Lenovo X8-4 and X8-8 Gen 8 Fibre Channel Directors
Product Guide

The Lenovo X8 Directors are a modular platform designed for large-scale storage environments, providing a stable, scalable, and high-performance storage networking foundation. It supports growth, workload consolidation, and reliable operations, making it ideal for mission-critical and enterprise AI workloads.

With up to 384 × 128G ports, the X8-8 Director offers exceptional bandwidth and throughput, crucial for supporting a growing number of devices, applications, and workloads without compromising performance. Its high bandwidth and ultra-low latency eliminate I/O bottlenecks, maximizing performance for high-transaction workloads and next-generation storage. This performance headroom allows organizations to consolidate workloads onto fewer systems. To further maximize utilization, up to 128 UltraScale ICL links allow the director to scale efficiently with fewer chassis by preserving device ports for device connectivity. The X8 Director also provides flexible deployment options, multiprotocol support, and mixed-blade capability, allowing organizations to adapt their infrastructure to optimize resources and meet evolving storage and server requirements.

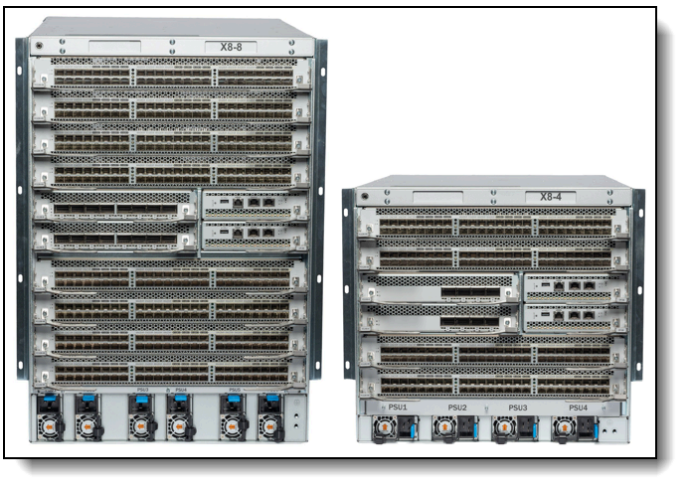

Figure 1. Lenovo Gen 8 Director X8-8 (left) and X8-4 (right)

Did you know?

The Lenovo X8 Directors boasts a cyber-resilient, quantum-safe architecture, protecting SAN data and applications from quantum computing and cybersecurity threats. Lenovo and Brocade secure storage traffic with Fibre Channel isolation and role-based access controls, preventing unauthorized access. The switch uses hardened Fabric OS and hardware, validating hardware and software roots of trust to ensure only authenticated components operate, reducing the risk of hijacking and malicious software installation.

Key features

The X8 Directors lay the foundation for the autonomous SAN. With autonomous SAN technology, the director harnesses the power of analytics and the simplicity of automation to optimize performance, ensure reliability, and simplify management. Leveraging these capabilities enables organizations to realize a self-learning, self-optimizing, and self-healing SAN.

The X8 Directors offer the following features and benefits:

- Scale more devices, applications, and workloads with up to 384 x 128G ports per chassis
- Maximize VM and application density with industry-leading 128G bandwidth for unmatched efficiency and utilization
- Enable faster response time and enhance user experience of enterprise AI and critical workloads with unmatched low latency
- Scale out efficiently using fewer chassis with up to 128 UltraScale ICL links, without sacrificing device ports
- Protect critical information from quantum computing and cybersecurity threats with advanced cryptographic algorithms, enhanced access controls, and integrated security
- Eliminate time-consuming, manual correlation of all application resources
- Learn and adapt to changing application demands by dynamic load balancing across virtual channels
- Simplify complex telemetry into actionable insights to improve performance, reduce downtime, and simplify operations
- Automatically monitor fabric behavior, detect anomalies, and self-correct before issues impact performance
- Design flexible architectures to increase agility with concurrent Fibre Channel, NVMe, or FICON storage connectivity

Additionally benefits of the X8 Directors are:

As workloads become more demanding and cyber threats more sophisticated, fortifying the storage network against hidden risks is essential. The network must deliver optimal performance, operate autonomously, streamline management, and protect critical data.

The X8 Directors, featuring Brocade Gen 8 technology, combines 128G performance, quantum-safe security, and AI-powered autonomy, creating a robust foundation for modern data center architectures. Integrated quantum-resistant encryption safeguards SAN fabrics against cybersecurity threats in the era of quantum computing. Embedded SAN AI technology modernizes SAN management, enabling autonomous and efficient SAN operations.

By hardening the SAN against evolving security risks and enabling AI-powered autonomy to learn, adapt, and respond, Brocade Gen 8 delivers the most secure, intelligent, and high-performance network for storage. This leads to faster decision-making, improved operational efficiency, and high levels of resiliency.

Engineered to meet continuous data growth and demanding application requirements, the X8 Director's modular design provides the capacity, throughput, and resiliency needed for all-flash and NVMe workloads in large-scale Fibre Channel storage environments, while enabling flexible, scalable SAN architectures.

The X8 Directors safeguard SAN fabrics with quantum-resistant 256-bit encryption and advanced cryptographic algorithms. Its Post-Quantum Cryptography (PQC) algorithms resist quantum attacks, protecting sensitive data from future quantum computers. Brocade Gen 8 also hardens the SAN hardware and software, minimizing attack surfaces with strong access controls and limited privileges using the principle of least privilege. This architecture grants minimal necessary access, strengthening security and reducing vulnerabilities.

Brocade SANnav Management Portal enhances security by capturing MAPS alerts for real-time monitoring of

SAN security configuration, fabric health, and performance. It automates security assessments and maintains best practices, alerting on inconsistencies.

Brocade Gen 8 technology maximizes network uptime, simplifies SAN management, and provides unprecedented visibility and insight. The X8 Director, with embedded SAN AI, automates application infrastructure management and offers a robust analytics architecture, reducing manual administration. This ensures a resilient network that remains stable and efficient as workloads and infrastructure complexity grow. Brocade Gen 8 modernizes SAN management with AI-powered autonomy developed over three decades.

The Brocade SAN Fabric Intelligence (SAN FI) feature eliminates manual correlation of application resources by combining monitoring, troubleshooting, and cross-correlation of servers, storage, VMs, and fabric connections. This provides end-to-end visibility for all connected devices and components, accelerating troubleshooting and driving smarter management decisions. This automation aids understaffed IT teams, providing faster response times than humans.

Gen 8 self-optimizing capabilities use actionable intelligence to maximize performance. Real-time monitoring enables smarter decisions on traffic prioritization, congestion management, and notification, ensuring optimal network performance. Brocade Adaptive Traffic Optimizer guarantees critical application performance by automatically prioritizing traffic. It dynamically adapts to traffic changes, classifying and separating traffic with similar characteristics and isolating adversely impacting flows to avoid application performance issues.

Gen 8 leverages extensive data collection and powerful analytics to understand environment health and performance, identifying potential impacts or trending problems. Built-in intelligence collates millions of data points into actionable insights, improving performance, reducing downtime, and simplifying operations. Autonomous SAN features monitor fabric behavior, detect anomalies, and self-correct before performance is impacted.

Components and connectors

The X8-4 Director is a 9U rack mount chassis that is built for midsize networks. It has four horizontal blade slots to provide up to 192 ports for device connectivity. The optional X8-4 UltraScale ICL blades provide the equivalent to 64 x Gen 8 ports for chassis-to-chassis interconnect.

The X8-8 Director is a 14U rack mount chassis that is built for large enterprise networks. It has eight horizontal blade slots to provide up to 384 ports for device connectivity. The optional X8-8 UltraScale ICL blades provide the equivalent to 128 x Gen 8 ports for chassis-to-chassis interconnect.

In this section:

X8-4 Chassis

The following figure shows the port-side view of the X8-4 FC SAN Director.

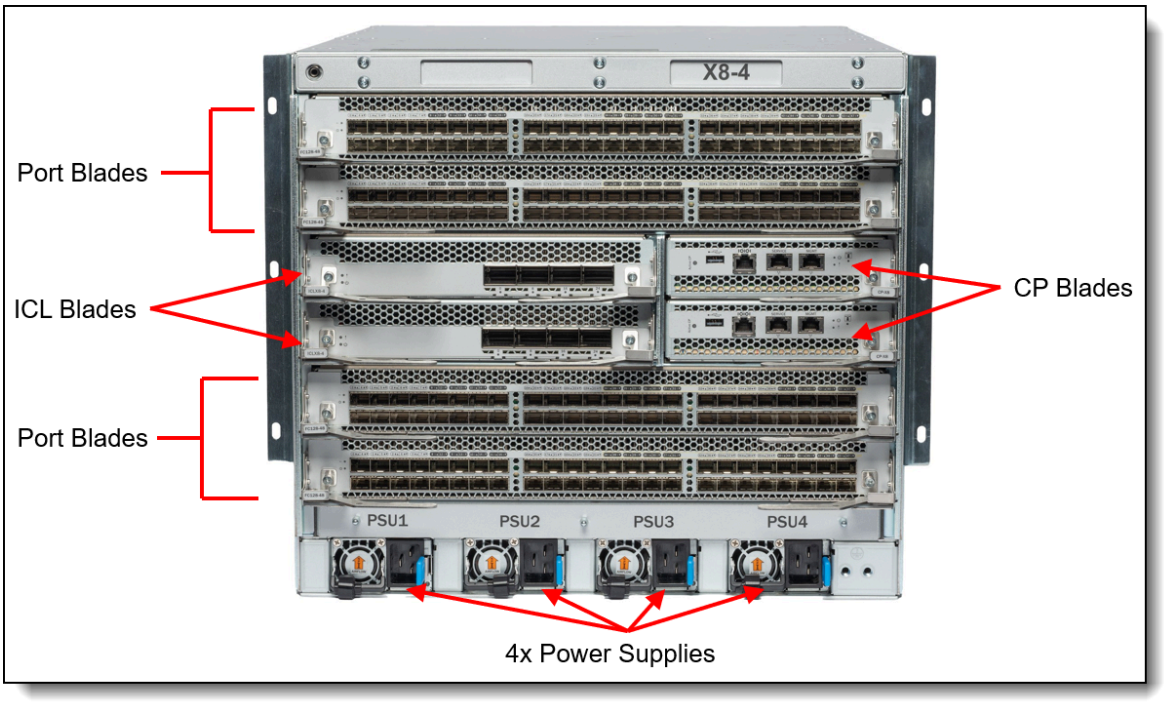

Figure 2. X8-4 FC SAN Director port-side view

The port side of the X8-4 chassis has the following components:

