



# Huawei CloudEngine 8865-4C Data Center Modular Switch Datasheet

Huawei CloudEngine 8865 series switches are next-generation modular switches that support flexible cards ranging from GE to 400GE and are designed for data centers (DCs).



## Product Overview

CloudEngine 8865-4C series are Huawei's next-generation Ethernet switches designed for DCs. They feature high performance, high density, low latency, and flexible cards. They are built on an advanced hardware structure and provide high-density 400GE, 100GE, and 25GE ports. Running over the Huawei YunShan software platform, they support abundant DC features. In addition, they can work with CloudEngine 16800/8800/6800/5800 switches to build an elastic, virtual, and high-quality data center network (DCN), meeting networking requirements of DCs in the cloud computing era. CloudEngine 8865-4C series switches can function as core or aggregation switches on DCNs to help enterprises and carriers to build a DCN platform for the cloud computing era. They can also be used as aggregation or core switches on campus networks. Huawei CloudEngine 8800 series switches provide high-speed forwarding at line-rate on all ports in both Layer2 and Layer3 modes.

# Product Models and Appearances

| Product Appearance                                                                                                    | Description                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br>Port side                        | 2 U high, supporting four half-width flexible cards and flexible combination of five types of cards <ul style="list-style-type: none"><li>• 4 x 400GE + 8 x 25GE</li><li>• 24 x 10GE (electrical) + 2 x 100GE</li></ul> |
| <br>Fan module and power module side | <ul style="list-style-type: none"><li>• 24 x 25GE + 2 x 100GE</li><li>• 16 x 100GE</li><li>• 10 x 100GE</li></ul>                                                                                                       |

## Product Features

### High-Density Access, Providing Superior Capacity

- 4 x 400GE + 8 x 25GE card (CE88-D8YS4DQ-H): A CloudEngine 8865-4C series switch supports up to 16 400GE QSFP-DD ports and 32 25GE SFP28 ports. A 400GE port can be split into four 100GE ports (4 x 100GE) or two 200GE ports (2\*200GE). A 25GE port can work at the rate of 50 Gbit/s, 10 Gbit/s, or Gbit/s.
- 10 x 100GE card (CE88-D10CQ-H): A CloudEngine 8865-4C series switch supports up to 40 100GE QSFP28 ports. Each 100GE port can work at the rate of 40 Gbit/s, be split into four 25GE or 10GE ports, or upgraded to a 200GE port by using RTU licenses. A 200GE port can be split into two 100GE ports.
- 16 x 100GE card (CE88-D16CQ-H): A CloudEngine 8865-4C series switch supports up to 64 100GE QSFP28 ports. It uses 16 x 100GE ports by default, and four of the ports can be upgraded to 200GE ports by using RTU licenses, supporting 12 x 100GE + 4 x 200GE. A 200GE port can be split into four 50GE, 25GE, or 10GE ports or two 100GE ports. Ports (except 5 to 8) can function as 40GE ports. Ports 1 to 4, 9 to 12, and 13 to 16 form different groups. In each group, an odd-numbered port can be split into four ports (4 x 25GE/4 x 10GE). When an odd-numbered port in each group is split, the corresponding even-numbered port is unavailable.
- 24 x 25GE + 2 x 100GE card (CE88-D24YS2CQ-H): A CloudEngine 8865-4C series switch supports up to eight 100GE QSFP28 ports and 96 25GE SFP28 ports. The ports can be upgraded to downlink 50GE ports and uplink 200GE ports by using RTU licenses. A 25GE port can work at the rate of 10 Gbit/s or Gbit/s, and a 100GE port can work at the rate of 40 Gbit/s. An uplink 200GE port can be split into four 50GE, 25GE, or 10GE ports, or two 100GE ports.
- 24 x 10GE electrical + 2 x 100GE card (CE88-D24T2CQ-H): A CloudEngine 8865-4C series switch supports up to 96 10GE electrical ports and eight 100GE QSFP28 ports. A 10GE electrical port can work at the rate of Gbit/s. A 100GE port can work at the rate of 40 Gbit/s, and be upgraded to a 200GE port by using RTU licenses. An uplink 200GE port can be split into four 50GE, 25GE, or 10GE ports, or two 100GE ports.

### Inter-Device Link Aggregation, Ensuring High Efficiency and Reliability

- CloudEngine 8865 series switches support Multichassis Link Aggregation Group (M-LAG) to implement link aggregation among multiple devices, improving link reliability from the card level to the device level.
- Switches in an M-LAG 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, Achieving Rapid Deployment

- ★ CloudEngine 8865 series switches can work with the industry's mainstream virtualization platforms. When functioning as high-performance hardware gateways on an overlay network (VXLAN), CloudEngine 8865 series switches can support the operations of a DC with up to 16 million tenants.
- ★ When functioning as hardware gateways on an overlay network, CloudEngine 8865 series switches can connect to cloud platforms through open APIs, facilitating unified management of virtual and physical networks.
- ★ The hardware virtualized gateway solution achieves rapid service deployment without having to change the customer network, protecting customer investments.
- ★ CloudEngine 8865 series switches support Border Gateway Protocol - Ethernet VPN (BGP-EVPN), which can run as the VXLAN control plane to simplify VXLAN configuration within and between DCs.

