CloudEngine 5800 Series
Data Center Switches

HUAWEI TECHNOLOGIES CO., LTD.

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Product Overview

Huawei CloudEngine 5800 series (CE5800 for short) switches are next-generation, high-density Gigabit Ethernet switches designed for data centers and high-end campus networks. The CE5800 hardware has an advanced architectural design with the industry's highest density of GE access ports. The CE5800 is also the first Gigabit Ethernet access switch to provide 40GE uplink ports. Using the Huawei VRP8 software platform, CE5800 switches support Transparent Interconnection of Lots of Links (TRILL) and have a high stacking capability (up to 16-member switches in a stack system). In addition, the airflow direction (front-to-back or back-to-front) can be changed. CE5800 switches can work with CE12800 switches to build an elastic, virtualized, high-quality fabric that meets the requirements of cloud-computing data centers. CE5800 switches provide high-density GE access to help enterprises build a scalable data center network platform for cloud computing. They can also be used as aggregation or access switches for enterprise campus networks.

Product Appearance

The CE5800 comes in five models.

CE5855-48T4S2Q-EI

48*GE BASE-T ports, 4*10GE SFP+ ports, 2*40GE QSFP+ ports

CE5855-24T4S2Q-EI

24*GE BASE-T ports, 4*10GE SFP+ ports, 2*40GE QSFP+ ports

CE5850-48T4S2Q-HI

48*GE BASE-T ports, 4*10GE SFP+ ports, 2*40GE QSFP+ ports

CE5810-48T4S-EI

48*GE BASE-T ports, 4*10GE SFP+ ports

CE5810-24T4S-EI

24*GE BASE-T ports, 4*10GE SFP+ ports

Product Characteristics

High-density GE Access

- Each CE5800 switch provides 48*GE line-speed ports, which makes future data center expansion easy.
- The CE5850 is the first GE access switch to provide 40GE uplink ports. CE5850 switches can work with CE12800 switches to build a high-performance data center network that provides 40GE access. The two 40GE uplink ports on CE5850 back up each other to improve system reliability.
- The CE5810 has models with 48*GE and 24*GE ports that can be flexibly deployed in racks with different server port densities to meet different cabling requirements in data center equipment rooms.

Highly Reliable, High-Performance Stacking

- The industry's first 9-member stack system
  - » A stack system of 9 member switches has up to 432*GE access ports for high-density server access in a data center.
  - » Multiple stacked switches 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, highly reliable stacking
  - » CE5800 switches can use either 10GE or 40GE ports as stack ports. A stack system can be established with switches in the same rack or different racks, and even over long distances.
  - » The 40GE ports of the CE5850 can set up large-capacity stack channels that enable multiple CE5800 switches to constitute a non-blocking stack system.

Vertical Virtualization Simplifies Management

- The CE5800 supports Super Virtual Fabric (SVF), which can virtualize multiple physical switches of the same or different types into one logical switch to simplify network management and improve reliability.
- SVF virtualizes multiple leaf switches into remote cards of the spine switch, making it easier to connect cables and manage devices in equipment rooms. The CE5810 switches act as leaf switches in an SVF system.
- Huawei's SVF is the first in the industry to implement local forwarding on leaf switches. When horizontal traffic dominates in a data center, SVF improves the forwarding efficiency and reduces network delay.

Large-Scale Routing Bridge, On-demand Scaling

- The CE5850 supports the TRILL protocol and can be used on a large Layer 2 TRILL network with GE/10GE servers. 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 CE5850 supports up to 16 TRILL-based Layer 2 equal-cost paths, greatly improving links' load balancing capabilities. The network has a fat-tree architecture that enhances expansion.

Programmable Network Device, Flexible Customization

- The CE5800 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).

