



# Lenovo ThinkSystem DB400D and DB800D 32Gb FC SAN Directors

## Product Guide

The Lenovo ThinkSystem DB400D and DB800D 32Gb FC SAN Directors combine innovative hardware, firmware, and integrated network sensors to ensure the highest levels of operational stability and application performance. Designed to enable maximum flexibility and reliability, the Lenovo FC SAN Directors deliver market-leading 32 Gb Gen 6 Fibre Channel technology with modular building blocks for increased scalability to accommodate growth for large-scale enterprise infrastructures.

The Lenovo FC SAN Directors provide full non-blocking performance with scalability of up to four (DB400D) or eight (DB800D) port blades to deliver up to 256x (DB400D) or 512x (DB800D) ports that are FC-capable with speeds up to 32 Gbps or FCoE-capable of speeds up to 25 Gbps. The Directors also offer FCoE support with up to 64x (DB400D) or 128x (DB800D) 40 Gbps FCoE ports.

The Lenovo FC SAN Directors offer FC over IP extension capabilities with support for up to 8x 40 GbE QSFP+ ports and up to 64x 1/10 GbE SFP+ ports with up to four extension blades. For inter-chassis connectivity, the Directors provide 16x (DB400D) or 32x (DB800D) FC QSFP+ ports that support 4x 16/32 Gbps speeds.



Figure 1. Lenovo ThinkSystem DB400D (Left) and DB800D (Right) 32Gb FC SAN Directors

### Did you know?

The DB400D and DB800D 32Gb FC SAN Directors leverage storage connectivity technologies from Brocade, a leader in Fibre Channel networking.

Fabric Vision technology, an extension of Gen 6 Fibre Channel, provides unprecedented insight and visibility across the SAN with powerful built-in monitoring, management, and diagnostic tools.

With Lenovo FC SAN Switch offerings, Lenovo can be your trusted partner that offers "one stop shop" and single point of contact for delivery of leading edge technologies and innovations from Lenovo and other leading IT vendors. These offerings can satisfy the wide range of your end-to-end IT infrastructure needs, including end-user devices, servers, storage, networking, services, management software, and financing.

## Key features

The ThinkSystem DB400D and DB800D 32Gb FC SAN Directors offer the following features and benefits:

- Enhance operational stability, maximize application performance, and increase business agility with enterprise-class Gen 6 FC SAN directors
- Scale to 256 (DB400D) or 512 (DB800D) FC or FCoE ports with industry-leading port density and consolidate infrastructure with 128 Gbps Brocade UltraScale ICL connectivity for simpler, flatter, low-latency fabrics.
- Enable “pay-as-you-grow” scalability with full-fabric enterprise capabilities, supporting Fibre Channel connectivity of up to 32 Gbps or Fibre Channel over Ethernet (FCoE) connectivity of up to 40 Gbps.
- Accelerate application response time by up to 71 percent across 32 Gbps FC links.
- Optimize fabric behavior and ensure sufficient bandwidth for mission-critical applications with advanced traffic management capabilities and adaptive networking.
- Extend replication over distance with a highly scalable extension solution for Fibre Channel, IP, and FICON.
- Protect existing device investments with auto-sensing 4, 8, 16, and 32 Gbit/sec capabilities and native operation with Fabric OS-based fabrics.
- Simplify end-to-end management of large-scale environments by automating monitoring and diagnostics.
- Run Fabric OS, which delivers distributed intelligence throughout the network and enables a wide range of value-added features.
- Leverage Fabric Vision technology’s powerful monitoring, management, and diagnostic tools to simplify administration, increase uptime, and reduce costs.
- Provide proactive, non-intrusive, real-time monitoring and alerting of VM and storage I/O health and performance with VM Insight and IO Insight through integrated network sensors.
- Leverage predefined MAPS policies to automatically identify and isolate devices that cause network performance issues.
- Supply a rich set of standard features at no extra cost, including fabric services, advanced zoning, adaptive networking, integrated 10 Gb FC, diagnostic tools, ISL trunking, advanced monitoring and alerting, long-distance fabrics, and FICON CUP.
- Expand fabric capabilities with optional licensed functions, including Inter-Chassis Links (ICLs) and FC-FC routing.
- Compress and encrypt in-flight data on up to four ports for more efficient link utilization and better security.
- Virtualize physical FC SAN switches and fabrics into logical entities for better flexibility, utilization, management, and efficiency.
- Allow organizations to seamlessly integrate Gen 6 Fibre Channel networks with the next generation of flash storage – NVMe over Fibre Channel – by being NVMe-ready, without a disruptive rip and replace, to achieve faster application response times and harness the performance of solid state drives for better scalability across virtual data centers with flash storage.
- Help optimize the performance of NVMe with real-time latency monitoring on the FC32-64 port blade.
- Designed to provide 99.999% uptime capabilities and maximize resiliency with redundant hot-swap components, including power supplies, cooling modules, blades, transceivers, online diagnostics, and non-disruptive firmware download and activation.
- Accelerate troubleshooting with built-in advanced diagnostics tools featuring ClearLink Diagnostics with D\_Ports and select adapters from QLogic and Emulex, which helps ensure optical and signal integrity for 16 Gb and 32 Gb Fibre Channel optics and cables.
- Automate repetitive daily tasks (such as fabric inventory, provisioning, and operational state monitoring) by using the standard REST APIs available directly from the switch.
- Simplify common SAN management practices by quickly integrating systems with open source PyFOS, a Python language.

## Components and connectors

The following figure shows the port-side view of the DB400D 32Gb FC SAN Director.

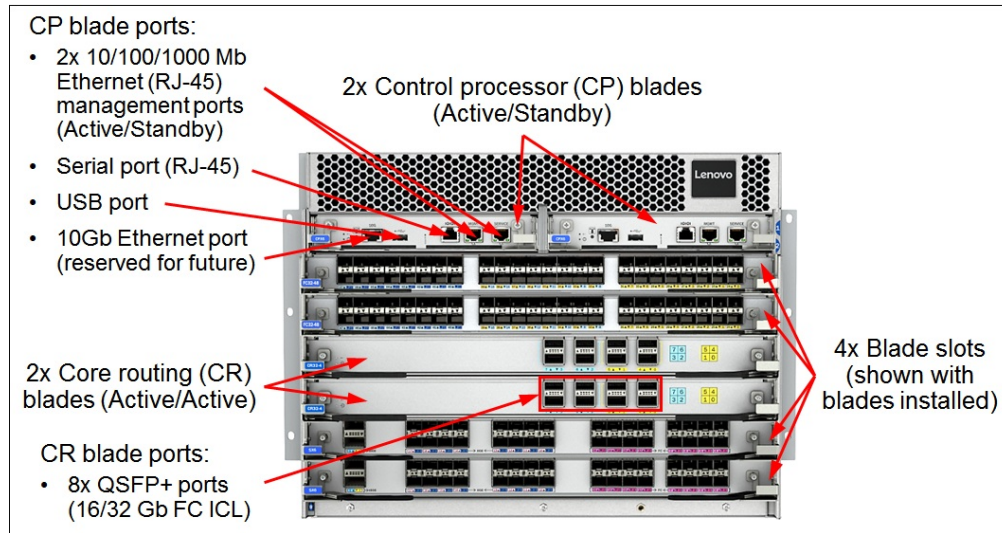


Figure 2. DB400D 32Gb FC SAN Director port-side view

The port side of the DB400D chassis has the following components:

- 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 redundant hot-swap active/active Core Routing CR32-4 blades (CR blades come with the chassis) Core routing blades contain ASICs that allow switching between up to four port blades, and each core routing blade provides 96 Fibre Channel backplane ports for port or extension blade connections and 32 front-end FC links that are mapped to 8 QSFP+ ports for inter-chassis links (ICLs).
- Four hot-swap slots for port blades and extension blades (The chassis comes without port blades or extension blades, see [Blades](#) for ordering information)

The following figure shows the non-port side view of the DB400D 32Gb FC SAN Director.

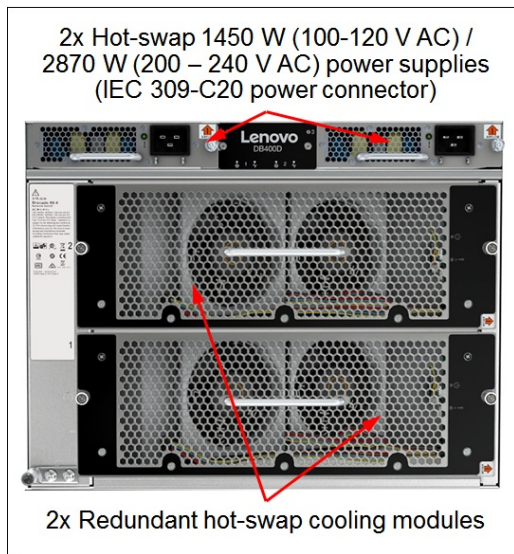


Figure 3. DB400D 32Gb FC SAN Director non-port side view

The non-port side of the DB400D chassis has the following components:

- Two hot-swap power supplies (must be ordered together with the chassis)
- Two hot-swap cooling modules (must be ordered together with the chassis)

The following figure shows the port-side view of the DB800D 32Gb FC SAN Director.

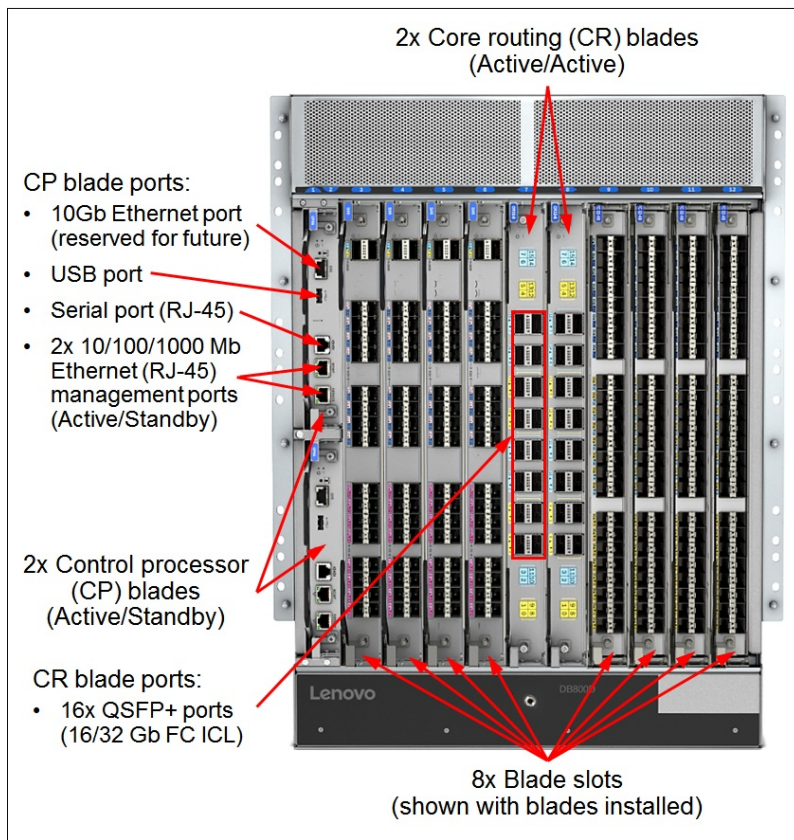


Figure 4. DB800D 32Gb FC SAN Director port-side view

The port side of the DB800D chassis has the following components:

- 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 redundant hot-swap active/active Core Routing CR32-8 blades (CR blades come with the chassis)  
Core routing blades contain ASICs that allow switching between up to eight port blades, and each core routing blade provides 192 Fibre Channel backplane ports for port or extension blade connections and 64 front-end FC links that are mapped to 16 QSFP+ ports for inter-chassis links (ICLs).
- Eight hot-swap slots for port blades and extension blades (The chassis comes without port blades or extension blades, see [Blades](#) for ordering information)

The following figure shows the non-port side view of the DB800D 32Gb FC SAN Director.

