



Huawei Agile Controller-DCN Datasheet

The Agile Controller-DCN is Huawei's next-generation SDN controller for data centers and the core component of the company's CloudFabric cloud data center network solution.

The Agile Controller-DCN centralizes management and control of the cloud data center Fabric network, implements automated mapping from applications to physical networks, performs resource pool deployment, and visualizes Operations and Maintenance (O&M), enabling administrators to build service-oriented features for dynamically scheduling network services. Additionally, the Agile Controller-DCN seamlessly interoperates with popular cloud platforms, container platforms and computing resources through open and standards-based northbound and southbound interfaces. These facilities provide flexible collaboration capabilities between computing and network resources. With these capabilities, the Agile Controller-DCN allows customers to flexibly deploy and schedule network resources based on their application requirements and service development process, enabling the data center network to be more agile for cloud services.

Product Description

The maturity of big data analysis and mining technologies allows personalized applications to be developed today at an increasingly faster pace, shortening the product life cycle. A growing number of enterprises have chosen to use virtualization and cloud computing technologies to improve the efficiency, processes, and competitiveness of their business, as well as to accelerate IT architecture transformation. Data center networks are a key IT infrastructure, but outdated technical architecture makes them a sticking point for business expansion. This is preventing horizontal expansion of computing and storage resources of data centers and has failed to keep the speed of network deployment consistent with that of computing and storage resource virtualization, resulting in serious resource wastage and low cloud service development efficiency.

Huawei's CloudFabric solution provides a new data center network architecture. It supports network resource pools and can be flexibly defined as required. It allows centralized control and large-scale, flexible, and automatic deployment of services. It connects to computing and storage resources seamlessly. The Huawei CloudFabric solution leverages the preceding features to help customers build simple, flexible, and open data center networks. As the core of the CloudFabric solution, the Agile Controller-DCN enables unified control and dynamic scheduling of network resources and supports automated and prompt deployment of cloud services.

