# Huawei CloudEngine 6885-SAN-56F Data Center Storage Network Switch Datasheet

Huawei CloudEngine 6885-SAN-56F series switches are next-generation high-density 10GE/25GE/50GE access switches designed for all-flash storage networks of data centers (DCs). They provide 40GE/100GE/200GE uplink ports.

## Product Overview

Huawei CloudEngine 6885-SAN-56F series switches are next-generation 10GE, 25GE, and 50GE switches designed for all-flash storage networks of DCs. They feature high performance, high reliability, low latency, and easy operations and maintenance (O&M). This series of switches adopt an advanced hardware structure design, provide high-density 40GE/100GE/200GE uplink ports, enable flexible selection of airflow directions, and support the exclusive iLossless algorithm, making NVMe more efficient and fully unleashing the potential of all-flash. They also support NOF+ technology to implement plug-and-play of the storage network and fast fault detection.

CloudEngine 6860-SAN-56F series switches can work with CloudEngine 8850-SAN or CloudEngine 16800-X series switches to build an intelligent lossless data center network (DCN), meeting storage network requirements in the all-flash era.

## Product Models and Appearances

CloudEngine 6860-SAN-56F series switches provide 48 x 25GE SFP28 ports or 48 x 50GE SFP56 ports, and eight 100GE QSFP28 ports or eight 200GE QSFP56 ports. The switches fall into the following models:

| Product Appearance | Description |
| --- | --- |



CloudEngine 6885-SAN-56F port side



CloudEngine 6885-SAN-56F fan module and power module side

- Downlink: 48 x 25GE SFP28/48 x 50GE SFP56 (25GE and 50GE ports can work at 10 Gbit/s and can be switched to GE ports)
- Uplink: 8 x 100GE QSFP28/8 x 200GE QSFP56 (each 100GE port can work at 40 Gbit/s, and each 200GE port can work at 100 Gbit/s or 40 Gbit/s)

# Product Features

## High-Density Access, Providing Superior Capacity

- The speed of 25GE ports can be upgraded to 50 Gbit/s and that of 100GE ports can be upgraded to 200 Gbit/s through port RTUs.
- The CloudEngine 6860-SAN-56F supports a maximum of eight 100GE high-performance QSFP28 ports. With port RTUs loaded, the switch supports up to eight 200GE high-performance QSFP56 ports. The 200GE QSFP56 ports can work as 40GE/100GE ports through auto-sensing. A 100GE QSFP28 port can work as a 40GE QSFP+ port or be split into four 25GE SFP28 ports or four 10GE SFP+ ports to provide flexible networking capabilities.

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

- CloudEngine 6860-SAN-56F 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 6860-SAN-56F series switches also support the iNOF feature. By quickly managing and controlling connected hosts, the iNOF feature can detect newly connected hosts in a timely manner, intelligently adjust configurations of the intelligent lossless network, and notify the storage system of host information to help the storage system manage hosts, implementing plug-and-play of the storage system. Computing and storage rollout implements second-level automatic link setup based on the network plan. In addition, the switches support rapid fault detection and active/standby server switchover within seconds.
- CloudEngine 6860-SAN-56F 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 6860-SAN-56F 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 6860-SAN-56F series switches support ECN overlay. ECN overlay applies ECN to a VXLAN network, enabling the traffic receiver to detect congestion on the network in a timely manner and instruct the traffic sender to reduce its packet sending rate to relieve network congestion.

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

- CloudEngine 6885-SAN-56F 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 6885-SAN-56F series switches can work with the industry's mainstream virtualization platforms. When functioning as high-performance hardware gateways on an overlay network (VXLAN), CloudEngine 6885 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 6885-SAN-56F 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 6885-SAN-56F 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 6885-SAN-56F series switches support NETCONF and can interconnect with iMaster NCE-Fabric.
- CloudEngine 6885-SAN-56F series switches support Ansible — an automatic management and O&M tool — to implement unified provisioning of physical and virtual networks.
- CloudEngine 6885-SAN-56F 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 6885-SAN-56F series switches support 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 6885-SAN-56F 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 6885-SAN-56F 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 6885-SAN-56F 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 iMaster NCE-FabricInsight collector.

