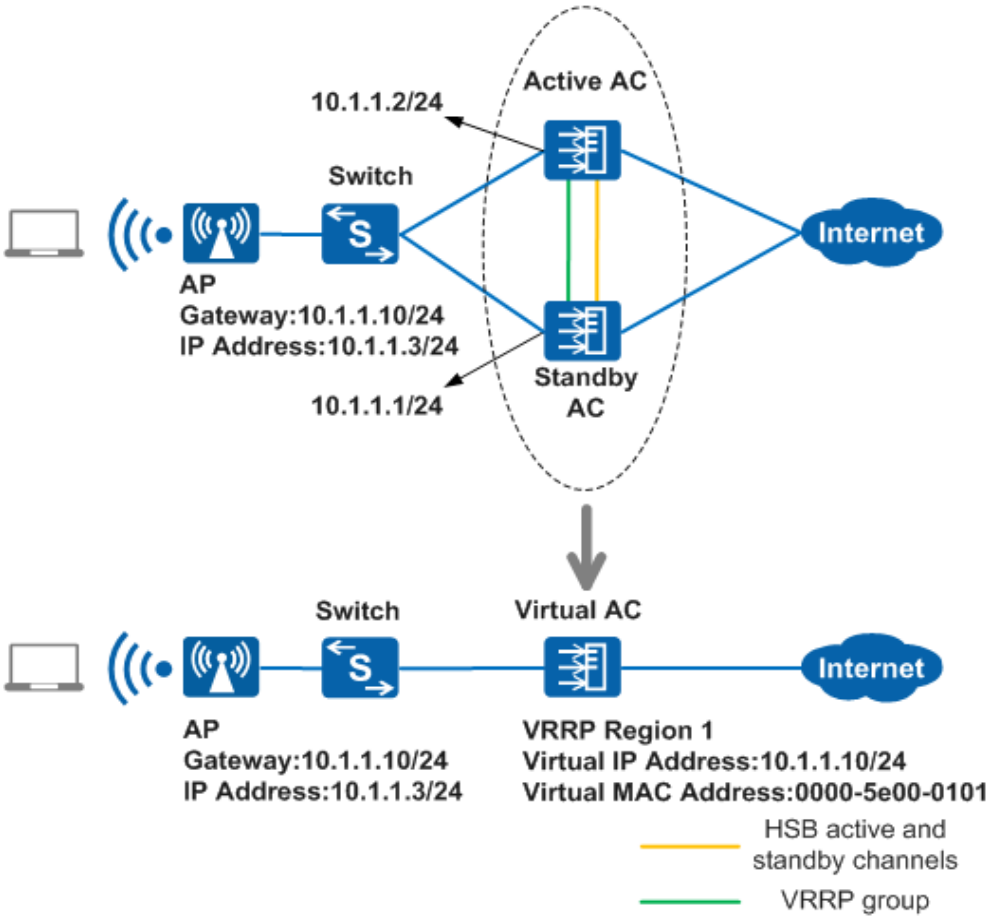
**Figure 1-63** HSB + dual-link backup networking




- HSB + VRRP: As shown in **Figure 1-64**, an AP obtains only the virtual IP address of both the active and standby ACs. The active AC backs up information including AP entries, CAPWAP link information, and user information on the standby AC. In this mode, the AP only detects the presence of one AC. The active/standby switchover is determined by the Virtual Router Redundancy Protocol (VRRP). Currently, this mode cannot be used in a VRRP multi-instance scenario. This mode restricts deployment locations of both ACs. Compared to HSB + dual-link backup, services can be switched faster in this mode.

**Figure 1-64** HSB + VRRP networking




## 1.6.2.5 Cloud AC Networking

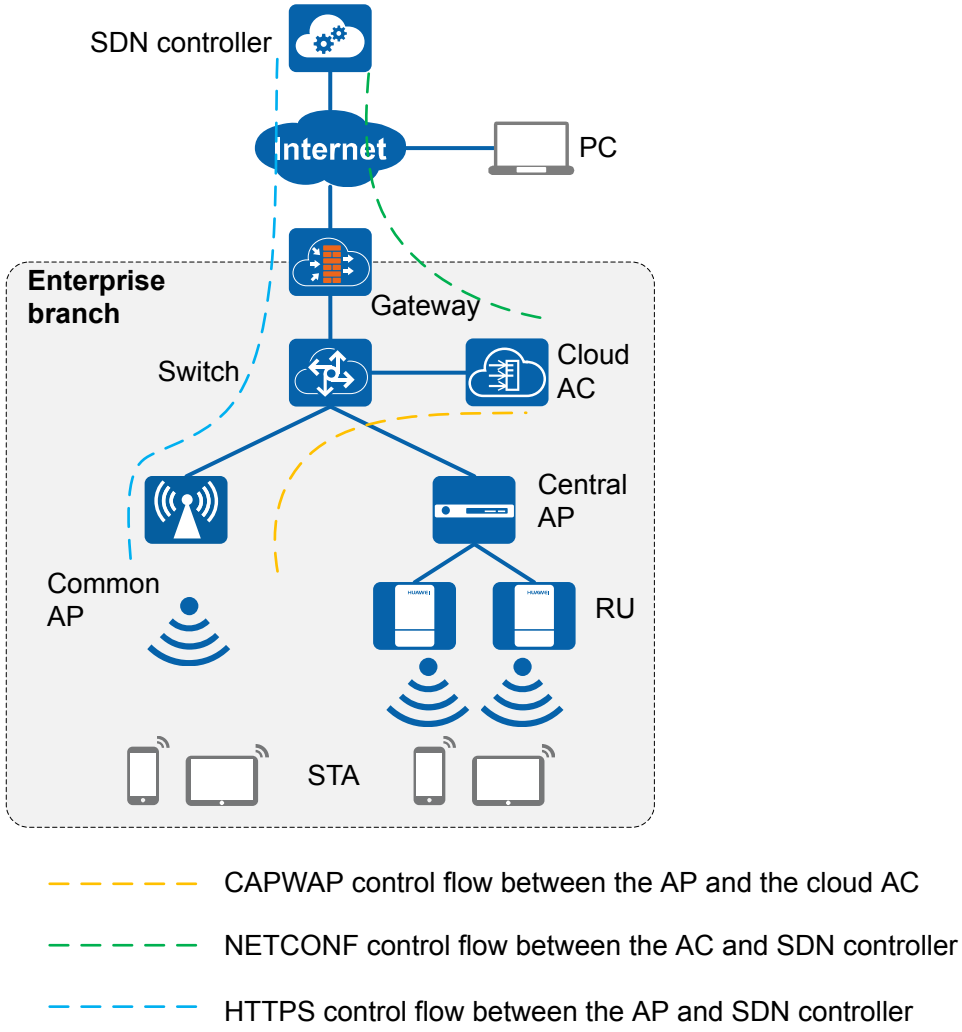
The cloud AC solution is suitable for medium- and large-sized sites with a large number of APs.

As shown in **Figure 1-65**, the AP in Fit mode registers with the AC through CAPWAP. The AC works in cloud mode and uses NETCONF to register with the SDN controller (CloudCampus@AC-Campus for ACs running V200R019C00 and earlier versions; iMaster NCE-Campus for ACs running V200R019C10 and later versions). The administrator can remotely manage the ACs and APs on the enterprise network to implement automatic WLAN deployment, service provisioning, and monitoring and O&M.

- Log in to the AC's web platform through the SDN controller to remotely configure services.
- Manage the status of ACs and APs on the SDN controller to learn about performance and service statistics in real time.

**Figure 1-65** Typical cloud AC networking diagram




## 1.6.3 Product Structure (AC6800V)

### Appearance and Structure

**Figure 1-66** and **Figure 1-67** show the appearance of the AC6800V.

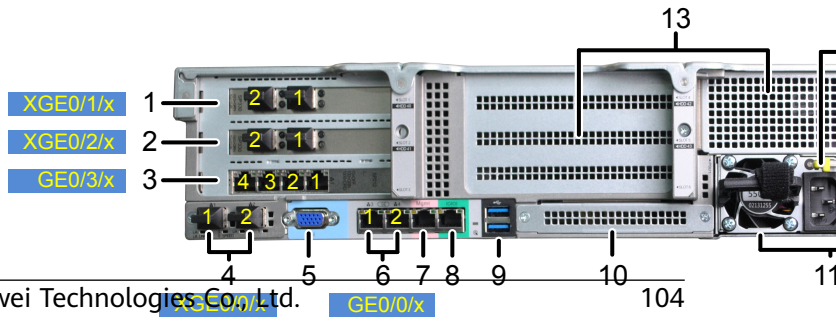
**Figure 1-66** Appearance of the AC6800V (front view)

| | | | |
|---|---|---|---|
| 1 | USB 2.0 ports | 2 | Built-in DVD-RW drive (optional) |
| 3 | USB 3.0 ports | 4 | VGA port |
| 5 | Label (including SN) | 6 | Hard disk |

**Figure 1-67** Appearance of the AC6800V (rear view)



| | | | |
|---|---|---|---|
| 1 | 10GE optical ports | 2 | 10GE optical ports |
| 3 | GE electrical ports | 4 | 10GE optical ports |
| 5 | VGA port | 6 | GE electrical ports |
| 7 | Management network port | 8 | Serial port |
| 9 | USB 3.0 ports | 10 | Flexible NIC (optional) |
| 11 | Power supply unit (PSU) | 12 | PSU sockets |
| 13 | I/O module | - | - |

**NOTE**

You can change NICs (GE/10GE/40GE) as required to meet different port requirements. The preceding figure is for reference only.

The AC6800V supports only Huawei optical transceivers of the following part numbers: 02318169, 02318170, 02310RMB, and 02310MHS.

**Table 1-18** Ports on the rear panel

| Port | Type | Quantity | Description |
|---|---|---|---|
| 10GE optical port | 10GE SFP+ | 6 | The mainboard provides two 10GE optical ports and the network adapter provides four 10GE optical ports. |
| VGA port | DB15 | 1 | The VGA port is connected to a terminal, such as a monitor or KVM.<br>**NOTE**<br>If cables are connected to the front and rear VGA ports at the same time, the display effect may be affected. |

| Port | Type | Quantity | Description |
| --- | --- | --- | --- |
| GE electrical port | 1000BASE-T | 6 | Server service network port. The mainboard provides two GE electrical ports and the network adapter provides four GE electrical ports. |
| Serial port | RJ45 | 1 | The serial port is used as the system serial port by default. You can set it as the iBMC serial port by using the iBMC command. This port is used for debugging. |
| Management network port | 1000BASE-T | 1 | The 1000 Mbit/s Ethernet port is used for server management. |
| USB port | USB 3.0 | 2 | The USB ports allow USB devices to be connected to the server.<br>**NOTE**<br>Before connecting an external USB device, check that the USB device functions properly. A server may operate abnormally if an abnormal USB device is connected. |

| Port | Type | Quantity | Description |
| --- | --- | --- | --- |
| PSU socket | - | 1 or 2 | Determine the number of PSUs based on actual requirements, but ensure that the rated power of the PSUs is greater than that of the server. When one PSU is used, **Predicted PSU Status** cannot be set to **Active/Standby** on the iBMC WebUI. |

**Table 1-19** LOM port description

| LOM Port | Chip Model | Rate Negotiation Mode | Supported Rate | Not Supported Rate |
| --- | --- | --- | --- | --- |
| 10GE optical port | X722 | Auto-negotiation 10000 Mbit/s (full duplex) | 10000M | 10/100/1000 M |
| GE electrical port | | Auto-negotiation 1000 Mbit/s (full duplex) | 1000M | 10/100M |

## Physical Specifications

**Table 1-20** Physical specifications

| Item | | Description |
| --- | --- | --- |
| Dimensions and weight | Dimensions (H x W x D) | 86.1 mm x 477 mm x 708 mm (3.39 in. x 18.78 in. x 27.87 in.) |
| | Maximum weight (standard configuration) | 21 kg |

| Item | | Description |
| --- | --- | --- |
| Power specifications | Maximum power consumption | 21 kg350 W |
| | AC input voltage | • Rated voltage range: 100 V AC to 240 V AC, 50/60 Hz<br>• Maximum voltage range: 90 V AC to 264 V AC, 47 Hz to 63 Hz |
| Environment specifications | Operating temperature and altitude | -60 m to +1800 m: 0°C to 45°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Relative humidity | 8% RH to 95% RH, noncondensing |
| | Operating altitude | -60 m to +5000 m |

## 1.6.4 Performance Specifications (AC6800V)

For AC performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AC model, or query the specifications using **Info-Finder**.

# 1.7 AirEngine 9700-M Product Description

## 1.7.1 Product Characteristics (AirEngine 9700-M)

The AirEngine 9700-M is a high-specification wireless access controller (AC) for medium and large enterprise campuses, enterprise branches, and school campuses. The AirEngine 9700-M can manage up to 2048 access points (APs) and provide up to 20 Gbit/s forwarding performance. It features high scalability and offers users considerable flexibility in configuring the number of managed APs. When used with Huawei's full series 802.11ax, 802.11ac, and 802.11n APs, the AirEngine 9700-M delivers an adaptable solution for medium and large campus networks, enterprise office networks, wireless metropolitan area networks (MANs), and hotspot coverage networks.

**Figure 1-68** AirEngine 9700-M

## Large-capacity and high-performance design

- The AirEngine 9700-M is capable of supporting medium and large campuses with up to 2048 APs.
- Provides 2 x 40GE optical interfaces, 12 x 10GE optical interfaces and 16 x GE electrical interfaces, supporting up to 20 Gbit/s forwarding performance. (The 40GE port cannot be used when one of the four 10GE combo ports is in use.)

## SmartRadio for air interface optimization

- Load balancing during smart roaming: The load balancing algorithm works during smart roaming, enabling load balancing detection between APs on the network after STA roaming to adjust the STA load on each AP, improving network stability.
- Intelligent DFA technology: The dynamic frequency assignment (DFA) algorithm is used to automatically detect adjacent-channel and co-channel interference, and identify any redundant 2.4 GHz radios. Through automatic inter-AP negotiation, a redundant radio is automatically switched to another mode (dual-5G AP models support 2.4G-to-5G switchover) or is disabled to reduce 2.4 GHz co-channel interference and increase the system capacity.
- Intelligent conflict optimization technology: Dynamic enhanced distributed channel access (EDCA) and airtime scheduling algorithms are used to schedule the channel occupation time and service priority of each user. This ensures that each user is assigned a relatively equal amount of time for using channel resources and user services are scheduled in an orderly manner, improving service processing efficiency and user experience.

## Various roles

The AirEngine 9700-M has a built-in Portal/AAA server and can provide Portal/802.1X authentication for users, protecting customer investment.

## Flexible networking

- The WLAN AC can be deployed in bypass or inline mode, allows for the bridging or mesh networking, and supports the centralized and local data forwarding modes.
- The WLAN AC and APs can be connected across a Layer 2 or Layer 3 network. In addition, NAT can be deployed when APs are deployed on the private network and the WLAN AC is deployed on the public network.
- The WLAN AC is compatible with Huawei full-series 802.11n, 802.11ac and 802.11ax APs and supports the hybrid networking of 802.11n, 802.11ac, and 802.11ax APs for simple scalability.

## Built-in application identification server

- Supports Layer 4 to Layer 7 application identification and can identify over 6000 applications, including common office applications and P2P download applications, such as Lync, FaceTime, YouTube, and Facebook.
- Supports application-based policy control technologies, including traffic blocking, traffic limit, and priority adjustment policies.
- Supports automatic application expansion in the application signature database.

## Comprehensive reliability design

- Supports AC power supply.
- Supports WLAN AC 1+1 HSB, and N+1 backup, ensuring uninterrupted services.
- Supports port backup based on the Link Aggregation Control Protocol (LACP) or Multiple Spanning Tree Protocol (MSTP).
- Supports WAN authentication escape between APs and WLAN ACs. In local forwarding mode, this feature keeps existing STAs online and allows for the access of new STAs when APs are disconnected from WLAN ACs, ensuring service continuity.

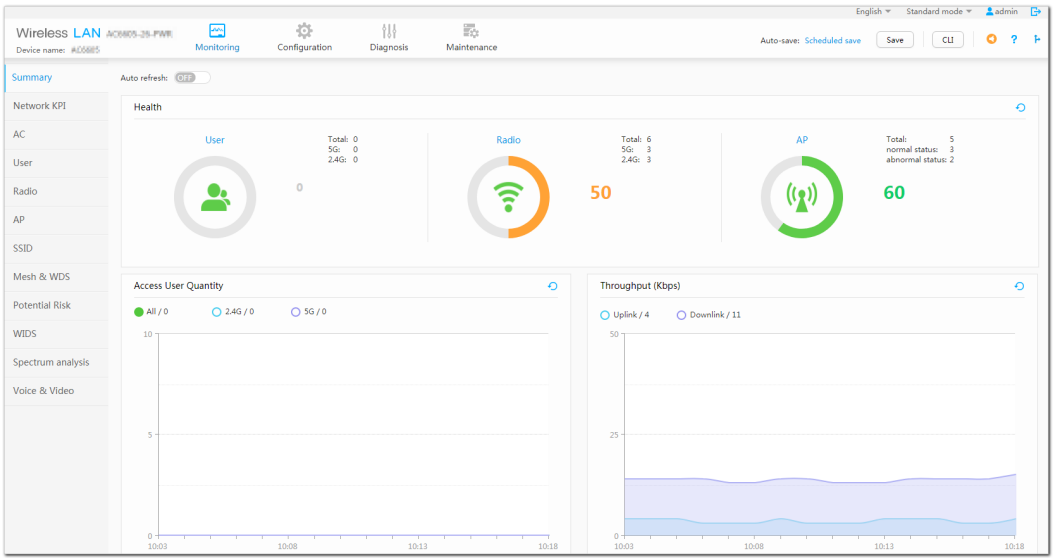
## Built-in visualized network management platform

The AirEngine 9700-M has a built-in web system that is easy to configure and provides comprehensive monitoring and intelligent diagnosis.

## Health-centric one-page monitoring, visualized KPIs

One page integrates the summary and real-time statistics. KPIs are displayed in graphs, including user, radio, and AP performance, enabling users to extract useful information from the massive amount of data, while also being instantly aware of the device and network status.

**Figure 1-69** Monitoring interface

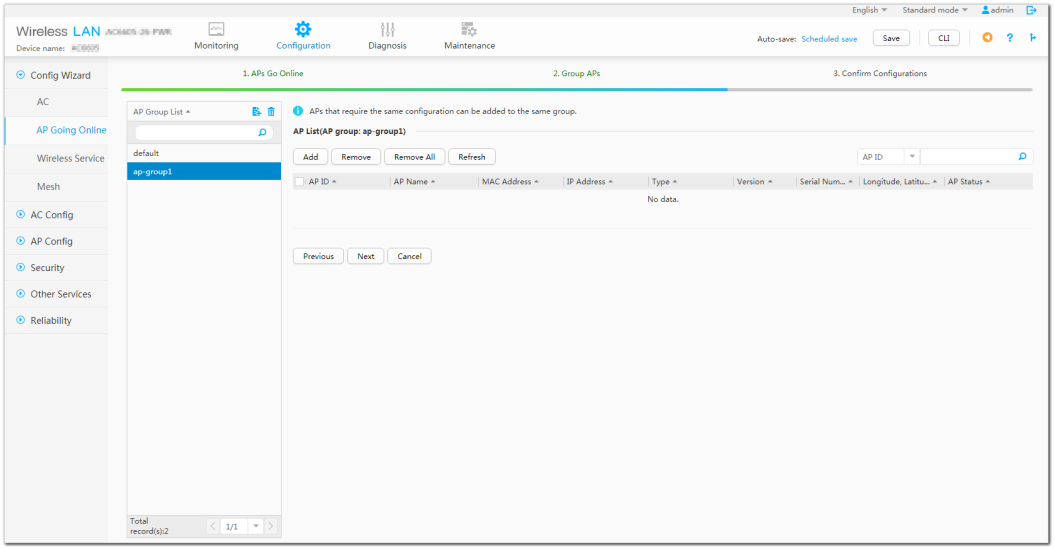



## Profile-based configuration by AP group simplifies configuration and improves efficiency

- The web system supports AP group-centric configuration and automatically selects the common parameters for users, simplifying configuration.
- If two AP groups have small configuration differences, users can copy the configurations of one AP group to the other. This improves configuration efficiency because users only need to modify the original configurations instead of creating entirely new ones each time.

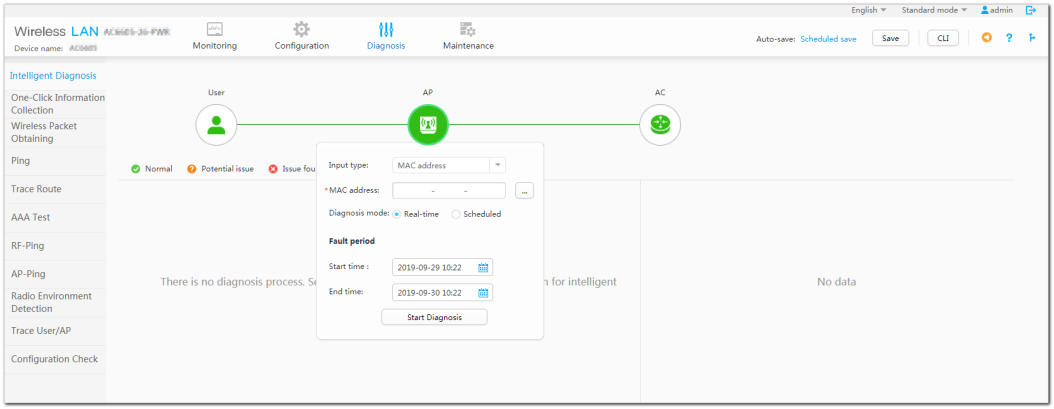
**Figure 1-70** Configuration interface




## One-click diagnosis solves 80% of common network problems.

The web system supports real-time and periodic one-click intelligent diagnosis from the dimensions of users, APs, and WLAN ACs, and provides feasible suggestions for troubleshooting.

**Figure 1-71** Intelligent diagnosis




# 1.7.2 Application Scenarios (AirEngine 9700-M)

## 1.7.2.1 Bypass Networking

In bypass networking mode, the AC is connected to a network device (usually an aggregation switch) to manage APs.

The AC manages APs. Management flows are transmitted in CAPWAP tunnels, and data flows are forwarded to the upper layer network by the aggregation switch and do not pass through the AC.

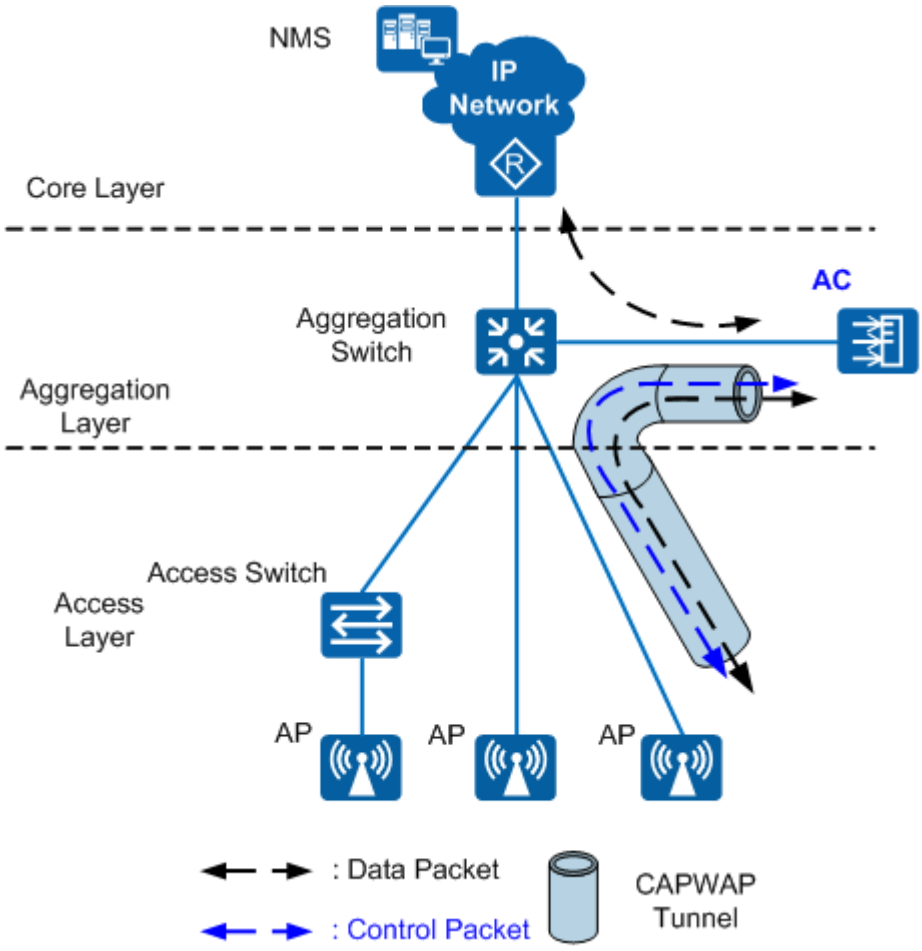
## Tunnel Forwarding

In tunnel forwarding mode, wireless data is transmitted between APs and ACs over CAPWAP tunnels.

In **Figure 1-72**, both management flows and data flows of APs are transmitted to the AC over CAPWAP tunnels, and then the AC transparently transmits these flows to the upstream device.

Tunnel forwarding is usually used to control wireless user traffic in a centralized manner. This forwarding mode facilitates device deployment and controls all wireless service data flows by aggregating traffic of all wireless users connected to APs to an AC through CAPWAP data tunnels.

**Figure 1-72** Bypass networking in tunnel forwarding mode



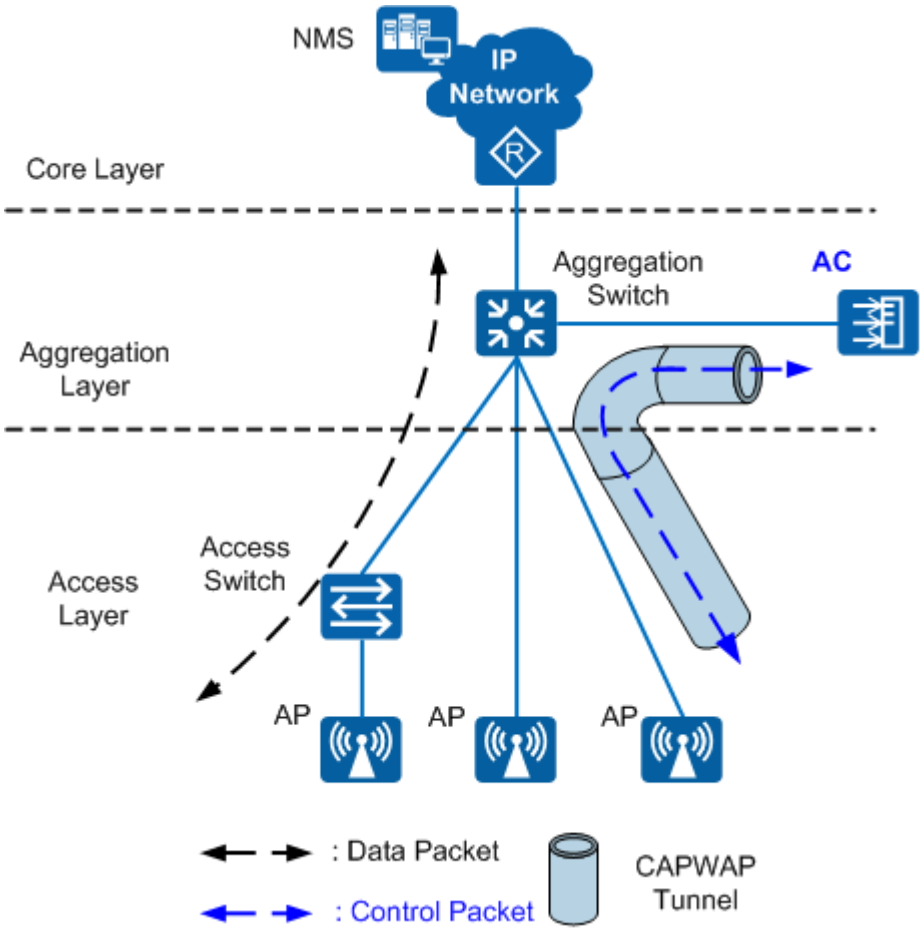

## Direct Forwarding

In direct forwarding mode, wireless data is translated from 802.3 packets into 802.11 packets, which are then forwarded by an uplink aggregation switch.

The bypass networking mode is often used on enterprise networks. Wireless data does not need to be processed by an AC, eliminating the bandwidth bottleneck and facilitating the usage of existing security policies. Therefore, this networking mode is recommended for integrated network deployment.

**Figure 1-73** Bypass networking in direct forwarding mode




- The AC only manages APs. All AP management flows (including authentication traffic) must arrive at the AC.

  Interfaces connected to the AC are reserved on the aggregation switch. The aggregation switch functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode or broadcast mode.
- Data flows from APs are forwarded by the Layer 2 switch and aggregation switch, and do not pass through the AC.

  Different service VLANs are assigned to STAs with different service set identifiers (SSIDs). The access switch and aggregation switch identify packets from these VLANs and forward these packets to the upstream device. The aggregation switch allocates IP addresses to STAs.

## Application

In bypass networking mode, the AC manages all the APs connected to the aggregation switch. This network topology applies to scenarios where APs are scattered across hot spots.

The bypass networking mode requires only a small modification to the existing network, facilitating device deployment. You can select the direct or tunnel forwarding mode according to networking requirements.

### 1.7.2.2 Inline Networking

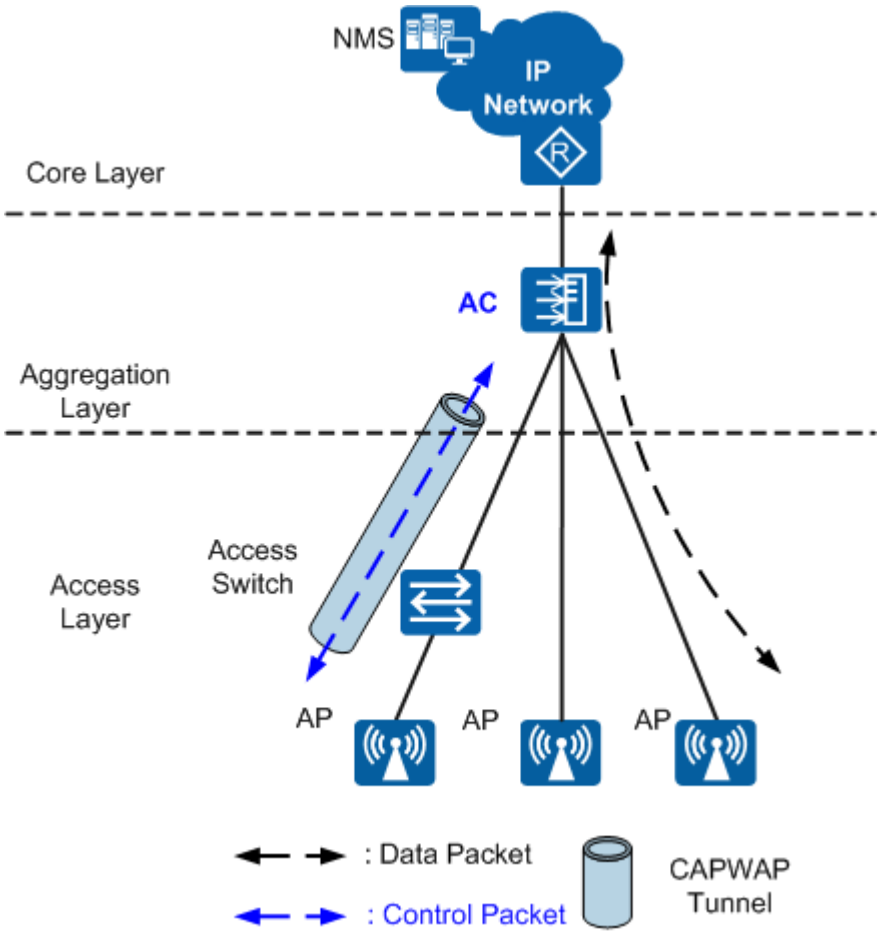
In inline networking mode, APs or access switches are directly connected to the AC. The AC also functions as an aggregation switch to forward and process APs' data and management services.

In inline networking mode, the AC sets up CAPWAP tunnels with APs to configure and manage these APs over CAPWAP tunnels. Service data of wireless users can be forwarded between APs and the AC over CAPWAP data tunnels or be directly forwarded by APs.

In inline networking mode, direct forwarding is often used so that service data can be forwarded on APs.

The AC functions as the DHCP server to allocate IP addresses to APs. APs obtain the IP address of the AC using the DNS mode, DHCP mode, or broadcast mode, and set up data tunnels with the AC.

**Figure 1-74** Data flows not transmitted in CAPWAP tunnels




In direct forwarding mode, only control flows are transmitted in CAPWAP tunnels, and data flows sent from APs are transparently transmitted to the upstream device by the AC, as shown in **Figure 1-74**.

When data flows are not transmitted in CAPWAP tunnels, configure management VLANs and data VLANs as follows:

- On the AC and its upstream devices, configure an AC management VLAN to transmit control flows between the AC and the NMS.
- On the switches between APs and the AC, configure AP management VLANs to transmit control flows between APs and the AC.
- On all switches between APs and the AC, configure data VLANs to differentiate WLAN data flows.

## Application

The AC provides powerful access, aggregation, and switching capabilities. Therefore, APs can directly connect to the AC. Direct forwarding is often used in inline networking mode. This networking mode simplifies the network architecture and applies to small- and medium-scale centralized WLANs.

## 1.7.2.3 Wireless Backhaul Networking

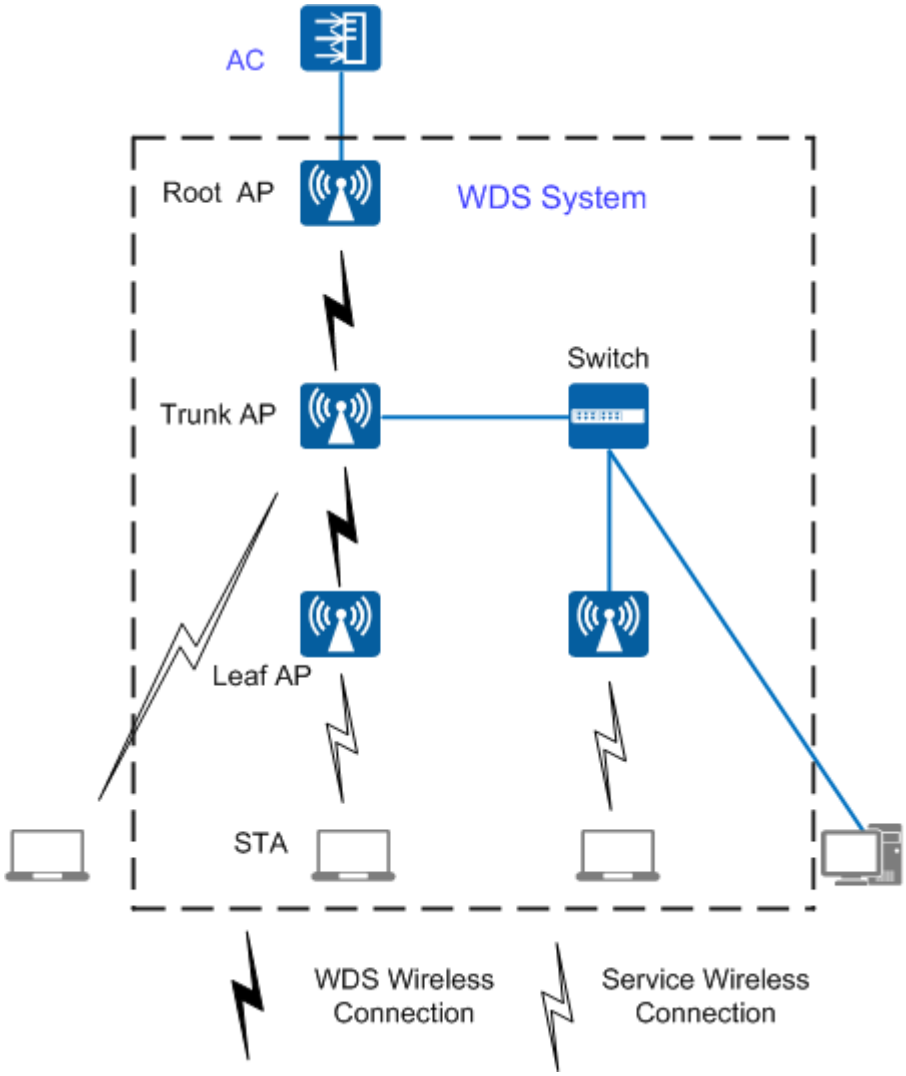
802.11 wireless technology has been widely used in home networks and enterprise networks. Users can easily access the Internet over WLANs. In this network application, APs must be connected to the existing wired network to provide network access services for wireless users. To expand the wireless coverage area, APs need to be connected using cables, switches, and power supplies. This increases network costs and prolongs network construction period. Wired deployment requirements may not be met in special circumstances. The Wireless Distribution System (WDS) or mesh technology allows APs to be connected wirelessly, facilitating WLAN construction in a complex environment.

## WDS

The WDS is a distribution system comprised of APs. The WDS connects to an AC on the network side, which is then connected to a network device such as a gateway or an aggregation switch. The WDS connects to a station (STA) or a wired network device (such as a PC) on the user side.

**Figure 1-75** WDS




On a WDS network, an AC manages the following devices:

- Root AP: connects to an AC on the wired side, and functions as a WDS master to connect to trunk APs or leaf APs.
- Trunk AP: functions as a WDS slave to connect to a root AP, connects to wired devices on the wired side, or functions as a WDS master to connect to leaf APs.
- Leaf AP: functions as a WDS slave to connect to a root AP or trunk AP or connects to STAs on the wireless side.

**NOTE**

Both the root AP and trunk AP can function as leaf APs.

The WDS networking can expand WLANs and applies to indoor wireless deployment scenarios.

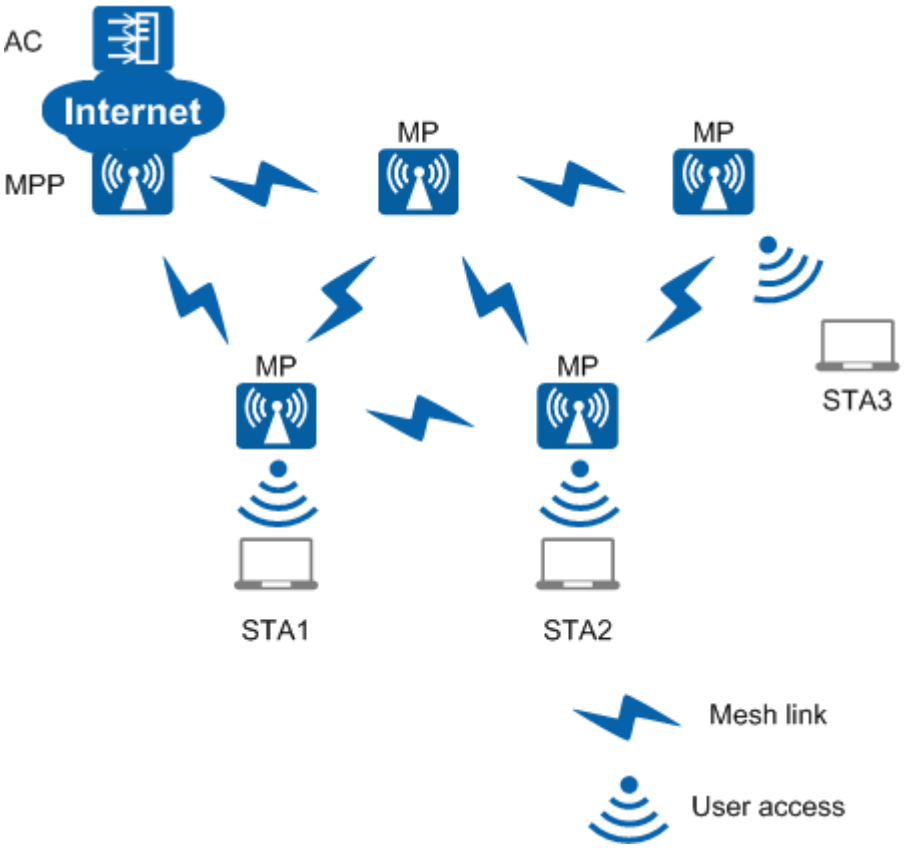
  

## WMN

Compared with a traditional WLAN, a Wireless Mesh Network (WMN) has the following advantages:

- Fast deployment: Mesh nodes can be easily installed to construct a WMN in a short time, much shorter than the construction period of a traditional WLAN.
- Dynamic coverage area expansion: As more mesh nodes are deployed on a WMN, the WMN coverage area can be rapidly expanded.
- Robustness: A WMN is a peer-to-peer network that will not be affected by the failure of a single node. If a node fails, packets are forwarded to the destination node along other paths.
- Flexible networking: An AP can directly join or leave a WMN, without the need of connections to infrastructure. This allows for flexible networking.
- Various application scenarios: Besides traditional WLAN scenarios such as enterprise networks, office networks, and campus networks, a WMN also applies to scenarios such as large-scale warehouses, docks, MANs, metro lines, and emergency communications.
- Cost-effectiveness: Only MPPs need to connect to a wired network, which minimizes the dependency of a WMN on wired devices and saves costs in wired device purchasing and cable deployment.

**Figure 1-76** WMN




Nodes on a WMN can be classified into the following types based on their functions:

- Mesh point (MP)

  A mesh-capable node that uses IEEE 802.11 MAC and physical layer protocols for wireless communication. This node supports automatic topology discovery, automatic route discovery, and data packet forwarding.

- Mesh portal point (MPP)

  An MP that connects to a WMN or another type of network. This node has the portal function and enables mesh nodes to communicate with external networks.

On a WMN, MPs are fully meshed to establish an auto-configured, and self-healing backbone WMN, and MPPs with the gateway function provide connections to the Internet. An MP provides access services and connects a STA to a WMN. A WMN uses special mesh routing protocols, which ensures high transmission quality. The WMN is applicable to scenarios that require high-bandwidth and highly stable Internet connections.

### 1.7.2.4 Dual-AC Networking

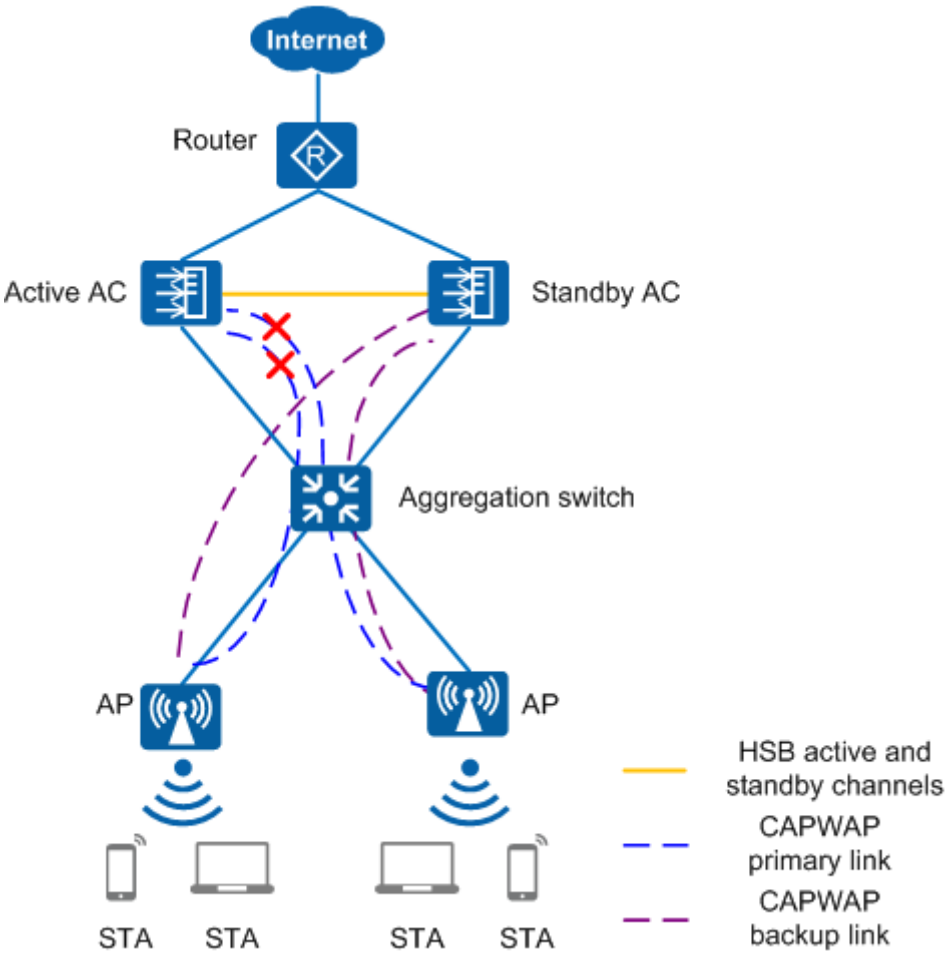
To ensure uninterrupted service forwarding, enterprises that require high reliability use active and standby ACs for networking.

Dual-AC backup can be implemented in two modes:

- HSB + dual-link backup: As shown in **Figure 1-77**, an AP establishes CAPWAP tunnels with both the active and standby ACs. The two ACs synchronize service information (such as NAC and WLAN service information) through the hot standby (HSB) function. When an AP is disconnected from the active AC, the AP notifies the standby AC of a switchover. This mode frees active and standby ACs from location restrictions and allows both ACs to be flexibly deployed. In this mode, the two ACs can implement load balancing to make efficient use of resources. However, service switching takes a relatively long time.

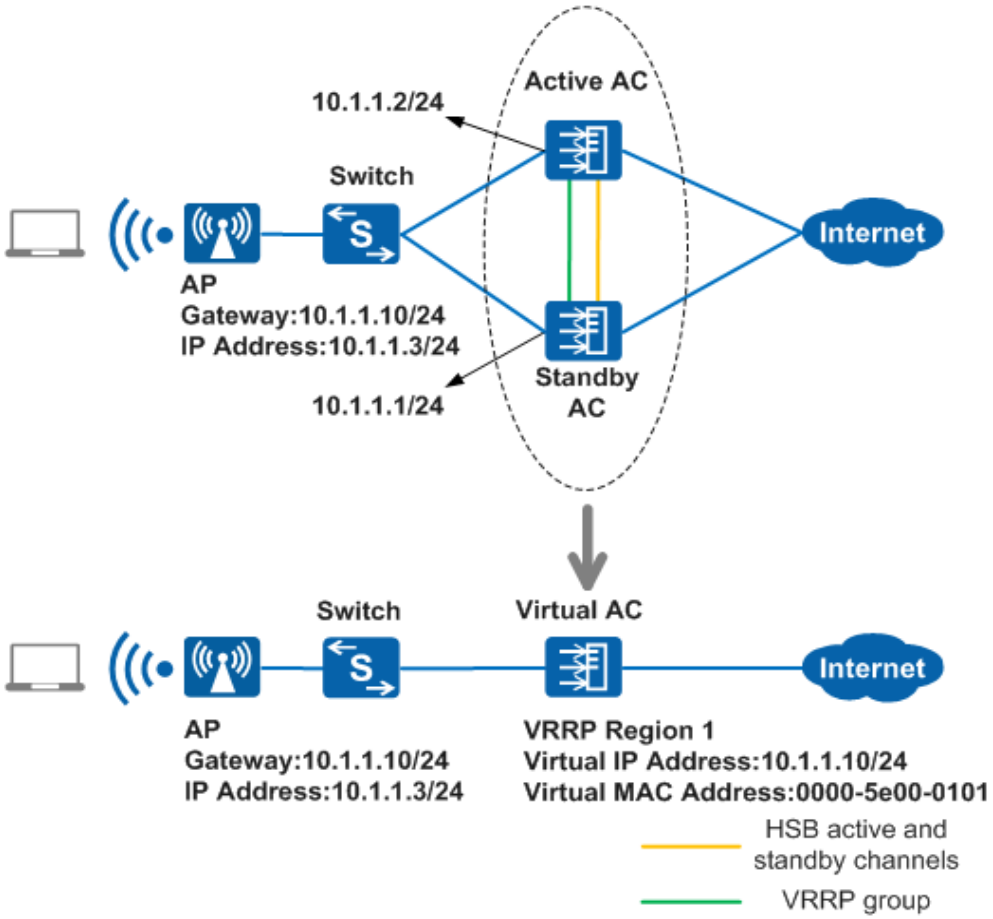
**Figure 1-77** HSB + dual-link backup networking




- HSB + VRRP: As shown in **Figure 1-78**, an AP obtains only the virtual IP address of both the active and standby ACs. The active AC backs up information including AP entries, CAPWAP link information, and user information on the standby AC. In this mode, the AP only detects the presence of one AC. The active/standby switchover is determined by the Virtual Router Redundancy Protocol (VRRP). Currently, this mode cannot be used in a VRRP multi-instance scenario. This mode restricts deployment locations of both ACs. Compared to HSB + dual-link backup, services can be switched faster in this mode.

**Figure 1-78** HSB + VRRP networking




## 1.7.2.5 Cloud AC Networking

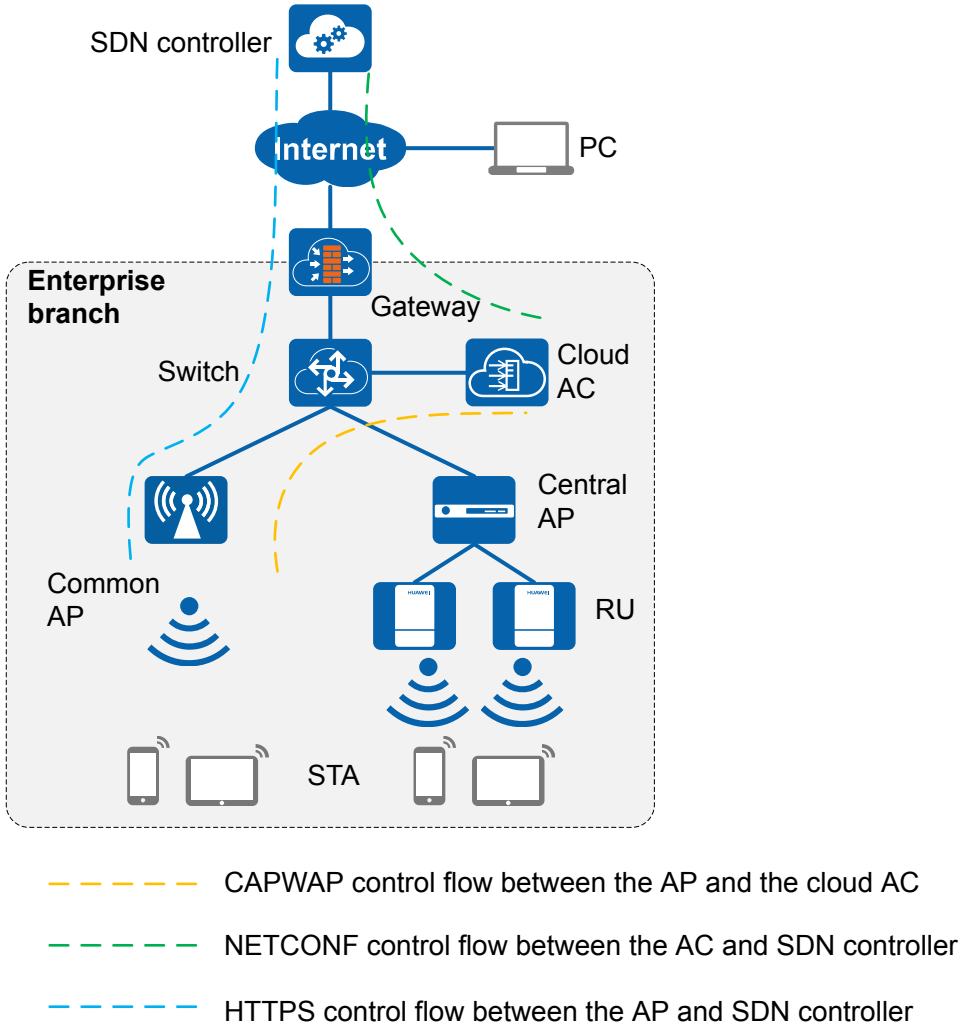
The cloud AC solution is suitable for medium- and large-sized sites with a large number of APs.

As shown in **Figure 1-79**, the AP in Fit mode registers with the AC through CAPWAP. The AC works in cloud mode and uses NETCONF to register with the SDN controller (CloudCampus@AC-Campus for ACs running V200R019C00 and earlier versions; iMaster NCE-Campus for ACs running V200R019C10 and later versions). The administrator can remotely manage the ACs and APs on the enterprise network to implement automatic WLAN deployment, service provisioning, and monitoring and O&M.

- Log in to the AC's web platform through the SDN controller to remotely configure services.
- Manage the status of ACs and APs on the SDN controller to learn about performance and service statistics in real time.

**Figure 1-79** Typical cloud AC networking diagram




## 1.7.3 Hardware Information (AirEngine 9700-M)

### Appearance and Structure

Figure 1-80 and Figure 1-81 show the appearance of the AirEngine 9700-M.

**Figure 1-80** Appearance of the AirEngine 9700-M (front view)

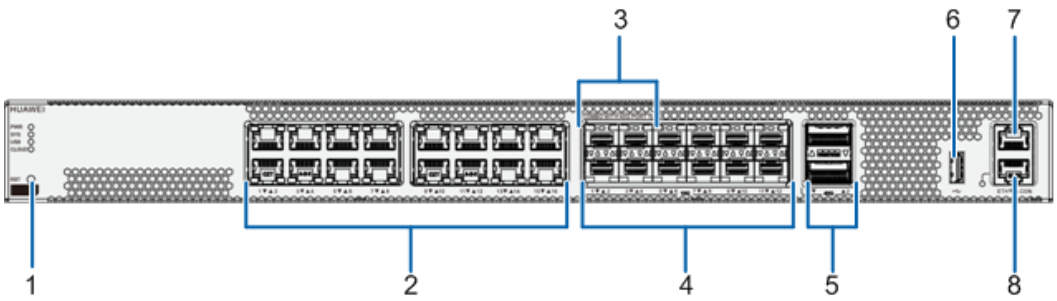
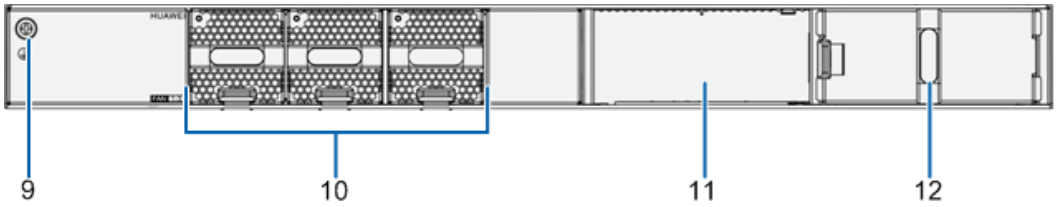


**Figure 1-81** Appearance of the AirEngine 9700-M (rear view)




| No. | Description |
| --- | --- |
| 1 | Reset button.<br>• Press the reset button (for no more than 3 seconds) to reset the AC manually. Resetting the AC will cause service interruption. Exercise caution when using this button.<br>• Press and hold down the reset button (for more than 5 seconds) to restore the AC configuration. |
| 2 | Sixteen 10/100/1000BASE-T Ethernet electrical ports. |
| 3 | Combo port: can be used as one 40GE QSFP+ optical port or four 10GE SFP+ optical ports. By default, the one 40GE QSFP+ optical works, and SFP+ ports 1 through 4 are unavailable. After these SFP+ ports are configured to work, the QSFP+ port becomes unavailable. |
| 4 | Twelve 10GE SFP+ uplink optical ports. |
| 5 | Two 40GE QSFP+ Ethernet optical ports.<br>If an MPO connector is used, select the Type B fiber. |
| 6 | Standard USB 2.0 port. |
| 7 | Console port. |
| 8 | ETH management port. |
| 9 | Ground point. |
| 10 | Pluggable fan module. Houses a FAN-023A-B fan module. (Part Number: 02312DKW) |
| 11 | Power module slot. |
| 12 | Filler panel for the backup power module. |

## Indicator Description

**Figure 1-82** shows the indicators on the AirEngine 9700-M front panel, and **Figure 1-83**shows the fan indicator.

**Figure 1-82** Indicators on the AirEngine 9700-M front panel

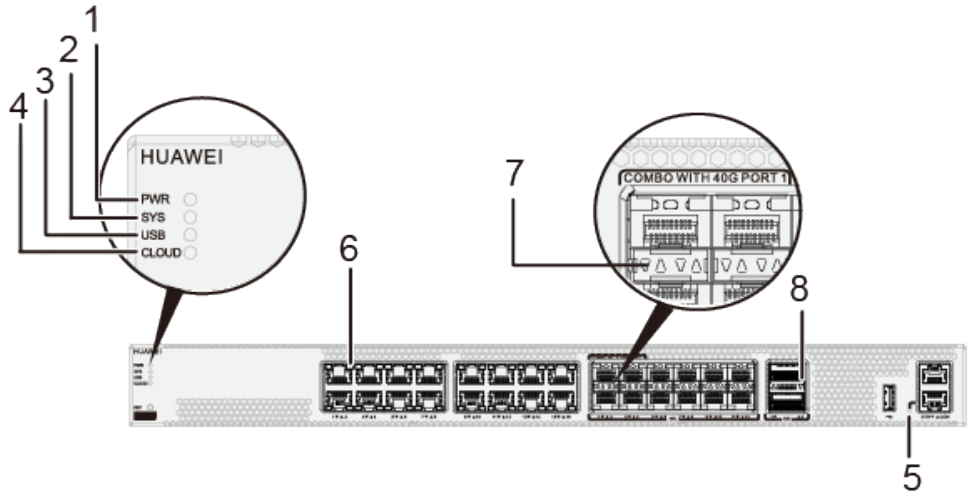



**Figure 1-83** Fan indicator on the AirEngine 9700-M

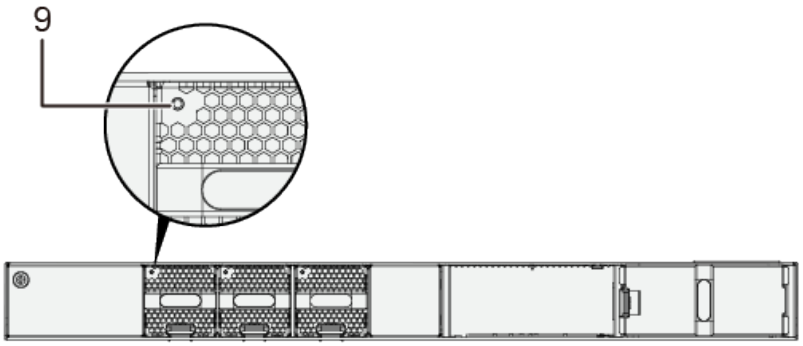



Table 1-21 describes the indicators on AirEngine 9700-M front panel.

**Table 1-21** Description of indicators on AirEngine 9700-M front panel

| Number | Indicator | Color | Description |
| --- | --- | --- | --- |
| 1 | PWR: power supply indicator | - | Off: The system is powered off or faulty. |
| | | Green | Steady on: The power module is working properly. |

| Number | Indicator | Color | Description |
| --- | --- | --- | --- |
| 2 | SYS: system status indicator | - | Off: The system is not running. |
| | | Green | • Fast blinking (4 Hz): The system is starting.<br>• Slow blinking (0.5 Hz): The system is running properly.<br>• Steady on: The system is powering on or restarting. |
| | | Red | Steady on:<br>• The system is faulty.<br>• The power module does not work properly.<br>**NOTE**<br>When the device supports two power modules:<br>1. If only one power module is available and is running properly, the SYS indicator blinks green.<br>2. If two power modules are present in the power supply slots and one or two of them are faulty, the SYS indicator blinks red.<br>• The fan module does not work properly.<br>**NOTE**<br>When the red indicator is on, the reasons are one or more of the preceding ones. Locate faults in sequence. |
| 3 | USB indicator | - | Off: No USB flash drive is connected to the AC. |
| | | Green | Steady on: A USB flash drive is connected and works properly. |
| 4 | CLOUD indicator | Green | • Off: The device is not connected or lost the connection to the Agile Controller-Campus.<br>• Steady on: The connection to the Agile Controller-Campus is normal.<br>• Fast blinking (4 Hz): The device is connecting to the Agile Controller-Campus. |

| Number | Indicator | Color | Description |
| --- | --- | --- | --- |
| 5 | ETH indicator | Green | • Off: No link is established on the ETH port.<br>• On: The ETH port is connected.<br>• Blinking: The ETH port is sending or receiving data. |
| 6 | GE electrical service port indicator<br>Indicators correspond to ports 1 through 12 from left to right. | Green | • Off: No link is established on the port.<br>• Steady on: The port is connected.<br>• Blinking: The port is sending or receiving data. |
| 7 | GE/10GE optical service port indicator<br>• A down arrow indicates a lower port, while an up arrow indicates an upper port.<br>• Four indicators (arrows) are located between two ports vertically, with two yellow indicators on the left, and two green indicators on the right. | Green | • Off: No link is established on the port.<br>• Steady on: The port is connected. |
| | | Yellow | Blinking: The port is sending or receiving data. |

| Number | Indicator | Color | Description |
| --- | --- | --- | --- |
| 8 | 40GE optical service port indicator | Green | • Off: No link is established on the port.<br>• Steady on: The port is connected.<br>• Blinking: The port is sending or receiving data. |
| 9 | Fan indicator | - | Off: The fan module is not installed. |
| | | Green | Blinking: The fan module is working properly. |
| | | Red | Blinking: The fan is not running at a proper speed or stops rotating. |

## Physical Specifications

**Table 1-22** Physical specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | • Basic: 43.6 mm x 442 mm x 420 mm<br>• Maximum: 43.6 mm x 442 mm x 444 mm |
| | Weight | 5.65 kg |
| Power specifications | Maximum power consumption | 122.3 W |
| | Rated input voltage | • AC power input: 100 V AC to 240 V AC, 50/60 Hz<br>• DC power input: 240 V DC |
| Environment specifications | Operating temperature and altitude | • - 60 m to +1800 m: 0°C to +45°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature and altitude | -60 m to +5000 m: -40°C to +70°C |
| | Operating altitude of the power modules | 0 m to 5000 m |
| | Relative humidity | 5% RH to 95% RH, noncondensing |

## 1.7.4 Performance Specifications (AirEngine 9700-M)

For AC performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AC model, or query the specifications using **Info-Finder**.

# 1.8 ACU2 Product Description

## 1.8.1 ACU2 Overview

Wireless local area network (WLAN) uses radio technology to implement fast Ethernet access. Data traffic sent from wireless stations (STAs) to the Internet is transmitted over two types of media: wireless links between the STAs and access points (APs) and wired links between APs and access controllers (ACs). WLAN technology allows STAs, such as computers, to access a network through a wireless medium but not a physical cable. This facilitates network construction and allows users to move around without interrupting communication.

### 1.8.1.1 Introduction to the ACU2

The ACU2 can be installed on an S7700&S9300&S9700&S12700 switch and functions as a WLAN AC. The ACU2 is used to deploy WLANs on industry networks.

The ACU2's WLAN feature makes network construction and access more flexible.

### Product Orientation

Wireless local area network (WLAN) technology defined in IEEE 802.11 is widely used on MANs and enterprise networks. WLAN can be used as the last-mile access solution. Compared with other wireless access technologies, WLAN provides higher bandwidth with lower costs, fully meeting user requirements for the high-speed wireless broadband service.

As increasing laptops, tablet PCs, and Wi-Fi mobile phones are used to connect to the Internet, WLAN access has become an important access mode for enterprises, and therefore wireless access control and switching are indispensable on enterprise networks.

The ACU2 is a service unit used on a chassis switch and provides access control capabilities on an enterprise wireless network. An aggregation switch with an ACU2 provides both wireless and wired service capabilities, reducing space occupied and cables in equipment rooms and lowering network construction cost.

ACU2s can be installed on chassis switches such as S7700&S9300&S9700&S12700 to establish WLAN networks.

A commonly used deployment mode is to install ACU2s on an aggregation switch. Another method is to install ACU2s on a switch connected to the aggregation switch in bypass mode. The AP management capability of the switch can be expanded smoothly by adding ACU2s on the switch.

## Product Characteristics

- High access capacity and processing capability
  - An ACU2 can manage a maximum of 2048 APs (packet forwarding over 2048 tunnels) and supports a maximum of 32K STAs.
  - The ACU2 provides nearly 40 Gbit/s line-speed forwarding capacity.
- Independent service unit, facilitating centralized deployment and capacity expansion
  - The ACU2 provides access control capabilities on an enterprise wireless network. An aggregation switch with ACU2s provides both wireless and wired service capabilities, reducing space occupied and cables in equipment rooms and lowering network construction cost.
  - You can install multiple ACU2s on a switch to manage *N*x2048 APs. (*N* is the number of ACU2s.)
- Flexible user policy management and authority control capabilities
  - The ACU2 implements per-user access control based on parameters delivered by the RADIUS server, such as ACLs, VLAN IDs, and bandwidth limit.
  - You can define user groups for users of different rules and apply access control policies to the user groups. Access of users in a user group is controlled based on the ACL, user isolation policy, and bandwidth limit applied to the user group. You can configure inter-group user isolation or intra-group user isolation as required to implement access control.
- Visualized WLAN network management and maintenance

  The ACU2 and APs establish a fit AP+AC networking for centralized AP management, facilitating network management and maintenance. Huawei AC and AP products support standard Link Layer Discovery Protocol (LLDP), which helps display topology of wired and wireless networks for visualized management and maintenance.

## 1.8.1.2 ACU2 Functions and Applications

An ACU2 is a WLAN service card installed on a chassis switch such as an S7700&S9300&S9700&S12700 switch.

WLAN ACU2 provides the following functions:

- Centralized configuration and management of APs
- WLAN user access control (authentication and authorization)
- WLAN service configuration and delivery
- Integrated DHCP server to assign addresses to STAs
- Traffic management, congestion control, forwarding and scheduling of data packets

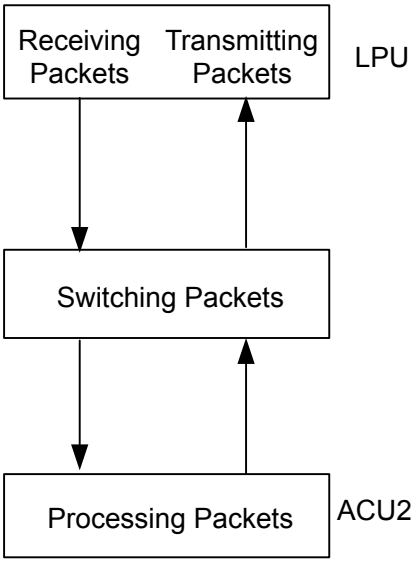
## Data Processing on the ACU2

The ACU2 can be installed in any LPU slot of a chassis switch such as the S7700&S9300&S9700&S12700. The ACU2 processes data packets sent from the MPU of the S7700&S9300&S9700&S12700 to manage APs in a centralized manner and control access from STAs. In centralized deployment mode, the ACU2 is responsible for routing and forwarding of wireless user traffic.

**Figure 1-84** shows how the ACU2 processes data.

**Figure 1-84** Data processing on the ACU2

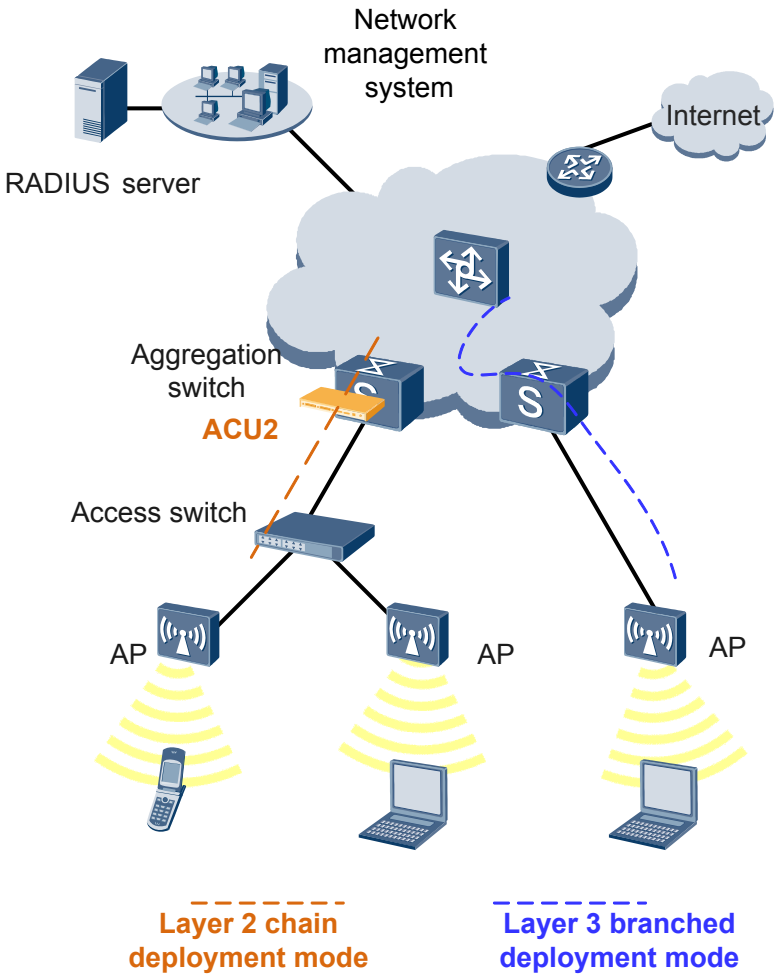



## Typical Networking of the ACU2

**Figure 1-85** shows deployment of the ACU2 in a WLAN (AC + fit AP) networking.

**Figure 1-85** WLAN networking




Different from an individual case-shaped AC, the ACU2 is installed on a switch. The ACU2 supports two deployment modes:

- Layer 2 chain deployment mode: as shown in the left part of **Figure 1-85**

  The ACU2 is installed on an aggregation switch to manage APs connected to the aggregation switch directly or through an access switch.

  In this deployment mode, the network between aggregation switches (ACs) and APs is a Layer 2 network.

- Layer 3 branched deployment mode, as shown in the right part of **Figure 1-85**

  The ACU2 is installed on an aggregation switch other than the aggregation switch connected to APs. APs communicate with the ACU2 through the local aggregation switch. In this deployment mode, the network between ACs and APs is a Layer 3 network.

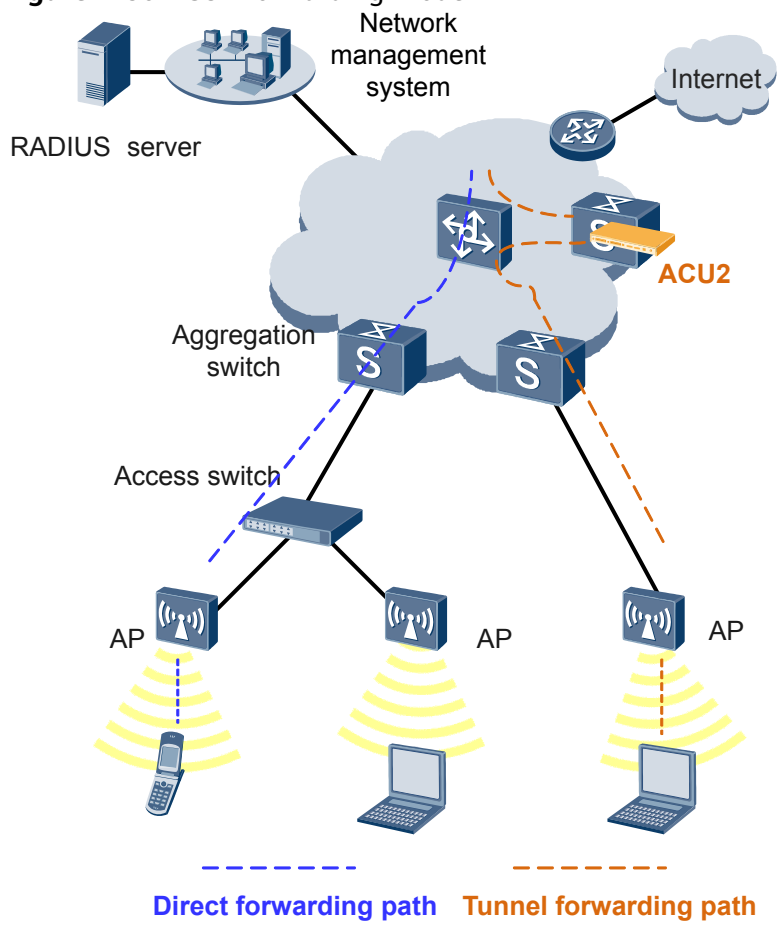
  

NOTE

- Layer 2 chain deployment is recommended for small- and medium-scale WLAN networking because this mode brings fewer changes to existing network.
- Layer 3 branched deployment is recommended for large-scale WLAN networking. As shown in **Figure 1-86**, a chassis switch is used as an AC. In this deployment mode, the WLAN network capacity can be smoothly expanded by installing more ACU2s on the aggregation switch.

## ACU2 Forwarding Mode

**Figure 1-86** ACU2 forwarding mode




- Direct Forwarding

  In direct forwarding mode, wireless user service data is translated from 802.3 packets into 802.11 packets, which are then forwarded by an uplink aggregation switch.

  The branched networking mode is often used on enterprise networks. Wireless user service data does not need to be processed by an AC, eliminating the bandwidth bottleneck and facilitating the usage of existing security policies. Therefore, this networking mode is recommended.

- Tunnel Forwarding

In tunnel forwarding mode, wireless user service data is transmitted between APs and ACs over CAPWAP tunnels.

Both control flows and service data flows are transmitted in CAPWAP tunnels. APs send data packets to the switch where the ACU2 is installed, and the ACU2 decapsulates the packets and forwards the packets.

Traffic from wireless users under all APs is aggregated to the AC through CAPWAP tunnels to implement centralized traffic control.

## 1.8.2 Hardware Structure of the ACU2

This section describes hardware information about the ACU2.

### 1.8.2.1 Appearance and Structure

This section describes appearance and structure of ACU2.

Figure 1-87 shows ACU2 appearance.

**Figure 1-87** ACU2 appearance

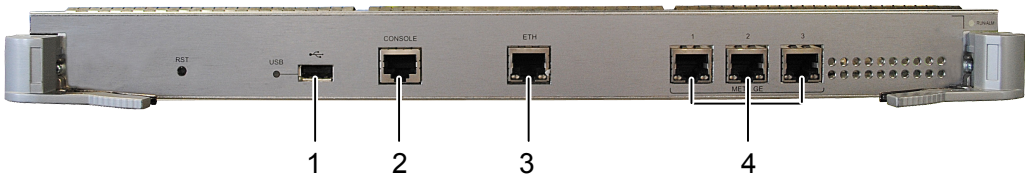



**Table 1-23** Description of ACU2 buttons and interfaces

| No. | Interface | Quantity | Description |
| --- | --- | --- | --- |
| 1 | RST | - | The Reset button is used for resetting cards manually. Resetting a card interrupts services. Confirm the action before you press this button. |
| 2 | USB interface | 1 | Connects to a USB flash drive to transfer configuration files. |
| 3 | Console interface | 1 | Provides a serial interface. To configure the ACU2 locally, you can log in to the local ACU2 by connecting a cable between the serial interface on the host and the console interface on the ACU2. |
| 4 | Ethernet interface | 1 | Provides a GE interface. To configure the ACU2, you can log in to the ACU2 through Telnet. |
| 5 | GE interface | 3 | Reserved interface |

### 1.8.2.2 Interface Attributes

This section describes connector types, attributes, operation modes, and compliance standards of the serial interfaces and ETH interfaces on the ACU2 panel.

**Table 1-24** and **Table 1-25** describe attributes of the interfaces on the ACU2.

**Table 1-24** Serial interface attributes

| Attribute | Description |
| --- | --- |
| Connector type | RJ45 |
| Interface attribute | RS232 |
| Standards compliance | EIA/TIA-232 |

**Table 1-25** Ethernet interface attributes

| Attribute | Description |
| --- | --- |
| Connector type | RJ45 |
| Interface attribute | 10BASE-T/100BASE-TX/1000BASE-T |
| Operation mode | Full duplex |
| Standards compliance | IEEE 802.3 |

### 1.8.2.3 Indicator Description

This section describes indicators on the panel of ACU2, including its colors, blinking states, and state meanings.

**Figure 1-88** shows indicators on the ACU2 panel.

**Figure 1-88** Indicators on the ACU2 panel

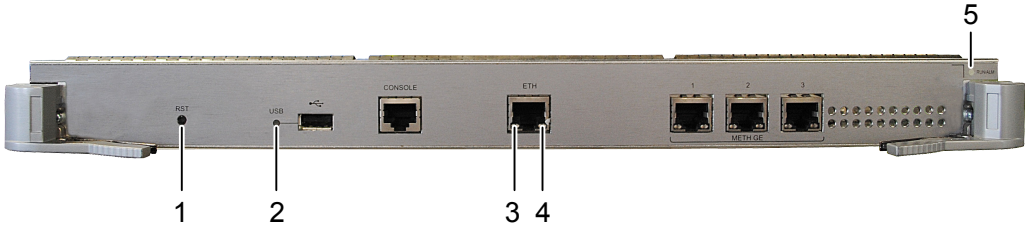



**Table 1-26** describes indicators on the ACU2.

**Table 1-26** Indicators on the ACU2

| No. | Indicator/ Button | Color | Description |
| --- | --- | --- | --- |
| 1 | USB | Off | In the current version, the USB indicator remains off. |
| 2 | ACT | yellow | When the indicator blinks, data is being transmitted or received.<br>When the indicator is off, no data is being transmitted or received. |
| 3 | LINK | Green | When the indicator is on, the link is connected.<br>When the indicator is off, the link is blocked. |
| 4 | RUN/ALM | Green | When the indicator is on, the board is powered on but the software is not running.<br>When the indicator blinks once every 2s (0.5 Hz), the system is running properly.<br>When the indicator blinks once every 0.25s (4 Hz), the system is starting. |
| | | Red | When the indicator is on, the board is faulty. |
| | | yellow | When the indicator is on, the board is installed in the slot and is powered on. |

## 1.8.2.4 Technical Specifications

This section describes technical specifications of the ACU2, including board dimensions, maximum power consumption, and board weight.

Table 1-27 describes technical specifications of the ACU2.

**Table 1-27** Technical specifications of the ACU2

| Parameter | Description |
| --- | --- |
| Board dimensions | 35.56 mm x 380.00 mm x 378.45 mm (height x width x depth) |
| Maximum power consumption | 168 w |
| Board weight | 3.2 kg |

## 1.8.3 Performance Specifications of the ACU2

For AC performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AC model, or query the specifications using **Info-Finder**.

# 2 Indoor Access Points

## About This Chapter



# 2.1 AP1050DN-S Product Description

## 2.1.1 Product Characteristics (AP1050DN-S)

Huawei AP1050DN-S is a wireless access point (AP) targeted at the SMB distribution market that supports 1 x 1 MU-MIMO. It provides comprehensive service support capabilities and features high reliability, high security, easy network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meet indoor network requirements. It provides basic 802.11ac Wave 2 wireless networks for small- and medium-sized enterprises and can be flexibly deployed in distributed mode for different environments.

- 802.11ac Wave 2 compliance, 1 x 1 MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 200 Mbit/s at 2.4 GHz and 433 Mbit/s at 5 GHz, and 633 Mbit/s for the device
- One GE uplink interface
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

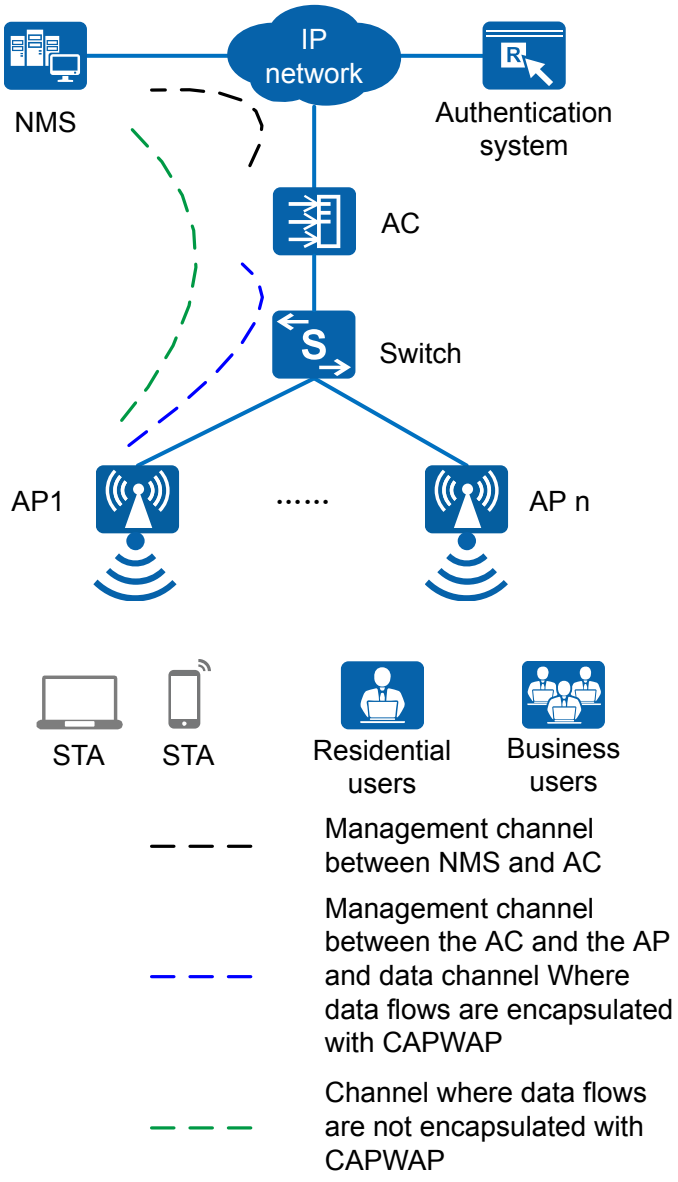
## 2.1.2 Usage Scenarios (AP1050DN-S)

The AP1050DN-S can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-1** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-2** Fit AP networking (WDS mode: point-to-point)

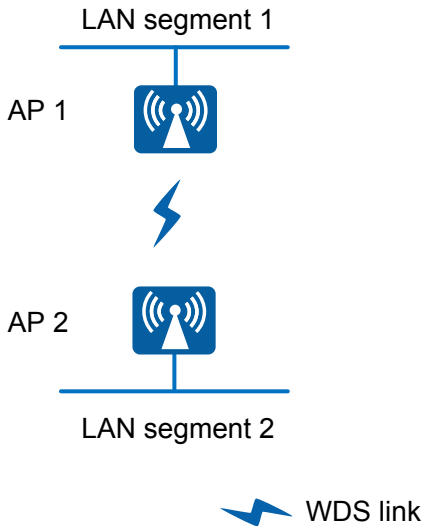
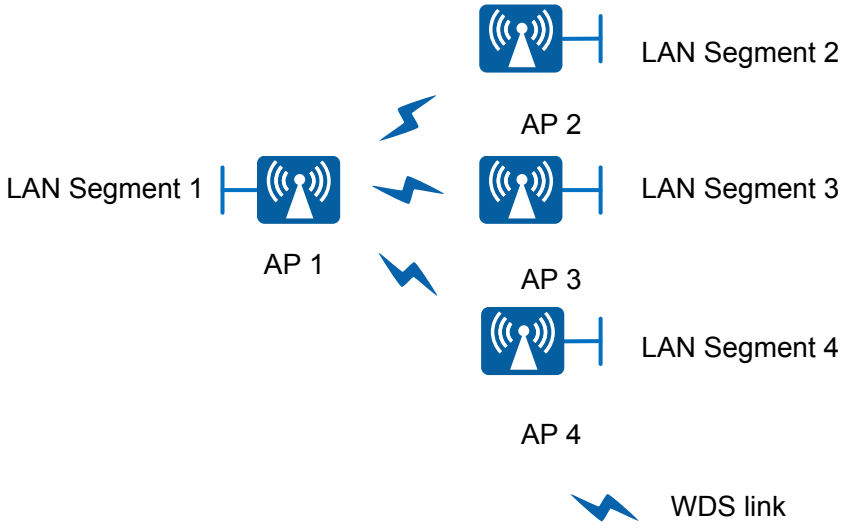


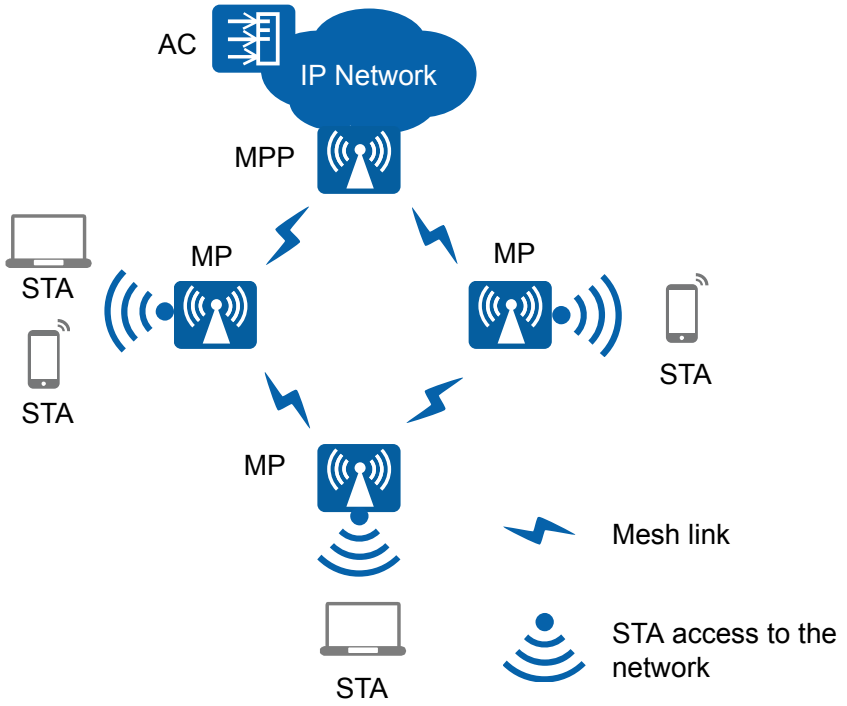

**Figure 2-3** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

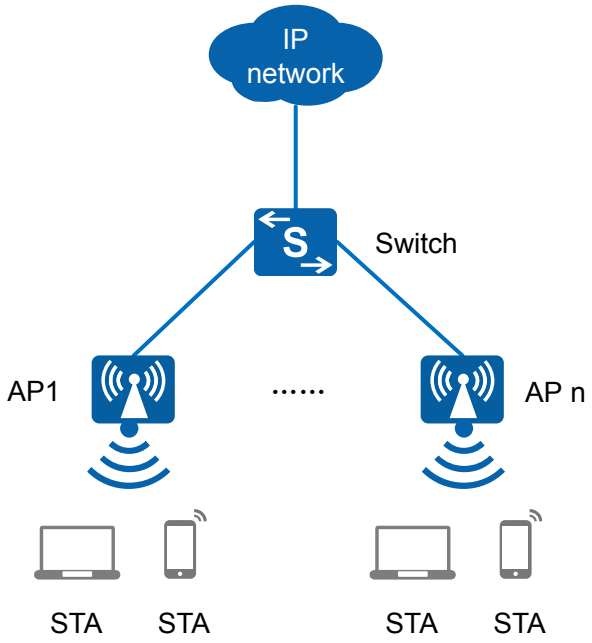
**Figure 2-4** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

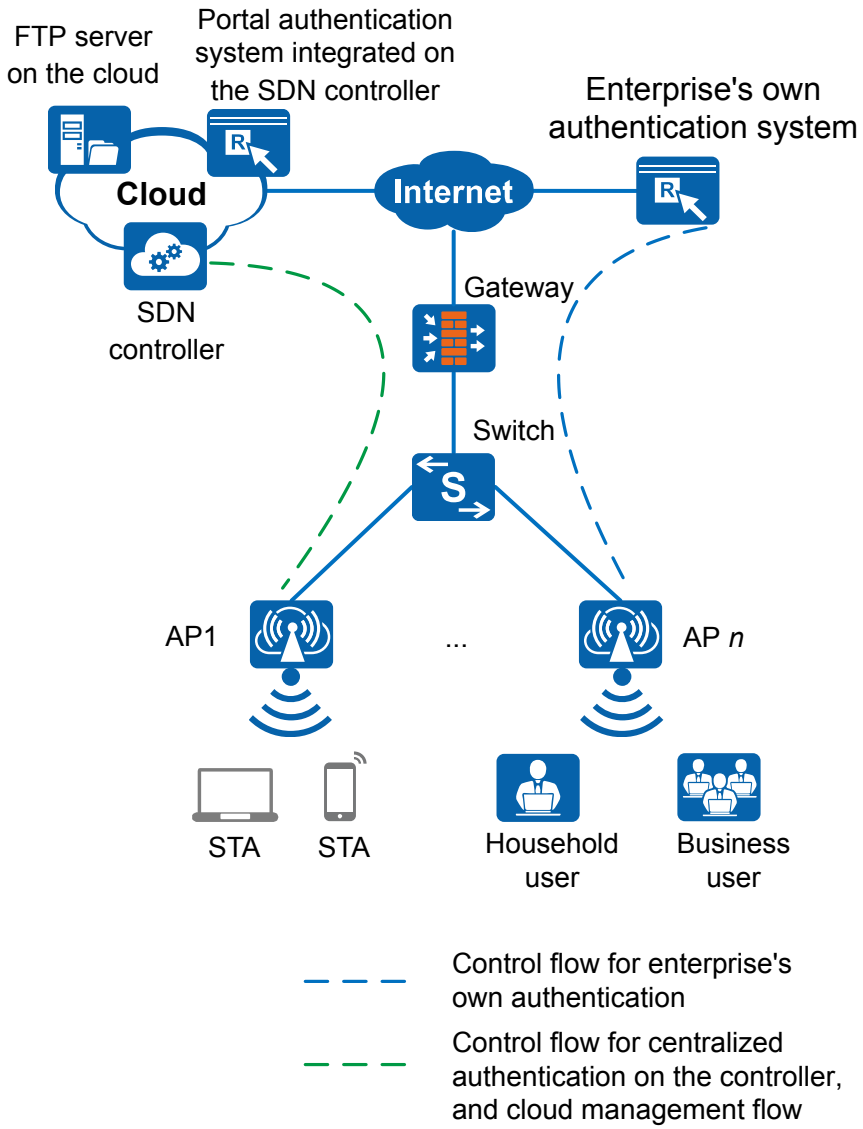
**Figure 2-5** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-6** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.1.3 Hardware Information (AP1050DN-S)

### Appearance

NOTE

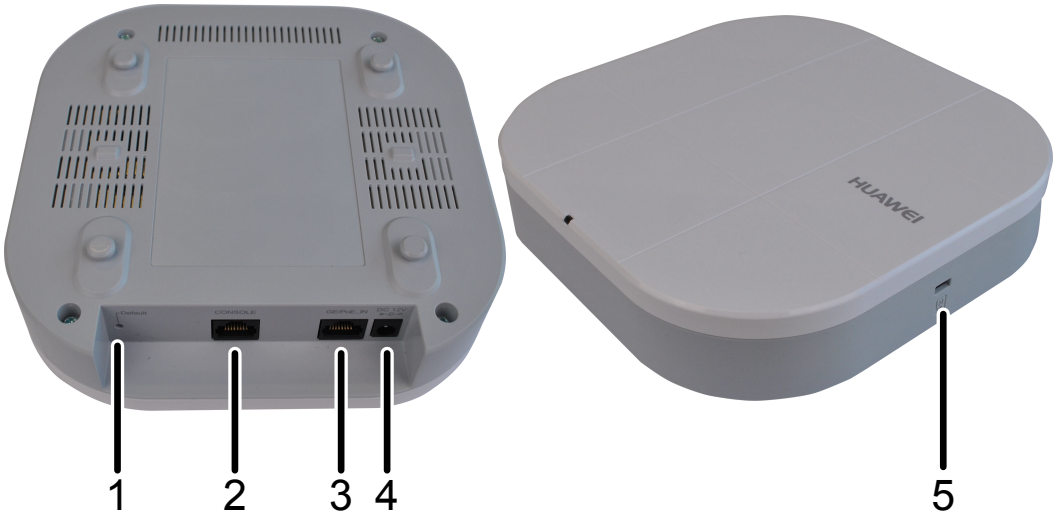
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-7** AP1050DN-S appearance


## Ports

**Figure 2-8** AP1050DN-S ports




As shown in **Figure 2-8**, each port can be described as follows:

1. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

2. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
3. GE/PoE_IN:10/100/1000M port that connects to the wired Ethernet and supports PoE input.
4. DC 12V: Connects a 12 V power adapter to the AP.
5. Security slot: Connects to a security lock.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-1** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-2** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 35 mm × 170 mm × 170 mm |
| | Weight | 0.41 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 64 MB NOR FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 8.1 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: The maximum temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-3** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional dual-band antenna |
| Antenna gain | • 2.4 GHz: 5 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | Fit AP: ≤ 256<br>Fat AP: ≤ 256<br>Cloud AP: ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 20 dBm<br>• 5 GHz: 20 dBm<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 200 Mbit/s<br>• 802.11ac: 6.5 to 433.3 Mbit/s | | |

## 2.1.4 Performance Specifications (AP1050DN-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.2 AP2030DN Product Description

## 2.2.1 Product Characteristics (AP2030DN)

**Table 2-4** Product characteristics

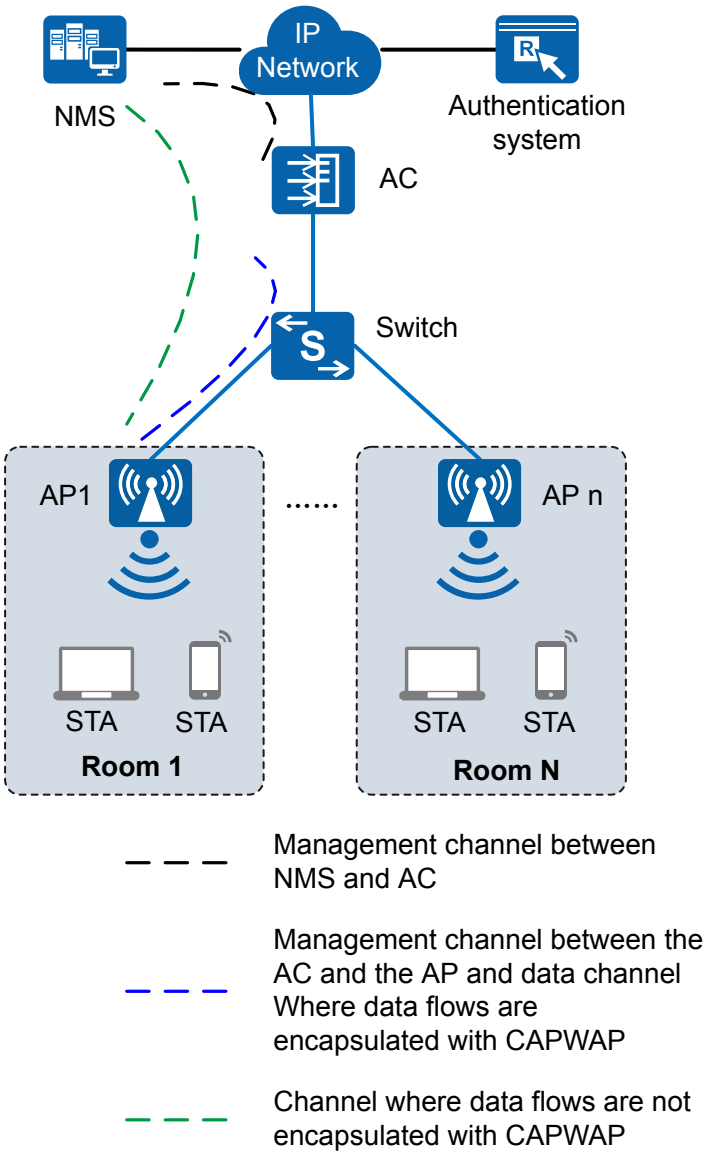
| Model | Frequency Band Supported | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP2030DN | Dual bands supported:<br>• 2.4 GHz<br>• 5 GHz<br>The AP provides services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | Huawei AP2030DN is a wall plate access point that can be easily installed in a junction box (86 mm). The AP2030DN is beautifully designed, with built-in antennas, a hidden indicator, and a sliding panel. It provides comprehensive service support capabilities and features high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. The AP2030DN can connect to wireless terminals through wireless connections or to wired terminals using wired cables. This makes it the ideal choice of customers to construct indoor distributed networks. | Huawei AP2030DN offers both wired and wireless network connections, applicable to hotels, apartments, and offices. |

## 2.2.2 Usage Scenarios (AP2030DN)

The following figure shows typical AP2030DN networking.

**Figure 2-9** Fit AP networking




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

## 2.2.3 Hardware Information (AP2030DN)

### Appearance

**Figure 2-10** shows the appearance of the device.

NOTE

The actual device appearance may be different from the following device appearance; these differences will not affect device functions.

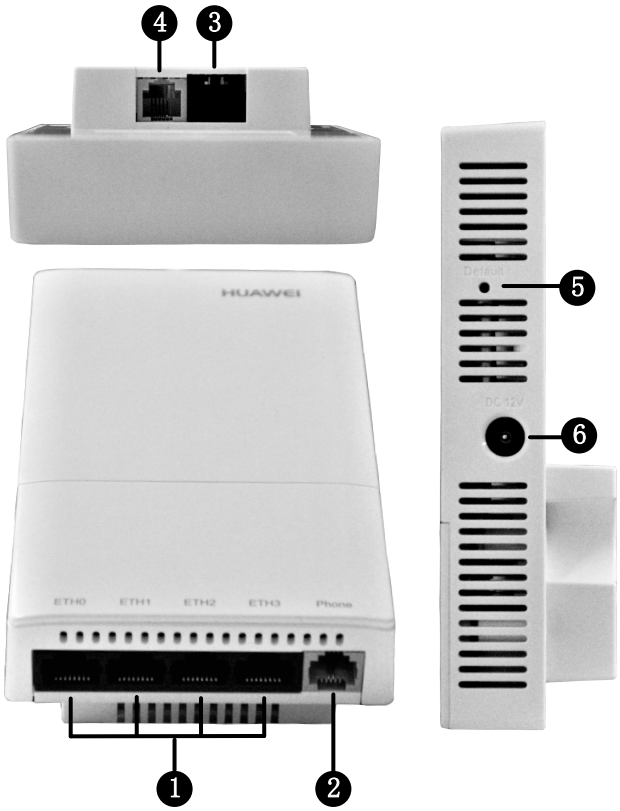
  

**Figure 2-10** Appearance


## Port

**Figure 2-11** shows ports on the device.

**Figure 2-11** Ports




Each port can be described as follows:

1. ETH0 to ETH3: 10/100M port used to connect to the wired Ethernet.
2. Phone: Phone interface used to connect to a POTS phone or modem device.
3. GE/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for the device.
4. Phone: Phone interface used to connect to a traditional PSTN.
5. Default: Reset button used to restore factory settings if you hold down the button more than 3 seconds.
6. Power input interface: 12 V DC.

## LED Indicator

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Table 2-5** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-6** Basic specifications of the AP2030DN

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions outside the wall (H x W x D) | 25 mm x 140 mm x 86 mm |
| | Dimensions inside the wall (H x W x D) | 16.5 mm x 51.5 mm x 63.5 mm |
| | Weight | 0.2 kg |
| | System memory | • 128 MB DDR2<br>• 32 MB Flash |
| Power specifications | Power input | 12 V ± 10%<br>PoE power: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 8.7 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature and altitude | -60 m to +1800 m: 0°C to +40°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 2-7** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 2 dBi<br>• 5 GHz: 3 dBi |
| Maximum number of users | ≤ 64 |
| Maximum number of VAPs for each radio | 8 |
| Maximum transmit power | • 2.4 GHz: 21 dBm (combined power)<br>• 5 GHz: 20 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. The AP2030DN applies only to countries and regions that support junction boxes (86 mm). |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>802.11b/g<br>• 20 MHz: 3<br>802.11n<br>• 20 MHz: 3<br>• 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 300 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.2.4 Performance Specifications (AP2030DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.3 AP2030DN-S Product Description

## 2.3.1 Product Characteristics (AP2030DN-S)

**Table 2-8** Product characteristics

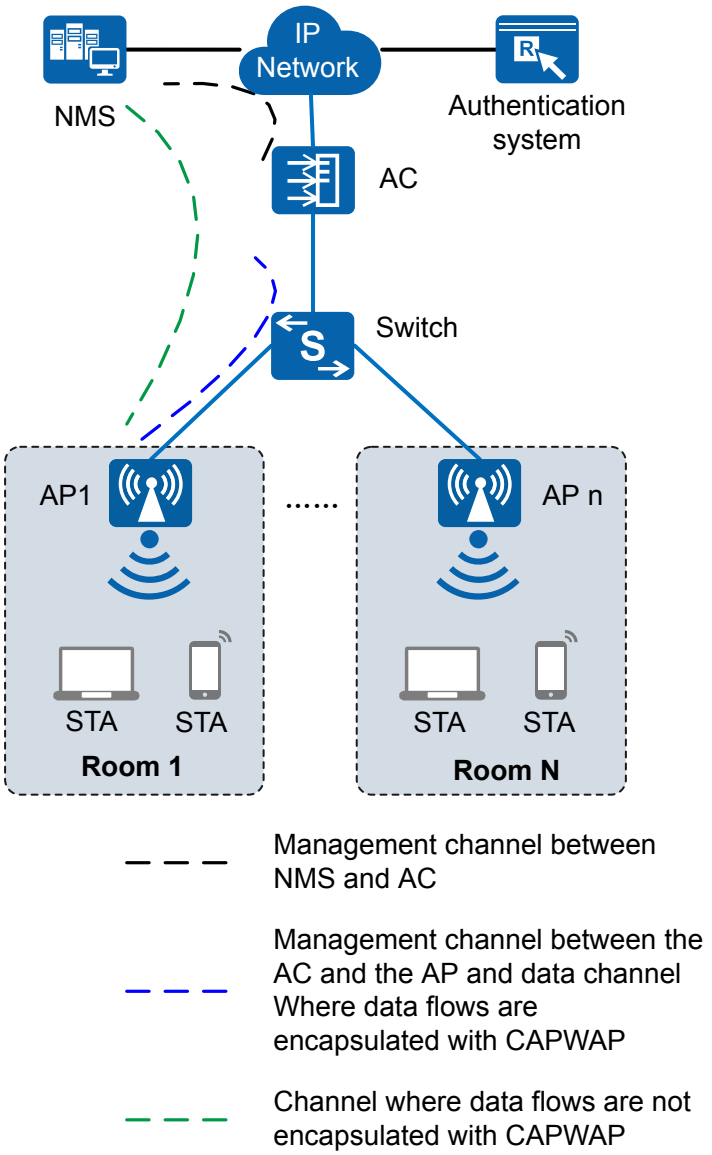
| Model | Frequency Band Supported | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP2030DN-S | Dual bands supported:<br>• 2.4GHz<br>• 5GHz<br>The AP provides services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11 a/b/g/n/ac | Huawei AP2030DN-S is a wall plate access point that can be easily installed in a junction box (86 mm). The AP2030DN-S is beautifully designed, with built-in antennas, a hidden indicator, and a sliding panel. It provides comprehensive service support capabilities, and features high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. The AP2030DN-S connects to wireless STAs through wireless connections, and is ideal for constructing indoor distributed Wi-Fi networks. | The AP2030DN-S provides wireless network connections and is applicable to scenarios such as hotels, apartments, and offices. |

## 2.3.2 Usage Scenarios (AP2030DN-S)

The following figure shows typical AP2030DN-S networking.

**Figure 2-12** Fit AP networking




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

## 2.3.3 Hardware Information (AP2030DN-S)

### Appearance

**Figure 2-13** shows the appearance of the device.

NOTE

The actual device appearance may be different from the following device appearance; these differences will not affect device functions.

**Figure 2-13** Appearance


## Port

Figure 2-14 shows ports on the device.

**Figure 2-14** Ports


Each port can be described as follows:

1. ETH/PoE: 10/100M auto-sensing network port that connects to the central AP and supports PoE input.
2. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

## LED Indicator

The AP2030DN-S provides only one indicator, as shown in **Figure 2-15**.

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 2-15** Indicator

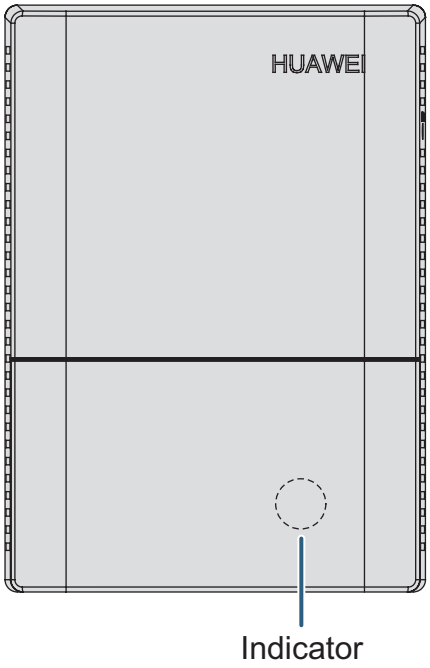



**Table 2-9** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-10** Basic specifications of the AP2030DN-S

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 26 mm x 86 mm x 120 mm |
| | Weight | 0.1 kg |
| | System memory | 128 MB DDR2 |
| | Flash | 32 MB NOR flash |

| Item | | Description |
| --- | --- | --- |
| Power specifications | Power input | PoE power supply: in compliance with IEEE 802.3af |
| | Maximum power consumption | 5.1 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment parameters | Operating temperature and altitude | -60 m to +1800 m: 0°C to 40°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-11** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in antenna |
| Antenna gain | • 2.4 GHz: 3 dBi<br>• 5 GHz: 4 dBi |
| Maximum number of users | ≤ 64 |
| Maximum number of VAPs for each radio | 16 |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 21 dBm (combined power)<br>• 5 GHz: 20 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations. The AP2030DN-S can be installed in a junction box (86 mm) and applies only to countries and regions that support the junction boxes of such specifications.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
<tr><td>Channel rate</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 300 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s</td></tr>
</table>

### 2.3.4 Performance Specifications (AP2030DN-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

## 2.4 AP2050DN and AP2050DN-E Product Description

### 2.4.1 Product Characteristics (AP2050DN and AP2050DN-E)

Huawei AP2050DN and AP2050DN-E are latest-generation gigabit wall plate access points (APs) in compliance with 802.11ac Wave 2. They use an 86 mm x 86

mm plate design and can be easily installed in a standard 86-type junction box. The APs are beautifully designed, with built-in antennas, a hidden indicator, and a sliding panel. These highlights make the APs suitable for environments with densely distributed small rooms, such as hotel guest rooms, student dormitories, hospital wards, and small offices. The APs provide enhanced service support capabilities and feature high security, easy network deployment, automatic AC discovery and configuration, and real-time management and maintenance. The APs can connect to wireless terminals through wireless connections or to wired terminals using wired cables. This makes them the ideal choice of customers to construct indoor distributed networks.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- One GE uplink interface, four GE downlink interfaces, and two RJ45 pass-through phone ports
- USB interface used for external power supply and storage
- AP2050DN-E: Built-in Bluetooth to implement positioning with eSight
- AP2050DN-E: PoE out function, supplying power for terminals such as IP phones
- Various installation modes for easy deployment, including ceiling-mounting, wall-mounting, plate-mounting, and desk-mounting
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

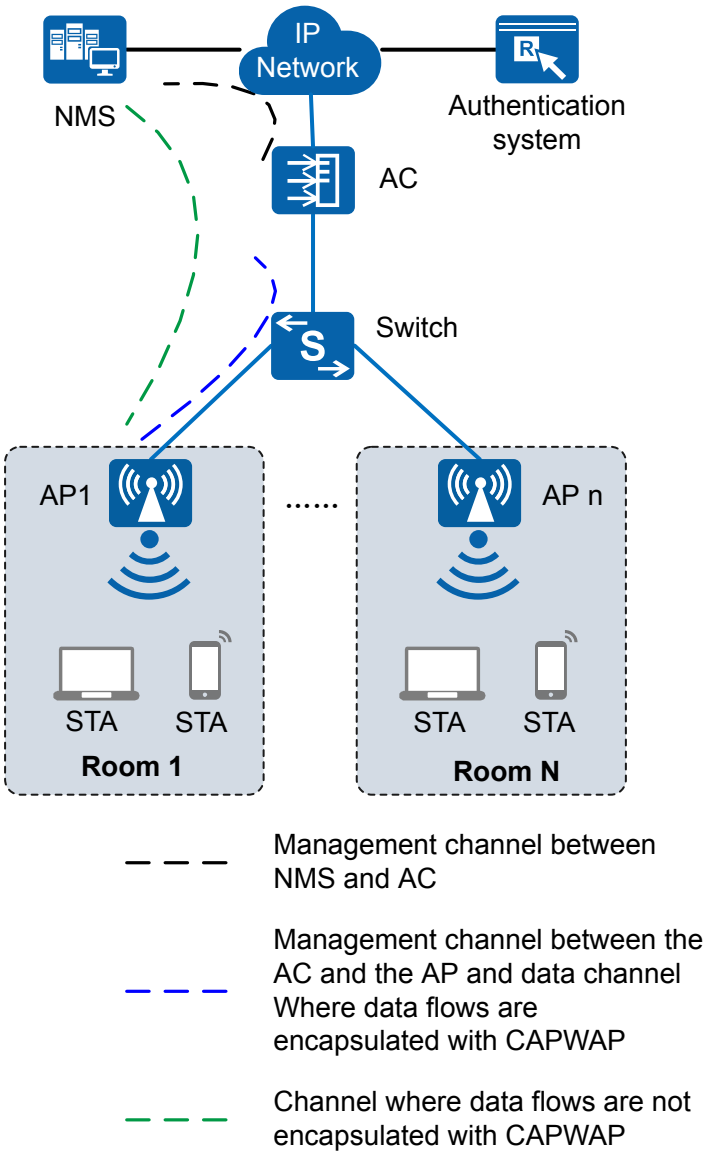
## 2.4.2 Usage Scenarios (AP2050DN, AP2050DN-E)

AP2050DN and AP2050DN-E can work as a Fat AP, Fit AP, or cloud AP. The AP can switch flexibly among three working modes based on the network plan.

The following figure shows typical AP2050DN and AP2050DN-E networking.

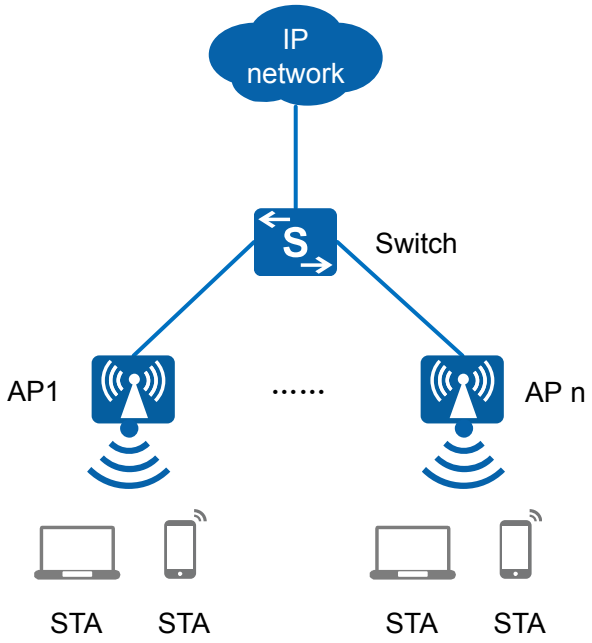
**Figure 2-16** Fit AP networking




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

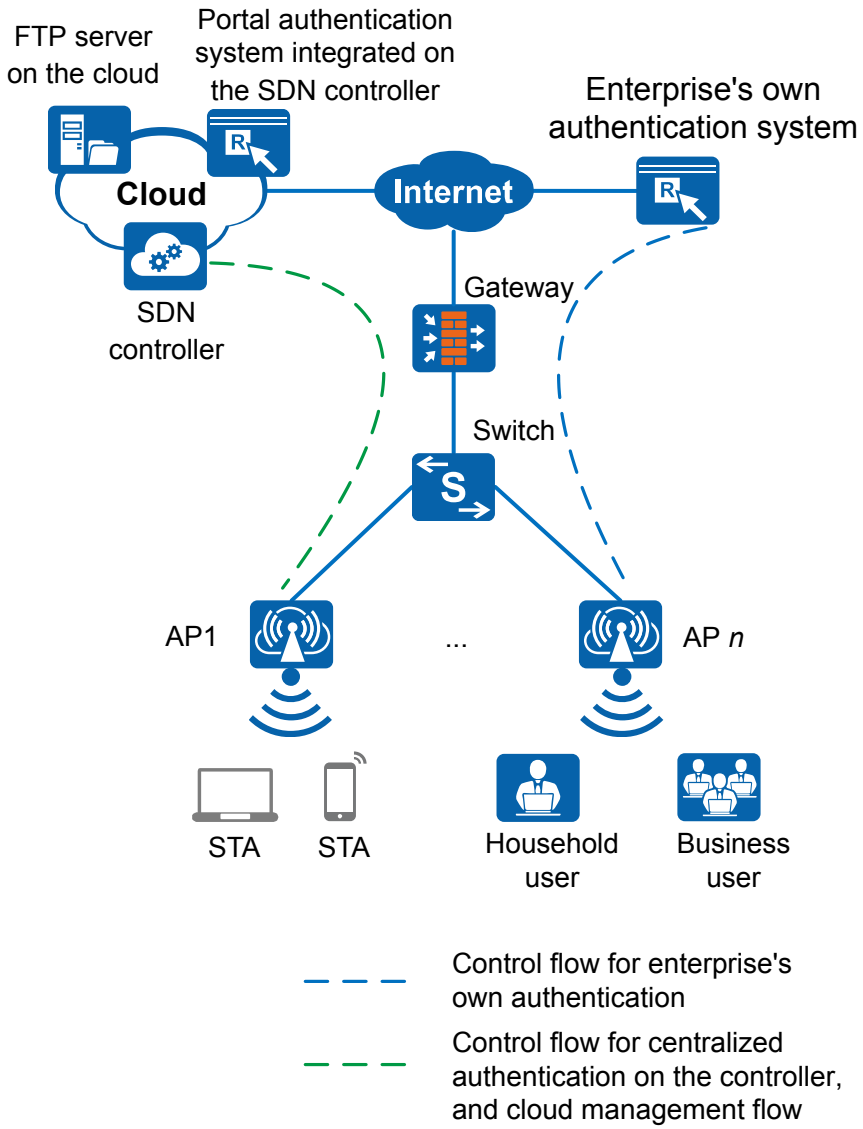
**Figure 2-17** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-18** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.4.3 Hardware Information (AP2050DN)

### Appearance

NOTE

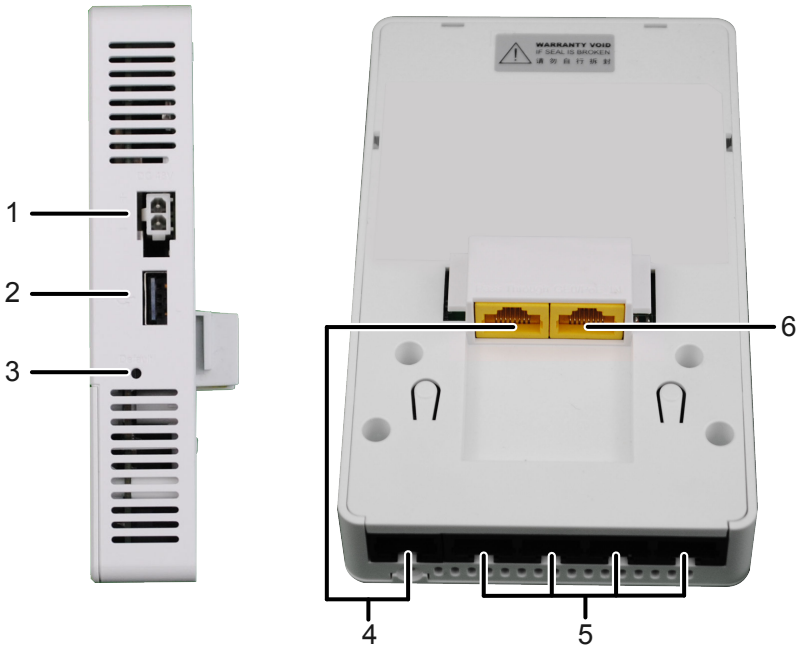
The actual device appearance may slightly differ from the following device appearance; these differences will not affect device functions.

**Figure 2-19** Appearance

## Port

**Figure 2-20** Ports




Each port can be described as follows:

1. DC 48V: DC power socket connecting a 48 V power adapter to the AP.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB 2.0 standard is supported.
3. Default button: restores factory settings and restarts the device if you hold down the button more than 3 seconds.

4. Pass Through port (RJ45): Connects to a network cable or phone cable for transparent transmission.
5. GE1 to GE4: 10/100/1000M port connected to the wired Ethernet.
6. GE0/PoE_IN: 10/100/1000M port connected to the wired Ethernet. The port supports PoE input.