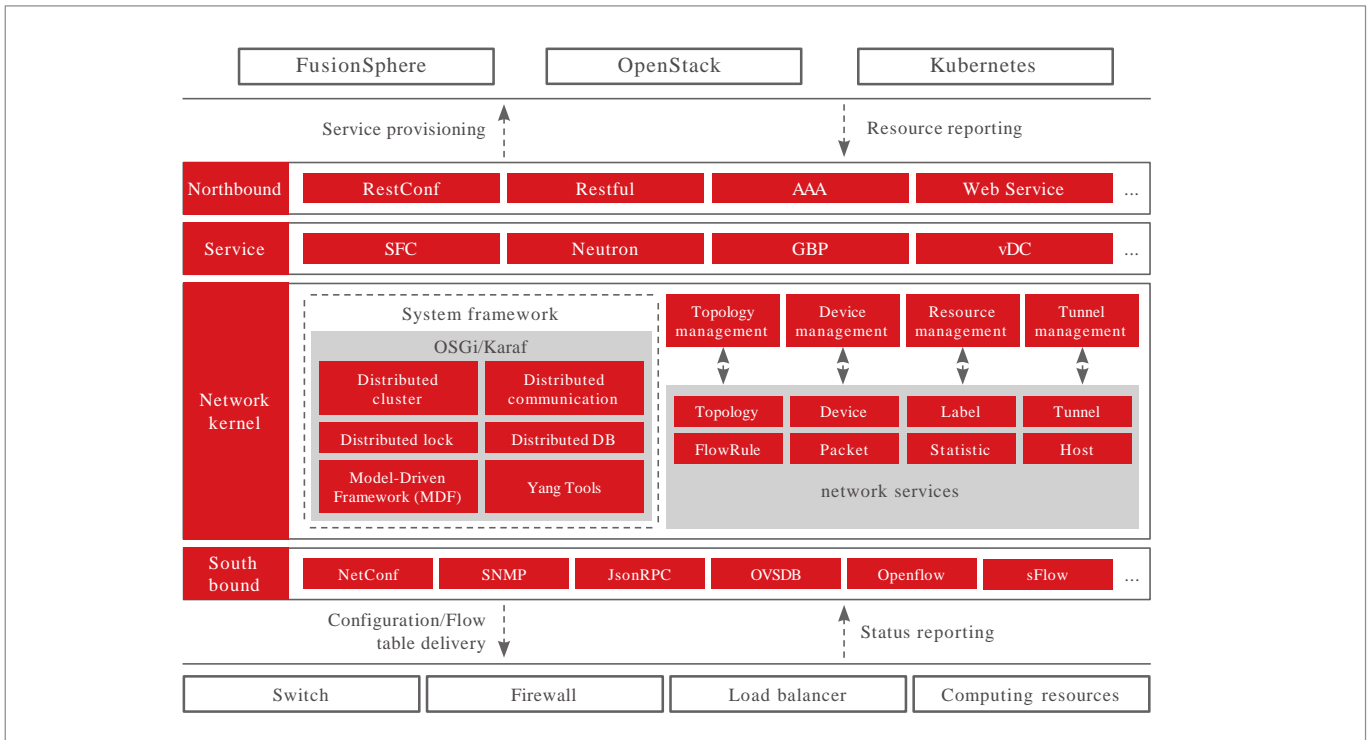
Key Components

Agile Controller-DCN is an open system designed and provides various standard interfaces. It connects to Layer 2-7 of mainstream OpenStack and Kubernetes platforms through northbound interfaces and connects to physical switches, virtual switches, and firewalls through southbound interfaces. The Agile Controller-DCN converts northbound network service interfaces into southbound configuration to achieve network automation. If no cloud platform is used, the Agile Controller-DCN provides independent service distribution GUIs and supports

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connections to computing resource management systems in the east and west directions for network and computing collaboration.



Benefits

High efficiency: automated network, 10-times faster at service launch

- Provides a multitude of Fabric networking capabilities.
- Distributes services in different scenarios.
- Manages multiple tenants.
