

# CloudEngine 6800 Series Data Center Switches





# CloudEngine 6800

Series Data Center Switches

## Product Overview

Huawei CloudEngine 6800 series (CE6800 for short) switches are next-generation 10G Ethernet switches designed for data centers and high-end campus networks. The switches provide high-performance, high-density 10GE ports and low latency. The CE6800 hardware has an advanced architectural design with 40GE uplink ports and the industry's highest density of 10GE access ports. Using the Huawei VRP8 software platform, CE6800 switches provide extensive data center service features and high stacking capability. In addition, the air flow direction through ventilation channels (front-to-rear or rear-to-front) can be changed. CE6800 switches can work with CE12800 switches to build an elastic, virtualized and high-quality fabric, meeting the requirements of cloud-computing data centers.

The CE6800 series switches have two models: the 48S4Q model providing 10GE optical access ports and the 48T4Q model providing 10GE electrical access ports. Each switch has 48\*10GE ports (optical or electrical) and 4\*40GE QSFP+ ports (each QSFP+ port can be used as 4\*10GE ports). These ports provide L2/L3 line-speed forwarding. CE6800 switches provide high-density 10GE access 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 on enterprise campus networks.



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## Product Appearance

The CE6800 is available in two models, as shown in the following figure.

### CE6850-48S4Q-EI (10GE optical access ports)



### CE6850-48T4Q-EI (10GE electrical access ports)



## Product Characteristics

### High-Density 10GE Access, Leading Performance

- Each CE6800 switch provides a total switching capacity of 1.28 Tbps, which is the industry's highest performance (in a 1U TOR). The switch has a 960Mpps total forwarding performance and supports L2/L3 line-speed forwarding.
- The CE6800 provides a maximum of 64\*10GE ports, which is the industry's highest 10GE port density (in a 1U TOR) and meets the requirement for high-density 10GE server access.
- The CE6800 has 4\*40GE QSFP+ ports. Each of the QSFP+ ports can be used as 4\*10GE ports, allowing flexible network deployment. Through the 40GE QSFP+ ports, CE6800 switches can work with CE12800 switches to build a non-blocking network platform.

### Highly Reliable Stacking, Superior Capacity

- The industry's first 16-member stack system
  - » A stack system of 16 member switches has more than 768\*10GE access ports to support 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-point failures and greatly improves system reliability.
- Long-distance stacking

- » The CE6800 series switches can use service ports as stack ports. A stack system can be established by switches in the same rack or different racks even over long distances.
- » Service bandwidth and stack bandwidth can be allocated based on the network scale so that network resources can be used more efficiently.

### Large-Scale Routing Bridge, Flexible Deployment

- The CE6800 series switches support the IETF TRILL protocol and can be used in a large Layer 2 TRILL network with GE/10GE servers. The TRILL network can contain more than 500 nodes, allowing flexible service deployments and large-scale 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 tree (SPF) and equal-cost multipath (ECMP) routing. SPF and ECMP avoid the suboptimal path selection problem in STP and increase the link bandwidth efficiency to 100%.
- Each CE6800 switch supports up to 16 TRILL-based Layer 2 equal-cost paths, greatly improving load balancing capabilities of links. The network has a fat-tree architecture to support smooth expansion.

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

- The CE6800 series switches support Fibre Channel over Ethernet (FCoE), which allows the storage service, data service and computing service to be transmitted on one network, reducing the costs of network construction and maintenance.
- The CE6800 series switches support centralized FCoE/FC gateway deployment. Within this deployment, the Ethernet network is compatible with the FC SAN, but Ethernet access devices do not participate in the computing of the FC protocol, making network operation and maintenance simpler.
- The CE6800 series switches support various features to ensure lossless transmission, such as 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 the FC storage service and high-speed computing service.

### Automated Service Deployment, Fast VM Migration

- The next-generation Huawei automated Network Management Center, nCenter, can work with the VM management platform to dynamically deploy network policies for VMs on CE6800 switches. This allows fast in-service migration of VMs.
- nCenter delivers network policies through high-speed RADIUS interfaces so that VMs can migrate at a speed 10 to 20 times the industry average.
- nCenter is based on open APIs and is compatible with all major virtualized platforms.

### Changeable Air Flow Direction, Innovative Energy-Saving Technologies

- Flexible front-to-rear/rear-to-front ventilation channel design
  - » The CE6800 series switches use a straight ventilation channel design that separates cold air

flows from hot air flows to improve heat dissipation efficiency. This is the best ventilation channel design for data center equipment rooms.

- » Air can flow from front to rear or rear to front in ventilation channels when different fans and power modules are used.
- » Power modules and fans can be configured in redundancy mode to ensure uninterrupted service transmission.
- Innovative energy-saving technologies
  - » The CE6800 series switches 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 operation and maintenance costs and contribute towards a greener data center.