Zero Touch Provisioning, Automatic O&M

- The CE5800 supports Zero Touch Provisioning (ZTP). ZTP enables the CE5800 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, High Energy Efficiency

- Flexible front-to-back/back-to-front airflow design
  - » The CE5800 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.
- Energy-saving technology
  - » The CE5800 has energy-saving chips and can measure system power consumption in real time. Fan speeds 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.
- » State and stack indicators on both the front and rear panels enable operators to maintain the switch from either side.
- » CE5800 switches support 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	CE5855-48T4S2Q-EI	CE5855-24T4S2Q-EI	CE5850-48T4S2Q-HI	CE5810-48T4S-EI	CE5810-24T4S-EI
Base-T ports	48	24	48	48	24
SFP+ ports	4	4	4	4	4
QSFP+ ports	2	2	2	-	-
Switching capacity	336 Gbit/s	288 Gbit/s	336 Gbit/s	176 Gbit/s	128 Gbit/s
Forwarding rate	252 Mpps	215 Mpps	252 Mpps	132 Mpps	96 Mpps
Airflow design	Front-to-back or back-to-front				
Device virtualization	iStack[1]				
	Super Virtual Fabric (SVF)[2]				
	M-LAG				
Network virtualization	TRILL (CE5855 & CE5850)				
Programmability	Open Programmability System (OPS)				

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

Item	CE5855-48T4S2Q-EI	CE5855-24T4S2Q-EI	CE5850-48T4S2Q-HI	CE5810-48T4S-EI	CE5810-24T4S-EI
Traffic analysis	NetStream				
	sFlow				
VLAN	Adding access, trunk, and hybrid interfaces to VLANs				
	Default VLAN				
	QinQ				
	MUX VLAN				
	GVRP				
ACL	ingress 9k egress 2k	ingress 4.5k egress 1k	ingress 2.25k egress 1k	ingress 4.5k egress 1k	ingress 2.25k egress 512
MAC address table	Maximum: 64k	Maximum: 64k	Maximum: 128k	Maximum: 32k	Maximum: 32k
	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)	54k	54k	16k	8k	8k
ND (Maximum)	16k	16k	4k	4k	4k
IPv4 FIB (Maximum)	32k	32k	16k	12k	12k
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)	16k	16k	8k	6k	6k
IPv6	IPv6 Neighbor Discovery (ND)				
	Path MTU Discovery (PMTU)				
	TCP6, ping IPv6, tracert IPv6, socket IPv6, UDP6, and Raw IP6				
Multicast FIB (Maximum)	2k	2k	4k	8k	8k

Item	CE5855-48T4S2Q-EI	CE5855-24T4S2Q-EI	CE5850-48T4S2Q-HI	CE5810-48T4S-EI	CE5810-24T4S-EI
Multicast	IGMP, PIM-SM, PIM-DM, MSDP, and MBGP				
	IGMP snooping				
	Fast leave of multicast member interfaces				
	Multicast traffic suppression				
	Multicast VLAN				
Reliability	LACP				
	STP, RSTP, VBST, 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				
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)				

Item	CE5855-48T4S2Q-EI	CE5855-24T4S2Q-EI	CE5850-48T4S2Q-HI	CE5810-48T4S-EI	CE5810-24T4S-EI
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 number, and VLAN ID				
	Authentication methods, including AAA, RADIUS, and HWTACACS				
	Remote Network Monitoring (RMON)				
Dimensions (W x D x H)	442 mm x 420 mm x 43.6 mm				
Weight (fully loaded)	8.4 kg (18.5 lb)	8.1 kg (17.8 lb)	8.8 kg (19.4 lb)	8.2 kg (18.1 lb)	8 kg (17.6 lb)
Environmental 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				
Operating voltage	AC: 90 V to 264 V		AC: 90 V to 290 V		
	DC: -38.4 V to -72 V				
Maximum power consumption	103 W	75 W	131 W	92 W	68 W