- Flexibly orchestrates services from Layer 4 to Layer 7.
- Automatically distributes network resources based on demands.

Simplicity: simpler O&M and controllable and visualized network

- Provides the virtual perception solution and visualizes network resources.
- Provides mapping of physical, logical, and application topologies to visualize network services.
- Provides service quality checks to visualize network paths.

Openness: standardized interfaces and open ecosystem

- Supports northbound RESTful interface to connect to mainstream container platforms, cloud platforms and third-party applications.
- Supports NetConf, OpenFlow, OVSDB, and SNMP southbound interfaces to manage physical and virtual network devices.
- Supports heterogeneous networks that consist of third-party computing platforms of different vendors in the east and west directions for orchestration of network and computing resources.

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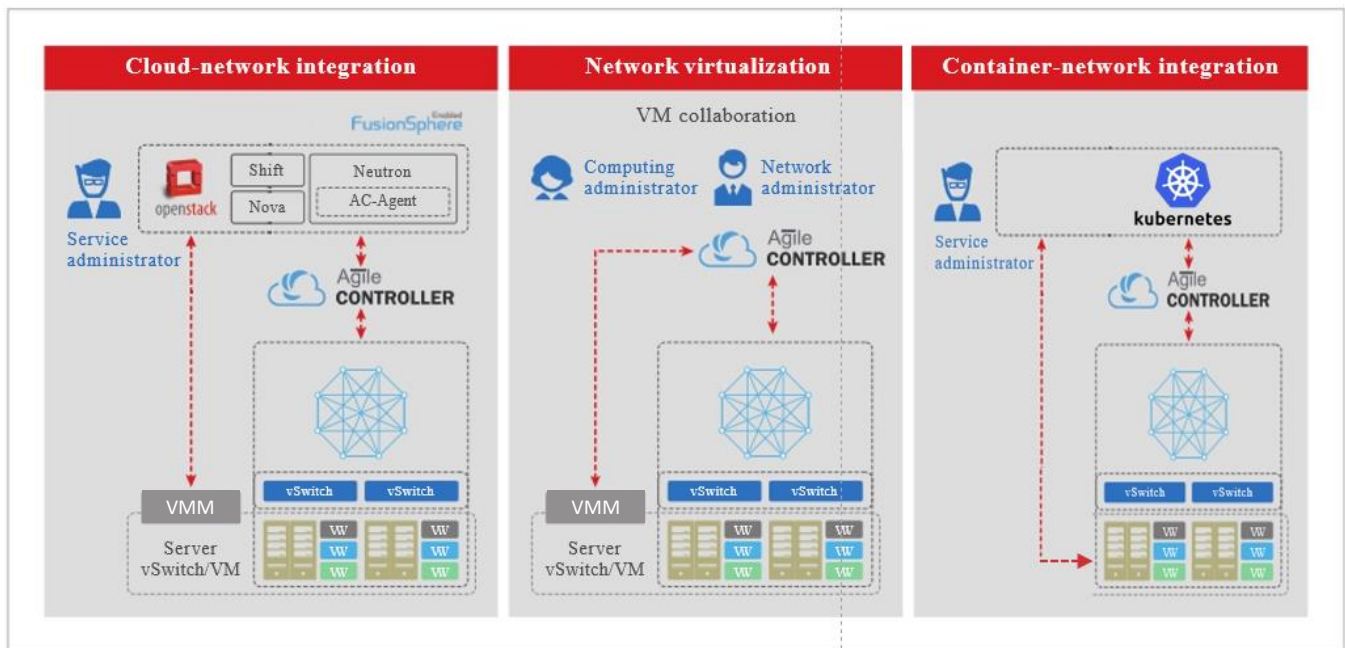
Key Features

