

# CloudEngine S5731-S Series Switches





CloudEngine S5731-S series switches are next-generation standard gigabit switches that provide GE electrical access ports and 10GE uplink ports.

## Product Overview

The CloudEngine S5731-S series switches were developed based on next-generation high-performing hardware and the Huawei Versatile Routing Platform (VRP). The CloudEngine S5731-S supports simplified operations and maintenance (O&M), intelligent stack (iStack), flexible Ethernet networking. It also provides enhanced Layer 3 features and mature IPv6 features. The CloudEngine S5731-S can be used in various scenarios. For example, it can be used as an access or aggregation switch on a campus network or as an access switch in a data center.

## Models and Appearances

The following models are available in the CloudEngine S5731-S series.

Models and Appearances	Description
 CloudEngine S5731-S24T4X	<ul style="list-style-type: none"> <li>• 24 10/100/1000Base-T Ethernet ports, 4 10GE SFP+ ports</li> <li>• 1+1 power backup</li> <li>• Forwarding performance: 96 Mpps</li> <li>• Switching capacity: 672 Gbit/s</li> </ul>
 CloudEngine S5731-S24P4X	<ul style="list-style-type: none"> <li>• 24 10/100/1000Base-T Ethernet ports, 4 10GE SFP+ ports</li> <li>• 1+1 power backup</li> <li>• PoE+</li> <li>• Forwarding performance: 96 Mpps</li> <li>• Switching capacity: 672 Gbit/s</li> </ul>
 CloudEngine S5731-S48T4X	<ul style="list-style-type: none"> <li>• 48 10/100/1000Base-T Ethernet ports, 4 10GE SFP+ ports</li> <li>• 1+1 power backup</li> <li>• Forwarding performance: 125 Mpps</li> <li>• Switching capacity: 672 Gbit/s</li> </ul>
 CloudEngine S5731-S48P4X	<ul style="list-style-type: none"> <li>• 48 10/100/1000Base-T Ethernet ports, 4 10GE SFP+ ports</li> <li>• 1+1 power backup</li> <li>• PoE+</li> <li>• Forwarding performance: 125 Mpps</li> <li>• Switching capacity: 672 Gbit/s</li> </ul>

# Features and Highlights

## Powerful Service Processing Capability and Multiple Security Control Mechanisms

- The CloudEngine S5731-S supports many Layer 2/Layer 3 multicast protocols such as PIM SM, PIM DM, PIM SSM, MLD, and IGMP snooping, to support multi-terminal high-definition video surveillance and video conferencing services.
- The CloudEngine S5731-S supports multiple Layer 3 features including OSPF, IS-IS, BGP, and VRRP, meeting enterprises' requirements on access and aggregation service bearing, and enabling a variety of voice, video, and data applications.
- The CloudEngine S5731-S supports MAC address authentication, 802.1x authentication, and Portal authentication, and implements dynamic delivery of policies (VLAN, QoS, and ACL) to users.
- The CloudEngine S5731-S provides a series of mechanisms to defend against DoS and user-targeted attacks. DoS attacks are targeted at switches and include SYN flood, Land, Smurf, and ICMP flood attacks. User-targeted attacks include bogus DHCP server attacks, IP/MAC address spoofing, DHCP request flood, and change of the DHCP CHADDR value.
- The CloudEngine S5731-S sets up and maintains a DHCP snooping binding table, and discards the packets that do not match the table entries. You can specify DHCP snooping trusted and untrusted ports to ensure that users connect only to the authorized DHCP server.
- The CloudEngine S5731-S supports strict ARP learning, which protects a network against ARP spoofing attacks to ensure normal network access.

## Easy O&M

- The CloudEngine S5731-S supports Super Virtual Fabric (SVF), which virtualizes the "Core/aggregation + Access switch + AP" structure into a logical device. The CloudEngine S5731-S provides the innovative network management solution in the industry to simplify device management. It allows plug-and-play access switches and APs. In addition, the CloudEngine S5731-S supports service configuration templates. The templates are configured on core devices and automatically delivered to access devices, enabling centralized control, simplified service configuration, and flexible configuration modification. The CloudEngine S5731-S functions as a client in an SVF system.
- The CloudEngine S5731-S supports zero-touch deployment, replacement of faulty devices without additional configuration, USB-based deployment, batch configuration, and batch remote upgrade. The capabilities facilitate device deployment, upgrade, service provisioning, and other management and maintenance operations, and also greatly reduce O&M costs. The CloudEngine S5731-S can be managed using SNMP v1/v2c/v3, CLI, web-based network management system, or SSH v2.0. Additionally, it supports RMON, multiple log hosts, port traffic statistics collection, and network quality analysis, which facilitate network optimization and reconstruction.

