

Brocade DCX 8510 Backbones Frequently Asked Questions

Introduction

This document answers frequently asked questions about the Brocade® DCX® 8510 Backbone family.

For product information, visit:

www.brocade.com/products/all/san-backbones/index.page?network=FIBRE_CHANNEL.

General Questions and Answers

Q. What are Brocade DCX 8510 Backbones?

A. Brocade DCX 8510 Backbones are the industry's most reliable, scalable, and high-performance Gen 5 Fibre Channel switching infrastructure for mission-critical storage. They are designed to increase business agility while providing non-stop access to information and reducing infrastructure and administrative costs. The backbone family includes the eight-slot Brocade DCX 8510-8 and four-slot Brocade DCX 8510-4.

The Brocade DCX 8510 Backbone family:

- Maximizes performance for I/O and bandwidth-intensive applications with unmatched scalability, performance, and reliability
- Utilizes Brocade UltraScale chassis connectivity for simpler, flatter, low-latency fabrics
- Optimizes data center connectivity over distance with integrated high-performance metro and global connectivity
- Leverages Brocade Fabric Vision® technology's powerful monitoring, management, and diagnostic tools to simplify administration, increase uptime, and reduce costs
- Helps pinpoint problems faster and simplify SAN configuration and management with customizable Brocade Network Advisor health and performance dashboards

Q. What is Gen 5 Fibre Channel?

A. Gen 5 Fibre Channel is the purpose-built, data center-proven network infrastructure for storage, delivering unmatched reliability, simplicity, and 16 Gbps performance. The Brocade DCX 8510 with Gen 5 Fibre Channel unleashes the full potential of high-density server virtualization, cloud architectures, and next-generation storage.

Q. What distinguishes Brocade DCX 8510 Backbones from other Brocade DCX Backbones?

A. Brocade DCX 8510 Backbones are the industry's most reliable, scalable, and high-performance Gen 5 Fibre Channel switching infrastructure for mission-critical storage. Brocade DCX 8510 Backbones are available in two modular form factors. Built for large enterprise networks, the 14U Brocade DCX 8510-8 has eight vertical blade slots to provide up to 512 16 Gbps Fibre Channel ports. Built for midsize networks, the 8U Brocade DCX 8510-4 has four horizontal blade slots to provide up to 256 16 Gbps Fibre Channel ports. The Brocade DCX 8510 family supports 2, 4, 8, 10, and 16 Gbps Fibre Channel, FICON®, and 1/10 Gbps Fibre Channel over IP (FCIP).

Brocade DCX Backbones are the most advanced 8 Gbps switching platforms in the industry. Customers can continue to purchase Brocade DCX Backbones knowing that their investments today will support them in the future as they transition to Gen 5 Fibre Channel.

See the table below for a detailed comparison of these backbones.

	Brocade DCX 8510-8 with Gen 5 Fibre Channel	Brocade DCX	Brocade DCX 8510-4 with Gen 5 Fibre Channel	Brocade DCX-4S
Total Bandwidth with UltraScale vs. Standard ICLs	8.2 Tbps	4.6 Tbps	2.3 Tbps	1.5 Tbps
Maximum Total Ports	384 at 16 Gbps 512 at 8 Gbps	512 at 8 Gbps	192 at 16 Gbps 256 at 8 Gbps	256 at 8 Gbps
Slot Bandwidth	512 Gbps	256 Gbps	512 Gbps	256 Gbps
Maximum Chassis Connected via UltraScale ICLs	10 core-edge 9 active-active mesh	3 active-active mesh	6 core-edge 5 active-active mesh	3 active-active mesh
UltraScale vs. Standard ICL Ports	32 at 64 Gbps	4 at 128 Gbps	16 at 64 Gbps	4 at 64 Gbps
UltraScale vs. Standard ICL Bandwidth	2 Tbps	512 Gbps	1 Tbps	512 Gbps
UltraScale vs. Standard ICL Cables	Up to 100 m optical	2 m copper	Up to 100 m optical	2 m copper
Energy Efficiency	0.3 watts/Gbps	0.3 watts/Gbps	0.3 watts/Gbps	0.4 watts/Gbps
ClearLink Diagnostic Ports (D_Ports)	Yes	No	Yes	No
In-flight Encryption and Compression	Yes	No	Yes	No
10 Gbps Native Fibre Channel	Yes	No	Yes	No
Forward Error Correction (FEC)	Yes	No	Yes	No
ASIC-Enabled Buffer Credit Loss Detection and Automatic Recovery at Virtual Channel Level	Yes	No	Yes	No
Concurrent Support for Top Talkers and Fibre Channel Routing	Yes	No	Yes	No
E_Port Top Talkers	Yes	No	Yes	No

The Future of Fibre Channel Technology

Q. Is Fibre Channel still the best infrastructure for data center storage?

A. Networks need to evolve in order to support the growing demands of highly virtualized environments and cloud architectures. Today, Fibre Channel is the de facto standard for storage networking in the data center. The introduction of Gen 5 Fibre Channel extends the life of this robust, reliable, and high-performance technology. Gen 5 Fibre Channel is the purpose-built, data center-proven network infrastructure for storage, delivering unmatched reliability, simplicity, and 16 Gbps performance. Brocade switches with Gen 5 Fibre Channel unleash the full potential of high-density server virtualization, cloud architectures, and next-generation storage. This enables organizations to continue leveraging their existing IT investments as they solve their most difficult business challenges.

