Huawei CloudEngine 12800 Switch Datasheet

Huawei CloudEngine 12800 series switches use an advanced hardware architecture design, providing as much as 178Tbit/s (scalable to 1032 Tbps) switching capacity and has up to 576*100GE, 576*40GE, 2,304*25GE, or 2,304*10GE line-rate ports.

Using Huawei's VRP8 software platform, CloudEngine 12800 series switches provide stable, reliable, and secure high-performance L2/L3 switching capabilities to help build an elastic, virtualized, and high-quality network.

Product Overview

The CloudEngine 12800 series switches are next-generation, high-performance core switches designed for data center networks and high-end campus networks. Using Huawei's next-generation VRP8 software platform, CloudEngine 12800 series switches provide stable, reliable, and secure high-performance L2/L3 switching capabilities to help build an elastic, virtualized, and high-quality network.

The CloudEngine 12800 series switches use an advanced hardware architecture design. The CloudEngine 12800 series provides as much as 178 Tbps (scalable to 1032 Tbps) switching capacity and has up to 576*100GE, 576*40GE, 2,304*25GE, or 2,304*10GE line-rate ports.

The CloudEngine 12800 series switches use an industry-leading Clos architecture and provide industrial-grade reliability. The switches support comprehensive virtualization capabilities along with data center service features. Their front-to-back airflow design suits data center equipment rooms, and the innovative energy conservation technologies greatly reduce power consumption.

Product Appearance

The CloudEngine 12800 series is available in six models: CloudEngine 12816,   CloudEngine 12808, CloudEngine 12804, CloudEngine 12808S and CloudEngine 12804S.

Platform Chassis

The CloudEngine 12800 series is available in six models: CloudEngine 12816,   CloudEngine 12808, CloudEngine 12804, CloudEngine 12808S and CloudEngine 12804S.

CloudEngine 12804: 4-Slot Chassis	

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	- Up to 2 MPUs (Main Processing Unit) - Up to 2 CMUs (Centralized Monitoring Unit) - Up to 4 LPUs - Up to 6 SFUs (Switch Fabric Unit) - Up to 4 power modules - Up to 9 fan modules

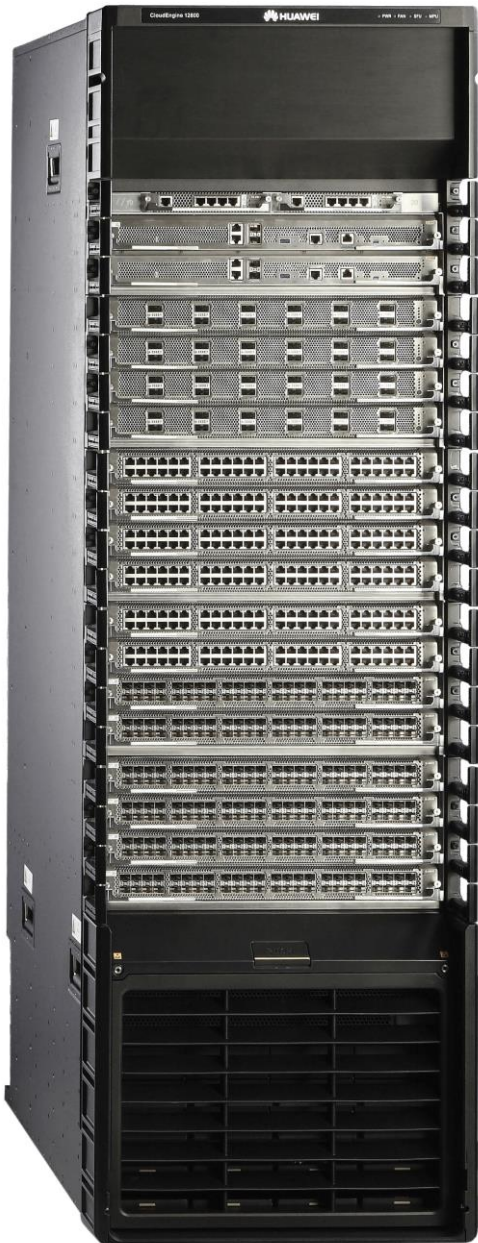| CloudEngine 12808: 8-Slot Chassis	
	- Up to 2 MPUs (Main Processing Unit) - Up to 2 CMUs (Centralized Monitoring Unit) - Up to 8 LPUs - Up to 6 SFUs (Switch Fabric Unit) - Up to 8 power modules - Up to 13 fan modules

CloudEngine 12816: 16-Slot Chassis	

CloudEngine 12816: 16-Slot Chassis	
	• Up to 2 MPUs (Main Processing Unit) • Up to 2 CMUs (Centralized Monitoring Unit) • Up to 16 LPUs • Up to 6 SFUs (Switch Fabric Unit) • Up to 20 power modules • Up to 23 fan modules

CloudEngine 12804S: 4-Slot Chassis	
	• Up to 2 MPUs (Main Processing Unit) • Up to 4 LPUs • Up to 2 SFUs (Switch Fabric Unit) • Up to 4 power modules • Up to 3 fan modules

CloudEngine 12808S: 8-Slot Chassis	
	• Up to 2 MPUs (Main Processing Unit) • Up to 8 LPUs • Up to 4 SFUs (Switch Fabric Unit) • Up to 8 power modules • Up to 6 fan modules

Centralized Monitoring Unit

The CE-CMU is the Centralized Monitoring Unit of the CloudEngine 12804/CloudEngine 12808/CloudEngine 12816 chassis and provides highly reliable device monitoring, management, and energy saving functions. A chassis can be configured with double CE-CMUs for 1:1 hot standby. This configuration improves system reliability.

