Huawei CloudEngine 6850 Switch Datasheet

Huawei CloudEngine 6850 series switches have advanced hardware architecture with 40GE/100GE uplink ports and high-density 10GE access ports.

CloudEngine 6850 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 be used as aggregation or core switches for enterprise campus networks.

Product Overview

Huawei CloudEngine 6850 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 CE6850 series uses an advanced hardware architecture with 40GE uplink ports and high density 10GE access ports.

Using the Huawei VRP8 software platform, CE6850 series 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.

CE6850 series can work with CloudEngine 16800 or CloudEngine 12800 switches to build an elastic, virtualized, high-quality fabric that meets the requirements of cloud-computing data centers.
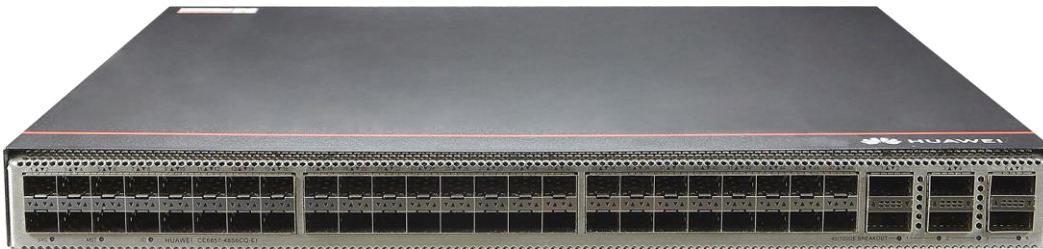
CE6850 series provide high-density 10GE access to help enterprises and carriers build a scalable data center network platform in the cloud computing era. They can also be used as aggregation or core switches for enterprise campus networks.

Product Appearance

CloudEngine 6856-48T6Q-HI switches provide 48 x 10GE Base-T ports, 6 x 40GE QSFP+ ports.
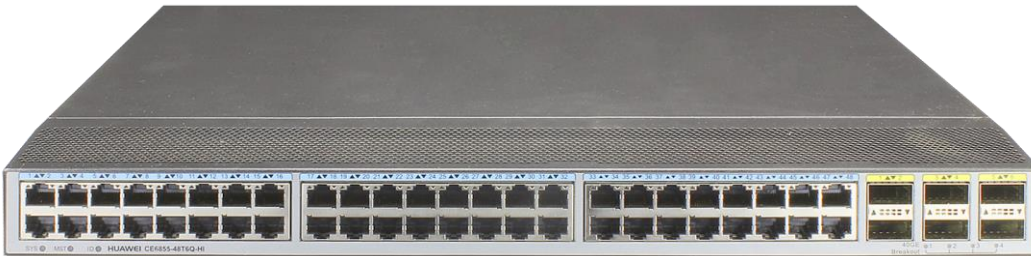
CloudEngine 6857-48S6CQ-EI switches provide 48 x 10GE SFP+ ports, 6 x 100GE QSFP28 ports or   6 x 40GE QSFP+ ports.

Product Characteristics

High-Density 10GE Access

- CloudEngine 6850 series provide 48 x 10GE ports, high-density 10GE ports among 1 U ToR switches, allowing for high-density 10GE server access.

- CloudEngie 6850 series have a maximum of six 100GE QSFP 28 or 40GE QSFP+ ports. Each QSFP28 or QSFP+ port can be used as four 10GE SFP+ ports, providing flexibility in networking. The uplink QSFP28 or 40GE QSFP+ ports can be connected to CloudEngine 16800 or CloudEngine 12800 switches to build a non-blocking network platform.

Inter-device Link Aggregation, High Efficiency and Reliability

- CloudEngine 6850 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.

- With comprehensive inter-device link aggregation technology, the device networking coupling relationship evolves from stacking at the control plane to the use of M-LAG and then finally to coupling-free M-LAG Lite. This achieves active-active server access and zero interruption of services when upgrading switches.

Virtualized Hardware Gateway, Enabling Quick Deployment

- CloudEngine 6850 series can work with the industry's mainstream virtualization platforms and acts a hardware gateway on an overlay network (VXLAN). The virtualization function protects investments by ensuring services can be deployed quickly without requiring network changes.

- CloudEngine 6850 series can connect to a cloud platform through open APIs, facilitating the unified management of virtual and physical networks.

