



# Huawei CloudEngine 6820 Switch Datasheet

Huawei CloudEngine 6820 series switches have advanced hardware architecture with 40GE/100GE uplink ports and high-density 10GE access ports.



# Product Overview

Huawei CloudEngine 6820 series switches are next-generation 10GE access switches that provide high performance and high port density on data center networks and high-end campus networks. The CloudEngine 6820 series have advanced hardware architecture with 40GE/100GE uplink ports and high-density 10GE access ports. Using Huawei's VRP8 software platform, CloudEngine 6820 series switches support extensive data center features and high stacking capabilities. In addition, the CloudEngine 6820 series use a flexible airflow design (front-to-back or back-to-front). CloudEngine 6820 series can work with CloudEngine 16800 or CloudEngine 12800 series data center core switches to build elastic, virtual, and high-quality 40GE/100GE full-mesh networks, meeting requirements of cloud computing data centers.

CloudEngine 6820 series 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 work as core or aggregation switches on campus networks.

## Product Appearance

CloudEngine 6820 series switches provide 48 x 10GE SFP+ ports, 6 x 100GE QSFP28 ports.



## Product Characteristics

### High-Density 10GE Access

- CloudEngine 6820 series provide up to 48 x 10GE ports, allowing for high-density 10GE server access and smooth evolution.
- CloudEngine 6820 series provide up to 6 x 100GE QSFP28 ports. Each QSFP28 port can also be used as one 40GE QSFP+ port, providing flexibility in networking. The uplink 40GE/100GE ports can be connected to CloudEngine 16800 or CloudEngine 12800 series switches to build a non-blocking network platform.

### Highly Reliable, Long-Distance Stacking

16-member stack system

- A stack system of 16 member switches has a maximum of 768 x 10GE 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 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 points of failure and greatly improves system reliability.

Long-distance stacking

- CloudEngine 6820 series 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 scale to ensure that network resources are used more efficiently.

### Inter-device Link Aggregation, High Efficiency and Reliability

- CloudEngine 6820 series support multi-chassis link aggregation group (M-LAG), which enables links of multiple switches to aggregate into one to implement device-level link backup.
- Switches in an M-LAG system all work in active state to share traffic and back up each other, enhancing system reliability.

- Switches in an M-LAG system can be upgraded independently. During the upgrade, other switches in the system take over traffic forwarding to ensure uninterrupted services.
- M-LAG supports dual-homing to Ethernet, and IP networks, allowing for flexible networking.

## Standard Interfaces, Enabling Openness and Interoperability

- CloudEngine 6820 series support NETCONF.
- CloudEngine 6820 series support Ansible-based automatic configuration and open-source module release, expanding network functions and simplifying device management and maintenance.

## ZTP, Implementing Automatic O&M

- CloudEngine 6820 series support Zero Touch Provisioning (ZTP). ZTP enables the CloudEngine 6820 series to automatically obtain and load version files from a USB flash drive or file server, freeing network engineers from onsite configuration and deployment. ZTP reduces labor costs and improves device deployment efficiency.
- ZTP provides built-in scripts through open APIs. Data center personnel can use a programming language they are familiar with, such as Python, to centrally configure network devices.
- ZTP decouples the configuration time of new devices from the device quantity and area distribution, which improves service provisioning efficiency.

## Flexible Airflow Design, Improving Energy Efficiency

Flexible front-to-back/back-to-front airflow design

- CloudEngine 6820 series use a strict front-to-back/back-to-front airflow design that isolates cold air channels from hot air channels. This design improves heat dissipation efficiency and meets design requirements of data center equipment rooms.
- Air can flow from front to back or back to front depending on the fans and power modules that are used.
- Redundant power modules and fans can be configured to ensure service continuity.

Innovative energy-saving technologies

- CloudEngine 6820 series 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 O&M costs and contribute to a greener data center.

## Clear Indicators, Simplifying Maintenance

Clear indicators

- Port indicators clearly show the port status and port rate. The 100GE port indicators can show the states of all ports derived from the 100GE ports.
- State and stack indicators on both the front and rear panels enable users to maintain the switch from either side.
- CloudEngine 6820 series support remote positioning. Remote positioning indicators enable users to easily identify the switches they want to maintain 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

Note: This content is applicable only to regions outside mainland China. Huawei reserves the right to interpret this content.