## Standard Ports, Enabling Open Interconnection

- ★ CloudEngine 8865 series switches support NETCONF and can interconnect with iMaster NCE-Fabric.
- ★ CloudEngine 8865 series switches support Ansible — an automatic management and O&M tool — to implement unified provisioning of physical and virtual networks.
- ★ CloudEngine 8865 series switches are integrated with mainstream cloud platforms (including commercial and open-source cloud platforms) and third-party controllers, enabling flexible service customization and automatic management.

## Zero Touch Provisioning (ZTP), Enabling Automatic O&M

- CloudEngine 8865 series switches support Zero Touch Provisioning (ZTP). ZTP enables the switches to automatically obtain and load version files from a file server, freeing network engineers from onsite configuration and deployment. ZTP reduces labor costs and improves device deployment efficiency.
- ZTP supports embedded script languages and provides them for users through open APIs. DC users can use a familiar programming language (such as Python) to centrally configure network devices.
- ZTP decouples the configuration time of new devices from device quantity and geographical distribution, shortening the service provisioning time and improving the service provisioning efficiency.

## Intelligent O&M Through Collaboration with iMaster NCE-FabricInsight

- CloudEngine 8865 series switches support telemetry technology to collect device data in real time and send the collected data to iMaster NCE-FabricInsight — the DCN analysis component of Huawei iMaster NCE. Leveraging the intelligent fault identification algorithm, iMaster NCE-FabricInsight can analyze network data, accurately display the real-time network status, locate faults and identify their root causes in a timely and effective manner, and detect network problems that can affect user experience, precisely guaranteeing user experience.
- CloudEngine 8865 series switches can insert IFIT extension headers into packets, visualize paths, and analyze interface-level packet loss, traffic, and latency to implement high-precision service-level packet loss measurement and facilitate fault demarcation.
- CloudEngine 8865 series switches support Packet Event. When a device discards packets due to reasons such as abnormal forwarding, specified packet discarding rules, a full buffer, or ACL rule deny actions, or when the latency of packets exceeds a specified threshold, the device reports related flow entries to the iMaster NCE-FabricInsight collector.
- CloudEngine 8865 series switches support application views. An application view clearly displays the applications, IP subnets, and their indicators and access relationships on the network.

## Simplified DCN Deployment via Collaboration with iMaster NCE-Fabric

- CloudEngine 8865 series switches can interconnect with iMaster NCE-Fabric through standard protocols such as NETCONF and SNMP to adapt to networks and implement automatic network management. This helps to provide more efficient and intelligent operation methods, simplifying network management and reducing the OPEX.

## Intelligent Lossless Network, Meeting High Performance Requirements of RoCEv2 Applications

- CloudEngine 8865 series switches support the iLossless algorithm to eliminate packet loss on the conventional Ethernet. This helps to build a lossless, low-latency, and high-throughput network environment for RoCEv2 traffic, meeting high performance requirements of RoCEv2 applications.

- CloudEngine 8865 series switches support PFC deadlock prevention. They can identify service flows that may cause PFC deadlocks and change queue priorities of these flows to prevent PFC deadlocks.
- CloudEngine 8865 series switches support Artificial Intelligence Explicit Congestion Notification (AI ECN). This future-oriented function can intelligently adjust the ECN thresholds of lossless queues based on the live-network traffic model to ensure low latency and high throughput with zero packet loss, maximizing the performance of lossless services.
- CloudEngine 8865 series switches support Explicit Congestion Notification (ECN) Overlay. ECN Overlay applies ECN to a VXLAN network, enabling the traffic receiver to detect congestion on the overlay network in a timely manner and instruct the traffic sender to reduce its packet sending rate to relieve network congestion.

## Strict Front-to-Back Airflow Design, Achieving High Energy Efficiency

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

- CloudEngine 8865-4C series switches use a strict front-to-back airflow design that isolates cold air channels from hot air channels, meet heat dissipation requirements in DC equipment rooms.
- Air can flow from front to back or from back to front depending on the fan modules and power modules in use.
- Redundant power modules and fan modules can be configured to ensure service continuity.

Innovative energy-saving technologies:

- CloudEngine 8865 series switches use energy-saving chips and an intelligent fan speed control scheme to measure system power consumption in real time. This can reduce O&M costs and help to build a green DC.

## Clear Indicators, Simplifying O&M

Clear indicators:

- The innovative port indicators can clearly show the port status, port speed, and status of all sub-ports.
- State indicators on both the front and rear panels enable users to maintain the switch from either side.
- CloudEngine 8865 series switches support remote positioning. Users can turn on the remote positioning indicator through the network management system (NMS) or console to easily identify the switches they want to maintain in an equipment room full of devices.

Simple maintenance:

- The management port, fan modules, and power modules are on the front panel, which facilitates device maintenance.
- Data ports are located at the rear, facing servers. This facilitates cabling.

