CloudEngine 8800 Series
Data Center Switches

HUAWEI TECHNOLOGIES CO., LTD.

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Product Overview

Huawei CloudEngine 8800 series (CE8800) switches are 100G Ethernet switches designed for data centers and high-end campus networks. The switches provide high-performance, high-density 100GE/40GE/25GE/10GE ports, and low latency. Using the Huawei VRP8 software platform, CE8800 switches provide extensive data center service features and high stacking capability. In addition, the airflow direction (front-to-back or back-to-front) can be changed. CE8800 switches can work with CE12800/CE8800/CE6800/CE5800 switches to build an elastic, virtualized, high-quality fabric that meets the requirements of cloud-computing data centers.

CE8800 switches can function as core or aggregation switches on data center networks to help enterprises and carriers build a scalable data center network platform in the cloud computing era. They can also be used as aggregation or core switches for enterprise campus networks.

Product Appearance

The CE8800 series is available in the following models:

CE8860-4C-EI

2 U high, supporting four flexible cards of half the standard width

CE8850-32CQ-EI

32*100GE QSFP28 ports;2*10GE SFP+ ports

CE8860 supports the following models of cards:

CE88-D24S2CQ

24*10GE (SFP+) or 25GE (SFP28) and 2*100GE (QSFP28) card

CE88-D24T2CQ

24*10GE (BASE-T) and 2*100GE (QSFP28) card

CE88-D8CQ

8*100GE (QSFP28) card

CE88-D16Q

16*40GE (QSFP+) card

Product Characteristics

Industry's First 25GE Access Switch

- CE8860 supports 25GE (SFP28)/10GE (SFP+) auto-sensing interfaces and is applicable to scenarios of high-density 25GE/10GE server access.
- CE8860 supports a maximum of 32*100GE, 64*40GE, or 128*25GE/10GE ports, delivering high-density access and aggregation capabilities through flexible card combinations.
- CE8850 supports a maximum of 32*100GE, 32*40GE, 128*25GE, or 130*10GE ports, delivering high-density access and aggregation capabilities.

High-Density 100GE/40GE Aggregation and Outstanding Switching Capacity

- The CE8800 provides 6.4 Tbit/s switching capacity , forwarding performance of 3,200 Mpps, and supports L2/L3 line-speed forwarding.
- The CE8860 provides a maximum of 32*100GE QSFP28 or 64*40GE QSFP+ ports, and can function as the core or aggregation switch on a data center or campus network.
- The 100GE QSFP28 port supports 100GE optical modules. Each 100GE port can be used as four 25GE SFP28 ports. The 100GE QSFP28 port also supports 40GE QSFP+ optical modules. 40GE ports can be converted to 10GE ports through QSFP+ breakout cable.
- The CE8860 supports 100GE/40GE/25GE/10GE flexible cards, delivering flexible networking capability. It can work with CE12800/CE7800/CE6800/CE5800 series data center switches to build a non-blocking network platform.

Highly Reliable, High-Performance Stacking

- Support 9-member stack system
  - » A stack system of 9 member switches has a maximum of 864*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, easy-to-manage data center network platform.
  - » A stack system separates the control plane from the data plane. This eliminates the risk of single-point failures and greatly improves system reliability.
- Long-distance stacking
  - » The CE8800 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's scale so that network resources can be used more efficiently.

Large-Scale Routing Bridge, On-Demand Scalability

- The CE8800 supports the IETF Transparent Interconnection of Lots of Links (TRILL) protocol. A TRILL network can contain more than 500 nodes, enabling flexible service deployments and large-scale Virtual Machine (VM) migrations.
- The TRILL protocol uses a routing mechanism similar to IS-IS and sets a limited Time-to-Live (TTL) value in packets to prevent Layer 2 loops. This significantly improves network stability and speeds up network convergence.
- On a TRILL network, all data flows are forwarded quickly using Shortest Path First (SPF) and Equal-Cost Multi-Path (ECMP) routing. SPF and ECMP avoid the suboptimal path selection problem in STP and increase link bandwidth efficiency to 100 percent.
- The CE8800 supports TRILL-based Layer 2 equal-cost paths, greatly improving links' load balancing capabilities. The network has a fat-tree architecture that enhances expansion.

