



The Brocade SilkWorm 3200 Entry Fabric Switch simplifies Storage Area Network (SAN) deployment, enabling cost-effective migration from Direct-Attached Storage (DAS) environments.

SILKWORM 3200

Highlights

- Provides a low-cost switch solution for DAS-to-SAN migration, small SAN islands, NAS back ends, the edge of core-to-edge enterprise SANs, and hub/loop switch replacement
- Enables cost-effective storage connectivity for server clustering environments
- Helps increase ROI for organizations that need reliable, high-performance SANs to support business applications
- Enables 8-port 1 Gbit/sec and 2 Gbit/sec intelligent switching at an unprecedented price point
- Provides full forward and backward compatibility with other Brocade SilkWorm switches
- Simplifies SAN deployment and administration through embedded Brocade WEB TOOLS management software

EXCELLENT VALUE FOR A VARIETY OF SAN ENVIRONMENTS

The Brocade® SilkWorm® 3200 8-port, 1 Gbit/sec and 2 Gbit/sec auto-sensing entry fabric switch significantly increases performance and functionality for small-to-medium-sized SANs. Based on advanced Brocade third-generation switch ASIC technology, the SilkWorm 3200 combines over 32 Gbit/sec of aggregate Fibre Channel throughput with advanced new features that greatly enhance the value of a wide range of SAN environments.

Designed for low-cost flexibility, the SilkWorm 3200 can provide an end-to-end 2 Gbit/sec switch solution that serves a variety of purposes, including:

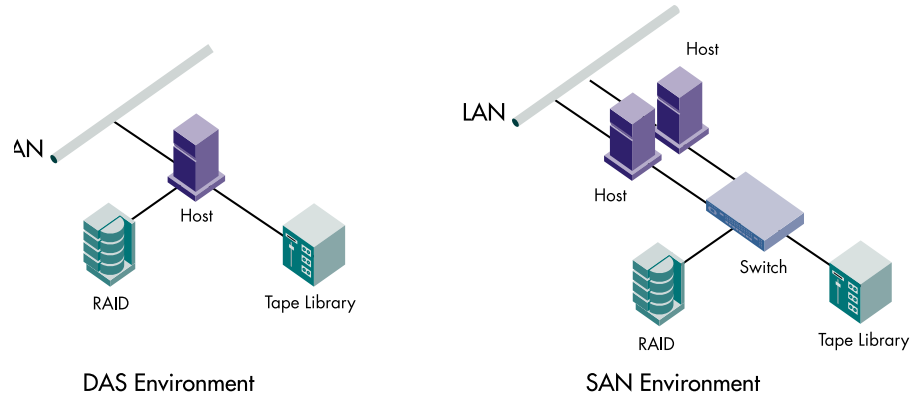
- A fast and easy way to migrate from DAS to SAN environments (see Figure 1)
- A reliable base for small SAN islands and storage fan-out connectivity

- A key component for highly available server clustering environments
- A NAS back end that supports storage consolidation and tape backup for multiple NAS filers
- An entry-point edge switch for high-performance core-to-edge networks supporting the connectivity of 2 Gbit/sec devices
- A cost-effective replacement for legacy hubs and loop switches

INCREASED INTELLIGENCE IN THE SWITCH

Brocade has developed an Intelligent Fabric Services Architecture that incorporates intelligence directly into the switch fabric—creating a highly available, scalable, and secure environment for storage applications. This architecture improves performance for SAN applications through the use of advanced fabric services such as Brocade Inter-Switch Link (ISL) Trunking and wire-speed Frame Filtering.

Figure 1. While DAS environments do not allow storage resource sharing, SANs provide an easy and cost-effective way to share storage—even in multivendor environments.



To support high-speed data traffic, ISL Trunking combines up to four ISLs between a pair of switches into a single, logical high-speed trunk running at up to 8 Gbit/sec. In addition, Frame Filtering improves both SAN security and manageability. This intelligent design enables new capabilities such as hardware-enforced zoning based on World-Wide Name (WWN) and advanced performance monitoring to optimize storage resource utilization.

HIGH AVAILABILITY THROUGHOUT THE FABRIC

The SilkWorm 3200 is designed to provide high-availability switching in redundant dual-fabric SANs for small-to-medium-sized deployments. Combining the proven reliability of the SilkWorm family with a wide range of advanced fabric services, the SilkWorm 3200 provides a SAN fabric capable of delivering overall system availability greater than 99.999 percent—the “five nines” of availability.

With the Brocade Extended Fabrics feature and Dense Wave Division Multiplexing (DWDM) technology, storage networks can span up to 100 km (1 Gbit/sec) or 50 km (2 Gbit/sec) over Metropolitan Area Networks (MANs)—helping to ensure the highest levels of business continuance.

