Lenovo ThinkSystem DB610S Gen 6 FC SAN Switch
Product Guide

The Lenovo ThinkSystem DB610S FC SAN Switch provides exceptional price/performance value by delivering market-leading 32 Gb Gen 6 Fibre Channel technology and combining flexibility, simplicity, and enterprise-class functionality to meet the demands of growing flash-based storage environments.

Designed to enable maximum flexibility and reliability, the ThinkSystem DB610S is a compact, 1U rack-mount FC switch that offers low-cost access to industry-leading Storage Area Network (SAN) technology while providing “pay-as-you-grow” scalability to meet the needs of an evolving storage environment.

The DB610S FC SAN Switch offers 24x SFP+ ports that support 4/8/16/32 Gbps speeds. The DB610S FC SAN switch provides easy integration into the existing SAN environments while realizing the benefits of Gen 6 Fibre Channel connectivity, and the switch offers a rich set of standard features with the options to expand its capabilities as needed.

The DB610S FC SAN Switch can be configured in Access Gateway Mode to simplify deployment. The switch provides full non-blocking performance with Ports On Demand scalability to support SAN expansion and enable long-term investment protection.

The following figure shows the Lenovo ThinkSystem DB610S 32Gb FC SAN Switch.



Figure 1. Lenovo ThinkSystem DB610S 32Gb FC SAN Switch

Did you know?

Lenovo offers models of the DB610S with lifetime warranties which allows customers to get hardware support and access to FOS support until the end of life of the DB610S switch.

The DB610S FC SAN Switch leverages storage connectivity technologies from Brocade, a leader in Fibre Channel networking.

The DB610S FC SAN Switch offers dual functionality as either a full-fabric SAN switch or as an N_Port ID Virtualization (NPIV)-enabled Access Gateway that simplifies server connectivity.

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.

Key features

The ThinkSystem DB610S FC SAN Switch offers the following features and benefits:

- Provides an affordable enterprise-class 32 Gb FC solution with 24 SFP+ ports to support flash-based storage environments.
- Increases performance for demanding workloads with support for 32 Gbps FC links.
- Enables “pay-as-you-grow” scalability from single-switch fabric to full-fabric enterprise capabilities with Ports On Demand scalability.
- Optimizes fabric behavior and ensure sufficient bandwidth for mission-critical applications with advanced traffic management capabilities and adaptive networking.
- Provides proactive, non-intrusive, real-time monitoring and alerting of VM health and performance with VM Insight through integrated network sensors.
- Leverages predefined MAPS policies to automatically identify and isolate devices that cause network performance issues.
- Offers dual functionality as either a full-fabric SAN switch or as an NPIV-enabled Access Gateway (requires 24 SFP+ ports be licensed) that enhances fabric scalability and simplifies management.
- Protects existing device investments with auto-sensing 4, 8, 16, and 32 Gbit/sec capabilities and native operation with Brocade fabrics.
- Runs Fabric OS, which delivers distributed intelligence throughout the network and enables a wide range of value-added features.
- Leverages Fabric Vision technology’s powerful monitoring, management, and diagnostic tools to simplify administration, increase uptime, and reduce costs.
- Supplies a rich set of standard features at no extra cost, including fabric services, advanced zoning, adaptive networking, full fabric and access gateway operations, and diagnostic tools.
- Expands fabric capabilities with optional licensed functions, including trunking, advanced monitoring and alerting, and long-distance fabrics.
- 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.
- Accelerates 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.

For details on the latest features supported with the DB610S FC SAN Switch see the Administration Guide for the latest available Fabric OS version 8.2 or 9.0 and above:
https://www.broadcom.com/products/fibre-channel-networking/software/fabric-operating-system.

Components and connectors

The following figure shows the port-side view of the DB610S FC SAN Switch.

