

BROCADE FR4-18i DIRECTOR BLADE



STORAGE AREA NETWORK

An Integrated Platform for Enterprise Consolidation and Business Continuity

HIGHLIGHTS

- Provides an enterprise building block for consolidation and business continuity solutions that drive efficiency and cost savings
- Significantly reduces the cost and effort of SAN design, implementation, and management
- Enables secure connections across IP WANs through IPSec encryption, and provides powerful hardware-assisted FCIP capabilities for line-rate performance
- Optimizes performance for SAN extension across suboptimal WANs with storage-optimized protocol enhancements and features such as Fast Write for FCIP and Fibre Channel-based extension, Tape Pipelining, and hardware-based compression
- Simplifies interconnection and support for mixed-vendor SAN environments

Many of today's IT organizations have implemented multiple Storage Area Network (SAN) islands to support specific applications, projects, and sites throughout their enterprises. With the Brocade® FR4-18i Blade, these organizations can now interconnect their SAN islands for greater resource utilization and long-distance extension. By providing this advanced level of connectivity without the associated risk and complexity of physically merging SAN islands into a single large fabric, the Brocade FR4-18i supports strategic business initiatives such as disaster recovery, data migration, and ongoing technology upgrades.

The Brocade FR4-18i combines the industry's first 4 Gbit/sec Fibre Channel routing capability with powerful hardware-assisted traffic forwarding for Fibre Channel over IP (FCIP). The blade features 16 Fibre Channel ports and two 1 Gigabit Ethernet ports—delivering high performance to run

storage applications at line-rate speed with either protocol. By integrating these services in a single platform, the Brocade FR4-18i offers a wide range of benefits for inter-SAN connectivity, including long-distance SAN extension, greater resource sharing (either locally or across geographical areas), and simplified management.



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FIBRE CHANNEL ROUTING FOR ENHANCED OPERATIONAL EFFICIENCY

Featuring a hierarchical Fibre Channel routing architecture for improved scalability and fault isolation, along with multivendor interoperability, the Brocade FR4-18i helps maximize the value of existing SAN investments while streamlining new SAN implementation. During deployment, organizations can easily interconnect individual SANs using their current addressing schemes. This approach helps minimize downtime and risk while lowering overall management costs.

Although the SANs are physically connected, organizations can control which devices are shared to ensure the appropriate level of SAN fabric isolation. As a result, the Brocade FR4-18i supports faster, easier topology changes that enable organizations to take advantage of new solutions that reduce costs or increase productivity. Moreover, simplified device sharing helps overcome the logistical challenges and organizational boundaries that often exist among departmental SANs.

By providing such a highly scalable approach for extending SAN infrastructures, the Brocade FR4-18i supports key business objectives such as:

- Migrating from old to new SANs
- Consolidating data centers and rebalancing storage resources
- Enabling multivendor meta SAN connectivity
- Moving equipment on and off lease

PERFORMANCE-OPTIMIZED SAN EXTENSION

One of the key advantages of the Brocade FR4-18i is its ability to extend the benefits of existing SAN infrastructures across the enterprise. Combined with Fibre Channel routing, SAN extension enhances resource

sharing and data movement between departmental SANs or local data centers while isolating SANs from IP WANs to minimize risk and potential disruption.

For SAN extension over native Fibre Channel, the Brocade FR4-18i utilizes Brocade Extended Fabrics capabilities. SAN extension can reach up to 100 kilometers at 4 Gbit/sec Fibre Channel speeds, 250 kilometers at 2 Gbit/sec speeds, and more than 500 kilometers at 1 Gbit/sec speeds. To maximize performance across native Fibre Channel links, the Brocade FR4-18i provides unique write acceleration capabilities, including Fast Write for Fibre Channel-based extension.

For SAN extension over IP WANs, the Brocade FR4-18i provides unique bandwidth-maximizing FCIP features to optimize performance:

- Hardware-based compression and IPsec encryption
- Extensive port buffering
- Line-rate Gigabit Ethernet performance with support for jumbo packets
- Scalable fan-in of multiple distant SANs
- Write acceleration (Fast Write for FCIP) capabilities for synchronous applications
- Tape acceleration (Tape Pipelining) for maximizing performance over high latencies
- Extended WAN statistics and analysis tools for bandwidth, latency, and packet loss
- Eight virtual FCIP tunnels per port, each with its own unique traffic-shaping and QoS capabilities, for maximum scalability and utilization of WAN resources

The Brocade FR4-18i also supports FICON® SAN extension over FCIP. This combined Fibre Channel routing and FCIP approach enables a more secure and reliable distance-connectivity solution for strategic initiatives such as business continuance, site mirroring, replication, and data migration.