- Four blade slots within the X8-4 chassis can be populated with optional port blades. The chassis comes without port blades, see Blades for ordering information.
- Two redundant hot-swap active/standby Control Processor blades (CP blades come with the chassis). The Control Processor (CP) blade operates the control plane for the director, hosts the Fabric OS (FOS) that manages all Director hardware, and provides the following external connections for device configuration, firmware downloads, service, management, and monitoring functions:USB port for firmware downloads and technical support data
    - Serial console RJ-45 port
    - 10/100/1000 Mb Ethernet RJ-45 port for device management and configuration
    - 10/100/1000 Mb Ethernet RJ-45 port for service
    - 10 Gb Ethernet RJ-45 port (reserved for future use)
    - **Note:** The two 10/100/1000 Mb Ethernet ports are configured in an active/standby pair.
- Two Core routing blades (CR128-4) come standard and allow switching between the port blades. They are installed on the non-port side of the chassis, behind the fans. Core routing blades contain ASICs that allow switching up to four port blades. Core routing blades connect to port blades through Fibre Channel ports through a high-speed connector. Each core routing blade provides 96 Gen 8 FC ports for the port blade connection.
- Two optional ICL (Inter-Chassis Links) Blades are available and provide chassis-to-chassis connections without using devices ports. ICL slots to ship from factory with filler panels installed.
- Four modular, hot-swappable 3000W AC power supplies (100–240 VAC autosensing), 2+2 or N+N redundancy. Choice of airflow Non-Port side Intake (NPI) or Non-Port side Exhaust (NPE):
    - AC power supply model supporting NPI provides up to 3000W (100–240 VAC). This assembly has one fan that moves the air from the port-side to the port side of the device.
    - AC power supply model supporting NPE provides up to 3000W (100–240 VAC). This assembly has one fan that moves the air from the port side to the non-port side of the device.

The following figure shows the non-port side view of the X8-4 FC SAN Director.

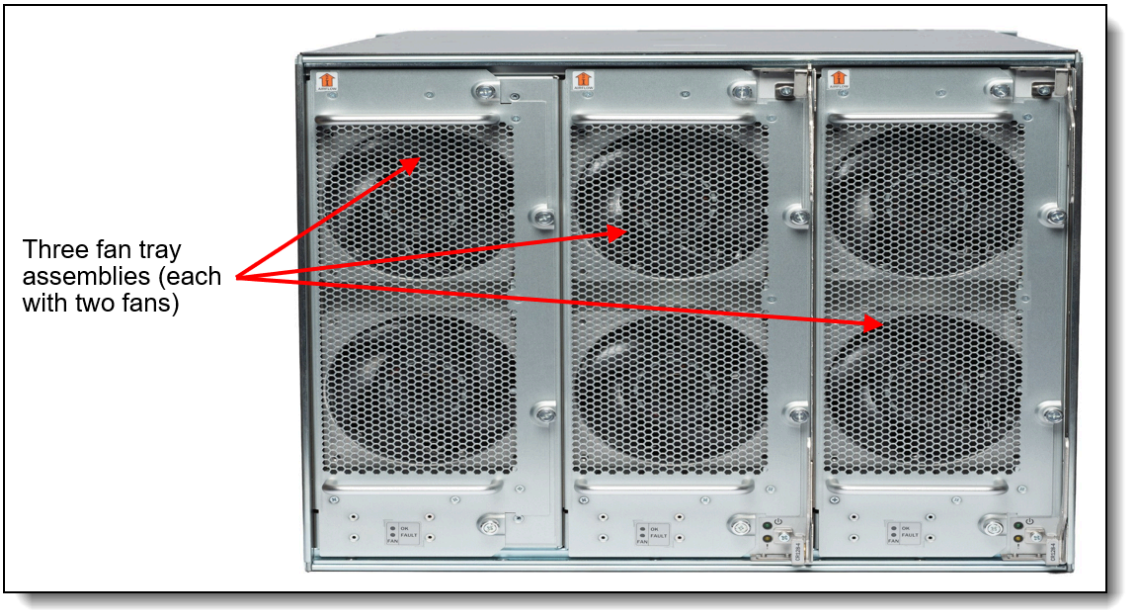

Figure 3. X8-4 FC SAN Director non-port side view with 3 Fan assemblies

The non-port side of the X8-4 chassis requires three hot-swappable rear-mounted Fan Assemblies for 2+1 redundancy, which must be ordered together with the chassis. Each fan assembly contains two fans for a total of six fans for three installed fan assemblies. One fan assembly can be hot swapped at a time. Customers have the choice of airflow NPI or NPE but they must match the power supplies selected.

- Non-port side air intake (NPI) moves the air from the non-port side to the port side of the device.
- Non-port side air exhaust (NPE) moves the air from the port side to the non-port side of the device. More common in Telco deployments.

X8-8 Chassis

The following figure shows the port-side view of the X8-8 FC SAN Director.

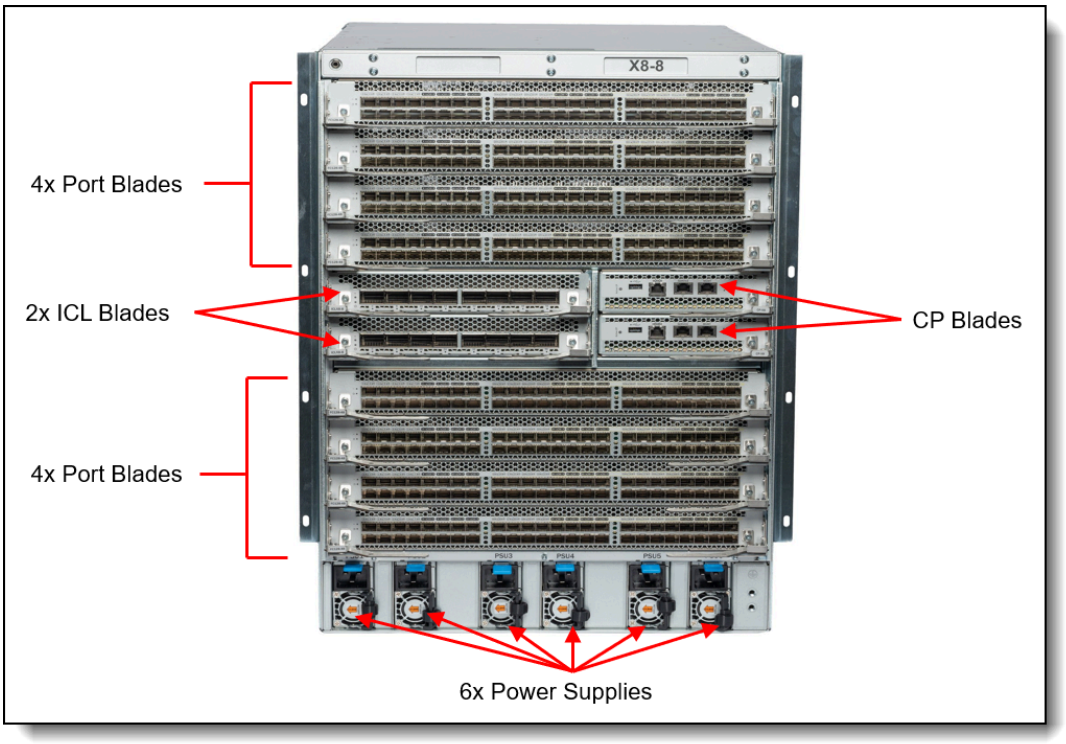

Figure 4. X8-8 FC SAN Director port-side view

The port side of the X8-8 chassis has the following components:

- Eight blade slots within the X8-8 chassis can be populated with optional port or extension blades. The chassis comes without port blades or extension blades, see Blades for ordering information.
- Two redundant hot-swap active/standby Control Processor blades (CP blades come with the chassis) A Control Processor (CP) blade contains the control plane for the device and hosts the Fabric OS that manages all hardware within the device, and it provides the following external connections for device configuration, firmware downloads, service, management, and monitoring functions:
    - USB port for firmware download and technical support data
    - Serial console RJ-45 port
    - 10/100/1000 Mb Ethernet RJ-45 port for device management and configuration
    - 10/100/1000 Mb Ethernet RJ-45 port for service
    - 10 Gb Ethernet RJ-45 port (reserved for future use)
    - **Note**: The two 10/100/1000 Mb Ethernet ports are configured in an active/standby pair.
- Two Core routing blades (CR128-8) come standard and allow switching between the port blades. They are installed on the non-port side of the chassis, behind the fans. Core routing blades contain ASICs that allow switching up to eight port blades. Core routing blades connect to port blades through Fibre Channel ports through a high-speed connector. Each core routing blade provides 192 Gen 8 FC ports for the port blade connection.
- Two Optional ICL (Inter-Chassis Links) Blades are available and provide chassis-to-chassis connections without using devices ports. ICL slots to ship from factory with filler panels installed.
- Six modular, hot-swappable 3000W AC power supplies (100–240 VAC autosensing), 3+3 or N+N redundancy. Choice of airflow NPI or NPE.
    - AC power supply model supporting NPI provides up to 3000W (100–240 VAC). This assembly has one fan that moves the air from the port-side to the port side of the device.

- AC power supply model supporting NPE provides up to 3000W (100–240 VAC). This assembly has one fan that moves the air from the port side to the non-port side of the device.

The following figure shows the non-port side view of the X8-8 FC SAN Director.

