

BROCADE 5300 SWITCH



STORAGE AREA NETWORK

An Industry-Leading Switch for Virtualized Data Centers

HIGHLIGHTS

- Delivers full 8 Gbit/sec 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
- Protects existing device investments with auto-sensing 1, 2, 4, and 8 Gbit/sec capabilities and native operation with Brocade and Brocade M-Series fabrics
- 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
- Improves energy efficiency by combining increased bandwidth with lower power consumption

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 Gbit/sec 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.

Used 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 to help enable 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.

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 Gbit/sec full duplex with no over-subscription—providing an aggregate bandwidth of 1360 Gbit/sec. 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 ASIC technology featuring eight 8-port groups. Within these groups, an Inter-Switch Link (ISL) trunk can supply up to 68 Gbit/sec 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 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 provide 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.

ADAPTIVE NETWORKING SERVICES

The Brocade 5300 utilizes Brocade Adaptive Networking services, a suite of tools for optimizing fabric behavior and ensuring ample bandwidth for mission-critical applications. These tools currently include QoS, Ingress Rate Limiting, Traffic Isolation, and Top Talkers.

By assigning zones a high, medium, or low priority, QoS allocates bandwidth in the event of congestion to expedite high-priority traffic and keep all traffic flowing. Ingress Rate Limiting restricts data flow from less-critical hosts at preset bandwidths. Traffic Isolation assigns high-bandwidth data flows to specific ISLs. And Top Talkers measures the top bandwidth-consuming traffic in real time for a specific physical or virtual device, or end to end across the fabric.

SUPERIOR ROI AND INVESTMENT PROTECTION

The Brocade 5300 enables organizations to use 4 Gbit/sec SFPs today and upgrade to 8 Gbit/sec SFPs, so they can fully leverage their existing IT resources and seamlessly incorporate new capabilities as necessary. To protect investments in operational training and management, organizations can manage the Brocade 5300 with existing applications such as Brocade Enterprise Fabric Connectivity Manager (EFCM) and Brocade Fabric Manager.

INTEGRATED ROUTING

As an option for connecting switches in a fabric, 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 to special-purpose routing 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.

OPEN SAN MANAGEMENT

By networking Fibre Channel switches such as the Brocade 5300 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 a command line interface, Brocade Web Tools, EFCM, or Fabric Manager.

To facilitate deployment, the Brocade 5300 integrates easily into heterogeneous environments with operating systems such as Windows NT, 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.

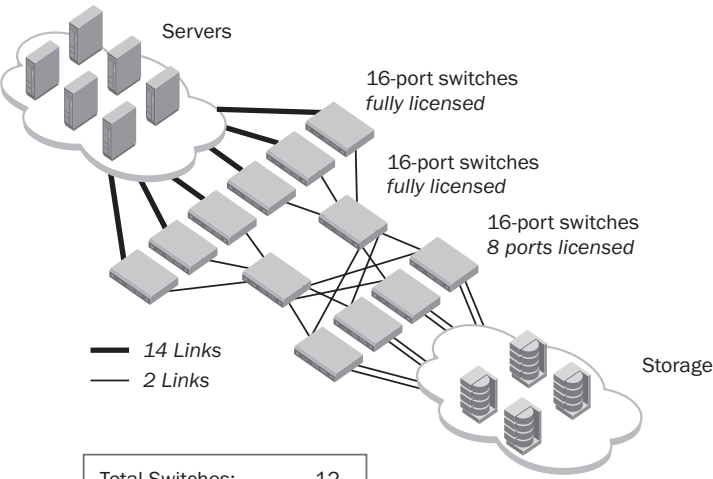
HIGHER FABRIC SECURITY FOR CRITICAL INFORMATION

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.

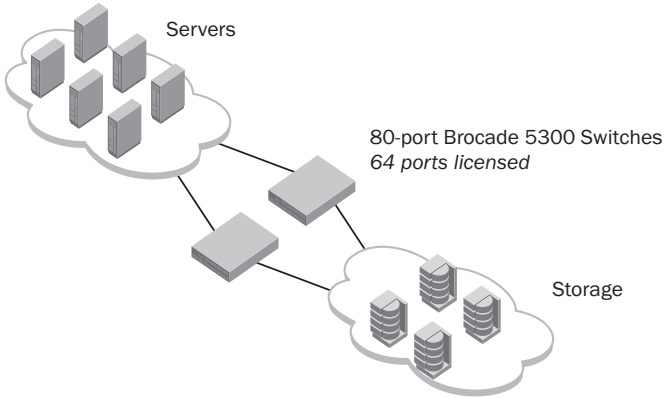
MAXIMIZING INVESTMENTS

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.



