Datasheet
Brocade DCX 8510 backbone family

The Brocade DCX 8510 Backbone is designed to unleash the full potential of private cloud storage. With unmatched scalability, 16Gbps performance, and reliability, it is the strategic platform for transforming current SAN fabrics into cloud-optimized SANs.

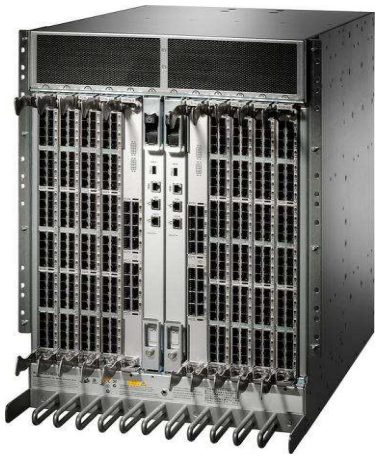
BROCADE DCX 8510 BACKBONE FAMILY

Brocade® DCX® 8510 Backbones are highly robust network switching platforms that combine breakthrough performance, scalability, and energy efficiency with long-term investment protection. Supporting open systems and System z environments, Brocade DCX 8510 Backbones are designed to address the data growth and application demands of evolving enterprise data centers; enable server, SAN, and data center consolidation; and reduce infrastructure and administrative costs.

Networks need to evolve in order to support the growing demands of highly virtualized environments and private cloud architectures. Today, Fibre Channel is the de facto standard for storage networking in the data center. The introduction of Brocade DCX 8510 Backbones with 16 Gbps Fibre Channel extends the life of this robust, reliable, and high-performance technology. This enables organizations to continue leveraging their existing IT investments as they solve their most difficult business challenges.

BROCADE DCX 8510-4/DCX 8510-8

- Unleashes the full potential of private cloud storage with unmatched scalability, performance, and reliability
- Enables simpler, flatter, low-latency chassis connectivity to reduce network complexity, management, and costs
- Optimizes data center connectivity over distance with integrated high-performance metro and global connectivity
- Simplifies and centralizes end-to-end SAN management with comprehensive diagnostics, monitoring, and automation
- Maximizes performance for I/O- and bandwidth-intensive applications with more than seven times the performance of competitive offerings
- Protects investments in existing SAN fabrics and automation tools while reducing operational costs and minimizing business disruption



Green IT

Green Policy Innovation

Green Product

This product cleared our company's original evaluation standard which followed global

Features and benefits

Main features	Benefits
CHOICE AT THE CORE AND AT THE EDGE	
■ Eight-slot Brocade DCX 8510-8 Backbone for the core of large enterprise networks ■ Four-slot Brocade DCX-8510-4 Backbone for the core of midsize networks, or the edge of large networks	■ Enables organizations to utilize Brocade 8Gb,16Gb switches, or for complete backbone-class capabilities.
HIGHEST PERFORMANCE AND SCALABILITY	
■ All ports can operate simultaneously at full 16 Gbps or 8 Gbps speed ■ 512 Gbps bandwidth per slot plus local switching ■ Brocade DCX 8510-8: 8.2 Tbps chassis bandwidth ■ Brocade DCX 8510-4: 4.1 Tbps chassis bandwidth ■ Brocade DCX 8510-8: Up to 384 16 Gbps Fibre Channel ports in a single chassis, Up to 512 8 Gbps Fibre Channel ports in a single chassis; 2.048 Tbps of aggregate ICL bandwidth ■ Brocade DCX 8510-4: Up to 192 16 Gbps Fibre Channel ports in a single chassis, Up to 256 8 Gbps Fibre Channel ports in a single chassis; 1.024 Tbps of aggregate ICL bandwidth	■ Maximizes network performance ■ Achieve greater server, storage, network, and data center consolidation ■ Helps organizations reduce equipment, facility, and overhead costs
INTELLIGENT MANAGEMENT	
■ Brocade Network Advisor (BNA) for intuitive system configuration, comprehensive management, and a topology-centric view across Brocade data center solutions.	■ Helps maximize network performance and reduce operational expense
BROCADE FOS-POWERED WITH TRAFFIC MONITORING AND ADAPTIVE NETWORKING	
■ Powerful Brocade Fabric OS embedded operating system	■ Helps optimize fabric behavior and application performance
■ Top Talkers real-time traffic measurement (part of Advanced Performance Monitoring)	
■ Adaptive Networking to include Ingress Rate Limiting, Traffic Isolation, and Quality of Service (QoS)	■ Enables predictability and avoiding network congestion
■ Bottleneck Detection to identify and alert administrators to "slow drain" storage devices	■ Maximizes network performance and reduce administrative overhead
ENERGY EFFICIENCY, RELIABLITY, AND INVESTMENT PROTECTION	
■ Less than one-half watt per Gbps - Fifteen times more energy efficient than competitive offerings	■ Helps organizations reduce energy costs and achieve "green" initiatives
■ Hot-pluggable components, including redundant power supplies, fans, WWN cards, blades, and optics - designed to support 99.999% uptime	■ Helps minimize downtime costs
■ Connect natively to Brocade B-Series fabrics without disruption.	■ Maximizes return on existing investments