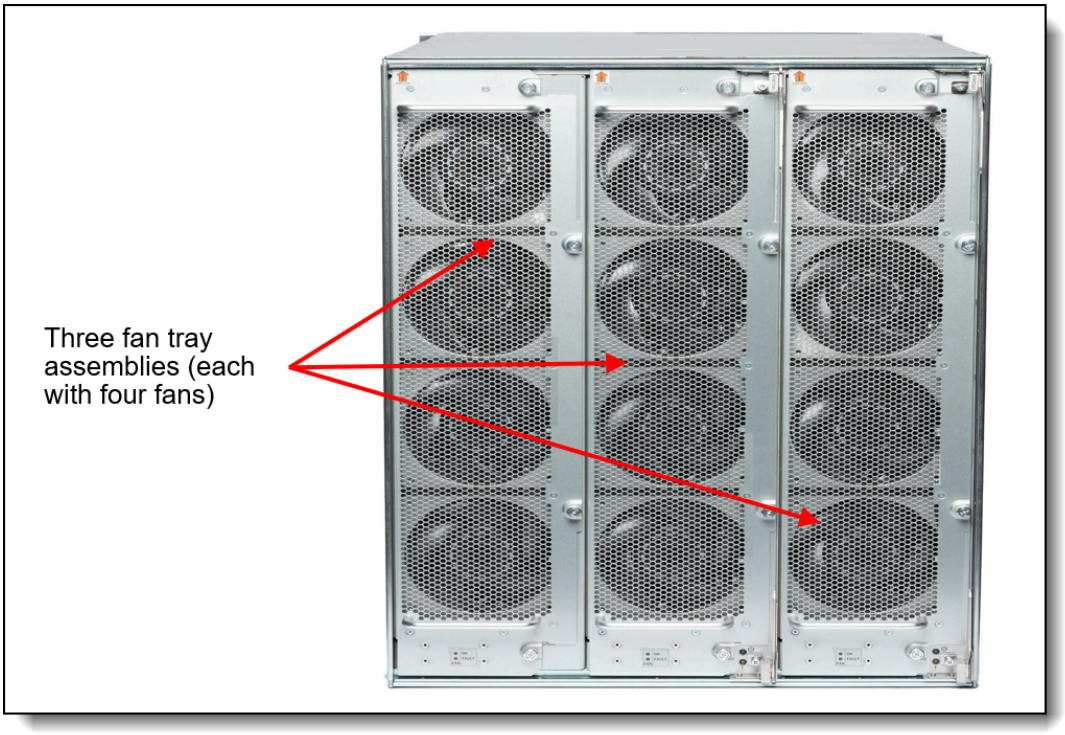

Figure 5. X8-8 FC SAN Director non-port side view

The non-port side of the X8-8 chassis requires three hot-swappable rear-mounted Fan Assemblies for 2+1 redundancy, which must be ordered together with the chassis. Each assembly contains four fans for a total of 12. One fan assembly can be hot swapped at a time. Customers have the choice of airflow NPI or NPE but they must match the power supplies selected.

- Non-port side air intake (NPI) moves the air from the non-port side to the port side of the device.
- Non-port side air exhaust (NPE) moves the air from the port side to the non-port side of the device. More common in Telco deployments.

Port Blades Blades

The following figure shows the Gen 8 FC128-48 port blade.

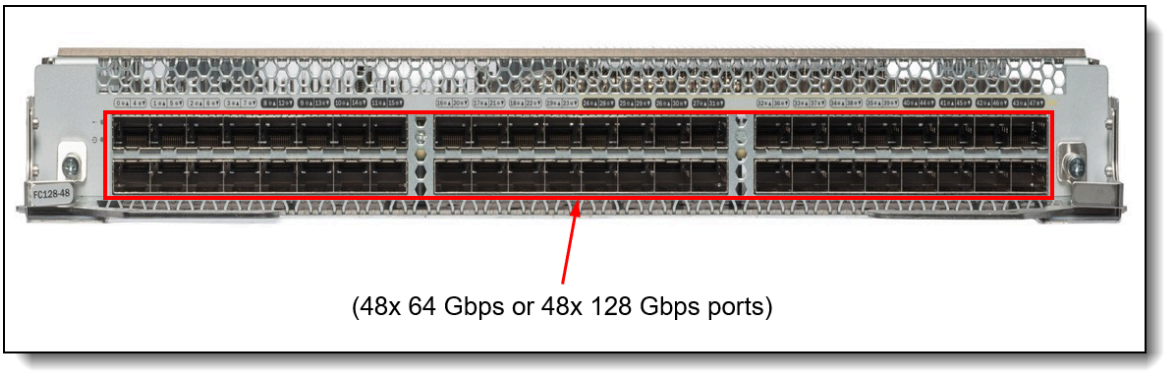

Figure 6. Gen 8 FC128-48 port blade

There are multiple 48-port blades offerings. These blades contain 48 ports capable of Fibre Channel speeds up to 128 Gbps depending on model and support up to 192 128Gbps external ports in a single X8-4 chassis, and up to 384 128 Gbps external ports in a single X8-8 chassis. While most clients leverage SWL transceiver models, LWL models are available for those mainframe-connected environments or those needing connectivity over longer distances.

- The Gen 8 FC128-48 Fibre Channel port blade provides 48 x 64G or 48 x 128G Fibre Channel ports with backward-compatibility support for 16, 32, and 64G Fibre Channel connectivity using the 64G SFP+.

System specifications

The following table lists the X8-4 and X8-8 FC SAN Director system specifications.

Note: The supported hardware options and firmware features listed in this product guide are based on the Fabric OS version 10.X.

Table 1. Specifications

Component	Specification
System Architecture	
Chassis	**X8-8:** Non-blocking architecture • X8-8 Director with 8 128G 48-port blades: 62Tb/s of aggregate chassis bandwidth (384 device ports with a 128G data rate plus 16 UltraScale ICL ports with 8 x Gen 8) **X8-4:** Non-blocking architecture • X8-4 Director with 4 128G 48-port blades: 31Tb/s of aggregate chassis bandwidth (192 device ports with a 128G data rate plus 8 UltraScale ICL ports with 8 x Gen 8) Each provides support for (E, F, D, M, SIM, and EX) Fibre Channel ports using Fibre Channel blades
Control processor	Redundant (active/standby) control processor blades.
Scalability	Full-fabric architecture of 239 switches.
Certified maximum	6000 active devices per switch; 56 switches, 19 hops in Brocade Fabric OS® (FOS) fabrics; larger fabrics certified as required.
Port blades	**FC128-48 port blade** provides 48 ports of 64Gb/s Fibre Channel. • Fibre Channel: 112.2Gbps line speed, full duplex; 57.8Gbps line speed, full duplex; 28.05Gbps line speed, full duplex; 14.025Gbps line speed, full duplex; autosensing of 128, 64, 32, and 16G port speeds depending on SFPs used. • Autosensing of 16, 32, 64 and 128Gbps port speeds depending on SFPs used.
ISL Trunking	Frame-based trunking with up to eight 128G SFP+ ports per ISL trunk; up to 1024Gbps per ISL trunk between switches using 128, 64, 32, or 16G ports; Exchange-based load balancing across ISLs with DPS included in Brocade FOS.
UltraScale ICL Trunking	For chassis-to-chassis links on the inter-chassis link (ICL) blade to form a trunk: • Trunks are formed from individual FC ports within different OSFP ports residing in the same trunk group indicated by the color borders under the ports on the blade faceplate. • A minimum of within a port trunk group on the ICL blades that are installed in one device must be connected to a pair of OSFPs within a trunk group on the ICL blades in another device. This will result in 8 trunks of 2 ports each. • Additional OSFP connections should be added in pairs, with each additional pair residing within the same trunk boundary. Best practice is to deploy across both ICL blades on each chassis to achieve ICL blade redundancy.
Multi-chassis with UltraScale ICL ports	Up to 4608 Fibre Channel ports; UltraScale ICL ports (16 ports per 8-slot chassis or 8 ports per 4-slot chassis, optical OSFP) connect up to 9 chassis in a full-mesh topology or up to 12 chassis in a core-edge topology.
Slot bandwidth	6144Gbps providing line-rate performance for the FC128-48 blade.
Maximum frame size	2112-byte payload.

Component	Specification
Frame buffers	40,000 per ASIC.
Fibre Channel port types	• **FC128-48**: F_Port, E_Port, EX_Port, M_Port, SIM, and D_Port. • **ICLX8-8 and ICLX8-4 CR Blades**: E_Port, EX_Port, and D_Port. Self-discovery is based on switch type (U_Port) with an optional port type control.
Data traffic types	Fabric switches supporting unicast.

Media types	• **FC128-48 port blade:**
	  ◦ 128G FC SFP+: SWL (LC Connector)
	  ◦ 64G FC SFP+: SWL, LWL, ELWL (LC Connector)
	• **Inter-Chassis Links (ICL) blades:**
	  ◦ Gen 8 FC OSFP MMF, OSFP connector: SWL 100m (MPO-16 connector)
	  ◦ Gen 8 FC OSFP SMF, LCx2 connector: LWL 2 km (LC x 2 connector)
	All Brocade transceivers are PC/UPC compatible.

USB	One USB port per control processor for firmware download, SupportSave, and configuration upload or download.
Fabric services	BB Credit Recovery; Brocade Advanced Zoning (Default Zoning, Port/WWN Zoning, Peer Zoning); Congestion Signaling; Dynamic Path Selection (DPS); Extended Fabrics; Fabric Performance Impact Notification (FPIN); Fabric Vision; FDMI; FICON CUP; Flow Vision; F_Port Trunking; FSPF; Integrated Routing; ISL Trunking; Management Server; Name Server; NPIV; NTP v3; Port Decommission/Fencing; QoS; Registered State Change Notification (RSCN); Target-Driven Zoning; Traffic Optimizer; Virtual Fabrics (Logical Switch, Logical Fabric); SAN Fabric Intelligence; VMID+ and AppServer.
Long Distance	Fibre Channel, in-flight compression (Brocade LZO) and encryption (AES-GCM-256 encryption on FC ISLs [E_Port]); support for DWDM MAN connectivity.
System Components	
Classes of service	Class 2, Class 3, Class F (inter-switch frames).
ANSI Fibre Channel protocol	Fibre Channel Physical and Signaling Interface standard (FC-PH).
Port-to-port latency	• Local switching: 580 ns at 128G with dual forward error correction (FEC). • Blade-to-blade: 1.74 µs.
High Availability	
Architecture	Nonblocking shared memory; passive backplane; redundant active/passive control processor; redundant active/active core switching blades; single chassis ID (CID) card with built in redundancy. Card is not field replaceable.