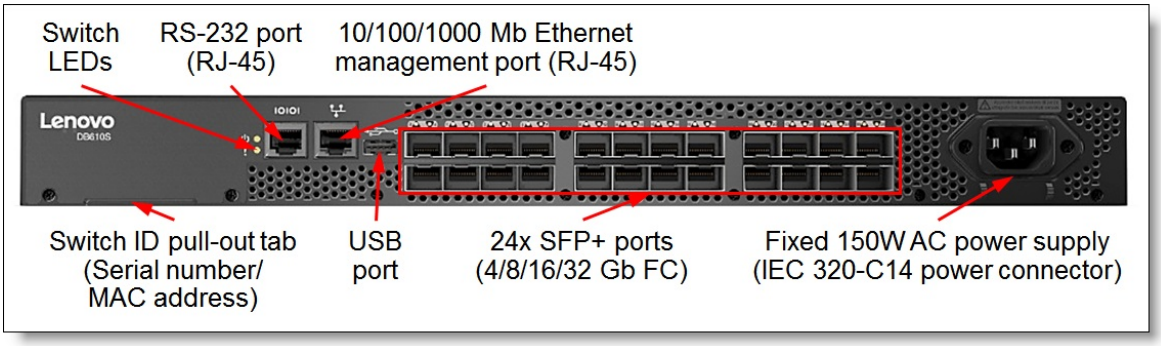


Figure 2. DB610S FC SAN Switch port-side view

The following figure shows the non-port side view of the DB610S FC SAN Switch.

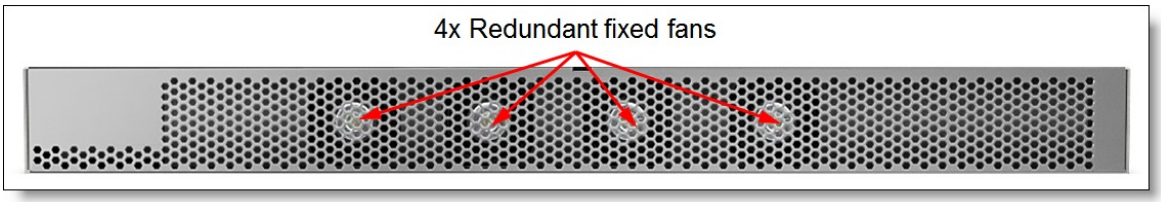


Figure 3. DB610S FC SAN Switch non-port-side view

System specifications

The following table lists the ThinkSystem DB610S system specifications.

Table 1. System specifications

Component	Specification
Machine type	6559 (1-year warranty) 7D8P (Lifetime warranty)
Form factor	Standalone or 1U rack mount
Ports	24x SFP+ physical ports. The number of ports that are activated is model dependent and can be upgraded with additional licenses - see the Port activation licenses section.
Media types	• 32 Gb FC SFP+ transceivers: short wavelength (SWL), long wavelength (LWL) • 16 Gb FC SFP+ transceivers: SWL, LWL, extended long wavelength (ELWL)
Port speeds	• 32 Gb FC SFP+ transceivers: 32/16/8 Gbps auto-sensing • 16 Gb FC SFP+ transceivers: 16/8/4 Gbps auto-sensing
FC port types	• Full Fabric mode: F_Port, M_Port (Mirror Port), E_Port, D_Port (Diagnostic Port) • Access Gateway mode: F_Port and NPIV-enabled N_Port
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 mode, Access Gateway, Advanced Zoning, Fabric Services, Adaptive Networking, Advanced Diagnostic Tools
Optional features	Enterprise Bundle (ISL Trunking, Fabric Vision, Extended Fabric)

Component	Specification
Performance	Non-blocking architecture with wire-speed forwarding of traffic: • 4GFC: 4.25 Gbit/sec line speed, full duplex • 8GFC: 8.5 Gbit/sec line speed, full duplex • 16GFC: 14.025 Gbit/sec line speed, full duplex • 32GFC: 28.05 Gbit/sec line speed, full duplex • Aggregated throughput: 768 Gbps • Up to 0.9 µs local switching latency
Scalability	• Maximum number of switches in the fabric: 239 • Maximum frame size: 2,112-byte payload • Maximum number of frame buffers per switch: 2,000 • Maximum number of ports per ISL trunk: 8x SFP+ (ISL Trunking license is included in the Enterprise Bundle)
Cooling	Four fixed fans with N+1 cooling redundancy. Non-port to port side airflow
Power supply	One fixed 150 W AC (100 - 240 V) power supply (IEC 320-C14 connector)
Hot-swap parts	SFP+ transceivers
Management ports	One 10/100/1000 Mb Ethernet port (UTP, RJ-45); one RS-232 port (RJ-45); one USB port (for additional firmware/log/configuration files storage)
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)
Hardware warranty	• Machine type 6559: One-year limited warranty, customer-replaceable unit with 9x5 next business day parts delivered • Machine type 7D8P: Lifetime non-transferrable warranty, customer-replaceable unit 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, 1-year or 2-year post-warranty extensions, and Basic Hardware Installation Services
Firmware entitlement	• Machine type 6559: One-year (Models HC4, HC5,and HC7) firmware entitlement and support license is included. Firmware entitlement extension licenses for Models HC4, HC5, and HC7 are included in the warranty service upgrades for Models HC4, HC5, and HC7. • Machine type 7D8P: Lifetime firmware entitlement and support license are standard.
Dimensions	Height: 43 mm (1.7 in.); width: 429 mm (16.9 in.); depth: 307 mm (12.1 in.)
Weight	Empty: 4.2 kg (9.3 lb); Fully configured: 5.8 kg (12.7 lb)