MAXIMUM FLEXIBILITY AND RELIABILITY

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 384 16 Gbps Fibre Channel ports. Built for midsize networks, the 8U Brocade DCX 8510-4 has four horizontal blade slots to provide up to 192 16 Gbps Fibre Channel ports. The Brocade DCX 8510 family supports 2, 4, 8 and 16 Gbps Fibre Channel.and 1/10 Gbps Fibre Channel over IP (FCIP.)
To help minimize downtime costs, Brocade DCX 8510 Backbones build upon years of innovation and leverage the core technology of Brocade systems performing at greater than 99.999 percent uptime in the world's most demanding data centers.

SIMPLIFIED SCALE-OUT NETWORK DESIGN

Connecting distributed data centers enables data mobility for advanced data protection solutions. Brocade DCX 8510 Backbones include integrated metro and global Storage Area Network (SAN) extension that provides application agility and flexible business continuity and disaster recovery solutions.
The Brocade DCX 8510 family enables high-speed replication and backup solutions over metro or WAN links with native Fibre Channel The integrated metro connectivity includes in-flight compression and encryption to optimize bandwidth and minimize the risk of unauthorized access.

SIMPLIFIED DEPLOYMENT AND CENTRALIZED MANAGEMENT

Automating and simplifying SAN management enables data centers to quickly adapt to change and overcome disruptions in a private cloud infrastructure. Brocade DCX 8510 advanced diagnostics, monitoring, and management reduce end-to-end SAN management complexities and costs.
The Brocade DCX 8510 helps reduce operating costs through simpler server provisioning and change management, advanced cable and optics diagnostics, and comprehensive management. Several technologies support these capabilities, including:

- Dynamic Fabric Provisioning: Reduces or eliminates the need to reconfigure zoning and Logical Unit Number (LUN) masking when adding or replacing servers
- Diagnostic Ports (D_Ports): Help identify and isolate optics and cable problems, reducing fabric deployment and diagnostic times
- Brocade Network Advisor: Provides comprehensive management of data center fabrics, including configuration, monitoring, and management of Brocade backbones, switches, and adapters

INDUSTRY-LEADING PERFORMANCE

Emerging and evolving critical workloads and higher density virtualization are continuing to push the limits of SAN infrastructure. The Brocade DCX 8510 features industry-leading 16 Gbps performance and 8.2 Tbps chassis bandwidth to address next-generation I/O- and bandwidth-intensive applications.
Brocade DCX 8510 Backbones provide unmatched chassis, slot-to-slot, and port performance and bandwidth. In addition, local switching capabilities ensure that data traffic within the same port group does not consume slot bandwidth, maximizing the number of line-rate ports. Performance capabilities include:

- Brocade DCX 8510-8:
  - Up to 384 ports (equivalent to 512 with ICLs) at 16 Gbps
  - 8.2 Tbps chassis bandwidth
- 6.1 Tbps universal ports
- 2.1 Tbps ICL bandwidth
  - 512 Gbps bandwidth per slot
- Brocade DCX 8510-4:
  - Up to 192 ports (equivalent to 256 with ICLs) at 16 Gbps
  - 4.1 Tbps chassis bandwidth
- 3.1 Tbps universal ports
- 1 Tbps ICL bandwidth
  - 512 Gbps bandwidth per slot

SAN FABRIC INVESTMENT PROTECTION

Data centers worldwide have invested more than $50 billon in Fibre Channel technology. With new 16 Gbps Fibre Channel products, Brocade offers a compelling, long-term solution for mission-critical applications that require high-performance, low-latency storage networks. The Brocade DCX 8510 offers maximum investment protection by:

- Seamlessly integrating with 30 million existing 2, 4, and 8 Gbps Fibre Channel ports
- Leveraging investments in existing 8 Gbps Brocade DCX Backbone port and specialty blades
- Providing a simple upgrade path to 16 Gbps for 8 Gbps Brocade DCX Backbone users
- Providing a unified network management solution—Brocade Network Advisor—that integrates with leading data center server and storage automation solutions to bridge operational gaps across server, network, and storage administrators

INDUSTRY-LEADING ENERGY EFFICIENCY

Brocade DCX 8510 Backbones are highly efficient at reducing power consumption, cooling, and the carbon footprint in data centers. While providing unmatched performance and scale, they use less than one watt per Gbps—making them 15 times more efficient than competitive offerings.

Technical details

SYSTEM ARCHITECTURE	
Chassis	Single chassis: Up to 384 (Brocade DCX 8510-8) or 192 (Brocade DCX 8510-4) 16 Gbps universal (E, F, D, M, and EX) Fibre Channel ports using up to eight 32-, or 48-port Fibre Channel blades. Up to 512 (Brocade DCX 8510-8) or 256 (Brocade DCX 8510-4) 8 Gbps universal (E, F, D, M, and EX) Fibre Channel ports using 64-port 8 Gbps Fibre Channel blades. Multi-chassis: Up to 2304 (Brocade DCX 8510-8) or 960 (Brocade DCX 8510-4) 16 Gbps universal Fibre Channel ports; up to 3072 (Brocade DCX 8510-8) or 1280 (Brocade DCX 8510-4) 8 Gbps universal Fibre Channel ports; ICL ports (32 or 16 per chassis, optical QSFP) connect up to six Brocade DCX 8510 chassis.
Control processor	Redundant (active/standby) control processor modules
Scalability	Full-fabric architecture of 239 switches
Certified maximum	6000 active nodes; 56 switches, 19 hops in Brocade Fabric OS® fabrics; 31 switches, three hops in Brocade M-EOS fabrics; larger fabrics certified as required
Special-purpose blades	Brocade FX8-24 Extension Blade provides SAN extension over IP networks(12 8Gbps Fibre Channel ports,10 1GbE ports with license option for up to two 10 GbE ports per blade; up to four blades).
Performance	Fibre Channel: 2.125 Gbps line speed, full duplex; 4.25 Gbps line speed, full duplex; 8.5 Gbps line speed, full duplex; 14.025 Gbps line speed, full duplex; auto-sensing of 2, 4, 8, and 16 Gbps port speeds; 10 Gbps and optionally programmable to fixed port speed
ISL Trunking	Frame-based trunking with up to eight 16 Gbps ports per ISL trunk; up to 128 Gbps per ISL trunk Exchange-based load balancing across ISLs with DPS included in Brocade Fabric OS
Chassis bandwidth	Brocade DCX 8510-8: 8.2 Tbps per chassis (384 ports × 16 Gbps data rate + 2.048 Tbps ICL bandwidth) Brocade DCX 8510-4: 4.1 Tbps per chassis (192 ports × 16 Gbps data rate + 1.024 Tbps ICL bandwidth)
Slot bandwidth	512 Gbps (data rate)
Local switching bandwidth	512 Gbps for Brocade FC16-32:32 ports × 8 Gbps (data rate) 768 Gbps for Brocade FC16-48:48 ports × 8 Gbps (data rate) 512 Gbps for Brocade FC8-64:64 ports × 8 Gbps (data rate)
ICL bandwidth	Brocade DCX 8510-8: 2.048 Tbps; 32 ICL ports provide the equivalent of 128 16 Gbps ports. Each ICL port provides 64 Gbps bandwidth over a QSFP (4×16 Gbps) link. Brocade DCX 8510-4: 1.024 Tbps; 16 ICLs provide the equivalent of 64 16 Gbps ports. Each ICL port provides 64 Gbps bandwidth over a QSFP (4×16 Gbps) link. Both models: Frame-based trunking is enabled between four ICLs. DPS distributes exchanges across all frame trunks.
Switch latency	Locally switched port latency is 300 to 800 ns; blade-to-blade latency is 0.9 to 2.4 µsec; encryption/compression is 5.5 µsec per node; Forward Error Correction (FEC) adds 400 ns between E_Ports (enabled by default).
Maximum frame size	2112-byte payload
Frame buffers	8192 per 16-port group on 32-port blades and up to 8192 per 24-port group on 48-port blades, dynamically allocated
Classes of service	Class 2, Class 3, Class F (inter-switch frames)
Fibre Channel port types	D_Port (Diagnostic Port), E_Port, EX_Port, F_Port, M_Port (Mirror Port); self-discovery based on switch type (U_Port); optional port type control
Data traffic types	Fabric switches supporting unicast