## Clear Indicators, Simple Maintenance

- Clear indicators
  - » Port indicators clearly show port status and port speeds. The 40GE 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 CE6800 series switches support remote positioning. Operators can turn on the remote positioning indicators on the switches they want to maintain, so that they can find these devices 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	CE6850-48T4Q-EI	CE6850-48S4Q-EI
Ports	48*10GE Base-T, 4*40GE QSFP+	48*10GE SFP+, 4*40GE QSFP+
Total switching capacity	1.28 Tbps	
Total forwarding performance	960 Mpps	
Air ventilation channel	Strict front-to-rear or rear-to-front	
Equipment virtualization	iStack	
Network virtualization	TRILL	
VM-awareness	nCenter	
Network convergence	FCoE	
	DCBX, PFC, ETS	
Traffic analysis	Netstream	
	sFlow	

Item	CE6850-48T4Q-EI	CE6850-48S4Q-EI
VLAN	Adding access, trunk and hybrid interfaces to VLANs	
	Default VLAN	
	802.1ad 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, ISISv6, BGP4+	
IPv6	IPv6 Neighbor Discovery (ND)	
	Path MTU Discovery (PMTU)	
	TCP6, ping IPv6, tracer IPv6, socket IPv6, UDP6, and Raw IP6	
Multicast	IGMP, PIM-SM, MSDP, MBGP	
	IGMP Snooping	
	IGMP Proxy	
	Fast Leave of Multicast Member Interfaces	
	Multicast Traffic Suppression	
	Multicast VLAN	
Reliability	LACP	
	STP, RSTP, and MSTP	
	BPDU protection, root protection, and loop protection	
	SmartLink and Multi-Instance	
	DLDP	
	VRRP, VRRP load balance, 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-mark and schedule	
	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/v2/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	

Item	CE6850-48T4Q-EI	CE6850-48S4Q-EI
Security and management	Command line authority control based on user levels, preventing unauthorized users from using commands	
	DoS attack defense, ARP attack defense and ICMP attack defense	
	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 43.6 mm	442 mm x 600 mm x 43.6 mm
Weight (fully loaded)	10 kg	10 kg
Environment parameters	Operating temperature: 0°C to 40°C (0 m to 1800 m) Storage temperature: -40°C to +70°C Relative humidity: 5% RH to 95% RH, noncondensing	
Operating voltage	AC: 90~290 V	AC: 90V~290V DC: -38.4V~-72V
Max. power consumption	≤ 380W	≤ 272W

## Ordering Information

### Mainframe

CE6850-48S4Q-EI	CE6850-48S4Q-EI Switch (48-Port 10G SFP+, 4-Port 40G QSFP+, Without Fan and Power Module)
CE6850-48T4Q-EI	CE6850-48T4Q-EI Switch (48-port 10GE RJ45, 4-port 40G QSFP+, Without Fan and Power Module)

### Fan box

FAN-40EA-F	Fan box(EA, Front to Back)
FAN-40EA-B	Fan box(EA, Back to Front)

### Power

PAC-350WA-F	350W AC Power Module(Front to Back)
PAC-350WA-B	350W AC Power Module(Back to Front)
PAC-600WA-F	600W AC Power Module(Front to Back)
PAC-600WA-B	600W AC Power Module(Back to Front)
PDC-350WA-F	350W DC Power Module(Front to Back)
PDC-350WA-B	350W DC Power Module(Back to Front)

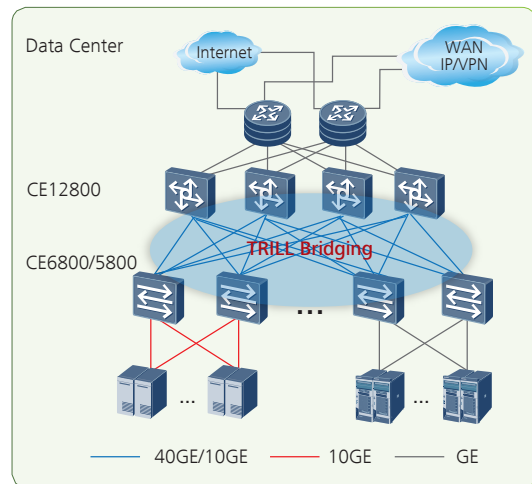


## Networking and Application

### Application in a Data Center

In a typical data center network, CE12800 switches work as core switches and CE6800/CE5800 switches work as TOR switches. CE6800/CE5800 switches connect to CE12800 switches through 40GE/10GE ports. The CE12800 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 also be used on campus networks to support flexible service deployment in different service areas.



### Application on a Campus Network

CE6800 switches can be used as aggregation or core switches on a campus network. Its high-density line-speed 10GE ports and high stacking capability can meet the ever-increasing demand for network bandwidth. CE6800 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 switches are virtualized into a logical core switch using CSS 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 stacked using iStack technology to provide high-densities of line-speed ports.

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