## LED Indicators

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Table 2-12** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-13** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 36 mm x 86 mm x 140 mm (1.42 in. x 3.39 in. x 5.51 in.) |
| | Weight | 0.26 kg |
| | System memory | 256 MB DDR3L |
| | Flash | 64 MB NOR FLASH |
| Power specifications | Power input | ● DC: 48 V±5%<br>● PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 11.5 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to +40°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-14** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | Fit AP: ≤ 256<br>Fat AP: ≤ 256<br>Cloud AP: ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 21 dBm (combined power)<br>• 5 GHz: 20 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. The AP2050DN and AP2050DN-E can be installed in junction boxes (86 mm) and apply only to countries and regions that support the junction boxes of such specifications. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

# 2.4.4 Hardware Information (AP2050DN-E)

## Appearance

NOTE

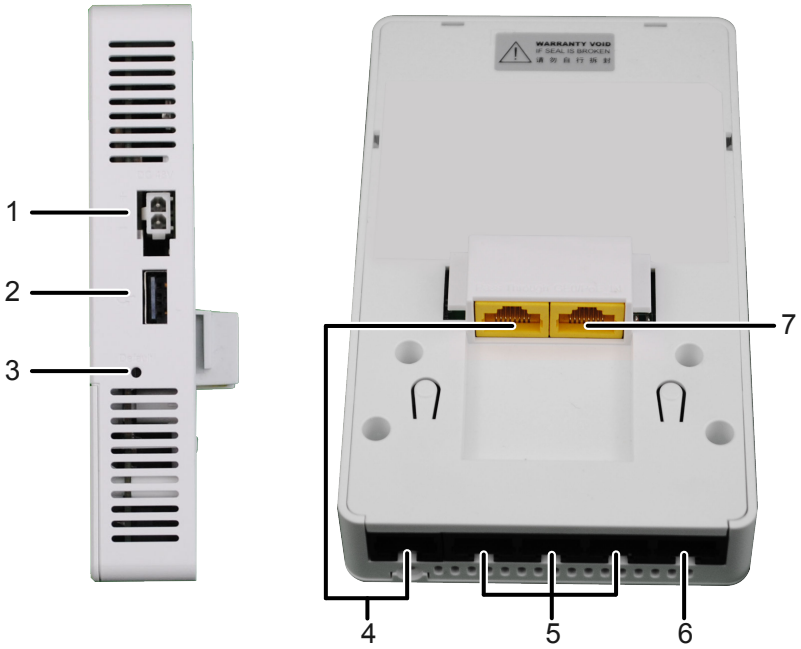
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-21** AP2050DN-E appearance

## Ports

**Figure 2-22** AP2050DN-E ports




As shown in **Figure 2-22**, each port can be described as follows:

1. DC 48V: DC power socket connecting a 48 V power adapter to the AP.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB 2.0 standard is supported.
3. Default button: restores factory settings and restarts the device if you hold down the button more than 3 seconds.

4. Pass Through port (RJ45): Connects to a network cable or phone cable for transparent transmission.
5. GE2 to GE4: 10/100/1000M port connected to the wired Ethernet.
6. GE1/PoE_OUT: 10/100/1000M port connected to the wired Ethernet and supports PoE output.
7. GE0/PoE_IN: 10/100/1000M port connected to the wired Ethernet. The port supports PoE input.

## LED Indicators

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Table 2-15** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-16** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 36 mm x 86 mm x 140 mm (1.42 in. x 3.39 in. x 5.51 in.) |
| | Weight | 0.26 kg |
| | System memory | 256 MB DDR3L |
| | Flash | 64 MB NOR FLASH |
| Power specifications | Power input | ● DC: 48 V±5%<br>● PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 11.5 W (excluding the output power of the USB port and PoE_OUT port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to +40°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-17** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | Fit AP: ≤ 256<br>Fat AP: ≤ 256<br>Cloud AP: ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 21 dBm (combined power)<br>• 5 GHz: 20 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. The AP2050DN and AP2050DN-E can be installed in junction boxes (86 mm) and apply only to countries and regions that support the junction boxes of such specifications. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.4.5 Performance Specifications (AP2050DN, AP2050DN-E)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.5 AP2050DN-S Product Description

## 2.5.1 Product Characteristics (AP2050DN-S)

Huawei AP2050DN-S is the latest-generation wall plate access point (AP) targeted at the SMB distribution market in compliance with 802.11ac Wave 2, providing high-quality wireless network services. The device has built-in antennas and can be quickly deployed with a standard 86-type junction box. The front is beautifully designed with a sliding panel, applicable to hotels, apartments, offices, and other places.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- One GE uplink interface, four GE downlink interfaces, and two RJ45 pass-through phone ports
- USB interface used for external power supply and storage
- Various installation modes for easy deployment, including ceiling-mounting, wall-mounting, plate-mounting, and desk-mounting
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

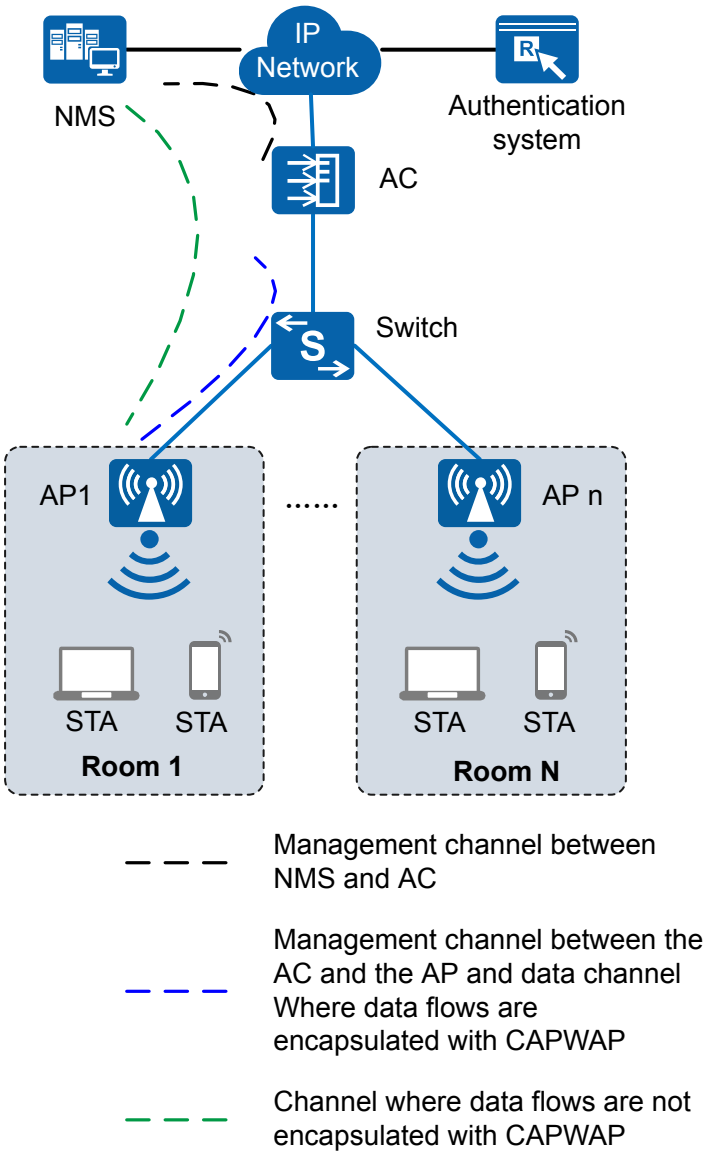
## 2.5.2 Usage Scenarios (AP2050DN-S)

The AP2050DN-S can work as a Fat, Fit, or cloud AP, and switch its working mode based on network planning requirements.

The following figure shows a typical AP2050DN-S networking.

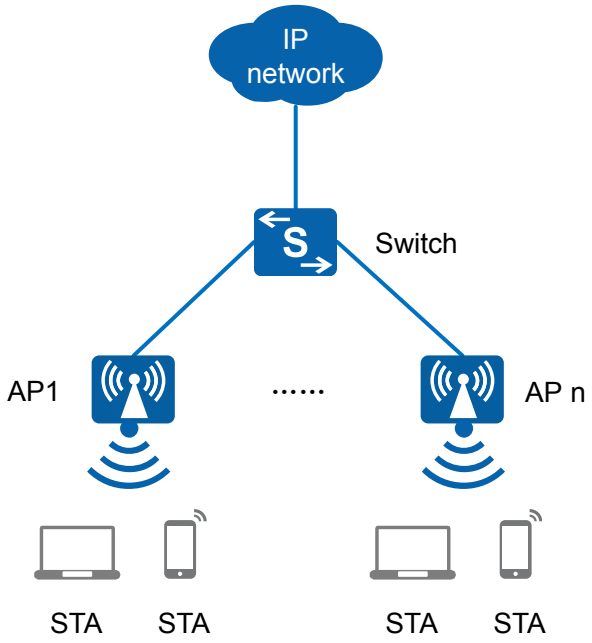
**Figure 2-23** Fit AP networking




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

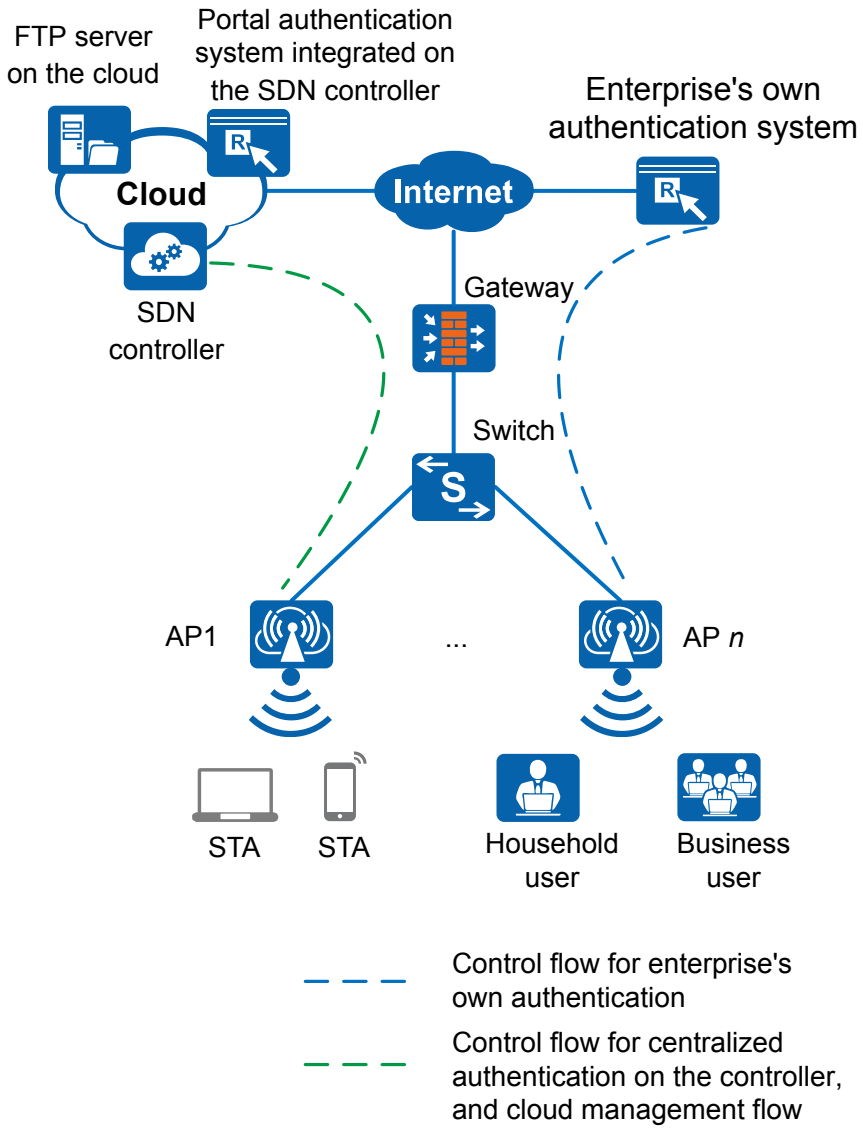
**Figure 2-24** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-25** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.5.3 Hardware Information (AP2050DN-S)

### Appearance

NOTE

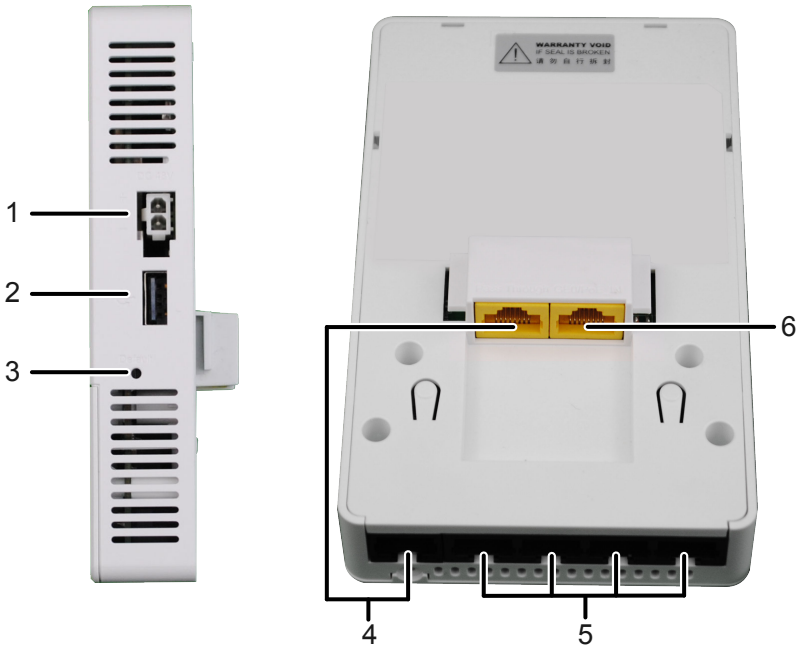
The actual device appearance may slightly differ from the following device appearance; these differences will not affect device functions.

**Figure 2-26** Appearance

## Port

**Figure 2-27** Ports




Each port can be described as follows:

1. DC 48V: DC power socket connecting a 48 V power adapter to the AP.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB 2.0 standard is supported.
3. Default button: restores factory settings and restarts the device if you hold down the button more than 3 seconds.

4. Pass Through port (RJ45): Connects to a network cable or phone cable for transparent transmission.
5. GE1 to GE4: 10/100/1000M port connected to the wired Ethernet.
6. GE0/PoE_IN: 10/100/1000M port connected to the wired Ethernet. The port supports PoE input.

## LED Indicators

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Table 2-18** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-19** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 36 mm x 86 mm x 140 mm |
| | Weight | 0.26 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 64 MB NOR FLASH |
| Power specifications | Power input | ● DC: 48 V ± 5%<br>● PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 11.5 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to +40°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-20** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | Fit AP: ≤ 256<br>Fat AP: ≤ 256<br>Cloud AP: ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 21 dBm (combined power)<br>• 5 GHz: 20 dBm (combined power)<br>**NOTE**<br>The actual maximum transmit power varies depending on local laws and regulations. The AP2050DN-S is installed in a junction box (86 mm), and therefore is applicable only to countries and regions where junction boxes of 86 mm are supported. |

| Item | Description | | |
|---|---|---|---|
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.5.4 Performance Specifications (AP2050DN-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.6 AP2051DN and AP2051DN-E Product Description

## 2.6.1 Product Characteristics (AP2051DN and AP2051DN-E)

Huawei AP2051DN and AP2051DN-E are the gigabit wall plate access points (APs) in compliance with 802.11ac Wave 2. With mounting brackets, the APs can be easily adapted to junction boxes (86/118/120 mm) and wall-mounting scenarios. The APs boast built-in smart antennas, a hidden indicator, and a brand-new "morning dew" style. These highlights make the APs suitable for environments with densely distributed small rooms, such as hotel guest rooms, student dormitories, hospital wards, and small offices. The APs provide enhanced service support capabilities and feature high security, easy network deployment,

automatic AC discovery and configuration, and real-time management and maintenance. The APs can connect to wireless terminals through wireless connections or to wired terminals using wired cables. This makes them the ideal choice of customers to construct indoor distributed networks.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- One GE uplink interface, four GE downlink interfaces, and two RJ45 pass-through phone ports
- Various installation modes for easy deployment, including ceiling-mounting, wall-mounting, plate-mounting, and desk-mounting
- USB interface used for external power supply and storage
- Built-in smart antennas, increasing the coverage area
- AP2051DN-E: the PoE out function, supplying power for terminals such as IP phones
- AP2051DN-E: Built-in Bluetooth to implement positioning with eSight
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

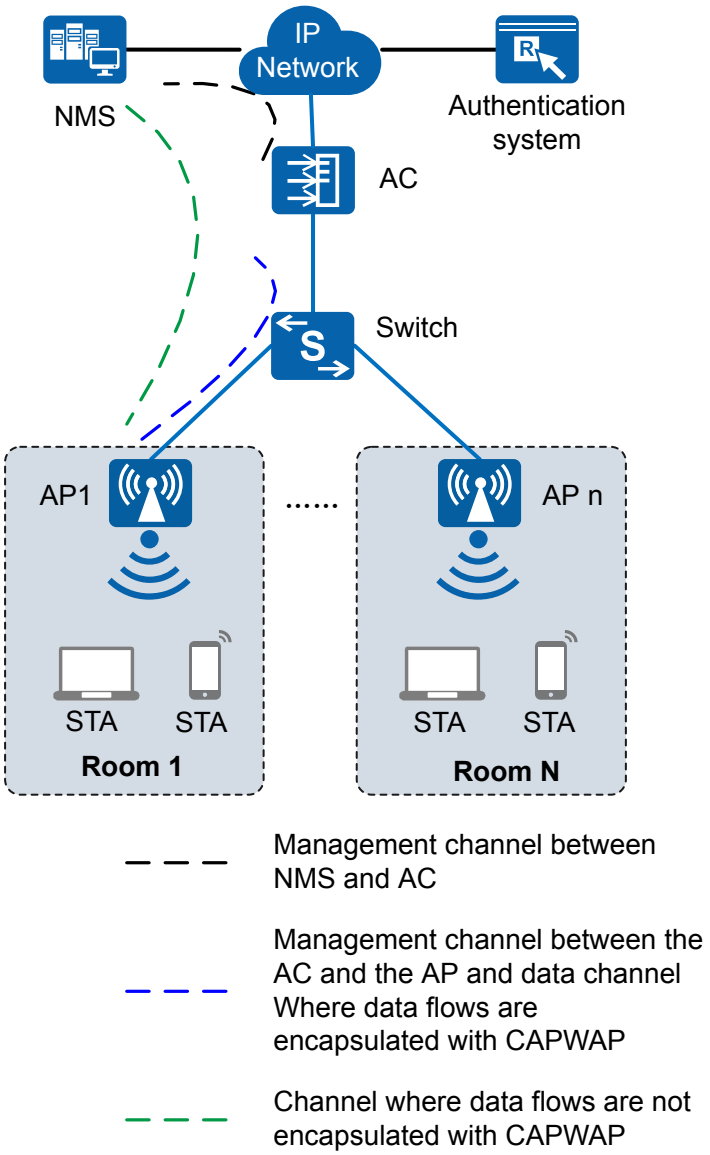
## 2.6.2 Usage Scenarios (AP2051DN and AP2051DN-E)

The AP2051DN and AP2051DN-E can work as a Fat AP, Fit AP, or cloud AP. The AP can switch flexibly among three working modes based on the network plan.

The following figure shows typical AP2051DN and AP2051DN-E networking.

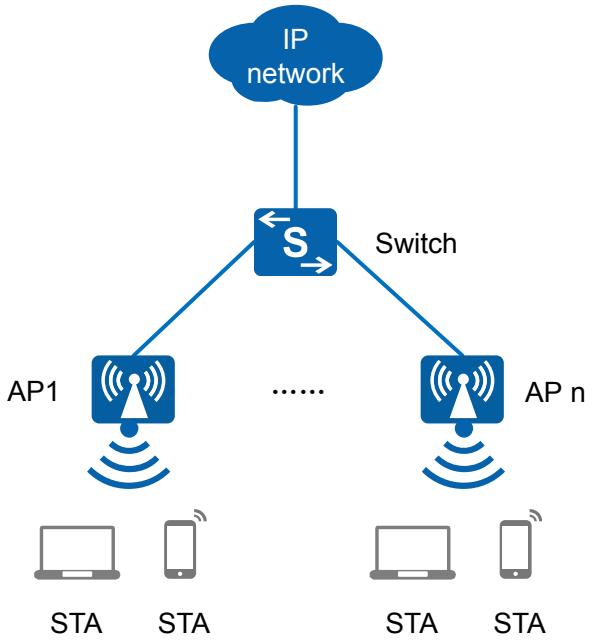
**Figure 2-28** Fit AP networking




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

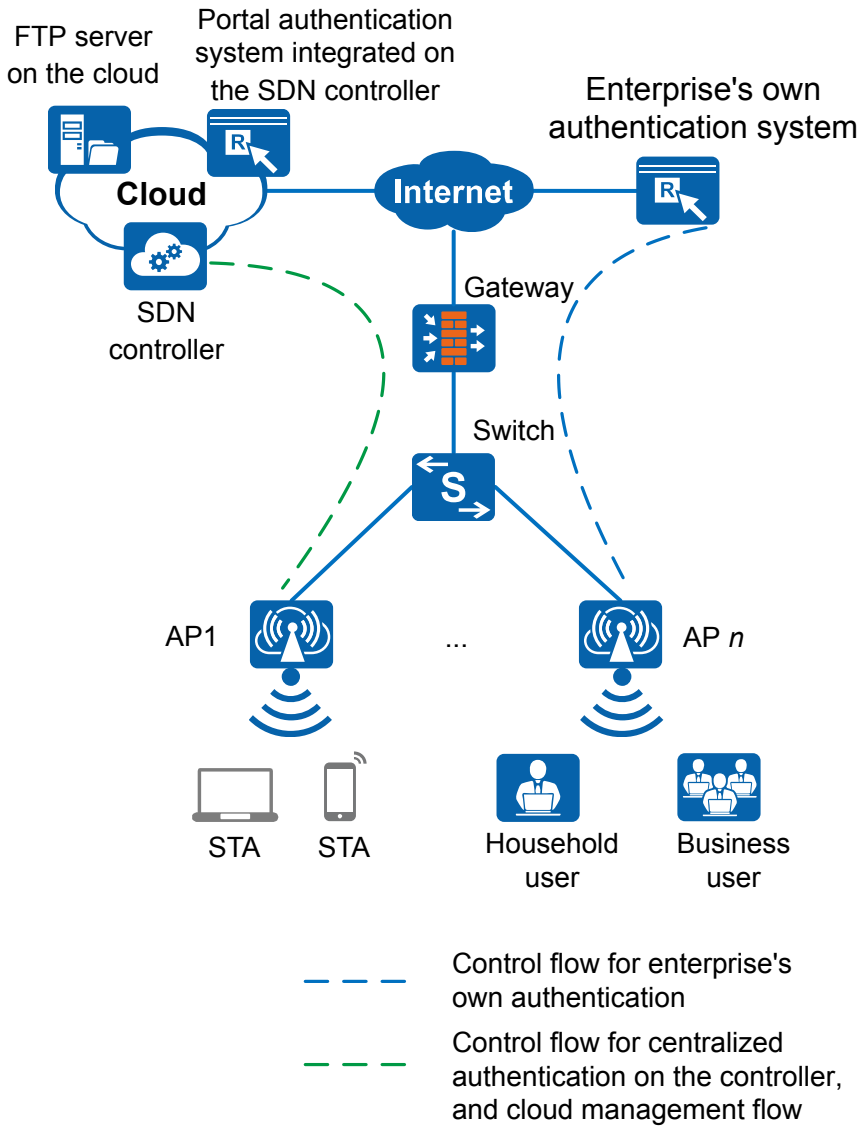
**Figure 2-29** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-30** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.6.3 Hardware Information (AP2051DN)

### Appearance

NOTE

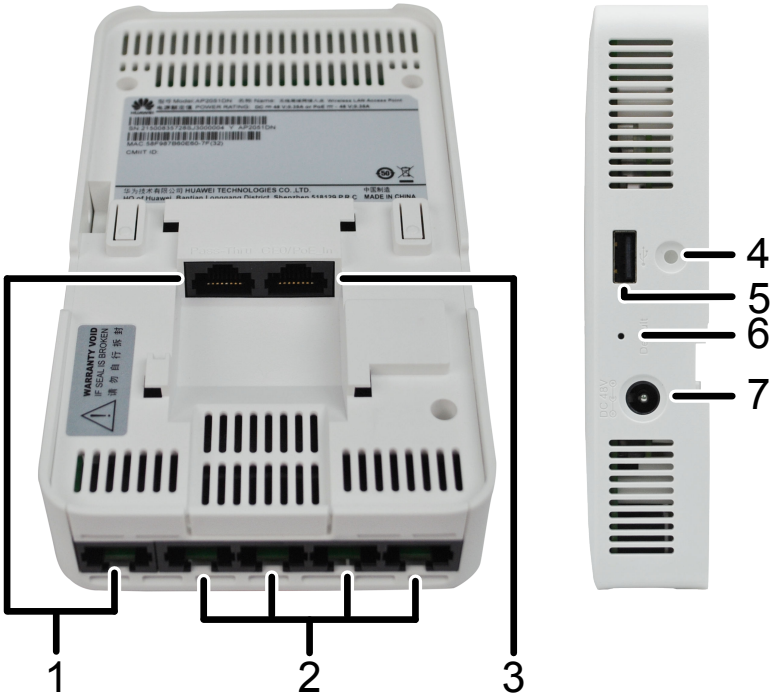
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-31** Appearance


## Port

**Figure 2-32** Ports




Each port can be described as follows:

1. Pass Through: RJ45 ports that connect to network cables or phone cables for transparent transmission.
2. GE4 to GE1: 10/100/1000M port that connects to the wired Ethernet.
3. GE0/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
4. Captive screw hole: Accommodates a captive screw.

   **NOTE**

   Tighten an M3x4 crosshead screw into the device to prevent the device from dropping. If the anti-theft function is required, tighten an M3x4 torx screw (instead of an M3x4 crosshead screw) into the device using a T9 torx security screwdriver. The tightening torques of the two screw types are both 0.15 N•m.
5. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
6. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
7. DC 48V: Connects a 48 V power adapter to the AP.

   **NOTE**

   When the AP uses the DC power supply, use a power adapter for power supply; otherwise, the AP may be damaged.

## LED Indicators

The AP2051DN provides only one indicator, as shown in **Figure 2-33**.

**NOTE**

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 2-33** Indicator

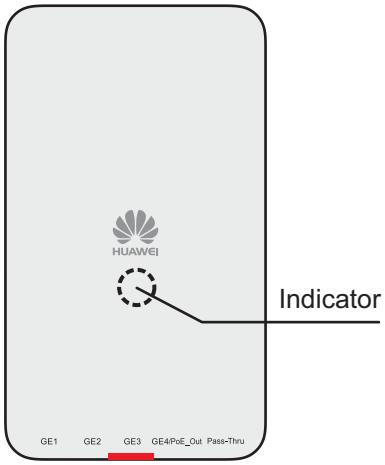


**Table 2-21** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-22** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 32.5 mm x 86 mm x 150 mm (1.28 in. x 3.39 in. x 5.91 in.) |
| | Weight | 0.25 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 64 MB NOR FLASH |
| Power specifications | Power input | • DC: 45.6 V to 57 V<br>• PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 11.5 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to +40°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-23** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in smart antenna |
| Antenna gain | • 2.4 GHz: 3 dBi<br>• 5 GHz: 4 dBi |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum number of users</td><td colspan="3">Fit AP: ≤ 256<br>Fat AP: ≤ 256<br>Cloud AP: ≤ 256<br>NOTE<br>The actual number of users varies according to the environment.</td></tr>
<tr><td>Maximum number of VAPs for each radio</td><td colspan="3">16</td></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations. The AP2051DN and AP2051DN-E can be installed in junction boxes (86 mm) and apply only to countries and regions that support the junction boxes of such specifications.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
<tr><td>Channel rate</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s</td></tr>
</table>

# 2.6.4 Hardware Information (AP2051DN-E)

## Appearance

NOTE

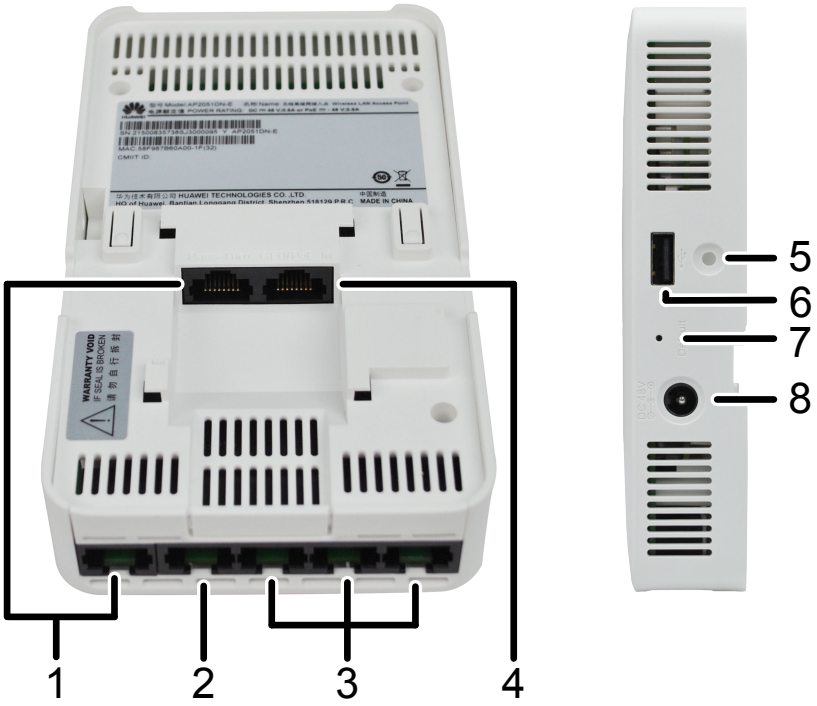
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-34** Appearance

## Ports

**Figure 2-35** Ports




As shown in **Figure 2-35**, each port can be described as follows:

1. Pass Through: RJ45 ports that connect to network cables or phone cables for transparent transmission.
2. GE4/PoE_Out: 10/100/1000M port that connects to the wired Ethernet and supports PoE output.
3. GE3 to GE1: 10/100/1000M port that connects to the wired Ethernet.
4. GE0/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
5. Captive screw hole: Accommodates a captive screw.

   **NOTE**

   Tighten an M3x4 crosshead screw into the device to prevent the device from dropping. If the anti-theft function is required, tighten an M3x4 torx screw (instead of an M3x4 crosshead screw) into the device using a T9 torx security screwdriver. The tightening torques of the two screw types are both 0.15 N•m.
6. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
7. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
8. DC 48V: Connects a 48 V power adapter to the AP.

   **NOTE**

   When the AP uses the DC power supply, use a power adapter for power supply; otherwise, the AP may be damaged.

## LED Indicators

The AP2051DN-E provides only one indicator, as shown in **Figure 2-36**.

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 2-36** Indicator

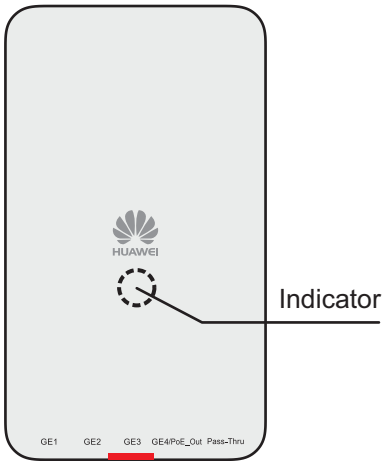



**Table 2-24** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-25** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 32.5 mm x 86 mm x 150 mm (1.28 in. x 3.39 in. x 5.91 in.) |
| | Weight | 0.25 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 64 MB NOR FLASH |
| Power specifications | Power input | ● DC: 45.6 V to 57 V<br>● PoE power supply: in compliance with IEEE 802.3af/at |

| Item | | Description |
| --- | --- | --- |
| | Maximum power consumption | 11.5 W (excluding the output power of the USB port and PoE_OUT port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to +40°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-26** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in smart antenna |
| Antenna gain | • 2.4 GHz: 3 dBi<br>• 5 GHz: 4 dBi |
| Maximum number of users | Fit AP: ≤ 256<br>Fat AP: ≤ 256<br>Cloud AP: ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. The AP2051DN and AP2051DN-E can be installed in junction boxes (86 mm) and apply only to countries and regions that support the junction boxes of such specifications. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.6.5 Performance Specifications (AP2051DN and AP2051DN-E)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.7 AP2051DN-S Product Description

## 2.7.1 Product Characteristics (AP2051DN-S)

Huawei AP2051DN-S is the latest-generation wall plate access point (AP) targeted at the SMB distribution market in compliance with 802.11ac Wave 2. The AP2051DN-S boasts built-in smart antennas and a hidden indicator. These highlights make the AP suitable for environments with densely distributed small rooms, such as hotel guest rooms, student dormitories, hospital wards, and small offices. The AP provides enhanced service support capabilities and features high security, easy network deployment, automatic AC discovery and configuration, and

real-time management and maintenance. With mounting brackets, the AP can be easily adapted to junction boxes (86/118/120 mm) and wall-mounting scenarios.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- One GE uplink interface, four GE downlink interfaces, and two RJ45 pass-through phone ports
- Various installation modes for easy deployment, including ceiling-mounting, wall-mounting, plate-mounting, and desk-mounting
- USB interface used for external power supply and storage
- Built-in smart antennas, increasing the coverage area
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

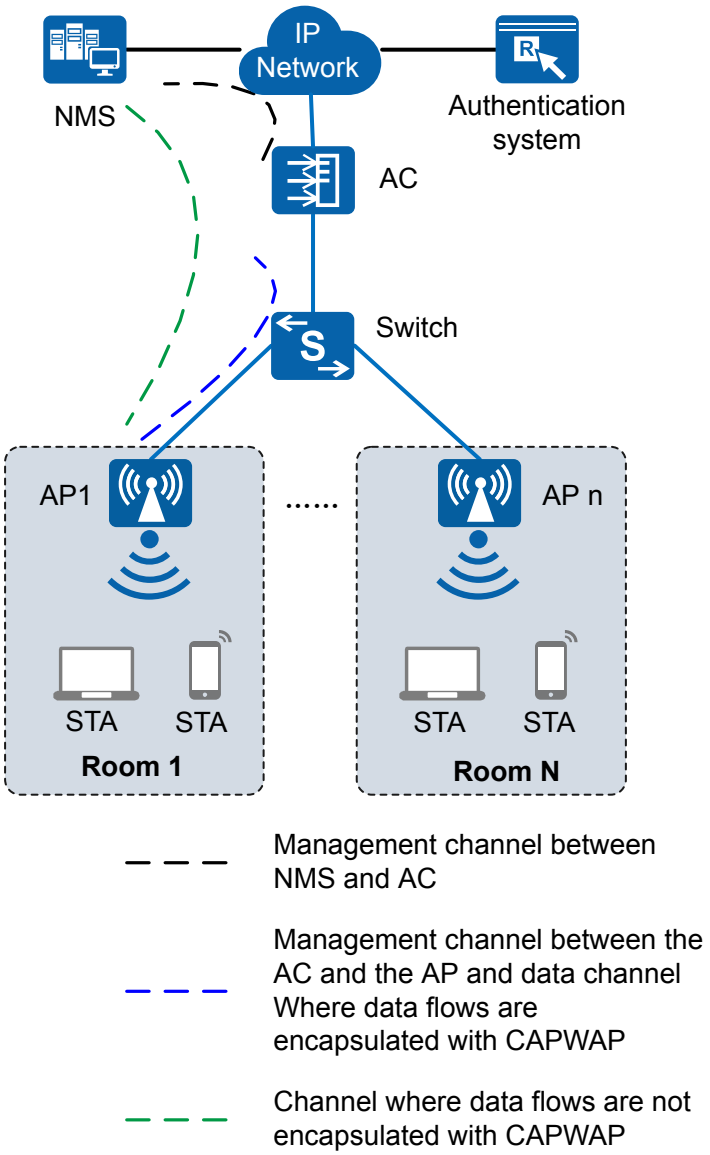
## 2.7.2 Usage Scenarios (AP2051DN-S)

The AP2051DN-S can work as a Fat, Fit, or cloud AP, and switch its working mode based on network planning requirements.

The following figure shows a typical AP2051DN-S networking.

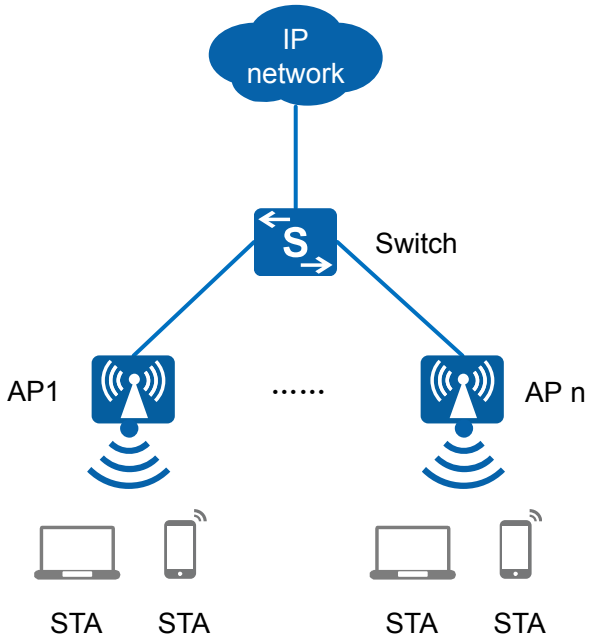
**Figure 2-37** Fit AP networking




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

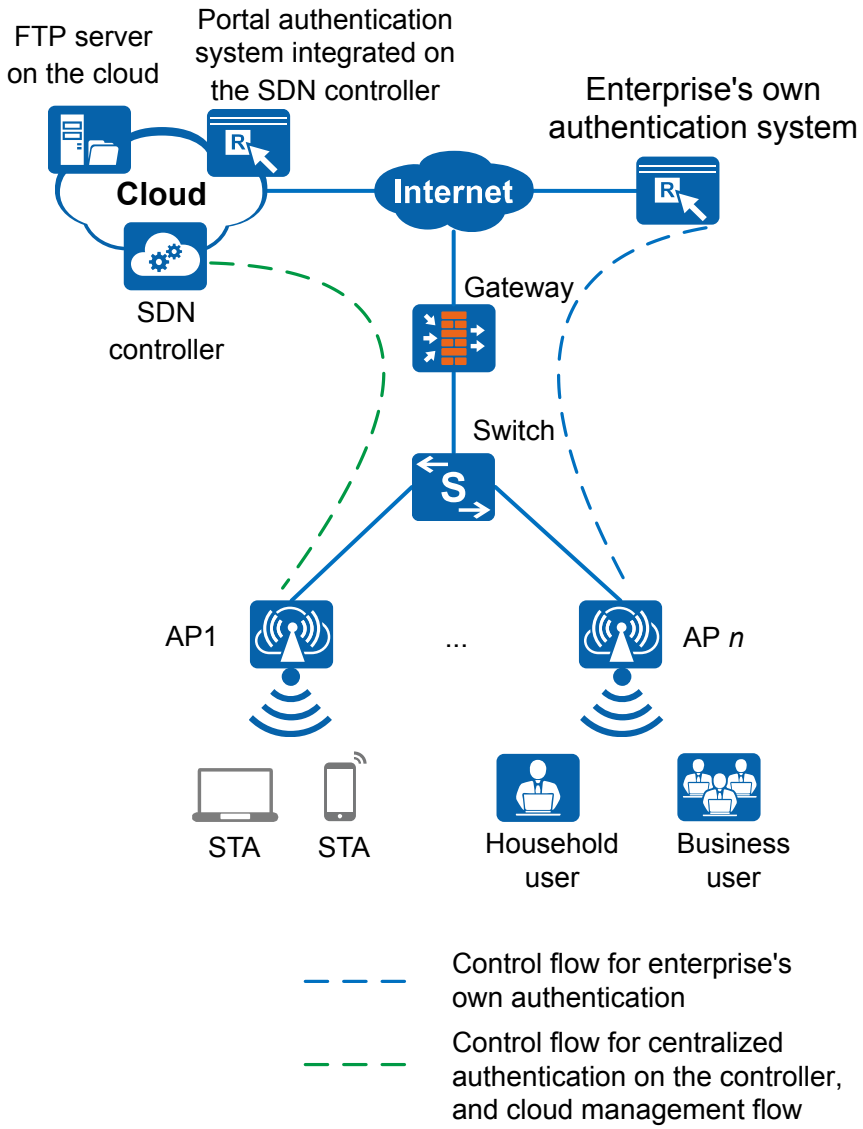
**Figure 2-38** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-39** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.7.3 Hardware Information (AP2051DN-S)

### Appearance

NOTE

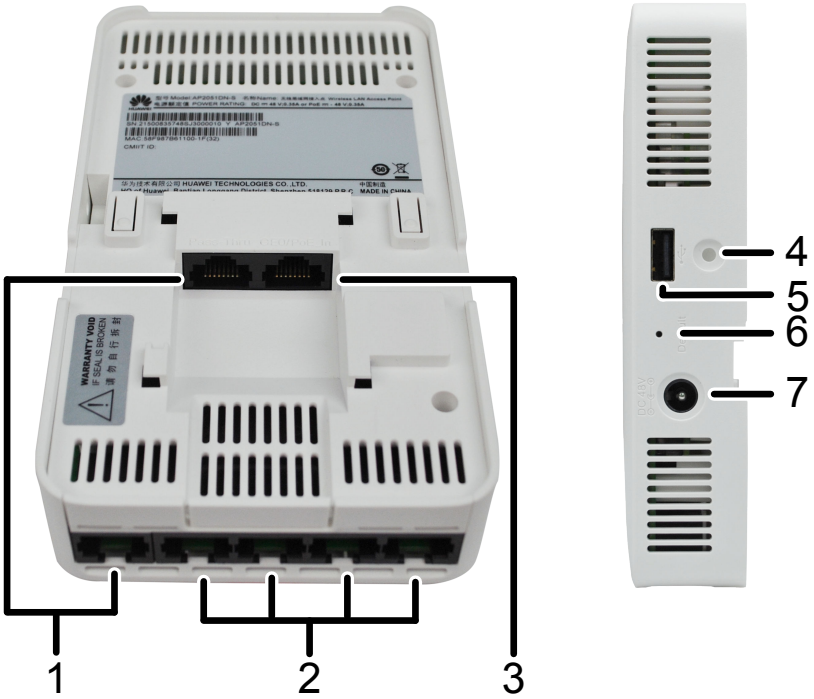
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-40** Appearance


## Ports

**Figure 2-41** AP2051DN-S ports




Each port can be described as follows:

1. Pass Through: RJ45 ports that connect to network cables or phone cables for transparent transmission.
2. GE4 to GE1: 10/100/1000M port that connects to the wired Ethernet.
3. GE0/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
4. Captive screw hole: Accommodates a captive screw.

   **NOTE**

   Tighten an M3x4 crosshead screw into the device to prevent the device from dropping. If the anti-theft function is required, tighten an M3x4 torx screw (instead of an M3x4 crosshead screw) into the device using a T9 torx security screwdriver. The tightening torques of the two screw types are both 0.15 N•m.
5. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
6. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
7. DC 48V: Connects a 48 V power adapter to the AP.

   **NOTE**

   When the AP uses the DC power supply, use a power adapter for power supply; otherwise, the AP may be damaged.

## LED Indicators

The AP2051DN-S provides only one indicator, as shown in **Figure 2-42**.

**NOTE**

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 2-42** Indicator

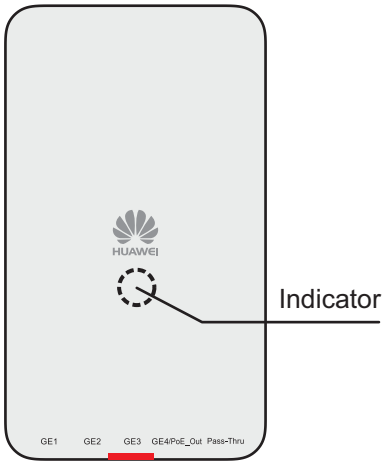


**Table 2-27** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>• The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-28** Basic specifications of the AP2051DN-S

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 32.5 mm x 86 mm x 150 mm |
| | Weight | 0.25 kg |
| | System memory | 256 MB DDR3L |
| | Flash | 64 MB NOR flash |
| Power specifications | Power input | • DC: 45.6 V to 57 V<br>• PoE power supply: in compliance with IEEE 802.3af/at |
| | In this scenario, BLE tags are used, and tablet kiosks are installed on the shelves. Data on the BLE tags is uplinked to the smart shopping guide server through the tablet kiosks for Big Data analytics and statistics. | 11.5 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment parameters | Operating temperature and altitude | • -60 m to +1800 m: 0°C to 40°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-29** Radio specifications

| Item | Description | | |
|---|---|---|---|
| Antenna type | Built-in smart antenna | | |
| Antenna gain | • 2.4 GHz: 3 dBi<br>• 5 GHz: 4 dBi | | |
| Maximum number of users | Fit AP: ≤ 256<br>Fat AP: ≤ 256<br>Cloud AP: ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. | | |
| Maximum number of VAPs for each radio | 16 | | |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual maximum transmit power varies depending on local laws and regulations. The AP2051DN-S can be installed in a junction box (86 mm) and applies only to countries and regions that support the junction boxes of such specifications. | | |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |

| Item | Description |
| --- | --- |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s |

### 2.7.4 Performance Specifications (AP2051DN-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

## 2.8 AP2051DN-L-S Product Description

### 2.8.1 Product Characteristics (AP2051DN-L-S)

Huawei AP2051DN-L-S is the latest-generation wall plate access point (AP) targeted at the SMB distribution market in compliance with 802.11ac Wave 2. It uses an 86 mm x 86 mm plate design and can be easily installed in a standard 86-type junction box. The AP is beautifully designed, with built-in antennas, a hidden indicator, and a sliding panel. These highlights make the AP suitable for environments with densely distributed small rooms, such as hotel guest rooms, student dormitories, hospital wards, and small offices. The AP provides enhanced service support capabilities and features high security, easy network deployment, automatic AC discovery and configuration, and real-time management and maintenance. The AP can connect to wireless terminals through wireless connections or to wired terminals using wired cables. This makes it the ideal choice of customers to construct indoor distributed networks.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 433 Mbit/s at 5 GHz, and 833 Mbit/s for the device
- One GE uplink interface and one FE downlink interface
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

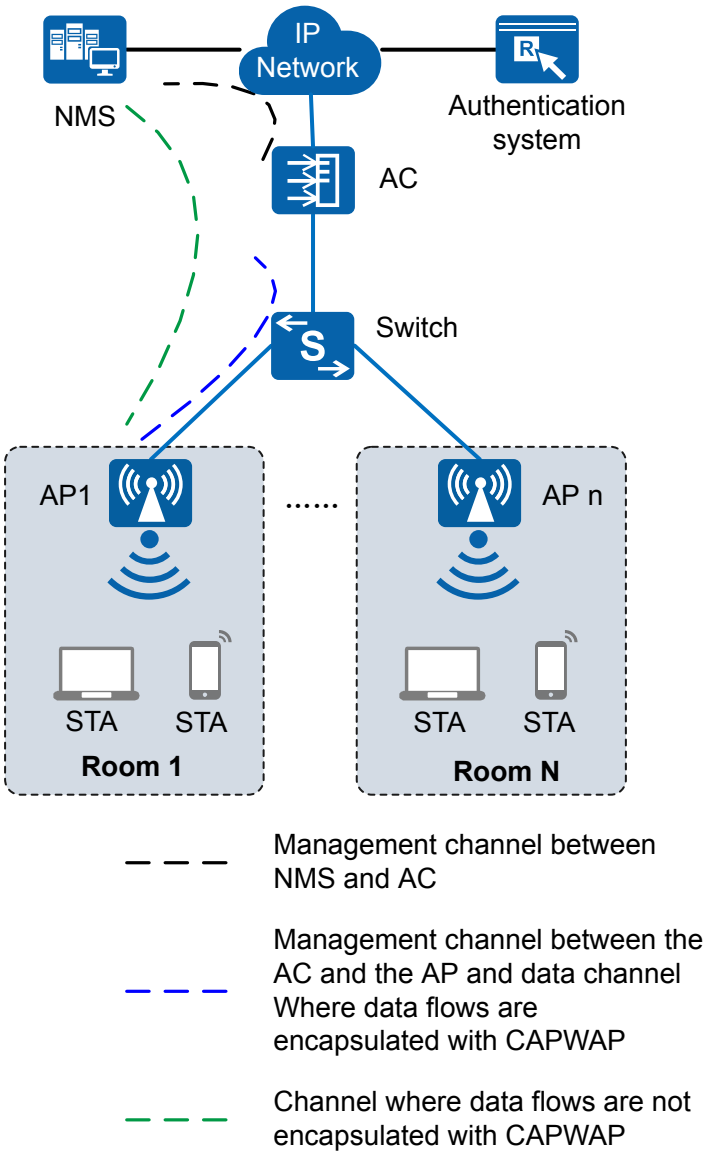
### 2.8.2 Usage Scenarios (AP2051DN-L-S)

The AP2051DN-L-S can work as a Fat AP, Fit AP, or cloud AP. The AP can switch flexibly among three working modes based on the network plan.

The following figure shows typical AP2051DN-L-S networking.

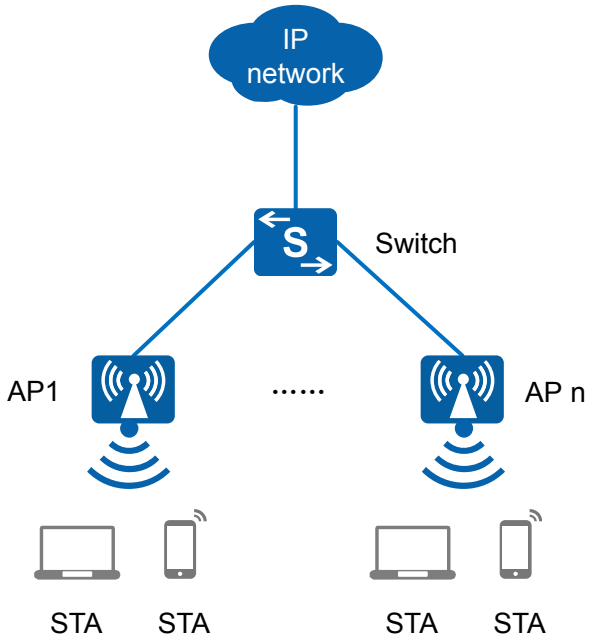
**Figure 2-43** Fit AP networking




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

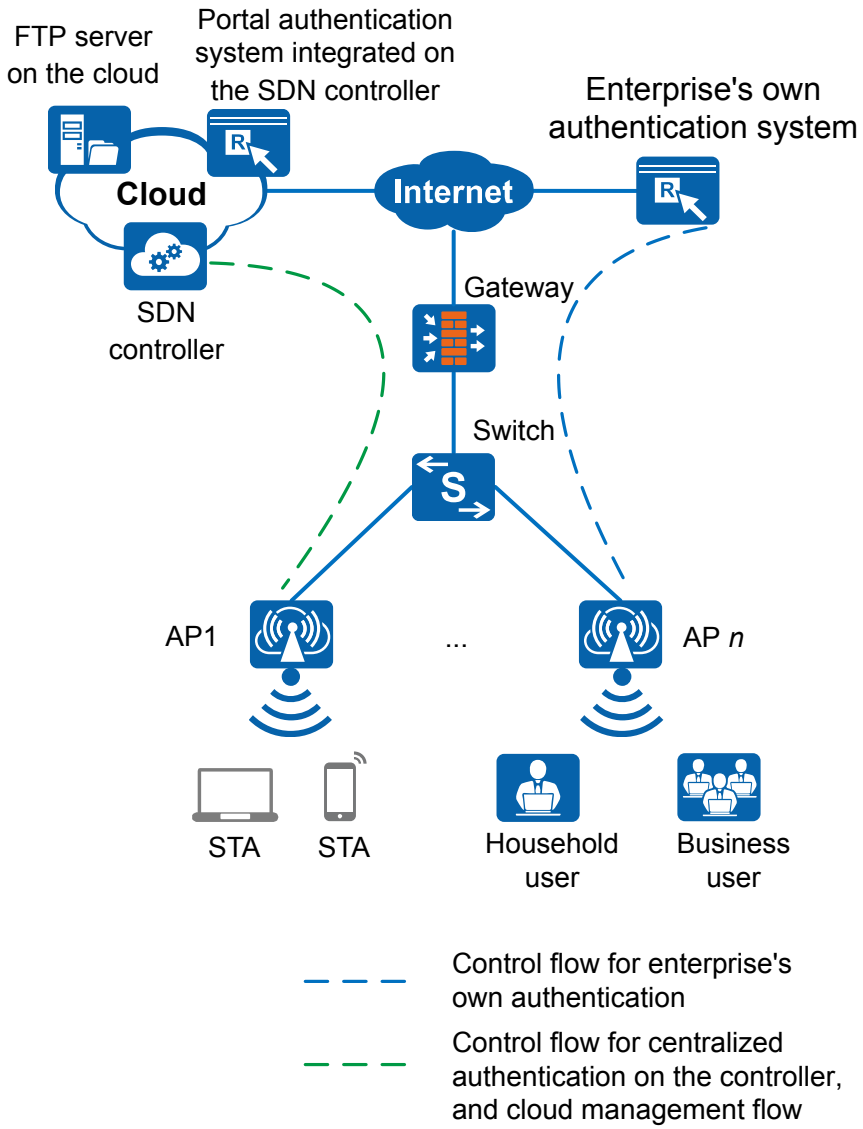
**Figure 2-44** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-45** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.8.3 Hardware Information (AP2051DN-L-S)

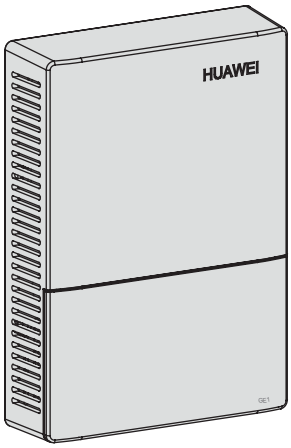
### Appearance

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

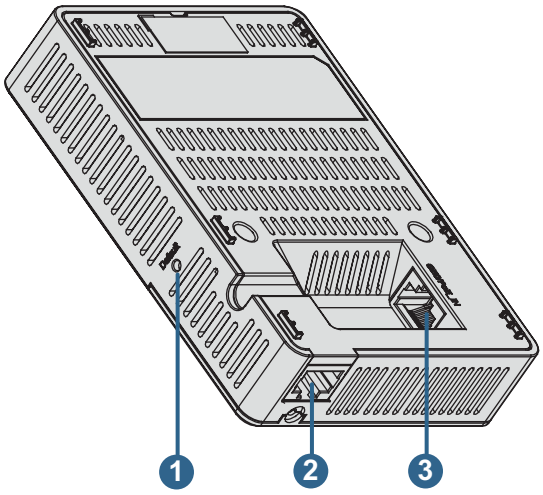
  

**Figure 2-46** Appearance




## Port

**Figure 2-47** Ports




As shown in **Figure 2-47**, each port can be described as follows:

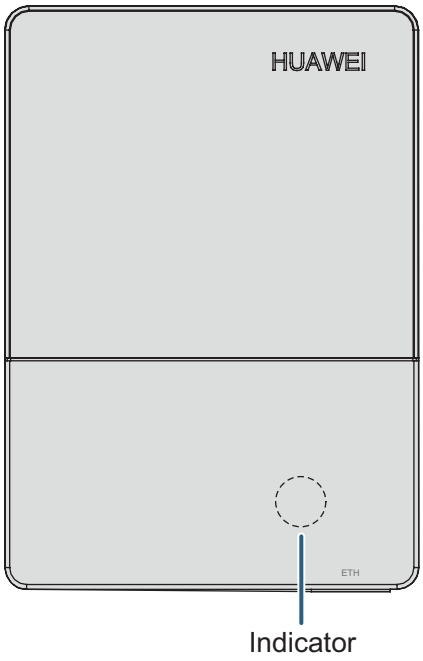
1. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
2. ETH: 10/100M port that connects to the wired Ethernet.
3. GE/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.

## Indicator

The AP2051DN-L-S provides only one indicator, as shown in **Figure 2-48**.

**Figure 2-48** Indicator




**NOTE**

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Table 2-30** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once Alarm Green every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>● The AP registration fails (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-31** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 26 mm x 86 mm x 120 mm |
| | Weight | 0.2 kg |
| | System memory | ● 256 MB DDR3L<br>● 64 MB Flash |
| Power specifications | Power input | PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 6.63 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to +40°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-32** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 6 dBi |
| Maximum number of users | Fit AP: ≤ 256<br>Fat AP: ≤ 256<br>Cloud AP: ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 21 dBm (combined power)<br>• 5 GHz: 17 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 433 Mbit/s | | |

## 2.8.4 Performance Specifications (AP2051DN-L-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.9 AP3010DN-V2 Product Description

## 2.9.1 Product Characteristics (AP3010DN-V2)

**Table 2-33** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP3010DN-V2 | Dual bands:<br>• 2.4GHz<br>• 5GHz<br>The AP3010DN-V2 can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The cost-effective AP3010DN-V2 supports 2 x 2 MIMO and provides comprehensive service support capabilities. It is deployed indoors and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. | The AP3010DN-V2 provides 802.11n/ac wireless access networks for places with simple building structure, small size, dense users, and high capacity demands, such as small and medium enterprises and branches. It can be flexibly deployed in different environments.<br>The AP3010DN-V2 can be flexibly deployed and work in hybrid mode (Fit AP +bridge). |

## 2.9.2 Usage Scenarios (AP3010DN-V2)

The AP3010DN-V2 can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on the network plan.

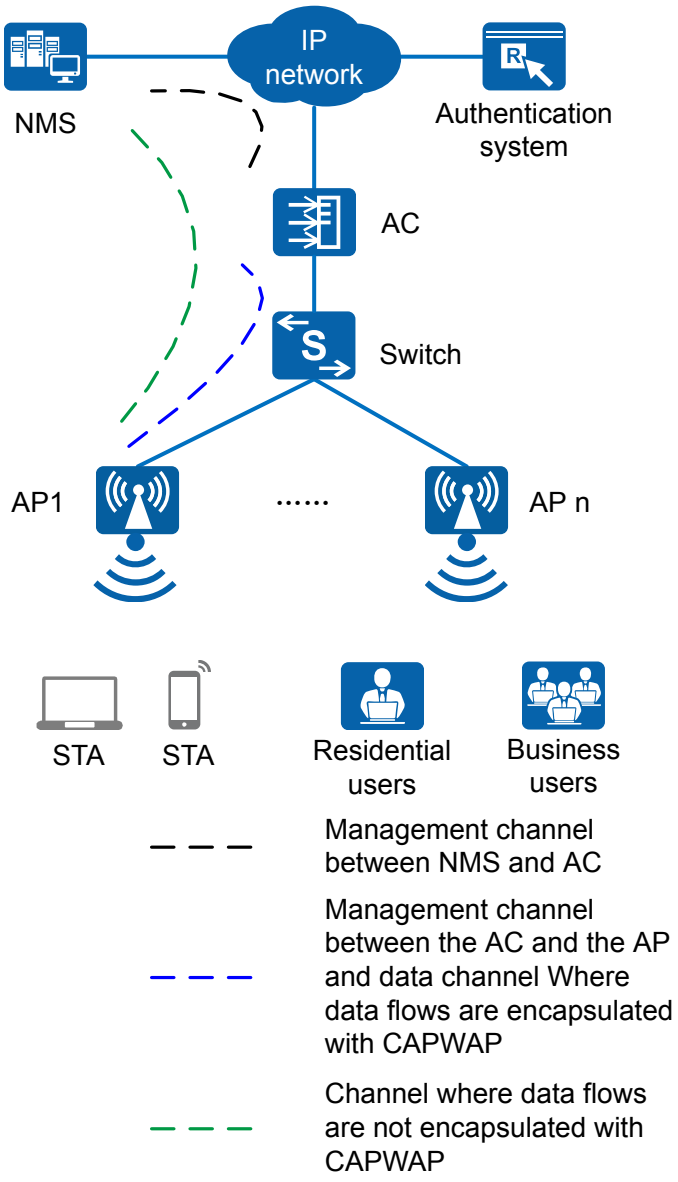
When the wireless network scale is small, customers need to purchase only AP products and configure the APs to work as Fat APs. As the network scale expands, tens of or hundreds of APs exist on the network. To simplify network

management, customers are advised to purchase ACs to perform centralized management on the APs and set the APs to work as Fit APs.

Typical networking modes are as follows:

**Figure 2-49** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-50** Fit AP networking (WDS mode: point-to-point)

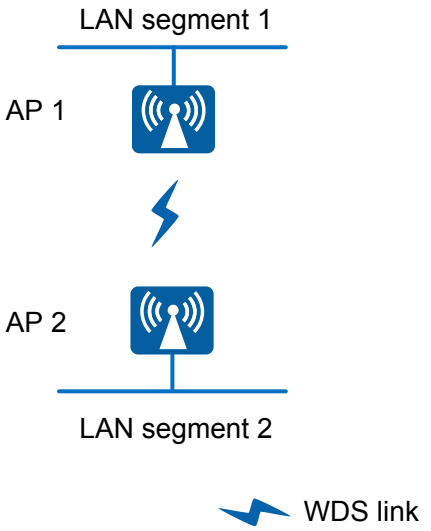
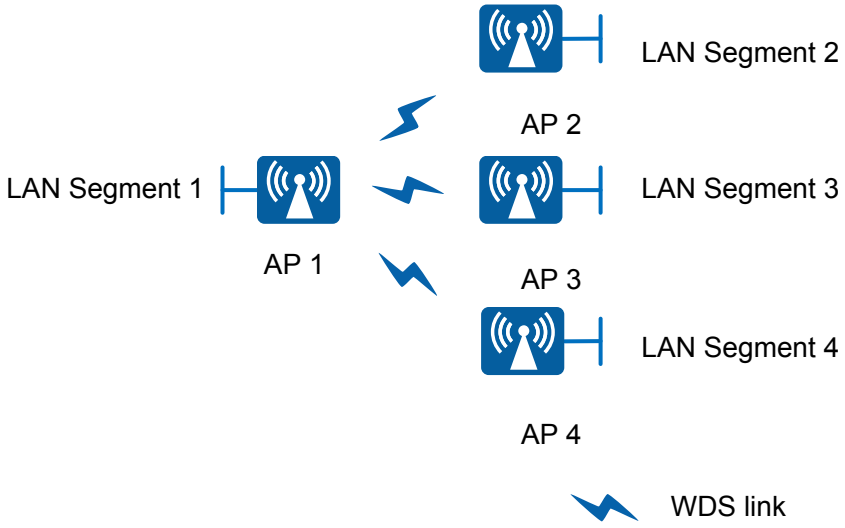


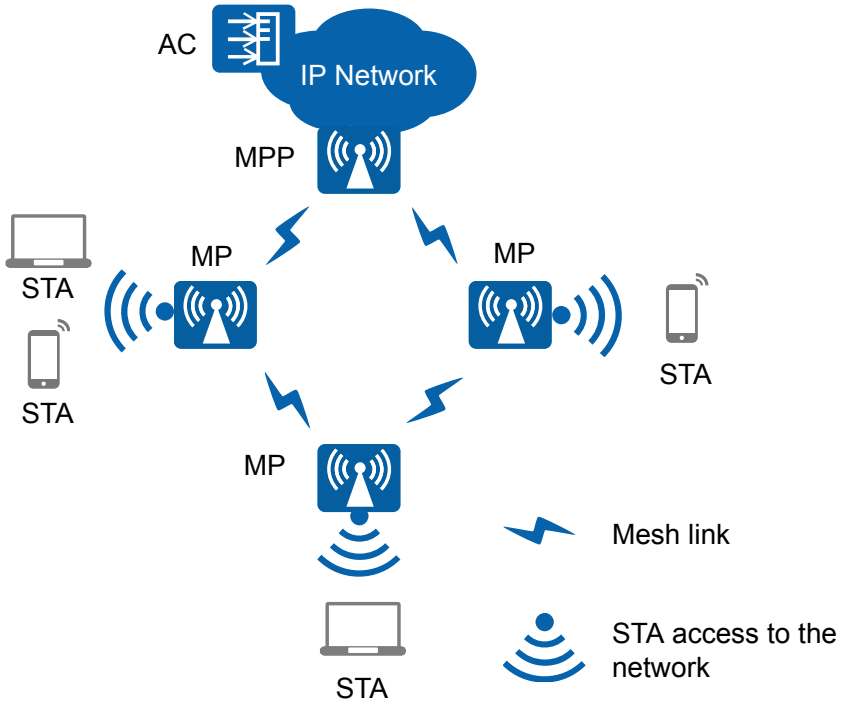

**Figure 2-51** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

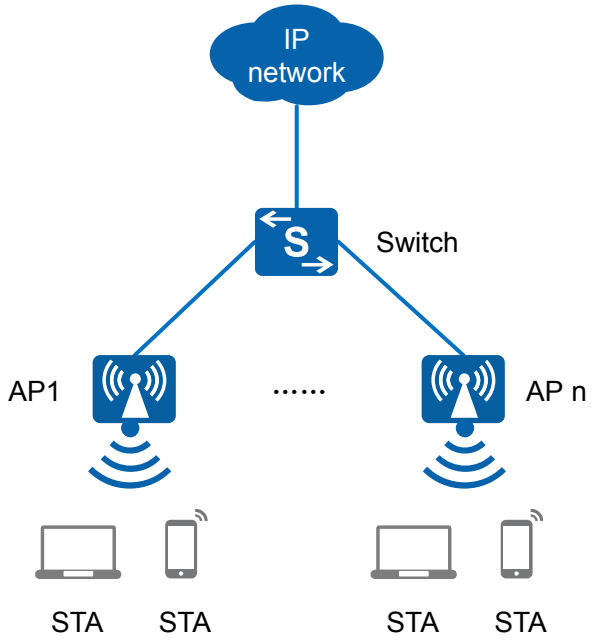
**Figure 2-52** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

**Figure 2-53** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

## 2.9.3 Hardware Information (AP3010DN-V2)

### Appearance

Figure 2-54 shows the appearance of the AP.

NOTE

The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

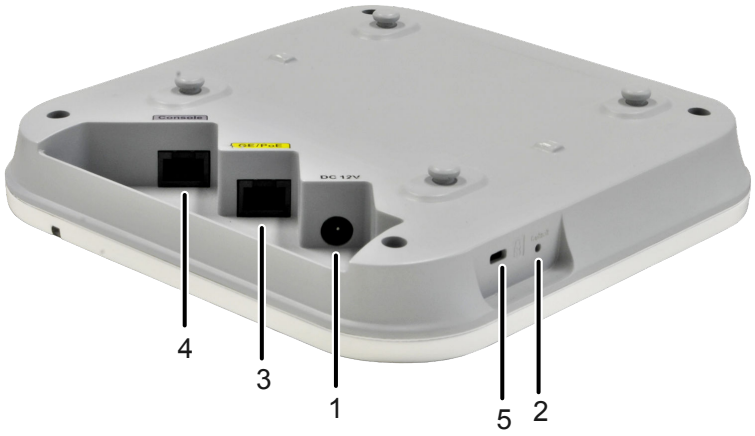
**Figure 2-54** AP3010DN-V2 appearance

## Port

The following figure shows ports on the AP3010DN-V2.

**Figure 2-55** AP3010DN-V2 ports




As shown in **Figure 2-55**, each port can be described as follows:

- 1. Input port for 12 V DC power supply
- 2. Default button: restores factory settings if you hold down the button more than 3 seconds.
- 3. GE/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
- 4. Console port: connects to the maintenance terminal for AP configuration and management.
- 5. Lock port: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-34** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-35** Basic specifications of the AP3030DN

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 39.5 mm x 180 mm x 180 mm |
| | Weight | 0.4 kg |
| | System memory | • 256 MB DDR2<br>• 32 MB flash |

| Item | | Description |
| --- | --- | --- |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 10.2 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment parameters | Operating temperature and altitude | -60 m to +1800 m: -10°C to +50°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 2-36** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4G: 4dBi<br>• 5G: 6dBi |
| Maximum number of users | • Fit AP: ≤ 128<br>• Fat AP: ≤ 64 |
| Maximum number of VAPs for each radio | 16 |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 300 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s</td></tr>
</table>

## 2.9.4 Performance Specifications (AP3010DN-V2)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.10 AP3030DN Product Description

# 2.10.1 Product Characteristics (AP3030DN)

**Table 2-37** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP3030DN | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP3030DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The cost-effective AP3030DN supports 2x2 MIMO and provides comprehensive service support capabilities. It is deployed indoors and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. Huawei AP3030DN complies with IEEE 802.11ac and can provide gigabit access for wireless users. This high capacity greatly improves user experience on wireless networks. | The AP3030DN provides 802.11n/ac wireless access networks for places with simple building structure, small size, dense users, and high capacity demands, such as small and medium enterprises and branches. It can be flexibly deployed in different environments.<br>The AP3030DN can be flexibly deployed and work in both Fit AP and bridge mode. |

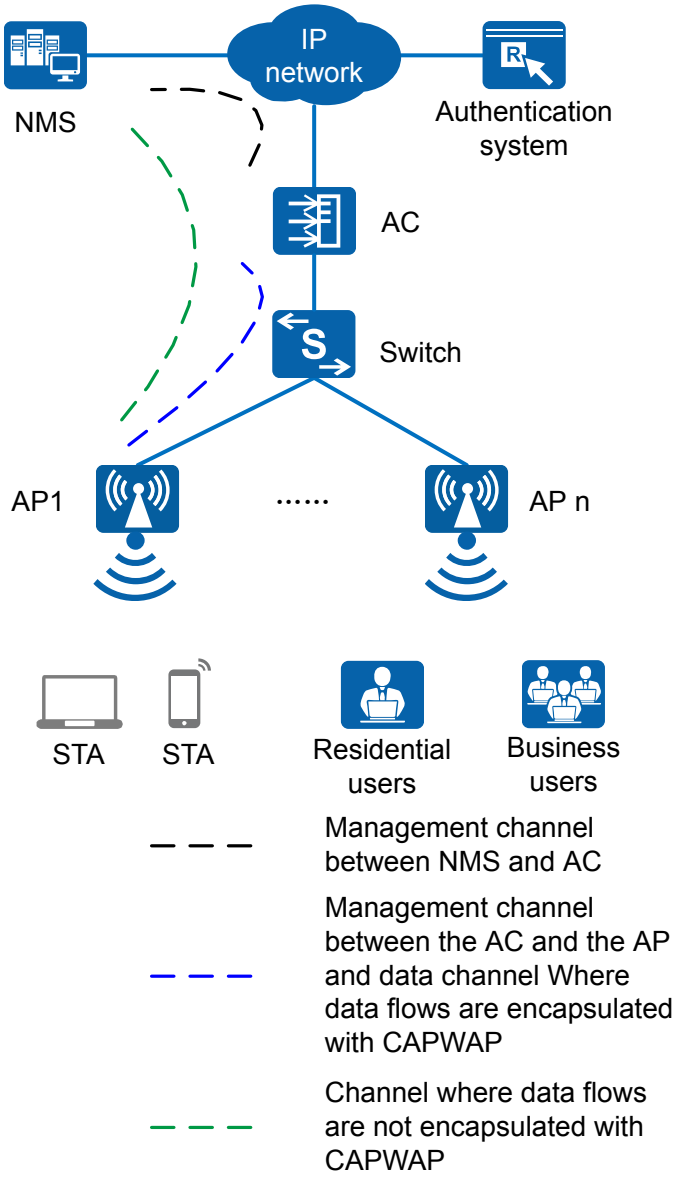
## 2.10.2 Usage Scenarios (AP3030DN)

The AP3030DN can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on the network plan.

When the wireless network scale is small, customers need to purchase only AP products and configure the APs to work as Fat APs. As the network scale expands, tens of or hundreds of APs exist on the network. To simplify network management, customers are advised to purchase ACs to perform centralized management on the APs and set the APs to work as Fit APs.

Typical networking modes are as follows:

**Figure 2-56** Fit AP networking (AP mode)



In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-57** Fit AP networking (WDS mode: point-to-point)

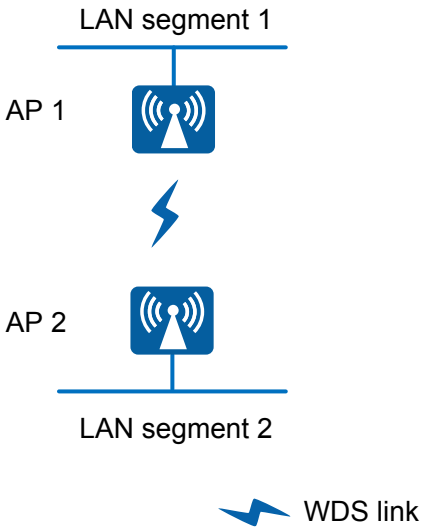
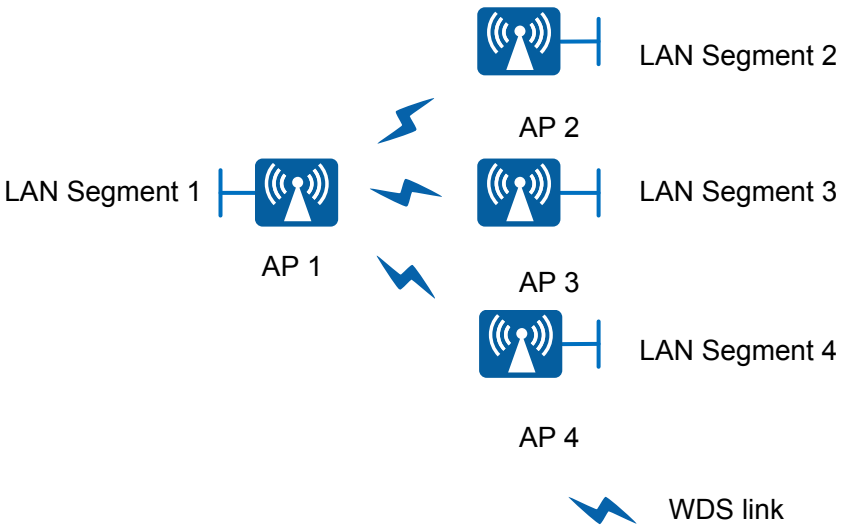


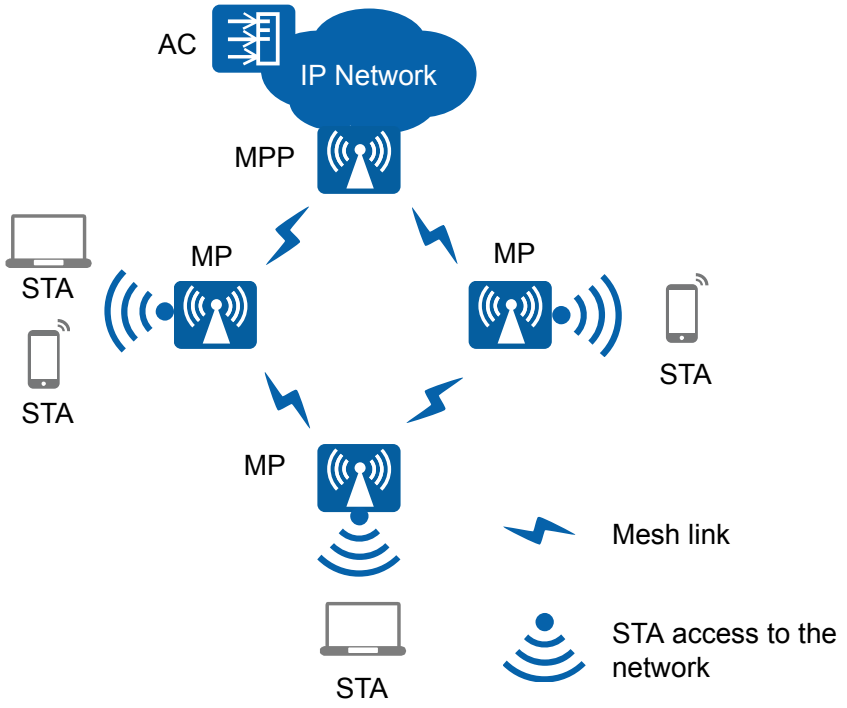

**Figure 2-58** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

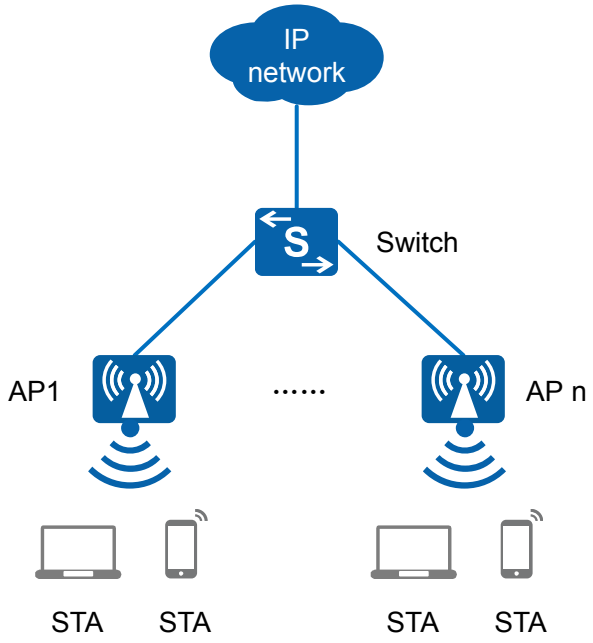
**Figure 2-59** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

**Figure 2-60** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

## 2.10.3 Hardware Information (AP3030DN)

### Appearance

Figure 2-61 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

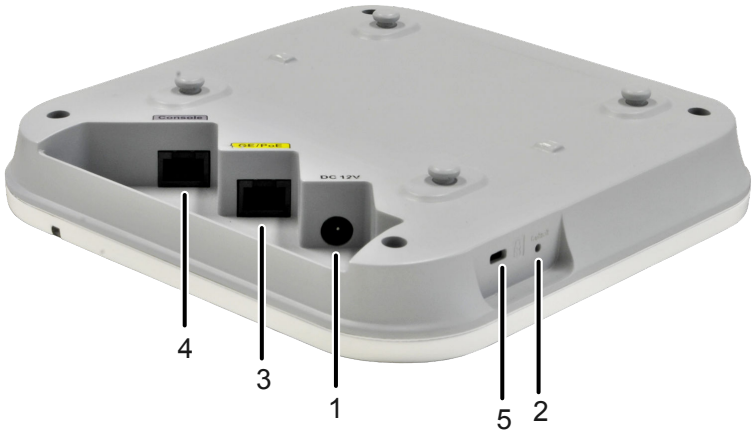
**Figure 2-61** AP3030DN appearance

## Port

The following figure shows ports on the AP3030DN.

**Figure 2-62** AP3030DN ports




As shown in **Figure 2-62**, each port can be described as follows:

- 1. Input port for 12 V DC power supply
- 2. Default button: restores factory settings if you hold down the button more than 3 seconds.
- 3. GE/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
- 4. Console port: connects to the maintenance terminal for AP configuration and management.
- 5. Lock port: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-38** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-39** Basic specifications of the AP3030DN

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 39.5 mm x 180 mm x 180 mm |
| | Weight | 0.4 kg |
| | System memory | • 256 MB DDR2<br>• 32 MB flash |

| Item | | Description |
| --- | --- | --- |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 10.2 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment parameters | Operating temperature and altitude | -60 m to +1800 m: -10°C to +50°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 2-40** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 6 dBi |
| Maximum number of users | • Fit AP: ≤ 256<br>• Fat AP: ≤ 64 |
| Maximum number of VAPs for each radio | 16 |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 300 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s</td></tr>
</table>

## 2.10.4 Performance Specifications (AP3030DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.11 AP3050DE Product Description

## 2.11.1 Product Characteristics (AP3050DE)

Huawei AP3050DE is a wireless access point (AP) in the business distribution market that supports 802.11ac Wave 2, 2 x 2 MIMO, and two spatial streams. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and

configuration, and real-time management and maintenance, which meets network deployment requirements. The AP has built-in smart antennas, complies with 802.11n and 802.11ac protocols, and can provide gigabit STA access, which greatly improves user experience on wireless networks and applies to small- and medium-sized enterprises, airports and stations, stadiums, cafes, and recreation centers.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- Smart antenna array technology enables targeted signal coverage for mobile terminals, reduces interferences, and improves signal quality. Additionally, it supports millisecond-level switchover as terminals move.
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

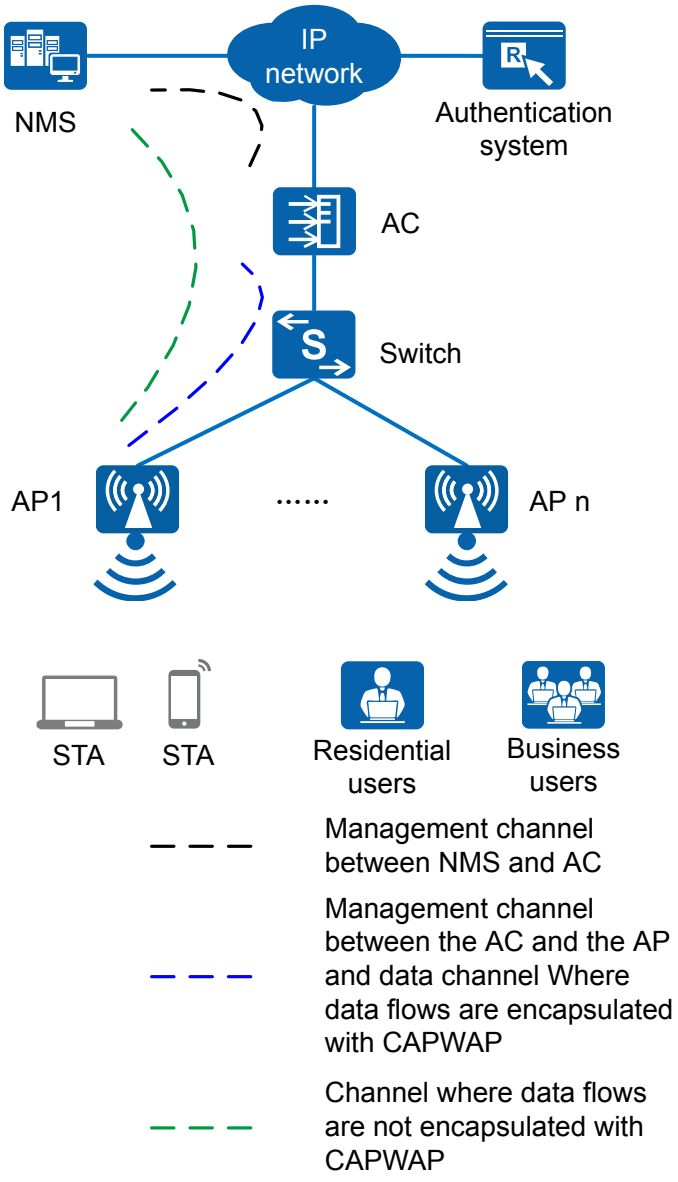
## 2.11.2 Usage Scenarios (AP3050DE)

The AP3050DE can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-63** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-64** Fit AP networking (WDS mode: point-to-point)

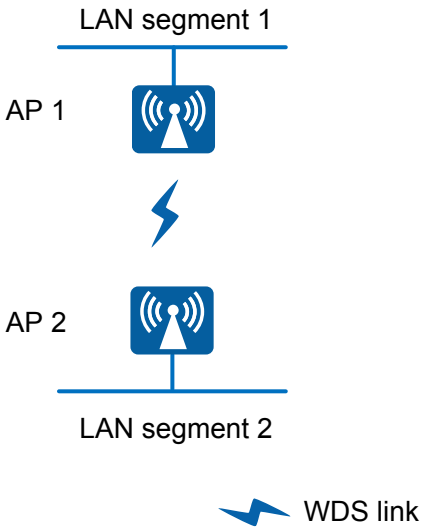
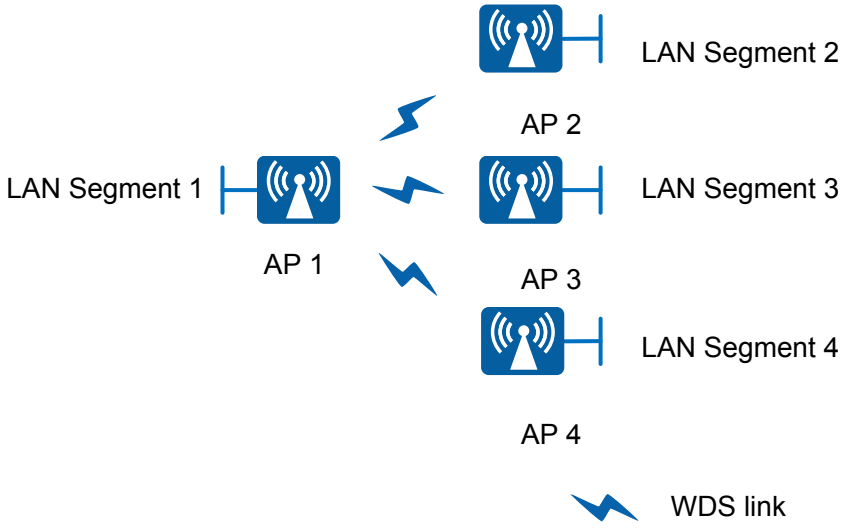


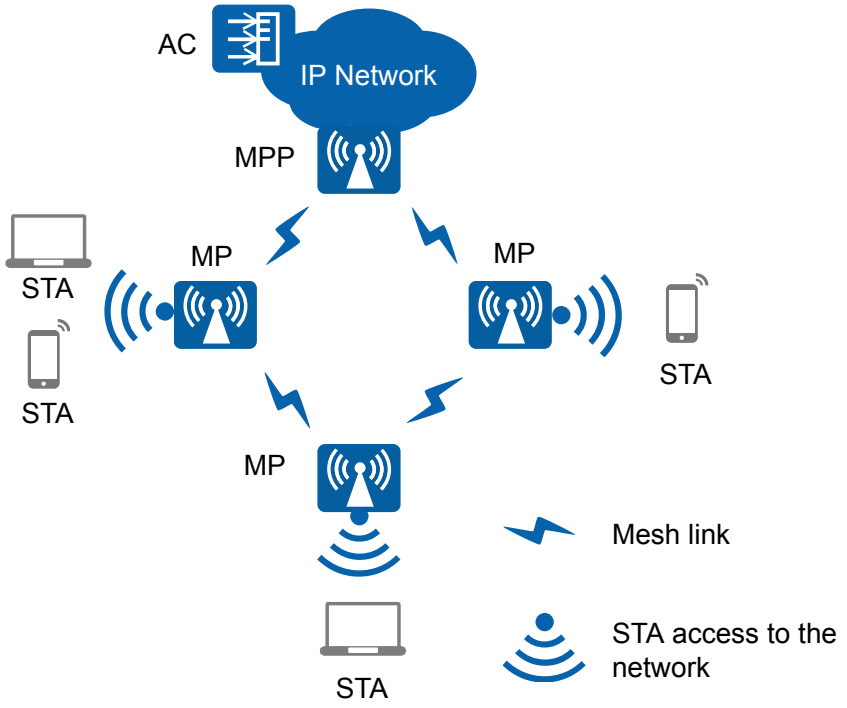

**Figure 2-65** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

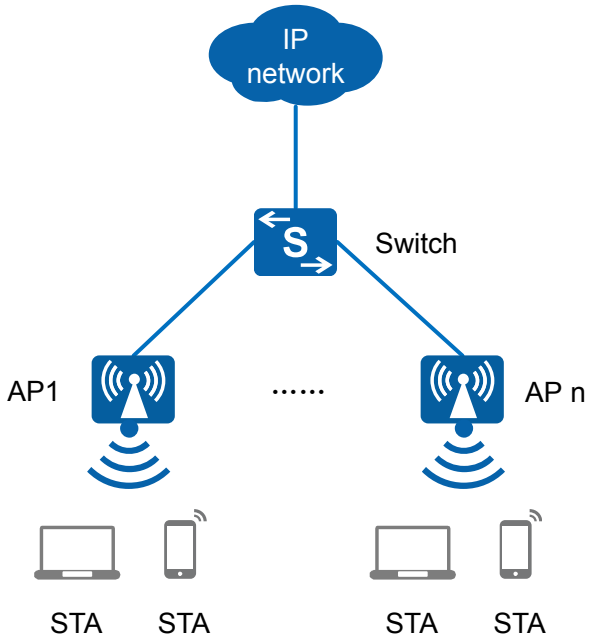
**Figure 2-66** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

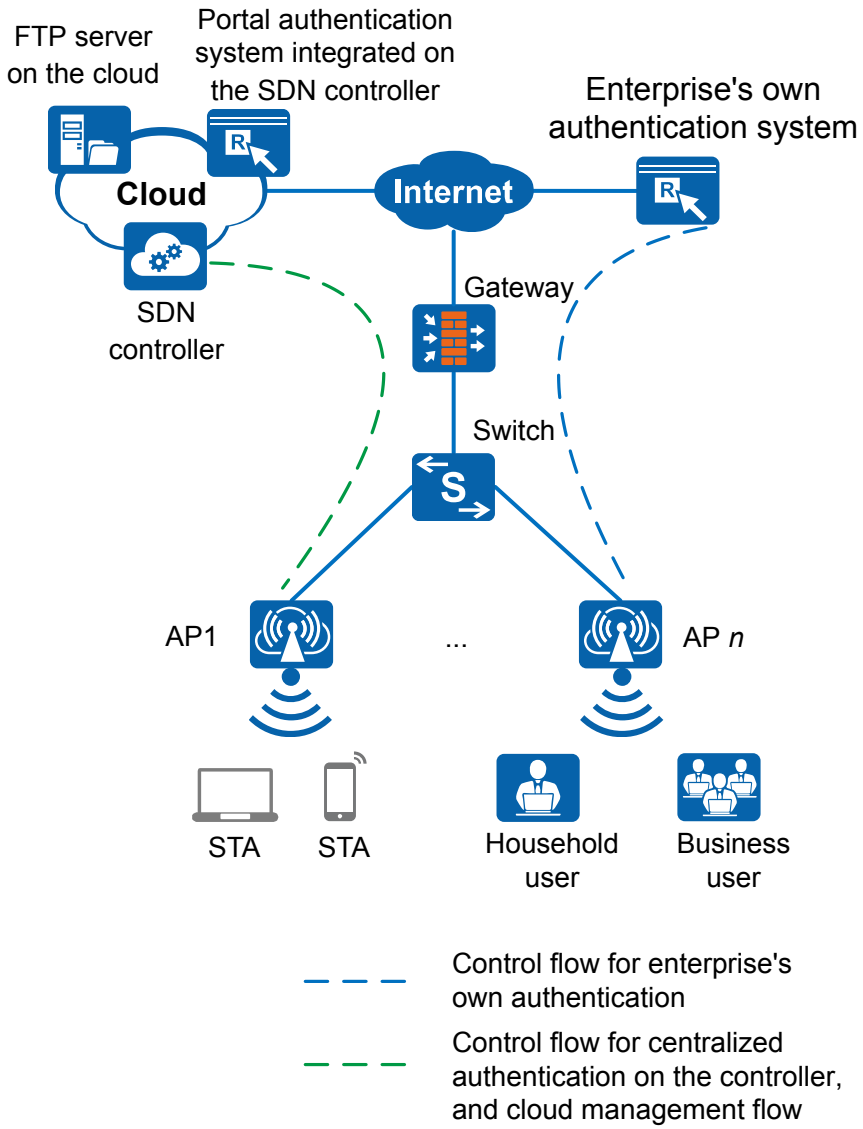
**Figure 2-67** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-68** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.11.3 Hardware Information (AP3050DE)

### Appearance

NOTE

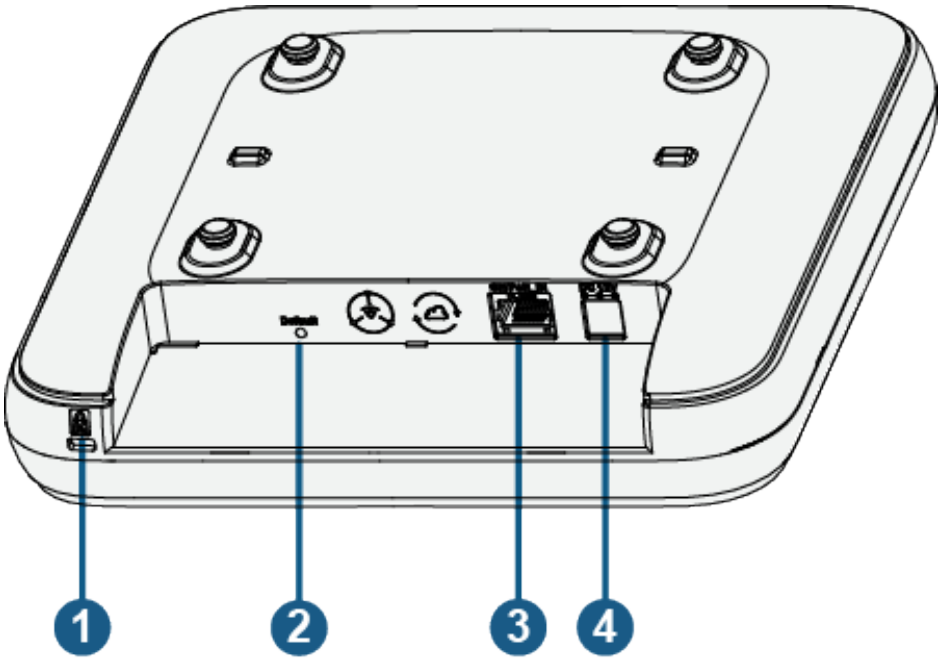
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-69** Appearance

## Ports

**Figure 2-70** Ports



As shown in **Figure 2-70**, each port can be described as follows:

1. Security slot: Connects to a security lock.
2. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
3. GE/PoE_IN: GE/PoE_IN
4. DC 12 V: Connects a 12 V power adapter to the AP.

**NOTE**

- The AP supports the following power supply modes: PoE power supply and DC power supply.
- Use the selected power adapter for power supply; otherwise, the AP may be damaged.

## LED Indicators

The AP3050DE provides only a single indicator, as shown in **Figure 2-71**.

**NOTE**

Indicator colors may vary slightly at different temperature.

**Figure 2-71** Indicator

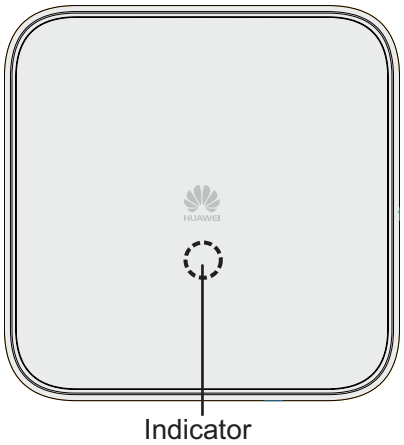



**Table 2-41** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-42** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 47 mm x 200 mm x 200 mm |
| | Weight | 0.7 kg |

| Item | | Description |
| --- | --- | --- |
| | System memory | • 256 MB DDR3L<br>• 4 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power supply: in compliance with IEEE 802.3at/af |
| | Maximum power consumption | 11.48 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-43** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in dual-band smart omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 3 dBi<br>• 5 GHz: 3 dBi |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 20 dBm (combined power)<br>• 5 GHz: 20 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s</td></tr>
</table>

## 2.11.4 Performance Specifications (AP3050DE)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.12 AP4030DN Product Description

# 2.12.1 Product Characteristics (AP4030DN)

**Table 2-44** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP4030DN | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP4030DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The cost-effective AP4030DN supports 2 x 2 MIMO and provides comprehensive service support capabilities. It is deployed indoors and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. Huawei AP4030DN complies with IEEE 802.11ac and can provide gigabit access for wireless users. This high capacity greatly improves user experience on wireless networks. | The AP4030DN provides 802.11n/ac wireless access networks for places with simple building structure, small size, dense users, and high capacity demands, such as small and medium enterprises and branches. It can be flexibly deployed in different environments.<br>The AP4030DN can be flexibly deployed and work in hybrid mode (Fit AP +bridge). |

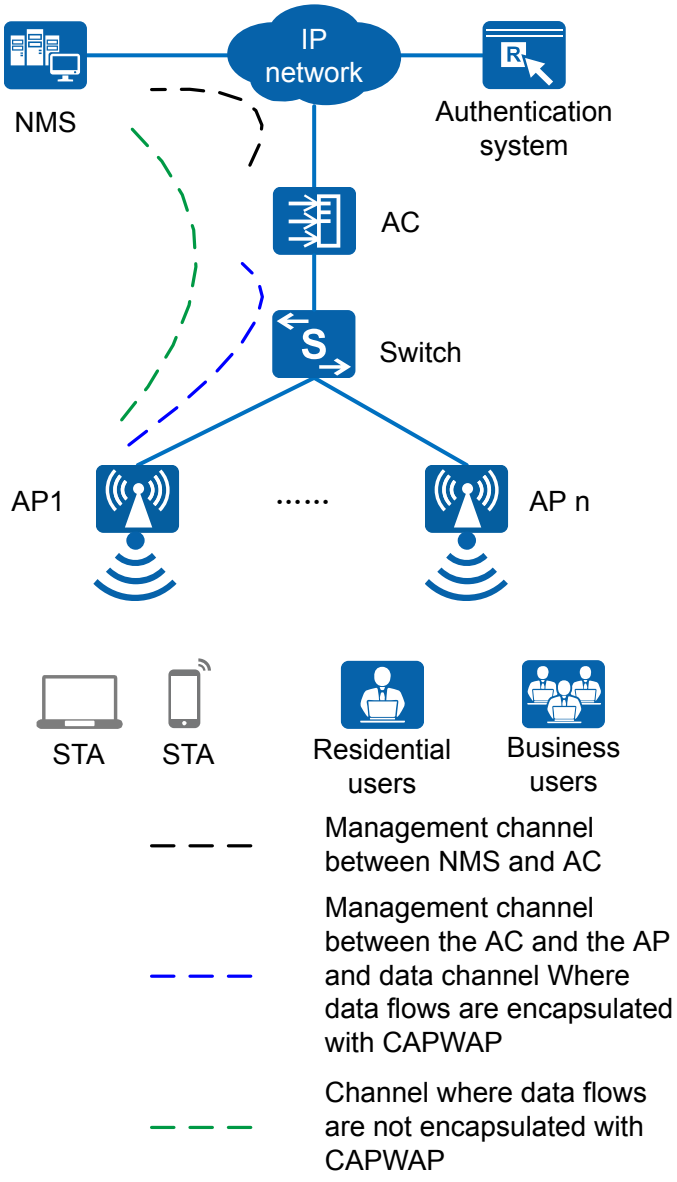
## 2.12.2 Usage Scenarios (AP4030DN)

The AP4030DN can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on the network plan.

When the wireless network scale is small, customers need to purchase only AP products and configure the APs to work as Fat APs. As the network scale expands, tens of or hundreds of APs exist on the network. To simplify network management, customers are advised to purchase ACs to perform centralized management on the APs and set the APs to work as Fit APs.

Typical networking modes are as follows:

**Figure 2-72** Fit AP networking (AP mode)



In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-73** Fit AP networking (WDS mode: point-to-point)

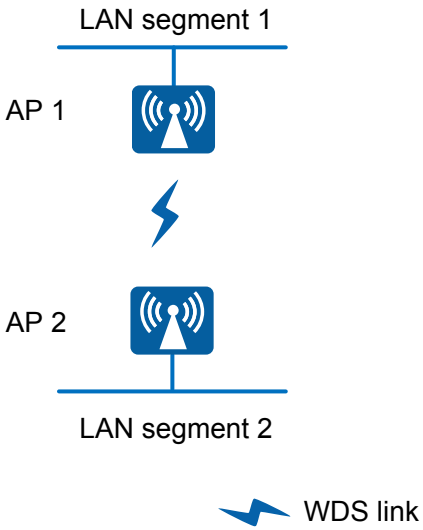
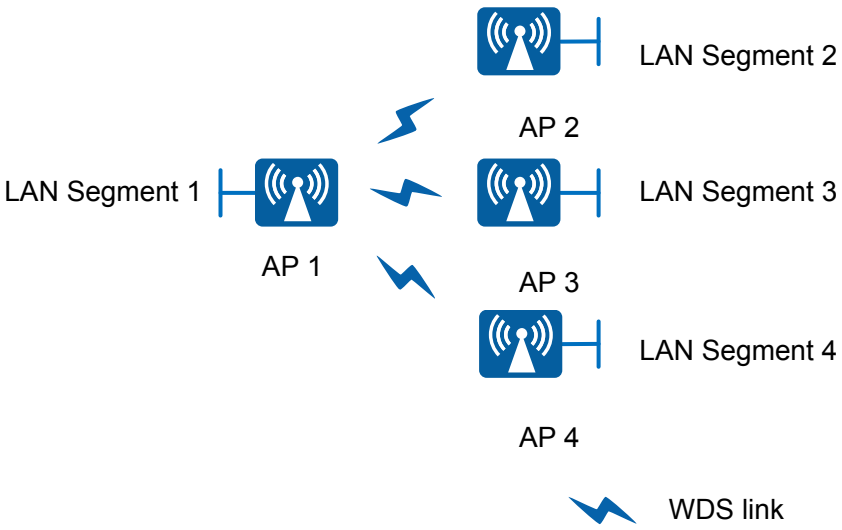


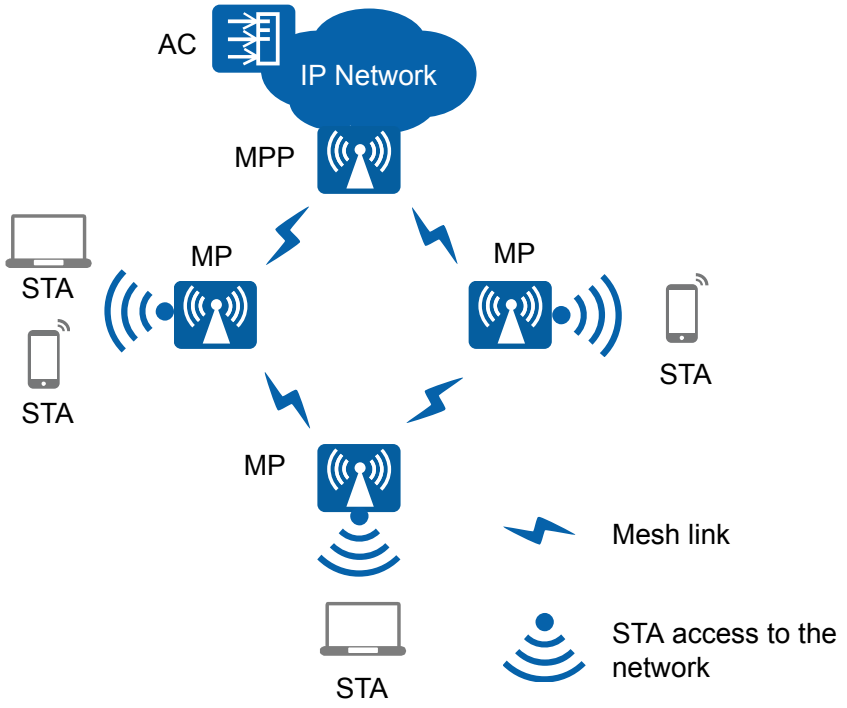

**Figure 2-74** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

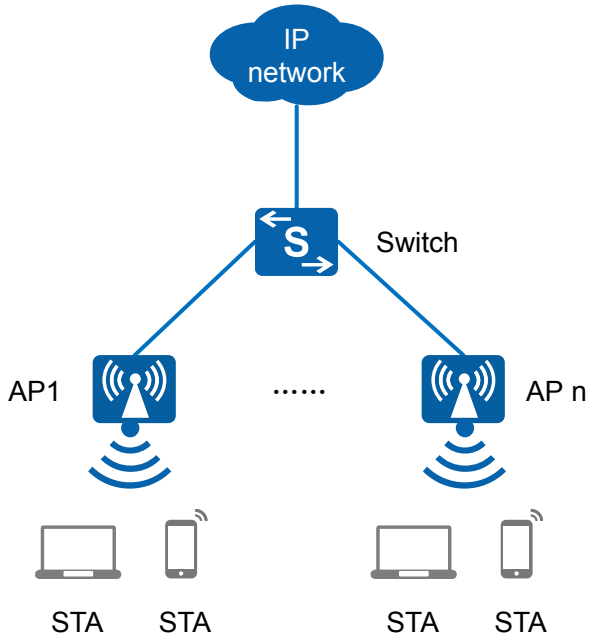
**Figure 2-75** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

**Figure 2-76** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

## 2.12.3 Hardware Information (AP4030DN)

### Appearance

Figure 2-77 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

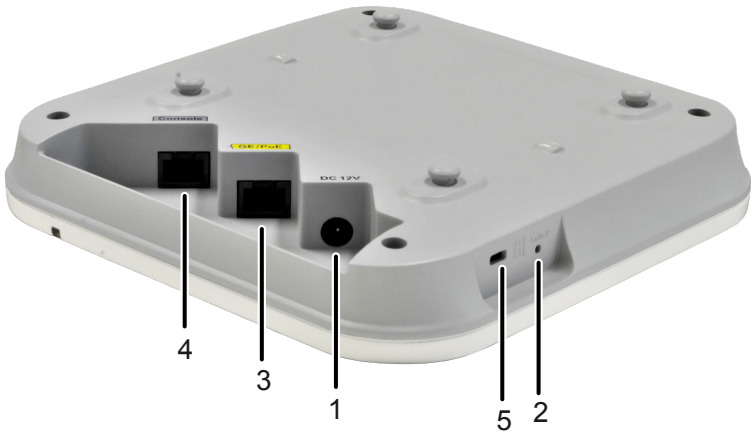
**Figure 2-77** AP4030DN appearance

## Port

Figure 2-78 shows ports on the AP4030DN.

**Figure 2-78** AP4030DN ports




As shown in Figure 2-78, each port can be described as follows:

1. Input port for 12 V DC power supply
2. Default button: restores factory settings if you hold down the button more than 3 seconds.
3. GE/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
4. Console port: connects to the maintenance terminal for AP configuration and management.
5. Lock port: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-45** Description about the single indicator

| Type | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-46** Basic specifications of the AP4030DN

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 39.5 mm x 180 mm x 180 mm |
| | Weight | 0.4 kg |
| | System memory | • 256 MB DDR2<br>• 32 MB Flash |

| Item | | Description |
| --- | --- | --- |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 10.2 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to +1800 m: -10°C to +50°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 2-47** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 6 dBi |
| Maximum number of users | • Fit AP: ≤ 256<br>• Fat AP: ≤ 64 |
| Maximum number of VAPs for each radio | 16 |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20MHz: 13<br>– 40MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 300 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s</td></tr>
</table>

## 2.12.4 Performance Specifications (AP4030DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.13 AP4030DN-E Product Description

## 2.13.1 Product Characteristics (AP4030DN-E)

**Table 2-48** Product characteristics

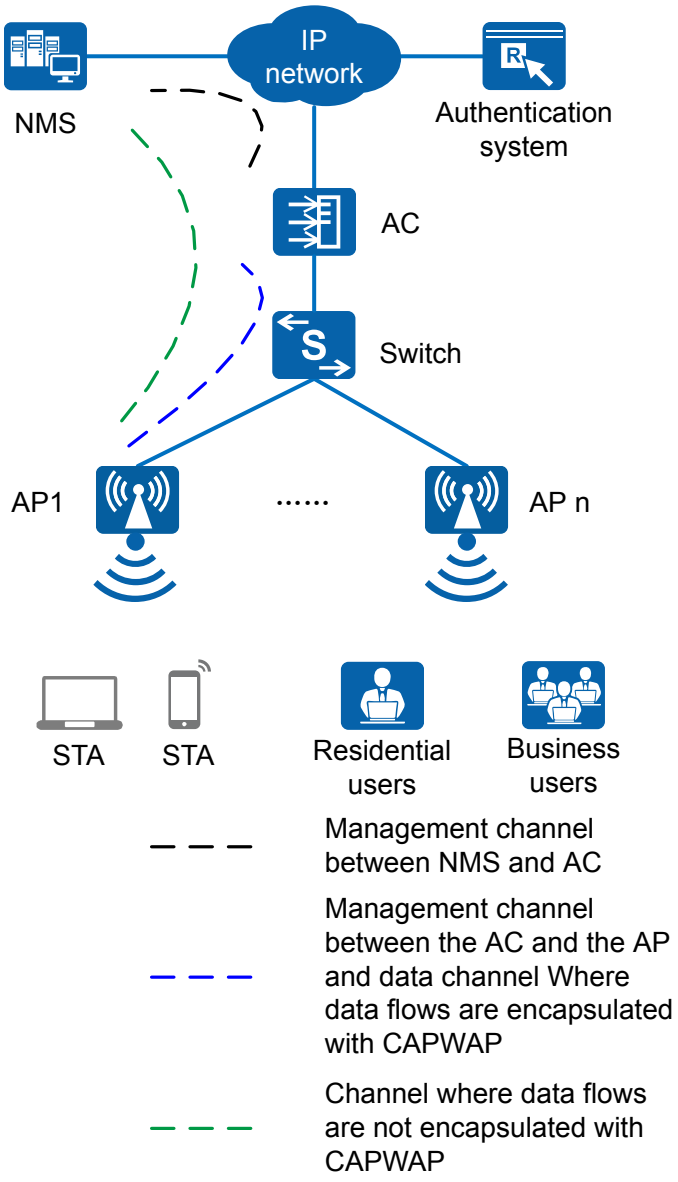
| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Application Scenario |
| --- | --- | --- | --- | --- |
| AP4030DN-E | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP4030DN-E can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The cost-effective AP4030DN-E supports 2x2 MIMO on the 2.4 GHz band and 3x3 MIMO on the 5 GHz band, and provides comprehensive service support capabilities. It features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. The AP4030DN-E complies with 802.11ac and can provide gigabit access for wireless users. This high capacity greatly improves user experience on wireless networks. | The AP4030DN-E provides basic 802.11n/ac wireless networks for scenarios with a simple building structure, a small area, densely located users, and high-capacity demands, for example, small- to medium-sized enterprises and enterprise branches. The AP4030DN-E can be flexibly deployed in different environments. |

## 2.13.2 Usage Scenarios (AP4030DN-E)

The AP4030DN-E can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on the network plan.

**Figure 2-79** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-80** Fit AP networking (WDS mode: point-to-point)

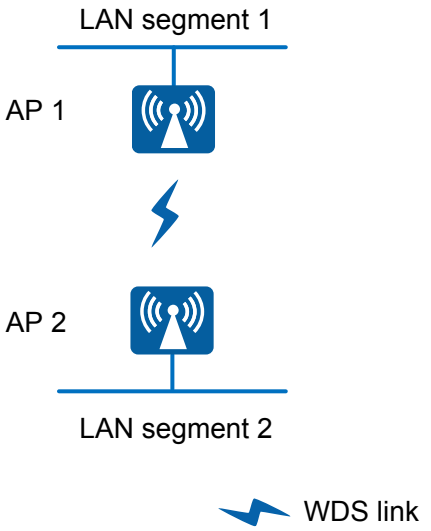
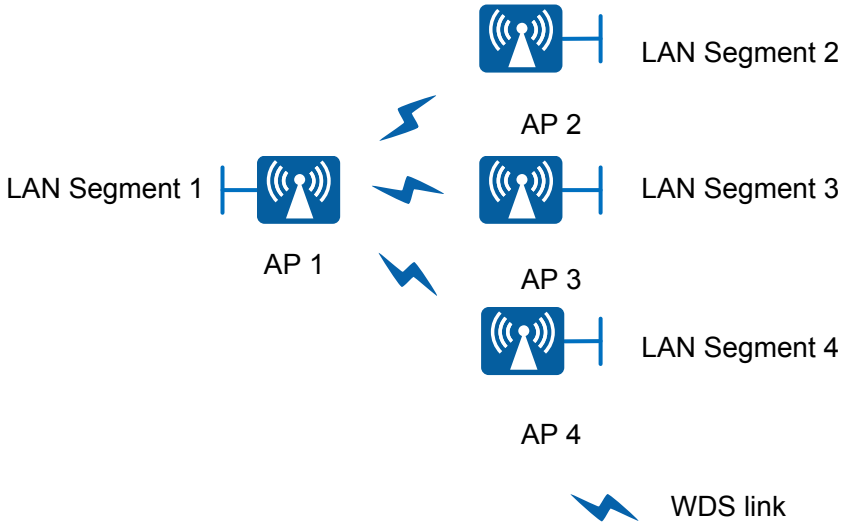


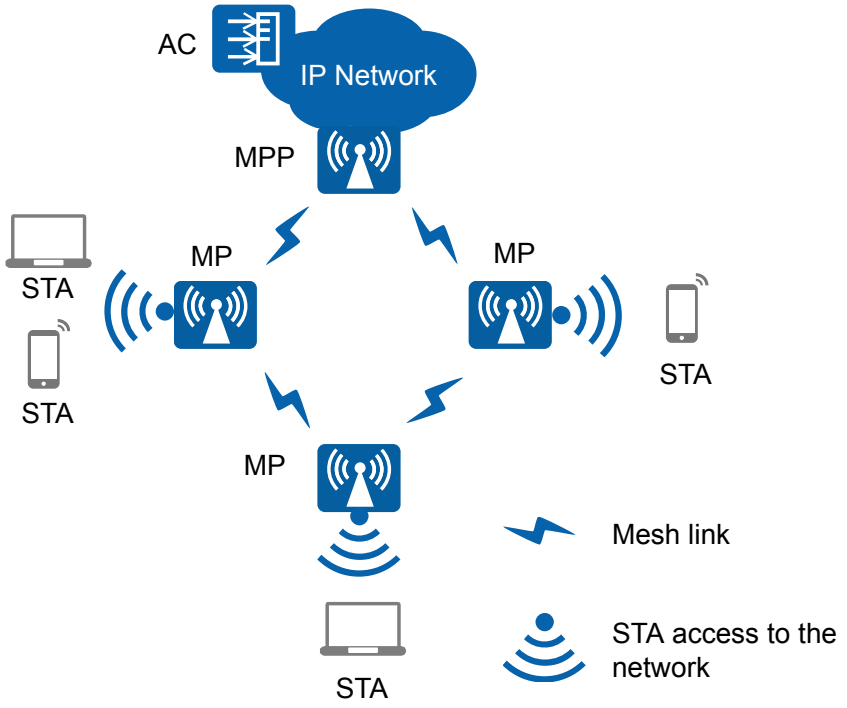

**Figure 2-81** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

**Figure 2-82** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

## 2.13.3 Hardware Information (AP4030DN-E)

### Appearance

**Figure 2-83** shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

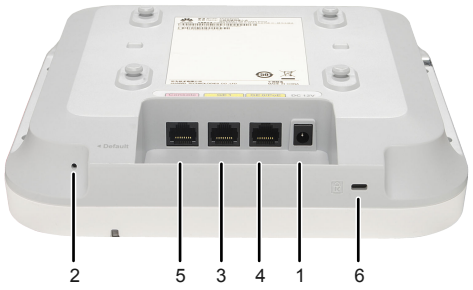
**Figure 2-83** AP appearance

## Port

The following figure shows ports on the AP.

**Figure 2-84** AP ports




As shown in **Figure 2-84**, each port can be described as follows:

- 1. Input port for 12 V DC power supply
- 2. Default button: restores factory settings if you hold down the button more than 3 seconds.
- 3. GE1: 10/100/1000M port used to connect to the wired Ethernet.
- 4. GE0/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
- 5. Console port: connects to the maintenance terminal for AP configuration and management.
- 6. Lock port: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-49** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-50** Basic specifications of the AP4030DN-E

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 53 mm x 220 mm x 220 mm |
| | Weight | 0.8 kg |
| | System memory | • 256 MB DDR2<br>• 32 MB flash |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 11.5 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment parameters | Operating temperature and altitude | -60 m to +1800 m: -10°C to +50°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |

| Item | | Description |
| --- | --- | --- |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 2-51** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | ≤ 256 |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 25 dBm (combined power)<br>**NOTE**<br>The actual maximum transmit power varies depending on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 450 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s | | |

## 2.13.4 Performance Specifications (AP4030DN-E)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.14 AP4030TN Product Description

# 2.14.1 Product Characteristics (AP4030TN)

**Table 2-52** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP4030TN | It supports three radios. One radio supports only the 5 GHz frequency band and the other radios support 2.4 GHz and 5 GHz frequency bands, providing more flexible and larger-capacity access capabilities. | IEEE 802.11a/b/g/n/ac | The cost-effective AP4030TN supports 2x2 MIMO and provides comprehensive service support capabilities. It is deployed indoors and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. Huawei AP4030TN complies with IEEE 802.11ac and can provide gigabit access for wireless users. This high capacity greatly improves user experience on wireless networks. | The AP4030TN provides basic 802.11n/ac wireless networks for electronic classrooms in elementary education, high-density scenarios, shopping malls, and supermarkets.<br>The AP4030TN supports flexible radio switchover and 2.4G + dual-5G access for education and office scenarios. One radio of an AP4030TN can be used for processing value-added services such as WIDS, Wi-Fi terminal location, and spectrum analysis, reducing impact on Wi-Fi coverage.<br>The AP4030TN can be flexibly |

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| | | | | deployed and work in hybrid mode (Fit AP +bridge). |

## 2.14.2 Usage Scenarios (AP4030TN)

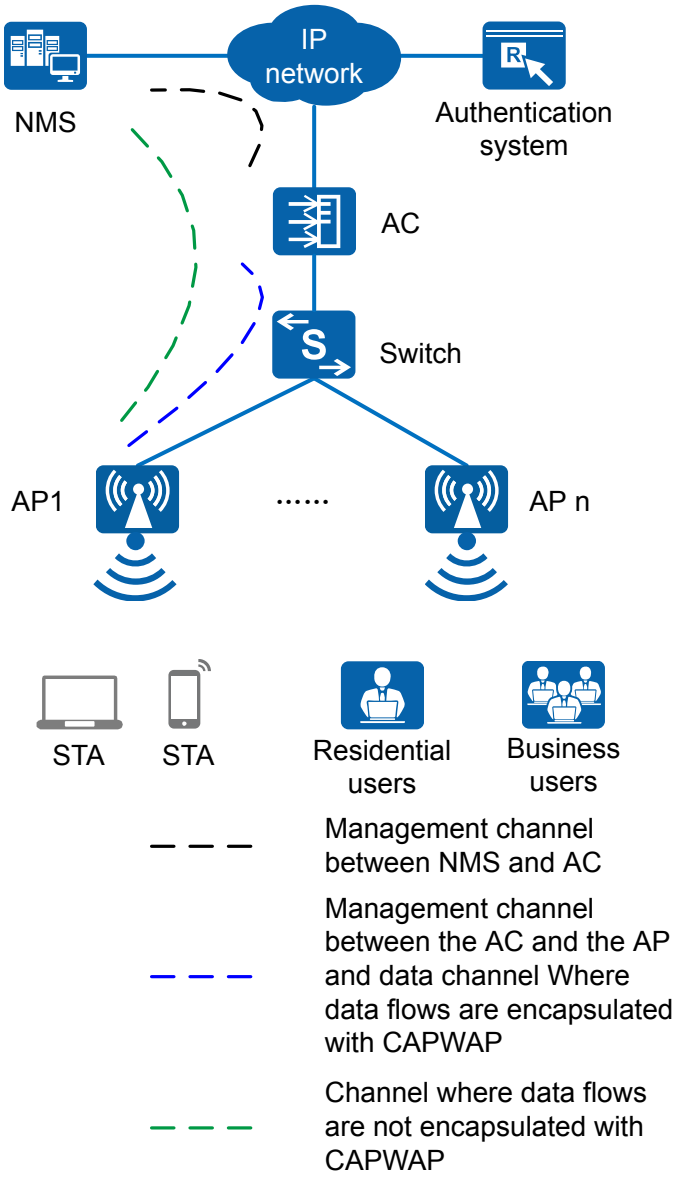
The AP4030TN can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on the network plan.