Models

The following table lists the DB610S FC SAN Switch models.

Table 2. Lenovo ThinkSystem DB610S FC SAN Switch models

Model	Base MTM	Feature code	Description
Lifetime warranty and lifetime firmware support			
7D8PA003WW	7D8PCTO4WW	BLAF	Lenovo ThinkSystem DB610S, ENT Bundle, 24 ports licensed, 24x 32Gb SWL SFPs, 1 PS, Rail Kit, Lifetime Warranty Support
7D8PA001WW	7D8PCTO2WW	BLAD	Lenovo ThinkSystem DB610S, ENT Bundle, 24 ports licensed, 24x 16Gb SWL SFPs, 1 PS, Rail Kit, Lifetime Warranty Support
7D8PA002WW	7D8PCTO3WW	BLAE	Lenovo ThinkSystem DB610S, 8 ports licensed, 8x 32Gb SWL SFPs, 1 PS, Rail Kit, Lifetime Warranty Support
7D8PA000WW	7D8PCTO1WW	BLAC	Lenovo ThinkSystem DB610S, 8 ports licensed, 8x 16Gb SWL SFPs, 1 PS, Rail Kit, Lifetime Warranty Support
1-year warranty and 1-year firmware support			
6559F1A	6559-HC4	B4QB	Lenovo ThinkSystem DB610S, ENT Bundle, 24 ports licensed, 24x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW
6559F4A	6559-HC7	BCA4	Lenovo ThinkSystem DB610S, 8 ports licensed, 8x 32Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW
6559F2A	6559-HC5	B4QC	Lenovo ThinkSystem DB610S, 8 ports licensed, 8x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW

The DB610S FC SAN Switch part numbers include the following physical components:

- One FC SAN Switch - with transceivers included and ports activated as listed in the Port activation licenses section
- Serial cable (DB-9/RJ-45 to RJ-45)
- Fixed rack mount kit.
- Online Documentation web pointer card
- SANNav web pointer card

The models with "ENT Bundle" in the description include the Enterprise Bundle of software features, as described in the Enterprise Bundle section.

Note: The switch comes standard without a power cord; one power cable must be purchased together with the switch. See the Power supplies and cables section for details.

Firmware entitlement

Firmware entitlement is included with the DB610S FC SAN Switch and provides lifetime or 1 year of firmware support, depending on the model. See the Models section for specifics.

Firmware entitlements can be upgraded as follows:

- All models: Firmware entitlement is included in any warranty service upgrades.

Port activation licenses

The DB610S FC SAN Switch models ship with port licenses (port activations) and transceivers as listed in the following table.

Table 4. Transceivers and Port activations included

Model	Base MTM	Ports activated (maximum 24)	Transceivers included
Lifetime warranty and lifetime firmware support			
7D8PA003WW	7D8PCTO4WW	24	24x 32Gb FC SWL SFP+
7D8PA001WW	7D8PCTO2WW	24	24x 16Gb FC SWL SFP+
7D8PA002WW	7D8PCTO3WW	8	8x 32Gb FC SWL SFP+
7D8PA000WW	7D8PCTO1WW	8	8x 16Gb FC SWL SFP+
1-year warranty and 1-year firmware support			
6559F1A	6559-HC4	24	24x 16Gb FC SWL SFP+
6559F4A	6559-HC7	8	8x 32Gb FC SWL SFP+
6559F2A	6559-HC5	8	8x 16Gb FC SWL SFP+

For models without the full 24 ports activated, the remaining ports can be activated by purchasing and installing Ports on Demand (POD) licenses. Port licenses and transceiver bundles are sold in 8-port increments. The following table lists the ordering information. Some licenses include transceivers as indicated.