## Functions and Features

Item	CloudEngine 6820-48S6CQ
Device virtualization	iStack <sup>1</sup>

Item	CloudEngine 6820-48S6CQ
	M-LAG
Network convergence	PFC
Programmability	OPS programming
	OpenFlow
	Ansible-based automatic configuration and open-source module release
Traffic analysis	NetStream
VLAN	Adding access, trunk, and hybrid interfaces to VLANs
	Default VLAN
	QinQ
MAC address	Dynamic learning and aging of MAC address entries
	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, IS-IS, and BGP
	IPv6 routing protocols, such as RIPng, OSPFv3, IS-ISv6, and BGP4+
	IP packet fragmentation and reassembly
IPv6	IPv6 Neighbor Discovery (ND)
	Path MTU Discovery (PMTU)
	TCP6, IPv6 ping, IPv6 tracer, IPv6 socket , UDP6, and Raw IP6
Multicast	Multicast routing protocols such as IGMP, PIM-SM, and MBGP
	IGMP snooping
	IGMP proxy
	Fast leaving of multicast member interfaces
	Multicast traffic suppression
	Multicast VLAN
Reliability	Link Aggregation Control Protocol (LACP)
	STP, RSTP, VBST, and MSTP
	BPDU Guard
	Smart Link and multi-instance
	Device Link Detection Protocol (DLDP)
	Hardware-based Bidirectional Forwarding Detection (BFD)
	VRRP, VRRP load balancing, and BFD for VRRP
	BFD for BGP/IS-IS/OSPF/Static route
QoS	Traffic classification based on Layer 2, Layer 3, Layer 4, and priority information

Item	CloudEngine 6820-48S6CQ
	ACL, CAR, re-marking, and scheduling
	Queue scheduling modes such as PQ,DWRR and PQ+DWRR
	Congestion avoidance mechanisms, including WRED and tail drop
	Traffic shaping
O&M	Network-wide path detection
	Telemetry
	ERSPAN+
	Statistics on the buffer microburst status
Configuration and maintenance	Console, Telnet, and SSH terminals
	Network management protocols, such as SNMPv1/v2/v3
	File upload and download through FTP and TFTP
	BootROM upgrade and remote upgrade
	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
	Defense against DoS address attacks, ARP storms, and ICMP attacks
	Port isolation, port security, and sticky MAC
	Binding of the IP address, MAC address, port number, and VLAN ID
	Authentication methods, including AAA, RADIUS, and HWTACACS
	Remote Network Monitoring (RMON)

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

## Performance and Scalability

Item	CloudEngine 6820-48S6CQ
Maximum number of MAC address entries	256K
Maximum number of Forwarding routes (FIB IPv4/ IPv6)	256K/80K
ARP table size	256K
Maximum number of VRF	4096
IPv6 ND (Neighbor Discovery) table size	80K
Maximum Number of multicast routes (Multicast FIB IPv4/IPv6)	32K/NA
Maximum VRRP groups	1024
Maximum number of ECMP paths	128

Item	CloudEngine 6820-48S6CQ
Maximum ACL number	7500
Maximum number of lag group	1024
Maximum number of links in a lag group	128
Maximum number of MSTP instance	64
VBST (Maximum number of VLANs where VBST can be configured)	500

Note: This specification may vary between different scenarios. Please contact Huawei for details.

## Hardware Specifications

Item	CloudEngine 6820-48S6CQ	
Physical Features	Dimensions (W x D xH ,mm)	442*420*43.6
	Weight (excluding optical transceivers, power modules, and fan assemblies/ including AC power modules and fan assemblies, excluding optical transceivers, kg)	5.6/7.7
	Switching capacity (Tbps)	2.16
	Forwarding performance (Mpps)	470
10GE SFP+ ports	48	
40/100GE QSFP28 ports	6	
Management interface	Out-of-band management port	1*GE management interface
	Console port	1*RJ45 interface
	USB port	1
CPU	Main frequency (GHZ)	1.4
	Number of cores	4
Storage	RAM	4GB
	NOR Flash	64MB
	NAND Flash	4GB
System	System buffer	21MB
Power Supply System	Power modules	600W AC 1000W -48V DC
	Rated voltage range (V)	AC: 100V to 240V DC: -48V to -60V
	Maximum voltage range (V)	AC: 90V to 290V DC: -38.4V to -72V
	Maximum input current	AC 600W: 100V to 240V 8A