# Licensing

Huawei CloudEngine 8865 series switches support the CloudFabric IDN One Software (N1) business model, which bundles iMaster NCE-Fabric, iMaster NCE-FabricInsight, and CloudEngine switches in a range of typical scenarios. This approach simplifies transactions, provides customers with more functions and value, and protects customers' software investment through Software License Portability.

| Feature                                                               | N1 Software Package (Mandatory) |          |         | N1 Add-On Package (Optional) |                     |     |             |          |                          |                               |                                      |                                   |             |
|-----------------------------------------------------------------------|---------------------------------|----------|---------|------------------------------|---------------------|-----|-------------|----------|--------------------------|-------------------------------|--------------------------------------|-----------------------------------|-------------|
|                                                                       | Foundation                      | Advanced | Premium | TCP Acceleration             | Distributed Storage | HPC | AI Scenario | Security | Multi-Cloud and Multi-DC | xFlow Specified Flow Analysis | xFlow Intelligent Full-Flow Analysis | Financial-Grade High Availability | Digital Map |
| Basic functions (including IPv6 and VXLAN)                            | ●                               | ●        | ●       |                              |                     |     |             |          |                          |                               |                                      |                                   |             |
| Telemetry                                                             | ●                               | ●        | ●       |                              |                     |     |             |          |                          |                               |                                      |                                   |             |
| PTP                                                                   | ●                               | ●        | ●       |                              |                     |     |             |          |                          |                               |                                      |                                   |             |
| Multicast NAT                                                         |                                 | ●        | ●       |                              |                     |     |             |          |                          |                               |                                      |                                   |             |
| M-LAG virtual peer-link <sup>[1]</sup>                                | ●                               | ●        | ●       |                              |                     |     |             |          |                          |                               |                                      |                                   |             |
| MACsec                                                                |                                 |          |         |                              |                     |     |             | ●        |                          |                               |                                      |                                   |             |
| AI ECN 2.0                                                            |                                 |          |         |                              | ●                   | ●   |             |          |                          |                               |                                      |                                   |             |
| TCP optimization                                                      |                                 |          |         | ●                            | ●                   | ●   | ●           |          |                          |                               |                                      |                                   |             |
| NSLB                                                                  |                                 |          |         |                              |                     | ●   | ●           |          |                          |                               |                                      |                                   |             |
| Enhanced network scale load balancing (NSLB)                          |                                 |          |         |                              |                     |     | ●           |          |                          |                               |                                      |                                   |             |
| MoFRR                                                                 |                                 |          |         |                              |                     |     |             |          |                          |                               |                                      | ●                                 |             |
| INC                                                                   |                                 |          |         |                              |                     | ●   |             |          |                          |                               |                                      |                                   |             |
| Adaptive routing                                                      |                                 |          |         |                              |                     | ●   |             |          |                          |                               |                                      |                                   |             |
| Automation functions                                                  | ●                               | ●        | ●       |                              |                     |     |             |          |                          |                               |                                      |                                   |             |
| Basic intent functions                                                |                                 |          | ●       |                              |                     |     |             |          |                          |                               |                                      |                                   |             |
| Runbook                                                               |                                 | ●        | ●       |                              |                     |     |             |          |                          |                               |                                      |                                   |             |
| Multi-cloud and multi-DC automation scenario package                  |                                 |          |         |                              |                     |     |             |          | ●                        |                               |                                      |                                   |             |
| Basic digital map functions                                           |                                 |          |         |                              |                     |     |             |          |                          |                               |                                      |                                   | ●           |
| Basic network analysis functions                                      | ●                               | ●        | ●       |                              |                     |     |             |          |                          |                               |                                      |                                   |             |
| Network health functions                                              |                                 | ●        | ●       |                              |                     |     |             |          |                          |                               |                                      |                                   |             |
| Network flow analysis (100 VMs)                                       |                                 |          | ●       |                              |                     |     |             |          |                          | ●                             |                                      |                                   |             |
| Intelligent full-flow analysis (per 20 Gbps)                          |                                 |          |         |                              |                     |     |             |          |                          |                               | ●                                    |                                   |             |
| IFIT service assurance                                                |                                 | ●        | ●       |                              |                     |     |             |          |                          |                               |                                      |                                   |             |
| Value-added package of the multi-cloud and multi-DC analysis scenario |                                 |          |         |                              |                     |     |             |          | ●                        |                               |                                      |                                   |             |

| Feature         | N1 Software Package (Mandatory)                                                                                                                                                  |          |         | N1 Add-On Package (Optional)                                     |                     |     |             |          |                          |                               |                                      |                                   |             |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|------------------------------------------------------------------|---------------------|-----|-------------|----------|--------------------------|-------------------------------|--------------------------------------|-----------------------------------|-------------|
|                 | Foundation                                                                                                                                                                       | Advanced | Premium | TCP Acceleration                                                 | Distributed Storage | HPC | AI Scenario | Security | Multi-Cloud and Multi-DC | xFlow Specified Flow Analysis | xFlow Intelligent Full-Flow Analysis | Financial-Grade High Availability | Digital Map |
| Version mapping | Select one from the three packages. The Advanced package contains the features of the Foundation package, and the Premium package contains the features of the Advanced package. |          |         | Used together with the Foundation, Advanced, or Premium package. |                     |     |             |          |                          |                               |                                      |                                   |             |

