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FAQ

Brocade® X7 Director

Frequently Asked Questions

Overview

Designed to meet continuous data growth and critical application demands, the Brocade® X7 Director is purpose-built to power large-scale storage environments that require increased capacity, greater throughput, and higher levels of resiliency and operational efficiency. Brocade directors build upon years of innovation and leverage the core technology of Brocade systems to consistently deliver five-nines availability in the world's most demanding data centers. Delivering nondisruptive software upgrades, hot-pluggable components, and a no-single-point-of-failure design, the Brocade X7 offers a highly resilient solution for today's enterprise-class storage environments.

This document answers frequently asked questions about the Brocade X7 Director family.

For product information, visit www.broadcom.com/products/fibre-channel-networking/directors/x7-directors.

General Questions and Answers

What distinguishes Brocade X7 Directors from Brocade X6 Directors?

The Brocade X7 product family is designed for modernized data centers with performance-sensitive workloads that require scalability and maximum uptime. The Brocade X7 is based on the seventh generation Fibre Channel standard and leverages the advanced capabilities of the Condor 5 ASIC. With the doubled performance of 64G links and 50% lower latency compared to Gen 6, the Brocade X7 Director is the highest performing, most scalable chassis switching platform in the market. Together with built-in analytics, advanced automation, integrated security, and congestion management capabilities, the Brocade X7 Director is a faster, more intelligent, and more resilient solution. The Brocade X7 supports both Gen 6 and Gen 7 blades within the same chassis, providing the flexibility to easily migrate to the latest Fibre Channel technology.

Which components are common between the Brocade Gen 6 and Gen 7 directors?

The Brocade Gen 6 and Gen 7 director families share a common chassis and backplane, power supplies, and fans that allow for easy upgradeability of a Brocade X6 to Gen 7 functionality. The Brocade X7 chassis supports any combination of Gen 6 and Gen 7 port blades for maximum flexibility and investment protection.

Can I upgrade an existing Brocade X6 Director to a Brocade X7 Director?

Brocade directors offer a simple upgrade option to extend the life of the Brocade X6 chassis and gain the extra value of Gen 7 technology. Since the Brocade X7 leverages the same chassis, only a core routing blade upgrade is needed to transform the X6 into a Gen 7 Director. Although the upgrade does require taking the chassis offline to replace the core routing blades, it will be nondisruptive to the applications in a dual fabric since traffic moves to the other fabric while the

upgrade is happening. Once the X6 is upgraded, organizations can choose to keep their existing port blades and start to leverage the new Gen 7 blades within the same chassis. The *Brocade X6 Field Migration Guide* is available to walk through the step-by-step process at support.broadcom.com for Brocade Direct Support customers. For nondirect Brocade customers, contact your OEM partner for this information.

What is the difference in functionality between a Brocade X7 and an upgraded Brocade X6?

The main difference between a Brocade X7 and an upgraded Brocade X6 is the control processor (CP) blade in the factory-shipped X7, which includes support for Secure Boot functionality, thereby ensuring the integrity of the system firmware. An upgraded Brocade X6 supports all Gen 7 Fibre Channel functions, and it supports Gen 7 as well as Gen 6 port blades.

What blades are compatible with the Brocade X7 chassis? Can I combine Gen 6 and Gen 7 blades within the same Brocade X7 Director chassis?

The Brocade X7 supports mix-and-match blades, allowing Gen 6 and Gen 7 blades to be installed within the same chassis. The following optional port or extension blades are available:

- 48-port Gen 7 Brocade FC64-48 port blade with 64G line rate ports
- 64-port Gen 7 Brocade FC64-64 high-density port blade with 64G line rate SFP-DD ports
- 48-port Gen 6 Brocade FC32-X7-48 port blade with 32G line rate ports
- 48-port Brocade FC32-48 port blade with 32G line rate ports
- 64-port Gen 6 Brocade FC32-64 high-density port blade with 32G line rate ports
- Brocade SX6 Extension blade with 16 x 32G Fibre Channel/FICON ports, 16 x 1/10-Gigabit Ethernet (GbE) ports, and 2 x 40GbE ports; extends replication over long distance for disaster recovery and data protection

What benefit do Brocade UltraScale Inter-Chassis Links provide for the Brocade X7?

