BROCADE FCOE10-24 BLADE

STORAGE AREA NETWORK

High-Density, End-of-Row Connectivity for Server I/O Consolidation

HIGHLIGHTS

- Provides Fibre Channel over Ethernet (FCoE) and Data Center Bridging (DCB) end-of-row server connectivity using high-density Brocade DCX Backbones
- Delivers line-rate 10 Gbps performance across 24 DCB ports using a cut-through, non-blocking architecture
- Processes FCoE traffic at wire speed for transport to Fibre Channel and FCoE storage systems
- Supports end-to-end FCoE using Fibre Channel ISLs
- Utilizes Link Aggregation Control Protocol (LACP) and Brocade frame-based trunking to maximize DCB bandwidth
- Combines with Brocade Converged Network Adapters (CNAs) and Brocade Network Advisor to provide a unified DCB/FCoE solution that reduces CapEx and OpEx

The Brocade One™ strategy helps organizations transition smoothly to a world where information and applications reside anywhere. The Brocade FCOE10-24 Blade supports this strategy by enabling LAN and SAN access over a single server connection to simplify network design.

Designed for midsize and large enterprise environments, the Brocade® FCOE10-24 Blade for Brocade DCX® Backbones enables access to LANs and SANs over a common server connection by utilizing the emerging Data Center Bridging (DCB) and Fibre Channel over Ethernet (FCoE) protocols. The blade forwards LAN traffic to aggregation layer Ethernet switches using conventional 10 Gigabit Ethernet (GbE) connections, and it forwards storage traffic to Brocade Fibre Channel SANs and FCoE storage systems.

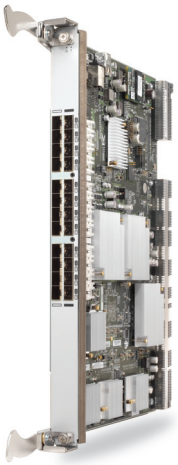
Full support for end-to-end FCoE is achieved via Fibre Channel ISLs, allowing FCoE traffic to be carried from FCoE initiators across multiple Fibre Channel ISL hops, eventually terminating in Fibre Channel or FCoE storage. By simplifying system configuration, the Brocade FCOE10-24 enables Brocade DCX Backbones to provide high-density, end-of-row server connectivity that helps reduce both capital and operating expenses in enterprise data centers.

A UNIFIED DCB/FCOE SOLUTION TO REDUCE COSTS

The Brocade FCOE10-24 connects to servers utilizing Brocade 1010/1020 Converged Network Adapters (CNAs) or third-party CNAs. Consolidating server I/O reduces the number of server adapters, which in turn reduces cabling and switch ports, and ultimately results in lower infrastructure costs, including reduced power and cooling costs. To further reduce complexity and administrative overhead, organizations can manage Brocade CNAs and Brocade DCX Backbones across their Brocade Fibre Channel SAN infrastructures with Brocade Network Advisor—providing a unified DCB/FCoE solution that is unique in the industry.

INDUSTRY-LEADING PERFORMANCE AND SCALABILITY

Utilized in a Brocade DCX or Brocade DCX-4S chassis, the Brocade FCOE10-24 Blade supports data-intensive applications by delivering best-in-class performance.



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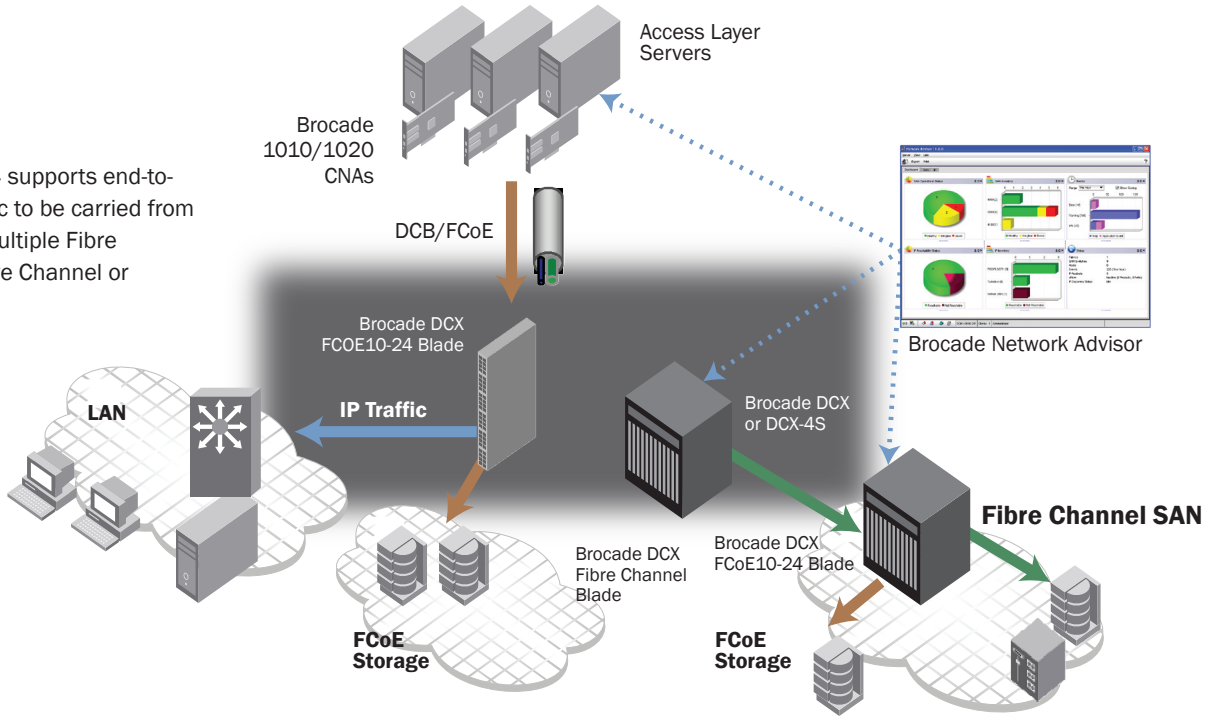