Component	Specification
Chassis power	**X8-8:** • All six 3000W power supplies are required to support N+N redundancy • Chassis ships with Core Processing (CP) and Core Routing (CR) blades only • Offers optional airflow directions: nonport-side intake (NPI) or nonport-side exhaust (NPE) • PSU and fan assemblies with matching airflow direction must be ordered separately **X8-4:** • All four 3000W power supplies are required to support N+N redundancy • Chassis ships with Core Processing (CP) and Core Routing (CR) blades only • Offers optional airflow directions: nonport-side intake NPI or nonport-side exhaust NPE • PSU and fans with matching airflow direction must be ordered separately
Cooling	**X8-8:** • Requires 3 fan tray assemblies for a 2+1 redundancy. A failure condition is 1 failed fan from any fan tray. • Each assembly contains 4 fans for a total of 12 fans. The system requires 11 of 12 functioning fans for operation in the X8-8. One fan tray assembly can be hot-swapped and should be replaced immediately in the event of a failure. **X8-4:** • Requires 3 fan tray assemblies for a 2+1 redundancy. A failure condition is 1 failed fan from any fan tray. • Each assembly contains 2 fans for a total of 6 fans. The system requires 5 of 6 functioning fans for operation in the X8-4. One fan assembly can be hot-swapped and should be replaced immediately in the event of a failure.
Solution availability	Designed to provide 99.999% uptime with nondisruptive capabilities, hot-pluggable components and a no-single-point-of-failure design. • Includes redundant: power supplies, fans, CID cards, processors, core switching, ICL blades, port blades, and optics. • Includes online diagnostics and nondisruptive firmware download and activation
Management	
Management	Brocade Web Tools; Brocade SANnav Management Portal and SANnav Global View; command-line interface (CLI); HTTPS; RESTful API; SSH; SNMPv3 (FE MIB, FC Management MIB); trial licenses for add-on capabilities.
Security	AES-GCM-256 encryption on FC ISLs (E_Port); Device Connection Control (DCC); DH-CHAP (between switches and end devices); Fabric Configuration Server (FCS); Federated Authentication; FCAP switch authentication; FIPS 140-3 compliant; HTTPS; IP filtering; OpenLDAP; port binding; principle of least privilege architecture; user-defined role-based access control (RBAC); Secure Boot; Secure Copy (SCP); Secure Syslog; SFTP; SSH v2; Switch Binding; TLS v1.3; PQC algorithms; Trusted FOS Certificates (TruFOS); USGv6 compliant.
Management access	1/10Gbps Ethernet (RJ-45) per control processor; serial console port (RJ-45) and one USB per control processor module; DHCP/DHCPv6; call-home integration enabled through Brocade SANnav Management Portal.

Component	Specification
Diagnostics	Active Support Connectivity (ASC) and Brocade Support Link (BSL); built-in flow generator; ClearLink optics and cable diagnostics, including link traffic/latency/distance; Fabric Performance Impact Monitoring (FPI); flow mirroring; dual forward error correction (FEC); frame viewer; IO Insight for SCSI and NVMe monitoring; Monitoring and Alerting Policy Suite (MAPS); nondisruptive daemon restart; optics health monitoring; POST and embedded online/offline diagnostics, including environmental monitoring, FCping, and Pathinfo (FC traceroute); power monitoring; RAStrace logging; Rolling Reboot Detection (RRD); SAN Fabric Intelligence (SAN FI); Syslog/Audit Log; VM Insight.
Warranty & Support	
Hardware warranty & SW entitlement	Three-year customer-replaceable unit limited warranty with 9x5 next business day parts delivered. Also, entitlement to access latest FOS software
Service and support	Optional service upgrades are available through Lenovo Services: 9x5 next business day onsite response, 24x7 2-hour or 4-hour onsite response, 24x7 6-hour or 24-hour committed service repair, up to 5 years of warranty coverage, and 1-year or 2-year post-warranty extensions.

Models

he following table lists the X8-4 and X8-8 FC SAN Director Models.

Table 2. Models

Part number	Description
7DMBCTO1WW	Lenovo ThinkSystem X8-4 FC Director, 4 Blade Slots, rail kit, 9U, 3-year Warranty/entitlement
7DMBCTO2WW	Lenovo ThinkSystem X8-8 FC Director, 8 Blade slots, rail kit, 14U, 3-year Warranty/entitlement

The X8-4 and X8-8 Gen 8 FC SAN Director part numbers include the following items:

- One Director chassis that contains the following components:
  - Two Control Processing (CP) blades
  - Two Core Routing (CR) blades Internally Mounted
- Enterprise Bundle & Integrated Routing SW license installed
- Ground lug kit
- Wrist strap
- 4-post adjustable (27"-31") rack mount Kit
- X8-4 or X8-8 specific vertical cable management comb

Configuration notes:

- Models come standard with **CR blades**, however in order to leverage the ICLs, optional ICL blades are required. See the Inter-Chassis Links section for details.
- Models do not include **port blades** and will need to be ordered for the Director model. See the Blades section for details.
- Models do not include **fan modules** or **power supplies** and must be ordered together with the Director model. See Cooling and Power supplies and cables for details.
- Models do not include **power cords** and must be ordered together with the director model. See Power supplies and cables for details.

Port-Blades

The X8-4 and X8-8 FC SAN Directors support the port blade options that are listed in the following table.

Blades can be mixed, but the maximum is four for the X8-4 and eight for the X8-8.

Table 3. Port blades

Part number	Feature code	Description
Port Blades		
4C57B07468	CBUQ	Brocade Gen 8 Port Blade FC128-48, 48x 64Gb SFP+ SWL transceivers
4C57B07469	CBUP	Brocade Gen 8 Port Blade FC128-48, 48x 128Gb SFP+ SWL transceivers
4C57B07470	CBUN	Brocade Gen 8 Port Blade FC128-48, 48x 64Gb SFP+ LWL transceivers

Port blades come standard with all ports activated. They also include a specific number and type of transceivers, as indicated in the description of each part number. Additional transceivers and cables can be ordered. See Transceivers and cables for details.

Inter-Chassis Links (ICL) Blades

ICL blades are optional for the X8 Directors. These blades allow organizations to seamlessly scale out their storage environments. Brocade UltraScale chassis connectivity leverages optical inter-chassis links (ICLs). These links can connect up to 12 Brocade Gen 7 or Gen 8 directors, enabling flatter, faster, and simpler fabrics that increase consolidation while reducing network complexity and costs.

UltraScale ICLs use Octal Small Form-factor Pluggable (OSFP) media and enable scalable core-edge and active-active full mesh chassis topologies. These high-density chassis topologies reduce Interswitch cabling by 87.5%. UltraScale ICL connections reside on the core routing blades instead of consuming ports on the port blades, enabling up to 33% more device ports for server and storage connectivity. This maximizes overall port density within the smallest amount of rack space while freeing up front-facing device ports for server and storage connectivity.

ICL blades are sold in pairs and include transceivers that populate half of the ports. ICL upgrade kits are available for those wanting more ports (4 OSP transceivers are included, no POD licenses are required for any ports for simpler deployment). Clients have a choice of 100M or 2KM.

The following table lists ordering information for the optional blades and upgrades for the X8-4 and X8-8 Directors.

Blades can be mixed, but the maximum is four for the X8-4 and eight for the X8-8.

Table 4. Optional ICL blades are sold in pairs for X8-4 and X8-8 Directors

Part number	**Feature code**	**X8-8 Options Description (Pairs)**	**100M Upgrade (Max) 4TC7B07519**	**2KM Upgrade (Max) 4TC7B07520**
4C57B07489	CBUC	X8-8 ICL Blade with 8x Gen 8 100m OSFP Transceivers	2 (Mix allowed)	
4C57B07518	CBUB	X8-8 ICL Blade with 8x Gen 8 2km OSFP Transceivers	2 (Mix allowed)	
Part number	**Feature code**	**X8-4 Options Description**	**100M Upgrade (Max) 4TC7B07519**	**2KM Upgrade (Max) 4TC7B07520**
4C57B07487	CBUE	X8-4 ICL Blade with 4x Gen 8 100m OSFP Transceivers	1 (Mix allowed)	
4C57B07488	CBUD	X8-4 ICL Blade with 4x Gen 8 2km OSFP Transceivers	1 (Mix allowed)	

Transceivers and cables

In this section:

Connectivity choices

With the flexibility of the X8-4 and X8-8 Directors, customers can choose the following connectivity technologies:

- SFP+ ports on the FC128-48-port blades
    - For 128 Gbps FC links, customers can use 128 Gbps FC SFP+ SWL optical transceivers for distances up to 100 meters on OM4/OM5 or up to 70 meters on OM3 50 µ multimode fiber (MMF) optic cables.
    - For 64 Gbps FC links, customers can use 128 Gbps or 64 Gbps FC SFP+ SWL optical transceivers for distances up to 100 meters on OM4/OM5 or up to 70 meters on OM3 50 µ multimode fiber (MMF) optic cables. For longer distances, the 64 Gbps FC LW SFP+ optical transceivers can support up to 10 kilometers on 9 µ single-mode fiber (SMF) optic cables. For extended distances, the 64 Gbps FC ELW SFP+ optical transceivers can support up to 25 kilometers on 9 µ SMF cables.
    - For 32 Gbps FC links, customers can use 128 Gbps or 64 Gbps FC SFP+ SW optical transceivers for distances up to 100 meters on OM4 or up to 70 meters on OM3 50 µ multimode fiber (MMF) optic cables. For longer distances, the 32 Gbps FC LW SFP+ optical transceivers can support up to 10 kilometers on 9 µ single-mode fiber (SMF) optic cables. For extended distances, the 32 Gbps FC ELW SFP+ optical transceivers can support up to 25 kilometers on 9 µ SMF cables.
    - For 16 Gbps FC links (Must use 64 Gbps transceivers), customers can use 64 Gbps FC SFP+ SW optical transceivers for distances up to 125 meters on OM4 or up to 100 meters on OM3 50 µ MMF cables. For longer distances, the 16 Gbps FC LW SFP+ optical transceivers can support up to 10 kilometers on 9 µ SMF cables. For extended distances, the 16 Gbps FC ELW SFP+ optical transceivers can support up to 25 kilometers on 9 µ SMF cables.
- OSFP ports on the Inter-Chassis Links (ICL) blades:
    - For Gen 8 ICL OSFP customers can use OSFP optical transceivers for distances up to 100 meters on OM4 or up to 70 meters on OM3 50 µ MMF cables. For longer distances, we can support up to 2 kilometers on 9 µ SMF cables.
- 1 GbE RJ-45 management ports on control processor blades: Customers can use UTP cables for distances up to 100 meters.