# Product Specifications

| Item                   | CloudEngine 8865-4C                                                                                       |
|------------------------|-----------------------------------------------------------------------------------------------------------|
| Device virtualization  | M-LAG                                                                                                     |
| Port                   | Jumbo frames                                                                                              |
| Network virtualization | VXLAN routing and VXLAN bridging                                                                          |
|                        | BGP-EVPN                                                                                                  |
| SDN                    | iMaster NCE-Fabric                                                                                        |
| Network convergence    | PFC and AI ECN                                                                                            |
|                        | RDMA and RoCE (RoCE v1 and RoCE v2)                                                                       |
| Programmability        | OpenFlow                                                                                                  |
|                        | OPS programming                                                                                           |
| Traffic analysis       | NetStream                                                                                                 |
| VLAN                   | Access, trunk, and hybrid ports                                                                           |
|                        | Default VLAN                                                                                              |
| MAC address table      | Automatic MAC address learning and aging                                                                  |
|                        | Static, dynamic, and blackhole MAC address entries                                                        |
|                        | Source MAC address filtering                                                                              |
|                        | MAC address learning limiting based on ports and VLANs                                                    |
| Policy Routing         | Policy-based Routing(PBR)                                                                                 |
| IP routing             | IPv4 dynamic routing protocols such as RIP, OSPF, IS-IS, and BGP                                          |
|                        | IPv6 dynamic routing protocols such as RIPng, OSPFv3, IS-ISv6, and BGP4+                                  |
| IPv6                   | VXLAN over IPv6                                                                                           |
|                        | IPv6 VXLAN over IPv4                                                                                      |
|                        | IPv6 neighbor discovery (ND)                                                                              |
|                        | Path MTU discovery (PMTU)                                                                                 |
|                        | TCP6, IPv6 ping, IPv6 tracer, IPv6 socket, UDP6, and raw IPv6                                             |
| Multicast              | Multicast routing protocols such as IGMP, PIM-SM, and MSDP                                                |
|                        | IGMP snooping and IGMP proxy                                                                              |
|                        | IPv6 Layer 3 multicast and configuration of both Layer 2 and Layer 3 multicast services                   |
|                        | Fast leaving of multicast member interfaces                                                               |
|                        | Multicast traffic suppression                                                                             |
|                        | Multicast NAT                                                                                             |
| Reliability            | LACP                                                                                                      |
|                        | STP, RSTP, VBST, and MSTP                                                                                 |
|                        | BPDU protection                                                                                           |
|                        | Smart link and multi-instance                                                                             |
|                        | Hardware-based Bidirectional Forwarding Detection (BFD), with a minimum packet sending interval of 3.3 ms |
|                        | VRRP, VRRP load sharing, and BFD for VRRP                                                                 |
|                        | BFD for BGP, IS-IS, OSPF, and static routing                                                              |
|                        | BFD for VXLAN                                                                                             |

|                                      |                                                                                                        |
|--------------------------------------|--------------------------------------------------------------------------------------------------------|
| <b>QoS</b>                           | Traffic classification based on Layer 2 headers, Layer 3 protocols, and Layer 4 protocol priorities    |
|                                      | ACL, CAR, re-marking, and scheduling                                                                   |
|                                      | Queue scheduling modes such as PQ, DRR, and PQ+DRR                                                     |
|                                      | Congestion avoidance mechanisms such as WRED and tail drop                                             |
|                                      | Traffic shaping                                                                                        |
|                                      | IEEE 1588v2 (PTP)                                                                                      |
| <b>Intelligent O&amp;M</b>           | Network-wide path detection                                                                            |
|                                      | Telemetry                                                                                              |
|                                      | Enhanced ERSPAN                                                                                        |
|                                      | In-situ Flow Information Telemetry (IFIT)                                                              |
|                                      | Packet Event: packet loss visualization and ultra-long latency visualization                           |
|                                      | Statistics collection on the buffer microburst status                                                  |
| <b>Intelligent lossless network</b>  | VXLAN OAM: VXLAN ping and VXLAN tracer                                                                 |
|                                      | PFC deadlock prevention                                                                                |
|                                      | AI ECN                                                                                                 |
|                                      | ECN Overlay                                                                                            |
| <b>Configuration and maintenance</b> | Enhanced NSLB                                                                                          |
|                                      | Terminal login through the console port, Telnet, and SSH                                               |
|                                      | Network management protocols, such as SNMPv1/v2/v3                                                     |
|                                      | File upload and download through FTP and TFTP                                                          |
|                                      | Boot Read-Only Memory (BootROM) upgrade and remote online upgrade                                      |
|                                      | Hot patching                                                                                           |
|                                      | User operation logs                                                                                    |
|                                      | Configuration rollback                                                                                 |
| <b>Security and management</b>       | ZTP                                                                                                    |
|                                      | MACsec                                                                                                 |
|                                      | Microsegmentation                                                                                      |
|                                      | Command line authority control based on user levels, preventing unauthorized users from using commands |
|                                      | Defense against DoS, ARP, and ICMP attacks                                                             |
|                                      | Port isolation, port security, and sticky MAC                                                          |
|                                      | Binding of the IP address, MAC address, port ID, and VLAN ID                                           |
|                                      | Authentication methods, including AAA, LDAP, RADIUS, and HWTACACS                                      |
|                                      | RMON                                                                                                   |