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

- CloudEngine 6885-SAN-56F 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.

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

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

- CloudEngine 6885-SAN-56F 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 rear or from rear 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 6885-SAN-56F 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-interfaces.
- State and stack indicators on both the front and rear panels enable users to maintain the switch from either side.
- CloudEngine 6885-SAN-56F 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 6885-SAN-56F series switches support the CloudFabric IDN One Software (N1) business model, which bundles 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 | AI Fabric<br>NOF+ Software Scenario Function Package (Mandatory) | |
|---|---|---|
| | NOF+ Foundation Package | NOF+ Advanced Package |
| Basic functions (including IPv6 and VXLAN) | • | • |
| M-LAG hitless upgrade | • | • |
| Telemetry | • | • |
| AI ECN 2.0 | • | • |
| Plug-and-play, switchover in seconds (iNOF) | • | • |
| NOF+ long-distance lossless transmission (ABS) (200 km) | • | • |
| iMaster NCE-FabricInsight's basic analysis function | • | • |
| IFIT | | • |
| iMaster NCE-FabricInsight's network health function | | • |
| IFIT service assurance function | | • |
| **Mapping** | Select either the foundation or advanced package. The advanced package includes all the functions of the foundation package. | |

# Product Specifications

| Item | CloudEngine 6885-SAN-56F |
|---|---|
| **10/25GE SFP28 port** | 48 |
| **50GE SFP56 port 1** | 48 |
| **40/100GE QSFP28 port** | 8 |
| **200GE QSFP56 port 1** | 8 |
| **Switching capacity** | 48 x 25G + 8 x 100G: 4 Tbit/s<br>48 x 50G + 8 x 200G: 8 Tbit/s |
| **Packet forwarding rate** | 1200 Mpps |
| **Air duct type** | Standard front-to-back or back-to-front airflow |
| **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 2.0 |
| | RDMA, RoCE (RoCEv1 and RoCEv2), and NVMe over RoCE |
| **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 |

| Item | CloudEngine 6885-SAN-56F |
| --- | --- |
| **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 tracert, IPv6 socket, UDP6, and raw IPv6 |
| **Multicast** | Multicast routing protocols such as IGMP, PIM-SM, and MSDP |
| | IGMP snooping |
| | IGMP proxy |
| | Fast leaving of multicast member interfaces |
| | Multicast traffic suppression |
| **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 |
| **QoS** | Traffic classification based on Layer 2 headers, Layer 3 headers, and Layer 4 protocol priorities |
| | ACL, CAR, re-marking, and scheduling |
| | Queue scheduling modes such as PQ, DRR, and PQ+DRR |

| Item | CloudEngine 6885-SAN-56F |
| --- | --- |
| | Congestion avoidance mechanisms such as WRED and tail drop |
| | Traffic shaping |
| **Intelligent O&M** | IEEE 1588v2 |
| | Network-wide path detection |
| | Telemetry |
| | Enhanced ERSPAN |
| | In-situ Flow Information Telemetry (IFIT) |
| | Packet Event: packet loss visualization and ultra-long latency visualization |
| | VXLAN OAM: VXLAN ping and VXLAN tracert |

| Item | CloudEngine 6885-SAN-56F |
| --- | --- |
| **Intelligent lossless network** | PFC deadlock prevention |
| | AI ECN |
| | iNOF |
| | ECN Overlay |
| **Configuration and maintenance** | 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 patches |
| | User operation logs |
| | Configuration rollback |
| | ZTP |
| **Security and management** | MACsec |
| | 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, RADIUS, and HWTACACS |
| | RMON |
| **Dimensions (H x W x D)** | 43.6 mm x 442 mm x 420 mm |
| **Weight in full configuration** | 8.55 kg |
| **Environment requirements** | Operating temperature: 0°C to 40°C (0 m to 1800 m) Storage temperature: –40°C to +70°C<br>Relative humidity: 5% RH to 95% RH (noncondensing) |