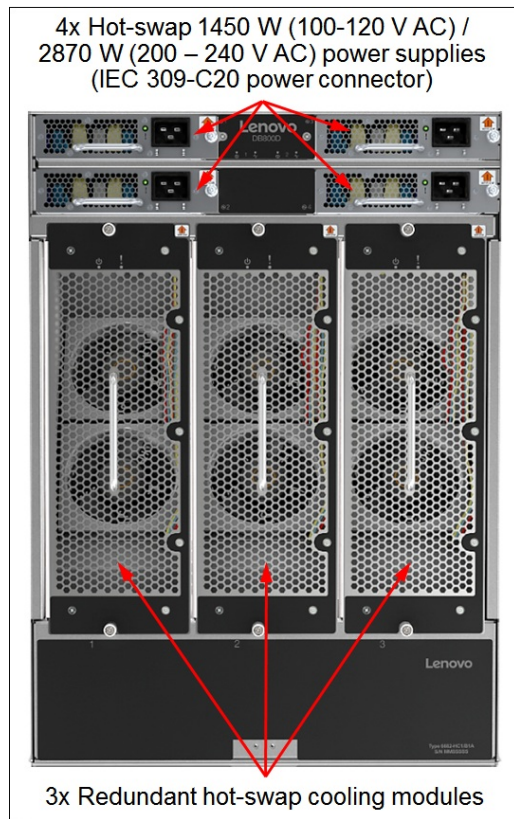


Figure 5. DB800D 32Gb FC SAN Director non-port side view

The non-port side of the DB800D chassis has the following components:

- Three or four hot-swap power supplies (must be ordered together with the chassis)
- Three hot-swap cooling modules (must be ordered together with the chassis)

The following figure shows the FC32-64 port blade.

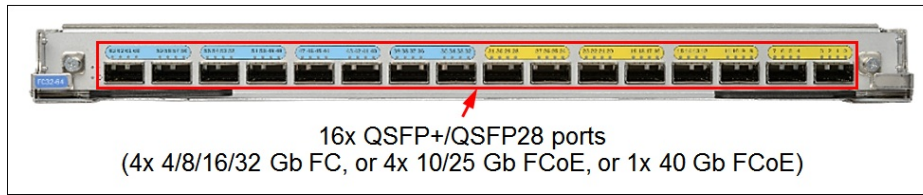


Figure 6. FC32-64 port blade

The FC32-64 port blade contains 16 QSFP+/QSFP28 ports can be split out into four Fibre Channel ports capable of speeds up to 32 Gbps or four FCoE ports capable of 10 Gbps or 25 Gbps speeds. Each QSFP+ port is also capable of supporting 40 Gbps FCoE. The FC32-64 port blade enables industry-leading platform density for Gen 6 SAN configurations supporting up to 256 32-Gbps external ports in a single DB400D chassis, and up to 512 32-Gbps external ports in a single DB800D chassis.

The following figure shows the FC32-48 port blade.

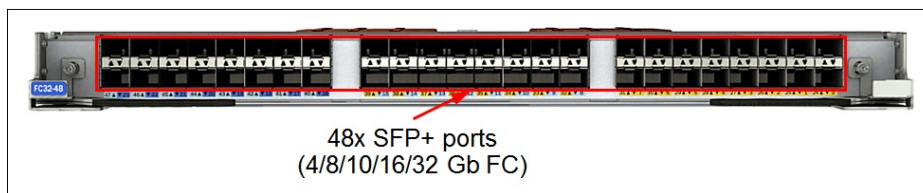


Figure 7. FC32-48 port blade

The FC32-48 port blade contains 48 ports capable of Fibre Channel speeds up to 32 Gbps. The FC32-48 port blade enables Gen 6 SAN configurations supporting up to 192 32-Gbps external ports in a single DB400D chassis, and up to 384 32-Gbps external ports in a single DB800D chassis.

The following figure shows the SX6 extension blade.

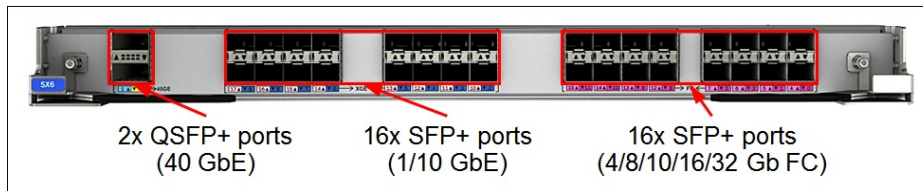


Figure 8. SX6 extension blade

The SX6 Extension blade is intended as an extension platform to support Fibre Channel, FICON, and IP based storage data flows. Extension features enable you to use the existing IP wide area network (WAN) infrastructure to connect Fibre Channel and IP fabrics. Extension features support applications such as remote data replication (RDR), centralized backup, and data migration over very long distances. Extension tunnels, built on a physical connection between two extension switches or blades, allow Fibre Channel and IP I/O to pass through the IP WAN. The SX6 Extension blade can connect with an SX6 blade in another DB400D or DB800D 32Gb FC SAN Director or with a Brocade 7840 Extension Switch.

## System specifications

The following table lists the ThinkSystem DB400D and DB800D 32Gb 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 8.2. For details about specific firmware releases that introduced support for certain hardware options and firmware features, refer to the Release notes of the particular firmware release that can be found at:

<http://datacentersupport.lenovo.com/us/en/products/storage/fibre-channel-switches/db400d-fc-switch/6682/downloads>

<http://datacentersupport.lenovo.com/us/en/products/storage/fibre-channel-switches/db800d-fc-switch/6684/downloads>

Table 1. ThinkSystem DB400D and DB800D 32Gb FC SAN Director system specifications

Attribute	Specification	
	DB400D	DB800D
Form factor	8U rack mount (Machine Type 6684) 9U rack mount with the airflow diversion kit	14U rack mount (Machine Type 6682)
Blades	<ul style="list-style-type: none"> <li>• 2x Redundant control processor blades</li> <li>• 2x Redundant CR32-4 core routing blades</li> <li>• 4x slots for port and extension blades:               <ul style="list-style-type: none"> <li>◦ Up to 4x FC32-64 port blades</li> <li>◦ Up to 4x FC32-48 port blades</li> <li>◦ Up to 4x SX6 extension blades</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 2x Redundant Control processor blades</li> <li>• 2x Redundant CR32-8 core routing blades</li> <li>• 8x slots for port and extension blades:               <ul style="list-style-type: none"> <li>◦ Up to 8x FC32-64 port blades</li> <li>◦ Up to 8x FC32-48 port blades</li> <li>◦ Up to 4x SX6 extension blades</li> </ul> </li> </ul>
Ports	<ul style="list-style-type: none"> <li>• CR32-4 core routing blade:               <ul style="list-style-type: none"> <li>◦ 8x 64/128 Gb FC QSFP+ ports</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• CR32-8 core routing blade:               <ul style="list-style-type: none"> <li>◦ 16x 64/128 Gb FC QSFP+ ports</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• FC32-64 port blade:               <ul style="list-style-type: none"> <li>◦ 16x QSFP+/QSFP28 ports; each port is capable of:                   <ul style="list-style-type: none"> <li>▪ 4x 4/8/16/32 Gb FC; or</li> <li>▪ 4x 10 Gb or 4x 25 Gb FCoE; or</li> <li>▪ 1x 40 Gb FCoE</li> </ul> </li> </ul> </li> <li>• FC32-48 port blade:               <ul style="list-style-type: none"> <li>◦ 48x 4/8/10/16/32 Gb FC SFP+ ports</li> </ul> </li> <li>• SX6 extension blade:               <ul style="list-style-type: none"> <li>◦ 16x 4/8/10/16/32 Gb FC SFP+ ports</li> <li>◦ 16x 1/10 Gb Ethernet SFP+ ports</li> <li>◦ 2x 40 Gb Ethernet QSFP+ ports</li> </ul> </li> </ul>	
Media types	<ul style="list-style-type: none"> <li>• Fibre Channel transceivers:               <ul style="list-style-type: none"> <li>◦ 128 Gb (4x 32 Gb) FC QSFP+: short-wavelength (SWL), long-wavelength (LWL).</li> <li>◦ 4x 16 Gb FC QSFP+: SWL, LWL.</li> <li>◦ 32 Gb FC SFP+: SWL, LWL.</li> <li>◦ 16 Gb FC SFP+: SWL, LWL, extended long-wavelength (ELWL).</li> <li>◦ 10 Gb FC SFP+: SWL, LWL.</li> </ul> </li> <li>• Fibre Channel over Ethernet (FCoE) transceivers:               <ul style="list-style-type: none"> <li>◦ 100 Gb (4x 25 Gb) FCoE QSFP28: SWL.</li> <li>◦ 40 Gb (4x 10 Gb) FCoE QSFP+: SWL.</li> <li>◦ 40 Gb BiDi FCoE QSFP+: SWL.</li> </ul> </li> <li>• Ethernet transceivers:               <ul style="list-style-type: none"> <li>◦ 40 GbE QSFP+: short-range (SR4), long-range (LR4), extended range (ER4).</li> <li>◦ 10 GbE SFP+: short-range (SR), long-range (LR), Dense Wavelength Division Multiplexing (DWDM).</li> <li>◦ 1 GbE SFP: short-wavelength (SX), long-wavelength (LX), RJ-45 unshielded twisted pair (UTP).</li> </ul> </li> </ul>	

Attribute	Specification	
	DB400D	DB800D
Port speeds	<ul style="list-style-type: none"> <li>• Fibre Channel transceivers: <ul style="list-style-type: none"> <li>◦ 128 Gb (4x 32 Gb) FC SWL QSFP+: 4x 32 Gbps or 4x 16 Gbps.</li> <li>◦ 128 Gb (4x 32 Gb) FC LWL QSFP+: 4x 32 Gbps fixed.</li> <li>◦ 4x 16 Gb FC QSFP+: 4x 16 Gbps fixed.</li> <li>◦ 32 Gb FC SFP+: 32/16/8 Gbps auto-sensing.</li> <li>◦ 16 Gb FC SFP+: 16/8/4 Gbps auto-sensing.</li> <li>◦ 10 Gb FC SFP+: 10 Gbps fixed.</li> </ul> </li> <li>• Fibre Channel over Ethernet (FCoE) transceivers: <ul style="list-style-type: none"> <li>◦ 100 Gb (4x 25 Gb) FCoE QSFP28: 4x 25 Gbps fixed.</li> <li>◦ 40 Gb (4x 10 Gb) FCoE QSFP+: 40 Gbps or 4x 10 Gbps.</li> <li>◦ 40 Gb BiDi FCoE QSFP+: 40 Gbps fixed.</li> </ul> </li> <li>• Ethernet transceivers: <ul style="list-style-type: none"> <li>◦ 40 GbE QSFP+: 40 Gbps fixed</li> <li>◦ 10 GbE SFP+: 10 Gbps fixed</li> <li>◦ 1 GbE SFP: 1 Gbps fixed</li> </ul> </li> </ul>	
FC port types	<ul style="list-style-type: none"> <li>• FC32-64 port blade: <ul style="list-style-type: none"> <li>◦ F_Port, E_Port, VF_Port (FCoE), VE_Port (FCoE), EX_Port (Requires an optional Integrated Routing License), M_Port (Mirror Port), D_Port (Diagnostic Port).</li> </ul> </li> <li>• FC32-48 port blade: <ul style="list-style-type: none"> <li>◦ F_Port, E_Port, EX_Port (Requires an optional Integrated Routing License), M_Port (Mirror Port), D_Port (Diagnostic Port).</li> </ul> </li> <li>• SX6 extension blade: <ul style="list-style-type: none"> <li>◦ F_Port, FL_Port, E_Port, EX_Port (FC), VE_Port (Ethernet) (EX_Port and VE_Port require an optional Integrated Routing License).</li> </ul> </li> <li>• Core routing blades (CR32-4 and CR32-8): <ul style="list-style-type: none"> <li>◦ E_Port, EX_Port (EX_Port requires an optional Integrated Routing License).</li> </ul> </li> </ul>	
Data traffic types	Unicast (Class 2 and Class 3), multicast (Class 3 only), broadcast (Class 3 only).	
Classes of service	Class 2, Class 3, Class F (inter-switch frames).	
Standard features	Full Fabric, Advanced Zoning, Fabric Services, 10 Gb FC, Adaptive Networking, Advanced Diagnostic Tools, Virtual Fabrics, In-flight Compression, In-flight Encryption, ISL Trunking, Fabric Vision, Extended Fabric, FICON CUP (except FC32-64 port blade).	
Optional features	UltraScale Inter-Chassis Links (ICLs), Integrated Routing.	
Architecture	Non-blocking shared memory; passive backplane; redundant active/passive control processor; redundant active/active core switching blades; redundant WWN cards.	
Performance	<ul style="list-style-type: none"> <li>• Slot bandwidth: 1.536 Tbps <ul style="list-style-type: none"> <li>◦ FC32-48 port blade, SX6 extension blade: Line-rate performance</li> <li>◦ FC32-64 port blade: 1.33 to 1 oversubscription</li> </ul> </li> <li>• Line-rate forwarding of FC traffic: <ul style="list-style-type: none"> <li>◦ 4GFC: 4.25 Gbit/sec line speed, full duplex</li> <li>◦ 8GFC: 8.5 Gbit/sec line speed, full duplex</li> <li>◦ 10GFC: 10.51875 Gbit/sec line speed, full duplex</li> <li>◦ 16GFC: 14.025 Gbit/sec line speed, full duplex</li> <li>◦ 32GFC: 28.05 Gbit/sec line speed, full duplex</li> </ul> </li> <li>• Cut-through FC switching: <ul style="list-style-type: none"> <li>◦ Up to 780 ns port-to-port local switching latency (including FEC)</li> <li>◦ Up to 2.6 µs blade-to-blade switching latency (including FEC)</li> </ul> </li> </ul>	
Aggregated throughput	10.24 Tbps	20.48 Tbps