Table 5. Port On-Demand upgrades

Part number	Feature code	Description	Transceivers included	Maximum quantity
Paper authorization licenses and bundles				
01KP846	AVUK	Lenovo DB610S 8 PORT-ON-DEMAND License with 8 X 16G SWL SFPs	8x 16Gb FC SWL SFP+	2
4M27A64094	BCA5	Lenovo DB610S 8 PORT-ON-DEMAND License with 8 X 32G SWL SFPs	8x 32Gb FC SWL SFP+	2

Transceivers and cables

With the flexibility of the DB610S FC SAN Switch, customers can choose the following connectivity:

- For 32 Gb FC links, customers can use 32 Gb FC SFP+ SWL optical transceivers for distances up to 100 meters on 50 µ OM4 multimode fiber optic cables. For longer distances, the 32 Gb FC LWL SFP+ optical transceivers can support up to 10 kilometers on single-mode fiber optic cables. These transceivers can operate at 32 Gbps, 16 Gbps, or 8 Gbps speeds.
- For 16 Gb FC links, customers can use 16 Gb FC SFP+ SWL optical transceivers for distances up to 125 meters on 50 µ OM4 multimode fiber optic cables. For longer distances, the 16 Gb FC LWL SFP+ optical transceivers can support up to 10 kilometers on single-mode fiber optic cables. For extended distances, the 16 Gb FC ELWL SFP+ optical transceivers can support up to 25 kilometers on single-mode fiber optic cables. These transceivers can operate at 16 Gbps, 8 Gbps, or 4 Gbps speeds.
- For the 1 GbE RJ-45 management port, customers can use UTP cables for distances up to 100 meters.

The DB610S FC SAN Switch models ship with 8x or 24x SWL transceivers as listed in the table in the Port activation licenses section. Additional SWL, LWL, and ELWL SFP+ transceivers can be ordered for the switch, if needed.

The following table lists the supported SFP+ options and cables.

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

Table 6. SFP+ transceivers and cables

Description	Part number	Feature code	Maximum supported
32 Gb FC SFP+ transceivers			
Brocade Secure 32Gb SWL SFP+ Transceiver	4M27A65416	BF69	24
Brocade Secure 32Gb SWL SFP+ Transceiver (8-pack)	4M27A65417	BF6A	3
Brocade Secure 32Gb LWL SFP+ Transceiver	4M27A65418	BF6B	24
Brocade Secure 32Gb LWL SFP+ Transceiver (8-pack)	4M27A65419	BF6C	3
Brocade Secure 32Gb ELWL SFP+ (25 km)	4M27A65424	BF6D	24
Brocade 32Gb SWL SFP+ Transceiver (8-pack)	01KN793	AVGD	3
Brocade 32Gb LWL SFP+ Transceiver (8-pack)	01KN799	AVGF	3
16 Gb FC SFP+ transceivers			
Brocade Secure 16Gb SWL SFP+	4M27A65411	BF64	24
Brocade Secure 16Gb SWL SFP+ 8-pack	4M27A65412	BF65	3
Brocade Secure 16Gb LWL SFP+ (10 km)	4M27A65413	BF66	24
Brocade Secure 16Gb LWL SFP+ (10 km) 8pk	4M27A65414	BF67	3
Brocade Secure 16Gb ELWL SFP+ (25 km)	4M27A65415	BF68	24*
Brocade 16Gb SWL SFP+ Optical Transceiver	88Y6393	A22R	24
OM3 optical cables for 16 Gb and 32 Gb FC SW SFP+ transceivers			
Lenovo 0.5m LC-LC OM3 MMF Cable	00MN499	ASR5	24
Lenovo 1m LC-LC OM3 MMF Cable	00MN502	ASR6	24
Lenovo 3m LC-LC OM3 MMF Cable	00MN505	ASR7	24
Lenovo 5m LC-LC OM3 MMF Cable	00MN508	ASR8	24
Lenovo 10m LC-LC OM3 MMF Cable	00MN511	ASR9	24
Lenovo 15m LC-LC OM3 MMF Cable	00MN514	ASRA	24
Lenovo 25m LC-LC OM3 MMF Cable	00MN517	ASRB	24
Lenovo 30m LC-LC OM3 MMF Cable	00MN520	ASRC	24
OM4 optical cables for 16 Gb and 32 Gb FC SW SFP+ transceivers			
Lenovo 0.5m LC-LC OM4 MMF Cable	4Z57A10845	B2P9	24
Lenovo 1m LC-LC OM4 MMF Cable	4Z57A10846	B2PA	24
Lenovo 3m LC-LC OM4 MMF Cable	4Z57A10847	B2PB	24
Lenovo 5m LC-LC OM4 MMF Cable	4Z57A10848	B2PC	24
Lenovo 10m LC-LC OM4 MMF Cable	4Z57A10849	B2PD	24
Lenovo 15m LC-LC OM4 MMF Cable	4Z57A10850	B2PE	24