When the wireless network scale is small, customers need to purchase only AP products and configure the APs to work as Fat APs. As the network scale expands, tens of or hundreds of APs exist on the network. To simplify network management, customers are advised to purchase ACs to perform centralized management on the APs and set the APs to work as Fit APs.

Typical networking modes are as follows:

**Figure 2-85** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-86** Fit AP networking (WDS mode: point-to-point)

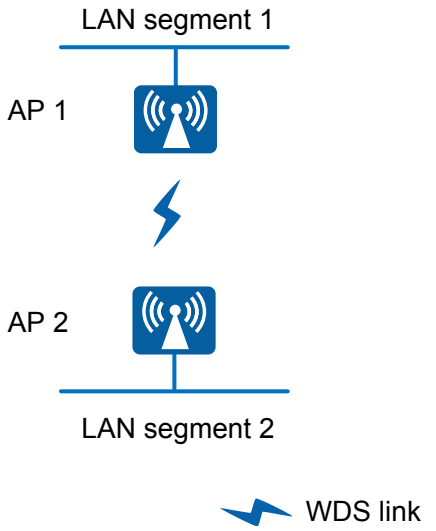
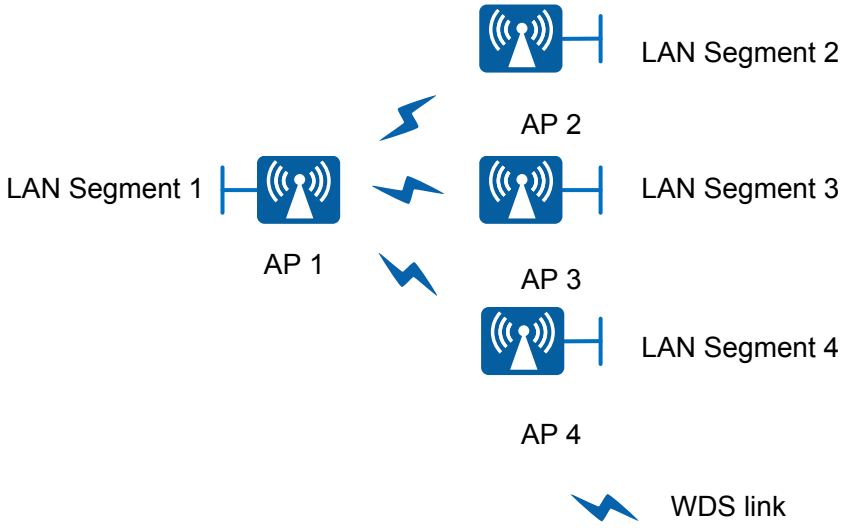


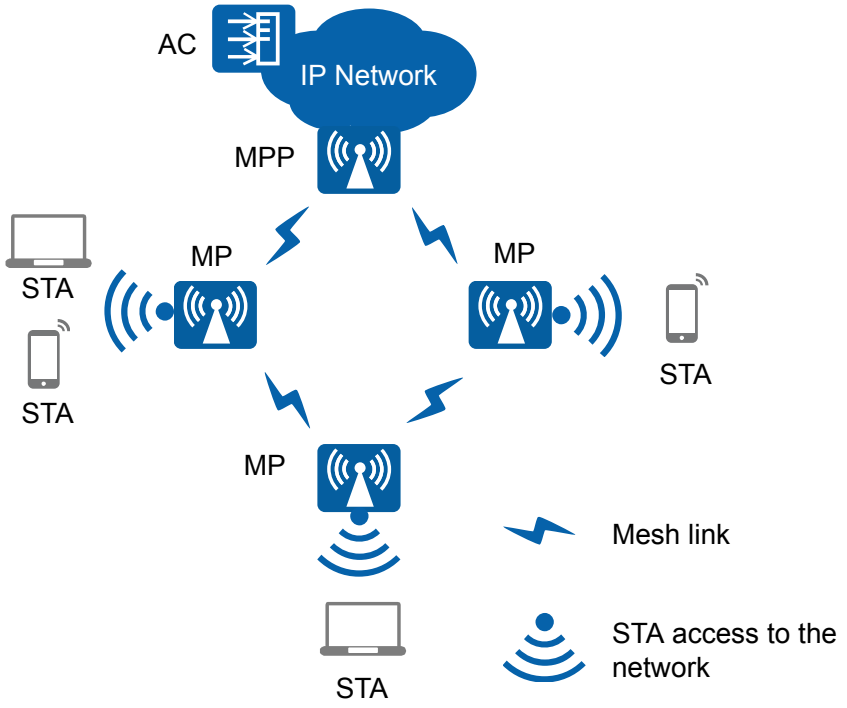

**Figure 2-87** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

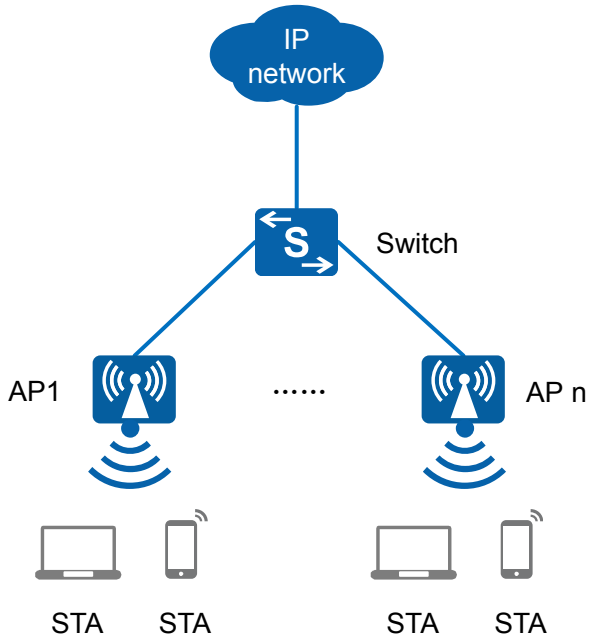
**Figure 2-88** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

**Figure 2-89** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

## 2.14.3 Hardware Information (AP4030TN)

### Appearance

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

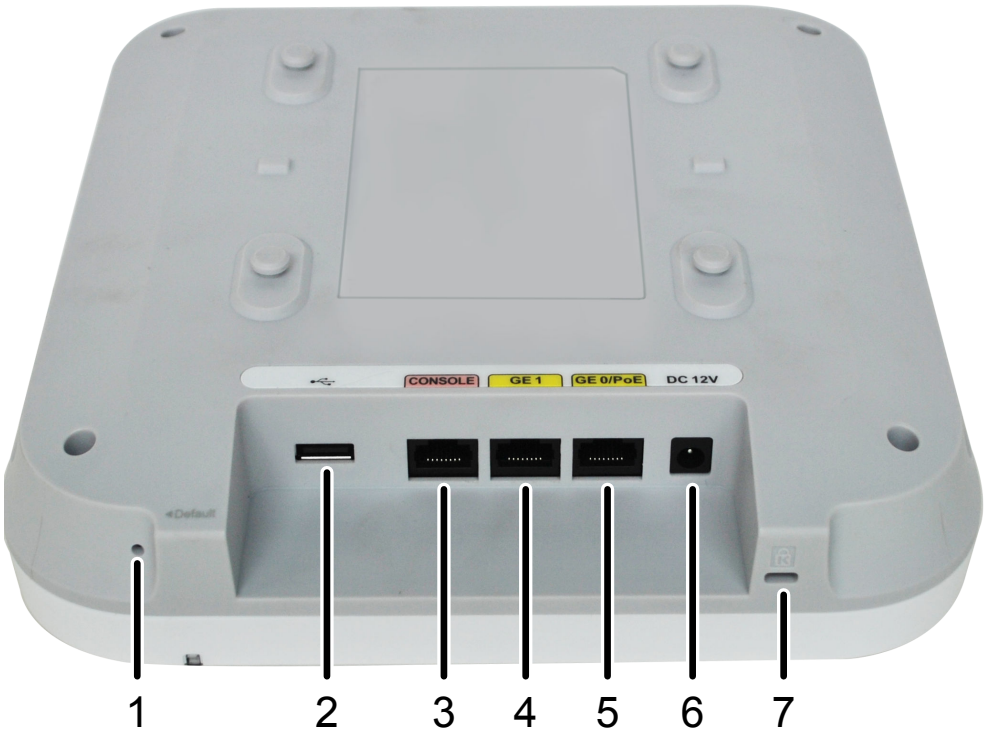
  

**Figure 2-90** AP4030TN appearance

## Ports

**Figure 2-91** AP4030TN ports




As shown in **Figure 2-91**, each port can be described as follows:

1. Default button: restores factory settings and restarts the device if you hold down the button more than 3 seconds.
2. USB port: connects to a USB flash drive to extend the storage space of the AP, and provides a maximum of 2.5 W power.
3. Console port: connects to a maintenance terminal for AP configuration and management.
4. GE1: 10/100/1000M port used to connect to the wired Ethernet.
5. GE0/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
6. Input port for 12 V DC power supply.
7. Security lock slot: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-53** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>● The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-54** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 53 mm x 220 mm x 220 mm |
| | Weight | 0.86 kg |
| | System memory | • 256 MB DDR2<br>• 64 MB NOR FLASH |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power supply: in compliance with IEEE 802.3at |
| | Maximum power consumption | 21.5 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +45°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-55** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 5 dBi<br>• 5 GHz: 5 dBi |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum number of users</td><td colspan="3">• Fit AP: ≤ 384<br>• Fat AP: ≤ 96</td></tr>
<tr><td>Maximum number of VAPs for each radio</td><td colspan="3">16</td></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 300 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s</td></tr>
</table>

## 2.14.4 Performance Specifications (AP4030TN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.15 AP4050DN Product Description

## 2.15.1 Product Characteristics (AP4050DN)

Huawei AP4050DN is a wireless access point (AP) that supports 802.11ac Wave 2, 2 x 2 MIMO, and two spatial streams. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets network deployment requirements. The AP complies with 802.11n and 802.11ac protocols and can provide gigabit STA access, which greatly improves user experience on wireless networks and applies to small- and medium-sized enterprises, airports and stations, stadiums, cafes, and recreation centers.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

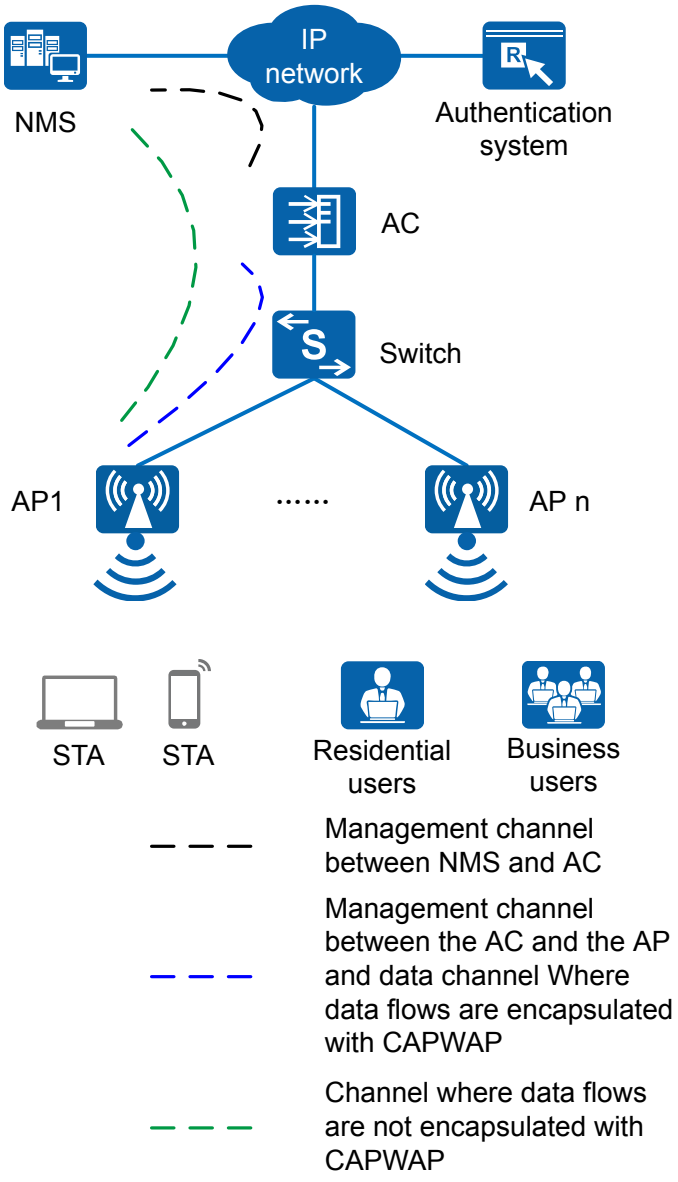
## 2.15.2 Usage Scenarios (AP4050DN)

The AP4050DN can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-92** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-93** Fit AP networking (WDS mode: point-to-point)

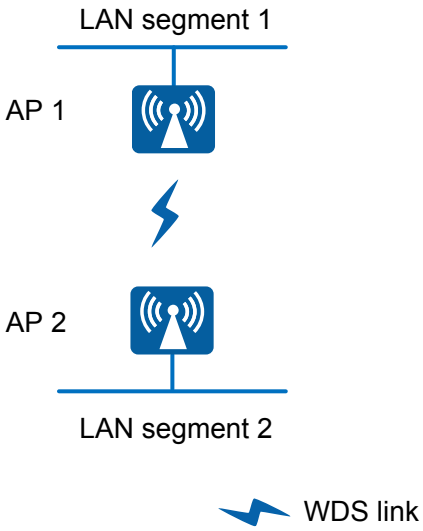
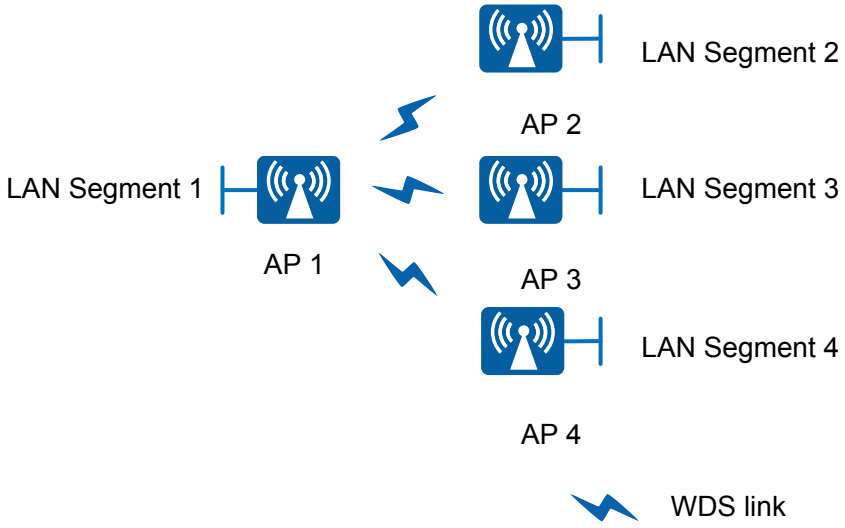


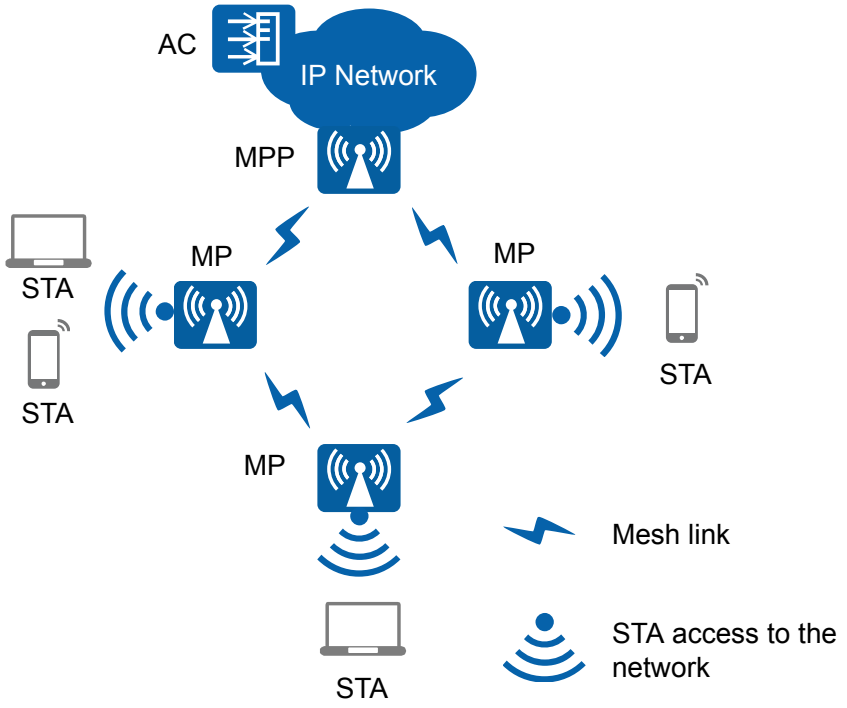

**Figure 2-94** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

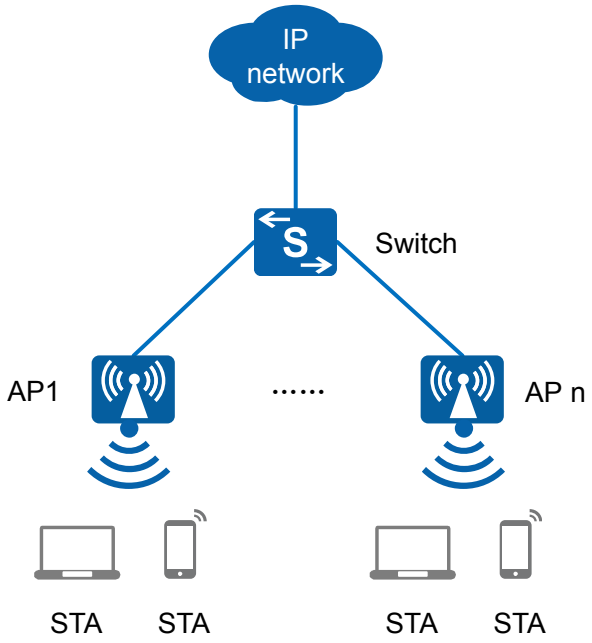
**Figure 2-95** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

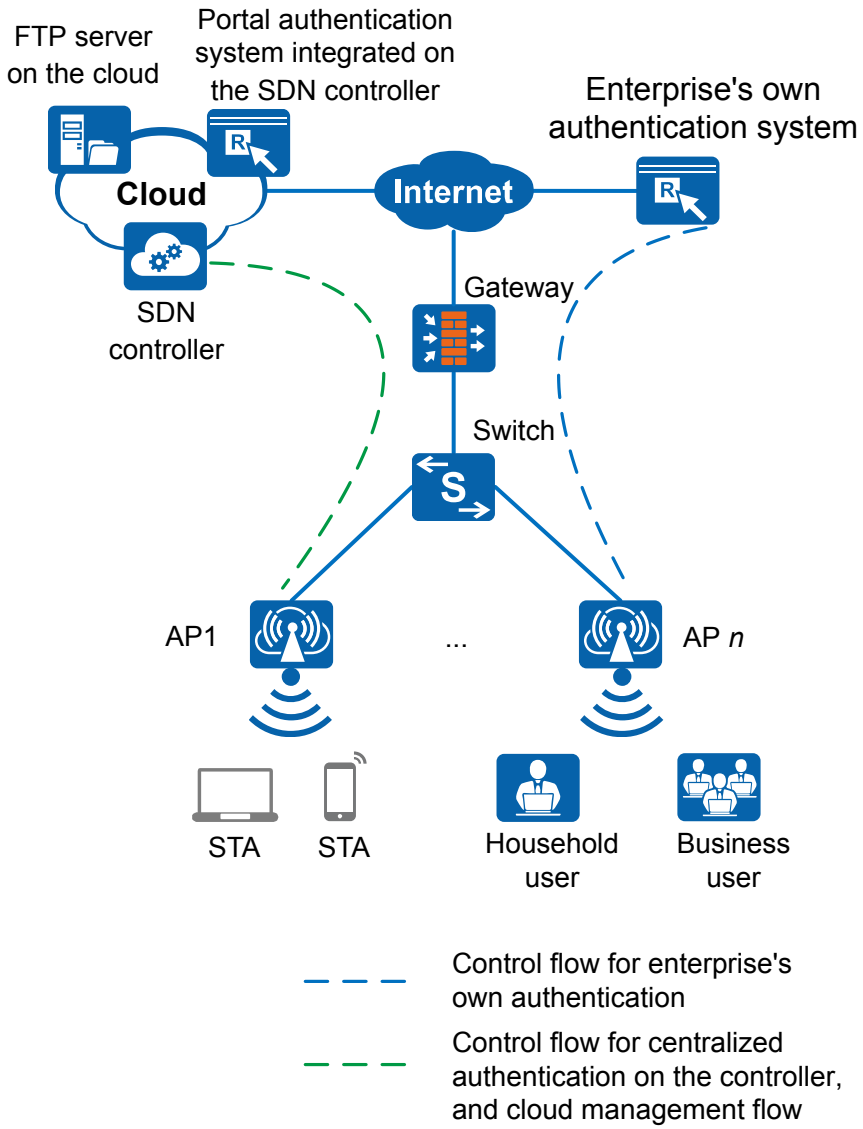
**Figure 2-96** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-97** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.15.3 Hardware Information (AP4050DN)

### Appearance

NOTE

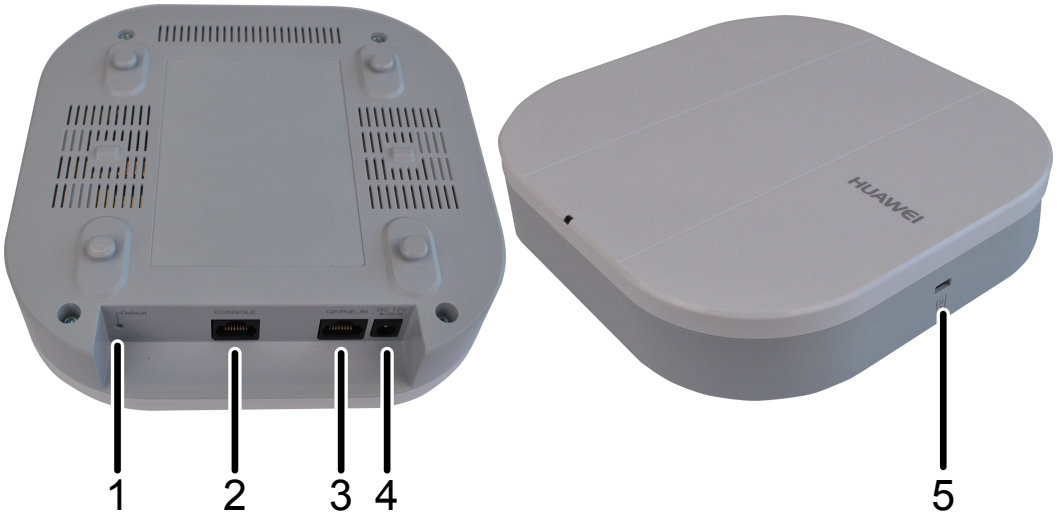
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-98** AP4050DN appearance


## Ports

**Figure 2-99** AP4050DN ports




As shown in **Figure 2-99**, each port can be described as follows:

1. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

2. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
3. GE/PoE_IN:10/100/1000M port that connects to the wired Ethernet and supports PoE input.
4. DC 12V: Connects a 12 V power adapter to the AP.
5. Security slot: Connects to a security lock.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-56** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-57** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 35 mm × 170 mm × 170 mm |
| | Weight | 0.41 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 64 MB NOR FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 12.1 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-58** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional dual-band antenna |
| Antenna gain | • 2.4 GHz: 5 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.15.4 Performance Specifications (AP4050DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.16 AP4050DN-S Product Description

## 2.16.1 Product Characteristics (AP4050DN-S)

Huawei AP4050DN-S is a wireless Access Point (AP) that complies with 802.11ac Wave 2 and supports 2 x 2 MIMO and two spatial streams. It has comprehensive service support capabilities including high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. The AP4050DN-S supports 802.11n and 802.11ac, and provides gigabit access for STAs, which greatly improve user experience on wireless networks and apply to small- and medium-sized enterprises, airports and stations, sports mediums, cafes, and entertainment centers.

- Supports the 802.11ac Wave 2 standard and MU-MIMO, and provides services simultaneously on both 2.4 GHz and 5 GHz frequency bands. The maximum rates at the 2.4 GHz and 5 GHz frequency bands are 400 Mbit/s and 867 Mbit/s respectively, and the maximum rate of the device is 1.267 Gbit/s.
- Supports the Fat, Fit, and cloud modes.
- Enables Huawei SDN controller to manage and operate APs and services on the APs, reducing network O&M costs.

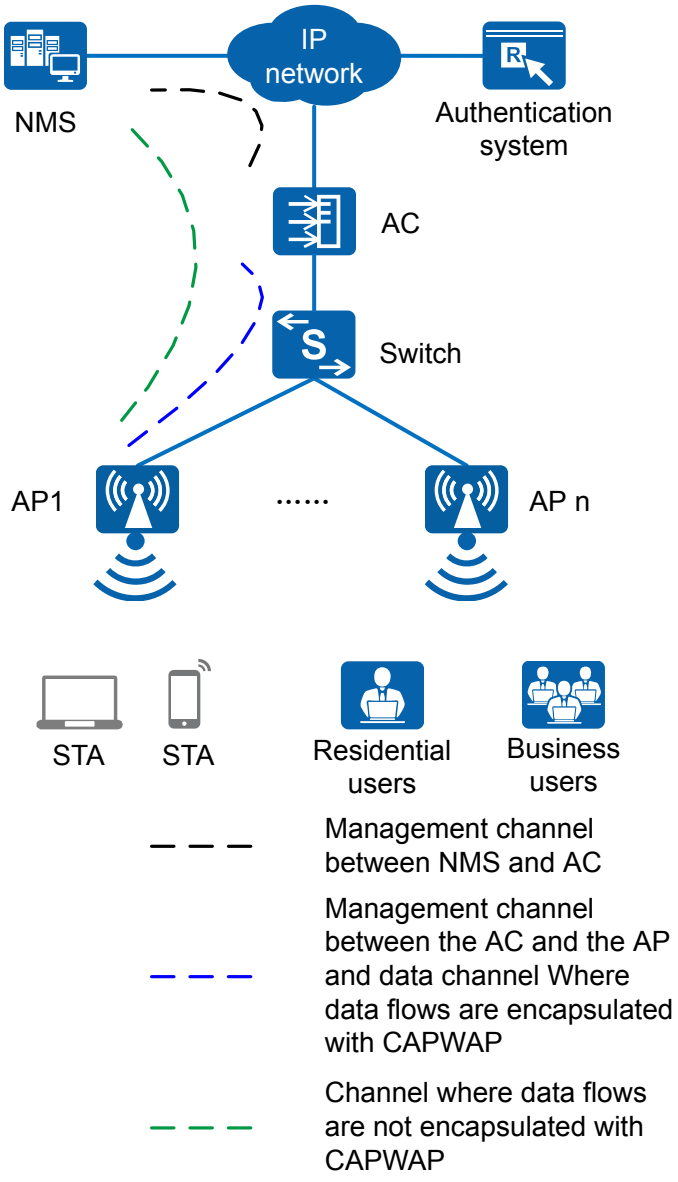
## 2.16.2 Usage Scenarios (AP4050DN-S)

The AP4050DN-S can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-100** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-101** Fit AP networking (WDS mode: point-to-point)

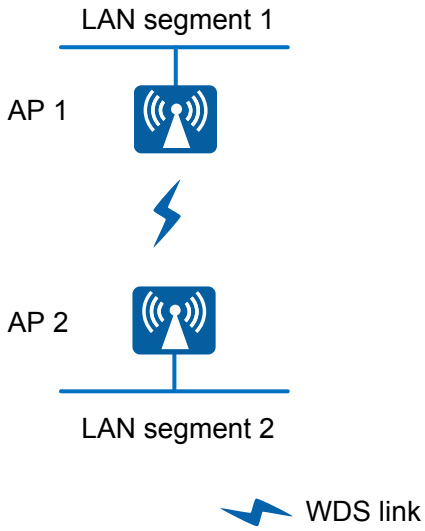
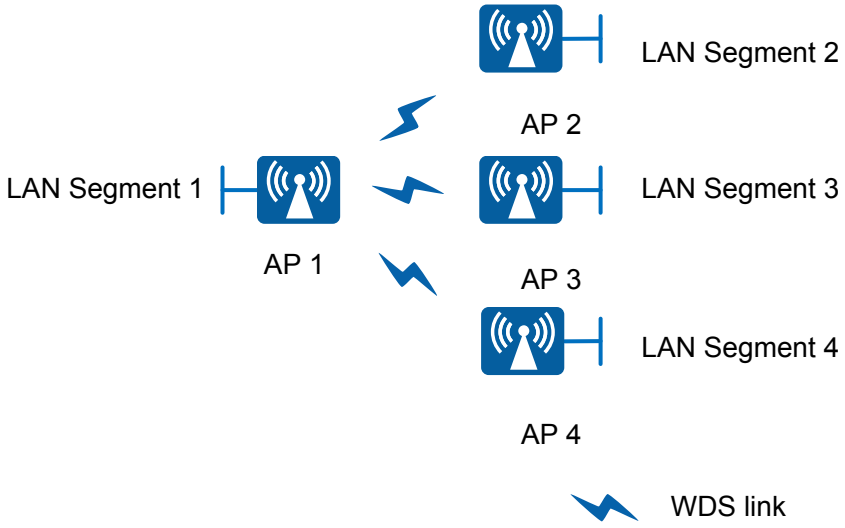


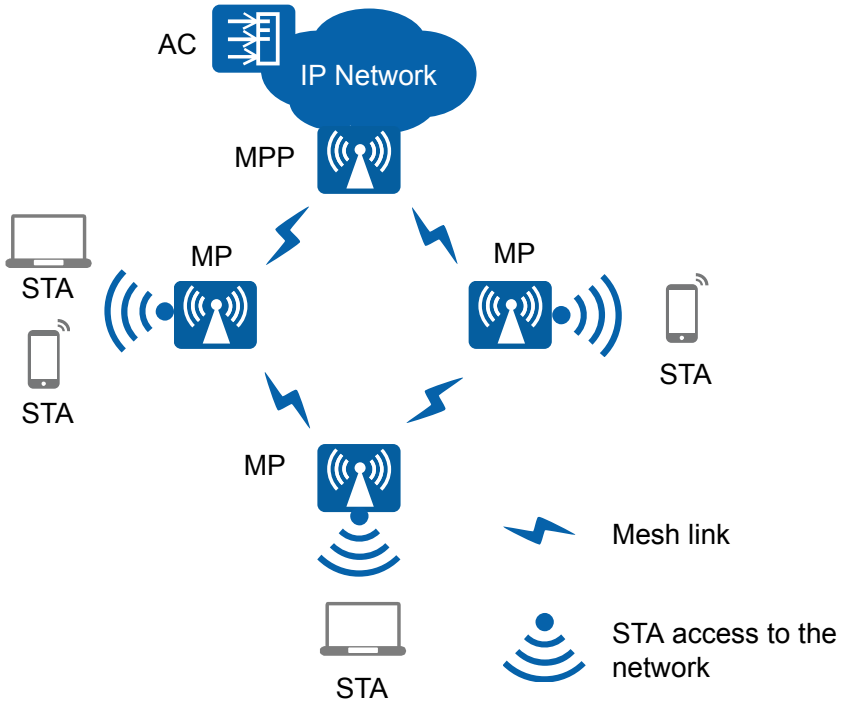

**Figure 2-102** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

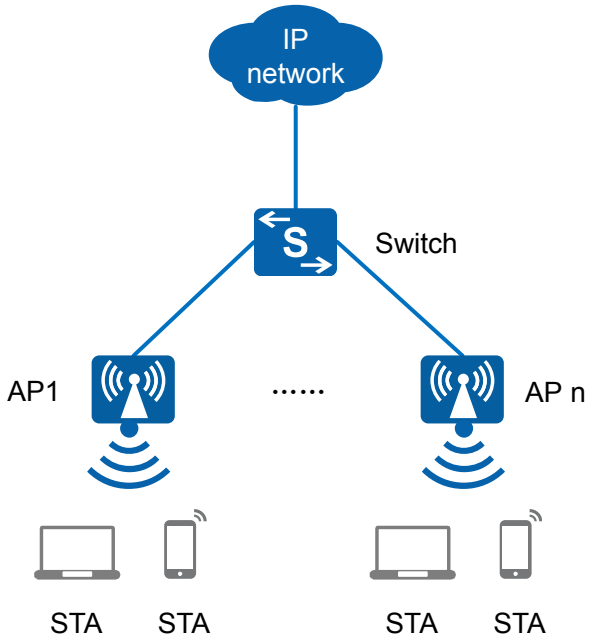
**Figure 2-103** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

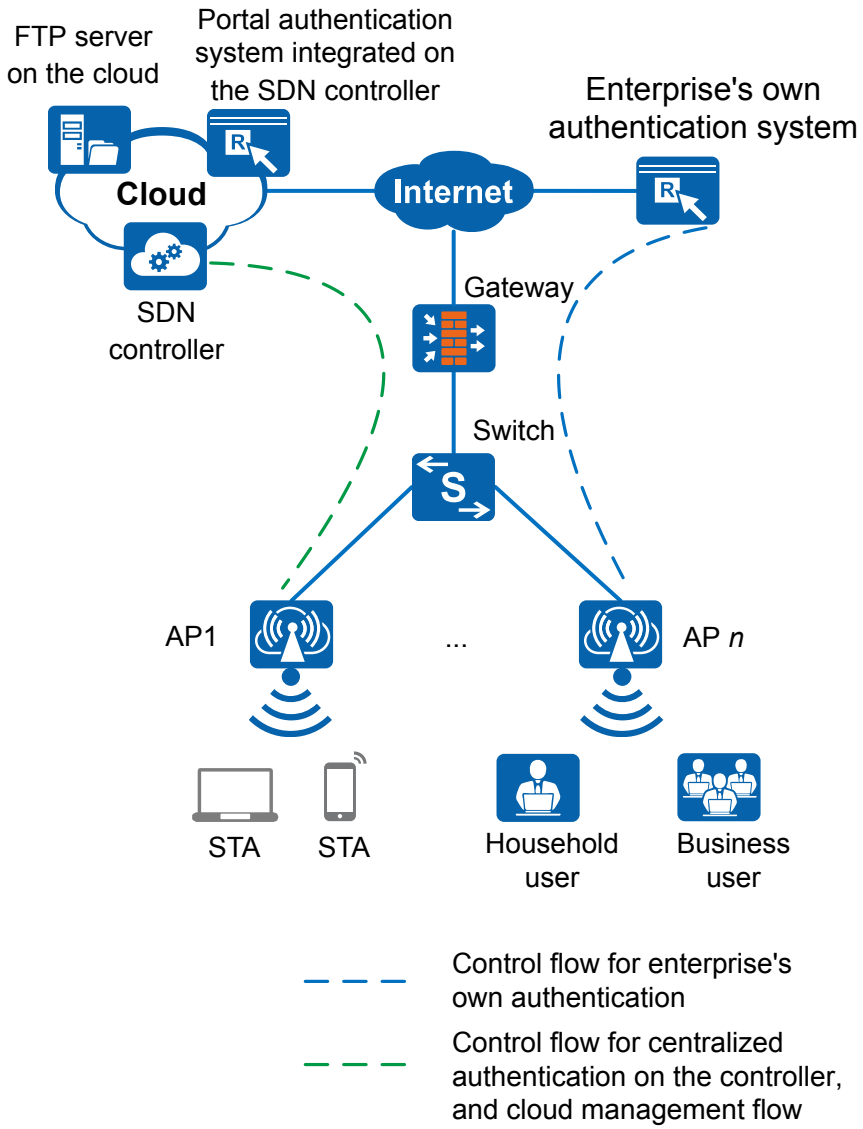
**Figure 2-104** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-105** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.16.3 Hardware Information (AP4050DN-S)

### Appearance

NOTE

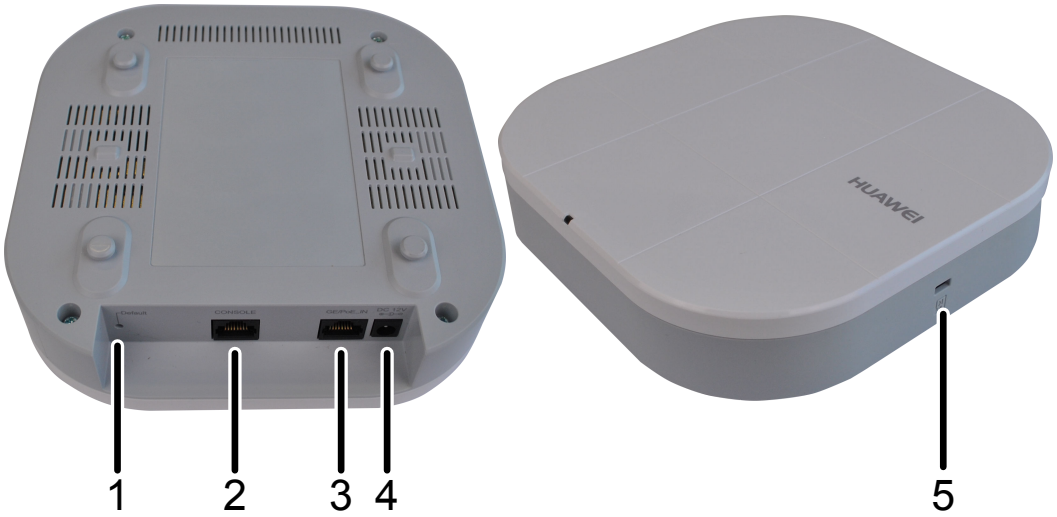
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-106** AP4050DN-S appearance


## Ports

**Figure 2-107** AP4050DN-S ports




As shown in **Figure 2-107**, each port can be described as follows:

1. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

2. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
3. GE/PoE_IN:10/100/1000M port that connects to the wired Ethernet and supports PoE input.
4. DC 12V: Connects a 12 V power adapter to the AP.
5. Security slot: Connects to a security lock.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-59** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-60** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 35 mm x 170 mm x 170 mm (1.38 in. x 6.69 in. x 6.69 in.) |
| | Weight | 0.41 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 64 MB NOR FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 12.1 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature and altitude | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-61** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional dual-band antenna |
| Antenna gain | • 2.4 GHz: 5 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.16.4 Performance Specifications (AP4050DN-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.17 AP4050DN-E Product Description

## 2.17.1 Product Characteristics (AP4050DN-E)

Huawei AP4050DN-E is an IoT wireless access point (AP) that supports 802.11ac Wave 2, 2 x 2 MIMO, and two spatial streams. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets network deployment requirements. The AP complies with 802.11n and 802.11ac protocols and can provide gigabit STA access, which greatly improves user experience on wireless networks.

The AP4050DN-E has built-in Bluetooth and provides three module slots for function expansion, applicable to commercial chains, medical, warehousing, manufacturing, and logistics environments.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- Built-in Bluetooth to implement precise positioning with eSight
- IoT module to allow for flexible expansion of IoT applications
- Dual Ethernet interfaces support link aggregation and traffic load balancing while ensuring link reliability. The Ethernet interface GE0 supports the PoE in function, and the Ethernet interface GE1 supports the PoE out function.
- USB interface used for external power supply and storage
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

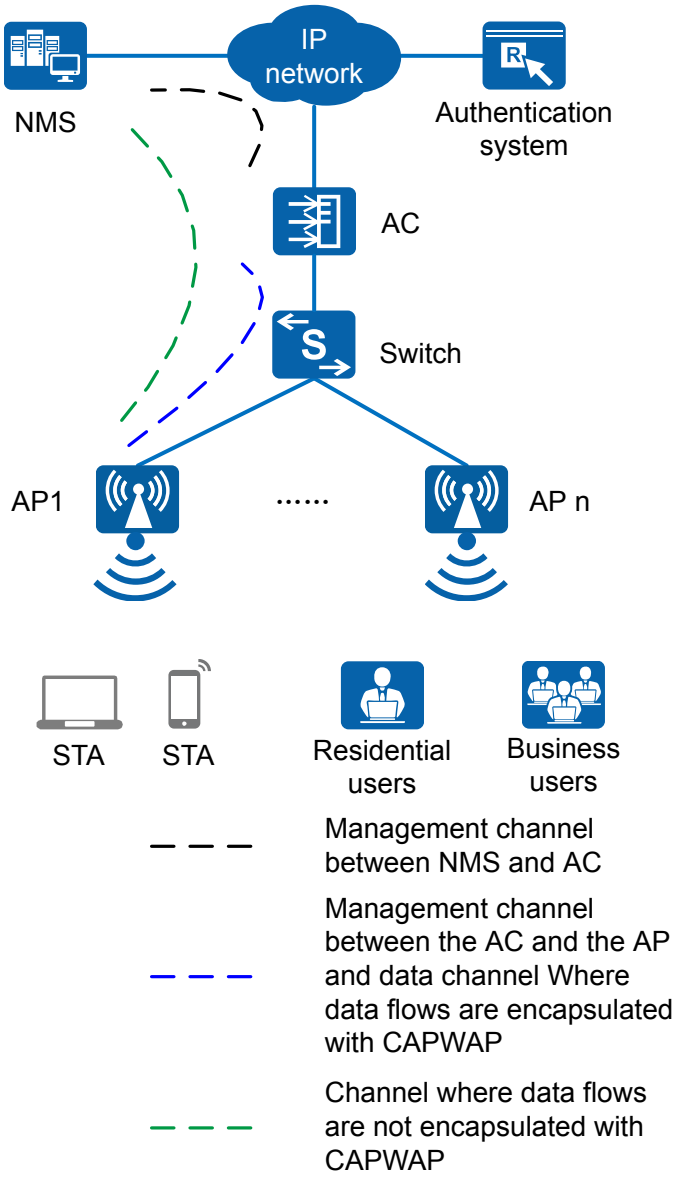
## 2.17.2 Usage Scenarios (AP4050DN-E)

The AP4050DN-E can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-108** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-109** Fit AP networking (WDS mode: point-to-point)

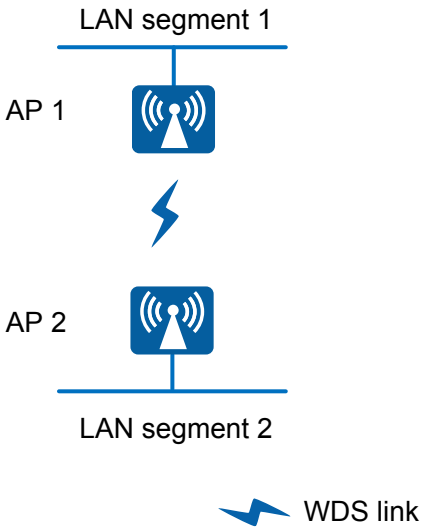
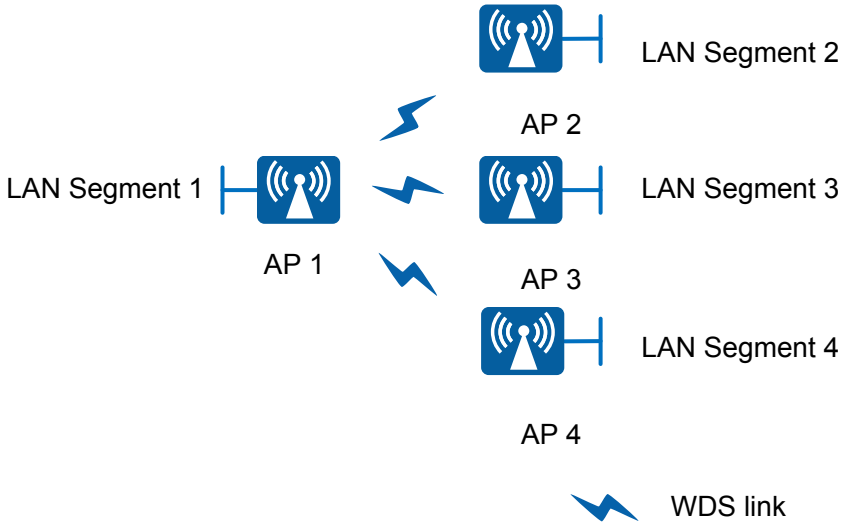


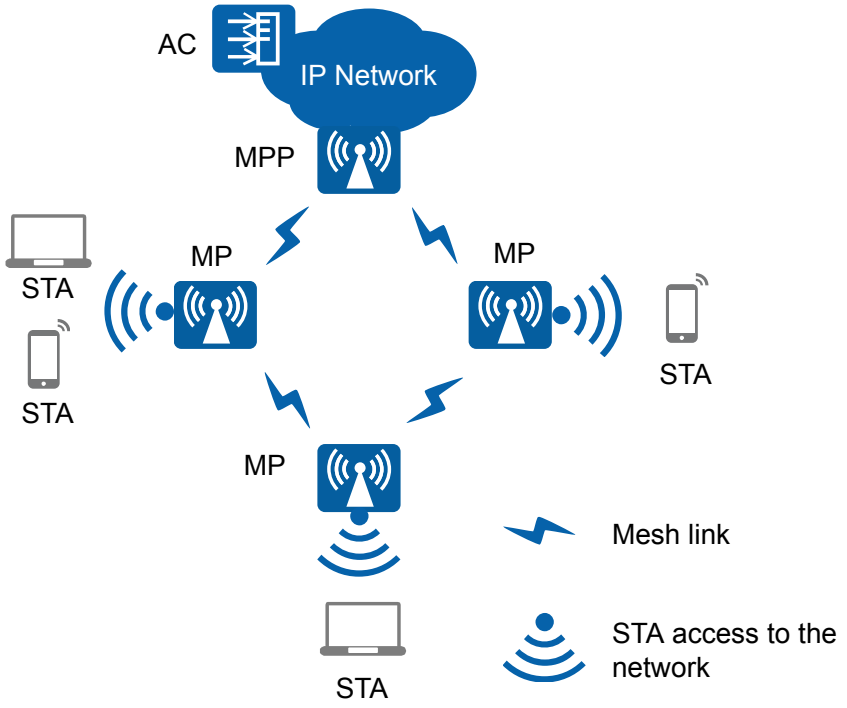

**Figure 2-110** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

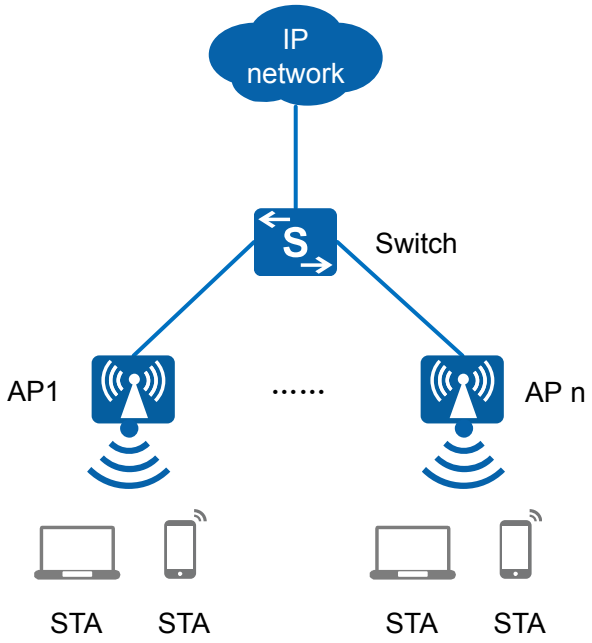
**Figure 2-111** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

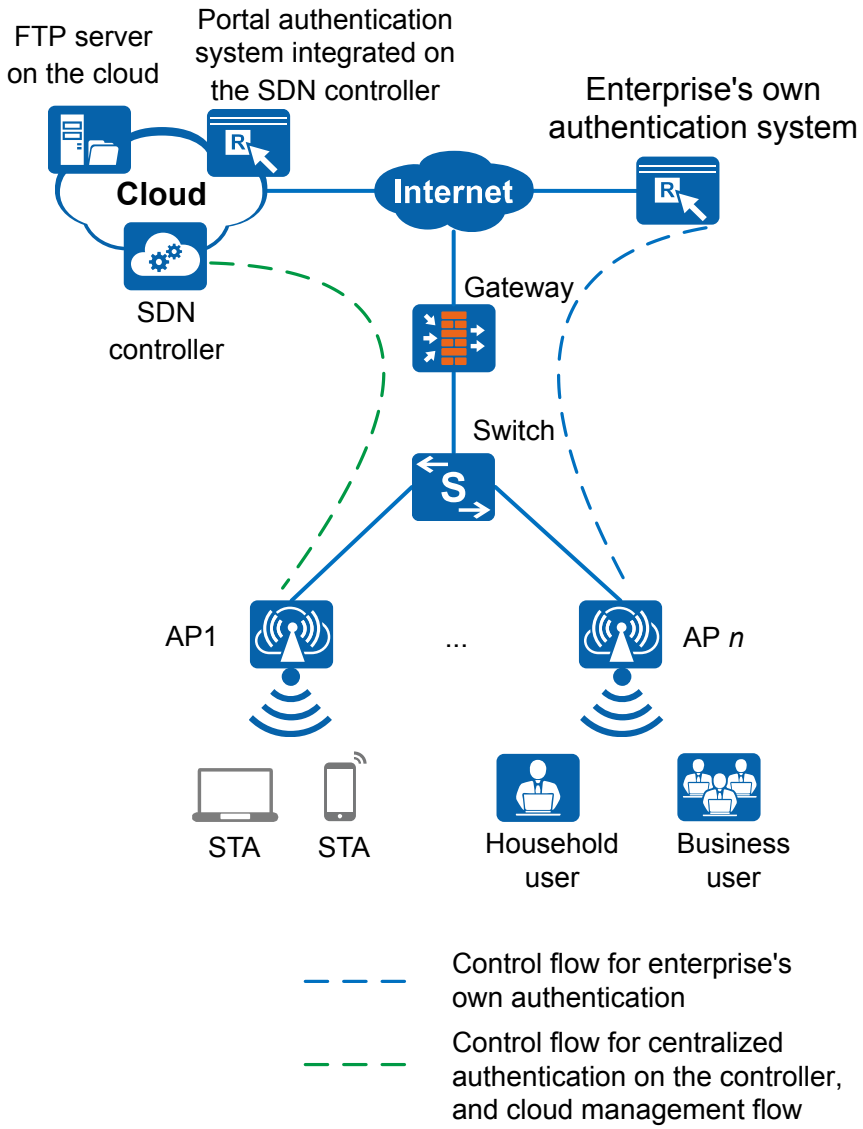
**Figure 2-112** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-113** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.17.3 Hardware Information (AP4050DN-E)

### Appearance

NOTE

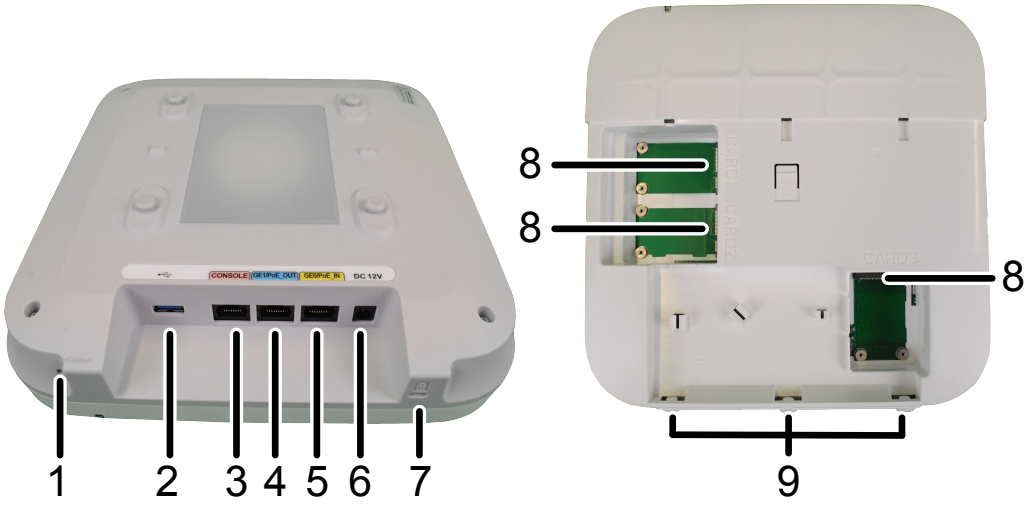
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-114** AP4050DN-E appearance


## Ports

**Figure 2-115** AP4050DN-E ports




As shown in **Figure 2-115**, each port can be described as follows:

1. Default button: restores factory settings and restarts the device if you hold down the button more than 3 seconds.
2. USB port: connects to a USB flash drive to extend the storage space of the AP, and provides a maximum of 2.5 W power.
3. Console port: connects to the maintenance terminal for AP configuration and management.

4. GE1/PoE_OUT: 10/100/1000M port used to connect to the wired Ethernet and support PoE output.
5. GE0/PoE_IN: 10/100/1000M port used to connect to the wired Ethernet and support PoE input.
6. DC 12V: connects a 12 V power adapter to the AP.
7. Lock port: protects the AP against theft.
8. IoT slot: allows IoT cards to be inserted to provide extended functions such as RFID location.
9. Radio port: connects to an IoT card and an antenna.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-62** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-63** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 53 mm x 220 mm x 220 mm |
| | Weight | 0.84 kg |
| | System memory | ● 256 MB DDR3L<br>● 64 MB NOR FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3at |
| | Maximum power consumption | 16.0 W (excluding the output power of the USB port, IoT card, or PoE_OUT port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-64** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional dual-band antenna |
| Antenna gain | • 2.4 GHz: 3 dBi<br>• 5 GHz: 4 dBi |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.17.4 Performance Specifications (AP4050DN-E)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.18 AP4050DN-HD Product Description

## 2.18.1 Product Characteristics (AP4050DN-HD)

Huawei AP4050DN-HD is a wireless access point (AP) that supports 802.11ac Wave 2, 2 x 2 MIMO, and two spatial streams. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets network deployment requirements. The AP complies with 802.11n and 802.11ac protocols and can provide gigabit STA access, which greatly improves user experience on wireless networks. It has built-in smart high-density antennas and therefore provides more precise wireless coverage, applicable to indoor high-density stadiums.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- Embedded with smart antennas purpose-built for high-density scenarios. These antennas can reduce construction costs and mitigate interference between APs.
- Dual Ethernet interfaces support link aggregation and traffic load balancing while ensuring link reliability. The Ethernet interface GE0 supports the PoE in function, and the Ethernet interface GE1 supports the PoE out function.
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

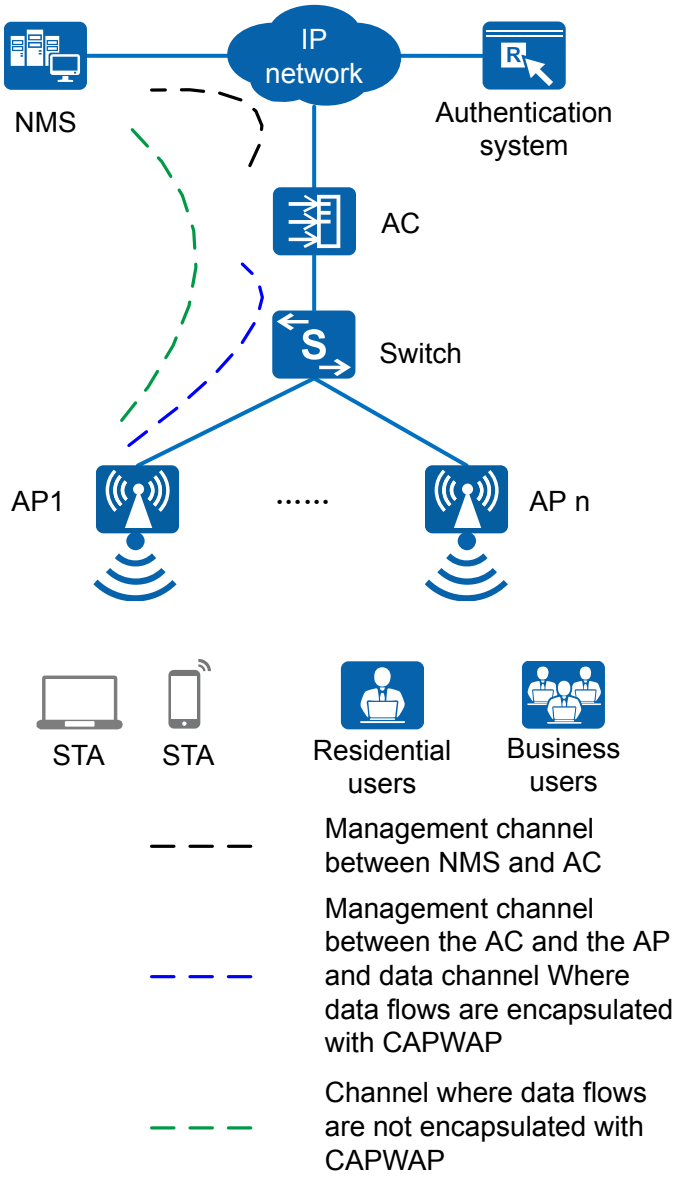
## 2.18.2 Usage Scenarios (AP4050DN-HD)

The AP4050DN-HD can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-116** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-117** Fit AP networking (WDS mode: point-to-point)

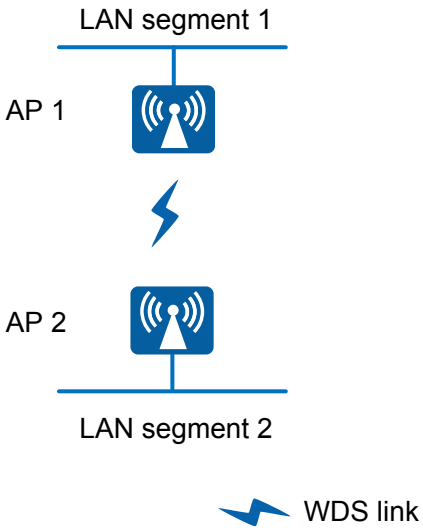
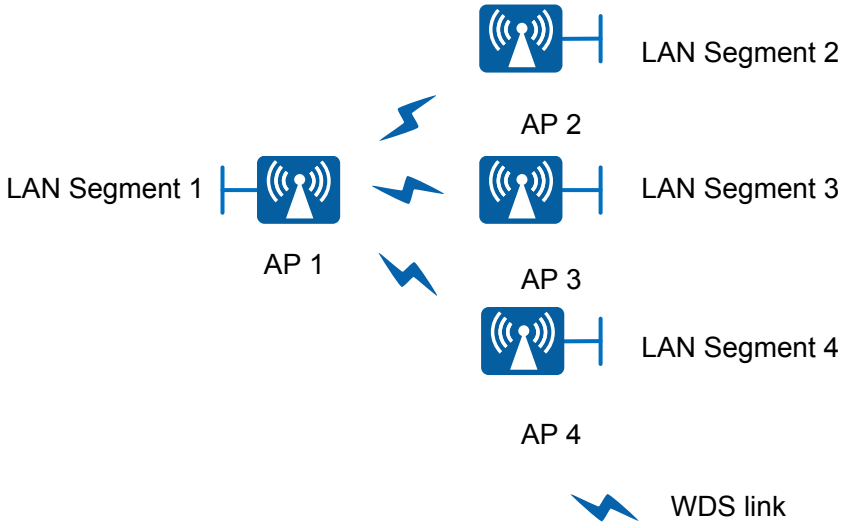


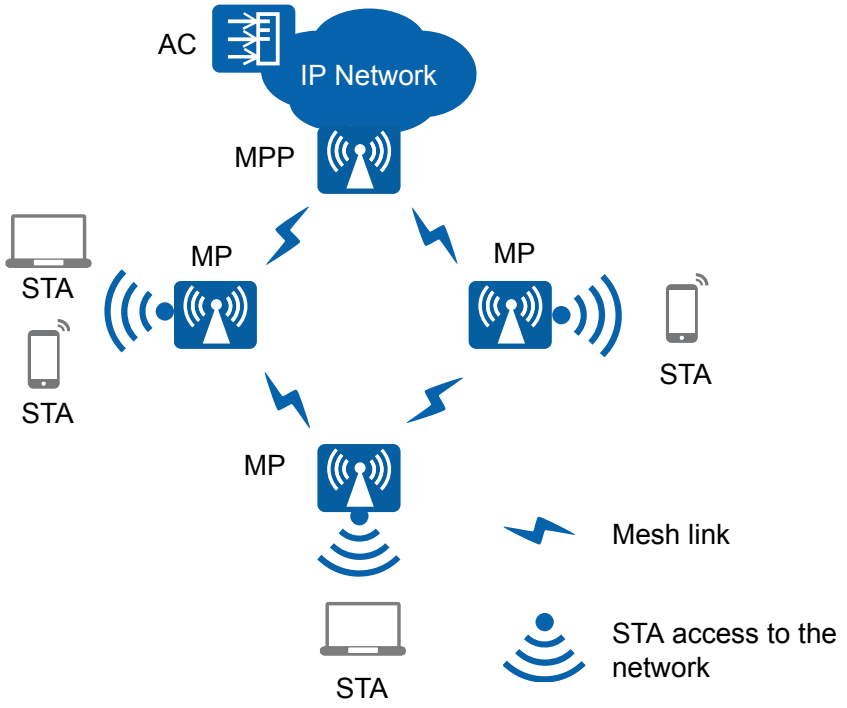

**Figure 2-118** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

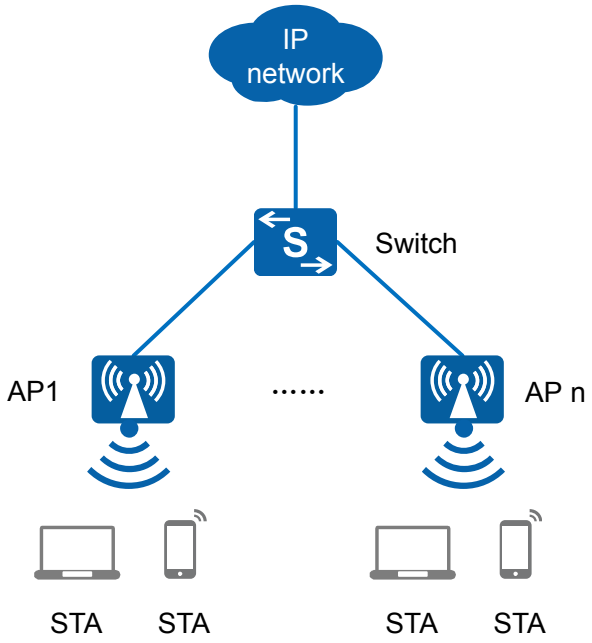
**Figure 2-119** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

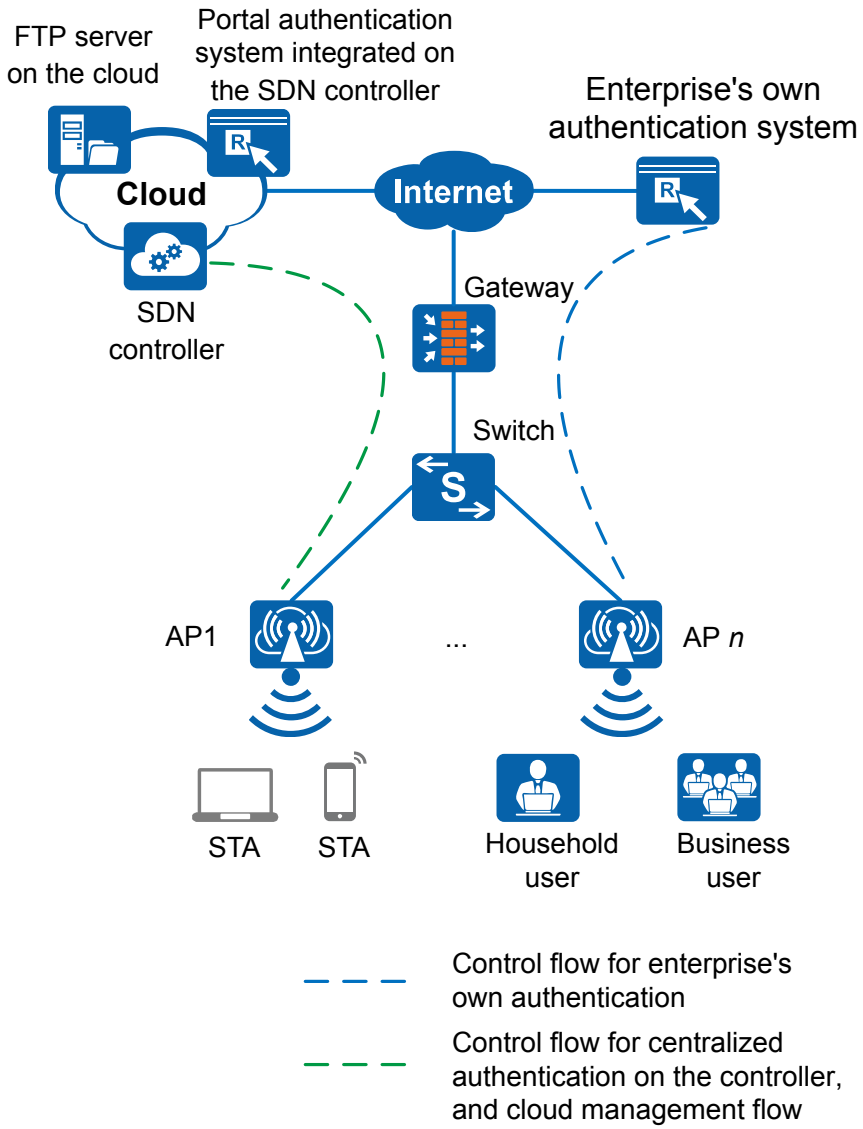
**Figure 2-120** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-121** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.18.3 Hardware Information (AP4050DN-HD)

### Appearance

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

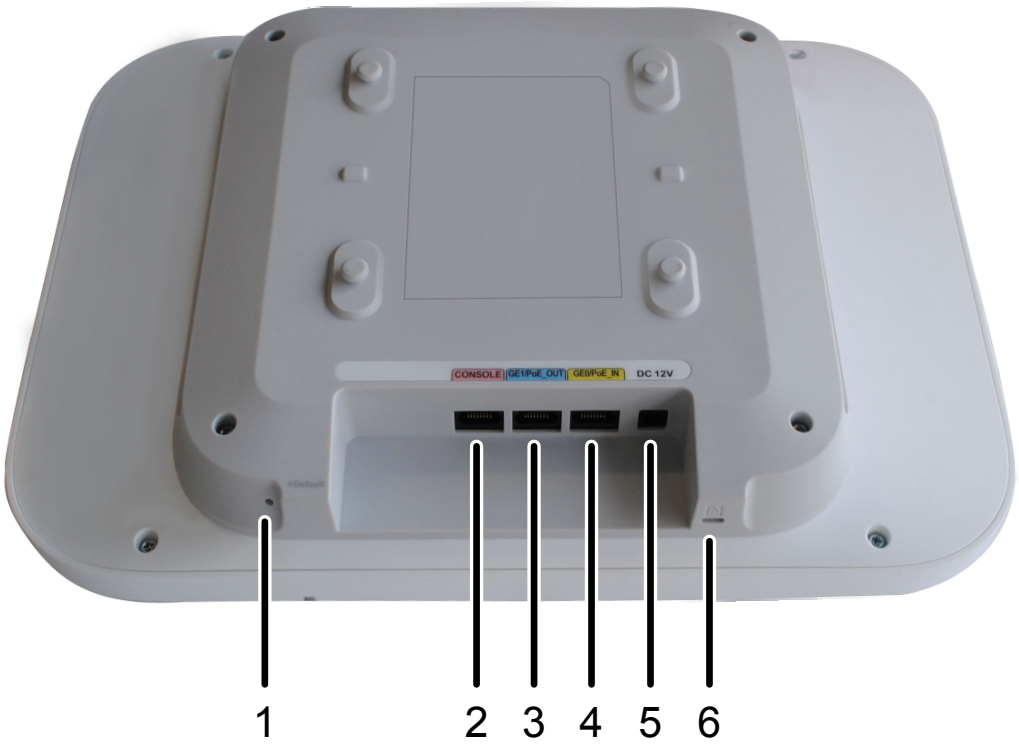
  

**Figure 2-122** AP4050DN-HD appearance

## Ports

**Figure 2-123** AP4050DN-HD ports




As shown in **Figure 2-123**, each port can be described as follows:

1. Default button: restores factory settings and restarts the device if you hold down the button more than 3 seconds.
2. Console port: connects to the maintenance terminal for AP configuration and management.
3. GE1/PoE_OUT: 10/100/1000M port used to connect to the wired Ethernet. The port allows the AP to provide PoE power supply to downlink devices.
4. GE0/PoE_IN: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
5. Input port for 12 V DC power supply.
6. Security slot: protects the AP against theft.

## LED Indicators

**NOTE**

Indicator colors may vary slightly at different temperature.

**Table 2-65** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-66** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 65 mm x 334 mm x 240 mm |
| | Weight | 1.5 kg |
| | System memory | • 256 MB DDR3L<br>• 64 MB NOR FLASH |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | • 11.8 W (in 802.3af PoE or DC mode)<br>• 13.9 W (in 802.3at PoE mode, excluding the output power of the PoE_OUT port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-67** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in dual-band directional antenna (beamwidth: 30 degrees) |
| Antenna gain | • 2.4 GHz: 13 dBi<br>• 5 GHz: 10 dBi |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum number of users</td><td colspan="3">Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>NOTE<br>The actual number of users varies according to the environment.</td></tr>
<tr><td>Maximum number of VAPs for each radio</td><td colspan="3">16</td></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 22 dBm (combined power)<br>• 5 GHz: 22 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.<br>NOTICE<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac Wave 2: 6.5 to 867 Mbit/s</td></tr>
</table>

## 2.18.4 Performance Specifications (AP4050DN-HD)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.19 AP4050DE-B-S Product Description

## 2.19.1 Product Characteristics (AP4050DE-B-S)

Huawei AP4050DE-B-S is a wireless access point (AP) tailored to SMB that supports 802.11ac Wave 2, 2 x 2 MU-MIMO, and two spatial streams. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets network deployment requirements. The AP has built-in smart antennas, complies with 802.11n and 802.11ac protocols, and can provide gigabit STA access, which greatly improves user experience on wireless networks and applies to small- and medium-sized enterprises, airports and stations, stadiums, cafes, and recreation centers.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- Smart antenna array technology enables targeted signal coverage for mobile terminals, reduces interferences, and improves signal quality. Additionally, it supports millisecond-level switchover as terminals move.
- Built-in Bluetooth to implement precise positioning with eSight
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

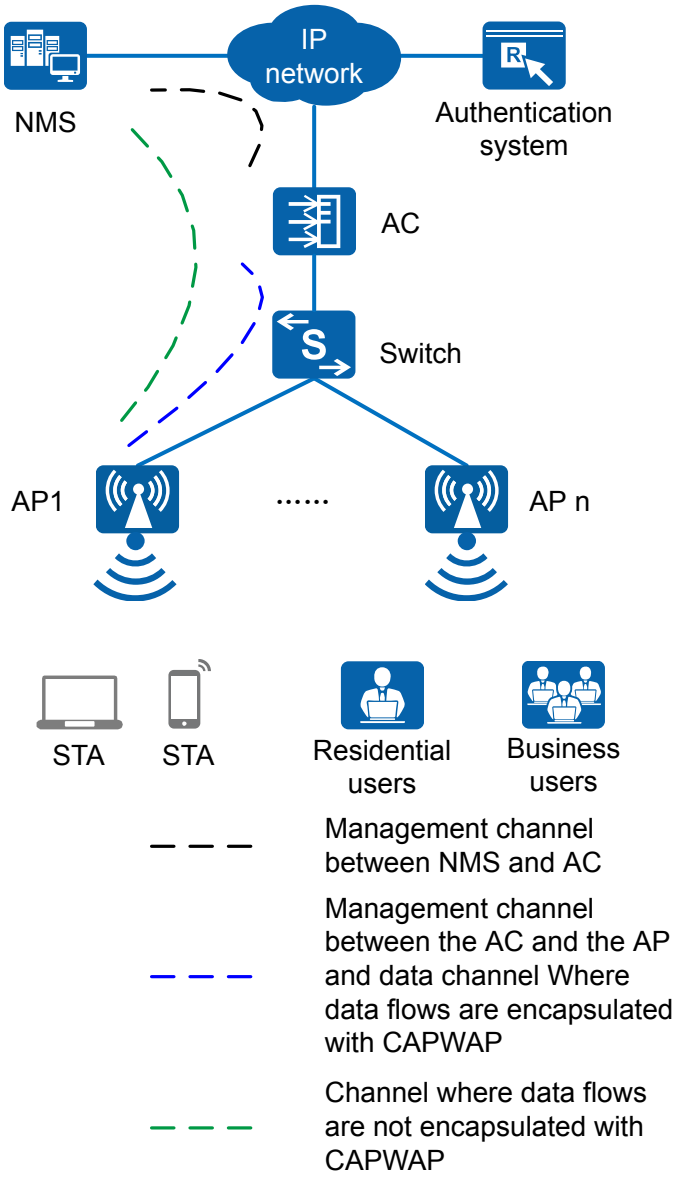
## 2.19.2 Usage Scenarios (AP4050DE-B-S)

The AP4050DE-B-S can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-124** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-125** Fit AP networking (WDS mode: point-to-point)

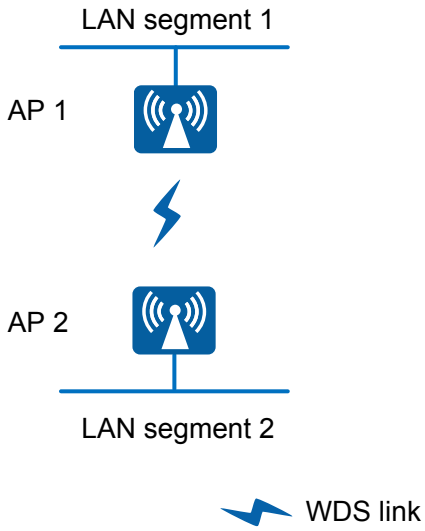
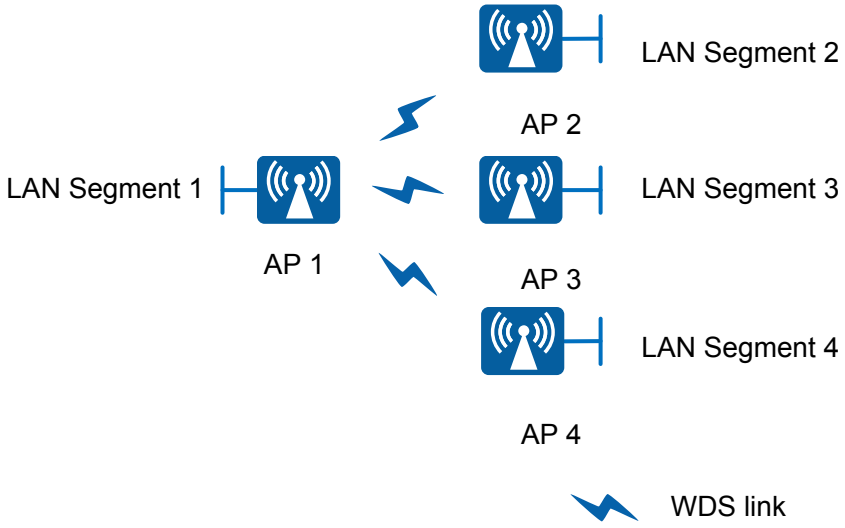


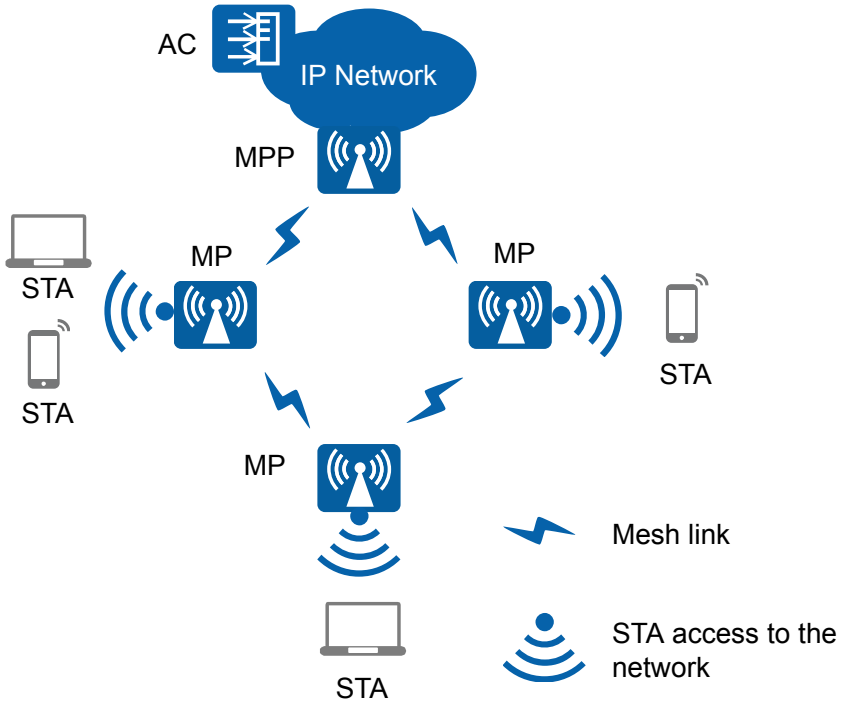

**Figure 2-126** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

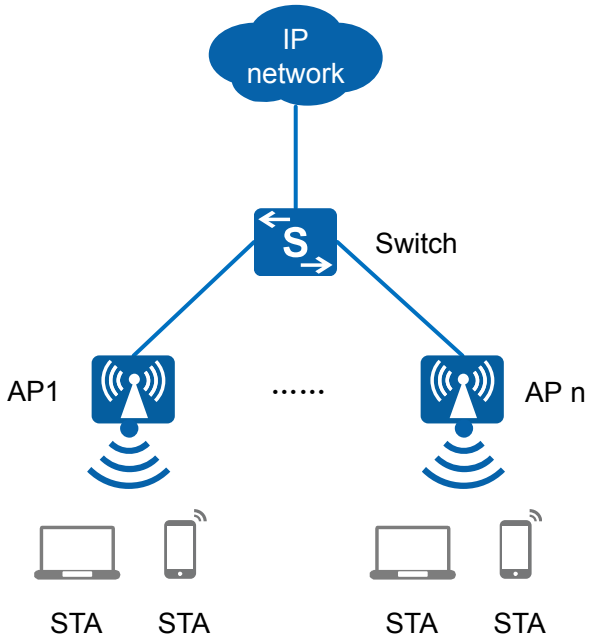
**Figure 2-127** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

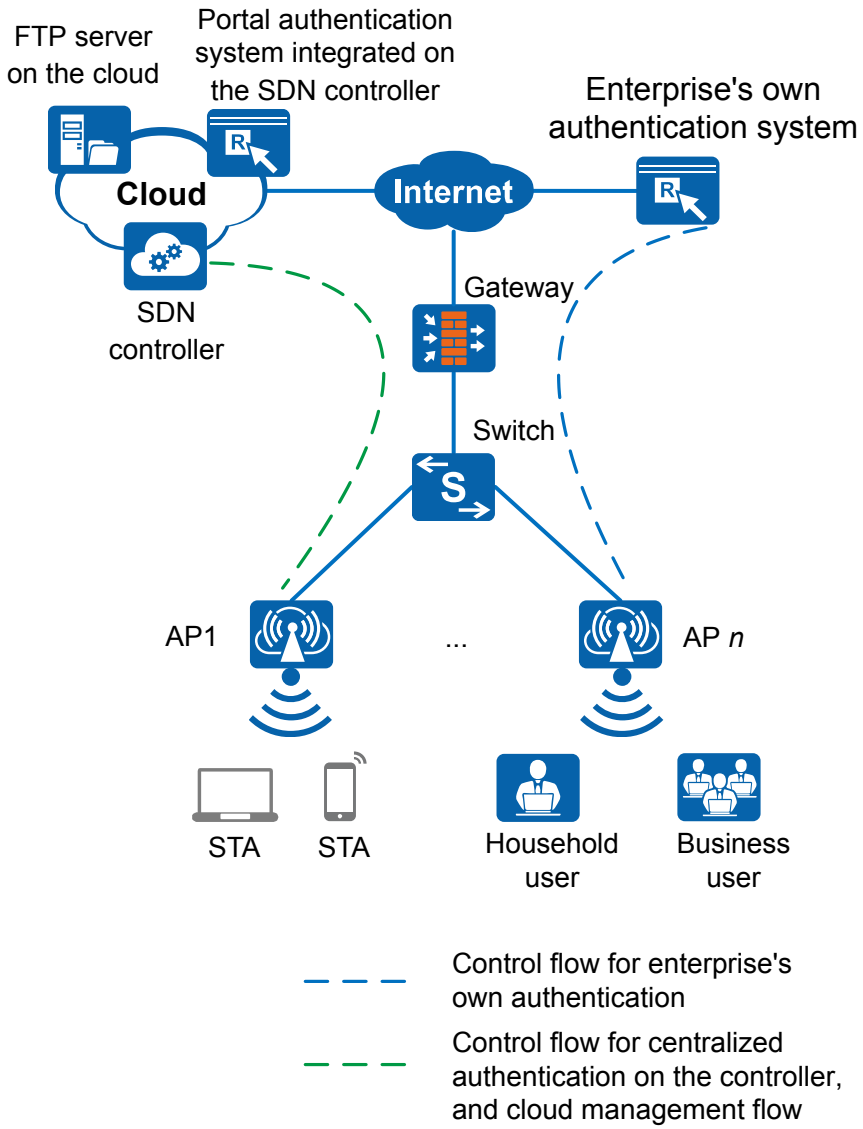
**Figure 2-128** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-129** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.19.3 Hardware Information (AP4050DE-B-S)

### Appearance

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

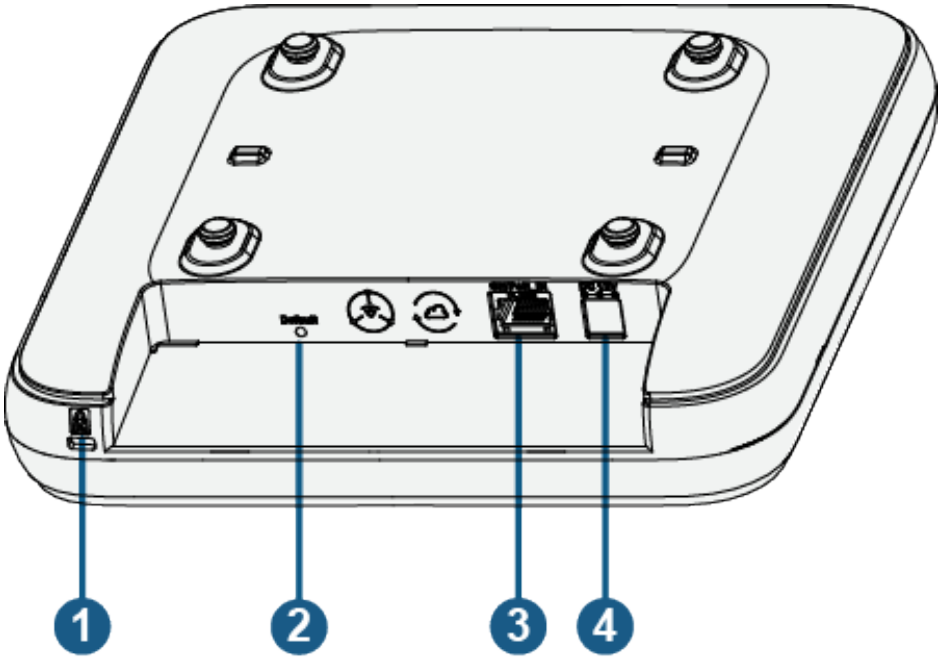
  

**Figure 2-130** Appearance

## Ports

**Figure 2-131** Ports




As shown in **Figure 2-131**, each port can be described as follows:

1. Security slot: Connects to a security lock.
2. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
3. GE/PoE_IN: GE/PoE_IN
4. DC 12V: Connects a 12 V power adapter to the AP.

## LED Indicators

The AP4050DE-B-S provides only a single indicator, as shown in **Figure 2-132**.

NOTE

Indicator colors may vary slightly at different temperature.

**Figure 2-132** Indicator

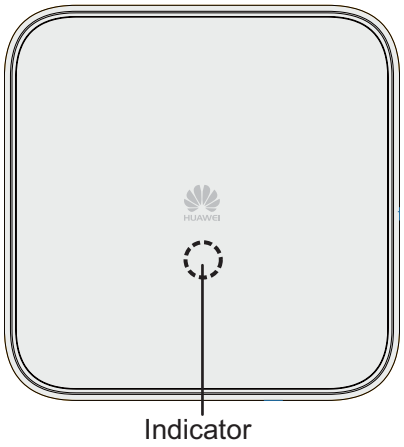



**Table 2-68** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-69** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 47 mm x 200 mm x 200 mm |
| | Weight | 0.7 kg |
| | System memory | ● 256 MB DDR3L<br>● 4 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3at/af |
| | Maximum power consumption | 14.05 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-70** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in dual-band smart omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 3 dBi<br>• 5 GHz: 3 dBi |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
|---|---|---|---|
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.19.4 Performance Specifications (AP4050DE-B-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.20 AP4050DE-M Product Description

## 2.20.1 Product Characteristics (AP4050DE-M)

Huawei AP4050DE-M is a wireless access point (AP) that supports 802.11ac Wave 2, 2 x 2 MIMO, and two spatial streams. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets network deployment requirements. The AP has built-in smart antennas, complies with 802.11n and 802.11ac protocols, and can provide gigabit STA access, which greatly improves user experience on wireless networks and applies to small- and medium-sized enterprises, airports and stations, stadiums, cafes, and recreation centers.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- Smart antenna array technology enables targeted signal coverage for mobile terminals, reduces interferences, and improves signal quality. Additionally, it supports millisecond-level switchover as terminals move.
- Built-in Bluetooth to implement precise positioning with eSight
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

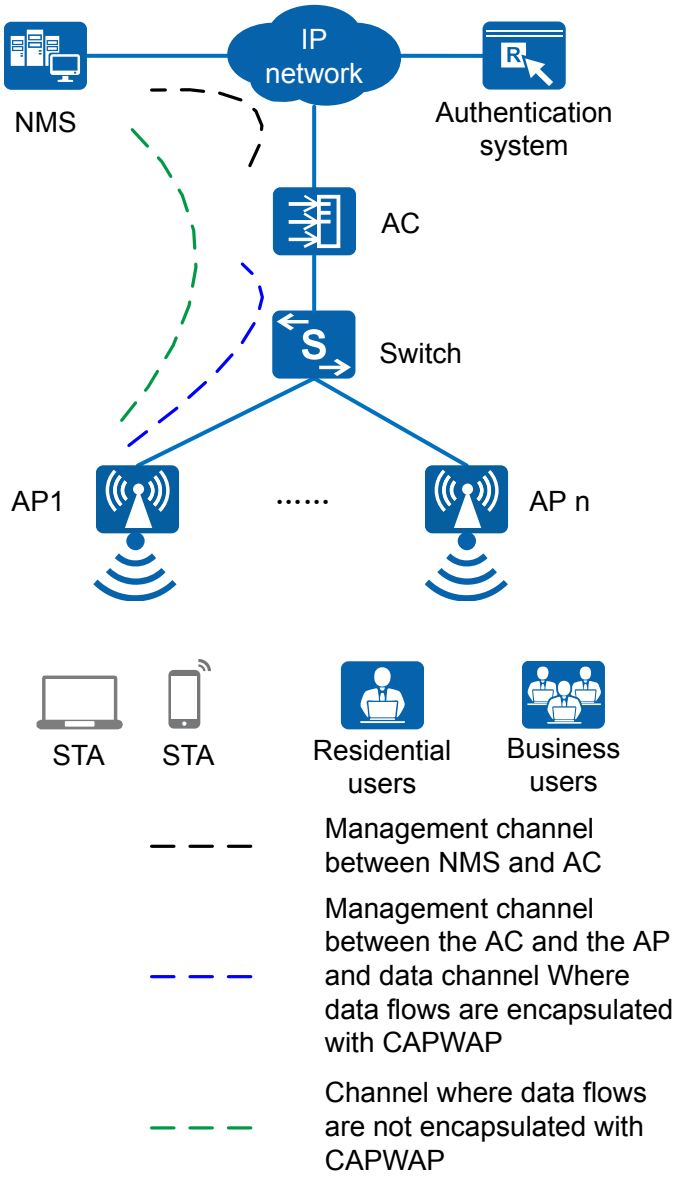
## 2.20.2 Usage Scenarios (AP4050DE-M)

The AP4050DE-M can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-133** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-134** Fit AP networking (WDS mode: point-to-point)

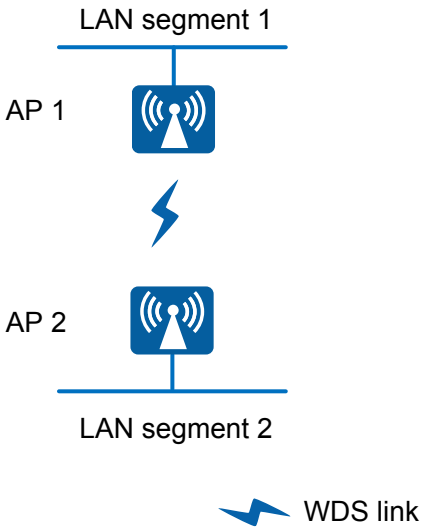
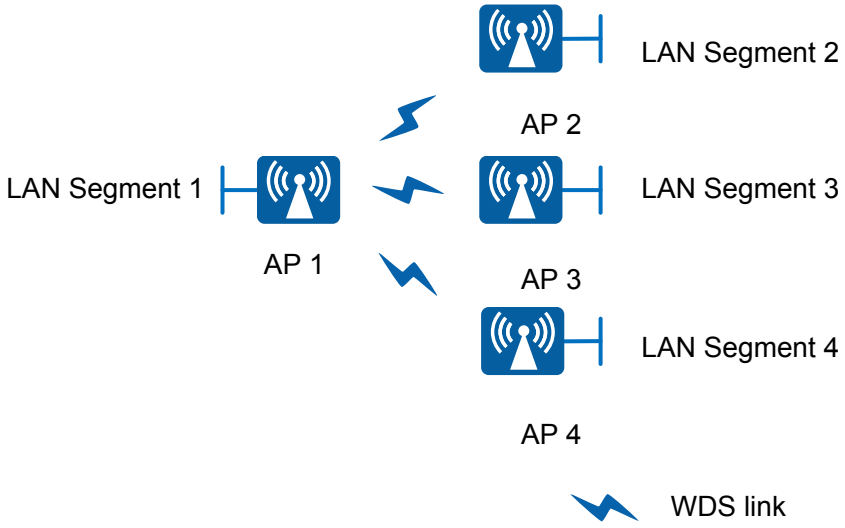


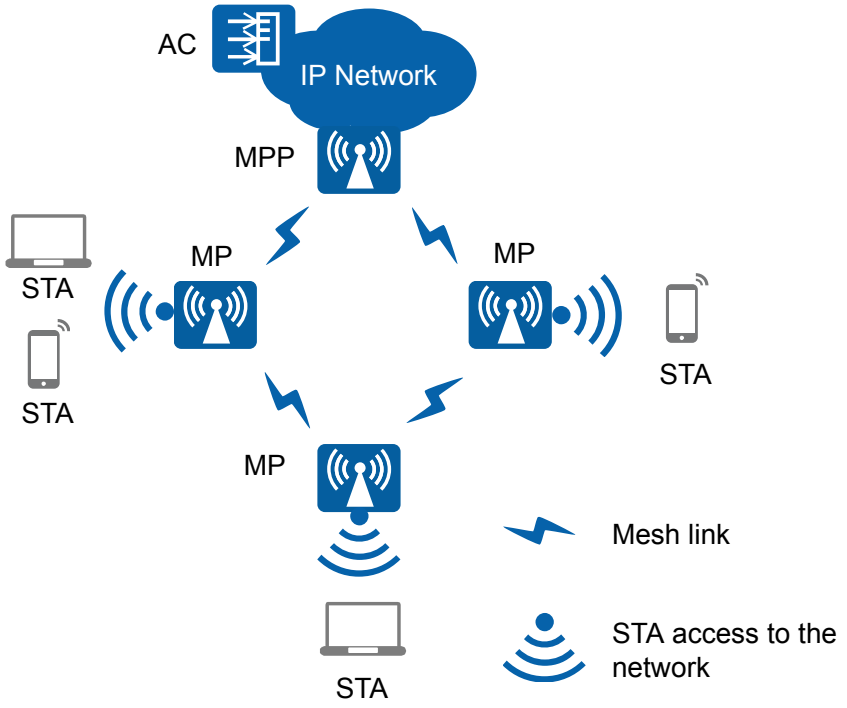

**Figure 2-135** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

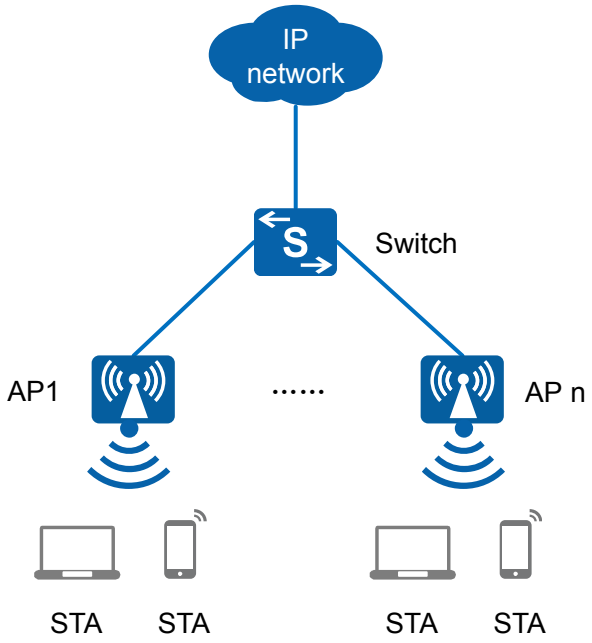
**Figure 2-136** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

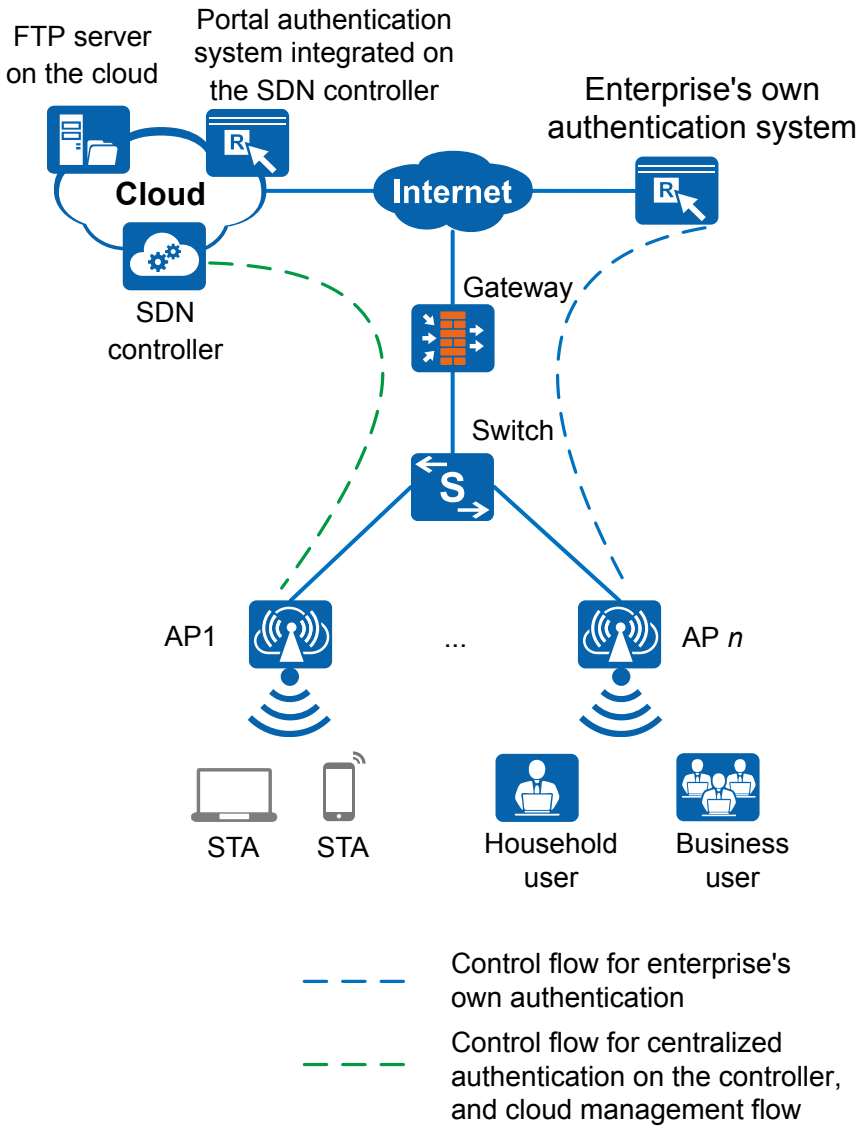
**Figure 2-137** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-138** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.20.3 Hardware Information (AP4050DE-M)

### Appearance

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

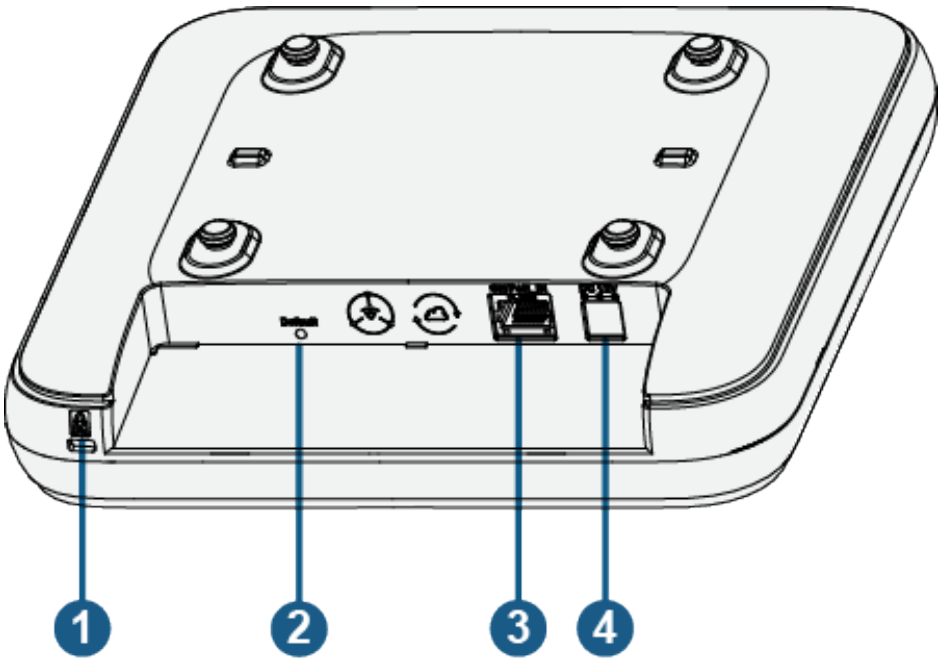
  

**Figure 2-139** Appearance

## Ports

**Figure 2-140** Ports




As shown in **Figure 2-140**, each port can be described as follows:

1. Security slot: Connects to a security lock.
2. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
3. GE/PoE_IN: GE/PoE_IN
4. DC 12V: DC 12V

## LED Indicators

The AP4050DE-M provides only a single indicator, as shown in **Figure 2-141**.

NOTE

Indicator colors may vary slightly at different temperature.

**Figure 2-141** Indicator

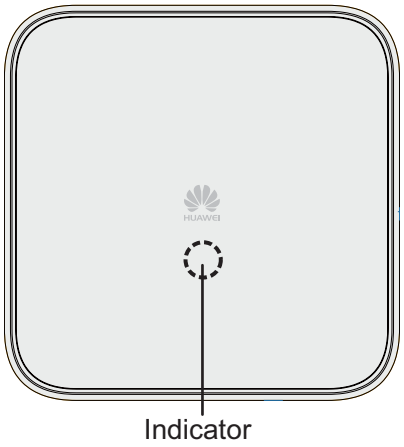



**Table 2-71** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-72** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 47 mm x 200 mm x 200 mm |
| | Weight | 0.7 kg |
| | System memory | ● 256 MB DDR3L<br>● 4 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3at/af |
| | Maximum power consumption | 16.40 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-73** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in dual-band smart omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 3 dBi<br>• 5 GHz: 3 dBi |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 27 dBm (combined power)<br>• 5 GHz: 27 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
|---|---|---|---|
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.20.4 Performance Specifications (AP4050DE-M)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.21 AP4050DE-M-S Product Description

## 2.21.1 Product Characteristics (AP4050DE-M-S)

Huawei AP4050DE-M-S is a wireless access point (AP) that supports 802.11ac Wave 2, 2 x 2 MIMO, and two spatial streams. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets network deployment requirements. The AP has built-in smart antennas, complies with 802.11n and 802.11ac protocols, and can provide gigabit STA access, which greatly improves user experience on wireless networks and applies to small- and medium-sized enterprises, airports and stations, stadiums, cafes, and recreation centers.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- Smart antenna array technology enables targeted signal coverage for mobile terminals, reduces interferences, and improves signal quality. Additionally, it supports millisecond-level switchover as terminals move.
- Built-in Bluetooth to implement precise positioning with eSight
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

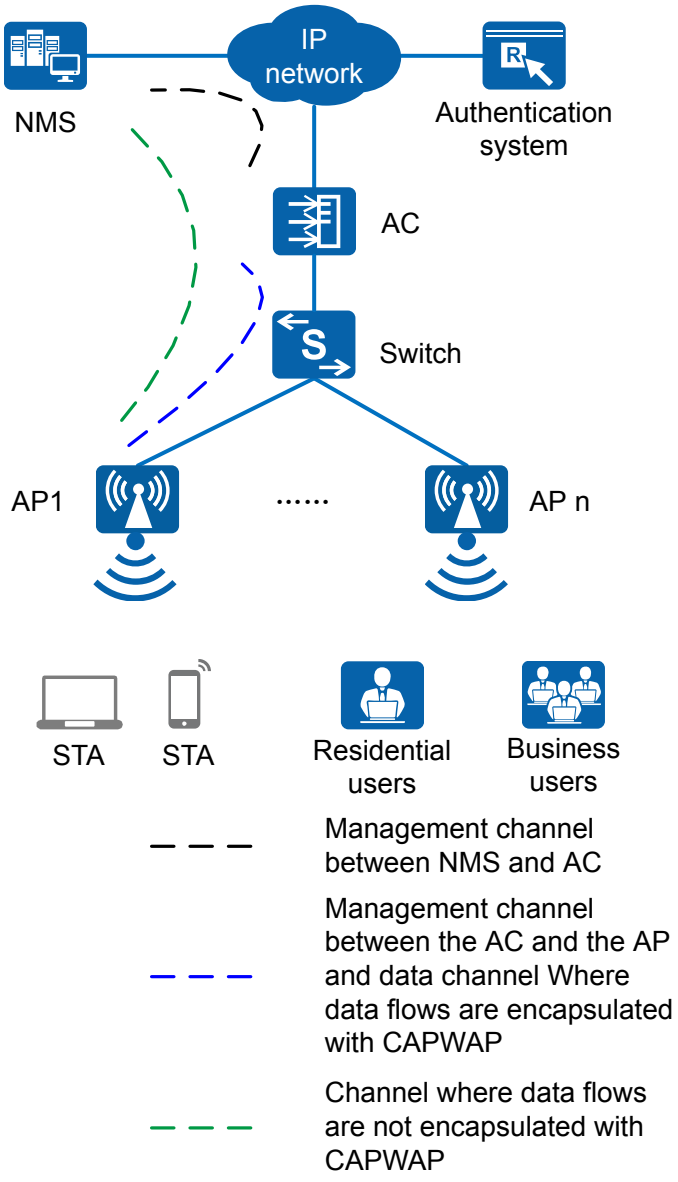
## 2.21.2 Usage Scenarios (AP4050DE-M-S)

The AP4050DE-M-S can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-142** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-143** Fit AP networking (WDS mode: point-to-point)

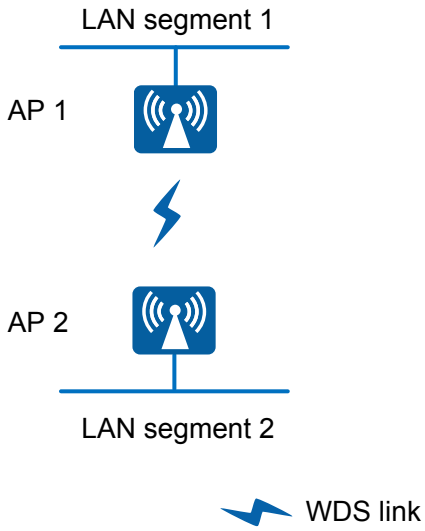
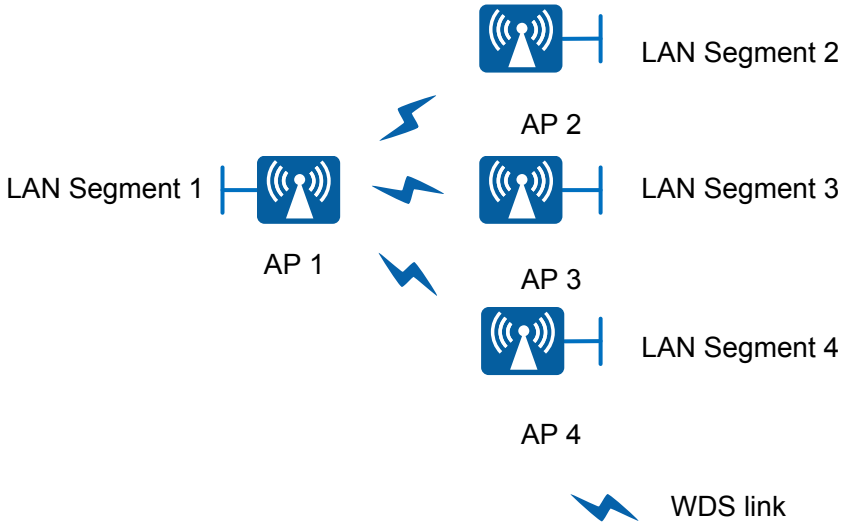


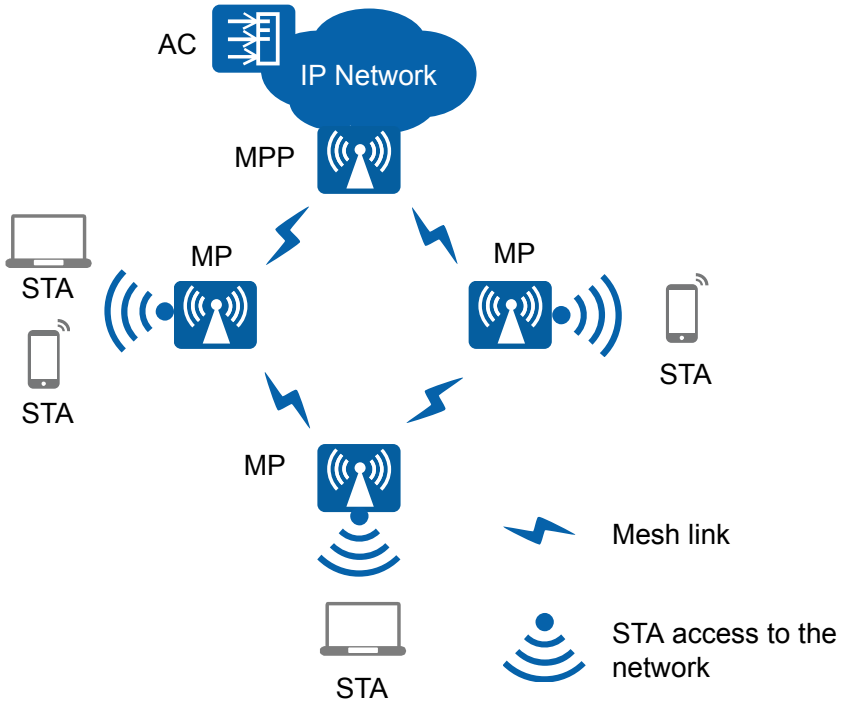

**Figure 2-144** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

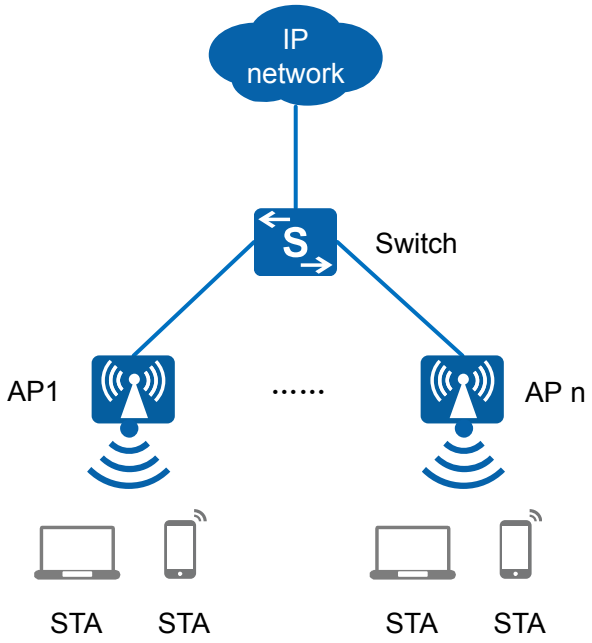
**Figure 2-145** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

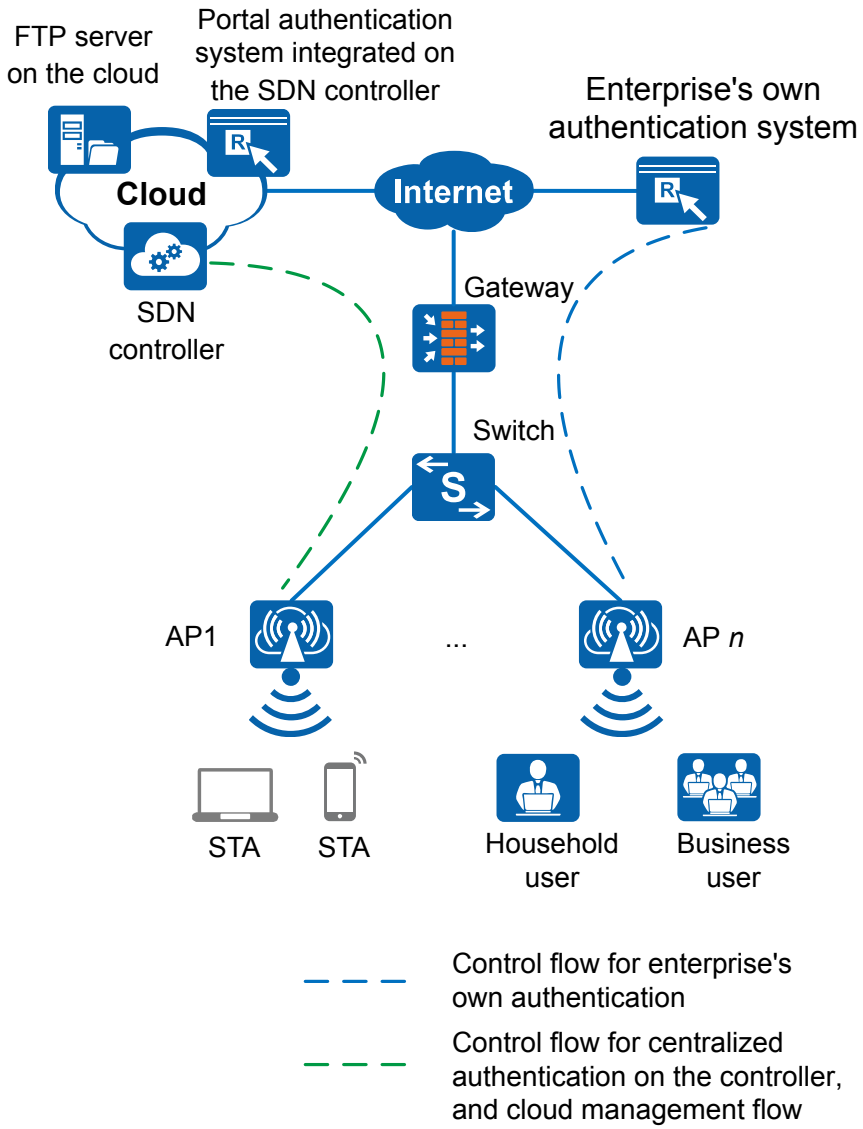
**Figure 2-146** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-147** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.21.3 Hardware Information (AP4050DE-M-S)

### Appearance

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

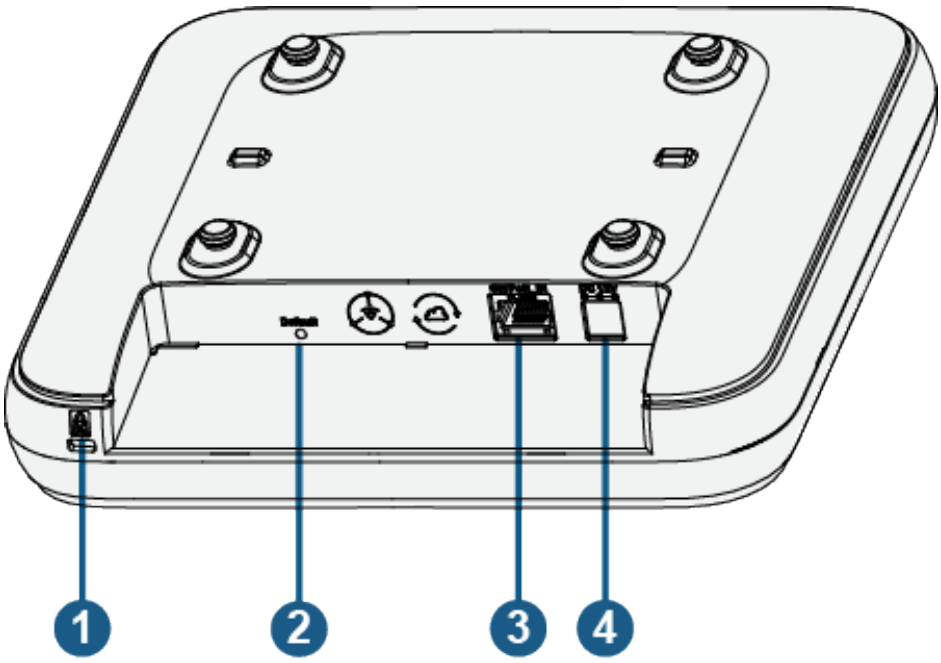
  

**Figure 2-148** Appearance

## Ports

**Figure 2-149** Ports




As shown in **Figure 2-149**, each port can be described as follows:

1. Security slot: Connects to a security lock.
2. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
3. GE/PoE_IN: GE/PoE_IN
4. DC 12V: Connects a 12 V power adapter to the AP.

## LED Indicators

The AP4050DE-M-S provides only a single indicator, as shown in **Figure 2-150**.

NOTE

Indicator colors may vary slightly at different temperature.