Figure 1.
The Brocade FCOE10-24 supports end-to-end FCoE, allowing traffic to be carried from FCoE initiators across multiple Fibre Channel ISL hops to Fibre Channel or FCoE storage.

Its non-blocking architecture features 24 10 GbE DCB ports. Each Brocade DCX and Brocade DCX-4S chassis supports a maximum of four Brocade FCOE10-24 Blades, providing up to 96 10 GbE FCoE/DCB-capable ports per chassis.

In addition, unique Brocade frame-based trunking provides unmatched server connection throughput (up to 40 Gbps). The blade also utilizes advanced ASIC technology to provide standards-based Link Aggregation Control Protocol (LACP) for LAN connections.

COMPREHENSIVE LAYER 2 LAN CAPABILITIES

Leveraging deep Brocade expertise in Ethernet technologies, the Brocade FCOE10-24 provides broad, standards-based Data Link Layer (Layer 2) capabilities. DCB ports provide uplink connections to aggregation layer Ethernet switches (Brocade or third-party devices) using conventional 10 GbE ports. Layer 2 functions are configured and administered accordingly at the access layer.

FABRIC OS-POWERED, NON-DISRUPTIVE SAN CONNECTIVITY

The Brocade FCOE10-24 utilizes the same Brocade Fabric OS® that supports the entire Brocade SAN product family—from fixed port switches to the Brocade DCX Backbone. This helps ensure backward and forward compatibility, and enables seamless, high-speed connectivity to Brocade Fibre Channel SANs and FCoE storage systems (see Figure 1). The Brocade DCX control processor failover and firmware upgrade processes are completely non-disruptive to FCoE and Fibre Channel traffic flowing through the Brocade DCX Backbone.

HIGHER FABRIC SECURITY

To help organizations safeguard their critical information, the Brocade FCOE10-24 is designed for the highest level of fabric security. It utilizes advanced port and switch Access Control Lists (ACLs) to simplify administration and significantly increase control over data access. To enhance access security, the Brocade FCOE10-24 supports Active Directory with LDAP and 802.1x security and authentication.

SEAMLESS, UNIFIED MANAGEMENT

Brocade Network Advisor provides comprehensive management of unified data center fabrics, including configuration, monitoring, and management of the Brocade DCX Backbone and Brocade directors, routers, switches, Host Bus Adapters (HBAs), and CNAs. It also helps organizations discover, monitor, and manage converged FCoE network environments as well as IP switching and routing networks.

Brocade Network Advisor provides comprehensive Layer 2 configuration, with easy-to-use DCB interface administration, FCoE port and trunk configurations, and Quality of Service (QoS).

MAXIMIZING INVESTMENTS

To help optimize technology investments, Brocade and its partners offer complete solutions that include education, support, and services. For more information, contact a Brocade sales partner or visit www.brocade.com.

BROCADE FCOE10-24 SPECIFICATIONS

The following feature information is based on a Brocade DCX Backbone running Fabric OS 6.4.1_fcoe or higher.