Attribute	Specification	
	DB400D	DB800D
Scalability	<ul style="list-style-type: none"> <li>Maximum number of switches in the fabric: 239</li> <li>Maximum frame size: 2,112-byte payload</li> <li>Maximum number of frame buffers per switching ASIC: 15,360</li> <li>Maximum number of ports per ISL trunk: 8x SFP+</li> <li>Maximum bandwidth per ISL trunk: 256 Gbps</li> <li>Maximum number of ports per UltraScale ICL trunk (CR blades only): 4x QSFP+</li> <li>Maximum bandwidth per UltraScale ICL trunk (CR blades only): 512 Gbps</li> <li>Maximum UltraScale ICL bandwidth per chassis (CR blades only): <ul style="list-style-type: none"> <li>DB400D: 2.048 Tbps</li> <li>DB800D: 4.096 Tbps</li> </ul> </li> <li>Maximum number of chassis in UltraScale ICL multi-chassis configurations: <ul style="list-style-type: none"> <li>Full mesh topology: 9</li> <li>Core-edge topology: 12</li> </ul> </li> <li>Maximum number of ports in UltraScale ICL multi-chassis configurations: <ul style="list-style-type: none"> <li>Full mesh topology: 4,608</li> <li>Core-edge topology: 6,144</li> </ul> </li> </ul>	
Cooling	2x Hot-swap cooling modules required; each module contains two fans. N+1 (3+1) fan redundancy. Non-port side to side vent (default) or non-port to port side (optional) airflow.	3x Hot-swap cooling modules required; each module contains two fans. N+1 (5+1) fan redundancy. Non-port to port side airflow.
Power supply type	1450 W (100 - 120 V AC) / 2870 W (200 - 240 V AC) hot-swap power supply (IEC 309-C20 connector).	
Power supply quantity	2 required	3 required; 4 maximum
Hot-swap parts	Blades, SFP+/QSFP+ transceivers, power supplies, cooling modules.	
Management ports	Per control processor blade: <ul style="list-style-type: none"> <li>2x 10/100/1000 Mb Ethernet ports (UTP, RJ-45); 1x RS-232 port (RJ-45); 1x USB port (for additional firmware/log/configuration files storage; requires a supported USB memory key).</li> </ul> In-band management over Fibre Channel is supported.	
Management interfaces	Web-based GUI (Web Tools); Command Line Interface (CLI); SMI-S; SNMP; REST API. Optional Brocade SANnav Management Portal and SANnav Global View.	
Security features	Secure Socket Layer (SSL); Secure Shell (SSH); Secure Copy (SCP); Secure FTP (SFTP); user level security, Role-based Access Control (RBAC); LDAP, RADIUS, and TACACS+ authentication; access control lists (ACLs); IP security (IPsec).	
Hardware warranty	One-year customer-replaceable unit limited warranty with 9x5 next business day parts delivered.	
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.	
Firmware entitlement	One-year (DB400D and DB800D Models HC2) or three-year (DB400D and DB800D Models HC1) firmware entitlement and support license is included. Optional one- and two-year firmware support extension licenses are available from Lenovo for DB400D and DB800D Models HC1. Firmware entitlement extension licenses for DB400D and DB800D Models HC2 are included in the warranty service upgrades for DB400D and DB800D Models HC2.	
Dimensions	<ul style="list-style-type: none"> <li>Height: 345 mm (13.6 in.)</li> <li>Width: 437 mm (17.2 in.)</li> <li>Depth: 611 mm (24.0 in.)</li> </ul>	<ul style="list-style-type: none"> <li>Height: 612 mm (24.1 in.)</li> <li>Width: 437 mm (17.2 in.)</li> <li>Depth: 611 mm (24.0 in.)</li> </ul>
Weight	<ul style="list-style-type: none"> <li>Empty: 24.5 kg (54.0 lb)</li> <li>Fully configured: 69.0 kg (152.0 lb).</li> </ul>	<ul style="list-style-type: none"> <li>Empty: 35.6 kg (78.5 lb)</li> <li>Fully configured: 145.8 kg (321.5 lb).</li> </ul>

## Models

The following table lists the DB400D and DB800D 32Gb FC SAN Director models.

Table 2. DB400D and DB800D 32Gb FC SAN Director models

Description	Part number	Machine Type-Model	Feature code
Lenovo ThinkSystem DB400D 32Gb FC Director, ENT. Feature set, 4 Blade slots, 8U, 1Yr FW	6684D2A	6684-HC2	B4QH
Lenovo ThinkSystem DB400D 32Gb FC Director, ENT. Feature set, 4 Blade slots, 8U, 3Yr FW	6684B2A	6684-HC1	AVK7
Lenovo ThinkSystem DB800D 32Gb FC Director, ENT. Feature set, 8 Blade slots, 14U, 1Yr FW	6682D1A	6682-HC2	B4QG

The DB400D and DB800D 32Gb FC SAN Director part numbers include the following items:

- One 32 Gb FC Director chassis that contains the following components:
  - Two control blades
  - Two core routing blades
- Chassis door
- Serial cable (DB-9/RJ-45 to RJ-45)
- Power cord retainer clips
- Cable management assembly
- Adjustable rack mount kit
- Ground lug kit
- Online Documentation web pointer card
- SANNav web pointer card

### Configuration notes:

- The ThinkSystem DB400D and DB800D models come standard without port or extension blades; they should be ordered for the director model (See [Blades](#) for details).
- The ThinkSystem DB400D and DB800D models come standard without fan modules and power supplies; at least a minimum quantity required must be ordered together with the director model (See [Cooling](#) and [Power supplies and cables](#) for details).
- The ThinkSystem DB400D and DB800D models come standard without power cords; they must be ordered together with the director model (see [Power supplies and cables](#) for details).

## Blades

The DB400D and DB800D 32Gb FC SAN Directors support the port and extension blade options that are listed in the following table.

Table 3. Port and extension blades

Description	Part number	Feature code	Quantity	
			DB400D	DB800D
Port blades (for Models HC1 and HC2)				
Lenovo Gen 6 Port Blade FC32-48 (no transceivers)	01KN845	AVGT	4	8
Lenovo Gen 6 Port Blade FC32-48 (48 transceivers, 32Gbps)	01KN848	AVGU	4	8
Lenovo Gen 6 Port Blade FC32-64 (8 4x32Gb QSFP+ transceivers)	4M27A09985	B26X	4	8
Extension blades (for Model HC2)				
Lenovo SX6 FC-IP SAN Extension Blade + 16 32Gb SWL SFPs, 1YR	4M27A14145	B5Z7	4	4
Lenovo SX6 FC-IP SAN Extension Blade + 16 32Gb LWL SFPs, 1YR	4M27A14146	B5Z8	4	4

Port and extension blades come standard with all ports activated, and certain part numbers also include transceivers. Additional transceivers and cables can be ordered, if required (See [Transceivers and cables](#) for details).

## Transceivers and cables

With the flexibility of the DB400D and DB800D 32Gb FC SAN Directors, customers can choose the following connectivity technologies:

- SFP+ ports on the FC32-48 port blade and SX6 extension blade
  - For 32 Gb FC links, customers can use 32 Gb 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 Gb FC LW SFP+ optical transceivers can support up to 10 kilometers on 9 μ single-mode fiber (SMF) optic cables.
  - For 16 Gb FC links, customers can use 16 Gb 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 Gb FC LW SFP+ optical transceivers can support up to 10 kilometers on 9 μ SMF cables. For extended distances, the 16 Gb FC ELW SFP+ optical transceivers can support up to 25 kilometers on 9 μ SMF cables.
  - For 10 Gb FC links, customers can use 10 Gb FC SFP+ SW transceivers for distances up to 550 meters on OM4 or up to 300 meters on OM3 50 μ MMF cables, or 10 Gb FC SFP+ LW transceivers for distances up to 10 km on 9 μ SMF cables. 10 Gb FC operations allow metro connectivity by directly utilizing a fiber optic cable between sites or by creating multiple channels on an optical cable between sites, utilizing Wave Division Multiplexing (WDM) technology.
- QSFP+/QSFP28 ports on the FC32-64 port blade
  - For 32 Gb FC links, customers can use the 128 Gb (4x 32 Gbps) SWL QSFP+ Transceiver with OM4 MMF MPO-4xLC breakout cables for distances up to 100 meters or OM3 MMF MPO-4xLC breakout cables for distances up to 70 meters. For longer-distance ISL links, the 128 Gb (4x 32 Gbps) FC LWL QSFP+ optical transceivers can support up to 2 kilometers on 9 μ SMF cables.
  - For 16 Gb FC links, customers can use MMF MPO-4xLC breakout cables with the following transceivers:
    - 128 Gb (4x 32 Gb) QSFP+ SWL optical transceivers running at 4x 16 Gb speeds for distances up to 125 meters on OM4 or up to 100 meters on OM3 MMF cables.
    - 4x 16 Gb FC QSFP+ SWL optical transceivers for distances up to 100 meters on OM4 or up to 66 meters on OM3 MMF cables.
  - For 40 Gb FCoE links, customers can use the 40 Gb SR4 QSFP+ bi-directional transceivers or 40 Gb (4x 10 Gbps) SR4 QSFP+ transceivers for distances up to 100 meters on OM3 or up to 150 meters on OM4 MMF cables.

- For 25 Gb FCoE links, customers can use the 100 Gb (4x 25 Gbps) QSFP28 SR4 transceiver for distances up to 70 meters on OM3 or up to 100 meters on OM4 MMF MPO-4xLC breakout cables.
- For 10 Gb FCoE links, customers can use the 40 Gb (4x 10 Gbps) SR4 QSFP+ transceivers for distances up to 100 meters on OM3 or up to 150 meters on OM4 MMF MPO-4xLC breakout cables.
- QSFP+ ports on the core routing blades:
  - For 128 Gb FC inter-chassis links for connectivity between the DB400D or DB800D 32Gb FC Directors, customers can use 128 Gb (4x 32 Gb) FC QSFP+ SW optical transceivers for distances up to 100 meters on OM4 or up to 70 meters on OM3 50  $\mu$  MMF cables.
 

**Note:** ICL trunks are formed automatically with corresponding 32 Gbps ports on different QSFP+ transceivers (ICL trunks cannot be formed with the 4x 32 Gbps ports on the same QSFP+ transceiver), and the trunking license is not required.
  - For 64 Gb FC inter-chassis links for connectivity between the DB400D or DB800D 32Gb FC Directors and Brocade DCX 8510 Backbones, customers can use the following transceivers:
    - 128 Gb (4x 32 Gb) QSFP+ SWL v2 optical transceivers running at 4x 16 Gb speeds for distances up to 125 meters on OM4 or up to 100 meters on OM3 50  $\mu$  MMF cables.
    - 4x 16 Gb FC QSFP+ SWL optical transceivers for distances up to 100 meters on OM4 or up to 66 meters on OM3 50  $\mu$  MMF cables.
    - 4x 16 Gb FC QSFP+ LWL optical transceivers for distances up to 2 kilometers on parallel 9  $\mu$  SMF cables.
 

**Note:** ICL trunks are formed automatically with corresponding 16 Gbps ports on different QSFP+ transceivers (ICL trunks cannot be formed with the 4x 16 Gbps ports on the same QSFP+ transceiver), and the trunking license is not required.
- 1/10 GbE SFP+ and 40 GbE QSFP+ ports on extension blades allow connection to IP WANs and allow Fibre Channel and IP I/O traffic to pass through the IP WAN through extension tunnels.
  - For 1 GbE links, customers can use RJ-45 SFP transceivers with UTP cables up to 100 meters. Customers that need longer distances can use a 1000BASE-SX transceiver, which can drive distances up to 220 meters with 62.5  $\mu$  OM1 and up to 550 meters on 50  $\mu$  OM2 MMF cables, or the 1000BASE-LX transceivers that support distances up to 10 kilometers on 9  $\mu$  SMF cables.
  - For 10 GbE links, customers can use a 10GBASE-SR transceiver that supports distances up to 300 meters on OM3 or up to 400 meters on OM4 50  $\mu$  MMF cables. For longer distances, the 10GBASE-LR transceivers can support distances up to 10 kilometers on 9  $\mu$  SMF cables.
  - For 40 GbE links, customers can use the 40GBASE-SR4 QSFP+ transceivers for distances up to 100 meters on OM3 or up to 150 meters on OM4 50  $\mu$  MMF cables. For longer distances, the 40GBASE-LR4 transceivers can support distances up to 10 kilometers on 9  $\mu$  SMF cables. For extended distances, the 40GBASE-ER4 transceivers can support distances up to 40 kilometers on 9  $\mu$  SMF cables.
- 1 GbE RJ-45 management ports on control processor blades: Customers can use UTP cables for distances up to 100 meters.