## Multiple Reliability Mechanisms

- The CloudEngine S5731-S supports iStack. This technology can virtualize up to nine physical switches into one logical switch. Member switches in a stack implement redundancy backup to improve device reliability and use inter-device link aggregation to improve link reliability. iStack provides high network scalability. You can increase a stack's ports, bandwidth, and processing capacity by simply adding member switches. iStack also simplifies device configuration and management. After a stack is set up, multiple physical switches are virtualized into one logical device. You can log in to any member switch in the stack to manage all the member switches in the stack.
- The CloudEngine S5731-S is equipped with two removable power modules that can work in 1+1 redundancy backup mode.
- In addition to traditional STP, RSTP, and MSTP, the CloudEngine S5731-S supports Huawei-developed Smart Ethernet Protection (SEP) technology and the latest Ethernet Ring Protection Switching (ERPS) standard. SEP is a ring protection protocol specific to the Ethernet link layer, and applies to various ring network topologies, such as open ring topology, closed ring topology, and cascading ring topology. This protocol is reliable, easy to maintain, and implements fast protection switching within 50 ms. ERPS is defined in ITU-T G.8032. It implements millisecond-level protection switching based on traditional Ethernet MAC and bridging functions.
- The CloudEngine S5731-S supports Smart Link. One CloudEngine S5731-S switch can connect to multiple aggregation switches through multiple links, implementing backup of uplinks and significantly improving reliability of access devices.
- The CloudEngine S5731-S supports Ethernet OAM (IEEE 802.3ah/802.1ag) to detect link faults quickly.

## Mature IPv6 Technologies

- The CloudEngine S5731-S uses the mature, stable VRP platform and supports IPv4/IPv6 dual stack, IPv6 RIPng, and IPv6 over IPv4 tunnels (including manual, 6-to-4, and ISATAP tunnels). With these IPv6 features, the CloudEngine S5731-S can be deployed on a pure IPv4 network, a pure IPv6 network, or a shared IPv4/IPv6 network, helping achieve IPv4-to-IPv6 transition.

## OPS

- Open Programmability System (OPS) is an open programmable system based on the Python language. IT administrators can program the O&M functions of a switch through Python scripts to quickly innovate functions and implement intelligent O&M.

## Intelligent O&M

- The CloudEngine S5731-S provides telemetry technology to collect device data in real time and send the data to Huawei campus network analyzer CampusInsight. The CampusInsight analyzes network data based on the intelligent fault identification algorithm, accurately displays the real-time network status, effectively demarcates and locates faults in a timely manner, and identifies network problems that affect user experience, accurately guaranteeing user experience.

- The CloudEngine S5731-S supports a variety of intelligent O&M features for audio and video services, including the enhanced Media Delivery Index (eMDI). With this eMDI function, the switch can function as a monitored node to periodically conduct statistics and report audio and video service indicators to the CampusInsight platform. In this way, the CampusInsight platform can quickly demarcate audio and video service quality faults based on the results of multiple monitored nodes.

## Intelligent Upgrade

- Switches support the intelligent upgrade feature. Specifically, switches obtain the version upgrade path and download the newest version for upgrade from the Huawei Online Upgrade Platform (HOUP). The entire upgrade process is highly automated and achieves one-click upgrade. In addition, preloading the version is supported, which greatly shortens the upgrade time and service interruption time.

- The intelligent upgrade feature greatly simplifies device upgrade operations and makes it possible for the customer to upgrade the version independently. This greatly reduces the customer's maintenance costs. In addition, the upgrade policies on the HOUP platform standardize the upgrade operations, which greatly reduces the risk of upgrade failures.

