Huawei CloudEngine 6863 Switch Datasheet

Huawei CloudEngine 6863 series switches have advanced hardware architecture with 40GE/100GE uplink ports and high-density 25GE access ports.



CloudEngine 6863 series can be used to build a scalable data center network platform in the cloud computing era, or work as core or aggregation switches on campus networks.

Product Overview

Huawei CloudEngine 6863 series switches are next-generation 25GE access switches that provide high performance and high port density on data center networks and high-end campus networks. The CloudEngine 6863 series have advanced hardware architecture with 40GE/100GE uplink ports and high-density 25GE access ports. Using Huawei's VRP8 software platform, CloudEngine 6863 series switches support extensive data center features and high stacking capabilities. In addition, the CloudEngine 6863 series use a flexible airflow design (front-to-back or back-to-front).

CloudEngine 6863 series can work with CloudEngine 16800 or CloudEngine 12800 series data center core switches to build elastic, virtual, and high-quality 40GE/100GE full-mesh networks, meeting requirements of cloud computing data centers.

CloudEngine 6863 series provide high-density 25GE access to help enterprises and carriers build a scalable data center network platform in the cloud computing era. They can also work as core or aggregation switches on campus networks.

Product Appearance

CloudEngine 6863 series switches provide 48*25GE SFP28 ports and 6*40GE/100GE QSFP28 ports.



Product Characteristics

High-Density 25GE Access

- CloudEngine 6863 series provide up to 48 x 25GE ports, allowing for high-density 10GE/25GE server access and smooth evolution.
- CloudEngine 6863 series provide up to 6 x 100GE QSFP28 ports. Each QSFP28 port can also be used as one 40GE QSFP+ port, providing flexibility in networking. The uplink 40GE/100GE ports can be connected to CloudEngine 16800 or CloudEngine 12800 series switches to build a non-blocking network platform.

Highly Reliable, Long-Distance Stacking

16-member stack system

- A stack system of 16 member switches has a maximum of 768 x 25GE access ports that provide high-density server access in a data center.
- Multiple switches in a stack system are virtualized into one logical device, making it possible to build a scalable and easy-to-manage data center network platform.
- A stack system separates the control plane from the data plane. This eliminates the risk of single points of failure and greatly improves system reliability.

Long-distance stacking

- CloudEngine 6863 series can use service ports as stack ports. A stack system can be established with switches in the same rack or different racks, and even over long distances.
- Service and stack bandwidths can be allocated based on the network scale to ensure that network resources are used more efficiently.

Inter-device Link Aggregation, High Efficiency and Reliability

- CloudEngine 6863 series support multi-chassis link aggregation group (M-LAG), which enables links of multiple switches to aggregate into one to implement device-level link backup.
- Switches in an M-LAG all work in active state to share traffic and back up each other, enhancing system reliability.

- Switches in an M-LAG can be upgraded independently. During the upgrade, other switches in the system take over traffic forwarding to ensure uninterrupted services.
- M-LAG supports dual-homing to Ethernet, VXLAN, and IP networks, allowing for flexible networking.

ESI Multi-homing Access

CloudEngine 6863 series support RFC-compliant EVPN multi-homing solution. The Ethernet Segment Identifier (ESI) is used to expand EVPN VXLAN gateways from active-active mode to multi-active mode. EVPN VXLAN gateways can work in active-active mode or active/standby mode to implement multi-homing access of servers (servers can be quad-homed to EVPN VXLAN gateways).

Virtualized Hardware Gateway, Enabling Quick Deployment

- CloudEngine 6863 series can connect to a cloud platform through open APIs, facilitating unified management of virtual and physical networks.
- CloudEngine 6863 series can work with the industry's mainstream virtualization platforms. The virtualization function protects investments because services can be deployed quickly without requiring network changes.
- The hardware gateway deployment enables fast service deployment without changing the customer network, providing investment protection.
- CloudEngine 6863 series support Border Gateway Protocol - Ethernet VPN (BGP-EVPN), which can run as the VXLAN control plane to simplify VXLAN configuration within and between data centers.

Standard Interfaces, Enabling Openness and Interoperability

- CloudEngine 6863 series support NETCONF and can work with Huawei Agile Controller.
- CloudEngine 6863 series support Ansible-based automatic configuration and open-source module release, expanding network functions and simplifying device management and maintenance.
- CloudEngine 6863 series can be integrated into mainstream SDN and cloud computing platforms flexibly and quickly.