The FC32-64 port blades come standard with 8x 128 Gb (4x 32 Gbps) SWL QSFP+ transceivers. The FC32-48 port blades come standard with or without 48x 32 Gb FC SWL SFP+ transceivers. The SX6 extension blades come standard with 16x 32 Gb FC SWL or LWL SFP+ transceivers. The optional ICL bundles include 8x or 16x 128 Gb FC or 64 Gb FC QSFP+ transceivers. Additional Fibre Channel or Ethernet SFP+ and QSFP+/QSFP28 transceivers can be ordered, if required.

The following table lists the supported SFP+ and QSFP+/QSFP28 transceiver options and optical cables.

Table 4. SFP+ and QSFP+/QSFP28 transceivers and optical cables

Description	Part number	Feature code	Maximum quantity supported						
			Per blade					Per chassis	
			FC32-48	FC32-64	SX6	CR32-4	CR32-8	DB400D	DB800D
<b>QSFP+ FC transceivers</b>									
Brocade 128Gb (4x32Gbps) SWL QSFP+ Transceiver v2	4M27A08820	B145	-	16	-	8	16	80	160
Brocade 128Gb (4x32Gbps) 2KM QSFP+ Transceiver	4M27A09986	B26T	-	16	-	8	16	80	160
Brocade 4x16Gb FC-Compliant SWL QSFP+ Transceiver	01KN805	AVGH	-	16	-	8	16	80	160
Brocade 4x16Gbps 2km LWL QSFP+ Transceiver	01KN809	AVGK	-	-	-	8	16	16	32
<b>QSFP+/QSFP28 FCoE transceivers</b>									
Brocade 100Gb (4x25GbE) QSFP28 SR4 FCoE Transceiver	4M27A09989	B26W	-	16	-	-	-	64	128
Brocade 40Gb (4x10GbE) QSFP+ SR4 FCoE Transceiver	4M27A09987	B26U	-	16	-	-	-	64	128
Brocade 40Gb QSFP+ SR4 FCoE Transceiver, BiDi	4M27A09988	B26V	-	16	-	-	-	64	128
<b>32 Gb FC SFP+ transceivers</b>									
Brocade 32Gb SWL SFP+ Transceiver	01KN789	AVGC	48	-	16	-	-	192	384
Brocade 32Gb SWL SFP+ Transceiver (8-pack)	01KN793	AVGD	6	-	2	-	-	24	48
Brocade 32Gb LWL SFP+ Transceiver	01KN795	AVGE	48	-	16	-	-	192	384
Brocade 32Gb LWL SFP+ Transceiver (8-pack)	01KN799	AVGF	6	-	2	-	-	24	48
<b>16 Gb FC SFP+ transceivers</b>									
Brocade 16Gb SWL SFP+ Optical Transceiver	88Y6393	A22R	48	-	16	-	-	192	384
Brocade 16Gb 10km LWL SFP+ Transceiver	00MY768	ASK2	48	-	16	-	-	192	384
Brocade 16Gb 25km ELWL SFP+ Transceiver	00MY770	ASK3	48	-	16	-	-	192	384
<b>10 Gb FC SFP+ transceivers</b>									
Brocade 10Gb FC SWL SFP+ Transceiver	00YH933	ATSY	48	-	16	-	-	192	384
Brocade 10Gb FC LWL SFP+ Transceiver	00YH929	ATSX	48	-	16	-	-	192	384
<b>40 Gb Ethernet QSFP+ transceivers</b>									
Brocade 40Gb QSFP+ SR4 Optical Transceiver	01KN813	AVGL	-	-	2	-	-	8	8
Brocade 40Gb QSFP+ LR4 Optical Transceiver	01KN817	AVGM	-	-	2	-	-	8	8
Brocade 40Gb QSFP+ ER4 Optical Transceiver	01KN821	AVGN	-	-	2	-	-	8	8
<b>10 Gb Ethernet SFP+ transceivers</b>									
Brocade 10Gb SFP+ SR Optical Transceiver	49Y4216	0069	-	-	16	-	-	64	64
Brocade 10Gb SFP+ LR Optical Transceiver	95Y0540	A3AB	-	-	16	-	-	64	64
<b>1 Gb Ethernet SFP transceivers</b>									
Brocade 1000BASE-SX SFP Transceiver	01KN825	AVGP	-	-	16	-	-	64	64
Brocade 1000BASE-LX SFP Transceiver	01KN829	AVGQ	-	-	16	-	-	64	64
Brocade 1000BASE-T SFP Transceiver	01KN833	AVGR	-	-	16	-	-	64	64
<b>Optical cables for 128 Gb v2 / 4x16 Gb FC SWL, 40 Gb SR4 FCoE, and 40 GbE SR4 QSFP+ transceivers</b>									
Lenovo 10m QSFP+ MPO-MPO OM3 MMF Cable	00VX003	AT2U	-	16	2	8	16	80	160
Lenovo 30m QSFP+ MPO-MPO OM3 MMF Cable	00VX005	AT2V	-	16	2	8	16	80	160
<b>Optical breakout cables for 128 Gb v2 / 4x16 Gb FC SWL, 100 Gb / 40 Gb SR4 FCoE, and 40 GbE SR4 transceivers</b>									
Lenovo 1m MPO-4xLC OM3 MMF Breakout Cable	00FM412	A5UA	-	16	2	8	16	80	160
Lenovo 3m MPO-4xLC OM3 MMF Breakout Cable	00FM413	A5UB	-	16	2	8	16	80	160

Description	Part number	Feature code	Maximum quantity supported							
			Per blade					Per chassis		
			FC32-48	FC32-64	SX6	CR32-4	CR32-8	DB400D	DB800D	
Lenovo 5m MPO-4xLC OM3 MMF Breakout Cable	00FM414	A5UC	-	16	2	8	16	80	160	
OM3 optical cables for 16 Gb FC SWL, 32 Gb FC SWL, 40 Gb SR4 FCoE BiDi, and 1/10 GbE SFP+ transceivers										
Lenovo 0.5m LC-LC OM3 MMF Cable	00MN499	ASR5	48	16	16	-	-	192	384	
Lenovo 1m LC-LC OM3 MMF Cable	00MN502	ASR6	48	16	16	-	-	192	384	
Lenovo 3m LC-LC OM3 MMF Cable	00MN505	ASR7	48	16	16	-	-	192	384	
Lenovo 5m LC-LC OM3 MMF Cable	00MN508	ASR8	48	16	16	-	-	192	384	
Lenovo 10m LC-LC OM3 MMF Cable	00MN511	ASR9	48	16	16	-	-	192	384	
Lenovo 15m LC-LC OM3 MMF Cable	00MN514	ASRA	48	16	16	-	-	192	384	
Lenovo 25m LC-LC OM3 MMF Cable	00MN517	ASRB	48	16	16	-	-	192	384	
Lenovo 30m LC-LC OM3 MMF Cable	00MN520	ASRC	48	16	16	-	-	192	384	
OM4 optical cables for 16 Gb FC SWL, 32 Gb FC SWL, 40 Gb SR4 FCoE BiDi, and 1/10 GbE SFP+ transceivers										
Lenovo 0.5m LC-LC OM4 MMF Cable	4Z57A10845	B2P9	48	16	16	-	-	192	384	
Lenovo 1m LC-LC OM4 MMF Cable	4Z57A10846	B2PA	48	16	16	-	-	192	384	
Lenovo 3m LC-LC OM4 MMF Cable	4Z57A10847	B2PB	48	16	16	-	-	192	384	
Lenovo 5m LC-LC OM4 MMF Cable	4Z57A10848	B2PC	48	16	16	-	-	192	384	
Lenovo 10m LC-LC OM4 MMF Cable	4Z57A10849	B2PD	48	16	16	-	-	192	384	
Lenovo 15m LC-LC OM4 MMF Cable	4Z57A10850	B2PE	48	16	16	-	-	192	384	
Lenovo 25m LC-LC OM4 MMF Cable	4Z57A10851	B2PF	48	16	16	-	-	192	384	
Lenovo 30m LC-LC OM4 MMF Cable	4Z57A10852	B2PG	48	16	16	-	-	192	384	
UTP Category 6 cables (Green) for 1 GbE RJ-45 SFP transceivers and management ports										
0.75m CAT6 Green Cable	00WE123	AVFW	-	-	16	2	2	68	68	
1.0m CAT6 Green Cable	00WE127	AVFX	-	-	16	2	2	68	68	
1.25m CAT6 Green Cable	00WE131	AVFY	-	-	16	2	2	68	68	
1.5m CAT6 Green Cable	00WE135	AVFZ	-	-	16	2	2	68	68	
3m CAT6 Green Cable	00WE139	AVG0	-	-	16	2	2	68	68	
10m CAT6 Green Cable	90Y3718	A1MT	-	-	16	2	2	68	68	
25m CAT6 Green Cable	90Y3727	A1MW	-	-	16	2	2	68	68	
UTP Category 6 cables (Blue) for 1 GbE RJ-45 SFP transceivers and management ports										
0.6m Blue Cat5e Cable	40K5679	3801	-	-	16	2	2	68	68	
1.5m Blue Cat5e Cable	40K8785	3802	-	-	16	2	2	68	68	
3m Blue Cat5e Cable	40K5581	3803	-	-	16	2	2	68	68	
10m Blue Cat5e Cable	40K8927	3804	-	-	16	2	2	68	68	
25m Blue Cat5e Cable	40K8930	3805	-	-	16	2	2	68	68	

The following table lists the cabling requirements for the directors.

Table 5. DB400D and DB800D 32Gb FC SAN Director cabling requirements

Transceiver	Standard	Cable	Connector
<b>128 Gb (4x 32 Gb) Fibre Channel</b>			
128 Gb (4x 32 Gb) FC SWL QSFP+ v2 (4M27A08820)	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 Table 4). 850 nm 50 $\mu$ MPO-MPO MMF cable: <ul style="list-style-type: none"> <li>• 32GFC: Up to 100 m (OM4) or up to 70 m (OM3).</li> <li>• 16GFC: Up to 125 m (OM4) or up to 100 m (OM3).</li> </ul>	MPO
128 Gb (4x 32 Gb) FC 2km LWL QSFP+ (4M27A09986)	FC-PI-6	32GFC: 1310 nm 9 $\mu$ LC-LC SMF cable up to 2 km.	LC
<b>64 Gb (4x 16 Gb) Fibre Channel</b>			
4x 16 Gb FC SWL QSFP+ (01KN805)	FC-PI-5	Up to 30 m with MPO-MPO MMF cables or up to 5 m with MPO-4xLC MMF breakout cables supplied by Lenovo (see Table 4). 16GFC: 850 nm 50 $\mu$ MPO-MPO MMF cable up to 100 m (OM4) or up to 66 m (OM3).	MPO
4x 16 Gb FC LWL QSFP+ (01KN809)	FC-PI-5	16GFC: Parallel 1310 nm 9 $\mu$ MPO-MPO SMF cables up to 2 km.	MPO
<b>32 Gb Fibre Channel</b>			
32 Gb FC SWL SFP+ (01KN789, 01KN793)	FC-PI-6	Up to 30 m with LC-LC MMF cables supplied by Lenovo (see Table 4). 850 nm 50 $\mu$ LC-LC MMF cable: <ul style="list-style-type: none"> <li>• 32GFC: Up to 100 m (OM4) or up to 70 m (OM3).</li> <li>• 16GFC: Up to 125 m (OM4) or up to 100 m (OM3).</li> <li>• 8GFC: Up to 190 m (OM4) or up to 150 m (OM3).</li> </ul>	LC
32 Gb FC LWL SFP+ (01KN795, 01KN799)	FC-PI-6	32GFC, 16GFC, 8GFC: 1310 nm 9 $\mu$ SMF cable up to 10 km.	LC
<b>16 Gb Fibre Channel</b>			
16 Gb FC LWL SFP+ (00MY768)	FC-PI-5	1310 nm 9 $\mu$ SMF cable: <ul style="list-style-type: none"> <li>• 16GFC, 8GFC: Up to 10 km.</li> <li>• 4GFC: Up to 30 km.</li> </ul>	LC
16 Gb FC SWL SFP+ (88Y6393)	FC-PI-5	Up to 30 m with LC-LC MMF cables supplied by Lenovo (see Table 4). 850 nm 50 $\mu$ LC-LC MMF cable: <ul style="list-style-type: none"> <li>• 16GFC: Up to 125 m (OM4) or up to 100 m (OM3).</li> <li>• 8GFC: Up to 190 m (OM4) or up to 150 m (OM3).</li> <li>• 4GFC: Up to 400 m (OM4) or up to 380 m (OM3).</li> </ul>	LC
16 Gb FC ELWL SFP+ (00MY770)	FC-PI-5	16GFC: 1310 nm 9 $\mu$ SMF cable up to 25 km.	LC
<b>10 Gb Fibre Channel</b>			
10 Gb FC SWL SFP+ (00YH933)	FC-10GFC	10GFC: 850 nm 50 $\mu$ LC-LC MMF cable up to 550 m (OM4) or up to 300 m (OM3).	LC
10 Gb FC LWL SFP+ (00YH929)	FC-10GFC	10GFC: 1310 nm 9 $\mu$ SMF cable up to 10 km.	LC
<b>100 Gb (4x 25 Gb) Fibre Channel over Ethernet</b>			
100Gb (4x25Gb) SR4 QSFP28 (4M27A09989)	100GBASE-SR4	Up to 5 m with MPO-4xLC MMF breakout cables supplied by Lenovo (see Table 4). 850 nm 50 $\mu$ MPO-4xLC MMF breakout cable up to 70 m (OM3) or up to 100 m (OM4).	MPO