CE-CMUs of the CloudEngine 12804/12808/12816 chassis include CE-CMUA and CE-CMUB. They differ in the following ways:

• The quantities of PMs and fan modules that they monitor and manage are different.

• They are applicable to different chassis models and installed in CMU slots with different slot IDs. The below table describes differences between the CE-CMUA and CE-CMUB.

CMU Model	Power Modules Monitored	Fan Modules Monitored	Applicable Chassis Model and Slot ID
CE-CMUA	A maximum of 12	A maximum of 17	• Slot 7 and slot 8 of the CloudEngine 12804 chassis • Slot 11 and slot 12 of the CloudEngine 12808 chassis
CE-CMUB	A maximum of 20	A maximum of 23	• Slot 19 and slot 20 of the CloudEngine 12816 chassis

Different CE-CMU models look the same except that they have different card name labels. The below figure shows the appearance of the CE-CMUA as an example.

Main Processing Units

The CE-MPUA/ CE-MPUB is the main control unit of the CloudEngine 12804/CloudEngine 12808/CloudEngine 12816 chassis and is responsible for system control and management. A chassis can be configured with double CE-MPUA cards for 1:1 hot standby. This configuration improves system reliability. The below figure shows the appearance of the CE-MPUA.

Power Supply

CloudEngine 12800 platform supports hot-swappable, AC, DC, and AC & high-voltage DC power supplies. N+1 and N+N redundancy modes are supported depending on the chassis configuration.

CloudEngine 12800 platform supports below power modules:

- 2200 W DC power module: 2200 W DC power module receives -48 V DC/-60 V DC input power and provides 48.5 V DC/2200 W output power, which use a front-to-back airflow design
- 3000 W AC & high-Voltage DC Power Module: 3000 W AC & high-voltage DC power module receives 220 V AC/110 V AC or 240 V DC input power and provides 53.5 V DC/3000 W output power, which use a front-to-back airflow design

Fan Trays

The hot-swappable fan trays support front-to-back cooling. Both fan trays work in 1+1 backup mode; each fan tray has two counter-rotating fans working in 1+1 backup mode, ensuring efficient heat dissipation.

NOTE

For detailed information of CloudEngine 12800 Platform information, visit
https://support.huawei.com/enterprise/en/doc/EDOC1000013855?idPath=7919710%7C21782165%7C21782236%7C22318638%7C7542409

Product Characteristics

Next-Generation Core Engine with the High Performance

1032 Tbps Switching Capacity

- The CloudEngine 12800 provides up to 178 Tbps (scalable to 1032 Tbps) switching capacity. This high capacity can support sustainable development of cloud-computing data centers for the next 10 years.
- The CloudEngine 12800, together with the CloudEngine 8800/CloudEngine 6800/CloudEngine 5800 series Top-of-Rack (ToR) switches, can implement large non-blocking switching network in the industry. This network can provide access for tens of thousands of 25GE/10GE/GE servers.

4T High-Density Line Cards

The forwarding capacity of a line card can reach up to 3.6 Tbps

- The CloudEngine 12800 supports 36*40GE, 36*100GE, 144*25GE, and 144*10GE line cards, which provide line-rate forwarding.
- The CloudEngine 12800 provides as many as 576*100GE, 576*40GE, 2,304*25GE, or 2,304*10GE line-rate ports.

Super-Large Buffer Size of 24 GB

All service ports (100GE/40GE/10GE/GE) provide a super high buffer capacity (up to 200 ms).

- The distributed buffer mechanism on inbound interfaces can effectively handle incast traffic loads in data centers.
- A line card provides up to 24 GB buffer, which is dynamically shared by interfaces to improve usage efficiency.

4M FIB Entries

- The CloudEngine 12800 series switches support up to 4 million FIB entries for use in large-scale container networks.
- MAC, FIB, ARP, and ACL entries can be changed flexibly to suit dynamic service requirements.

Comprehensive Virtualization Capabilities Implement Simple, Efficient Networking

VS Implements On-demand Resource Sharing

- High device virtualization capability: The CloudEngine 12800 uses Virtual System (VS) technology to provide an industry-leading virtualization capability that enables one switch to be virtualized into as many as 16 logical switches. This 1:16 ratio enables one core switch to manage services for an enterprise's multiple service areas such as production, office, and DMZ, or for multiple tenants.
- Higher security and reliability: VS technology divides a network into separate logical areas for service isolation. The failure of one virtual switch does not affect other virtual switches, enhancing network security.
- Lower CAPEX: VS technology improves the use efficiency of physical devices by implementing on-demand resource allocation. This ensures network scalability and reduces investment in devices.
- Lower OPEX: Using one physical device to implement multiple logical devices saves space in a data center equipment room and reduces the cost of device maintenance.