Total Switches:	12
Ports for Devices:	100
Ports for ISLs:	56
Licensed Ports Free:	4
Unlicensed Ports:	32



Total Switches:	2
Ports for Devices:	100
Ports for ISLs:	0
Licensed Ports Free:	28
Unlicensed Ports:	32

BROCADE 5300 SPECIFICATIONS

Systems Architecture	
Fibre Channel ports	80 ports, universal (E, F, M, EX, and FL)
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 Gbit/sec line speed, full duplex; 2.125 Gbit/sec line speed, full duplex; 4.25 Gbit/sec line speed, full duplex; 8.5 Gbit/sec line speed, full duplex; auto-sensing of 1, 2, 4, and 8 Gbit/sec port speeds; optionally programmable to fixed port speed; speed matching between 1, 2, 4, and 8 Gbit/sec ports
ISL Trunking	Frame-based trunking with up to eight 8 Gbit/sec ports per ISL trunk with optional license; up to 68 Gbit/sec per ISL trunk (8 ports × 8.5 Gbit/sec (line rate)) Exchange-based load balancing across ISLs with DPS included in Fabric OS
Aggregate bandwidth	1360 Gbit/sec: 80 ports × 8.5 Gbit/sec (line rate) × 2 (full duplex)

Fabric latency	Locally switched ports 700 ns, latency between port groups less than 2.1 µsec with no contention, cut-through routing at 8 Gbit/sec 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	<u>4 Gbit/sec</u> : Requires Brocade hot-pluggable, Small Form-factor Pluggable (SFP), LC connector; 4 Gbit/sec Short-Wavelength Laser (SWL); 4 Gbit/sec Long-Wavelength Laser (LWL); 4 Gbit/sec Extended Long-Wavelength Laser (ELWL); distance depends on fiber-optic cable and port speed <u>8 Gbit/sec</u> : Requires Brocade hot-pluggable SFP+, LC connector; Short-Wavelength Laser (SWL); distance depends on fiber-optic cable and port speed

BROCADE 5300 SPECIFICATIONS (CONTINUED)

Fabric services	Simple Name Server (SNS); Registered State Change Notification (RSCN); NTP v3; Reliable Commit Service (RCS); Dynamic Path Selection (DPS); Brocade Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning); NPIV; N_Port Trunking; FDMI; Management Server; FSPF; Fabric Watch; Extended Fabrics; ISL Trunking; Advanced Performance Monitoring; Adaptive Networking (per data flow QoS, Ingress Rate Limiting, Traffic Isolation, Top Talkers; licensing varies); IPoFC, Integrated Routing; Frame Redirection; Port Fencing; BB credit recovery
FICON	FICON, FICON cascading (FOS and M-EOS), and FICON CUP
Options	Rack-mount rail kits (fixed, slide, mid-mount)
Management	
Management	Telnet, HTTP, SNMP v1/v3 (FE MIB, FC Management MIB); Auditing, Syslog, Change Management tracking; EZSwitchSetup wizard; Brocade Advanced Web Tools; Brocade EFCM Standard/Enterprise 9.x (optional); Brocade Fabric Manager (optional: FOS environments only); SMI-S compliant, SMI-S scripting toolkit, Administrative Domains; trial licenses for select add-on capabilities
Security	SSL, SSH v2, HTTPS, LDAP, RADIUS, Role-Based Access Control (RBAC), DH-CHAP (between switches and end devices), Port Binding, Switch Binding, Secure RPC, Secure Copy (SCP), Trusted Switch, IPsec, IP Filtering
Management access	10/100 Ethernet (RJ-45), in-band over Fibre Channel; serial port (RJ-45); USB; call-home integration enabled through Brocade EFCM and Brocade 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)

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

Mechanicals	
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
Environmentals	
Operating	Temperature: 0°C to 40°C (32°F to 104°F) Humidity: 10% to 85% non-condensing
Non-operating	Temperature: -25°C to 70°C (-13°F to 158°F) Humidity: 10% to 95% non-condensing
Altitude	Operating: Up to 3,000 meters (9,842 feet) Storage: Up to 12 kilometers (39,370 feet)
Shock	Operating: 20 g, 6 ms half-sine Non-operating: 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 Gbit/sec per year
Airflow	Maximum 60 CFM (cu. ft./min.); nominal 44 CFM
Power	
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 Gbit/sec

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

Corporate Headquarters

San Jose, CA USA
T: (408) 333-8000
info@brocade.com

European Headquarters

Geneva, Switzerland
T: +41 22 799 56 40
emea-info@brocade.com

Asia Pacific Headquarters

Singapore
T: +65-6538-4700
apac-info@brocade.com

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