BROCADE 5300 SWITCH

STORAGE AREA NETWORK

An Industry-Leading Switch for Virtualized Data Centers

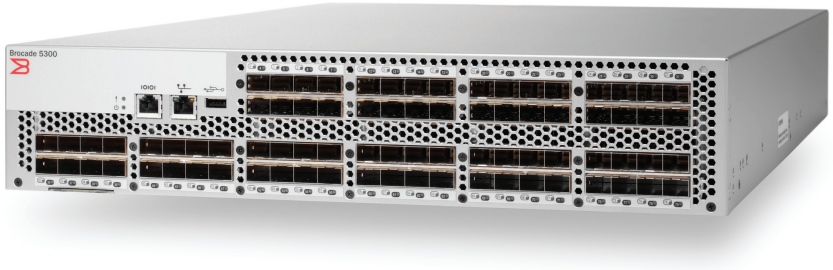
HIGHLIGHTS

- Delivers full 8 Gbps 1:1 performance for up to 80 ports in a single-domain, optimized 2U form factor
- Offers best-in-class port density and scalability for enterprise SAN switches along with redundant, hot-pluggable components and non-disruptive software upgrades
- Features Ports on Demand capabilities for fast, easy, and cost-effective scalability from 48 to 80 ports in 16-port increments
- Provides Adaptive Networking services such as Quality of Service (QoS) to help optimize application performance in consolidated, virtual environments
- Supports Fibre Channel Integrated Routing for selective device sharing while maintaining remote fabric isolation for higher levels of scalability and fault isolation
- Enables logical partitioning of switches and fabrics into virtual data and management domains through Virtual Fabrics
- Utilizes the Brocade EZSwitchSetup wizard to simplify deployment, and is Microsoft Simple SAN-compatible (Brocade DCFM Professional is included for fabric-wide SAN monitoring and management)

As the value and volume of business data continue to rise, organizations need technology solutions that are easy to implement and manage, and that can grow and change with minimal disruption. The Brocade® 5300 Switch is designed to consolidate connectivity in rapidly growing mission-critical environments—combining 1, 2, 4, and 8 Gbps technology in configurations of 48, 64, or 80 ports in an efficiently designed 2U package. The combination of density, performance, and "pay-as-you-grow" scalability increases server and storage utilization while reducing complexity for virtualized servers and storage.

Deployed at the fabric core or at the edge of a tiered core-to-edge infrastructure, the Brocade 5300 operates seamlessly with existing Brocade switches through native E_Port connectivity into Brocade Fabric OS® (FOS) or M-Enterprise OS (M-EOS)* environments. The evolutionary design makes it very efficient in power, cooling, and rack density—enabling medium- and large-scale server and storage consolidation. The Brocade 5300 also includes Adaptive Networking capabilities to more efficiently manage resources in highly consolidated environments while providing the highest service levels to data center applications.

To consolidate server connectivity using Fibre Channel over Ethernet (FCoE) and Converged Enhanced Ethernet (CEE), the Brocade 5300 is compatible with Brocade CEE/FCoE solutions.



* *Brocade M-EOS fabrics are McDATA switches and directors running McDATA Enterprise OS in McDATA Fabric mode or McDATA Open Fabric mode.*

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SUPERIOR PERFORMANCE AND DENSITY

To support mission-critical environments, the Brocade 5300 features a non-blocking architecture with as many as 80 ports concurrently active at 8 Gbps full duplex with no over-subscription—providing an aggregate bandwidth of 640 Gbps. It also supports new virtualization technologies that are driving efficiency and flexibility benefits. For example, organizations that have deployed virtual server environments require higher levels of connectivity for consolidation and higher levels of performance to cost-effectively meet the demands of virtual data centers.

The Brocade 5300 utilizes sixth-generation ASIC technology featuring eight 8-port groups. Within these groups, an Inter-Switch Link (ISL) trunk can supply up to 64 Gbps of balanced data throughput. In addition to reducing congestion and increasing bandwidth, enhanced Brocade ISL Trunking utilizes ISLs more efficiently to preserve the number of usable switch ports.