CSS Simplifies Network Management

- The CloudEngine 12800 uses industry-leading Cluster Switch System (CSS) technology, which can virtualize two physical switches into one logical switch to facilitate network management and improve reliability.
- The CloudEngine 12800 provides a dedicated system inter-connect port and separates the control channel from the service channel, improving reliability.
- The CloudEngine 12800 provides a cluster bandwidth of 3.2 Tbps. This super-high bandwidth prevents traffic bottlenecks on data center networks.
- The CloudEngine 12800 combines CSS and VS technologies to turn a network into a resource pool, enabling network resources to be allocated on demand. This on-demand resource allocation is ideal for the cloud-computing service model.

Network-Wide Reliability, Ensuring Zero Service Interruptions

- The management and control planes on one Multichassis Link Aggregation Group (M-LAG) node are independent from that on the other, which substantially improves system reliability.
- The two nodes of an M-LAG can be upgraded independently from each other. During the upgrade of one node, the other node takes over forwarding the services on the first node, ensuring that the services remain uninterrupted.
- M-LAG is able to seamlessly collaborate with CSS, thus enabling highly reliable 4-to-1 virtualization.
- With the 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.

MACsec Hardware Encryption Ensures High Security and Reliability

The CloudEngine 12800 supports MACsec, which provides hop-by-hop data encryption and secure MAC-layer data sending and receiving services including user data encryption, data frame integrity check, and data source verification. The CloudEngine 12800 is applicable to networks that require high data confidentiality, such as those of government and finance institutions.

Virtualized Gateway Achieves Fast Service Deployment

- The CloudEngine 12800 can work with a mainstream virtualization platform. As the high-performance, hardware gateway of an overlay network (VXLAN), a CloudEngine series switch can support more than 16 million tenants.
- The CloudEngine 12800 can connect to a cloud platform using open API, allowing for unified management of software and hardware networks.

- This function implements fast service deployment without changing the customer network. It also protects customer investments.

VXLAN and EVPN Enable Flexible Expansion Within and Across Data Centers

- The CloudEngine 12800 supports Border Gateway Protocol - Ethernet VPN (BGP-EVPN), which can run as the VXLAN control plane to simplify VXLAN deployment.

- BGP-EVPN triggers automatic VXLAN tunnel setup between virtual tunnel endpoints (VTEPs), removing the need for full-mesh tunnel configuration. BGP-EVPN also reduces flooding of unknown traffic by advertising MAC routes on the control plane. With this protocol, large Layer 2 networks can be established for data centers.

- Because BGP-EVPN is a standard protocol, the CloudEngine 12800 is interoperable with devices from other vendors, enabling long-term network evolution.

- The CloudEngine 12800 supports centralized and distributed VXLAN deployment and supports various VXLAN access modes, including QinQ access VXLAN and IPv6 over VXLAN. This allows for flexible customization of heterogeneous networks.

- EVPN and VXLAN can be used to set up Layer 2 interconnections between data centers, enabling active-active VXLAN deployment across data centers and conserving DCI link bandwidth.

- The CloudEngine 12800 supports IP packet fragmentation and reassembling, enabling oversized IP packets to travel across a WAN network without limited by the MTU. The switch can also identify fragmented packets to seamlessly interconnect with routers.

- The CloudEngine 12800 supports VXLAN mapping, implementing interconnection between multiple DCs at Layer 2, unified service provisioning and O&M, and inter-DC resource sharing.

Multicast-capable Distributed Gateways Implement On-demand Traffic Forwarding

VXLAN supports Layer 3 multicast. A multicast-capable gateway that functions as the VTEP node greatly reduces the east-west traffic bandwidth.

Openness and Programmability Enable Agile Deployment and O&M

OPS Implements Programmability at the Control Plane

- The CloudEngine 12800 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). 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 networking.

Standard Interfaces Provide Openness and Interoperability

- The CloudEngine 12800 supports NETCONF/OpenFlow. It can work with Huawei Agile Controller .

- The CloudEngine 12800 provides the standard NETCONF interface for third-party software to invoke. This enables programming of functions and integration with third-party software, providing openness and flexibility.

- You can use CloudEngine modules for Ansible released on open-source websites and Ansible tools to automate network deployment, simplifying device management and maintenance. Through in-depth collaboration with mainstream cloud platforms, and O&M tools, the CloudEngine 12800 series switches can be integrated into SDN and cloud computing platforms flexibly and quickly.

ZTP, Agile Network Deployment

- The CloudEngine 12800 supports Zero Touch Provisioning (ZTP). ZTP enables the CloudEngine 12800 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.

Intelligent O&M with the FabricInsight Solution

- The CloudEngine 12800 provides proactive path detection on the entire network. It periodically checks sample flows to determine connectivity of all paths on the network and locates failure points, enabling you to know the network health in real time.

- The CloudEngine 12800 supports visualization of all flows and congestion, improving service experience.

- The Segment Routing (SR) capability of the CloudEngine 12800 implements label-based packet forwarding, regardless of service types. This feature enables automatic optimization and switching of end-to-end links.

Advanced Architecture Ensures Industry-Leading Network Quality

High-Performance, Non-blocking Switching Architecture

- The CloudEngine 12800 has a non-blocking switching architecture that is characterized by its orthogonal switch fabric design, Clos architecture, cell switching, Virtual Output Queuing (VoQ), and super-large buffer size.