## Performance and Scalability

| Item                                     | Value     |
|------------------------------------------|-----------|
| Maximum number of MAC address entries    | 640K      |
| Maximum number of routes (FIB IPv4/IPv6) | 1.5M/750K |
| ARP size                                 | 128K      |

|                                                              |                                                             |
|--------------------------------------------------------------|-------------------------------------------------------------|
| Maximum number of VRFs                                       | 4096                                                        |
| IPv6 ND table size                                           | 128K                                                        |
| Maximum number of multicast routes (multicast FIB IPv4/IPv6) | 32K/16K                                                     |
| Maximum number of VRRP groups                                | 1024                                                        |
| Support ECMP                                                 | Yes, 128 member paths in each ECMP group for load balancing |
| Maximum number of ACLs                                       | 34K@160 bits (inbound) + 2K@320 bits (outbound) (K = 1024)  |
| Maximum number of VXLAN bridge domains                       | 16K                                                         |
| Maximum number of BDIF interfaces                            | 16K                                                         |
| Maximum number of virtual tunnel endpoints (VTEPs)           | 16K                                                         |
| Maximum number of LAGs                                       | 1024                                                        |
| Maximum number of links in a LAG                             | 256                                                         |
| Maximum number of MSTIs                                      | 1000                                                        |
| Maximum number of VLANs where VBST can be configured         | 1000K                                                       |
| Maximum number of supported VLANs                            | 4063                                                        |

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

## Hardware Specifications

| Item                 |                                                         | CloudEngine 8865-4C           |
|----------------------|---------------------------------------------------------|-------------------------------|
| Physical features    | Dimensions (H x W x D)                                  | 88.1 mm x 442.0 mm x 600.0 mm |
|                      | Weight without packaging (full configuration) [kg (lb)] | 16.54                         |
|                      | Switching capacity (Tbps)                               | 16                            |
|                      | Forwarding performance (Mpps)                           | 2400                          |
| Management interface | Console port                                            | 1 x RJ45 interface            |
|                      | USB port                                                | 1                             |
| CPU                  | Number of cores                                         | 16                            |

| Item         |                         | CloudEngine 8865-4C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Buffer       | System Buffer           | 65 MB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Power supply | Power modules           | 2000 W AC&240 V DC power module<br>1800 W AC&240 V DC power module<br>2000 W high-voltage DC power module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|              | Rated input voltage [V] | 2000 W AC&240 V DC power module: AC: 100 V AC to 240 V AC, 50/60 Hz; DC: 240 V DC<br>1800 W AC&240 V DC power module: AC: 100 V AC to 240 V AC, 50/60 Hz; DC: 240 V DC<br>2000 W high-voltage DC power module: 336 V DC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|              | Input voltage range [V] | 2000 W AC&240 V DC power module: AC: 90 V AC to 290 V AC, 45 Hz to 66 Hz; DC: 190 V DC to 290 V DC<br>1800 W AC&240 V DC power module: AC: 90 V AC to 290 V AC, 45 Hz to 66 Hz; DC: 190 V DC to 290 V DC<br>2000 W high-voltage DC power module: 260 V DC to 400 V DC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|              | Maximum input current   | 2000 W AC&240 V DC power module: 10 A (100 V AC to 240 V AC); 10 A (240 V DC)<br>1800 W AC&240 V DC power module: 10 A (100 V AC to 240 V AC); 10 A (240 V DC)<br>2000 W high-voltage DC power module: 10 A (336 V DC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|              | Typical power           | Configured with four CE88-D16CQ-H cards:<br>- 650 W (100% traffic load, copper cables on 32 x 100GE ports, normal temperature, dual AC power modules)<br>- 728 W (100% traffic load, short-distance optical modules on 32 x 100GE ports, normal temperature, dual AC power modules)<br>Configured with four CE88-D10CQ-H cards:<br>- 315 W (100% traffic load, copper cables on 20 x 100GE ports, normal temperature, dual AC power modules)<br>- 338 W (100% traffic load, copper cables on 20 x 200GE ports, normal temperature, dual AC power modules)<br>- 345 W (100% traffic load, short-distance optical modules on 20 x 100GE ports, normal temperature, dual AC power modules)<br>- 420 W (100% traffic load, short-distance optical modules on 20 x 200GE ports, normal temperature, dual AC power modules)<br>Configured with four CE88-D8YS4DQ-H cards:<br>- 306 W (100% traffic load, copper cables on 8 x 400GE + 16 x 25GE ports, normal temperature, dual AC power modules)<br>- 406 W (100% traffic load, short-distance optical modules on 8 x 400GE + 16 x 25GE ports, normal temperature, dual AC power modules)<br>Configured with four CE88-D24YS2CQ-H cards:<br>- 305 W (100% traffic load, copper cables on 48 x 25GE + 4 x 100GE ports, normal temperature, dual AC power modules)<br>- 338 W (100% traffic load, short-distance optical modules on 48 x 25GE + 4 x 100GE ports, normal temperature, dual AC power modules)<br>Configured with four CE88-D24T2CQ-H cards:<br>- 381 W (100% traffic load, copper cables on 48 x 10GE electrical + 4 x 100GE ports, normal temperature, dual AC power modules)<br>- 388 W (100% traffic load, short-distance optical modules on 48 x 10GE electrical + 4 x 100GE ports, normal temperature, dual AC power modules) |