**Figure 2-150** Indicator

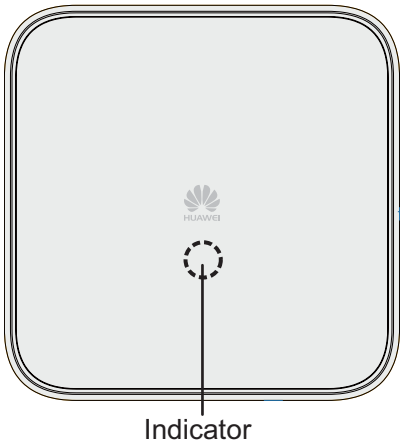



**Table 2-74** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-75** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 47 mm x 200 mm x 200 mm |
| | Weight | 0.7 kg |
| | System memory | ● 256 MB DDR3L<br>● 4 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3at/af |
| | Maximum power consumption | 16.4 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-76** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in dual-band smart omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 3 dBi<br>• 5 GHz: 3 dBi |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 27 dBm (combined power)<br>• 5 GHz: 27 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.21.4 Performance Specifications (AP4050DE-M-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.22 AP4051DN and AP4151DN Product Description

## 2.22.1 Product Characteristics (AP4051DN and AP4151DN)

Huawei AP4051DN and AP4151DN are wireless access points (APs) that support 802.11ac Wave 2, 2 x 2 MIMO, and two spatial streams. They provide comprehensive service support capabilities and feature high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets network deployment requirements. The AP complies with 802.11n and 802.11ac protocols and can provide gigabit STA access, which greatly improves user experience on wireless networks and applies to small- and medium-sized enterprises, airports and stations, stadiums, cafes, and recreation centers.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- Dual gigabit Ethernet uplink interfaces supporting PoE for power backup
- USB interface used for external power supply and storage
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

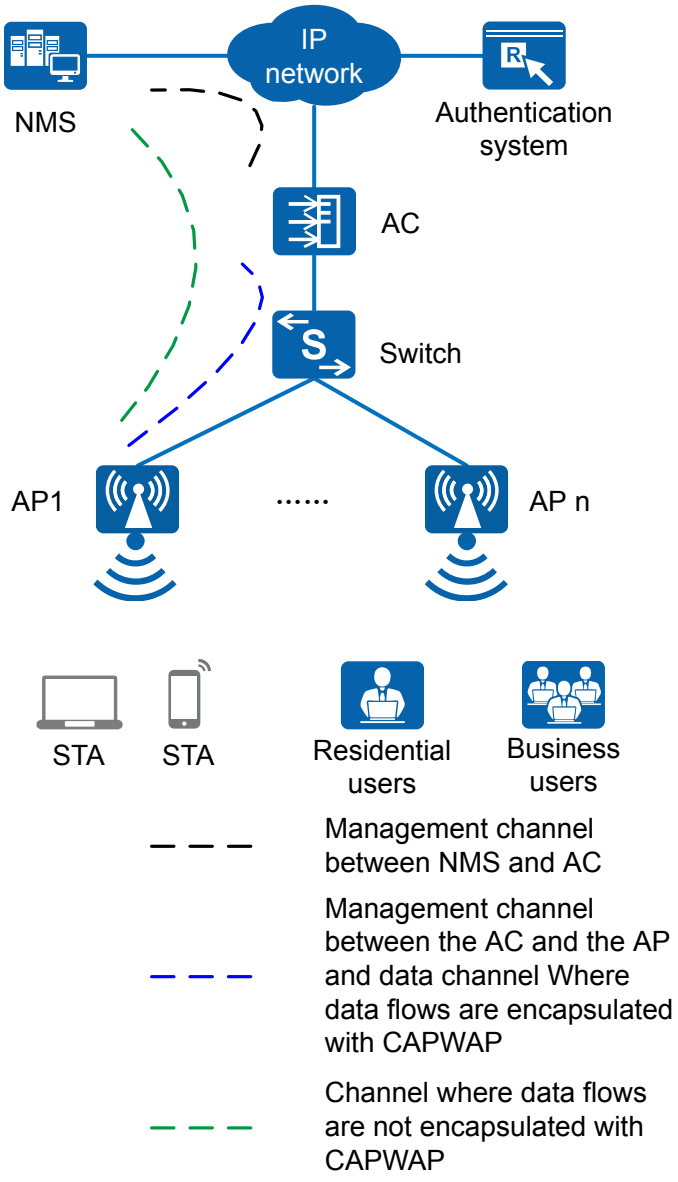
## 2.22.2 Usage Scenarios (AP4051DN and AP4151DN)

The AP4051DN and AP4151DN can work in Fat AP, Fit AP, or cloud AP mode. They can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-151** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-152** Fit AP networking (WDS mode: point-to-point)

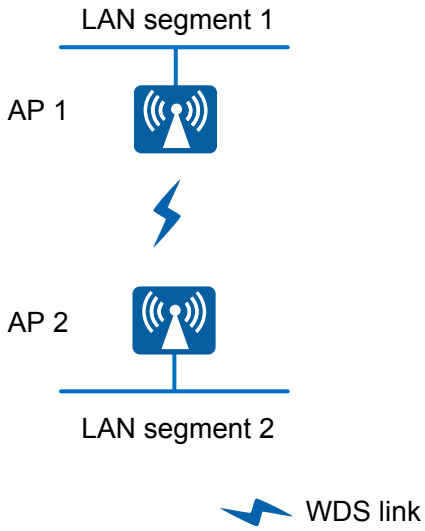
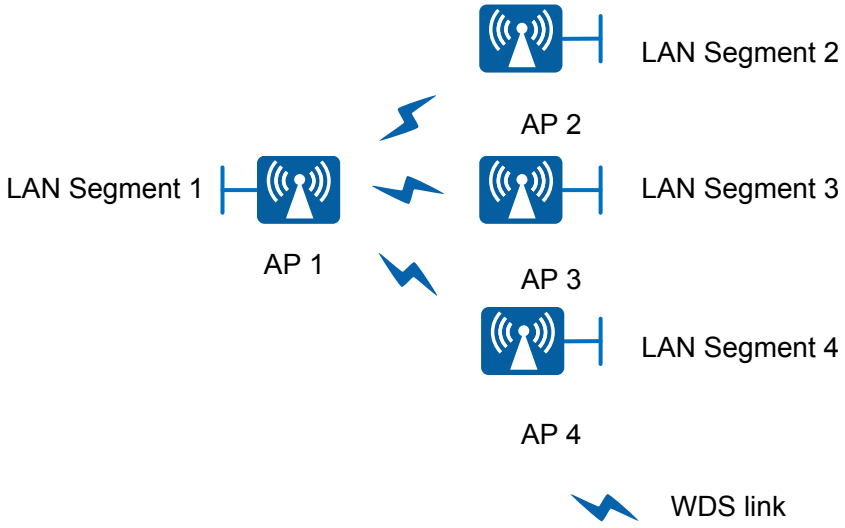


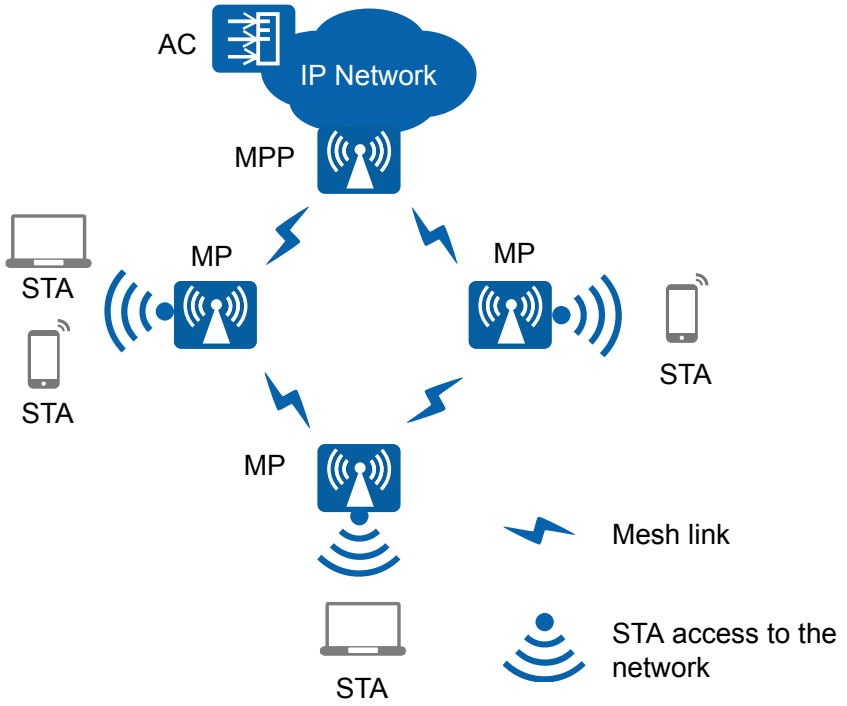

**Figure 2-153** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

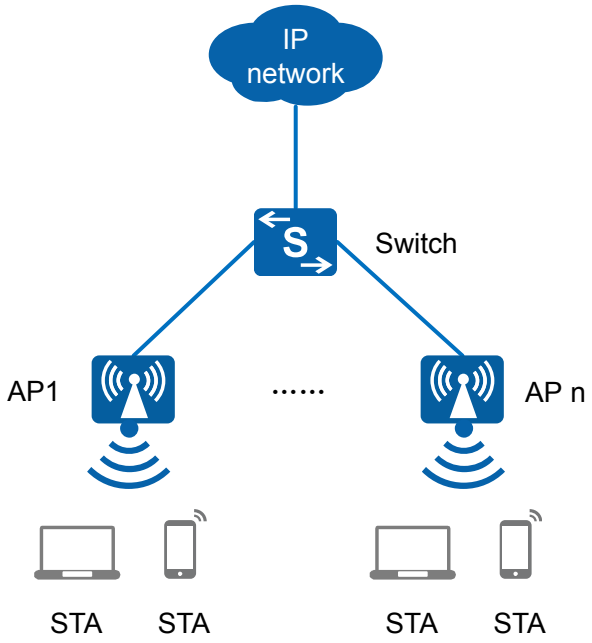
**Figure 2-154** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

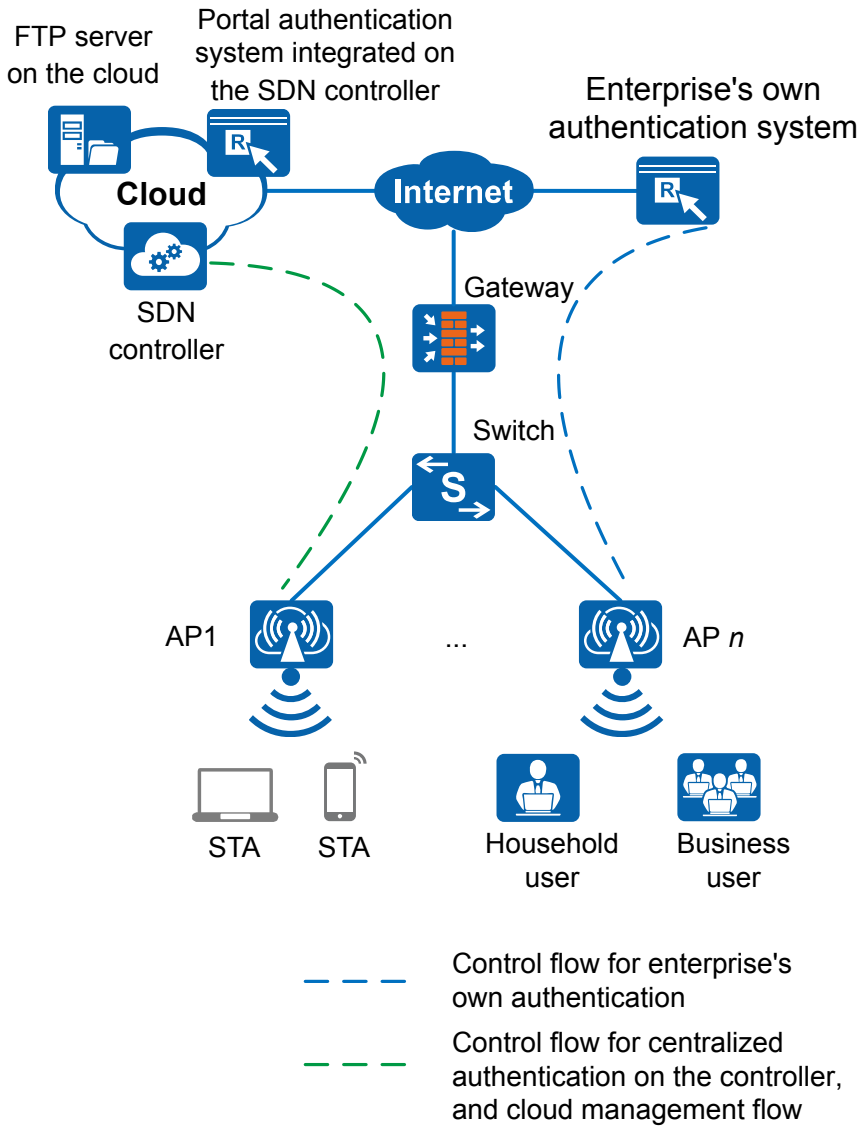
**Figure 2-155** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-156** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.22.3 Hardware Information (AP4051DN)

### Appearance

NOTE

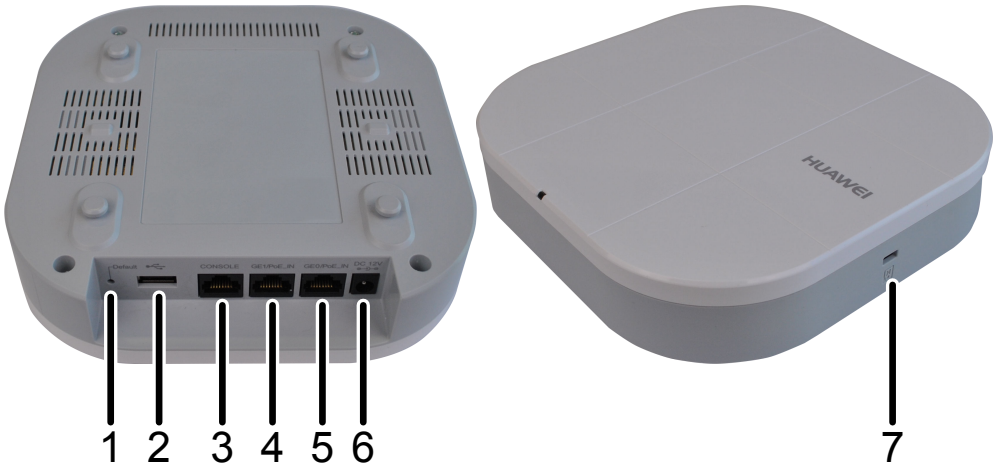
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-157** AP4051DN appearance


## Ports

**Figure 2-158** AP4051DN ports




As shown in **Figure 2-158**, each port can be described as follows:

1. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.

3. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
4. GE1/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input. PoE power supplies on two Ethernet ports are supported.
5. GE0/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input. PoE power supplies on two Ethernet ports are supported.
6. DC 12V: Connects a 12 V power adapter to the AP.
7. Security slot: Connects to a security lock.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-77** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-78** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 35 mm x 170 mm x 170 mm (1.38 in. x 6.69 in. x 6.69 in.) |
| | Weight | 0.43 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 64 MB NOR FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 12.3 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature and altitude | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-79** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional dual-band antenna |
| Antenna gain | • 2.4 GHz: 5 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

# 2.22.4 Hardware Information (AP4151DN)

## Appearance

NOTE

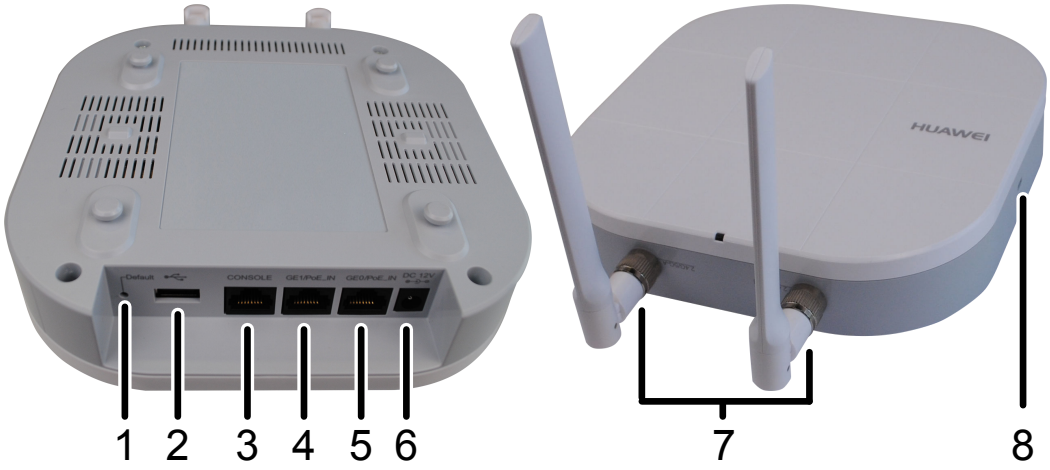
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-159** AP4151DN appearance


## Ports

**Figure 2-160** AP4151DN ports



As shown in **Figure 2-160**, each port can be described as follows:

1. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
3. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
4. GE1/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input. PoE power supplies on two Ethernet ports are supported.
5. GE0/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input. PoE power supplies on two Ethernet ports are supported.
6. DC 12V: Connects a 12 V power adapter to the AP.
7. Antenna port: Connects an antenna to the AP to send and receive wireless signals. The port type is RP-SMA-K.
8. Security slot: Connects to a security lock.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-80** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-81** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 35 mm x 170 mm x 170 mm (1.38 in. x 6.69 in. x 6.69 in.) |
| | Weight | 0.45 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 64 MB NOR FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3af/at |

| Item | | Description |
| --- | --- | --- |
| | Maximum power consumption | 12.3 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature and altitude | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-82** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | External dual-band combined antenna |
| Antenna gain | • 2.4 GHz: 3.5 dBi<br>• 5 GHz: 4 dBi |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.22.5 Performance Specifications (AP4051DN and AP4151DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.23 AP4051DN-S Product Description

## 2.23.1 Product Characteristics (AP4051DN-S)

Huawei AP4051DN-S is a wireless Access Point (AP) that complies with 802.11ac Wave 2 and supports 2 x 2 MIMO and two spatial streams. It has comprehensive service support capabilities including high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. The AP4051DN-S supports 802.11n and 802.11ac, and provides gigabit access for STAs, which greatly improve user experience on wireless networks and apply to small- and medium-sized enterprises, airports and stations, sports mediums, cafes, and entertainment centers.

- Supports the 802.11ac Wave 2 standard and MU-MIMO, and provides services simultaneously on both 2.4 GHz and 5 GHz frequency bands. The maximum rates at the 2.4 GHz and 5 GHz frequency bands are 400 Mbit/s and 867 Mbit/s respectively, and the maximum rate of the device is 1.267 Gbit/s.
- Provides dual GE Ethernet uplink ports that both support the PoE in function, achieving PoE power supply backup.
- Provides a USB port for external power supply and storage.
- Supports the Fat, Fit, and cloud modes.
- Enables Huawei SDN controller to manage and operate APs and services on the APs, reducing network O&M costs.

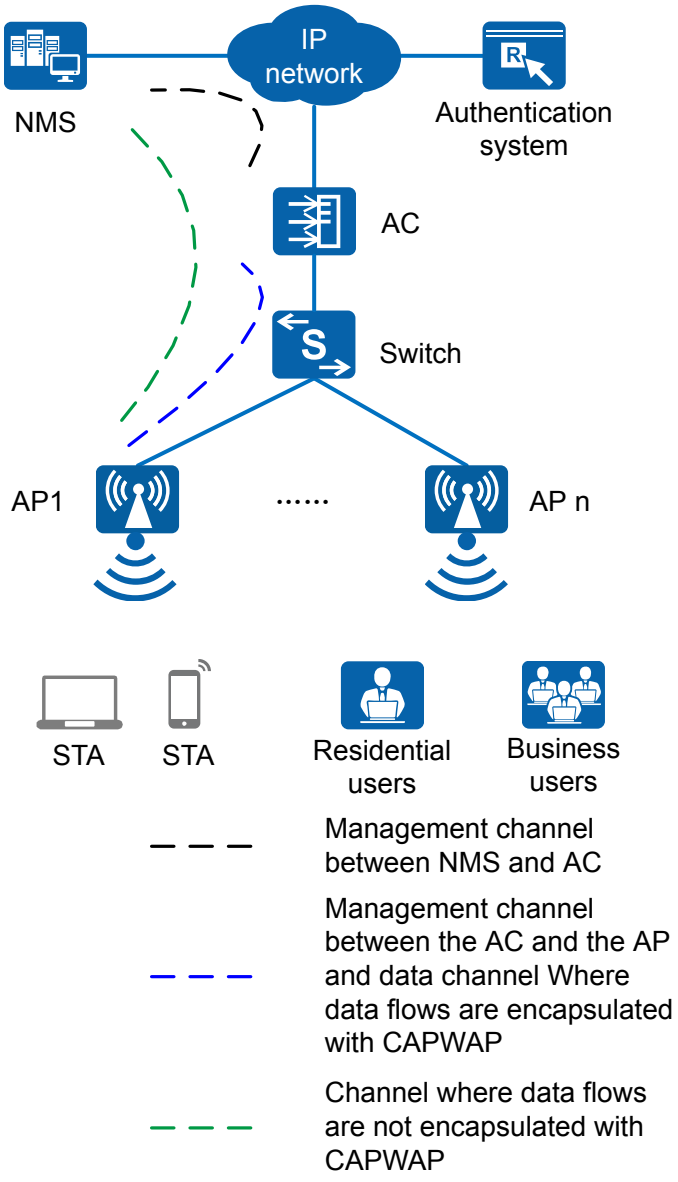
## 2.23.2 Usage Scenarios (AP4051DN-S)

The AP4051DN-S can work as a Fat, Fit, or cloud AP, and switch its working mode based on network planning requirements.

Typical networking modes are as follows:

**Figure 2-161** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-162** Fit AP networking (WDS mode: point-to-point)

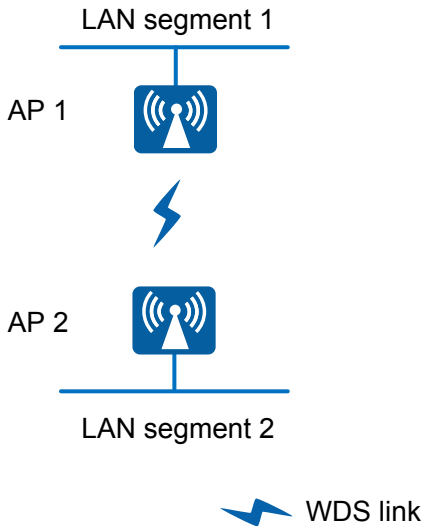
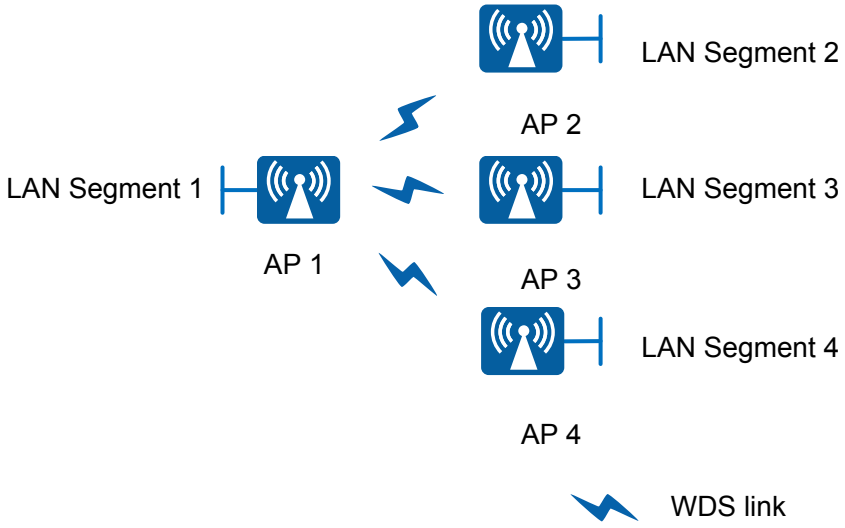


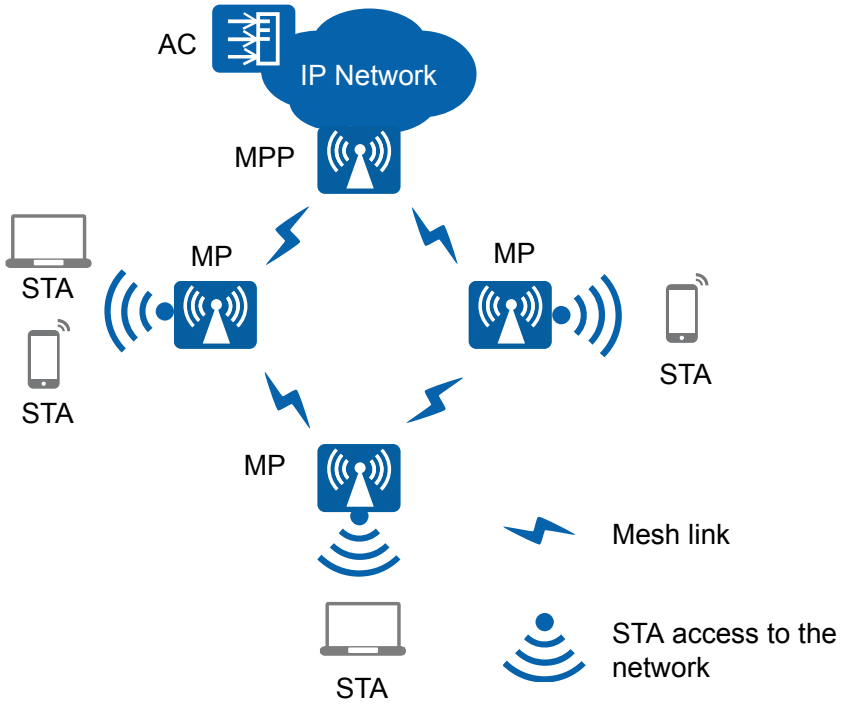

**Figure 2-163** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

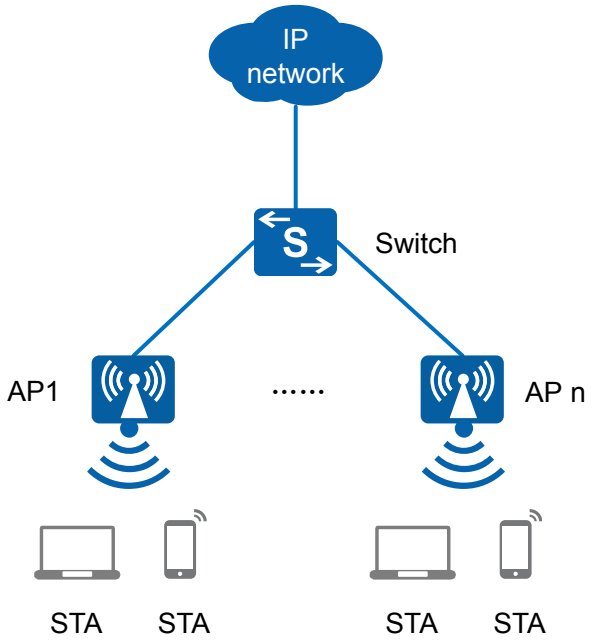
**Figure 2-164** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

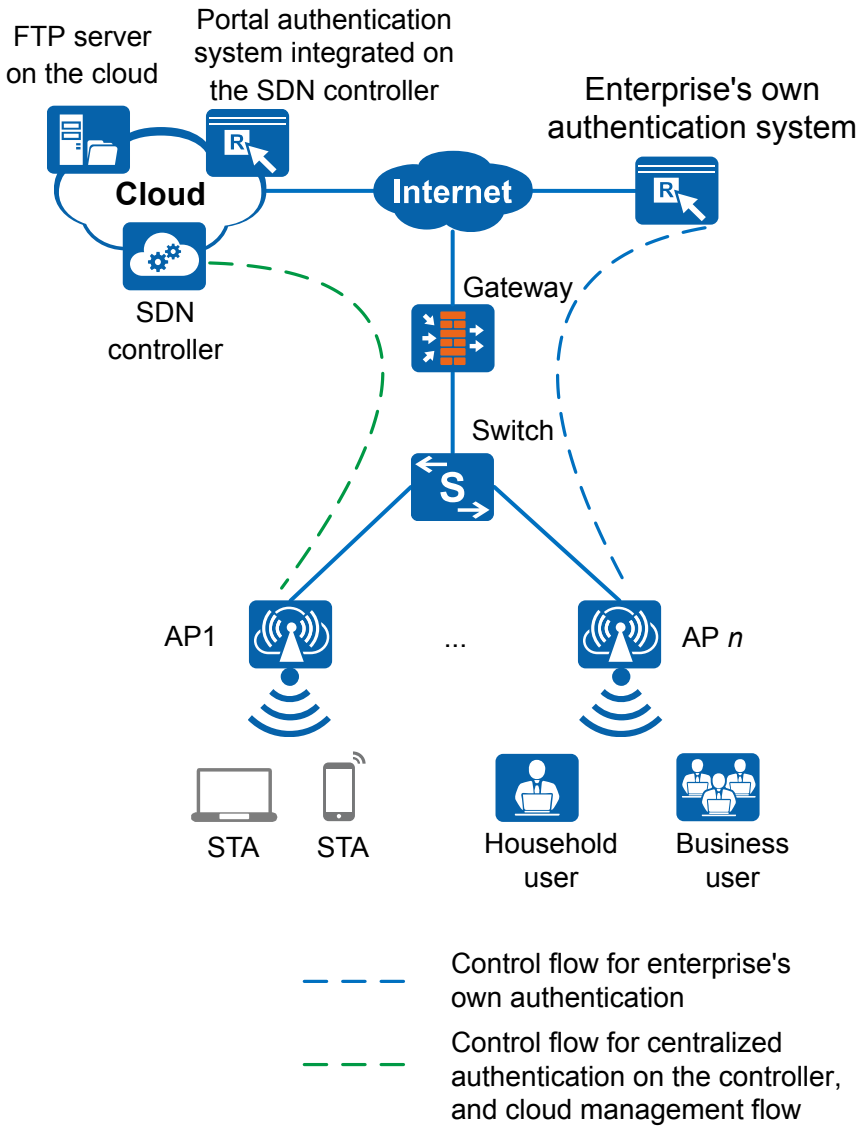
**Figure 2-165** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-166** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.23.3 Hardware Information (AP4051DN-S)

### Appearance

NOTE

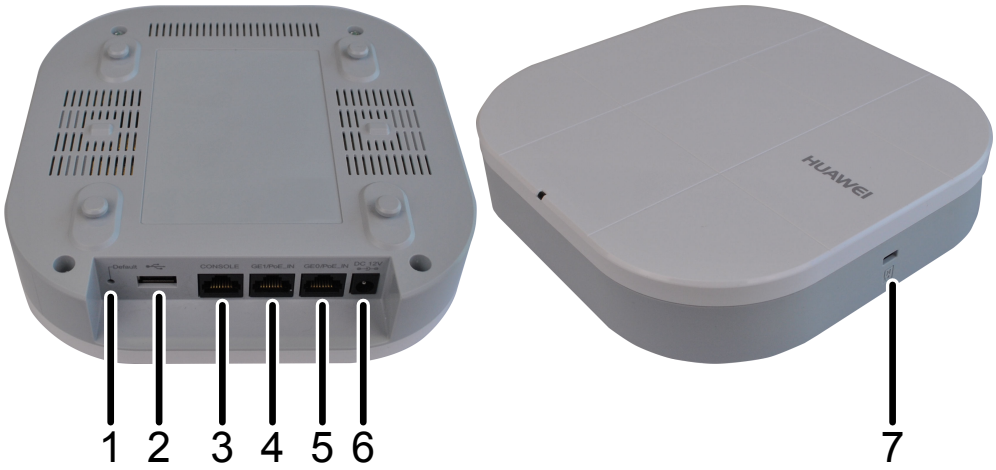
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-167** AP4051DN-S appearance


## Ports

**Figure 2-168** AP4051DN-S ports




As shown in **Figure 2-168**, each interface can be described as follows:

1. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.

3. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
4. GE1/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input. PoE power supplies on two Ethernet ports are supported.
5. GE0/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input. PoE power supplies on two Ethernet ports are supported.
6. DC 12V: Connects a 12 V power adapter to the AP.
7. Security slot: Connects to a security lock.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-83** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-84** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 35 mm x 170 mm x 170 mm (1.38 in. x 6.69 in. x 6.69 in.) |
| | Weight | 0.43 kg |
| | System memory | 256 MB DDR3L |
| | Flash | 64 MB NOR FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 12.3 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment parameters | Operating temperature and altitude | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-85** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional dual-band antenna |
| Antenna gain | • 2.4 GHz: 5 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual maximum transmit power varies depending on local laws and regulations. |

| Item | Description | | |
|---|---|---|---|
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.23.4 Performance Specifications (AP4051DN-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.24 AP4051TN Product Description

## 2.24.1 Product Characteristics (AP4051TN)

Huawei AP4051TN is an 802.11ac Wave 2 wireless access point (AP). It has three radios: one 2.4 GHz radio and two 5 GHz radios. The 2.4 GHz radio supports 2x2 MIMO and two spatial streams; one 5 GHz radio supports 2x2 MIMO and two spatial streams; and the other 5 GHz radio supports 4x4 MIMO and four spatial streams. The AP4051TN provides comprehensive service support capabilities, and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meet network deployment requirements. The AP supports 802.11n and 802.11ac and can provide gigabit access for wireless users, greatly improving wireless

network experience. The AP is applicable to e-classrooms, shopping malls, and supermarkets.

- 802.11ac Wave 2 compliance, delivering services simultaneously on one 2.4G radio and two 5G radios (one 5G radio supporting 2x2 MU-MIMO and the other 5G radio supporting 4x4 MU-MIMO); 400 Mbit/s at 2.4 GHz, 867 Mbit/s + 1733 Mbit/s at 5 GHz, and 3 Gbit/s for the device.
- Provides dual GE Ethernet uplink ports that both support the PoE in function, achieving PoE power supply backup.
- Provides USB ports for storage and external power supply, and supports IoT application extension.
- Provides built-in Bluetooth to implement precise location with eSight.
- Supports the Fat, Fit, and cloud modes.
- Enables Huawei SDN controller to manage and operate APs and services on the APs, reducing network O&M costs.

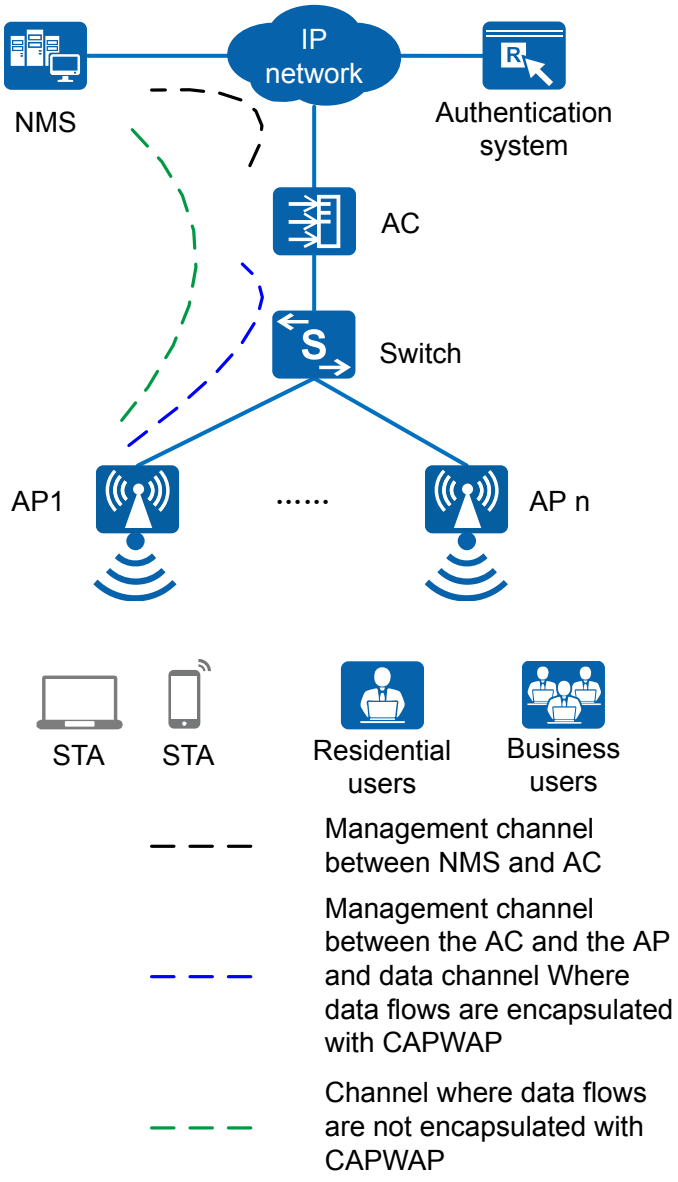
## 2.24.2 Usage Scenarios (AP4051TN)

The AP4051TN can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-169** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-170** Fit AP networking (WDS mode: point-to-point)

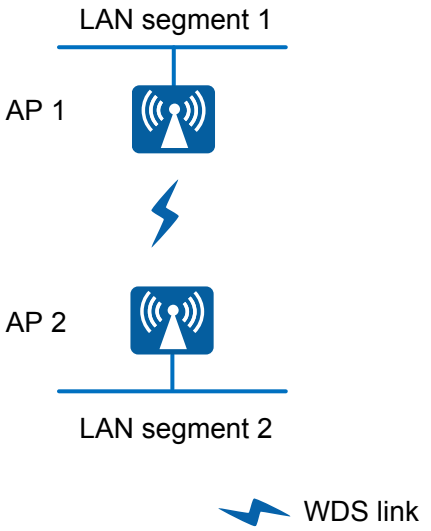
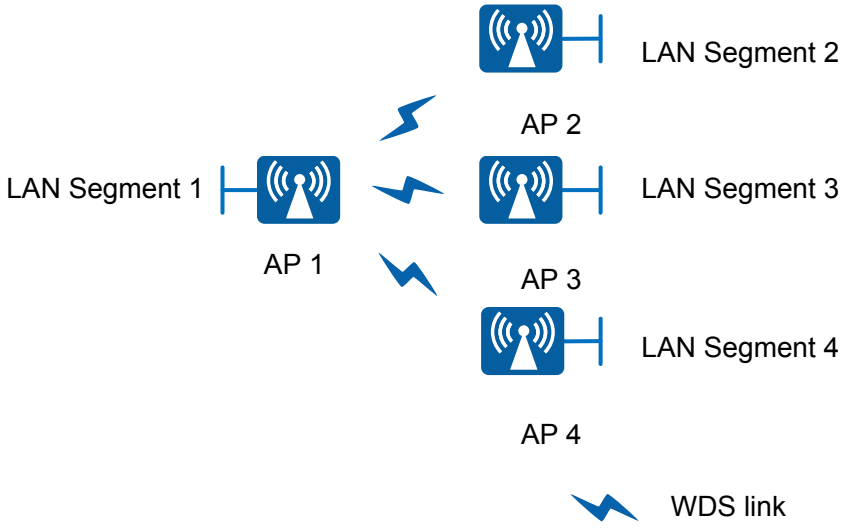


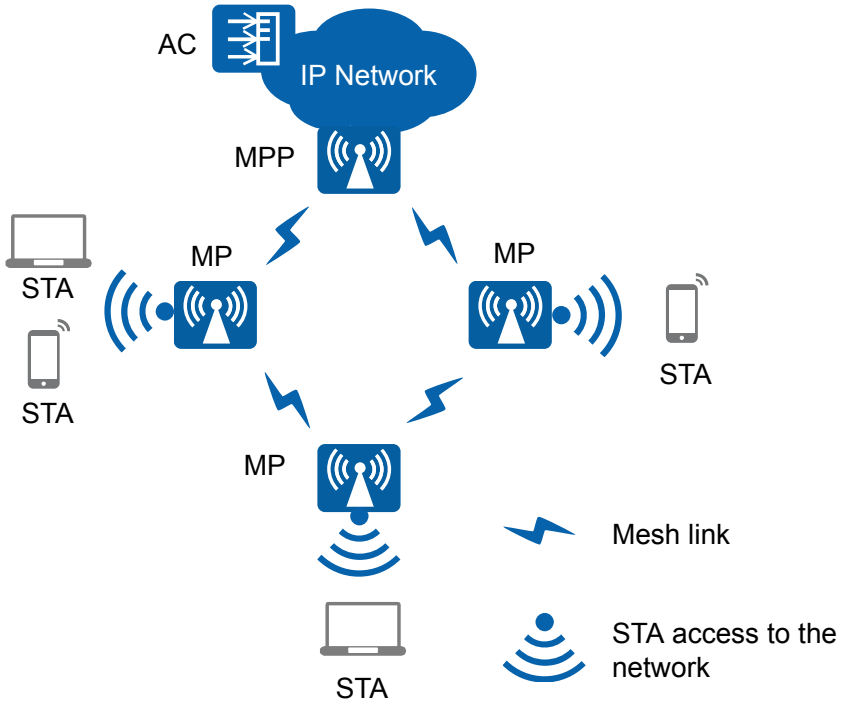

**Figure 2-171** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. The AP can implement wireless bridging and access functions.

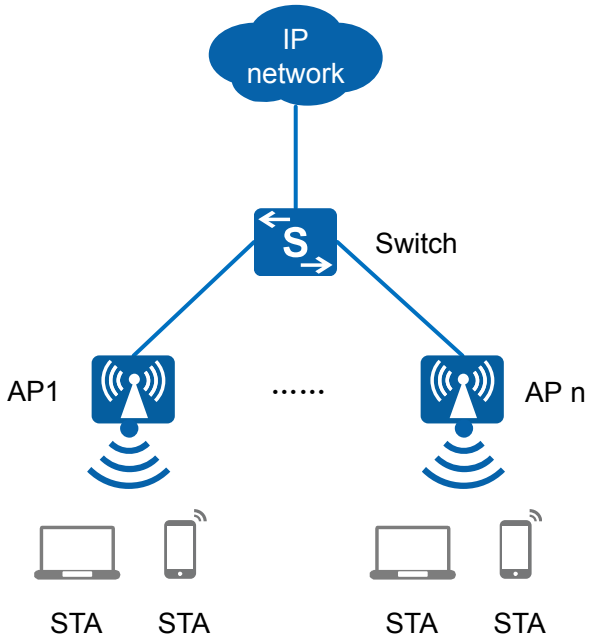
**Figure 2-172** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

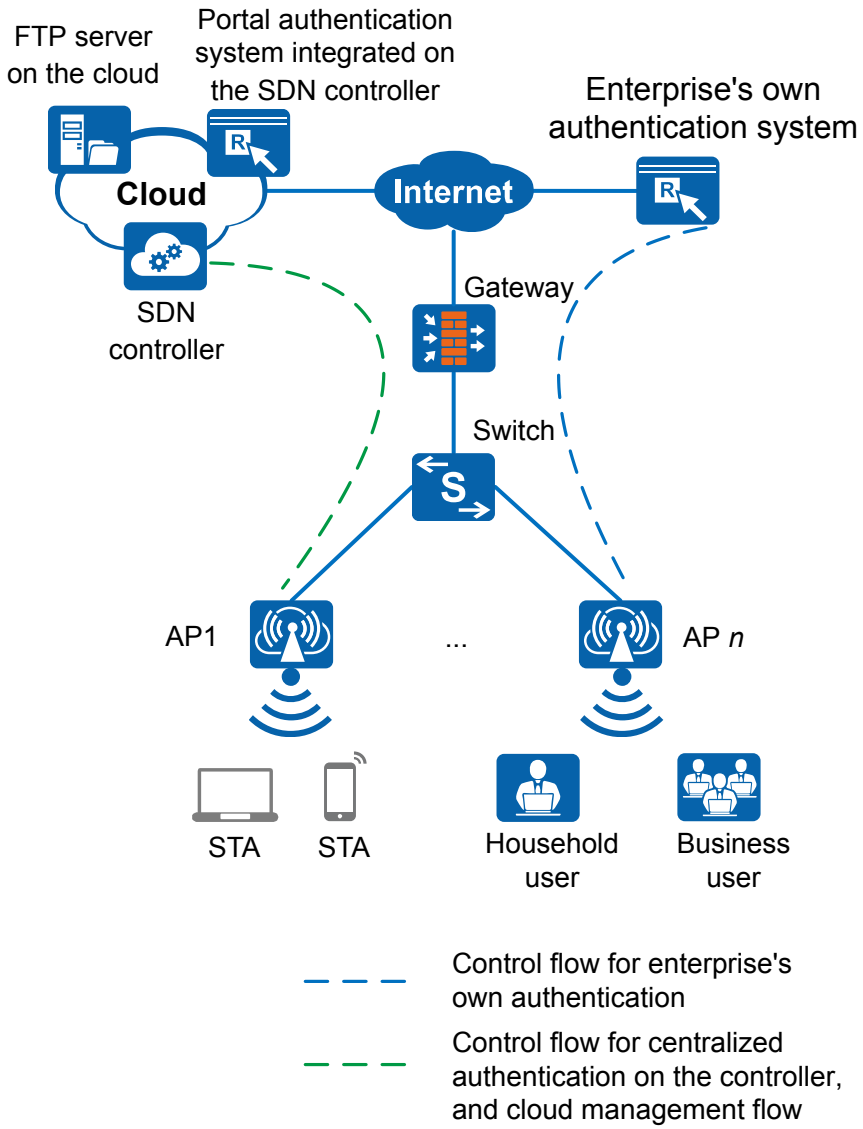
**Figure 2-173** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-174** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.24.3 Hardware Information (AP4051TN)

### Appearance

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

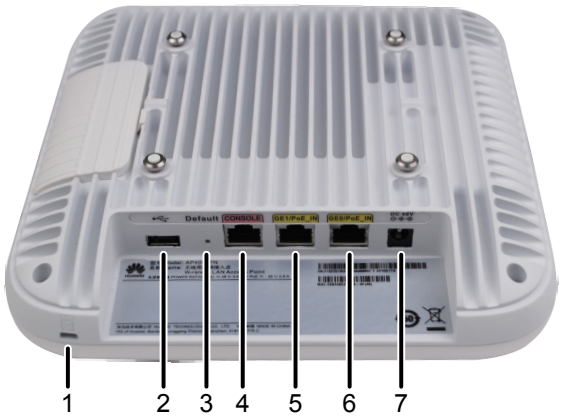
  

**Figure 2-175** AP4051TN appearance

## Ports

**Figure 2-176** AP4051TN ports




As shown in **Figure 2-176**, each port can be described as follows:

1. Security slot: Connects to a security lock.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
3. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

4. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
5. GE1/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
6. GE0/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
7. DC 48V: Connects a power adapter to the AP.

## LED Indicators

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 2-177** Indicator

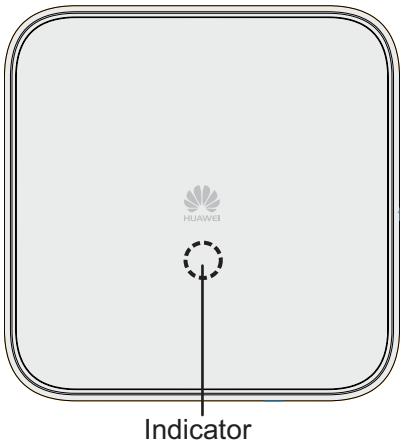



**Table 2-86** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-87** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 52 mm × 220 mm × 220 mm (2.05 in. x 8.66 in. x 8.66 in.) |
| | Weight | 1.35 kg |
| | System memory | 512 MB DDR3L |

| Item | | Description |
| --- | --- | --- |
| | Flash | 4 MB NOR FLASH + 128 MB Nand FLASH |
| Power specifications | Power input | • DC: 42.5 V to 57 V<br>• PoE power supply: in compliance with IEEE 802.3at/af |
| | Maximum power consumption | • DC/802.3at power supply: 22 W (excluding the output power of the USB port)<br>• 802.3af power supply: 12.95 W (The USB function is unavailable.)<br>**NOTE**<br>• The actual maximum power consumption depends on local laws and regulations.<br>• In 802.3af power supply mode, a radio uses a single spatial stream to send signals. |
| Environment specifications | Operating temperature and altitude | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-88** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 2.2 dBi<br>• 5 GHz (Radio 1): 2.7 dBi<br>• 5 GHz (Radio 2): 2.7 dBi |

<table>
<tr><th>Item</th><th colspan="4">Description</th></tr>
<tr><td>Maximum number of users</td><td colspan="4">• Fit AP: ≤ 768<br>• Fat AP: ≤ 768<br>• Cloud AP: ≤ 768<br>NOTE<br>The actual number of users varies according to the environment.</td></tr>
<tr><td>Maximum number of VAPs for each radio</td><td colspan="4">16</td></tr>
<tr><td>Maximum transmit power</td><td colspan="4">• 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz (Radio 1): 22 dBm (combined power)<br>• 5 GHz (Radio 2): 23 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (Radio 1) (5.5 GHz to 5.825 GHz)<br>• 802.11a<br>– 20MHz: 5<br>• 802.11n<br>– 20 MHz: 5<br>– 40 MHz: 2<br>• 802.11ac<br>– 20 MHz: 5<br>– 40 MHz: 2<br>– 80 MHz: 1</td><td>5 GHz (Radio 2) (5.18 GHz to 5.32 GHz)<br>• 802.11a<br>– 20 MHz: 8<br>• 802.11n<br>– 20 MHz: 8<br>– 40 MHz: 4<br>• 802.11ac<br>– 20 MHz: 8<br>– 40 MHz: 4<br>– 80 MHz: 2<br>– 160 MHz: 1</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
</table>

| Item | Description |
| --- | --- |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n:<br>– Radio 0: 6.5 to 400 Mbit/s<br>– Radio 1: 6.5 to 400 Mbit/s<br>– Radio 2: 6.5 to 800 Mbit/s<br>• 802.11ac:<br>– Radio 1: 6.5 to 867 Mbit/s<br>– Radio 2: 6.5 to 1733 Mbit/s |

### 2.24.4 Performance Specifications (AP4051TN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

## 2.25 AP4130DN Product Description

## 2.25.1 Product Characteristics (AP4130DN)

**Table 2-89** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
|---|---|---|---|---|
| AP4130DN | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP4130DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The cost-effective AP4130DN supports 2 x 2 MIMO and provides comprehensive service support capabilities. It is deployed indoors and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. Huawei AP4130DN complies with IEEE 802.11ac and can provide gigabit access for wireless users. This high capacity greatly improves user experience on wireless networks. | The AP4130DN provides 802.11n/ac wireless access networks for places with simple building structure, small size, dense users, and high capacity demands, such as small and medium enterprises and branches. It can be flexibly deployed in different environments.<br>The AP4130DN can be flexibly deployed and work in hybrid mode (Fit AP+bridge). |

## 2.25.2 Usage Scenarios (AP4130DN)

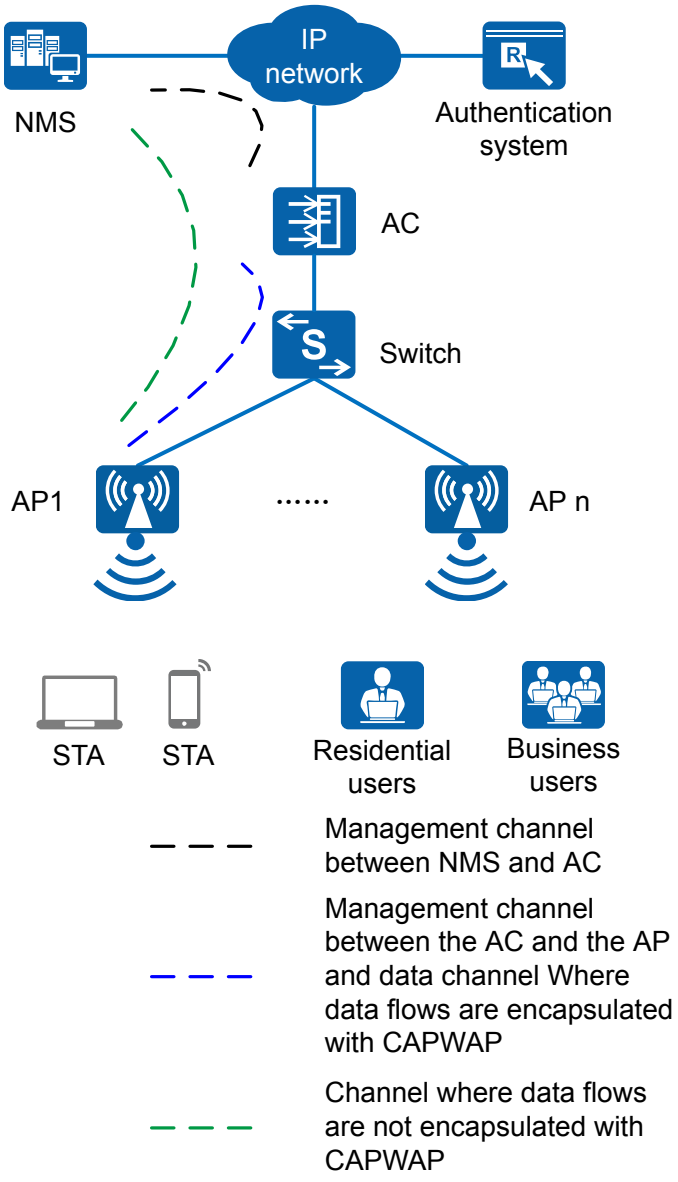
The AP4130DN can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on the network plan.

When the wireless network scale is small, customers need to purchase only AP products and configure the APs to work as Fat APs. As the network scale expands, tens of or hundreds of APs exist on the network. To simplify network management, customers are advised to purchase ACs to perform centralized management on the APs and set the APs to work as Fit APs.

Typical networking modes are as follows:

**Figure 2-178** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-179** Fit AP networking (WDS mode: point-to-point)

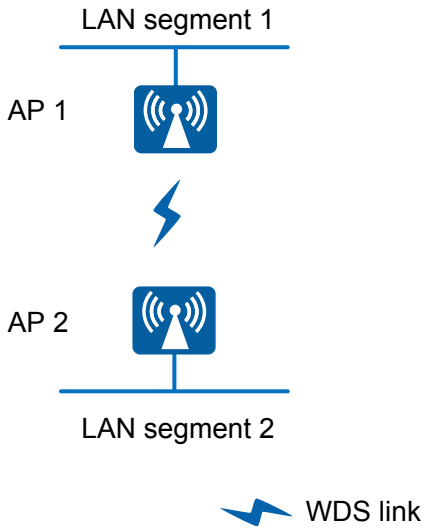
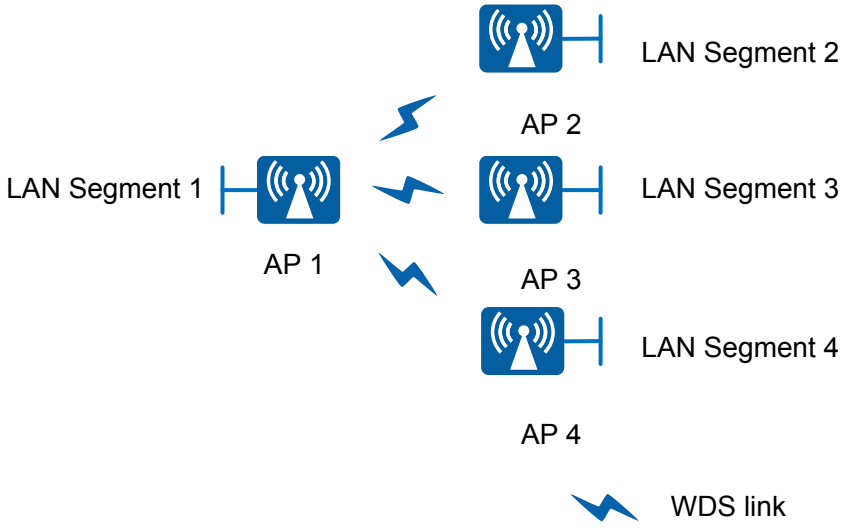


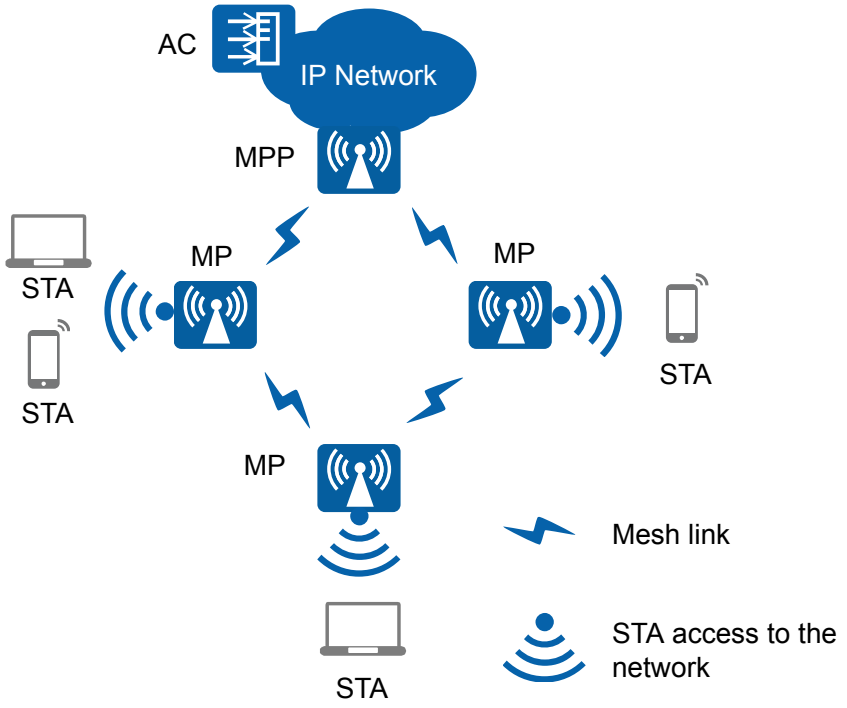

**Figure 2-180** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

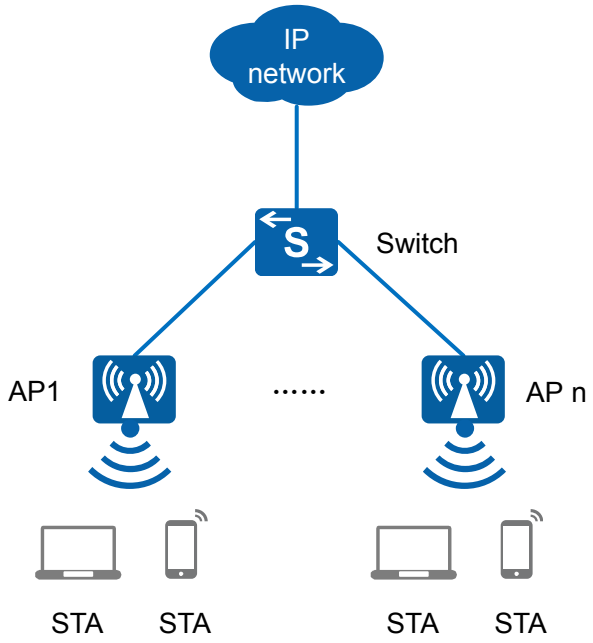
**Figure 2-181** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

**Figure 2-182** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

## 2.25.3 Hardware Information (AP4130DN)

### Appearance

**Figure 2-183** shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

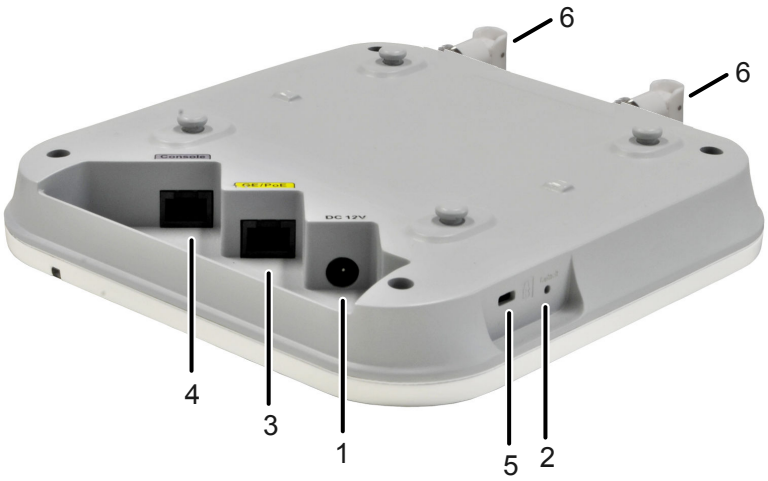
  

**Figure 2-183** AP4130DN appearance

## Port

The following figure shows ports on the AP4130DN.

**Figure 2-184** AP4130DN ports




As shown in **Figure 2-184**, each port can be described as follows:

- 1. Input port for 12 V DC power supply
- 2. Default button: restores factory settings if you hold down the button more than 3 seconds.
- 3. GE/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.

- 4. Console port: connects to the maintenance terminal for AP configuration and management.
- 5. Lock port: protects the AP against theft.
- 2.4G/5G: Connects a 2.4GHz/5GHz dual-band antenna to the AP to send and receive wireless signals. The port type is RP-SMA-K.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-90** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-91** Basic specifications of the AP4130DN

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 39.5 mm x 180 mm x 180 mm |
| | Weight | 0.4 kg |
| | System memory | • 256 MB DDR2<br>• 32 MB Flash |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 10.2 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | -60 m to +1800 m: -10°C to +50°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 2-92** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | External dual-band antenna (2.4 GHz and 5 GHz) |
| Antenna gain | Antennas delivered with the APs:<br>• 2.4 GHz: 2.5 dBi<br>• 5 GHz: 4 dBi |
| Maximum number of users | • Fit AP: ≤ 256<br>• Fat AP: ≤ 64 |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 300 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 2.25.4 Performance Specifications (AP4130DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.26 AP430-E Product Description

# 2.26.1 Product Characteristics (AP430-E)

**Table 2-93** Product positioning

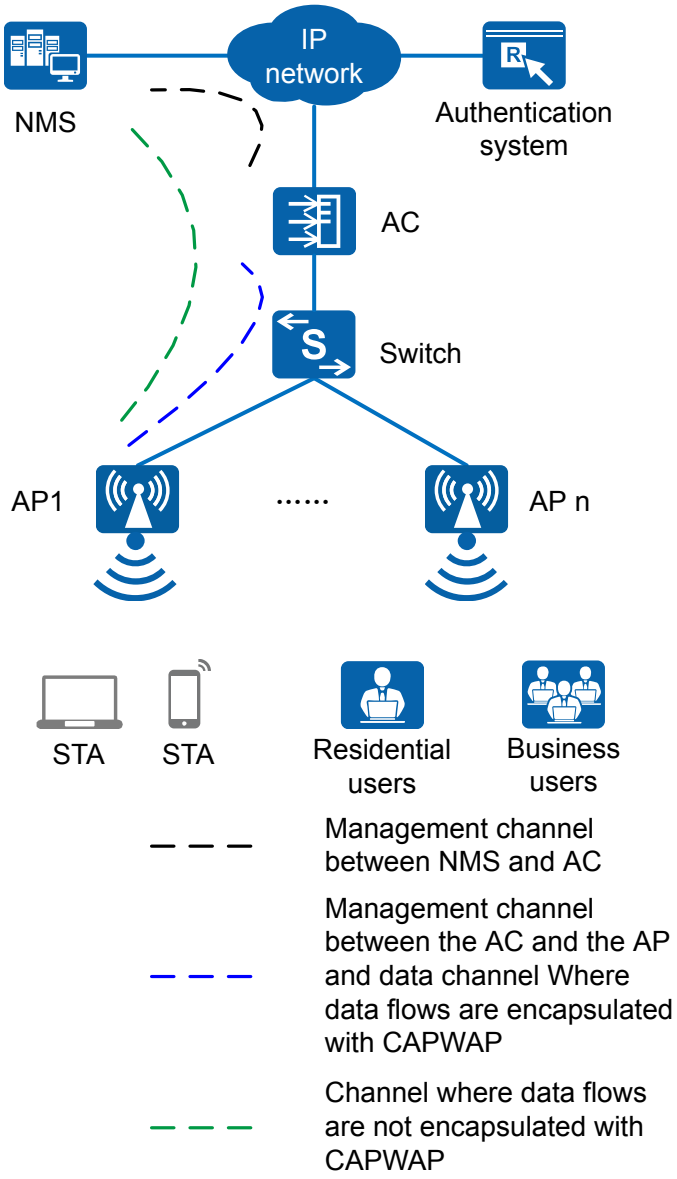
| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP430-E | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP430-E can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The cost-effective AP430-E supports 2x2 MIMO and provides comprehensive service support capabilities. It is deployed indoors and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. Huawei AP430-E complies with IEEE 802.11ac and can provide gigabit access for wireless users. This high capacity greatly improves user experience on wireless networks. | The AP430-E provides 802.11n/ac wireless access networks for places with simple building structure, small size, dense users, and high capacity demands, such as small and medium enterprises and branches. It can be flexibly deployed in different environments.<br>The AP430-E can work in hybrid mode (Fit AP and bridge). |

## 2.26.2 Usage Scenarios (AP430-E)

Typical networking modes are as follows:

**Figure 2-185** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-186** Fit AP networking (WDS mode: point-to-point)

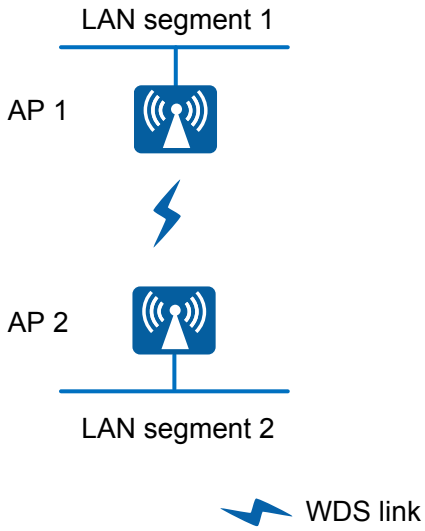
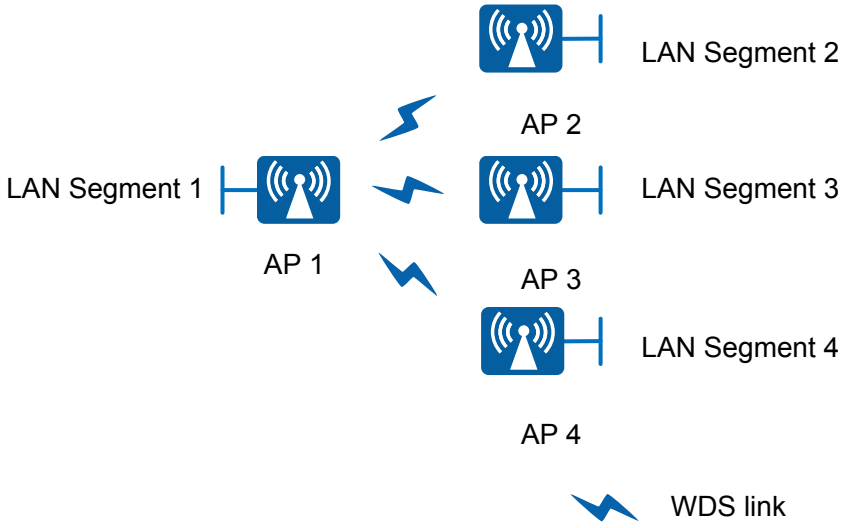


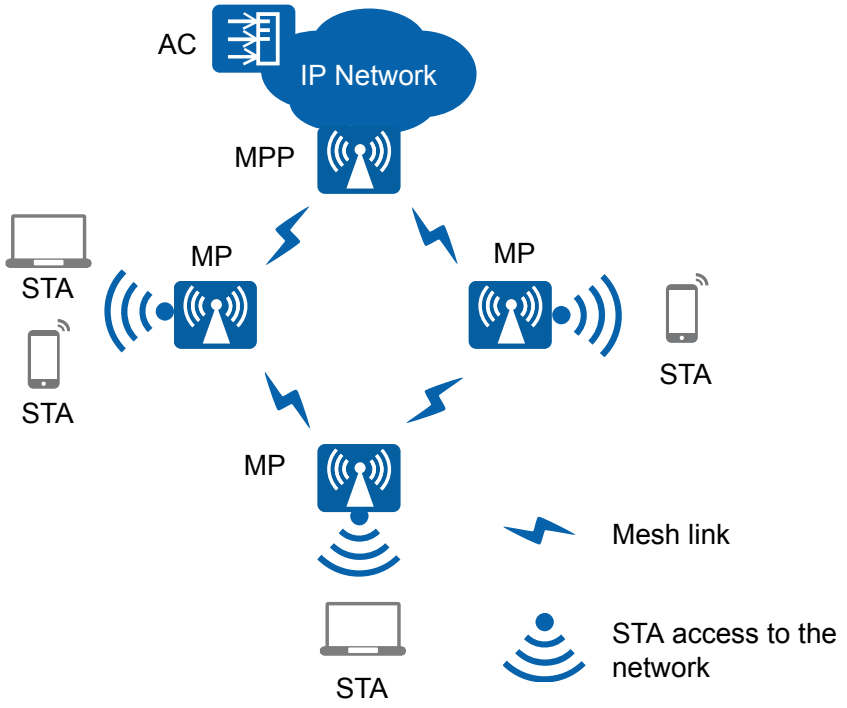

**Figure 2-187** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

**Figure 2-188** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

## 2.26.3 Hardware Information (AP430-E)

### Appearance

Figure 2-189 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

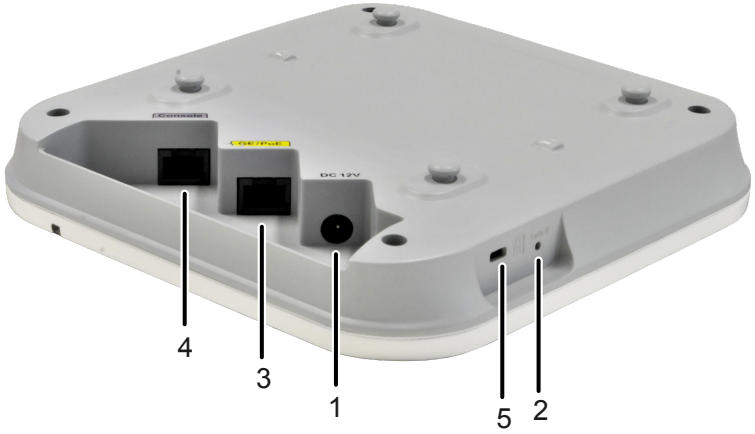
  

**Figure 2-189** AP430-E appearance

## Port

**Figure 2-190** shows ports on the AP430-E.

**Figure 2-190** AP430-E ports




As shown in **Figure 2-190**, each port can be described as follows:

- 1. Input port for 12 V DC power supply
- 2. Default button: restores factory settings if you hold down the button more than 3 seconds.
- 3. GE/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
- 4. Console port: connects to the maintenance terminal for AP configuration and management.
- 5. Lock port: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-94** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>● The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-95** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 39.5 mm x 180 mm x 180 mm |
| | Weight | 0.4kg |
| | System memory | • 256 MB DDR2<br>• 32 MB Flash |
| Power specifications | Power input | • DC 12 V ± 10%<br>• PoE power: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 10.2 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to +1800 m: -10°C to +50°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-96** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 6 dBi |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum number of users</td><td colspan="3">≤ 256</td></tr>
<tr><td>Maximum number of VAPs for each radio</td><td colspan="3">16</td></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 300 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s</td></tr>
</table>

## 2.26.4 Performance Specifications (AP430-E)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.27 AP5030DN Product Description

# 2.27.1 Product Characteristics (AP5030DN)

**Table 2-97** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP5030DN | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP5030DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The cost-effective AP5030DN supports 3x3 MIMO and provides comprehensive service support capabilities. It is deployed indoors and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. Huawei AP5030DN complies with IEEE 802.11ac and can provide gigabit access for wireless users. This high capacity greatly improves user experience on wireless networks. | The AP5030DN provides 802.11n/ac wireless access networks for places with simple building structure, small size, dense users, and high capacity demands, such as small and medium enterprises and branches. It can be flexibly deployed in different environments.<br>The AP5030DN can be flexibly deployed and work in hybrid mode (Fit AP +bridge). |

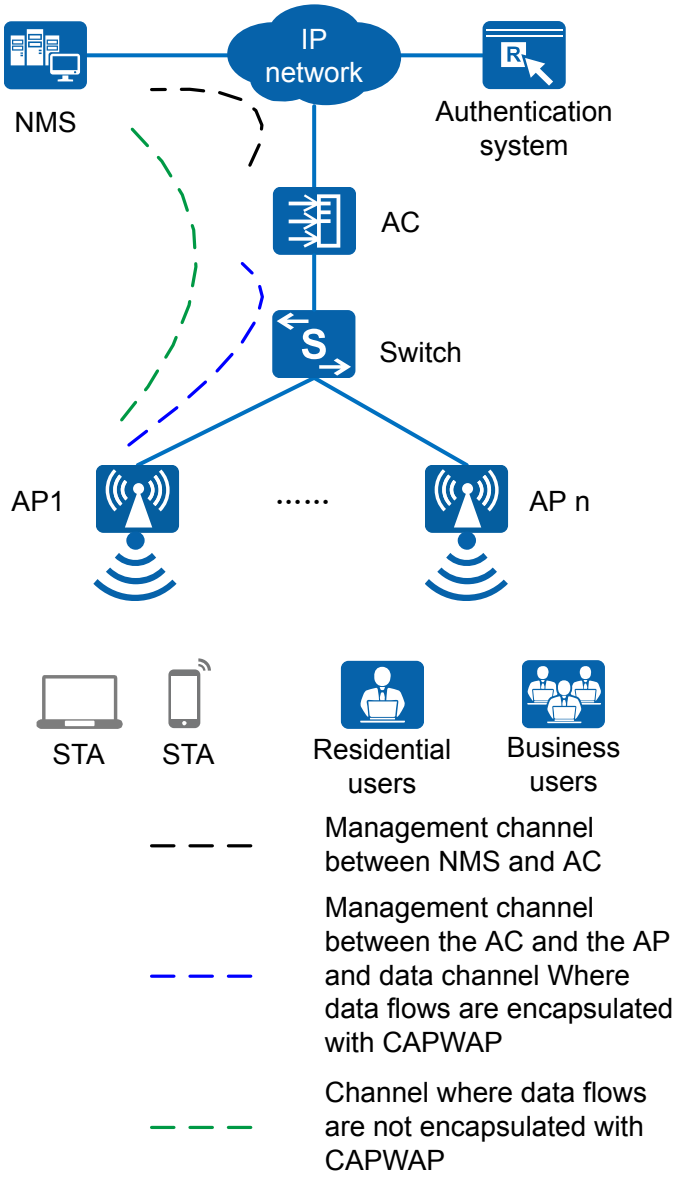
## 2.27.2 Usage Scenarios (AP5030DN)

The AP5030DN can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on the network plan.

When the wireless network scale is small, customers need to purchase only AP products and configure the APs to work as Fat APs. As the network scale expands, tens of or hundreds of APs exist on the network. To simplify network management, customers are advised to purchase ACs to perform centralized management on the APs and set the APs to work as Fit APs.

Typical networking modes are as follows:

**Figure 2-191** Fit AP networking (AP mode)



In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-192** Fit AP networking (WDS mode: point-to-point)

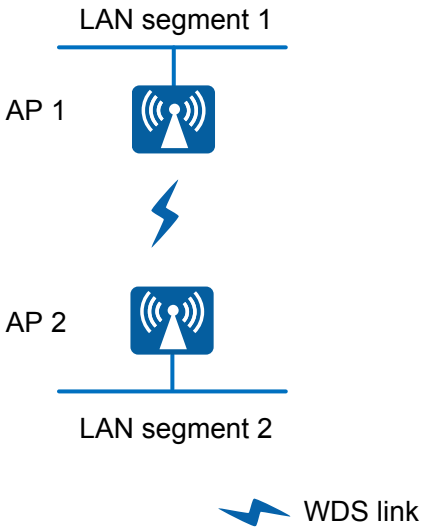
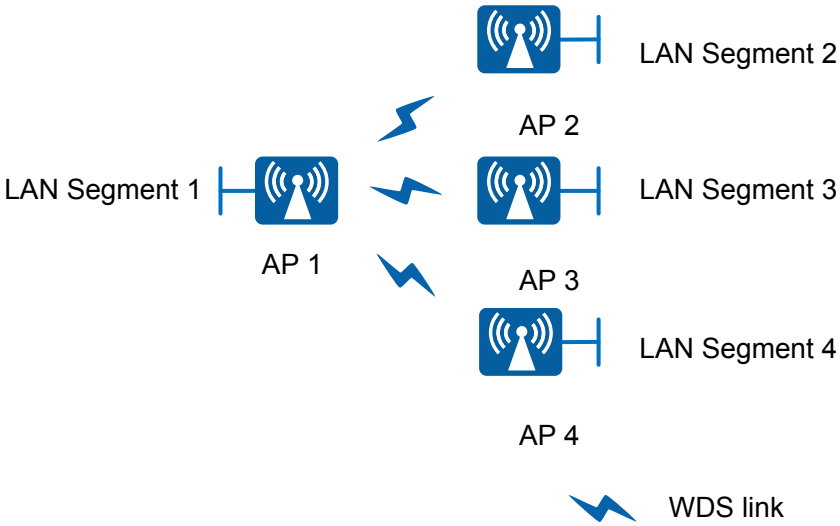


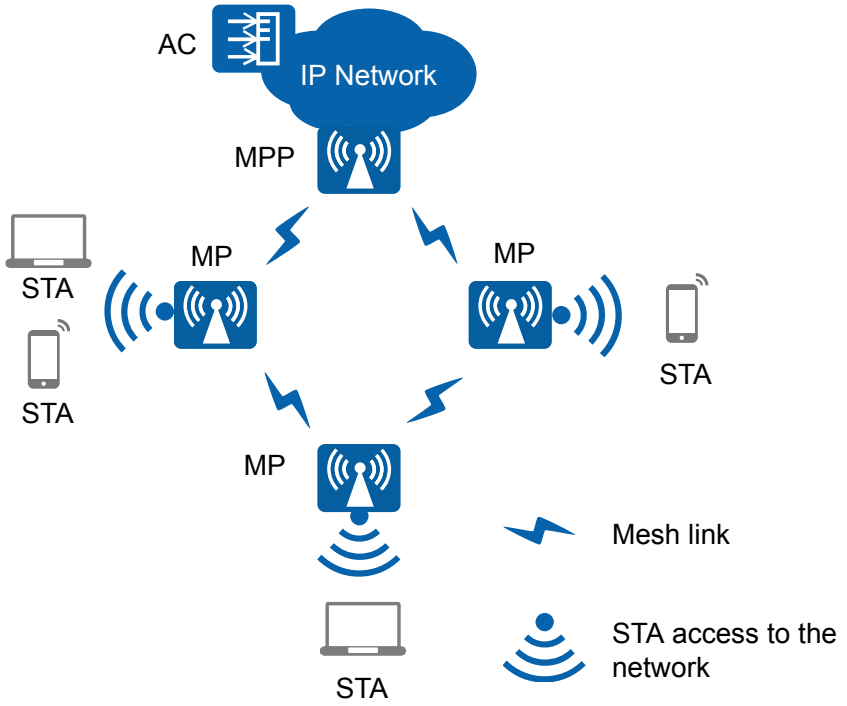

**Figure 2-193** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

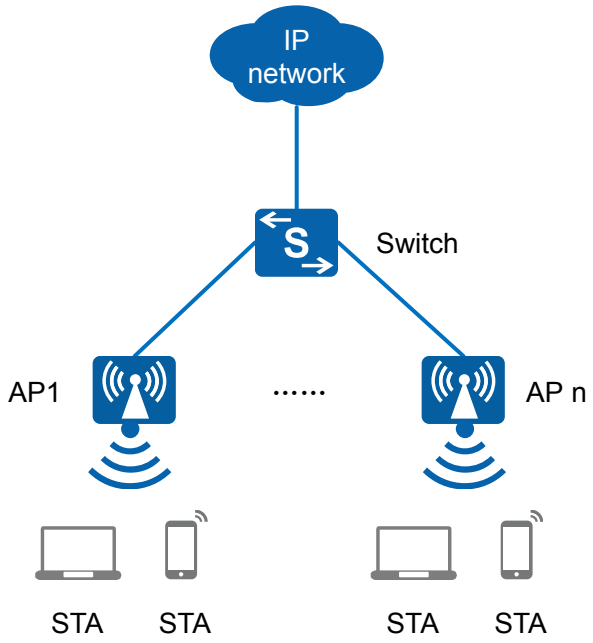
**Figure 2-194** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

**Figure 2-195** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

## 2.27.3 Hardware Information (AP5030DN)

### Appearance

Figure 2-196 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

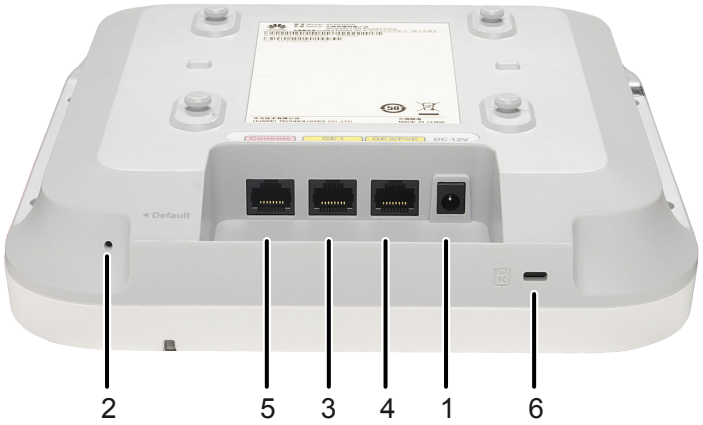
**Figure 2-196** AP appearance

## Port

The following figure shows ports on the AP.

**Figure 2-197** AP ports




As shown in **Figure 2-197**, each port can be described as follows:

- 1. Input port for 12 V DC power supply
- 2. Default button: restores factory settings if you hold down the button more than 3 seconds.
- 3. GE1: 10/100/1000M port used to connect to the wired Ethernet.
- 4. GE0/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
- 5. Console port: connects to the maintenance terminal for AP configuration and management.
- 6. Lock port: protects the AP against theft.

## LED Indicators

**NOTE**

Indicator colors may vary slightly at different temperature.

**Table 2-98** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-99** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 53 mm × 220 mm × 220 mm (2.09 in. x 8.66 in. x 8.66 in.) |
| | Weight | 0.8 kg |
| | System memory | 256 MB DDR2 |

| Item | | Description |
| --- | --- | --- |
| | FLASH | 32 MB NOR FLASHH |
| Power specifications | Power input | • DC 12 V±10%<br>• PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 12.95 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-100** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | • Fit AP: ≤ 256<br>• Fat AP: ≤ 64 |
| Maximum number of VAPs for each radio | 16 |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 25 dBm (combined power)<br>• 5 GHz: 25 dBm (combined power)<br>NOTE<br>The 2.4 GHz radio does not support the 40M bandwidth in FCC regions (including the US).<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.<br>NOTICE<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 450 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s</td></tr>
</table>

## 2.27.4 Performance Specifications (AP5030DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.28 AP5030DN-C Product Description

# 2.28.1 Product Characteristics (AP5030DN-C)

**Table 2-101** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP5030DN-C | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP5030DN-C can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The cost-effective AP5030DN-C supports 3x3 MIMO and provides comprehensive service support capabilities. It is deployed indoors and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. Huawei AP5030DN-C complies with IEEE 802.11ac and can provide gigabit access for wireless users. This high capacity greatly improves user experience on wireless networks. | The AP5030DN-C provides 802.11n/ac wireless access networks for places with simple building structure, small size, dense users, and high capacity demands, such as small and medium enterprises and branches. It can be flexibly deployed in different environments. |

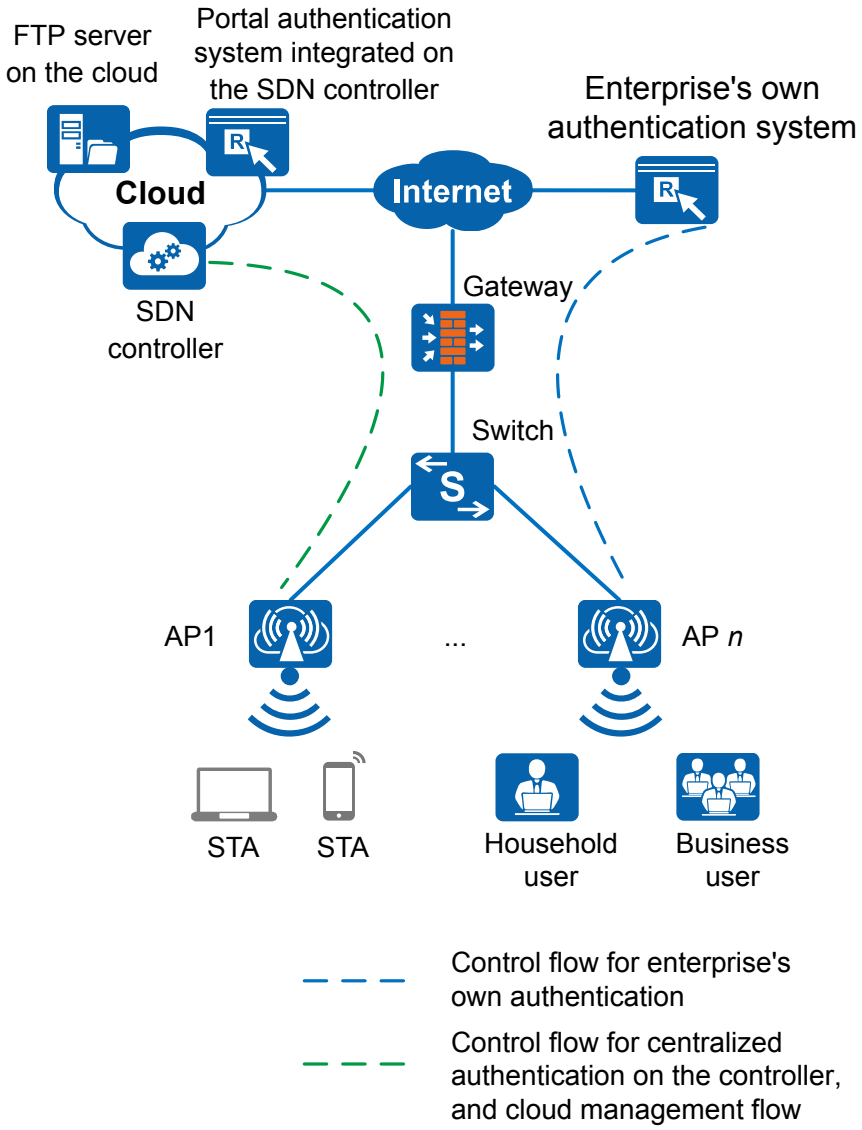
  

## 2.28.2 Usage Scenarios (AP5030DN-C)

The AP5030DN-C can work only in cloud AP mode. In this mode, the AP needs to work with the server on the cloud.

Typical networking modes are as follows:

**Figure 2-198** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

# 2.28.3 Hardware Information (AP5030DN-C)

## Appearance

Figure 2-199 shows the appearance of the AP.

NOTE

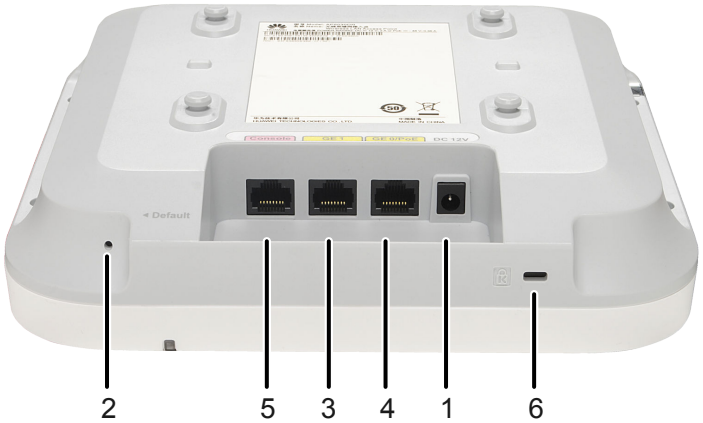
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-199** AP appearance


## Port

The following figure shows ports on the AP.

**Figure 2-200** AP ports




As shown in Figure 2-200, each port can be described as follows:

1. Input port for 12 V DC power supply
2. Default button: restores factory settings if you hold down the button more than 3 seconds.
3. GE1: 10/100/1000M port used to connect to the wired Ethernet.

4. GE0/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
5. Console port: connects to the maintenance terminal for AP configuration and management.
6. Lock port: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-102** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-103** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 53 mm x 220 mm x 220 mm |
| | Weight | 0.8 kg |
| | System memory | ● 256 MB DDR2<br>● 64 MB flash memory |
| Power specifications | Power input | ● DC 12 V ± 10%<br>● PoE power: -48 V DC (in compliance with IEEE 802.3af/at) |
| | Maximum power consumption | 12.95 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature and altitude | -60 m to +1800 m: -10°C to +50°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-104** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | ≤ 256 |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 25 dBm (combined power)<br>• 5 GHz: 25 dBm (combined power)<br>**NOTE**<br>The 2.4 GHz radio does not support the 40M bandwidth in FCC regions (including America).<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 450 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s | | |

## 2.28.4 Performance Specifications (AP5030DN-C)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.29 AP5030DN-S Product Description

# 2.29.1 Product Characteristics (AP5030DN-S)

**Table 2-105** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP5030DN-S | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP5030DN-S can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The cost-effective AP5030DN-S supports 3x3 MIMO and provides comprehensive service support capabilities. It is deployed indoors and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. Huawei AP5030DN-S complies with IEEE 802.11ac and can provide gigabit access for wireless users. This high capacity greatly improves user experience on wireless networks. | The AP5030DN-S provides 802.11n/ac wireless access networks for places with simple building structure, small size, dense users, and high capacity demands, such as small and medium enterprises and branches. The AP5030DN-S can be flexibly deployed and work in hybrid mode (Fit AP +bridge). |

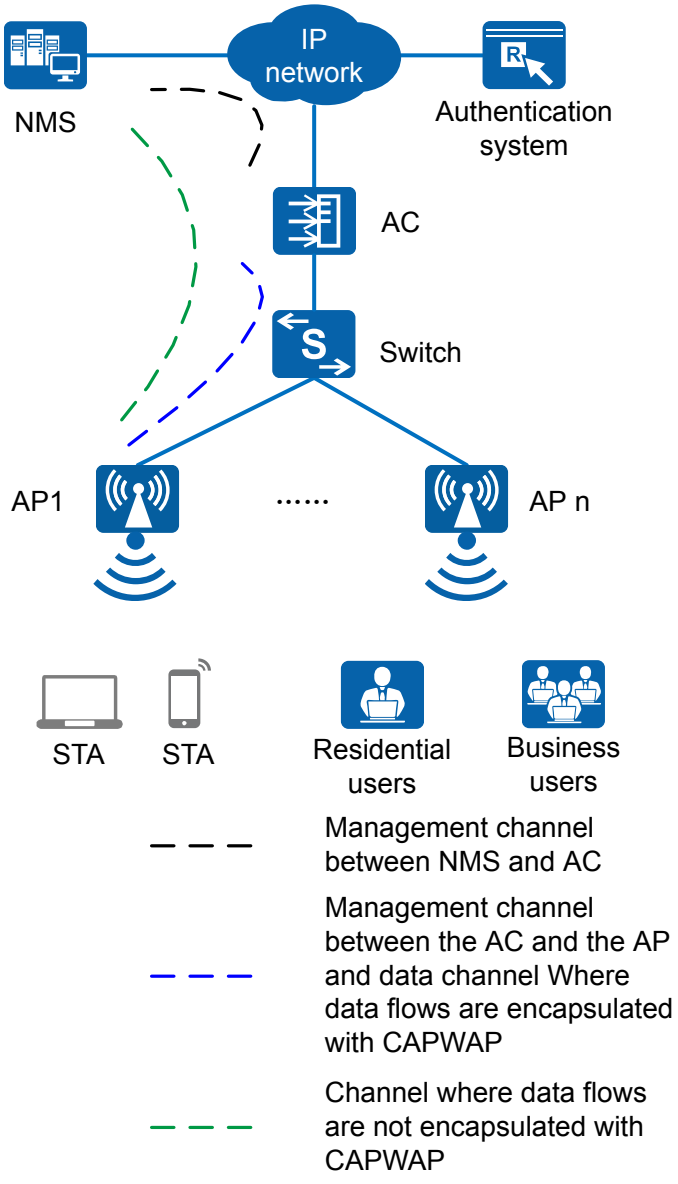
## 2.29.2 Usage Scenarios (AP5030DN-S)

The AP5030DN-S can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on the network plan.

When the wireless network scale is small, customers need to purchase only AP products and configure the APs to work as Fat APs. As the network scale expands, tens of or hundreds of APs exist on the network. To simplify network management, customers are advised to purchase ACs to perform centralized management on the APs and set the APs to work as Fit APs.

Typical networking modes are as follows:

**Figure 2-201** Fit AP networking (AP mode)



In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-202** Fit AP networking (WDS mode: point-to-point)

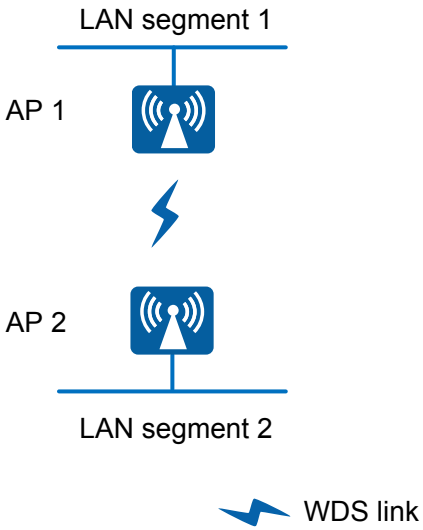
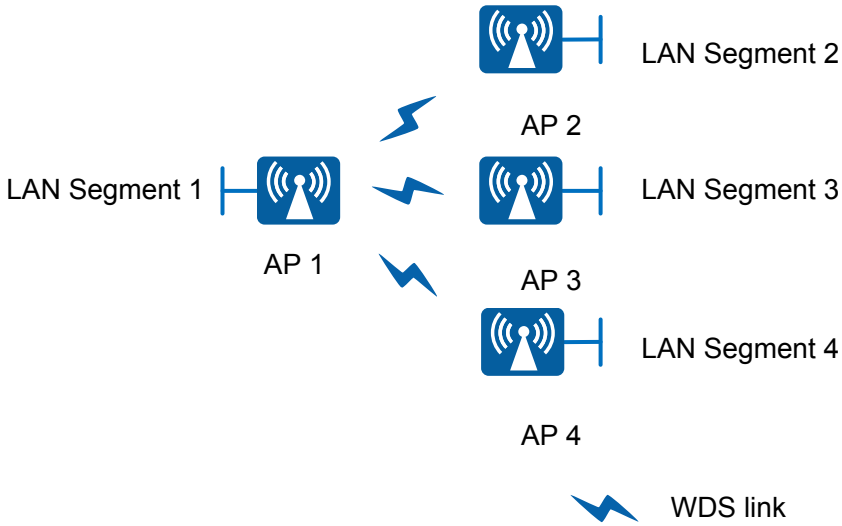


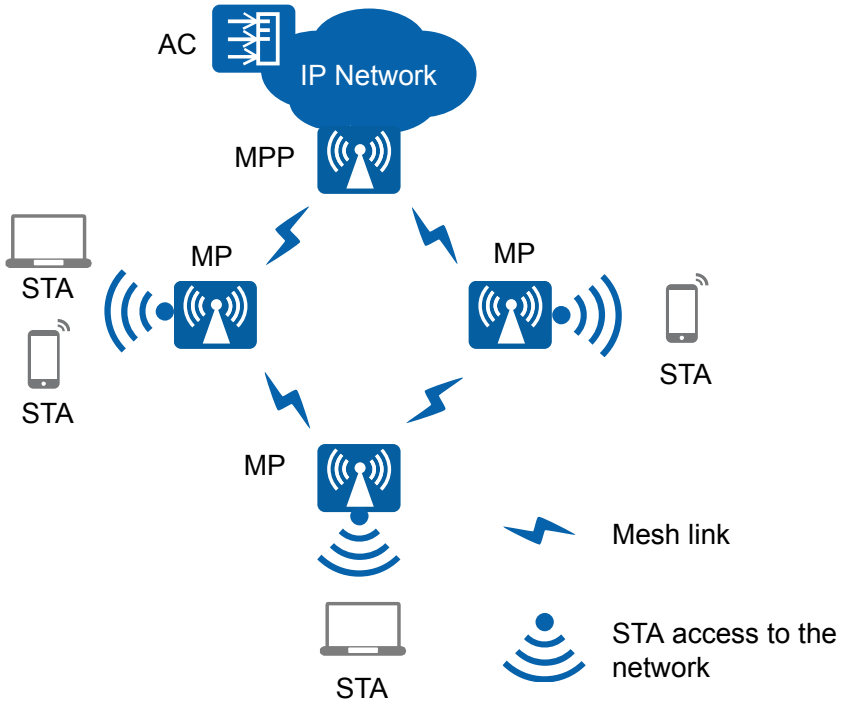

**Figure 2-203** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

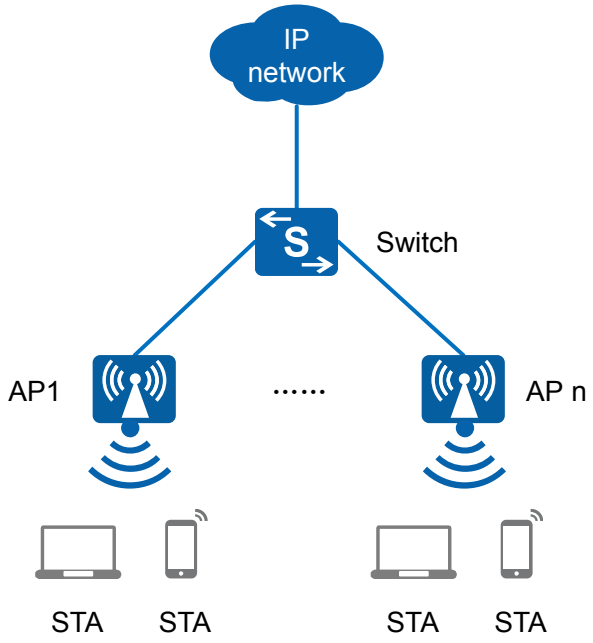
**Figure 2-204** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

**Figure 2-205** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

## 2.29.3 Hardware Information (AP5030DN-S)

### Appearance

Figure 2-206 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

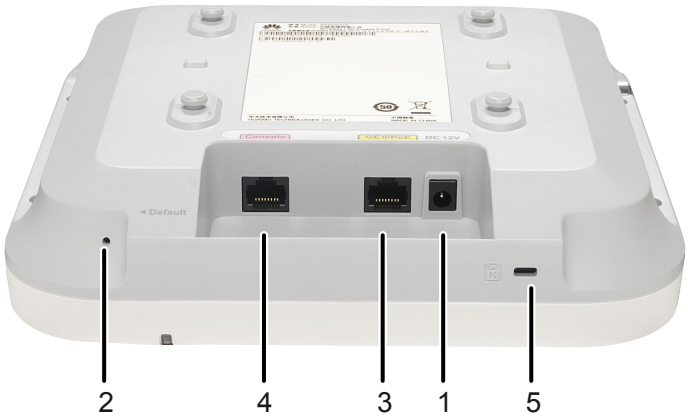
**Figure 2-206** AP5030DN-S appearance

## Port

The following figure shows ports on the AP5030DN-S.

**Figure 2-207** AP5030DN-S ports




As shown in **Figure 2-207**, each port can be described as follows:

- 1. Input port for 12 V DC power supply
- 2. Default button: restores factory settings if you hold down the button more than 3 seconds.
- 3. GE0/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
- 4. Console port: connects to the maintenance terminal for AP configuration and management.
- 5. Lock port: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-106** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-107** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 53 mm × 220 mm × 220 mm (2.09 in. x 8.66 in. x 8.66 in.) |
| | Weight | 0.8 kg |
| | System memory | 256 MB DDR2 |

| Item | | Description |
| --- | --- | --- |
| | FLASH | 32 MB NOR FLASHH |
| Power specifications | Power input | • DC 12 V±10%<br>• PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 12.95 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-108** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | • Fit AP: ≤ 256<br>• Fat AP: ≤ 64 |
| Maximum number of VAPs for each radio | 16 |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 25 dBm (combined power)<br>• 5 GHz: 25 dBm (combined power)<br>NOTE<br>The 2.4 GHz radio does not support the 40M bandwidth in FCC regions (including the US).<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.<br>NOTICE<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 450 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s</td></tr>
</table>

## 2.29.4 Performance Specifications (AP5030DN-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.30 AP5050DN-S Product Description

## 2.30.1 Product Characteristics (AP5050DN-S)

Huawei AP5050DN-S is a wireless access point (AP) targeted at the SMB distribution market in compliance with 802.11ac Wave 2, providing gigabit STA

access for concurrent users. The AP supports 3 x 3 MU-MIMO and three spatial streams at 2.4 GHz, 4 x 4 MU-MIMO and four spatial streams at 5 GHz, reaching up to 2.33 Gbit/s for the device. It supports smooth evolution from 802.11n to 802.11ac and meets the bandwidth requirements of high-bandwidth services such as High Definition (HD) video streams, multimedia, and desktop cloud services, delivering smooth and high-quality wireless services to enterprise users.

The AP5050DN-S applies to high-density scenarios of medium or large size, such as mobile offices, general education, and higher education.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 600 Mbit/s at 2.4 GHz and 1.73 Gbit/s at 5 GHz, and 2.33 Gbit/s for the device
- Dual Ethernet interfaces supporting link aggregation and traffic load balancing while ensuring link reliability
- USB interface used for external power supply and storage
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

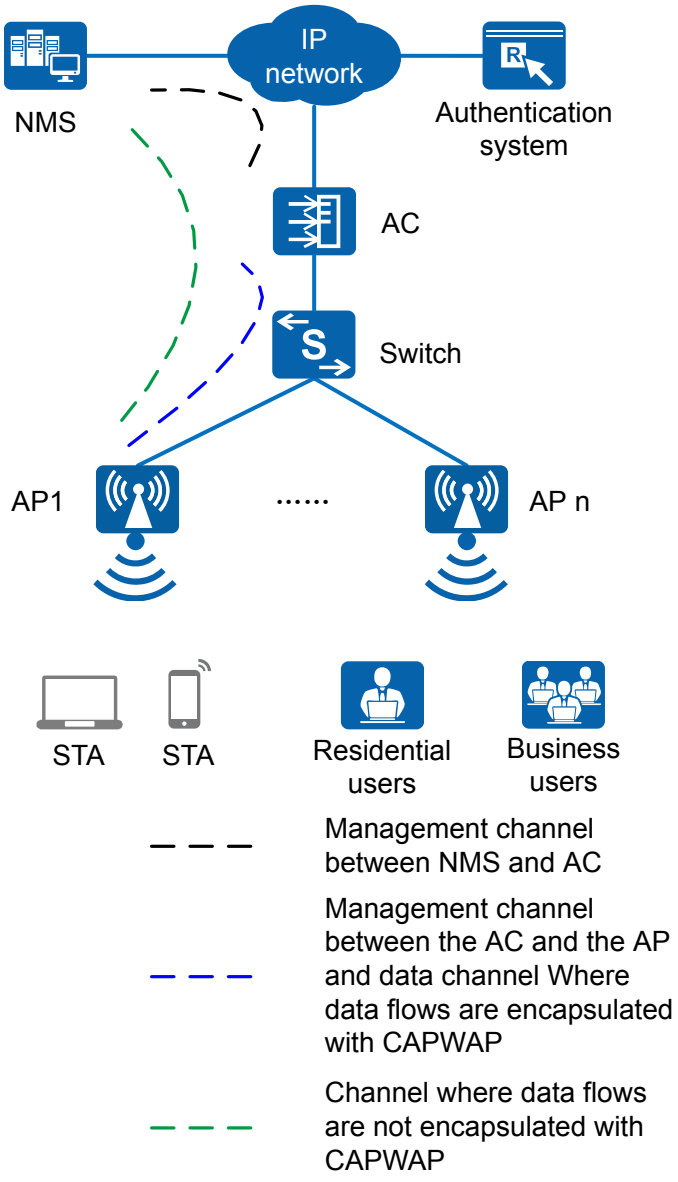
## 2.30.2 Usage Scenarios (AP5050DN-S)

The AP5050DN-S can work as a Fat, Fit, or cloud AP, and switch its working mode based on network planning requirements.

Typical networking modes are as follows:

**Figure 2-208** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-209** Fit AP networking (WDS mode: point-to-point)

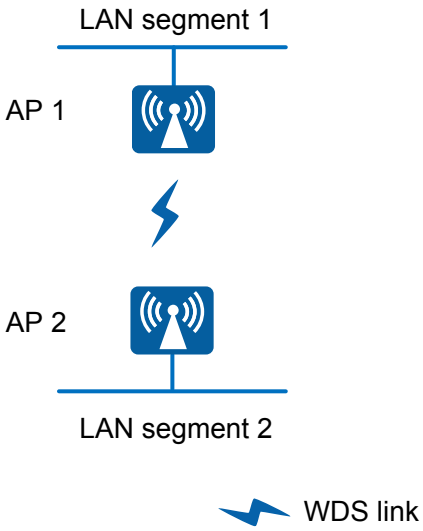
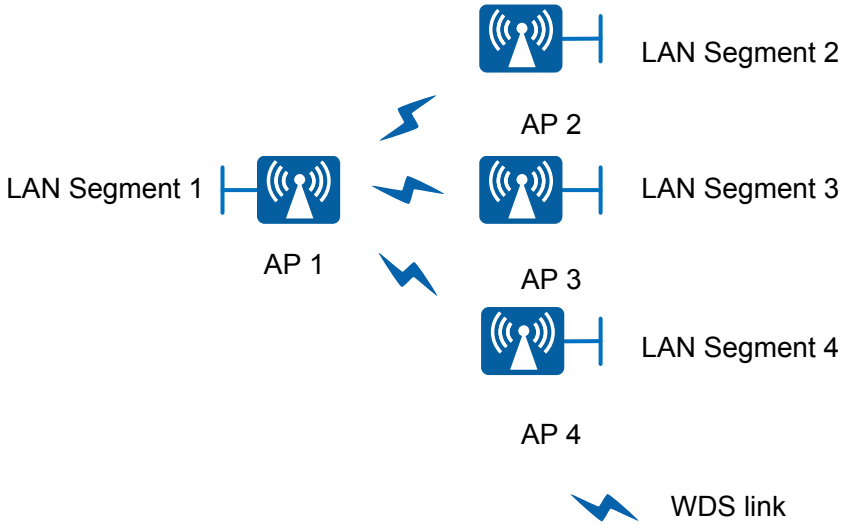


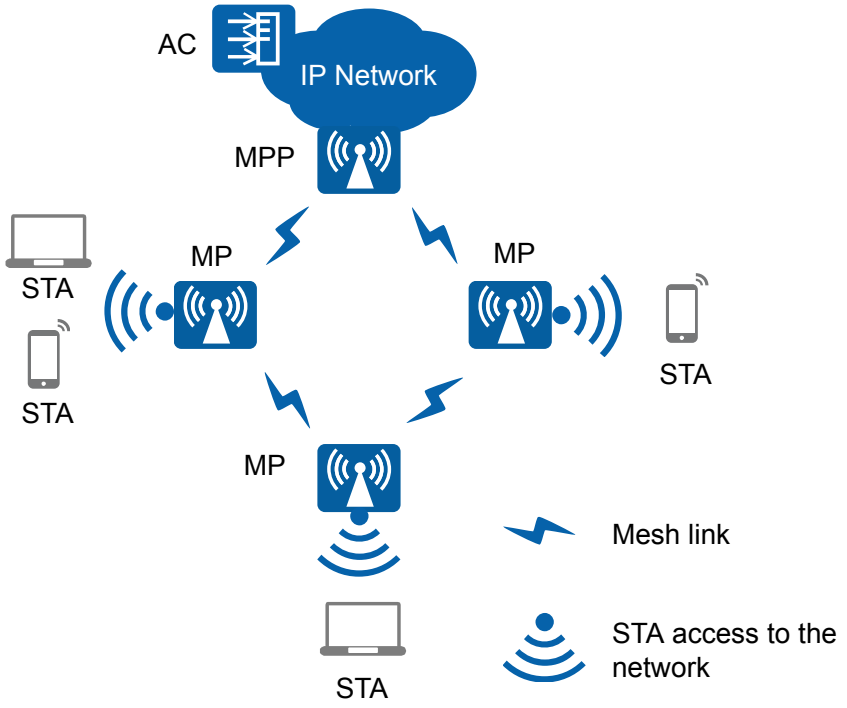

**Figure 2-210** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

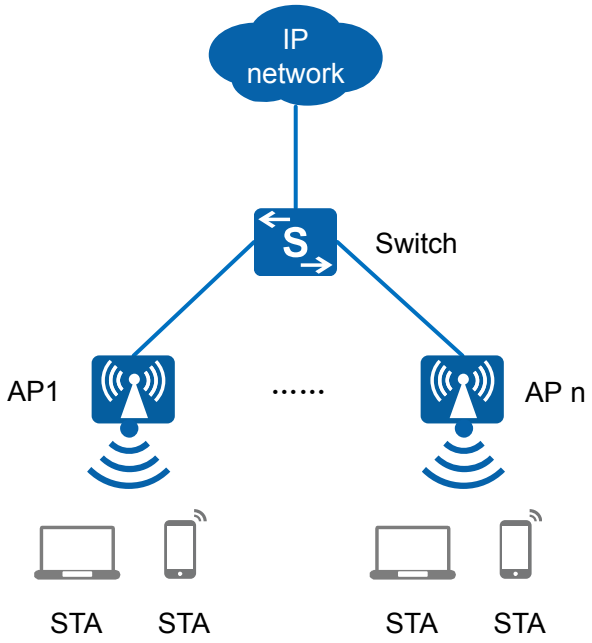
**Figure 2-211** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

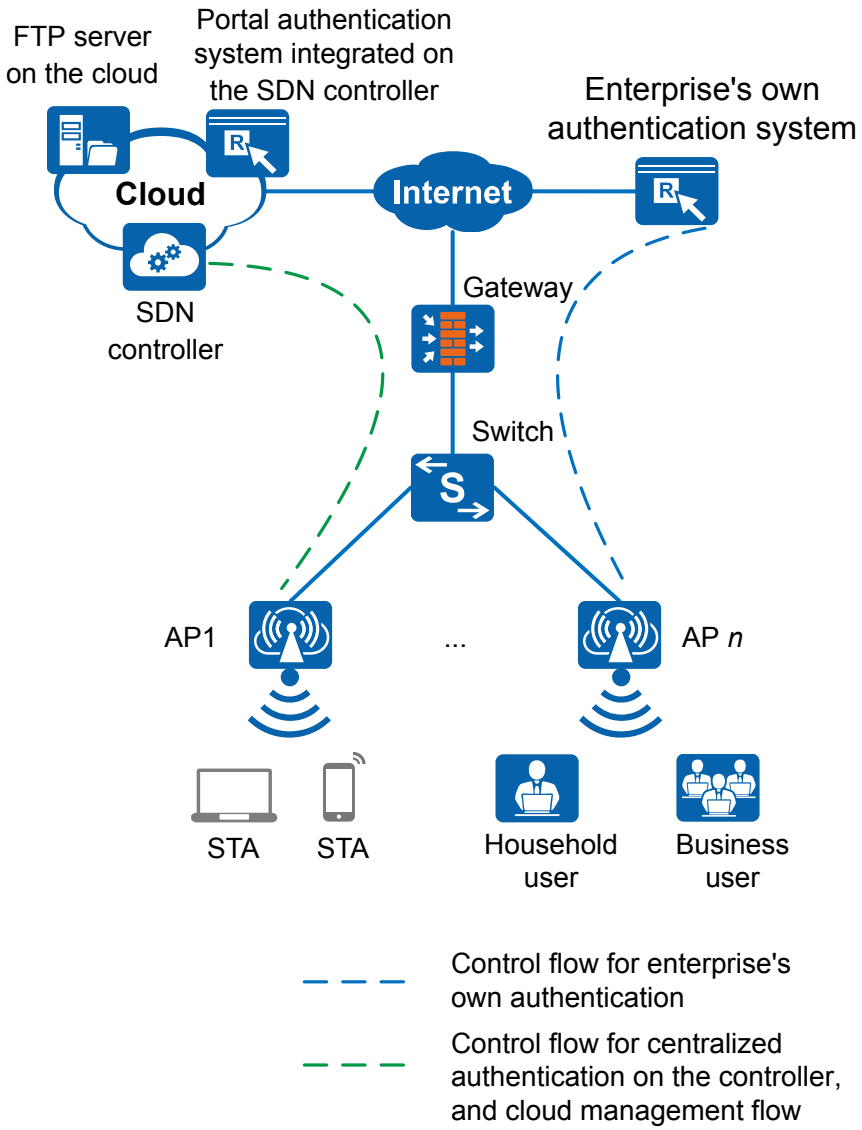
**Figure 2-212** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-213** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.30.3 Hardware Information (AP5050DN-S)

### Appearance

Figure 2-214 shows the AP5050DN-S appearance.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

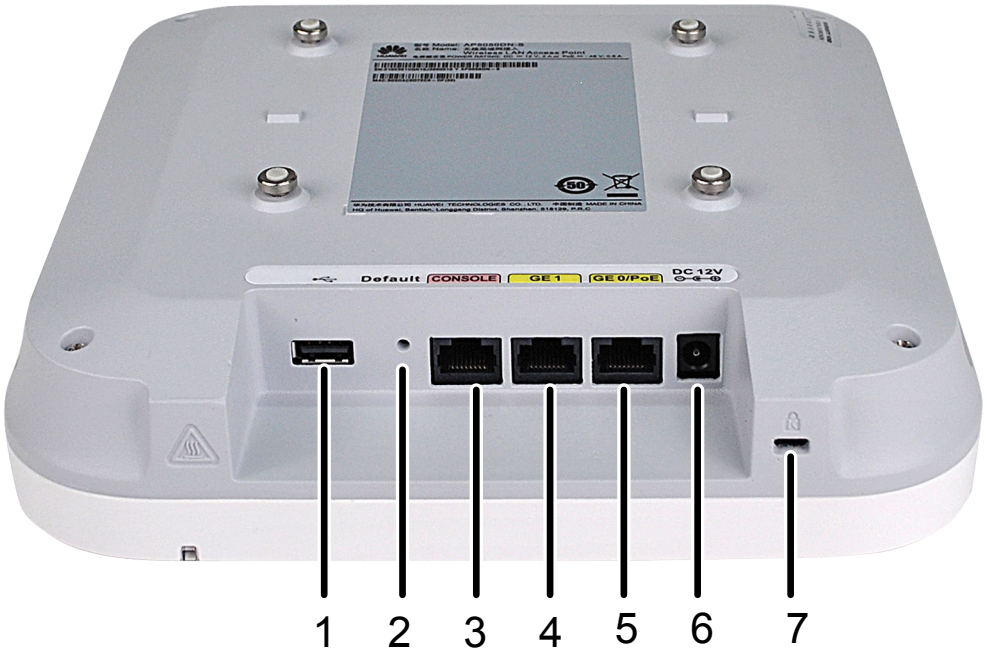
  

**Figure 2-214** AP5050DN-S appearance


## Ports

The following figure shows ports on the AP5050DN-S.

**Figure 2-215** AP5050DN-S ports




As shown in **Figure 2-215**, each interface can be described as follows:

1. USB port: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
2. Default button: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

3. Console port: Connects to a maintenance terminal for AP configuration and management.
4. GE1: 10/100/1000M port that connects to the wired Ethernet.
5. GE0/PoE: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
6. DC 12V: Connects a 12 V power adapter to the AP.
7. Security slot: Connects to a security lock.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-109** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-110** Basic specifications of the AP5050DN-S

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 56 mm x 220 mm x 220 mm (2.20 in. x 8.66 in. x 8.66 in.) |
| | Weight | 1.3 kg |
| | System memory | 512 MB DDR3L |
| | Flash | 16 MB NOR flash + 128 MB NAND flash |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3at |
| | Maximum power consumption | 19.7 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment parameters | Operating temperature and altitude | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-111** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional dual-band antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 4 dBi |
| Maximum number of users | ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 25 dBm (combined power)<br>• 5 GHz: 26 dBm (combined power)<br>**NOTE**<br>The actual maximum transmit power varies depending on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3<br>– 160 MHz: 1 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 600 Mbit/s<br>• 802.11ac Wave 2: 6.5 to 1733.3 Mbit/s | | |

## 2.30.4 Performance Specifications (AP5050DN-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.31 AP5130DN Product Description

# 2.31.1 Product Characteristics (AP5130DN)

**Table 2-112** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP5130DN | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP5130DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The cost-effective AP5130DN supports 3 x 3 MIMO and provides comprehensive service support capabilities. It is deployed indoors and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. Huawei AP5130DN complies with IEEE 802.11ac and can provide gigabit access for wireless users. This high capacity greatly improves user experience on wireless networks. | The AP5130DN provides 802.11n/ac wireless access networks for places with simple building structure, small size, dense users, and high capacity demands, such as small and medium enterprises and branches. It can be flexibly deployed in different environments.<br>The AP5130DN can be flexibly deployed and work in hybrid mode (Fit AP +bridge). |

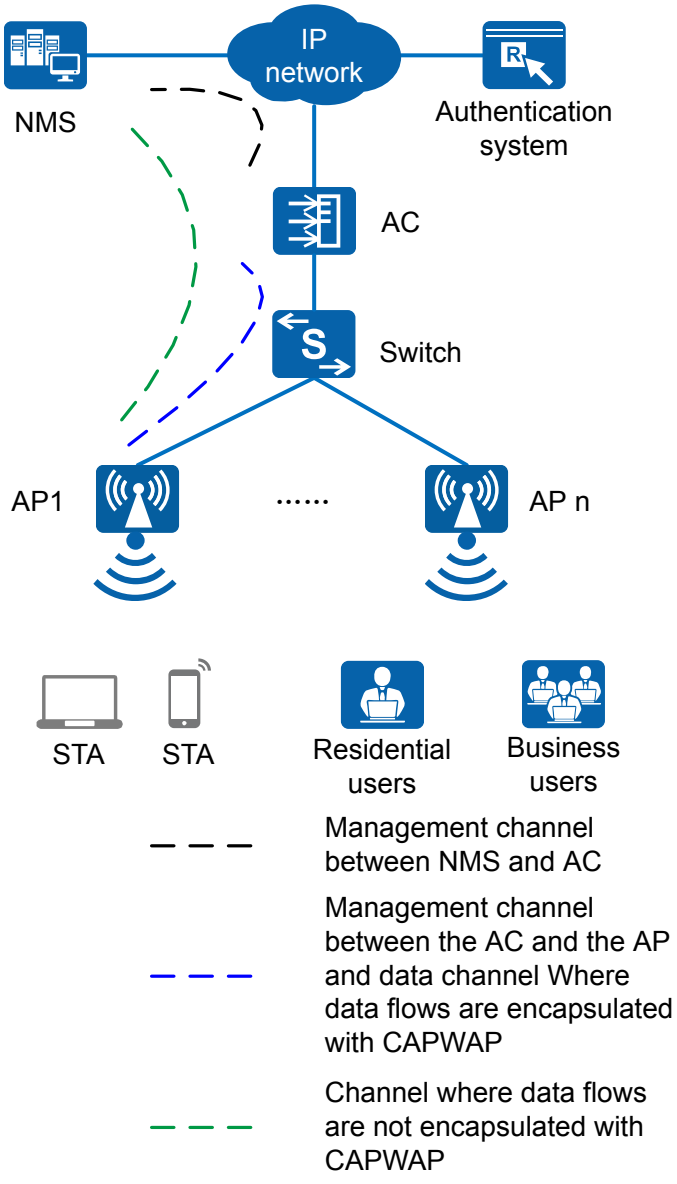
## 2.31.2 Usage Scenarios (AP5130DN)

The AP5130DN can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on the network plan.

When the wireless network scale is small, customers need to purchase only AP products and configure the APs to work as Fat APs. As the network scale expands, tens of or hundreds of APs exist on the network. To simplify network management, customers are advised to purchase ACs to perform centralized management on the APs and set the APs to work as Fit APs.