All port-blades come standard with transceivers that you see reflected in the descriptions. The optional ICL blades include four or two Gen 8 FC OSFP transceivers each. Additional or different Fibre Channel transceivers can be ordered, if required.

Transceivers

The following table lists the supported transceiver options and optical cables.

Brocade secure transceivers: These transceivers have features to ensure that you are using genuine Brocade components to maximize performance and reliability and to help avoid issues related to counterfeit products.

Table 5. Supported transceivers

Part number	Feature code	Description	Blade support (Y=supported)		
			FC128-48	X8-8 ICL	X8-4 ICL
128 Gbps FC SFP+ transceivers (LC Connectors)					
4TC7B07569	CBUS	Brocade Secure 128Gb SWL SFP+ Transceiver	Y	N	N
4TC7B07570	CBUR	Brocade Secure 128Gb SWL SFP+ Transceiver 8-pack	Y	N	N
64 Gbps FC SFP+ transceivers (LC Connectors)					
4M27A65425	BF6J	Brocade Secure 64-Gb SWL SFP+ Transceiver	Y	N	N
4M27A65426	BF6K	Brocade Secure 64-Gb SWL SFP+ Transceiver 8-pack	Y	N	N
4M27A65433	BQQG	Brocade Secure 64Gb LWL SFP+ Transceiver (10 km)	Y	N	N
4M27A65434	BQQH	Brocade Secure 64Gb LWL SFP+ Transceiver (10 km) 8-pack	Y	N	N
4M27A65432	BQQF	Brocade Secure 64Gb ELWL SFP+ Transceiver (25 km)*	Y	N	N
Gen 8 FC OSFP transceivers					
4TC7B07523	CBU8	Gen 8 ICL 100m OSFP Transceiver	N	Y	Y
4TC7B07524	CBU7	Gen 8 ICL 2km OSFP Transceiver	N	Y	Y

* ELWL Requires same optic type/part number on both ends (no-mixing) to assure interoperability.

Cables

The following table lists the supported optical cables and Cat6 UTP cables.

Table 6. Supported Cables

Part number	Feature code	Description	Blade support (Y=supported)		
			FC128-48	X8-8 ICL	X8-4 ICL
Optical cables for OSFP Gen 8 to Gen 8 (100m Transceiver)					
4X97B11708	CD1B	Lenovo 5M MPO16-MPO16 OSFP OM4 FC ICL Cable	N	Y	Y
4X97B11709	CD1C	Lenovo 30M MPO16-MPO16 OSFP OM4 FC ICL Cable	N	Y	Y
Optical cables for OSFP Gen 8 to Gen 7 (100m Transceiver)					
4X97B11747	CD1D	Lenovo 5M MPO16-2xMPO12 OM4 Breakout FC ICL Cable	N	Y	Y
4X97B11748	CD1E	Lenovo 30M MPO16-2xMPO12 OM4 Breakout FC ICL Cable	N	Y	Y
Optical cables for OSFP Gen 8 to Gen 7 (2KM Transceiver)					
4X97B11749	CD1F	Lenovo 5M 2xLC-2xLC OSFP-QSFP FC Cable	N	Y	Y
4X97B11750	CD1G	Lenovo 30M 2xLC-2xLC OSFP-QSFP FC Cable	N	Y	Y
OM3 optical cables for 64 Gbps FC SWL, 128 Gbps FC SWL SFP+ transceivers					
00MN499	ASR5	Lenovo 0.5m LC-LC OM3 MMF Cable	Y	Y	Y
00MN502	ASR6	Lenovo 1m LC-LC OM3 MMF Cable	Y	Y	Y
00MN505	ASR7	Lenovo 3m LC-LC OM3 MMF Cable	Y	Y	Y
00MN508	ASR8	Lenovo 5m LC-LC OM3 MMF Cable	Y	Y	Y

Part number	Feature code	Description	Blade support (Y=supported)		
			FC128-48	X8-8 ICL	X8-4 ICL
00MN511	ASR9	Lenovo 10m LC-LC OM3 MMF Cable	Y	Y	Y
00MN514	ASRA	Lenovo 15m LC-LC OM3 MMF Cable	Y	Y	Y
00MN517	ASRB	Lenovo 25m LC-LC OM3 MMF Cable	Y	Y	Y
00MN520	ASRC	Lenovo 30m LC-LC OM3 MMF Cable	Y	Y	Y
OM4 optical cables for 64 Gbps FC SWL, 128 Gbps FC SWL					
4Z57A10845	B2P9	Lenovo 0.5m LC-LC OM4 MMF Cable	Y	Y	Y
4Z57A10846	B2PA	Lenovo 1m LC-LC OM4 MMF Cable	Y	Y	Y
4Z57A10847	B2PB	Lenovo 3m LC-LC OM4 MMF Cable	Y	Y	Y
4Z57A10848	B2PC	Lenovo 5m LC-LC OM4 MMF Cable	Y	Y	Y
4Z57A10849	B2PD	Lenovo 10m LC-LC OM4 MMF Cable	Y	Y	Y
4Z57A10850	B2PE	Lenovo 15m LC-LC OM4 MMF Cable	Y	Y	Y
4Z57A10851	B2PF	Lenovo 25m LC-LC OM4 MMF Cable	Y	Y	Y
4Z57A10852	B2PG	Lenovo 30m LC-LC OM4 MMF Cable	Y	Y	Y
UTP Category 6 cables (Green) for management ports					
00WE123	AVFW	0.75m CAT6 Green Cable	N	N	N
00WE127	AVFX	1.0m CAT6 Green Cable	N	N	N
00WE131	AVFY	1.25m CAT6 Green Cable	N	N	N
00WE135	AVFZ	1.5m CAT6 Green Cable	N	N	N
00WE139	AVG0	3m CAT6 Green Cable	N	N	N
90Y3718	A1MT	10m CAT6 Green Cable	N	N	N
90Y3727	A1MW	25m CAT6 Green Cable	N	N	N
UTP Category 6 cables (Blue) for management ports					
40K5679	3801	0.6m Blue Cat5e Cable	N	N	N
40K8785	3802	1.5m Blue Cat5e Cable	N	N	N
40K5581	3803	3m Blue Cat5e Cable	N	N	N
40K8927	3804	10m Blue Cat5e Cable	N	N	N
40K8930	3805	25m Blue Cat5e Cable	N	N	N

Cabling requirements

The following table lists the cabling requirements for the directors.

Table 7. Cabling requirements

Transceiver	Standard	Cable	Connector
Brocade Secure Gen 8 OSFP 100m Fibre Channel Transceiver			

Transceiver	Standard	Cable	Connector
4TC7B07523	FC-PI-6	Up to 100m with MPO-MPO MMF cables or up to 5 m with MPO-4xLC MMF breakout cables supplied by Lenovo (see Cables). 850 nm 50 µ MPO-MPO MMF cable: • 32GFC: Up to 100 m (OM4) or up to 70 m (OM3). • 16GFC: Up to 125 m (OM4) or up to 100 m (OM3).	MPO-16
Brocade Secure Gen 8 OSFP 2KM Fibre Channel Transceiver			
4TC7B07524	FC-PI-6	Up to 30 m with MPO-MPO MMF cables or up to 5 m with MPO-4xLC MMF breakout cables supplied by Lenovo (see Cables). 16GFC: 850 nm 50 µ MPO-MPO MMF cable up to 100 m (OM4) or up to 66 m (OM3).	LC x 2
128 Gbps Fibre Channel SFP+ Transceiver			
SWL (4TC7B07569, 4TC7B07570)	FC-PI-6	Up to 30 m with LC-LC MMF cables supplied by Lenovo (see Cables). 850 nm 50 µ LC-LC MMF cable: • 64GFC: Up to 100 m (OM4) or up to 70 m (OM3) • 32GFC: Up to 100 m (OM4) or up to 70 m (OM3) • 16GFC: Up to 125 m (OM4) or up to 100 m (OM3)	LC
64 Gbps Fibre Channel SFP Transceiver			
SWL (4M27A65425, 4M27A65426)	FC-PI-6	Up to 30 m with LC-LC MMF cables supplied by Lenovo (see Cables). 850 nm 50 µ LC-LC MMF cable: • 64GFC: Up to 100 m (OM4) or up to 70 m (OM3) • 32GFC: Up to 100 m (OM4) or up to 70 m (OM3) • 16GFC: Up to 125 m (OM4) or up to 100 m (OM3)	LC
LWL (4M27A65433, 4M27A65434)	FC-PI-5	1310 nm 9 µ SMF cable: 64GFC, 32GFC, 16GFC: Up to 25 km.	LC
ELWL (4M27A65432)	FC-PI-5	1310 nm 9 µ SMF cable: 64GFC, 32GFC, 16GFC: Up to 25 km.	LC
Management ports			
10/100/1000 Mb Ethernet port	1000BASE-T	Up to 25 m with UTP cables supplied by Lenovo (see Table 4). UTP Category 5, 5E, or 6 up to 100 meters.	RJ-45
Serial port	RS-232	DB-9/RJ-45-to-RJ-45 console cable (comes with the director).	RJ-45

Firmware

For details on the latest features supported with the X8-4 & X8-8 FC SAN Directors, see the Administration Guide for the latest available Fabric OS version 10.0 and above:
https://www.broadcom.com/products/fibre-channel-networking/software/fabric-operating-system

Management software

Lenovo offers optional Brocade SANnav™ Management Portal and SANnav Global View software license subscriptions that provide comprehensive visibility into the SAN environment, allow administrators to quickly identify, isolate, and correct problems, and accelerate administrative tasks by simplifying and automating workflows.

