

# CloudEngine 6810 Series Data Center Switches



# CloudEngine 6810 Series Data Center Switches

## Product Overview

Huawei CloudEngine 6810 (CE6810 for short) series switches are next-generation 10G Ethernet switches designed for data centers and high-end campus networks, providing high-performance, high-density 10GE ports, and low latency. The CE6810 series uses an advanced hardware architecture with 40GE uplink ports and the industry's highest density of 10GE access ports.

Using the Huawei VRP8 software platform, CE6810 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. CE6810 switches can work with CE12800 switches to build an elastic, virtualized, high-quality fabric that meets the requirements of cloud-computing data centers.

The CE6810 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 for enterprise campus networks.

## Product Appearance

The CE6810 series comes in five models.

### CE6810-48S4Q-EI



48\*10GE SFP+ ports, 4\*40GE QSFP+ ports

### CE6810-48S4Q-LI



48\*10GE SFP+ ports, 4\*40GE QSFP+ ports

### CE6810-32T16S4Q-LI



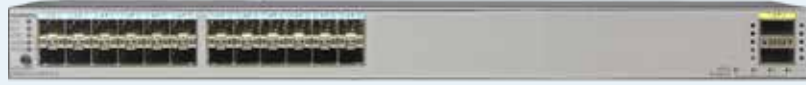
32\*10GE Base-T ports, 16\*10GE SFP+ ports, 4\*40GE QSFP+ ports

### CE6810-48S-LI



48\*10GE SFP+ ports

## CE6810-24S2Q-LI



24\*10GE SFP+ ports, 2\*40GE QSFP+ ports

### Product Characteristics

#### High-Density 10GE Access

- The CE6810 is the industry's highest-performing 1 U ToR switch. It provides forwarding performance of 960 Mpps and supports L2/L3 line-rate forwarding.
- The CE6810 provides 64\*10GE ports, allowing for high-density 10G server access.
- The CE6810 has four 40GE QSFP+ ports, each of which can be used as four 10GE SFP+ ports to provide flexibility in network deployment. Using the 40GE uplink ports, the CE6810 switches can connect to CE12800 switches to build a non-blocking network platform.

#### Highly Reliable, High-Performance Stacking

- The industry's first 16-member stack system
  - » A stack system of 16 member switches has up to 768\*10GE access ports that provide 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
  - » The CE6810 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.

#### Vertical Virtualization Simplifies Management

- The CE6810 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 enables different types of switches to set up a vertical virtual system. In an SVF system, CE6810 switches can act as leaf nodes and connect to spine switch CE6850 as its remote line cards. This facilitates cabling and equipment management in equipment rooms.
- 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 CE6810 supports the IETF Transparent Interconnection of Lots of Links (TRILL) protocol and can connect to 10G and 1G servers simultaneously. CE6810 switches can establish a large Layer 2 TRILL network with 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 CE6810 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, Allowing for Data, Storage, and Computing Services on One Network

- The CE6810 series switches support 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 CE6810 series switches support centralized FCoE gateway deployment, which makes network O&M simpler.
- The CE6810 series switches support multiple data center features: 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.

## Fast VM Migration, Policy Mobility

- The CE6810 works with Huawei's Agile Controller to permit network policies to be dynamically deployed on the CE6800. 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 CE6810 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 CE6810 supports Zero Touch Provisioning (ZTP). ZTP enables the CE6810 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 CE6810 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 CE6810 series switches have 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. 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.
  - » CE6810 series 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	CE6810EI	CE6810LI			
	CE6810-48S4Q-EI	CE6810-48S4Q-LI	CE6810-32T16S4Q-LI	CE6810-48S-LI	CE6810-24S2Q-LI
10G Base-T ports	0	0	32	0	0
SFP+ ports	48	48	16	48	24
QSFP+ ports	4	4	4	0	2
Switching capacity	1.28 Tbit/s	1.28 Tbit/s	1.28 Tbit/s	960 Gbit/s	640 Gbit/s
Forwarding rate	960 Mpps	960 Mpps	960 Mpps	720Mpps	480Mpps
Airflow design	Front-to-back or back-to-front				
Device virtualization	iStack <sup>1</sup>				
	Super Virtual Fabric (SVF) <sup>2</sup>				
Network virtualization	M-LAG				
	TRILL (CE6810EI)				
VM awareness	Agile Controller				
Network convergence	FCoE				
	DCBX, PFC, ETS				
Programmability	OpenFlow				
	OPS				
	Puppet and OVSDB plugins released on open source websites (CE6810EI)				
	Linux container for open source and customization programming				
Traffic analysis	NetStream				
	sFlow				