- The hardware gateway deployment enables fast service deployment without changing the customer network, providing investment protection.

- CloudEngine 6850 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 6850 series support NETCONF and can work with Huawei iMaster NCE-Fabric.

- CloudEngine 6850 series support Ansible-based automatic configuration and open-source module release, expanding network functions and simplifying device management and maintenance.

- CloudEngine 6850 series can be integrated into mainstream SDN and cloud computing platforms flexibly and quickly.

ZTP, Implementing Automatic O&M

- CloudEngine 6850 series support Zero Touch Provisioning (ZTP). ZTP enables the CloudEngine 6850 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

- The CloudEngine 6850 provides telemetry technology to collect device data in real time and send the data to Huawei data center network analyzer iMaster NCE-FabricInsight. The iMaster NCE-FabricInsight analyzes network data based on the intelligent fault identification algorithm, accurately displays the real-time network status, effectively demarcates and locates faults in a timely manner, and identifies network problems that affect user experience, accurately guaranteeing user experience.

iMaster NCE-based Simplified Network Deployment

- CloudEngine 6850 series switches can interconnect with iMaster NCE-Fabric through standard protocols such as NetConf and SNMP to implement network automatic management and control, providing more efficient and intelligent operation methods, simplifying network management, and reducing the OPEX.

Flexible Airflow Design, Improving Energy Efficiency

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

- CloudEngine 6850 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 6850 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 40GE/100GE port indicators can show the states of all ports derived from the 40GE/100GE ports.
- State and stack indicators on both the front and rear panels enable users to maintain the switch from either side.
- CloudEngine 6850 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.

Licensing

CloudEngine 6850 supports both the traditional feature based licensing mode and the latest Huawei IDN One Software (N1 Huawei IDN One Software (N1 mode for short) licensing mode. The CloudFabric N1 business model combines the NCE controller, analyzer, and CloudEngine switch software for use in a range of common scenarios. This simplifies transactions, provides customers with more functions and value, and protects their software investment with Software License Portability.

Product	Feature	N1 Mandatory Software Packages			N1 Add-on Software Packages
CloudEngine 6850 Series Switch		Foundation	Advanced	Premium	Multi-cloud Multi-DC Value-added Package
	Basic software	√	√	√	
	IPv6	√	√	√	
	VXLAN	√	√	√	
	Lossless upgrade	√	√	√	
	Telemetry	√	√	√	
	MPLS		√	√	
iMaster NCE-Fabric controller	SDN automation	√	√	√	
	Basic intent functions (simulation and verification, and network-wide configuration rollback)			√	
	Multi-cloud multi-DC function				√
iMaster NCE-FabricInsight analyzer	Basic network analysis functions of telemetry	√	√	√	
	Network health ("1-3-5" intelligent		√	√	

Product	Feature	N1 Mandatory Software Packages			N1 Add-on Software Packages
	O&M)				
	Value-added functions for network traffic analysis (managing 100 VMs)			√	
Version mapping		Select one from three options. The Advanced software package contains functions of the Foundation software package, and the Premium software package contains functions of the Advanced software package.			It is used with the Foundation, Advanced, or Premium software package.
For details about product function differences, refer to the product documentation.					

Note: For detailed information of Huawei CloudFabric N1 business model, visit
https://e.huawei.com/en/material/networking/dcswitch/03a0e69bfa2c4f168323ba94a75f1f09.

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 6856-48T6Q-HI	CloudEngine 6857-48S6CQ-EI
Device virtualization	iStack	
	M-LAG	
Network virtualization	VXLAN in routing and bridging modes	
	BGP-EVPN	
	QinQ access VXLAN	
Data center interconnect	VXLAN mapping, implementing interconnection between multiple DCI networks at Layer 2	
SDN	iMaster NCE-Fabric	
Network convergence	DCBX, PFC, ETS	
	RDMA and RoCE (RoCEv1 and RoCEv2)	
Programmability	OPS	
	Ansible-based automatic configuration and open-source module release	
Traffic analysis	NetStream	
	sFlow	
VLAN	Adding access, trunk, and hybrid interfaces to VLANs	
	Default VLAN	