Typical networking modes are as follows:

**Figure 2-216** Fit AP networking (AP mode)



In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-217** Fit AP networking (WDS mode: point-to-point)

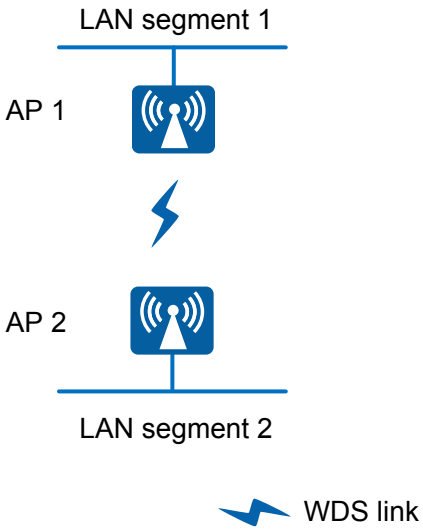
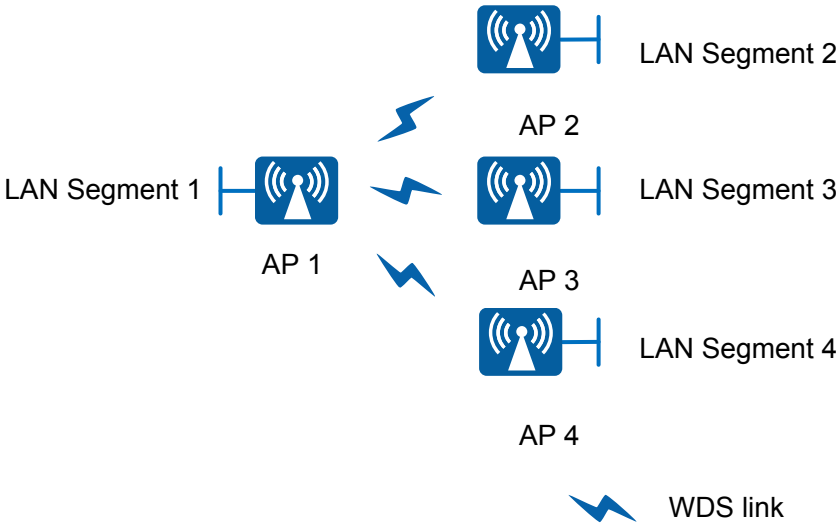


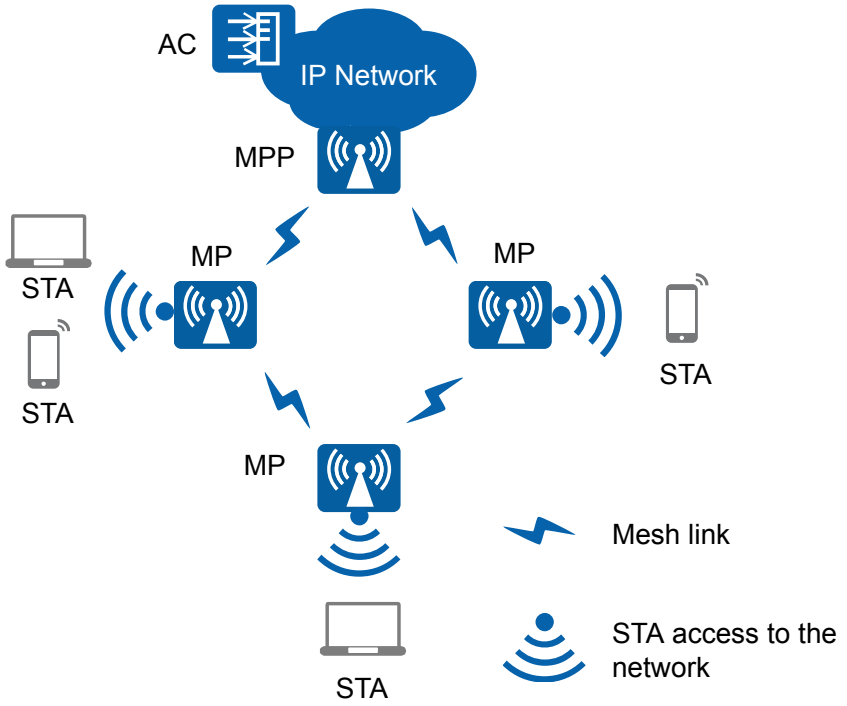

**Figure 2-218** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

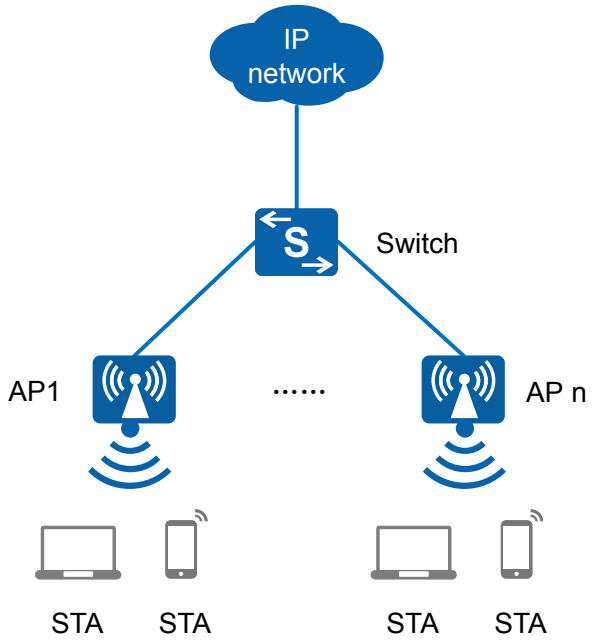
**Figure 2-219** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

**Figure 2-220** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

## 2.31.3 Hardware Information (AP5130DN)

### Appearance

**Figure 2-221** shows the appearance of the AP.

NOTE

The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

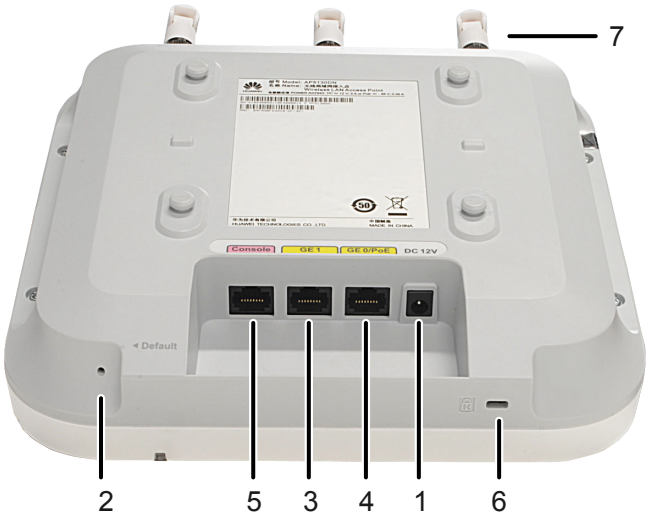
  

**Figure 2-221** AP5130DN appearance


## Port

The following figure shows ports on the AP5130DN.

**Figure 2-222** AP5130DN ports




As shown in **Figure 2-222**, each port can be described as follows:

1. Input port for 12 V DC power supply
2. Default button: restores factory settings if you hold down the button more than 3 seconds.
3. GE1: 10/100/1000M port used to connect to the wired Ethernet.
4. GE0/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
5. Console port: connects to the maintenance terminal for AP configuration and management.
6. Lock port: protects the AP against theft.

7. 2.4G/5G: Connects a 2.4GHz/5GHz dual-band antenna to the AP to send and receive wireless signals. The port type is RP-SMA-K.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-113** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-114** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 53 mm × 220 mm × 220 mm (2.09 in. x 8.66 in. x 8.66 in.) |
| | Weight | 0.8 kg |
| | System memory | 256 MB DDR2 |
| | FLASH | 32 MB NOR FLASHH |
| Power specifications | Power input | • DC 12 V±10%<br>• PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 12.95 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-115** Radio specifications

| Item | Description | | |
|---|---|---|---|
| Antenna type | External dual-band antenna (2.4 GHz and 5 GHz) | | |
| Antenna gain | Antennas delivered with the APs:<br>• 2.4G: 3.5 dBi<br>• 5G: 4 dBi | | |
| Maximum number of users | • Fit AP: ≤ 256<br>• Fat AP: ≤ 64 | | |
| Maximum number of VAPs for each radio | 16 | | |
| Maximum transmit power | • 2.4 GHz: 25 dBm (combined power)<br>• 5 GHz: 25 dBm (combined power)<br>**NOTE**<br>The 2.4 GHz radio does not support the 40M bandwidth in FCC regions (including America).<br>The actual transmit power depends on local laws and regulations. | | |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |

| Item | Description |
| --- | --- |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 450 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s |

## 2.31.4 Performance Specifications (AP5130DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.32 AP5510-W-GP Product Description

## 2.32.1 Product Characteristics (AP5510-W-GP)

Huawei AP5510-W-GP is a gigabit wall plate access point (AP) in compliance with 802.11ac Wave 2. With mounting brackets, the AP can be easily adapted to junction boxes (86/118/120 mm) and wall-mounting scenarios. The AP boasts built-in smart antennas, a hidden indicator, and a brand-new "morning dew" style. It supports GPON uplink transmission. These highlights make the AP suitable for environments with densely distributed small rooms, such as student dormitories. The AP provides enhanced service support capabilities and features high security, easy network deployment, automatic AC discovery and configuration, and real-time management and maintenance. The AP can connect to wireless terminals through wireless connections or to wired terminals using wired cables. This makes it the ideal choice of customers to construct indoor distributed networks.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- One GPON uplink interface and four GE downlink interfaces
- Various installation modes for easy deployment, including wall-mounting, plate-mounting, and desk-mounting
- Built-in smart antennas, increasing the coverage area
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

## 2.32.2 Usage Scenarios (AP5510-W-GP)

The AP5510-W-GP can work as a Fat AP, Fit AP, or cloud AP. The AP can switch flexibly among three working modes based on the network plan.

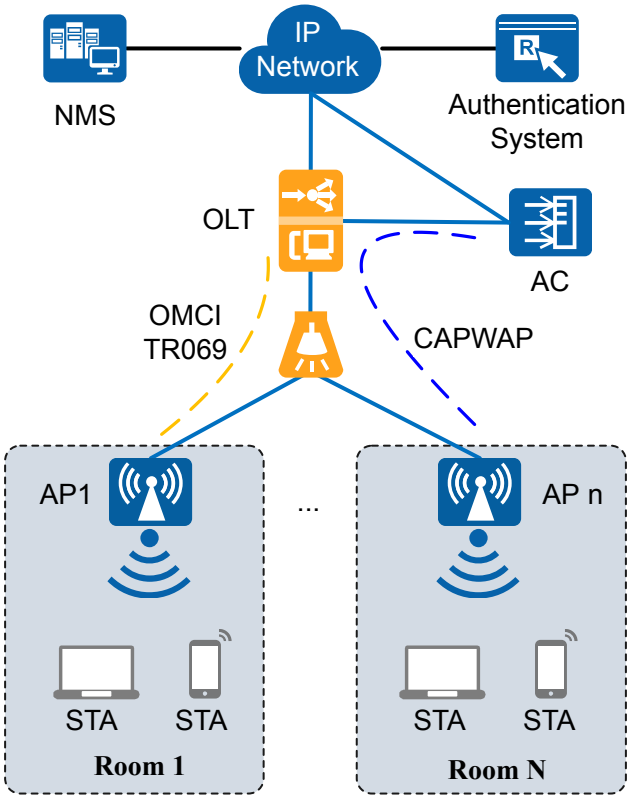
The AP5510-W-GP supports the ONT capabilities and can connect to an OLT through the uplink GPON port. The AP can work with the following Huawei OLT

products: EA5800-X17, EA5800-X15, EA5800-X7, EA5800-X2 (V100R018C10 or V100R019C00), and EA5801 (V100R019C00).

The following figure shows typical AP5510-W-GP networking.

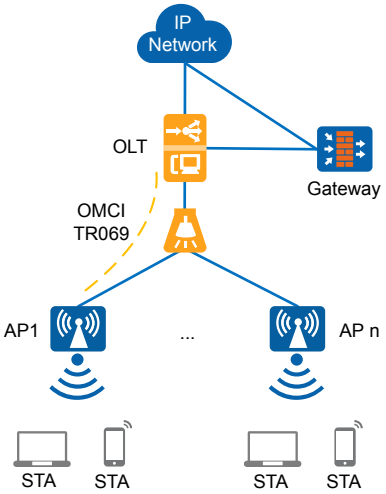
**Figure 2-223** Fit AP networking




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

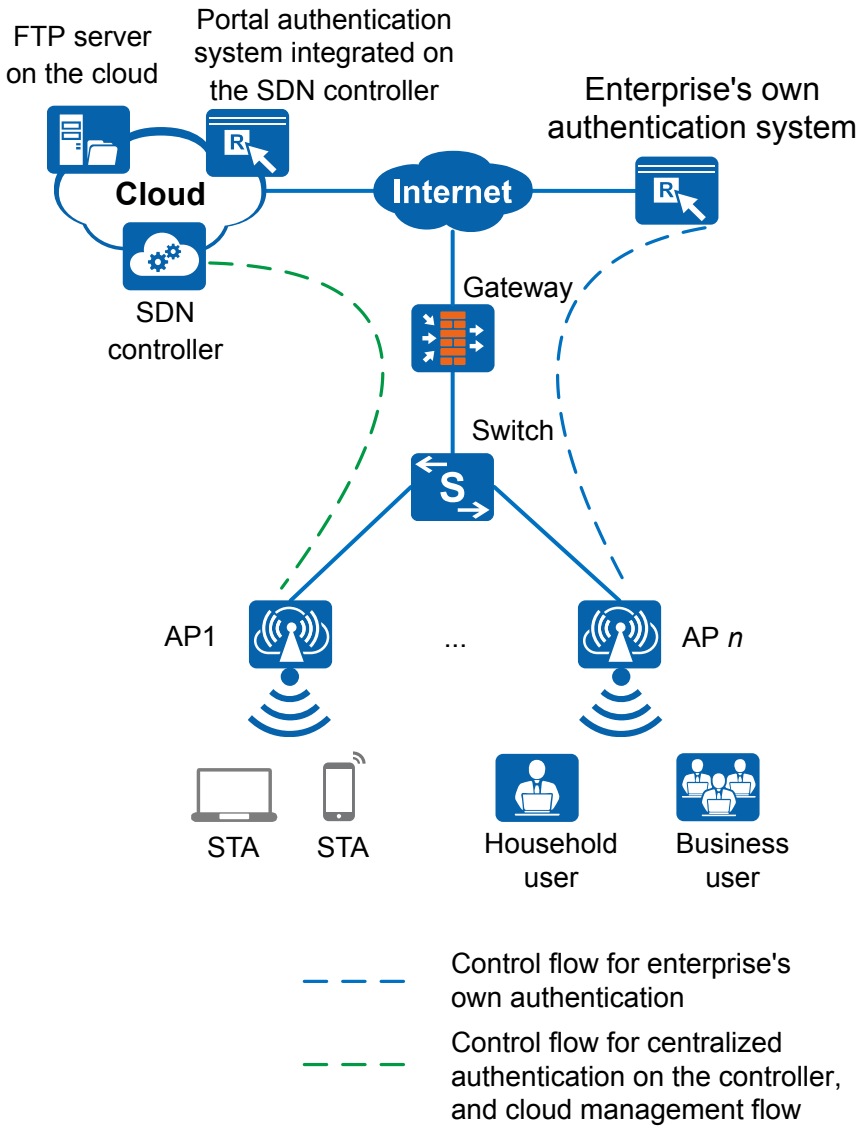
**Figure 2-224** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-225** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.32.3 Hardware Information (AP5510-W-GP)

### Appearance

NOTE

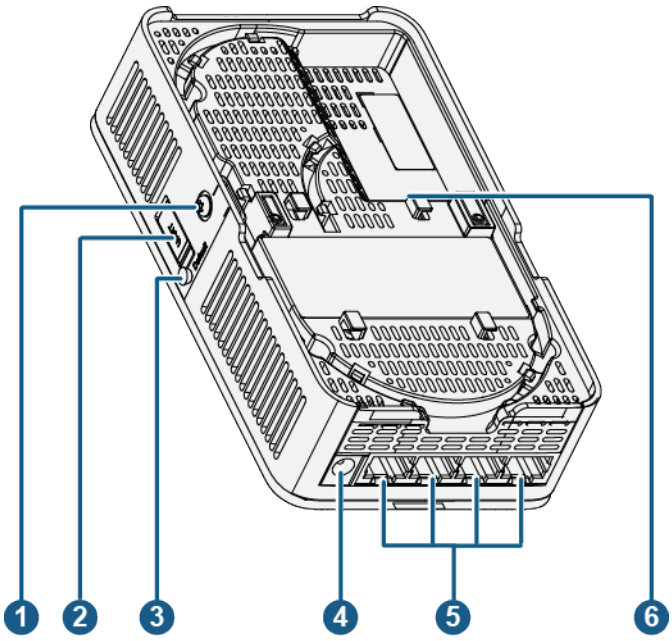
The actual device appearance may be different from the following device appearance; these differences will not affect device functions.

**Figure 2-226** Appearance

## Port

**Figure 2-227** Ports




Each port can be described as follows:

1. Anti-theft screw: Accommodates a captive screw.
2. UART: Used only for O&M commissioning.
3. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
4. DC 12V: Connects a 12 V power adapter to the AP.

NOTE

When the AP uses the DC power supply, use a power adapter for power supply; otherwise, the AP may be damaged.

5. GE4 to GE1: 10/100/1000M port that connects to the wired Ethernet.
6. OPTICAL: Connects to optical fibers.

## LED Indicator

The AP5510-W-GP has one indicator on the front, as shown in **Figure 2-228**.

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 2-228** Indicator

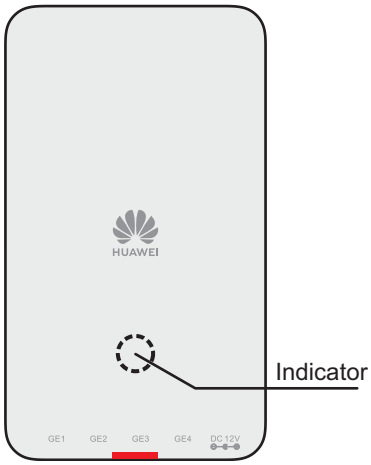



**Table 2-116** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is loaded and started, the AP requests to go online if it works in Fit AP management mode. The indicator remains in this state before the AP successfully goes online.<br>• The AP works in Fit AP management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

Indicators on the side of the AP5510-W-GP are shown in **Figure 2-229**.

**Figure 2-229** Indicator

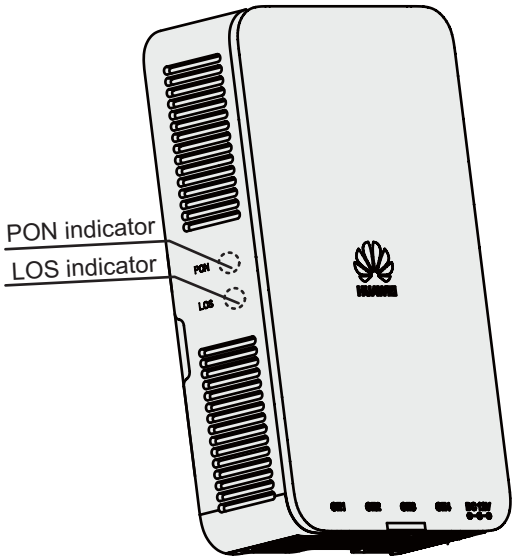



**Table 2-117** Indicator description

| Indicator | Color | Status | Description |
| --- | --- | --- | --- |
| PON indicator | Green | Steady on | The PON indicator is steady on and the LOS indicator is off: The optical network terminal (ONT) has set up a connection with an optical line terminal (OLT). |

| Indicator | Color | Status | Description |
| --- | --- | --- | --- |
| | | Fast blinking | • The PON indicator is blinking fast and the LOS indicator is off: The ONT is setting up a connection with an OLT.<br>• The PON indicator is blinking fast and the LOS indicator is slowly blinking: The receive optical power is out of the receive sensitivity range. |
| | | - | • The PON indicator is off and the LOS indicator is slowly blinking: No optical fiber is connected, or no optical signal is available.<br>• The PON indicator is off and the LOS indicator is steady on: The optical network unit (ONU) is forbidden by the OLT, or the transmit optical power is abnormal. |

| Indicator | Color | Status | Description |
| --- | --- | --- | --- |
| | | Blinking slowly | The PON and LOS indicators are slowly blinking: A hardware exception occurs on the ONU. |
| LOS indicator | Red | For the indicator meanings, refer to the description of the PON indicator above.<br>**NOTE**<br>• Fast blinking: once every 0.5s (2 Hz)<br>• Slowly blinking: once every 2s (0.5 Hz) | |

## Basic Specifications

**Table 2-118** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 38.5 mm x 86 mm x 150 mm (1.52 in. x 3.39 in. x 5.91 in.) |
| | Weight | 0.3 kg |
| | System memory | 256 MB DDR3L |
| | Flash | 64 MB NOR Flash |
| Power specifications | Power input | DC: 12 V ± 5% |
| | Maximum power consumption | 14.2 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to 40°C<br>• 1800 m to 5000 m: The maximum temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-119** Radio specifications

| Item | Description | | |
|---|---|---|---|
| Antenna type | Built-in smart antenna | | |
| Antenna gain | • 2.4 GHz: 3 dBi<br>• 5 GHz: 4 dBi | | |
| Maximum number of users | ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. | | |
| Maximum number of VAPs for each radio | 16 | | |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. | | |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

# 2.32.4 Performance Specifications (AP5510-W-GP)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.33 AirEngine 5760-10 Product Description

## 2.33.1 Product Characteristics (AirEngine 5760-10)

The AirEngine 5760-10 is a standard Wi-Fi 6 (802.11ax) wireless access point (AP) released by Huawei. It supports 2x2 MIMO, provides services simultaneously on the 2.4 GHz and 5 GHz band, and can reach a rate of up to 1.774 Gbit/s. It has comprehensive service support capabilities including high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, meeting network deployment requirements. The AirEngine 5760-10 has built-in smart antennas, supports 802.11n, 802.11ac, and 802.11ax, and provides gigabit access for STAs, which greatly improve user experience on wireless networks and apply to small- and medium-sized enterprises, airports and stations, sports mediums, cafes, and entertainment centers.

- Support 802.11ax and OFDMA.
- Provide services simultaneously on both the 2.4 GHz and 5 GHz bands, at a rate of up to 574 Mbit/s at 2.4 GHz, 1.2 Gbit/s at 5 GHz, and 1.774 Gbit/s for the device.
- USB interface used for external power supply and storage.
- Provide an external IoT module, allowing for flexible IoT application extension.
- Support the Fat, Fit, and cloud modes.
- Enable Huawei SDN controller to manage and operate APs and services on the APs, reducing network O&M costs.

### Wi-Fi 6 (802.11ax) compliance

- The AP supports 1024-QAM modulation and 2x2 MIMO, achieving an air interface rate of up to 1.2 Gbit/s on the 5 GHz band and 1.774 Gbit/s for the device.
- OFDMA modulation enables multiple users to receive and send information at the same time, reducing the delay and improving network efficiency.

### Smart antenna

The AP integrates smart antennas and implicit beamforming to implement more precise user detection, suppress interference, and improve signal quality, providing users with a seamless and smooth wireless network experience.

### IoT extension

The AP provides an external IoT module that allows for extension of ZigBee and RFID, implementing short-distance and lower-power-consumption IoT applications.

### Cloud-based management

Huawei CloudCampus Solution consists of SDN controller and a full range of cloud managed network devices. SDN controller provides various functions including

management of APs, tenants, applications, and licenses, network planning and optimization, device monitoring, network service configuration, and value-added services.

## High Density Boost technology

Huawei uses the following technologies to address challenges in high-density scenarios, including access problems, data congestion, and poor roaming experience:

**SmartRadio for air interface optimization**

- Load balancing during smart roaming: The load balancing algorithm can work during smart roaming, enabling load balancing detection between APs on the network after STA roaming to adjust the STA load on each AP, improving network stability.
- Intelligent DFA technology: The dynamic frequency assignment (DFA) algorithm is used to automatically detect adjacent-channel and co-channel interference, and identify any redundant 2.4 GHz radio. Through automatic inter-AP negotiation, a redundant radio is automatically switched to another mode (dual-5G AP models support 2.4G-to-5G switchover) or is disabled to reduce 2.4 GHz co-channel interference and increase the system capacity.
- Intelligent conflict optimization technology: Dynamic enhanced distributed channel access (EDCA) and airtime scheduling algorithms are used to schedule the channel occupation time and service priority of each user. This ensures that each user is assigned a relatively equal amount of time for using channel resources and user services are scheduled in an orderly manner, improving service processing efficiency and user experience.

**Air interface performance optimization**

- In high-density scenarios where many users access the network, an increased number of low-rate STAs consume more resources on the air interface, reduce the AP capacity, and lower user experience. Therefore, Huawei APs will check the signal strength of STAs during access and rejects access from weak-signal STAs. At the same time, the APs monitor the rate of online STAs in real time and forcibly disconnect low-rate STAs so that the STAs can reassociate with APs that have stronger signals. Terminal access control technology can increase air interface use efficiency and allow access from more users.

**5G-prior access (Band steering)**

- The AP supports both 2.4G and 5G frequency bands. The 5G-prior access function enables an AP to steer STAs to the 5 GHz frequency band first, which reduces load and interference on the 2.4 GHz frequency band, improving user experience.

**Automatic radio calibration**

- Automatic radio calibration allows an AP to collect signal strength and channel parameters of surrounding APs and generate AP topology according to the collected data. Based on interference from authorized APs, rogue APs, and non-Wi-Fi interference sources, each AP automatically adjusts its transmit power and working channel to make the network operate at better performance. In this way, network reliability and user experience are improved.

## Wired and wireless dual security guarantee

To ensure data security, Huawei APs integrate wired and wireless security measures and provide comprehensive security protection.

**Authentication and encryption for wireless access**

- The AP supports WEP, WPA/WPA2-PSK, WPA/WPA2-PPSK, WPA/WPA2-802.1X, and WAPI authentication/encryption modes to ensure security of the wireless network. The authentication mechanism is used to authenticate user identities so that only authorized users can access network resources. The encryption mechanism is used to encrypt data transmitted over wireless links to ensure that the data can only be received and parsed by expected users.

**Analysis on non-Wi-Fi interference sources**

- Huawei APs can analyze the spectrum of non-Wi-Fi interference sources and identify them, including baby monitors, Bluetooth devices, digital cordless phones (at 2.4 GHz frequency band only), wireless audio transmitters (at both the 2.4 GHz and 5 GHz frequency bands), wireless game controllers, and microwave ovens. Coupled with Huawei eSight, the precise locations of the interference sources can be detected, and the spectrum of them displayed, enabling the administrator to remove the interference in a timely manner.

**Rogue device monitoring**

- Huawei APs support WIDS/WIPS, and can monitor, identify, defend, counter, and perform refined management on the rogue devices, to provide security guarantees for air interface environment and wireless data transmission.

**AP access authentication and encryption**

- The AP access control ensures validity of APs. The CAPWAP link protection and DTLS encryption provide security assurance, improving data transmission security between the AP and the AC

## Automatic application identification

Huawei APs support smart application control technology and can implement visualized control on Layer 4 to Layer 7 applications.

**Traffic identification**

- Coupled with Huawei ACs, the APs can identify over 1600 common applications in various office scenarios. Based on the identification results, policy control can be implemented on user services, including priority adjustment, scheduling, blocking, and rate limiting to ensure efficient bandwidth resource use and improve quality of key services.

**Traffic statistics collection**

- Traffic statistics of each application can be collected globally, by SSID, or by user, enabling the network administrator to know application use status on the network. The network administrator or operator can implement visualized control on service applications on smart terminals to enhance security and ensure effective bandwidth control.

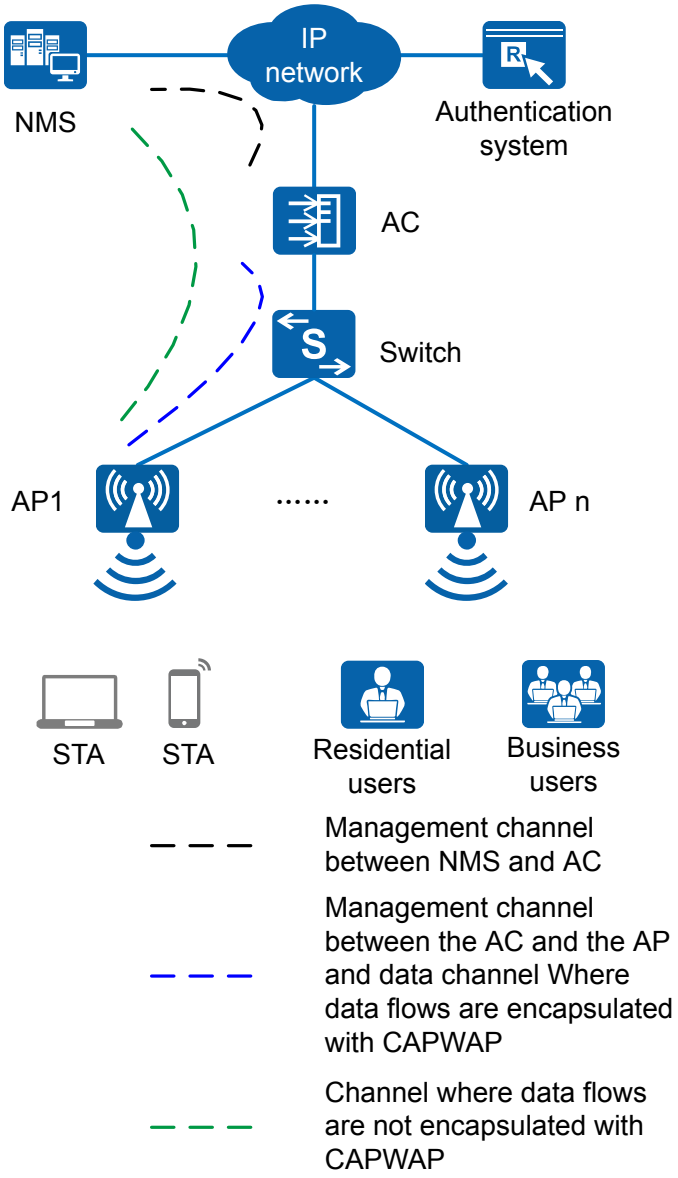
  

## 2.33.2 Usage Scenarios (AirEngine 5760-10)

The AirEngine 5760-10 can work as a Fat AP, Fit AP, or cloud AP. The AP can switch flexibly among three working modes based on the network plan.

### Typical Fit AP Networking

**Figure 2-230** Fit AP networking (AP mode)

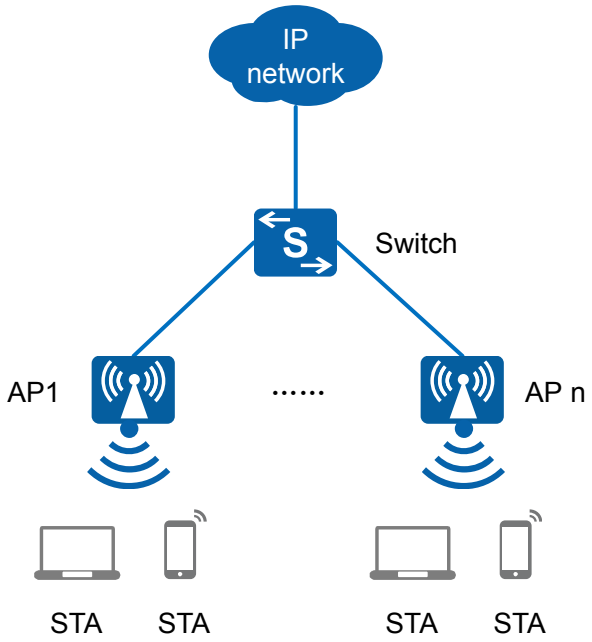



In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

## Typical Fat AP Networking

**Figure 2-231** Fat AP networking

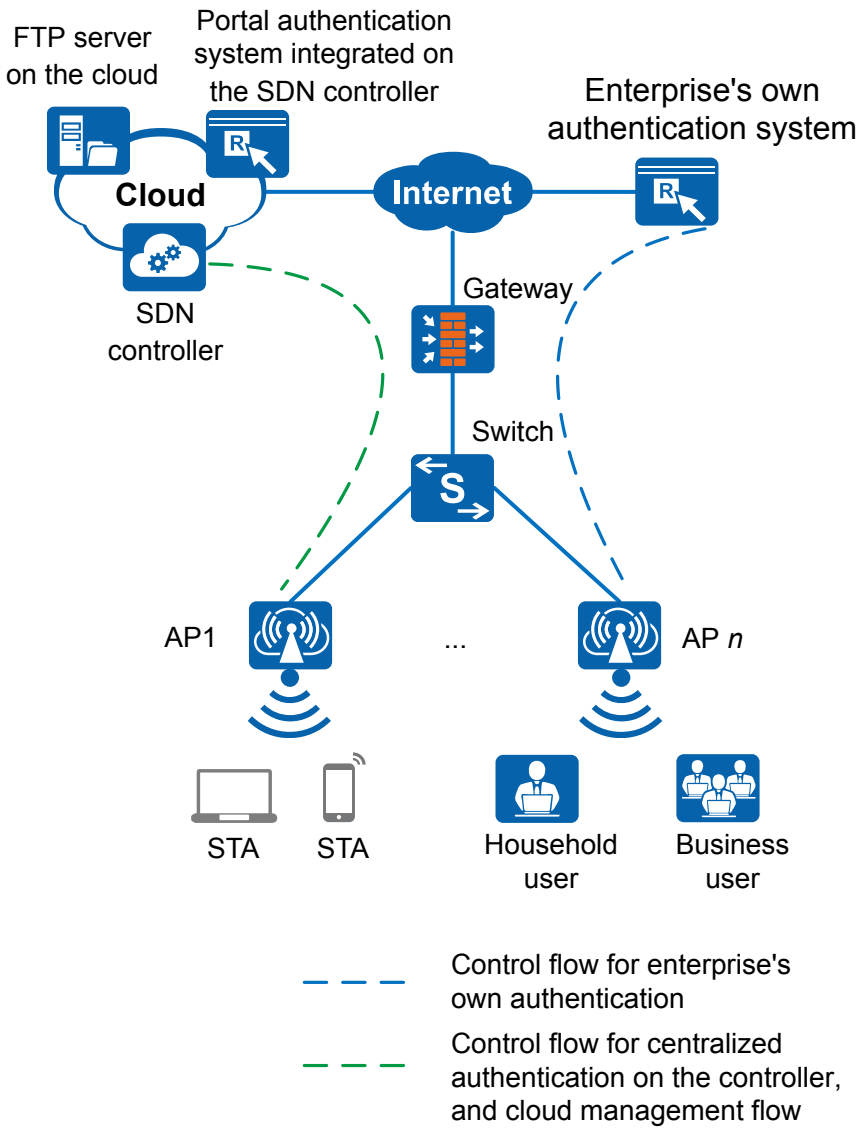



In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

## Typical Cloud AP Networking

**Figure 2-232** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

# 2.33.3 Hardware Information (AirEngine 5760-10)

## Appearance

**Figure 2-233** shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-233** AirEngine 5760-10 appearance

## Port

**Figure 2-234** Port of the AirEngine 5760-10

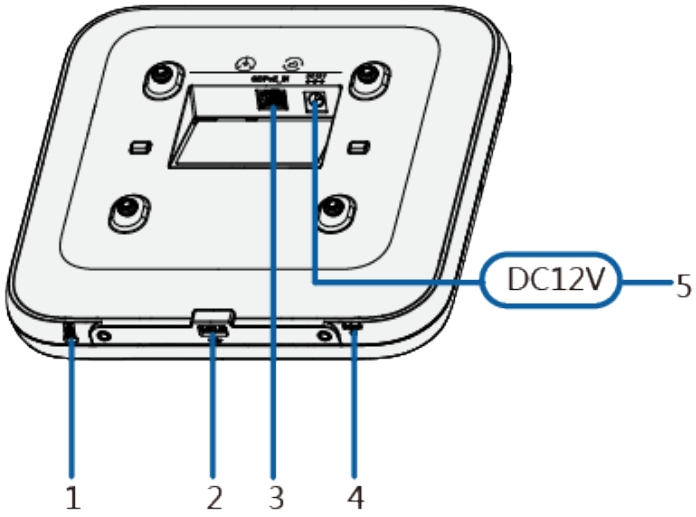



**Table 2-120** Interface description

| No. | Name | Description |
| --- | --- | --- |
| 1 | Security slot | Connects to a security lock. |
| 2 | USB port | Connects to a USB flash drive or an IoT module. |
| 3 | GE/PoE_IN | 10/100/1000M port that connects to the wired Ethernet and supports PoE input. |
| 4 | Default | Restores factory settings and restarts the device when you hold down the button more than 3 seconds. |
| 5 | DC 12V | Connects a 12 V power adapter to the AP. |

NOTE

- The AP supports the following power supply modes: PoE power supply and DC power supply.
- Use the selected power adapter for power supply; otherwise, the AP may be damaged.

## LED Indicators

The AirEngine 5760-10 provides only a single indicator, as shown in **Figure 2-235**.

NOTE

Indicator colors may vary slightly at different temperature.

**Figure 2-235** Indicator


**Table 2-121** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | White | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | White | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks white once. Until the software is uploaded and started, the indicator remains steady white. |
| | - | White | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | White | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>• The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-122** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 47 mm x 200 mm x 200 mm (1.85 in. x 7.87 in. x 7.87 in.) |
| | Weight | 1.05 kg |
| | System memory | 1024 MB DDR4 16 bit |
| | Flash | 16 MB NOR FLASH +128 MB NAND FLASH |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power supply: in compliance with IEEE 802.3at/af |
| | Maximum power consumption | 15.8 W (excluding the output power of the USB port or IoT card port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature and altitude | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |
| Radio specifications | Antenna type | Built-in dual-band smart antenna |
| | Antenna gain | Maximum gain of a single antenna:<br>• 2.4 GHz: 3.5 dBi<br>• 5 GHz: 5 dBi<br>Gain of combined antennas:<br>• 2.4 GHz: 1 dBi<br>• 5 GHz: 2 dBi |
| | Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| | Maximum transmit power | • 2.4 GHz: 25 dBm (combined power)<br>• 5 GHz: 25 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |
| | Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac Wave 2: 6.5 to 867 Mbit/s<br>• 802.11ax: 9 to 1200 Mbit/s |

## 2.33.4 Performance Specifications (AirEngine 5760-10)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.34 AP6050DN and AP6150DN Product Description

## 2.34.1 Product Characteristics (AP6050DN and AP6150DN)

Huawei AP6050DN and AP6150DN are the latest-generation wireless access points (APs) that comply with the 802.11ac Wave 2 standard and provide gigabit bandwidth for wireless networks. They support 4×4 MIMO and four spatial streams and provide a peak rate of 2.53 Gbit/s. The APs support smooth evolution from 802.11n to 802.11ac and meet the bandwidth requirements of large-bandwidth services such as High Definition (HD) video streams, multimedia, and desktop cloud services, delivering smooth and high-quality wireless services to enterprise users.

The AP6050DN and AP6150DN apply to high-density scenarios of medium or large size, such as mobile offices, general education, and higher education.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 800 Mbit/s at 2.4 GHz and 1.73 Gbit/s at 5 GHz, and 2.53 Gbit/s for the device
- Dual Ethernet interfaces supporting link aggregation and traffic load balancing while ensuring link reliability
- USB interface used for external power supply and storage
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

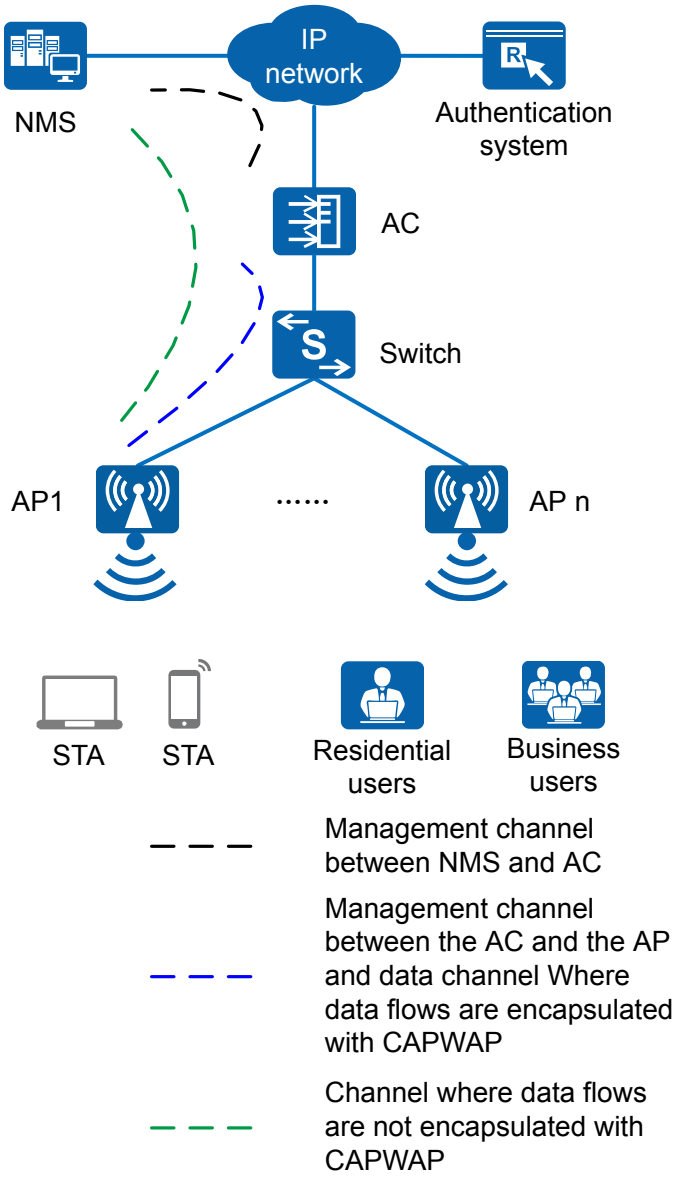
## 2.34.2 Usage Scenarios (AP6050DN and AP6150DN)

The AP6050DN and AP6150DN can work as a Fat AP, Fit AP, or cloud AP. The AP can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-236** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-237** Fit AP networking (WDS mode: point-to-point)

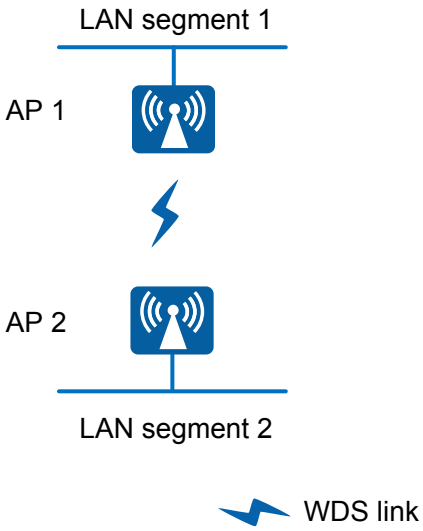
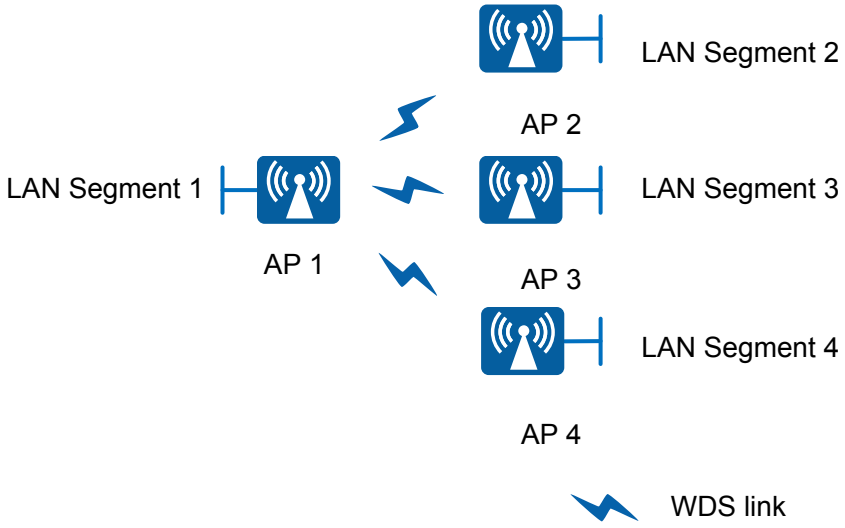


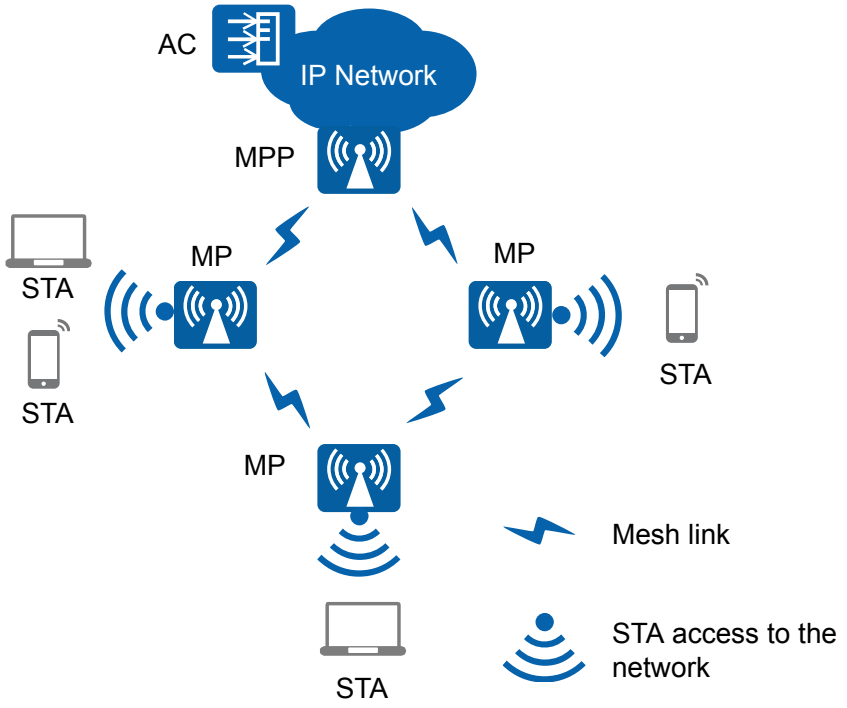

**Figure 2-238** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

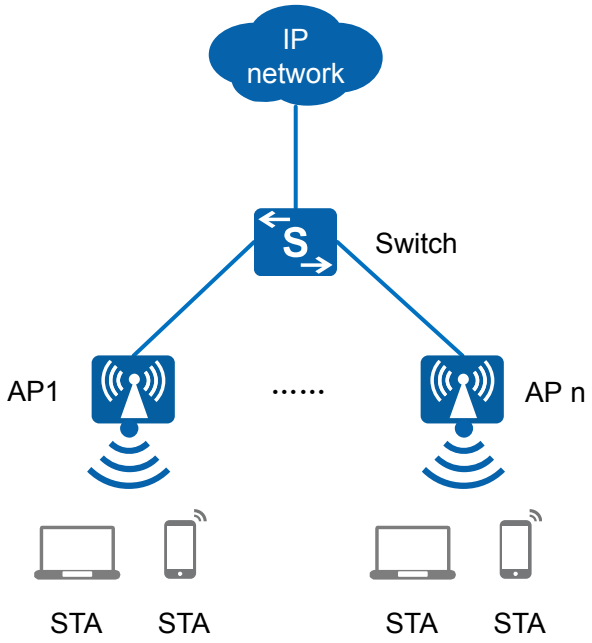
**Figure 2-239** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

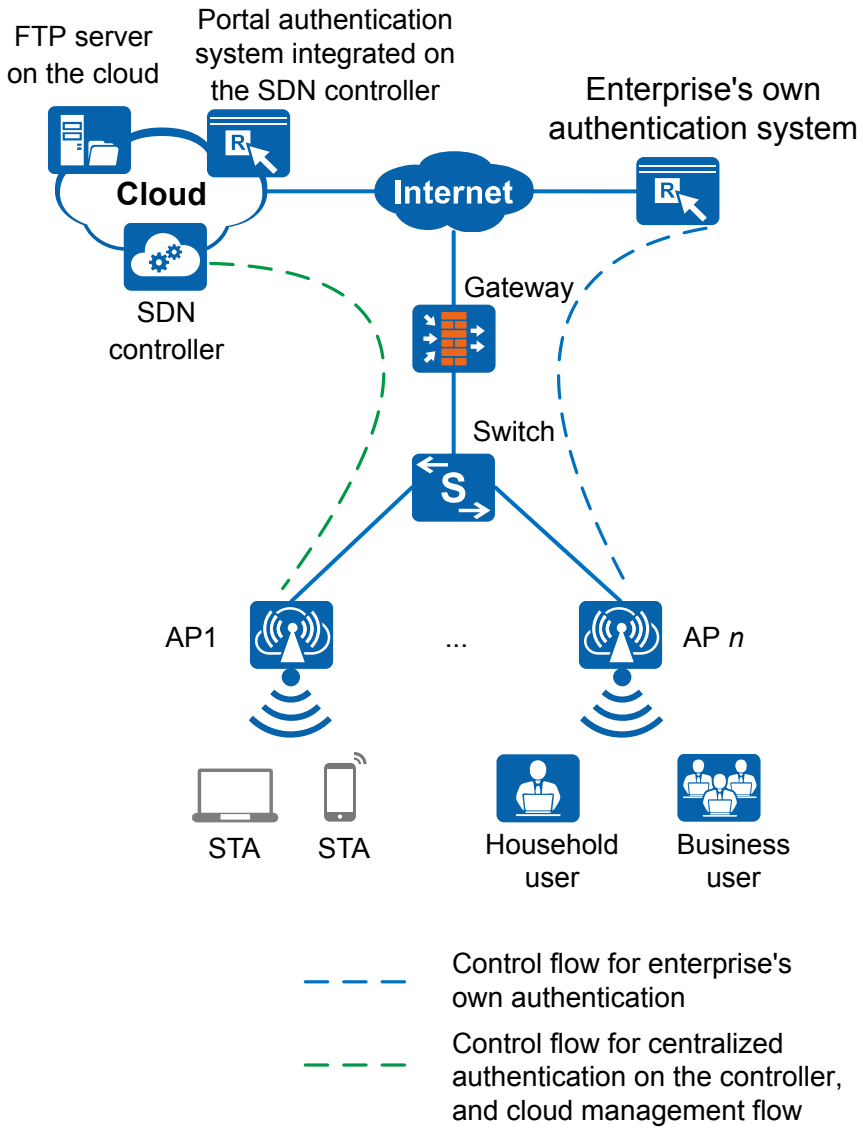
**Figure 2-240** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-241** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.34.3 Hardware Information (AP6050DN)

### Appearance

Figure 2-242 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

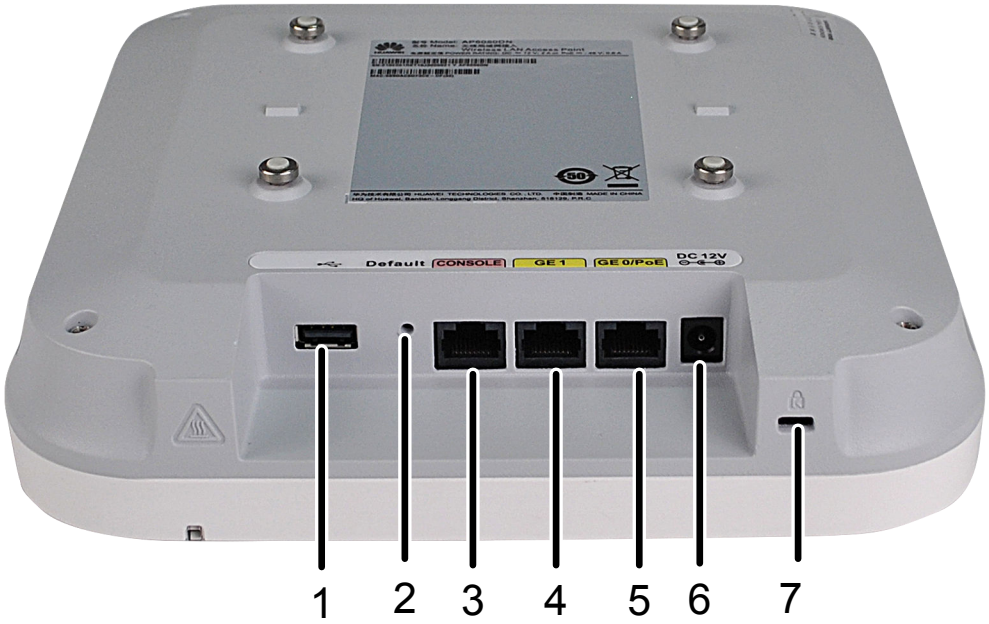
  

**Figure 2-242** AP6050DN appearance


## Port

The following figure shows ports on the AP6050DN.

**Figure 2-243** AP6050DN ports




As shown in **Figure 2-243**, each port can be described as follows:

1. USB port: connects to a USB flash drive to extend the storage space of the AP, and provides a maximum of 2.5 W power.
2. Default button: restores factory settings if you hold down the button more than 3 seconds.

3. Console port: connects to the maintenance terminal for AP configuration and management.
4. GE1: 10/100/1000M port used to connect to the wired Ethernet.
5. GE0/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
6. Input port for 12 V DC power supply.
7. Lock port: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-123** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-124** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 56 mm x 220 mm x 220 mm |
| | Weight | 1.3 kg |
| | System memory | 512 MB DDR3L |
| | FLASH | 16 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3at |
| | Maximum power consumption | 22.9 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-125** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional dual-band antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 4 dBi<br>**NOTE**<br>After antenna optimization on the AP6050DN, the 2.4 GHz and 5 GHz antenna gains become 4 dBi and 4 dBi (from 6 dBi and 6 dBi), respectively, improving the overall performance of the AP6050DN. |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 26 dBm (combined power)<br>• 5 GHz: 26 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
|---|---|---|---|
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3<br>– 160 MHz: 1 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>• If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.<br>• If the AP is delivered to Europe, pay attention to the following on channel and frequency band usage:<br>1. The AP cannot work at frequencies in the range of 5725 MHz to 5850 MHz. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac Wave 2: 6.5 to 1733.3 Mbit/s | | |

# 2.34.4 Hardware Information (AP6150DN)

## Appearance

**Figure 2-244** shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

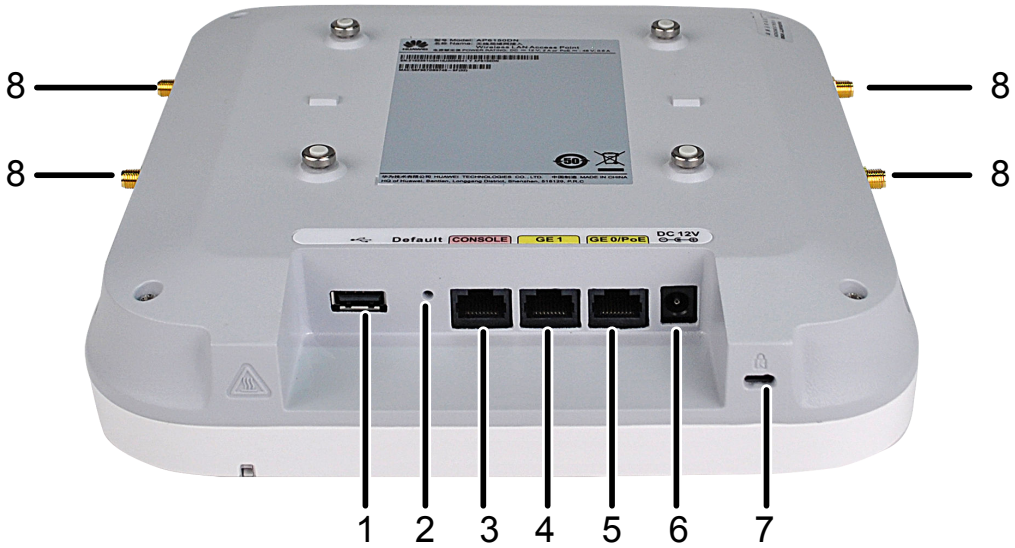
  

**Figure 2-244** AP6150DN appearance


## Ports

The following figure shows ports on the AP6150DN.

**Figure 2-245** AP6150DN ports




As shown in **Figure 2-245**, each port can be described as follows:

1. USB port: connects to a USB flash drive to extend the storage space of the AP, and provides a maximum of 2.5 W power.
2. Default button: restores factory settings if you hold down the button more than 3 seconds.
3. Console port: connects to the maintenance terminal for AP configuration and management.
4. GE1: 10/100/1000M port used to connect to the wired Ethernet.

5. GE0/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
6. Input port for 12 V DC power supply.
7. Lock port: protects the AP against theft.
8. Antenna port: Connects an antenna to the AP to send and receive wireless signals. The port type is RP-SMA-K.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-126** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-127** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 56 mm x 220 mm x 220 mm |
| | Weight | 1.3 kg |
| | System memory | 512 MB DDR3L |
| | FLASH | 16 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3at |
| | Maximum power consumption | 22.9 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-128** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | External omnidirectional dual-band antenna |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 26 dBm (combined power)<br>• 5 GHz: 26 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
|---|---|---|---|
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3<br>– 160 MHz: 1 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>• If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.<br>• If the AP is delivered to Europe, pay attention to the following on channel and frequency band usage:<br>1. The AP cannot work at frequencies in the range of 5725 MHz to 5850 MHz. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac Wave 2: 6.5 to 1733.3 Mbit/s | | |

## 2.34.5 Performance Specifications (AP6050DN and AP6150DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.35 AP6052DN Product Description

## 2.35.1 Product Characteristics (AP6052DN)

Huawei AP6052DN is the latest-generation technology-leading wireless access point (AP). It provides secure gigabit wireless access in compliance with the

802.11ac Wave 2 standards. The AP supports 4 x 4 MIMO, four spatial streams, and 2.4G-to-5G switchover, and provides a rate of up to 3.46 Gbit/s in dual-5G mode. The AP has built-in omnidirectional antennas and supports smooth evolution from 802.11n to 802.11ac. It meets the bandwidth requirements of large-bandwidth services such as High Definition (HD) video streams, multimedia, and desktop cloud services, delivering smooth and high-quality wireless services to enterprise users.

As the 802.11ac Wave 2 AP that provides the 5GE uplink interface, it is intelligent, secure, and easy to use. Delivering industry-leading performance in a rugged, attractive enclosure, it is ideal for enterprise office and education scenarios.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 800 Mbit/s at 2.4 GHz and 1.73 Gbit/s at 5 GHz, and 2.53 Gbit/s for the device
- AP6052DN: 2.4G-to-5G switchover, with a device rate of up to 3.46 Gbit/s in dual-5G mode
- 5GE uplink interface that can connect to a 100 MHz/1000 MHz/2.5 GHz interface, to improve the service load capability
- Built-in Bluetooth to implement precise positioning with eSight
- USB interface used for external power supply and storage
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

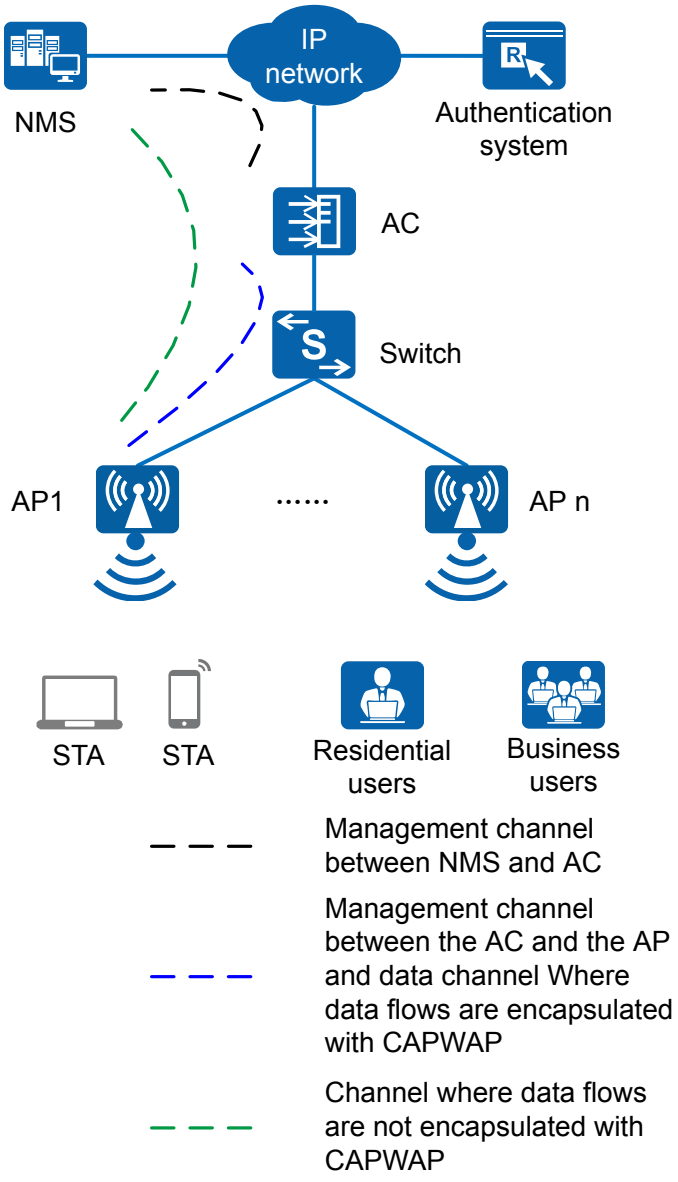
## 2.35.2 Usage Scenarios (AP6052DN)

The AP6052DN can work as a Fat AP, Fit AP, or cloud AP. The AP can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-246** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-247** Fit AP networking (WDS mode: point-to-point)

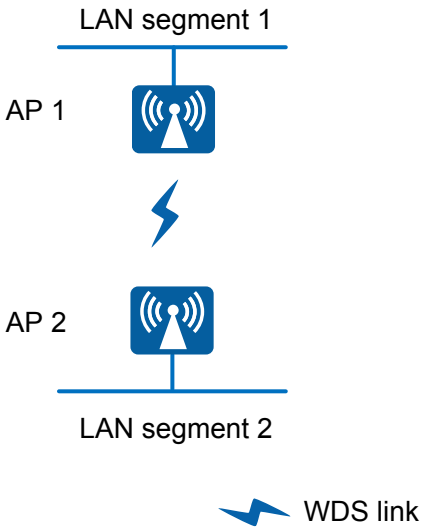
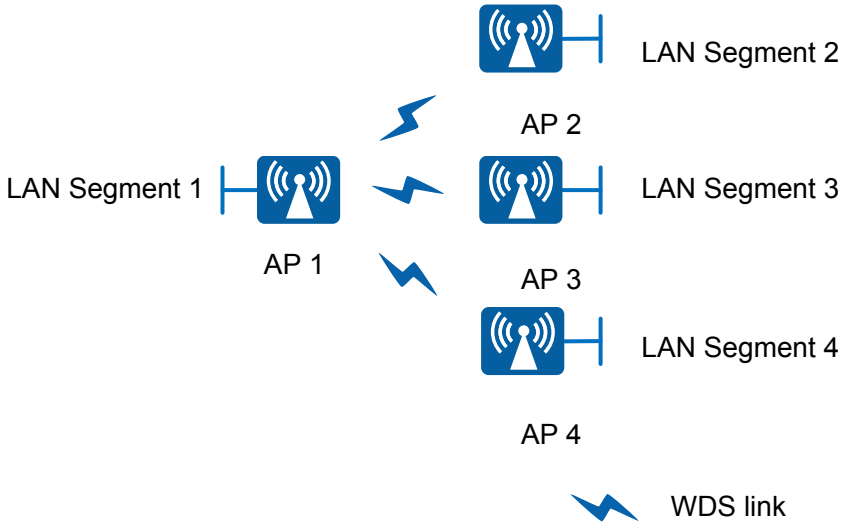


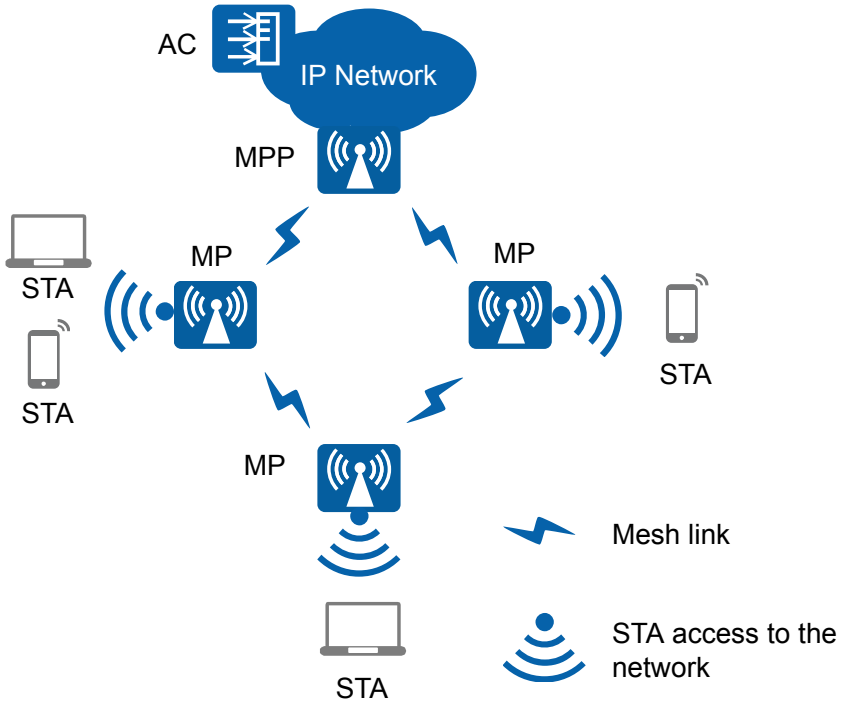

**Figure 2-248** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

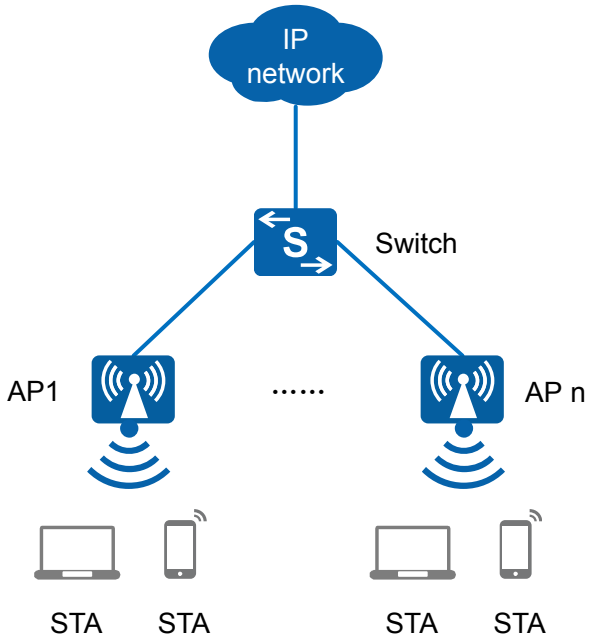
**Figure 2-249** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

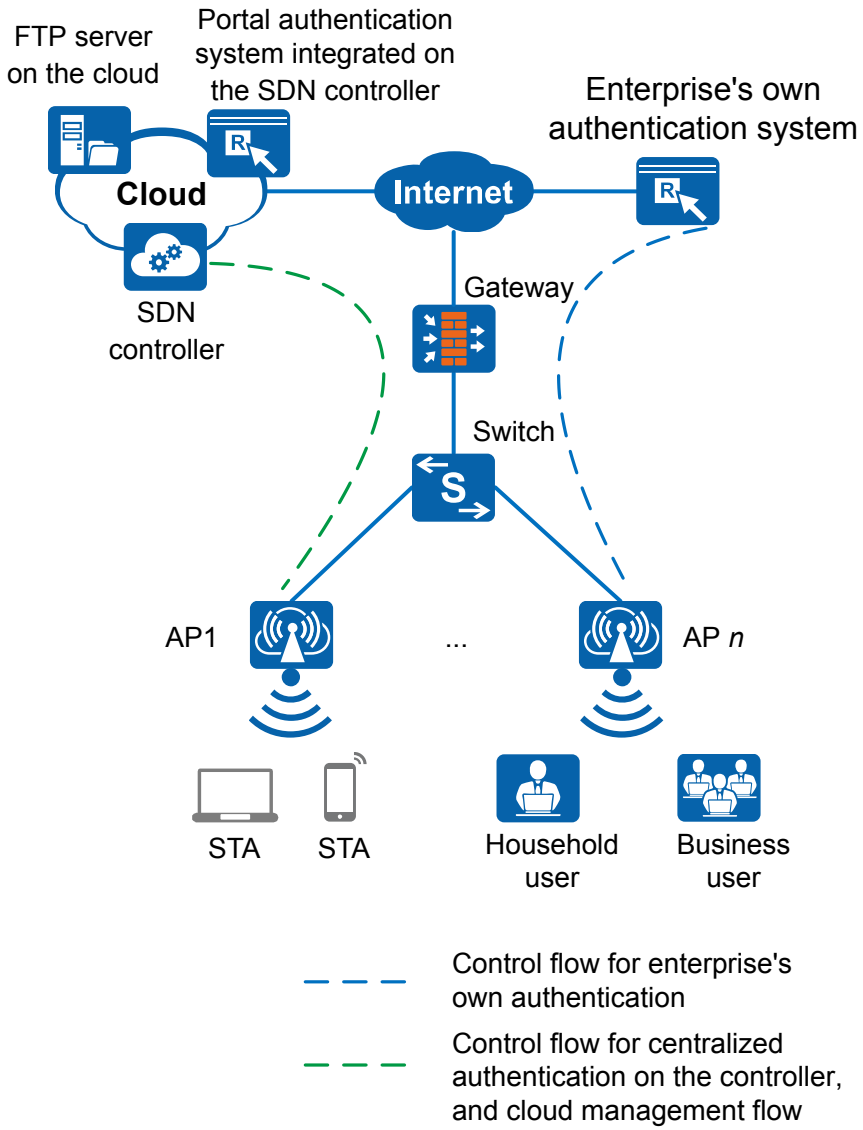
**Figure 2-250** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-251** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.35.3 Hardware Information (AP6052DN)

### Appearance

Figure 2-252 shows the appearance of the AP.

NOTE

The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

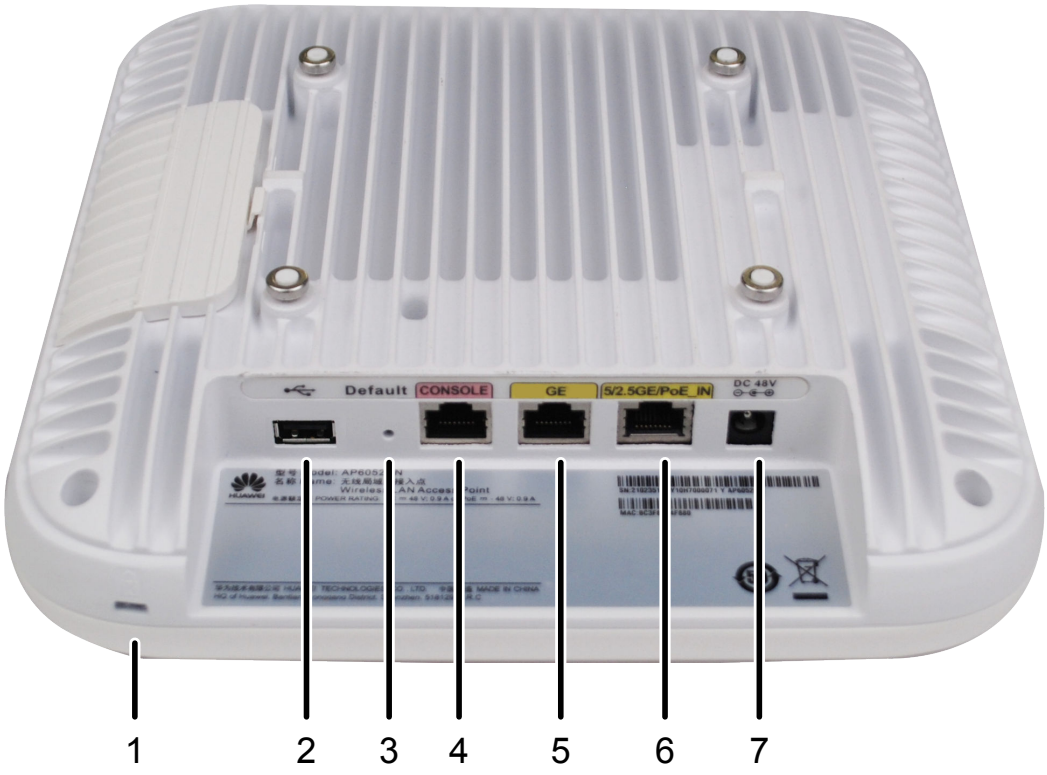
  

**Figure 2-252** AP6052DN appearance

## Port

The following figure shows ports on the AP6052DN.

**Figure 2-253** AP6052DN ports



As shown in **Figure 2-253**, each port can be described as follows:

1. Security slot: Connects to a security lock.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
3. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
4. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
5. GE: 10/100/1000M port that connects to the wired Ethernet.
6. 5/2.5GE/PoE_IN:100M/1000M/2.5G/5G port that connects to the wired Ethernet and supports PoE input.
7. DC 48V: Connects a power adapter to the AP.

## LED Indicators

**NOTE**

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 2-254** Indicator

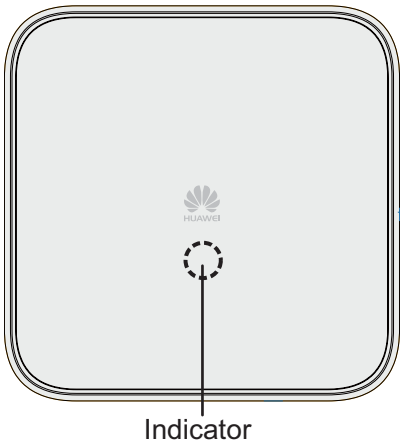



**Table 2-129** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-130** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 52 mm × 220 mm × 220 mm (2.05 in. x 8.66 in. x 8.66 in.) |
| | Weight | 1.66 kg |
| | System memory | 512 MB DDR3L |
| | Flash | 16 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | • DC: 42.5 V to 57 V<br>• PoE power supply: in compliance with IEEE 802.3at/bt |
| | Maximum power consumption | • DC/802.3bt power supply: 32 W (excluding the output power of the USB port)<br>• 802.3at power supply: 25.5 W (The USB function is unavailable. The port rate of 5/2.5GE/PoE_IN decreases to 2.5 Gbit/s. The GE port is unavailable.)<br>**NOTE**<br>• The actual maximum power consumption depends on local laws and regulations.<br>• In 802.3at power supply mode, radio power is managed in self-adaptive mode. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-131** Radio specifications

| Item | Description | | |
|---|---|---|---|
| Antenna type | Built-in omnidirectional dual-band antenna | | |
| Antenna gain | • 2.4G/5G (switchable): 2 dBi/2.8 dBi<br>• 5G (non-switchable): 2.8 dBi | | |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. | | |
| Maximum number of VAPs for each radio | 16 | | |
| Maximum transmit power | • 2.4G/5G (switchable): 26 dBm/21 dBm (combined power)<br>• 5G (non-switchable): 24 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. | | |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3<br>– 160 MHz: 1 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |

| Item | Description |
| --- | --- |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac Wave 2: 6.5 to 1733.3 Mbit/s |

## 2.35.4 Performance Specifications (AP6052DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.36 AP6750-10T Product Description

## 2.36.1 Product Characteristics (AP6750-10T)

Huawei AP6750-10T is an access point (AP) that complies with 802.11ac Wave 2 and has built-in smart antennas. It has three radios: one 2.4 GHz radio and two 5 GHz radios. The 2.4 GHz radio supports 2x2 MIMO and two spatial streams, one 5 GHz radio supports 2x2 MIMO and two spatial streams, and the other 5 GHz radio supports 4x4 MIMO and four spatial streams. The AP6750-10T provides comprehensive service support capabilities, and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meet network deployment requirements The AP complies with 802.11n and 802.11ac and can provide gigabit access for wireless users, greatly improving wireless network experience. The AP is applicable to e-classrooms, shopping malls, and supermarkets.

- Provides services simultaneously on one 2.4GHz radio and two 5GHz radios.
- Supports dual GE uplink interfaces.
- Provides built-in Bluetooth 5.0, implements precise location of Bluetooth terminals, and supports remote wireless O&M through Bluetooth console ports.
- Provides a USB port for external power supply and storage.
- Supports an external IoT module, allowing for flexible IoT application extension.
- Supports the Fat, Fit, and cloud modes.
- Enables Huawei SDN controller to manage and operate APs and services on the APs, reducing network O&M costs.

### Triple-radio design

The AP has three radios: one 2.4G radio and two 5G radios. The 2.4 GHz radio supports 2x2 MIMO and two spatial streams, and provides a maximum rate of 400

Mbit/s. One 5 GHz radio supports 2x2 MU-MIMO, and the other 5 GHz radio supports 4x4 MU-MIMO, providing a maximum rate of 867 Mbit/s and 1733 Mbit/s, respectively. The AP provides service functions simultaneously on the three radios, at a rate of 3 Gbit/s for the device.

## MU-MIMO

The AP supports MU-MIMO to send data to multiple STAs at the same time.

## Smart antenna

The AP integrates smart antennas and implicit beamforming to implement more precise user detection, suppress interference, and improve signal quality, providing users with a seamless and smooth wireless network experience.

## IoT extension

The AP provides an IoT slot for connecting to an external IoT module such as a ZigBee or RFID module, implementing short-distance, lower-power consumption IoT applications.

## Cloud-based management

Huawei CloudCampus Solution consists of SDN controller and a full range of cloud managed network devices. SDN controller provides various functions including management of APs, tenants, applications, and licenses, network planning and optimization, device monitoring, network service configuration, and value-added services.

## High Density Boost technology

Huawei uses the following technologies to address challenges in high-density scenarios, including access problems, data congestion, and poor roaming experience:

**SmartRadio for air interface optimization**

- Load balancing during smart roaming: The load balancing algorithm can work during smart roaming, enabling load balancing detection between APs on the network after STA roaming to adjust the STA load on each AP, improving network stability.
- Intelligent Dynamic Frequency Assignment (DFA) technology: The DFA algorithm is used to automatically detect adjacent-channel and co-channel interference, and identify any redundant 2.4 GHz radio. Through automatic inter-AP negotiation, a redundant radio is automatically switched to another mode (dual-5G AP models support 2.4G-to-5G switchover) or is disabled to reduce 2.4 GHz co-channel interference and increase the system capacity.
- Intelligent conflict optimization technology: Dynamic enhanced distributed channel access (EDCA) and airtime scheduling algorithms are used to schedule the channel occupation time and service priority of each STA. This ensures that each STA is assigned a relatively equal amount of time for using channel resources and user services are scheduled in an orderly manner, improving service processing efficiency and user experience.

**Air interface performance optimization**

- In high-density scenarios where many STAs access the network, an increased number of low-rate STAs consume more resources on the air interface, reduce the AP capacity, and lower user experience. Therefore, Huawei APs will check the signal strength of STAs during access and reject access from weak-signal STAs. At the same time, the APs monitor the rate of online STAs in real time and forcibly disconnect low-rate STAs so that the STAs can reassociate with APs that have stronger signals. Terminal access control technology can increase air interface use efficiency and allow access of more STAs.

**5G-prior access**

- The AP supports both 2.4G and 5G frequency bands. The 5G-prior access function enables an AP to steer STAs to the 5 GHz frequency band first, which reduces load and interference on the 2.4 GHz frequency band, improving user experience.

**Automatic radio calibration**

- Automatic radio calibration allows an AP to collect signal strength and channel parameters of surrounding APs and generate an AP topology according to the collected data. Based on interference from authorized APs, rogue APs, and non-Wi-Fi interference sources, each AP automatically adjusts its transmit power and working channel to make the network operate at better performance. In this way, network reliability and user experience are improved.

## Wired and wireless dual security guarantee

To ensure data security, Huawei APs integrate wired and wireless security measures and provide comprehensive security protection.

**Authentication and encryption for wireless access**

- Huawei APs support WEP, WPA/WPA2-PSK, WPA/WPA2-PPSK, WPA/WPA2-802.1X, and WAPI authentication/encryption modes to ensure security of a wireless network. The authentication mechanism is used to authenticate user identities so that only authorized users can access network resources. The encryption mechanism is used to encrypt data transmitted over wireless links to ensure that the data can only be received and parsed by expected users.

**Analysis on non-Wi-Fi interference sources**

- Huawei APs can analyze the spectrum of non-Wi-Fi interference sources and identify them, including baby monitors, Bluetooth devices, digital cordless phones (on 2.4 GHz frequency band only), wireless audio transmitters (on both the 2.4 GHz and 5 GHz frequency bands), wireless game controllers, and microwave ovens. Coupled with Huawei eSight, the APs can accurately detect interference sources, and display the spectrum of them on eSight, enabling the administrator to remove the interference in a timely manner.

**Rogue device monitoring**

- Huawei APs support WIDS/WIPS, and can monitor, identify, defend against, counter, and perform refined management on rogue devices, providing

security guarantees for air interface environment and wireless data transmission.

**Authentication and encryption for wired access**

- The AP access control ensures validity of APs. CAPWAP link protection and DTLS encryption provide security assurance, improving data transmission security between APs and ACs.

## Automatic application identification

Huawei APs support smart application control technology and can implement visualized management and control on Layer 4 to Layer 7 applications.

**Traffic identification**

- Coupled with Huawei ACs, the APs can identify over 1600 common applications in various office scenarios. Based on the identification results, policy control can be implemented on user services, including priority adjustment, scheduling, blocking, and rate limiting to ensure efficient bandwidth resource use and improve quality of key services.

**Traffic statistics collection**

- Traffic statistics of each application can be collected globally, by SSID, or by user, so that the network administrator can know application use status on the network. The network administrator or operator then can implement visualized management and control on service applications on smart terminals to enhance security and ensure effective bandwidth control.

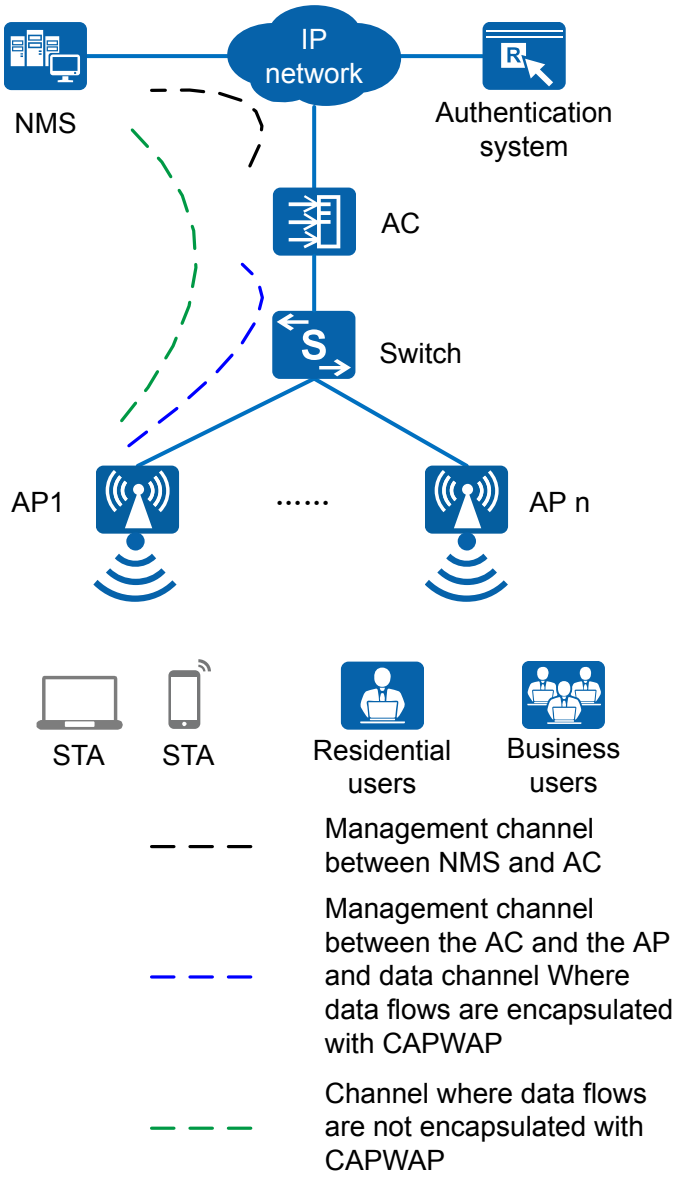
# 2.36.2 Usage Scenarios (AP6750-10T)

The AP6750-10T can work as a Fat AP, Fit AP, or cloud AP. The AP can switch flexibly among three working modes based on the network plan.

## Typical Fit AP Networking

**Figure 2-255** Fit AP networking (AP mode)

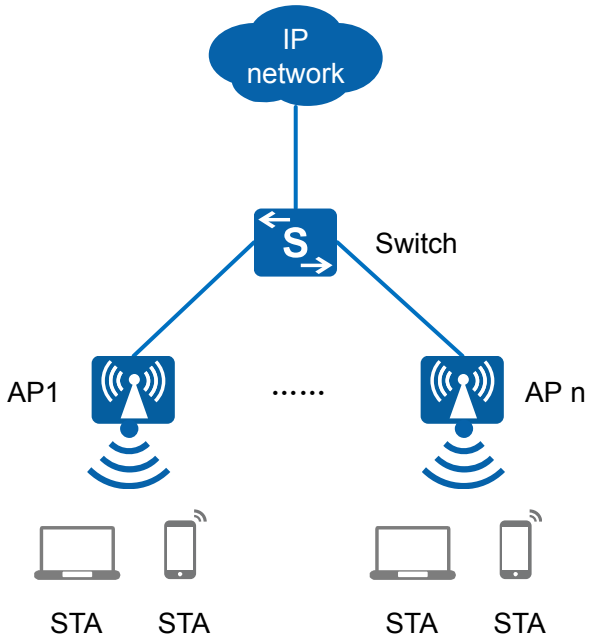



In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

## Typical Fat AP Networking

**Figure 2-256** Fat AP networking

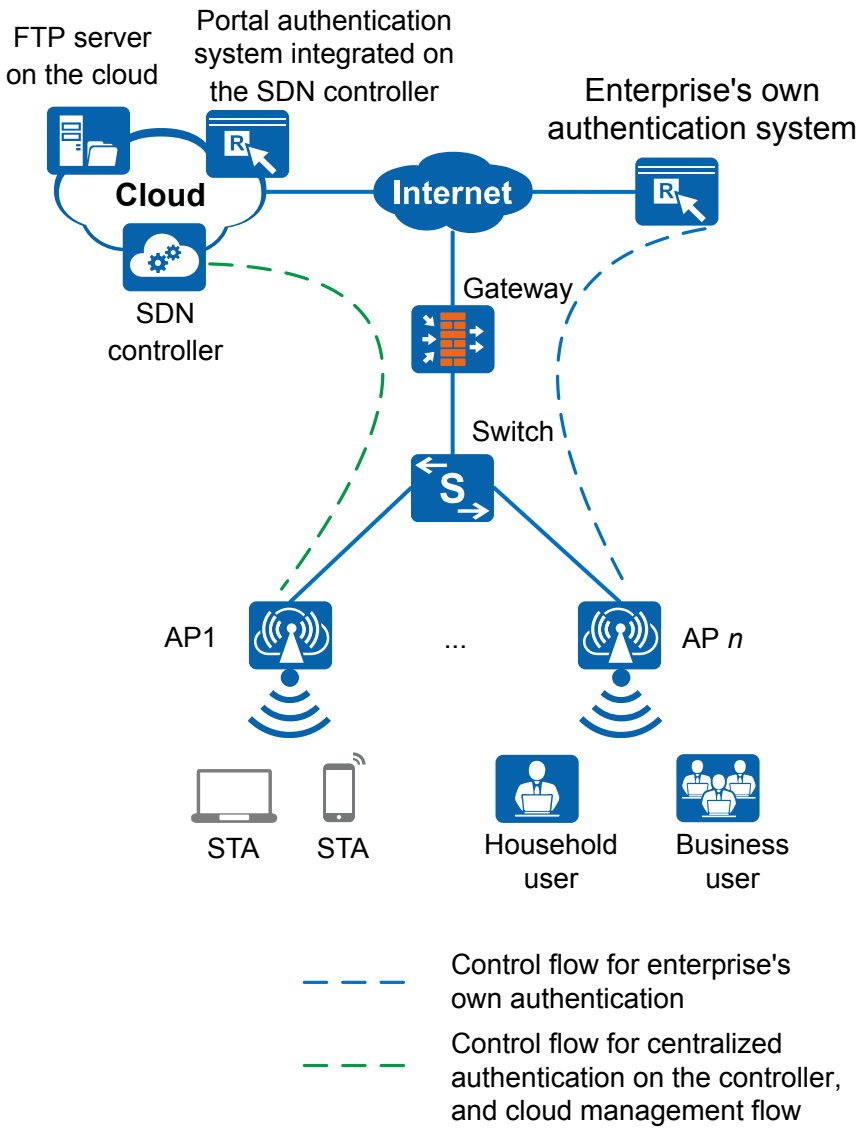



In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

## Typical Cloud AP Networking

**Figure 2-257** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

# 2.36.3 Hardware Information (AP6750-10T)

## Appearance

**Figure 2-258** shows the appearance of the AP.

NOTE

The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

**Figure 2-258** AP6750-10T appearance

## Port

**Figure 2-259** Port of the AP6750-10T

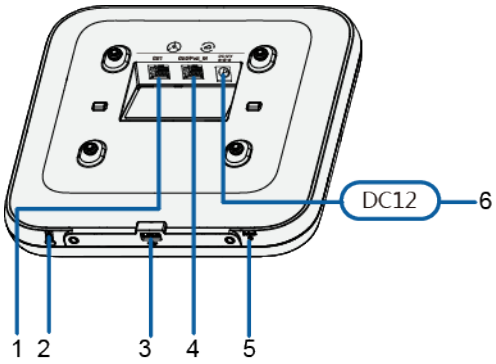



**Table 2-132** Interface description

| No. | Name | Description |
|---|---|---|
| 1 | GE1 | 10/100/1000M port that connects to the wired Ethernet. |
| 2 | Security slot | Connects to a security lock. |
| 3 | USB port | Connects to a USB flash drive or an IoT module. |
| 4 | GE0/PoE_IN | 10/100/1000M port that connects to the wired Ethernet and supports PoE input. |
| 5 | Default | Restores factory settings and restarts the device when you hold down the button more than 3 seconds. |
| 6 | DC 12V | Connects a 12 V power adapter to the AP. |

NOTE

- The AP supports the following power supply modes: PoE power supply and DC power supply.
- Use the selected power adapter for power supply; otherwise, the AP may be damaged.

## LED Indicators

The AP6750-10T provides only one indicator, as shown in **Figure 2-260**.

NOTE

Indicator colors may vary slightly at different temperature.

**Figure 2-260** Indicator

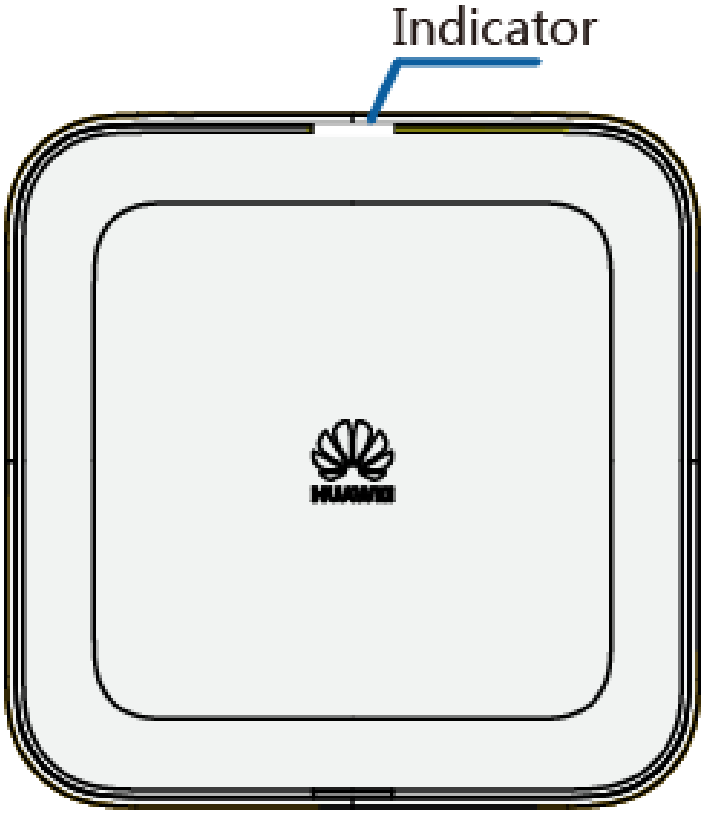



**Table 2-133** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | White | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | White | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks white once. Until the software is uploaded and started, the indicator remains steady white. |
| | - | White | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | White | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-134** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 47 mm × 220 mm × 220 mm |
| | Weight | 1.2 kg |
| | System memory | 512 MB DDR3L 16-bit |
| | Flash | 4 MB NOR Flash + 128 MB NAND Flash |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power supply: in compliance with IEEE 802.3at/af |
| | Maximum power consumption | 19.3 W (excluding the output power of the USB port or IoT card port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: The maximum temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |
| Radio specifications | Antenna type | Built-in smart antenna |
| | Antenna gain | Maximum gain of a single antenna:<br>• 2.4G: 3.5 dBi<br>• 5G: 5 dBi<br>Gain of combined antennas:<br>• 2.4G: 1 dBi<br>• 5G-1: 2 dBi<br>• 5G-2: 3 dBi |

| Item | | Description |
| --- | --- | --- |
| | Maximum number of users | Fit AP: ≤ 768<br>Fat AP: ≤ 768<br>Cloud AP: ≤ 768<br>**NOTE**<br>The actual number of users varies according to the environment. |
| | Maximum transmit power | • 2.4G: 23 dBm (combined power)<br>• 5G-1: 24 dBm (combined power)<br>• 5G-2: 27 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |
| | Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac Wave 2: 6.5 to 1733.3 Mbit/s |

## 2.36.4 Performance Specifications (AP6750-10T)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.37 AP7030DE Product Description

## 2.37.1 Product Characteristics (AP7030DE)

**Table 2-135** Product characteristics

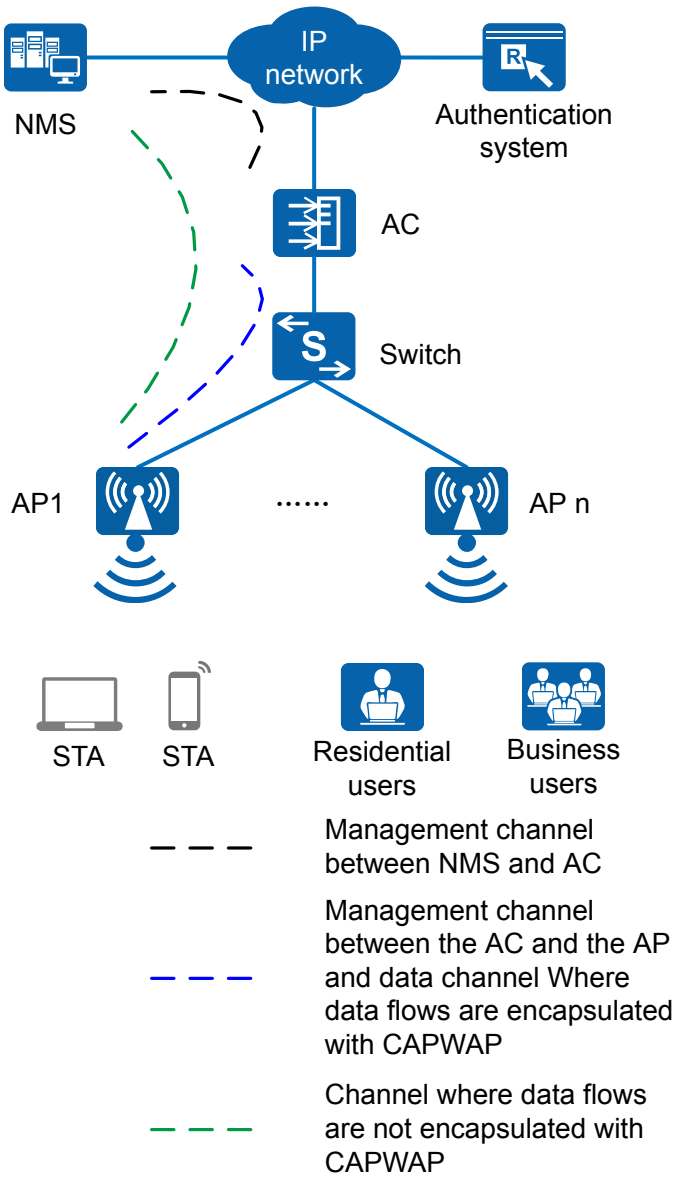
| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP7030DE | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP7030DE can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The latest-generation technology-leading AP7030DE supports 3x3 MIMO and provides comprehensive service support capabilities. It is deployed indoors and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. Huawei AP7030DE complies with IEEE 802.11ac and can provide gigabit access for wireless users. This high capacity greatly improves user experience on wireless networks. | The AP7030DE provides high-performance wireless services for large and medium enterprises in high-density scenarios.<br>It can be flexibly deployed in different environments. |

## 2.37.2 Usage Scenarios (AP7030DE)

Typical networking modes are as follows:

**Figure 2-261** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

## 2.37.3 Hardware Information (AP7030DE)

### Appearance

**Figure 2-262** shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-262** Appearance

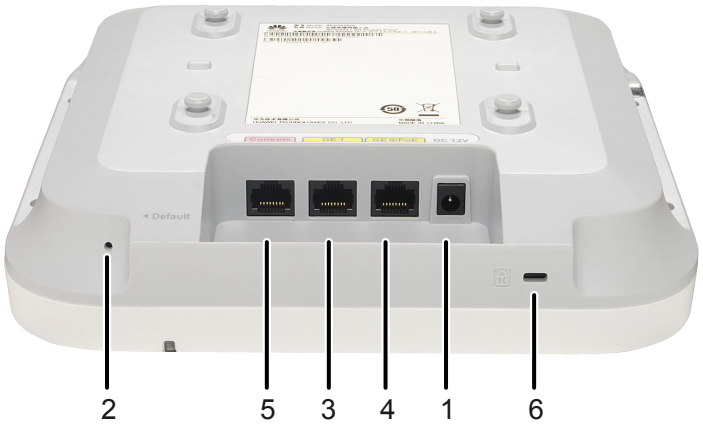

CAUTION

 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP7030DE.

**Figure 2-263** Interfaces




As shown in **Figure 2-263**, the AP7030DE has the following interfaces.

- 1. Input port for 12 V DC power supply

- 2. Default button: restores factory settings if you hold down the button more than 3 seconds.
- 3. GE1/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs. PoE power supply is supported on dual network ports.
- 4. GE0/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
- 5. Console port: connects to the maintenance terminal for AP configuration and management.
- 6. Lock port: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-136** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-137** Basic specifications of the AP7030DE

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 53 mm x 220 mm x 220 mm |
| | Weight | 1.1 kg |
| | System memory | • 256 MB DDR3<br>• 64 MB flash memory |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power: in compliance with IEEE 802.3at |
| | Maximum power consumption | 19 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to +1800 m: -20°C to +50°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |

| Item | | Description |
| --- | --- | --- |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 2-138** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in dual-band smart antenna (up to 12 antennas) |
| Antenna gain | • 2.4 GHz: 5 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | ≤ 256 |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 25 dBm (combined power)<br>• 5 GHz: 21 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>802.11b/g<br>• 20 MHz: 3<br>802.11n<br>• 20 MHz: 3<br>• 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>802.11a<br>• 20 MHz: 13<br>802.11n<br>• 20 MHz: 13<br>• 40 MHz: 6<br>802.11ac<br>• 20 MHz: 13<br>• 40 MHz: 6<br>• 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.<br>NOTICE<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 600 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s</td></tr>
</table>

## 2.37.4 Performance Specifications (AP7030DE)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.38 AP7050DE Product Description

## 2.38.1 Product Characteristics (AP7050DE)

Huawei AP7050DE is the latest-generation technology-leading wireless access point (AP). It provides secure gigabit wireless access in compliance with the 802.11ac Wave 2 standards. The AP supports 4 x 4 MU-MIMO and four spatial streams and provides a rate of up to 2.53 Gbit/s. The AP has built-in smart antennas and supports smooth evolution from 802.11n standards to 802.11ac standards and meets the bandwidth requirements of large-bandwidth services such as High Definition (HD) video streams, multimedia, and desktop cloud services, delivering smooth and high-quality wireless services to enterprise users.

As the 802.11ac Wave 2 AP that uses smart antenna technology, it is intelligent, secure, and easy to use. The AP delivers industry-leading performance in a rugged, attractive enclosure and is ideal for indoor coverage scenarios, such as schools and large campuses.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 800 Mbit/s at 2.4 GHz and 1.73 Gbit/s at 5 GHz, and 2.53 Gbit/s for the device
- Smart antenna array technology enables targeted signal coverage for mobile terminals, reduces interferences, and improves signal quality. Additionally, it supports millisecond-level switchover as terminals move.
- Built-in Bluetooth to implement precise positioning with eSight
- Dual Ethernet interfaces supporting link aggregation and traffic load balancing while ensuring link reliability
- USB interface used for external power supply and storage
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

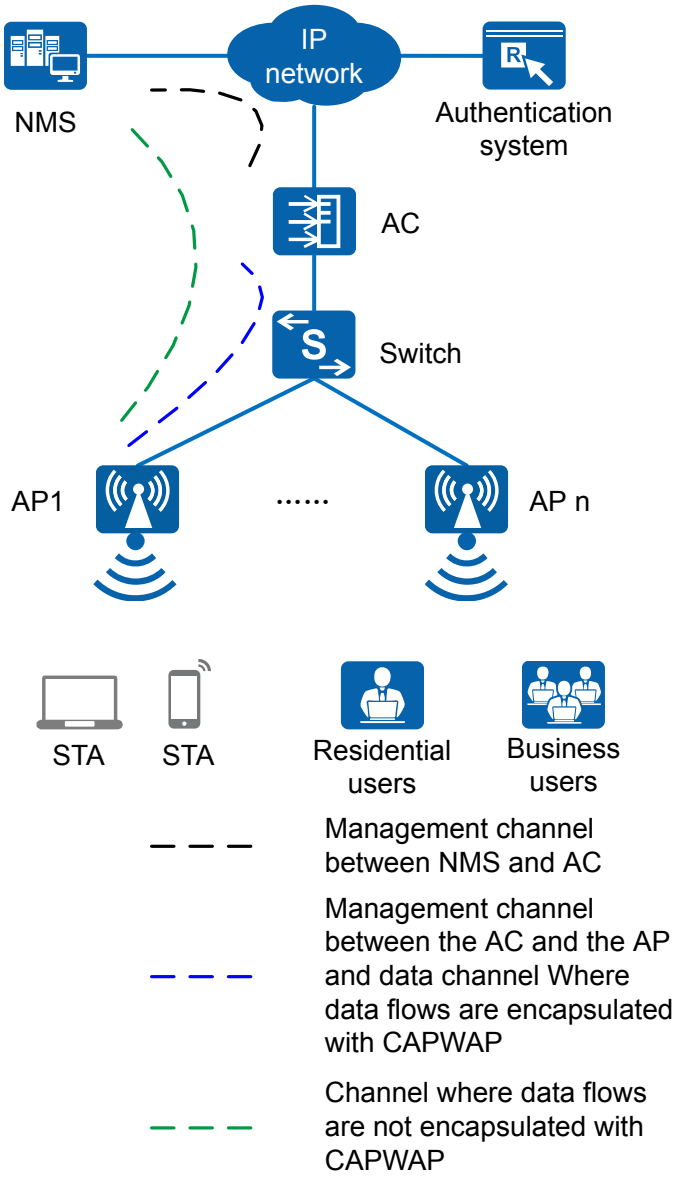
## 2.38.2 Usage Scenarios (AP7050DE)

The AP7050DE can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-264** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-265** Fit AP networking (WDS mode: point-to-point)

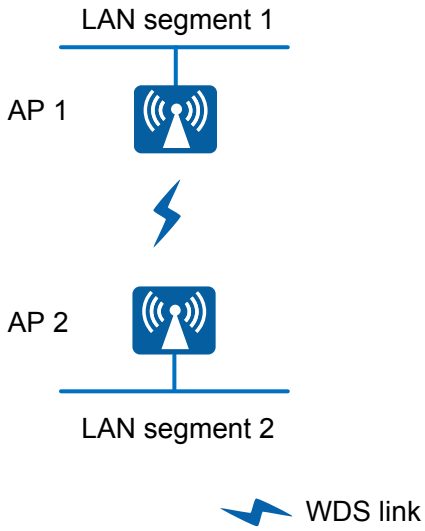
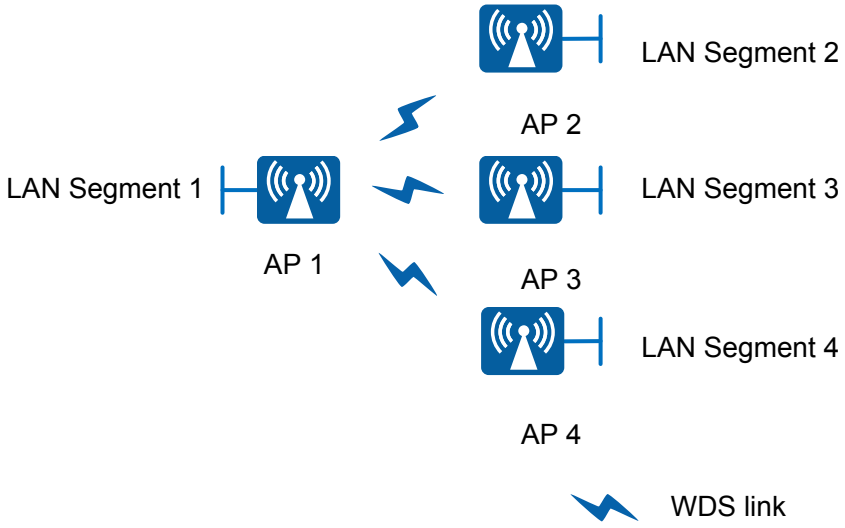


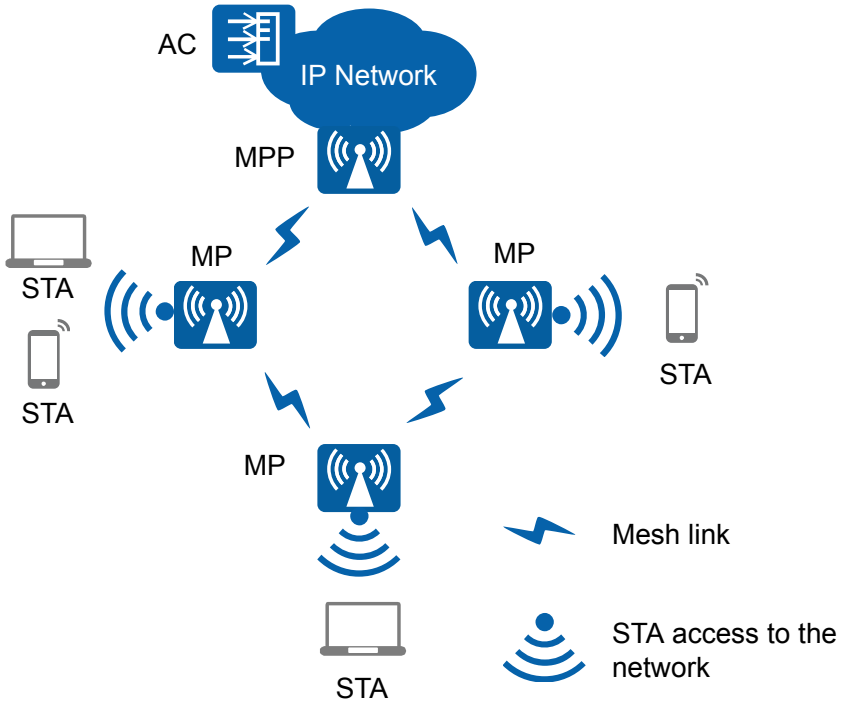

**Figure 2-266** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

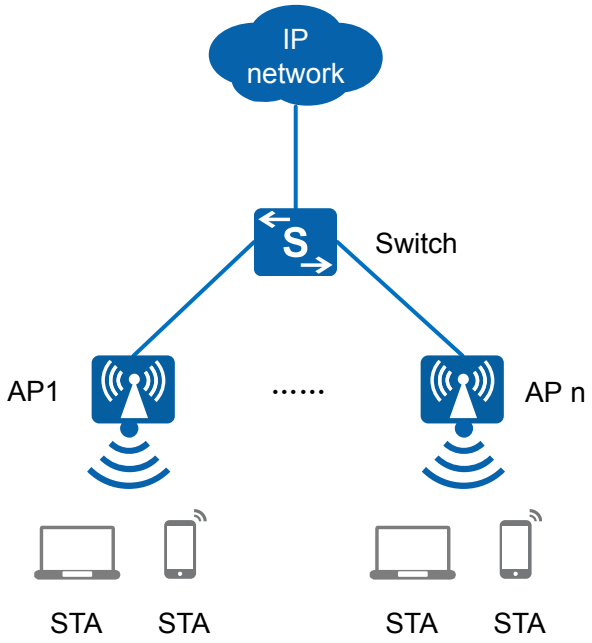
**Figure 2-267** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

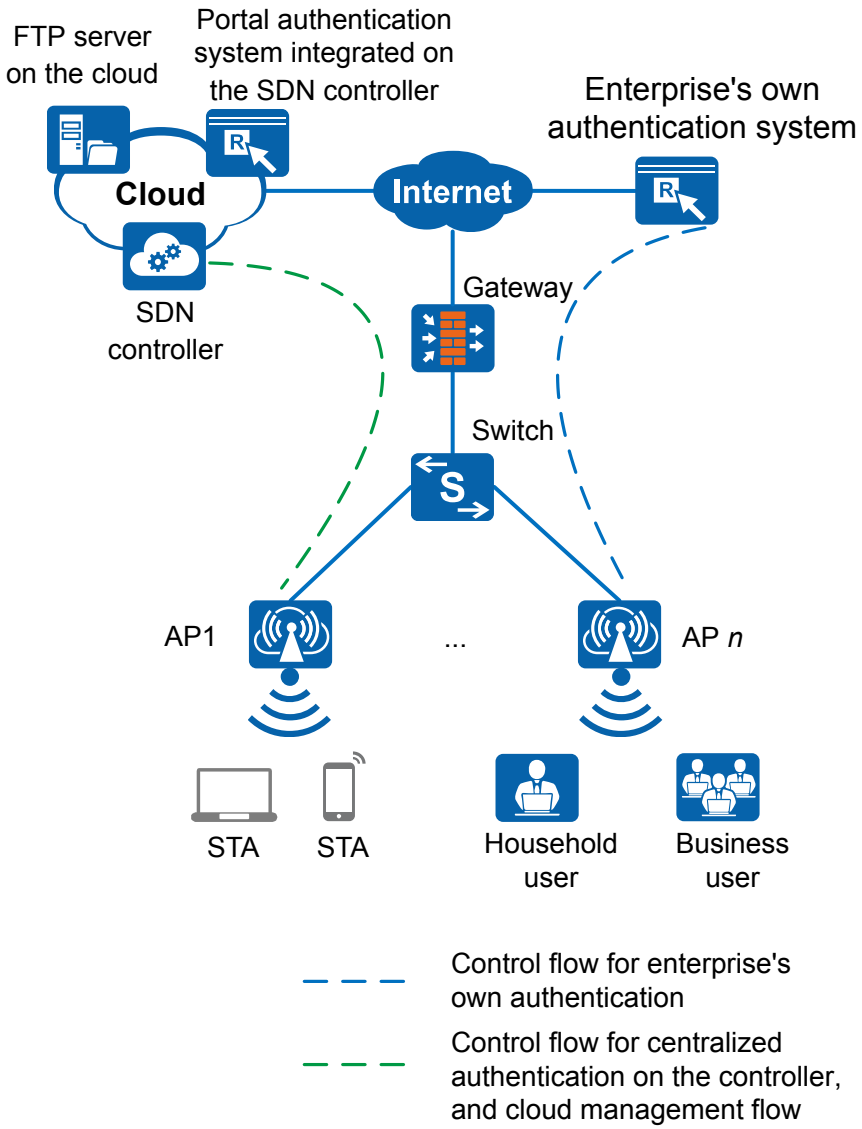
**Figure 2-268** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-269** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.38.3 Hardware Information (AP7050DE)

### Appearance

NOTE

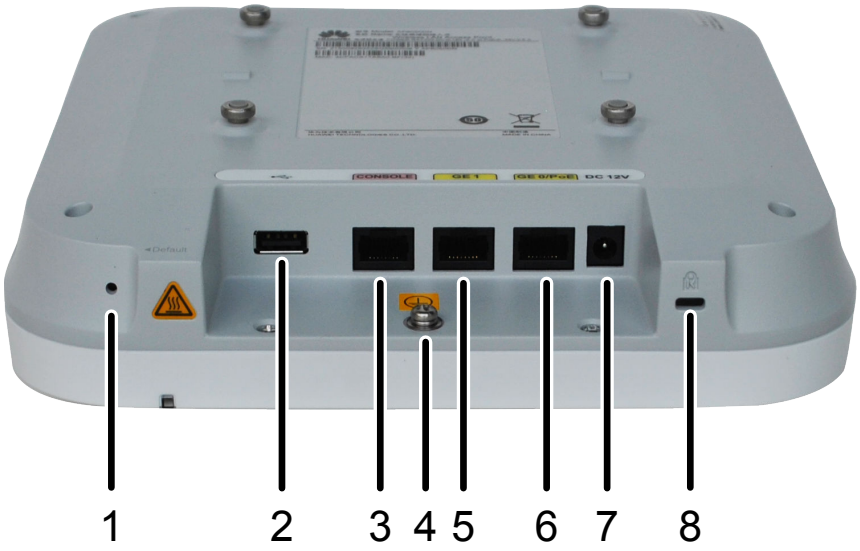
The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

**Figure 2-270** AP7050DE appearance


## Port

**Figure 2-271** AP7050DE ports




As shown in **Figure 2-271**, each port can be described as follows:

1. Default button: restores factory settings if you hold down the button more than 3 seconds.
2. USB port: connects to a USB flash drive to extend the storage space of the AP, and provides a maximum of 2.5 W power.
3. Console port: connects to the maintenance terminal for AP configuration and management.

4. Ground screw: connects the AP to a ground cable.
5. GE1: 10/100/1000M port used to connect to the wired Ethernet.
6. GE0/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs.
7. Input port for 12 V DC power supply.
8. Lock port: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-139** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-140** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 53 mm x 220 mm x 220 mm (2.09 in. x 8.66 in. x 8.66 in.) |
| | Weight | 1.3 kg |
| | System memory | ● 512 MB DDR3L<br>● 4 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | ● DC: 12 V ± 10%<br>● PoE power supply: in compliance with IEEE 802.3at |
| | Maximum power consumption | 24 W (excluding the output power of the USB port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-141** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in dual-band smart antenna (hardware) |
| Antenna gain | • 2.4 GHz: 2dBi<br>• 5 GHz: 3dBi |
| Maximum number of users | FIT AP: ≤ 512<br>FAT AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 26 dBm (combined power)<br>• 5 GHz: 27 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3<br>– 160 MHz: 1 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac wave2: 6.5 to 1733.3 Mbit/s | | |

## 2.38.4 Performance Specifications (AP7050DE)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.39 AP7050DN-E Product Description

## 2.39.1 Product Characteristics (AP7050DN-E)

Huawei AP7050DN-E is the latest-generation technology-leading wireless access point (AP). It provides secure gigabit wireless access in compliance with the 802.11ac Wave 2 standards. The AP supports 4 x 4 MU-MIMO and four spatial streams and provides a rate of up to 2.53 Gbit/s. The AP has built-in omnidirectional antennas and supports smooth evolution from 802.11n standards to 802.11ac standards and meets the bandwidth requirements of large-bandwidth services such as High Definition (HD) video streams, multimedia, and desktop

cloud services, delivering smooth and high-quality wireless services to enterprise users.