- Orthogonal switch fabric design: CloudEngine 12800 service line cards and switch fabric units (SFUs) use an orthogonal design in which service traffic between line cards is directly sent to the SFUs through orthogonal connectors. This approach reduces backplane cabling and minimizes signal attenuation. The orthogonal design can support signal rates as high as 25 Gbps per SerDes, which is 2.5 times the industry average. This design greatly improves system bandwidth and evolution capabilities, enabling the system switching capacity to scale to more than 100 Tbps.

- Clos architecture: The CloudEngine 12800's three-level Clos architecture permits flexible expansion of switch fabric capacity. The architecture uses Variable Size Cell (VSC) and provides dynamic routing. Load balancing among multiple switch fabrics prevents the switching matrix from being blocked and easily copes with complex, volatile traffic in data centers.

- VoQ: The CloudEngine 12800 supports 96,000 VoQ queues that implement fine-grained Quality of Service (QoS) based on the switch fabrics. With the VOQ mechanism and super-large buffer on inbound interfaces, the CloudEngine 12800 creates independent VOQ queues on inbound interfaces to perform end-to-end flow control on traffic destined for different outbound interfaces. This method ensures unified service scheduling and sequenced forwarding and implements non-blocking switching.

Highly Reliable Industry-grade Hardware Architecture

- Hot backup of five key components: Main Processing Units (MPUs) and Centralized Monitoring Unit (CMUs) work in 1+1 hot backup mode. SFUs work in N+M hot backup mode. Power supplies support dual inputs and N+N backup and have their own fans. Both fan trays work in 1+1 backup mode; each fan tray has two counter-rotating fans working in 1+1 backup mode, ensuring efficient heat dissipation.

- Redundancy of three types of major buses: Monitoring, management, and data buses all work in 1+1 backup mode. Bus redundancy ensures reliable signal transmission.

- Independent triple-plane design: The independent control, data, and monitoring planes of the CloudEngine 12800 improve system reliability and ensure service continuity.

High-Performance VRP8 Software Architecture

- The CloudEngine 12800 takes advantage of Huawei's next-generation VRP8, a high-performance, highly reliable modular software platform that provides continuous services.

- Fine-grained distributed architecture: VRP8, the industry's high-end software platform, uses a fine-grained, fully distributed architecture that can process network protocols and services concurrently using multiple instances. This architecture takes full advantage of multi-core/multi-CPU processes to maximize performance and reliability.

Pioneering Energy-saving Technology

Strict Front-to-Back Airflow Design

- The CloudEngine 12800 uses a patented front-to-back airflow design that isolates cold air channels from hot air channels. This design meets heat dissipation requirements in data center equipment rooms.

- Line cards and SFUs use independent airflow channels, which solve the problems of mixing hot and cold air and cascade heating, and effectively reduce energy consumption in equipment rooms.

- Each fan tray has two counter-rotating fans, ensuring efficient heat dissipation.

- The fan speed in each area can be dynamically adjusted based on the workload of line cards in the area. This on-demand cooling design lowers power consumption and reduces noise.

Low Power Consumption

- The CloudEngine 12800 uses innovative energy saving technologies. The port power consumption is merely half of the industry average. It greatly reduces power consumption in the data center equipment room.
- Miercom has performed a series of strict tests for the CloudEngine 12800, proving its low power consumption.

Efficient, Intelligent Power Supply System

- The CloudEngine 12800 incorporates efficient digital power modules, which provide power efficiency of 96 percent.
- The power supply system measures power consumption in real time and puts one or more power modules into sleep mode when system power demands are low.
- The CloudEngine 12800 can save energy dynamically by adjusting the power consumption of components to adapt to changes in service traffic volume.

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 12804S	CloudEngine 12808S	CloudEngine 12804	CloudEngine 12808	CloudEngine 12816
Switching capacity (Tbps)	30/258	59/516	45/258	89/516	178/1032
Forwarding rate (Mpps)	17,280	34,560	17,280	34,560	69,120
Service slots	4	8	4	8	16
Switching fabric module slots	2	4	6	6	6
Fabric architecture	Clos architecture, cell switching, VoQ, and distributed large buffer				
Airflow design	Strict front-to-back				
Device virtualization	Virtual System (VS)				
	Cluster Switch System (CSS)				
Network virtualization	M-LAG				
	TRILL				
	VXLAN routing and bridging				
	EVPN				
	QinQ access VXLAN				
VM awareness	Agile Controller				
Network convergence	FCoE				
	DCBX, PFC, ETS				
Data center	BGP-EVPN				