ZTP, Implementing Automatic O&M

- CloudEngine 6863 series support Zero Touch Provisioning (ZTP). ZTP enables the CloudEngine 6863 series to automatically obtain and load version files from a USB flash drive or file server, freeing network engineers from onsite configuration and deployment. ZTP reduces labor costs and improves device deployment efficiency.
- ZTP provides built-in scripts through open APIs. Data center personnel can use a programming language they are familiar with, such as Python, to centrally configure network devices.
- ZTP decouples the configuration time of new devices from the device quantity and area distribution, which improves service provisioning efficiency.

FabricInsight-based Intelligent O&M

- Huawei's Packet Conservation Algorithm for Internet (iPCA) technology implements accurate per-hop packet loss, delay, and jitter detection for real service flows, locating network faults in real time.
- CloudEngine 6863 series proactively perform path detection over the entire network, periodically checking sample flows to determine the connectivity of all paths on the network and locates fault points, providing real-time network health information.
- CloudEngine 6863 series support visualization of all flows and congestion, improving service experience.

Flexible Airflow Design, Improving Energy Efficiency

Flexible front-to-back or back-to-front airflow design

- CloudEngine 6863 series use a strict front-to-back or back-to-front airflow design that isolates cold air channels from hot air channels. This design improves heat dissipation efficiency and meets design requirements of data center equipment rooms.
- Air can flow from front to back or back to front depending on the fans and power modules that are used.
- Redundant power modules and fans can be configured to ensure service continuity.

Innovative energy-saving technologies

- CloudEngine 6863 series have innovative energy-saving chips and can measure system power consumption in real time. The fan speed can be adjusted dynamically based on system consumption. These energy-saving technologies reduce O&M costs and contribute to a greener data center.

Clear Indicators, Simplifying Maintenance

Clear indicators

- Port indicators clearly show the port status and port rate. The 100GE port indicators can show the states of all ports derived from the 100GE ports.
- State and stack indicators on both the front and rear panels enable users to maintain the switch from either side.
- CloudEngine 6863 series support remote positioning. Remote positioning indicators enable users to easily identify the switches they want to maintain in an equipment room full of devices.

Simple maintenance

- The management port, fans, and power modules are on the front panel, which facilitates device maintenance.
- Data ports are located at the rear, facing servers. This simplifies cabling.

Product Specifications

Note: This content is applicable only to regions outside Chinese mainland. Huawei reserves the right to interpret this content.

Functions and Features

Item	CloudEngine 6863-48S6CQ
Device virtualization	iStack
	M-LAG
	ESI
Network virtualization	VXLAN
	BGP-EVPN
	QinQ access VXLAN
Data center interconnect	VXLAN mapping, implementing interconnection between multiple DCI networks at Layer 2
SDN	Agile Controller
Network convergence	PFC
Programmability	OPS programming
	OpenFlow
	Ansible-based automatic configuration and open-source module release
Traffic analysis	NetStream
	sFlow
VLAN	Adding access, trunk, and hybrid interfaces to VLANs
	Default VLAN
	QinQ
MAC address	Dynamic learning and aging of MAC address entries

Item	CloudEngine 6863-48S6CQ
	Static, dynamic, and blackhole MAC address entries
	Packet filtering based on source MAC addresses
	MAC address limiting based on ports and VLANs
IP routing	IPv4 routing protocols, such as RIP, OSPF, IS-IS, and BGP
	IPv6 routing protocols, such as RIPng, OSPFv3, IS-ISv6, and BGP4+
	IP packet fragmentation and reassembly
IPv6	VXLAN over IPv6
	IPv6 VXLAN over IPv4
	IPv6 Neighbor Discovery (ND)
	Path MTU Discovery (PMTU)
	TCP6, IPv6 ping, IPv6 tracert, IPv6 socket, UDP6, and raw IPv6
Multicast	Multicast routing protocols such as IGMP, PIM-SM, and MBGP
	IGMP snooping
	IGMP proxy
	Fast leaving of multicast member interfaces
	Multicast traffic suppression
	Multicast VLAN
Reliability	Fine-grained microsegmentation isolation (IPv4 and IPv6)
	Link Aggregation Control Protocol (LACP)
	STP, RSTP, VBST, and MSTP
	BPDU protection
	Smart Link and multi-instance
	Device Link Detection Protocol (DLDP)
	Hardware-based Bidirectional Forwarding Detection (BFD)
	VRRP, VRRP load balancing, and BFD for VRRP
	BFD for BGP/IS-IS/OSPF/static route
	BFD for VXLAN
NSH	IETF-defined NSH (IPv4 and IPv6)
QoS	Traffic classification based on Layer 2, Layer 3, Layer 4, and priority information
	ACL, CAR, re-marking, and scheduling
	Queue scheduling modes such as PQ, DWRR, and PQ+DWRR
	Congestion avoidance mechanisms, including WRED and tail drop
	Traffic shaping
O&M	iPCA