## Product Specifications

Item	CloudEngine S5731-S24T4X	CloudEngine S5731-S24P4X	CloudEngine S5731-S48T4X	CloudEngine S5731-S48P4X
Fixed port	24 10/100/1000Base-T ports, 4 10GE SFP+ ports	24 10/100/1000Base-T (PoE+) ports, 4 10GE SFP+ ports	48 10/100/1000Base-T ports, 4 10GE SFP+ ports	48 10/100/1000Base-T (PoE+) ports, 4 10GE SFP+ ports
Dimensions (W x D x H)	442 mm x 420 mm x 43.6 mm	442 mm x 420 mm x 43.6 mm	442 mm x 420 mm x 43.6 mm	442 mm x 420 mm x 43.6 mm
Chassis height	1U	1U	1U	1U
Chassis weight (full configuration weight)	8.4kg	8.6kg	8.55kg	8.8kg
Input voltage	<ul style="list-style-type: none"> <li>Rated voltage range: 100 V AC to 240 V AC, 50/60 Hz</li> <li>Maximum voltage range:                             <ul style="list-style-type: none"> <li>AC input: 90 V AC to 290 V AC, 45 Hz to 65 Hz</li> <li>High-Voltage DC</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Rated voltage range: 100 V AC to 240 V AC, 50/60 Hz</li> <li>Maximum voltage range:                             <ul style="list-style-type: none"> <li>AC input: 90 V AC to 290 V AC, 45 Hz to 65 Hz</li> <li>High-Voltage DC</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Rated voltage range: 100 V AC to 240 V AC, 50/60 Hz</li> <li>Maximum voltage range:                             <ul style="list-style-type: none"> <li>AC input: 90 V AC to 290 V AC, 45 Hz to 65 Hz</li> <li>High-Voltage DC</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Rated voltage range: 100 V AC to 240 V AC, 50/60 Hz</li> <li>Maximum voltage range:                             <ul style="list-style-type: none"> <li>AC input: 90 V AC to 290 V AC, 45 Hz to 65 Hz</li> <li>High-Voltage DC</li> </ul> </li> </ul>

Item	CloudEngine S5731-S24T4X	CloudEngine S5731-S24P4X	CloudEngine S5731-S48T4X	CloudEngine S5731-S48P4X
	input: 190 V DC to 290 V DC	input: 190 V DC to 290 V DC	input: 190 V DC to 290 V DC	input: 190 V DC to 290 V DC
Maximum power consumption	114 W	<ul style="list-style-type: none"> <li>121 W (without PDs);</li> <li>977 W (with PDs, PDs: 740 W)</li> </ul>	124 W	<ul style="list-style-type: none"> <li>132 W (without PDs);</li> <li>1750 W (with PDs, PDs: 1440 W)</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Under normal temperature (sound power): 57.5dB(A)</li> <li>Under high temperature (sound power): 70.9dB(A)</li> <li>Under normal temperature (sound pressure): 47.5dB(A)</li> </ul>	<ul style="list-style-type: none"> <li>Under normal temperature (sound power): 62.3dB(A)</li> <li>Under high temperature (sound power): 71.8dB(A)</li> <li>Under normal temperature (sound pressure): 52.8dB(A)</li> </ul>	<ul style="list-style-type: none"> <li>Under normal temperature (sound power): 57.5dB(A)</li> <li>Under high temperature (sound power): 70.9dB(A)</li> <li>Under normal temperature (sound pressure): 47.5dB(A)</li> </ul>	<ul style="list-style-type: none"> <li>Under normal temperature (sound power): 62.3dB(A)</li> <li>Under high temperature (sound power): 71.8dB(A)</li> <li>Under normal temperature (sound pressure): 52.8dB(A)</li> </ul>
Operating temperature	<ul style="list-style-type: none"> <li>0-1800 m altitude: -5°C to 45°C</li> <li>1800-5000 m altitude: The operating temperature reduces by 1°C every time the altitude increases by 220 m.</li> </ul>	<ul style="list-style-type: none"> <li>0-1800 m altitude: -5°C to 45°C</li> <li>1800-5000 m altitude: The operating temperature reduces by 1°C every time the altitude increases by 220 m.</li> </ul>	<ul style="list-style-type: none"> <li>0-1800 m altitude: -5°C to 45°C</li> <li>1800-5000 m altitude: The operating temperature reduces by 1°C every time the altitude increases by 220 m.</li> </ul>	<ul style="list-style-type: none"> <li>0-1800 m altitude: -5°C to 45°C</li> <li>1800-5000 m altitude: The operating temperature reduces by 1°C every time the altitude increases by 220 m.</li> </ul>
Storage temperature	-40 °C~70 °C	-40 °C~70 °C	-40 °C~70 °C	-40 °C~70 °C
Relative humidity	5% to 95% (non-condensing)	5% to 95% (non-condensing)	5% to 95% (non-condensing)	5% to 95% (non-condensing)
Surge protection specification (service port)	Common mode: ±6 kV	Common mode: ±6 kV	Common mode: ±6 kV	Common mode: ±6 kV
Surge protection specification (power port)	<ul style="list-style-type: none"> <li>Differential mode: ±6 kV</li> <li>Common mode: ±6 kV</li> </ul>	<ul style="list-style-type: none"> <li>Differential mode: ±6 kV</li> <li>Common mode: ±6 kV</li> </ul>	<ul style="list-style-type: none"> <li>Differential mode: ±6 kV</li> <li>Common mode: ±6 kV</li> </ul>	<ul style="list-style-type: none"> <li>Differential mode: ±6 kV</li> <li>Common mode: ±6 kV</li> </ul>
Heat dissipation	Air cooling heat dissipation, intelligent speed adjustment, and pluggable fans	Air cooling heat dissipation, intelligent speed adjustment, and pluggable fans	Air cooling heat dissipation, intelligent speed adjustment, and pluggable fans	Air cooling heat dissipation, intelligent speed adjustment, and pluggable fans