Q. What is the future of Fibre Channel technology in the data center?

A. Fibre Channel will continue to play a vital role in the data center of the future. Its robust capabilities make it the technology of choice today, and organizations around the world have shown their confidence by investing over \$50 billion in Fibre Channel infrastructure. These organizations must be able to leverage those investments for the long term as they face new business demands. As the leader in Fibre Channel solutions, Brocade continues to invest heavily in R&D, along with its broad ecosystem of industry partners.

Q. Is Fibre Channel better than Fibre Channel over Ethernet (FCoE), iSCSI, or NAS for storage networks and clouds?

A. All of these technologies have value for specific use cases. But when it comes to the elevated demands of virtualization and cloud-based architectures, only Fibre Channel is the proven and trusted networking technology that meets the stringent requirements for zero-data loss and flow control with enterprise-class, mission-critical storage applications. Robust Fibre Channel infrastructures are specifically built for the reliability and performance that data centers demand.

Q. What value does 16 Gbps port speed provide when I currently have sufficient bandwidth at 4/8 Gbps?

A. High-performance, highly reliable Gen 5 Fibre Channel solutions provide the ideal networking infrastructure to accommodate the growing workloads and transformational changes in storage environments. No other technology is currently capable of supporting the highly demanding requirements associated with growing virtualized and private cloud infrastructures.

Emerging and evolving critical workloads and higher-density virtualization are continuing to push the limits of SAN infrastructure. This trend is driving ever-higher I/O and bandwidth requirements, shortening the time horizon when speeds beyond 8 Gbps are needed. The Brocade DCX 8510 features industry-leading Gen 5 Fibre Channel performance, 420 million frames-per-second switching, and 8.2 Tbps chassis bandwidth to address these next-generation I/O- and bandwidth-intensive applications.

In addition, Gen 5 Fibre Channel platforms and Brocade Fabric OS® (FOS) 7.0 introduce new functionality—such as Brocade Fabric Vision technology, Brocade ClearLink® Diagnostics, Brocade UltraScale chassis connectivity, Dynamic Fabric Provisioning (DFP), as well as in-flight compression and encryption—to reduce operational costs and complexity, and improve the reliability and availability of a fabric.

Q. What Brocade Global Services offerings are available for Brocade DCX 8510 Backbones?

A. Brocade offers assessment, design, implementation, and Brocade Resident Consultant services as well as Brocade Technical Support for the Brocade DCX 8510 Backbone.

New Features

Q. What is Brocade Fabric Vision technology?

A. Brocade Fabric Vision technology is an advanced hardware and software solution that combines capabilities from the Brocade Gen 5 Fibre Channel ASIC, Brocade Fabric OS (FOS), and Brocade Network Advisor to help administrators address problems before they impact operations, accelerate new application deployments, and dramatically reduce operational costs.

Fabric Vision technology provides unprecedented visibility and insight across the storage network through innovative diagnostic, monitoring, and management technology.

Q. What features and capabilities does Brocade Fabric Vision technology offer?

A. Brocade Fabric Vision technology, an extension of Brocade Gen 5 Fibre Channel solutions, offers technology innovation that is unmatched in the industry. Fabric Vision technology includes:

- **Monitoring and Alerting Policy Suite (MAPS):** Provides a new, easy-to-use solution for policy-based threshold monitoring and alerting. MAPS proactively monitors the health and performance of the SAN infrastructure to ensure application uptime and availability. By leveraging pre-built, rule-/policy-based templates, MAPS simplifies fabric-wide threshold configuration, monitoring, and alerting. Administrators can configure the entire fabric (or multiple fabrics) at one time using common rules and policies, or customize policies for specific ports or switch elements.
- **Fabric Performance Impact (FPI) Monitoring:** Uses pre-defined thresholds and alerts in conjunction with MAPS to automatically detect and alert administrators to severe levels of latency, and identifies slow drain devices that might impact the network. This feature uses advanced monitoring capabilities and intuitive MAPS dashboard reporting to indicate various latency severity levels, pinpointing exactly which devices are causing or are impacted by a bottlenecked port.
- **Dashboards:** Provides integrated dashboards that display an overall SAN health view, along with details on out-of-range conditions, to help administrators easily identify trends and quickly pinpoint issues occurring on a switch or in a fabric.
- **Configuration and Operational Monitoring Policy Automation Services Suite (COMPASS):** Simplifies deployment, safeguards consistency, and increases operational efficiencies of larger environments with automated switch and fabric configuration services. Administrators can configure a template or adopt an existing configuration as a template and seamlessly deploy the configuration across the fabric. In addition, they can ensure that settings do not drift over time with COMPASS configuration and policy violation monitoring within Brocade Network Advisor dashboards.
- **Brocade ClearLink Diagnostics:** Ensures optical and signal integrity for Gen 5 Fibre Channel optics and cables, simplifying deployment and support of high-performance fabrics. ClearLink Diagnostic Port (D_Port) is an advanced capability of Gen 5 Fibre Channel platforms.
- **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 into flows within the fabric, including the ability to automatically learn flows and non-disruptively monitor flow performance. Administrators can monitor all flows from a specific host to multiple targets/LUNs, from multiple hosts to a specific target/LUN, or across a specific ISL. Additionally, they can perform LUN-level monitoring of specific frame types to identify resource contention or congestion that is impacting application performance.
 - **Flow Generator:** Provides a built-in traffic generator for pre-testing and validating the data center infrastructure—including route verification and integrity of optics, cables, ports, back-end connections, and ISLs—for robustness before deploying applications.
- **Forward Error Correction (FEC):** Enables recovery from bit errors in ISLs, enhancing transmission reliability and performance.
- **Credit Loss Recovery:** Helps overcome performance degradation and congestion due to buffer credit loss.