Item	CloudEngine 6863-48S6CQ
	Network-wide path detection
	Telemetry
	ERSPAN+
	Statistics on the buffer microburst status
	VXLAN OAM: VXLAN ping and VXLAN tracert
Configuration and maintenance	Console, Telnet, and SSH terminals
	Network management protocols, such as SNMPv1/v2/v3
	File upload and download through FTP and TFTP BootROM upgrade and remote upgrade
	Hot patches
	User operation logs
	Zero Touch Provisioning (ZTP)
Security and management	802.1x authentication
	Command line authority control based on user levels, preventing unauthorized users from using commands
	Defense against DoS attacks, ARP storms, and ICMP attacks
	Port isolation, port security, and sticky MAC
	Binding of the IP address, MAC address, port number, and VLAN ID
	Authentication methods, including AAA, RADIUS, and HWTACACS
	Remote Network Monitoring (RMON)

Performance and Scalability

Item	CloudEngine 6863-48S6CQ
Maximum number of MAC address entries	256K
Maximum number of routes (FIB IPv4/IPv6)	256K/80K
ARP table size	256K
Maximum number of VRFs	4096
IPv6 ND table size	80K
Maximum number of multicast routes (multicast FIB IPv4/IPv6)	32K/2000
Maximum number of VRRP groups	1024
Maximum number of ECMP paths	128
Maximum number of ACLs	30K
Maximum number of broadcast domains	8000
Maximum number of BDIF interfaces	8000

Item	CloudEngine 6863-48S6CQ
Maximum number of tunnel endpoints (VTEPs)	2K
Maximum number of LAGs	1024
Maximum number of links in a LAG	128
Maximum number of MSTP instance	64
Maximum number of VLANs where VBST can be configured	500

Note: This specification may vary between different scenarios. Please contact Huawei for details.

Hardware Specifications

Item		CloudEngine 6863-48S6CQ
Physical features	Dimensions (W × D × H)	442 mm x 420 mm x 43.6 mm
	Weight (excluding optical transceivers, power modules, and fan assemblies/including AC power modules and fan assemblies, excluding optical transceivers, kg)	5.7/7.8
	Switching capacity (Tbit/s)	3.6
	Forwarding performance (Mpps)	940
10/25GE SFP28 ports		48
40/100GE QSFP28 ports		6
Management interface	Out-of-band management port	1 x GE management interface
	Console port	1 x RJ45 interface
	USB port	1
CPU	Main frequency (GHz)	1.4
	Number of cores	4
Storage	RAM	4 GB
	NOR flash	64 MB
	NAND flash	4 GB
System	System buffer	42 MB
Power supply	Power modules	600 W AC 1000 W -48 V DC
	Rated voltage range (V)	AC: 100 V to 240 V DC: -48 V to -60 V
	Maximum voltage range (V)	AC: 90 V to 290 V DC: -38.4 V to -72 V
	Maximum input current	AC 600 W: 100 V to 240 V, 8 A 1000 W -48 V DC: -48 V to -60 V, 30 A