|  |               |                                                                                                                                                                        |
|--|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Maximum power | Configured with four CE88-D16CQ-H cards:<br>- 888 W (100% traffic load, short-distance optical modules on 64 x 100GE ports, normal temperature, dual AC power modules) |
|--|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Item                       |                                      | CloudEngine 8865-4C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                                      | <ul style="list-style-type: none"> <li>- 1318 W (100% traffic load, long-distance optical modules on 64 x 100GE ports, high temperature, dual AC power modules)</li> <li>- 1376 W (100% traffic load, long-distance optical modules on 48 x 100GE + 16 x 200GE ports, high temperature, dual AC power modules)</li> </ul> Configured with four CE88-D10CQ-H cards: <ul style="list-style-type: none"> <li>- 406 W (100% traffic load, short-distance optical modules on 40 x 100GE ports, normal temperature, dual AC power modules)</li> <li>- 549 W (100% traffic load, short-distance optical modules on 40 x 200GE ports, normal temperature, dual AC power modules)</li> <li>- 612 W (100% traffic load, long-distance optical modules on 40 x 100GE ports, high temperature, dual AC power modules)</li> <li>- 965 W (100% traffic load, long-distance optical modules on 40 x 200GE ports, high temperature, dual AC power modules)</li> </ul> Configured with four CE88-D8YS4DQ-H cards: <ul style="list-style-type: none"> <li>- 531 W (100% traffic load, short-distance optical modules on 16 x 400GE + 32 x 25GE ports, normal temperature, dual AC power modules)</li> <li>- 830 W (100% traffic load, long-distance optical modules on 16 x 400GE + 32 x 25GE ports, high temperature, dual AC power modules)</li> </ul> Configured with four CE88-D24YS2CQ-H cards: <ul style="list-style-type: none"> <li>- 410 W (100% traffic load, short-distance optical modules on 96 x 25GE + 8 x 100GE ports, normal temperature, dual AC power modules)</li> <li>- 718 W (100% traffic load, long-distance optical modules on 96 x 25GE + 8 x 100GE ports, high temperature, dual AC power modules)</li> </ul> Configured with four CE88-D24T2CQ-H cards: <ul style="list-style-type: none"> <li>- 455 W (100% traffic load, short-distance optical modules on 96 x 10GE electrical + 8 x 100GE ports, normal temperature, dual AC power modules)</li> <li>- 732 W (100% traffic load, long-distance optical modules on 96 x 10GE electrical + 8 x 100GE ports, high temperature, dual AC power modules)</li> </ul> |
|                            | Frequency (AC, Hz)                   | 50/60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Heat dissipation           | Heat dissipation mode                | Air cooling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                            | Number of fans                       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                            | Heat dissipation airflow             | Front-to-back or back-to-front airflow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Environment specifications | Long-term operating temperature (°C) | 0°C to 40°C (0-1800 m)<br>The temperature decreases by 1°C each time the altitude increases by 220 m.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                            | Storage temperature (°C)             | -40°C to +70°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                            | Storage relative humidity (RH)       | 5% to 95%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                            | Operating altitude (m)               | Up to 5000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|             |                                                          |                                                                                                                                                                |
|-------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | Noise at normal temperature (27°C, sound pressure) (dBA) | Port-side air intake: < 64.3 dB(A) Port-side air exhaust: < 65.2 dB(A)                                                                                         |
|             | Noise at high temperature (40°C, sound pressure) (dBA)   | Port-side air intake: < 86.1 dB(A) Port-side air exhaust: < 87.9 dB(A)                                                                                         |
|             | Surge protection                                         | AC power supply protection: 6 kV in common mode and 6 kV in differential mode<br>DC power supply protection: 4 kV in common mode and 2 kV in differential mode |
| <b>Item</b> |                                                          | <b>CloudEngine 8865-4C</b>                                                                                                                                     |
|             |                                                          | differential mode                                                                                                                                              |
| Reliability | MTBF (year)                                              | 48.4                                                                                                                                                           |
|             | MTTR (hour)                                              | 1.86                                                                                                                                                           |
|             | Availability                                             | 0.9999964621                                                                                                                                                   |

## Safety and Regulatory Compliance

The following table lists the safety and regulatory compliance of CloudEngine 6800 series switches.