Description	Part number	Feature code	Maximum supported
Lenovo 25m LC-LC OM4 MMF Cable	4Z57A10851	B2PF	24
Lenovo 30m LC-LC OM4 MMF Cable	4Z57A10852	B2PG	24
UTP Category 6 cables (Green) for the 1 GbE RJ-45 management port			
0.75m CAT6 Green Cable	00WE123	AVFW	1
1.0m CAT6 Green Cable	00WE127	AVFX	1
1.25m CAT6 Green Cable	00WE131	AVFY	1
1.5m CAT6 Green Cable	00WE135	AVFZ	1
3m CAT6 Green Cable	00WE139	AVG0	1
10m CAT6 Green Cable	90Y3718	A1MT	1
25m CAT6 Green Cable	90Y3727	A1MW	1
UTP Category 5e cables (Blue) for the 1 GbE RJ-45 management port			
0.6m Blue Cat5e Cable	40K5679	3801	1
1.5m Blue Cat5e Cable	40K8785	3802	1
3m Blue Cat5e Cable	40K5581	3803	1
10m Blue Cat5e Cable	40K8927	3804	1
25m Blue Cat5e Cable	40K8930	3805	1

* When using ELW SFP+ transceivers over distances over 10 km, the Extended Fabric feature that is available in the Enterprise Bundle is required on a SAN switch to drive the maximum bandwidth over the extended links.

The following table lists the cabling requirements for the switch.

Table 7. DB610S FC SAN Switch cabling requirements

Transceiver	Standard	Cable	Connector
32 Gb Fibre Channel			
32 Gb FC SWL SFP+ (01KN793)	FC-PI-6	Up to 30 m with fiber optic cables supplied by Lenovo (see Table 4). 850 nm 50 µ multi-mode fiber optic cable: • 32GFC: Up to 100 m (OM4) or up to 70 m (OM3) • 16GFC: Up to 125 m (OM4) or up to 100 m (OM3) • 8GFC: Up to 190 m (OM4) or up to 150 m (OM3)	LC
32 Gb FC LWL SFP+ (01KN799)	FC-PI-6	1310 nm 9 µ single-mode fiber optic cable: • 32GFC, 16GFC, 8GFC: Up to 10 km	LC
16 Gb Fibre Channel			
16 Gb FC SWL SFP+ (88Y6393)	FC-PI-5	Up to 30 m with fiber optic cables supplied by Lenovo (see Table 4). 850 nm 50 µ multi-mode fiber optic cable: • 16GFC: Up to 125 m (OM4) or up to 100 m (OM3) • 8GFC: Up to 190 m (OM4) or up to 150 m (OM3) • 4GFC: Up to 400 m (OM4) or up to 380 m (OM3)	LC
Management ports			

Transceiver	Standard	Cable	Connector
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, and 6 up to 100 meters	RJ-45
Serial port	RS-232	DB-9/RJ-45-to-RJ-45 console cable (comes with the switch)	RJ-45

Enterprise Bundle

As listed in the Models section, some models include a set of software features known as the Enterprise Bundle. The Enterprise Bundle is comprised of the following features:

- ISL Trunking (TRK): 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.
- Fabric Vision (FV)
  - Monitoring and Alerting Policy Suite (MAPS): Provides a policy-based, fabric-wide threshold monitoring and alerting tool.
  - Flow Vision: Enables administrators to identify, monitor, and analyze specific application flows in order to simplify troubleshooting, maximize performance, avoid congestion, and optimize resources. Flow Vision includes:
    - Flow Monitor: Provides comprehensive visibility, automatic learning, and non-disruptive monitoring of a flow's performance. Administrators can monitor all flows from a specific host to multiple targets or volumes, from multiple hosts to a specific target/volume, or across a specific ISL. Additionally, they can perform volume-level monitoring of specific frame types to identify resource contention or congestion that is impacting application performance. With VM Insight, administrators can monitor network throughput statistics for each VM.
    - Flow Learning: Enables administrators to non-disruptively discover all flows that go to or come from a specific host port or a storage port, or traverse ISLs/IFLs (Inter-Fabric Links) or Fibre Channel over Internet Protocol (FCIP) tunnels, to monitor fabric-wide application performance. In addition, administrators can discover top and bottom bandwidth-consuming devices and manage capacity planning.
    - Flow Generator: Provides a built-in traffic generator for pretesting and validating the data center infrastructure for robustness—including route verification and integrity of optics, cables, ports, back-end connections, and ISLs—before deploying applications.
    - Flow Mirroring: Provides the ability to non-disruptively create copies of specific application and data flows or frame types that can be captured for in-depth analysis.
  - 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.
  - 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 (EF): Extends Fibre Channel SANs beyond 10 km distance limitations for replication and backup at full bandwidth.

For other models, the Enterprise Bundle is an optional upgrade. Ordering details are listed in the following table. One license is needed per switch.

Table 8. Optional Enterprise Bundle feature

Description	Part number	Feature code
Electronic authorization licenses		
Lenovo DB610S Enterprise Bundle (TRK, FV, EF)	7S0C000CWW	B3EC

Management software

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

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

Lenovo offers the following SANnav Management Portal subscriptions:

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

SANnav Management Portal supports all Brocade SAN switches and platforms that run the Fabric OS® version 7.4 or above, including Lenovo B300, B6505, B6510, DB610S, DB620S, DB400D, DB720S, DB800D, Brocade Directors, 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 20 SANnav Management Portal instances.

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

The following table lists ordering information for the optional SANnav Management Portal and SANnav Global View management tools.

Table 9. SANnav Management Portal and SANnav Global View subscription licenses

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

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

Fibre Channel standards

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

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

Power supplies and cables

The DB610S FC SAN Switch ships with one fixed 150 W AC power supply that has an IEC 309-C14 connector.

The switch comes standard without a power cord; one rack power cable or line cord must be ordered together with the switch (see the following table).

Table 10. Power cord options

Description	Part number	Feature code
Rack power cables		
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	6201
1.8m, 10A/100-250V, 2xC13PM to IEC 320-C14 Rack Power Cable	None*	6568
2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08366	6311
2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable	39Y7938	6204
4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7932	6263
Line cords		
10A/125V C13 to NEMA 5-15P 4.3m line cord	39Y7931	6207
10A/250V C13 to NEMA 6-15P 2.8m line cord	46M2592	A1RF
Argentina 10A/250V C13 to IRAM 2073 2.8m line cord	39Y7930	6222
Australia/NZ 10A/250V C13 to AS/NZ 3112 2.8m line cord	39Y7924	6211
Brazil 10A/125V C13 to NBR 6147 2.8m line cord	39Y7929	6223
China 10A/250V C13 to GB 2099.1 2.8m line cord	39Y7928	6210
Denmark 10A/250V C13 to DK2-5a 2.8m line cord	39Y7918	6213
European 10A/230V C13 to CEE7-VII 2.8m line cord	39Y7917	6212
India 10A/250V C13 to IS 6538 2.8m line cord	39Y7927	6269
Israel 10A/250V C13 to SI 32 2.8m line cord	39Y7920	6218
Italy 10A/250V C13 to CEI 23-16 2.8m line cord	39Y7921	6217
Japan 12A/125V C13 to JIS C-8303 2.8m line cord	46M2593	A1RE
Korea 12A/250V C13 to KETI 2.8m line cord	39Y7925	6219
South Africa 10A/250V C13 to SABS 164 2.8m line cord	39Y7922	6214
Switzerland 10A/250V C13 to SEV 1011-S24507 2.8m line cord	39Y7919	6216
Taiwan 10A/250V C13 to CNS 10917-3 2.8m line cord	00CG265	A53E
Taiwan 15A/125V C13 to CNS 10917-3 2.8m line cord	00CG267	A53F
United Kingdom 10A/250V C13 to BS 1363/A 2.8m line cord	39Y7923	6215

