

BROCADE 7800 EXTENSION SWITCH

DATA CENTER

HIGHLIGHTS

- Leverages next-generation Fibre Channel and FCIP technology to enable fast, reliable, and cost-effective remote data replication, backup, and migration
- Maximizes flexibility with an extensible hardware platform and flexible software licensing to support a broad range of SAN extension requirements
- Offers best-in-class Fibre Channel and FCIP port density, bandwidth, and throughput with up to sixteen 8 Gbps Fibre Channel ports and six 1 GbE ports in a 1U space
- Scales from simple point-to-point disk or tape extension up to comprehensive multisite enterprise extension solutions for open systems and FICON environments
- Maximizes replication, backup, and migration throughput over distance using advanced Fibre Channel frame compression, disk and tape protocol acceleration, and QoS-aware FCIP networking technology
- Introduces FCIP Trunking to maximize FCIP tunnel bandwidth and WAN link resiliency
- Introduces Adaptive Rate Limiting to maximize utilization and sharing of bandwidth

Next-Generation SAN Extension for Remote Data Replication, Backup, and Migration

IT organizations continue to face unprecedented data growth as more platforms, applications, and users connect to the data center network. In turn, the storage network infrastructure must continue evolving to enable fast, continuous, and cost-effective access to mission-critical data from anywhere in the world.

To address this challenge, the Brocade® 7800 Extension Switch helps provide the fastest, most reliable, and most cost-effective network infrastructure for remote data replication, backup, and migration. Leveraging next-generation Fibre Channel and advanced Fibre Channel over IP (FCIP) technology, the Brocade 7800 provides a flexible and extensible platform to move more data faster and further than ever before.

Whether configured for simple point-to-point or comprehensive multisite SAN extension, the Brocade 7800 addresses the most

demanding business continuity, compliance, and global data access requirements. Up to sixteen 8 Gbps Fibre Channel ports and six 1 Gigabit Ethernet (GbE) ports provide unmatched Fibre Channel and FCIP bandwidth, port density, and throughput for maximum application performance over WAN links.

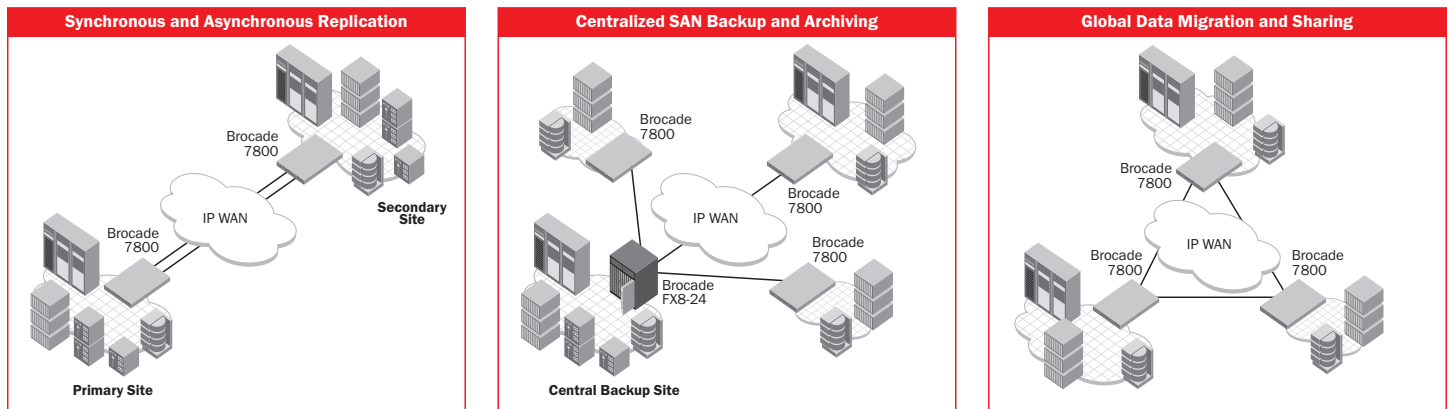
A SCALABLE, FLEXIBLE SAN EXTENSION PLATFORM

The Brocade 7800 is an ideal platform for building or expanding a high-performance SAN extension infrastructure for disaster recovery, data protection, and data mobility storage solutions (see figure 1). It leverages cost-effective IP WAN transport to extend open systems and mainframe disk and tape storage applications over distances that would otherwise be impossible, impractical, or too expensive with standard Fibre Channel connections.



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Figure 1. The Brocade 7800 provides flexible deployment options to extend disaster recovery, data protection, and data mobility storage solutions across any distance.



Available in two configurations (the Brocade 7800 16/6 Extension Switch and the Brocade 7800 4/2 Extension Switch), the Brocade 7800 supports a variety of architectures and deployment models to address current and future SAN extension requirements. A broad range of optional advanced extension, FICON®, and SAN fabric services are available to address the most challenging extension and storage networking requirements.