Item		CloudEngine 6863-48S6CQ
	Typical power	234 W (100% traffic load, copper cable, normal temperature, dual power modules) 275 W (100% traffic load, short-distance optical transceivers, normal temperature, dual power modules)
	Maximum power	417 W
	Frequency (AC, Hz)	50/60
Heat dissipation	Heat dissipation mode	Air cooling
	Number of fan trays	4
	Heat dissipation airflow	Front-to-back or back-to-front airflow
	Maximum heat consumption (BTU/hour)	1423
Environment specifications	Long-term operating temperature (°C)	0°C to 40°C (0-1800 m) The temperature decreases by 1°C each time the altitude increases by 220 m.
	Storage temperature (°C)	-40°C to +70°C
	Relative humidity	5% to 95%
	Operating altitude (m)	Up to 5000
	Sound power at 27°C (dBA)	Front-to-back airflow: < 67 Back-to-front airflow: < 66
	Sound power at 40°C (dBA)	Front-to-back airflow: < 84 Back-to-front airflow: < 83
	Sound pressure at 27°C (dBA)	Front-to-back airflow: 53 on average (maximum: 58) Back-to-front airflow: 52 on average (maximum: 57)
	Surge protection	AC power supply protection: 6 kV in common mode and 6 kV in differential mode DC power supply protection: 4 kV in common mode and 2 kV in differential mode
Reliability	MTBF (year)	47.81
	MTTR (hour)	1.95
	Availability	0.9999962836

Note: For detailed information of CloudEngine 6800 hardware information, visit https://support.huawei.com/enterprise/en/doc/EDOC1000019246?idPath=7919710%7C21782165%7C21782239%7C22318540%7C7597815.

Safety and Regulatory Compliance

The following table lists the safety and regulatory compliance of CloudEngine 6800 series switches.

Certification Category	Description
Safety	• EN 60950-1 • EN 60825-1 • EN 60825-2

Certification Category	Description
	• UL 60950-1 • CSA-C22.2 No. 60950-1 • IEC 60950-1 • AS/NZS 60950-1 • GB4943
Electromagnetic Compatibility (EMC)	• EN 300386 • EN 55032: CLASS A • EN 55024 • IEC/EN 61000-3-2 • IEC/EN 61000-3-3 • FCC 47CFR Part15 CLASS A • ICES-003: CLASS A • CISPR 32: CLASS A • CISPR 24 • AS/NZS CISPR32 • VCCI- CISPR32: CLASS A • GB9254 CLASS A
Environment	• 2011/65/EU EN 50581 • 2012/19/EU EN 50419 • (EC) No.1907/2006 • GB/T 26572 • ETSI EN 300 019-1-1 • ETSI EN 300 019-1-2 • ETSI EN 300 019-1-3 • ETSI EN 300 753 GR63

Note

EMC: electromagnetic compatibility

CISPR: International Special Committee on Radio Interference

EN: European Standard

ETSI: European Telecommunications Standards Institute

CFR: Code of Federal Regulations

FCC: Federal Communication Commission

IEC: International Electrotechnical Commission

AS/NZS: Australian/New Zealand Standard

VCCI: Voluntary Control Council for Interference

UL: Underwriters Laboratories

CSA: Canadian Standards Association

Supported MIBs

For details about the MIB information, visit http://support.huawei.com/hedex/hdx.do?docid=EDOC1100020548&lang=en&idPath=7919710%7C21782165%7C21782239%7C22318540%7C7597815.

Optical Transceivers and Cable

For details about the optical transceivers and cables information, visit https://e.huawei.com/en/material/networking/dcswitch/f6d91cf16df0474998087676a33fd41e.

Ordering Information

Mainframe	
CE6863-48S6CQ	CE6863-48S6CQ switch (48*25 SFP28, 6*100G QSFP28, without fan and power modules)
CE6863-48S6CQ-B	CE6863-48S6CQ-B switch (48*25G SFP28, 6*100G QSFP28, 2*AC power modules, 4*fan modules, port-side intake)
CE6863-48S6CQ-F	CE6863-48S6CQ-F switch (48*25G SFP28, 6*100G QSFP28, 2*AC power modules, 4*fan modules, port-side exhaust)

Fan Tray

Model	Description	Applicable Product
FAN-031A-F	Fan box (F,FAN panel side intake)	CE6863-48S6CQ
FAN-031A-B	Fan box (B,FAN panel side exhaust)	CE6863-48S6CQ

Power

Model	Description	Applicable Product
PAC600S12-CF	600W AC Power Module(Front to Back,Power panel side intake)	CE6863- 48S6CQ
PAC600S12-CB	600W AC Power Module(Back to Front, Power panel side exhaust)	CE6863- 48S6CQ
PDC1000S12-DF	1000W DC Power Module (Front to Back,Power panel side intake)	CE6863-48S6CQ
PDC1000S12-DB	1000W DC Power Module (Front to Back,Power panel side exhaust)	CE6863-48S6CQ

