The Brocade SilkWorm 4900 Fibre Channel switch combines up to 64 ports of 4 Gbit/sec performance with high availability and Ports on Demand flexibility to support mission-critical SANs.

SILKWORM 4900

Highlights

- Provides up to 64 ports in a single domain and a 2U enclosure, facilitating more easily managed SAN fabrics with fewer domains

- Utilizes Ports on Demand capabilities for fast, easy, and cost-effective scalability from 32 to 64 ports in 16-port increments

- Enables switch consolidation through its high port count—increasing utilization, lowering management expenses, and reducing fabric complexity

- Protects existing investments and offers an upgrade path to support earlier 1 and 2 Gbit/sec devices

- Supports full 4 Gbit/sec operations at distances up to 100 kilometers (or 500 kilometers at 1 Gbit/sec) for cost-effective business continuance

- Increases network performance with enhanced Brocade ISL Trunking, which enables a high-speed data path up to 32 Gbit/sec

- Meets high-availability requirements with redundant, hot-pluggable components, non-disruptive software upgrades, and hot code activation

Large SAN Capabilities in a Small Space

The Brocade® SilkWorm® 4900 is a high-performance, high-availability Fibre Channel switch that provides high port density for addressing mission-critical storage requirements. With a flexible architecture that supports 1, 2, and 4 Gbit/sec technology with 32, 48, or 64 ports, the SilkWorm 4900 provides an affordable high-port-count, single-domain solution. As a result, organizations with large Storage Area Network (SAN) requirements can reduce the size of their SAN footprint and simplify management by lowering the total number of domains.

The SilkWorm 4900 also provides "pay-as-you-grow" scalability through flexible Ports on Demand capabilities. Because it is fully compatible with previous 1 and 2 Gbit/sec devices, the SilkWorm 4900 protects existing technology investments while providing a strategic solution for the future.

These capabilities help make the SilkWorm 4900 ideal for departments in large enterprises and midsized organizations. It can be used as a port-dense core switch or a high-connectivity edge switch in SANs ranging from small deployments to larger core-to-edge SAN infrastructures that support enterprise-class applications such as ERP, MRP, data warehousing, and e-mail.

INDUSTRY-LEADING PERFORMANCE

To support the most demanding business applications, the SilkWorm 4900 provides best-in-class performance for midrange SAN switches. It features a non-blocking architecture with as many as 64 ports concurrently active at 4 Gbit/sec full duplex to provide an aggregate bandwidth of 512 Gbit/sec.

BROCADE

HIGH
PERFORMANCE

The SilkWorm 4900 utilizes Brocade fifth-generation ASIC technology featuring eight 8-port groups. As a result, an Inter-Switch Link (ISL) trunk can have up to eight ports supplying as much as 32 Gbit/sec of data throughput. In addition to reducing congestion between switches and providing greater total bandwidth, enhanced ISL Trunking utilizes ISLs more efficiently to free up the number of usable switch ports (see Figure 1).

Flexible SAN deployment advantages include the following:

• A high-port-count, high-availability switch is an ideal SAN core solution when requirements include limiting the cost and complexity of the SAN.

• Enterprise-class SANs built with a core-to-edge topology feature highly redundant configurations requiring the use of many ports for ISLs to provide a failover capability. The SilkWorm 4900 provides more usable ports in a large core-to-edge design by requiring fewer switches overall, and thus fewer ports dedicated to ISLs.

ENTERPRISE-CLASS AVAILABILITY FOR BUSINESS CONTINUANCE

With enterprise-class availability features such as hot-swappable redundant fans and power supplies, the SilkWorm 4900 provides a reliable foundation for disaster recovery and business continuance. Moreover, hot code activation helps maximize application uptime with faster system upgrades and maintenance that reduce the dependency on scheduled outages.

Combined with a wide range of Brocade diagnostic and monitoring functions, these capabilities help provide a high-availability SAN environment.

To support disaster recovery and business continuance operations, the SilkWorm 4900 enables connectivity distances up to 500 kilometers at 1 Gbit/sec and 100 kilometers at 4 Gbit/sec. This capability facilitates the deployment of high-performance, long-distance SAN solutions such as data center consolidation and disaster recovery.