## Service Features

Feature	Description
MAC address table	IEEE 802.1d standards compliance
	32K MAC address entries
	MAC address learning and aging

Feature	Description
	Static, dynamic, and blackhole MAC address entries
	Packet filtering based on source MAC addresses
VLAN	4094 VLANs
	Guest VLAN and voice VLAN
	GVRP
	MUX VLAN
	VLAN assignment based on MAC addresses, protocols, IP subnets, policies, and ports
	VLAN mapping
Ethernet loop protection	RRPP ring topology and RRPP multi-instance
	Smart Link tree topology and Smart Link multi-instance, providing millisecond-level protection switching
	SEP
	ERPS (G.8032)
	BFD for OSPF, BFD for IS-IS, BFD for VRRP, and BFD for PIM
	STP (IEEE 802.1d), RSTP (IEEE 802.1w), and MSTP (IEEE 802.1s)
	BPDU protection, root protection, and loop protection
IP routing	Static routes, RIP v1/2, RIPng, OSPF, OSPFv3, IS-IS, IS-ISv6, BGP, BGP4+, ECMP, routing policy
	Up to 16K FIBv4 entries
	Up to 8K FIBv4 entries
Interoperability	VLAN-Based Spanning Tree (VBST), working with PVST, PVST+, and RPVST
	Link-type Negotiation Protocol (LNP), similar to DTP
	VLAN Central Management Protocol (VCMP), similar to VTP
IPv6 features	Up to 8K ND entries
	PMTU
	IPv6 Ping, IPv6 Tracert, and IPv6 Telnet
	ACLs based on source IPv6 addresses, destination IPv6 addresses, Layer 4 ports, or protocol types
	Multicast Listener Discovery snooping (MLDv1/v2)
	IPv6 addresses configured for sub-interfaces, VRRP6, DHCPv6, and L3VPN
Multicast	IGMP v1/v2/v3 snooping and IGMP fast leave
	Multicast forwarding in a VLAN and multicast replication between VLANs
	Multicast load balancing among member ports of a trunk
	Controllable multicast
	Port-based multicast traffic statistics
	IGMP v1/v2/v3, PIM-SM, PIM-DM, and PIM-SSM
	MSDP