As the 802.11ac Wave 2 AP that provides the 2.5GE uplink interface, it is intelligent, secure, and easy to use. Delivering industry-leading performance in a rugged, attractive enclosure, it is ideal for co-deployment with Pico base stations, campuses, and large or medium enterprises.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 800 Mbit/s at 2.4 GHz and 1.73 Gbit/s at 5 GHz, and 2.53 Gbit/s for the device
- 2.5GE uplink interface to improve the service load capability
- Support for the PoE out function, with a maximum output power of 45 W, supplying power to Pico base stations and providing GE high-bandwidth access
- USB interface used for external power supply and storage
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

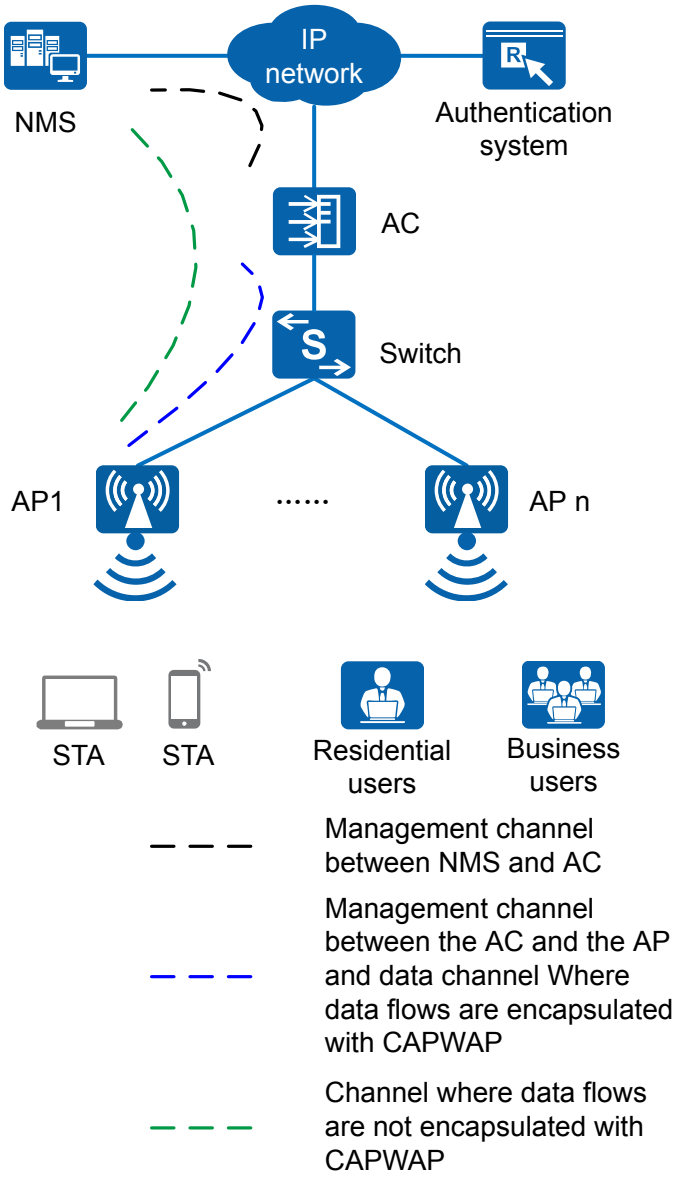
## 2.39.2 Usage Scenarios (AP7050DN-E)

The AP7050DN-E can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-272** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-273** Fit AP networking (WDS mode: point-to-point)

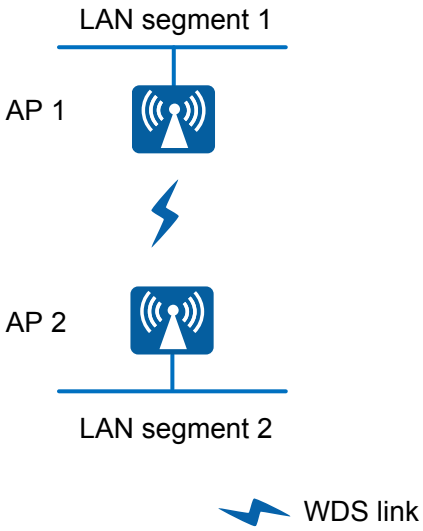
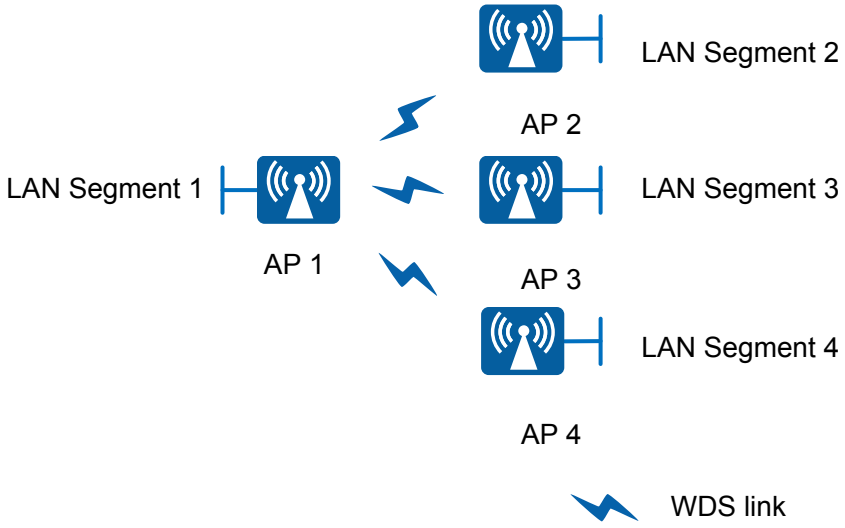


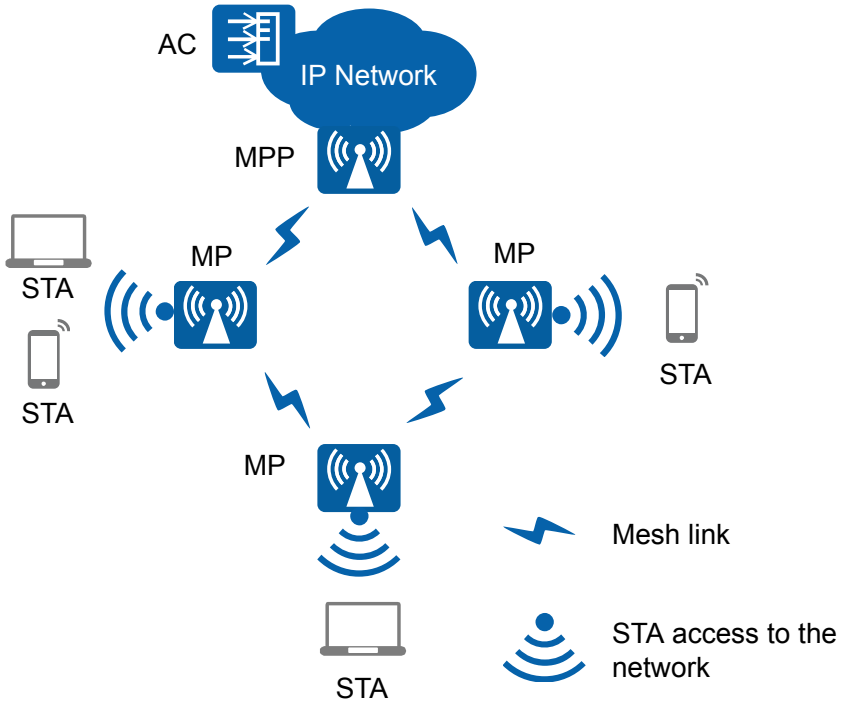

**Figure 2-274** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

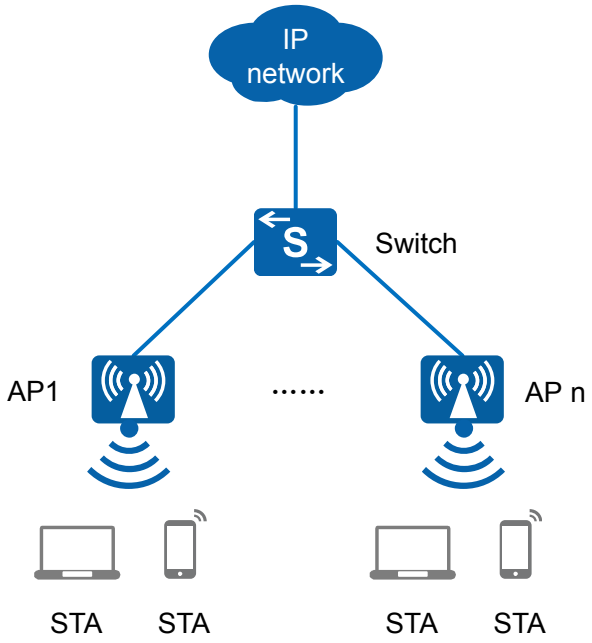
**Figure 2-275** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

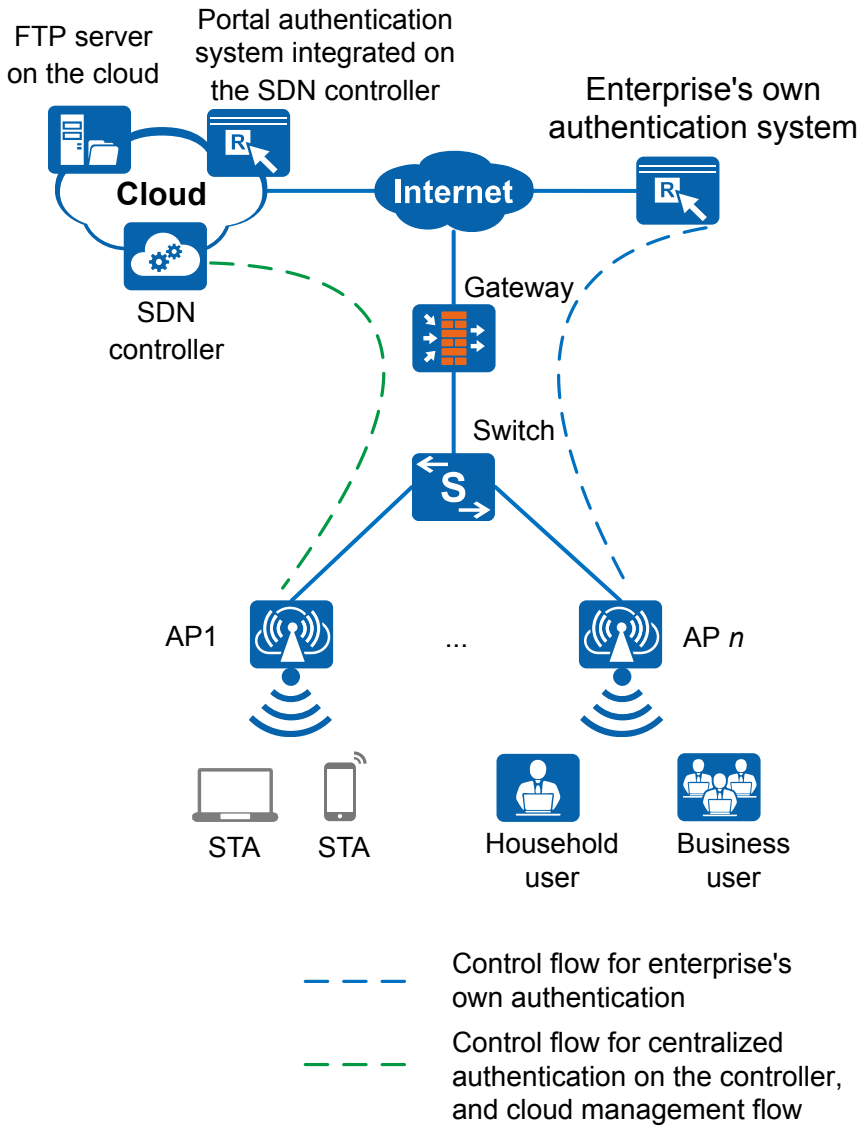
**Figure 2-276** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-277** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.39.3 Hardware Information (AP7050DN-E)

### Appearance

NOTE

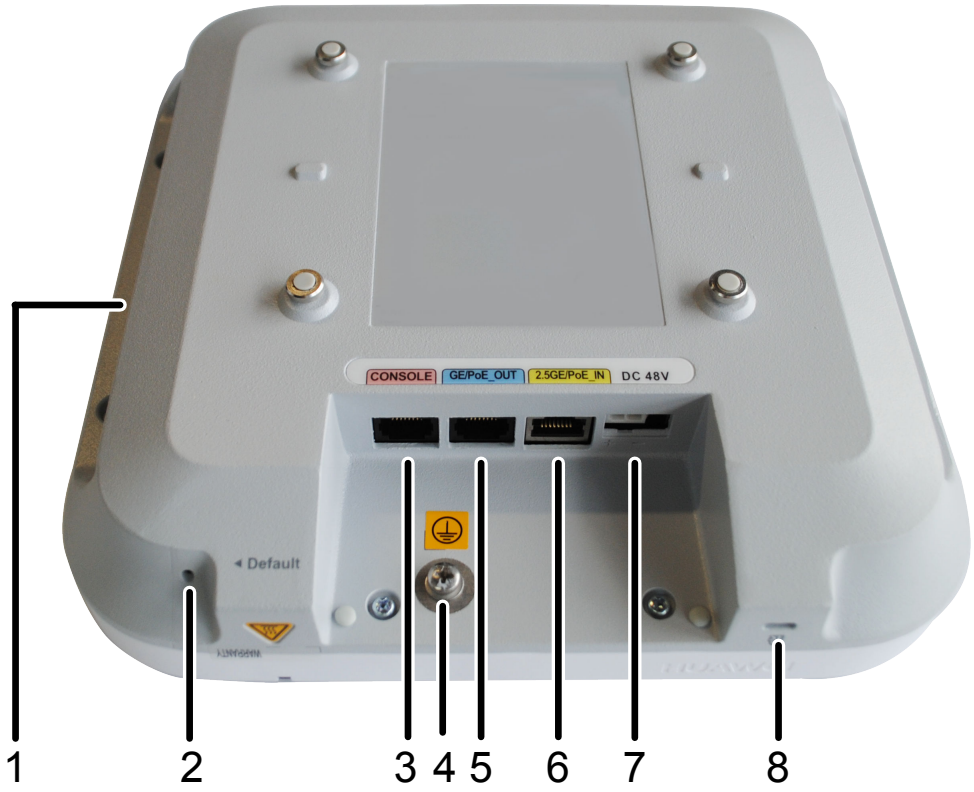
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-278** AP7050DN-E appearance

## Ports

**Figure 2-279** AP7050DN-E ports



As shown in **Figure 2-279**, each port can be described as follows:

1. USB port: connects to a USB flash drive to extend the storage space of the AP, and provides a maximum of 2.5 W power.
2. Default button: restores factory settings and restarts the device if you hold down the button more than 3 seconds.
3. Console port: connects to the maintenance terminal for AP configuration and management.
4. Ground screw: connects the AP to a ground cable.
5. GE/PoE_OUT: 10/100/1000M port used to connect to the wired Ethernet. The port can supply PoE power to downlink devices, such as Pico devices.

   NOTE

   The GE/PoE_OUT port provides the maximum power of 45 W, and complies with the 802.3af and 802.3at standards.
6. 2.5GE/PoE_IN: 100/1000/2500 Mbit/s port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for the AP and support UPoE input.
   - When UPoE power input is used, connect the port to a Huawei switch that supports UPoE output.
   - When DC power input is used, connect the port to an AC or upper-layer switch.

   NOTE

   If the port works in 100 Mbit/s, it cannot be connected to remote devices working at a rate of 100 Mbit/s.
7. DC 48 V: input port for 48 V DC power supply.

   NOTE

   When the AP uses the DC power supply, use a power adapter for power supply; otherwise, the AP may be damaged.
8. Security slot: protects the AP against theft.

## LED Indicators

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-142** Description about the single indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-143** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 53 mm x 220 mm x 220 mm (2.09 in. x 8.66 in. x 8.66 in.) |
| | Weight | 1.47 kg |
| | System memory | • 512 MB DDR3L<br>• 4 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | • DC: 48 V ± 2.4 V<br>• PoE power supply: in compliance with IEEE 802.3at/bt |
| | Maximum power consumption | • DC/802.3bt power supply: 30.6 W (excluding the output power of the USB port or PoE_OUT port)<br>• 802.3at power supply: 24.3 W (The USB and PoE_OUT functions are unavailable.)<br>**NOTE**<br>• The actual maximum power consumption depends on local laws and regulations.<br>• In 802.3at power supply mode, the 2.4 GHz radio works in 2x2 MIMO mode, and the 5 GHz radio works in 3x3 MIMO mode. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +45°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m.<br>**NOTE**<br>The operating temperature ranges from 0°C to 40°C when the AP is installed together with a Pico base station. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-144** Radio specifications

| Item | Description | | |
|---|---|---|---|
| Antenna type | Built-in dual-band omnidirectional antenna | | |
| Antenna gain | • 2.4 GHz: 5 dBi<br>• 5 GHz: 6 dBi | | |
| Maximum number of users | FIT AP: ≤ 512<br>FAT AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. | | |
| Maximum number of VAPs for each radio | 16 | | |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 27 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. | | |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3<br>– 160 MHz: 1 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |

| Item | Description |
| --- | --- |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac: 6.5 to 1730 Mbit/s |

## 2.39.4 Performance Specifications (AP7050DN-E)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.40 AP7052DE Product Description

## 2.40.1 Product Characteristics (AP7052DE)

Huawei AP7052DE is the latest-generation technology-leading wireless access point (AP). It provides secure gigabit wireless access in compliance with the 802.11ac Wave 2 standards. The AP supports 4 x 4 MIMO and four spatial streams and provides a rate of up to 2.53 Gbit/s. The AP has built-in smart antennas and supports smooth evolution from 802.11n standards to 802.11ac standards and meets the bandwidth requirements of large-bandwidth services such as High Definition (HD) video streams, multimedia, and desktop cloud services, delivering smooth and high-quality wireless services to enterprise users.

As the 802.11ac Wave 2 AP that provides the 5GE uplink interface, it is intelligent, secure, and easy to use. Delivering industry-leading performance in a rugged, attractive enclosure, it is ideal for enterprise office and education scenarios.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 800 Mbit/s at 2.4 GHz and 1.73 Gbit/s at 5 GHz, and 2.53 Gbit/s for the device
- 5GE uplink interface that can connect to a 100 MHz/1000 MHz/2.5 GHz interface, to improve the service load capability
- Smart antenna array technology enables targeted signal coverage for mobile terminals, reduces interferences, and improves signal quality. Additionally, it supports millisecond-level switchover as terminals move.
- Dual PoE power supply for backup
- Built-in Bluetooth to implement precise positioning with eSight
- USB interface used for external power supply and storage
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

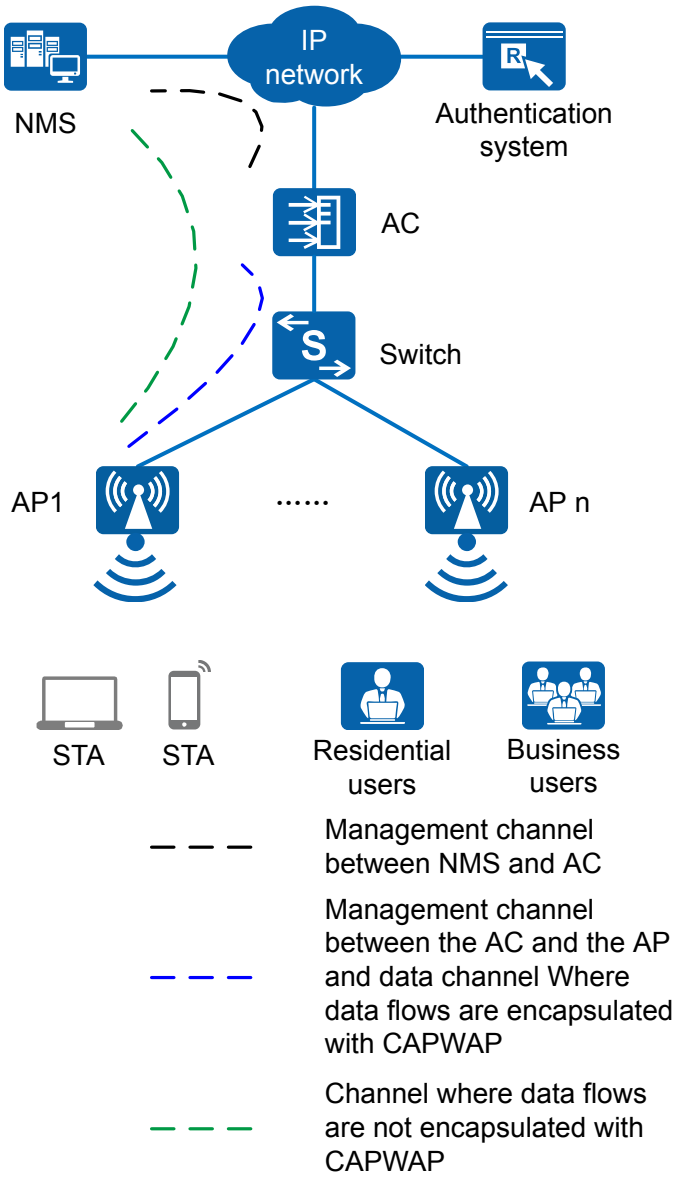
  

## 2.40.2 Usage Scenarios (AP7052DE)

The AP7052DE can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-280** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-281** Fit AP networking (WDS mode: point-to-point)

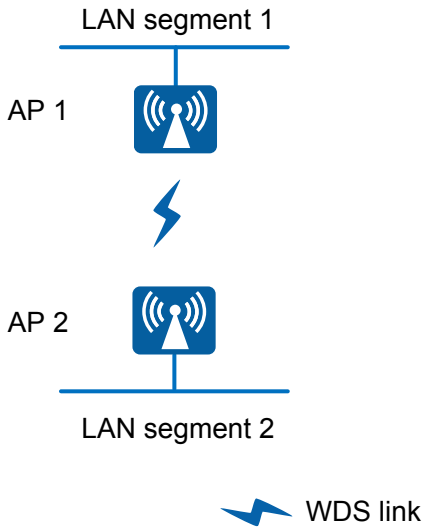
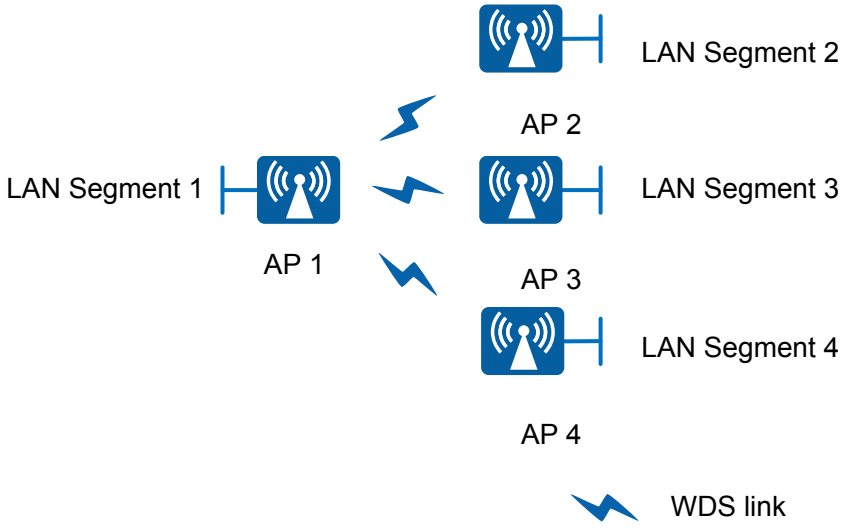


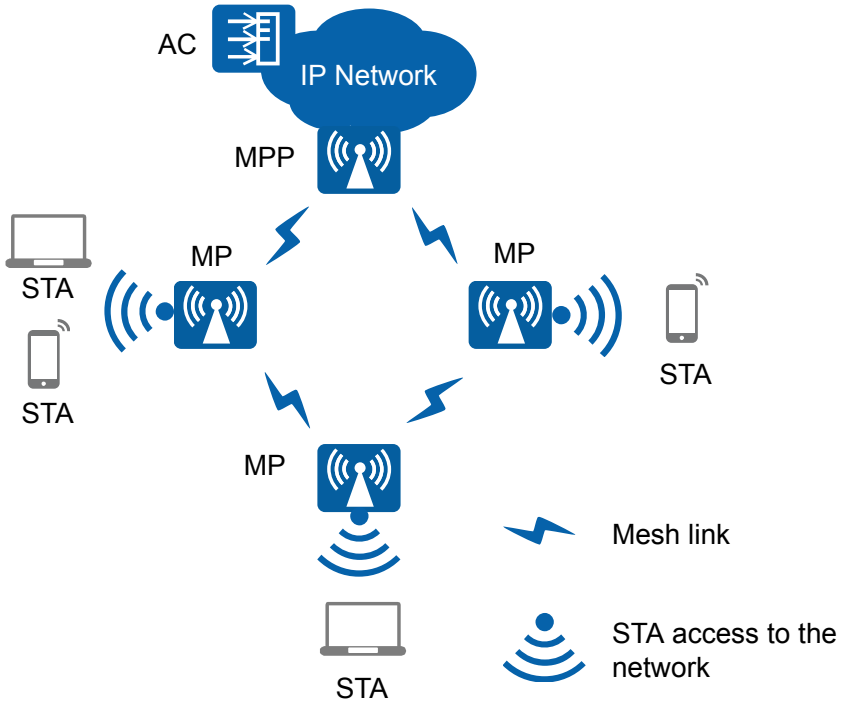

**Figure 2-282** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

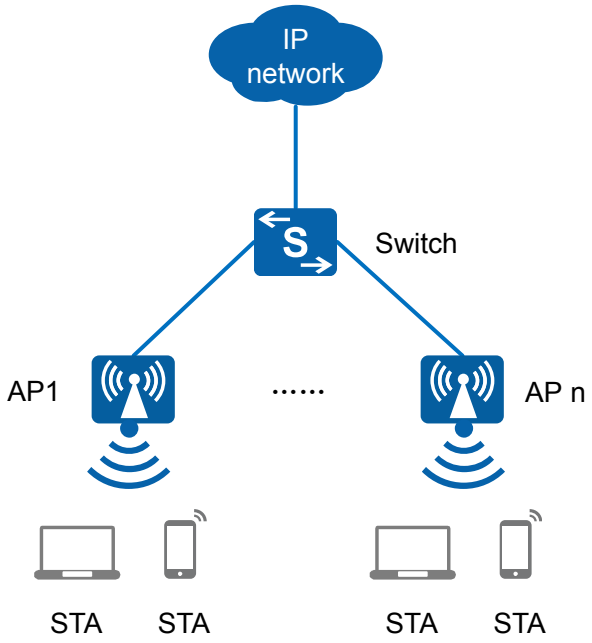
**Figure 2-283** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

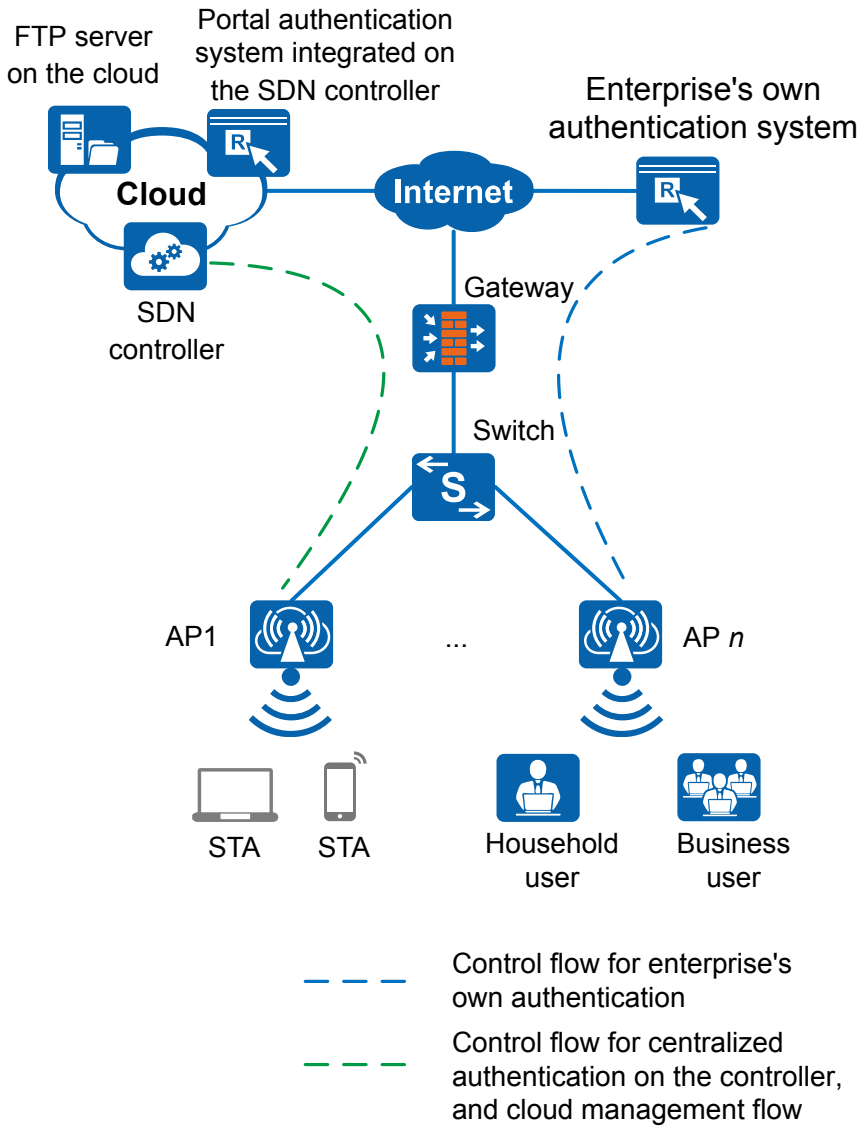
**Figure 2-284** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-285** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.40.3 Hardware Information (AP7052DE)

### Appearance

NOTE

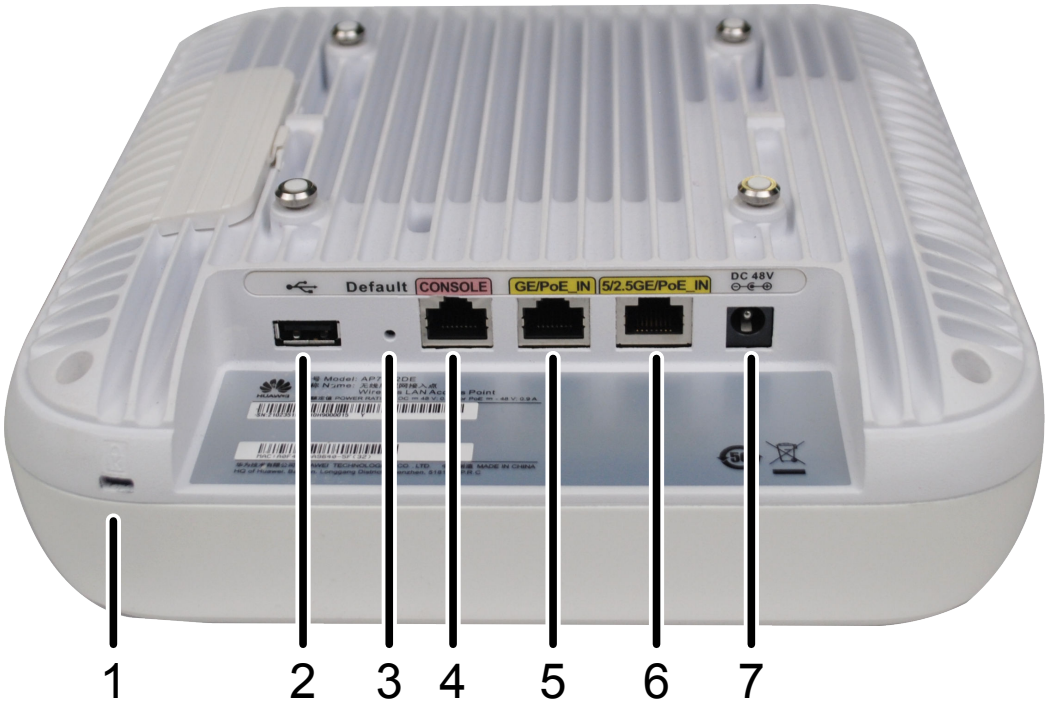
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-286** AP7052DE appearance

## Port

**Figure 2-287** AP7052DE ports



As shown in **Figure 2-287**, each port can be described as follows:

1. Security slot: Connects to a security lock.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
3. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
4. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
5. GE/PoE_IN:10/100/1000M port that connects to the wired Ethernet and supports PoE input.
6. 5/2.5GE/PoE_IN:100M/1000M/2.5G/5G port that connects to the wired Ethernet and supports PoE input.
7. DC 48V: Connects a power adapter to the AP.

## LED Indicators

**NOTE**

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 2-288** Indicator

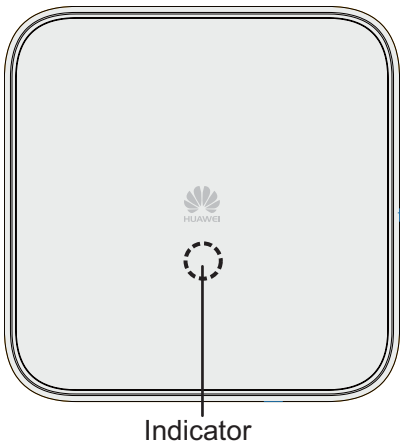



**Table 2-145** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-146** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 74.5 mm × 220 mm × 220 mm (2.93 in. x 8.66 in. x 8.66 in.) |
| | Weight | 1.75 kg |
| | System memory | 512 MB DDR3L |
| | FLASH | 16 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | • DC: 42.5 V to 57 V<br>• PoE power supply: in compliance with IEEE 802.3at/bt |
| | Maximum power consumption | • DC/802.3bt power supply: 35.7 W (excluding the output power of the USB port)<br>• 802.3at power supply: 25.5 W (The USB function is unavailable. The port rate of 5/2.5GE/PoE_IN decreases to 2.5 Gbit/s.)<br>**NOTE**<br>• The actual maximum power consumption depends on local laws and regulations.<br>• In 802.3at power supply mode, radio power is managed in self-adaptive mode. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-147** Radio specifications

| Item | Description | | |
|---|---|---|---|
| Antenna type | Built-in dual-band smart antenna (hardware) | | |
| Antenna gain | • 2.4 GHz: 3dBi<br>• 5 GHz: 4dBi | | |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. | | |
| Maximum number of VAPs for each radio | 16 | | |
| Maximum transmit power | • 2.4 GHz: 29 dBm (combined power)<br>• 5 GHz: 28 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. | | |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3<br>– 160 MHz: 1 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |

| Item | Description |
| --- | --- |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac Wave 2: 6.5 to 1733.3 Mbit/s |

### 2.40.4 Performance Specifications (AP7052DE)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

## 2.41 AP7052DN and AP7152DN Product Description

### 2.41.1 Product Characteristics (AP7052DN and AP7152DN)

Huawei AP7052DN and AP7152DN are the latest-generation technology-leading wireless access points (APs). They provide secure gigabit wireless access in compliance with the 802.11ac Wave 2 standards. The APs support 4 x 4 MIMO, four spatial streams, and 2.4G-to-5G switchover, and provide a rate of up to 3.46 Gbit/s in dual-5G mode. The APs have built-in omnidirectional antennas and support smooth evolution from 802.11n standards to 802.11ac standards. They meet the bandwidth requirements of large-bandwidth services such as High Definition (HD) video streams, multimedia, and desktop cloud services, delivering smooth and high-quality wireless services to enterprise users.

As 802.11ac Wave 2 APs that provide the 5GE uplink interface, they are intelligent, secure, and easy to use. Delivering industry-leading performance in a rugged, attractive enclosure, the two AP models are ideal for enterprise office and education scenarios.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 800 Mbit/s at 2.4 GHz and 1.73 Gbit/s at 5 GHz, and 2.53 Gbit/s for the device
- 2.4G-to-5G switchover, with a device rate of up to 3.46 Gbit/s in dual-5G mode
- 5GE uplink interface that can connect to a 100 MHz/1000 MHz/2.5 GHz interface, to improve the service load capability
- Dual PoE power supply for backup
- Built-in Bluetooth to implement precise positioning with eSight
- USB interface used for external power supply and storage
- IoT module to allow for flexible expansion of IoT applications
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

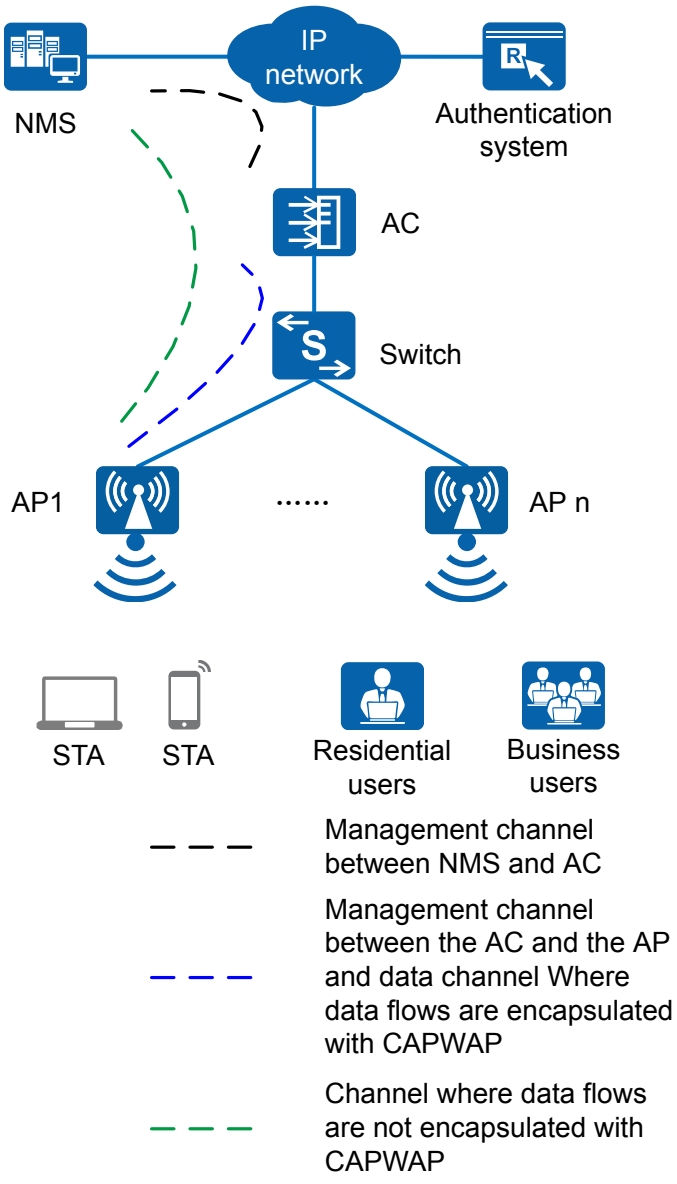
  

## 2.41.2 Usage Scenarios (AP7052DN and AP7152DN)

The AP7052DN and AP7152DN can work as a Fat AP, Fit AP, or cloud AP. The AP can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-289** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 2-290** Fit AP networking (WDS mode: point-to-point)

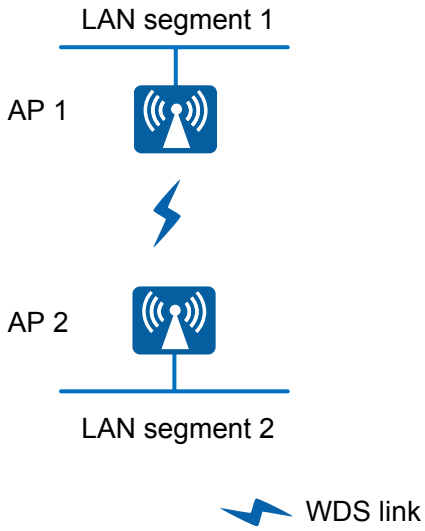
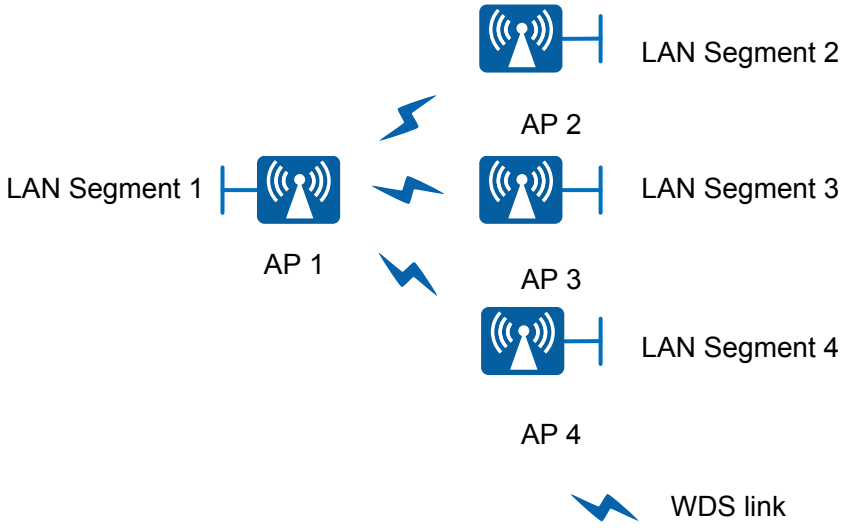


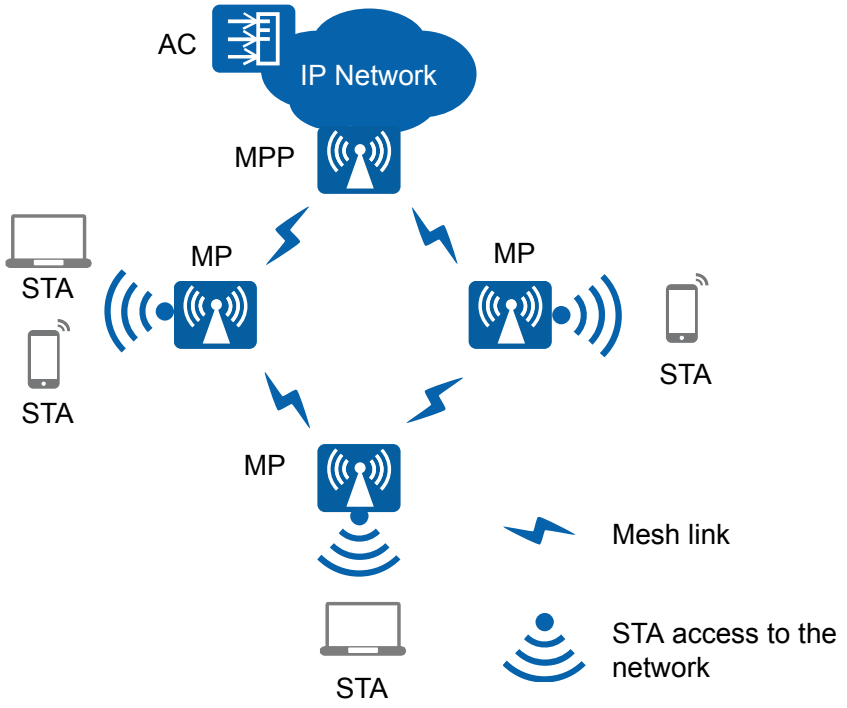

**Figure 2-291** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

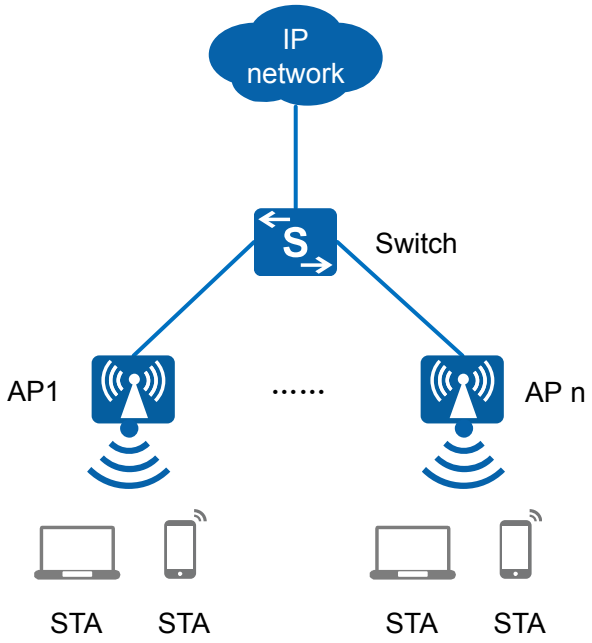
**Figure 2-292** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

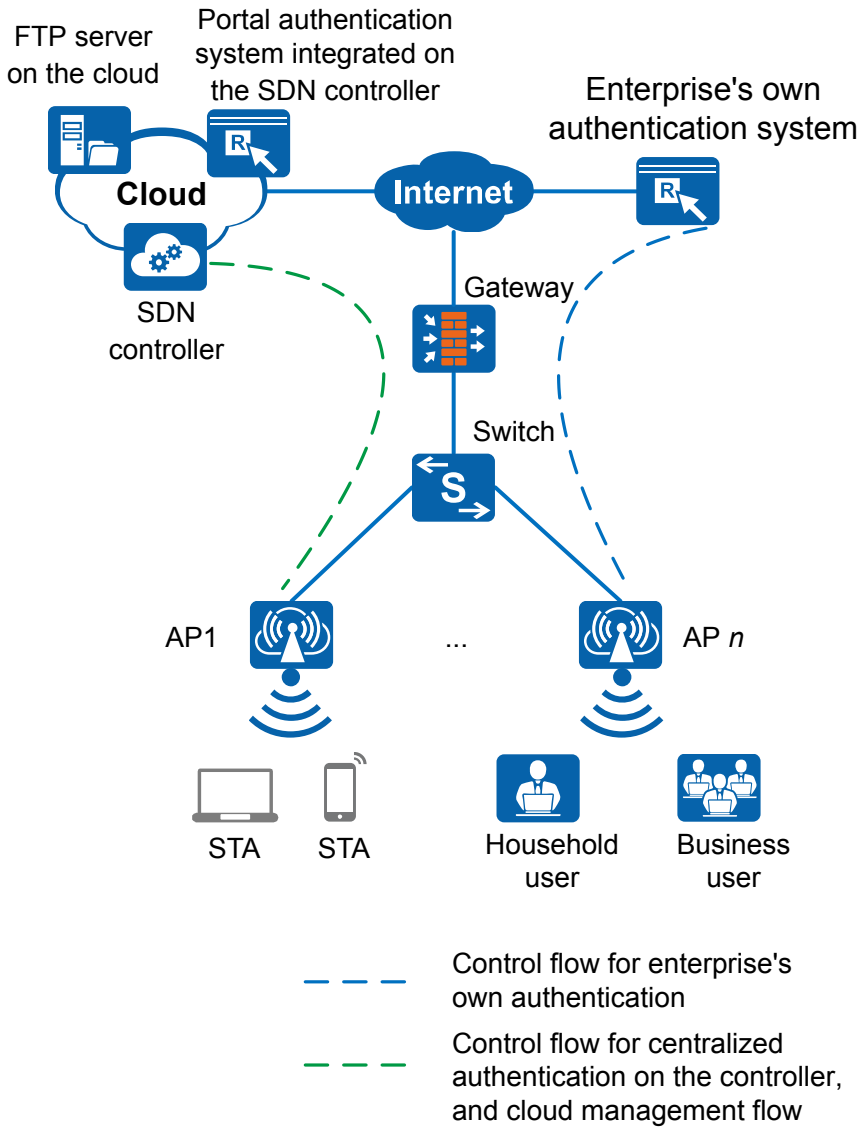
**Figure 2-293** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-294** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.41.3 Hardware Information (AP7052DN)

### Appearance

Figure 2-295 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

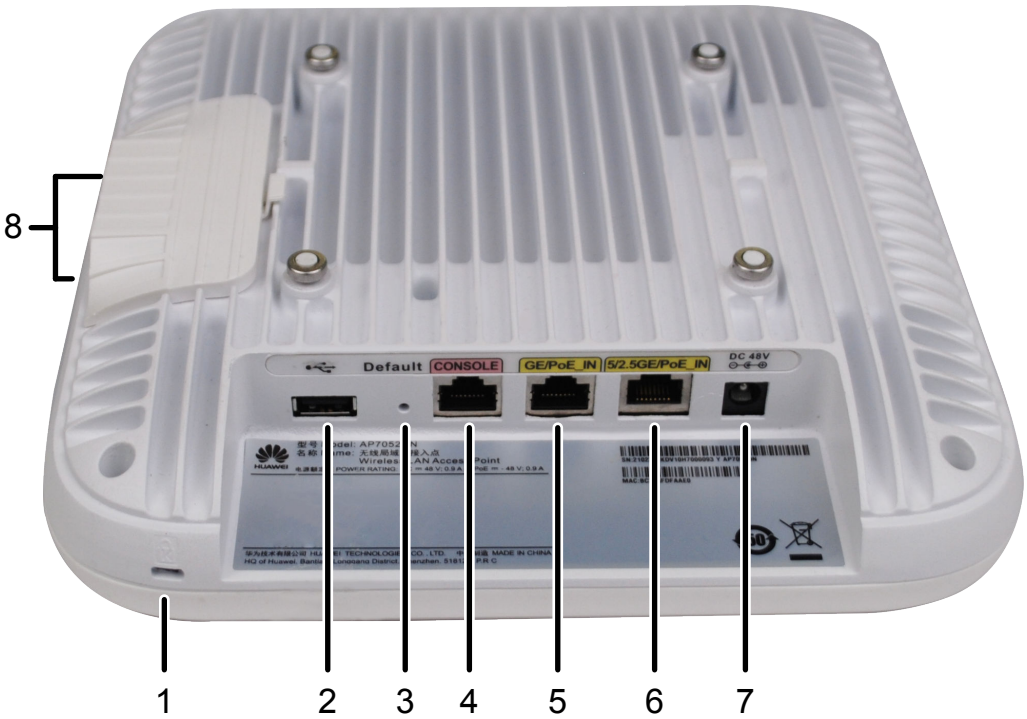
  

**Figure 2-295** AP7052DN appearance

## Port

The following figure shows ports on the AP7052DN.

**Figure 2-296** AP7052DN ports




As shown in **Figure 2-296**, each port can be described as follows:

1. Security slot: Connects to a security lock.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
3. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
4. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
5. GE/PoE_IN:10/100/1000M port that connects to the wired Ethernet and supports PoE input.
6. 5/2.5GE/PoE_IN:100M/1000M/2.5G/5G port that connects to the wired Ethernet and supports PoE input.
7. DC 48V: Connects a power adapter to the AP.
8. Radio port: Connects an antenna to an IoT card through a radio cable.

## LED Indicators

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 2-297** Indicator

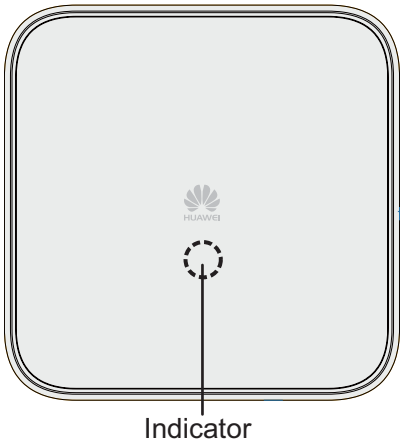



**Table 2-148** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-149** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 52 mm x 220 mm x 220 mm (2.05 in. x 8.66 in. x 8.66 in.) |
| | Weight | 1.68 kg |
| | System memory | 512 MB DDR3L |
| | FLASH | 16 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | • DC: 42.5 V to 57 V<br>• PoE power supply: in compliance with IEEE 802.3at/bt |
| | Maximum power consumption | • DC/802.3bt power supply: 33 W (excluding the output power of the USB port)<br>• 802.3at power supply: 25.5 W (The USB function is unavailable. The port rate of 5/2.5GE/PoE_IN decreases to 2.5 Gbit/s. The IoT card power is lower than 0.5 W.)<br>**NOTE**<br>• The actual maximum power consumption depends on local laws and regulations.<br>• In 802.3at power supply mode, radio power is managed in self-adaptive mode. |
| Environment specifications | Operating temperature and altitude | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-150** Radio specifications

| Item | Description | | |
|---|---|---|---|
| Antenna type | Built-in omnidirectional dual-band antenna | | |
| Antenna gain | • 2.4G/5G (switchable): 2 dBi/2.8 dBi<br>• 5G (non-switchable): 2.8 dBi | | |
| Maximum number of users | Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. | | |
| Maximum number of VAPs for each radio | 16 | | |
| Maximum transmit power | • 2.4G/5G (switchable): 26 dBm/21 dBm (combined power)<br>• 5G (non-switchable): 24 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. | | |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3<br>– 160 MHz: 1 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |

| Item | Description |
| --- | --- |
| Channel rate supported | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac Wave 2: 6.5 to 1733.3 Mbit/s |

## 2.41.4 Hardware Information (AP7152DN)

### Appearance

Figure 2-298 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

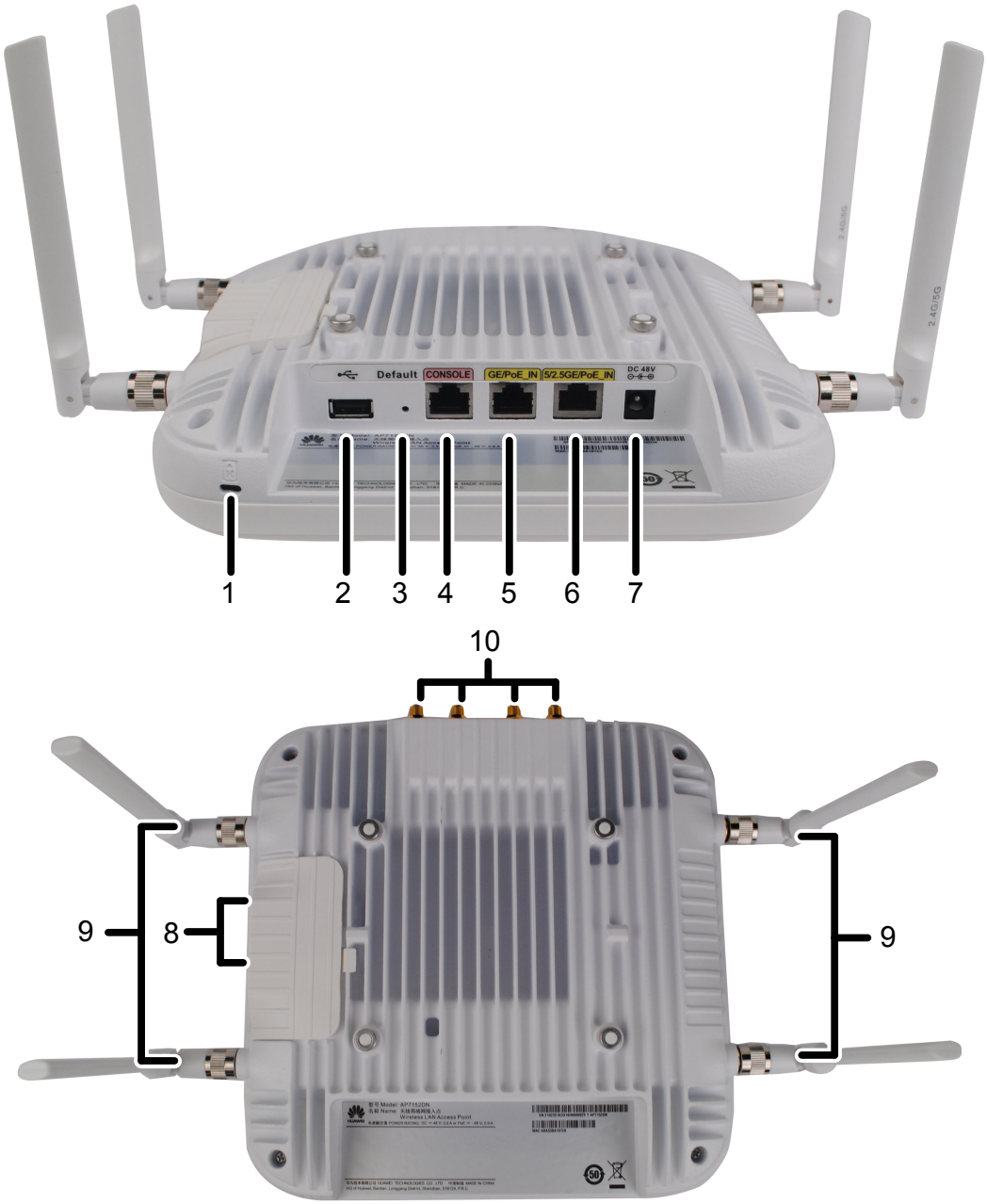
**Figure 2-298** AP7152DN appearance

### Port

The following figure shows ports on the AP7152DN.

**Figure 2-299** AP7152DN ports




As shown in **Figure 2-299**, each port can be described as follows:

1. Security slot: Connects to a security lock.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
3. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
4. CONSOLE: Connects to a maintenance terminal for AP configuration and management.

5. GE/PoE_IN:10/100/1000M port that connects to the wired Ethernet and supports PoE input.
6. 5/2.5GE/PoE_IN:100M/1000M/2.5G/5G port that connects to the wired Ethernet and supports PoE input.
7. DC 48V: Connects a power adapter to the AP.
8. Radio port: Connects an antenna to an IoT card through a radio cable.
9. 2.4G/5G: Connects a 2.4 GHz or 5 GHz antenna to the AP to send and receive wireless signals.The port type is RP-SMA-K.The port is applicable only to an AP that supports external antennas.
10. 5G: Connects a 5 GHz antenna to the AP to send and receive wireless signals.The port type is RP-SMA-K.The port is applicable only to an AP that supports external antennas.

## LED Indicators

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 2-300** Indicator

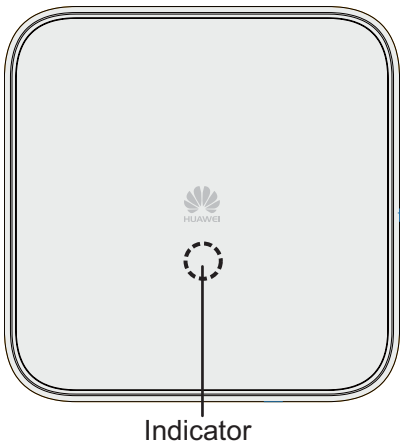



**Table 2-151** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-152** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 52 mm x 220 mm x 220 mm (2.05 in. x 8.66 in. x 8.66 in.) |
| | Weight | 1.7 kg |
| | System memory | 512 MB DDR3L |

| Item | | Description |
| --- | --- | --- |
| | FLASH | 16 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | • DC: 42.5 V to 57 V<br>• PoE power supply: in compliance with IEEE 802.3at/bt |
| | Maximum power consumption | • DC/802.3bt power supply: 33 W (excluding the output power of the USB port)<br>• 802.3at power supply: 25.5 W (The USB function is unavailable. The port rate of 5/2.5GE/PoE_IN decreases to 2.5 Gbit/s. The IoT card power is lower than 0.5 W.)<br>**NOTE**<br>• The actual maximum power consumption depends on local laws and regulations.<br>• In 802.3at power supply mode, radio power is managed in self-adaptive mode. |
| Environment specifications | Operating temperature and altitude | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-153** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | External omnidirectional dual-band antenna |
| Antenna gain | • 2.4G/5G (switchable): 3.5 dBi/4 dBi<br>• 5G (non-switchable): 4 dBi |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum number of users</td><td colspan="3">Fit AP: ≤ 512<br>Fat AP: ≤ 512<br>Cloud AP: ≤ 512<br>NOTE<br>The actual number of users varies according to the environment.</td></tr>
<tr><td>Maximum number of VAPs for each radio</td><td colspan="3">16</td></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4G/5G (switchable): 26 dBm/21 dBm (combined power)<br>• 5G (non-switchable): 24 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3<br>– 160 MHz: 1</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.<br>NOTICE<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac Wave 2: 6.5 to 1733.3 Mbit/s</td></tr>
</table>

## 2.41.5 Performance Specifications (AP7052DN and AP7152DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.42 AP7060DN Product Description

## 2.42.1 Product Characteristics (AP7060DN)

Huawei AP7060DN is a cutting-edge 802.11ax wireless access point (AP) with built-in omnidirectional antennas. The device rate can reach up to 6 Gbit/s. On the 2.4 GHz band, the AP7060DN supports 4x4 MIMO and four spatial streams, achieving a rate of 1.15 Gbit/s. On the 5 GHz band, the AP7060DN supports 8x8 MIMO and eight spatial streams, achieving a rate of 4.8 Gbit/s. With its 10GE uplink port, the AP7060DN can easily eliminate the bottleneck in upstream bandwidth of common APs. The AP7060DN supports high-bandwidth services such as VR/AR interactive teaching, HD video streaming, multimedia, and desktop cloud, and provides high-quality wireless services for enterprises.

- Provides services simultaneously on both the 2.4 GHz and 5 GHz frequency bands, at a rate of up to 1.15 Gbit/s at 2.4 GHz, 4.8 Gbit/s at 5 GHz, and 6 Gbit/s for the device.
- Provides a 10GE uplink port that supports 100M/1000M/2.5G/5G auto sensing.
- Supports Bluetooth serial interface–based O&M through built-in Bluetooth by collaborating with CloudCampus APP.
- Supports precise locating of Bluetooth terminals by collaborating with eSight.
- Provides a USB port for external power supply and storage.
- Supports an external IoT module, allowing for flexible IoT application extension.
- Supports the Fat, Fit, and cloud modes.
- Enables Huawei SDN controller to manage and operate APs and services on the APs, reducing network O&M costs.

### Wi-Fi 6 (802.11ax) standard compliance

- The AP supports 1024-QAM and 8x8 MIMO, achieving an air interface rate of 4.8 Gbit/s.
- Orthogonal Frequency Division Multiple Access (OFDMA) enables multiple STAs to receive and send data at the same time, reducing the latency and improving network efficiency.

### IoT extension

The AP provides an IoT slot for connecting to an external IoT module such as a ZigBee or RFID module, implementing short-distance, lower-power consumption IoT applications.

### Cloud-based management

Huawei CloudCampus Solution consists of SDN controller and a full range of cloud managed network devices. SDN controller provides various functions including

management of APs, tenants, applications, and licenses, network planning and optimization, device monitoring, network service configuration, and value-added services.

## High Density Boost technology

Huawei uses the following technologies to address challenges in high-density scenarios, including access problems, data congestion, and poor roaming experience:

**SmartRadio for air interface optimization**

- Load balancing during smart roaming: The load balancing algorithm can work during smart roaming, enabling load balancing detection between APs on the network after STA roaming to adjust the STA load on each AP, improving network stability.
- Intelligent Dynamic Frequency Assignment (DFA) technology: The DFA algorithm is used to automatically detect adjacent-channel and co-channel interference, and identify any redundant 2.4 GHz radio. Through automatic inter-AP negotiation, a redundant radio is automatically switched to another mode (dual-5G AP models support 2.4G-to-5G switchover) or is disabled to reduce 2.4 GHz co-channel interference and increase the system capacity.
- Intelligent conflict optimization technology: Dynamic enhanced distributed channel access (EDCA) and airtime scheduling algorithms are used to schedule the channel occupation time and service priority of each STA. This ensures that each STA is assigned a relatively equal amount of time for using channel resources and user services are scheduled in an orderly manner, improving service processing efficiency and user experience.

**Air interface performance optimization**

- In high-density scenarios where many STAs access the network, an increased number of low-rate STAs consume more resources on the air interface, reduce the AP capacity, and lower user experience. Therefore, Huawei APs will check the signal strength of STAs during access and reject access from weak-signal STAs. At the same time, the APs monitor the rate of online STAs in real time and forcibly disconnect low-rate STAs so that the STAs can reassociate with APs that have stronger signals. Terminal access control technology can increase air interface use efficiency and allow access of more STAs.

**5G-prior access**

- The APs support both 2.4 GHz and 5 GHz frequency bands. The 5G-prior access function enables an AP to steer STAs to the 5 GHz frequency band first, which reduces load and interference on the 2.4 GHz frequency band, improving user experience.

## Wired and wireless dual security guarantee

To ensure data security, Huawei APs integrate wired and wireless security measures and provide comprehensive security protection.

**Authentication and encryption for wireless access**

- Huawei APs support WEP, WPA/WPA2-PSK, WPA/WPA2-PPSK, WPA/WPA2-802.1X, and WAPI authentication/encryption modes to ensure security

of a wireless network. The authentication mechanism is used to authenticate user identities so that only authorized users can access network resources. The encryption mechanism is used to encrypt data transmitted over wireless links to ensure that the data can only be received and parsed by expected users.

**Analysis on non-Wi-Fi interference sources**

- Huawei APs can analyze the spectrum of non-Wi-Fi interference sources and identify them, including baby monitors, Bluetooth devices, digital cordless phones (on 2.4 GHz frequency band only), wireless audio transmitters (on both the 2.4 GHz and 5 GHz frequency bands), wireless game controllers, and microwave ovens. Coupled with Huawei eSight, the APs can accurately detect interference sources, and display the spectrum of them on eSight, enabling the administrator to remove the interference in a timely manner.

**Rogue device monitoring**

- Huawei APs support WIDS/WIPS, and can monitor, identify, defend against, counter, and perform refined management on rogue devices, providing security guarantees for air interface environment and wireless data transmission.

**Authentication and encryption for wired access**

- The AP access control ensures validity of APs. CAPWAP link protection and DTLS encryption provide security assurance, improving data transmission security between APs and ACs.

## Automatic radio calibration

- Automatic radio calibration allows an AP to collect signal strength and channel parameters of surrounding APs and generate an AP topology according to the collected data. Based on interference from authorized APs, rogue APs, and non-Wi-Fi interference sources, each AP automatically adjusts its transmit power and working channel to make the network operate at better performance. In this way, network reliability and user experience are improved.

## Automatic application identification

Huawei APs support smart application control technology and can implement visualized management and control on Layer 4 to Layer 7 applications.

**Traffic identification**

- Coupled with Huawei ACs, the APs can identify over 1600 common applications in various office scenarios. Based on the identification results, policy control can be implemented on user services, including priority adjustment, scheduling, blocking, and rate limiting to ensure efficient bandwidth resource use and improve quality of key services.

**Traffic statistics collection**

- Traffic statistics of each application can be collected globally, by SSID, or by user, so that the network administrator can know application use status on the network. The network administrator or operator then can implement

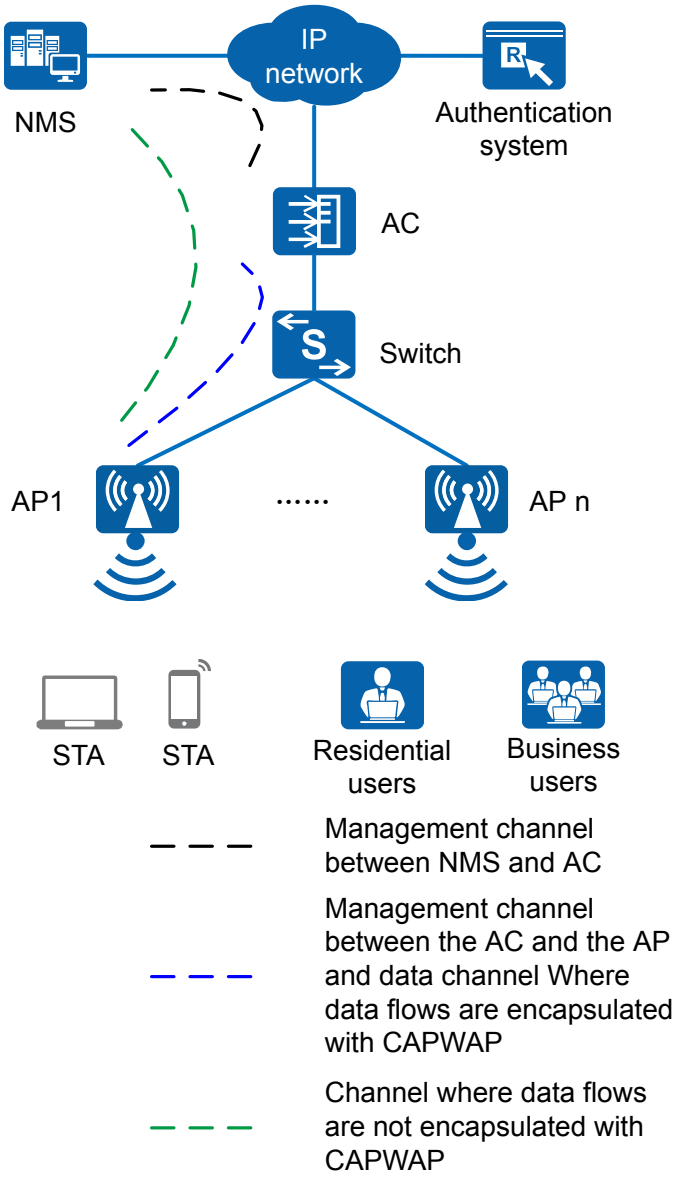
visualized management and control on service applications on smart terminals to enhance security and ensure effective bandwidth control.

## 2.42.2 Usage Scenarios (AP7060DN)

The AP7060DN can work as a Fat AP, Fit AP, or cloud AP. The AP can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 2-301** Fit AP networking (AP mode)

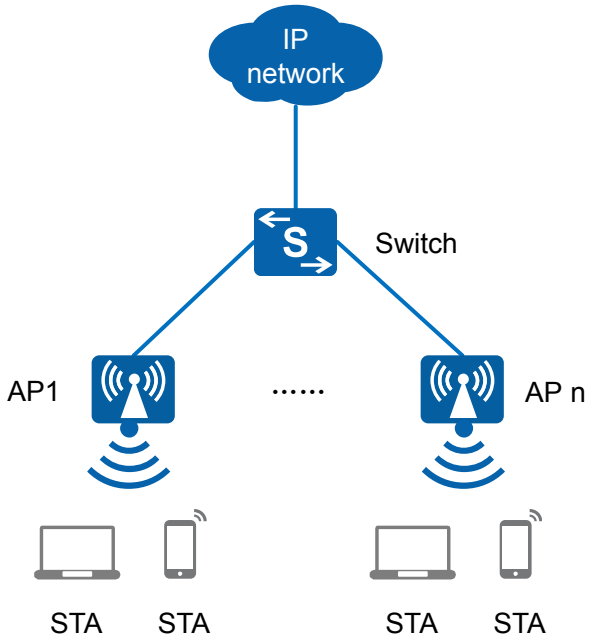



In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and

QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

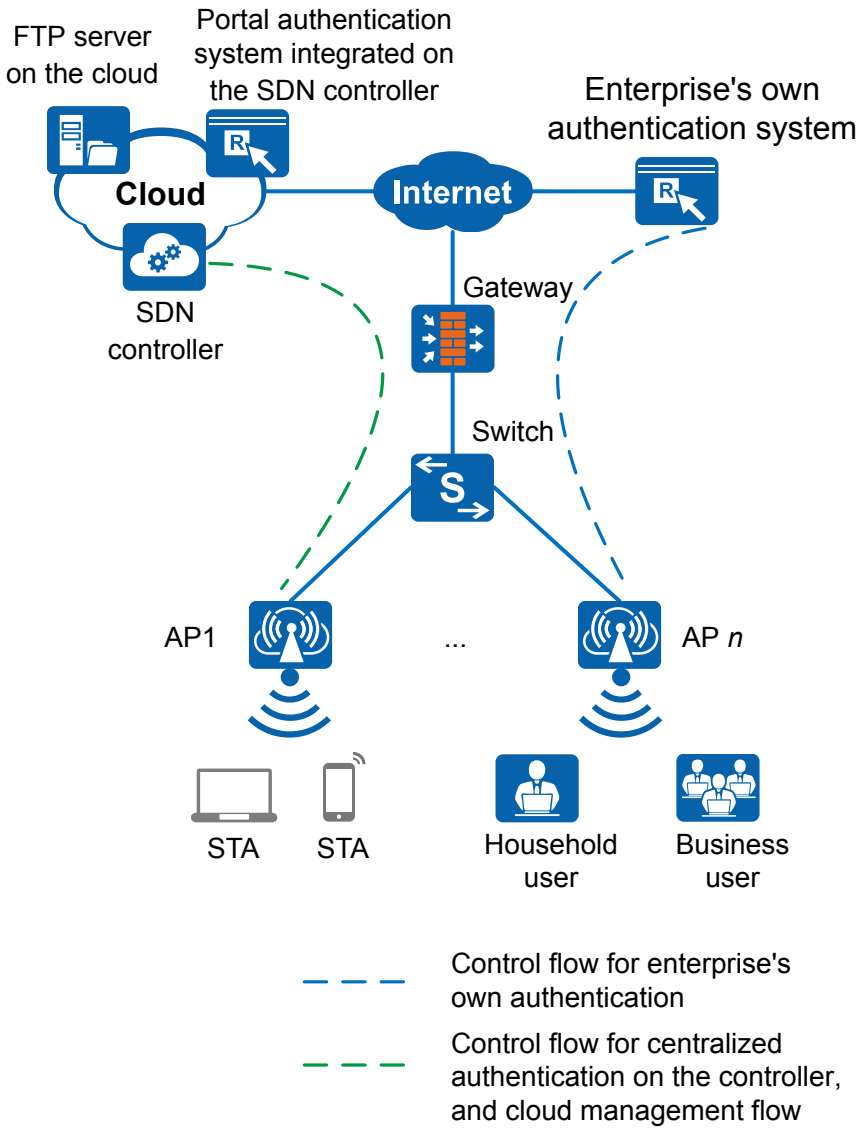
**Figure 2-302** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 2-303** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 2.42.3 Hardware Information (AP7060DN)

### Appearance

Figure 2-304 shows the appearance of the AP.

NOTE

The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

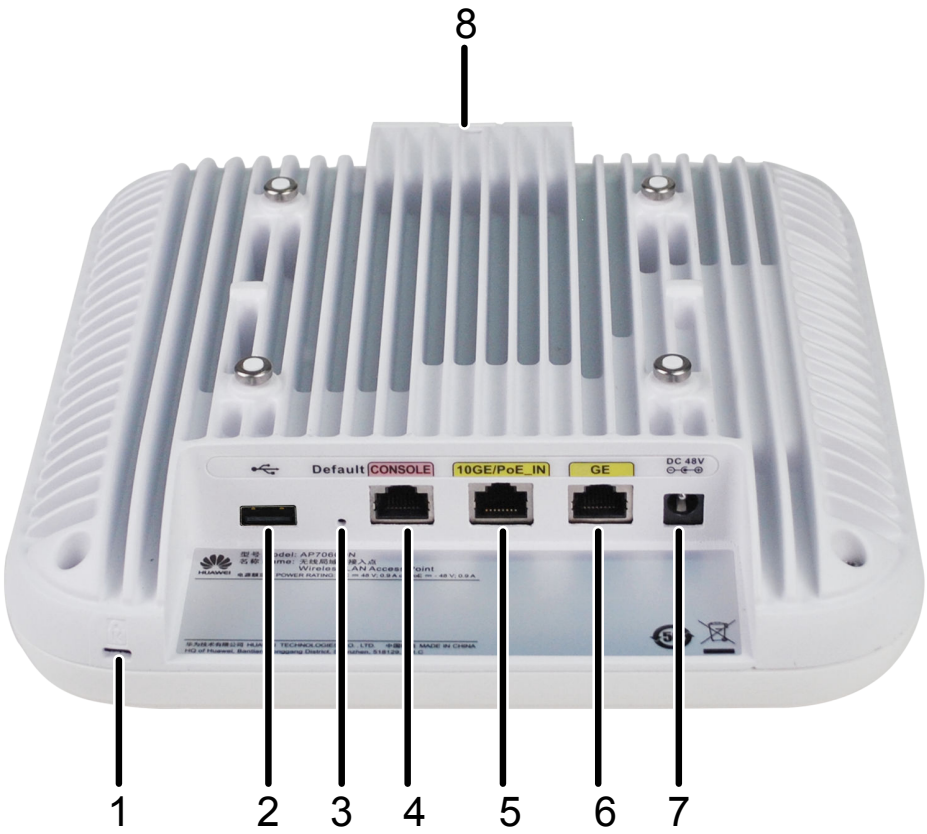
**Figure 2-304** Appearance

## Port

The following figure shows ports on the AP7060DN.

**Figure 2-305** Ports




As shown in **Figure 2-305**, each port can be described as follows:

1. Security slot: Connects to a security lock.
2. USB port: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
3. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
4. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
5. 10GE/PoE_IN: 100M/1000M/2.5G/5G/10G port that connects to the wired Ethernet and supports PoE input.
6. GE: 10/100/1000M port that connects to the wired Ethernet.
7. DC 48V: Connects a power adapter to the AP.
8. IoT extended port: Connects to an IoT module.

**NOTE**

- The AP supports the following power supply modes: PoE power supply and DC power supply.
- Use the selected power adapter for power supply; otherwise, the AP may be damaged.

## LED Indicators

The AP7060DN provides only a single indicator, as shown in **Figure 2-306**.

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 2-306** LED indicator

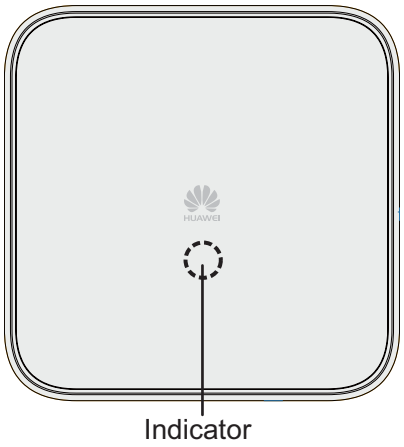



**Table 2-154** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-155** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 57 mm x 220 mm x 220 mm (2.24 in. x 8.66 in. x 8.66 in.) |
| | Weight | 1.8 kg |
| | System memory | 2 GB DDR4 |
| | FLASH | 32 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | ● DC: 42.5 V to 57 V<br>● PoE power supply: in compliance with IEEE 802.3bt/at |

| Item | | Description |
| --- | --- | --- |
| | Maximum power consumption | 30 W (excluding the output power of the USB port or IoT card port)<br>**NOTE**<br>• The actual maximum power consumption depends on local laws and regulations.<br>• In 802.3at power supply mode, the USB function and IoT module are unavailable, the 2.4 GHz radio works in 3x3 MIMO mode, and the 5 GHz radio works in 6x6 MIMO mode. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 2-156** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in dual-band combined antenna |
| Antenna gain | • 2.4 GHz: 4.6 dBi<br>• 5 GHz: 5.6 dBi<br>**NOTE**<br>• The preceding gain is the peak gain of a single antenna.<br>• Equivalent antenna gain after all 2.4 GHz or 5 GHz antennas are combined: 2.4 GHz: 4 dBi5 GHz: 2 dBi |
| Maximum number of users | Fit AP: ≤ 1024<br>Fat AP: ≤ 1024<br>Cloud AP ≤ 1024<br>**NOTE**<br>The actual number of users varies according to the environment. |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum number of VAPs for each radio</td><td colspan="3">16</td></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 24 dBm (combined power)<br>• 5 GHz: 27 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1<br>• 802.11ax<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3<br>– 160 MHz: 1<br>• 802.11ax<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3<br>– 160 MHz: 1</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.<br>NOTICE<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.</td></tr>
<tr><td>Channel rate supported</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac wave2: 6.5 to 1733.3 Mbit/s<br>• 802.11ax: 9 to 4800 Mbit/s</td></tr>
</table>

## 2.42.4 Performance Specifications (AP7060DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 2.43 AP9330DN Product Description

## 2.43.1 Product Characteristics (AP9330DN)

**Table 2-157** Product characteristics

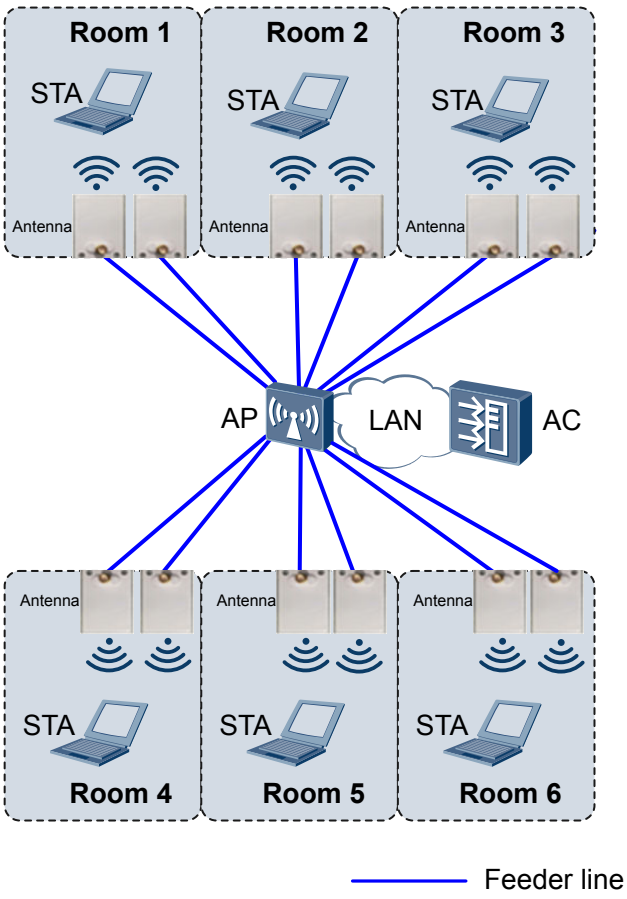
| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
|---|---|---|---|---|
| AP9330DN | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP9330DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | The latest-generation technology-leading AP9330DN supports smart distributed antenna system technology. With this technology, one AP9330DN can cover six rooms with double streams for each room. Deployed indoors, the AP provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. | It provides high quality wireless services for industries, such as healthcare, and hotels. The AP9330DN provides flexible distribution options in different environments.<br>The AP9330DN is not recommended in large-capacity scenarios for providing wireless coverage, such as school dormitory buildings. |

## 2.43.2 Usage Scenarios (AP9330DN)

Typical networking modes are as follows:

**Figure 2-307** Typical Fit AP networking (one AP for six rooms with dual bands and double streams)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

## 2.43.3 Hardware Information (AP9330DN)

### Appearance

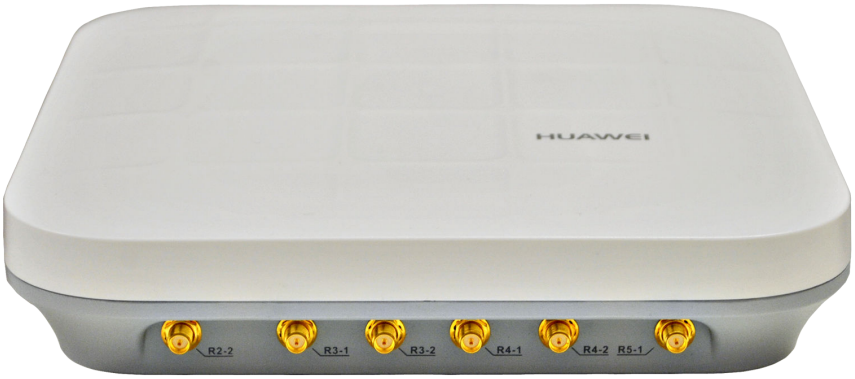
**Figure 2-308** shows AP9330DN appearance.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 2-308** AP9330DN appearance



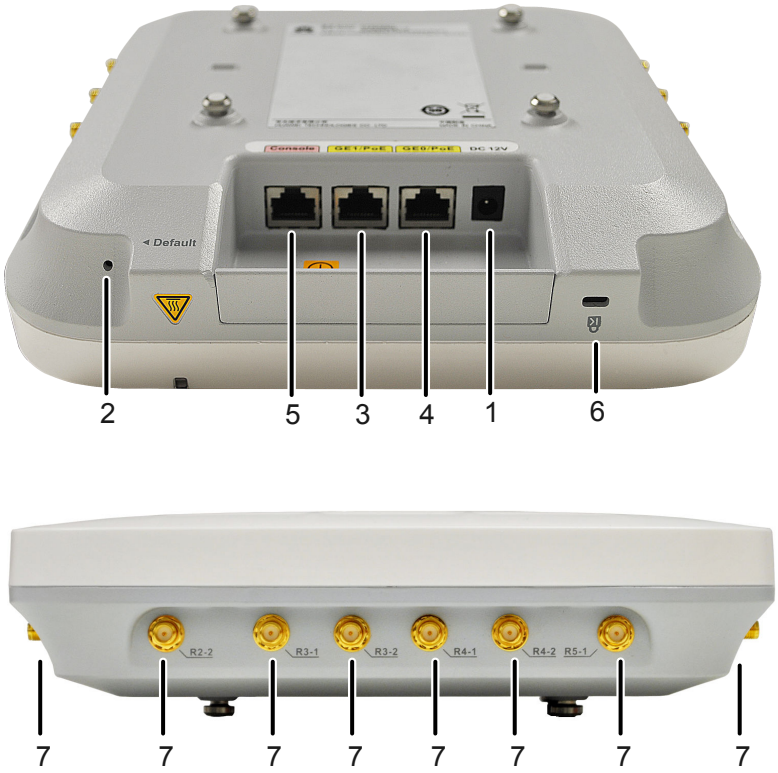

**CAUTION**

There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Port

The following figure shows ports on the AP9330DN.

**Figure 2-309** Ports on the AP9330DN



As shown in **Figure 2-309**, each port can be described as follows:

- 1. Power input port: 12 V DC.
- 2. Default button: restores the factory settings if you hold down the button more than 3 seconds.
- 3. GE1/PoE port: a 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs. PoE power supply is supported on dual network ports.
- 4. GE0/PoE port: a 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for APs. PoE power supply is supported on dual network ports.
- 5. Console port: connects to a maintenance terminal for device configuration and management.
- 6. Lock port: protects the AP against theft.
- 7. Antenna port: uses an RP-SMA-K connector (outside thread, central pin) and connects to box antennas and feeder cables in rooms. An AP9330DN has a total of twelve such ports. The antenna port is identified as Rn-1 or Rn-2. In scenarios where one AP covers six rooms with double streams and dual bands for each room, the antennas connected to two antenna ports with the same **n** value must be deployed in the same room.

## LED Indicator

NOTE

Indicator colors may vary slightly at different temperature.

**Table 2-158** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP works in Fit AP and fails to go online (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 2-159** Basic specifications of the AP9330DN

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 53 mm x 220 mm x 220 mm |
| | Weight | 1.3 kg |
| | System memory | • 256 MB DDR3<br>• 64 MB flash memory |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power: in compliance with IEEE 802.3at |

| Item | | Description |
| --- | --- | --- |
| | Maximum power consumption | 19 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to +1800 m: -10°C to +50°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 2-160** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | External antenna. The AP has a total of twelve antenna ports which use RP-SMA-K connectors (outside thread, central pin), applicable to indoor distribution scenarios. |
| Maximum number of users | ≤ 256 |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 25 dBm (combined power)<br>• 5 GHz: 21 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz<br>802.11b/g<br>• 20 MHz: 3<br>802.11n<br>• 20 MHz: 3<br>• 40 MHz: 1 | 5 GHz<br>802.11a<br>• 20 MHz: 13<br>802.11n<br>• 20 MHz: 13<br>• 40 MHz: 6<br>802.11ac<br>• 20 MHz: 13<br>• 40 MHz: 6<br>• 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 600 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s | | |

## 2.43.4 Performance Specifications (AP9330DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 3 Outdoor Access Points

## About This Chapter



## 3.1 AP8030DN Product Description

## 3.1.1 Product Characteristics (AP8030DN)

**Table 3-1** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
|---|---|---|---|---|
| AP8030DN | Dual band:<br>• 2.4 GHz<br>• 5 GHz<br>The AP8030DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | Huawei AP8030DN is the latest 802.11ac outdoor dual-band wireless access point (AP). Physically hardened, the AP8030DN supports 3x3 MIMO and offers enhanced outdoor coverage performance. It can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. It also provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets requirements of outdoor deployment. | Huawei AP8030DNs comply with IP67 dustproof and waterproof protection standards, applicable to coverage scenarios (for example, squares, pedestrian streets, and amusement parks) and bridging scenarios (for example, wireless harbors, data backhaul, video surveillance, and train-to-ground backhaul). |

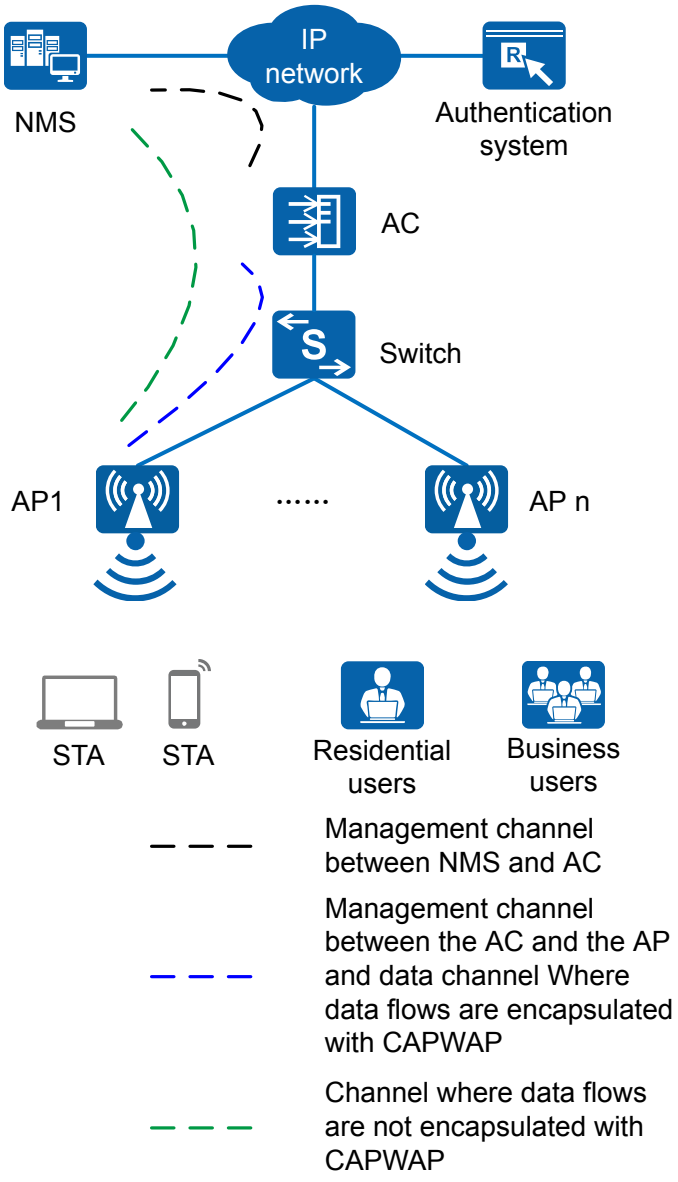
## 3.1.2 Usage Scenarios (AP8030DN)

The AP8030DN can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 3-1** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 3-2** Fit AP networking (WDS mode: point-to-point)

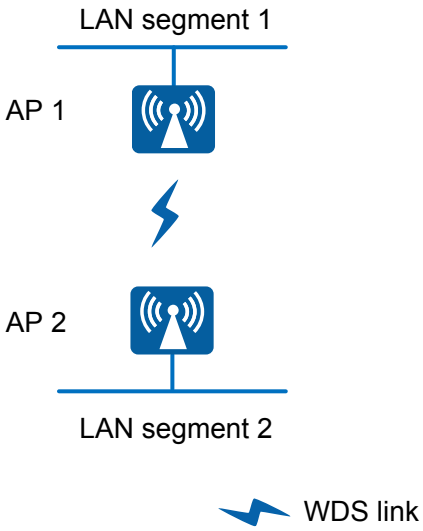
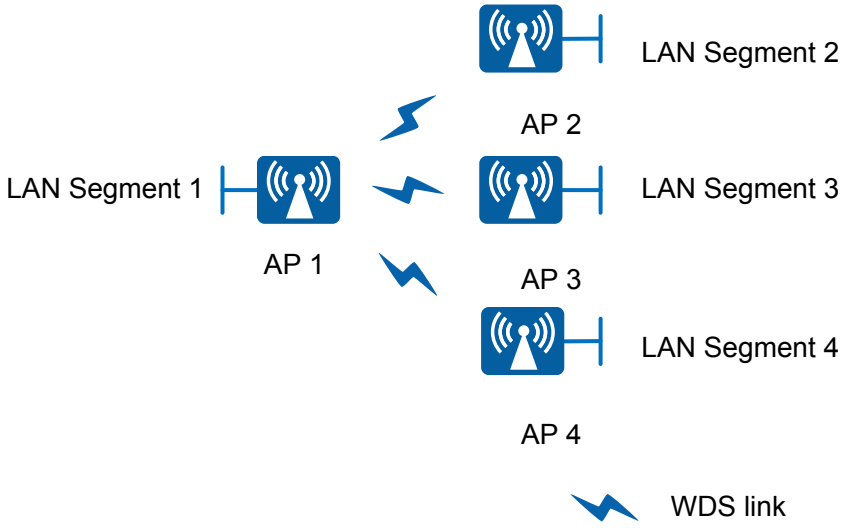


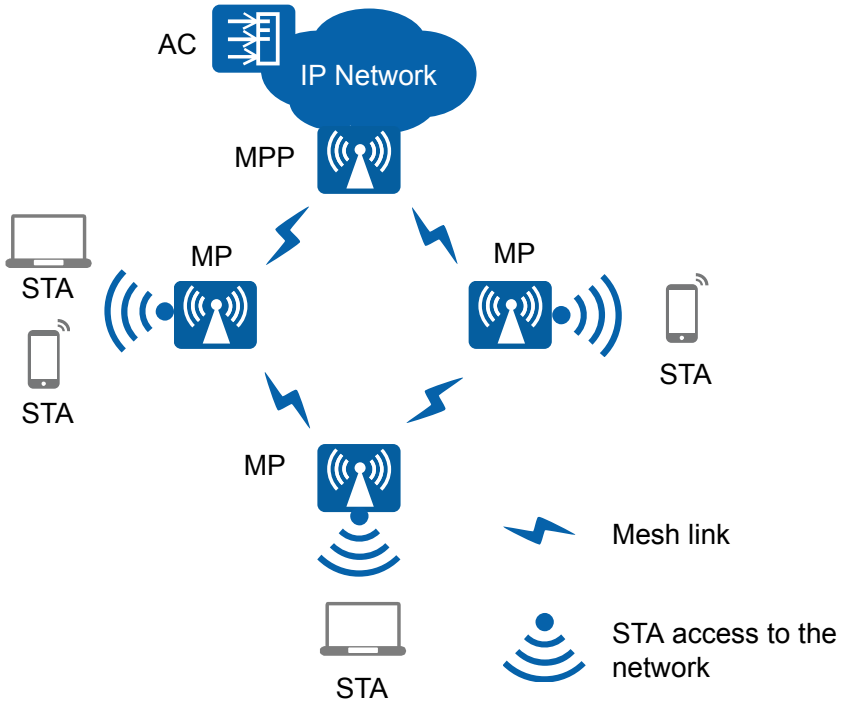

**Figure 3-3** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

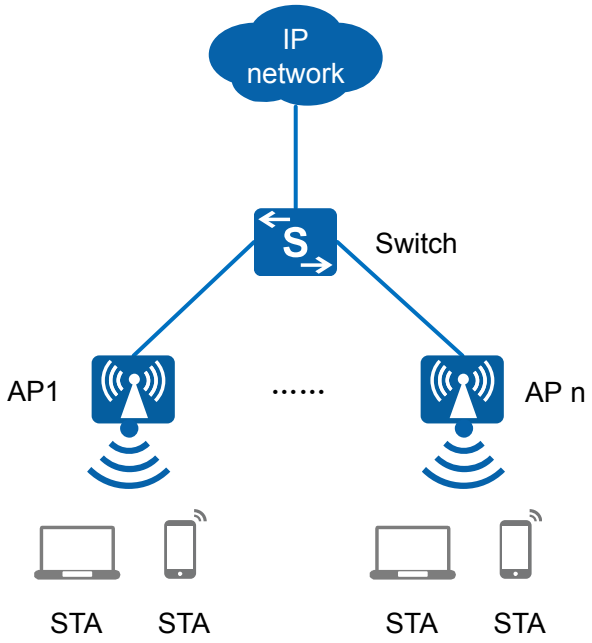
**Figure 3-4** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

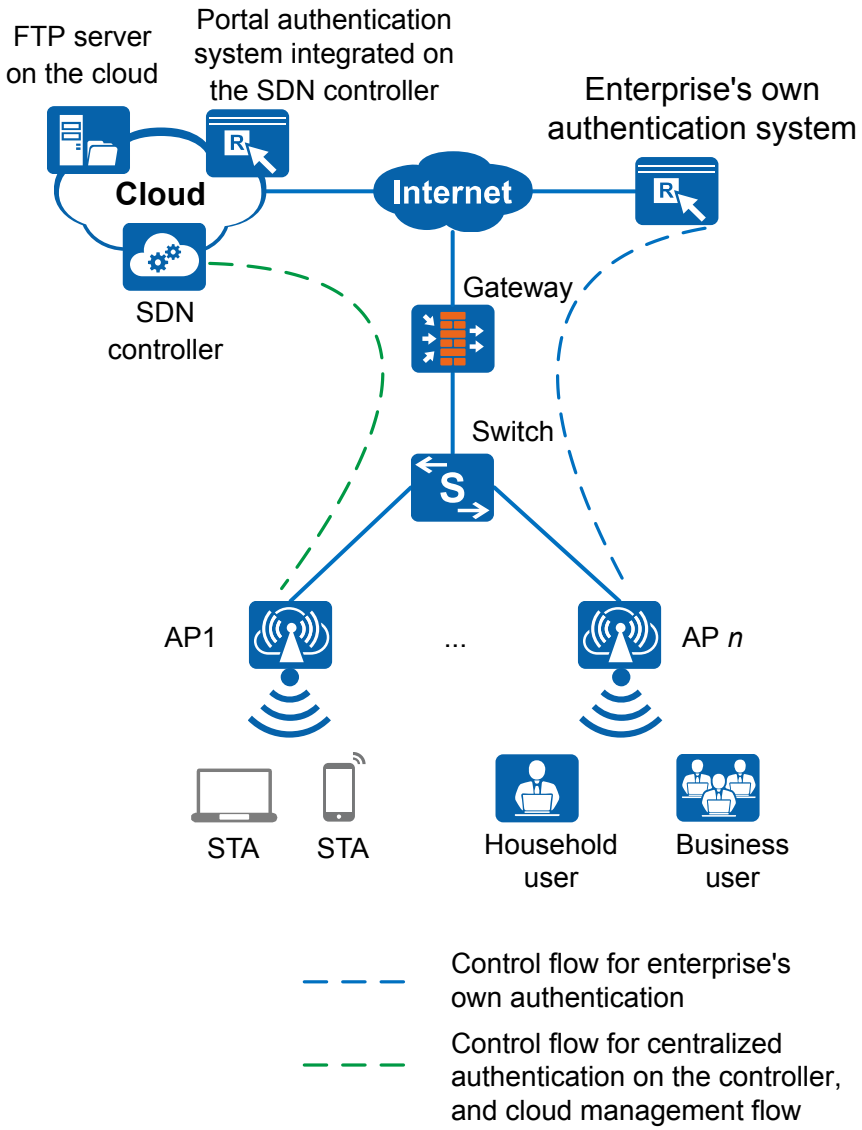
**Figure 3-5** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 3-6** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 3.1.3 Hardware Information (AP8030DN)

### Appearance

Figure 3-7 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 3-7** AP appearance


**CAUTION**

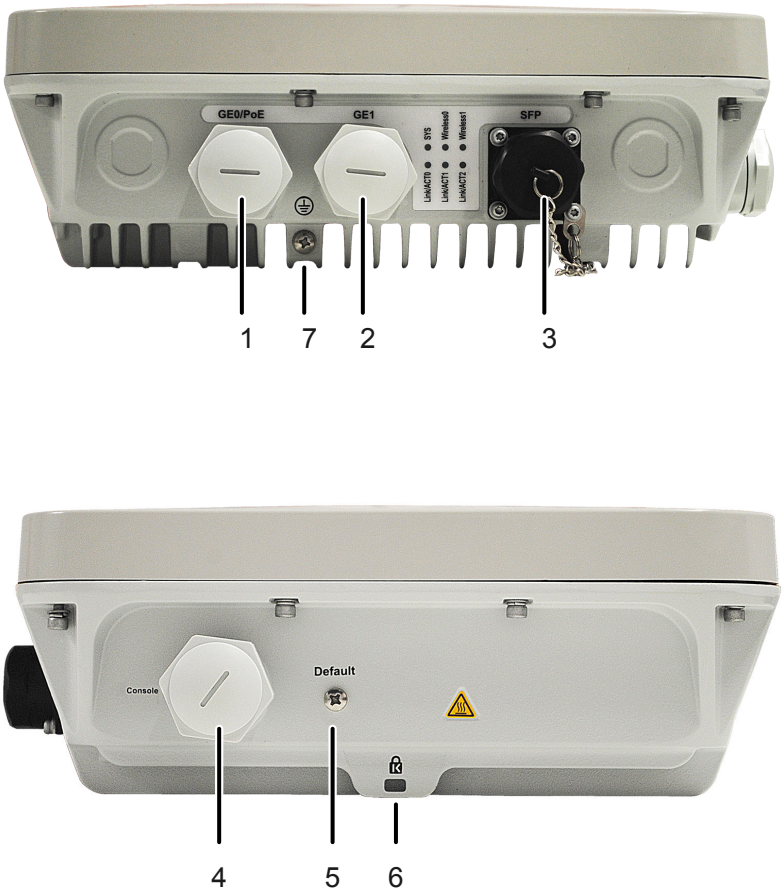
 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP.

**Figure 3-8** Interfaces on the AP




1. GE0/PoE interface: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
2. GE1 interface: 10/100/1000M port that connects to the wired Ethernet.
3. SFP: Optical port that supports the 100M/1000M optical module.
4. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
5. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

   NOTE

   The Reset button is protected by a waterproof screw. Before pressing the Reset button, remove the waterproof screw. Keep the screw properly and install it again after pressing the Reset button.
6. Security slot: Connects to a security lock.
7. Device ground screw: Connects the device to a ground cable.

## LED Indicators

The AP provides multiple indicators: SYS indicator, Link/ACT indicator, and Wireless indicator. The following table describes indicators on AP.

**NOTE**

Indicator colors may vary slightly at different temperature.

Indicators of the same type have the same state meanings.

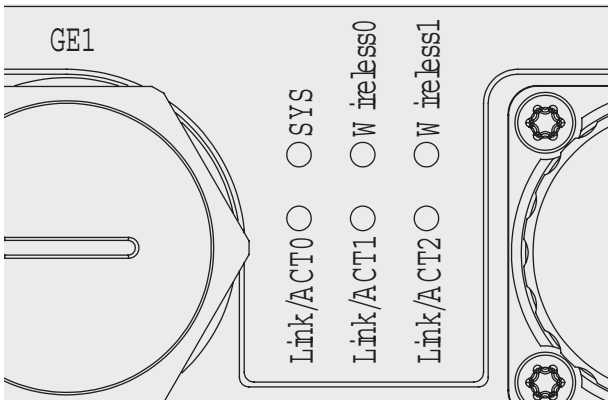



**Table 3-2** Descriptions about the SYS indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| SYS | System indicator | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>• The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

Link/ACT indicators consist of Link/ACT0, Link/ACT1, and Link/ACT2, showing link status of interfaces GE0/PoE, GE1, SFP respectively.

**Table 3-3** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| LINK | Green | Steady on | The system is running properly, the Ethernet connection is normal, and no data is being transmitted. |
| ACT | Green | Blinking | The system is running properly, the Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

Wireless indicators consist of Wireless0 and Wireless1, showing wireless link status of the 2.4/5 GHz and 5 GHz radio interfaces respectively.

**Table 3-4** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

**Table 3-5** Description about the Wireless indicator in signal strength mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | The AP is not transmitting or receiving data or the signal strength is extremely low. |
| | Blinking once every 2s (0.5 Hz) | The AP is transmitting or receiving data normally, and the signal strength is low. |
| | Blinking once every 0.25 seconds (4 Hz) | The AP is transmitting or receiving data normally, and the signal strength is medium. |
| | Steady on | The AP is transmitting or receiving data normally, and the signal strength is high. |

NOTE

When the WDS/Mesh function is enabled on an AP, the blinking frequency of its Wireless indicator indicates the receive signal strength on the WDS/Mesh connection by default. After you connect an AP to a WDS/Mesh network, you can run the **wifi-light** { **signal-strength** | **traffic** } command on the AC to specify whether the Wireless indicator blinking frequency indicates the receive signal strength or service traffic rate. **wifi-light signal-strength**:

- If the Mesh function is enabled on the AP, the blinking frequency of the Wireless indicator reflects the weakest signal strength of all neighboring APs.
- If WDS is enabled on an AP, the blinking frequency of the Wireless indicator reflects the strength of signals received from a WDS AP.
  - If the AP works in leaf mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a middle AP.
  - If the AP works in middle mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a root AP.
  - If the AP works in root mode, the blinking frequency of the Wireless indicator reflects the weakest signal strength of middle APs.

**wifi-light traffic**: allows the Wireless indicator to reflect the service traffic volume on the radio.

When an AP functions as a Fat AP, the Wireless indicator of the AP cannot reflect the signal strength.

## Basic Specifications

**Table 3-6** Basic specifications of the AP8030DN

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 100 mm x 290 mm x 260 mm |
| | Weight | 3.6 kg |
| | System memory | • 256 MB DDR3<br>• 64 MB Flash |
| Power specifications | Power input | PoE power supply in compliance with IEEE 802.3at |
| | Maximum power consumption | 20.1 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to 1800 m: -40°C to +65°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 0% to 100% (non-condensing) |

| Item | | Description |
| --- | --- | --- |
| | IP rating | IP67 |
| | Wind resistance | Up to 149 MPH |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 3-7** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in directional antenna<br>• Horizontal beamwidth: 60 degrees<br>• Vertical beamwidth: 30 degrees |
| Antenna gain | • 2.4 GHz: 10 dBi<br>• 5 GHz: 10 dBi |
| Maximum number of users | • Fit AP: ≤ 256<br>• Fat AP: ≤ 64<br>• Cloud AP: ≤ 256 |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 28 dBm (combined power)<br>• 5 GHz: 26 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 450 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s | | |

## 3.1.4 Performance Specifications (AP8030DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 3.2 AP8130DN Product Description

## 3.2.1 Product Characteristics (AP8130DN)

**Table 3-8** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP8130DN | Dual band:<br>• 2.4 GHz<br>• 5 GHz<br>The AP8130DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users.<br>It supports 2.4G-to-5G switchover and works on dual 5 GHz frequency bands. | IEEE 802.11 a/b/g/n/ac | Huawei AP8130DN, physically hardened, supports 3x3 MIMO and offers enhanced outdoor coverage performance. It complies with IEEE 802.11a/b/g/n/ac, and can work as a wireless bridge. The AP can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets requirements of outdoor deployment. | Huawei AP8130DNs comply with IP67 dustproof and waterproof protection standards, applicable to coverage scenarios (for example, squares, pedestrian streets, and amusement parks) and bridging scenarios (for example, wireless harbors, data backhaul, video surveillance, and train-to-ground backhaul). |

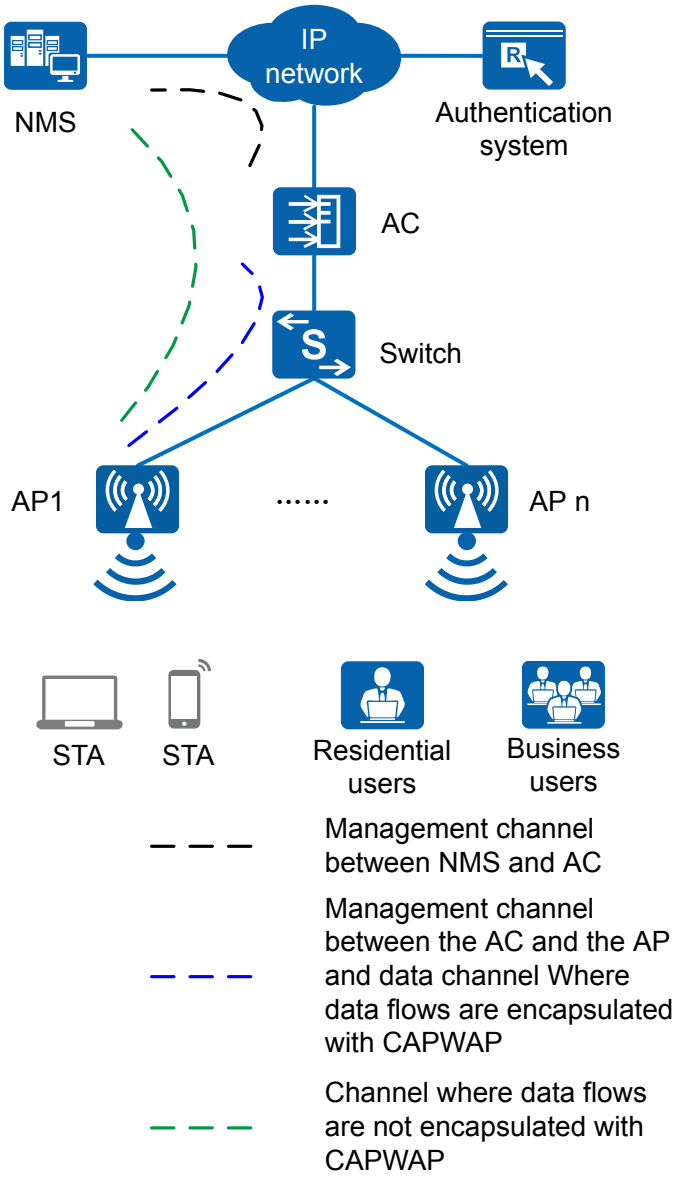
## 3.2.2 Usage Scenarios (AP8130DN)

The AP8130DN can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 3-9** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 3-10** Fit AP networking (WDS mode: point-to-point)

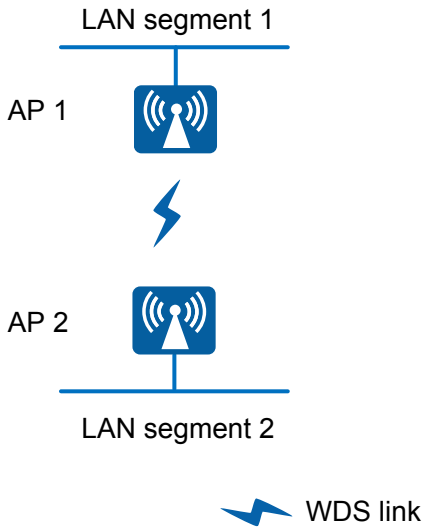
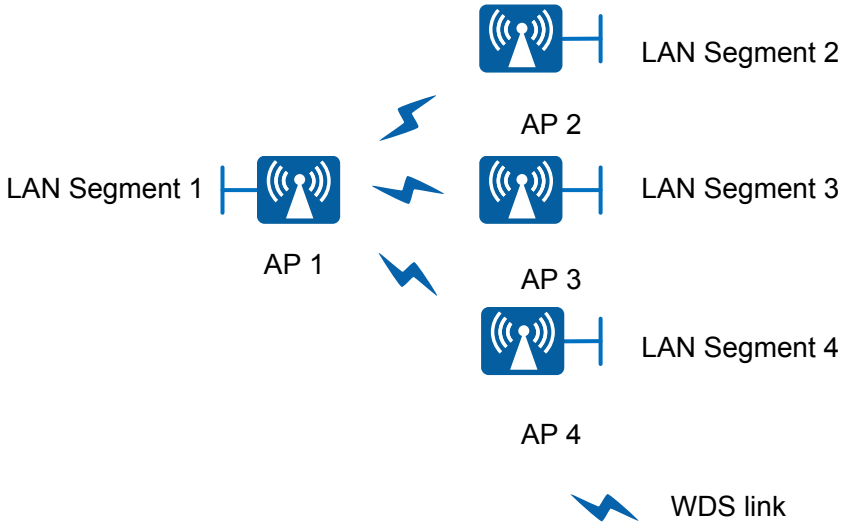


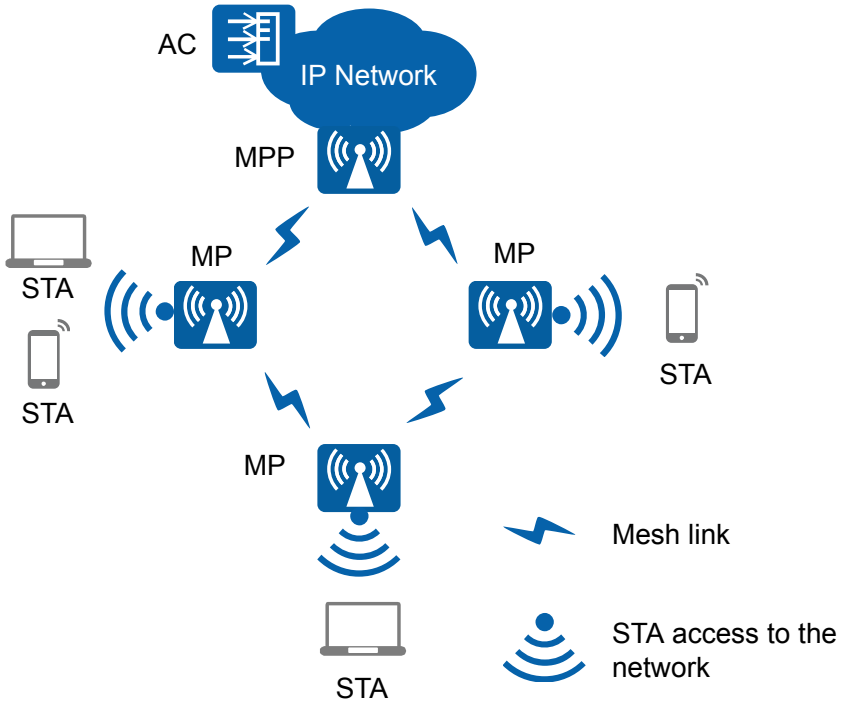

**Figure 3-11** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

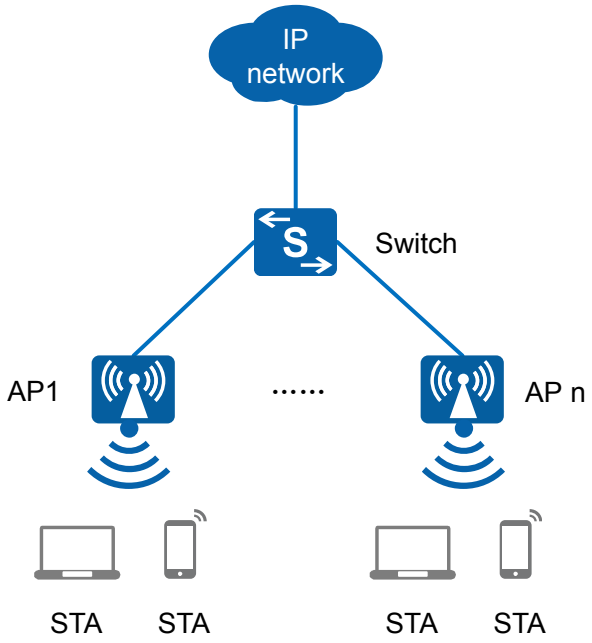
**Figure 3-12** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

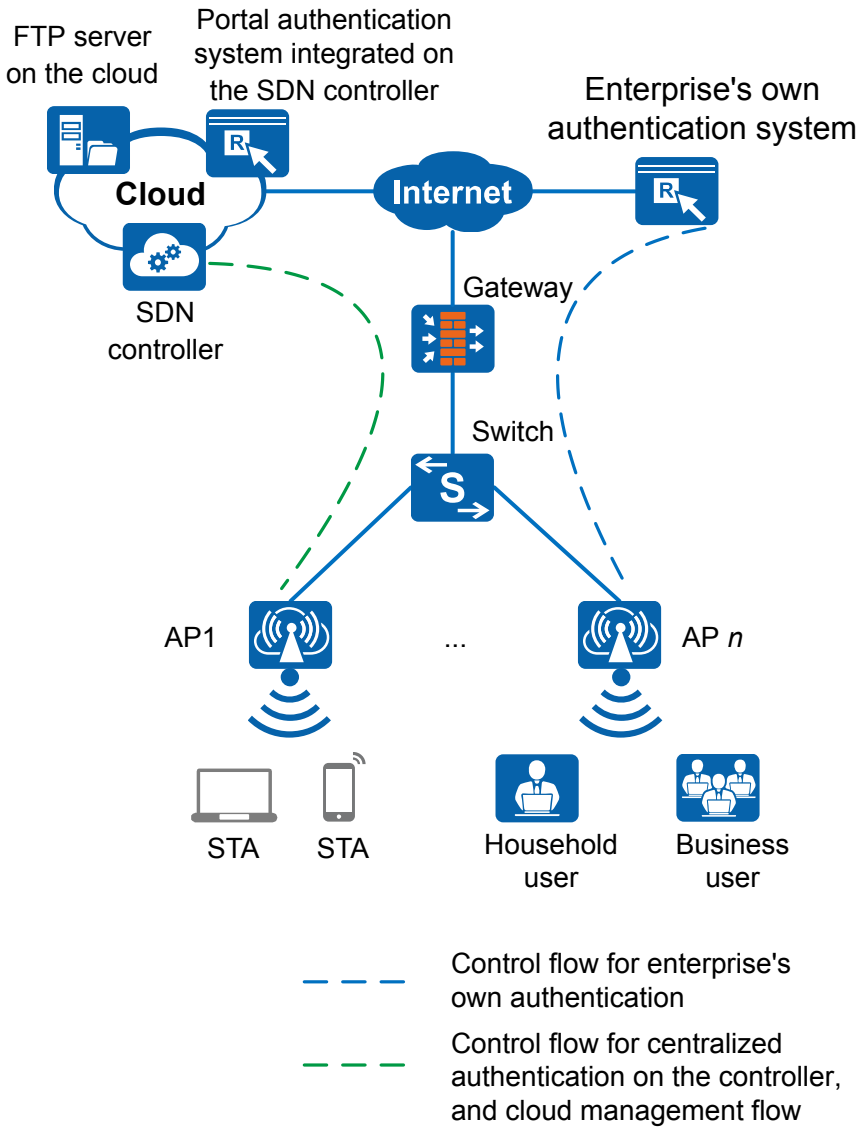
**Figure 3-13** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 3-14** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 3.2.3 Hardware Information (AP8130DN)

### Appearance

Figure 3-15 shows the appearance of the AP.

NOTE

The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

**Figure 3-15** AP appearance


**CAUTION**

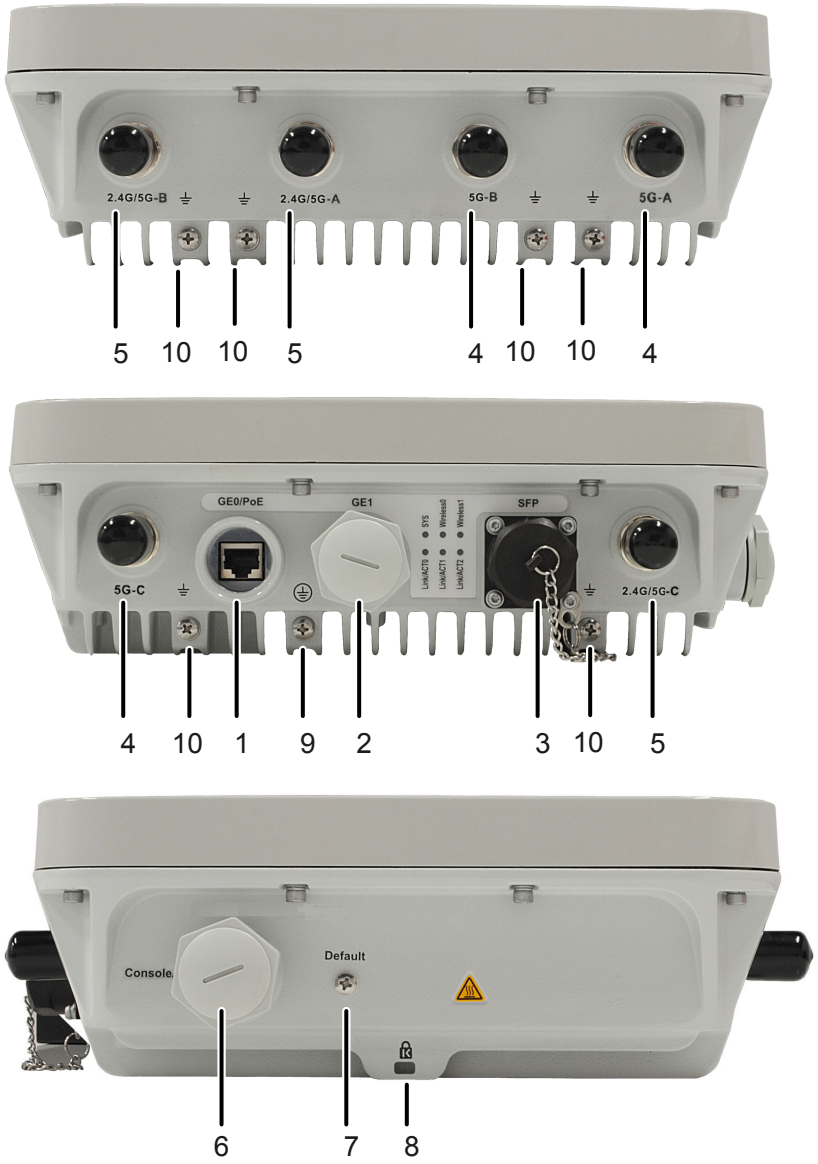
 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP.

**Figure 3-16** Interfaces on the AP




1. GE0/PoE interface: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
2. GE1 interface: 10/100/1000M port that connects to the wired Ethernet.
3. SFP: Optical port that supports the 100M/1000M optical module.
4. 5G: Connects a 5 GHz antenna to the AP to send and receive wireless signals. The port type is N-type female.
5. 2.4G/5G: Connects a 2.4 GHz or 5 GHz antenna to the AP to send and receive wireless signals. The port type is N-type female.
6. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
7. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

NOTE

The Reset button is protected by a waterproof screw. Before pressing the Reset button, remove the waterproof screw. Keep the screw properly and install it again after pressing the Reset button.

8. Security slot: Connects to a security lock.
9. Device ground screw: Connects the device to a ground cable.
10. Ground screw for the surge protective device: Connects the AP to the ground point of an external surge protective device.

## LED Indicators

The AP8130DN provides multiple indicators: SYS indicator, Link/ACT indicator, and Wireless indicator. The following table describes indicators on AP.