Item	CloudEngine 12804S	CloudEngine 12808S	CloudEngine 12804	CloudEngine 12808	CloudEngine 12816
interconnect	VXLAN mapping, implementing interconnection between multiple DCI networks at Layer 2				
Programmability	OpenFlow				
	OPS programming				
	Ansible-based automatic configuration and open-source module release				
Traffic analysis	NetStream				
	sFlow				
VLAN	Adding access, trunk, and hybrid interfaces to VLANs				
	Default VLAN				
	QinQ				
	MUX VLAN				
	GVRP				
MAC address	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, IS-IS, and BGP				
	IPv6 routing protocols, such as RIPng, OSPFv3, IS-ISv6, and BGP4+				
	IP packet fragmentation and reassembling				
IPv6	VXLAN over IPv6				
	IPv6 VXLAN over IPv4				
	IPv6 Neighbor Discovery (ND)				
	Path MTU Discovery (PMTU)				
	TCP6, ping IPv6, tracert IPv6, socket IPv6, UDP6, and Raw IP6				
Multicast	IGMP, PIM-SM, PIM-DM, MSDP, and MBGP				
	IGMP snooping				
	IGMP proxy				
	Fast leaving of multicast member interfaces				
	Multicast traffic suppression				
	Multicast VLAN				
	Multicast VXLAN				
MPLS	Basic MPLS functions				
	MPLS VPN/VPLS/VPLS over GRE				
Reliability	Link Aggregation Control Protocol (LACP)				

Item	CloudEngine 12804S	CloudEngine 12808S	CloudEngine 12804	CloudEngine 12808	CloudEngine 12816
	STP, RSTP, VBST, and MSTP				
	BPDU protection, root protection, and loop protection				
	Smart Link and multi-instance				
	Device Link Detection Protocol (DLDP)				
	Ethernet Ring Protection Switching (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				
	Segment Routing (SR)				
QoS	Traffic classification based on Layer 2, Layer 3, Layer 4, and priority information				
	Actions including ACL, CAR, and re-marking				
	Queue scheduling modes such as PQ, WFQ, and PQ+WRR				
	Congestion avoidance mechanisms, including WRED and tail drop				
	Traffic shaping				
O&M	Network-wide path detection				
	Telemetry				
	Statistics on the buffer microburst status				
	VXLAN OAM: VXLAN ping, VXLAN tracert				
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				
	Hot patches				
	User operation logs				
	Zero Touch Provisioning (ZTP)				
Security and management	802.1x authentication				
	RADIUS and HWTACACS authentication for login users				
	Command line authority control based on user levels, preventing unauthorized users from using commands				
	DoS, ARP, MAC address attacks, broadcast storms, and heavy-traffic and ICMP attack defenses				
	Ping and traceroute				
	Remote Network Monitoring (RMON)				

Hardware Specifications

Item	CloudEngine 12804S	CloudEngine 12808S	CloudEngine 12804	CloudEngine 12808	CloudEngine 12816
Dimensions (W x D x H, mm)	442 x 620 x 352.8 (8U)	442 x 620 x 708.4 (16U)	442 x 813 x 486.15 (11 U)	442 x 813 x 752.85 (17 U)	442 x 905 x 1597.4 (36 U)
Chassis weight (empty)	<60kg/ 132lb	<100kg/ 220lb	<91kg/ 201lb	<120kg/ 265lb	<222kg/ 489lb
Operating voltage	AC: 90 V to 290 V DC: -40 V to -72 V HVDC: 188 V to 288 V				
Hot swappable (Power Modules)	Yes				
Max. power supply (W)	6000	12000	6000	12000	30000
Operating temperature	Long-term working temperature: 0ºC to 40ºC Short-term working temperature: -5ºC to +55ºC				
Nonoperating (storage) temperature	-40ºC to +70ºC				
Humidity	Long-term operating humidity: 5% to 85%, non-condensing Short-term operating humidity: 0% to 95%, non-condensing				
Altitude	Operating altitude:<1800 Storage altitude:<5000m				
MTBF	39.02 years	34.72 years	40.28 years	35.11 years	32.00 years
MTTR	1 hours				
MTTF	39.02 years	34.72 years	40.28 years	35.11 years	32.00 years
Availability	0.99999667	0.99999619	0.9999972	0.9999967	0.9999964326
Power supply backup	Dual power supply systems: N+N (N ≤ 2) Single power supply system: N+1	Dual power supply systems: N+N (N ≤ 4) Single power supply system: N+1	Dual power supply systems: N+N (N ≤ 2) Single power supply system: N+1	Dual power supply systems: N+N (N ≤ 4) Single power supply system: N+1	Dual power supply systems: N+N (N ≤ 10) Single power supply system: N+1
Fan module backup	3 fan assemblies	6 fan assemblies	9 fan assemblies	13 fan assemblies	23 fan assemblies
Device management backup	Two CANBuses on the backplane, in 1+1 hot backup				
MPU backup	MPUs in 1: 1 hot standby (HSB)				
SFU backup	SFUs in N+M backup				
CMU backup	1: 1 backup (CloudEngine 12800S CMU is integrated in MPU slots)				
Hot swapping	Supported by power modules, fan modules, and cards				

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=EDOC1100101217&lang=en&idPath=24030814%7C21782165%7C21782236%7C22318638%7C7542409

