DATASHEET
BROCADE 7800 EXTENSION SWITCH DATA CENTER

THE BROCADE 7800 EXTENSION SWITCH IS AN IDEAL PLATFORM FOR BUILDING OR EXPANDING A HIGH-PERFORMANCE SAN EXTENSION INFRASTRUCTURE FOR DISASTER RECOVERY, DATA PROTECTION, AND DATA MOBILITY STORAGE SOLUTIONS

BROCADE EXTENSION SOLUTION

Brocade extension solutions provide an ideal foundation for building or expanding a high-performance SAN extension infrastructure for disaster recovery, data protection, and data mobility storage solutions. They leverage 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.

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. Brocade extension products enable replication and backup applications to send more data over FCIP links in less time, protecting high-priority traffic and optimizing available WAN bandwidth.

Innovative extension technology maximizes throughput over distance using advanced compression, disk and tape protocol acceleration, and FCIP networking technology. The next-generation Brocade FX8-24 blade and Brocade 7800 switch introduce new performance and optimization technologies, including FCIP Trunking, Adaptive Rate Limiting, and FCIP Quality of Service, that move more data faster and further than ever before.

BROCADE 7800 EXTENSION SWITCH

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 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.

The Brocade 7800 is an ideal platform for building or expanding a high-performance SAN extension infrastructure. 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.

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.

Green IT

FEATURES AND BENEFITS

MAIN FEATURES	BENEFITS
NEXT-GENERATION SAN EXTENSION FOR REMOTE DATA REPLICATION, BACKUP, AND MIGRATION	
■ Best-in-class Fibre Channel and Fibre Channel over IP (FCIP) port density, bandwidth, and throughput	■ Enables fast, continuous, and cost-effective access to mission-critical data from anywhere in the world
■ Leveraging next-generation Fibre Channel and FCIP technology	■ Enables fast, reliable, and cost-effective remote data replication, backup, and migration
■ Up to sixteen 8 Gbps Fibre Channel ports and six 1 Gigabit Ethernet (GbE) ports	■ Maximizes application performance over WAN links
A SCALABLE, FLEXIBLE SAN EXTENSION PLATFORM	
■ Available in two configuration – Brocade 7800 16/6 and Brocade 7800 4/2	■ Maximizes flexibility for a broad range of SAN extension requirements
■ Brocade 7800 4/2 can be easily upgraded to Brocade 7800 16/6 through software licensing	■ Scales from point-to-point disk replication to comprehensive multisite enterprise extension solutions with investment protection for growing environments
SIMPLIFIED DISASTER RECOVERY AND DATA PROTECTION	
■ Advanced performance and network optimization	■ Enables replication and backup application to send more data over FCIP links in less time
■ Fast Write SCSI acceleration	■ Maximizes replication performance and enables cost-effective synchronous and asynchronous replication access across any distance
■ FCIP Tape Pipelining	■ Reduces backup and recovery times over distance anywhere in the world
■ Hot-pluggable redundant power supplies and fans with non-disruptive software upgrade	■ Maximizes application uptime and minimizes outages
UNMATCHED PERFORMANCE AND OPTIMIZATION	
■ Up to 350 ms Round-Trip Time (RTT) of latency	■ Enable cost-effective SAN extension solutions over distances up to 17,500 kilometers or 11,000 miles
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■ Unique performance and optimization technologies such as FCIP Trunking, Adaptive Rate Limiting, FCIP Quality of Services, FCIP Fast Write SCSI, FCIP Tape Pipelining, and Advanced Accelerator for FICON	■ Maximizes replication, backup, and migration throughput over distance
■ A new compression architecture	■ Optimizes compression ratio for various throughput requirements
INTEGRATED ARCHITECTURE AND MANAGEMENT	
■ Same Brocade Fabric OS® which powers the entire Brocade products	■ Enables seamless interoperability with optional advanced features
■ Brocade Data Center Fabric Manager (DCFM™) for SAN infrastructure management	■ Enables legacy management application to seamlessly support Brocade FICON environments

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.

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.

SIMPLIFIED DISASTER RECOVERY AND DATA PROTECTION

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.

TECHNICAL DETAILS

SYSTEM ARCHITECTURE	BROCADE 7800 EXTENSION SWITCH
Fibre Channel ports	16 ports, universal (E, F, M, Ex, and FL)
FCIP ports	6 ports, 1 GbE (VE)
Scalability	Full fabric architecture with 239 switches maximum
Certified maximum	Single fabric: 56 domains, 7 hops Multiprotocol routing fabric: 19 hops
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.
FCIP performance	1 Gbps line speed
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.
Fibre Channel aggregate bandwidth	128 Gbps: 16 ports at 8 Gbps (data rate)
FCIP aggregate bandwidth	6 Gbps: 6 ports at 1 Gbps (data rate)
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)
Port types	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).
Data traffic types	Fabric switches supporting unicast, multicast (255 groups), and broadcast
USB	One USB port for system log file downloads or firmware upgrades
Media types	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 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
Fabric services	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.
Licensing options	The following optional extension features can be enabled via license keys: · 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 The following options are available for the Brocade 7800 16/6 Extension Switch or Brocade 7800 4/2 Extension Switch with the Upgrade License: · 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

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

FUJITSU PLATFORM SOLUTIONS

In addition to Brocade 7800 Extension Switch, 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: Industrial 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 7800 Extension Switch, 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:
www.fujitsu.com/global/about/environment/

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