HIGH SCALABILITY WITH PORTS ON DEMAND

Delivering up to 64 ports in a single domain, the SilkWorm 4900 combines the cost-effectiveness of a switch designed for high-port-count requirements with highly scalable Ports on Demand capabilities. It comes with a minimum of 32 ports enabled, and organizations can easily expand the number of ports to 48 or 64 by activating a license as their requirements change. Because the SilkWorm 4900 is easily upgradable, it extends the Brocade modular "pay-as-you-grow" approach to support cost-effective business growth.

SUPERIOR ROI AND INVESTMENT PROTECTION

The SilkWorm 4900 combines strategic performance, availability, and scalability advantages with investment protection for existing SAN environments. For instance, auto-sensing capabilities for 1, 2, and 4 Gbit/sec ports enable rapid implementation in existing SAN environments—reducing both deployment cost and complexity.
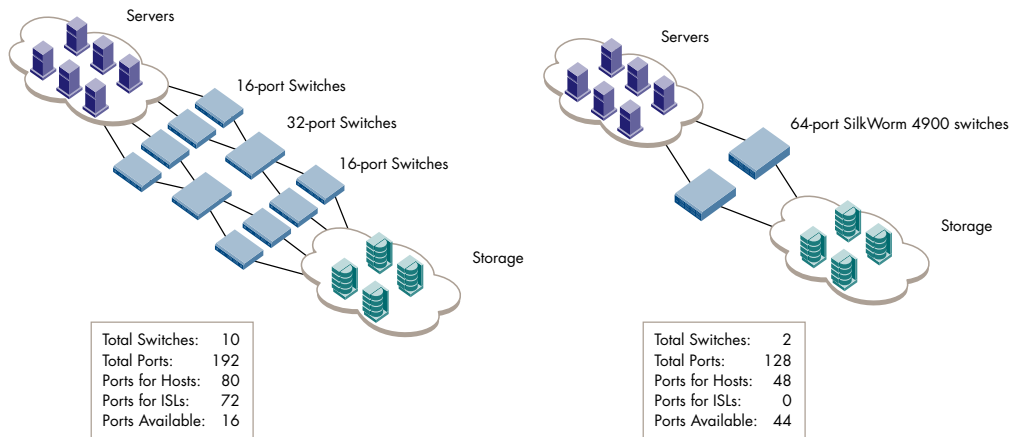
Servers

16-port Switches

32-port Switches

16-port Switches

Storage

Total Switches:	10
Total Ports:	192
Ports for Hosts:	80
Ports for ISLs:	72
Ports Available:	16

Servers

64-port SilkWorm 4900 switches

Storage

Total Switches:	2
Total Ports:	128
Ports for Hosts:	48
Ports for ISLs:	0
Ports Available:	44

Figure 1. Simplified SAN deployments supporting greater device attachment.

The SilkWorm 4900 utilizes the same Brocade Fabric OS® code stream that supports the SilkWorm product line— from the base 8-port SilkWorm 200E to the 256-port SilkWorm 48000. This helps ensure full forward and backward compatibility among SilkWorm switches while simplifying software maintenance and field upgrades. As a result, the SilkWorm 4900 enables organizations to better leverage their current training, tools, devices, and processes.

OPEN SAN MANAGEMENT

By networking Fibre Channel switches such as the SilkWorm 4900 under a common platform, Fabric OS greatly simplifies SAN management. An embedded real-time operating system, Fabric OS includes standard management interfaces, a full range of management tools, and support for third-party SAN management applications.

To simplify SAN administration and reduce costs, the SilkWorm 4900 supports switch management through a command line interface, Brocade Web Tools, and Brocade Fabric Manager. It also leverages Brocade Advanced Fabric Services to improve the utilization of existing

storage and server assets, increase administrator efficiency, and lower the cost of storage management.

To facilitate deployment, the SilkWorm 4900 integrates easily into heterogeneous environments such as AIX, Linux, Solaris, UNIX, and Windows NT.