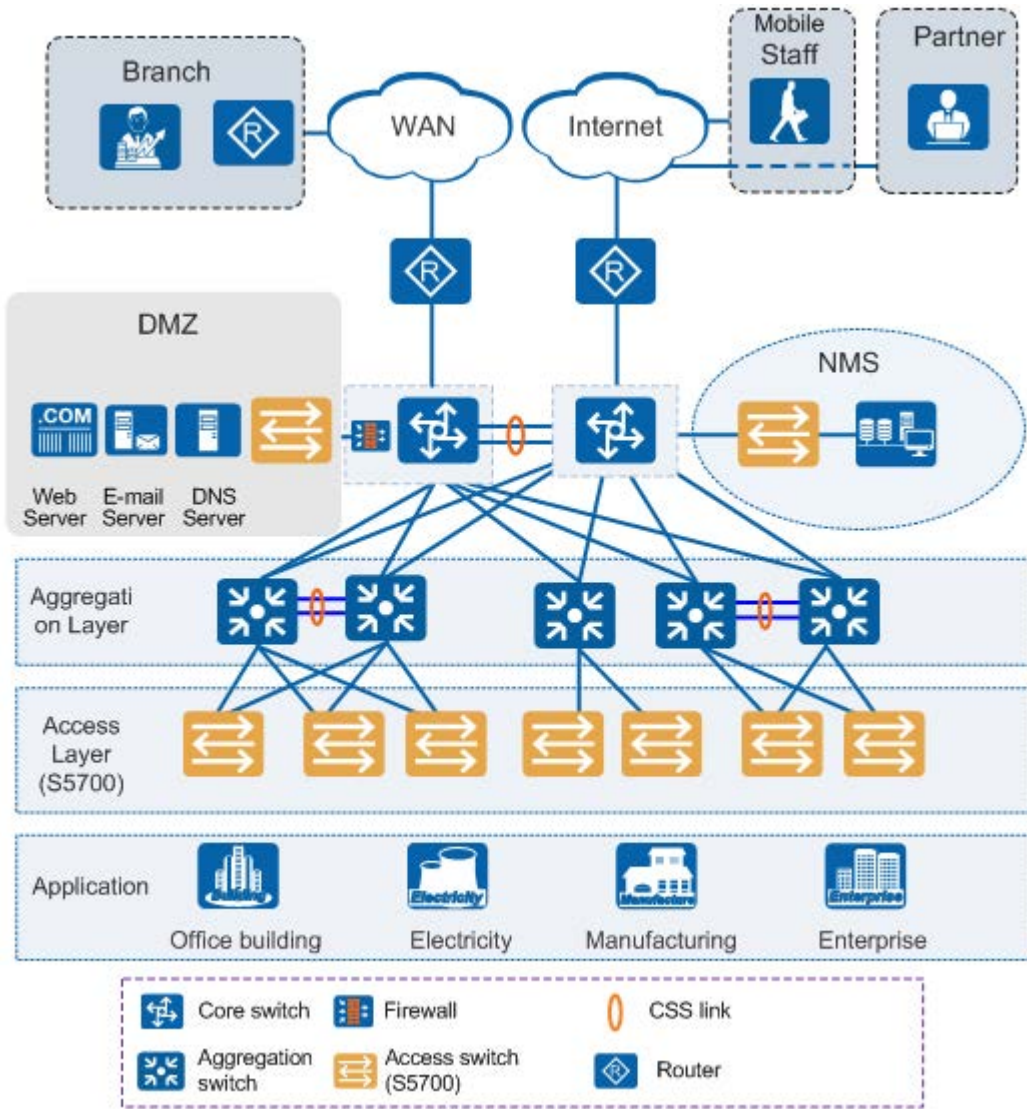
Feature	Description
	MVPN
QoS/ACL	Rate limiting in the inbound and outbound directions of a port
	Packet redirection
	Port-based traffic policing and two-rate three-color CAR
	Eight queues per port
	DRR, SP and DRR+SP queue scheduling algorithms
	WRED
	Re-marking of the 802.1p and DSCP fields of packets
	Packet filtering at Layer 2 to Layer 4, filtering out invalid frames based on the source MAC address, destination MAC address, source IP address, destination IP address, TCP/UDP port number, protocol type, and VLAN ID
	Queue-based rate limiting and shaping on ports
Security	Hierarchical user management and password protection
	DoS attack defense, ARP attack defense, and ICMP attack defense
	Binding of the IP address, MAC address, port number, and VLAN ID
	Port isolation, port security, and sticky MAC
	MAC Forced Forwarding (MFF)
	Blackhole MAC address entries
	Limit on the number of learned MAC addresses
	IEEE 802.1x authentication and limit on the number of users on a port
	AAA authentication, RADIUS authentication, and HWTACACS authentication
	NAC
	SSH V2.0
	HTTPS
	CPU protection
	Blacklist and whitelist
	Attack source tracing and punishment for IPv6 packets such as ND, DHCPv6, and MLD packets
	Secure Boot
	IPSec
	ECA
	Deception
	Reliability
E-trunk	
Ethernet OAM (IEEE 802.3ah and IEEE 802.1ag)	
ITU-Y.1731	