Ordering Information

Mainframe	
CE5850-HI-B00	CE5850-48T4S2Q-HI Switch (2*150W AC Power Module, 2*FAN Box, Port side exhaust)
CE5810-EI-B00	CE5810-48T4S-EI Switch (2*150W AC Power Module, 2*FAN Box, Port side exhaust)
CE5810-EI-B01	CE5810-24T4S-EI Switch (2*150W AC Power Module, 2*FAN Box, Port side exhaust)
CE5810-EI-B11	CE5810-EI Bundle 11 (CE5810-24T4S-EI mainframe, 4*SFP-10G-USR, Without Fan and Power Module)

CE5810-EI-B10	CE5810-EI Bundle 10 (CE5810-48T4S-EI mainframe, 8*SFP-10G-USR, Without Fan and Power Module)
CE5855-48T4S2Q-EI	CE5855-48T4S2Q-EI Switch (48-Port GE RJ45,4-Port 10GE SFP+,2-Port 40G QSFP+, Without Fan and Power Module)
CE5855-24T4S2Q-EI	CE5855-24T4S2Q-EI Switch (24-Port GE RJ45,4-Port 10GE SFP+,2-Port 40G QSFP+, Without Fan and Power Module)
CE5850-48T4S2Q-HI	CE5850-48T4S2Q-HI Switch (48-Port GE RJ45,4-Port 10GE SFP+,2-Port 40G QSFP+, Without Fan and Power Module)
CE5810-48T4S-EI	CE5810-48T4S-EI Switch (48-Port GE RJ45, 4-Port 10GE SFP+, Without Fan and Power Module)
CE5810-24T4S-EI	CE5810-24T4S-EI Switch (24-Port GE RJ45,4-Port 10GE SFP+, Without Fan and Power Module)

Fan box

Part Number	Product Description	Support Product
FAN-40EA-F	Fan box (EA, Front to Back, FAN panel side intake)	CE5850-48T4S2Q-HI
FAN-40EA-B	Fan box (EA, Back to Front, FAN panel side exhaust)	CE5850-48T4S2Q-HI
FAN-40SB-F	Fan box (SB, Front to Back, FAN panel side intake)	CE5810-48T4S-EI CE5810-24T4S-EI
FAN-40SB-B	Fan box (SB, Back to Front, FAN panel side exhaust)	CE5810-48T4S-EI CE5810-24T4S-EI
FAN-040A-F	Fan box(F,FAN panel side exhaust)	CE5855-48T4S2Q-EI CE5855-24T4S2Q-EI
FAN-040A-B	Fan box(B,FAN panel side exhaust)	CE5855-48T4S2Q-EI CE5855-24T4S2Q-EI

Power

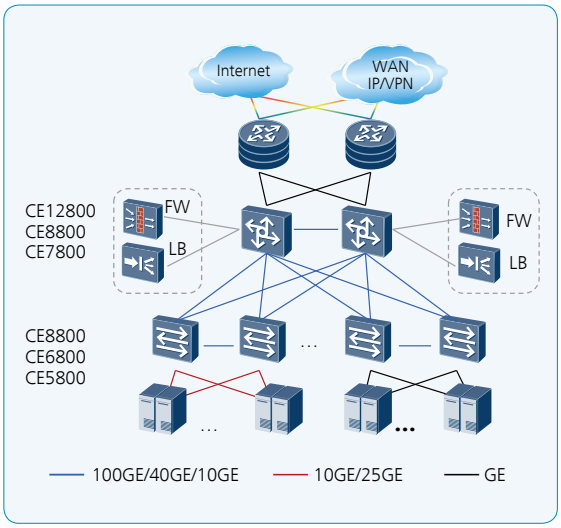
Part Number	Product Description	Support Product
PAC-150WA	150W AC Power Module (No Fan)	CE5850-48T4S2Q-HI, CE5810-48T4S-EI, CE5810-24T4S-EI
ES0W2PSA0150	150W AC Power Module(Black)	CE5855-48T4S2Q-EI, CE5855-24T4S2Q-EI
PDC-350WA-F	350W DC Power Module (Front to Back, Power panel side intake)	CE5850-48T4S2Q-HI, CE5810-48T4S-EI, CE5810-24T4S-EI, CE5855-48T4S2Q-EI, CE5855-24T4S2Q-EI
PDC-350WA-B	350W DC Power Module (Back to Front, Power panel side exhaust)	CE5850-48T4S2Q-HI, CE5810-48T4S-EI, CE5810-24T4S-EI, CE5855-48T4S2Q-EI, CE5855-24T4S2Q-EI