For more information about Fabric Vision technology, visit www.brocade.com/FabricVision.

Q. What are the advantages of Brocade Fabric Vision technology?

A. Brocade Fabric Vision technology provides a breakthrough hardware and software solution that helps simplify monitoring, maximize network availability, and dramatically reduce costs. Featuring innovative monitoring, management, and diagnostic capabilities, Fabric Vision technology enables administrators to avoid problems before they impact operations, helping their organizations meet Service Level Agreements (SLAs). For more information about Fabric Vision technology, visit www.brocade.com/FabricVision.

Q. What differentiates second-generation UltraScale Inter-Chassis Links (ICLs) for the Brocade DCX 8510?

A. Second-generation UltraScale ICL technology includes new optical ports, higher port density, and support for standard optical cables up to 100 meters and 2 km QSFPs for long distances. UltraScale ICLs can connect up to 10 Brocade DCX 8510 Backbones, enabling flatter, faster, and simpler fabrics that increase consolidation while reducing network complexity and costs.

UltraScale ICLs enable connections of up to 10 chassis in a core-edge, and up to nine chassis in an active-active mesh topology. These high-density chassis topologies reduce inter-switch cabling by 75 percent and free up to 33 percent of ports for server and storage. This maximizes overall port density in the lowest amount of rack space.

UltraScale ICL Ports on Demand are licensed in increments of 16 ICL ports. Connecting five or more chassis via UltraScale ICLs requires an Enterprise ICL license.

Q. What is the throughput of the UltraScale ICL connections? What happens if an UltraScale ICL connection fails?

A. Each UltraScale ICL port provides 64 Gbps of bandwidth over a QSFP (4×16 Gbps) link. A minimum of four ports (two from each core switching blade) are required to connect chassis together.

The Brocade DCX 8510-8 has a total of 32 UltraScale ICL ports (16 per CR16-8 core switching blade) that deliver 2.1 Tbps of bandwidth. This is equivalent to 128 16 Gbps ISLs. The Brocade DCX 8510-4 has a total of 16 UltraScale ICL ports (eight per CR16-4 core switching blade) that deliver 1 Tbps of bandwidth. This is equivalent to 64 16 Gbps ISLs.

Frame-based trunking (if licensed) is enabled between up to four UltraScale ICLs. Brocade Dynamic Path Selection (DPS) balances exchanges across all ICL connections using a hash of the SID, DID, RxPort, and OxID. If an UltraScale ICL connection fails, all traffic will travel over remaining active links.

Q. Can UltraScale ICLs be used to connect any backbone chassis? Can I connect more than two backbone chassis?

A. Second-generation UltraScale ICLs can be used to connect up to 10 Brocade DCX 8510 chassis in a core-edge topology, or up to nine chassis in an active-active mesh topology. Conventional Inter-Switch Links (ISLs) can be used to connect to existing 8 Gbps backbones, directors, and switches.

Q. Can UltraScale ICLs and ISLs be used together to connect chassis?

A. Simultaneous ICL and ISL connectivity between two Brocade DCX 8510 chassis is not supported. However, if Brocade Virtual Fabrics is enabled, simultaneous ICLs and ISLs can coexist between a pair of Brocade DCX 8510 chassis if ICLs are in a different logical switch than the ISLs.

Q. What kinds of cables are used with the 4×16 GFC 50 m QSFP+ for UltraScale ICL links?

A. Brocade DCX 8510 UltraScale ICL cables connect UltraScale ICL ports over OM3 or OM4 optical cables up to 50 meters in the following manner:

- Brocade DCX 8510 4×16 GFC 50 m QSFPs require MTP 1×12 OM3 or OM4 ribbon cable connectors and multimode ribbon fiber cable, limited to 50 meters.
- Although the connector has 12 lanes in a row, the 4×16 GFC 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, it is female-female and key-up to key-up orientation.