Multi-scenario service distribution

The Agile Controller-DCN provides complete and simple GUIs for network management and control as well as service distribution, helping operators automatically deploy networks. The Agile Controller-DCN is an open software platform and can connect to mainstream cloud platforms and container platforms, which then distribute network services.

The Agile Controller-DCN can be used in one of the following service distribution scenarios to meet different customer requirements:

- **Container-network integration:** The Agile Controller-DCN connects to the Kubernetes through northbound interfaces.
- **Cloud-network integration:** The Agile Controller-DCN connects to the cloud platform through northbound interfaces. The cloud platform distributes network services, by orchestrating and unifying the management of network, computing, and storage resources.
- **Network virtualization:** The Agile Controller-DCN manages and controls the network. Network administrators distribute network services in the Agile Controller-DCN to automatically deploy networks. This scenario can be divided into the following two smaller scenarios based on whether the Agile Controller-DCN collaborates with VMs:
 - **VM collaboration:** The Agile Controller-DCN creates VMs, connects them to the network, and supports VM migration.
 - **Independent network management:** The Agile Control-DCN independently manages and controls the network to implement distribution and automatic deployment of network services. This scenario is applicable mainly to the rack leasing service of carriers. In this scenario, fragmented rack resources can be integrated, the network resource pool can be built, and services such as bandwidth leasing and VASs can be provided.