* Available for factory-built custom configurations and solutions only.

Rack installation

The DB610S FC SAN Switch comes standard with the fixed rack mount kit that can be used for 4-post rack installations. If needed, the DB610S FC SAN Switch can be mounted in a 2-post rack cabinet by using the optional mid-mount rack kit that is listed in the following table.

Table 11. Rack-mount options

Description	Part number	Feature code	Maximum quantity supported
Lenovo DB610S Mid-mount (Telco) Rack Kit	01KP847	AX4D	1

The optional mid-mount rack kit for the DB610S FC SAN Switch is shown in the following figure.

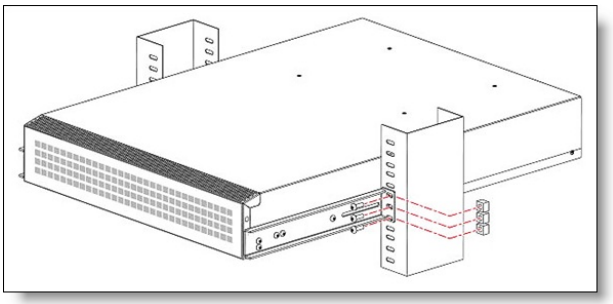


Figure 4. Lenovo DB610S Mid-mount (Telco) Rack Kit

Physical specifications

The DB610S FC SAN Switch has the following dimensions and weight (approximate):

- Height: 43 mm (1.7 in.)
- Width: 429 mm (16.9 in.)
- Depth: 307 mm (12.1 in.)
- Weight:
  - Empty: 4.2 kg (9.3 lb)
  - 5.8 kg (12.7 lb) with one integrated power supply, without power cord

Operating environment

The DB610S FC SAN Switch is 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: 10% to 85% non-condensing
  - Non-operating: 10% to 90% non-condensing

- Electrical power:
  - Voltage range: 100 V AC - 240 V AC (nominal)
  - Frequency: 50 Hz / 60 Hz (nominal)
  - Power consumption:
    - Idle: 56 watts
    - Typical: 64 watts
    - Maximum: 77 watts
- Heat dissipation:
  - Idle: 191 BTU per hour
  - Typical: 216 BTU per hour
  - Maximum: 262 BTU per hour
- Acoustical noise emission (maximum): 64 dB

Warranty and support

The DB610S FC SAN Switch has the following warranty term:

- Machine type 6559: One-year warranty
- Machine type 7D8P: Lifetime non-transferrable warranty

Note: For machine type 7D8P, the limited lifetime warranty is active until the SAN switch reaches its end of service date announced by Lenovo. Lenovo typically provides support for at least five years following the last order date of a product.

The standard warranty terms are customer-replaceable unit (CRU) and onsite (for field-replaceable units FRUs only) 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 your data center, with an experience consistently ranked number one in customer satisfaction worldwide. Available offerings include:

- **Premier Support**

  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:

  - Direct technician-to-technician access through a dedicated phone line
  - 24x7x365 remote support
  - Single point of contact service
  - End to end case management
  - Third-party collaborative software support
  - Online case tools and live chat support
  - On-demand remote system analysis

- **Warranty Upgrade (Preconfigured Support)**

  Services are available to meet the on-site response time targets that match the criticality of your systems.

  - 3, 4, or 5 years of 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 markets)
  - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select markets)

- **Managed Services**

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

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

- **Technical Account Management (TAM)**

  A Lenovo Technical Account Manager helps you optimize the operation of your data center based on a deep understanding of your business. You gain direct access to your Lenovo TAM, who serves as your single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. In addition, your TAM will help proactively make service recommendations and manage your service relationship with Lenovo to make certain your needs are met.