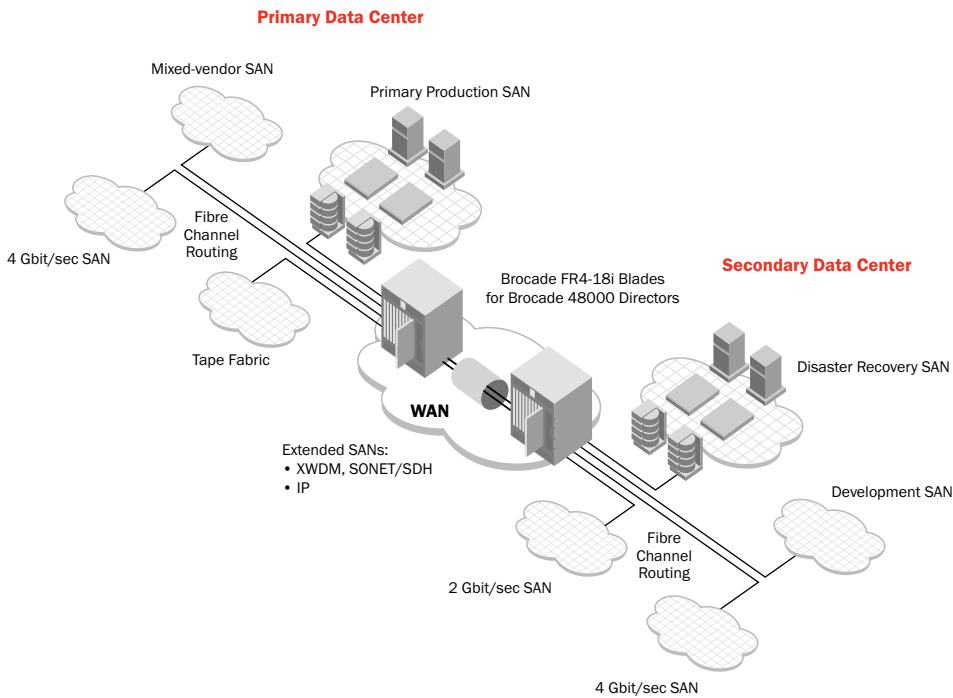


Figure 1.

The Brocade FR4-18i utilizes high-performance Fibre Channel routing and FCIP to enable powerful consolidation and business continuity solutions for the enterprise.

INTEGRATED ARCHITECTURE AND MANAGEMENT

The Brocade FR4-18i supports interconnectivity through Logical SANs (LSANs) by utilizing familiar zoning methods and administration tools. A simplified management scheme means that organizations can implement a common configuration for device sharing through Fibre Channel routing regardless of whether that connectivity is across native Fibre Channel or FCIP links. Moreover, FCIP trunking behavior operates in the same manner as E_Port functionality in existing SAN infrastructures.

Because the Fibre Channel routing services on the Brocade FR4-18i are designed to be backward compatible with existing SAN environments, organizations can easily scale those environments without requiring

significant changes. All services can be administered through Brocade management tools consistent with the rest of the overall SAN infrastructure. By leveraging these tools and Brocade Fabric OS®, the Brocade FR4-18i provides a consistent, centralized management platform that minimizes training and deployment time while significantly reducing overall costs.

MAXIMIZING SAN INVESTMENTS

Brocade and its partners offer complete solutions to meet a wide range of technology and business requirements. These solutions include education and training, support, service, and professional services to help optimize technology investments. For more information, contact an authorized Brocade sales partner or visit www.brocade.com.

BROCADE FR4-18i DIRECTOR BLADE SPECIFICATIONS

Systems Architecture	
Ports	18 ports: 16 Fibre Channel (E, F, FL, EX) ports and 2 Gigabit Ethernet (VE, Vex) ports
M-EOS switch interoperability	3216, 3232, 4300, 4500, 6064, 6140
Performance	<u>Fibre Channel</u> : 1.063, 2.125, and 4.250 Gbit/sec line speed, full duplex; auto-sensing of 1, 2, and 4 Gbit/sec port speeds; optionally programmable to fixed port speed; speed matching between 1, 2, and 4 Gbit/sec ports <u>Ethernet</u> : 1.25 Gbit/sec
Fabric latency	< 8 microseconds (FC-to-FC routed traffic) 30 microseconds (FCIP)
Maximum frame size	2112-byte payload for Fibre Channel, 2250-byte payload for Gigabit Ethernet, 2048-byte payload for Fibre Channel routed networks
Classes of service	Class 2 and 3
Port types	FL_Port, F_Port, EX_Port, and E_Port; self-discovery based on switch type (U_Port); Gigabit Ethernet for VE and Vex
Media types	Hot-pluggable, industry-standard Small Form-factor Pluggable (SFP), LC connector; Short-Wavelength Laser (SWL) up to 500 meters (1640 feet); Long-Wavelength Laser (LWL) up to 10 km (6.2 mi); Extended Long-Wavelength Laser (ELWL) up to 80 km (49.6 mi); distance depends on fiber-optic cable and port speed, CWDM SFPs (8 lambdas); RJ-45 Copper SFP for Gigabit Ethernet ports
Fabric services	Simple Name Server, Registered State Change Notification (RSCN); Brocade FC-FC Routing Service, Brocade Advanced Zoning, and Brocade Web Tools; optional fabric services include the Brocade FCIP Tunneling Service and Brocade Advanced ISL Trunking

Mechanicals	
Size	Width: 1.41 in (3.60 cm) Height: 16.56 in (42.06 cm) Depth: 11.77 in (29.89 cm) Occupies one slot in a Brocade 48000 Director chassis
System weight	3.4 kg (7.4 lb), no SFPs

Environmentals		
	Operating	Non-Operating
Temperature	10° to 40°C	25°C to 70°C
Humidity	5 to 85%, non-condensing	0 to 93%, non-condensing
Altitude	3 km	3 km
Shock	20 G, 11 ms, half-sine	33 G, 11 ms, half-sine
Vibration	5 G (0–3000Hz)	10 G (0–5000Hz)

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

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

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