Item		CloudEngine 6820-48S6CQ
		-48V DC 1000W : -48V to -60V 30A
	Typical power	162W (100% traffic load, copper cable, normal temperature, dual power modules) 196W (100% traffic load, short-distance optical transceivers, normal temperature, dual power modules)
	Maximum power	282W
	Frequency (AC, HZ)	50/60
Heat Dissipation	Heat dissipation mode	Air cooling
	Number of fan trays	4
	Heat dissipation airflow	Front-to-back or back-to-front airflow
	Maximum heat consumption (BTU/hr)	962
Environment specifications	Long-term operating temperature (°C)	0°C to 40°C (0-1800m) The temperature decreases by 1°C each time the altitude increases by 220 m.
	Storage temperature (°C)	-40°C to +70°C
	Relative humidity	5% to 95%
	Operating altitude (m)	Up to 5000
	Sound power at 27°C (dBA)	Front-to-back airflow: < 64      Back-to-front airflow: < 65
	Sound power at 40°C (dBA)	Front-to-back airflow: < 84      Back-to-front airflow: < 85
	Sound pressure at 27°C (dBA)	Front-to-back airflow: 51 in average (maximum: 55) Back-to-front airflow: 51 in average (maximum: 56)
	Surge protection	AC power supply protection: 6 kV in common mode and 6 kV in differential mode DC power supply protection: 4 kV in common mode and 2 kV in differential mode
Reliability	MTBF (year)	45.48
	MTTR (hour)	1.52
	Availability	0.99999618

Note: For detailed information of CloudEngine 6800 Platform hardware information, visit <https://support.huawei.com/enterprise/en/doc/EDOC1000019246?idPath=7919710%7C21782165%7C21782239%7C22318540%7C7597815>

## Safety and Regulatory Compliance

The following table lists the safety and regulatory compliance of CloudEngine switches.

Certification Category	Description
Safety	<ul style="list-style-type: none"> <li>EN 60950-1</li> <li>EN 60825-1</li> <li>EN 60825-2</li> <li>UL 60950-1</li> </ul>

Certification Category	Description
	<ul style="list-style-type: none"> <li>• CSA-C22.2 No. 60950-1</li> <li>• IEC 60950-1</li> <li>• AS/NZS 60950-1</li> <li>• GB4943</li> </ul>
Electromagnetic Compatibility (EMC)	<ul style="list-style-type: none"> <li>• EN 300386</li> <li>• EN 55032: CLASS A</li> <li>• EN 55024</li> <li>• IEC/EN 61000-3-2</li> <li>• IEC/EN 61000-3-3</li> <li>• FCC 47CFR Part15 CLASS A</li> <li>• ICES-003: CLASS A</li> <li>• CISPR 32: CLASS A</li> <li>• CISPR 24</li> <li>• AS/NZS CISPR32</li> <li>• VCCI- CISPR32: CLASS A</li> <li>• GB9254 CLASS A</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• 2011/65/EU EN 50581</li> <li>• 2012/19/EU EN 50419</li> <li>• (EC) No.1907/2006</li> <li>• GB/T 26572</li> <li>• ETSI EN 300 019-1-1</li> <li>• ETSI EN 300 019-1-2</li> <li>• ETSI EN 300 019-1-3</li> <li>• ETSI EN 300 753 GR63</li> </ul>

#### Note

EMC: electromagnetic compatibility

CISPR: International Special Committee on Radio Interference

EN: European Standard

ETSI: European Telecommunications Standards Institute

CFR: Code of Federal Regulations

FCC: Federal Communication Commission

IEC: International Electrotechnical Commission

AS/NZS: Australian/New Zealand Standard

VCCI: Voluntary Control Council for Interference

UL: Underwriters Laboratories

CSA: Canadian Standards Association

## Supported MIBs

For details about the MIB information, visit

<https://support.huawei.com/hedex/hdx.do?docid=EDOC1100101219&lang=en&idPath=24030814%7C21782165%7C21782239%7C22318540%7C7597815>



## Optical Transceivers and Cable

For details about the optical transceivers and cables information, visit  
<https://e.huawei.com/en/material/networking/dcs/switch/f6d91cf16df0474998087676a33fd41e>