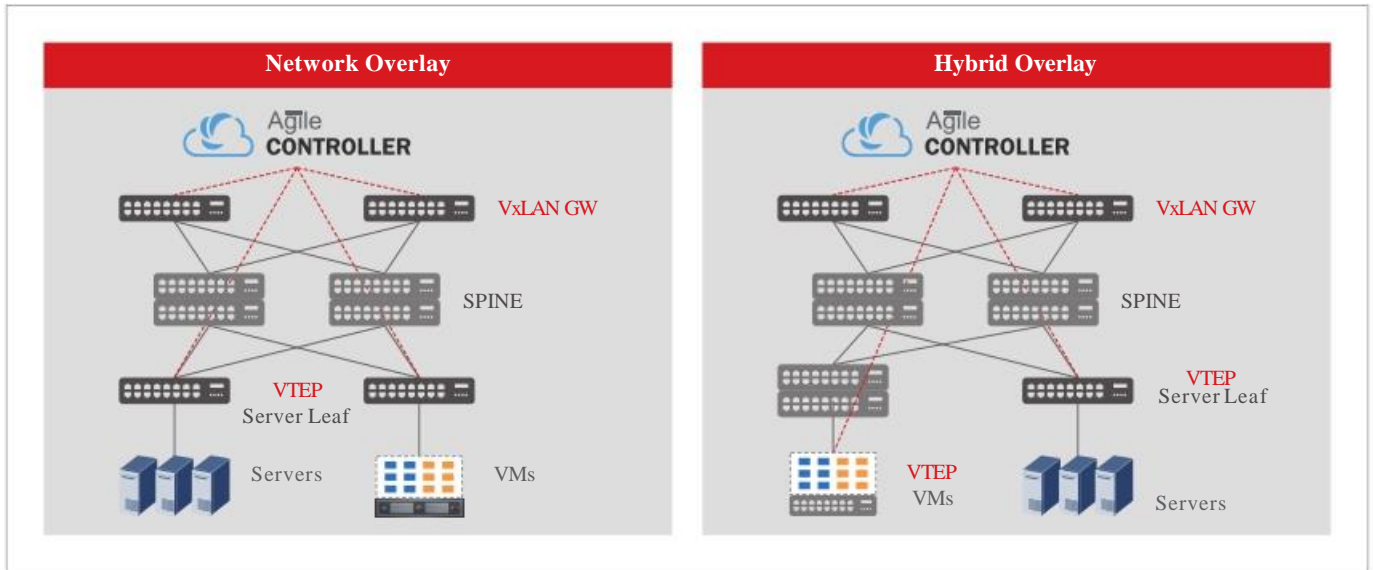
Multiple Fabric networking modes

The Agile Controller-DCN supports multiple Fabric networking modes to meet application requirements of different users and provides flexible deployment schemes for them.

- **Network Overlay:** In this networking mode, the VXLAN is composed of physical devices with higher performance and reliability, so this mode is suitable for private cloud users who have high requirements on the forwarding performance and reliability. Moreover, this mode perfectly supports heterogeneous networks that consist of physical and virtual servers of different vendors.
- **Hybrid Overlay:** In this networking mode, the VXLAN is composed of physical and virtual devices, and the VTEP can be deployed through vSwitches, so existing network devices can be reused.

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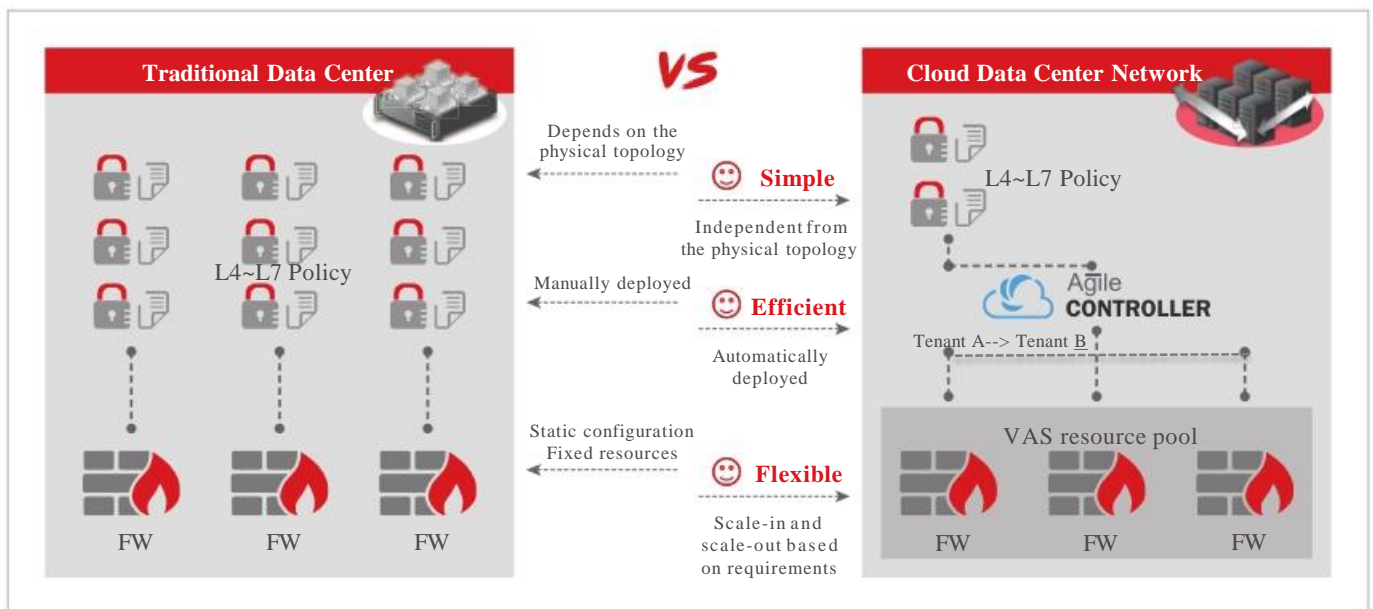