The Brocade 7800 16/6 Extension Switch is a robust platform for data centers and multisite environments implementing disk and tape solutions for open systems and mainframe environments. Organizations can optimize bandwidth and throughput through sixteen 8 Gbps Fibre Channel ports and six 1 GbE ports. The Brocade 7800 16/6 Extension Switch is ideal for:

- Open systems and mainframe disk and tape extension
- Multisite synchronous and asynchronous storage replication
- Centralized SAN backup, recovery, and archiving
- Global data and storage resource migration, distribution, and sharing

The Brocade 7800 4/2 Extension Switch is a cost-effective option for smaller data centers and remote offices implementing point-to-point disk replication for open systems. Organizations can optimize

bandwidth and throughput through four 8 Gbps Fibre Channel ports and two 1 GbE ports. The Brocade 7800 4/2 can be easily upgraded to the Brocade 7800 16/6 through software licensing, providing scalability and investment protection for growing environments. The Brocade 7800 4/2 Extension Switch is ideal for:

- Open systems disk extension
- Point-to-point synchronous and asynchronous disk replication
- Global data and storage resource migration, distribution, and sharing

SIMPLIFIED DISASTER RECOVERY AND DATA PROTECTION

Today's organizations depend on fast, reliable access to data wherever and whenever needed, regardless of location. As a result, the ramifications and potential business impact of an inadequate disaster recovery and data protection infrastructure are greater than ever.

The advanced performance and network optimization features of the Brocade 7800 enable replication and backup applications to send more data over FCIP links in less time, protecting time-sensitive synchronous or other high-priority traffic, and optimizing available WAN bandwidth.

Fast Write SCSI acceleration maximizes replication performance and enables cost-effective synchronous and asynchronous

replication across any distance. In addition, FCIP Tape Pipelining utilizes unique read and write tape processing to significantly reduce backup and recovery times over distance anywhere in the world. Optional FCIP Trunking provides FCIP tunnel redundancy for lossless path failover and guaranteed in-order data delivery in the event of a failure.

The Brocade 7800 leverages the core technology of Brocade systems performing at greater than 99.999 percent uptime in the world's most demanding data centers. It combines enterprise-class availability features such as hot-pluggable redundant power supplies and fans with non-disruptive software upgrades to maximize application uptime and minimize outages. These unique capabilities enable a high-performance and highly reliable network infrastructure for disaster recovery and data protection.

UNMATCHED PERFORMANCE AND OPTIMIZATION

Best-in-class Fibre Channel and FCIP switch port density, bandwidth, and throughput address today's dynamic I/O and workload requirements and are designed to meet tomorrow's evolving requirements for virtual data centers. Supporting up to 350 ms Round-Trip Time (RTT) of latency, the Brocade 7800 enables cost-effective SAN extension solutions over distances up to 17,500 kilometers (nearly 11,000 miles).

The Brocade 7800 maximizes replication, backup, and migration throughput over distance using advanced Fibre Channel frame compression, disk and tape protocol acceleration, and FCIP networking technology. Unique performance and optimization technologies include the following:

- New FCIP Trunking combines multiple IP source and destination address pairs into a logical high-bandwidth FCIP trunk spanning multiple physical ports to provide load balancing and network failure resiliency.
- New Adaptive Rate Limiting dynamically adjusts bandwidth between minimum and maximum rate limits to optimize bandwidth utilization and sharing.
- New FCIP Quality of Service (QoS) provides high-, medium-, and low-priority handling of initiator-target flows within the same FCIP tunnel for transmission over the WAN.
- A new compression architecture provides multiple modes to optimize compression ratios for various throughput requirements.
- FCIP Fast Write accelerates SCSI write processing, maximizing performance of synchronous and asynchronous replication applications across high-latency WAN connections.
- Open Systems Tape Pipelining accelerates read and write tape processing over distance, minimizing backup and restore windows.
- Brocade Advanced Accelerator for FICON uses advanced networking technologies, data management techniques, and protocol intelligence to accelerate FICON disk and tape read and write operations over distance.
- Storage-Optimized TCP optimizes TCP window size and flow control, accelerating TCP transport for storage applications.

INTEGRATED ARCHITECTURE AND MANAGEMENT

The Brocade 7800 utilizes the same Fabric OS® that supports the entire Brocade SAN product family—from the 8-port Brocade 300 Switch to the 768-port Brocade DCX® Backbone. This helps ensure seamless interoperability with optional advanced features such as ISL Trunking, Advanced Performance Monitoring, Fabric Watch, and Advanced Zoning.

In addition, organizations can perform management and administrative tasks through familiar Brocade management tools, including Brocade Data Center Fabric Manager (DCFM™), Web Tools, and the command line interface. Moreover, optional FICON Control Unit Port (CUP) capabilities enable legacy management applications to seamlessly support Brocade FICON environments.