Cables are available from:

Vendor	5 m (OM3 part number)	15 m (OM3 part number)	50 m (OM3 part number)	50 m (OM4 part number)
Molex	106283-1005	106283-1015	106283-1050	N/A
Wave2Wave	50-4120P-5M	50-4120P-15M	50-4120P-50M	50-9120P-50M
CWI Trading	N/A	N/A	N/A	QSFP-PFPF-4R-50M

For more information, visit www.molex.com or www.wave-2-wave.com, or contact Kit Yee at CWI Trading (kit.yee@cwitrading.com).

Q. What kinds of cables are used with the new 4×16 GFC 100 m QSFP+ for UltraScale ICL links?

A. Brocade DCX 8510 UltraScale ICL cables connect UltraScale ICL ports over 50 and 100 meter OM4 optical cables in the following manner:

- Brocade DCX 8510 4×16 GFC 100 m QSFPs require MTP 1×12 ribbon cable connectors and multimode ribbon fiber cable, limited to 100 meters on OM4 cables.
- Although the connector has 12 lanes in a row, the 4×16 GFC QSFP uses only the outer eight lanes (four from each end).
- The central four lanes are not used.
- The ICL 100 m QSFP can support 100 m distance using OM4 fiber via patch panels if the total patch panel loss for the link is 1 dB or less, with FEC enabled.
- Plug orientation does not matter because the plug is polarized—it takes care of itself, just like RJ-45. Specifically, it is female-female and key-up to key-up orientation.

The 100 m OM4 cables are available from:

Vendor	50 m (OM4 part number)	100 m (OM4 part number)
Wave2Wave	50-9120P-50M	50-9120P-100M
CWI Trading	QSFP-PFPF-4R-50M	QSFP-PFPF-4R-100M

For more information, visit www.wave-2-wave.com or contact Kit Yee at CWI Trading (kit.yee@cwitrading.com).

Q. What are integrated metro and geo connectivity?

A. Brocade DCX 8510 Backbones support integrated SAN extension over native Fibre Channel (metro connections up to 100 km) or over Fibre Channel over IP (FCIP) (geo connections beyond 100 km). Native Fibre Channel connections now include in-flight compression and encryption as well as optional support for 10 Gbps Fibre Channel over DWDM and dark fiber. The optional Brocade FX8-24 Extension Blade supports SAN extension over 1/10 Gigabit Ethernet (GbE) FCIP links.

Q. What are the benefits of in-flight compression over ISLs?

A. In-flight compression optimizes network performance within the data center and over long-distance links. Data is compressed at the source and uncompressed at the destination. Performance varies by data type, but Brocade uses an efficient algorithm to generally achieve 2:1 compression with minimal impact on performance. Compression can be used in conjunction with in-flight encryption. In-flight compression is only available on Gen 5 Fibre Channel port blades.

Q. What are the benefits of in-flight encryption over ISLs?

A. In-flight encryption minimizes the risk of unauthorized access for traffic within the data center and over long-distance links. It's switch-to-switch encryption, not device or data-at-rest encryption. Data is encrypted at the source and decrypted at the destination. Encryption and decryption are performed in hardware using the AES-GCM-256 algorithm, minimizing any impact on performance. Encryption can be used in conjunction with in-flight compression. In-flight encryption is available only on Gen 5 Fibre Channel port blades and is complementary to data-at-rest encryption provided by the Brocade FS8-18 Encryption Blade.

Q. How can Dynamic Fabric Provisioning simplify server deployment?

A. Dynamic Fabric Provisioning (DFP) allows organizations to eliminate fabric reconfiguration when adding or replacing servers through the virtualization of host World Wide Names (WWNs). It combines Brocade switch and adapter technology to reduce or eliminate the need to modify zoning or Logical Unit Number (LUN) masking. In addition, DFP enables pre-provisioning of virtual WWNs, helping organizations eliminate time-consuming steps when deploying new equipment or moving devices within a switch.

Q. How do Condor3 switching ASICs compare to previous generations?

A. The Condor3 ASIC is the industry's most powerful and efficient switching technology. In addition to Gen 5 Fibre Channel 16 Gbps speed, it includes more bandwidth (768 Gbps), faster I/O performance (420 million frames switched per second), more functionality (including D_Port, in-flight encryption and compression, and Forward Error Correction [FEC]), and higher energy efficiency (less than 1 watt/Gbps).

Q. What other enhancements and features are included in Brocade FOS 7.4?

A. Brocade FOS 7.4 provides extended configuration policies and templates for simplified deployment, peer zoning, and target-driven zoning and monitoring of Fibre Channel SANs; MAPS and Flow Vision enhancements; and COMPASS (Configuration and Operational Monitoring Policy Automation Services Suite), a new feature that simplifies deployment, safeguards consistencies, and increases operational efficiencies of larger environments with automated switch and fabric configuration services. Using COMPASS, administrators can configure a template or adopt an existing configuration as a template and seamlessly deploy the configuration across the fabric. In addition, they can ensure that settings do not drift over time with COMPASS configuration and policy violation monitoring within Brocade Network Advisor dashboards.