Networking and Application

Data Center Applications

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

Note: CSS and M-LAG can be also used on campus networks to support flexible service deployments in different service areas.

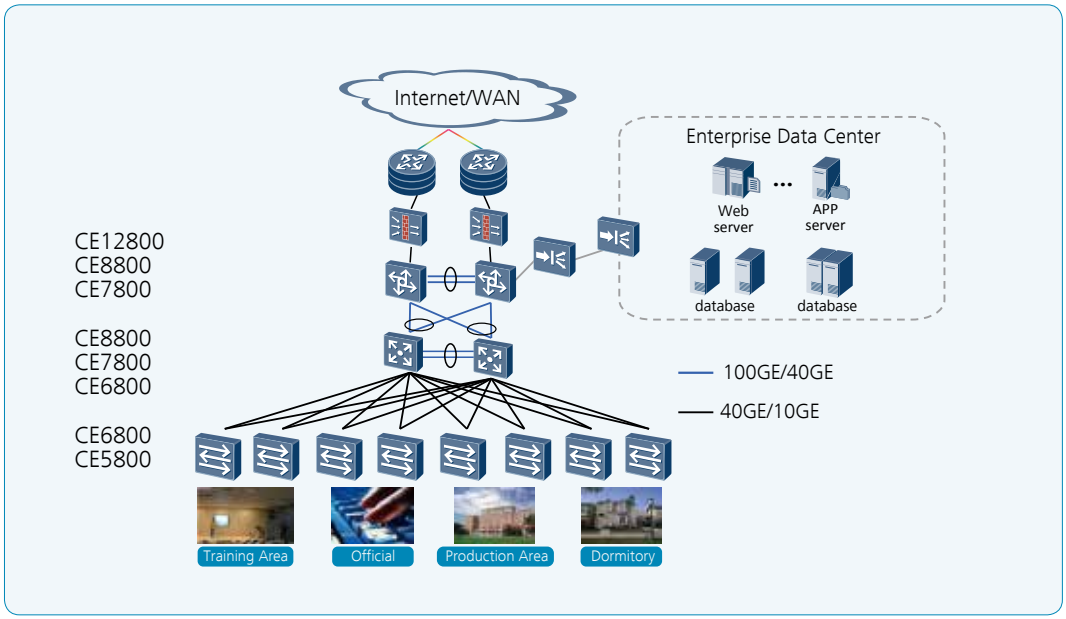


Campus Network Applications

CE5800 switches can be used as aggregation or access switches on a campus network. Their high-density, line-speed GE ports, unique 40GE uplink ports, and high stacking capabilities can meet the ever-increasing demand for network bandwidth. CE5800 switches are cost-effective campus network switches, thanks to their extensive service features and innovative energy-saving technologies.

On a typical campus network, multiple CE12800/CE8800/CE7800 switches are virtualized into a logical core switch using CSS or iStack technology. Multiple CE8800/CE7800/CE6800 switches at the aggregation layer form a logical switch using iStack technology. CSS and iStack improve network reliability and simplify network management. At the access layer, CE6800/CE5800 switches are virtualized with CloudFabric technology, such as SVF or M-LAG (vertical virtualization), to provide high-density line-rate ports.

Note: CSS, iStack, SVF, and M-LAG are also widely used in data centers to facilitate network management.



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