HIGHER FABRIC SECURITY FOR CRITICAL INFORMATION

To help organizations safeguard their critical information, the SilkWorm 4900 is designed for the highest levels of SAN fabric security. It utilizes Brocade Zoning, Advanced Zoning, and Secure Fabric OS® to help organizations simplify administration and significantly increase their control over data access.

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**.

SILKWORM 4900 SPECIFICATIONS

Systems Architecture

Fibre Channel ports	64 ports, universal (E, F, and FL)
Scalability	Full fabric architecture with 239 switches maximum
Certified maximum	56 switches, 7 hops; larger fabrics may be certified as required
Interoperability	SilkWorm 2000, 3000, 200E, and 4000 series switches; SilkWorm 12000, 24000, and 48000 directors; SilkWorm Multiprotocol Router
Performance	1.063 Gbit/sec line speed, full duplex; 2.125 Gbit/sec line speed, full duplex; 4.25 Gbit/sec line speed, full duplex and 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
ISL Trunking	Up to eight 4 Gbit/sec ports per ISL trunk; up to 32 Gbit/sec per ISL trunk
Aggregate bandwidth	512 Gbit/sec end to end
Fabric latency	~700 nanoseconds within a locally switched group and <2.4 µsec with no contention, cut-through routing at 4 Gbit/sec between locally switched groups
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 supporting unicast and broadcast
Media types	Small Form-factor Pluggable (SFP) media; short-wave up to 500 meters (1640 feet); long-wave up to 10 kilometers (6.2 miles); extended long-wave up to 100 km (62.1 miles). Distance depends on fiber optic cable and port speed.
Fabric services	Simple Name Server; Registered State Change Notification (RSCN). *Optional fabric services include:* Brocade Advanced Zoning, Brocade Fabric Watch, Brocade Extended Fabrics, Brocade Remote Switch, Brocade ISL Trunking, Brocade Advanced Performance Monitoring, Brocade Web Tools
Options	SFP media

Management

Management software supported	Telnet; SNMP (FE MIB, FC Management MIB); Brocade Advanced Web Tools (optional); Brocade Fabric Manager (optional)
Management access	10/100 Ethernet port (RJ-45); Serial port (RJ-45); In-band through Management Server
Diagnostics	POST and embedded online/offline diagnostics

Mechanicals

Enclosure	Non-port side to port side (port side exhaust); back-to-front airflow; power from rear; 2.0U, 19-in. EIA-compliant
Size	Width: 42.87 cm (16.88 in) Height: 8.60 cm (3.39 in) Depth: 61.0 cm (24.02 in)
System weight	13.7 kg (30.2 lb) — with dual power supply, no SFP

Environmentals

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: 20% to 85% non-condensing at 40°C (104°F)
Altitude	Operating: Up to 3,000 m (9,800 ft) Storage: Up to 12 km (32,200)
Shock	Operating: 20G, 6 ms half-sine Non-operating: 15G, 12 to 18 ms trapezoid
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

Airflow

Max airflow	74 CFM
Nominal airflow	54 CFM

Power

Maximum output	300 Watts
System power consumption	Nominal system draw 175 Watts
Nominal input voltage	90 to 264 VAC, 47 to 63 Hz
Input line frequency	47 to 63 Hz
Minimum input voltage	90 VAC
Maximum input voltage	264 VAC
BTU rating (80% efficiency)	220 Watts / 0.8 X 3.412 BTU/hr/Watts = 756 BTU/hr
Inrush current	Maximum of 15 Amps for period between 10 to 150 ms at 50°C (122°F), hot or cold start

The SilkWorm 4900 complies with the following safety certifications:

- UL 60950-1: 2003, First Edition (Underwriters Laboratories)
- CSA 60950-1-03 (Canadian Standards Association)
- Nemko EN60950:2000
- TUV EN60950:2000 / IEC60950:1999 (TUV "GS" for Germany, TUV "S" for Argentina)
- GOST (Russia)
- Low Voltage Directive (73/23/EEC) for CE Marking in European Union

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