Converged Enhanced Ethernet, Data, Storage, and Computing Traffic over One Network

- The CE8800 supports Fibre Channel over Ethernet (FCoE), which permits storage, data, and computing services to be transmitted on one network, reducing the costs of network construction and maintenance.
- The CE8800 supports centralized FCoE/FC gateway deployment, which makes network O&M simpler.
- Various CE8800 features ensure lossless transmission: Priority-based Flow Control (PFC), Enhanced Transmission Selection (ETS) and Data Center Bridging eXchange (DCBX). These features ensure low latency and zero packet loss for FC storage and high-speed computing services.

Programmable Network Device, Flexible Customization

- The CE8800 uses the Open Programmability System (OPS) embedded in the VRP8 software platform to provide programmability at the control plane.
- The OPS provides open APIs. APIs can be integrated with mainstream cloud platforms (including commercial and open cloud platforms) and third-party controllers. The OPS enables services to be flexibly customized and provides automatic management.
- Users or third-party developers can use open APIs to develop and deploy specialized network management policies to implement extension of fast service functions, automatic deployment, and intelligent management. The OPS also implements automatic operation and maintenance, and reduces management costs.

- The OPS provides seamless integration of data center service and network in addition to a service-oriented, Software-Defined Network (SDN).

Virtualized Gateway Achieves Fast Service Deployment

- The CE8800 can work with a mainstream virtualization platform. As the high-performance, hardware gateway of an overlay network (VXLAN), the CE8800 can support more than 16M tenants.
- The CE8800 can connect to a cloud platform through an open API to provide unified management of software and hardware networks.
- This function implements fast service deployment without changing the customer network. It also protects customer investments.

Zero-Configuration Deployment, Automatic O&M

- The CE8800 supports Zero Touch Provisioning (ZTP). ZTP enables the CE8800 to automatically obtain and load version files from a USB flash drive or file server, freeing network engineers from onsite configuration or deployment. ZTP reduces labor costs and improves device deployment efficiency.
- ZTP provides built-in scripts for users through open APIs. Data center personnel can use the programming language they are familiar with, such as Python, to provide unified configuration of network devices.
- ZTP decouples configuration time of new devices from device quantity and area distribution, which improves service provisioning efficiency.

Flexible Airflow Design Saves Energy

- Flexible front-to-back/back-to-front airflow design
  - » The CE8800 uses a front-to-back/back-to-front airflow design that isolates cold air channels from hot air channels. This design meets heat dissipation requirements in data center equipment rooms.
  - » Air can flow from front to back, or back to front when different fans and power modules are used.
  - » Redundant power modules and fans can be configured to ensure uninterrupted service transmission.
- Innovative energy-saving technologies
  - » The CE8800 has energy-saving chips and can measure system power consumption in real time. 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, Simple Maintenance

- Clear indicators
  - » Port indicators clearly show port status and port speeds. The port indicators can show the state of all the 10GE ports derived from the 40GE ports.
  - » State and stack indicators on both the front and rear panels enable operators to maintain the switch from either side.
  - » The CE8800 supports remote positioning. Operators can turn on remote positioning indicators on the switches they want to maintain, so that they can find switches easily 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