1 For details about the configuration, please see: [http://support.huawei.com/online/toolsweb/virtual/en/dc/stack\\_index.html?dcb](http://support.huawei.com/online/toolsweb/virtual/en/dc/stack_index.html?dcb)

2 For details about the configuration, please see: [http://support.huawei.com/online/toolsweb/virtual/en/dc/svf\\_index.html?dcb](http://support.huawei.com/online/toolsweb/virtual/en/dc/svf_index.html?dcb)

Item	CE6810EI	CE6810LI			
	CE6810-48S4Q-EI	CE6810-48S4Q-LI	CE6810-32T16S4Q-LI	CE6810-48S-LI	CE6810-24S2Q-LI
VLAN	Adding access, trunk, and hybrid interfaces to VLANs				
	Default VLAN				
	QinQ				
	MUX VLAN				
	GVRP				
ACL	Ingress:2250 Egress:1000	Ingress:1250 Egress:500	Ingress:1250 Egress:500	Ingress:1250 Egress:500	Ingress:1250 Egress:500
MAC address table	Maximum: 64k	Maximum: 128k	Maximum: 128k	Maximum: 128k	Maximum: 128k
	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)	4k	1.5k	1.5k	1.5k	1.5k
IPv4 FIB (Maximum)	16k	1.5k	1.5k	1.5k	1.5k
IP routing	IPv4 routing protocols, such as RIP, OSPF, BGP, and IS-IS				
	IPv6 routing protocols, such as RIPng, OSPFv3, IS-ISv6, and BGP4+ (CE6810EI)				
IPv6 FIB (Maximum)	8k	/	/	/	/
Multicast FIB (Maximum)	2k	/	/	/	/
Multicast	IGMP, PIM-SM, PIM-DM, MSDP, and MBGP (CE6810EI)				
	IGMP snooping				
	IGMP proxy (CE6810EI)				
	Fast leave of multicast member interfaces(CE6810EI)				
	Multicast traffic suppression(CE6810EI)				
	Multicast VLAN(CE6810EI)				

Item	CE6810EI	CE6810LI			
	CE6810-48S4Q-EI	CE6810-48S4Q-LI	CE6810-32T16S4Q-LI	CE6810-48S-LI	CE6810-24S2Q-LI
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 (CE6810EI)				
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				
	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)				



Item	CE6810EI	CE6810LI			
	CE6810-48S4Q-EI	CE6810-48S4Q-LI	CE6810-32T16S4Q-LI	CE6810-48S-LI	CE6810-24S2Q-LI
Dimensions (W x D x H, mm)	442 x 600 x 43.6	442 x 600 x 43.6	442 x 420 x 43.6	442 x 600 x 43.6	442 x 600 x 43.6
Weight (fully loaded)	10.4 kg (22.9 lb)	10.4 kg (22.9 lb)	8.5 kg (18.7 lb)	10.2 kg (22.5 lb)	10.1 kg (22.3 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 290 V DC: -38.4V to -72V				
Max. power consumption	238 W	238 W	288 W	178 W	171 W