System Architecture	
DCB ports	24 ports with 10 Gigabit Ethernet (GbE)
FCoE	The Brocade FCOE10-24 de-encapsulates FCoE traffic and forwards it to chassis-based Brocade DCX Fibre Channel port blades
Performance	10 Gbps line speed
Maximum frame size	9048-byte Ethernet frame for DCB ports
Data traffic types	Fabric switches supporting unicast, multicast (255 groups), and broadcast
MAC address table entries	32,000 MAC addresses
DCB features	Priority-based Flow Control (PFC): IEEE 802.1Qbb Enhanced Transmission Selection (ETS): IEEE 802.1Qaz Data Center Bridging eXchange (DCBX)
DCB media types	Hot-pluggable, Brocade 10 GbE SFP+ supports any combination of Short-Reach (SR) and Long-Reach (LR) optical transceivers
Data Link Layer (Layer 2) Features	
Layer 2 features	Layer 2 Virtual Local Area Networks (VLANs): 4096 VLAN Encapsulation 802.1Q Rapid Spanning Tree Protocol (RSTP) Multiple Spanning Tree MSTP (802.1s): 16 instances STP PortFast and PortFast Guard STP Root Guard Link Aggregation Control Protocol (LACP) IEEE- 802.3ad Brocade enhanced frame-based trunking Advanced PortChannel hashing based on Layer 2, 3, and 4 information Pause Frames (802.3x) Storm Control (unicast, multicast, and broadcast) Address Resolution Protocol (ARP) RFC 826 Internet Group Management Protocol (IGMP) snooping versions 1, 2, and 3
Layer 2 security	Ingress Access Control Lists (ACLs) Standard and extended Layer 2 ACLs VLAN-based ACLs (VACLs) Port-based ACLs (PACLs) Named ACLs ACL statistics Optimized ACL distribution Port-based network Access Control, IEEE 802.1X
Layer 2 Quality of Service (QoS)	Eight priority levels for QoS IEEE 802.1p Class of Service (CoS) Eight hardware queues per port Per-port QoS configuration CoS trust: IEEE 802.1p Modular QoS CLI (MQC) compliance Per-port Virtual Output Queuing CoS-based egress queuing Egress Strict Priority Queuing Egress port-based scheduling: Weighted Round-Robin (WRR)
FCoE features	Complete T11 FCoE entity and FCoE bridging. The FCoE hardware engine provides: • Detection of Fibre Channel encapsulation and redirection of FCoE fabric login frames • Encapsulation of Fibre Channel frames in FCoE Ethernet packets (FC > FCoE) • Extraction of Fibre Channel frames from FCoE Ethernet packets (FCoE > FC) • Mapping of Fibre Channel destination Virtual Fabrics and destination FC_ID to Ethernet Virtual LAN and destination MAC addresses Fabric-Provided MAC Addresses (FPMAs) enable new Ethernet MAC addresses to be created using the FC_ID assigned by the fabric.
Licensing options	FCoE support is enabled on the Brocade FCOE10-24 blade
Management	
Management software	Brocade Network Advisor: • Brocade Network Advisor uses HTTP/HTTPS and SNMP protocols to communicate with the Brocade DCX/DCX-4S to manage and monitor DCB features • Brocade Network Advisor supports the following FCoE/DCB functionality: - Discovery, connectivity map, and product list - Configuration management - Performance management - Fault management - Security management • Web Tools

BROCADE FCOE10-24 SPECIFICATIONS (CONTINUED)

Management protocols	Industry-common Command Line Interface (CLI) Security Shell (SSH) v2 Authentication, Authorization, and Accounting (AAA) Simple Network Management Protocol (SNMP) v1, v2, and v3 Unified username and passwords across CLI and SNMP Syslog Microsoft Challenge Handshake Authentication Protocol (CHAP) Remote Monitoring (RMON) Per-port ingress and egress counters Role-Based Access Control (RBAC) Power-On Self-Test (POST) Comprehensive bootup diagnostics
Diagnostics	Power-On Self-Test (POST): These tests are port blade-oriented to ensure that the switch is ready for use. Testing is performed on physical ports. Switch-level testing is executed at the user port level. The tests rely on the standard Fabric OS support to provide routing and port setup. Manufacturing support includes long-duration testing.

Mechanical	
Size	Width: 27.9 cm (11.0 in) Height: 41.2 cm (16.2 in) Thickness: 3.6 cm (1.4 in)
Environmental	
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: 10% to 85% non-condensing at 40°C (104°F) Non-operating: 10% to 93% at 70°C (158°F)
Altitude	Operating: Up to 3000 m (9842 ft) Storage: Up to 12 km (39,370 ft)
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
Power	
Power	Nominal: 250 watts
Input voltage	40 to 50 VAC nominal
Input line frequency	47 to 63 Hz
Inrush current	60 amps maximum
Maximum current	29 amps at 12 V DC

For information about supported SAN standards, visit www.brocade.com/sanstandards.

For information about switch and device interoperability, visit www.brocade.com/interoperability.

For information about hardware regulatory compliance, visit www.brocade.com/regulatorycompliance.

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