Item	CE8860-4C-EI	CE8850-32CQ-EI
Ports	4 slots; different cards can be flexibly used in combinations to achieve a maximum of: 32*100GE QSFP28 or 64*40GE QSFP+ or 128*25GE SFP28 or 128*10GE SFP+ ports	32*100GE QSFP28 and 2*10GE SFP+
Switching capacity	6.4 Tbit/s	
Forwarding performance	3200Mpps	
Airflow design	Front-to-back or back-to-front	
Device virtualization	iStack[1]	
	M-LAG	
Network virtualization	VXLAN routing and bridging	
	BGP-EVPN	
	TRILL	
	QinQ access VXLAN	
	IPv6 over VXLAN	
SDN	Agile Controller	
	VMware NSX	
Network convergence	FCoE	
	DCBX, PFC, ETS	
Programmability	OPS	
	Puppet,Ansible, and OVSDB plugins released on open source websites	
	Linux container for open source and customization programming	
Traffic analysis	NetStream	
	sFlow	
VLAN	Adding access, trunk, and hybrid interfaces to VLANs	
	Default VLAN	
	QinQ	
	MUX VLAN	
	GVRP	

1 For details about the configuration, please see: http://support.huawei.com/onlinetoolsweb/virtual/en/dc/stack_index.html?dcb

Item	CE8860-4C-EI	CE8850-32CQ-EI
ACL	Ingress 2000; Egress 1000	
MAC address table	Maximum: 136k	
	Dynamic learning and aging of MAC addresses	
	Static, dynamic, and blackhole MAC address entries	
	Packet filtering based on source MAC addresses	
	MAC address limiting based on ports and VLANs	
ARP	Maximum: 84k	
ND	Maximum:32k	
IPv4 FIB	Maximum: 128k	
IP routing	IPv4 routing protocols, such as RIP, OSPF, BGP, and IS-IS	
	IPv6 routing protocols, such as RIPng, OSPFv3, IS-ISv6, and BGP4+	
IPv6 FIB	Maximum: 64k	
IPv6	IPv6 Neighbor Discovery (ND)	
	Path MTU Discovery (PMTU)	
	TCP6, ping IPv6, tracert IPv6, socket IPv6, UDP6, and Raw IP6	
Multicast FIB	Maximum: 8k	
Multicast	IGMP, PIM-SM, PIM-DM, MSDP, and MBGP	
	IGMP snooping	
	IGMP proxy	
	Fast leave of multicast member interfaces	
	Multicast traffic suppression	
	Multicast VLAN	
MPLS	MPLS	
Reliability	LACP	
	STP, RSTP, VBST and MSTP	
	BPDU protection, root protection, and loop protection	
	Smart Link and multi-instance	
	DLDP	
	ERPS (G.8032)	
	VRRP, VRRP load balancing, and BFD for VRRP	
	BFD for BGP/IS-IS/OSPF/Static route	

Item	CE8860-4C-EI	CE8850-32CQ-EI
QoS	Traffic classification based on Layer 2 headers, Layer 3 protocols, Layer 4 protocols, and 802.1p priority	
	Actions of ACL, CAR, re-marking, and scheduling	
	Queue scheduling algorithms, including PQ, WRR, DRR, PQ+WRR, and PQ+DRR	
	Congestion avoidance mechanisms, including WRED and tail drop	
	Traffic shaping	
Configuration and maintenance	Console, Telnet, and SSH terminals	
	Network management protocols, such as SNMPv1/v2c/v3	
	File upload and download through FTP and TFTP	
	BootROM upgrade and remote upgrade	
	802.3az Energy Efficient Ethernet (EEE)	
	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	
	DoS, ARP, and ICMP attack defenses	
	Port isolation, port security, and sticky MAC	
	Binding of the IP address, MAC address, interface and VLAN	
	Authentication methods, including AAA, RADIUS, and HWTACACS	
	Remote Network Monitoring (RMON)	
Dimensions (W x D x H)	442 mm x 600 mm x 88.1 mm	442mm×420mm×43.6mm
Weight (fully loaded)	21.2 kg (46.7 lb)	9kg (19.8lb)
Environment parameters	Operating temperature: 0°C to 40°C (32°F to 104°F) (0 m to 1,800 m) Storage temperature: -40°C to +70°C (-40°F to 158°F) Relative humidity: 5% RH to 95% RH, non-condensing	