FAST, RELIABLE 2 GBIT/SEC PERFORMANCE

The SilkWorm 3200 provides excellent price/performance value with all ports capable of operating at 1 and 2 Gbit/sec (full-duplex) to enable 32 Gbit/sec of uncongested switch throughput. Auto-sensing and speed-matching of 1 and 2 Gbit/sec traffic ensures interoperability between current 1 Gbit/sec devices and next-generation 2 Gbit/sec devices.

INVESTMENT PROTECTION FOR EXISTING TECHNOLOGY

To help protect existing investments, the SilkWorm 3200 offers full backward and forward compatibility with other SilkWorm switches—providing a seamless migration path to 2 Gbit/sec connectivity and intelligent fabric services.

Because the new switch supports multivendor SAN environments—such as those built on Windows NT/2000, UNIX, Linux, Solaris, and AIX platforms—organizations migrating from DAS environments have much greater flexibility in building cost-effective, easy-to-manage SANs. As a result, these organizations can quickly deploy business continuance applications such as remote, LAN-free, and serverless backup; storage consolidation; remote mirroring; clustering; and data replication.

SIMPLIFIED SAN MONITORING AND MANAGEMENT

The SilkWorm 3200 simplifies SAN management by leveraging Brocade Fabric OS, an embedded real-time operating system. As a result, organizations can easily centralize storage management, automate management tasks, and reduce overall administrative costs. The optional Brocade Fabric Manager provides additional functions for managing multiple SAN fabrics from a single location.

Through optional software such as Brocade Advanced Performance Monitoring, organizations can also improve end-to-end performance analysis by measuring resource utilization on a fabric-wide basis—to quickly identify bottlenecks, optimize fabric configurations, and plan for when additional capacity will be required.

To reduce the complexity of deploying and maintaining multiple Field-Replaceable Units (FRUs), the SilkWorm 3200 is a single FRU that includes redundant cooling fans.

A NEW LEVEL OF SAN SECURITY

To ensure that devices can access only their authorized storage resources, Brocade Advanced Zoning logically groups a SAN fabric into an unlimited number of secure private SANs (zones).

MULTIPLE FABRIC OPTIONS FOR GREATER FLEXIBILITY

To support multiple levels of availability and scalability, the SilkWorm 3200 includes the option for full-fabric or entry-fabric operation (see Figure 2). All entry-fabric switches can be nondisruptively upgraded to full-fabric switches with a simple software license key upgrade.

Full-Fabric Option

The full-fabric switch option is designed for highly available dual-fabric SAN environments as well as for cost-effective core-to-edge SANs (as an edge switch). The full-fabric switch option features a full set of universal ports that enable high scalability and availability in growing SAN environments. Also included are software license keys for Brocade WEB TOOLS, Advanced Zoning, and QuickLoop—as well as the option for Small Form-factor Pluggable (SFP) media.

Entry-Fabric Option

The entry-fabric switch option is most suitable for supporting basic SAN connectivity, tape backup for multiple NAS devices, low-cost hub replacement,

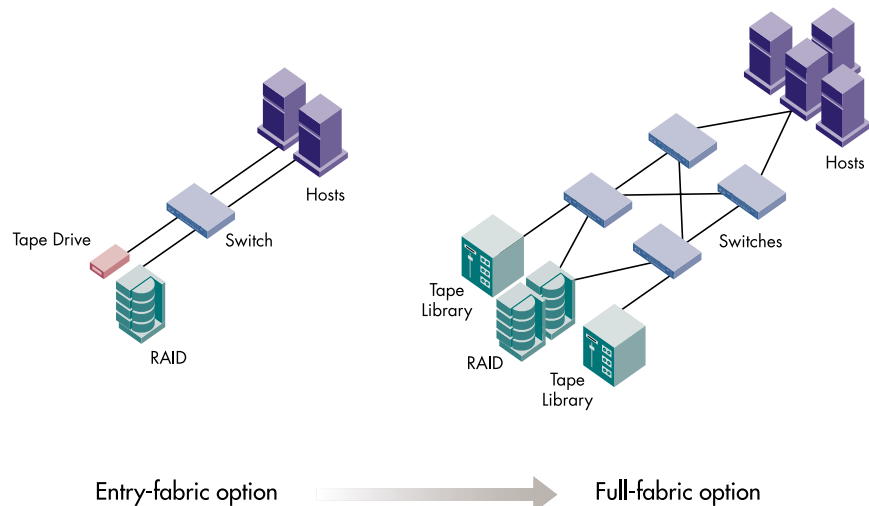
and embedded SAN or NAS applications. The entry-fabric switch option features a single universal port that enables connectivity with one other switch. Also included is a software license key for Brocade WEB TOOLS—as well as the option for SFP media.