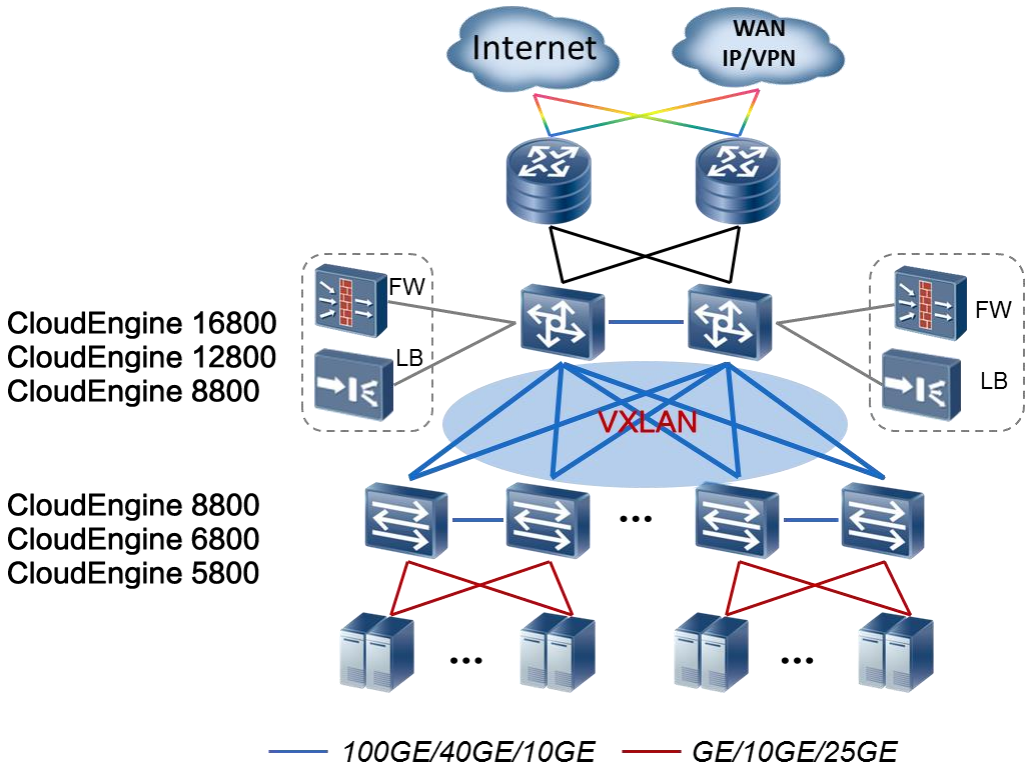
Software	
N1-CE68LIC-CFMM	N1-CloudFabric Management SW License for CloudEngine 6800(N1-CE68LIC-CFMM software is applicable to Non-SDN scenario, includes basic software functions and VXLAN)
N1-CE68CFMM-SnS1Y	N1-CE68CFMM-SnS1Y,N1-CloudFabric Management SW License for CloudEngine 6800
N1-CE68LIC-CFFD	N1-CloudFabric Foundation SW License for CloudEngine 6800 (N1-CE68LIC-CFFD software is applicable to single DC scenarios, includes basic software functions, VXLAN, and Telemetry,Agile Controller-DCN management of each fixed device,Fabricinsight Intelligent network analysis basic function)
N1-CE68CFFD-SnS1Y	N1-CloudFabric Foundation SW License for CloudEngine 6800-SnS-1 Year (The annual fee for the CloudFabric N1 package)
N1-CE68LIC-CFAD	N1-CloudFabric Advanced SW License for CloudEngine 6800 (N1-CE68LIC-CFAD software is applicable to multiple DC scenarios, includes all the functions of the N1-CE68LIC-CFFD software package and NSH function)

Software	
N1-CE68CFAD-SnS1Y	N1-CloudFabric Advanced SW License for CloudEngine -SnS -1 Year (The annual fee for the CloudFabric N1 package)

Networking and Application

Data Center Applications

On a typical data center network, CloudEngine 6863 switches work as TOR switches and connect to CloudEngine 16800 or CloudEngine 12800 or CloudEngine 8800 switches using 40GE/100GE ports, building an end-to-end 100GE full-mesh network. The core and TOR switches use fabric technologies such as VXLAN to build a non-blocking large Layer 2 network, which allows for large-scale VM migration and flexible service deployment.



Note: VXLAN can also be used on campus networks to support flexible service deployment in different service areas.

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