Item	CloudEngine 6856-48T6Q-HI	CloudEngine 6857-48S6CQ-EI
	QinQ	
	MUX VLAN	
	GVRP	
MAC address table	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+	
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, PIM-DM, MSDP, 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 protection, root protection, and loop prevention	
	Smart Link and multi-instance	
	Device Link Detection Protocol (DLDP)	
	ERPS (G.8032)	
	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 algorithms, including PQ, WRR, DRR, PQ+WRR, and PQ+DRR	
	Congestion avoidance mechanisms, including WRED and tail drop	
	Traffic shaping	
O&M	Network-wide path detection	

Item	CloudEngine 6856-48T6Q-HI	CloudEngine 6857-48S6CQ-EI
	Telemetry	
	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	
	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 6856-48T6Q-HI	CloudEngine 6857-48S6CQ-EI
Maximum number of MAC address entries	288K	
Maximum number of routes (FIB IPv4/IPv6)	256K/128K	380K/256K
ARP size	128K	168K
Maximum number of VRFs	4096	
IPv6 ND (Neighbor Discovery) table size	48K	64K
Maximum Number of multicast routes (Multicast FIB IPv4/IPv6)	8K/2K	
Maximum VRRP groups	256	1K
Maximum number of ECMP paths	128	
Maximum Number of broadcast domains	8K	16K
Maximum number of BDIF interfaces	4K	8K
Maximum number of virtual tunnel endpoints (VTEP)	2K	
Maximum number of LAGs	1024/512/256/128/64	

Item	CloudEngine 6856-48T6Q-HI	CloudEngine 6857-48S6CQ-EI
Maximum number of links in a LAG	2/4/8/16/32	
Maximum number of MSTIs	64	
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 6856-48T6Q-HI	CloudEngine 6857-48S6CQ-EI
Physical Features	Dimensions (W x D x H)	442 mm x 600 mm x 43.6 mm	442 mm x 420 mm x 43.6 mm
	Weight (excluding optical transceivers, power modules, and fan assemblies/ including AC power modules and fan assemblies, excluding optical transceivers, kg)	8.8/12.6	5.3/7.6
	Switching capacity (Tbps)	1.44	2.16
	Forwarding performance (Mpps)	1080	1000
10GE SFP+ ports		0	48
10GE BASE-T		48	0
40GE QSFP+ ports		6	0
40/100GE QSFP28 ports		0	6
Management interface	Out-of-band management port	2*GE RJ45 & SFP (combo) management interfaces	1*GE management interface
	Console port	1*RJ45 + 1*MiniUSB (multiplexing)	1*RJ45
	USB port	1	
CPU	Main frequency (GHz)	1.2	1.4
	Number of cores	4	
Storage	RAM	4 GB	
	NOR flash	16 MB	64 MB
	NAND flash	1 GB	2 GB
System	System buffer	16 MB	32 MB
Power Supply System	Power modules	AC: 600 W AC HDC: 600 W 380 V DC: 1200 W -48 V	AC: 600 W AC DC: 350 W -48 V DC
	Rated voltage range (V)	AC: 100 V to 240 V DC 380 V HVDC: 240 V to 380 V DC: -48 V to -60 V	AC: 100 V to 240 V DC: -48 V to -60 V

Item		CloudEngine 6856-48T6Q-HI	CloudEngine 6857-48S6CQ-EI
	Maximum voltage range (V)	AC: 90 V to 290 V 240 V HVDC: 188 V to 290 V DC 380 V HVDC: 188 V to 400 V DC: -38.4 V to -72 V	AC: 90 V to 290 V DC:-38.4 V to -72 V
	Maximum input current	600 W AC power module: 100 V to 240 V 8A 600 W 240 VDC power module: 240 V 4A 600 W 380 VDC power module: 240 V to 380V 4 A 1200 W -48 V power module: -48 V to 60 V 38A	600 W AC power module: 100 V to 240 V 8A 350 W DC power module: -48 V to -60 V 11A
	Typical power	219 W (100% traffic load, 3 m network cable and copper cable, normal temperature, dual power modules) 224 W (100% traffic load, 3 m network cable, short-distance optical transceivers, normal temperature, dual power modules)	152 W (100% traffic load, copper cable, normal temperature, dual power modules) 195 W (100% traffic load, shortdistance optical modules, normal temperature, dual power modules)
	Maximum power	346 W	287 W
	Frequency (AC, Hz)	50/60	
Heat Dissipation	Heat dissipation mode	Air cooling	
	Number of fan trays	2	4
	Heat dissipation airflow	Front-to-back or back-to-front airflow	
	Maximum heat consumption (BTU/hr)	1181	979
Environment specifications	Long-term operating temperature (°C)	0°C to 40°C (0-1800 m) 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: < 64	Frontto-back airflow: < 63 dBA Backto-front airflow: < 63 dBA
	Sound power at 40°C (dBA)	Front-to-back airflow: < 80 Back-to-front airflow: < 84	Frontto-back airflow: < 84 dBA Backto-front airflow: < 82 dBA
	Sound pressure at 27°C (dBA)	Front-to-back airflow: 48 in average (maximum: 53) Back-to-front airflow: 58 in average (maximum: 53)	Frontto-back airflow: 48 dBA in average (maximum: 52 dBA) Backto-front airflow: 49 dBA in average (maximum: 53 dBA)
	Surge protection	AC power supply protection: 6 kV in common mode and 6 kV in	