Feature	Description
	DLDP
	LLDP
	BFD for BGP, BFD for IS-IS, BFD for OSPF, BFD for static route
VXLAN	VXLAN L2 and L3 gateways
	Centralized and distributed gateway
	BGP-EVPN
	Configured through the NETCONF protocol
Super Virtual Fabric (SVF)	A two-layer client architecture is supported.
	IGMP snooping can be enabled on access switches (ASs) and the maximum number of access users on a port can be configured.
	ASs can be independently configured. Services that are not supported by templates can be configured on the parent.
	Third-party devices are allowed between SVF parent and clients.
	Working as an SVF client that is plug-and-play with zero configuration
iPCA	Directly coloring service packets to collect real-time statistics on the number of lost packets and packet loss ratio
	Collection of statistics on the number of lost packets and packet loss ratio at network and device levels
TWAMP	Two-way IP link performance measurement
	Measurement on two-way packet delay, one-way packet loss rate, and one-way packet jitter
Management and maintenance	iStack, with up to 9 member switches in a stack
	SNMP v1/v2c/v3
	RMON
	Smart Application Control (SAC)
	Web-based NMS
	System logs and alarms of different levels
	GVRP
	MUX VLAN
	NetStream
	Intelligent O&M

## Networking and Applications

### Large-sized Enterprise Campus Networks

The CloudEngine S5731-S provides various terminal security management features, and supports functions such as PoE, voice VLAN, and QoS. The switch can be used for desktop access and provides gigabit access speed.



The CloudEngine S5731-S provides various security features including ARP security, IP security, IP source guard, and user access control policies such as NAC and ACLs, to control access of user terminals.

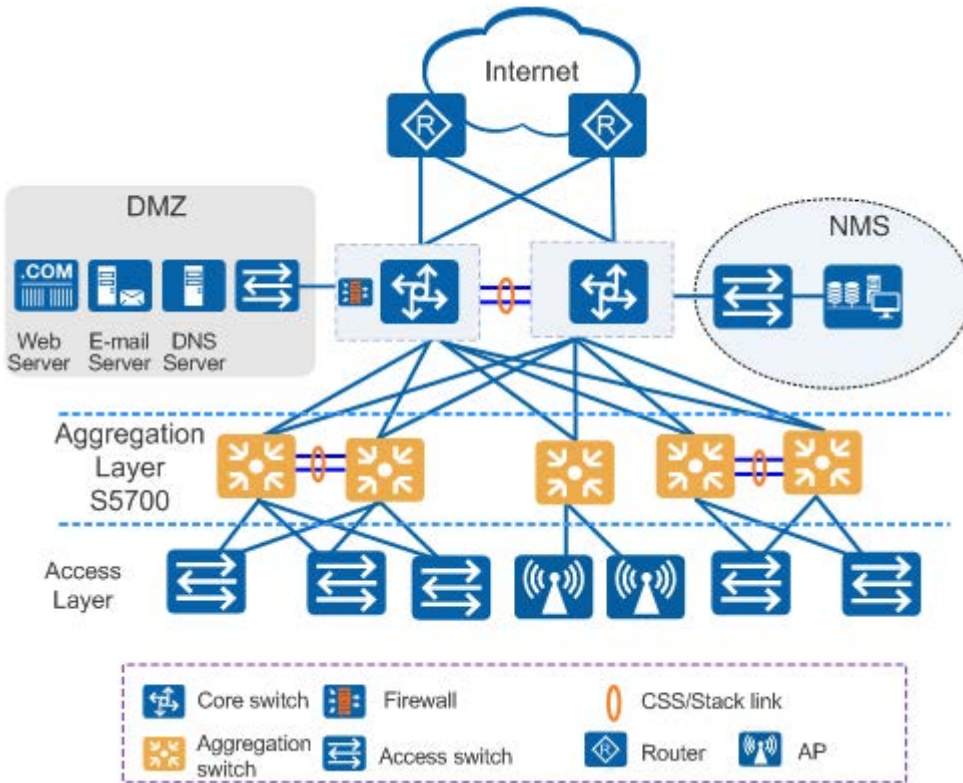
In addition, the switch supports the Link Aggregation Control Protocol (LACP) to provide multi-link access for servers, improving link bandwidth and reliability.