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

Basic Configuration	
CE-RACK-A01	FR42812 Assembly Rack (800x1200x2000mm)
CE12804S-AC1	CE12804S AC/HVDC Assembly Chassis(with Fans)
CE12804SA-B0	CE12804S Bundle0 (Assembly Chassis,1*MPUA-S,1*SFUB-S,2*PHD-3000WA)
CE12804SA-B1	CE12804S Bundle1 (Assembly Chassis,2*MPUA-S,2*SFUB-S,2*PHD-3000WA)
CE12804SA-B2	CE12804S Bundle2 (Assembly Chassis,2*MPUA-S,2*SFUC-S,2*PHD-3000WA)
CE12804SA-B3	CE12804S Bundle3 (AC Assembly Chassis,2*MPUA-S,2*SFUF-S,2*PHD-3000WA)
CE12804SA-B6	CE12804S Bundle 6(AC/HVDC Assembly Chassis,2*MPUA-S,2*SFUG-S,2*PHD-3000WA)
CE12804SA-B7	CE12804S Bundle 7(AC/HVDC Assembly Chassis,2*MPUA-S,2*SFUG-S,2*PHD-3000WA,2*CE-L36CQ-SD)
CE12804SA-B8	CE12804S Bundle 8(AC/HVDC Assembly Chassis,2*MPUA-S,2*SFUG-S,2*PHD-3000WA,2*CE-L36CQ-SD,2*CE-L48XS-FD)
CE12804SA-BA	CE12804S Bundle A(Assembly Chassis,2*MPUA-S,2*SFUB-S,2*PHD-3000WA,2*CE-L48XS-EC,OS)
CE12804SA-BB	CE12804S Bundle B (Assembly Chassis,2*MPUA-S,2*SFUC-S,2*PHD-3000WA,2*CE-L24LQ-EC1,OS)
CE12804SA-BC	CE12804S Bundle C(AC Assembly Chassis,2*MPUC-S,2*SFUF1-S,2*PHD-3000WA)
CE12804SA-BD	CE12804S BundleD(AC Assembly Chassis,2*MPUC-S,2*SFUG-S,2*PHD-3000WA)
CE12808S-AC1	CE12808S AC/HVDC Assembly Chassis(with Fans)
CE12808SA-B0	CE12808S Bundle0 (Assembly Chassis,2*MPUA-S,2*SFUB-S,2*PHD-3000WA)
CE12808SA-B1	CE12808S Bundle1 (Assembly Chassis,2*MPUA-S,4*SFUB-S,2*PHD-3000WA)
CE12808SA-B2	CE12808S Bundle2 (Assembly Chassis,2*MPUA-S,3*SFUC-S,2*PHD-3000WA)
CE12808SA-B3	CE12808S Bundle3 (AC Assembly Chassis,2*MPUA-S,4*SFUF-S,2*PHD-3000WA)
CE12808SA-B6	CE12808S Bundle 6(AC/HVDC Assembly Chassis,2*MPUA-S,4*SFUG-S,2*PHD-3000WA)
CE12808SA-B7	CE12808S Bundle 7(AC/HVDC Assembly Chassis,2*MPUA-S,4*SFUG-S,2*PHD-3000WA,2*CE-L36CQ-SD)
CE12808SA-B8	CE12808S Bundle 8(AC/HVDC Assembly Chassis,2*MPUA-S,4*SFUG-S,2*PHD-3000WA,2*CE-L36CQ-SD,2*CE-L48XS-FD)
CE12808SA-BA	CE12808S Bundle A (Assembly Chassis,2*MPUA-S,4*SFUB-S,2*PHD-3000WA,3*CE-L48XS-EC,OS)

Basic Configuration	
CE12808SA-BB	CE12808S Bundle B (Assembly Chassis,2*MPUA-S,4*SFUC-S,2*PHD-3000WA,2*CE-L24LQ-EC1,OS)
CE12808SA-BC	CE12808S BundleC (AC Assembly Chassis,2*MPUC-S,4*SFUF1-S,2*PHD-3000WA)
CE12808SA-BE	CE12808S BundleE (AC/HVDC Assembly Chassis,2*MPUC-S,4*SFUG-S,2*PHD-3000WA)
CE12804S-DC	CE12804S DC Assembly Chassis (with Fans)
CE12804SD-B0	CE12804S DC Bundle0 (DC Assembly Chassis,1*MPUA-S,1*SFUB-S,2*PDC-2200WA)
CE12804SD-B1	CE12804S DC Bundle1 (DC Assembly Chassis,2*MPUA-S,2*SFUB-S,2*PDC-2200WA)
CE12804SD-B2	CE12804S DC Bundle2 (DC Assembly Chassis,2*MPUA-S,2*SFUC-S,2*PDC-2200WA)
CE12808S-DC	CE12808S DC Assembly Chassis (with Fans)
CE12808SD-B0	CE12808S DC Bundle0 (DC Assembly Chassis,2*MPUA-S,2*SFUB-S,4*PDC-2200WA)
CE12808SD-B1	CE12808S DC Bundle1 (DC Assembly Chassis,2*MPUA-S,4*SFUB-S,4*PDC-2200WA)
CE12808SD-B2	CE12808S DC Bundle2 (DC Assembly Chassis,2*MPUA-S,3*SFUC-S,4*PDC-2200WA)
CE12804-AC	CE12804 AC Assembly Chassis (with CMUs and Fans)
CE12804-AC1	CE12804 AC/HVDC Assembly Chassis(with CMUs and Fans)
CE12804A-B08	CE12804 Bundle8 (AC Assembly Chassis,2*MPUA,5*SFU04G,4*PHD-3000WA)
CE12804A-B11	CE12804 Bundle11 (AC Assembly Chassis,2*MPUB,5*SFU04G1,4*PHD-3000WA)
CE12808-AC	CE12808 AC Assembly Chassis (with CMUs and Fans)
CE12808-AC1	CE12808 AC/HVDC Assembly Chassis(with CMUs and Fans)
CE12808A-B08	CE12808 Bundle8 (AC Assembly Chassis,2*MPUA,5*SFU08G,4*PHD-3000WA)
CE12808A-B12	CE12808 Bundle12 (AC Assembly Chassis,2*MPUB,4*SFU08F1,4*PHD-3000WA)
CE12808A-B13	CE12808 Bundle13 (AC Assembly Chassis,2*MPUB,5*SFU08G1,4*PHD-3000WA)
CE12816-AC	CE12816 AC Assembly Chassis (with CMUs and Fans)
CE12816-AC1	CE12816 AC/HVDC Assembly Chassis(with CMUs and Fans)
CE12816A-B02	CE12816 AC Bundle2 (AC Assembly Chassis,2*MPUA,5*SFU16B,8*PHD-3000WA)
CE12816A-B10	CE12816 Bundle10 (AC Assembly Chassis,2*MPUB,4*SFU16F1,4*PHD-3000WA)
CE12804-DC	CE12804 DC Assembly Chassis (with CMUs and Fans)
CE12808-DC	CE12808 DC Assembly Chassis (with CMUs and Fans)
CE12816-DC	CE12816 DC Assembly Chassis (with CMUs and Fans)