NOTE

Indicator colors may vary slightly at different temperature.

Indicators of the same type have the same state meanings.

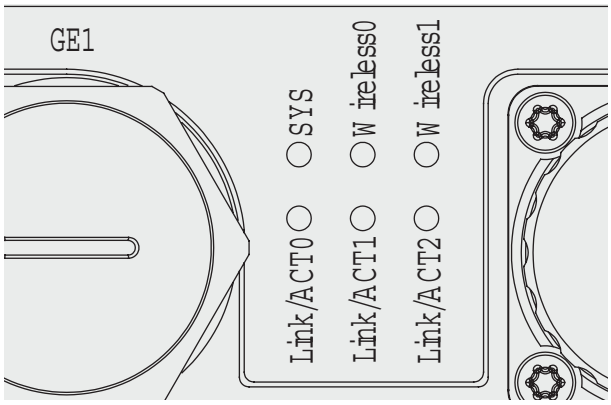



**Table 3-9** Descriptions about the SYS indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| SYS | System indicator | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

Link/ACT indicators consist of Link/ACT0, Link/ACT1, and Link/ACT2, showing link status of interfaces GE0/PoE, GE1, SFP respectively.

**Table 3-10** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| LINK | Green | Steady on | The system is running properly, the Ethernet connection is normal, and no data is being transmitted. |

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| ACT | Green | Blinking | The system is running properly, the Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

Wireless indicators consist of Wireless0 and Wireless1, showing wireless link status of the 2.4/5 GHz and 5 GHz radio interfaces respectively.

**Table 3-11** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

**Table 3-12** Description about the Wireless indicator in signal strength mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | The AP is not transmitting or receiving data or the signal strength is extremely low. |
| | Blinking once every 2s (0.5 Hz) | The AP is transmitting or receiving data normally, and the signal strength is low. |

| Color | Status | Description |
| --- | --- | --- |
| | Blinking once every 0.25 seconds (4 Hz) | The AP is transmitting or receiving data normally, and the signal strength is medium. |
| | Steady on | The AP is transmitting or receiving data normally, and the signal strength is high. |

NOTE

When the WDS/Mesh function is enabled on an AP, the blinking frequency of its Wireless indicator indicates the receive signal strength on the WDS/Mesh connection by default. After you connect an AP to a WDS/Mesh network, you can run the **wifi-light** { **signal-strength** | **traffic** } command on the AC to specify whether the Wireless indicator blinking frequency indicates the receive signal strength or service traffic rate.**wifi-light signal-strength**:

- If the Mesh function is enabled on the AP, the blinking frequency of the Wireless indicator reflects the weakest signal strength of all neighboring APs.
- If WDS is enabled on an AP, the blinking frequency of the Wireless indicator reflects the strength of signals received from a WDS AP.
  - If the AP works in leaf mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a middle AP.
  - If the AP works in middle mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a root AP.
  - If the AP works in root mode, the blinking frequency of the Wireless indicator reflects the weakest signal strength of middle APs.

**wifi-light traffic**: allows the Wireless indicator to reflect the service traffic volume on the radio.

When an AP functions as a Fat AP, the Wireless indicator of the AP cannot reflect the signal strength.

## Basic Specifications

**Table 3-13** Basic specifications of the AP8130DN

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 100 mm x 290 mm x 260 mm (3.94 in. x 11.42 in. x 10.24 in.) |
| | Weight | 4.0 kg |
| | System memory | • 256 MB DDR3<br>• 64 MB Flash |
| Power specifications | Power input | PoE power supply in compliance with IEEE 802.3at |

| Item | | Description |
| --- | --- | --- |
| | Maximum power consumption | 22.4 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to 1800 m: -40°C to +65°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 0% to 100% (non-condensing) |
| | IP rating | IP67 |
| | Wind resistance | Up to 149 MPH |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 3-14** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Outdoor external antenna |
| Maximum number of users | • Fit AP mode: ≤ 256<br>• Fat AP mode: ≤ 64<br>• Cloud AP mode: ≤ 256 |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 28 dBm (combined power)<br>• 5 GHz: 26 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 450 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s | | |

## 3.2.4 Performance Specifications (AP8130DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 3.3 AP8050DN and AP8150DN Product Description

## 3.3.1 Product Characteristics (AP8050DN and AP8150DN)

Huawei AP8050DN and AP8150DN are dual-band wireless access points (APs) that support 802.11ac Wave 2, 2 x 2 MU-MIMO, and two spatial streams. The APs are physically hardened and offer enhanced outdoor coverage performance. They can operate at both the 2.4 GHz and 5 GHz frequencies and support the wireless bridge function. They have built-in Bluetooth and comply with IEEE 802.11a/b/g/n/ac. Their ability to operate at both 2.4 GHz and 5 GHz allows more access and provides gigabit-level wireless outdoor bandwidth. They provide comprehensive service support capabilities and feature high reliability, high

security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meet outdoor network requirements. It is applicable to coverage scenarios (for example, densely-populated stadiums, squares, pedestrian streets, and amusement parks) and bridging scenarios (for example, wireless harbors, data backhaul, video surveillance, and train-to-ground backhaul).

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- AP8150DN: 2.4G-to-5G switchover, with a device rate of up to 1.73 Gbit/s in dual-5G mode In addition, one AP can provide high-performance wireless bridging and relay functions, reducing costs and improving device installation efficiency.
- Built-in 5 kA surge protectors; no external surge protection device required, simplifying installation and reducing costs
- High-grade metal materials and an overall heat dissipation design, working temperature ranging from –40°C to +65°C, 6 kA or 6 kV surge protection capability on an Ethernet interface, and IP68 waterproof and dustproof, meeting industry-level requirements
- Built-in Bluetooth to extend Bluetooth-based applications
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

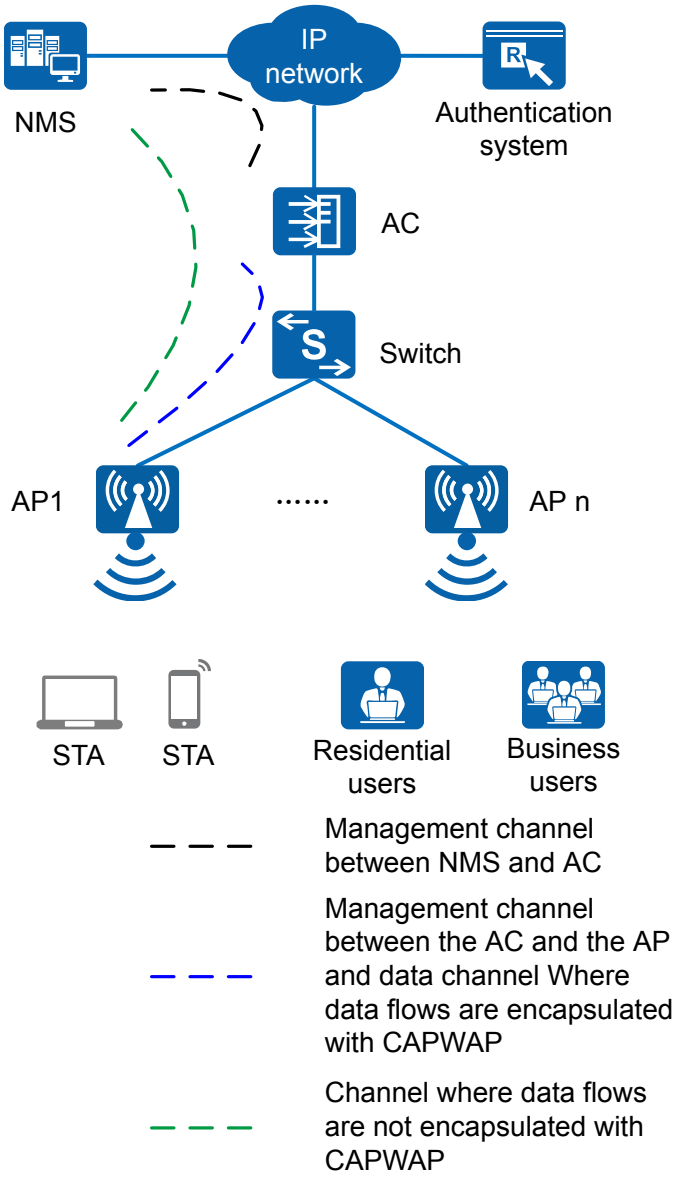
## 3.3.2 Usage Scenarios (AP8050DN and AP8150DN)

The AP8050DN and AP8150DN can work as a Fat AP, Fit AP, or cloud AP. They can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 3-17** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 3-18** Fit AP networking (WDS mode: point-to-point)

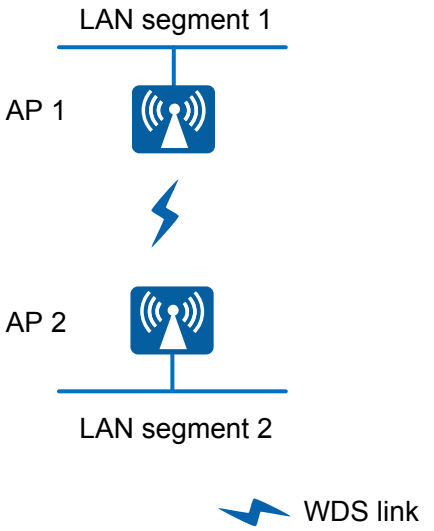
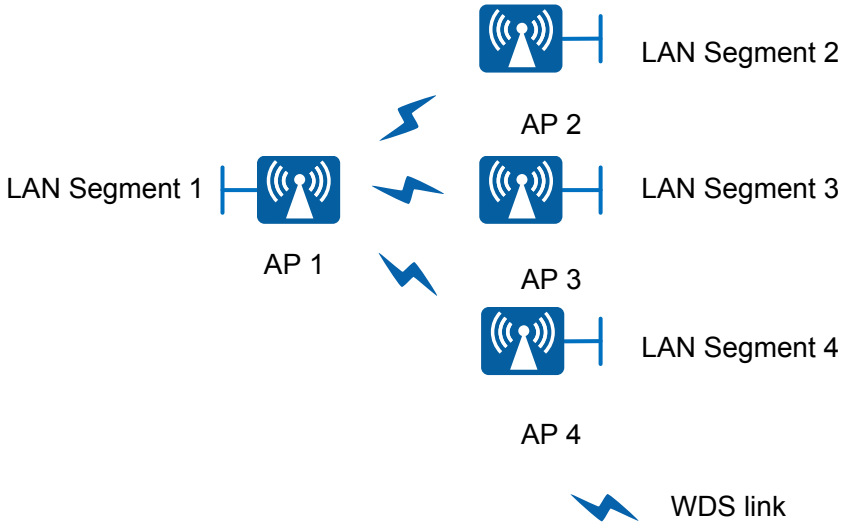


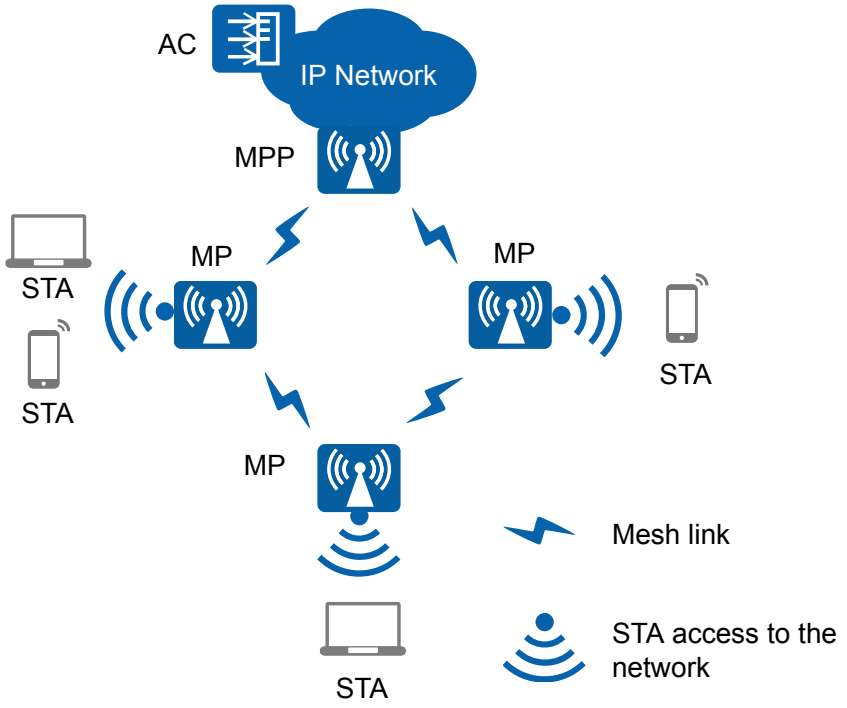

**Figure 3-19** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

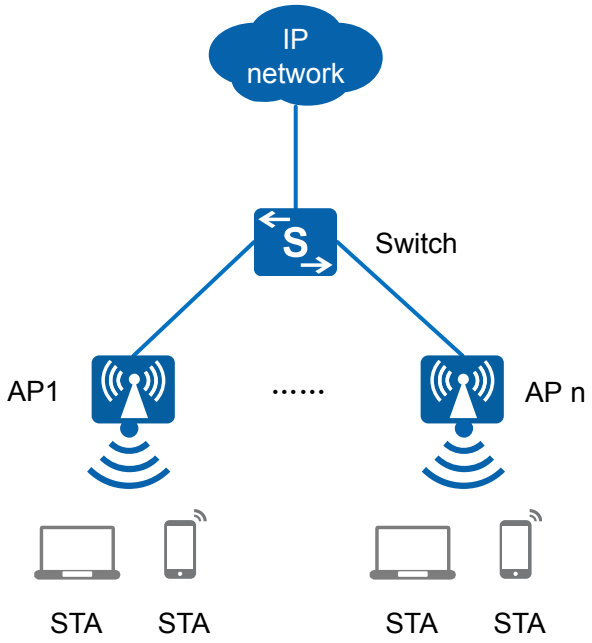
**Figure 3-20** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

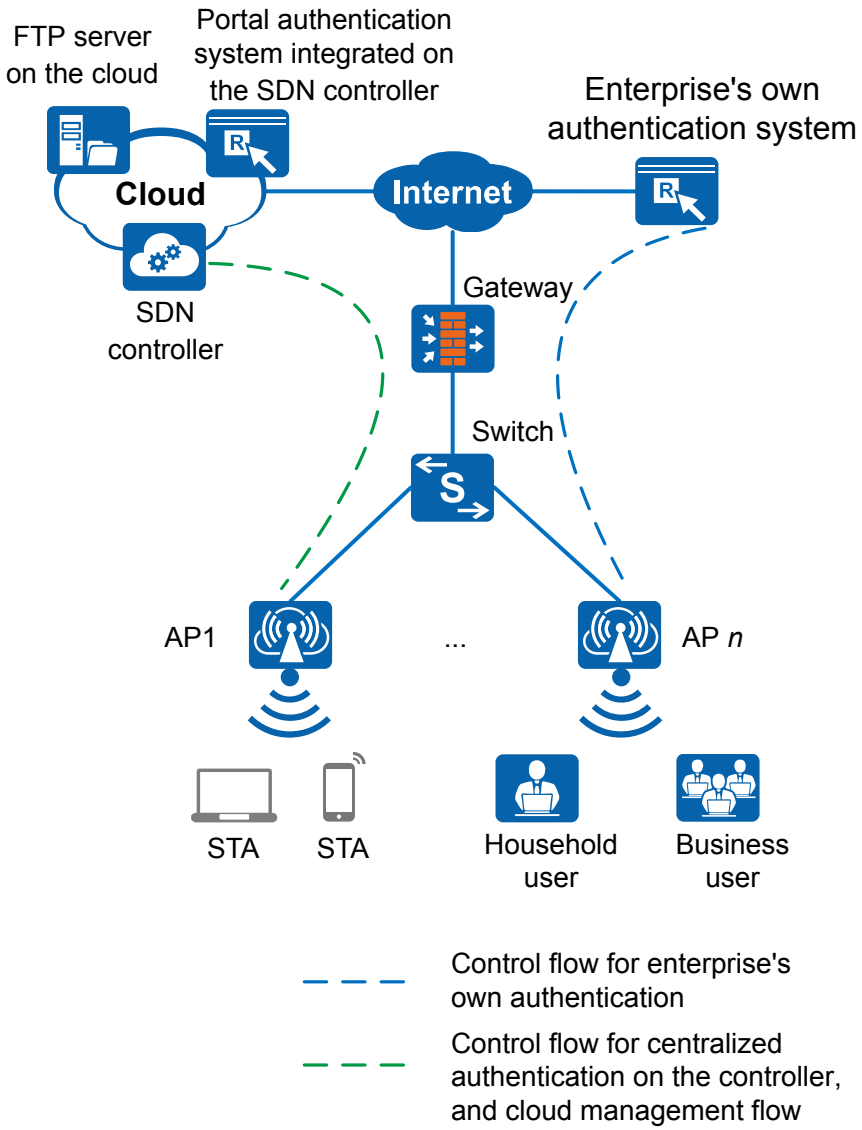
**Figure 3-21** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 3-22** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 3.3.3 Hardware Information (AP8050DN)

### Appearance

Figure 3-23 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 3-23** AP appearance


CAUTION

 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP.

**Figure 3-24** Interfaces on the AP


1. GE0/PoE: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
2. Device ground screw: Connects the device to a ground cable.
3. GE1: 10/100/1000M port that connects to the wired Ethernet.
4. SFP: Optical port that supports the 100M/1000M optical module.
5. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
6. Security slot: Connects to a security lock.
7. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

NOTE

The Reset button is protected by a waterproof screw. Before pressing the Reset button, remove the waterproof screw. Keep the screw properly and install it again after pressing the Reset button.

## LED Indicators

The AP provides multiple indicators: SYS indicator, Link/ACT indicator, and Wireless indicator. The following table describes indicators on AP.

**NOTE**

Indicator colors may vary slightly at different temperature.

Indicators of the same type have the same state meanings.

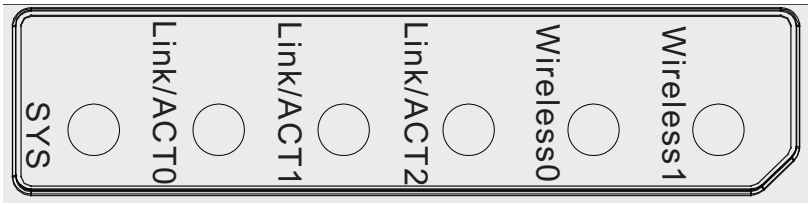



**Table 3-15** Descriptions about the SYS indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| SYS | System indicator | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>• The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

Link/ACT indicators consist of Link/ACT0, Link/ACT1, and Link/ACT2, showing link status of interfaces GE0/PoE, GE1, SFP respectively.

**Table 3-16** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| LINK | Green | Steady on | The system is running properly, the Ethernet connection is normal, and no data is being transmitted. |
| ACT | Green | Blinking | The system is running properly, the Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

Wireless indicators consist of Wireless0 and Wireless1, showing wireless link status of the 2.4/5 GHz and 5 GHz radio interfaces respectively.

**Table 3-17** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

**Table 3-18** Description about the Wireless indicator in signal strength mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | The AP is not transmitting or receiving data or the signal strength is extremely low. |
| | Blinking once every 2s (0.5 Hz) | The AP is transmitting or receiving data normally, and the signal strength is low. |
| | Blinking once every 0.25 seconds (4 Hz) | The AP is transmitting or receiving data normally, and the signal strength is medium. |
| | Steady on | The AP is transmitting or receiving data normally, and the signal strength is high. |

NOTE

When the WDS/Mesh function is enabled on an AP, the blinking frequency of its Wireless indicator indicates the receive signal strength on the WDS/Mesh connection by default. After you connect an AP to a WDS/Mesh network, you can run the **wifi-light** { **signal-strength** | **traffic** } command on the AC to specify whether the Wireless indicator blinking frequency indicates the receive signal strength or service traffic rate.**wifi-light signal-strength**:

- If the Mesh function is enabled on the AP, the blinking frequency of the Wireless indicator reflects the weakest signal strength of all neighboring APs.
- If WDS is enabled on an AP, the blinking frequency of the Wireless indicator reflects the strength of signals received from a WDS AP.
  - If the AP works in leaf mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a middle AP.
  - If the AP works in middle mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a root AP.
  - If the AP works in root mode, the blinking frequency of the Wireless indicator reflects the weakest signal strength of middle APs.

**wifi-light traffic**: allows the Wireless indicator to reflect the service traffic volume on the radio.

When an AP functions as a Fat AP, the Wireless indicator of the AP cannot reflect the signal strength.

## Basic Specifications

**Table 3-19** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 100 mm x 220 mm x 220 mm (3.94 in. x 8.66 in. x 8.66 in.) |
| | Weight | 2 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 4 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | PoE power supply in compliance with IEEE 802.3at |
| | Maximum power consumption | 18 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to 1800 m: -40°C to +65°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +85°C |

| Item | | Description |
| --- | --- | --- |
| | Operating humidity | 0% to 100% (non-condensing) |
| | IP rating | IP68 |
| | Wind resistance | Up to 149 MPH |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 3-20** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in directional antenna<br>• Horizontal beamwidth: 60 degrees<br>• Vertical beamwidth: 30 degrees |
| Antenna gain | • 2.4 GHz: 10 dBi<br>• 5 GHz: 10 dBi |
| Maximum number of users | • Fit AP: ≤ 512<br>• Fat AP: ≤ 512<br>• Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 27 dBm (combined power)<br>• 5 GHz: 26 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
|---|---|---|---|
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

# 3.3.4 Hardware Information (AP8150DN)

## Appearance

**Figure 3-25** shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 3-25** AP appearance


**CAUTION**

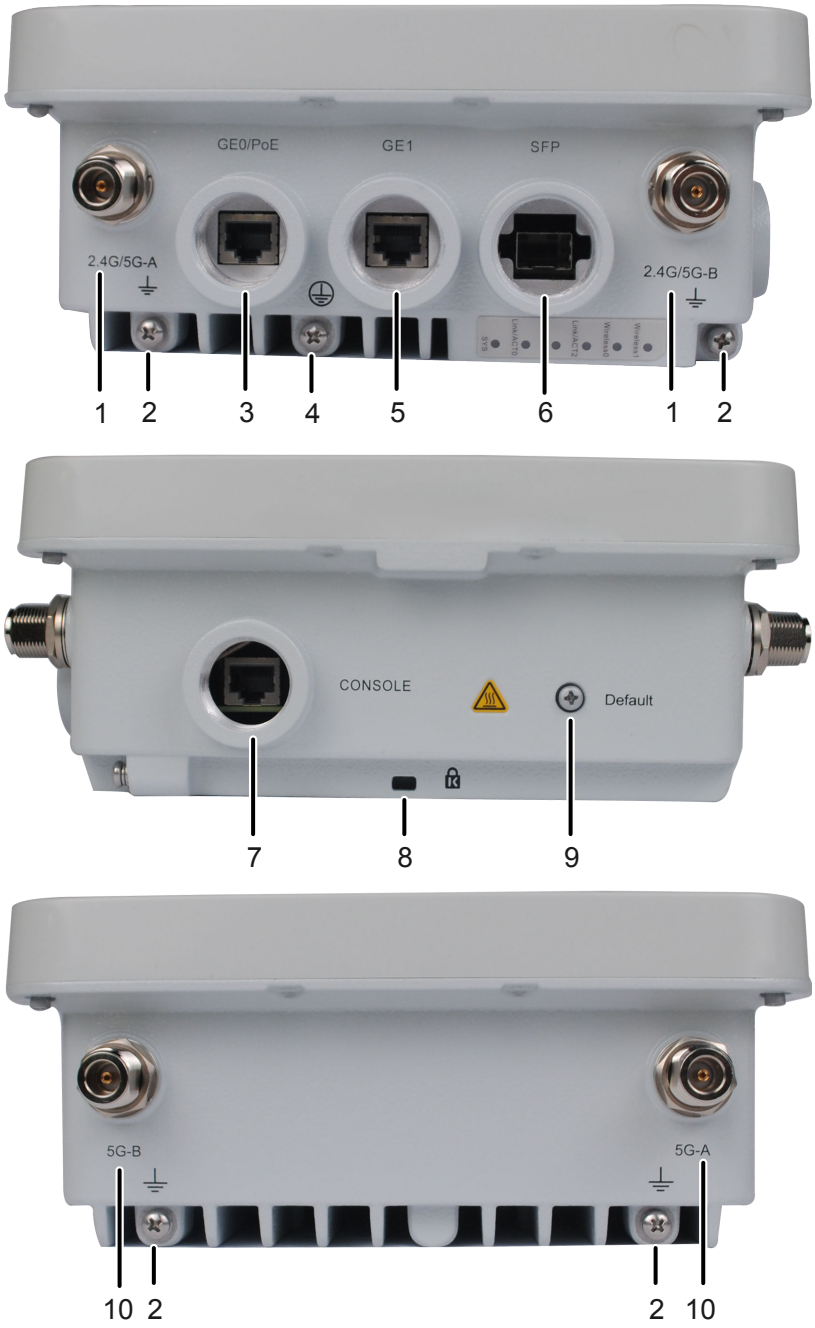
 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP.

**Figure 3-26** Interfaces on the AP




1. 2.4G/5G: Connects a 2.4 GHz or 5 GHz antenna to the AP to send and receive wireless signals. The port type is N-type female.
2. Ground screw for the surge protective device:Connects the AP to the ground point of an external surge protective device.
3. GE0/PoE: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
4. Device ground screw: Connects the device to a ground cable.
5. GE1: 10/100/1000M port that connects to the wired Ethernet.
6. SFP: Optical port that supports the 100M/1000M optical module.

7. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
8. Security slot: Connects to a security lock.
9. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

   NOTE

   The Reset button is protected by a waterproof screw. Before pressing the Reset button, remove the waterproof screw. Keep the screw properly and install it again after pressing the Reset button.
10. 5G: Connects a 5 GHz antenna to the AP to send and receive wireless signals. The port type is N-type female.

## LED Indicators

The AP provides multiple indicators: SYS indicator, Link/ACT indicator, and Wireless indicator. The following table describes indicators on AP.

NOTE

Indicator colors may vary slightly at different temperature.

Indicators of the same type have the same state meanings.

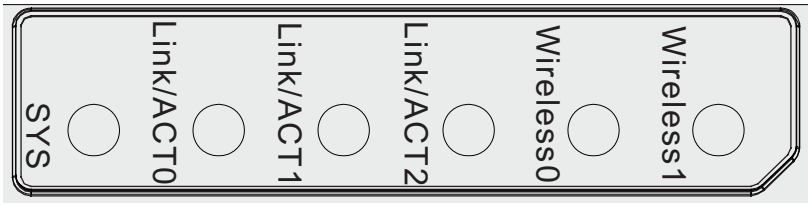



**Table 3-21** Descriptions about the SYS indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| SYS | System indicator | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>• The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

Link/ACT indicators consist of Link/ACT0, Link/ACT1, and Link/ACT2, showing link status of interfaces GE0/PoE, GE1, SFP respectively.

**Table 3-22** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| LINK | Green | Steady on | The system is running properly, the Ethernet connection is normal, and no data is being transmitted. |
| ACT | Green | Blinking | The system is running properly, the Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

Wireless indicators consist of Wireless0 and Wireless1, showing wireless link status of the 2.4/5 GHz and 5 GHz radio interfaces respectively.

**Table 3-23** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

**Table 3-24** Description about the Wireless indicator in signal strength mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | The AP is not transmitting or receiving data or the signal strength is extremely low. |
| | Blinking once every 2s (0.5 Hz) | The AP is transmitting or receiving data normally, and the signal strength is low. |
| | Blinking once every 0.25 seconds (4 Hz) | The AP is transmitting or receiving data normally, and the signal strength is medium. |
| | Steady on | The AP is transmitting or receiving data normally, and the signal strength is high. |

NOTE

When the WDS/Mesh function is enabled on an AP, the blinking frequency of its Wireless indicator indicates the receive signal strength on the WDS/Mesh connection by default. After you connect an AP to a WDS/Mesh network, you can run the **wifi-light** { **signal-strength** | **traffic** } command on the AC to specify whether the Wireless indicator blinking frequency indicates the receive signal strength or service traffic rate.**wifi-light signal-strength**:

- If the Mesh function is enabled on the AP, the blinking frequency of the Wireless indicator reflects the weakest signal strength of all neighboring APs.
- If WDS is enabled on an AP, the blinking frequency of the Wireless indicator reflects the strength of signals received from a WDS AP.
  - If the AP works in leaf mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a middle AP.
  - If the AP works in middle mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a root AP.
  - If the AP works in root mode, the blinking frequency of the Wireless indicator reflects the weakest signal strength of middle APs.

**wifi-light traffic**: allows the Wireless indicator to reflect the service traffic volume on the radio.

When an AP functions as a Fat AP, the Wireless indicator of the AP cannot reflect the signal strength.

## Basic Specifications

**Table 3-25** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 100 mm x 220 mm x 220 mm (3.94 in. x 8.66 in. x 8.66 in.) |
| | Weight | 1.95 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 4 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | PoE power supply in compliance with IEEE 802.3at |
| | Maximum power consumption | 18 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to 1800 m: -40°C to +65°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +85°C |

| Item | | Description |
| --- | --- | --- |
| | Operating humidity | 0% to 100% (non-condensing) |
| | IP rating | IP68 |
| | Wind resistance | Up to 149 MPH |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 3-26** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Outdoor external antenna |
| Maximum number of users | • Fit AP: ≤ 512<br>• Fat AP: ≤ 512<br>• Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 27 dBm (combined power)<br>• 5 GHz: 24 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

### 3.3.5 Performance Specifications (AP8050DN and AP8150DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

## 3.4 AP8050DN-S Product Description

### 3.4.1 Product Characteristics (AP8050DN-S)

Huawei AP8050DN-S is a dual-band wireless access point (AP) that supports 802.11ac Wave 2, 2 x 2 MU-MIMO, and two spatial streams. The AP is physically hardened and offers enhanced outdoor coverage performance. It can operate at both the 2.4 GHz and 5 GHz frequencies and support the wireless bridge function. It has a built-in Bluetooth and complies with IEEE 802.11a/b/g/n/ac. Its ability to operate at both 2.4 GHz and 5 GHz allows more access and provides gigabit-level wireless outdoor bandwidth. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic

AC discovery and configuration, and real-time management and maintenance, which meet outdoor network requirements. It is applicable to coverage scenarios (for example, densely-populated stadiums, squares, pedestrian streets, and amusement parks) and bridging scenarios (for example, wireless harbors, data backhaul, video surveillance, and train-to-ground backhaul).

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on 2.4 GHz and 5 GHz frequencies, peak rate of 400 Mbit/s at 2.4 GHz and 867 Mbit/s at 5 GHz, and 1.267 Gbit/s for the device
- Built-in 5 kA surge protectors; no external surge protection device required, simplifying installation and reducing costs
- High-grade metal materials and an overall heat dissipation design, working temperature ranging from –40°C to +65°C, 6 kA or 6 kV surge protection capability on an Ethernet interface, and IP68 waterproof and dustproof, meeting industry-level requirements
- Built-in Bluetooth to extend Bluetooth-based applications
- Support for the Fat, Fit, and cloud modes
- Support for cloud-based management and O&M of APs and services through SDN controller, reducing O&M costs

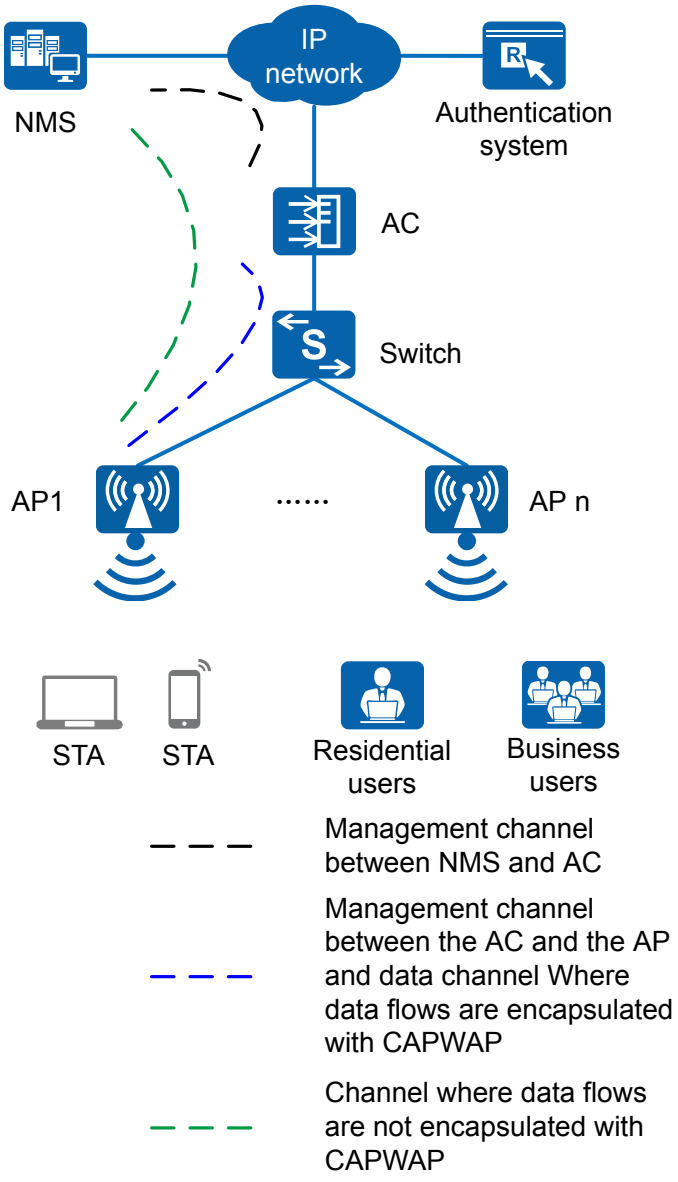
## 3.4.2 Usage Scenarios (AP8050DN-S)

The AP8050DN-S can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 3-27** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 3-28** Fit AP networking (WDS mode: point-to-point)

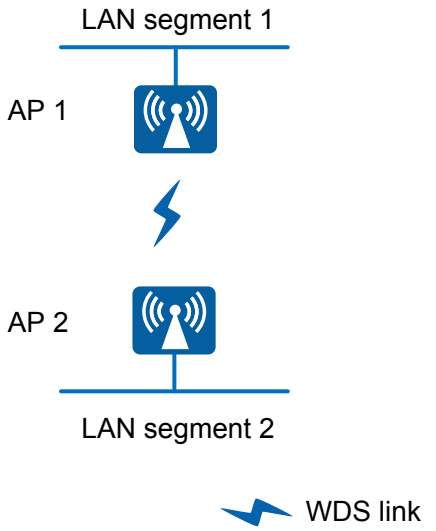
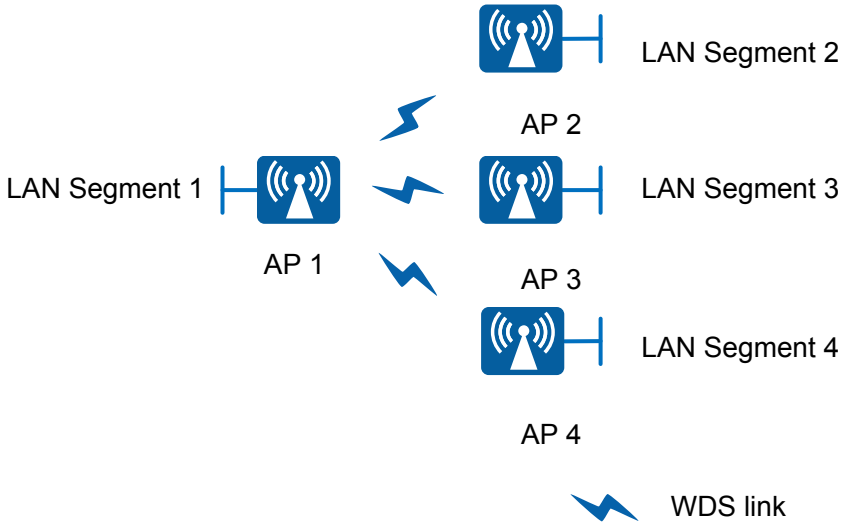


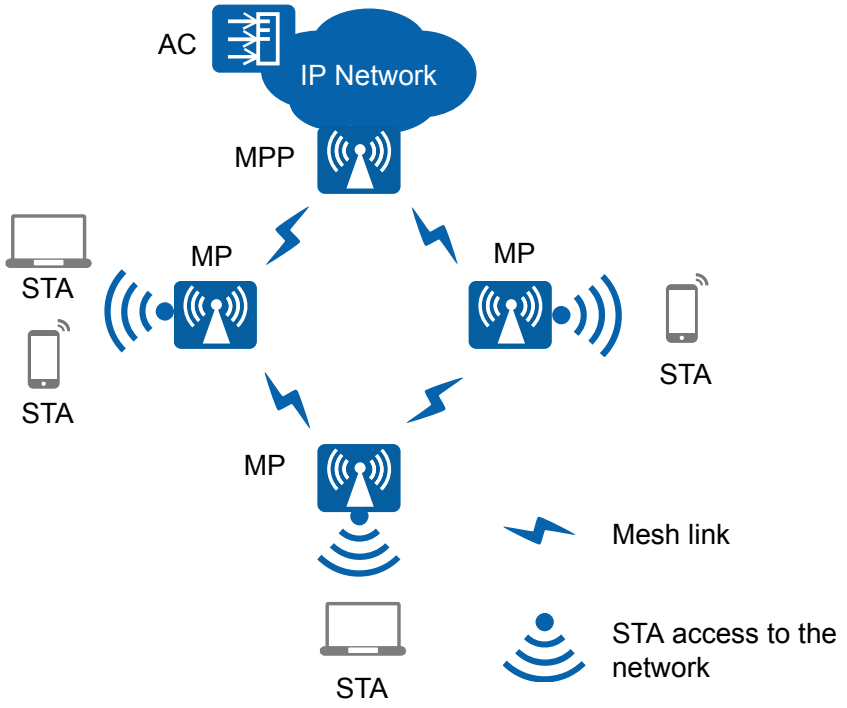

**Figure 3-29** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

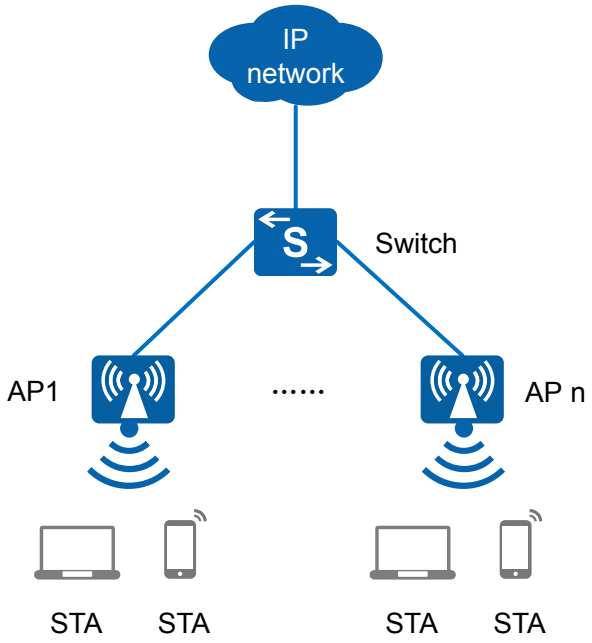
**Figure 3-30** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

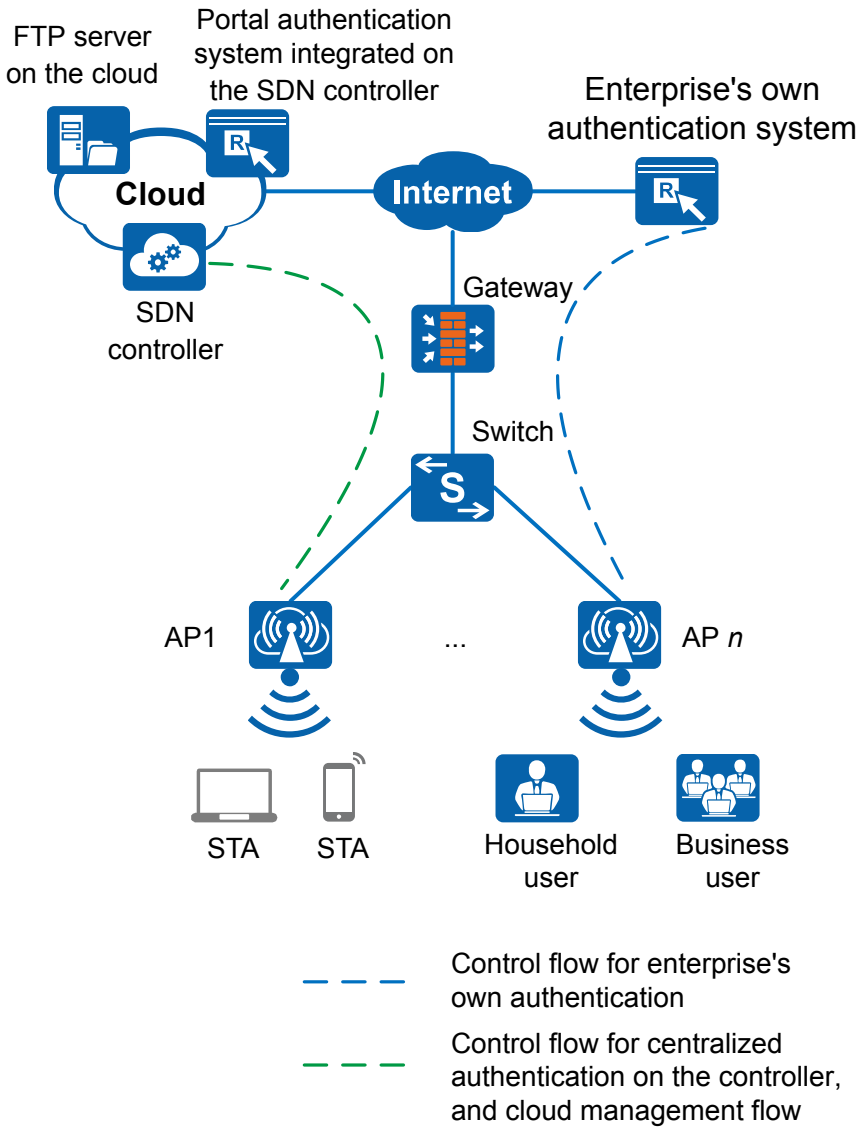
**Figure 3-31** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 3-32** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 3.4.3 Hardware Information (AP8050DN-S)

### Appearance

Figure 3-33 shows the appearance of the AP.

NOTE

The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

**Figure 3-33** AP appearance


**CAUTION**

 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP.

**Figure 3-34** Interfaces on the AP


1. GE0/PoE: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
2. Device ground screw: Connects the device to a ground cable.
3. GE1: 10/100/1000M port that connects to the wired Ethernet.
4. SFP: Optical port that supports the 100M/1000M optical module.
5. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
6. Security slot: Connects to a security lock.
7. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

NOTE

The Reset button is protected by a waterproof screw. Before pressing the Reset button, remove the waterproof screw. Keep the screw properly and install it again after pressing the Reset button.

## LED Indicators

The AP provides multiple indicators: SYS indicator, Link/ACT indicator, and Wireless indicator. The following table describes indicators on AP.

**NOTE**

Indicator colors may vary slightly at different temperature.

Indicators of the same type have the same state meanings.

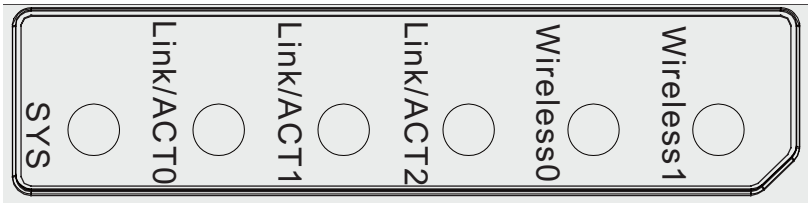



**Table 3-27** Descriptions about the SYS indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| SYS | System indicator | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>• The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

Link/ACT indicators consist of Link/ACT0, Link/ACT1, and Link/ACT2, showing link status of interfaces GE0/PoE, GE1, SFP respectively.

**Table 3-28** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| LINK | Green | Steady on | The system is running properly, the Ethernet connection is normal, and no data is being transmitted. |
| ACT | Green | Blinking | The system is running properly, the Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

Wireless indicators consist of Wireless0 and Wireless1, showing wireless link status of the 2.4/5 GHz and 5 GHz radio interfaces respectively.

**Table 3-29** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

**Table 3-30** Description about the Wireless indicator in signal strength mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | The AP is not transmitting or receiving data or the signal strength is extremely low. |
| | Blinking once every 2s (0.5 Hz) | The AP is transmitting or receiving data normally, and the signal strength is low. |
| | Blinking once every 0.25 seconds (4 Hz) | The AP is transmitting or receiving data normally, and the signal strength is medium. |
| | Steady on | The AP is transmitting or receiving data normally, and the signal strength is high. |

NOTE

When the WDS/Mesh function is enabled on an AP, the blinking frequency of its Wireless indicator indicates the receive signal strength on the WDS/Mesh connection by default. After you connect an AP to a WDS/Mesh network, you can run the **wifi-light** { **signal-strength** | **traffic** } command on the AC to specify whether the Wireless indicator blinking frequency indicates the receive signal strength or service traffic rate.**wifi-light signal-strength**:

- If the Mesh function is enabled on the AP, the blinking frequency of the Wireless indicator reflects the weakest signal strength of all neighboring APs.
- If WDS is enabled on an AP, the blinking frequency of the Wireless indicator reflects the strength of signals received from a WDS AP.
  - If the AP works in leaf mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a middle AP.
  - If the AP works in middle mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a root AP.
  - If the AP works in root mode, the blinking frequency of the Wireless indicator reflects the weakest signal strength of middle APs.

**wifi-light traffic**: allows the Wireless indicator to reflect the service traffic volume on the radio.

When an AP functions as a Fat AP, the Wireless indicator of the AP cannot reflect the signal strength.

## Basic Specifications

**Table 3-31** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 100 mm x 220 mm x 220 mm |
| | Weight | 2 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 4 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | PoE power supply in compliance with IEEE 802.3at |
| | Maximum power consumption | 18 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to 1800 m: -40°C to +65°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +85°C |

| Item | | Description |
| --- | --- | --- |
| | Operating humidity | 0% to 100% (non-condensing) |
| | IP rating | IP68 |
| | Wind resistance | Up to 149 MPH |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 3-32** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in directional antenna<br>• Horizontal beamwidth: 60 degrees<br>• Vertical beamwidth: 30 degrees |
| Antenna gain | • 2.4 GHz: 10 dBi<br>• 5 GHz: 10 dBi |
| Maximum number of users | • Fit AP: ≤ 512<br>• Fat AP: ≤ 512<br>• Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 27 dBm (combined power)<br>• 5 GHz: 26 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<ul><li>802.11b/g<ul><li>20 MHz: 3</li></ul></li><li>802.11n<ul><li>20 MHz: 3</li><li>40 MHz: 1</li></ul></li></ul></td><td>5 GHz (5.18 GHz to 5.825 GHz)<ul><li>802.11a<ul><li>20 MHz: 13</li></ul></li><li>802.11n<ul><li>20 MHz: 13</li><li>40 MHz: 6</li></ul></li><li>802.11ac<ul><li>20 MHz: 13</li><li>40 MHz: 6</li><li>80 MHz: 3</li></ul></li></ul></td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.<br>NOTICE<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<ol><li>The country code of the AP is fixed.</li><li>High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.</li></ol></td></tr>
<tr><td>Channel rate</td><td colspan="3"><ul><li>802.11b: 1, 2, 5.5, and 11 Mbit/s</li><li>802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s</li><li>802.11n: 6.5 to 400 Mbit/s</li><li>802.11ac: 6.5 to 867 Mbit/s</li></ul></td></tr>
</table>

## 3.4.4 Performance Specifications (AP8050DN-S)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 3.5 AP8050TN-HD Product Description

## 3.5.1 Product Characteristics (AP8050TN-HD)

Huawei AP8050TN-HD is an 802.11ac Wave 2 wireless access point (AP) designed for high-density scenarios such as stadiums and outdoor courts. The AP has three radios: one 2.4 GHz radio and two 5 GHz radios. The 2.4 GHz radio supports 2x2 MIMO and two spatial streams; and the 5 GHz radios both support 2x2 MIMO and two spatial streams. The entire AP supports six spatial streams and a maximum rate of 2.134 Gbit/s. The ruggedized AP8050TN-HD provides excellent coverage performance, has built-in Bluetooth, and complies with 802.11a/b/g/n/ac. The AP8050TN-HD can provide services simultaneously on the 2.4 GHz and 5 GHz

frequency bands to support more access users and provide gigabit access for wireless users. The AP provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance. The AP8050TN-HD has built-in high-density smart antennas that provide more accurate coverage, applicable to high-density scenarios.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on both 2.4 GHz and 5 GHz frequency bands; 400 Mbit/s at 2.4 GHz; 867 Mbit/s+867 Mbit/s at 5 GHz; and 2.134 Gbit/s for the device.
- Built-in 5 kA surge protectors; no additional surge protection device required. This design simplifies installation and saves costs.
- Uses a metal shell and heat dissipation design, and provides 6 kA or 6 kV surge protection capability on an Ethernet interface, and IP68 rating, meeting industry-level use requirements.
- Provides a built-in Bluetooth module to extend Bluetooth-based applications.
- Supports the Fat, Fit, and cloud modes.
- Enables Huawei SDN controller to manage and operate APs and services on the APs, reducing network O&M costs.

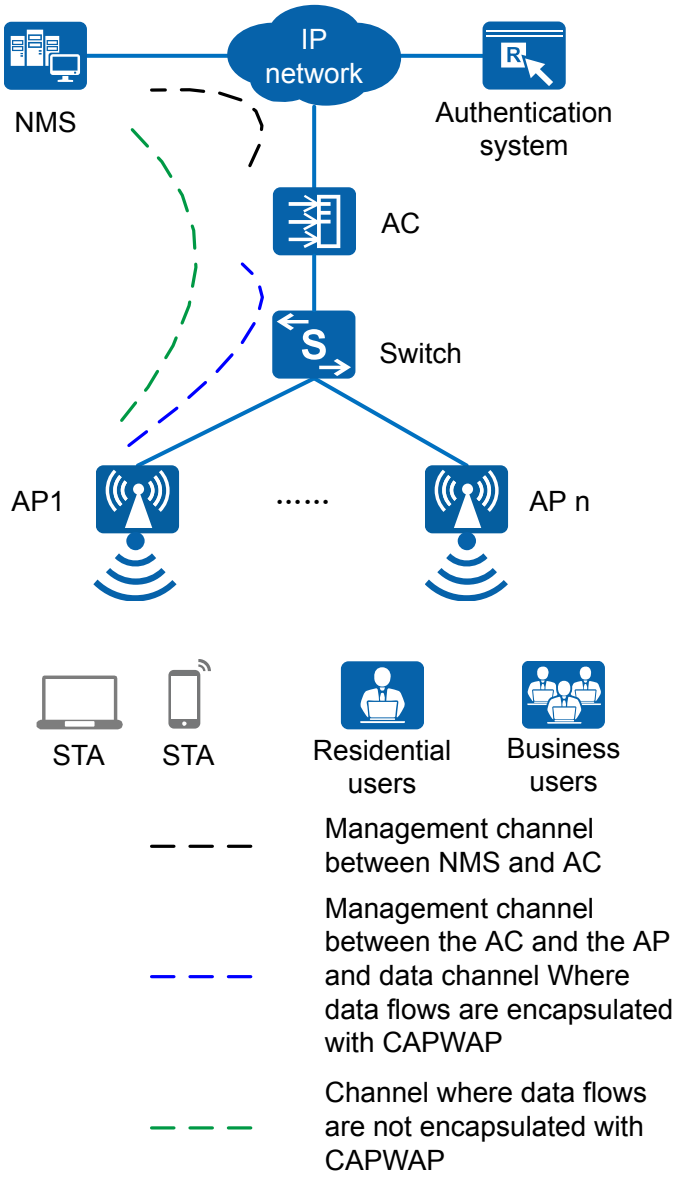
## 3.5.2 Usage Scenarios (AP8050TN-HD)

The AP8050TN-HD can work as a Fat AP, Fit AP, or cloud AP. It can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 3-35** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 3-36** Fit AP networking (WDS mode: point-to-point)

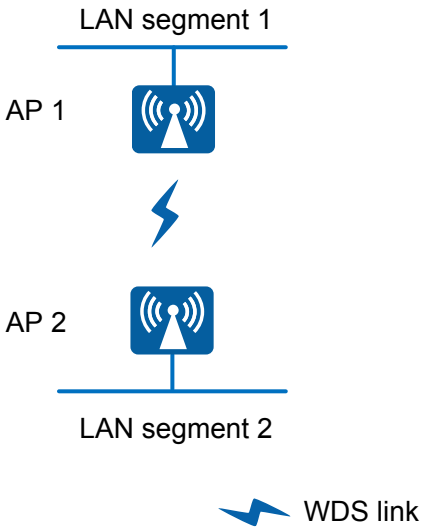
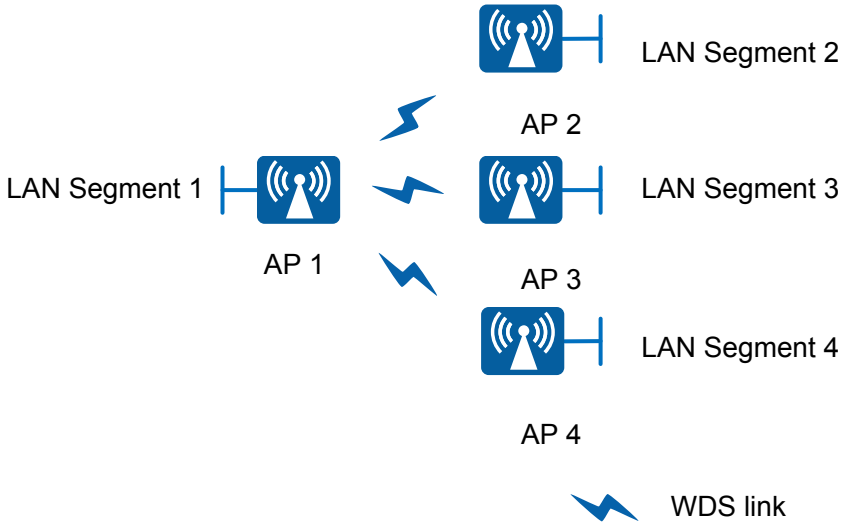


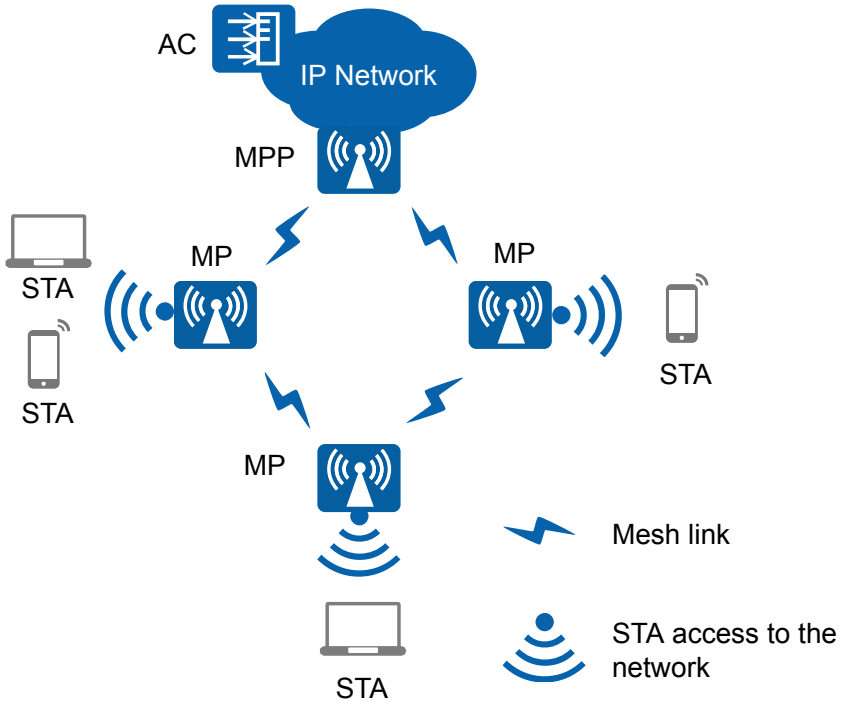

**Figure 3-37** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

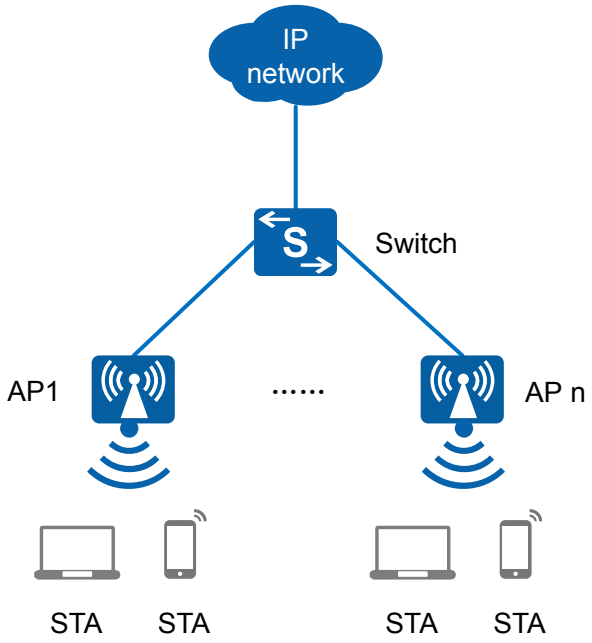
**Figure 3-38** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

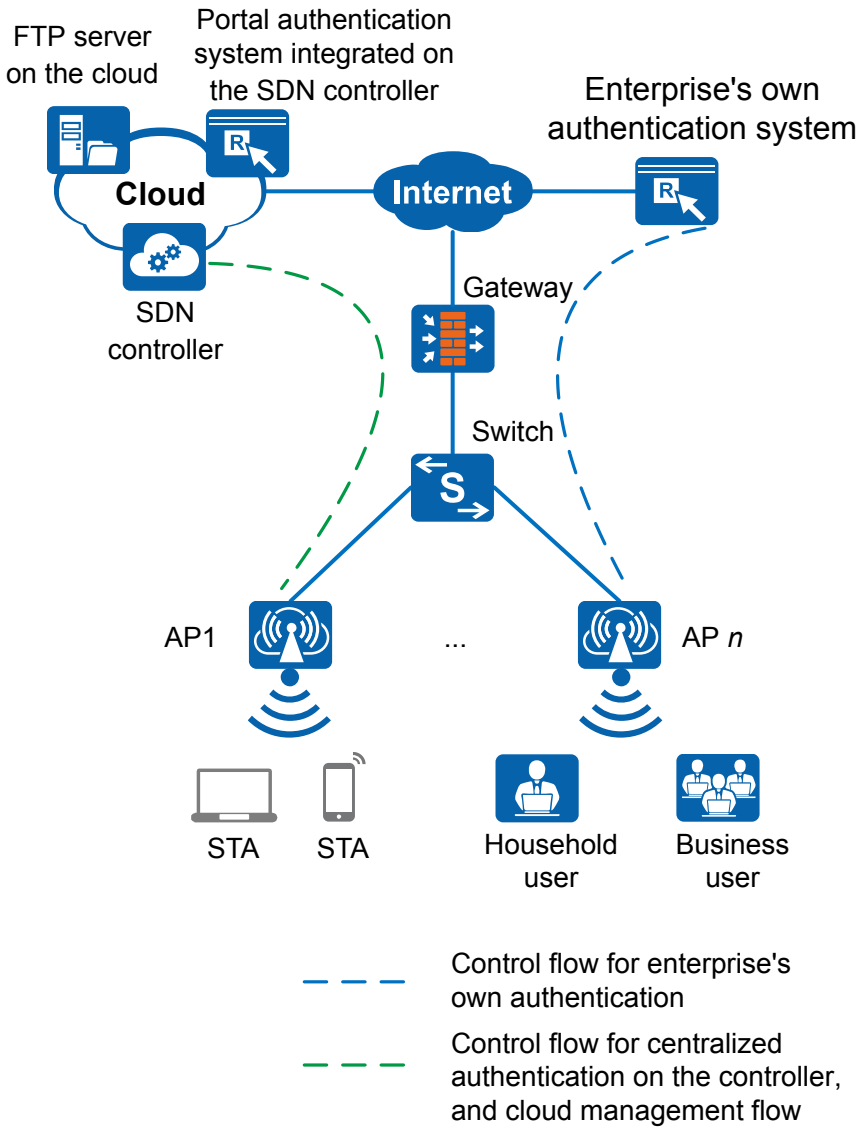
**Figure 3-39** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 3-40** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 3.5.3 Hardware Information (AP8050TN-HD)

### Appearance

Figure 3-41 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 3-41** AP appearance

**CAUTION**

 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP.

**Figure 3-42** Interfaces on the AP


1. GE0/PoE: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
2. Device ground screw: Connects the device to a ground cable.
3. GE1: 10/100/1000M port that connects to the wired Ethernet.
4. SFP: Optical port that supports the 100M/1000M optical module.
5. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
6. Security slot: Connects to a security lock.
7. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

   **NOTE**

   The Reset button is protected by a waterproof screw. Before pressing the Reset button, remove the waterproof screw. Keep the screw properly and install it again after pressing the Reset button.

## LED Indicators

The AP provides multiple indicators: SYS indicator, Link/ACT indicator, and Wireless indicator. The following table describes indicators on AP.

NOTE

Indicator colors may vary slightly at different temperature.


**SYS Indicator**

**Table 3-33** Descriptions about the SYS indicator

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| SYS | System indicator | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>• The AP works in Fit AP or cloud-based management mode and fails to go online. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

### Link/ACT Indicators

Link/ACT indicators consist of Link/ACT0, Link/ACT1, and Link/ACT2, showing the link status of interfaces GE0/PoE, GE1, SFP respectively.

**Table 3-34** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| LINK | Green | Steady on | The system is running properly, the Ethernet connection is normal, and no data is being transmitted. |
| ACT | Green | Blinking | The system is running properly, the Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

### Wireless Indicators

Wireless indicators consist of Wireless0 and Wireless1, showing the wireless link status of the 2.4/5 GHz and 5 GHz radio interfaces, respectively.

**Table 3-35** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

| Color | Status | Description |
| --- | --- | --- |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

**Table 3-36** Description about the Wireless indicator in signal strength mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | The AP is not transmitting or receiving data or the signal strength is extremely low. |
| | Blinking once every 2s (0.5 Hz) | The AP is transmitting or receiving data normally, and the signal strength is low. |
| | Blinking once every 0.25 seconds (4 Hz) | The AP is transmitting or receiving data normally, and the signal strength is medium. |
| | Steady on | The AP is transmitting or receiving data normally, and the signal strength is high. |

**NOTE**

When the WDS/Mesh function is enabled on an AP, the blinking frequency of its Wireless indicator indicates the receive signal strength on the WDS/Mesh connection by default. After you connect an AP to a WDS/Mesh network, you can run the **wifi-light** { **signal-strength** | **traffic** } command on the AC to specify whether the Wireless indicator blinking frequency indicates the receive signal strength or service traffic rate.**wifi-light signal-strength**:

- If the Mesh function is enabled on the AP, the blinking frequency of the Wireless indicator reflects the weakest signal strength of all neighboring APs.
- If WDS is enabled on an AP, the blinking frequency of the Wireless indicator reflects the strength of signals received from a WDS AP.
  - If the AP works in leaf mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a middle AP.
  - If the AP works in middle mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a root AP.
  - If the AP works in root mode, the blinking frequency of the Wireless indicator reflects the weakest signal strength of middle APs.

**wifi-light traffic**: allows the Wireless indicator to reflect the service traffic volume on the radio.

When an AP functions as a Fat AP, the Wireless indicator of the AP cannot reflect the signal strength.

## Basic Specifications

**Table 3-37** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 100 mm x 320 mm x 320 mm |
| | Weight | 3.23 kg |
| | System memory | 512 MB DDR3L |
| | FLASH | 4 MB NOR FLASH + 128 MB NAND FLASH |
| Power specifications | Power input | PoE power supply in compliance with IEEE 802.3at/af |
| | Maximum power consumption | • 802.3at power supply: 19.4 W<br>• 802.3af power supply: 12.95 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to 1800 m: -40°C to +65°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +85°C |

| Item | | Description |
| --- | --- | --- |
| | Operating humidity | 0% to 100% (non-condensing) |
| | IP rating | IP68 |
| | Wind resistance | Up to 149 MPH |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 3-38** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in directional antenna<br>• 2.4 GHz:<br>– Horizontal beamwidth: 40 degrees<br>– Vertical beamwidth: 40 degrees<br>• 5 GHz<br>– Horizontal beamwidth: 27 degrees<br>– Vertical beamwidth: 27 degrees |
| Antenna gain | • 2.4 GHz: 7 dBi<br>• 5 GHz (Radio 1): 9 dBi<br>• 5 GHz (Radio 2): 9 dBi |
| Maximum number of users | • Fit AP: ≤ 768<br>• Fat AP: ≤ 768<br>• Cloud AP: ≤ 768<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 21 dBm (combined power)<br>• 5 GHz (5150 MHz to 5350 MHz): 20 dBm (combined power)<br>• 5 GHz (5490 MHz to 5850 MHz): 21 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 3.5.4 Performance Specifications (AP8050TN-HD)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 3.6 AP8082DN and AP8182DN Product Description

## 3.6.1 Product Characteristics (AP8082DN and AP8182DN)

Huawei AP8082DN and AP8182DN are latest-generation 802.11ac Wave 2 outdoor access points (APs) that support 4x4 MU-MIMO and four spatial streams and offer high flexibility with IEEE 802.11a/b/g/n/ac compliance. Both APs are physically hardened and feature enhanced outdoor coverage performance. The AP8082DN and AP8182DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users and provide gigabit access for wireless users in outdoor scenarios. The AP8082DN and AP8182DN provide comprehensive service support capabilities and feature high reliability,

high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meet outdoor network requirements. They are recommended for use in coverage scenarios, for example, high-density stadiums, squares, pedestrian streets, and amusement parks.

- 802.11ac Wave 2 compliance, MU-MIMO, delivering services simultaneously on both 2.4 GHz and 5 GHz frequency bands; 800 Mbit/s at 2.4 GHz; 1.73 Gbit/s at 5 GHz; and 2.53 Gbit/s for the device.
- The AP8182DN supports 2.4G-to-5G radio switching. When working at dual 5 GHz frequency bands simultaneously, the AP8182DN provides a system rate of 3.46 Gbit/s.
- Built-in 5 kA surge protectors; no additional surge protection device required. This design simplifies installation and saves costs.
- Uses a metal shell and heat dissipation design, and provides 6 kA or 6 kV surge protection capability on an Ethernet interface, and IP68 rating, meeting industry-level use requirements.
- Supports the Fat, Fit, and cloud modes.
- Enables Huawei SDN controller to manage and operate APs and services on the APs, reducing network O&M costs.

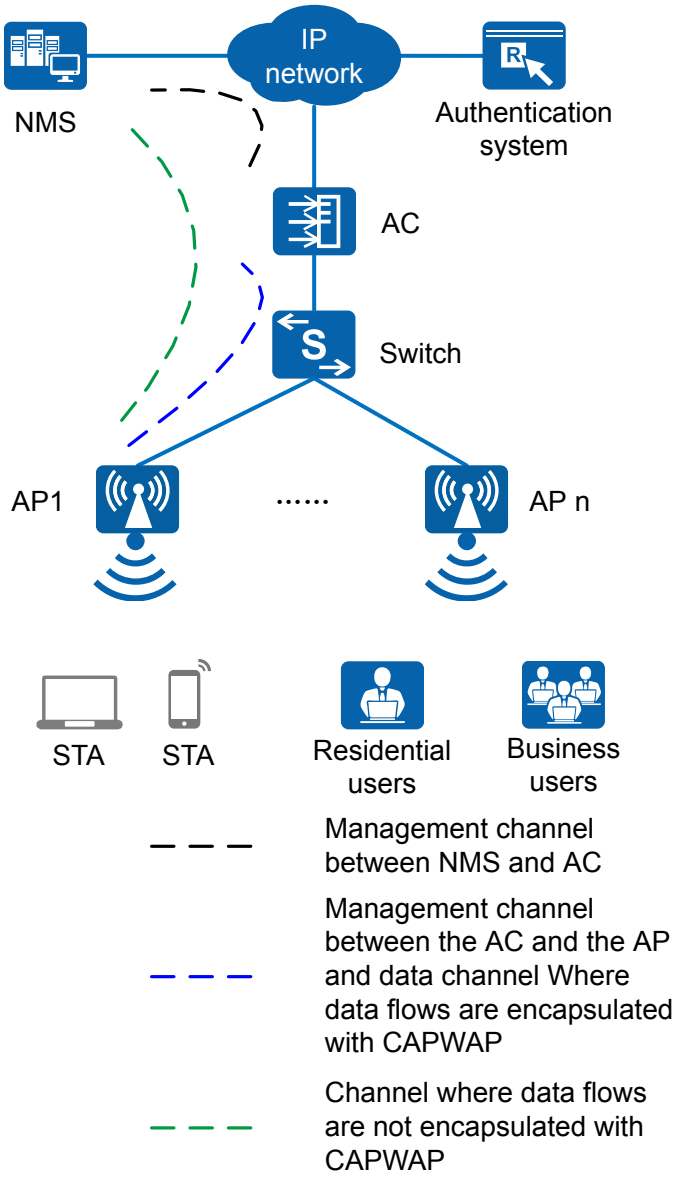
## 3.6.2 Usage Scenarios (AP8082DN and AP8182DN)

The AP8082DN and AP8182DN can work as a Fat AP, Fit AP, or cloud AP. They can switch flexibly among three working modes based on the network plan.

Typical networking modes are as follows:

**Figure 3-43** Fit AP networking (AP mode)




In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 3-44** Fit AP networking (WDS mode: point-to-point)

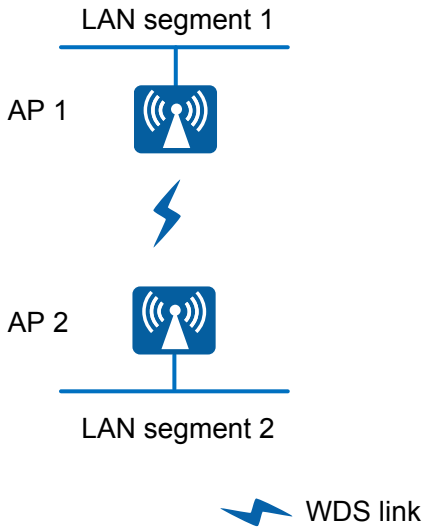
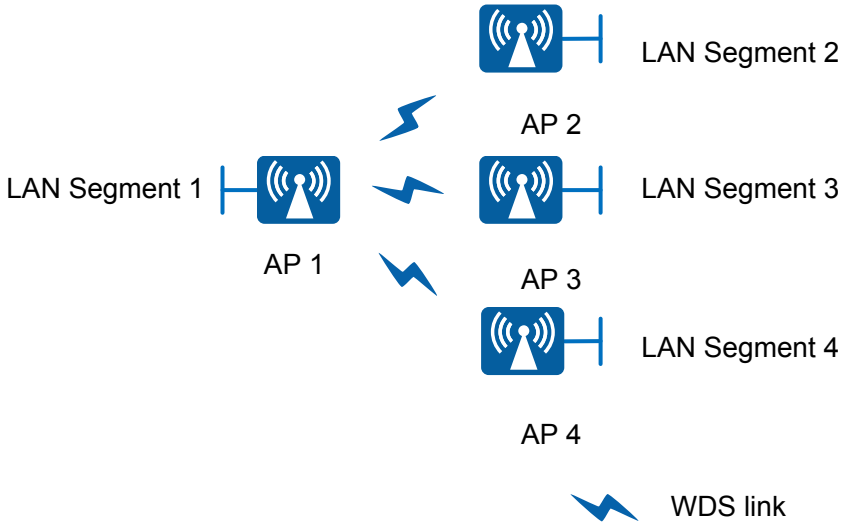


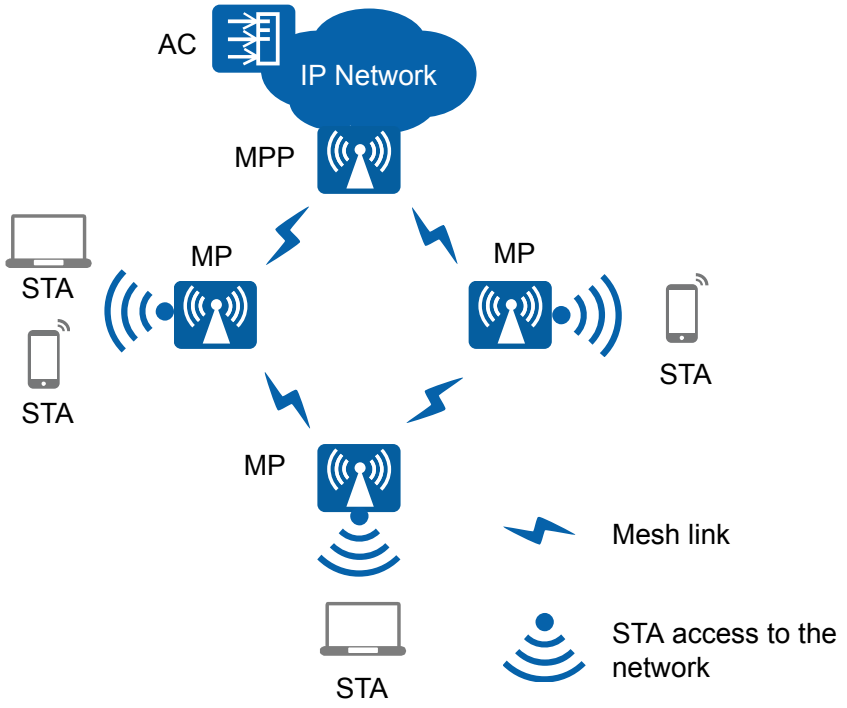

**Figure 3-45** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

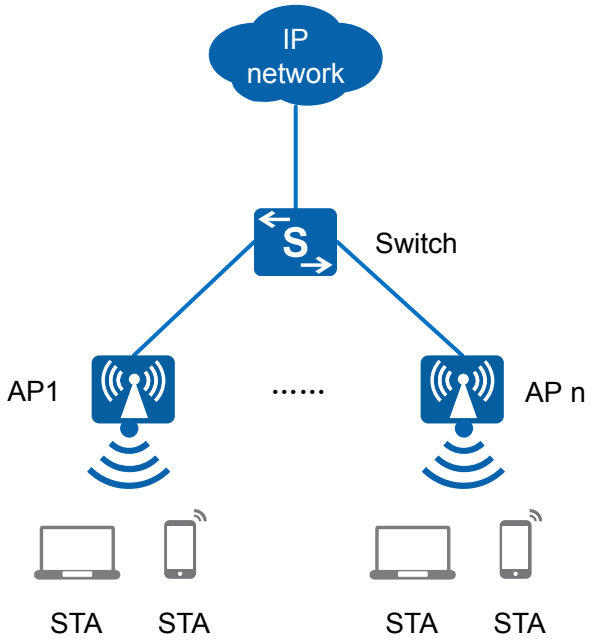
**Figure 3-46** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

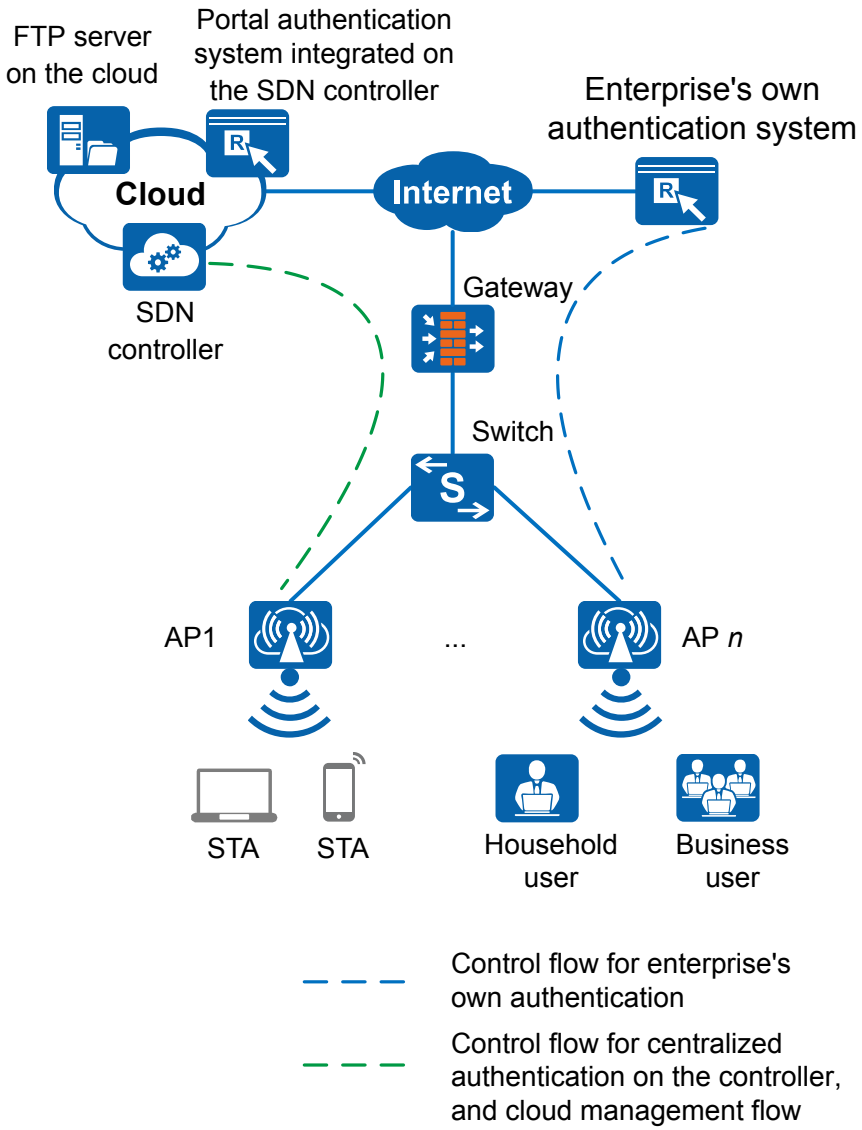
**Figure 3-47** Fat AP networking




In this networking, the device functions as a Fat AP to implement functions such as user access, authentication, data security, service forwarding, and QoS.

**Figure 3-48** Cloud AP networking




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 3.6.3 Hardware Information (AP8082DN)

### Appearance

Figure 3-49 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 3-49** AP appearance

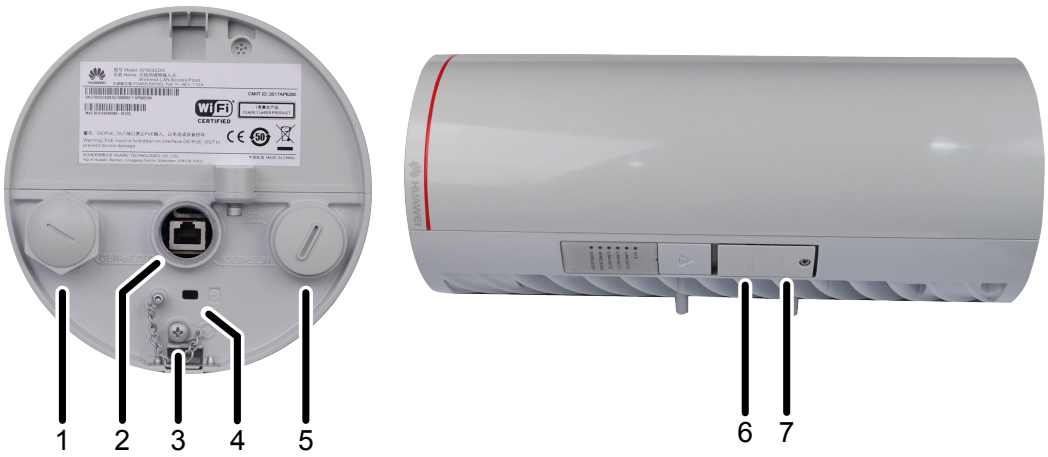
**CAUTION**

 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP.

**Figure 3-50** Interfaces on the AP



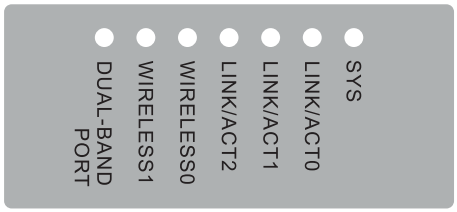
1. GE/PoE_OUT:10/100/1000M port that connects to the wired Ethernet and supports PoE output.
2. 5GE/PoE_IN: 100M/1000M/2.5G/5G port that connects to the wired Ethernet and supports PoE input.
3. Device ground screw: Connects the device to a ground cable.
4. Security slot: Connects to a security lock.
5. SFP: Optical port that supports the 100M/1000M optical module.
6. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
7. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

## LED Indicators

The AP provides multiple indicators: SYS indicator, Link/ACT indicator, and Wireless indicator. The following table describes indicators on AP.

**NOTE**

Indicator colors may vary slightly at different temperature.




**SYS Indicator**

**Table 3-39** Descriptions about the SYS indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| SYS | System indicator | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>• The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

**Link/ACT Indicators**

Link/ACT indicators consist of Link/ACT0, Link/ACT1, and Link/ACT2, showing the link status of interfaces GE/PoE_OUT, 5GE/PoE_IN, SFP respectively.

**Table 3-40** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| The AP serves as a PSE to supply | Green | Steady on | The Ethernet connection is normal, and no data is being transmitted. The PoE OUT function is available. |

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| power to PDs through the PoE_OUT port. | | Blinking | The Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. The PoE OUT function is available. |
| | Yellow | Steady on | The Ethernet connection fails, and the PoE OUT function is unavailable. |
| | | Off | The Ethernet connection fails, and the PoE OUT function is available. |
| | | Blinking | The Ethernet connection fails, and the PoE OUT function is faulty. |
| The AP does not provide the PoE OUT function to supply power to PDs. | Green | Steady on | The Ethernet connection is normal, and no data is being transmitted. |
| | | Blinking | The Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

**Wireless Indicators**

Wireless indicators consist of Wireless0 and Wireless1, showing the wireless link status of the 2.4/5 GHz and DUAL-BAND/5G radio interfaces respectively.

**Table 3-41** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

**Table 3-42** Description about the Wireless indicator in signal strength mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | The AP is not transmitting or receiving data or the signal strength is extremely low. |
| | Blinking once every 2s (0.5 Hz) | The AP is transmitting or receiving data normally, and the signal strength is low. |
| | Blinking once every 0.25 seconds (4 Hz) | The AP is transmitting or receiving data normally, and the signal strength is medium. |
| | Steady on | The AP is transmitting or receiving data normally, and the signal strength is high. |

NOTE

When the WDS/Mesh function is enabled on an AP, the blinking frequency of its Wireless indicator indicates the receive signal strength on the WDS/Mesh connection by default. After you connect an AP to a WDS/Mesh network, you can run the **wifi-light** { **signal-strength** | **traffic** } command on the AC to specify whether the Wireless indicator blinking frequency indicates the receive signal strength or service traffic rate.**wifi-light signal-strength**:

- If the Mesh function is enabled on the AP, the blinking frequency of the Wireless indicator reflects the weakest signal strength of all neighboring APs.
- If WDS is enabled on an AP, the blinking frequency of the Wireless indicator reflects the strength of signals received from a WDS AP.
  - If the AP works in leaf mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a middle AP.
  - If the AP works in middle mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a root AP.
  - If the AP works in root mode, the blinking frequency of the Wireless indicator reflects the weakest signal strength of middle APs.

**wifi-light traffic**: allows the Wireless indicator to reflect the service traffic volume on the radio.

When an AP functions as a Fat AP, the Wireless indicator of the AP cannot reflect the signal strength.

## Basic Specifications

**Table 3-43** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (length x diameter) | 387 mm x Φ165 mm (15.24 in. x Φ6.50 in.) |
| | Weight | 3.9 kg |
| | System memory | 1 GB DDR4 |
| | Flash | 16 MB NOR Flash + 128 MB NAND Flash |
| Power specifications | Power input | PoE power supply in compliance with IEEE 802.3at/bt |
| | Maximum power consumption | • 802.3bt power supply: 45 W (excluding the output power of the PoE_OUT port, 5GE and SFP are mutually exclusive.)<br>• 802.3at power supply: 25.5 W (The PoE_OUT function and GE/POE_OUT ports are unavailable, 5GE and SFP are mutually exclusive.)<br>**NOTE**<br>• The actual maximum power consumption depends on local laws and regulations.<br>• In 802.3at power supply mode, the radio power is reduced, and the 2.4 GHz radio works in 2x4 MIMO mode. |
| Environment specifications | Operating temperature | -60 m to +1800 m: -40°C to +65°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +85°C |
| | Operating humidity | 0% to 100% (non-condensing) |
| | IP rating | IP68 |
| | Wind resistance | Up to 149 MPH |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 3-44** Radio specifications

| Item | Description | | |
|---|---|---|---|
| Antenna type | AP8082DN: Built-in directional antenna<br>• Horizontal beamwidth: 60 degrees<br>• Vertical beamwidth: 30 degrees | | |
| Antenna gain | • 2.4 GHz: 7 dBi<br>• 5 GHz: 7 dBi | | |
| Maximum number of users | • Fit AP: ≤ 512<br>• Fat AP: ≤ 512<br>• Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. | | |
| Maximum number of VAPs for each radio | 16 | | |
| Maximum transmit power | AP8082DN:<br>• 2.4 GHz: 29 dBm (combined power)<br>• 5 GHz: 28 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. | | |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |

| Item | Description |
| --- | --- |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac: 6.5 to 1733.3 Mbit/s |

## 3.6.4 Hardware Information (AP8182DN)

### Appearance

Figure 3-51 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 3-51** AP appearance

**⚠ CAUTION**

 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP.

**Figure 3-52** Interfaces on the AP


1. GE/PoE_OUT:10/100/1000M port that connects to the wired Ethernet and supports PoE output.

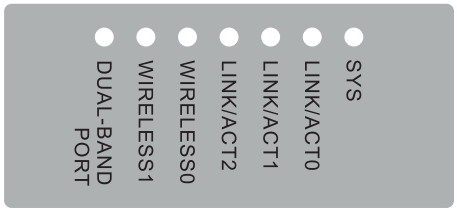
2. 5GE/PoE_IN: 100M/1000M/2.5G/5G port that connects to the wired Ethernet and supports PoE input.
3. Device ground screw: Connects the device to a ground cable.
4. Security slot: Connects to a security lock.
5. SFP: Optical port that supports the 100M/1000M optical module.
6. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
7. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
8. 2.4G/5G: Connects a 2.4 GHz or 5 GHz antenna to the AP to send and receive wireless signals. The port type is N-type female.
9. DUAL-BAND/5G: Connects a 2.4GHz/5GHz dual-band antenna or 5 GHz antenna to the AP to send and receive wireless signals.The port type is N-type female.

## LED Indicators

The AP provides multiple indicators: SYS indicator, Link/ACT indicator, and Wireless indicator. The following table describes indicators on AP.

**NOTE**

Indicator colors may vary slightly at different temperature.




**SYS Indicator**

**Table 3-45** Descriptions about the SYS indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| SYS | System indicator | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>• The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

**Link/ACT Indicators**

Link/ACT indicators consist of Link/ACT0, Link/ACT1, and Link/ACT2, showing the link status of interfaces GE/PoE_OUT, 5GE/PoE_IN, SFP respectively.

**Table 3-46** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| The AP serves as a PSE to supply | Green | Steady on | The Ethernet connection is normal, and no data is being transmitted. The PoE OUT function is available. |

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| power to PDs through the PoE_OUT port. | | Blinking | The Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. The PoE OUT function is available. |
| | Yellow | Steady on | The Ethernet connection fails, and the PoE OUT function is unavailable. |
| | | Off | The Ethernet connection fails, and the PoE OUT function is available. |
| | | Blinking | The Ethernet connection fails, and the PoE OUT function is faulty. |
| The AP does not provide the PoE OUT function to supply power to PDs. | Green | Steady on | The Ethernet connection is normal, and no data is being transmitted. |
| | | Blinking | The Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

**Wireless Indicators**

Wireless indicators consist of Wireless0 and Wireless1, showing the wireless link status of the 2.4/5 GHz and DUAL-BAND/5G radio interfaces respectively.

**Table 3-47** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

**Table 3-48** Description about the Wireless indicator in signal strength mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | The AP is not transmitting or receiving data or the signal strength is extremely low. |
| | Blinking once every 2s (0.5 Hz) | The AP is transmitting or receiving data normally, and the signal strength is low. |
| | Blinking once every 0.25 seconds (4 Hz) | The AP is transmitting or receiving data normally, and the signal strength is medium. |
| | Steady on | The AP is transmitting or receiving data normally, and the signal strength is high. |

NOTE

When the WDS/Mesh function is enabled on an AP, the blinking frequency of its Wireless indicator indicates the receive signal strength on the WDS/Mesh connection by default. After you connect an AP to a WDS/Mesh network, you can run the **wifi-light** { **signal-strength** | **traffic** } command on the AC to specify whether the Wireless indicator blinking frequency indicates the receive signal strength or service traffic rate.**wifi-light signal-strength**:

- If the Mesh function is enabled on the AP, the blinking frequency of the Wireless indicator reflects the weakest signal strength of all neighboring APs.
- If WDS is enabled on an AP, the blinking frequency of the Wireless indicator reflects the strength of signals received from a WDS AP.
  - If the AP works in leaf mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a middle AP.
  - If the AP works in middle mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a root AP.
  - If the AP works in root mode, the blinking frequency of the Wireless indicator reflects the weakest signal strength of middle APs.

**wifi-light traffic**: allows the Wireless indicator to reflect the service traffic volume on the radio.

When an AP functions as a Fat AP, the Wireless indicator of the AP cannot reflect the signal strength.

### Dual-Band Port Indicator

The dual-band port indicator shows the wireless link status of 5 GHz radio interfaces.

**Table 3-49** Description about the DUAL-BAND PORT indicator

| Color | Status | Description |
| --- | --- | --- |
| Green | Steady on | The dual-band port function is enabled, and the port is working on dual bands. |
| | Off | The dual-band port function is disabled, and the port is working on a single band. |

## Basic Specifications

**Table 3-50** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (length x diameter) | 387 mm x Φ165 mm (15.24 in. x Φ6.50 in.) |
| | Weight | 3.9 kg |
| | System memory | 1 GB DDR4 |
| | Flash | 16 MB NOR Flash + 128 MB NAND Flash |
| Power specifications | Power input | PoE power supply in compliance with IEEE 802.3at/bt |
| | Maximum power consumption | • 802.3bt power supply: 45 W (excluding the output power of the PoE_OUT port, 5GE and SFP are mutually exclusive.)<br>• 802.3at power supply: 25.5 W (The PoE_OUT function and GE/POE_OUT ports are unavailable, 5GE and SFP are mutually exclusive.)<br>**NOTE**<br>• The actual maximum power consumption depends on local laws and regulations.<br>• In 802.3at power supply mode, the radio power is reduced, and the 2.4 GHz radio works in 2x4 MIMO mode. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | -60 m to +1800 m: -40°C to +65°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +85°C |
| | Operating humidity | 0% to 100% (non-condensing) |
| | IP rating | IP68 |
| | Wind resistance | Up to 149 MPH |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 3-51** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Outdoor external antenna |
| Maximum number of users | • Fit AP: ≤ 512<br>• Fat AP: ≤ 512<br>• Cloud AP: ≤ 512<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | AP8182DN:<br>• 2.4 GHz: 28 dBm (combined power)<br>• 5 GHz: 27 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 800 Mbit/s<br>• 802.11ac: 6.5 to 1733.3 Mbit/s | | |

## 3.6.5 Performance Specifications (AP8082DN and AP8182DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 3.7 AP8130DN-W Product Description

# 3.7.1 Product Characteristics (AP8130DN-W)

**Table 3-52** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP8130DN-W | Dual band:<br>• 2.4 GHz<br>• 5 GHz<br>The AP8130DN-W can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users.<br>It supports 2.4G-to-5G switchover and works on dual 5 GHz frequency bands.<br>The 4.9 GHz frequency band is contained in 5 GHz radios. | IEEE 802.11a/b/g/n/ac | Huawei AP8030DN-W, physically hardened, supports 3x3 MIMO and offers enhanced outdoor coverage performance. The AP can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. It provides comprehensive service support capabilities and features high reliability, high security, simple network deployment, automatic AC discovery and configuration, and real-time management and maintenance, which meets requirements | Huawei AP8130DN-Ws comply with IP67 dustproof and waterproof protection standards, applicable to coverage scenarios (for example, squares, pedestrian streets, and amusement parks) and bridging scenarios (for example, wireless harbors, data backhaul, video surveillance, and train-to-ground backhaul).<br>When working at the 4.9 GHz frequency band, the AP8130DN-W supports only backhaul scenarios. |

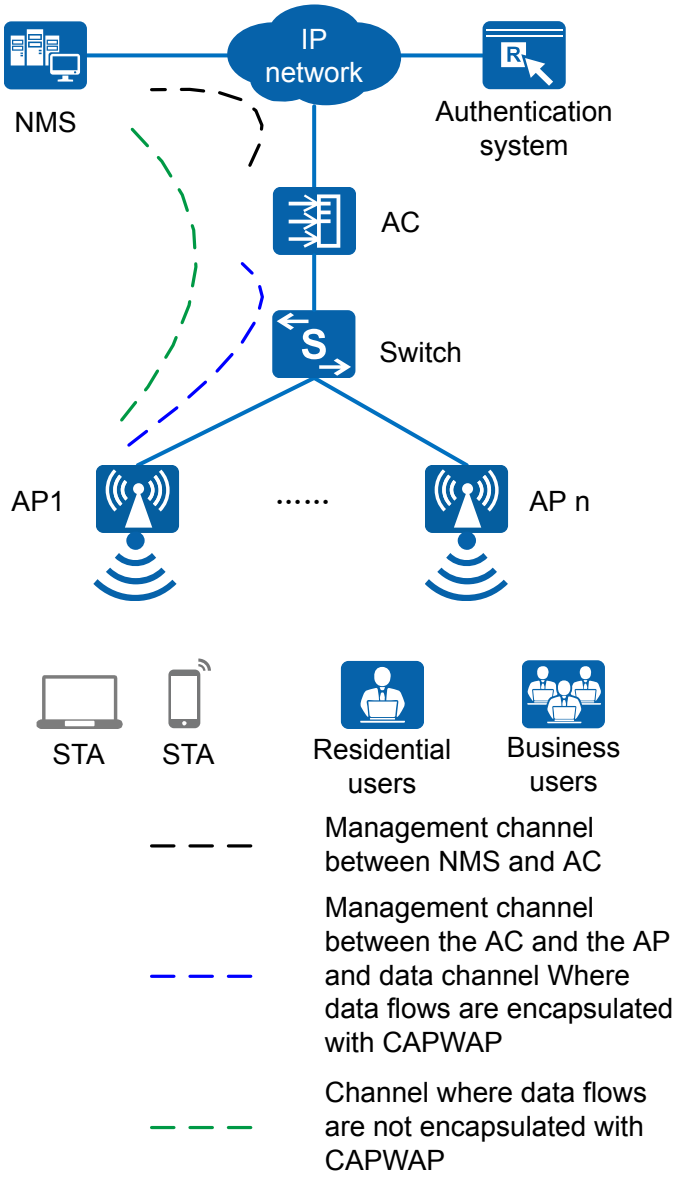
  

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
|---|---|---|---|---|
| | | | of outdoor deployment. | |

## 3.7.2 Usage Scenarios (AP8130DN-W)

Typical networking modes are as follows:

**Figure 3-53** Fit AP networking (AP mode)



In this networking, the AP functions as a Fit AP. The AC is responsible for user access, AP going-online, AP management, authentication, routing, security, and QoS. For Huawei products that provide the AC function, see **Quick Reference for WLAN AP Version Mapping and Models**.

**Figure 3-54** Fit AP networking (WDS mode: point-to-point)

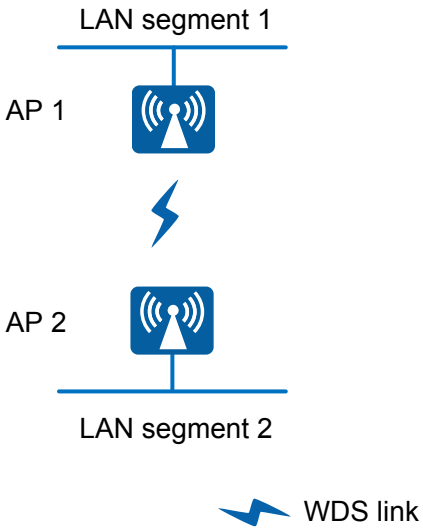
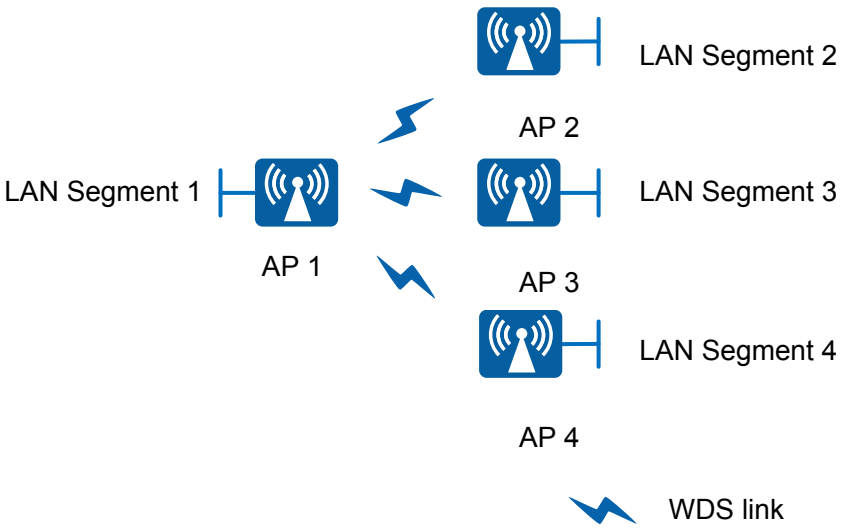


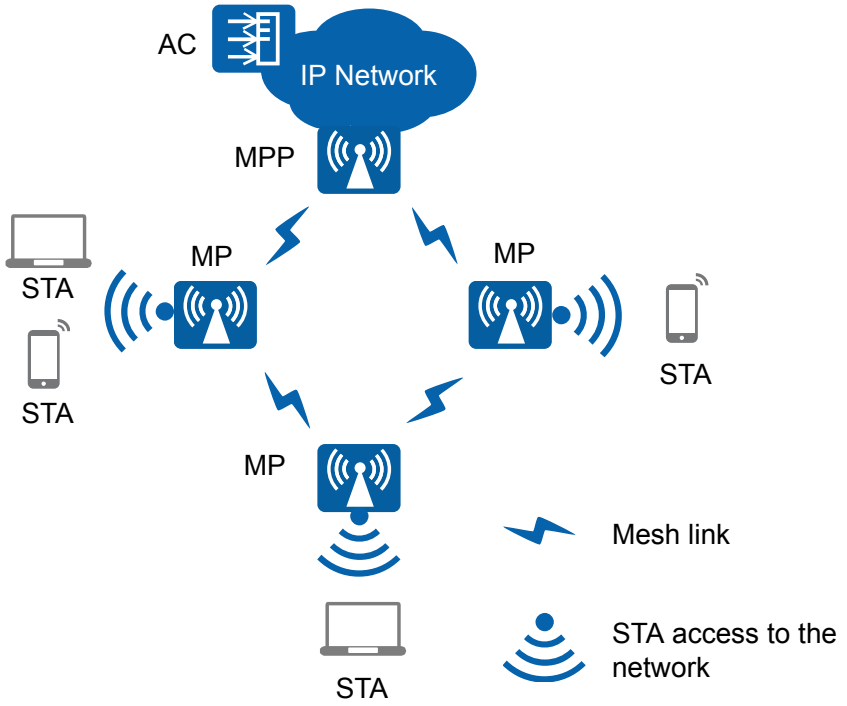

**Figure 3-55** Fit AP networking (WDS mode: point-to-multipoint)




In this networking, the AP connects two or more independently wired or wireless LANs through wireless links to construct a network on which users can exchange data. In Wireless Distribution System (WDS) mode, the AP supports point-to-point (P2P) and point-to-multipoint (P2MP) networking modes. Supporting 5 GHz and 2.4 GHz frequency bands, the AP can implement wireless bridging and access functions.

**Figure 3-56** Fit AP mesh networking




In this networking, APs function as mesh points (MPs) and are fully meshed to establish an auto-configured and self-healing wireless mesh network (WMN). APs with the gateway function can work as the mesh portal points (MPPs) through which the WMN can provide access to the Internet. Terminals connect to APs to access the WMN. The WMN uses dedicated mesh routing protocols to guarantee high transmission quality and is more applicable to scenarios that require high bandwidth and highly stable Internet connections.

## 3.7.3 Hardware Information (AP8130DN-W)

### Appearance

**Figure 3-57** shows the appearance of the AP.

**NOTE**

The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

**Figure 3-57** AP appearance


**CAUTION**

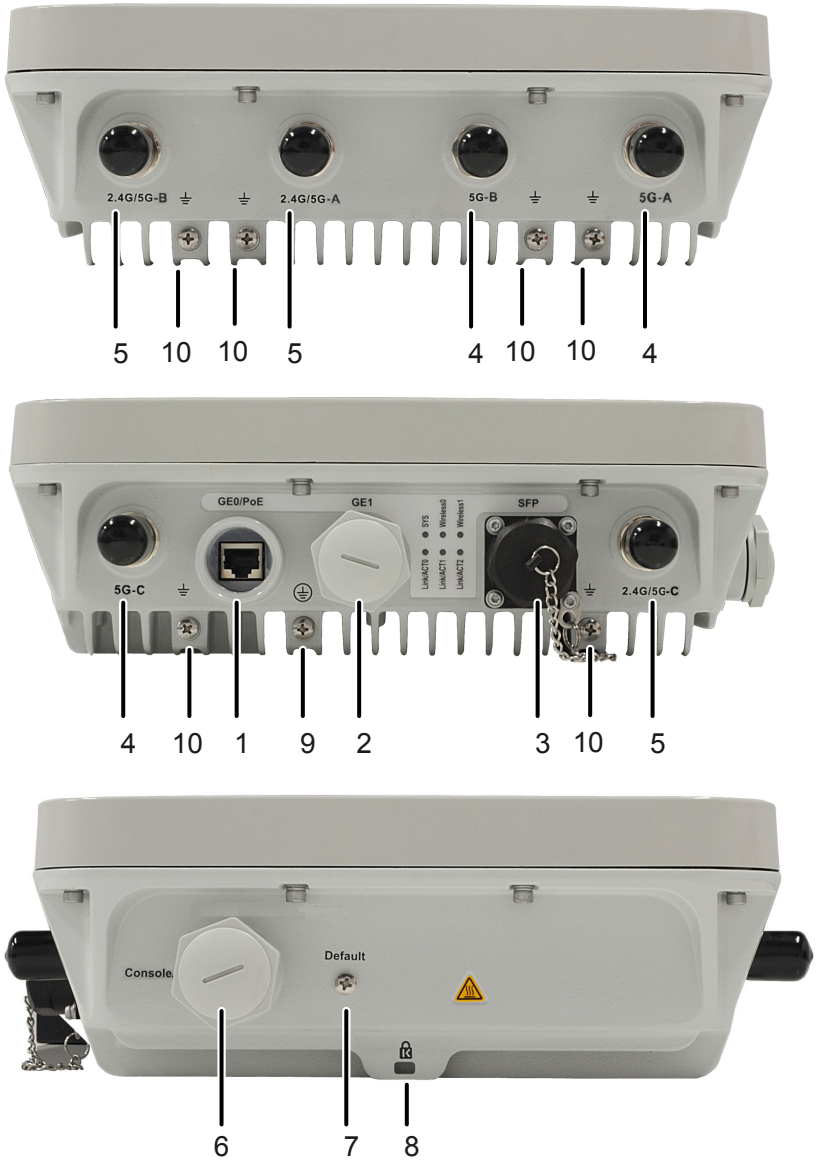
 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP.

**Figure 3-58** Interfaces on the AP




1. GE0/PoE interface: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
2. GE1 interface: 10/100/1000M port that connects to the wired Ethernet.
3. SFP: Optical port that supports the 100M/1000M optical module.
4. 5G: Connects a 5 GHz antenna to the AP to send and receive wireless signals. The port type is N-type female.
5. 2.4G/5G: Connects a 2.4 GHz or 5 GHz antenna to the AP to send and receive wireless signals. The port type is N-type female.
6. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
7. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

NOTE

The Reset button is protected by a waterproof screw. Before pressing the Reset button, remove the waterproof screw. Keep the screw properly and install it again after pressing the Reset button.

8. Security slot: Connects to a security lock.
9. Device ground screw: Connects the device to a ground cable.
10. Ground screw for the surge protective device: Connects the AP to the ground point of an external surge protective device.

## LED Indicators

The AP provides multiple indicators: SYS indicator, Link indicator, and Wireless indicator. The following table describes indicators on AP.

NOTE

Indicator colors may vary slightly at different temperature.

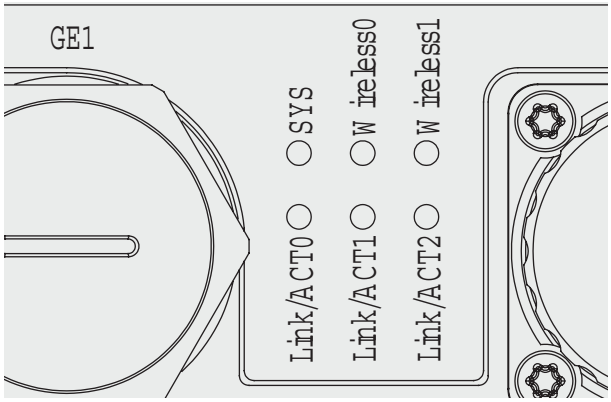



**Table 3-53** Descriptions about the SYS indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| SYS | System indicator | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP mode and fails to go online. |
| | | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

**Table 3-54** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| LINK | Green | Steady on | The system is running properly, the Ethernet connection is normal, and no data is being transmitted. |
| ACT | Green | Blinking | The system is running properly, the Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

**Table 3-55** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

**Table 3-56** Description about the Wireless indicator in signal strength mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | The AP is not transmitting or receiving data or the signal strength is extremely low. |
| | Blinking once every 2s (0.5 Hz) | The AP is transmitting or receiving data normally, and the signal strength is low. |
| | Blinking once every 0.25 seconds (4 Hz) | The AP is transmitting or receiving data normally, and the signal strength is medium. |
| | Steady on | The AP is transmitting or receiving data normally, and the signal strength is high. |

NOTE

When the WDS/Mesh function is enabled on an AP, the blinking frequency of its Wireless indicator indicates the receive signal strength on the WDS/Mesh connection by default. After you connect an AP to a WDS/Mesh network, you can run the **wifi-light** { **signal-strength** | **traffic** } command on the AC to specify whether the Wireless indicator blinking frequency indicates the receive signal strength or service traffic rate.**wifi-light signal-strength**:

- If the Mesh function is enabled on the AP, the blinking frequency of the Wireless indicator reflects the weakest signal strength of all neighboring APs.
- If WDS is enabled on an AP, the blinking frequency of the Wireless indicator reflects the strength of signals received from a WDS AP.
  - If the AP works in leaf mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a middle AP.
  - If the AP works in middle mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a root AP.
  - If the AP works in root mode, the blinking frequency of the Wireless indicator reflects the weakest signal strength of middle APs.

**wifi-light traffic**: allows the Wireless indicator to reflect the service traffic volume on the radio.

## Basic Specifications

**Table 3-57** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 100 mm x 290 mm x 260 mm |
| | Weight | 4.0 kg |
| | System memory | • 256 MB DDR3<br>• 64 MB Flash |
| Power specifications | Power input | PoE power supply in compliance with IEEE 802.3at |
| | Maximum power consumption | 22.4 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to 1800 m: -40°C to +65°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 0% to 100% (non-condensing) |
| | IP rating | IP67 |

| Item | | Description |
| --- | --- | --- |
| | Wind resistance | Up to 149 MPH |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 3-58** Radio specifications

| Item | Description | | |
| --- | --- | --- | --- |
| Antenna type | Outdoor external antenna | | |
| Maximum number of users | ≤ 256 | | |
| Maximum number of VAPs for each radio | 16 | | |
| Maximum transmit power | • 2.4 GHz: 28 dBm (combined power)<br>• 5 GHz: 26 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. | | |
| Maximum number of non-overlapping channels | 2.4 GHz<br>802.11b/g<br>• 20 MHz: 3<br>802.11n<br>• 20 MHz: 3<br>• 40 MHz: 1 | 5 GHz<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20MHz: 13<br>– 40MHz: 6<br>– 80MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*.<br>**NOTICE**<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency. |

| Item | Description |
| --- | --- |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 450 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s |

## 3.7.4 Performance Specifications (AP8130DN-W)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 4 Rail Transit Access Points

## About This Chapter



## 4.1 AP9130DN Product Description

## 4.1.1 Product Characteristics (AP9130DN)

**Table 4-1** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
|---|---|---|---|---|
| AP9130DN | Dual bands:<br>• 2.4 GHz<br>• 5 GHz<br>The AP9130DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | Huawei AP9130DN is the latest-generation 802.11ac vehicle-mounted dual-band AP that supports 3x3 MIMO. It uses industrial anti-vibration M12 sockets, complies with EN50155 vehicle-mounted electronic equipment standards, and supports 50 ms fast switchover, meeting train-to-ground backhaul network deployment requirements. | It is applicable to train-to-ground backhaul scenarios. |

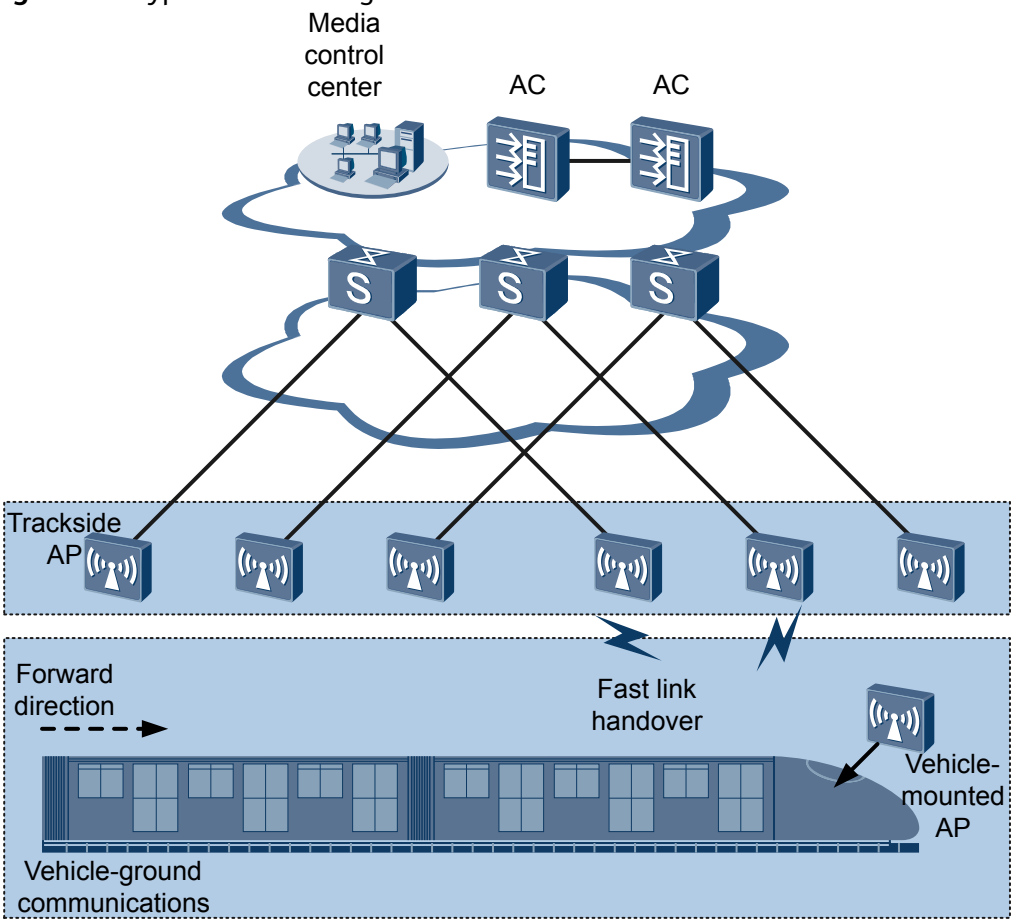
## 4.1.2 Usage Scenarios (AP9130DN)

The AP9130DN can work independently as a Fat AP, and is easy to deploy and commission in train-to-ground backhaul scenarios.

Typical networking modes are as follows:

**Figure 4-1** Typical networking




In this networking, the AP9130DN works as a trackside AP in Fit mode and is managed uniformly on the AC. The vehicle-mounted AP9130DN works in Fat mode and supports fast link switchover within 50 ms, enabling a high-speed and stable train-to-ground backhaul network.

## 4.1.3 Hardware Information (AP9130DN)

### Appearance

Figure 4-2 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 4-2** AP9130DN appearance

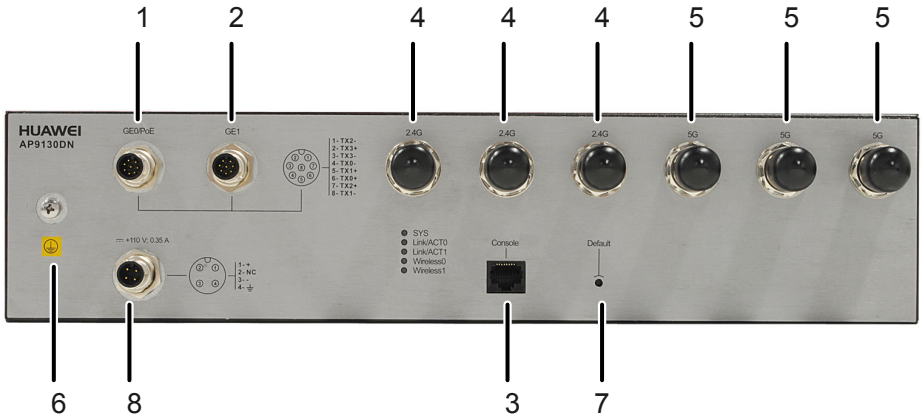

**CAUTION**

 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Ports

The following figure shows interfaces on the AP.

**Figure 4-3** Ports on the AP9130DN




1. GE0/PoE: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
2. GE1: 10/100/1000M port that connects to the wired Ethernet.
3. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
4. 2.4G: Connects a 2.4G antenna to the AP to send and receive wireless signals. The port type is N-type female.
5. 5G: Connects a 5 GHz antenna to the AP to send and receive wireless signals. The port type is N-type female.
6. Device ground screw: Connects the device to a ground cable.

7. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
8. DC: 110 V power port.

## LED Indicators

The AP9130DN provides multiple indicators: SYS indicator, Link/ACT indicator, and Wireless indicator. The following table describes indicators on AP9130DN.

NOTE

Indicator colors may vary slightly at different temperature.

Indicators of the same type have the same state meanings.

**Table 4-2** Descriptions about the SYS indicator

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| Default status after power-on | Green | Steady on | The AP is just powered on and the software is not started yet. |
| Software startup status | Green | Steady on after blinking once | After the system is reset and starts loading the software, the indicator blinks green once. Until the software is loaded and started, the indicator remains steady green. |
| Running status | Green | Blinking once every 2s (0.5 Hz) | • The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | Blinking once every 5s (0.2 Hz) | The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| Alarm | Green | Blinking once every 0.25s (4 Hz) | The software is being upgraded. |
| Fault | Red | Steady on | A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

**Table 4-3** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| LINK | Green | Steady on | The system is running properly, the Ethernet connection is normal, and no data is being transmitted. |
| ACT | Green | Blinking | The system is running properly, the Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

**Table 4-4** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

## Basic Specifications

**Table 4-5** Basic Specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 86.1 mm x 375 mm x 260 mm |
| | Weight | 4.5 kg |

| Item | | Description |
| --- | --- | --- |
| | System memory | • 256 MB DDR3<br>• 64 MB flash memory |
| Power specifications | Power input | • DC power supply: 110 V rated voltage; voltage range: 77 V to 137.5 V<br>• PoE power: in compliance with IEEE 802.3at<br>**NOTE**<br>The AP does not support AC power supply. If AC power supply is required, use a PoE adapter. Ensure that the installation position of the PoE adapter meets requirements. |
| | Maximum power consumption | 21.5 W (110 V DC)<br>20.1 W (PoE)<br>**NOTE**<br>The maximum power consumption depends on local laws. |
| Environment specifications | Operating temperature and altitude | -60 m to +1800 m: -40°C to +65°C<br>+1800 m to +5000 m: The maximum emperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP30 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 4-6** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Outdoor external antenna |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum number of users</td><td colspan="3">≤ 64</td></tr>
<tr><td>Maximum number of VAPs for each radio</td><td colspan="3">16</td></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 28 dBm (combined power)<br>• 5 GHz: 26 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.<br>NOTICE<br>If the AP is delivered to the USA, pay attention to the following on channel and frequency band usage:<br>1. The country code of the AP is fixed.<br>2. High power radars working at frequencies in the range of 5.25 GHz to 5.35 GHz, 5.47 GHz to 5.6 GHz, and 5.65 GHz to 5.725 GHz can interfere with or even damage APs working at the same frequency.</td></tr>
<tr><td>Channel rate</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 450 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s</td></tr>
</table>

## 4.1.4 Performance Specifications (AP9130DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 4.2 AP9131DN Product Description

## 4.2.1 Product Characteristics (AP9131DN)

**Table 4-7** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP9131DN | Dual band:<br>• 2.4 GHz<br>• 5 GHz<br>The AP9131DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | Huawei AP9131DN is the latest-generation 802.11ac vehicle-mounted dual-band AP that supports 3x3 MIMO. It uses industrial anti-vibration M12 interfaces, complies with EN50155 vehicle-mounted electronic equipment standards, and supports 50 ms fast switchover, meeting train-ground backhaul network deployment and compartment coverage requirements. | Train-ground backhaul and compartment coverage scenarios |

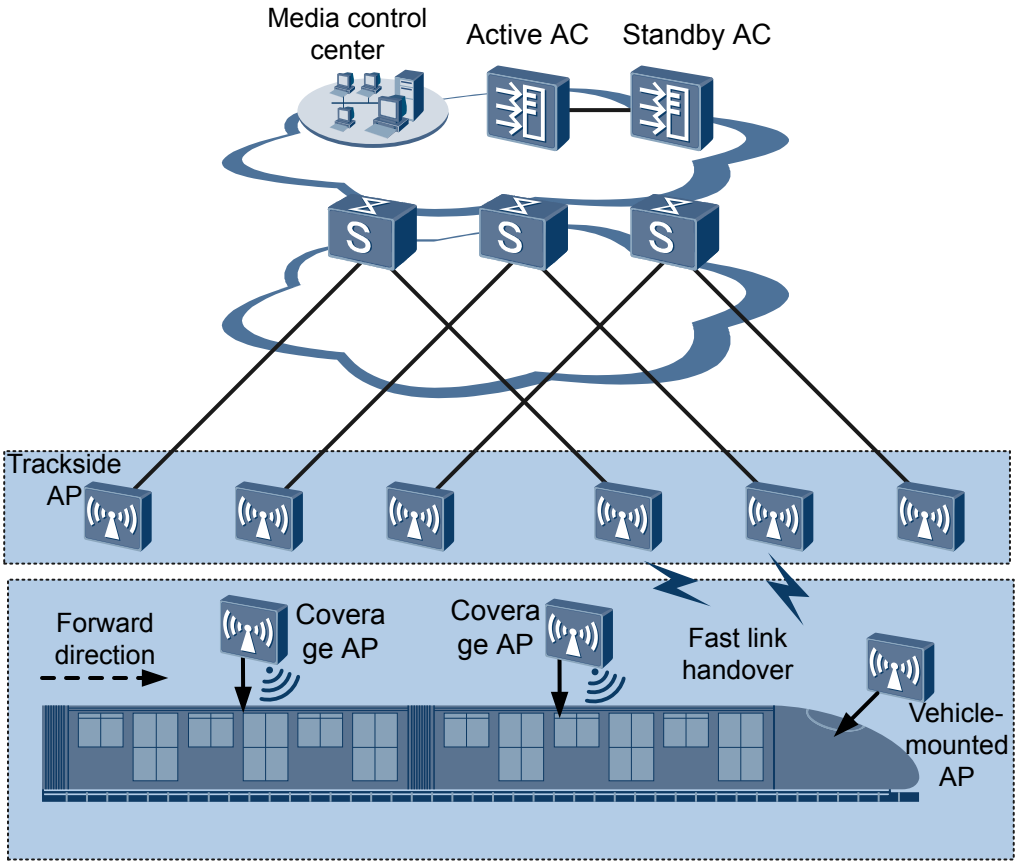
## 4.2.2 Usage Scenarios (AP9131DN)

The AP9131DN can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on network planning.