Q. What enhancements and features are included in Brocade FOS 7.3?

A. Brocade FOS 7.3 provides several enhancements, including leveraging Brocade ClearLink Diagnostic Port (D_Port) mode to ensure optical and signal integrity for Gen 5 Fibre Channel optics and cables, simplifying the deployment and support of high-performance fabrics. In addition to switch-to-switch link validation, Brocade FOS 7.3 provides the following features:

- **ClearLink Diagnostics integration into MAPS:** Provides threshold-based monitoring and alerting, and interpretation of test results.
- **ClearLink Diagnostics Pre-Provision:** Improves operational control and helps avoid costly mistakes.
- **ClearLink Automation:** Conducts automatic test runs based on port or switch events and configures them as an optional setting to reduce manual steps and ensure consistency.
- **Testing Visual Indication:** Provides a port LED that indicates failure and enhanced CLI outputs for clarity.

Through collaboration with industry partners, Brocade will extend ClearLink Diagnostics to additional end devices and adapters, providing end-to-end physical layer diagnostics and validation.

Q. What enhancements and features are included in Brocade FOS 7.2?

A. Brocade FOS 7.2 includes:

- New Fabric Vision technology features, including:
 - Monitoring and Alerting Policy Suite (MAPS)
 - Flow Vision
- Several other software features and enhancements. Refer to the Brocade FOS 7.2 Release Notes on www.MyBrocade.com for additional information.

Q. What other enhancements and features are included in Brocade FOS 7.1?

A. Brocade FOS 7.1 includes:

- ClearLink Diagnostic Port (D_Port) enhancements
 - D_Port support for Brocade DCX 8510 optical ICLs (link-distance measurement and traffic tests)
 - D_Port (including auto-configuration support) from Brocade 16 Gbps Host Bus Adapters (HBAs), such as the Brocade 1860 Fabric Adapter, to Brocade Gen 5 Fibre Channel platforms
 - Other D_Port extensions: Users can specify the number of frames, frame size, test duration, and more
- Other 16 Gbps platform RAS enhancements
 - FEC, credit recovery from Brocade 16 Gbps HBAs to 16 Gbps switches (requires Brocade HBA driver 3.2)
- In-flight encryption and compression enhancements
 - Supports more ports for encryption/compression at reduced speeds
- Fabric services enhancements
 - FDMI (Fabric Device Management Interface) enhancements
 - Performance optimization on long-distance ISLs

- FCR enhancements
 - Removes support for Interop mode 2 and Interop mode 3
 - In-flight encryption/compression on EX_Ports
 - Pathinfo over FCR
 - Credit recovery on EX_Ports
- Additional RAS enhancements
 - Bottleneck detection, backend link monitoring, edge hold time, credit recovery RASlog enhancements
 - RASlog management, audit log for CLI, CLI history enhancements
 - SFP monitoring, pathinfo enhancements
- Brocade FOS security and user management enhancements
 - TACACS+ support in Brocade FOS
 - LDAP support enhancements, including OpenLDAP support
- CL enhancements
 - 100 m ICL cable support (requires 4×16 GFC 100 m QSFPs and OM4 cables)
- FICON enhancements
 - FICON support for the Brocade 6510

Q. What other enhancements and diagnostic features are included in Brocade FOS 7.0?

A. Brocade FOS 7.0 includes: additional RASlogs messages for optics failures; Frame Viewer for Class 3 discards; Forward Error Correction (FEC) on ISLs; additional Audit Log support for Brocade Fabric Watch events; user-defined Role-Based Access Control (RBAC) and other security enhancements; the addition of E_Ports to Top Talkers; and port fencing due to CRC errors, transmission errors, and invalid Traffic Isolation Zones.

Q. What power management features are included?

A. Brocade DCX 8510 port blades and Brocade Gen 5 Fibre Channel switches (Brocade 6520, 6510, and 6505 Switches) support real-time power measurement, providing insight into power consumption in the fabric.

Brocade DCX and Brocade DCX 8510 Backbone Hardware

Q. What 8 Gbps Brocade DCX blades are compatible with Brocade DCX 8510 chassis?

A. The Brocade FC8-32E, FC8-48E, FC8-64, FS8-18, and FX8-24 are the only 8 Gbps blades supported on the Brocade DCX 8510.

Q. What are the differences between the Brocade FC8-32E and FC8-48E enhanced 8 Gbps blades and Brocade FC16-32 and FC16-48 Gen 5 Fibre Channel blades?

A. The Brocade FC8-32E and FC8-48E are 8 Gbps blades that deliver enhanced fabric resiliency and application uptime through advanced features enabled by the Condor3 ASIC, including increased buffers and no oversubscription for traffic across the backplane. These blades do not support native 10 Gbps Fibre Channel, in-flight encryption and compression, or diagnostic ports. These features are available only on Brocade FC16-32 and FC16-48 16 Gbps blades.