SYSTEM ARCHITECTURE (Continued)	
Media types	16 Gbps: Brocade FC16-32 and -48 require Brocade hot-pluggable SFP+, LC connector; 16 Gbps SWL 8 Gbps: Brocade FC16-32 and -48; require Brocade hot-pluggable SFP+, LC connector; 8 Gbps SWL, LWL, ELWL 8 Gbps: Brocade FC8-64 blades require Brocade hot-pluggable mSFP, mSFP LC connector; 8 Gbps SWL only ICL QSFP: Brocade CR16-8 and CR16-4 require Brocade hot-pluggable QSFP, MTP connector; 4×16 Gbps SWL Fibre Channel distance subject to fiber-optic cable and port speed
USB	1 USB port per control processor for firmware download, support save, and configuration upload/download
Fabric services	Brocade Advanced Performance Monitoring (APM) (including Top Talkers for E_Ports, F_Ports, and Fabric mode); Brocade Adaptive Networking (Ingress Rate Limiting, Traffic Isolation, QoS); Bottleneck Detection; Brocade Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning); Dynamic Fabric Provisioning (DFP); Dynamic Path Selection (DPS); Brocade Extended Fabrics; Enhanced BB credit recovery; Brocade Fabric Watch; FDMI; Frame Redirection; Frame-based Trunking; FSPF; Integrated Routing; IPoFC; Brocade ISL Trunking; Management Server; NPIV; NTP v3; Port Fencing; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Brocade Server Application Optimization (SAO); Simple Name Server (SNS); Virtual Fabrics (Logical Switch, Logical Fabric)
Extension	Supports DWDM, CWDM, and FC-SONET devices; Fibre Channel, in-flight compression (Brocade LZO) and encryption (AES-GCM-256) BB credit recovery FCIP,Adaptive Rate Limiting(ARL), date compression, Fast Wite, read/write Tape Pipelining, QoS

HIGH AVAILABILITY	
Architecture	Passive backplane; redundant active/passive control processor; redundant active/active core switching blades; redundant WWN cards
Chassis power	Two 2000 W AC power supply modules (100 to 240 V auto-sensing), 2N redundancy; Brocade DCX 8510-8 supports two additional power modules
Cooling	Brocade DCX 8510-8: Three blower assembly modules (two required for operation) Brocade DCX 8510-4: Two blower assembly modules (one required for operation)
Solution availability	Designed to provide 99.999 percent uptime capabilities; hot-pluggable redundant power supplies, fans, WWN cards, processors, core switching, port blades, and optics; online diagnostics; non-disruptive firmware download and activation

MANAGEMENT	
Management	HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog; Brocade Advanced Web Tools, Brocade APM, Brocade Fabric Watch; Brocade Network Advisor SAN Enterprise (Brocade DCX 8510-8, Brocade DCX 8510-4) or Brocade Network Advisor SAN Professional/Professional Plus (Brocade DCX 8510-4 only); Command Line Interface (CLI); SMI-S compliant; Administrative Domains; trial licenses for add-on capabilities; Fujitsu ETERNUS SF Storage Cruiser
Security	AES-GCM-256 encryption on ISLs; DH-CHAP (between switches and end devices), FCAP switch authentication; FIPS 140-2 L2-compliant, HTTPS, IPsec, IP filtering, LDAP with IPv6, Port Binding, RADIUS, User-defined Role-Based Access Control (RBAC), Secure Copy (SCP), Secure RPC, SFTP, SSH v2, SSL, Switch Binding, Trusted Switch
Management access	10/100/1000 Ethernet (RJ-45) per control processor, in-band over Fibre Channel; serial port (RJ-45) and one USB per control processor module; call-home integration enabled through Brocade Network Advisor
Diagnostics	D_Port offline diagnostics, including electrical/optical loopback, link traffic/latency/distance; POST and embedded online/offline diagnostics, including environmental monitoring, FCping and Pathinfo (FC traceroute), frame viewer, non-disruptive daemon restart port mirroring (SPAN port), optics health monitoring, power monitoring (16 Gbps blades-only), RAStrace logging, and Rolling Reboot Detection (RRD)