The high port density of the Brocade 5300 uniquely enables fan-out from the core of the data center fabric with less than half the number of switch devices to manage compared to traditional 32- or 40-port edge switches (see Figure 1). When deployed as a core SAN fabric switch, the 80-port Brocade 5300 provides a single-switch core footprint that is ideal for SAN fan-out using lower-density Brocade switches. This single-domain solution enables highly efficient server and storage consolidation, reducing the total number of domains to manage in the fabric.

ENTERPRISE-CLASS AVAILABILITY FOR BUSINESS CONTINUANCE

The Brocade 5300 provides a reliable SAN foundation by employing enterprise-class availability features such as hot-swappable, redundant fan and power supply assemblies. Moreover, hot code load and activation help maximize application uptime with faster system upgrades and maintenance to reduce the dependency on scheduled outages. Combined with a wide range of diagnostic and monitoring functions, these capabilities help establish a highly available SAN environment.

To support SAN extension, the Brocade 5300 enables servers and storage devices to reside up to 600 kilometers apart, allowing organizations to create highly available, high-performance clustered systems that support the most sophisticated business continuance and disaster recovery initiatives.

TRAFFIC MEASUREMENT AND ADAPTIVE NETWORKING

The Brocade 5300 offers Bottleneck Detection, Top Talkers (part of Brocade Advanced Performance Monitoring), and Adaptive Networking, a suite of tools including Ingress Rate Limiting, Traffic Isolation, and Quality of Service (QoS). These advanced capabilities help optimize fabric behavior and ensure ample bandwidth for mission-critical applications.

Bottleneck Detection identifies and alerts administrators to "slow drain" storage devices causing latency and I/O timeouts, particularly in highly virtualized server environments. Top Talkers measures the top bandwidth-consuming traffic (including by individual virtual machine) in real time over a physical device connection or throughout a network switch. Ingress Rate Limiting restricts data flow from less-critical hosts at preset bandwidths. Traffic Isolation dedicates paths in the fabric to high-bandwidth data flows. And QoS expedites critical traffic in the event of congestion while keeping all traffic flowing.

SUPERIOR INVESTMENT PROTECTION

The 8 Gbps Fibre Channel capabilities of the Brocade 5300 enable many organizations to get an extra generation of use from their storage networks. If organizations want to use 4 Gbps SFPs today, they can upgrade to 8 Gbps SFPs when necessary, seamlessly incorporating new capabilities. To protect their investments in operational training and management, organizations can monitor and manage the Brocade 5300 with fabric-wide applications such as Brocade Data Center Fabric Manager (DCFM™).

ADVANCED CAPABILITIES

As an option for connecting switches in different, unique fabrics, the Brocade 5300 provides Fibre Channel Integrated Routing capabilities. Integrated Routing leverages the latest generation of Brocade ASICs to provide native Fibre Channel Routing on a per-port basis rather than limiting routing capabilities to special-purpose switches. Integrated Routing uses EX_Ports to import/export devices between fabrics, enabling selective device sharing while maintaining remote fabric isolation for higher levels of scalability and fault isolation.

The Brocade 5300 includes a Virtual Fabrics feature that enables the partitioning of a physical SAN into logical fabrics. This provides fabric isolation by application, business group, customer, or traffic type without sacrificing performance, scalability, security, or reliability.

OPEN SAN MANAGEMENT

By enabling Fibre Channel switches such as the Brocade 5300 to operate under a common platform, Fabric OS simplifies management through standard interfaces and support for third-party management applications. The Brocade 5300 supports switch management through Brocade DCFM, Brocade Web Tools, or a command line interface.

To facilitate deployment, the Brocade 5300 includes EZSwitchSetup—providing simplified setup through a 3-step wizard. It integrates easily into heterogeneous server environments such as Windows, UNIX, Linux, Solaris, and AIX, as well as virtual server environments. It is also designed to provide FICON® support on a flexible port-by-port basis in IBM System z environments. FICON-ready capabilities include FICON intermix modes, cascaded FICON fabrics, and CUP support for monitoring tools.