Item	CE8860-4C-EI	CE8850-32CQ-EI
Operating voltage	Rated voltage range: 100 V AC to 240 V AC; 50/60 Hz Maximum voltage range: 90 V DC to 290 V AC; 47 Hz to 63 Hz 240 V high-voltage DC power voltage range: 188 to 290 V DC 380 V high-voltage DC rated voltage range: 240 V DC to 380 V DC 380 V high-voltage DC maximum voltage range: 188 V DC to 400 V DC	Rated voltage range: 100 V AC to 240 V AC; 50/60 Hz Maximum voltage range: 90 V DC to 290 V AC; 47 Hz to 63 Hz
Maximum power consumption	750W	453W

Ordering Information

Mainframe	
CE8860-4C-EI-F	CE8860-4C-EI Mainframe(With 4 Subcard Slots,2*FAN Box, Port-side Exhaust, Without Power Module)
CE8860-4C-EI-B	CE8860-4C-EI Mainframe(With 4 Subcard Slots,2*FAN Box, Port-side Intake, Without Power Module)
CE8860-4C-EI	CE8860-4C-EI Mainframe(With 4 Subcard Slots, Without FAN Box, Without Power Module)
CE8850-EI-F-B0A	CE8850-32CQ-EI Switch(32-Port 100GE QSFP28,2-Port 10GE SFP+,2*AC Power Module,2*FAN Box, Port-side Exhaust)
CE8850-EI-B-B0A	CE8850-32CQ-EI Switch(32-Port 100GE QSFP28, 2-Port 10GE SFP+,2*AC Power Module,2*FAN Box, Port-side Intake)
CE8850-32CQ-EI	CE8850-32CQ-EI Switch(32-Port 100GE QSFP28 Optical,2*FAN Box, Port-side Exhaust, Without Power Module)
Subcard	
CE88-D8CQ	CE8860:8 Port 100GE QSFP28 Interface Card
CE88-D16Q	CE8860:16 Port 40GE QSFP+ Interface Card
CE88-D24T2CQ	CE8860:24 Port 10GE Base-T and 2 Port 100GE QSFP28 Interface Card
CE88-D24S2CQ	CE8860:24 Port 25GE SFP28 and 2 Port 100GE QSFP28 Interface Card

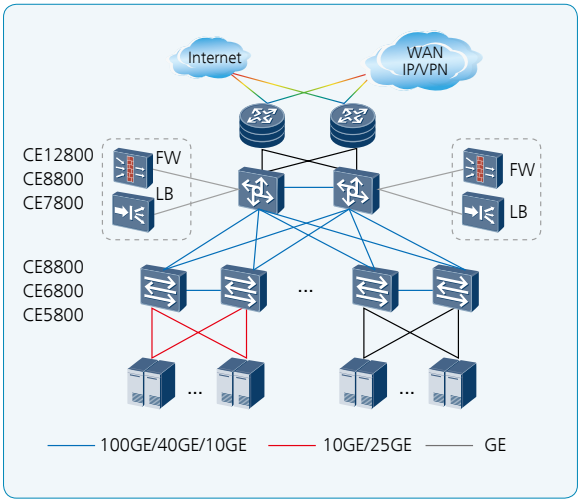
Fan box		
Part Number	Product Description	Support Product
FAN-180A-F	Fan box(F, FAN panel side intake)	CE8860-4C-EI
FAN-180A-B	Fan box(B, FAN panel side exhaust)	CE8860-4C-EI
FAN-40HA-F	Fan box(HA, Front to Back, FAN panel side intake)	CE8850-32CQ-EI
FAN-40HA-B	Fan box(HA, Back to Front, FAN panel side exhaust)	CE8850-32CQ-EI
Power module		
Part Number	Product Description	Support Product
PAC-1K2WA-F	1200W AC&240V DC Power Module(Power panel side intake)	CE8860-4C-EI
PAC-1K2WA-B	1200W AC&240V DC Power Module(Power panel side exhaust)	CE8860-4C-EI
PHD-1K2WA-F	1200W HVDC Power Module(Power panel side intake)	CE8860-4C-EI
PHD-1K2WA-B	1200W HVDC Power Module(Power panel side exhaust)	CE8860-4C-EI
PAC-600WA-F	600W AC Power Module(Front to Back, Power panel side intake)	CE8850-32CQ-EI
PAC-600WA-B	600W AC Power Module(Back to Front, Power panel side exhaust)	CE8850-32CQ-EI
Software		
CE88-LIC-NPV	CloudEngine 8800 FCOE NPV Function	
CE88-LIC-FCF16	CloudEngine 8800 FCF 16 Ports	
CE88-LIC-FCFAL	CloudEngine 8800 FCF All Ports	
CE88-LIC-VXLAN	CloudEngine 8800 VXLAN Function	