MECHANICAL SPECIFICATIONS	
Enclosure	Rear panel-to-door airflow; Brocade DCX 8510-4 ships with 1U exhaust shelf
Mounting	Rack-mountable in a standard 19-inch EIA cabinet
Size	Brocade DCX 8510-8 Width: 43.74 cm (17.22 in.) Height: 61.24 cm (24.11 in., 14U) Depth (without door): 61.19 cm (24.09 in.) Depth (with door): 73.20 cm (28.82 in.) Brocade DCX 8510-4 Width: 43.74 cm (17.22 in.) Height: 35.00 cm (13.78 in., 8U) plus 4.37 cm exhaust shelf (1.72 in, 1U) Depth without door: 61.19 cm (24.09 in.) Depth with door: 73.20 cm (28.82 in.)
System weight	Brocade DCX 8510-8 103.50 kg (228.20 lb) for 384-port configuration fully populated 39.55 kg (82.20 lb) for chassis Brocade DCX 8510-4 68.04 kg (150.00 lb) for 192-port configuration fully populated 25.76 kg (56.80 lb) for chassis

ENVIRONMENT	
Temperature	Operating: 0° C to 40° C (32° F to 104° F) Non-operating: –25° C to 70° C (–13° F to 158° F)
Humidity	Operating: 20% to 85% RH non-condensing at 40° C (104° F) Non-operating and storage (non-condensing): 10% to 93% at 70° C (158° F)
Altitude	Up to 3000 meters (9842 feet)
Shock	Operating: 20 g, 6 ms, half sine Non-operating: 33 g, 11 ms, half sine
Vibration	Operating: 0.5 g p-p, 5 to 500 to 5 Hz Non-operating: 2.0 g p-p, 5 to 500 to 5 Hz
Heat dissipation	Brocade DCX 8510-8 Min: 32-port configuration (no QSFP), 873 W, 2982 BTU/hr Max: 384-port configuration (fully-loaded w/QSFPs), 2242 W, 7654 BTU/hr Brocade DCX 8510-4 Min: 32-port configuration (no QSFP), 618 W, 2111 BTU/hr Max: 192-port configuration (fully-loaded w/QSFPs), 1195 W, 4078 BTU/hr
CO_2 emissions	Brocade DCX 8510-8 7.8 metric tonnes per year (with 384 ports at 0.42 kg/kWh) 0.95 kg per Gbps per year Brocade DCX 8510-4 4.3 metric tonnes per year (with 256 ports at 0.42 kg/kWh) 1.04 kg per Gbps per year

POWER	
Supported power range	Voltage Range: 85 to 264 VAC Auto-volt Nominal: 100 to 240 VAC Power 85 to 132 VAC: 1000 W 180 to 264 VAC: 2000 W
In-rush current	60 Amps maximum, peak
Frequency	47 to 63 Hz

More information

Fujitsu platform solutions

In addition to Brocade DCX Backbones, Fujitsu provides a range of platform solutions. They combine reliable Fujitsu products with the best in services, know-how and worldwide partnerships.

Dynamic Infrastructures
With the Fujitsu Dynamic Infrastructures approach, Fujitsu offers a full portfolio of IT products, solutions and services, ranging from clients to datacenter solutions, Managed Infrastructure and Infrastructure-as-a-Service. How much you benefit from Fujitsu technologies and services depends on the level of cooperation you choose. This takes IT flexibility and efficiency to the next level.

Computing products
www.fujitsu.com/global/services/computing/
- PRIMERGY: Industry standard server
- SPARC Enterprise: UNIX server
- PRIMEQUEST: Mission-critical IA server
- ETERNUS: Storage system

Software
www.fujitsu.com/software/
- Interstage: Application infrastructure software
- Systemwalker: System management software

More information

Learn more about Brocade DCX Backbones, please contact your Fujitsu sales representative, Fujitsu business partner, or visit our website.
www.fujitsu.com/eternus/

Fujitsu green policy innovation

Fujitsu Green Policy Innovation is our worldwide project for reducing burdens on the environment. Using our global know-how, we aim to resolve issues of environmental energy efficiency through IT. Please find further information at:
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