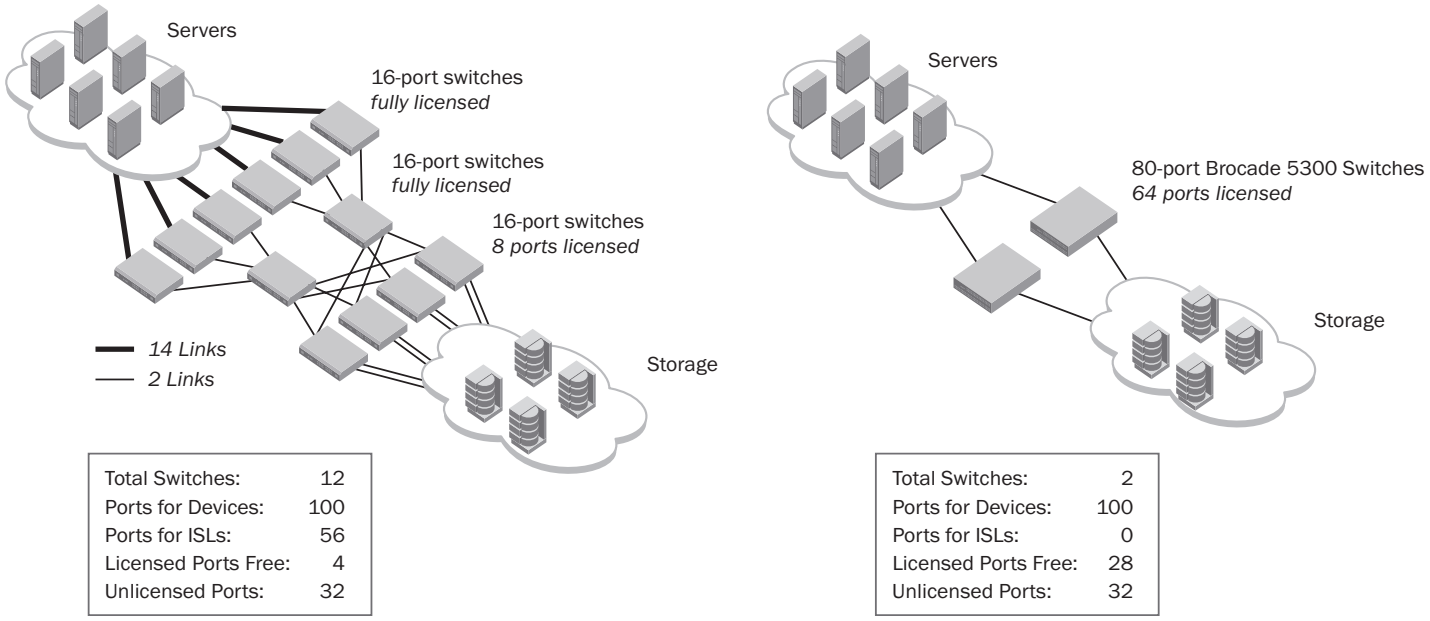
HIGHER FABRIC SECURITY FOR CRITICAL INFORMATION

The Brocade 5300 is designed for the highest level of fabric security to help organizations safeguard their critical information. It utilizes Brocade Advanced Zoning as well as advanced port and switch Access Control Lists (ACLs) to simplify administration and significantly increase control over data access. To simplify management access security, the Brocade 5300 supports Active Directory with LDAP.

MAXIMIZING INVESTMENTS

To help optimize technology investments, Brocade and its partners offer complete solutions that include education, support, and services. For more information, contact a Brocade sales partner or visit www.brocade.com.

Figure 1.
Simplified SAN deployments support greater consolidation.