- **Enterprise Server Software Support**

  Enterprise Software Support is an additional support service providing customers with software support on Microsoft, Red Hat, SUSE, and VMware applications and systems. Around the clock availability for critical problems plus unlimited calls and incidents helps customers address challenges fast, without incremental costs. Support staff can answer troubleshooting and diagnostic questions, address product comparability and interoperability issues, isolate causes of problems, report defects to software vendors, and more.

- **Health Check**

  Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that your 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.

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 Service offerings are region-specific. Not all preconfigured support and upgrade options are available in every region. For information about Lenovo service upgrade offerings that are available in your region, refer to the following resources:

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

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

- Lenovo Statement of Limited Warranty for Infrastructure Solutions Group (ISG) 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 your success. Our goal is to reduce your capital outlays, mitigate your IT risks, and accelerate your time to productivity.

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

Here's a more in-depth look at what we can do for you:

- **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 your customers. For more information, see the ARS page, https://lenovopress.com/lp1266-reduce-e-waste-and-grow-your-bottom-line-with-lenovo-ars.

- **Assessment Services**

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

- **Design Services**

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

- **Basic Hardware Installation**

  Lenovo experts can seamlessly manage the physical installation of your server, storage, or networking hardware. Working at a time convenient for you (business hours or off shift), the technician will unpack and inspect the systems on your 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 your team to focus on other priorities.

- **Deployment Services**

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

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

  Move existing physical & virtual workloads easily, or determine technical requirements to support increased workloads while maximizing performance. Includes tuning, validation, and documenting ongoing run processes. Leverage migration assessment planning documents to perform necessary migrations.

Regulatory compliance

The DB610S FC SAN Switch conforms to the following regulations:

- Electromagnetic compatibility
  - CISPR 22
  - CNS 13438
  - EN 55024
  - EN 55032
  - EN 61000-3-2
  - EN 61000-3-3
  - FCC Part 15, Subpart B
  - GB 9254
  - ICES-003
  - KN 32
  - KN 35
  - VCCI
- Safety
  - CNS 14336-1
  - EN/UL/CSA/IEC 60950-1
  - GB 4943.1
- Environmental: RoHS

Interoperability

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

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

External storage systems

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

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

External backup units

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

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

Table 12. External Fibre Channel backup options

Part number	Description
External tape backup libraries	
6741A1F	IBM TS4300 3U Tape Library-Base Unit
Fibre Channel backup drives for TS4300 Tape Library - Full Height	
01KP938	LTO 7 FH Fibre Channel Drive
01KP954	LTO 8 FH Fibre Channel Drive
02JH837	LTO 9 FH Fibre Channel Drive
Fibre Channel backup drives for TS4300 Tape Library - Full Height	
01KP936	LTO 7 HH Fibre Channel Drive
01KP952	LTO 8 HH Fibre Channel Drive
02JH835	LTO 9 HH Fibre Channel Drive

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

Rack cabinets

The following table lists the supported rack cabinets.

Table 13. Rack cabinets

Part number	Description
93072RX	25U Standard Rack (1000mm)
93072PX	25U Static S2 Standard Rack (1000mm)
7D6DA007WW	ThinkSystem 42U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6DA008WW	ThinkSystem 42U Pearl Primary Heavy Duty Rack Cabinet (1200mm)
93604PX	42U 1200mm Deep Dynamic Rack
93614PX	42U 1200mm Deep Static Rack
93634PX	42U 1100mm Dynamic Rack
93634EX	42U 1100mm Dynamic Expansion Rack
93074RX	42U Standard Rack (1000mm)
7D6EA009WW	ThinkSystem 48U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6EA00AWW	ThinkSystem 48U Pearl Primary Heavy Duty Rack Cabinet (1200mm)

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

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

Related publications and links

For more information, see the following resources:

- 3D Interactive Tour: https://lenovopress.com/lp0680-3d-tour-thinksystem-db610s
- Lenovo Storage DB610S FC SAN Switch product publications: http://datacentersupport.lenovo.com/us/en/products/storage/fibre-channel-switches/db610s-fc-switch/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*

Related product families

Product families related to this document are the following:

- DB Series SAN Switches
- Rack SAN Switches

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