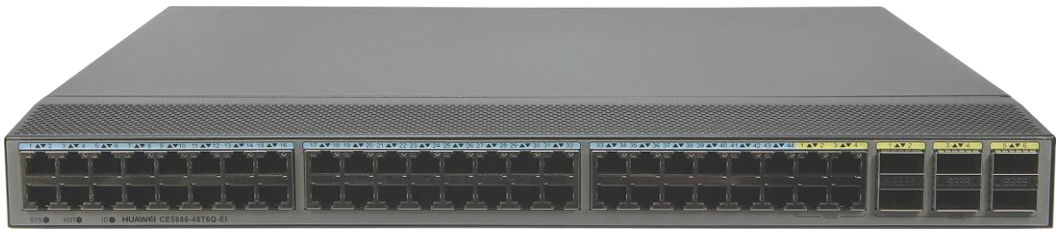
Huawei CloudEngine 5880 Switch Datasheet

Huawei CloudEngine 5880 series switches are next-generation, high-density Gigabit Ethernet switches designed for data centers and high-end campus networks.



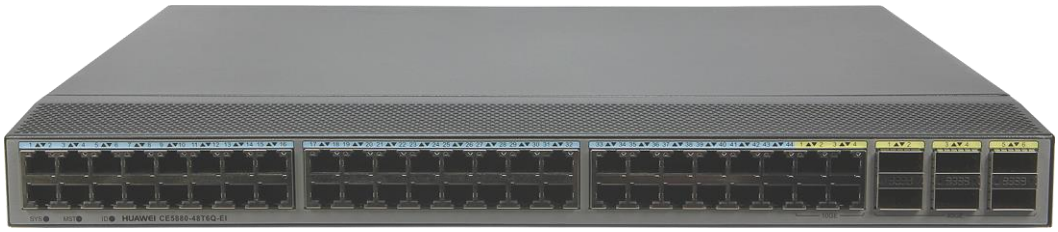
Product Overview

Huawei CloudEngine 5880 series switches are next-generation, high-density Gigabit Ethernet switches designed for data centers and high-end campus networks. The CloudEngine 5880 series have advanced hardware architecture with 40GE uplink ports and high-density GE access ports. Using Huawei's VRP8 software platform, CloudEngine 5880 series switches support extensive data center features and high stacking capabilities. In addition, the CloudEngine 5880 series use a flexible airflow design (front-to-back or back-to-front). CloudEngine 5880 series can work with Huawei CE12800 series data center core switches to build elastic, virtual, and high-quality fabric that meets requirements of cloud computing data centers.

CloudEngine 5880 series provide high-density GE access to help enterprises and carriers build a scalable data center network platform in the cloud computing era.

Product Appearance

The CloudEngine 5880-48T6Q-EI switches provide 44 x GE RJ45 ports, 4 x 10GE RJ45 ports, and 6 x 40GE QSFP+ ports.



Product Characteristics

High-Density GE Access

- CloudEngine 5880 series provide up to 44*GE and 4 x 10GE RJ 45 line-speed ports, allowing for high-density GE server access and smooth evolution.
- CloudEngine 5880 series provide up to 6 x 40GE QSFP+ ports. The uplink 40GE 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 704 x 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 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, highly reliable stacking

- CloudEngine 5880 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 5880 series support multichassis 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, VXLAN, and IP networks, allowing for flexible networking.

Virtualized Hardware Gateway, Enabling Quick Deployment

- CloudEngine 5880 series can connect to a cloud platform through open APIs, facilitating the unified management of virtual and physical networks.
- CloudEngine 5880 series can work with the industry's mainstream virtualization platforms. The virtualization function protects investments by ensuring services can be deployed quickly without requiring network changes.
- The hardware gateway deployment enables fast service deployment without changing the customer network, providing investment protection.
- CloudEngine 5880 series support Border Gateway Protocol - Ethernet VPN (BGP-EVPN), which can run as the VXLAN control plane to simplify VXLAN configuration within and between data centers.