Transceiver	Standard	Cable	Connector
<b>40 Gb Fibre Channel over Ethernet</b>			
40Gb (4x10Gb) SR4 QSFP+ (4M27A09987)	40GBASE-SR4	Up to 30 m with MPO-MPO MMF cables or up to 5 m with MPO-4xLC MMF breakout cables supplied by Lenovo (see Table 4). 850 nm 50 $\mu$ MPO-MPO MMF cable or MPO-4xLC MMF breakout cable up to 100 m (OM3) or up to 150 m (OM4).	MPO
40Gb SR QSFP+ BiDi (4M27A09988)	40GBASE-SR BiDi	Up to 30 m with LC-LC MMF cables supplied by Lenovo (see Table 4). 850 nm 50 $\mu$ LC-LC MMF cable up to 100 m (OM3) or up to 150 m (OM4).	LC
<b>40 Gb Ethernet</b>			
40 GbE SR4 QSFP+ (01KN813)	40GBASE-SR4	Up to 30 m with MPO-MPO MMF cables or up to 5 m with MPO-4xLC MMF breakout cables supplied by Lenovo (see Table 4). 850 nm 50 $\mu$ MPO-MPO MMF cable or MPO-4xLC MMF breakout cable up to 100 m (OM3) or up to 150 m (OM4).	MPO
40 GbE LR4 QSFP+ (01KN817)	40GBASE-LR4	1310 nm 9 $\mu$ SMF cable up to 10 km.	LC
40 GbE ER4 QSFP+ (01KN821)	40GBASE-ER4	1310 nm 9 $\mu$ SMF cable up to 40 km.	LC
<b>10 Gb Ethernet</b>			
10 GbE SR SFP+ (49Y4216)	10GBASE-SR	Up to 30 m with LC-LC MMF cables supplied by Lenovo (see Table 4). 850 nm 50 $\mu$ LC-LC MMF cable up to 400 m (OM4) or up to 300 m (OM3).	LC
10 GbE LR SFP+ (95Y0540)	10GBASE-LR	1310 nm 9 $\mu$ SMF cable up to 10 km.	LC
<b>1 Gb Ethernet</b>			
1 GbE SX SFP (01KN825)	1000BASE-SX	Up to 30 m with LC-LC MMF cables supplied by Lenovo (see Table 4). 850 nm 50 $\mu$ LC-LC MMF cable up to 550 m.	LC
1 GbE LX SFP (01KN829)	1000BASE-LX	1310 nm 9 $\mu$ SMF cable up to 10 km.	LC
1 GbE RJ-45 SFP (01KN833)	1000BASE-T	UTP Category 5, 5E, or 6 up to 100 meters.	RJ-45
<b>Management ports</b>			
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

The DB400D and DB800D 32Gb FC SAN Directors come standard with the following features (based on Fabric OS 8.2):

- Advanced Fabric Services
  - Full Fabric mode: Enables high performance 16 Gb or 32 Gb switching in multi-switch fabric.
  - Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning)
  - Dynamic fabric provisioning (DFP): Fabric-assigned port World Wide Names (FA-PWWNs).
  - Dynamic path selection (DPS): Distributes input traffic across multiple paths proportionally to the bandwidth of each path.
  - Dynamic load sharing (DLS): Distributes traffic across multiple equal paths between switches.
  - Fabric Shortest Path First (FSPF)
  - Buffer-to-Buffer (BB) credit flow control
  - Buffer credit recovery
  - Forward error correction (FEC)
  - Fabric Device Management Interface (FDMI)
  - Frame order delivery
  - Frame redirection
  - FC login services
  - Registered State Change Notification (RSCN)
  - Reliable Commit Service (RCS)
  - Simple Name Server (SNS)
  - Fibre Channel Authentication Protocol (FCAP) switch authentication
  - Management Server (MS): Assists in the auto-discovery of switch-based fabrics.
  - In-flight compression on up to 4 ports
  - In-flight encryption on up to 4 ports
  - Integrated 10Gb FC feature: Allows 10 Gb FC operations for metro connectivity.
  - ISL Trunking: Allows frame-based consolidation of up to 8 inter-switch links (ISLs) into fault-tolerant and load-balanced trunks with bandwidth of up to 256 Gbps.
  - Port fencing
  - Fabric Vision
    - Monitoring and Alerting Policy Suite (MAPS): Provides a policy-based, fabric-wide threshold monitoring and alerting tool.
    - Flow Vision: Identifies, monitors, and analyzes specific application flows.
    - VM Insight: Seamlessly monitors health and performance of individual Virtual Machines (VMs) to quickly identify abnormal VM behavior and enable administrators to proactively facilitate troubleshooting and fault isolation, helping to ensure performance and operational stability.
    - IO Insight: Proactively monitors I/O performance and behavior to gain deep insight into issues and ensure service levels by non-disruptively and non-intrusively gathering I/O statistics for storage traffic and applying this information within a policy-based monitoring and alerting suite to configure thresholds and alarms.
    - Fabric Performance Impact (FPI) Monitoring: Leverages predefined MAPS policies to automatically identify and isolate devices that cause network performance issues by detecting different latency severity levels, and to alert administrators.
  - Extended Fabric: Extends Fibre Channel SANs beyond 10 km distance limitations for replication and backup at full bandwidth.
  - Control Unit Port (CUP): Provides an in-band management interface that the FICON host (Mainframe) can use for managing and monitoring the FC SAN switches.  
**Note:** FICON CUP is not available on the FC32-64 port blade.
- Adaptive Networking
  - Traffic isolation zoning (TIZ): Creates a dedicated path for traffic flowing from a specific set of source ports (F\_Ports).
  - Quality of Service (QoS): SID/DID pair traffic prioritization (high, medium, low).

- Virtualization
  - N\_Port ID virtualization (NPIV): Enables a single FC port to appear as multiple, distinct ports with separate port identification within the fabric.
  - Virtual Fabrics (Logical Switch, Logical Fabric): Allows SAN design and management at the granularity of a port.
- Fibre Channel over Ethernet
  - FC-BB5 compliant Fibre Channel Forwarder (FCF)
  - FCoE host to FC storage connectivity
  - Encapsulation of Fibre Channel frames in FCoE Ethernet frames (FC-to-FCoE)
  - Extraction of Fibre Channel frames from FCoE Ethernet frames (FCoE-to-FC)
  - FCoE devices login
  - FCoE link aggregation
  - Converged Enhanced Ethernet (CEE)
    - Priority-based Flow Control (PFC): IEEE 802.1Qbb
    - Enhanced Transmission Selection (ETS): IEEE 802.1Qaz
    - Data Center Bridging eXchange (DCBX): IEEE 802.1AB
- Fibre Channel over IP and IP Extension
  - IP WAN infrastructure for connecting Fibre Channel and IP fabrics
  - 802.1Q VLAN tagging
  - Static link aggregation (trunking)
  - 802.1p Class of Service (CoS) and IP DSCP traffic classification and processing
  - IPv4 and IPv6 addressing
  - Fast Write
  - Tape Pipelining
  - Quality of Service
  - Adaptive Rate Limiting (ARL)
  - Traffic Control List (TCL) to manage and route IP flows
  - Ethernet jumbo frames up to 9,216 bytes
- Management
  - IPv4 and IPv6 addressing
  - Firmware upload and download
  - Hot code load and activation
  - Network Time Protocol (NTP) v3
  - Command line interface (CLI)
  - Web Tools (HTTP/HTTPS)
  - Brocade SANnav Management Portal and SANnav Global View (purchased separately)
  - SNMPv1, SNMPv3, and MIBs
  - SMI-S compliant
  - Syslog
  - REST API
- Security
  - Local switch user accounts
  - LDAP, RADIUS, TACACS+ user authentication
  - Role-based access control (RBAC)
  - IP Security (IPsec)
  - IP filtering
  - HTTPS
  - Secure Copy (SCP)
  - Secure RPC
  - Secure FTP (SFTP)
  - Secure Shell (SSH) v2
  - Secure Sockets Layer (SSL)
  - Federal Information Processing Standards (FIPS) 140-2 L2-compliant

- Advanced Diagnostic Tools
  - Power-on self-test (POST)
  - Event logging
  - Environmental monitoring
  - FCping
  - Pathinfo (FC traceroute)
  - Non-disruptive daemon restart
  - Flow mirroring
  - RAS trace logging
  - ClearLink Diagnostics with Diagnostic Port (D\_Port)
  - SFP and cable health assessment
  - Power monitoring
  - Rolling Reboot Detection (RRD)

The following optional features are available for the Lenovo FC SAN Directors:

- UltraScale Inter-Chassis Link (ICL): Allows to interconnect up to 9 (full-mesh) or 12 (core-edge) ThinkSystem DB400D or DB800D, or a combination of both, or connect ThinkSystem DB400D or DB800D to Brocade DCX 8510 Backbones by using the QSFP+ ports on the core routing blades.
- Integrated Routing: The FC-FC routing service provides Fibre Channel routing between two or more fabrics without merging those fabrics.

The following table lists ordering information for the optional features and bundles for the DB400D and DB800D 32Gb FC SAN Directors Models HC1 and HC2.

Table 7. Optional features and bundles for DB400D and DB800D Models HC1 and HC2

Description	Part number	Feature code	Maximum quantity supported
<b>Electronic authorization bundles and licenses for ThinkSystem DB400D and DB800D</b>			
Lenovo DB400D/DB800D Integrated Routing	7S0C000KWW	B3EK	1
<b>License and transceiver bundles for ThinkSystem DB400D</b>			
Gen 6 ICL SW 8-port License + 8x (4x32Gbps) QSFPs V2 for DB400D	4M27A14149	B5AC	2
Gen 6 ICL SW 8-port License + 8x (4x32Gbps) 2km QSFP for DB400D	4M27A14152	B5AF	2
Gen 5 ICL SW 8-port License + 8x (4x16Gbps) 2km QSFPs for DB400D	4M27A14150	B5AD	2
<b>License and transceiver bundles for ThinkSystem DB800D</b>			
Gen 6 ICL 16-port License + 16x (4x32Gbps) QSFPs V2 for DB800D	4M27A14148	B5AB	2
Gen 6 ICL SW 16-port License + 8x (4x32Gbps) 2km QSFP for DB800D	4M27A14151	B5AE	2
Gen 5 ICL 16-port License + 8x (4x16Gbps) 2km QSFPs for DB800D	4M27A14147	B5AA	2

Each Inter-Chassis Link (ICL) bundle includes Port on Demand (POD) licenses to activate a half of available QSFP+ ports on both CR blades in the chassis, that is, each ICL license activates four ports on each CR32-4 blade in the DB400D chassis and eight ports on each CR32-8 blade in the DB800D chassis.

Each ICL bundle also includes 8 (the DB400D bundles and the DB800D 2km QSFPs bundle) or 16 (the DB800D bundles excluding the 2km QSFPs bundles) QSFP+ transceivers to populate the activated ports.

Firmware entitlement is included with the DB400D and DB800D 32Gb FC SAN Directors and provides 3-year (DB400D and DB800D Models HC1) or 1-year (DB400D and DB800D Models HC2) firmware support. The options to extend the entitlement up to 7 years in 1-year or 2-year increments are available for DB400D Model HC1 and DB800D Model HC1. The firmware entitlement is included in the warranty service upgrades for DB400D Model HC2 and DB800D Model HC2.