## Ordering Information

Mainframe	
CE6820-48S6CQ	CE6820-48S6CQ switch (48*10G SFP+, 6*100G QSFP28, without fan and power modules)
CE6820-48S6CQ-B	CE6820-48S6CQ-B switch (48*10G SFP+, 6*100G QSFP28, 2*AC power modules, 4*fan modules, port-side intake)
CE6820-48S6CQ-F	CE6820-48S6CQ-F switch (48*10G SFP+, 6*100G QSFP28, 2*AC power modules, 4*fan modules, port-side exhaust)

### Fan Tray

Model	Description	Applicable Product
FAN-031A-F	Fan box (F,FAN panel side intake)	CE6820-48S6CQ
FAN-031A-B	Fan box (B,FAN panel side exhaust)	CE6820-48S6CQ

### Power

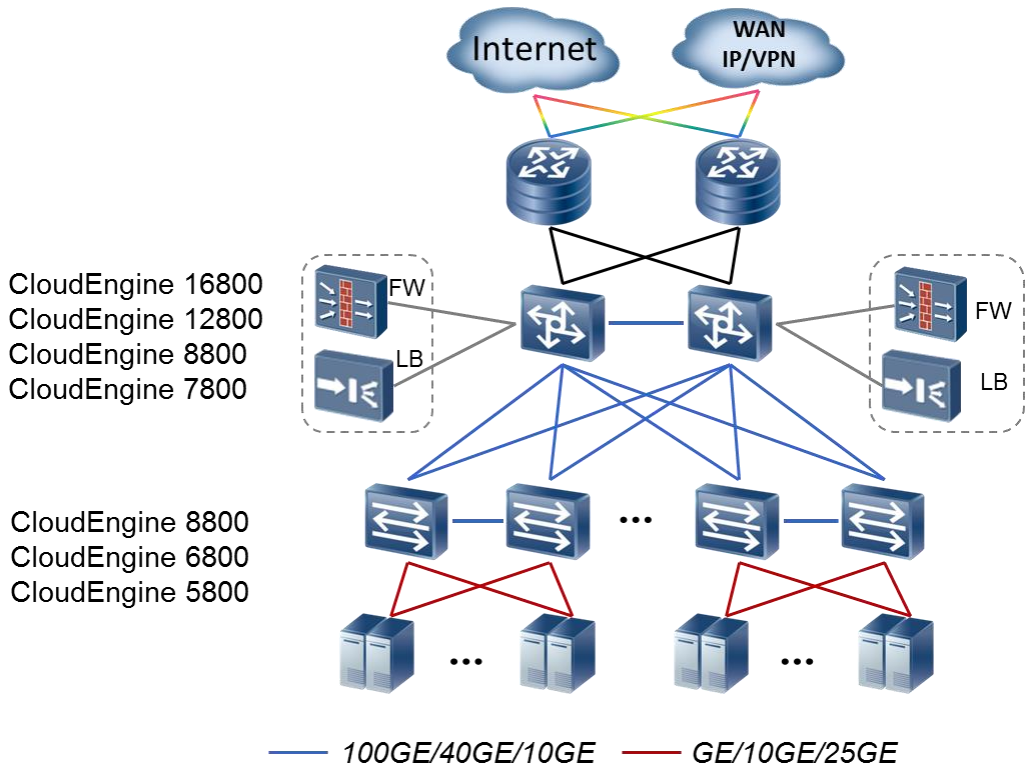
Model	Description	Applicable Product
PAC600S12-CF	600W AC Power Module(Front to Back,Power panel side intake)	CE6820-48S6CQ
PAC600S12-CB	600W AC Power Module(Back to Front, Power panel side exhaust)	CE6820-48S6CQ
PDC1000S12-DF	1000W DC Power Module (Front to Back,Power panel side intake)	CE6820-48S6CQ
PDC1000S12-DB	1000W DC Power Module (Front to Back,Power panel side exhaust)	CE6820-48S6CQ

Software	
N1-CE68LIC-CFMM	N1-CloudFabric Management SW License for CloudEngine 6800(N1-CE68LIC-CFMM software is applicable to Non-SDN scenario, includes basic software functions)
N1-CE68CFMM-SnS1Y	N1-CE68CFMM-SnS1Y,N1-CloudFabric Management SW License for CloudEngine 6800

## Networking and Application

### Data Center Applications

On a typical data center network, CloudEngine 6820 switches work as TOR switches and connect to CloudEngine16800, CloudEngine 12800, CloudEngine 8800, or CloudEngine 7800 core switches using 40GE/100GE ports, building an end-to-end 40GE/100GE full-mesh network.



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