Standard Interfaces, Enabling Openness and Interoperability

- CloudEngine 5880 series support NETCONF and can work with Huawei Agile Controller.
- CloudEngine 5880 series support Ansible-based automatic configuration and open-source module release, expanding network functions and simplifying device management and maintenance.
- CloudEngine 5880 series can be integrated into mainstream SDN and cloud computing platforms flexibly and quickly.

ZTP, Implementing Automatic O&M

- CloudEngine 5880 series support Zero Touch Provisioning (ZTP). ZTP enables the CloudEngine 5880 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.

FabricInsight-based Intelligent O&M

- Huawei's Packet Conservation Algorithm for Internet (iPCA) technology implements accurate per-hop packet loss, delay, and jitter detection for real service flows, locating network faults in real time.
- CloudEngine 5880 series proactively perform path detection over the entire network. The switches periodically check sample flows to determine the connectivity of all paths on the network and locates fault points, providing real-time network health information.
- CloudEngine 5880 series support visualization of all flows and congestion, improving service experience.

Flexible Airflow Design, Improving Energy Efficiency

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

- CloudEngine 5880 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 5880 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.
- State and stack indicators on both the front and rear panels enable users to maintain the switch from either side.

- CloudEngine 5880 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 5880-48T6Q-EI
Device virtualization	iStack
	M-LAG
Network virtualization	VXLAN
	BGP-EVPN
	QinQ access VXLAN
SDN	Agile Controller
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 tracert, IPv6 socket, UDP6, and Raw IP6
Multicast	Multicast routing protocols such as IGMP, PIM-SM, and MBGP
	IGMP snooping

Item	CloudEngine 5880-48T6Q-EI
	IGMP proxy
	Fast leaving of multicast member interfaces
	Multicast traffic suppression
	Multicast traffic suppression
Reliability	Fine-grained microsegmentation isolation
	Link Aggregation Control Protocol (LACP)
	STP, RSTP, and MSTP
	BPDU protection, root protection, and loop protection
	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
	BFD for VXLAN
QoS	Traffic classification based on Layer 2, Layer 3, Layer 4, and priority information
	ACL, CAR, re-marking, and scheduling
	Queue scheduling modes such as SP,DWRR,SP+DWRR
	Congestion avoidance mechanisms, including WRED and tail drop
	Traffic shaping
O&M	iPCA
	Network-wide path detection
	Telemetry
	ERSPAN+
	Statistics on the buffer microburst status
	VXLAN OAM: VXLAN ping and VXLAN tracert
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	Command line authority control based on user levels, preventing unauthorized users from using commands
	Defense against DoS address attacks, ARP storms, and ICMP attacks

Item	CloudEngine 5880-48T6Q-EI
	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)

Performance and Scalability

Item	CloudEngine 5880-48T6Q-EI
Maximum number of MAC address entries	176K
Maximum number of forwarding routes (FIB IPv4/ IPv6)	128K/64K
ARP table size	128K
Maximum number of VRF	4096
IPv6 ND (Neighbor Discovery) table size	64K
Maximum number of multicast routes (Multicast FIB IPv4/IPv6)	32K/NA
Maximum VRRP groups	1024
Maximum number of ECMP paths	128
Maximum ACL number	7500
Maximum number of broadcast domains	8000
Maximum number of BDIF	8000
Maximum number of tunnel endpoints (VTEP)	2000
Maximum number of lag group	1024
Maximum number of links in a lag group	64
Maximum number of MSTP instance	64

Note

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

Hardware Specifications

Item		CloudEngine 5880-48T6Q-EI
Physical Features	Dimensions (W × D ×H ,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)	6.3/9.1
	Switching capacity (Gbps)	648
	Forwarding performance (Mpps)	406
Number of GE Base-T ports		44
Number of 10GE Base-T ports		4