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 7800 SPECIFICATIONS

System Architecture		Port types
Fibre Channel ports	16 ports, universal (E, F, M, Ex, and FL)	FL_Port, F_Port, E_Port, Ex_Port, M_Port (Mirror Port), and self-discovery based on switch type (U_Port). For FCIP, VE_Port (Virtual E_Port).
FCIP ports	6 ports, 1 GbE (VE)	Data traffic types
Scalability	Full fabric architecture with 239 switches maximum	Fabric switches supporting unicast, multicast (255 groups), and broadcast
Certified maximum	Single fabric: 56 domains, 7 hops Multiprotocol routing fabric: 19 hops	USB
Fibre Channel performance	1.063 Gbps line speed, full duplex; 2.125 Gbps line speed, full duplex; 4.25 Gbps line speed, full duplex; 8.5 Gbps line speed, full duplex. Auto-sensing of 1 Gbps, 2 Gbps, 4 Gbps, and 8 Gbps port speeds; optionally programmable to fixed port speed. Speed matching between 1 Gbps, 2 Gbps, 4 Gbps, and 8 Gbps ports.	Media types
FCIP performance	1 Gbps line speed	Fibre Channel: Brocade hot-pluggable Small Form Factor Pluggable (SFP) and SFP+, LC connector; Short-Wave Laser (SWL) and Long-Wave Laser (LWL); distance depends on fiber-optic cable and port speed; supports SFP+ (2, 4, and 8 Gbps) and SFP (1, 2, and 4 Gbps) optical transceivers
ISL Trunking	Up to eight 8 Gbps ports per ISL trunk; up to 64 Gbps per ISL trunk. There is no limit to how many trunk groups can be configured in the switch.	1 GbE: Brocade hot-pluggable optical SFP, Short-Wave Laser (SWL) and Long-Wave Laser (LWL); GbE Copper SFP; built-in RJ-45 copper (two GbE ports); distance depends on fiber-optic or copper cable and port speed
Fibre Channel aggregate bandwidth	128 Gbps: 16 ports at 8 Gbps (data rate)	Fabric services
FCIP aggregate bandwidth	6 Gbps: 6 ports at 1 Gbps (data rate)	Brocade Advanced Zoning, Dynamic Path Selection (DPS), FDMI, Enhanced Group Management (EGM), Frame Redirection, Registered State Change Notification (RSCN), Reliable Commit Service (RCS), and Simple Name Server (SNS). Optional fabric services include Advanced Performance Monitoring, Fabric Watch, Integrated Routing, and ISL Trunking.
Fabric latency	700 ns with no contention, cut-through routing at 8 Gbps	
Maximum frame size	2112-byte payload	
Maximum MTU size	1500-byte Ethernet packets with FCIP	
Classes of service	Class 2, Class 3, Class F (inter-switch frames)	

BROCADE 7800 SPECIFICATIONS (CONTINUED)

Licensing options	<p>The following optional extension features can be enabled via license keys:</p> <ul style="list-style-type: none"> Advanced Extension: Enables FCIP Trunking and Adaptive Rate Limiting Adaptive Networking: Activates Fibre Channel and FCIP QoS functionality Brocade 7800 Upgrade License: Enables all ports, additional FCIP tunnels, and tape read/write pipelining <p>The following options are available for the Brocade 7800 16/6 Extension Switch or Brocade 7800 4/2 Extension Switch with the Upgrade License:</p> <ul style="list-style-type: none"> FICON Management Server: Control Unit Port (CUP) enables host control of switches in mainframe environments Advanced Accelerator for FICON: Accelerates FICON tape and replication over distance
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Management	
Supported management software	SSH v2, HTTP/HTTPS, SNMP v1/v3, Telnet; SNMP (FE MIB, FC Management MIB); Web Tools; DCFM Professional, Professional Plus, and Enterprise (optional); SMI-S, RADIUS, LDAP
Security	DH-CHAP (between switches and end devices), HTTPS, IPsec, IP Filtering, LDAP, Port Binding, RADIUS, Role-Based Access Control (RBAC), Secure Copy (SCP), Secure RPC, SSH v2, SSL, Switch Binding, Trusted Switch
Management access	10/100/1000 Ethernet (RJ-45), in-band over Fibre Channel ports; serial port (RJ-45) and one USB port
Diagnostics	POST and embedded online/offline diagnostics, including FCping, Pathinfo (FCtraceroute), etc.

Mechanical	
Enclosure	Back-to-front airflow; 1U, 19-inch EIA-compliant, power from back
Size	Width: 43.2 cm (17.0 in) Height: 4.5 cm (1.8 in) Depth: 64.1 cm (25.2 in)
System weight	10.9 kg (24.0 lbs) with two power supplies, without SFP/SFP+

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 Non-operating: 10% to 90% non-condensing
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, 3/eg Axis
Vibration	Operating: 0.5 g sine, 0.4 grms random, 5 to 500 Hz Non-operating: 2.0 g sine, 1.1 grms random, 5 to 500 Hz
Heat dissipation	Maximum 22 ports: 590 BTU/hr
Airflow	Maximum 60 CFM; nominal 44 CFM
Power	
Power supply	Dual hot-swappable redundant power supplies
Power inlet	C13
Input voltage	85 to 264 VAC nominal
Input line frequency	47 to 63 Hz
Inrush current	Maximum of 60 amps for period of 10 to 150 ms
Power	Nominal 145 watts; maximum 173 watts

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

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

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

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