Networking and Applications

Data Center Applications

On a typical data center network, CE12800/CE8800/CE7800 switches work as core switches, whereas CE6800 and CE5800 switches work as ToR switches and connect to the core switches using 100GE/40GE/10GE ports. These switches use fabric technology such as TRILL or VXLAN to establish a non-blocking large Layer 2 network, which allows large-scale VM migrations and flexible service deployments.

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

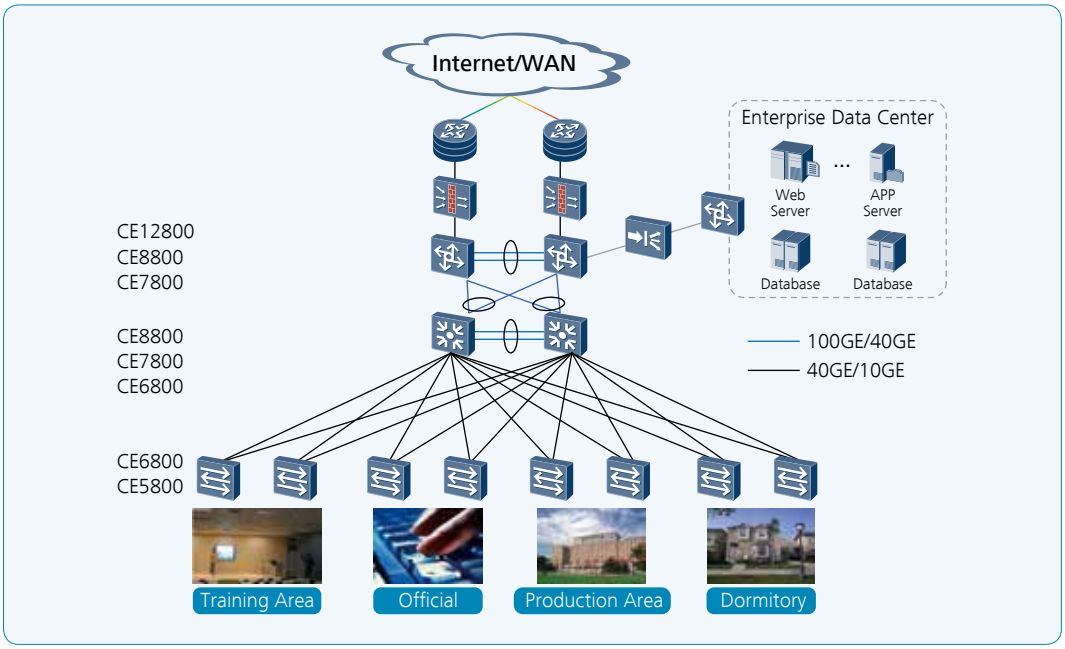


Campus Network Applications

The CE8800 can be used on a campus network. Its high-density, line-speed 100GE/40GE ports and high stacking capability can meet the ever-increasing demand for network bandwidth. CE8800 switches are cost-effective campus network switches, thanks to their extensive service features and innovative energy-saving technologies.

On a typical campus network, two CE12800/CE8800/CE7800 switches are virtualized into a logical core switch using CSS or iStack technology. Multiple CE6800 switches at the aggregation layer form a logical switch using iStack technology. CSS and iStack improve network reliability and simplify network management.

Note: iStack technology is also widely used in data centers to facilitate network management.



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