SANnav Management Portal is a next-generation SAN management application with a simple browser-based user interface (UI) and with a focus on streamlining common workflows, such as configuration, zoning, deployment, monitoring, troubleshooting, reporting, and analytics.

Lenovo offers the following SANnav Management Portal subscriptions:

- SANnav Management Portal Base: Designed for mid-sized SANs to manage up to 600 SAN switch ports only (SAN director ports can only be managed with the Enterprise edition).
- SANnav Management Portal Enterprise: Designed for enterprise-class SANs to manage up to 15,000 SAN switch and director ports.

SANnav Management Portal supports all Brocade SAN switches and platforms that run the Fabric OS® version 7.4 or above, including Lenovo DB610S, DB620S, DB630S, DB400D, DB710S, DB720S, DB730S, DB820S, DB800D, Brocade Directors X7 and X8. SANNav Version 3.X to manage Gen 8 switches.

With SANnav Global View, administrators can quickly visualize the health, performance, and inventory of multiple SANnav Management Portal instances using a simple, intelligent dashboard and can easily navigate from a global view down to local environments to investigate points of interest. SANnav Global View is designed to manage up to 20 SANnav Management Portal instances.

For more information, refer to the SANnav Management Portal documentation:
http://www.broadcom.com/products/fibre-channel-networking/software/sannav-management-portal#documentation

The following table lists ordering information for the optional SANnav Management Portal and SANnav Global View management tools. After a client has an active SANnav license, Lenovo offers a “license extension/renewal”. This offering provides our clients the flexible to extend their subscription down to a specific end date. This allows clients the ability to align to your company’s budget or align with warranty of your FC SAN switches/directors. Please engage directly with your Lenovo sales representative for more details.

Table 8. SANnav Management Portal and SANnav Global View subscription licenses

Part number	Feature code	Description
SANnav Management Portal electronic authorization licenses		
7S0C0010WW	S1K6	Brocade SANnav Mgmt Portal Base Edition - 1YR License 600 ports
7S0C0013WW	S1K8	Brocade SANnav Mgmt Portal Base Edition - 3YR License 600 ports
7S0C001KWW	S4MB	Brocade SANnav Mgmt Portal Base Edition - 5YR License 600 ports
7S0C0011WW	S1K7	Brocade SANnav Mgmt Portal Enterprise Edition - 1YR License 15K ports
7S0C0014WW	S1K9	Brocade SANnav Mgmt Portal Enterprise Edition - 3YR License 15K ports
7S0C001LWW	S4MC	Brocade SANnav Mgmt Portal Enterprise Edition - 5YR License 15K ports
SANnav Global View electronic authorization licenses		
7S0C0012WW	S1D8	Brocade SANnav Global View - 1YR License
7S0C0015WW	S1D9	Brocade SANnav Global View - 3YR License
7S0C001JWW	S4MA	Brocade SANnav Global View - 5YR License

The SANnav licenses are subscription-based with 1-year, 3-year, or 5-year software entitlement and support.

Fibre Channel standards

The SAN Directors supports the standards listed at the following web page:

https://www.broadcom.com/support/fibre-channel-networking/san-standards/standards-compliance

Ethernet standards

The X8 Directors support the following Ethernet standards:

- IEEE 802.1AB Data Center Bridging Capability Exchange Protocol (DCBX)
- IEEE 802.1p Class of Service (CoS) prioritization
- IEEE 802.1Q VLAN Tagging
- IEEE 802.1Qbb Priority-Based Flow Control (PFC)
- IEEE 802.1Qaz Enhanced Transmission Selection (ETS)
- IEEE 802.3 10BASE-T Ethernet (CP management interfaces)
- IEEE 802.3u 100BASE-TX Fast Ethernet (CP management interfaces)
- IEEE 802.3z 1000BASE-SX short range fiber optics Gigabit Ethernet
- IEEE 802.3z 1000BASE-LX long range fiber optics Gigabit Ethernet
- IEEE 802.3ab 1000BASE-T copper twisted pair Gigabit Ethernet
- IEEE 802.3ae 10GBASE-SR short range fiber optics 10 Gb Ethernet
- IEEE 802.3ae 10GBASE-LR long range fiber optics 10 Gb Ethernet
- IEEE 802.3ba 40GBASE-SR4 short range fiber optics 40 Gb Ethernet
- IEEE 802.3ba 40GBASE-LR4 long range fiber optics 40 Gb Ethernet
- IEEE 802.3bm 40GBASE-ER4 extended range fiber optics 40 Gb Ethernet
- IEEE 802.3bm 100GBASE-SR4 short range fiber optics 100 Gb Ethernet
- 10GBASE-ZRD DWDM fiber optics 10 Gb Ethernet

Cooling

The X8 Directors do not include cooling modules (fan assemblies) - the THREE cooling modules must be ordered as with both the X8-4 and X8-8. Each cooling module has integrated fans. Cooling Fan assembly modules provide 2+1 fan redundancy, and the device can continue operation while one fan assembly is replaced if the fan assembly is replaced immediately.

Air flow: It is also important to remember your fan tray airflow must match your power supplies!

The following table lists the supported cooling modules.

Table 9. Cooling modules

Part number	Feature code	Description
Fan Assemblies for the X8-8 Director Chassis		
4F17B07476	CBU6	X8-8 Director Fan Assembly (Non-Port side Intake)
4F17B07477	CBUG	X8-8 Director Fan Assembly (Non-Port side Exhaust)
Fan Assemblies for the X8-4 Director Chassis		
4F17B07474	CBUK	X8-4 Director Fan Assembly (Non-Port side Intake)
4F17B07475	CBUJ	X8-4 Director Fan Assembly (Non-Port side Exhaust)

Power supplies and cables

Models of the X8 Directors do not include power supplies - the power supplies must be ordered separately.

Power supply requirements:

- X8-8: Requires Six matching PSUs be installed to provide power efficiency and 3+3 or N+N redundancy
- X8-4: Requires Four matching PSUs be installed to provide power efficiency and 2+2 redundancy

The AC power supplies hot-swappable 3000W AC power supplies (100–240 VAC autosensing) and each power supply has an IEC 320-C20 connector. Each power supply has two integrated fans that provide non-port side air intake that matches the airflow of the cooling modules.

The following table lists the supported power supplies.

Table 10. Power supplies

Part number	Feature code	Description
4P57B07472	CBUM	FC SAN Director 3000W Power Supply Unit (Non-Port side Intake)
4P57B07473	CBUL	FC SAN Director 3000W Power Supply Unit (Non-Port side Exhaust)

The X8 Directors do not include power cords by default. Power cables or line cords should be ordered for the FC SAN Directors depending on the quantity of power supplies.

The following table lists the available power cords.

Table 11. Power cord options

Part number	Feature code	Description
Rack power cables		
39Y7916	6252	2.5m, 16A/125-250V, C19 to IEC 320-C20 Rack Power Cable
Line cords		
40K9777	6276	Argentina 4.3m, 16A/250V, C19 to IRAM 2073 Line Cord
40K9775	6277	Brazil 4.3m, 16A/250V, C19 to NBR 14136 Line Cord
40K9774	6288	China 4.3m, 16A/250V, C19 to GB2099.1 Line Cord
40K9776	6285	India 4.3m, 16A/250V, C19 to IS6538 Line Cord
40K9771	6282	Israel 4.3m, 16A/250V, C19 to SI 32 Line Cord
40K9768	6281	Italy 4.3m, 16A/250V, C19 to CEI 23-16 Line Cord
41Y9232	6290	Japan 4.3m, 15A/100V, C19 to JIS C-8303 Line Cord
41Y9233	6291	Japan 4.3m, 15A/200V, C19 to JIS C-8303 Line Cord
41Y9231	6289	Korea 4.3m, 15A/250V, C19 to KSC 8305 Line Cord
40K9770	6280	South Africa 4.3m, 16A/250V, C19 to SABS 164 Line Cord
81Y2391	6549	Switzerland 4.3m, 16A/250V, C19 to SEV 1011 Line Cord
41Y9229	6286	Taiwan 4.3m, 16A/125V, C19 to CNS 10917-3 Line Cord
41Y9230	6287	Taiwan 4.3m, 16A/250V, C19 to CNS 10917-3 Line Cord
40K9767	6278	United Kingdom 4.3m, 13A/250V, C19 to BS 1363/A Line Cord
4L67A08372	B0RV	United States 4.3m, 15A/125V, C19 to NEMA 5-15P Line Cord

Part number	Feature code	Description
00D7197	A1NV	United States 4.3m, 15A/250V, C19 to NEMA 6-15P Line Cord

Rack installation

Both X8 Directors come standard with a four-post adjustable 27" to 31" rack mount kit. For clients that might require short rack depths an optional four-post adjustable 22" to 27" rack mount kit is available (Part # 4XF7B07478). No mid-mount kit offering for Gen 8 Directors.

The X8 Director rack mount kits are shown in the following figure.