Q. Can Brocade FC8-32E and FC8-48E 8 Gbps blades be upgraded to 16 Gbps blades?

A. No. Brocade FC8-32E and FC8-48E blades are not upgradable to 16 Gbps functionality.

Q. What blades can be shared between the Brocade DCX 8510 and Brocade DCX Backbones?

A. The following table lists the blade-sharing possibilities.

Brocade Blade	Brocade DCX 8510-8 Backbone	Brocade DCX 8510-4 Backbone	Brocade DCX Backbone	Brocade DCX-4S Backbone
FC16-32	✓	✓	N/A	N/A
FC16-48	✓	✓	N/A	N/A
FC8-32E	✓	✓	N/A	N/A
FC8-48E	✓	✓	N/A	N/A
FC8-16	N/A	N/A	✓	✓
FC8-32	N/A	N/A	✓	✓
FC8-48	N/A	N/A	✓	✓
FC8-64	✓	✓	✓	✓
FC10-6	N/A	N/A	✓	✓
FR4-18i	N/A	N/A	✓	✓
FCOE10-24	Future Release	Future Release	✓	✓
FS8-18	✓	✓	✓	✓
FX8-24	✓	✓	✓	✓
Brocade DCX Control Processor	✓	✓	✓	✓
CR16-8 Core Switching	✓	N/A	✓	N/A
CR16-4 Core Switching	N/A	✓	N/A	✓

Q. How many Brocade FX8-24 Extension Blades can be utilized per backbone chassis?

A. Up to four Brocade FX8-24 blades per chassis are currently supported in a single chassis.

Q. How can customers utilize FCoE and Data Center Bridging (DCB) with Brocade DCX 8510 Backbones?

A. The Brocade FCOE10-24 Blade is currently supported on 8 Gbps Brocade DCX and Gen 5 Brocade DCX 8510 Backbones.

Q. How is chassis bandwidth calculated for Brocade DCX 8510 Backbones?

A. If all 512 (Brocade DCX 8510-8) or 256 (Brocade DCX 8510-4) ports are running at full 16 Gbps speed (data rate), and all traffic travels over the backplane (utilizing slot bandwidth), the total amount of oversubscription is 2:1 for either model. However, Brocade DCX 8510 Backbones have local switching—so ingress/egress traffic on the same blade does not consume slot bandwidth.

By utilizing a moderate amount of local switching, a Brocade DCX 8510 Backbone can ultimately yield 512/256 ports at full 16 Gbps speed without any oversubscription. ICL bandwidth adds an additional 2.0 Tbps (Brocade DCX 8510-8) and 1 Tbps (Brocade DCX 8510-4). The combination of port and ICL bandwidth yields the total chassis bandwidth of 10.2 Tbps (Brocade DCX 8510-8) or 5.1 Tbps (Brocade DCX 8510-4).

Q. Are Brocade Small Form-Factor Pluggables (SFPs) required for the Brocade Gen 5 Fibre Channel backbones and switches?

A. Yes. Brocade DCX 8510 Backbones and Brocade 6520, 6510, and 6505 Switches require Brocade-branded SFPs.

Q. Why do Brocade DCX 8510 Backbones require Brocade SFP optics?

A. This provides quality control that in turn avoids application downtime. The greater the port speed—especially 16 Gbps—the less tolerance that backbones and switches have for out-of-spec wavelengths that lead to port failure and application interruption.

Q. Are supported cable distances affected by 16 Gbps?

A. Yes. Supported distances are reduced as Fibre Channel speed increases. See the following table for a comparison of link distance based on speed and fiber type.

Transceiver Type	Form Factor	Speed	Multi-Mode Max Distance				Single-Mode Max Distance
			OM1	OM2	OM3	OM4	
SWL	SFP+	16 Gbps	15 m	35 m	100 m	125 m	N/A
	SFP+	10 Gbps	33 m	82 m	300 m	550 m	
	SFP+ and mSFP	8 Gbps	21 m	50 m	150 m	190 m	
	QSFP	64 Gbps	N/A	50 m	50 m	100 m	
LWL	SFP+	16 Gbps	N/A				10 km
	SFP+	10 Gbps					10 km
	SFP+	8 Gbps					10 km, 25 km
ELWL	SFP+	16 Gbps	N/A				10 km, 25 km

Q. What cable management solutions are available for Brocade DCX 8510 Backbones?

A. Brocade DCX 8510 Backbones include horizontal (Brocade DCX 8510-8) and vertical (Brocade DCX 8510-4) cable combs for basic cable management. Brocade will be offering structured cable management solutions using patch panels for existing (1U LC patch panel) and high-density (1U MPO patch panel) solutions. Consult the *Cable Management Best Practices Guide* for part numbers.