Typical networking modes are as follows:

**Figure 4-4** Typical networking




Vehicle-ground communications compartment coverage scenarios

The AP9131DN can work as a trackside AP in Fit mode to communicate with the vehicle-mounted AP and be managed uniformly on the AC.

Deployed in the front and rear of a train, the AP9131DN can work as a vehicle-mounted AP in Fat mode. It supports vehicle-ground fast link handover technology and can implement link switchover within 50 ms, enabling a high-speed and stable train-ground backhaul network.

The AP9131DN can work as a compartment coverage AP in Fit mode to provide WLAN access for passengers. The AP can provide signal coverage on both 2.4 GHz and 5 GHz radios in compartments.

## 4.2.3 Hardware Information (AP9131DN)

### Appearance

Figure 4-5 shows the appearance of the AP.

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 4-5** AP9131DN appearance

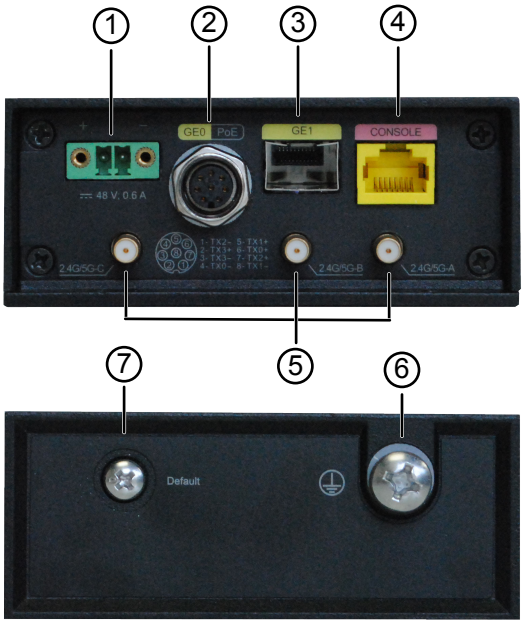

**CAUTION**

 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP9131DN.

**Figure 4-6** Interfaces on the AP9131DN



1. 48V: DC power interface.
2. GE0/PoE: 10/100/1000M Ethernet M12 electrical interface used to connect to the wired Ethernet. The interface supports PoE power supply.
3. GE1: 100/1000M Ethernet optical interface used to connect to the wired Ethernet. The interface must be installed with an optical fiber module.

   NOTE

   The GE1 interface of the AP can have a 1000 Mbit/s copper transceiver module installed. The module is purchased by customers.
4. CONSOLE: console interface.
5. 2.4G/5G: QMA female connector that connects to the combined 2.4 GHz and 5 GHz antennas.
6. Ground point: connects to a ground cable.
7. Default button: restores the factory settings if you hold down the button more than 3s from the hole.

## LED Indicators

The AP9131DN provides multiple indicators: SYS indicator, Link/ACT indicator, and Wireless indicator. The following table describes indicators on AP9131DN.

NOTE

- Indicator colors may vary slightly at different temperature.
- Indicators of the same type have the same state meanings.

**Table 4-8** Description about the SYS indicator

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| Default status after power-on | Green | Steady on | The AP is just powered on and the software is not started yet. |
| Software startup status | Green | Steady on after blinking once | After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| Running status | Green | Blinking once every 2s (0.5 Hz) | • The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | Blinking once every 5s (0.2 Hz) | The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| Alarm | Green | Blinking once every 0.25s (4 Hz) | • The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP working in Fit AP mode fails to go online on the AC (the CAPWAP link disconnects). |
| Fault | Red | Steady on | A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

**Table 4-9** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| LINK | Green | Steady on | The system is running properly, the Ethernet connection is normal, and no data is being transmitted. |
| ACT | Green | Blinking | The system is running properly, the Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

**Table 4-10** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

| Color | Status | Description |
| --- | --- | --- |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

**Table 4-11** Description about the Wireless indicator in signal strength mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | The AP is not transmitting or receiving data or the signal strength is extremely low. |
| | Blinking once every 2s (0.5 Hz) | The AP is transmitting or receiving data normally, and the signal strength is low. |
| | Blinking once every 0.25 seconds (4 Hz) | The AP is transmitting or receiving data normally, and the signal strength is medium. |
| | Steady on | The AP is transmitting or receiving data normally, and the signal strength is high. |

NOTE

When the WDS/Mesh function is enabled on an AP, the blinking frequency of its Wireless indicator indicates the receive signal strength on the WDS/Mesh connection by default. After you connect an AP to a WDS/Mesh network, you can run the **wifi-light** { **signal-strength** | **traffic** } command on the AC to specify whether the Wireless indicator blinking frequency indicates the receive signal strength or service traffic rate.**wifi-light signal-strength**:

- If the Mesh function is enabled on the AP, the blinking frequency of the Wireless indicator reflects the weakest signal strength of all neighboring APs.
- If WDS is enabled on an AP, the blinking frequency of the Wireless indicator reflects the strength of signals received from a WDS AP.
  - If the AP works in leaf mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a middle AP.
  - If the AP works in middle mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a root AP.
  - If the AP works in root mode, the blinking frequency of the Wireless indicator reflects the weakest signal strength of middle APs.

**wifi-light traffic**: allows the Wireless indicator to reflect the service traffic volume on the radio.

When an AP functions as a Fat AP, the Wireless indicator of the AP cannot reflect the signal strength.

## Basic Specifications

**Table 4-12** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 40 mm x 180 mm x 100 mm (1.72 in. x 7.09 in. x 3.94 in.) |
| | Weight | 1.2 kg |
| | System memory | • 256 MB DDR2<br>• 32 MB Flash |
| Power specifications | Power input | • DC: rated voltage 48 V; voltage range: 33.6 V to 60 V<br>• PoE power supply: in compliance with IEEE 802.3at |
| | Maximum power consumption | • Compartment coverage scenarios: 17.5 W<br>• Trackside single-5G scenarios: 12.5 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | -60 m to +1800 m:<br>• -40°C to +65°C (trackside 5G backhaul)<br>• -40°C to +55°C (vehicle-mounted dual-band coverage)<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 4-13** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | External dual-band combined antennas (QMA*3) |
| Maximum number of users | • Fit AP: ≤ 256<br>• Fat AP: ≤ 64 |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 25 dBm (combined power)<br>• 5 GHz: 25 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 450 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s | | |

## 4.2.4 Performance Specifications (AP9131DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 4.3 AP9132DN Product Description

## 4.3.1 Product Characteristics (AP9132DN)

**Table 4-14** Product characteristics

| Product Model | Frequency Band | IEEE Standards Compliance | Positioning | Usage Scenario |
| --- | --- | --- | --- | --- |
| AP9132DN | Dual band:<br>• 2.4 GHz<br>• 5 GHz<br>The AP9132DN can provide services simultaneously on the 2.4 GHz and 5 GHz frequency bands to support more access users. | IEEE 802.11a/b/g/n/ac | Huawei AP9132DN is the latest-generation 802.11ac vehicle-mounted dual-band AP that supports 3x3 MIMO. It uses industrial anti-vibration M12 interfaces, complies with EN50155 vehicle-mounted electronic equipment standards, and supports 50 ms fast switchover, meeting train-ground backhaul network deployment and compartment coverage requirements. | Train-ground backhaul and compartment coverage scenarios |

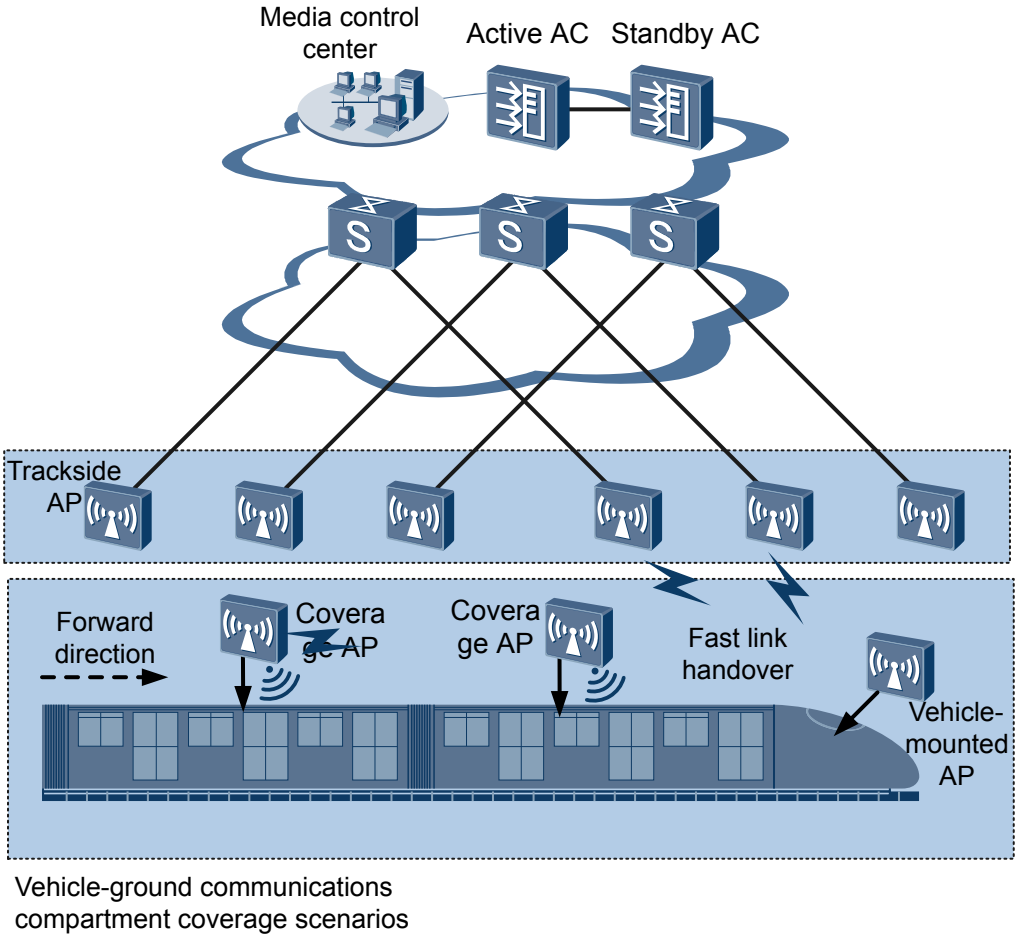
## 4.3.2 Usage Scenarios (AP9132DN)

The AP9132DN can work as a Fat AP or Fit AP and switch flexibly between the two working modes based on network planning.

Typical networking modes are as follows:

**Figure 4-7** Typical networking




The AP9132DNs can work as trackside APs in Fit AP mode to communicate with the vehicle-mounted AP and be managed uniformly on the AC.

Deployed in the front and rear of a train, the AP9132DN can work as a vehicle-mounted AP in Fat AP mode. It supports vehicle-ground fast link handover technology and can implement link switchover within 50 ms, enabling a high-speed and stable train-ground backhaul network.

The AP9132DN can work as a compartment coverage AP in Fit AP mode to provide WLAN access for passengers. The AP can provide signal coverage on both 2.4 GHz and 5 GHz radios in compartments or use the 2.4 GHz radio for signal coverage and the 5 GHz radio for AP bridging between compartments. You can flexibly select the working mode of the AP according to service requirements.

## 4.3.3 Hardware Information (AP9132DN)

### Appearance

**Figure 4-8** shows the appearance of the AP.

NOTE

The actual device appearance may be different from the following device appearance, but these differences will not affect device functions.

**Figure 4-8** AP9132DN appearance


CAUTION

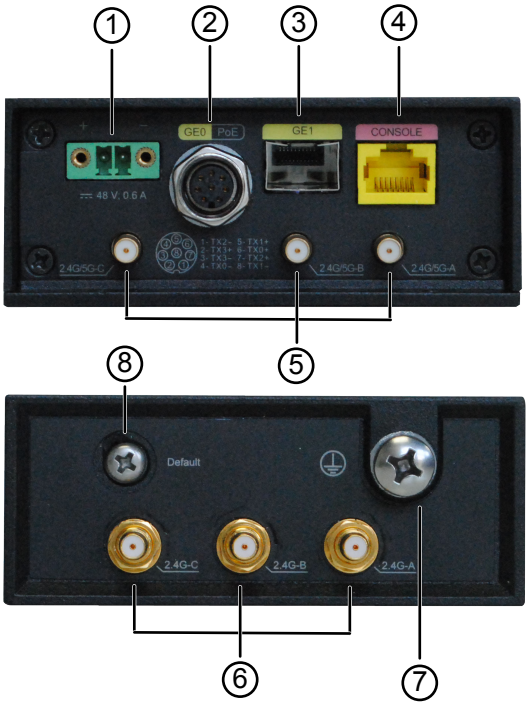
 There is a scald warning label attached on the device, warning you not to touch the device after the device has been operating for a long time.

## Interfaces

The following figure shows interfaces on the AP9132DN.

**Figure 4-9** Interfaces on the AP9132DN




1. 48V: DC power interface.
2. GE0/PoE: 10/100/1000M Ethernet M12 electrical interface used to connect to the wired Ethernet. The interface supports PoE power supply.
3. GE1: 100/1000M Ethernet optical interface used to connect to the wired Ethernet. The interface must be installed with an optical fiber module.

   **NOTE**

   The GE1 interface of the AP can have a 1000 Mbit/s copper transceiver module installed. The module is purchased by customers.
4. CONSOLE: console interface.
5. 2.4G/5G: QMA female connector that connects to 5 GHz antennas or dual-band combined antennas.
6. 2.4G: QMA female connector that connects to 2.4 GHz antennas.
7. Ground point: connects to a ground cable.
8. Default button: restores the factory settings if you hold down the button more than 3s from the hole.

## LED Indicators

The AP9132DN provides multiple indicators: SYS indicator, Link/ACT indicator, and Wireless indicator. The following table describes indicators on AP9132DN.

**NOTE**

- Indicator colors may vary slightly at different temperature.
- Indicators of the same type have the same state meanings.

**Table 4-15** Descriptions about the SYS indicator

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| Default status after power-on | Green | Steady on | The AP is just powered on and the software is not started yet. |
| Software startup status | Green | Steady on after blinking once | After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| Running status | Green | Blinking once every 2s (0.5 Hz) | • The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | Blinking once every 5s (0.2 Hz) | The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| Alarm | Green | Blinking once every 0.25s (4 Hz) | • The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP working in Fit AP mode fails to go online on the AC (the CAPWAP link disconnects). |
| Fault | Red | Steady on | A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |
| | | Blinking once every 0.25s (4 Hz) | A fault that affects services has occurred. The fault cannot be rectified automatically and requires manual intervention. (The fault may be an Ethernet port error, such as PHY detection failure or RF port error, such as PCI-e port detection failure or baseband chip detection failure.) |

**Table 4-16** Description about the Link/ACT indicators

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| LINK | Green | Steady on | The system is running properly, the Ethernet connection is normal, and no data is being transmitted. |
| ACT | Green | Blinking | The system is running properly, the Ethernet connection is normal, and the AP is transmitting data. The indicator blinks more quickly when more data is being transmitted. |

**Table 4-17** Description about the Wireless indicator in traffic volume mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | Radios are disabled, and no STA is connected to the AP. |
| Green/yellow | Steady on | The AP has STAs connected to the 2.4 GHz radio or 5 GHz radio, but no data is being transmitted. |
| Green | Blinking | The AP has STAs connected to the 2.4 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Yellow | Blinking | The AP has STAs connected to the 5 GHz radio and is transmitting data. The indicator blinks more quickly when more data is being transmitted. |
| Green/yellow | Blinking alternatively | The AP has STAs connected to both the 2.4 GHz radio and 5 GHz radio. The indicator blinks more quickly when more data is being transmitted. |

**Table 4-18** Description about the Wireless indicator in signal strength mode

| Color | Status | Description |
| --- | --- | --- |
| Green/yellow | Off | The AP is not transmitting or receiving data or the signal strength is extremely low. |
| | Blinking once every 2s (0.5 Hz) | The AP is transmitting or receiving data normally, and the signal strength is low. |

| Color | Status | Description |
| --- | --- | --- |
| | Blinking once every 0.25 seconds (4 Hz) | The AP is transmitting or receiving data normally, and the signal strength is medium. |
| | Steady on | The AP is transmitting or receiving data normally, and the signal strength is high. |

NOTE

When the WDS/Mesh function is enabled on an AP, the blinking frequency of its Wireless indicator indicates the receive signal strength on the WDS/Mesh connection by default. After you connect an AP to a WDS/Mesh network, you can run the **wifi-light** { **signal-strength** | **traffic** } command on the AC to specify whether the Wireless indicator blinking frequency indicates the receive signal strength or service traffic rate.**wifi-light signal-strength**:

- If the Mesh function is enabled on the AP, the blinking frequency of the Wireless indicator reflects the weakest signal strength of all neighboring APs.
- If WDS is enabled on an AP, the blinking frequency of the Wireless indicator reflects the strength of signals received from a WDS AP.
  - If the AP works in leaf mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a middle AP.
  - If the AP works in middle mode, the blinking frequency of the Wireless indicator reflects the strength of signals received from a root AP.
  - If the AP works in root mode, the blinking frequency of the Wireless indicator reflects the weakest signal strength of middle APs.

**wifi-light traffic**: allows the Wireless indicator to reflect the service traffic volume on the radio.

When an AP functions as a Fat AP, the Wireless indicator of the AP cannot reflect the signal strength.

## Basic Specifications

**Table 4-19** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 40 mm x 180 mm x 100 mm (1.72 in. x 7.09 in. x 3.94 in.) |
| | Weight | 1.2 kg |
| | System memory | • 256 MB DDR2<br>• 32 MB Flash |
| Power specifications | Power input | • DC: rated voltage 48 V; voltage range: 33.6 V to 60 V<br>• PoE power supply: in compliance with IEEE 802.3at |

| Item | | Description |
| --- | --- | --- |
| | Maximum power consumption | • Compartment coverage scenarios: 17.5 W<br>• Trackside single-5G scenarios: 12.5 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | -60 m to +1800 m:<br>• -40°C to +65°C (trackside 5G backhaul)<br>• -40°C to +55°C (vehicle-mounted dual-band coverage)<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 4-20** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | External antenna:<br>• Split mode: 2.4 GHz antenna (QMA*3), 5 GHz antenna (QMA*3).<br>• Combined mode: dual-band combined antennas (QMA*3). |
| Maximum number of users | • Fit AP mode: ≤ 256<br>• Fat AP mode: ≤ 64 |
| Maximum number of VAPs for each radio | 16 |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 26 dBm (combined power)<br>• 5 GHz: 25 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
<tr><td>Channel rate</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 450 Mbit/s<br>• 802.11ac: 6.5 to 1300 Mbit/s</td></tr>
</table>

## 4.3.4 Performance Specifications (AP9132DN)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

# 5 Agile Distributed Wi-Fi Access Points

## About This Chapter



## 5.1 AD9430DN Product Description

### 5.1.1 Product Characteristics (AD9430DN-12 and AD9430DN-24)

The AD9430DN is a central AP used in Huawei agile distributed Wi-Fi solution. It supports PoE power supply and can be connected to multiple remote units (RUs) deployed indoors. The central AP and RUs are connected through network cables, which greatly extends the coverage range, enhances flexibility in AP deployment and planning, and reduces the engineering construction costs. The central AP manages the RUs and processes services in a centralized manner. The RUs process radio signals independently. Such distributed architecture further improves the wireless access capability, creating optimal service experience for users.

The central AP is recommended for environments with complex wall structures and high-density rooms, such as schools, hotels, hospitals, and office meeting rooms. Signals are transmitted through network cables without attenuation. The RUs are deployed indoors and provide comprehensive signal coverage.

The AD9430DN is available in two models: AD9430DN-24 and AD9430DN-12. You can choose a model based on your network requirements.

- AD9430DN-24: provides 24 downlink GE interfaces and supports PoE power supply.
- AD9430DN-12: provides 12 downlink GE interfaces and supports PoE power supply.

The central AP does not provide radio modules, and therefore must be deployed together with RUs to implement various functions such as STA access.

The central AP can work in Fit, Fat, or cloud mode.

- Fit AP: The central APs are uniformly managed by the AC. The central AP and RUs are plug-and-play and can be managed and maintained in real time. Compared with traditional distributed AP solutions, the AC in Huawei agile distributed Wi-Fi solution needs to manage a smaller number of APs. A large number of RUs can be deployed, which improves the overall performance and reduces network deployment costs.
- Fat AP: The central AP manages RUs independently. A Fat AP can be used as the central AP when the network has low throughput requirements.
- Cloud AP: The central AP works with the SDN controller to implement functions such as user access, AP online, authentication, routing, AP management, security, and QoS. The central AP and RUs can go online without configurations and are centrally managed by the Cloud Manager.

**NOTICE**

The AD9430DN is a class A product. In daily lives, the product may cause radio interference in which case the user may be required to take adequate measures.

## Long-Distance Network Coverage

Unlike the traditional distributed AP which allows for a maximum feeder length of 15 m, the central AP uses network cables to replace feeder cables and supports up to 100 m distance from the RUs. The network coverage range is therefore expanded by several times.

## Flexible Deployment

The deployment of central APs is free from restrictions of feeder length. It can be easily mounted to a ceiling or wall in the equipment room or on the corridor.

## No Wall Penetration Loss, No Coverage Hole

Restricted by feeder length or installation requirements, signals have to pass through walls in some scenarios, resulting in large signal attenuation. If rooms to be covered have complex structures, coverage holes may occur. To prevent these problems, lots of calculation and verification work needs to be carried out. Huawei distributed solution solves these problems. In this solution, RUs are placed in rooms, and signals are transmitted over wired cables, without wall penetration loss, delivering high-quality wireless access services.

## Concurrent Traffic Forwarding on Uplink Gigabit Interfaces

The AD9430DN-24 provides four uplink combo interfaces that can be connected to optical fibers or network cables. The AD9430DN-12 provides two uplink GE interfaces. The central AP can forward service traffic on the uplink interfaces simultaneously. The high forwarding capability ensures that concurrent services of RUs are processed at high speeds.

## PoE Capability on Downlink Interfaces, Direct Connection to RUs

Downlink interfaces of the central AP support PoE power supply. Therefore, you do not need to configure a power supply for each RU separately. The AD9430DN-24 and AD9430DN-12 can be directly connected to 24 RUs and 12 RUs, respectively. They can connect to more RUs through PoE switches to cover more rooms.

## Link Disconnection Survival

The central AP in Fit mode supports link disconnection survival. When the link between the central AP and AC disconnects, the central AP and RUs can maintain the current working states, preventing service interruptions of users and ensuring high-reliability transmission.

## Low Engineering Cost

Compared with traditional distributed APs, the central AP cuts down the following expenses:

- Construction: Network cables replace expensive feeder cables. The central AP can directly use the network cables originally routed in the rooms, without the need of deploying new cables.
- License: The maximum number of central APs in Fit mode allowed by the AC is controlled by licenses, but RUs do not require licenses. Therefore, one central AP can use RUs to cover dozens of rooms.

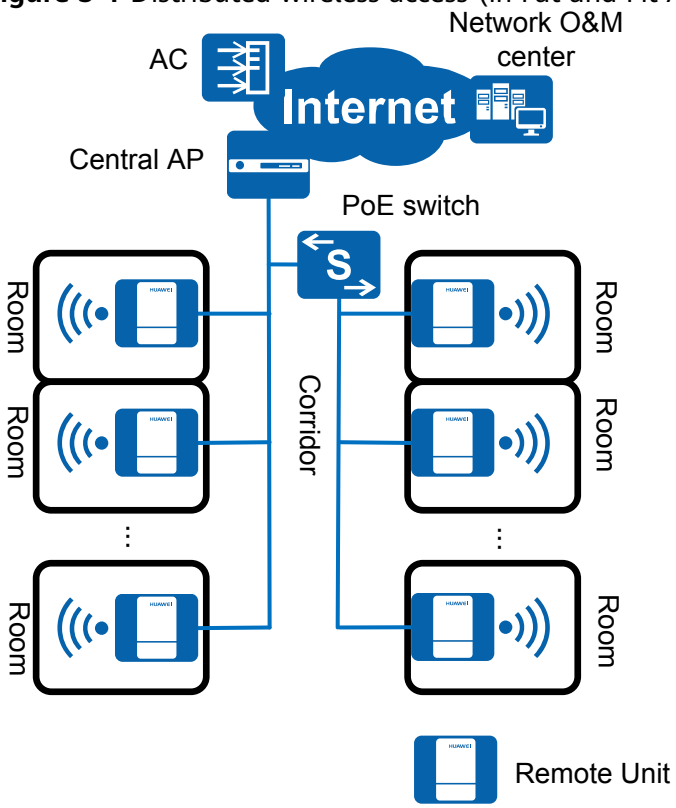
## Hierarchical Processing Technology, High Wireless Forwarding Capability

Huawei distributed solution uses innovative hierarchical processing technology. The central AP manages RUs in a centralized manner and concurrently forwards service traffic, while the RUs only process radio signals. The hierarchical design makes the network structure clearer and reduces the processing burden on the central AP and RUs, improving efficiency and optimizing the overall wireless forwarding performance.

## 5.1.2 Usage Scenario (AD9430DN-12 and AD9430DN-24)

**Figure 5-1** Distributed wireless access (in Fat and Fit AP modes)

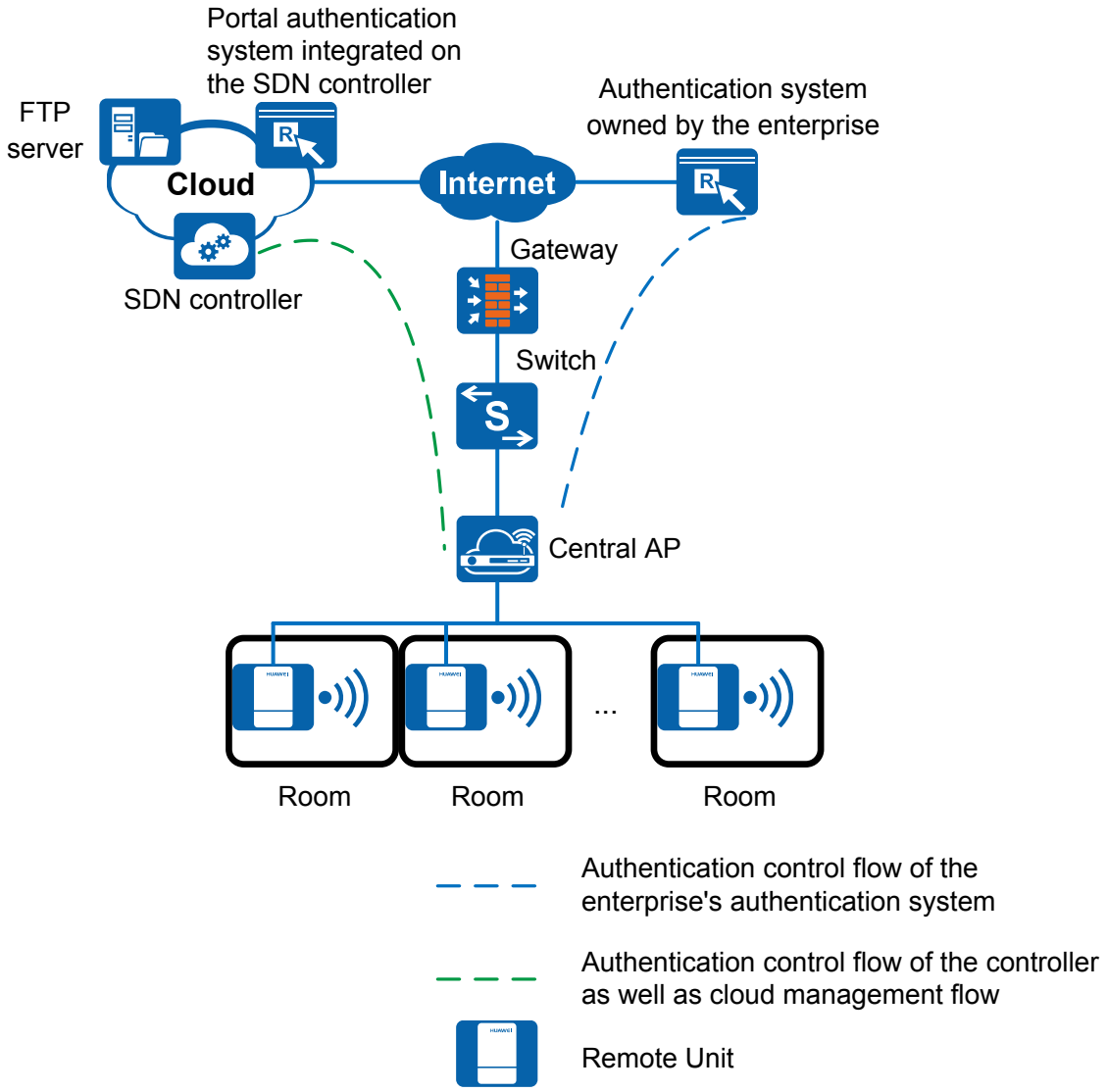



As shown in the figure, the downlink GE interfaces of the central AP support PoE power supply and can be directly connected to RUs. The central AP can connect to more RUs through a PoE switch. The central AP communicates with the RUs through network cables and can be placed in the equipment room or on the corridor.

When the central AP works in Fat AP mode, no AC needs to be deployed on the network. The services are directly configured on the central AP, and the central AP manages its connected RUs.

**Figure 5-2** Distributed wireless access (in cloud-based management mode)




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 5.1.3 Hardware Information (AD9430DN-12)

### Appearance

NOTE

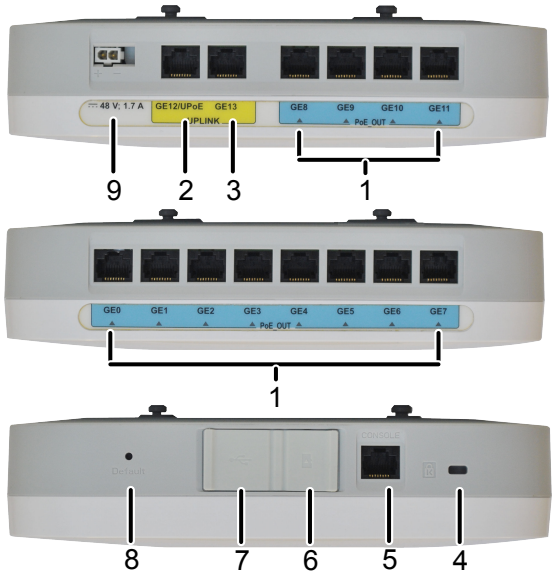
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 5-3** Appearance of the AD9430DN-12


## Ports

**Figure 5-4** Ports on the AD9430DN-12




As shown in **Figure 5-4**, each interface can be described as follows:

1. GE0-GE11: downlink network ports connecting to the RUs or lower-layer switch. These ports support 10M/100M/1000M auto-sensing and PoE output.
2. GE12/UPoE: uplink network port that supports 10M/100M/1000M auto-sensing and UPoE input.
3. GE13: uplink network port connecting to the AC switch or upper-layer. This interface supports 10M/100M/1000M auto-sensing.
4. Lock port: connects to the security lock to fix the device to an immovable object around.

5. Console port: RJ45 port used to connect to a maintenance terminal for AP configuration and management.
6. Micro SD card slot: connects to a Micro SD card to extend the storage space of the AP. The SD 2.0 standard is supported.
7. USB port: connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
8. Default button: restores factory settings and restarts the device if you hold down the button more than 3 seconds.
9. DC input power socket: connects to the power supply through a DC power cable.

## LED Indicator

The AD9430DN-12 provides the following indicators:

- System indicator: reflects running status of the device.
- Downlink interface indicators: reflect data transmission and PoE output status of downlink network interfaces.
- USB indicator: reflects data transmission status of the USB flash drive.

NOTE

- Indicator colors may vary slightly at different temperature.
- The USB indicator is located inside the panel. The indicator turns on after the AP is powered on and connected to a USB flash drive.

**Figure 5-5** System indicator

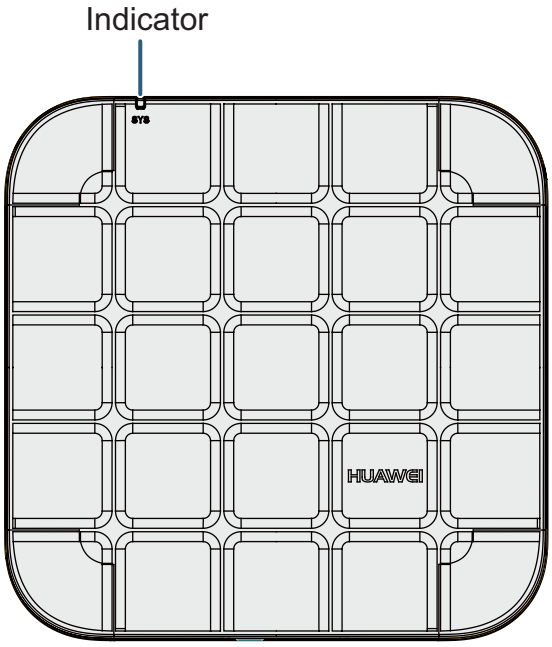


**Table 5-1** Description of the system indicator

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| Default status after power-on | Green | Steady on | The AP is just powered on and the software is not started yet. |
| Software startup status | Green | Steady on after blinking once | After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| Running status | Green | Blinking once every 2s (0.5 Hz) | • The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | Blinking once every 5s (0.2 Hz) | The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| Alarm | Green | Blinking once every 0.25s (4 Hz) | • The software is being upgraded.<br>• After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>• The AP works in Fit AP or cloud-based management mode and fails to go online. |

| Type | Color | Status | Description |
| --- | --- | --- | --- |
| Fault | Red | Steady on | A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

**Figure 5-6** Downlink interface indicators

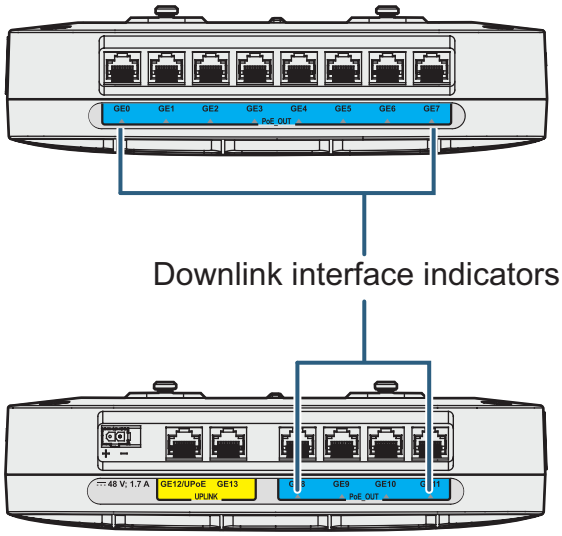
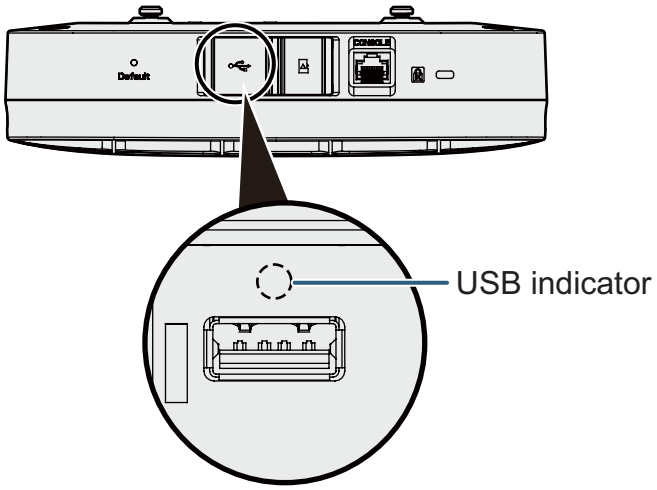



**Table 5-2** Description of downlink interface indicators

| Color | Status | Description |
| --- | --- | --- |
| Green | Steady on | The network interface is connected, and no data is being transmitted. |
| Green | Blinking | The network interface is connected, and data is being transmitted. |
| Yellow | Steady on | The network interface is not connected and the PoE out function is disabled. |
| Yellow | Blinking | The network interface is not connected and the PoE out function fails.<br>The device stops providing PoE power due to errors such as installing an incompatible PD. |
| - | Off | The network interface is not connected and the PoE out function is enabled. |

**Figure 5-7** USB indicator (reserved)




## Basic Specifications

**Table 5-3** Basic specifications

| Item | | Specification |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 53 mm x 220 mm x 220 mm |
| | Weight | 0.8 kg |
| | System memory | • 1 GB DDR3<br>• 4 MB NOR Flash<br>• 512 MB NAND Flash |
| Power specifications | Power input | • DC (rated voltage: 48 V; input voltage range: 46 V to 57 V)<br>• UPoE (complies with Huawei standards)<br>**NOTE**<br>To ensure that the device works normally, use the power adapter delivered with the device. |
| | Maximum power consumption | 16.2 W (excluding PoE and USB output power) |
| Environment specifications | Operating temperature and altitude | • -60 m to +1800 m: -10°C to +50°C<br>• 1,800 m to 5,000 m: The highest operating temperature reduces by 1°C every time the altitude increases by 300 m.<br>**NOTE**<br>• Operating temperature of the UPoE power adapter: -20°C to 60°C<br>• Operating temperature of the DC power adapter: 0°C to 40°C |

| Item | | Specification |
| --- | --- | --- |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 70 kPa to 106 kPa |

# 5.1.4 Hardware Information (AD9430DN-24)

## Appearance

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

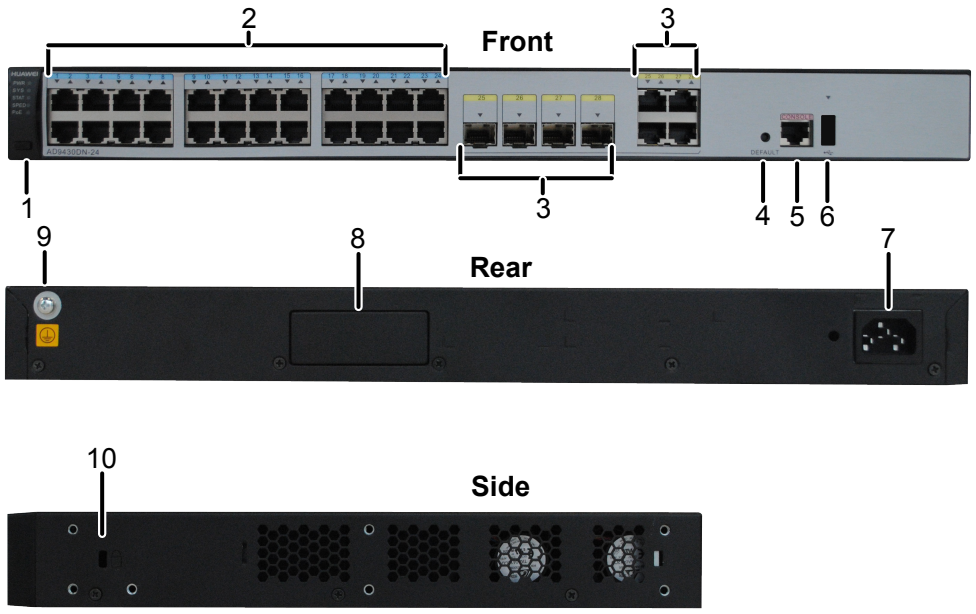
  

**Figure 5-8** Appearance of the AD9430DN-24

## Ports

**Figure 5-9** Ports on the AD9430DN-24




As shown in **Figure 5-9**, each port can be described as follows:

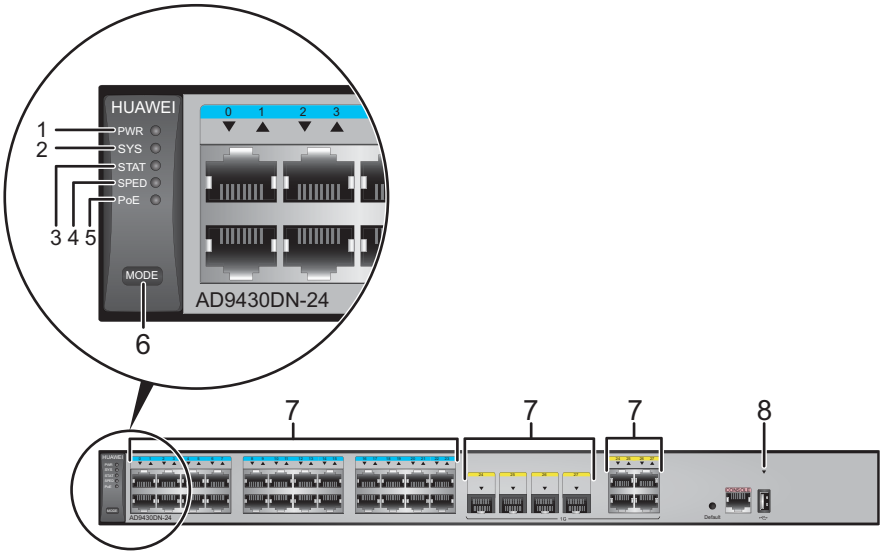
1. MODE button: switches the working mode of the indicator.
2. GE0-GE23: downlink network ports connecting to the RUs or lower-layer switch. These ports support 10M/100M/1000M auto-sensing and PoE output.
3. Combo port: uplink network port connecting to an AC or upper-layer switch. A combo port consists of an optical port and an electrical port, which cannot work at the same time. The electrical ports support 10M/100M/1000M auto-sensing, and the optical ports support 100M/1000M optical modules.
4. Default button: restores factory settings and restarts the device if you hold down the button more than 3 seconds.
5. Console port: connects to a maintenance terminal for device configuration and management.
6. USB port: connects to a USB flash drive to transfer configuration and upgrade files.
7. Power input port for AC power supply.
8. Filler panel: reserved for network expansion.
9. Ground point: connects to the ground cable.
10. Lock port: protects the device against theft.

## LED Indicator

**Figure 5-10** shows the indicators on the AD9430DN-24 front panel.

**Figure 5-10** Indicators on the AD9430DN-24 front panel




[Table 5-4](#) describes indicators on the AD9430DN-24 front panel.

NOTE

Indicator colors may vary slightly at different temperature.

**Table 5-4** Description of indicators on the AD9430DN-24 front panel

| No. | Indicator/ Button | Color | Description |
|---|---|---|---|
| 1 | Power supply indicator: PWR | Green | • Off: The device is powered off.<br>• Steady on: The power module is working properly. |
| 2 | System status indicator: SYS | - | Off: The system is not running. |
| | | Green | • Fast blinking (4 Hz): The system is starting.<br>• Slow blinking (0.5 Hz): The system is running properly. |
| | | Green | • Fast blinking (4 Hz): The system is registering or has failed to register in the cloud-managed mode.<br>• Slow blinking (0.5 Hz): The system has successfully registered in the cloud-managed mode. |
| | | Red | Steady on: After registering, the system does not operate properly, or a fan or temperature alarm has been generated. |

| No. | Indicator/ Button | Color | Description |
| --- | --- | --- | --- |
| 3 | Status mode indicator: STAT | Green | • Steady on: The service port indicators work in status mode and show the link connection states and link activity on ports.<br>• Off: The status mode is not selected. |
| 4 | Speed mode indicator: SPED | Green | • Steady on: The service port indicators show the port speed. After 45 seconds, the service port indicators automatically restore to the status mode.<br>• Off: The speed mode is not selected. |
| 5 | PoE mode indicator: PoE | Green | • Steady on: The service port indicators show the PoE status. After 45 seconds, the service port indicators automatically restore to the status mode.<br>• Off: The PoE mode is not selected. |
| 6 | Mode switching button: MODE | - | • When you press this button once, the SPED indicator turns green and the service port indicators change to the speed mode.<br>• When you press this button a second time, the PoE indicator turns green and the service port indicators change to the PoE mode.<br>• When you press this button a third time, the STAT indicator turns green and the service port indicators restore to the default mode.<br>**NOTE**<br>If you do not press the MODE button within 45 seconds, the service port indicators restore to the default mode. In this case, the STAT indicator is steady green, and the SPED and PoE indicators are off. |

| No. | Indicator/ Button | Color | Description |
| --- | --- | --- | --- |
| 7 | Service port indicator<br>• Electrical ports: The ports are numbered from bottom to top and left to right, starting with 0.<br>• Optical ports: Each optical port has a corresponding indicator above it. | Meanings of service port indicators vary in different modes. For details, see **Table 5-5**. | |
| 8 | USB indicator | Reserved | |

**Table 5-5** Description of service interface indicators in different modes

| Display Mode | Color | Description |
| --- | --- | --- |
| Status | Green | • Off: The port is not connected or has been shut down.<br>• Steady on: The port is connected.<br>• Blinking: The port is sending or receiving data. |
| Speed | Green | • Off: The port is not connected or has been shut down.<br>• Steady on: The port is operating at 10/100 Mbit/s.<br>• Blinking: The port is operating at 1000 Mbit/s. |

| Display Mode | Color | Description |
| --- | --- | --- |
| PoE | Green | • Off: The port does not provide PoE power.<br>• Steady on: The port is providing PoE power.<br>• Blinking: The power of the PD exceeds the power supply capability of the port or exceeds the threshold. Or the PD does not comply with PoE. |

## Basic Specifications

**Table 5-6** Basic Specifications

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 43.6 mm x 442 mm x 312 mm |
| | Weight | 4.4 kg |
| | System memory | • 1 GB DDR3<br>• 16 MB NOR Flash<br>• 2 GB SD card |
| Power specifications | Power input | • Rated voltage: 100 V AC to 240 V AC, 50/60 Hz<br>• Maximum voltage range: 90 V AC to 264 V AC, 47 Hz to 63 Hz |
| | Maximum power consumption | 435 W (device power consumption: 55 W, PoE: 380 W) |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to +45°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases by 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP20 |
| | Atmospheric pressure | 70 kPa to 106 kPa |

### 5.1.5 Hardware Information (AD9430DN-12 and AD9430DN-24)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

## 5.2 AD9431DN-24X Product Description

### 5.2.1 Product Characteristics (AD9431DN-24X)

The AD9431DN-24X is a central AP used in Huawei agile distributed Wi-Fi solution. It supports PoE power supply and can be connected to multiple remote units (RUs) deployed indoors. The central AP and RUs are connected through network cables, which greatly extends the coverage range, enhances flexibility in AP deployment and planning, and reduces the engineering construction costs. The central AP manages the RUs and processes services in a centralized manner. The RUs process radio signals independently. Such distributed architecture further improves the wireless access capability, creating optimal service experience for users.

The central AP is recommended for environments with complex wall structures and high-density rooms, such as schools, hotels, hospitals, and office meeting rooms. Signals are transmitted through network cables without attenuation. The RUs are deployed indoors and provide comprehensive signal coverage.

The AD9431DN-24X provides 24 downlink GE interfaces and supports PoE power supply.

The central AP does not provide radio modules, and therefore must be deployed together with RUs to implement various functions such as STA access.

The central AP can work in Fit, Fat, or cloud mode.

- Fit AP: The central APs are uniformly managed by the AC. The central AP and RUs are plug-and-play and can be managed and maintained in real time. Compared with traditional distributed AP solutions, the AC in Huawei agile distributed Wi-Fi solution needs to manage a smaller number of APs. A large number of RUs can be deployed, which improves the overall performance and reduces network deployment costs.
- Fat AP: The central AP manages RUs independently. A Fat AP can be used as the central AP when the network has low throughput requirements.
- Cloud AP: The central AP works with the SDN controller to implement functions such as user access, AP online, authentication, routing, AP management, security, and QoS. The central AP and RUs can go online without configurations and are centrally managed by the Cloud Manager.

NOTICE

The AD9431DN-24X is a class A product. In daily lives, the product may cause radio interference in which case the user may be required to take adequate measures.

## Long-Distance Network Coverage

Unlike the traditional distributed AP which allows for a maximum feeder length of 15 m, the central AP uses network cables to replace feeder cables and supports up to 100 m distance from the RUs. The network coverage range is therefore expanded by several times.

## Flexible Deployment

The deployment of central APs is free from restrictions of feeder length. It can be easily mounted to a ceiling or wall in the equipment room or on the corridor.

## No Wall Penetration Loss, No Coverage Hole

Restricted by feeder length or installation requirements, signals have to pass through walls in some scenarios, resulting in large signal attenuation. If rooms to be covered have complex structures, coverage holes may occur. To prevent these problems, lots of calculation and verification work needs to be carried out. Huawei distributed solution solves these problems. In this solution, RUs are placed in rooms, and signals are transmitted over wired cables, without wall penetration loss, delivering high-quality wireless access services.

## Concurrent Traffic Forwarding on Uplink 10GE Interfaces

The AD9431DN-24X provides four uplink 10GE interfaces that can be connected to optical fibers. The central AP can forward service traffic on the uplink interfaces simultaneously. The high forwarding capability ensures that concurrent services of RUs are processed at high speeds.

## PoE Capability on Downlink Interfaces, Direct Connection to RUs

Downlink interfaces of the central AP support PoE power supply. Therefore, you do not need to configure a power supply for each RU separately. The AD9431DN-24X can be directly connected to 24 RUs. They can connect to more RUs through PoE switches to cover more rooms.

## Link Disconnection Survival

The central AP in Fit mode supports link disconnection survival. When the link between the central AP and AC disconnects, the central AP and RUs can maintain the current working states, preventing service interruptions of users and ensuring high-reliability transmission.

### Low Engineering Cost

Compared with traditional distributed APs, the central AP cuts down the following expenses:

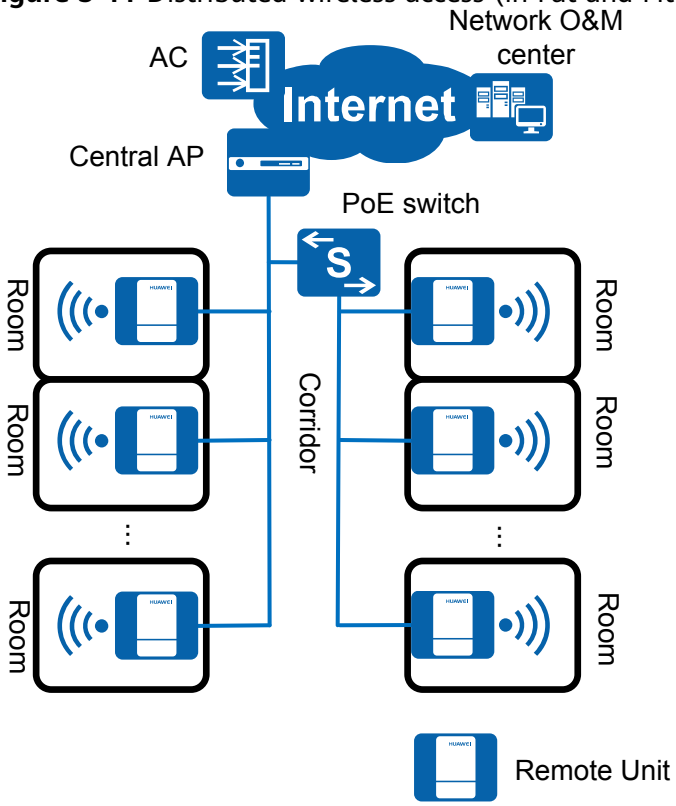
- Construction: Network cables replace expensive feeder cables. The central AP can directly use the network cables originally routed in the rooms, without the need of deploying new cables.
- License: The maximum number of central APs in Fit AP mode allowed by the AC is controlled by licenses, but RUs do not require licenses. Therefore, one central AP can use RUs to cover dozens of rooms.

### Hierarchical Processing Technology, High Wireless Forwarding Capability

Huawei distributed solution uses innovative hierarchical processing technology. The central AP manages RUs in a centralized manner and concurrently forwards service traffic, while the RUs only process radio signals. The hierarchical design makes the network structure clearer and reduces the processing burden on the central AP and RUs, improving efficiency and optimizing the overall wireless forwarding performance.

## 5.2.2 Usage Scenario (AD9431DN-24X)

**Figure 5-11** Distributed wireless access (in Fat and Fit AP modes)

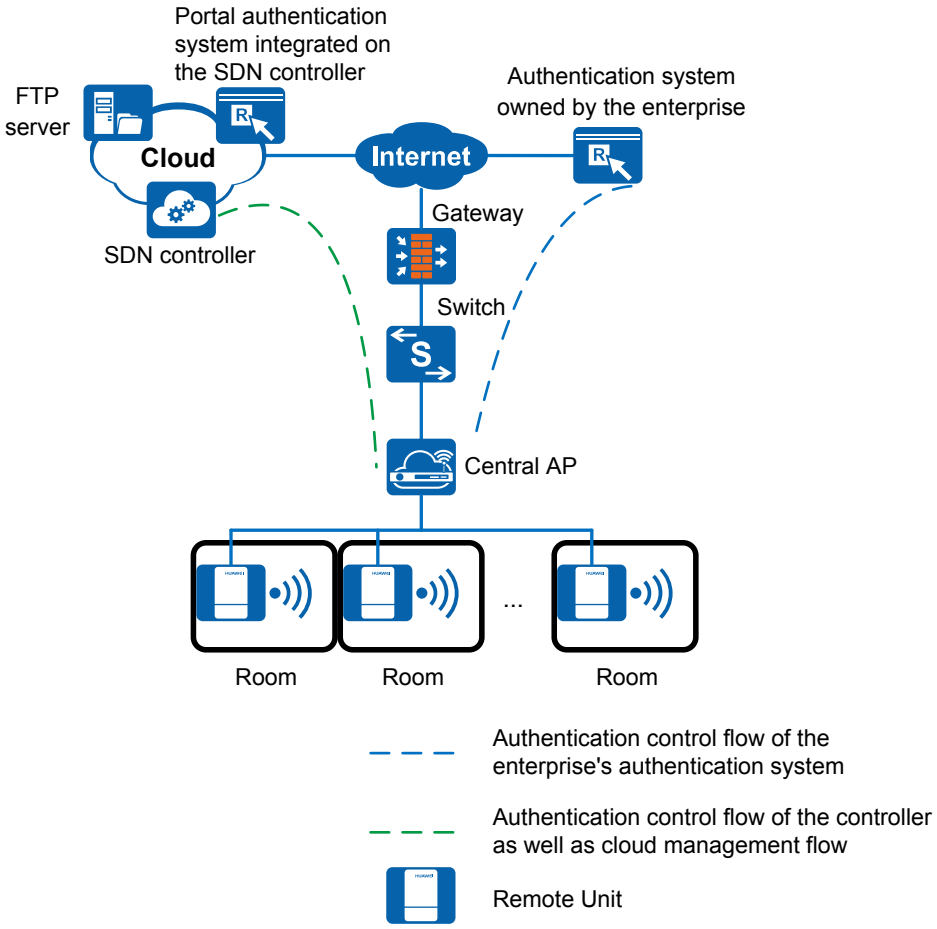



As shown in the figure, the downlink GE interfaces of the central AP support PoE power supply and can be directly connected to RUs. The central AP can connect to more RUs through a PoE switch. The central AP communicates with the RUs through network cables and can be placed in the equipment room or on the corridor.

When the central AP works in Fat mode, no AC needs to be deployed on the network. The services are directly configured on the central AP, and the central AP manages its connected RUs.

**Figure 5-12** Distributed wireless access (in cloud-based management mode)




In this networking, the device functions as a cloud AP and works with the SDN controller on the same cloud for user access, AP going-online, authentication, routing, AP management, security, and QoS. An enterprise can choose to use the Portal authentication server integrated in the SDN controller or the authentication server deployed by itself.

## 5.2.3 Hardware Information (AD9431DN-24X)

### Appearance

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

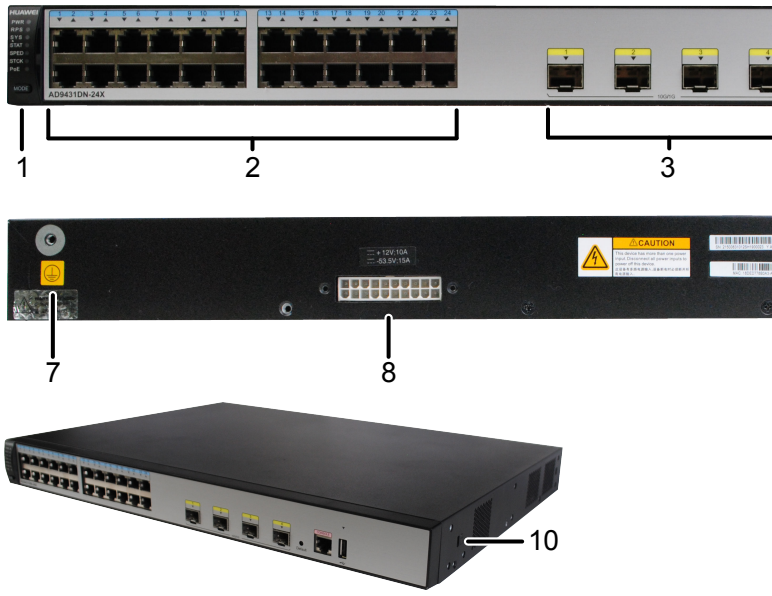
**Figure 5-13** Appearance of the AD9431DN-24X

## Ports

**Figure 5-14** Ports on the AD9431DN-24X



As shown in **Figure 5-14**, each port can be described as follows:

1. MODE: Switches the working mode of indicators when you press it.
2. 10/100/1000BASE-T Ethernet port: Twenty-four downlink network ports that support 10/100/1000Mbit/s auto-sensing and PoE output.
3. SFP+: Four 10GE optical ports that support the 100M/1000M/10GE optical module and high-speed cables (1 m, 3 m, or 5 m).
4. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
5. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
6. USB: Connects to a USB flash drive to transfer the configuration and upgrade files. The USB2.0 standard is supported.
7. Device ground screw: Connects the device to a ground cable.
8. RPS power jack: Connects to the power supply through a DC power output port on the RPS1800 chassis for power supply backup.
9. AC power jack: Connects to the power supply through an AC power cable.
10. Security slot: Connects to a security lock.

## Indicator

**Figure 5-15** shows the indicators on the AD9431DN-24X front panel.

**Figure 5-15** Indicators on the AD9431DN-24X front panel

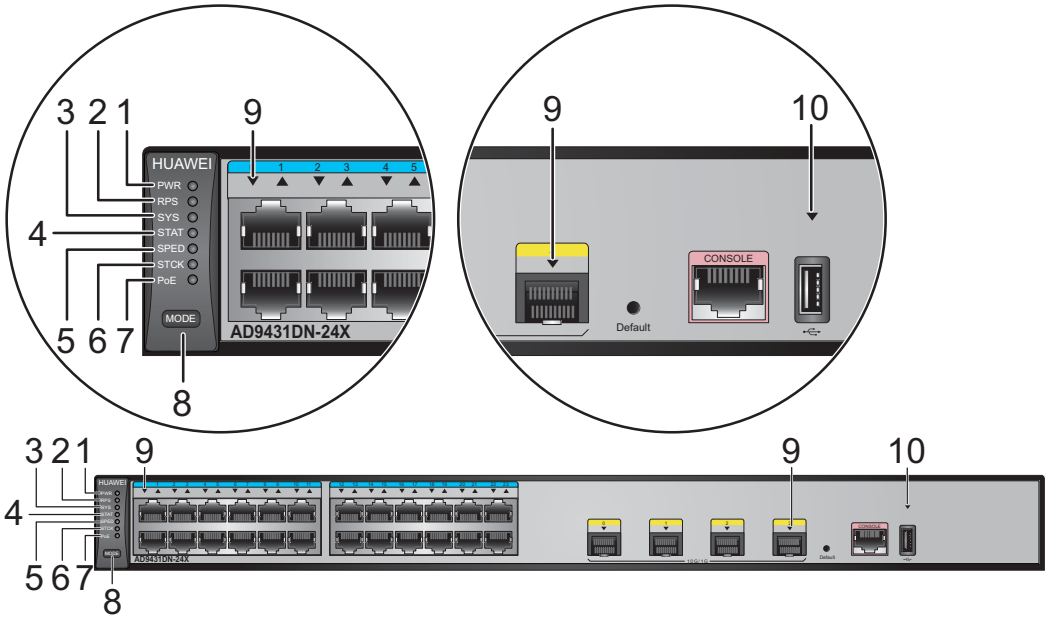



**Table 5-7** describes indicators on the AD9431DN-24X front panel.

**NOTE**

Indicator colors may vary slightly at different temperature.

**Table 5-7** Description of indicators on the AD9431DN-24X front panel

| No. | Indicator/ Button | Color | Description |
| --- | --- | --- | --- |
| 1 | PWR: internal power supply indicator | - | Off: The switch is powered off. |
| | | Green | Steady on: The switch is powered on. |
| | | Yellow | Steady on: The built-in power module is faulty, and the switch is powered by the RPS system. |
| 2 | RPS: RPS power supply indicator | - | Off: No RPS is connected to the central AP. |
| | | Green | • Steady on: The RPS is in cold standby state.<br>• Blinking: The RPS is providing power for another device. |
| | | Yellow | • Steady on: The RPS is in alarm state. (No 870 W PoE power module is available in the RPS1800 or the RPS1800 cannot provide power supply to the local central AP at this time.)<br>• Blinking: The RPS is providing power for the central AP and the built-in power module of the central AP is faulty. |
| 3 | SYS: system status indicator | - | Off: The system is not running. |
| | | Green | • Fast blinking: The system is starting.<br>• Slow blinking: The system is running normally. |
| | | Red | Steady on: The system does not work normally after registration, or a fan or temperature alarm has been generated. |
| 4 | STAT: status indicator | Green | • Off: The status mode is not selected.<br>• Steady on: The status mode (default mode) is selected. If the status mode is selected, the service port indicator shows the port link or activity state. |

| No. | Indicator/ Button | Color | Description |
| --- | --- | --- | --- |
| 5 | SPED: speed indicator | Green | • Off: The speed mode is not selected.<br>• Steady on: The speed mode is selected. If the speed mode is selected, the service port indicator shows the port speed state. After 45 seconds, the service port indicators automatically restore to the status mode. |
| 6 | STCK: stack indicator | Reserved | |
| 7 | PoE: PoE indicator | Green | • Off: The PoE mode is not selected.<br>• Steady on: The service port indicators show the PoE status. After 45 seconds, the service port indicators automatically restore to the status mode. |
| 8 | MODE: mode switch button | - | • When you press this button once, the service port indicators change to the speed mode and show the speed of each service port.<br>• When you press this button a second time, the service port indicators change to the stack mode and show the stack ID of the local switch.<br>• When you press this button a third time, the service port indicators change to PoE mode and show the PoE status of ports.<br>• When you press this button a fourth time, the service port indicators restore to the default mode, and the STAT indicator turns green.<br>If you do not press the MODE button within 45 seconds, the service port indicators restore to the default mode. In this case, the STAT indicator is steady green, the SPED and PoE indicators are off, and the STCK indicator is off or blinking green. |

| No. | Indicator/ Button | Color | Description |
| --- | --- | --- | --- |
| 9 | Service port indicator<br>• GE electrical ports: The ports are numbered from bottom to top and left to right, starting with 0.<br>• 10GE optical ports: Arrowheads show the positions of ports. | Meanings of service port indicators vary in different modes. For details, see **Table 5-8**. | |
| 10 | USB indicator | Reserved | |

**Table 5-8** Description of service interface indicators in different modes

| Display Mode | Color | Description |
| --- | --- | --- |
| Status | Green | • Off: The port is not connected or has been shut down.<br>• Steady on: The port is connected.<br>• Blinking: The port is sending or receiving data. |
| Speed | Green | • Off: The port is not connected or has been shut down.<br>• Steady on: The port is operating at 10/100 Mbit/s.<br>• Blinking: The port is operating at 1000 Mbit/s. |

| Display Mode | Color | Description |
| --- | --- | --- |
| PoE | Green | • Off: The port does not provide PoE power.<br>• Steady on: The port is providing PoE power.<br>• Blinking: The power of the PD exceeds the power supply capability of the port or exceeds the threshold. Or the PD does not comply with PoE. |

## Basic Specifications

**Table 5-9** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 43.6 mm × 442 mm × 310 mm |
| | Weight | 4.3 kg |
| | System memory | 512 MB DDR3 |
| | FLASH | 4 MB NOR FLASH + 512 MB NAND |
| Power specifications | Power input | • Rated voltage: 100 V AC to 240 V AC, 50/60 Hz<br>• Maximum voltage range: 90 V AC to 264 V AC, 47 Hz to 63 Hz |
| | Maximum power consumption | 410 W (device power consumption: 30 W, PoE out: 370 W) |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to +45°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases by 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP20 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

### 5.2.4 Performance Specifications (AD9431DN-24X)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

## 5.3 R230D and R240D Product Description

### 5.3.1 Product Characteristics (R230D, R240D)

The R230D and R240D are remote units (RUs) used in Huawei agile distributed Wi-Fi solution. They support PoE power supply, and are deployed indoors and connected to the central AP. The central AP and RUs are connected through network cables, which greatly extends the coverage range, enhances flexibility in AP deployment and planning, and reduces the engineering construction costs. The central AP manages the RUs and processes services in a centralized manner. The RUs process radio signals independently. Such distributed architecture further improves the wireless access capability, creating optimal service experience for users.

The RU uses an 86 mm plate in compliance with international standards and can be easily installed into a junction box in a room. It is equipped with a built-in antenna and a hidden indicator; therefore, installation of the RU does not affect indoor decorations and designs. It also has an IEEE 802.11a/b/g/n/ac wireless module and can work on both 5 GHz and 2.4 GHz frequency bands.

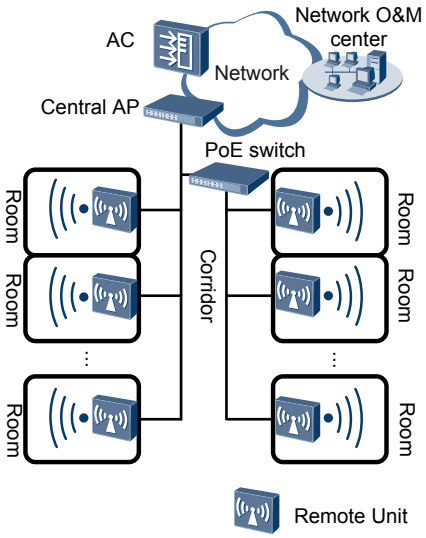
The RU is recommended for environments with complex wall structures and high-density rooms, such as schools, hotels, hospitals, and office meeting rooms. Signals are transmitted through network cables without attenuation. The RUs are deployed indoors and provide comprehensive signal coverage.

The RUs are managed by the central AP. The central AP and RUs are plug-and-play and can be managed and maintained in real time. Compared with traditional distributed AP solutions, the AC in Huawei agile distributed Wi-Fi solution needs to manage a smaller number of APs. A large number of RUs can be deployed, which improves the overall performance and reduces network deployment costs.

## 5.3.2 Usage Scenarios (R230D, R240D)

**Figure 5-16** Distributed wireless access




As shown in the figure, the downlink GE interfaces of the central AP support PoE power supply and can be directly connected to RUs. The central AP can connect to

more RUs through a PoE switch. RUs are deployed indoors and communicate with the central AP through network cables.

## 5.3.3 Hardware Information (R230D)

### Appearance

Figure 5-17 shows the appearance of the R230D.

NOTE

The actual device appearance may be different from the following device appearance; these differences will not affect device functions.

**Figure 5-17** R230D appearance


### Port

The following figure shows ports on the R230D.

**Figure 5-18** R230D ports

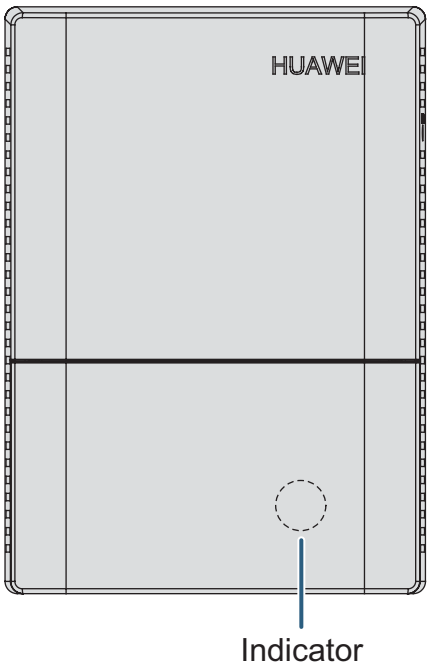

As shown in **Figure 5-18**, each port can be described as follows:

1. ETH/PoE: 10/100M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for the RU.
2. Default: Reset button used to restore factory settings if you hold down the button more than 3 seconds.

## LED Indicator

The R230D provides only one indicator, as shown in **Figure 5-19**.

**Figure 5-19** Indicator on the R230D



NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Table 5-10** Description of the indicator on the R230D

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>● The AP registration fails (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 5-11** Basic specifications of the R230D

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions (H x W x D) | 26 mm x 120 mm x 86 mm (1.02 in. x 4.72 in. x 3.39 in.) |
| | Weight | 0.1 kg |
| | System memory | • 128 MB DDR2<br>• 32 MB flash memory |
| Power parameters | Power input | • PoE power supply in compliance with IEEE 802.3af |
| | Maximum power consumption | 5.1 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature and altitude | -60 m to 1800 m: 0°C to 40°C<br>1,800 m to 5,000 m: The highest operating temperature reduces by 1°C every time the altitude increases by 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 5-12** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Antenna gain</td><td colspan="3">• 2.4 GHz: 3 dBi<br>• 5 GHz: 4 dBi</td></tr>
<tr><td>Maximum number of users</td><td colspan="3">≤ 256</td></tr>
<tr><td>Maximum number of VAPs for each radio</td><td colspan="3">8</td></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 20 dBm (combined power)<br>• 5 GHz: 18 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
<tr><td>Channel rate</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 300 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s</td></tr>
</table>

# 5.3.4 Hardware Information (R240D)

## Appearance

**Figure 5-20** shows the appearance of the device.

NOTE

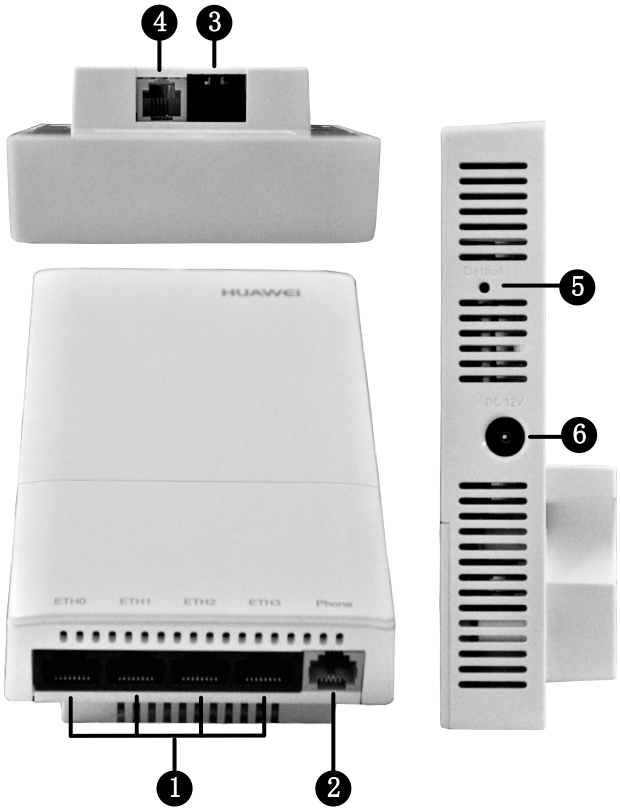
The actual device appearance may be different from the following device appearance; these differences will not affect device functions.

**Figure 5-20** Appearance


## Port

**Figure 5-21** shows ports on the device.

**Figure 5-21** Ports




Each port can be described as follows:

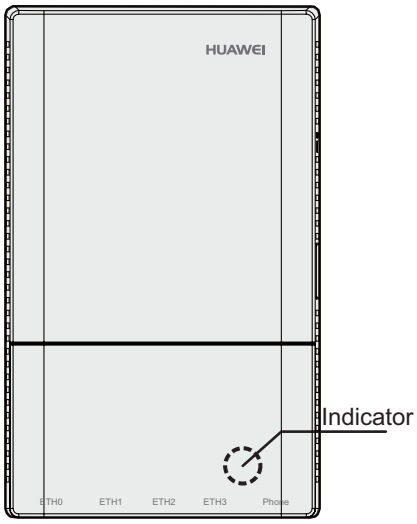
1. ETH0 to ETH3: 10/100M port used to connect to the wired Ethernet.
2. Phone: Phone interface used to connect to a POTS phone or modem device.
3. GE/PoE: 10/100/1000M port used to connect to the wired Ethernet. The port can connect to a PoE power supply to provide power for the device.
4. Phone: Phone interface used to connect to a traditional PSTN.
5. Default: Reset button used to restore factory settings if you hold down the button more than 3 seconds.
6. Power input interface: 12 V DC.

## LED Indicator

R240D provides only one indicator, as shown in **Figure 5-22**.

**Figure 5-22** Indicator on the R240D




NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Table 5-13** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once Alarm Green every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP registration fails (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 5-14** Basic specifications of the R240D

| Item | | Description |
| --- | --- | --- |
| Technical specifications | Dimensions outside the wall (H × W × D) | 25 mm x 140 mm x 86 mm (0.98 in. x 5.51 in. x 3.39 in.) |
| | Dimensions inside the wall (H × W × D) | 16.5 mm x 51.5 mm x 63.5 mm (0.65 in. x 2.03 in. x 2.50 in.) |
| | Weight | 0.2 kg |
| | System memory | • 128 MB DDR2<br>• 32 MB Flash |
| Power specifications | Power input | • 12 V ± 10%<br>• PoE power: in compliance with IEEE 802.3af/at |

| Item | | Description |
| --- | --- | --- |
| | Maximum power consumption | 8.7 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature and altitude | -60 m to +1800 m: 0°C to +40°C<br>1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 70 kPa to 106 kPa |

## Radio Specifications

**Table 5-15** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 2 dBi<br>• 5 GHz: 3 dBi |
| Maximum number of users | ≤ 256 |
| Maximum number of VAPs for each radio | 8 |
| Maximum transmit power | • 2.4 GHz: 21 dBm (combined power)<br>• 5 GHz: 20 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. The R240D uses an 86-type box and applies only to countries and regions that support 86-type boxes. |

| Item | Description | | |
|---|---|---|---|
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 300 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

### 5.3.5 Performance Specifications (R230D, R240D)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

## 5.4 R250D and R250D-E Product Description

### 5.4.1 Product Characteristics (R250D and R250D-E)

The R250D and R250D-E are remote units (RUs) used in Huawei agile distributed Wi-Fi solution. They support PoE power supply, and are deployed indoors and connected to the central AP. The central AP and RUs are plug-and-play and can be managed and maintained in real time. Compared with traditional distributed AP solutions, the AC in Huawei agile distributed Wi-Fi solution needs to manage a smaller number of APs. A large number of RUs can be deployed, which improves the overall performance and reduces network deployment costs.

The RU uses an 86 mm plate in compliance with international standards and can be easily installed into a junction box in a room. It is equipped with a built-in

antenna and a hidden indicator; therefore, installation of the RU does not affect indoor decorations and designs. It also has an IEEE 802.11a/b/g/n/ac/ac Wave 2 wireless module and can work on both 5 GHz and 2.4 GHz frequency bands.

The RU is recommended for environments with complex wall structures and high-density rooms, such as schools, hotels, hospitals, and office meeting rooms. Signals are transmitted through network cables without attenuation. The RUs are deployed indoors and provide comprehensive signal coverage.

The RUs are managed by the central AP. The central AP and RUs are plug-and-play and can be managed and maintained in real time. Compared with traditional distributed AP solutions, the AC in Huawei agile distributed Wi-Fi solution needs to manage a smaller number of APs. A large number of RUs can be deployed, which improves the overall performance and reduces network deployment costs.

## Long-Distance Network Coverage

Unlike the traditional distributed AP which allows for a maximum feeder length of 15 m, the central AP uses network cables to replace feeder cables and supports up to 100 m distance from the RUs. The network coverage range is therefore expanded by several times.

## No Wall Penetration Loss, No Coverage Hole

Restricted by feeder length or installation requirements, signals have to pass through walls in some scenarios, resulting in large signal attenuation. If rooms to be covered have complex structures, coverage holes may occur. To prevent these problems, lots of calculation and verification work needs to be carried out. Huawei distributed solution solves these problems. In this solution, RUs are placed in rooms, and signals are transmitted over wired cables, without wall penetration loss, delivering high-quality wireless access services.

## 802.11ac/ac Wave 2 Gigabit Wireless Rate

The RU complies with IEEE 802.11a/b/g/n/ac/ac Wave 2, supports 2x2 MIMO, works on both 2.4 and 5 GHz frequency bands, and provides strong signals and gigabit wireless rate.

## Unique, Graceful Plate Design

The RU is white in appearance and has heat emission holes and interfaces at the side and bottom. The mounting screws are hidden under the slide panel. The overall design is simple but graceful and blends well with the layout of hotels and apartments.

## Easy to Install in a Standard Junction Box (86 mm)

The RU uses an 86 mm plate in compliance with international standards and can be easily installed into a junction box in a room, requiring no drilling or cabling.

## Flexible Installation Modes

In addition to a junction box (86 mm), the R250D can be installed on a wall or ceiling, and the R250D-E can be installed on a desk, rendering the installation location flexible.

## Hidden Indicator, Zero Impact on Sleep

The RU uses a hidden indicator design. When being turned on, the indicator has soft light. The AC controls the switch of the indicator and turns off the indicator at nights to prevent blinking lights from affecting sleep of guests.

## Four Downlink Ethernet Interfaces, Supporting Wired Access from Multiple Users

The R250D-E has four downlink 1000M Ethernet interfaces that can process data concurrently. The interfaces can be connected to multiple terminals through network cables, such as the IPTV, desktop computer, and laptop, meeting requirements of hotels and apartments. One downlink 1000M Ethernet interface supports PoE out and can provide power supply for connected devices such as IP phones.

## Auto Shutdown of the Wired Interface

In some cases, a loop may occur on a network connected to the RU's wired interface, for example, when the RU and the network are connected through a hub. The auto shutdown function enables the RU to automatically shut down its wired interface for protection.

NOTE

This function takes effect only when the wired network connected to the RU's wired interface does not terminate STP packets from the RU.

## Low Engineering Cost

Compared with traditional distributed APs, the central AP cuts down the following expenses:

- Construction: Network cables replace expensive feeder cables. The central AP can directly use the network cables originally routed in the rooms, without the need of deploying new cables.
- License: The maximum number of central APs in Fit mode allowed by the AC is controlled by licenses, but RUs do not require licenses. Therefore, one central AP can use RUs to cover dozens of rooms.

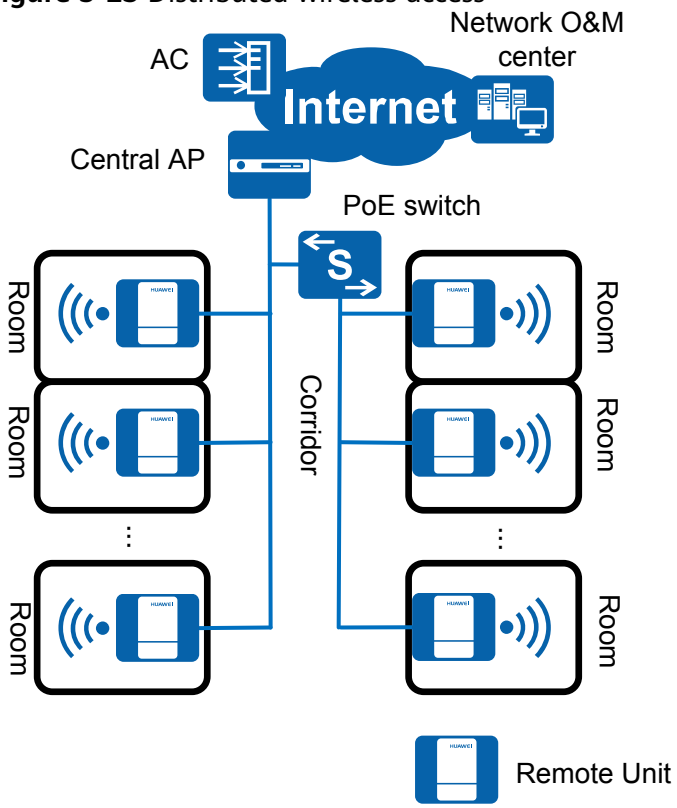
## Hierarchical Processing Technology, High Wireless Forwarding Capability

Huawei distributed solution uses innovative hierarchical processing technology. The central AP manages RUs in a centralized manner and concurrently forwards service traffic, while the RUs only process radio signals. The hierarchical design makes the network structure clearer and reduces the processing burden on the central AP and RUs, improving efficiency and optimizing the overall wireless forwarding performance.

## 5.4.2 Usage Scenarios (R250D and R250D-E)

**Figure 5-23** Distributed wireless access




As shown in the figure, the downlink GE interfaces of the central AP support PoE power supply and can be directly connected to RUs. The central AP can connect to more RUs through a PoE switch. RUs are deployed indoors and communicate with the central AP through network cables.

## 5.4.3 Hardware Information (R250D)

### Appearance

NOTE

The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 5-24** R250D appearance


## Ports

**Figure 5-25** R250D ports


As shown in **Figure 5-24**, each port can be described as follows:

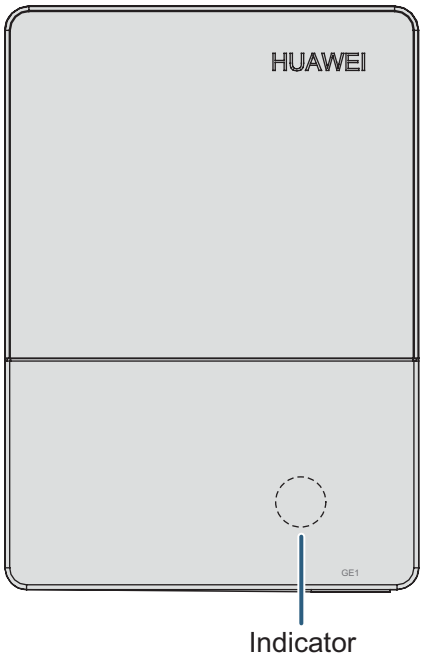
1. GE1: 10/100/1000M port used to connect to the wired Ethernet.
2. Default: Reset button used to restore factory settings and restarts the device if you hold down the button more than 3 seconds.
3. GE0/PoE_IN: 10/100/1000M port used to connect to the wired Ethernet and support PoE input.

## Indicator

The R250D provides only one indicator, as shown in **Figure 5-26**.

**Figure 5-26** Indicator




NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Table 5-16** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once Alarm Green every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>● The AP registration fails (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 5-17** R250D Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 26 mm x 86 mm x 120 mm |
| | Weight | 0.2 kg |
| | System memory | ● 256 MB DDR3L<br>● 32 MB Flash |
| Power specifications | Power input | PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 10.1 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to +40°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 5-18** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 6 dBi |
| Maximum number of users | ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 21 dBm (combined power)<br>• 5 GHz: 20 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

# 5.4.4 Hardware Information (R250D-E)

## Appearance

NOTE

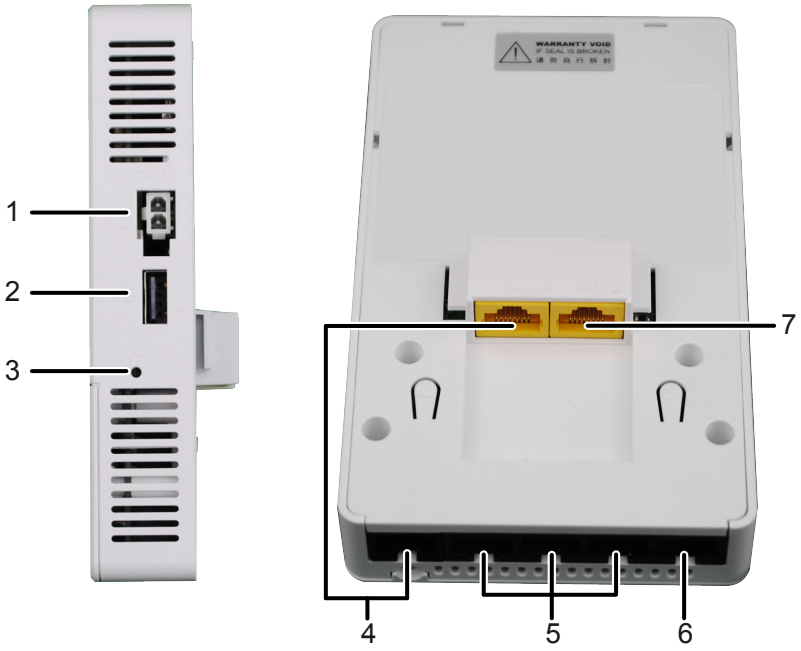
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 5-27** R250D-E appearance

## Ports

**Figure 5-28** R250D-E ports




As shown in **Figure 5-28**, each port can be described as follows:

1. DC 48V: DC power socket connecting a 48 V power adapter to the AP.
2. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
3. Default button: Reset button used to restore factory settings and restarts the device if you hold down the button more than 3 seconds.

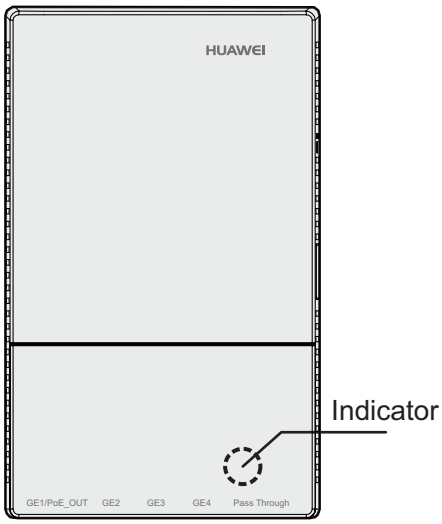
  

4. Pass Through port (RJ45): Connects to a network cable or phone cable for transparent transmission.
5. GE2 to GE4: 10/100/1000M port used to connect to the wired Ethernet.
6. GE1/PoE_OUT: 10/100/1000M port used to connect to the wired Ethernet and support PoE output.
7. GE0/PoE_IN: 10/100/1000M port used to connect to the wired Ethernet and support PoE input.

## LED Indicator

The R250D-E provides only a single indicator, as shown in **Figure 5-29**.

**Figure 5-29** Indicator




**NOTE**

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Table 5-19** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once Alarm Green every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>● The AP registration fails (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 5-20** R250D-E Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 36 mm x 86 mm x 140 mm |
| | Weight | 0.26 kg |
| | System memory | ● 256 MB DDR3L<br>● 32 MB Flash |

| Item | | Description |
| --- | --- | --- |
| Power specifications | Power input | • DC: 48 V ± 5%<br>• PoE power supply: in compliance with IEEE 802.3af/at |
| | Maximum power consumption | 11.5 W (excluding the output power of the USB port and PoE_OUT port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to +40°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 5-21** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 4 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 21 dBm (combined power)<br>• 5 GHz: 20 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

### 5.4.5 Performance Specifications (R250D, R250D-E)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

## 5.5 R251D and R251D-E Product Description

### 5.5.1 Product Characteristics (R251D, R251D-E)

Huawei R251D and R251D-E are remote units (RUs) used in Huawei agile distributed Wi-Fi solution. The RUs can receive PoE power supply, and are deployed in rooms and connected to a central AP. The central AP and RUs are plug-and-play and can be managed and maintained in real time. Compared with traditional distributed AP solutions, the AC in Huawei agile distributed Wi-Fi solution needs to manage a smaller number of APs. A large number of RUs can be deployed, which improves the overall performance and reduces network deployment costs.

The RUs can be easily installed in junction boxes (86 mm/120 mm/118 mm) without damaging indoor decoration. The hidden indicator design and the

optimized indicator luminance of the R251D and R251D-E reduce the light impact on users. The indicator can also be shut down through the software as required.

The R251D and R251D-E have an IEEE 802.11a/b/g/n/ac/ac Wave 2 wireless module and can work on both 5 GHz and 2.4 GHz frequency bands. The built-in smart antennas of the RUs help achieve better coverage.

The RU is recommended for environments with complex wall structures and high-density rooms, such as schools, hotels, hospitals, and office meeting rooms. Signals are transmitted through network cables without attenuation. The RUs are deployed indoors and provide comprehensive signal coverage.

The RUs are managed by the central AP. The central AP and RUs are plug-and-play and can be managed and maintained in real time. Compared with traditional distributed AP solutions, the AC in Huawei agile distributed Wi-Fi solution needs to manage a smaller number of APs. A large number of RUs can be deployed, which improves the overall performance and reduces network deployment costs.

## Long-Distance Network Coverage

Unlike the traditional distributed AP which allows for a maximum feeder length of 15 m, the central AP uses network cables to replace feeder cables and supports up to 100 m distance from the RUs. The network coverage range is therefore expanded by several times.

## No Wall Penetration Loss, No Coverage Hole

Restricted by feeder length or installation requirements, signals have to pass through walls in some scenarios, resulting in large signal attenuation. If rooms to be covered have complex structures, coverage holes may occur. To prevent these problems, lots of calculation and verification work needs to be carried out. Huawei distributed solution solves these problems. In this solution, RUs are placed in rooms, and signals are transmitted over wired cables, without wall penetration loss, delivering high-quality wireless access services.

## 802.11ac/ac Wave 2 Gigabit Wireless Rate

The RU complies with IEEE 802.11a/b/g/n/ac/ac wave2, supports 2x2 MIMO, works on both 2.4 and 5 GHz frequency bands, and provides strong signals and gigabit wireless rate.

## Unique, Graceful Plate Design

The RU is white in appearance and has heat emission holes and interfaces at the side and bottom. The mounting screws are hidden under the slide panel. The overall design is simple but graceful and blends well with the layout of hotels and apartments.

## Easy Installation in a Junction Box (86 mm/118 mm/120 mm)

RUs can be easily installed in a junction box (86 mm/118 mm/120 mm), without the need to drill holes or lay out cables.

## Flexible Installation Modes

RUs can also be installed on a wall or desktop, allowing for flexible installation.

## Hidden Indicator, Zero Impact on Sleep

The RU uses a hidden indicator design. When being turned on, the indicator has soft light. The AC controls the switch of the indicator and turns off the indicator at nights to prevent blinking lights from affecting sleep of guests.

## Four Downlink Ethernet Interfaces, Supporting Wired Access from Multiple Users

The R251D and R251D-E have four downlink GE interfaces that can process data concurrently. The interfaces can be connected to multiple STAs through Ethernet cables, such as the IPTV, desktop computer, and laptop, meeting requirements in hotels and apartments. One downlink GE interface of the R251D-E supports PoE out and can supply power to connected devices such as IP phones.

## Auto Shutdown of the Wired Interface

In some cases, a loop may occur on a network connected to the RU's wired interface, for example, when the RU and the network are connected through a hub. The auto shutdown function enables the RU to automatically shut down its wired interface for protection.

NOTE

This function takes effect only when the wired network connected to the RU's wired interface does not terminate STP packets from the RU.

## Low Engineering Cost

Compared with traditional distributed APs, the central AP cuts down the following expenses:

- Construction: Network cables replace expensive feeder cables. The central AP can directly use the network cables originally routed in the rooms, without the need of deploying new cables.
- License: The maximum number of central APs in Fit mode allowed by the AC is controlled by licenses, but RUs do not require licenses. Therefore, one central AP can use RUs to cover dozens of rooms.

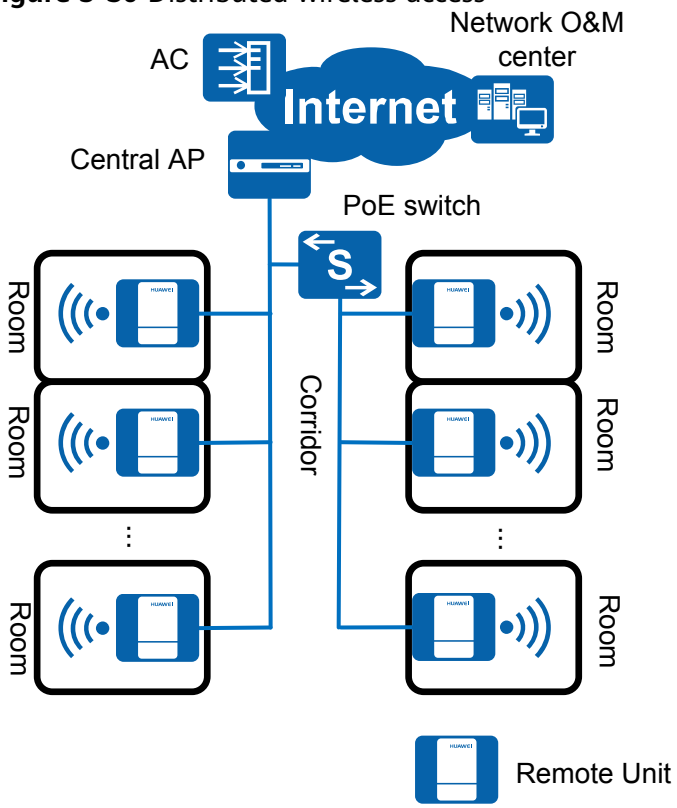
## Hierarchical Processing Technology, High Wireless Forwarding Capability

Huawei distributed solution uses innovative hierarchical processing technology. The central AP manages RUs in a centralized manner and concurrently forwards service traffic, while the RUs only process radio signals. The hierarchical design makes the network structure clearer and reduces the processing burden on the central AP and RUs, improving efficiency and optimizing the overall wireless forwarding performance.

## 5.5.2 Usage Scenario (R251D, R251D-E)

**Figure 5-30** Distributed wireless access




As shown in the figure, the downlink GE interface of a central AP supports PoE power supply and can be directly connected to RUs. The central AP can connect to more RUs through a PoE switch. RUs are deployed indoors and communicate with the central AP through network cables.

## 5.5.3 Hardware Information (R251D)

### Appearance

NOTE

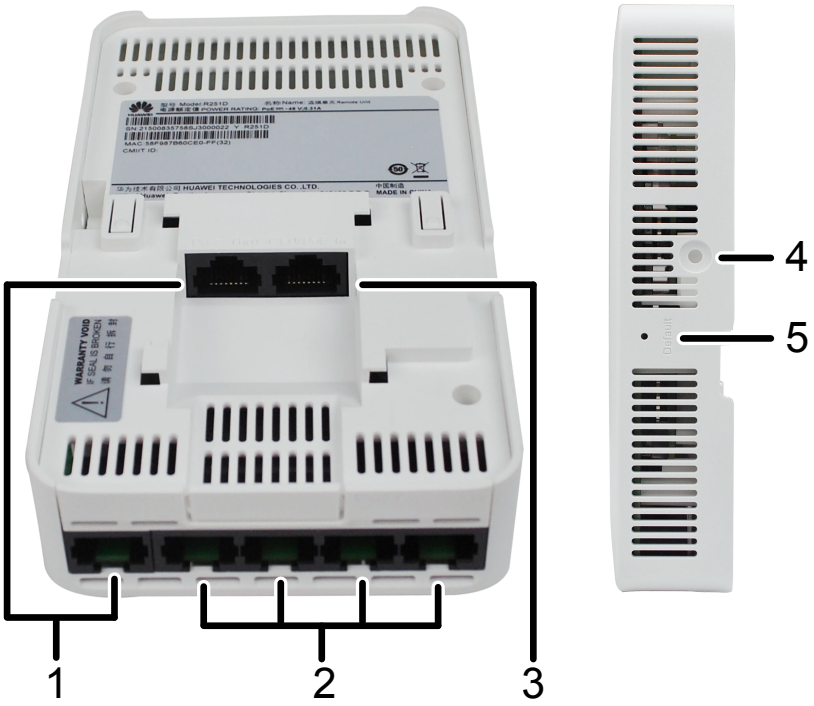
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 5-31** Appearance


## Ports

**Figure 5-32** Ports




As shown in **Figure 5-32**, each port can be described as follows:

1. Pass Through: RJ45 ports that connect to network cables or phone cables for transparent transmission.
2. GE4 to GE1: 10/100/1000M port that connects to the wired Ethernet.
3. GE0/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
4. Captive screw hole: Accommodates a captive screw.

   NOTE

   Tighten an M3x4 crosshead screw into the device to prevent the device from dropping. If the anti-theft function is required, tighten an M3x4 torx screw (instead of an M3x4 crosshead screw) into the device using a T9 torx security screwdriver. The tightening torques of the two screw types are both 0.15 N•m.
5. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

## LED Indicators

The R251D provides only one indicator, as shown in **Figure 5-33**.

NOTE

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 5-33** Indicator

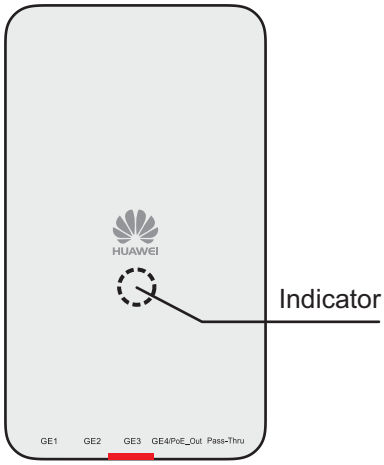



**Table 5-22** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>● The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>● The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 5-23** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 32.5 mm x 86 mm x 150 mm (1.28 in. x 3.39 in. x 5.91 in.) |
| | Weight | 0.25 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 32 MB NOR FLASH |
| Power specifications | Power input | PoE power supply:<br>● R251D: in compliance with IEEE 802.3af<br>● R251D-E: in compliance with IEEE 802.3at |
| | Maximum power consumption | ● R251D: 11.5 W<br>● R251D-E: 11.5 W (excluding the output power of the USB port and PoE_OUT port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | ● -60 m to +1800 m: 0°C to +40°C<br>● 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 5-24** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in smart antenna |

<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Antenna gain</td><td colspan="3">• 2.4 GHz: 3 dBi<br>• 5 GHz: 4 dBi<br>NOTE<br>Gain involves the physical gain and SINR enhancement of smart antennas.</td></tr>
<tr><td>Maximum number of users</td><td colspan="3">≤ 256<br>NOTE<br>The actual number of users varies according to the environment.</td></tr>
<tr><td>Maximum number of VAPs for each radio</td><td colspan="3">16</td></tr>
<tr><td>Maximum transmit power</td><td colspan="3">• 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>NOTE<br>The actual transmit power depends on local laws and regulations.</td></tr>
<tr><td>Maximum number of non-overlapping channels</td><td>2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1</td><td>5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3</td><td>NOTE<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.</td></tr>
<tr><td>Channel rate</td><td colspan="3">• 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s</td></tr>
</table>

# 5.5.4 Hardware Information (R251D-E)

## Appearance

NOTE

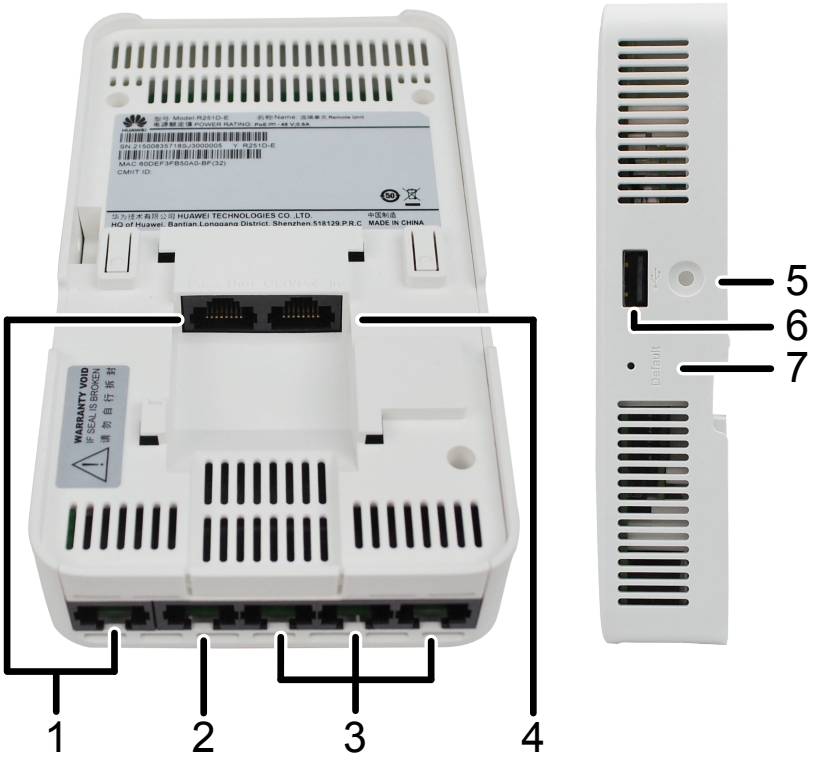
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 5-34** Appearance

## Ports

**Figure 5-35** Ports




As shown in **Figure 5-35**, each port can be described as follows:

1. Pass Through: RJ45 ports that connect to network cables or phone cables for transparent transmission.
2. GE4/PoE_Out: 10/100/1000M port that connects to the wired Ethernet and supports PoE output.
3. GE3 to GE1: 10/100/1000M port that connects to the wired Ethernet.
4. GE0/PoE_IN: 10/100/1000M port that connects to the wired Ethernet and supports PoE input.
5. Captive screw hole: Accommodates a captive screw.

   **NOTE**

   Tighten an M3x4 crosshead screw into the device to prevent the device from dropping. If the anti-theft function is required, tighten an M3x4 torx screw (instead of an M3x4 crosshead screw) into the device using a T9 torx security screwdriver. The tightening torques of the two screw types are both 0.15 N•m.
6. USB: Connects to a USB flash drive or other storage devices to extend the storage space of the AP. The USB2.0 standard is supported.
7. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.

## LED Indicators

The R251D-E provides only one indicator, as shown in **Figure 5-36**.

**NOTE**

- The indicator is located inside the panel, which turns on after the AP is powered on.
- Indicator colors may vary slightly at different temperature.

**Figure 5-36** Indicator

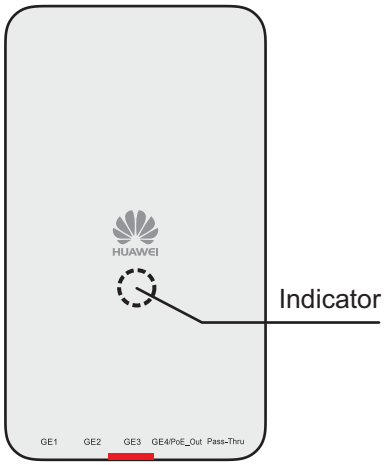



**Table 5-25** Description about the single indicator

| Indicator | Name | Color | Status | Description |
|---|---|---|---|---|
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>• The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP.<br>• The system enters the Uboot CLI. |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |

| Indicator | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | - | Green | Blinking once every 0.25s (4 Hz) | Alarm.<br>● The software is being upgraded.<br>● After the software is loaded and started, the AP requests to go online if it works in Fit AP or cloud-based management mode. The indicator remains in this state before the AP successfully goes online.<br>● The AP works in Fit AP or cloud-based management mode and fails to go online. |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 5-26** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 32.5 mm x 86 mm x 150 mm (1.28 in. x 3.39 in. x 5.91 in.) |
| | Weight | 0.25 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 32 MB NOR FLASH |
| Power specifications | Power input | PoE power supply:<br>● R251D: in compliance with IEEE 802.3af<br>● R251D-E: in compliance with IEEE 802.3at |
| | Maximum power consumption | ● R251D: 11.5 W<br>● R251D-E: 11.5 W (excluding the output power of the USB port and PoE_OUT port)<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |

| Item | | Description |
| --- | --- | --- |
| Environment specifications | Operating temperature | • -60 m to +1800 m: 0°C to +40°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 5-27** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in smart antenna |
| Antenna gain | • 2.4 GHz: 3 dBi<br>• 5 GHz: 4 dBi<br>**NOTE**<br>Gain involves the physical gain and SINR enhancement of smart antennas. |
| Maximum number of users | ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

### 5.5.5 Performance Specifications (R251D, R251D-E)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.

## 5.6 R450D Product Description

### 5.6.1 Product Characteristics (R450D)

The R450D is a remote unit (RU) used in Huawei agile distributed Wi-Fi solution. It supports PoE power supply, and is deployed indoors and connected to the central AP. The central AP and RUs are plug-and-play and can be managed and maintained in real time. Compared with traditional distributed AP solutions, the AC in Huawei agile distributed Wi-Fi solution needs to manage a smaller number of APs. A large number of RUs can be deployed, which improves the overall performance and reduces network deployment costs.

Installing the RU in settled mode does not affect indoor decorations or designs. It also has an IEEE 802.11a/b/g/n/ac/ac Wave 2 wireless module and can work on both 5 GHz and 2.4 GHz frequency bands.

The RU is recommended for environments with complex wall structures and high-density rooms, such as schools, hotels, hospitals, and office meeting rooms. Signals are transmitted through network cables without attenuation. The RUs are deployed indoors and provide comprehensive signal coverage.

The RU is managed by the central AP. The central AP and RUs are plug-and-play and can be managed and maintained in real time. Compared with traditional distributed AP solutions, the AC in Huawei agile distributed Wi-Fi solution needs to manage a smaller number of APs. A large number of RUs can be deployed, which improves the overall performance and reduces network deployment costs.

## Long-Distance Network Coverage

Unlike the traditional distributed AP which allows for a maximum feeder length of 15 m, the central AP uses network cables to replace feeder cables and supports up to 100 m distance from the RUs. The network coverage range is therefore expanded by several times.

## No Wall Penetration Loss, No Coverage Hole

Restricted by feeder length or installation requirements, signals have to pass through walls in some scenarios, resulting in large signal attenuation. If rooms to be covered have complex structures, coverage holes may occur. To prevent these problems, lots of calculation and verification work needs to be carried out. Huawei distributed solution solves these problems. In this solution, RUs are placed in rooms, and signals are transmitted over wired cables, without wall penetration loss, delivering high-quality wireless access services.

## 802.11ac/ac Wave 2 Gigabit Wireless Rate

The RU complies with IEEE 802.11a/b/g/n/ac/ac Wave 2, supports 2x2 MIMO, works on both 2.4 and 5 GHz frequency bands, and provides strong signals and gigabit wireless rate.

## Low Engineering Cost

Compared with traditional distributed APs, the central AP cuts down the following expenses:

- Construction: Network cables replace expensive feeder cables. The central AP can directly use the network cables originally routed in the rooms, without the need of deploying new cables.
- License: The maximum number of central APs in Fit mode allowed by the AC is controlled by licenses, but RUs do not require licenses. Therefore, one central AP can use RUs to cover dozens of rooms.

## Hierarchical Processing Technology, High Wireless Forwarding Capability

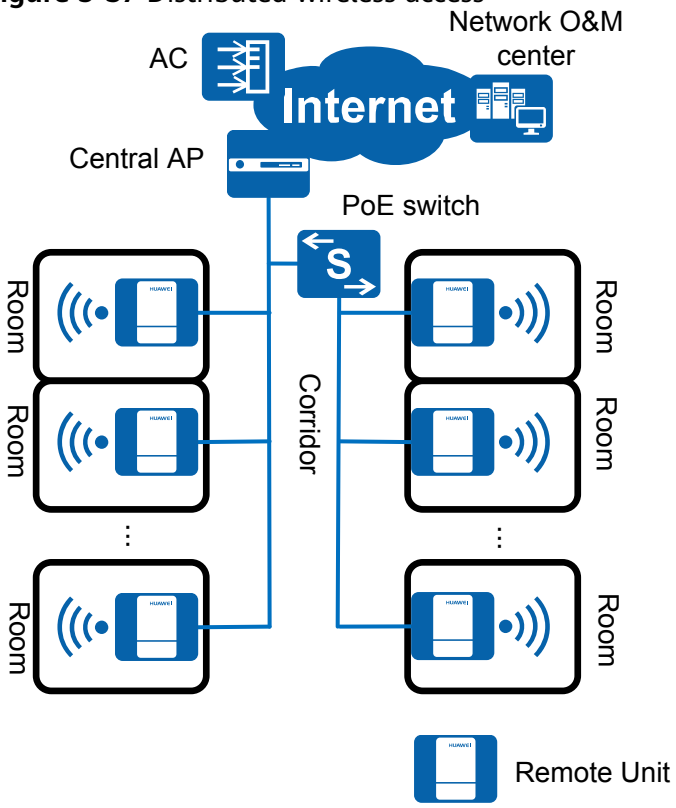
Huawei distributed solution uses innovative hierarchical processing technology. The central AP manages RUs in a centralized manner and concurrently forwards

service traffic, while the RUs only process radio signals. The hierarchical design makes the network structure clearer and reduces the processing burden on the central AP and RUs, improving efficiency and optimizing the overall wireless forwarding performance.

## 5.6.2 Usage Scenario (R450D)

**Figure 5-37** Distributed wireless access




As shown in the figure, the downlink GE interfaces of the central AP support PoE power supply and can be directly connected to RUs. The central AP can connect to more RUs through a PoE switch. RUs are deployed indoors and communicate with the central AP through network cables.

## 5.6.3 Hardware Information (R450D)

### Appearance

NOTE

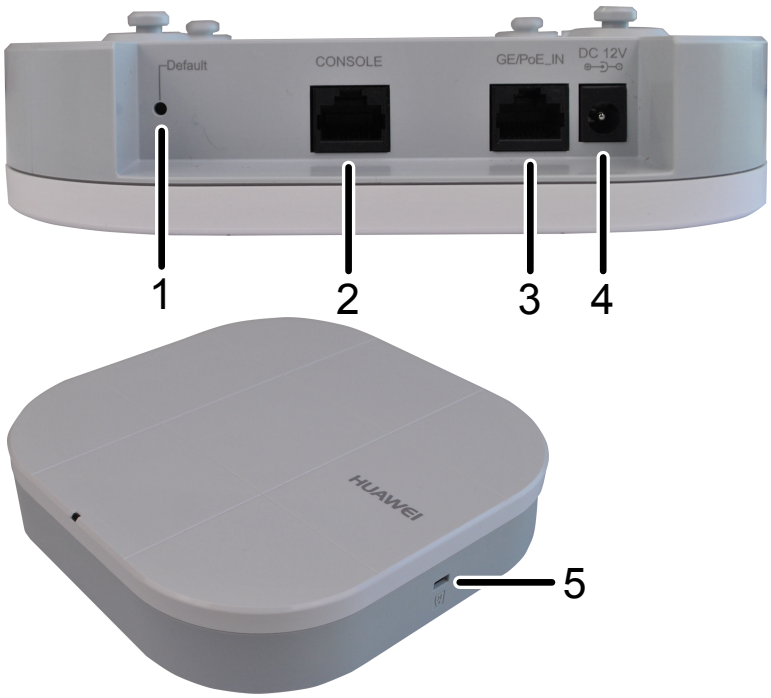
The actual device appearance may slightly differ from the following device appearance, but these differences will not affect device functions.

**Figure 5-38** R450D appearance


## Port

**Figure 5-39** R450D ports




As shown in **Figure 5-39**, each port can be described as follows:

1. Default: Restores factory settings and restarts the device when you hold down the button more than 3 seconds.
2. CONSOLE: Connects to a maintenance terminal for AP configuration and management.
3. GE/PoE_IN:10/100/1000M port that connects to the wired Ethernet and supports PoE input.

4. DC 12V: Connects a 12 V power adapter to the AP.

   NOTE

   When the AP uses the DC power supply, use a power adapter for power supply; otherwise, the AP may be damaged.

5. Security slot: Connects to a security lock.

## Indicator

The R450D provides only a single indicator, as shown in **Figure 5-40**.

NOTE

Indicator colors may vary slightly at different temperature.

**Figure 5-40** Indicator

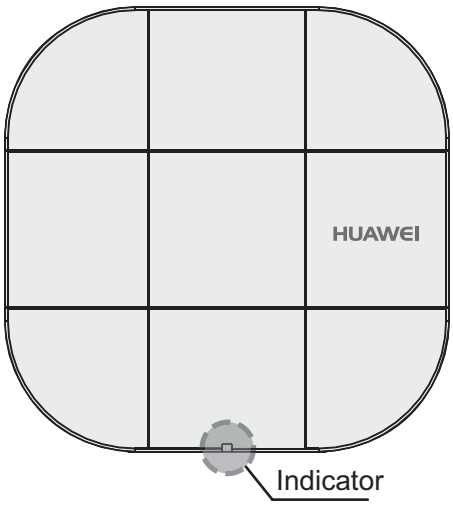



**Table 5-28** Description about the single indicator

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| Indicator | - | Green | Steady on | Default status after power-on.<br>The AP is just powered on and the software is not started yet. |
| | - | Green | Steady on after blinking once | Software startup status.<br>After the system is reset and starts uploading the software, the indicator blinks green once. Until the software is uploaded and started, the indicator remains steady green. |
| | - | Green | Blinking once every 2s (0.5 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and STAs are associated with the AP. |

| Type | Name | Color | Status | Description |
| --- | --- | --- | --- | --- |
| | | | Blinking once every 5s (0.2 Hz) | Running status.<br>The system is running properly, the Ethernet connection is normal, and no STA is associated with the AP. The system is in low power consumption state. |
| | - | Green | Blinking once Alarm Green every 0.25s (4 Hz) | Alarm.<br>• The software is being upgraded.<br>• After the software is uploaded and started, the AP working in Fit AP mode requests to go online on the AC and maintains this state until it goes online successfully on the AC (before the CAPWAP link is established).<br>• The AP registration fails (the CAPWAP link is disconnected). |
| | - | Red | Steady on | Fault.<br>A fault that affects services has occurred, such as a DRAM detection failure or system software loading failure. The fault cannot be automatically rectified and must be rectified manually. |

## Basic Specifications

**Table 5-29** Basic specifications

| Item | | Description |
| --- | --- | --- |
| Physical specifications | Dimensions (H x W x D) | 35 mm × 170 mm × 170 mm |
| | Weight | 0.41 kg |
| | System memory | 256 MB DDR3L |
| | FLASH | 64 MB NOR FLASH |
| Power specifications | Power input | • DC: 12 V ± 10%<br>• PoE power supply: in compliance with IEEE 802.3af/at |

| Item | | Description |
| --- | --- | --- |
| | Maximum power consumption | 12.1 W<br>**NOTE**<br>The actual maximum power consumption depends on local laws and regulations. |
| Environment specifications | Operating temperature | • -60 m to +1800 m: -10°C to +50°C<br>• 1800 m to 5000 m: Temperature decreases by 1°C every time the altitude increases 300 m. |
| | Storage temperature | -40°C to +70°C |
| | Operating humidity | 5% to 95% (non-condensing) |
| | IP rating | IP41 |
| | Atmospheric pressure | 53 kPa to 106 kPa |

## Radio Specifications

**Table 5-30** Radio specifications

| Item | Description |
| --- | --- |
| Antenna type | Built-in dual-band omnidirectional antenna |
| Antenna gain | • 2.4 GHz: 5 dBi<br>• 5 GHz: 5 dBi |
| Maximum number of users | ≤ 256<br>**NOTE**<br>The actual number of users varies according to the environment. |
| Maximum number of VAPs for each radio | 16 |
| Maximum transmit power | • 2.4 GHz: 23 dBm (combined power)<br>• 5 GHz: 23 dBm (combined power)<br>**NOTE**<br>The actual transmit power depends on local laws and regulations. |

| Item | Description | | |
| --- | --- | --- | --- |
| Maximum number of non-overlapping channels | 2.4 GHz (2.412 GHz to 2.472 GHz)<br>• 802.11b/g<br>– 20 MHz: 3<br>• 802.11n<br>– 20 MHz: 3<br>– 40 MHz: 1 | 5 GHz (5.18 GHz to 5.825 GHz)<br>• 802.11a<br>– 20 MHz: 13<br>• 802.11n<br>– 20 MHz: 13<br>– 40 MHz: 6<br>• 802.11ac<br>– 20 MHz: 13<br>– 40 MHz: 6<br>– 80 MHz: 3 | **NOTE**<br>The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the *Country Codes & Channels Compliance*. |
| Channel rate | • 802.11b: 1, 2, 5.5, and 11 Mbit/s<br>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s<br>• 802.11n: 6.5 to 400 Mbit/s<br>• 802.11ac: 6.5 to 867 Mbit/s | | |

## 5.6.4 Performance Specifications (R450D)

For AP performance specifications, log in to **Huawei official website** and download the brochure of the corresponding AP model, or query the specifications using **Info-Finder**.