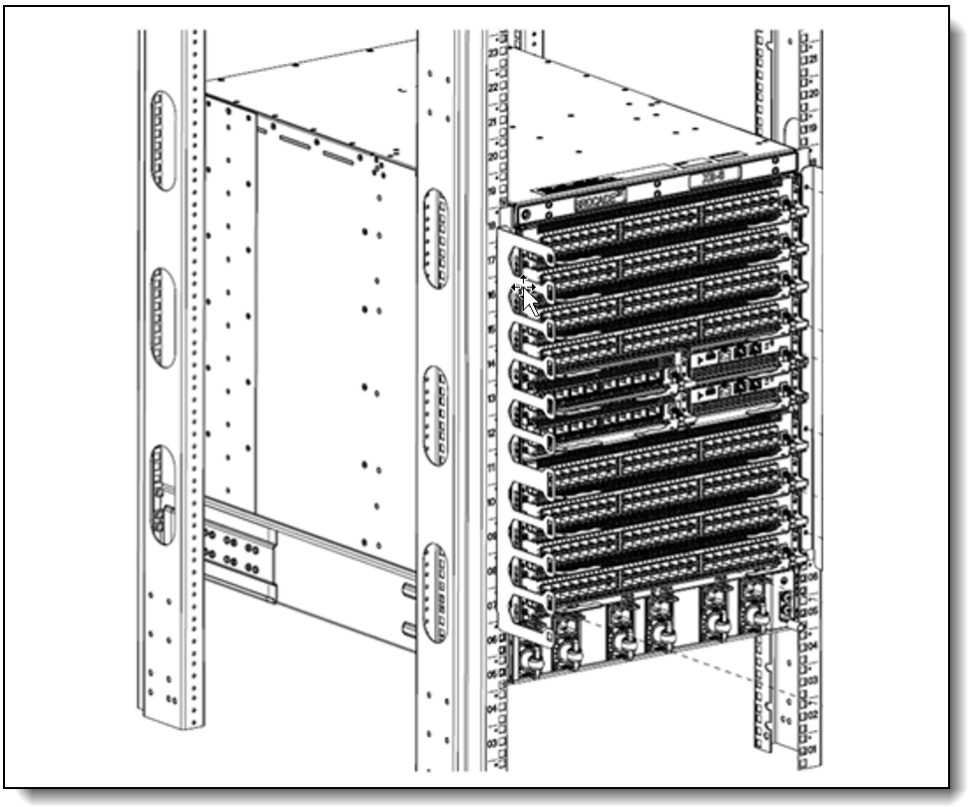

Figure 7. X8 Director 27” to 31” adjustable rail kit

Physical specifications

The X8 Directors have the following dimensions and weight:

Dimensions:

- X8-8 Director
  - Height: 61.8 cm (24.3 in., 14U)
  - Width: 44.2 cm (17.4 in.)
  - Depth: 68.7 cm (27 in.)
- X8-4 Director
  - Height: 39.6 cm (15.6 in., 9U)
  - Width: 44.2 cm (17.4 in.)
  - Depth: 68.7 cm (27 in.)

Weight:

- X8-8 Director
  - 45.2 kg (99.6 lb) for chassis
  - 116.8 kg (257.5 lb) maximum fully populated configuration
- X8-4 Director
  - 39.2 kg (86.4 lb) for chassis
  - 83.4 kg (183.9 lb) maximum fully populated configuration

Operating environment

Temperature and humidity, Electrical requirements, and Heat output Information can be found in the X8-4 and X8-8 Director Hardware Installation Guide. https://www.broadcom.com/products/fibre-channel-networking/directors/x8-directors

Warranty upgrades and post-warranty support

The X8 Directors have a three-year warranty.

Our global network of regional support centers offers consistent, local-language support enabling you to vary response times and level of service to match the criticality of your support needs:

- **Standard Next Business Day** – Best choice for non-essential systems requiring simple maintenance.
- **Premier Next Business Day** – Best choice for essential systems requiring technical expertise from senior-level Lenovo engineers.
- **Premier 24x7 4-Hour Response** – Best choice for systems where maximum uptime is critical.
- **Premier Enhanced Storage Support 24x7 4-Hour Response** – Best choice for storage systems where maximum uptime is critical.

For more information, consult the brochure Lenovo Operational Support Services for Data Centers Services.

Services

Lenovo Data Center Services empower you at every stage of your IT lifecycle. From expert advisory and strategic planning to seamless deployment and ongoing support, we ensure your infrastructure is built for success. Our comprehensive services accelerate time to value, minimize downtime, and free your IT staff to focus on driving innovation and business growth.

Note: Some service options may not be available in all markets or regions. For more information, go to https://lenovolocator.com/. For information about Lenovo service upgrade offerings that are available in your region, contact your local Lenovo sales representative or business partner.

In this section:

Lenovo Advisory Services

Lenovo Advisory Services simplify the planning process, enabling customers to build future-proofed strategies in as little as six weeks. Consultants provide guidance on projects including VM migration, storage, backup and recovery, and cost management to accelerate time to value, improve cost efficiency, and build a flexibly scalable foundation.

- **Assessment Services**

  An Assessment helps solve your IT challenges through an onsite, multi-day session with a Lenovo technology expert. We perform a tools-based assessment which provides a comprehensive and thorough review of a company's environment and technology systems. In addition to the technology based functional requirements, the consultant also discusses and records the non-functional business requirements, challenges, and constraints. Assessments help organizations like yours, no matter how large or small, get a better return on your IT investment and overcome challenges in the ever-changing technology landscape.

- **Design Services**

  Professional Services consultants perform infrastructure design and implementation planning to support your strategy. The high-level architectures provided by the assessment service are turned into low level designs and wiring diagrams, which are reviewed and approved prior to implementation. The implementation plan will demonstrate an outcome-based proposal to provide business capabilities through infrastructure with a risk-mitigated project plan.

Lenovo Plan & Design Services

Unlock faster time to market with our tailored, strategic design workshops to align solution approaches with your business goals and technical requirements. Leverage our deep solution expertise and end-to-end delivery partnership to meet your goals efficiently and effectively.

Lenovo Deployment, Migration, and Configuration Services

Optimize your IT operations by shifting labor-intensive functions to Lenovo's skilled technicians for seamless on-site or remote deployment, configuration, and migration. Enjoy peace of mind, faster time to value, and comprehensive knowledge sharing with your IT staff, backed by our best-practice methodology.

- **Deployment Services for Storage and ThinkAgile**

  A comprehensive range of remote and onsite options tailored specifically for your business needs to ensure your storage and ThinkAgile hardware are fully operational from the start.

- **Hardware Installation Services**

  A full-range, comprehensive setup for your hardware, including unpacking, inspecting, and positioning components to ensure your equipment is operational and error-free for the most seamless and efficient installation experience, so you can quickly benefit from your investments.

- **DM/DG File Migration Services**

  Take the burden of file migration from your IT’s shoulders. Our experts will align your requirements and business objectives to the migration plans while coordinating with your team to plan and safely execute the data migration to your storage platforms.

- **DM/DG/DE Health Check Services**

  Our experts perform proactive checks of your Firmware and system health to ensure your machines are operating at peak and optimal efficiency to maximize up-time, avoid system failures, ensure the security of IT solutions and simplify maintenance.

- **Factory Integrated Services**

  A suite of value-added offerings provided during the manufacturing phase of a server or storage system that reduces time to value. These services aim at improving your hardware deployment experience and enhance the quality of a standard configuration before it arrives at your facility.

Lenovo Support Services

In addition to response time options for hardware parts, repairs, and labor, Lenovo offers a wide array of additional support services to ensure your business is positioned for success and longevity. Our goal is to reduce your capital outlays, mitigate your IT risks, and accelerate your time to productivity.

- **Premier Support for Data Centers**

  Your direct line to the solution that promises the best, most comprehensive level of support to help you fully unlock the potential of your data center.

- **Premier Enhanced Storage Support (PESS)**

  Gain all the benefits of Premier Support for Data Centers, adding dedicated storage specialists and resources to elevate your storage support experience to the next level.

- **Committed Service Repair (CSR)**

  Our commitment to ensuring the fastest, most seamless resolution times for mission-critical systems that require immediate attention to ensure minimal downtime and risk for your business. This service is only available for machines under the Premier 4-Hour Response SLA.

- **Multivendor Support Services (MVS)**

  Your single point of accountability for resolution support across vast range of leading Server, Storage, and Networking OEMs, allowing you to manage all your supported infrastructure devices seamlessly from a single source.

- **Keep Your Drive (KYD)**

  Protect sensitive data and maintain compliance with corporate retention and disposal policies to ensure your data is always under your control, regardless of the number of drives that are installed in your Lenovo server.

- **Technical Account Manager (TAM)**

  Your single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time, ensuring smooth operations and optimized performance as your business grows.

- **Enterprise Software Support (ESS)**

  Gain comprehensive, single-source, and global support for a wide range of server operating systems and Microsoft server applications.

For more information, consult the brochure Lenovo Operational Support Services for Data Centers.

Lenovo Managed Services

Achieve peak efficiency, high security, and minimal disruption with Lenovo's always-on Managed Services. Our real-time monitoring, 24x7 incident response, and problem resolution ensure your infrastructure operates seamlessly. With quarterly health checks for ongoing optimization and innovation, Lenovo's remote active monitoring boosts end-user experience and productivity by keeping your data center's hardware performing at its best.

Lenovo Managed Services provides continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of your data center using state-of-the-art tools, systems, and practices by a team of highly skilled and experienced Lenovo services professionals.

Quarterly reviews check error logs, verify firmware & OS device driver levels, and software as needed. We'll also maintain records of latest patches, critical updates, and firmware levels, to ensure you systems are providing business value through optimized performance.

Lenovo Sustainability Services

- **Asset Recovery Services**

  Lenovo Asset Recovery Services (ARS) provides a secure, seamless solution for managing end-of-life IT assets, ensuring data is safely sanitized while contributing to a more circular IT lifecycle. By maximizing the reuse or responsible recycling of devices, ARS helps businesses meet sustainability goals while recovering potential value from their retired equipment. For more information, see the Asset Recovery Services offering page.

- **CO2 Offset Services**

  Lenovo's CO2 Offset Services offer a simple and transparent way for businesses to take tangible action on their IT footprint. By integrating CO2 offsets directly into device purchases, customers can easily support verified climate projects and track their contributions, making meaningful progress toward their sustainability goals without added complexity.