Organizations must adapt to continuous data growth with storage environments that can easily scale to meet their business needs. Brocade UltraScale chassis connectivity leverages dedicated optical Inter-Chassis Links (ICLs) to connect up to 12 Brocade Gen 5, Gen 6, or Gen 7 directors, enabling flatter, faster, and simpler fabrics that increase consolidation while reducing network complexity and costs.

UltraScale ICLs ports are QSFP-based and enable scalable core-edge and active-active mesh chassis topologies. These high-density chassis links reduce inter-switch cabling by 75%. Because the UltraScale ICL connections reside on the core routing blades instead of consuming ports on the port blades, up to 33% more device ports are available for server and storage connectivity. This maximizes overall port density within the smallest amount of rack space while freeing up front-facing device ports for server and storage connectivity.

What UltraScale ICL kits are required to enable these ports on the Brocade X7?

To license all the ports and enable the full capacity of the Brocade X7-8 Director, four X7 UltraScale Inter-Chassis Link (ICL) kits are required. Minimal operation requires one ICL kit per X7-8 to enable functionality; however it is best practice to have two ICL kits for maximum redundancy. To license all ports on the Brocade X7-4 Director, two Brocade X7 ICL kits are required. These ICL kits can provide connectivity for Gen 7 to Gen 7, Gen 7 to Gen 6, or Gen 7 to Gen 5.

Kit	Number of Optics per Kit	Licensed Ports	Purpose
Brocade X7 ICL Kit 100m P/N: BR-X7ICLKIT-100M-01	8	8 QSFP ports per chassis (4 QSFP ports per CR blade)	Gen 7 to Gen 7 at a 4 x Gen 7 ICL data rate, supporting distances up to 100m
Brocade X7 Gen 6 ICL Kit P/N: BR-X7GEN6ICLKIT-100M-1	8	8 QSFP ports per chassis (4 QSFP ports per CR blade)	Gen 7 to Gen 6 at 4x32G or Gen 7 to Gen 5 at 4x16G, supporting distances up to 100m
Brocade X7 ICL Kit 2km[a] P/N: BR-X7ICLKIT-2KM-01	8	8 QSFP ports per chassis (4 QSFP ports per CR blade)	Gen 7 to Gen 7 at a 4 x Gen 7 ICL data rate, supporting distances up to 2 km

a. Refer to the X7 Director product brief or hardware installation guide for details on the Gen 7 2 km ICL QSFP environmental specifications.

What types of cables and optics are used with the Brocade X7 for UltraScale ICLs?

Brocade X7 UltraScale ICL ports connect over OM3 or OM4 optical cables in the following manner:

- Brocade X7 Gen 7 100m QSFPs require MPO 1x12 OM4 ribbon cable connectors and multimode ribbon fiber cable, limited to 100 meters at a Gen 7 ICL data rate.
- Although the connector has 12 lanes in a row, the Gen 7 ICL QSFP uses only the outer eight lanes (four from each end). The central four lanes are not used.
- Plug orientation does not matter because the plug is polarized—it takes care of itself, just like RJ-45. Specifically, the patch cables should be female-female and key-up to key-up orientation (Type B).
- The Brocade Gen 7 2 km QSFP and 32G 2 km QSFP are also supported in the X7 and use standard LC duplex connectors over single-mode fiber. (Please note that the 32G 2 km QSFP is no longer available for purchase.)

What optics are supported with the Gen 7 Fibre Channel Brocade X7 Director port blades?

For the full list of supported optics for the Brocade X7 Director, refer to the *Brocade Transceiver Support Matrix* at https://docs.broadcom.com/docs/GA-MX-460.

What cable distances are supported on the Brocade X7?

The Brocade X7 supports cable distances up to 25 km using ELWL optics in a Gen 6 or Gen 7 48-port blade. The 64-port FC64-64 blade with SFP-DD optics supports device connectivity at 64G up to 100m while the 64-port FC32-64 blade with QSFP optics supports device connectivity at 32G up to 100m or ISL connectivity up to 2 km. (Please note that the 32G 2 km QSFP is no longer available for purchase.)

Which components are common between the Brocade X7-8 and Brocade X7-4 models? Which components are different?

Both the Brocade X7-8 and the Brocade X7-4 use the same port blades. They also use the same control processor blade (identified as either CPX7 or CPX), power supplies, fan assemblies, and Brocade UltraScale ICL optics. Besides the chassis frame, the only components that differ between the Brocade X7-8 and the Brocade X7-4 are the core routing blades (Brocade CR64-8 and CR64-4).