Q. Which components are common between the Brocade DCX 8510-8 and Brocade DCX 8510-4 models? Which are different?

A. Both the Brocade DCX 8510-8 and Brocade DCX 8510-4 models utilize the same Gen 5 Fibre Channel blades and SFPs (32, 48-port; 16 Gbps SFP+), Brocade FX8-24 SAN Extension Blade (for FCIP), and Brocade FC8-64 (8 Gbps 64-port) blade. They also use the same Control Processor (CP) blade, power supply FRU, fan FRU, and UltraScale ICL cables and optics. Besides the chassis, the only components that differ between the Brocade DCX 8510-8 and Brocade DCX 8510-4 models are the core switching blades (CR16-8/CR16-4) and World-Wide Name (WWN) cards.

Q. Will Brocade DCX 8510 Backbones work with existing firmware versions in current fabrics?

A. Brocade DCX 8510 models require Brocade FOS 7.0 or greater. Brocade DCX 8510 models are compatible with all 8 Gbps and 4 Gbps platforms running Brocade FOS 6.2.2 or later for Layer 2 connectivity. All other legacy devices running prior versions of Brocade FOS are supported only through Fibre Channel routing. For complete support information, please refer to the respective Brocade FOS release notes.

Q. Can Brocade DCX 8510 Backbones be connected to legacy McDATA devices?

A. Connecting Brocade DCX 8510 Backbones to legacy McDATA devices is supported only through Fibre Channel routing.

Q. The Brocade DCX 8510-8 model accommodates four power supplies. Why does it ship with two? Do both the Brocade DCX 8510-8 and Brocade DCX 8510-4 support 110 VAC power supplies?

A. Two 240 VAC power supplies come standard with the Brocade DCX 8510-8 model. Both are active/active, but if one fails, the other will provide power for the entire chassis. Two additional bays are available for higher (power) availability, or to meet increased power needs for particular blade options. The Brocade DCX 8510-8 also supports using 110 VAC power supplies in place of the two 240 VAC supplies, but with some restrictions.

The Brocade DCX 8510-4 has two power supply bays and ships with 240 VAC power supplies. Both are active/active, but if one fails, the other will provide power for the entire chassis. The 110 VAC power supplies can also be used to provide 1000 W redundant power, but with some restrictions.

Q. What are the power supply requirements for the Brocade DCX 8510 based on blade configurations?

A. Please note the general requirements below:

- The maximum number of Brocade FC16-48 and/or FC8-48E blades in a Brocade DCX 8510-8 requires a minimum of two power supplies for normal operation. Therefore, a third and/or fourth power supply needs to be added to enable high availability and non-disruptive power supply replacement. If a Brocade DCX 8510-8 maximum configuration is operated with only two power supplies (non-HA configuration), the twelfth slot (eighth port blade slot) will power down by design if one of the power supplies is removed.
- The maximum number of Brocade FC16-48 or FC8-48E blades supported with two 2,000 W power supplies is seven (one of the port blade slots must be empty) in a fully redundant (1+1) configuration.
- A fully populated Brocade DCX 8510-8 chassis with Brocade FC16-32 or FC8-32E blades requires only two 2,000 W power supplies in a fully redundant (1+1) configuration.

Brocade DCX 8510 Software

Q. What are the licensing differences between Brocade DCX 8510-8 and Brocade DCX 8510-4?

A. The Brocade DCX 8510-8 model ships standard with the Enterprise bundle (Brocade Fabric Vision technology, Brocade Extended Fabric, and Brocade ISL Trunking), whereas the Brocade DCX 8510-4 can be ordered with or without the Enterprise bundle from Brocade and OEMs (varies by OEM). Licenses that comprise the Enterprise bundle can be ordered individually for the Brocade DCX 8510-4.

Q. What optional software licenses are available for Brocade DCX 8510 Backbones?

A. Optional value-add licenses include: Integrated Routing, FICON CUP, 10 Gbps License for FCIP (FX8-24) or Integrated 10 Gbps Fibre Channel Extension, ICL Ports on Demand, and Enterprise ICL.

Q. What optional licenses are available for the Brocade FX8-24 Extension Blade?

A. The Advanced Extension license is required for FCIP Trunking and Adaptive Rate Limiting. An Advanced Accelerator for FICON license is required for Global Mirror emulation and tape pipelining. A 10 GbE port upgrade license enables the two optional 10 GbE ports and up to 20 Gbps FCIP bandwidth. Other optional Brocade FOS licenses include Integrated Routing and Extended Fabrics.

Q. What key SAN management capabilities are provided by Brocade Network Advisor?

A. Brocade Network Advisor provides comprehensive management of data center SAN fabrics, including configuration, monitoring, diagnostics, best-practices validation, and management of Brocade DCX 8510 Backbones, Brocade DCX Backbones, Brocade SAN directors and SAN switches (including Brocade Gen 5 Fibre Channel platforms), Host Bus Adapters (HBAs), and Converged Network Adapters (CNAs). Brocade Network Advisor 12.1 provides support for Monitoring and Alerting Policy Suite (MAPS) and Flow Vision, and Brocade Network Advisor 12.4 is required to provide support for Configuration and Operational Monitoring Policy Automation Services Suite (COMPASS). Each is part of Brocade Fabric Vision technology.