Multi-service flexible orchestration

By virtualizing the physical network and abstracting the logic, the Agile Controller-DCN turns VAS devices in a data center into a resource pool and guides forwarded traffic through network devices in an automatic and ordered manner. In this way, forwarded traffic can be scheduled flexibly, easily, and efficiently to form the service function chain (SFC) regardless of the topology during VAS processing.

The Agile Controller-DCN SFC has the following features:

- VASs are abstracted into a resource pool, and the resources are scheduled based on requirements. This enables sharing and smooth extension of VASs, such as security, among services.
- Network devices are decoupled, and SFCs and VAS nodes can be added or deleted in real time. This eliminates the physical topology constraints.
- SFCs can be deployed for individual tenants. Services can be flexibly orchestrated and modified for tenants according to their requirements without affecting the physical topology and other tenants.
- Various VASs such as firewall and load balancing are supported.



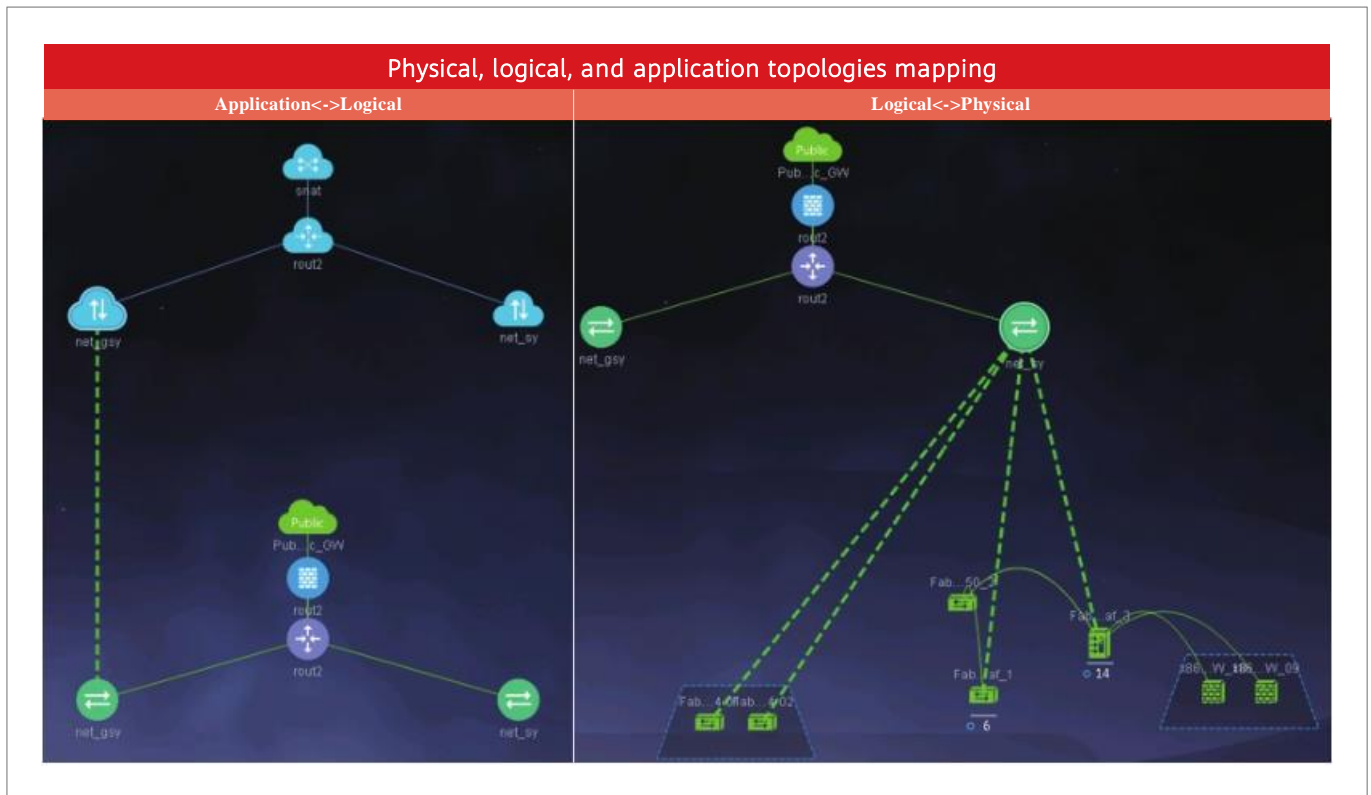
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Multi-dimensional and delicate O&M