Item		CloudEngine 5880-48T6Q-EI
40GE QSFP+ 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)	1.5
	Number of cores	8
Storage	RAM	2GB
	NOR Flash	32MB
	NAND Flash	1GB
System	System buffer	16.5MB
Power Supply System	Power modules	600W AC 600W -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 9A -48V DC 600W: -48V to -60V 20A
	Typical power	211W (100% traffic load, 3 m network cable and copper cable, normal temperature, dual power modules) 222W (100% traffic load, 3 m network cable, short-distance optical transceivers, normal temperature, dual power modules)
	Maximum power	244W
	Frequency (AC, HZ)	50/60
Heat Dissipation	Heat dissipation mode	Air cooling
	Number of fan trays	2
	Heat dissipation airflow	Front-to-back or back-to-front airflow
	Maximum heat consumption (BTU/hr)	833
Environment specifications	Long-term operating temperature (°C)	0 to 40°C (0-1800m) The temperature decreases by 1°C each time the altitude increases by 220 m
	Storage temperature (°C)	-40°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: < 64

Item		CloudEngine 5880-48T6Q-EI
	Sound power at 40°C (dBA)	Front-to-back airflow: < 88 Back-to-front airflow: < 84
	Sound pressure at 27°C (dBA)	Front-to-back airflow: 48 in average (maximum: 53) Back-to-front airflow: 48 in average (maximum: 53)
	Surge protection	AC power supply protection: 6 kV in common mode and 6 kV in differential mode
Reliability	MTBF (year)	49.14
	MTTR (hour)	1.71
	Availability	0.99999575382

Note: For detailed information of CloudEngine 5880 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	• EN 60950-1 • EN 60825-1 • EN 60825-2 • UL 60950-1 • CSA-C22.2 No. 60950-1 • IEC 60950-1 • AS/NZS 60950-1 • GB4943
Electromagnetic Compatibility (EMC)	• EN 300386 • EN 55032: CLASS A • EN 55024 • IEC/EN 61000-3-2 • IEC/EN 61000-3-3 • FCC 47CFR Part15 CLASS A • ICES-003: CLASS A • CISPR 32: CLASS A • CISPR 24 • AS/NZS CISPR32 • VCCI- CISPR32: CLASS A • GB9254 CLASS A
Environment	• 2011/65/EU EN 50581 • 2012/19/EU EN 50419 • (EC) No.1907/2006 • GB/T 26572

Certification Category	Description
	• ETSI EN 300 019-1-1 • ETSI EN 300 019-1-2 • ETSI EN 300 019-1-3 • ETSI EN 300 753 GR63

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/dcswitch/f6d91cf16df0474998087676a33fd41e.

Ordering Information

Mainframe	
CE5880-EI-B-B00	CE5880-48T6Q-EI Switch spare part(44*GE RJ45, 4*10GE RJ45, 6*40GE QSFP+, 2*AC power modules, 2*fan modules, port-side intake)
CE5880-EI-F-B00	CE5880-48T6Q-EI switch (44*GE RJ45, 4*10GE RJ45, 6*40GE QSFP+, 2*AC power modules, 2*fan modules, port-side exhaust)
CE5880-48T6Q-EI	CE5880-48T6Q-EI switch (44*GE RJ45, 4*10GE RJ45, 6*40GE QSFP+, without fan and power modules)

Fan Tray		
Model	Description	Applicable Product
FAN-40HA-F	Fan box(HA, Front to Back, FAN panel side intake)	CE5880-48T6Q-EI
FAN-40HA-B	Fan box(HA, Back to Front, FAN panel side exhaust)	CE5880-48T6Q-EI

Power		
Model	Description	Applicable Product
PAC-600WA-F	600W AC Power Module (Front to Back, Power panel side intake)	CE5880-48T6Q-EI
PAC-600WA-B	600W AC Power Module (Back to Front, Power panel side exhaust)	CE5880-48T6Q-EI
PDC600S12-CF	600W DC Power Module(Front to Back, Power panel side intake)	CE5880-48T6Q-EI
PDC600S12-CB	600W DC Power Module(Back to Front, Power panel side exhaust)	CE5880-48T6Q-EI