Item		CloudEngine 6856-48T6Q-HI	CloudEngine 6857-48S6CQ-EI
		differential mode DC power supply protection: 4 kV in common mode and 2 kV in differential mode	
Reliability	MTBF (year)	54.48	45.3
	MTTR (hour)	1.81	1.68
	Availability	0.99999620929	0.99999576002

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	• 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 • 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=EDOC1100136525&lang=en&idPath=24030814%7C21782165%7C21782239%7C22318540%7C7597815.

Optical Transceivers and Cable

For details about the optical transceivers and cables information, visit huawei.com

Ordering Information

Mainframe	
CE6856-48T6Q-HI	CE6856-48T6Q-HI Switch (48-Port 10GE RJ45, 6-Port 40GE QSFP+, 2*FAN Box, Without Fan and Power Module)
CE6856-HI-B-B00	CE6856-48T6Q-HI Switch (48-Port 10GE RJ45, 6-Port 40GE QSFP+, 2*AC Power Module, 2*FAN Box, Port-side Intake)
CE6856-HI-F-B00	CE6856-48T6Q-HI Switch (48-Port 10GE RJ45, 6-Port 40GE QSFP+, 2*AC Power Module, 2*FAN Box, Port-side Exhaust)
CE6857-48S6CQ-EI	CE6857-48S6CQ-EISwitch (48-Port 10GE SFP+, 6*100GE QSFP28, Without Fan and Power Module)
CE6857-EI-F-B0B	CE6857-48S6CQ-EISwitch (48*10GE SFP+, 6*100GE QSFP28, 2*AC Power Module, 2*FAN Box, Port-side Exhaust)
CE6857-EI-B-B0B	CE6857-48S6CQ-EI Switch (48*10GE SFP+, 6*100GE QSFP28, 2*AC Power Module, 2*FAN Box, Port-side Intake)

Fan Tray

Model	Description	Applicable Product
FAN-060A-F	Fan box (F, FAN panel side intake)	CE6856-48T6Q-HI
FAN-060A-B	Fan box (B, FAN panel side exhaust)	CE6856-48T6Q-HI
FAN-031A-F	FAN-031A-F, Fan box (F, FAN panel side intake)	CE6857-48S6CQ-EI

Model	Description	Applicable Product
FAN-031A-B	Fan box (B, FAN panel side exhaust)	CE6857-48S6CQ-EI

Power

Model	Description	Applicable Product
PDC-1K2WA-F	1200W DC Power Module (Front to Back, Power panel side intake)	CE6856-48T6Q-HI
PDC-1K2WA-B	1200W DC Power Module (Back to Front, Power panel side exhaust)	CE6856-48T6Q-HI
PAC-600WB-F	600W AC&240V DC Power Module (Power panel side intake)	CE6856-48T6Q-HI,CE6857-48S6CQ-EI
PAC-600WB-B	600W AC&240V DC Power Module (Power panel side exhaust)	CE6856-48T6Q-HI,CE6857-48S6CQ-EI
PHD-600WA-F	600W HVDC Power Module (Power panel side intake)	CE6856-48T6Q-HI
PHD-600WA-B	600W HVDC Power Module (Power panel side exhaust)	CE6856-48T6Q-HI
PDC-350WA-F	350W DC Power Module (Front to Back, Power panel side intake)	CE6857-48S6CQ-EI
PDC-350WA-B	350W DC Power Module (Back to Front, Power panel side exhaust)	CE6857-48S6CQ-EI