| Certification Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Description                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Safety</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EU CE: 2006/95/EC, EN 60950-1<br>Germany GS: EN 60950-1<br>CB: IEC 60950-1<br>USA UL: UL 60950-1<br>Canada CUL: CSA C22.2 No. 60950-1<br>Australia RCM: AS/NZS 60950-1<br>China CCC: GB 4943   |
| <b>Electromagnetic Compatibility (EMC)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | EU CE: 2014/30/EU, EN55032, EN 55024, and EN 300386<br>US FCC: 47CFR Part 15<br>Canada IC: ICES-003<br>Australia C-Tick: AS/NZS CIPSR22<br>Japan VCCI: VCCI-3 and VCCI-4<br>China CCC: GB 9254 |
| <b>Environment</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | EU ROHS: 2002/95/EC & 2011/65/EU<br>EU REACH: 1907/2006/EC<br>EU WEEE: 2002/96/EC<br>China RoHS: GB/T 26572                                                                                    |
| <p>EMC: electromagnetic compatibility; CISPR: International Special Committee on Radio Interference</p> <p>EN: European Standard; ETSI: European Telecommunications Standards Institute</p> <p>CFR: Code of Federal Regulations; FCC: Federal Communication Commission</p> <p>IEC: International Electrotechnical Commission</p> <p>AS/NZS: Australian/New Zealand Standard; VCCI: Voluntary Control Council for Interference</p> <p>UL: Underwriters Laboratories; CSA: Canadian Standards Association</p> |                                                                                                                                                                                                |

## Ordering Information

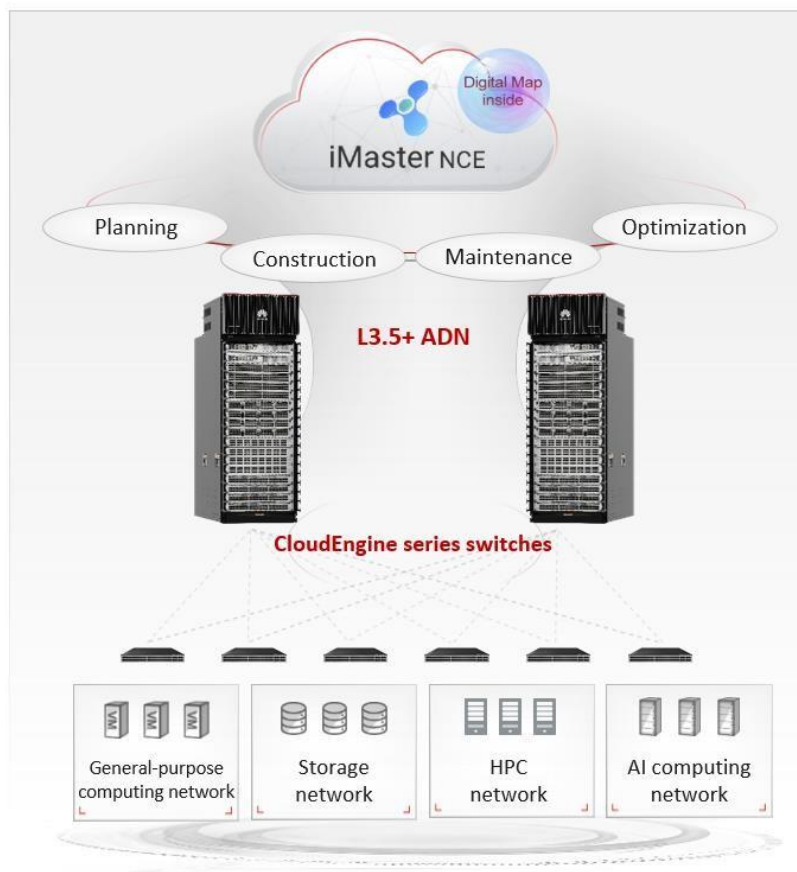
| Device                      | Description                                                                               |
|-----------------------------|-------------------------------------------------------------------------------------------|
| <b>CE8865-4C</b>            | CE8865-4C Mainframe (With 4 Subcard Slots, Without Fan and Power Modules)                 |
| <b>CE8865-4C-B</b>          | CE8865-4C Mainframe (With 4 Subcard Slots, 2*AC Power Modules, 3*Fans, Port-side Intake)  |
| <b>CE8865-4C-F</b>          | CE8865-4C Mainframe (With 4 Subcard Slots, 2*AC Power Modules, 3*Fans, Port-side Exhaust) |
| <b>Fan module</b>           |                                                                                           |
| Model                       | Description                                                                               |
| <b>FAN-180E-B</b>           | Fan box (B,FAN panel side exhaust)                                                        |
| <b>FAN-180E-F</b>           | Fan box (F,FAN panel side intake)                                                         |
| <b>Power supply modules</b> |                                                                                           |
| Model                       | Description                                                                               |
| <b>PAC2KS12-PB</b>          | 2000W AC&240V DC Power Module (Back to Front,Power panel side exhaust)                    |
| <b>PAC1K8S12-PF</b>         | 1800W AC&240V DC Power Module (Front to Back,Power panel side intake)                     |
| <b>PDC2K2S12-PB</b>         | 2200W DC Power Module (Back to Front, Power panel side exhaust)                           |
| <b>PDC2K2S12-PF</b>         | 2200W DC Power Module (Front to Back, Power panel side intake)                            |
| <b>PHD2KS12-PB</b>          | 2000W HVDC Power Module (Back to Front, Power panel side exhaust)                         |
| <b>Hardware RTU</b>         |                                                                                           |
| <b>CE88-RTU-U2CQ</b>        | 100GE upgraded to 200GE                                                                   |
| <b>CE88-RTU-U24YS</b>       | 25GE upgraded to 50GE                                                                     |
| <b>Software</b>             |                                                                                           |
| <b>N1-CE88LIC-CFFD</b>      | N1-CloudFabric Foundation SW License for CloudEngine 8800                                 |
| <b>N1-CE88CFFD-SnS1Y</b>    | N1-CloudFabric Foundation SW License for CloudEngine CE8800-SnS-Year                      |
| <b>N1-CE88LIC-CFAD</b>      | N1-CloudFabric Advanced SW License for CloudEngine 8800                                   |
| <b>N1-CE88CFAD- SnS1Y</b>   | N1-CloudFabric Advanced SW License for CloudEngine CE8800-SnS-Year                        |
| <b>N1-CE88LIC-CFPM</b>      | N1-CloudFabric Premium SW License for CloudEngine 8800                                    |
| <b>N1-CE88CFPM- SnS1Y</b>   | N1-CloudFabric Premium SW License for CloudEngine 8800-SnS-Year                           |
| <b>N1-CE88UPG-F-A</b>       | N1-CloudEngine 8800 Upgrade SW License:Foundation to Advanced                             |
| <b>N1-CE88UGFA- SnS1Y</b>   | N1-CloudEngine 8800 Upgrade SW License:Foundation to Advanced-SnS-Year                    |
| <b>N1-CE88UPG-A-P</b>       | N1-CloudEngine 8800 Upgrade SW License:Advanced to Premium                                |
| <b>N1-CE88UGAP- SnS1Y</b>   | N1-CloudEngine 8800 Upgrade SW License:Advanced to Premium-SnS-Year                       |
| <b>N1-CE88LIC-AFRD-2</b>    | N1-CloudEngine 8800 AI Fabric RDMA Application Acceleration Function 2                    |
| <b>N1-CE88AFRD2- SnS1Y</b>  | N1-CloudEngine 8800 AI Fabric RDMA Application Acceleration Function 2-SnS-Year           |
| <b>N1-CE168LIC-HPC</b>      | N1-CE88LIC-HPC,N1-CloudEngine 16800 AI Fabric Value-added Package for the HPC Scenarios   |