In terms of device management, the CloudEngine S5731-S provides Easy Operation and USB-based deployment, which facilitates device deployment and management.

## Small-and Middle-Sized Enterprise Campus Network

The CloudEngine S5731-S switches can be located at the aggregation layer to build a high-performance, reliable enterprise campus network.

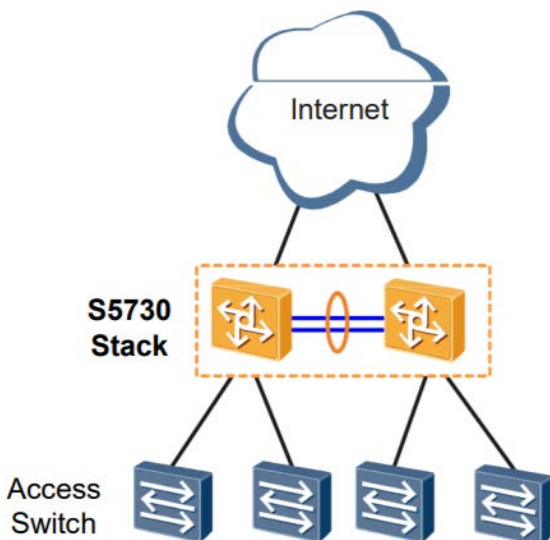




On an enterprise network or campus network, the CloudEngine S5731-S switches connect to access switches through gigabit or 10 gigabit interfaces, provide high performance and large switching capacity, and connect to core switches through 10 gigabit optical interfaces. The network provides 10 Gbit/s rate for the backbone layer and 100 Mbit/s access rate for terminals, meeting requirements for high bandwidth and multi-service.

The CloudEngine S5731-S provides SEP and RRPP to implement millisecond-level protection switchover. The switches form a stack system by using iStack technology to implement the distributed forwarding structure and fast fault recovery. The stack system increases the number of user interfaces and improves packet processing capability. The member switches can be managed in a uniform manner to facilitate network management and maintenance.

### Small-Sized Enterprise Campus Network



Other than that, the CloudEngine S5731-S switches can be used as the core switches of a small-sized enterprise campus network, which have powerful aggregation and routing capabilities. The CloudEngine S5731-S switches use iStack to ensure high reliability. The switches provide various access control policies to achieve centralized user management and simplify configuration.

# Ordering Information

The following table lists ordering information of the CloudEngine S5731-S series switches.

Model	Product Description
CloudEngine S5731-S24T4X	CloudEngine S5731-S24T4X (24*10/100/1000BASE-T ports, 4*10GE SFP+ ports, without power module)
CloudEngine S5731-S24P4X	CloudEngine S5731-S24P4X (24*10/100/1000BASE-T ports, 4*10GE SFP+ ports, PoE+, without power module)
CloudEngine S5731-S48T4X	CloudEngine S5731-S48T4X (48*10/100/1000BASE-T ports, 4*10GE SFP+ ports, without power module)
CloudEngine S5731-S48P4X	CloudEngine S5731-S48P4X (48*10/100/1000BASE-T ports, 4*10GE SFP+ ports, PoE+, without power module)
PAC600S12-CB	600W AC Power Module
PAC150S12-R	150W AC Power Module
PDC1000S12-DB	1000W DC Power Module
PAC1000S56-CB	1000W AC PoE Power Module
FAN-023A-B	Fan Module

## More Information


For more information about Huawei Campus Switches, visit <http://e.huawei.com> or contact us in the following ways:

- Global service hotline: <http://e.huawei.com/en/service-hotline>
- Logging in to the Huawei Enterprise technical support website: <http://support.huawei.com/enterprise/>
- Sending an email to the customer service mailbox: [support\\_e@huawei.com](mailto:support_e@huawei.com)

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