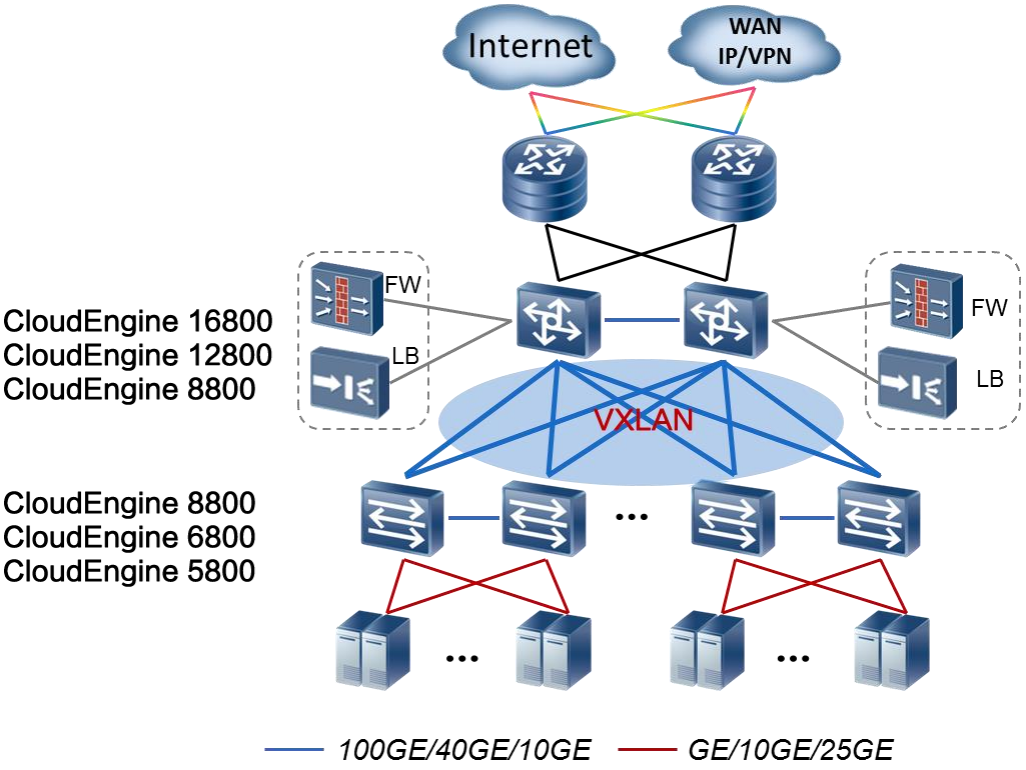
Software	
CE58-LIC-VXLAN	CloudEngine 5800 VXLAN Function
CE58-LIC-NSH	CloudEngine 5800 NSH Function
CE58-LIC-TLM	CloudEngine 5800 Telemetry Function
N1-CE58LIC-CFMM	N1-CloudFabric Management SW License for CloudEngine 5800
N1-CE58CFMM-SnS1Y	N1-CloudFabric Management SW License for CloudEngine 5800 -SnS-1 Year
N1-CE58LIC-CFFD	N1-CloudFabric Foundation SW License for CloudEngine 5800
N1-CE58CFFD-SnS1Y	N1-CloudFabric Foundation SW License for CloudEngine 5800-SnS-1 Year

Networking and Application

Data Center Applications

On a typical data center network, CloudEngine 5880 switches work as TOR switches and connect to CloudEngine 16800 CloudEngine 12800 or CloudEngine 8800 core switches using 40GE/100GE ports, building an end-to-end 40GE/100GE full-mesh network. The core and TOR switches use fabric technologies such as VXLAN to build a non-blocking large Layer 2 network, which allows for large-scale VM migration and flexible service deployment.

Note: VXLAN can also be used on campus networks to support flexible service deployment in different service areas.


Internet
WAN
IP/VPN
FW
LB
FW
LB
VXLAN
CloudEngine 16800
CloudEngine 12800
CloudEngine 8800
CloudEngine 8800
CloudEngine 6800
CloudEngine 5800
100GE/40GE/10GE
GE/10GE/25GE

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