## Ordering Information

### Mainframe

CE6810-EI-B00	CE6810-48S4Q-EI Switch (2*600W AC Power Module, 2*FAN Box, Port side exhaust)
CE6810-LI-B00	CE6810-48S4Q-LI Switch (2*600W AC Power Module, 2*FAN Box, Port side exhaust)
CE6810-LI-B01	CE6810-48S-LI Switch (2*600W AC Power Module, 2*FAN Box, Port side exhaust)
CE6810-LI-B10	CE6810-LI Bundle 10 (CE6810-48S4Q-LI mainframe, 4*QSFP-40G-iSR4, Without Fan and Power Module)
CE6810-LI-B11	CE6810-LI Bundle 11 (CE6810-48S-LI mainframe, 2*QSFP-40G-iSR4, 8*SFP-10G-USR, Without Fan and Power Module)
CE6810-48S4Q-EI	CE6810-48S4Q-EI Switch (48-Port 10GE SFP+, 4-Port 40G QSFP+, Without Fan and Power Module)
CE6810-48S4Q-LI	CE6810-48S4Q-LI Switch (48-Port 10GE SFP+, 4-Port 40G QSFP+, Without Fan and Power Module)
CE6810-32T16S4Q-LI	CE6810-32T16S4Q-LI Switch (32-port 10GE RJ45, 16-Port 10GE SFP+, 4-Port 40G QSFP+, Without Fan and Power Module)
CE6810-48S-LI	CE6810-48S-LI Switch (48-Port 10GE SFP+, Without Fan and Power Module)
CE6810-24S2Q-LI	CE6810-24S2Q-LI Switch (24-Port 10GE SFP+, 2-Port 40G QSFP+, 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)	CE6810-48S4Q-EI, CE6810-48S4Q-LI, CE6810-48S-LI, CE6810-32T16S4Q-LI, CE6810-24S2Q-LI
FAN-40EA-B	Fan box (EA, Back to Front, FAN panel side exhaust)	CE6810-48S4Q-EI, CE6810-48S4Q-LI, CE6810-48S-LI, CE6810-32T16S4Q-LI, CE6810-24S2Q-LI

### Power

Part Number	Product Description	Support Product
PAC-600WA-F	600W AC Power Module (Front to Back, Power panel side intake)	CE6810-48S4Q-EI, CE6810-48S4Q-LI, CE6810-48S-LI, CE6810-32T16S4Q-LI, CE6810-24S2Q-LI
PAC-600WA-B	600W AC Power Module (Back to Front, Power panel side exhaust)	CE6810-48S4Q-EI, CE6810-48S4Q-LI, CE6810-48S-LI, CE6810-32T16S4Q-LI, CE6810-24S2Q-LI
PDC-350WA-F	350W DC Power Module (Front to Back, Power panel side intake)	CE6810-48S4Q-EI, CE6810-48S4Q-LI, CE6810-48S-LI, CE6810-32T16S4Q-LI, CE6810-24S2Q-LI
PDC-350WA-B	350W DC Power Module (Back to Front, Power panel side exhaust)	CE6810-48S4Q-EI, CE6810-48S4Q-LI, CE6810-48S-LI, CE6810-32T16S4Q-LI, CE6810-24S2Q-LI

### Software

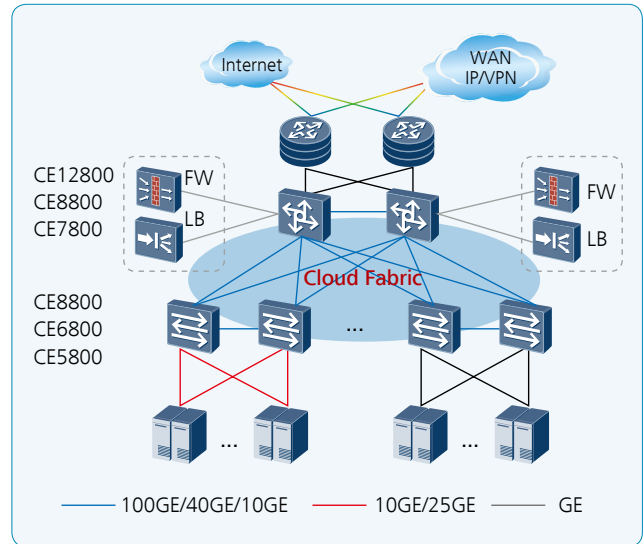
CE68-LIC-VXLAN	CloudEngine 6800 VXLAN Function
CE68-LIC-FCF16	CloudEngine 6800 FCF 16 Ports
CE68-LIC-FCFAL	CloudEngine 6800 FCF All Ports
CE6800-LIC-NPV	CloudEngine 6800 FCOE NPV Function