The Integrated Routing feature (7S0C000KWW) comes with its own 1-year firmware support entitlement. The options to extend entitlement for additional years of firmware support for the Integrated Routing feature are listed in the following table.

Table 8. Firmware support extension options for Integrated Routing

Description	Part number	Feature code
Lenovo DB400D/DB800D Integrated Routing Support Extension, 2-Years	7S0C000SWW	S0FA
Lenovo DB400D/DB800D Integrated Routing Support Extension, 4-Years	7S0C000ZWW	S0FH

The firmware entitlement and support extension options for the DB400D Model HC2 and DB800D Model HC2 are listed in the following table.

Table 9. Firmware entitlement extension options for DB400D Model HC2 and DB800D Model HC2

Description	Part number	Feature code
Firmware entitlement and support extension options for ThinkSystem DB400D Model HC2		
DB400D FC SAN FW Renewal, 1yr	4ZN7A08476	B0R4
DB400D FC SAN FW Renewal, 2yr	4ZN7A08477	B0R5
Firmware entitlement and support extension options for ThinkSystem DB800D Model HC2		
DB800D FC SAN FW Renewal, 1yr	4ZN7A08478	B0R6
DB800D FC SAN FW Renewal, 2yr	4ZN7A08479	B0R7

## Management software

Lenovo offers the following optional fabric management tools for Brocade-based SAN infrastructures:

- [Brocade SANnav Management Portal and SANnav Global View](#)

### Brocade SANnav Management Portal and SANnav Global View

Lenovo offers optional Brocade SANnav Management Portal and SANnav Global View 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 editions:

- 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 B300, B6505, B6510, DB610S, DB620S, DB400D, DB800D, and FC5022.

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 six 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.

Table 10. SANnav Management Portal and SANnav Global View licenses

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

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

## Fibre Channel standards

The DB400D and DB800D 32Gb FC SAN Directors support the following FC standards:

- 10GFC INCITS 364-2003 + Amendment 1
- FA FCMGMT-MIB
- FC-AL-2 INCITS 332-1999
- FC-BB-2 INCITS 372-2003
- FC-BB-3 INCITS 414-2006
- FC-BB-4 INCITS 419-2008
- FC-BB-5 INCITS 462-2010 + Amendment 1
- FC-BB-6 INCITS 509-2014
- FC-DA INCITS TR-36-2004
- FC-DA-2 INCITS TR-49-2012
- FC-FS INCITS 373-2003
- FC-FS-2 ANSI/INCITS 424-2006
- FC-FS-3 INCITS 470-2011
- FC-FS-4 INCITS 488 rev 1.41
- FC-GS-4 ANSI INCITS 387-2004
- FC-GS-5 ANSI INCITS 427-2007
- FC-GS-6 INCITS 463-2010
- FC-GS-7 INCITS 510
- FC-GS-8 INCITS 548 rev 11.01
- FC-IFR INCITS 475-2011
- FC-LS INCITS 433: 2007
- FC-LS-2 INCITS 477-2011
- FC-LS-3 INCITS 487
- FC-MI-2 ANSI/INCITS TR-39-2005
- FC-MI-3 INCITS TR-48-2012
- FCP ANSI X3.269-1996
- FCP-2 INCITS 350-2003
- FCP-3 INCITS 416-2006
- FCP-4 INCITS 481-2012
- FC-PI-3 INCITS 460-2012
- FC-PI-4 INCITS 450-2009
- FC-PI-5 INCITS 449-2011

- FC-PI-6 INCITS 512-2015
- FC-SB ANSI X3.271-1996
- FC-SB-2 INCITS 374-2001
- FC-SB-3 INCITS 374-2003 + Amendment 1
- FC-SB-4 INCITS 466-2011
- FC-SB-5 INCITS 485-2014
- FC-SB-6 INCITS 544
- FC-SP INCITS 426-2007
- FC-SP-2 INCITS 496-2012 + Amendment 1
- FC-SW-3 INCITS 384-2004
- FC-SW-4 INCITS 418-2006
- FC-SW-5 INCITS 461-2010
- FC-SW-6 INCITS 511
- FC-SW-7 INCITS 547 rev 1.04
- FC-TAPE INCITS TR-24-1999
- FC-VI INCITS 357-2002
- MIB-FA INCITS TR-32-2003
- RFC 2837 Fabric Element MIB
- RFC 4338 Transmission of IPv6, IPv4, and ARP over FC
- SNIA Storage Management Initiative Specification (SMI-S) Version 1.03 ISO standard IS24775-2006 (replaces ANSI INCITS 388: 2004)
- SNIA Storage Management Initiative Specification Version 1.1
- SNIA Storage Management Initiative Specification Version 1.2
- SNIA Storage Management Initiative Specification Version 1.4
- SNIA Storage Management Initiative Specification Version 1.5
- SNIA Storage Management Initiative Specification Version 1.6

## **Ethernet standards**

The DB400D and DB800D 32Gb FC SAN 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

## Cooling

The DB400D and DB800D 32Gb FC SAN Directors ship without cooling modules (fan assemblies); the cooling modules must be ordered together with the ThinkSystem DB400D and DB800D. Each cooling module has two integrated fans that provide non-port side air intake.

Two cooling modules are required for the ThinkSystem DB400D, and three cooling modules are required for the ThinkSystem DB800D. Cooling modules provide N + 1 fan redundancy (3 + 1 for the DB400D; 5 + 1 for the DB800D), and the device can continue operation while one fan assembly is replaced if the fan assembly is replaced immediately.

The following table lists the cooling modules for the DB400D and DB800D 32Gb FC SAN Directors.

Table 13. Power supplies

Description	Part number	Feature code	Quantity	
			DB400D	DB800D
FC SAN Director Fan Tray (Non-port side Intake for DB400D/DB800D)	01KN895	AVGY	2	3

## Power supplies and cables

The DB400D and DB800D 32Gb FC SAN Directors ship without power supplies; at least a minimum required quantity of the power supplies must be ordered together with the ThinkSystem DB400D and DB800D. Two power supplies are required for the ThinkSystem DB400D, and a minimum of three power supplies is required for the ThinkSystem DB800D. The fourth power supply can be added to the ThinkSystem DB800D to provide additional power redundancy in certain configurations.

The power supplies are hot-swap 1450 W (100 - 120 V AC) / 2870 W (200 - 240 V AC), 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 power supplies for the DB400D and DB800D 32Gb FC SAN Directors.

Table 14. Power supplies

Description	Part number	Feature code	Quantity (min / max)	
			DB400D	DB800D
FC SAN Director PSU (Non-port side Intake for DB400D/DB800D)	01KN892	AVGX	2 / 2	3 / 4*

\* In most scenarios, it is recommended to have 4 power supplies installed in the DB800D due to typical dual-PDU configurations with redundant power sources.

The power supply redundancy depends on the blade and port configuration and the AC input voltage level, as shown in the following table.

Table 15. Power supply redundancy

Model	Power supply quantity	Configured ports	Redundancy	
			100 - 120 V AC	200 - 240 V AC
DB400D	2	Any combination of ports and QSFP ICLs	No	N + N
DB800D	3	144x 32 Gbps ports and QSFP ICLs	N+1	N + 2
		Any other combination of ports and QSFP ICLs	No	N + 1
	4	144x 32 Gbps ports and QSFP ICLs	N+N	N + 3
		Any other combination of ports and QSFP ICLs	No	N + N

The FC SAN directors come standard without power cords; up to four rack power cables or line cords should be ordered for the FC SAN Directors depending on the quantity of power supplies.

The following table lists power cords for the DB400D and DB800D 32Gb FC SAN Directors.

Table 16. Power cord options

Description	Part number	Feature code
<b>Rack power cables</b>		
2.5m, 16A/125-250V, C19 to IEC 320-C20 Rack Power Cable	39Y7916	6252
<b>Line cords</b>		
Argentina 4.3m, 16A/250V, C19 to IRAM 2073 Line Cord	40K9777	6276
Brazil 4.3m, 16A/250V, C19 to NBR 14136 Line Cord	40K9775	6277
China 4.3m, 16A/250V, C19 to GB2099.1 Line Cord	40K9774	6288
India 4.3m, 16A/250V, C19 to IS6538 Line Cord	40K9776	6285
Israel 4.3m, 16A/250V, C19 to SI 32 Line Cord	40K9771	6282
Italy 4.3m, 16A/250V, C19 to CEI 23-16 Line Cord	40K9768	6281
Japan 4.3m, 15A/100V, C19 to JIS C-8303 Line Cord	41Y9232	6290
Japan 4.3m, 15A/200V, C19 to JIS C-8303 Line Cord	41Y9233	6291
Korea 4.3m, 15A/250V, C19 to KSC 8305 Line Cord	41Y9231	6289
South Africa 4.3m, 16A/250V, C19 to SABS 164 Line Cord	40K9770	6280
Switzerland 4.3m, 16A/250V, C19 to SEV 1011 Line Cord	81Y2391	6549
Taiwan 4.3m, 16A/125V, C19 to CNS 10917-3 Line Cord	41Y9229	6286
Taiwan 4.3m, 16A/250V, C19 to CNS 10917-3 Line Cord	41Y9230	6287
United Kingdom 4.3m, 13A/250V, C19 to BS 1363/A Line Cord	40K9767	6278
United States 4.3m, 15A/125V, C19 to NEMA 5-15P Line Cord	4L67A08372	B0RV
United States 4.3m, 15A/250V, C19 to NEMA 6-15P Line Cord	00D7197	A1NV

## Rack installation

The DB400D and DB800D 32Gb FC SAN Directors come standard with the adjustable 27" to 31" rack mount kits that can be used for 4-post rack installations. The ThinkSystem DB400D also supports the optional Airflow Diversion Kits that allow to divert the airflow from the side air vent to the port side. In addition, the Lenovo DB800D supports 22" rack mount kit for specific racks.

If required, the Lenovo FC SAN Directors can be mounted in a 2-post rack cabinet by using the optional mid-mount rack kits.

The following table lists rack-mount options for the DB400D and DB800D 32Gb FC SAN Directors.

Table 17. Rack-mount options

Description	Part number	Feature code	Maximum quantity supported
<b>ThinkSystem DB400D rack-mount options</b>			
Lenovo DB400D mid-mount rack kit	01KN874	AVKB	1
27-31" Airflow Diversion Kit for Lenovo DB400D	01KN877	AVKC	1*
18-24" Airflow Diversion Kit for Lenovo DB400D	01KN880	AVKD	1*
<b>ThinkSystem DB800D rack-mount options</b>			
Lenovo DB800D 22" rack mount kit	01KN883	AVH1	1
Lenovo DB800D mid-mount rack kit	01KN886	AVH2	1

\* 27-31" and 18-24" Airflow Diversion Kits are mutually exclusive. Only one of these kits should be ordered, depending on the depth of the rack cabinet.



The optional airflow diversion kit for the DB400D 32Gb FC Director is shown in the following figure.

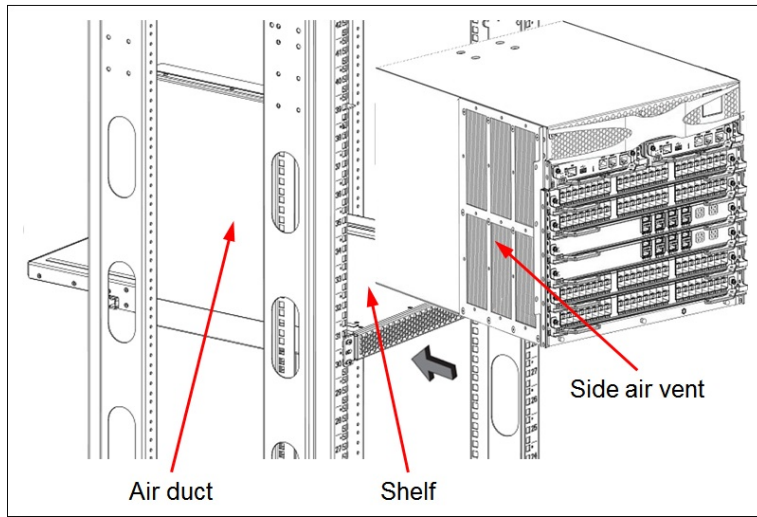


Figure 9. DB400D Airflow Diversion Kit

The optional mid-mount rack kits for the DB400D and DB800D 32Gb FC SAN Directors are shown in the following figure.