BROCADE 5300 SPECIFICATIONS

Systems Architecture	
Fibre Channel ports	48-, 64-, and 80-port configurations (16-port increments via Ports on Demand licenses); universal (E, F, M, EX, FL) ports
Scalability	Full fabric architecture with 239 switches maximum
Certified maximum	Single Brocade FOS fabric: 56 domains, 19 hops Single Brocade M-EOS fabric: 31 domains, 3 hops Larger fabrics certified as required; consult Brocade or OEM SAN design documents for configuration details
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, 2, 4, and 8 Gbps port speeds; optionally programmable to fixed port speed; speed matching between 1, 2, 4, and 8 Gbps ports
ISL Trunking	Frame-based trunking with up to eight 8 Gbps ports per ISL trunk with optional license; up to 64 Gbps per ISL trunk (8 ports × 8 Gbps [data rate]) Exchange-based load balancing across ISLs with DPS included in Fabric OS
Aggregate bandwidth	640 Gbps: 80 ports × 8 Gbps (data rate)
Fabric latency	Locally switched ports 700 ns, latency between port groups less than 2.1 µsec with no contention, cut-through routing at 8 Gbps between locally switched groups
Maximum frame size	2112-byte payload
Frame buffers	1460 dynamically allocated, 268 maximum per port
Classes of service	Class 2, Class 3, Class F (inter-switch frames)
Port types	FL_Port, F_Port, M_Port (Mirror Port), E_Port, EX_Port (Fibre Channel Integrated Routing); self-discovery based on switch type (U_Port); optional port type control
Data traffic types	Fabric switches supporting unicast, multicast (255 groups) and broadcast
USB	1 USB port for firmware download, support save, and configuration upload/download
Media types	8 Gbps: Requires Brocade hot-pluggable SFP+, LC connector; 8 Gbps Short-Wavelength Laser (SWL); 8 Gbps Long-Wavelength Laser (LWL); distance depends on fiber-optic cable and port speed 4 Gbps: Requires Brocade hot-pluggable, Small Form-factor Pluggable (SFP), LC connector; 4 Gbps Short-Wavelength Laser (SWL); 4 Gbps Long-Wavelength Laser (LWL); 4 Gbps Extended Long-Wavelength Laser (ELWL); distance depends on fiber-optic cable and port speed

BROCADE 5300 SPECIFICATIONS (CONTINUED)

Fabric services	Advanced Performance Monitoring (including Top Talkers); Adaptive Networking (Ingress Rate Limiting, Traffic Isolation, QoS); BB credit recovery; Brocade Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning); Bottleneck Detection; Dynamic Path Selection (DPS); Extended Fabrics; EX_Port Trunking; F_Port Trunking; Fabric Watch; FDMI; Frame Redirection; FSPF; Integrated Routing; IPoFC; ISL Trunking; Management Server; NPIV; NTP v3; Port Fencing; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Simple Name Server (SNS); Virtual Fabrics
FICON	FICON, FICON cascading (FOS and M-EOS), and FICON CUP
Options	Rack-mount rail kits (fixed, slide, mid-mount)
Management	
Management	HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), Telnet; auditing, change management tracking, Syslog; Brocade Advanced Web Tools, Brocade Fabric Watch; EZSwitchSetup wizard, Brocade Data Center Fabric Manager (DCFM), Brocade Fabric Manager (optional, FOS environments only), Brocade EFCM 9.x (optional), command line interface; SMI-S compliant, SMI-S scripting toolkit; Administrative Domains; trial licenses for add-on capabilities
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 Ethernet (RJ-45), in-band over Fibre Channel; serial port (RJ-45); USB; call-home integration enabled through Brocade DCFM, EFCM, and Fabric Manager
Diagnostics	POST and embedded online/offline diagnostics, including RAStrace logging, environmental monitoring, non-disruptive daemon restart, FCping and Pathinfo (FC traceroute), port mirroring (SPAN port)

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Mechanical	
Enclosure	Non-port to port side airflow; 2U, 19-inch EIA-compliant, power from non-port side
Size	Width: 42.88 cm (16.88 in) Height: 8.60 cm (3.40 in) Depth: 61.05 cm (24.00 in)
System weight	15.6 kg (34.4 lb) with dual power supplies, without SFP/SFP+ media
Environment	
Temperature	Operating: 0°C to 40°C (32°F to 104°F) Non-operating and storage: –25°C to 70°C (–13°F to 158°F)
Humidity	Operating: 10% to 85% non-condensing Non-operating and storage: 10% to 95% non-condensing
Altitude	Operating: Up to 3,000 meters (9,842 feet) Non-operating and storage: Up to 12 kilometers (39,370 feet)
Shock	Operating: 20 g, 6 ms half-sine Non-operating and storage: Half sine, 33 g 11 ms, 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 80 ports: 939 BTU/hr
CO_2 emissions	1012 kg per year (with 80 ports at 0.42 kg/kWh) 1.58 kg per Gbps per year
Airflow	Three hot-swappable, redundant fans; maximum 60 CFM (cu. ft./min); 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 38 amps for period between 10 to 150 ms at 50°C (122°F)
Power consumption	Nominal 260 watts; maximum 275 watts with 80 ports at 8 Gbps

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

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

For information about hardware regulatory compliance, visit www.brocade.com/regulatorycompliance

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