CloudEngine 5800 Series Data Center Switches

HUAWEI TECHNOLOGIES CO., LTD.

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Product Overview

Huawei CloudEngine 5800 series (CE5800) 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 six 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

CE5850-48T4S2Q-EI

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 16-member stack system
  - » A stack system of 16 member switches has a maximum of 768*GE 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, 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 homogeneous or heterogeneous physical switches into one logical switch to simplify network management and improve reliability.
- SVF implements vertical extension of heterogeneous switches and virtualizes multiple leaf switches into remote cards of the spine switch, making it easier to install cables in equipment rooms and manage devices. The CE5810 functions as the leaf switch.
  - » Huawei's SVF is the first in the industry to implement local forwarding of leaf switches. When horizontal traffic is the mainstream traffic in a data center, SVF improves forwarding efficiency and reduces network delay.

Large-scale Routing Bridge, On-demand Scalability

- 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.

Fast VM Migration, Policy Mobility

- The CE5800 works with Huawei's Agile Controller to permit network policies to be dynamically deployed on the CE5800. Agile Controller also supports online VM migration.
- Agile Controller delivers network policies through high-speed RADIUS interfaces. Its online VM migration is 10 to 20 times the rate of other industry platforms, enabling large-scale VM migrations.
- Agile Controller is based on open APIs and is compatible with all major virtualization platforms including VMware.

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-Configuration Deployment, 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 Saves Energy

- 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 technologies
  - » The CE5800 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.
  - » 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	CE5850-48T4S2Q-EI	CE5810-48T4S-EI	CE5810-24T4S-EI
Ports	48*10/100/1000BASE-T, 4*10GE SFP+, and 2*40GE QSFP+	24*10/100/1000BASE-T, 4*10GE SFP+, and 2*40GE QSFP+	48*10/100/1000BASE-T, 4*10GE SFP+, and 2*40GE QSFP+	48*10/100/1000BASE-T, 4*10GE SFP+, and 2*40GE QSFP+	48*10/100/1000BASE-T and 4*10GE SFP+	24*10/100/1000BASE-T and 4*10GE SFP+
Switching capacity	336 Gbit/s	288 Gbit/s	336 Gbit/s	336 Gbit/s	176 Gbit/s	128 Gbit/s
Forwarding performance	252 Mpps	216 Mpps	252 Mpps	252 Mpps	132 Mpps	96 Mpps
Airflow design	Front-to-back or back-to-front					
Device virtualization	iStack					
	Super Virtual Fabric (SVF)					
Network virtualization	M-LAG					
	TRILL (CE5855 & CE5850)					

Item	CE5855-48T4S2Q-EI	CE5855-24T4S2Q-EI	CE5850-48T4S2Q-HI	CE5850-48T4S2Q-EI	CE5810-48T4S-EI	CE5810-24T4S-EI
VM awareness	Agile Controller					
SDN	Open Programmability System (OPS)					
Traffic analysis	NetStream					
	sFlow					
VLAN	Adding access, trunk, and hybrid interfaces to VLANs					
	Default VLAN					
	QinQ					
	MUX VLAN					
MAC address table	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					
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	IPv6 Neighbor Discovery (ND)					
	Path MTU Discovery (PMTU)					
	TCP6, ping IPv6, tracert IPv6, socket IPv6, UDP6, and Raw IP6					
Multicast	IGMP,PIM-SM,PIM-DM, MSDP,and MBGP					
	IGMP snooping					
	IGMP proxy					
	Fast leave of multicast member interfaces					
	Multicast traffic suppression					
	Multicast VLAN					
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	CE5855-48T4S2Q-EI	CE5855-24T4S2Q-EI	CE5850-48T4S2Q-HI	CE5850-48T4S2Q-EI	CE5810-48T4S-EI	CE5810-24T4S-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 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	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	442 mm x 420 mm x 43.6 mm
Weight (fully loaded)	8 kg	7.5 kg	8.8 kg	8.8 kg	8.2 kg	8 kg
Environmental parameters	Operating temperature: 0°C to 40°C (0 m to 1,800 m) Storage temperature: -40°C to +70°C Relative humidity: 5% RH to 95% RH, non-condensing					
Operating voltage	AC: 90V ~ 290V DC: -38.4V ~ -72V					
Maximum power consumption	≤130 W	≤90 W	≤131W	≤133W	≤92W	≤68W