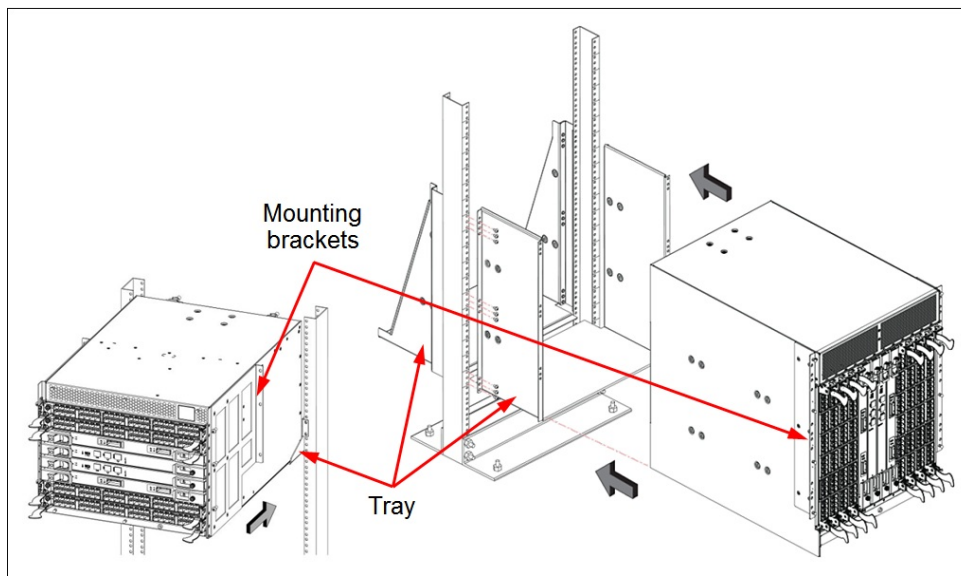


Figure 10. ThinkSystem DB400D (Left) and DB800D (Right) Mid-mount Rack Kits

In addition, in order for the DB400D and DB800D 32Gb FC SAN Directors to meet FIPS 140-2 Level 2 Physical Security requirements the tamper-evident seals must be installed (see the following table for ordering information).

Table 18. Tamper-evident security seals

Description	Part number	Feature code	Maximum quantity supported
Brocade FIPS 140-2 High Security Labels and Seals	01KN785	AVGB	1

## Physical specifications

The DB400D and DB800D 32Gb FC SAN Directors have the following dimensions and weight (approximate):

- Height:
  - DB400D: 345 mm (13.6 in.)
  - DB800D: 612 mm (24.1 in.)
- Width: 437 mm (17.2 in.)
- Depth: 611 mm (24.0 in.)
- Weight:
  - DB400D:
    - Empty: 24.5 kg (54.0 lb)
    - Fully configured: 69.0 kg (152.0 lb)
  - DB800D:
    - Empty: 35.6 kg (78.5 lb)
    - Fully configured: 145.8 kg (321.5 lb)

## Operating environment

The DB400D and DB800D 32Gb FC SAN Directors are supported in the following environment:

- Air temperature:
  - Operating: 0°C to 40°C (32°F to 104°F)
  - Non-operating: -25°C to +70°C (-13°F to 158°F)
- Maximum altitude:
  - Operating: 3,000 m (9,842 ft)
  - Non-operating: 12,000 m (39,370 ft)
- Humidity:
  - Operating: 5% to 93% non-condensing with 10% per hour maximum rate of change
  - Non-operating: 10% to 93% non-condensing
- Electrical power:
  - Voltage range: 100 V AC - 240 V AC (nominal)
  - Frequency: 50 Hz / 60 Hz (nominal)
  - Power consumption:
    - DB400D:
      - Idle: 840 watts
      - Typical: 1407 watts (FC32-48) / 1548 watts (FC32-64)
      - Maximum: 2438 watts (FC32-48) / 2953 watts (FC32-64)
    - DB800D:
      - Idle: 1515 watts
      - Typical: 2647 watts (FC32-48) / 2933 watts (FC32-64)
      - Maximum: 4339 watts (FC32-48) / 5380 watts (FC32-64)
- Heat dissipation:
  - DB400D:
    - Idle: 2867 BTU per hour
    - Typical: 4802 BTU per hour (FC32-48) / 5283 BTU per hour (FC32-64)
    - Maximum: 8322 BTU per hour (FC32-48) / 10049 BTU per hour (FC32-64)
  - DB800D:
    - Idle: 5171 BTU per hour
    - Typical: 9034 BTU per hour (FC32-48) / 10010 BTU per hour (FC32-64)
    - Maximum: 14810 BTU per hour (FC32-48) / 18362 BTU per hour (FC32-64)
- Acoustical noise emission:
  - DB400D: 64.2 dB
  - DB800D: 68.2 dB

## Warranty and support

The DB400D and DB800D 32Gb FC SAN Directors have a one-year customer-replaceable unit (CRU) limited warranty with standard call center support during normal business hours and 9x5 Next Business Day Parts Delivered.

Lenovo's additional support services provide a sophisticated, unified support structure for a customer's data center, with an experience consistently ranked number one in customer satisfaction worldwide.

The following Lenovo support services are available:

- **Premier Support** provides a Lenovo-owned customer experience and delivers direct access to technicians skilled in hardware, software, and advanced troubleshooting, in addition to the following capabilities:
  - Direct technician-to-technician access through a dedicated phone line.
  - 24x7x365 remote support.
  - Single point of contact service.
  - End to end case management.
  - 3rd Party collaborative software support.
  - Online case tools and live chat support.
  - On-demand remote system analysis.
- **Warranty Upgrades (Preconfigured Support)** are available to meet the on-site response time targets that match the criticality of your systems:
  - 1, 3, or 5 years of warranty service coverage.
  - 1-year or 2-year post-warranty extensions.
  - **Foundation Service:** 9x5 service coverage with next business day onsite response.
  - **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select regions).
  - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select regions).
- **Managed Services**  
Lenovo Managed Services provide continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of a customer's 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 and operating system device driver levels, and software as needed. Lenovo will also maintain records of latest patches, critical updates, and firmware levels, to ensure customer's systems are providing business value through optimized performance.

- **Technical Account Management (TAM)**  
A Lenovo Technical Account Manager helps customers optimize operations of their data centers based on a deep understanding of customer's business. Customers gain direct access to a Lenovo TAM, who serves as their single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. Also, a TAM helps proactively make service recommendations and manage service relationship with Lenovo to make certain that customer's needs are met.
- **Health Check**  
Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that customer systems and business are always running at their best. Health Check supports Lenovo-branded server, storage, and networking devices, as well as select Lenovo-supported products from other vendors that are sold by Lenovo or a Lenovo-Authorized Reseller.

Some regions might have different warranty terms and conditions than the standard warranty. This is due to local business practices or laws in the specific region. Local service teams can assist in explaining region-specific terms when needed. Examples of region-specific warranty terms are second or longer business day parts delivery or parts-only base warranty.

If warranty terms and conditions include onsite labor for repair or replacement of parts, Lenovo will dispatch a service technician to the customer site to perform the replacement. Onsite labor under base warranty is limited to labor for replacement of parts that have been determined to be field-replaceable units (FRUs). Parts that are determined to be customer-replaceable units (CRUs) do not include onsite labor under base warranty.

If warranty terms include parts-only base warranty, Lenovo is responsible for delivering only replacement parts that are under base warranty (including FRUs) that will be sent to a requested location for self-service. Parts-only service does not include a service technician being dispatched onsite. Parts must be changed at customer's own cost and labor and defective parts must be returned following the instructions supplied with the spare parts.

Lenovo support services are region-specific. Not all support services are available in every region. For information about Lenovo support services that are available in a specific region, refer to the following resources:

- Service part numbers in Data Center Solution Configurator (DCSC):  
<http://dcsc.lenovo.com/#/services>
- Lenovo Services Availability Locator  
<https://lenovolocator.com/>

For service definitions, region-specific details, and service limitations, refer to the following documents:

- Lenovo Statement of Limited Warranty for Data Center Group (DCG) Servers and System Storage  
<http://pcsupport.lenovo.com/us/en/solutions/ht503310>
- Lenovo Data Center Services Agreement  
<http://support.lenovo.com/us/en/solutions/ht116628>

## Services

Lenovo Services is a dedicated partner to customer success. Lenovo's goal for customers is to reduce capital outlays, mitigate IT risks, and accelerate time to productivity.

Here is a more in-depth look at what Lenovo can do for their customers:

- **Asset Recovery Services**  
Asset Recovery Services (ARS) helps customers recover the maximum value from their end-of-life equipment in a cost-effective and secure way. On top of simplifying the transition from old to new equipment, ARS mitigates environmental and data security risks associated with data center equipment disposal. Lenovo ARS is a cash-back solution for equipment based on its remaining market value, yielding maximum value from aging assets and lowering total cost of ownership for customers.
- **Assessment Services**  
An assessment helps solve customer IT challenges through an onsite, multi-day session with a Lenovo technology expert. Lenovo performs 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, no matter how large or small, get a better return on their IT investment and overcome challenges in the ever-changing technology landscape.
- **Design Services**  
Professional Services consultants perform infrastructure design and implementation planning to support customer's 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.
- **Basic Hardware Installation**  
Lenovo experts can seamlessly manage the physical installation of customer's server, storage, or networking hardware. Working at a time convenient for the customer (business hours or off shift), the technician will unpack and inspect the systems on customer site, install options, mount in a rack cabinet, connect to power and network, check and update firmware to the latest levels, verify operation, and dispose of the packaging, allowing customers to focus on other priorities.

- **Deployment Services**

When investing in new IT infrastructures, customers need to ensure that their business will see quick time to value with little to no disruption. Lenovo deployments are designed by development and engineering teams who know Lenovo products and solutions better than anyone else, and Lenovo technicians own the process from delivery to completion. Lenovo will conduct remote preparation and planning, configure and integrate systems, validate systems, verify and update appliance firmware, train on administrative tasks, and provide post-deployment documentation. Customer's IT teams leverage Lenovo skills to enable IT staff to transform with higher level roles and tasks.

- **Integration, Migration, and Expansion Services**

Integration, Migration, and Expansion Services allow to move existing physical and virtual workloads easily, or to determine technical requirements to support increased workloads while maximizing performance. These services include tuning, validation, and documenting ongoing run processes, and they leverage migration assessment planning documents to perform necessary migrations.

Some service options may not be available in every country. For more information about Lenovo service offerings that are available in a specific country or area, contact a local Lenovo sales representative or business partner.

## **Regulatory compliance**

The DB400D and DB800D 32Gb FC SAN Directors conform to the following regulations:

- Electromagnetic compatibility
  - FCC Part 15, Subpart B (Class A)
  - EN 55022 (CE mark) (Class A)
  - EN 55024 (CE mark)
  - ICES-003 (Canada) (Class A)
  - AS/NZ 55022 (Australia) (Class A)
  - VCCI (Japan) (Class A)
  - EN 61000-3-2
  - EN 61000-3-3
  - EN 61000-6-1
- Safety
  - UL/CSA 60950
  - EN 60950
  - IEC 60950
- Environmental: EU RoHS

## Fibre Channel SAN switches

The following table lists the FC SAN switches offered by Lenovo that can be used in FC SAN solutions.

**Note:** Information provided in this section is for ordering reference purposes only. End-to-end storage configuration support *must* be verified through the interoperability matrix for a particular storage system that can be found on the Lenovo Data Center Support web site:

<http://datacentersupport.lenovo.com>

Table 19. FC SAN switches

Description	Part number
<b>Rack-mount switches - 16 Gb FC</b>	
Lenovo ThinkSystem DB610S, 8 ports licensed, 8x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW	6559F2A
Lenovo ThinkSystem DB610S, ENT Bundle, 24 ports licensed, 24x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW	6559F1A
Lenovo ThinkSystem DB620S, 24 ports licensed, 24x 16Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW	6415J1A
Lenovo ThinkSystem DB620S, 24 ports licensed, 24x 16Gb SWL SFPs, 2 PS, Rail Kit (1yr)	6415L3A
<b>Rack-mount switches - 32 Gb FC</b>	
Lenovo ThinkSystem DB610S, 8 ports licensed, No SFPs, 1 PS, Rail Kit, 1Yr FW	6559F3A
Lenovo ThinkSystem DB620S, 24 ports licensed, No SFPs, 2 PS, Rail Kit, 1Yr FW	6415G3A
Lenovo ThinkSystem DB620S, 24 ports licensed, 24x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW	6415H11
Lenovo ThinkSystem DB620S, 24 ports licensed, 24x 32Gb SWL SFPs, 2 PS, Rail Kit (1yr)	6415L1A
Lenovo ThinkSystem DB620S, ENT Bundle, 48 ports licensed, 48x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW	6415H2A
Lenovo ThinkSystem DB620S, ENT Bundle, 48 ports licensed, 48x 32Gb SWL SFPs, 2 PS, Rail kit (1yr)	6415L2A
Lenovo ThinkSystem DB630S, 48 ports licensed, No SFPs, 2 PS, Rail Kit, 1Yr FW	7D1SA001WW
Lenovo ThinkSystem DB630S, 48 ports licensed, 48x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW	7D1SA002WW
Lenovo ThinkSystem DB630S, 48 ports licensed, 48x 32Gb SWL SFPs, 2 PS, Rail Kit (1yr)	7D1SA004WW
Lenovo ThinkSystem DB630S, ENT Bundle, 96 ports licensed, 96x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW	7D1SA003WW
Lenovo ThinkSystem DB630S, ENT Bundle, 96 ports licensed, 96x 32Gb SWL SFPs, 2 PS, Rail Kit (1yr)	7D1SA005WW
<b>Embedded switches - Gen 5 16 Gb FC</b>	
Lenovo Flex System FC5022 16Gb SAN Scalable Switch	88Y6374
Lenovo Flex System FC5022 24-port 16Gb SAN Scalable Switch (includes two 16 Gb SFPs)	00Y3324
Lenovo Flex System FC5022 24-port 16Gb ESB SAN Scalable Switch	90Y9356

For more information, see the list of Product Guides in the following categories:

- Rack-mount SAN switches:  
<http://lenovopress.com/storage/switches/rack#rt=product-guide>
- Blade Storage Modules:  
<http://lenovopress.com/servers/blades/storagemodule#rt=product-guide>

## External storage systems

The following table lists the external storage systems that are currently offered by Lenovo that can be used in Lenovo FC SAN storage solutions.