## Networking and Applications

### Data Center Applications

On a typical data center network, CE12800/CE8800/CE7800 switches work as core switches, whereas CE6810 and CE5800 switches work as ToR switches and connect to the core switches using 40GE/10GE ports. These switches use a fabric protocol, 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.

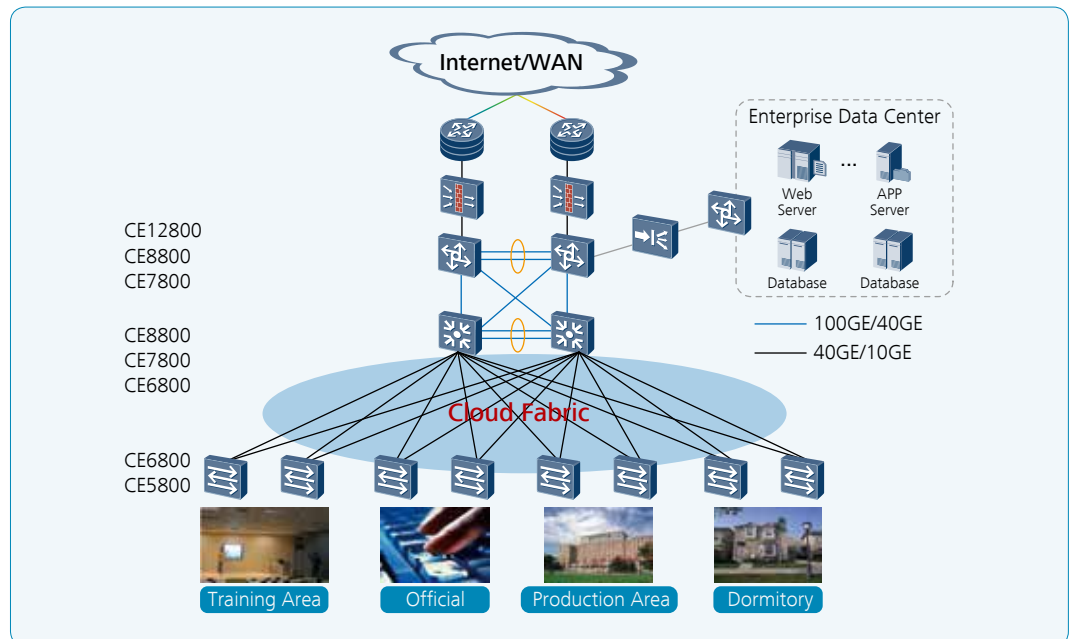


### Campus Network Applications

CE6800 switches can be used as aggregation or core switches on a campus network. Their high-density, line-rate 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, multiple CE12800/CE8800/CE7800 switches are virtualized into a logical core switch using CSS or iStack technology. Multiple CE6810 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-rate ports.

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



**Copyright © Huawei Technologies Co., Ltd. 2016. All rights reserved.**

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

**Trademark Notice**



, HUAWEI, and  are trademarks or registered trademarks of Huawei Technologies Co., Ltd.

Other trademarks, product, service and company names mentioned are the property of their respective owners.

**General Disclaimer**

The information in this document may contain predictive statements including, without limitation, statements regarding the future financial and operating results, future product portfolio, new technology, etc. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied in the predictive statements. Therefore, such information is provided for reference purpose only and constitutes neither an offer nor an acceptance. Huawei may change the information at any time without notice.

HUAWEI TECHNOLOGIES CO.,LTD.  
Huawei Industrial Base  
Bantian Longgang  
Shenzhen 518129,P.R.China  
Tel: +86 755 28780808

[www.huawei.com](http://www.huawei.com)