The Agile Controller-DCN provides in-depth and GUI-based O&M schemes for cloud data center networks, presenting the network information in various dimensions such as physical resource, virtual resource, physical network, logical network, application network, global, tenant, single service path, multi-service path.

- **Viewing global resources:** Administrators can monitor real-time resource status of physical network nodes and virtual network nodes as well as tenant statistics in different dimensions.
- **Viewing the topologies:** Administrators can view the physical topology, logical topology, and application topology as well as mapping of the three. During daily O&M, administrators can monitor the running status of applications and their logical and physical resource consumption, quickly locating faults and determining the impact range.
- **Viewing the service path:** Path detection is supported between VMs, that is, administrators can view the physical paths of service flows and determine whether there are any exceptions. In addition, loops on the network can be automatically detected, eliminating them before they affect network operations.
- **Viewing the system status:** Administrators can view the basic information, roles, status, and performance of controller cluster nodes to monitor the system status.

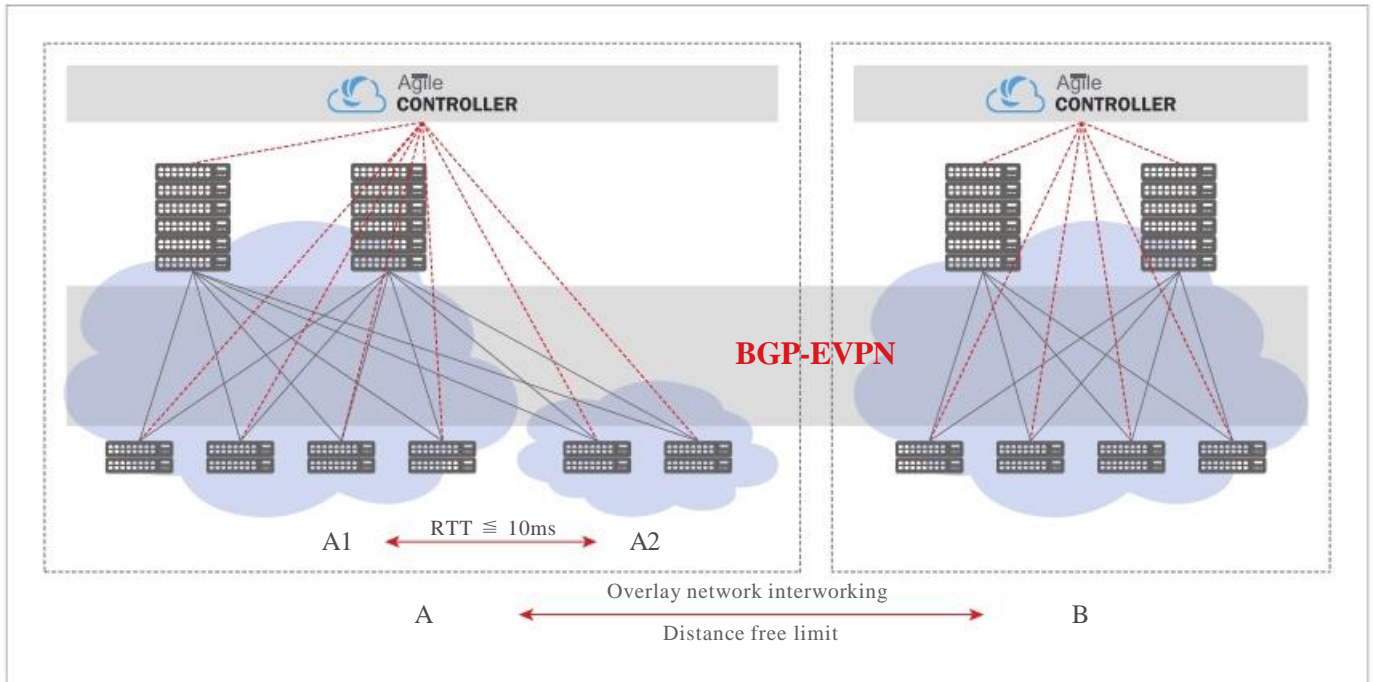


Multi-DC pool-based management

The Agile Controller-DCN manages data centers in different physical locations instead of one data center, expanding the scale and scope of data center services and eliminating the physical distance constraints of traditional data centers. Customers can integrate and share the data center network resources that are previously scattered in many physical locations, flexibly scheduling resources and maximizing resource usage.

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Specifications

Feature	Description
Zero Touch Provisioning	<ul style="list-style-type: none"> Allows devices to go online through ZTP Automatically identifies and manages network devices to implement automatic deployment of underlay networks.
Network Service Provisioning	<ul style="list-style-type: none"> Supports interconnection with the mainstream cloud platform OpenStack or third-party applications from Layer 2 to Layer 7. The cloud platform or third-party applications invoke the standard interfaces to provision network services. Supports independent network service provisioning (including association with computing platforms) to implement automatic network deployment. Supports automatic deployment of Overlay VxLAN.
Fabric Management	<ul style="list-style-type: none"> Uses the standard VXLAN protocol to implement automatic network deployment, including VXLAN protocol encapsulation. The Agile Controller-DCN also supports VXLAN Layer 2 and Layer 3 interconnection and interconnection between VXLAN and traditional networks. Supports various VXLAN networking scenarios and management and control of software and hardware network devices. It also allows hybrid access of multiple types of terminals such as physical servers, VMs, and bare metal servers in different scenarios.
Service Function Chain	<ul style="list-style-type: none"> Supports the IETF-based SFC model and adopts PBR or NSH as traffic diversion technologies to guide the service traffic to different nodes for service processing. In this way, the topology-independent SFC function with graphical orchestration and automatic configuration is implemented. Provides VAS services, including security policy, NAT, and IPsec VPN. Supports NSH Service Function Chain.