Main Processing Unit	
CE-MPU-S	CE12800S Main Processing Unit
CE-MPU	Main Processing Unit

Switch Fabric Unit[2]	

Switch Fabric Unit[2]	
CE-SFU-S	CE12800S Switch Fabric
CE-SFU04	CE12804 Switch Fabric
CE-SFU08	CE12808 Switch Fabric
CE-SFU16	CE12816 Switch Fabric

»»2 Fx series interface cards must be used with F or G series switch fabric units. For example, a CE-L36CQ-FD interface card must be used with CE-SFUxxG switch fabric units.

GE BASE-T Interface Card	
CE-L48GT-EA	48-Port 10/100/1000BASE-T Interface Card (RJ45)

10GBASE-T Interface Card	
CE-L48XT-EC	48-port 100M/1000M/10G BASE-T Interface Card (RJ45)

10GBASE-X Interface Card	
CE-L48XS	48-Port 10GBASE-X Interface Card (SFP/SFP+)

40GE Interface Card	
CE-L24LQ	24-Port 40G Interface Card (QSFP+)
CE-L36LQ	36-Port 40G Interface Card (QSFP+)

100GE Interface Card	
CE-L04CF	4-Port 100G Interface Card (CFP)
CE-L12CQ	12-Port 100G Interface Card (QSFP28)
CE-L16CQ	16-Port 100G Interface Card (QSFP28)
CE-L36CQ	36-Port 100G Interface Card (QSFP28)

Power	
PHD-3000WA	3000W HVDC Power Module
PDC-2200WA	2200W DC Power Supply

Software	
CE128-LIC-B29	CloudEngine 12800 Basic SW,V200R019
CE128-LIC-TRILL	TRILL Function License

Software	
CE128-LIC-MPLS	MPLS Function License
CE128-LIC-VS	Virtual System Function License
CE128-LIC-IPV6	IPV6 Function License
CE128-LIC-EVN	EVN Function License
CE128-LIC-TLM	CE12800 Telemetry Function
CE128-LIC-MACSEC	CE12800 MACsec Function
N1-CE128LIC-CFMM	N1-CloudFabric Management SW License for CloudEngine 12800
N1-CE128CFMM-SnS1Y	N1-CloudFabric Management SW License for CloudEngine 12800 -SnS-1 Year
N1-CE128LIC-CFFD	N1-CloudFabric Foundation SW License for CloudEngine 12800
N1-CE128CFFD-SnS1Y	N1-CloudFabric Foundation SW License for CloudEngine 12800-SnS-1 Year
N1-CE128LIC-CFAD	N1-CloudFabric Advanced SW License for CloudEngine 12800
N1-CE128CFAD-SnS1Y	N1-CloudFabric Advanced SW License for CloudEngine 12800-SnS-1 Year
N1-CE128LIC-SEC	N1-CloudEngine 12800 Security Function
N1-CE128SEC-SnS1Y	N1-CloudEngine 12800 Security Function-SnS-1 Year