What power supply options are available for the Brocade X7 Directors?

The Brocade X7 Directors support standard AC and high-voltage AC/DC power supply options, each of which is available for either non-port-side air intake (NPI) or non-port-side exhaust (NPE) airflow directions:

- Standard AC input with IEC receptacle (100V–120V AC, 200V–240V AC)
- High-voltage input for AC and DC power (DC input range: 240V–380V DC and HV AC range up to 277V AC)

Can the Brocade X7 Director family integrate with previous Brocade Director generations in a common fabric?

The Brocade X7 Directors can co-exist in a common fabric with both DCX 8510 Directors (Gen 5) and X6 Directors (Gen 6).

At what speeds can the X7 Directors connect to an existing fabric?

The Brocade X7 Directors offer backward connectivity support for 64G, 32G, and 16G speeds to easily connect to existing fabrics using ICL or ISL connections. For 8G connectivity requirements, backward compatibility is supported using ISL connections with a 32G optic. For those environments that are running older 4G devices, the Brocade X7 Director does support device connectivity at 4G speeds via F_Ports (device port) only, using the FC32-X7-48 or FC32-48 blade.

What advanced software is bundled with the Brocade 7 Director? Are there any optional licenses?

The Brocade X7-8 and X7-4 Directors ship with the Enterprise bundle preinstalled, which includes Brocade Fabric Vision® technology, Brocade Extended Fabric, Brocade Trunking, FICON CUP, 10G Fibre Channel extension, and Integrated Routing.

The only available value-add license is for ICL Ports on Demand (POD). The ICL POD license, offered together with optics as part of the ICL POD kits, enables eight UltraScale ICL ports on Brocade X7 Directors.

For more information about Fabric Vision software features, visit https://www.broadcom.com/fabric-vision.

What SAN management software is supported on Brocade X7 Directors?

Brocade SANnav™ Management Portal and Brocade SANnav Global View are supported on Brocade X7 Directors.

For more information on SANnav Management Portal, visit www.broadcom.com/sannav.

How do Brocade Gen 7 switches safeguard mission-critical workloads from cybersecurity vulnerabilities?

Fibre Channel fabrics are secure by design based on controlled access between servers and storage and isolation within the data center. Brocade Gen 7 technology further reduces the risk of vulnerabilities from malware and hijacking attacks by validating the integrity of the switch operating system, security settings, and hardware. Brocade Fabric OS® (FOS) software adds additional security enhancements to validate the integrity and security of Brocade hardware and software. These features include Secure Boot, Brocade Trusted FOS (TruFOS) Certificates, removal of root-level access, and automated distribution of SSL certificates via SANnav Management Portal. Brocade TruFOS Certificates ensure that enterprises running Brocade directors and switches are currently covered with support and securely enabled to perform critical operations without having to worry about whether the operating system has been tampered with. In addition, Brocade FOS has been hardened by removing root-level access to the operating system to protect the SAN against malware and hijacking attacks.

Does the Brocade X7 Director support a Brocade Unified Storage Fabric (USF)?

Brocade USF is a dedicated network that unifies storage provisioning and management, maximizes security, and ensures enterprise-class reliability and performance for IP storage connectivity. The Brocade X7 Director running FOS 9.2.1 or later supports Brocade USF with the Brocade FC64-48 port blade and 64G SFP+ optic. The Brocade FC64-48 port blade provides USF capability on 24 AnyIO ports per blade. This capability enables enterprises to leverage existing or future investments in Brocade Gen 7 Fibre Channel and IP infrastructure,using a common 64G SWL SFP+ optical transceiver for added flexibility and investment protection.

AnyIO ports can be configured as 8, 16, 32, and 64G Fibre Channel, or 10, 25, or 50GbE Ethernet speeds for IP traffic. The 32G optic is required for 8G Fibre Channel connectivity. The 32G optic does not support IP connectivity.

Up to 24 ports per 48-port blade can be configured as AnyIO ports that can connect to existing servers, IP networks, and storage arrays. The Brocade X7 48-port blade can enable ports 16–23 and 32–47 as AnyIO ports for either Fibre Channel or IP connections with the transceiver dynamically changing to Fibre Channel or Ethernet depending on the port configuration.

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