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Feature	Description
Network Security	<ul style="list-style-type: none"> Supports deployment of Huawei-developed firewalls and resource pooling, and provisions security services in various service provisioning scenarios. Supports traffic diversion to third-party firewalls and third-party load balancers (F5 LBs). Supports microsegmentation and implements security isolation based on refined groups, such as subnets, IP addresses, VMs name, or host name. Supports role-based access control to implement isolation between multiple tenants and management of multiple users' accounts and rights. Supports password-based local authentication and security authentication, such as RADIUS and AD.
O&M and Fault Location	<ul style="list-style-type: none"> Supports monitoring of physical, logical, and tenant resources. Supports visibility of the application, logical, and physical network topologies. Mappings from the application to logical topology, and from the logical topology to physical topology can also be displayed. Displays forwarding paths of VTEPs and VMs in VXLAN scenarios, implementing precise location from the logical network to the physical network. Supports intelligent loop detection and provides one-click repair. Supports detection of Layer 2 or Layer 3 network connectivity between VMs, as well as between VMs and external networks, through IP Ping and MAC Ping, helping administrators quickly rectify faults. Supports traffic mirroring (traffic on VMs or bare metals can be mirrored to remote addresses through GRE tunnels). Supports one-click emergency handling. When a device is faulty, one-click emergency operations can be performed in sequence to quickly rectify the fault. Supports southbound and northbound data consistency verification. Supports intent verification: detects connectivity, routing loops, and blackholes on physical networks.
Openness	<ul style="list-style-type: none"> Based on ONOS and compatible with ODL architecture. Supports northbound interfaces such as RESTful, RestConf, WebService, and Syslog from Layer 2 to Layer 7. Supports interconnection with the mainstream OpenStack platform (standard OpenStack, Red Hat, Mirantis and UnitedStack) with Neutron Plugin. Supports interconnection with the mainstream container orchestration system Kubernetes with plugins. Supports interconnection with physical and virtual network devices using southbound protocols, such as SNMP, NETCONF, OpenFlow (1.3/1.4), OVSD, JSON-RPC, and sFlow. Supports interconnection with a computing resource management system, such as VMware vCenter and Microsoft System Center, for collaboration with network and computing resources.
Reliability	<ul style="list-style-type: none"> Adopts distributed cluster deployment. A single cluster supports a maximum of 128 member nodes. The service control node supports dynamic expansion without service interruption. Supports deployment of cluster members in the same Layer 2 network or across a Layer 3 network as long as routes between cluster members are reachable. Load balances the northbound cloud platform API requests or web access to different controller nodes. Supports southbound load balancing capability. Devices on the entire network are evenly distributed for management by different controller nodes. If a fault occurs on one of the controller nodes, the network devices managed by it can be smoothly switched to other normal nodes to avoid service interruption.
Management Capacity and Performance	<p>Single-node cluster configuration</p> <ul style="list-style-type: none"> Number of managed physical network devices: 600 Number of managed physical servers: 3,000 Number of managed VMs: 60,000 <p>Typical configuration: Three nodes</p> <ul style="list-style-type: none"> Number of managed physical network devices: 1,800 Number of managed physical servers: 9,000 Number of managed VMs: 180,000 VM online rate: 200 per second <p>Typical configuration: Five nodes</p> <ul style="list-style-type: none"> Number of managed physical network devices: 3,000 Number of managed physical servers: 15,000 Number of managed VMs: 300,000 VM online rate: 350 per second

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Subscription Information

Module	Mandatory/ Optional	Description
Basic Configuration		
AC-DCN-SW Platform	Mandatory	Agile Controller-DCN software platform. The quantity must be the same as that of controller nodes (servers) and cannot be smaller than 3.
AC-DCN-Modular	Mandatory	Number of managed Huawei CE16800, CE12800 switches.
AC-DCN-Fixed	Mandatory	Number of managed Huawei CE8800, CE7800, and CE6800 switches.
AC-DCN-vSwitch	Mandatory	Number of deployed cores of Huawei CE1800v switches.
AC-DCN-VSA	Mandatory	Number of managed vFWs and vLBs of Huawei virtualized devices in Layer 4 to Layer 7.
Subscription and support (SnS)		
AC-DCN-Modular-SnS	Mandatory	This type of SnS is charged based on the number in AC-DCN-Modular, and the subscription term can be 1, 3, or 5 years.
AC-DCN-Modular-SnS	Mandatory	This type of SnS is charged based on the number in AC-DCN-Modular, and the subscription term can be 1, 3, or 5 years.
AC-DCN-Fixed-SnS	Mandatory	This type of SnS is charged based on the number in AC-DCN-Fixed, and the subscription term can be 1, 3, or 5 years.
AC-DCN-vSwitch-SnS	Mandatory	This type of SnS is charged based on the number in AC-DCN-vSwitch, and the subscription term can be 1, 3, or 5 years.
AC-DCN-VSA-SnS	Mandatory	This type of SnS is charged based on the number in AC-DCN-VSA, and the subscription term can be 1, 3, or 5 years.
Server and Operating System		
TaiShan 200 (Model 2280)	Optional	Number of servers for installing the Agile Controller-DCN. The number cannot be smaller than 3. Configuration: 2*Kunpeng 920-32Core@2.6GHz CPU,4*32G Memory,4*1200GB SAS HDD, 2*4 GE+2*4 25GE/10GE SFP+Optical Port

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