Software	
CE68-LIC-BUN01	CE6800 Function License Bundle 1
CE68-LIC-VXLAN	CloudEngine 6800 VXLAN Function
CE68-LIC-TLM	CE6800 Telemetry Function
N1-CE68LIC-CFFD	N1-CloudFabric Foundation SW License for CloudEngine 6800
N1-CE68CFFD-SnS1Y	N1-CloudFabric Foundation SW License for CloudEngine 6800-SnS-Year
N1-CE68LIC-CFAD	N1-CloudFabric Advanced SW License for CloudEngine 6800
N1-CE68CFAD-SnS1Y	N1-CloudFabric Advanced SW License for CloudEngine -SnS - Year
N1-CE68LIC-CFPM	N1-CloudFabric Premium SW License for CloudEngine 6800
N1-CE68CFPM-SnS1Y	N1-CloudFabric Premium SW License for CloudEngine 6800 -SnS-Year
N1-CE-F-LIC-MDCA	N1-CloudEngine Data Center Switch Multi-cloud Multi-DC Value-added Package - Fixed
N1-CEFMDCA -SnS1Y	N1-CloudEngine Data Center Switch Multi-cloud Multi-DC Value-added Package, Per Fixed device -SnS-Year

Networking and Application

Data Center Applications

On a typical data center network, CloudEngine 6850 series switches work as TOR switches and connect to CloudEngine16800, 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.
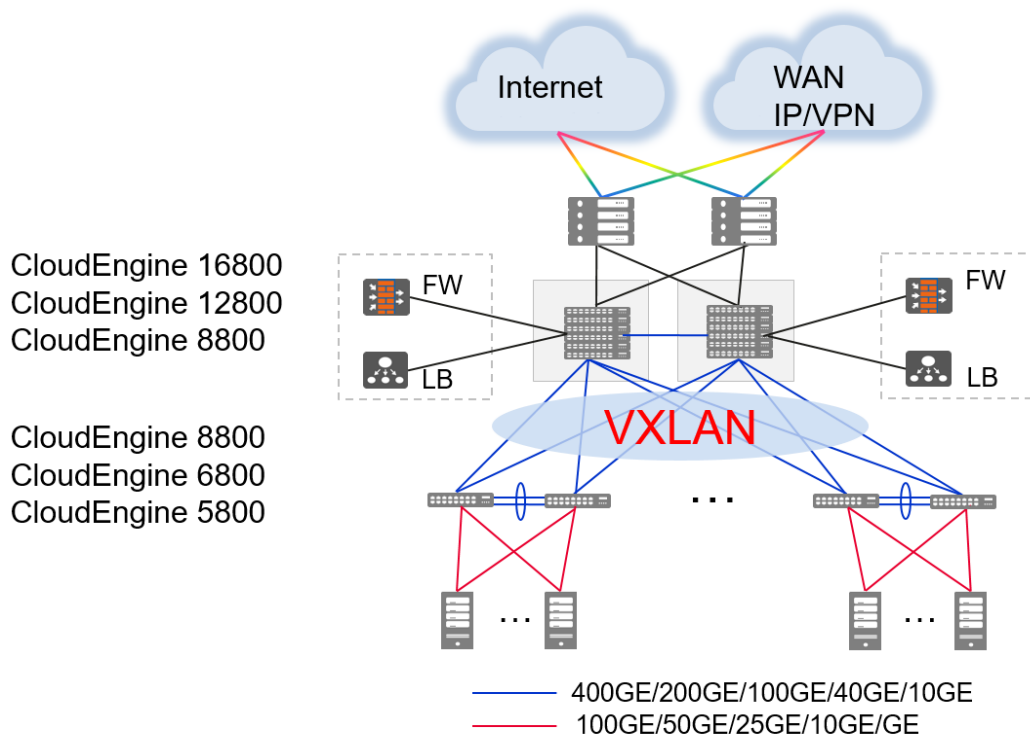
Note: VXLAN can also be used on campus networks to support flexible service deployment in different service areas.

Huawei Technologies Co., Ltd.

Address:Huawei Industrial Base Bantian, Longgang Shenzhen 518129 People's Republic of China

Website:www.huawei.com