MAXIMIZING SAN INVESTMENTS

Brocade and its partners offer complete SAN 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 SAN investments. For more information, contact an authorized Brocade sales partner or visit www.brocade.com.

Figure 2.

The entry-fabric switch option enables connectivity with one other switch, while the full-fabric switch option enables much wider connectivity for larger SAN environments.



SILKWORM 3200 SPECIFICATIONS AT A GLANCE

Systems Architecture

Fibre Channel ports	8 (all universal ports or any one universal port)
Scalability	Full-fabric architecture with 239 switches maximum
Certified maximum	32 switches, 7 hops; larger fabrics certified as required
Interoperability	Any SilkWorm 1000 series, 2000 series, 3000 series, or later switch
Performance	2.125 Gbit/sec line speed, full duplex
Aggregate bandwidth	32 Gbit/sec end-to-end
Fabric latency	<2 μ sec. with no contention, cut-through routing
Maximum frame size	2112-byte payload
Classes of service	Class 2, Class 3, Class F (inter-switch frames)
Port types	FL_Port, F_Port, and E_Port; self-discovery based on switch type (U_Port)
Data traffic types	Fabric switches support unicast, multicast (256 groups), and broadcast
Media types	Hot-pluggable, industry-standard Small Form-Factor Pluggable (SFP), LC connector; Short-Wavelength Laser (SWL); Long-Wavelength Laser (LWL); Extended Long-Wavelength Laser (ELWL); distance depends on fiber optic cable and port speed

Laser

Port speed	Cable	Short wavelength	Long wavelength
1 Gbit/sec	50u	500 m (1,640 ft)	N/A
1 Gbit/sec	62.5u	300 m (984 ft)	N/A
1 Gbit/sec	9u	N/A	10 km (6.2 miles)
2 Gbit/sec	50u	300 m (984 ft)	N/A
2 Gbit/sec	62.5u	150 m (492 ft)	N/A
2 Gbit/sec	9u	N/A	10 km (6.2 miles)

Fabric services	Simple Name Server, Registered State Change Notification (RSCN), Alias Server (multicast), Translative Mode, WEB TOOLS, Advanced Zoning (optional), QuickLoop (optional), Fabric Watch (optional), Extended Fabrics (optional), Advanced Performance Monitoring (optional), ISL Trunking (optional), and Remote Switch (optional)
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Management

Supported software	Telnet, SNMP, Fabric Access API, WEB TOOLS, Fabric Watch (optional), Fabric Manager (optional)
Management access	10/100 Ethernet (RJ-45), serial port
Diagnostics	POST and embedded online/offline diagnostics

Mechanical Specifications

Enclosure	Back-to-front airflow, power and cable on the same side, 1U, 19-in.-EIA compliant
Dimensions	Depth: 10.4 in (26.4 cm) Height: 1.7 in (4.2 cm) Width: 16.9 in (42.8 cm)
Weight	3.9 kg (8.5 lbs)
Environment	
Temperature	Operating: 10° C to 40° C (50° F to 104° F) Nonoperating: -25° C to 70° C (-13° F to 158° F) at 90% relative humidity
Humidity	20% to 85% noncondensing at 40° C (104° F)
Altitude	Up to 3,000 m (9,800 ft)
Vibration	Operating: 0.5 Gs, 5-500-5 Hz Non-operating: 2.0 Gs, 5-500-5 Hz
Shock	Operating: 150 Gs, 2.7 ms half-sine Nonoperating: 60 Gs, 13 ms trapezoid

Power Specifications

Supported power	Nominal: 100 to 240 VAC contiguous
Range	Operational: 90 VAC to 264 VAC
Frequency	47 to 63 Hz
Power consumption	50 Watts (maximum)

Regulatory Compliance

	Safety	EMC
Canada	CSA 60950	ICES-003 Class A
United States	UL 60950	FCC Part 15 Class A
Japan	IEC60950 A4	VCCI Class A
European Community	EN60950 TUV, NEMKO	EN55022 Level A EN55024 (Immunity)
Australia/New Zealand	—	AS/NZS 3548
International	IEC 60950	CISPR 22

Fibre Channel Standards and Revisions

FC-FG Rev 3.5, FC-AL Rev 4.5, FC-FLA Rev 2.7, FC-PLDA Rev 2.1, FC-VI Rev 1.5, FC-PH-2 Rev 7.4, FC-GS-2 Rev 5.3, FC-PH-3 Rev 9.4, FC-SW Rev 3.3, IPFC RFC 2625, FC-AL-2 Rev 7.0, and FC-PH Rev 4.3



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