Brocade Network Advisor also provides out-of-the-box support for leading data center management solutions from IBM, HP, and EMC, as well as seamless support for leading hypervisors from VMware and Microsoft.

Q. What Brocade DCX 8510 Backbone models do Brocade Network Advisor SAN Enterprise, Brocade Network Advisor SAN Professional Plus, and Brocade Network Advisor SAN Professional support?

A. Brocade Network Advisor SAN Enterprise supports Brocade DCX 8510 and Brocade DCX family models. Brocade Network Advisor SAN Professional/Professional Plus supports the Brocade DCX 8510-4 and Brocade DCX-4S only.

Q. Do I need a license to utilize Brocade Virtual Fabrics features?

A. No. Brocade FOS includes Brocade Virtual Fabrics capabilities for Brocade DCX 8510 Backbones as well as Brocade 6520 and 6510 Switches.

Brocade DCX 8510 Mainframe Support

Q. What do mainframe environments gain by using Brocade DCX 8510 FICON directors?

A. Brocade DCX 8510 FICON directors provide significant value for z System server environments, including:

- Organizations can immediately capitalize on new platform performance for z System servers. IBM currently supports up to 256 ports in a domain. The 512 Gbps slot bandwidth of Brocade DCX 8510 means users can drive all 256 ports at full 8 Gbps and 16 Gbps speed without oversubscription, enabling greater fabric consolidation and lower infrastructure costs, floor space consumption, and HVAC expense.
- At less than 0.2 watt/Gbps, the Brocade DCX 8510 frees up limited power and cooling resources to support more mainframe and storage equipment.
- With two modular and scalable form factors to select from, data centers have broad flexibility in delivering uncongested FICON performance in the most cost-effective manner. As an example, the Brocade DCX 8510-4 aligns well with the environment and budget objectives of the new IBM z System “Business Class” for midsize enterprises.
- Brocade Virtual Fabrics capabilities allow data centers supporting both open systems and z System servers to logically partition a Brocade DCX 8510 and SAN fabric into Fibre Channel and FICON environments. This enables the data center to reduce network infrastructure costs and improve return on investments, while keeping Fibre Channel and FICON management and traffic flows separate.
- For data replication and backup over distance, Brocade DCX 8510 FICON directors with Brocade FX8-24 blades have powerful extension capabilities that include disk-write acceleration over extended Fibre Channel and FCIP links (called Fast Write), FICON Tape Pipelining to accelerate tape reads and writes, and FICON Global Mirror Disk Emulation to accelerate disk reads when using IBM Global Mirror.
- Brocade Top Talkers and Adaptive Networking capabilities help optimize FICON environments and application service levels.
- When connecting two Brocade DCX 8510 chassis—for up to 768 (Brocade DCX 8510-8) or 384 (Brocade DCX 8510-4) Fibre Channel/FICON ports—ICLs do not count as a hop, so the one-hop FICON limit is not affected.

Q. Can Brocade FC16-48 blades be used in the Brocade DCX 8510 in FICON environments?

A. Yes, with some caveats. The 48-port 16 Gbps blade can be used in the Brocade DCX 8510-4 model without restriction in FICON environments. The 48-port 8 Gbps blade can be used in the Brocade DCX 8510-8 model in FICON or mixed Fibre Channel/FICON environments using Brocade Virtual Fabrics, logical switch port counts under 256, and flat addressing. The Brocade FC16-48 blade also can be used in mixed Fibre Channel/FICON environments without using Brocade Virtual Fabrics, as long as FICON traffic travels over Brocade FC16-32 blades only (Fibre Channel traffic can travel over Brocade FC16-32 and Brocade FC16-48 blades).

Q. Can Brocade FC8-32E, FC8-48E, and FC8-64 blades be used in Brocade DCX 8510 in FICON environments?

A. No. There are no plans to qualify these blades in a FICON environment.

Q. Can a single Brocade DCX 8510 with mixed FICON and Fibre Channel traffic use CUP to manage the system?

A. If CUP is used to manage the FICON environment, all FICON and Fibre Channel ports are seen and can be managed using CUP. If using Brocade Virtual Fabrics and "Logical Switch," CUP can be used to manage only those ports in the partition to which it is defined.

Q. Can I manage a FICON fabric with Brocade DCFM and Brocade Network Advisor?

A. Brocade Data Center Fabric Manager (DCFM®) 10.4.1 supports only the 8 Gbps Brocade DCX platform while Brocade Network Advisor 11.1 and later versions can support the entire Brocade DCX 8510 and Brocade DCX product families.

Q. How many CUP instances are supported for each Brocade DCX 8510 chassis?

A. Brocade FOS 7.0 will support four CUP instances on each chassis.

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