Document	
CE128-DOC	CloudEngine 12800 Series Switches Product Documentation

Networking and Application

Data Center Applications

On a typical data center network, CloudEngine 16800/12800/8800 switches work as core switches, whereas CloudEngine 8800/6800/5800 switches work as ToR switches and connect to the core switches using 100GE/40GE/10GE ports. These switches use a fabric protocols to establish a non-blocking large Layer 2 network, which allows large-scale VM migrations and flexible service deployments.
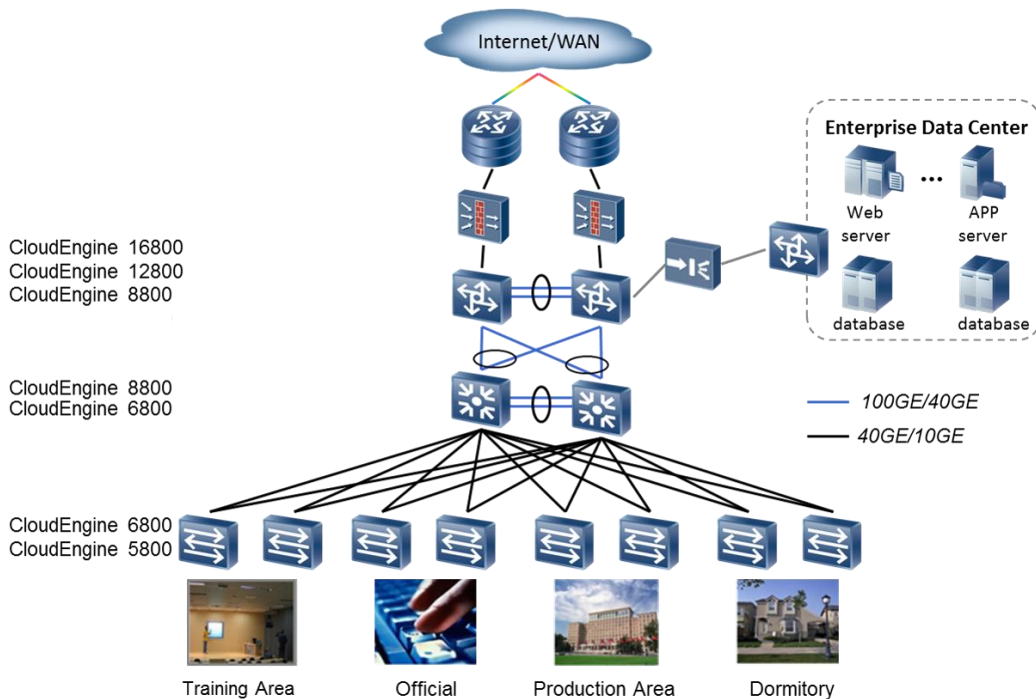
Note: VXLAN can be also used on campus networks to support flexible service deployments in different service areas.

CloudEngine 16800
CloudEngine 12800
CloudEngine 8800

CloudEngine 8800
CloudEngine 6800
CloudEngine 5800

— 100GE/40GE/10GE   — GE/10GE/25GE
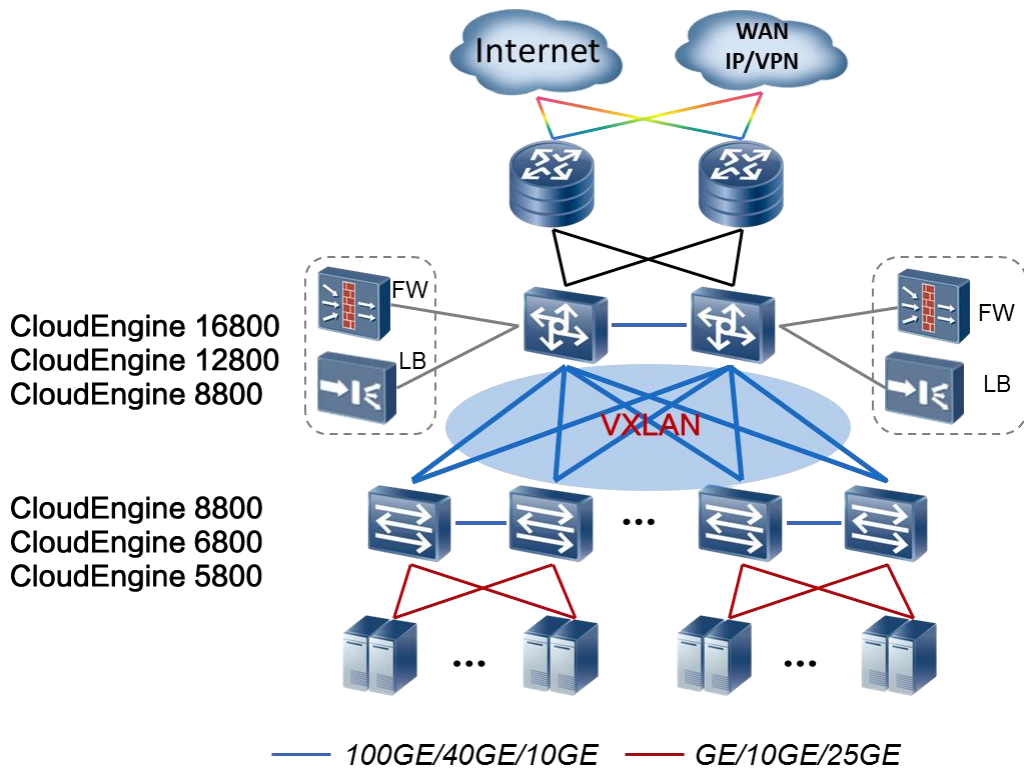
Campus Network Applications

On a typical campus network, multiple CloudEngine 16800/12800/8800 switches are virtualized into a logical core switch using CSS or iStack technology. Multiple CloudEngine 8800/6800 switches at the aggregation layer form a logical switch using iStack technology. CSS and iStack improve network reliability and simplify network management.

Note: CSS, iStack, and M-LAG are also widely used in data centers to facilitate network management.

Huawei Technologies Co., Ltd.

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

Website:www.huawei.com