A unique router that increases Storage Area Network (SAN) connectivity options and improves resource utilization for business continuity and Information Lifecycle Management (ILM).

SILKWORM MULTIPROTOCOL ROUTER

Highlights

- Seamlessly integrates into existing multivendor environments using standard software utilities and procedures
- Provides simple, efficient SAN connectivity between separate SANs for consolidation and maximum resource utilization
- Enables secure, selective Fibre Channel device connectivity between isolated SANs through Logical SANs (LSANs)
- Employs Ports on Demand for fast, easy, and cost-effective scalability from 8 to 16 ports
- Supports business continuity requirements with selective sharing between data centers over long-distance native Fibre Channel, xWDM, or IP networks
- Provides access for Microsoft iSCSI servers to shared Fibre Channel SAN resources

A Better Way to Extend SAN Value

As SANs play a more prominent role in today's data centers, many organizations are searching for innovative solutions that extend the benefits of their SANs throughout the enterprise. To support this effort, the unique Brocade® SilkWorm® Multiprotocol Router increases the functionality, connectivity, and versatility of today's SANs. The Multiprotocol Router is designed to host routing services that include:

- Brocade FC-FC Routing Service for SAN connectivity
- Brocade FCIP Tunneling Service for SAN extension over distance
- Brocade iSCSI Gateway Service for sharing Fibre Channel storage with iSCSI servers

These services provide new options for connecting SANs and extending SAN benefits in the enterprise over multiple networks and across longer distances (see Figure 1). The primary advantage of this approach is the ability to interconnect devices between SAN fabrics without merging those fabrics—thereby providing a more secure and flexible storage networking foundation.

This level of SAN connectivity gives organizations a better way to reduce or even eliminate disruptions associated with common operational events, including:

- Data migration or movement between tiers of storage for ILM, between 1 Gbit/sec storage arrays and 2 Gbit/sec systems, or between separated environments such as test/development SANs and production SANs
- All forms of consolidation projects that require resource sharing in a campus or over distance
- Resource sharing between multivendor SANs, between Brocade SANs from multiple suppliers, and between SANs from multiple switch vendors

FC-FC ROUTING SERVICE

The FC-FC Routing Service enables devices located in separate SAN fabrics to establish communication without requiring the fabrics to merge into a single large SAN.

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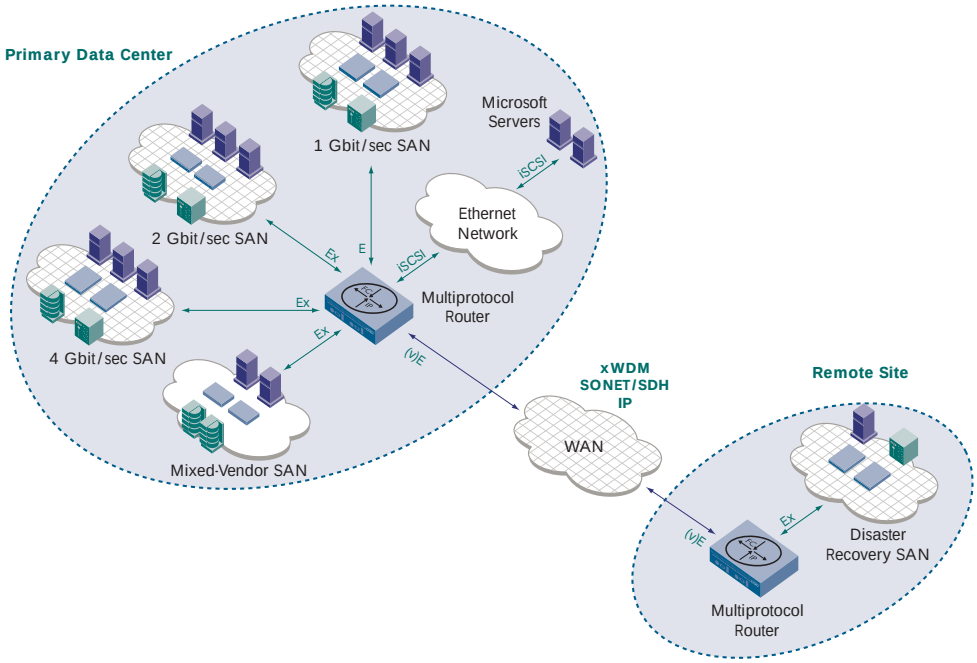

Figure 1. The Brocade SilkWorm Multiprotocol Router and routing services help extend SAN capabilities across the enterprise.