| Item | CloudEngine 6885-SAN-56F |
| --- | --- |
| **Input voltage range** | 600 W AC and 240 V DC power module: AC: 90 V AC to 290 V AC, 45 Hz to 65 Hz; DC: 190 V DC to 290 V DC<br>1200 W DC power module: -38.4 V DC to -72 V DC; 40 V DC to 57 V DC |

| Item | CloudEngine 6885-SAN-56F |
| --- | --- |
| **Typical power consumption** | 48 x 25G + 8 x 100G:<br>147 W (100% traffic load, copper cables on 24 x 25G and 4 x 100G ports, normal temperature, dual AC power modules)<br>166 W (100% traffic load, short-distance optical modules on 24 x 25G and 4 x 100G ports, normal temperature, dual AC power modules)<br>48 x 50G + 8 x 200G:<br>177 W (100% traffic load, copper cables on 24 x 50G ports, short-distance optical modules on 4 x 200G ports, normal temperature, dual AC power modules) |

1. Purchase the CE68-RTU-U48S8CQ hardware RTU to upgrade the port specification to 48 x 50GE + 8 x 200GE.

# Ordering Information

| Device | Description |
|---|---|
| **CE6885-SAN-56F** | CE6885-SAN-56F switch (48*25GE SFP28, 8*100GE QSFP28, Without Fan and Power Modules) |
| **CE6885-SAN-56F-B** | CE6885-SAN-56F switch (48*25GE SFP28, 8*100GE QSFP28, 2*AC Power Modules, 5*Fans, Port-side Intake) |
| **CE6885-SAN-56F-F** | CE6885-SAN-56F switch (48*25GE SFP28, 8*100GE QSFP28, 2*AC Power Modules, 5*Fans, Port-side Exhaust) |
| **Fan module** | |
| **Model** | **Description** |
| **FAN-031A-F** | Fan box (F,FAN panel side intake) |
| **FAN-031A-B** | Fan box (B,FAN panel side exhaust) |
| **FAN-031B-F** | Fan box (F,FAN panel side intake), supporting the electronic label function |
| **FAN-031B-B** | Fan box (B,FAN panel side exhaust), supporting the electronic label function |
| **Power module** | |
| **Model** | **Description** |
| **PAC600S12-PF** | 600W AC Power Module (Front to Back, Power panel side intake) |
| **PAC600S12-PB** | 600W AC Power Module (Back to Front, Power panel side exhaust) |
| **PDC1K2S12-PB** | 1200W DC Power Module (Front to Back, Power panel side intake) |
| **PDC1K2S12-CE** | 1200W DC Power Module (Back to Front, Power panel side exhaust) |
| **Hardware RTU** | |
| **CE68-RTU-U48S8CQ** | Downlink ports: 48 x 25GE upgraded to 48 x 50GE<br>Uplink ports: 8 x 100GE upgraded to 8 x 200GE |
| **Software** | |
| **N1-CE68LIC-NOF-BASE** | N1-CE6800 switch AI Fabric NOF+ storage scenario foundation package |
| **N1-CE68LIC-NOF-SENIOR** | N1-CE6800 switch AI Fabric NOF+ storage scenario advanced package |

# Networking and Applications

## Typical Application in an All-Flash Storage Network of a DC

On an all-flash storage network of a DC, the CloudEngine 16800-X and CloudEngine 8850-SAN can function as the core spine switches of the network, and the CloudEngine 6885-SAN-56F as the leaf switches. Leaf and spine switches are fully meshed through 100GE/400GE ports. Features such as Intelligent Lossless NVMe Over Fabrics (iNOF), Artificial Intelligence Explicit Congestion Notification (AI ECN), Priority-based Flow Control (PFC), and PFC deadlock detection are deployed to implement plug-and-play of storage systems and automatic provisioning of computing and storage services in seconds based on the network plan. All of this helps to build a network environment with zero packet loss, low latency, and high throughput for RoCEv2 traffic, meeting the high performance requirements of RoCEv2 applications.



## More Information

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- Global service hotline: https://e.huawei.com/en/about/service-hotline
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