**Note:** Information provided in this section is for ordering reference purposes only. End-to-end storage configuration support *must* be verified through the interoperability matrix for a particular storage system that can be found on the Lenovo Data Center Support web site:

<http://datacentersupport.lenovo.com>

Table 20. External storage systems: DE Series

Description	Part number	
	Worldwide	Japan
Lenovo ThinkSystem DE2000H FC Hybrid Flash Array LFF (16 GB cache)	7Y70A002WW	7Y701002JP
Lenovo ThinkSystem DE2000H FC Hybrid Flash Array SFF (16 GB cache)	7Y71A001WW	7Y711004JP
Lenovo ThinkSystem DE4000H FC Hybrid Flash Array 4U60 (16 GB cache)	7Y77A001WW	7Y771001JP
Lenovo ThinkSystem DE4000H FC Hybrid Flash Array LFF (16 GB cache)	7Y74A001WW	7Y74A001JP
Lenovo ThinkSystem DE4000H FC Hybrid Flash Array SFF (16 GB cache)	7Y75A002WW	7Y75A002JP
Lenovo ThinkSystem DE4000F FC All Flash Array SFF (16 GB cache)	7Y76A001WW	7Y76A001JP
Lenovo ThinkSystem DE4000F FC All Flash Array SFF (64 GB cache)	7Y76A006WW	7Y76A009JP
Lenovo ThinkSystem DE6000H FC Hybrid Flash Array 4U60 (32 GB cache)	7Y80A001WW	7Y801001JP
Lenovo ThinkSystem DE6000H FC Hybrid Flash Array SFF (32 GB cache)	7Y78A001WW	7Y781001JP
Lenovo ThinkSystem DE6000F FC All Flash Array SFF (128 GB cache)	7Y79A001WW	7Y79A001JP

Table 21. External storage systems: DM Series

Description	Part number
ThinkSystem DM3000H Hybrid Storage Array (2U12 LFF, CTO only)	7Y42CTO1WW
ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y421009NA*
ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y421002EA*
ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y421006EA*
ThinkSystem DM3000H, 96TB (12x 8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y421004EA*
ThinkSystem DM3000H, 96TB (12x 8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y421008EA*
ThinkSystem DM5000H Hybrid Storage Array (2U24 SFF, CTO only)	7Y57CTO1WW
ThinkSystem DM5000H, 11.5TB (12x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571011NA*
ThinkSystem DM5000H, 11.5TB (12x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571003EA*
ThinkSystem DM5000H, 11.5TB (12x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y57100KEA*
ThinkSystem DM5000H, 14.4TB (12x 1.2TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y57100BEA*
ThinkSystem DM5000H, 21.6TB (12x 1.8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y57100FEA*
ThinkSystem DM5000H, 23TB (24x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571005EA*
ThinkSystem DM5000H, 23TB (24x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y57100MEA*
ThinkSystem DM5000H, 28.8TB (24x 1.2TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y57100DEA*
ThinkSystem DM5000H, 43.2TB (24x 1.8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571010NA*
ThinkSystem DM5000H, 43.2TB (24x 1.8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y57100HEA*
ThinkSystem DM5000H, 43.2TB (24x 1.8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y57100ZEA*
ThinkSystem DM5000H, 46TB (12x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571007EA*
ThinkSystem DM5000H, 46TB (12x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y57100PEA*
ThinkSystem DM5000H, 92TB (24x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571009EA*
ThinkSystem DM5000H, 92TB (24x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y57100SEA*

Description	Part number
ThinkSystem DM5000F Flash Storage Array (2U24 SFF, CTO only)	7Y41CTO1WW
ThinkSystem DM5000F, 11.5TB (12x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y411001EA*
ThinkSystem DM5000F, 23TB (24x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y411003EA*
ThinkSystem DM5000F, 46TB (12x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y411005EA*
ThinkSystem DM5000F, 92TB (24x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y411000EA*
ThinkSystem DM7000H Hybrid Storage Array (3U, CTO only)	7Y56CTO1WW
ThinkSystem DM7000F Flash Storage Array (3U, CTO only)	7Y40CTO1WW
ThinkSystem DM7100H Hybrid Storage Array (4U, CTO only)	7D26CTO1WW
ThinkSystem DM7100F Flash Storage Array (4U, CTO only)	7D25CTO1WW

\* Preconfigured models that are available only in North America (part numbers that have NA at the end) or EMEA (part numbers that have EA at the end) and require Preconfigured support to be purchased with the storage system (See the respective product guide for details).

For more information, see the list of Product Guides in the Lenovo Storage category:

<http://lenovopress.com/storage/san/lenovo#rt=product-guide>

## Rack cabinets

The following table lists the rack cabinets that are offered by Lenovo that can be used in Lenovo FC SAN solutions.

Table 22. Rack cabinets

Description	Part number
25U S2 Standard Rack (1000 mm deep; 2 sidewall compartments)	93072RX
25U Static S2 Standard Rack (1000 mm deep; 2 sidewall compartments)	93072PX
42U S2 Standard Rack (1000 mm deep; 6 sidewall compartments)	93074RX
42U 1100mm Enterprise V2 Dynamic Rack (6 sidewall compartments)	93634PX
42U 1100mm Enterprise V2 Dynamic Expansion Rack (6 sidewall compartments)	93634EX
42U 1200mm Deep Dynamic Rack (6 sidewall compartments)	93604PX
42U 1200mm Deep Static Rack (6 sidewall compartments)	93614PX
42U Enterprise Rack (1105 mm deep; 4 sidewall compartments)	93084PX
42U Enterprise Expansion Rack (1105 mm deep; 4 sidewall compartments)	93084EX

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 that can be used in Lenovo FC SAN solutions.

Table 23. Power distribution units

Description	Part number
<b>0U Basic PDUs</b>	
0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord	00YJ776
0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord	00YJ777
0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 line cord	00YJ778
0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord	00YJ779
<b>Switched and Monitored PDUs</b>	
0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P line cord	00YJ781
0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 line cord	00YJ780
0U 18 C13/6 C19 Switched and Monitored 32A/200-240V/346-415V/3Ph PDU w/ IEC60309 532P6 cord	00YJ782
0U 12 C13/12 C19 Switched and Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 line cord	00YJ783
1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord)	46M4002
1U 9 C19/3 C13 Switched and Monitored 60A 3Ph PDU with IEC 309 3P+Gnd cord	46M4003
<b>Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)</b>	
Ultra Density Enterprise C19/C13 PDU Module (without line cord)	71762NX
Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord	71763NU
<b>C19 Enterprise PDUs (6x IEC 320 C19 outlets)</b>	
DPI Single Phase C19 Enterprise PDU (without line cord)	39Y8948
DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord	39Y8923
<b>Front-end PDUs (3x IEC 320 C19 outlets)</b>	
DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord	39Y8938
DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord	39Y8939
DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8934
DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8940
DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8935
<b>Line cords for PDUs that ship without a line cord</b>	
DPI 30a Line Cord (NEMA L6-30P)	40K9614
DPI 32a Line Cord (IEC 309 P+N+G)	40K9612
DPI 32a Line Cord (IEC 309 3P+N+G)	40K9611
DPI 60a Cord (IEC 309 2P+G)	40K9615
DPI 63a Cord (IEC 309 P+N+G)	40K9613
DPI Australian/NZ 3112 Line Cord (32A)	40K9617
DPI Korean 8305 Line Cord (30A)	40K9618

For more information, see the list of Product Guides in the PDU category:  
<http://lenovopress.com/servers/options/pdu#rt=product-guide>

## Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are offered by Lenovo that can be used in Lenovo FC SAN solutions with the DB400D and DB800D SAN Directors.

Table 24. Uninterruptible power supply units

Description	Part number
RT5kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets)	55945KX
RT6kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets)	55946KX
RT8kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets)	55948KX
RT11kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets)	55949KX
RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets)	55948PX
RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets)	55949PX

For more information, see the list of Product Guides in the Uninterruptible Power Supply Units category:  
<http://lenovopress.com/servers/options/ups#rt=product-guide>

## Lenovo Financial Services

Lenovo Financial Services reinforces Lenovo's commitment to deliver pioneering products and services that are recognized for their quality, excellence, and trustworthiness. Lenovo Financial Services offers financing solutions and services that complement your technology solution anywhere in the world.

We are dedicated to delivering a positive finance experience for customers like you who want to maximize your purchase power by obtaining the technology you need today, protect against technology obsolescence, and preserve your capital for other uses.

We work with businesses, non-profit organizations, governments and educational institutions to finance their entire technology solution. We focus on making it easy to do business with us. Our highly experienced team of finance professionals operates in a work culture that emphasizes the importance of providing outstanding customer service. Our systems, processes and flexible policies support our goal of providing customers with a positive experience.

We finance your entire solution. Unlike others, we allow you to bundle everything you need from hardware and software to service contracts, installation costs, training fees, and sales tax. If you decide weeks or months later to add to your solution, we can consolidate everything into a single invoice.

Our Premier Client services provide large accounts with special handling services to ensure these complex transactions are serviced properly. As a premier client, you have a dedicated finance specialist who manages your account through its life, from first invoice through asset return or purchase. This specialist develops an in-depth understanding of your invoice and payment requirements. For you, this dedication provides a high-quality, easy, and positive financing experience.

For your region specific offers please ask your Lenovo sales representative or your technology provider about the use of Lenovo Financial Services. For more information, see the following Lenovo website:  
<http://www.lenovo.com/us/en/landingpage/lenovo-financial-services>

## 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>
- Lenovo ThinkSystem DB400D and DB800D 32 Gb FC Director product publications:  
<http://datacentersupport.lenovo.com/us/en/products/storage/fibre-channel-switches/db400d-fc-switch/6682/documentation>  
<http://datacentersupport.lenovo.com/us/en/products/storage/fibre-channel-switches/db800d-fc-switch/6684/documentation>
  - *Hardware Installation Guide*
  - *Fabric OS Access Gateway Administration Guide*
  - *Fabric OS Administration Guide*
  - *Fabric OS Extension Configuration Guide*
  - *Fabric OS Troubleshooting and Diagnostics Guide*
  - *Fabric OS Command Reference*
  - *Fabric OS Message Reference*
  - *Fabric OS MIB Reference*
  - *Web Tools Administration Guide*
  - *Flow Vision Configuration Guide*
  - *Monitoring and Alerting Policy Suite Configuration Guide*
- Lenovo Data Center Support for the ThinkSystem DB400D FC Director:  
<http://datacentersupport.lenovo.com/us/en/products/storage/fibre-channel-switches/db400d-fc-switch/6682>
- Lenovo Data Center Support for the ThinkSystem DB800D FC Director:  
<http://datacentersupport.lenovo.com/us/en/products/storage/fibre-channel-switches/db800d-fc-switch/6684>

## Related product families

Product families related to this document are the following:

- [Rack SAN Switches](#)
- [DB Series 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.  
1009 Think Place - Building One  
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.

**© Copyright Lenovo 2020. All rights reserved.**

This document, LP0581, was created or updated on July 14, 2020.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:  
<http://lenovopress.com/LP0581>
- Send your comments in an e-mail to:  
[comments@lenovopress.com](mailto:comments@lenovopress.com)

This document is available online at <http://lenovopress.com/LP0581>.

## 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:

Flex System  
Lenovo Services  
Lenovo®  
ThinkSystem

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