- **Lenovo Certified Refurbished**

  Lenovo Certified Refurbished offers a cost-effective way to support IT circularity without compromising on quality and performance. Each device undergoes rigorous testing and certification, ensuring reliable performance and extending its lifecycle. With Lenovo's trusted certification, you gain peace of mind while making a more sustainable IT choice.

Lenovo TruScale

Lenovo TruScale XaaS is your set of flexible IT services that makes everything easier. Streamline IT procurement, simplify infrastructure and device management, and pay only for what you use – so your business is free to grow and go anywhere.

Lenovo TruScale is the unified solution that gives you simplified access to:

- The industry's broadest portfolio – from pocket to cloud – all delivered as a service
- A single-contract framework for full visibility and accountability
- The global scale to rapidly and securely build teams from anywhere
- Flexible fixed and metered pay-as-you-go models with minimal upfront cost
- The growth-driving combination of hardware, software, infrastructure, and solutions – all from one single provider with one point of accountability.

For information about Lenovo TruScale offerings that are available in your region, contact your local Lenovo sales representative or business partner.

Regulatory compliance

The X8 Directors conform to the following regulations which can be found in the Hardware Installation Guide, available from the following web page:
https://www.broadcom.com/products/fibre-channel-networking/directors/x8-directors

Interoperability

For end-to-end storage configuration support, refer to the Lenovo Storage Interoperation Center (LSIC): https://datacentersupport.lenovo.com/us/en/lsic

Use the LSIC to select the known components of your configuration and then get a list all other supported combinations, with details about supported hardware, firmware, operating systems, and drivers, plus any additional configuration notes. View results on screen or export them to Excel.

External storage systems

Lenovo offers the ThinkSystem DE Series, ThinkSystem DG Series, ThinkSystem DM Series and ThinkSystem DS Series external storage systems for high-performance storage. See the DE Series, DG Series and DM Series product guides for specific controller models, expansion enclosures and configuration options:

- ThinkSystem DE Series Storage
  https://lenovopress.com/storage/thinksystem/de-series#rt=product-guide
- ThinkSystem DS Series Storage
  https://lenovopress.lenovo.com/storage/thinksystem/ds-series
- ThinkSystem DM Series Storage
  https://lenovopress.com/storage/thinksystem/dm-series#rt=product-guide
- ThinkSystem DG Series Storage
  https://lenovopress.com/storage/thinksystem/dg-series#rt=product-guide

External backup units

The following table lists the external backup options that are offered by Lenovo that can be used in Lenovo FC SAN solutions.

Note: Information provided in this section is for ordering reference purposes only. End-to-end LTO Ultrium configuration support for a particular tape backup unit *must* be verified through the System Storage Interoperation Center (SSIC):
http://www.ibm.com/systems/support/storage/ssic

Table 12. External Fibre Channel backup options

Part number	Description
External tape backup libraries	
6741B1F	IBM TS4300 3U Tape Library Base Unit - Max 48U
6741B3F	IBM TS4300 3U Tape Library Expansion Unit - Max 48U
Full High 8 Gb Fibre Channel for TS4300	
01KP938	LTO 7 FH Fibre Channel Drive
01KP954	LTO 8 FH Fibre Channel Drive
02JH837	LTO 9 FH Fibre Channel Drive
Half High 8 Gb Fibre Channel for TS4300	
01KP936	LTO 7 HH Fibre Channel Drive
01KP952	LTO 8 HH Fibre Channel Drive
02JH835	LTO 9 HH Fibre Channel Drive

For more information, see the list of Product Guides in the Tape Autoloaders and Libraries category:
https://lenovopress.com/storage/tape/library

Rack cabinets

The following table lists the supported rack cabinets.

Table 13. Rack cabinets (D)

Model	Description
7D6DA007WW	ThinkSystem 42U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6DA008WW	ThinkSystem 42U Pearl Primary Heavy Duty Rack Cabinet (1200mm)
7D6EA009WW	ThinkSystem 48U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6EA00AWW	ThinkSystem 48U Pearl Primary Heavy Duty Rack Cabinet (1200mm)
93074RX	42U Standard Rack (1000mm)
93604PX	42U 1200mm Deep Dynamic Rack
93614PX	42U 1200mm Deep Static Rack
93634PX	42U 1100mm Dynamic Rack
93634EX	42U 1100mm Dynamic Expansion Rack

For specifications about these racks, see the Lenovo Rack Cabinet Reference, available from:
https://lenovopress.com/lp1287-lenovo-rack-cabinet-reference

For more information, see the list of Product Guides in the Rack cabinets category:
https://lenovopress.com/servers/options/racks

Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo.

Table 14. Power distribution units

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
0U Basic PDUs															
4PU7A93176	C0QH	0U 36 C13 and 6 C19 Basic 32A 1 Phase PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93177	C0QJ	0U 24 C13/C15 and 24 C13/C15/C19 Basic 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
0U Switched and Monitored PDUs															
4PU7A93181	C0QN	0U 21 C13/C15 and 21 C13/C15/C19 Switched and Monitored 48A 3 Phase Delta PDU v2 (60A derated)	N	Y	N	N	N	N	N	Y	N	Y	N	Y	N
4PU7A93178	C0QK	0U 20 C13 and 4 C19 Switched and Monitored 32A 1 Phase PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93171	C0D8	0U 20 C13 and 4 C19 Switched and Monitored 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93182	C0QP	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 63A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93175	C0CS	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 63A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93180	C0QM	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93179	C0QL	0U 16 C13/C15 and 16 C13/C15/C19 Switched and Monitored 24A 1 Phase PDU v2 (30A derated)	N	Y	N	N	N	N	N	Y	N	Y	N	Y	N
1U Switched and Monitored PDUs															
4PU7A90808	C0D4	1U 18 C19/C13 Switched and monitored 48A 3P WYE PDU V2 ETL	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A81117	BNDV	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - ETL	N	N	N	N	N	N	N	N	N	N	N	Y	N
4PU7A90809	C0DE	1U 18 C19/C13 Switched and monitored 48A 3P WYE PDU V2 CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
4PU7A90810	C0DD	1U 18 C19/C13 Switched and monitored 80A 3P Delta PDU V2	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A90811	C0DC	1U 12 C19/C13 Switched and monitored 32A 3P WYE PDU V2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A90812	C0DB	1U 12 C19/C13 Switched and monitored 60A 3P Delta PDU V2	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
Line cords for 1U PDUs that ship without a line cord															
40K9611	6504	4.3m, 32A/380-415V, EPDU/IEC 309 3P+N+G 3ph wye (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9612	6502	4.3m, 32A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9613	6503	4.3m, 63A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
40K9614	6500	4.3m, 30A/208V, EPDU to NEMA L6-30P (US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9615	6501	4.3m, 60A/208V, EPDU to IEC 309 2P+G (US) Line Cord	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N

For more information, see the Lenovo Press documents in the PDU category:
https://lenovopress.com/servers/options/pdu

Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are offered by Lenovo.

Table 15. Uninterruptible power supply units

Part number	Description
Rack-mounted or tower UPS units - 100-125VAC	
7DD5A001WW	RT1.5kVA 2U Rack or Tower UPS-G2 (100-125VAC)
7DD5A003WW	RT3kVA 2U Rack or Tower UPS-G2 (100-125VAC)
Rack-mounted or tower UPS units - 200-240VAC	
7DD5A002WW	RT1.5kVA 2U Rack or Tower UPS-G2 (200-240VAC)
7DD5A005WW	RT3kVA 2U Rack or Tower UPS-G2 (200-240VAC)

For more information, see the list of Product Guides in the UPS category:
https://lenovopress.com/servers/options/ups

Seller training courses

The following sales training courses are offered for employees and partners (login required). Courses are listed in date order.

1. **Partner Technical Webinar - New Fibre Channel Switches and Directors**
   2025-11-24 | 60 minutes | Employees and Partners

   In this 60-minute replay, Mike Easterly, Broadcom Technical Development, shared the details on the newest Brocade Fibre Channel switches and directors: Gen 8. He described how the new switches have increased performance, improved manageability and are Quantum-safe.

   Tags: Storage

   Published: 2025-11-24
   Length: 60 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: NOV2125

Related publications and links

For more information, see the following resources:

- Lenovo FC SAN Switches product page: https://www3.lenovo.com/us/en/data-center/storage/storage-area-network/fibre-channel-switches/c/san-fibre-channel-switches
- Brocade X8-4 and X8-8 FC Director product publications: https://www.broadcom.com/products/fibre-channel-networking/directors/x8-directors
  - Hardware Installation Guide
  - Fabric OS Administration Guide
  - Fabric OS Extension Configuration Guide
  - Fabric OS Command Reference
  - Fabric OS Message Reference
  - Fabric OS MIB Reference
  - Flow Vision Configuration Guide
  - FOS and SANnav Downloads - https://support.lenovo.com/us/en/solutions/TT116
  - TruFOS Certificates - https://support.lenovo.com/us/en/solutions/TT1149
  - Fabric OS Release Support Matrix - https://docs.broadcom.com/doc/Brocade-SW-Support-RM

Related product families

Product families related to this document are the following:

- DB Series SAN Switches
- DS Series Storage
- Rack SAN Switches

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
8001 Development Drive
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION ”AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

This document, LP2271, was created or updated on December 9, 2025.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
  https://lenovopress.lenovo.com/LP2271
- Send your comments in an e-mail to:
  comments@lenovopress.com

This document is available online at https://lenovopress.lenovo.com/LP2271.

Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at https://www.lenovo.com/us/en/legal/copytrade/.

The following terms are trademarks of Lenovo in the United States, other countries, or both:
Lenovo®
ThinkAgile®
ThinkSystem®

The following terms are trademarks of other companies:

UltraScale+™ and UltraScale™ are trademarks of Advanced Micro Devices, Inc.

Microsoft®, Excel®, and Georgia® are trademarks of Microsoft Corporation in the United States, other countries, or both.

IBM®, FICON®, and ibm.com® are trademarks of IBM in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.