Ordering Information

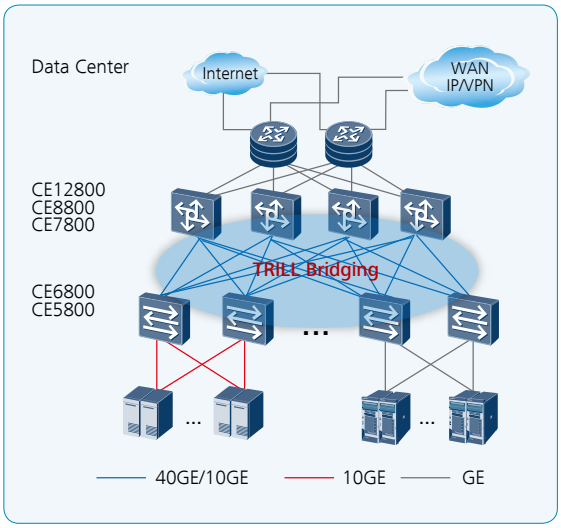
Mainframe	
CE5850-HI-B00	CE5850-48T4S2Q-HI Switch (2*150W AC Power Module,2*FAN Box,Port side exhaust)
CE5850-EI-B00	CE5850-48T4S2Q-EI Switch (2*150W AC Power Module,2*FAN Box,Port side exhaust)
CE5810-EI-B00	CE5810-48T4S-EI Switch (2*150W AC Power Module,2*FAN Box,Port side exhaust)
CE5810-EI-B01	CE5810-24T4S-EI Switch (2*150W AC Power Module,2*FAN Box,Port side exhaust)
CE5810-EI-B10	CE5810-EI Bundle 10 (CE5810-48T4S-EI mainframe, 8*SFP-10G-USR ,Without Fan and Power Module)
CE5810-EI-B11	CE5810-EI Bundle 11 (CE5810-24T4S-EI mainframe, 4*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)
CE5850-48T4S2Q-EI	CE5850-48T4S2Q-EI 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	
FAN-40EA-F	Fan box (EA, Front to Back, FAN panel side intake)
FAN-40EA-B	Fan box (EA, Back to Front, FAN panel side exhaust)
FAN-40SB-F	Fan box (SB, Front to Back, FAN panel side intake)
FAN-40SB-B	Fan box (SB, Back to Front, FAN panel side exhaust)
Power	
PAC-150WA	150W AC Power Module (No Fan)
PDC-350WA-F	350W DC Power Module (Front to Back, Power panel side intake)
PDC-350WA-B	350W DC Power Module (Back to Front, Power panel side exhaust)

Networking and Application

Data Center Applications

CE12800/CE8800/CE7800 switches work as core switches and CE6800/CE5800 switches work as TOR switches on a typical data center network. CE6800/CE5800 switches connect to CE12800/CE8800/CE7800 switches through 40GE/10GE ports. The CE12800/CE8800/CE7800 and CE6800/CE5800 switches use the TRILL protocol to build a non-blocking Layer 2 network, which allows large-scale VM migrations and flexible service deployments.

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

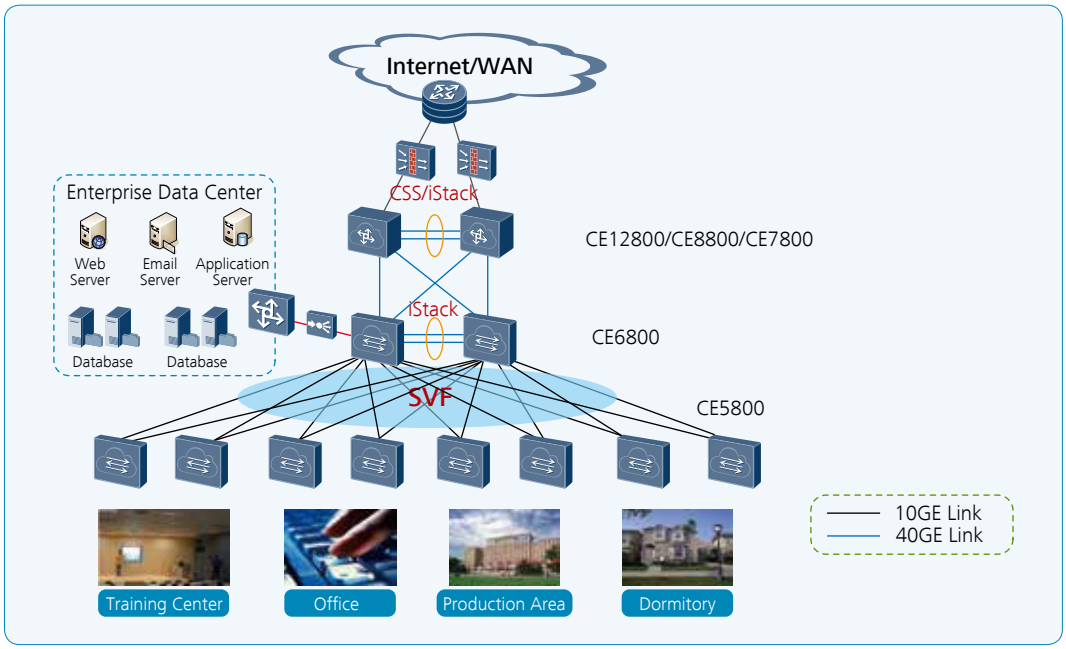


Campus Network Applications

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, 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. At the access layer, CE5800 switches are virtualized with SVF to provide high-density line-speed ports.

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



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