By using this service, organizations can interconnect devices without having to redesign or reconfigure their entire environment. FC-to-FC routing capabilities provide key strategic advantages, such as:

- Simplifying SAN design, implementation, security, support, and management
- Providing seamless any-to-any resource sharing across multiple SANs without the complexity of physically merging those SANs
- Simplifying multivendor SAN sharing by supporting connectivity without disruptive changes

When devices on different SAN fabrics are allowed to communicate through the Multiprotocol Router, the connectivity group is known as a Logical SAN (LSAN). Created with zoning procedures already familiar to SAN administrators, LSANs enable selective, secure resource sharing across multiple SAN fabrics and facilitate scalability by:

- Minimizing the risk and complexity of large SAN fabrics
- Right-sizing SANs based on application and business requirements rather than over-building just to avoid possible availability risk
- Enabling dynamic resource sharing without requiring changes in cabling or SAN parameters
- Supporting device sharing between Brocade SANs of any type, both with and without Secure Fabric OS
- Simplifying management and fault isolation while protecting existing technology investments

FCIP TUNNELING SERVICE

To support business continuance, the FCIP Tunneling Service enables organizations to extend their Fibre Channel SANs across Ethernet networks. The service was designed for real-world network conditions, including environments that might experience latency and packet loss. Deploying FCIP on the Multiprotocol Router is more flexible and easier to manage than external gateways, resulting in simplified resource sharing across geographical boundaries.

Using the FCIP Tunneling Service in conjunction with the FC-to-FC routing capability enables two fabrics to remain separate rather than merging them into a single fabric. This approach prevents WAN instabilities from causing disruptive fabric segmentation and merging. It also enables organizations to maintain separate fabrics for administrative isolation and increased security—providing a more stable and secure distance-connectivity solution for business continuance.

Systems Architecture

Dual-mode ports	16 total ports, Fibre Channel (E, F, EX) and Gigabit Ethernet Licensed minimum of 8 ports, maximum of 16 ports, Ports On Demand upgrade license from 8 to 16 ports
SilkWorm switch interoperability	Fabric OS® and Secure Fabric OS support based on switch type: SilkWorm 2xxx running Fabric OS 2.6.2 or later SilkWorm 3000, 3200, 3600, 3800 running Fabric OS 3.2.0 or later SilkWorm 3016 (embedded), 3250, 3850, 3900, 4100, 12000, 24000 running Fabric OS 4.4.0x or later SilkWorm 4012 (embedded) running Fabric OS 5.0.0 or later SilkWorm 3014 (embedded), 200E and 48000 running Fabric OS 5.0.1 or later SilkWorm 4020 (embedded) running Fabric OS 5.0.2 or later SilkWorm 4900, 7500, FR4-18i blade for SilkWorm 48000 running Fabric OS 5.1.0 or later
McDATA switch interoperability	ED 5000 running EOS 4.01.01 only Intrepid 6140, 6064 running EOS 5.x, 6.x, 7.x, 8.x Sphereon 3232, 4300, 4500, 3216 running EOS 5.x, 6.x, 7.x, 8.x
Performance	Fibre Channel: 1.063/2.125 Gbit/sec line speed, full duplex; auto-sensing of 1 and 2 Gbit/sec port speeds; optionally programmable to fixed port speed; speed matching between 1 and 2 Gbit/sec ports Ethernet: 1.25 Gbit/sec
Aggregate bandwidth	64 Gbit/sec
Fabric latency	Depends on storage application
Maximum frame size	2112 bytes for Fibre Channel, 1518 bytes for standard Gigabit Ethernet, 2250 bytes for networks supporting jumbo packet
Classes of service	Class 3
Port types	FL_Port (restricted), F_Port, EX_Port, and E_Port; self-discovery based on switch type (U_Port); Gigabit Ethernet
Media types	Small Form-Factor Pluggable (SFP) laser. Short-wave up to 500 m (1640 feet); long-wave up to 25 km (15.5 miles); and extended long-wave up to 100 km (62.1 miles). Distance depends on fiber optic cable and port speed. RJ45 Copper SFP for Gigabit Ethernet ports.
Fabric services	Standard services include Simple Name Server, Registered State Change Notification (RSCN), Brocade Advanced Zoning, Brocade Exchange-based Trunking, Brocade Web Tools — AP Edition, iSCSI Gateway Service, and Brocade Extended Fabrics Service. Optional services include FCIP and Fibre Channel Routing Services.
Options	Redundant power supply, SFP media

Management

Supported management software	Telnet; SNMP (FE MIB, FC Management MIB); Brocade Advanced Web Tools – AP Edition and Brocade Fabric Manager; third-party applications utilizing Brocade Fabric Access API
Management access	Dual 10/100 Ethernet (RJ-45), serial port
Diagnostics	POST and embedded online/offline diagnostics

Mechanicals

Enclosure	Non-cable-side to cable-side airflow; power from cable-side; 2U, 19-in.-EIA-rack compliant
Size	Height: 8.8 cm (3.5 in) Width: 42.7 cm (16.8 in) Depth: 63.5 cm (25.0 in)
System weight	15.9 kg (35.0 lb) with one power supply 18.1 kg (40.0 lb) with two power supplies

Environmentals

	Operating	Non-Operating
Temperature	10° to 40°C	-25°C to 70°C
Humidity	20 to 85%, non-condensing	20 to 85%, non-condensing
Altitude	3 km	3 km
Shock	105 G, 2.5 ms, half-sine	40 G, 13 ms, trapezoidal
Vibration	0.5 G (5-500-5Hz)	2.0 G (5-500-5Hz)

Power

AC input	Nominal: 6.0A@100-120 VAC; 3.0A@200-240 VAC
Frequency	47 to 63 Hz

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

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