| <b>N1-CE168HPC-SnS1Y</b>   | N1-CloudEngine 16800 AI Fabric Value-added Package for the HPC Scenarios-SnS-1 Year,                  |
|----------------------------|-------------------------------------------------------------------------------------------------------|
| <b>N1-CE88LIC-AI</b>       | N1-CloudEngine 8800 Value-added Package for the AI Scenarios                                          |
| <b>N1-CE88AI-SnS1Y</b>     | N1-CloudEngine 8800 Value-added Package for the AI Scenarios-SnS Year                                 |
| <b>N1-CE88LIC-SEC</b>      | N1-CloudEngine 8800 Security Function                                                                 |
| <b>N1-CE88SEC-SnS1Y</b>    | N1-CloudEngine 8800 Security Function-SnS-Year                                                        |
| <b>N1-CE-F-LIC-MDCA</b>    | N1-CloudEngine Data Center Switch Multi-cloud Multi-DC Value-added Package - Fixed                    |
| <b>N1-CEFMDCA - SnS1Y</b>  | N1-CloudEngine Data Center Switch Multi-cloud Multi-DC Value-added Package, Per Fixed device-SnS-Year |
| Device                     | Description                                                                                           |
| <b>N1-CE-F-LIC-DM</b>      | N1-CloudEngine Digital Map Basic Function-Fixed                                                       |
| <b>N1-CEMDF-SnS1Y</b>      | N1-CloudEngine Digital Map Function                                                                   |
| <b>N1-CE-LIC-AFP100VM</b>  | N1-CloudEngine Specified Flow Analysis Value-added Package Per 100 VM                                 |
| <b>N1-CEAFP100VM-SnS1Y</b> | N1-CloudEngine Specified Flow Analysis Value-added Package Per 100 VM-SnS-Year                        |
| <b>N1-CE88LIC-TCPAC</b>    | N1-CE88LIC-TCPAC,N1-CloudEngine 8800 Value-added Package for the TCP Acceleration Scenarios           |
| <b>N1-CE-LIC-XFLOW20G</b>  | N1-CloudEngine xFlow Intelligent Full-flow Analysis                                                   |

## Networking and Applications

### Typical Application in DCs

On a typical DCN, CloudEngine 16800-X or 16800 switches work as core switches, whereas CloudEngine 8865 series switches work as TOR switches and connect to the core switches through 40GE, 100GE, or 200GE ports to build an end-to-end and fully-connected 100GE/200GE/400GE network. The switches use VXLAN and other fabric protocols to establish a non-blocking large Layer 2 network, which allows large-scale VM migration and flexible service deployment.



## More Information

For more information about Huawei products, visit <http://e.huawei.com> or contact Huawei's local sales office.

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- ★ Global service hotline: <http://e.huawei.com/en/service-hotline>
- ★ Enterprise technical support website: <http://support.huawei.com/enterprise/>
- ★ Service email address for enterprise users: support\_e@huawei.com

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