

# Datasheet Brocade 6510 Fibre Channel switch

## **FLEXIBLE, EASY-TO-USE ENTERPRISE-CLASS SAN SWITCH FOR PRIVATE CLOUD STORAGE**

To remain competitive, IT organizations must keep pace with ever-increasing workloads without a similar increase in their budgets or resources. While virtualization has provided some relief by enabling the benefits of faster deployment and consolidation, it also tends to put additional stress on data center networks. In addition, the move toward cloud computing, which promises greater efficiency and a more service-oriented business model, means that these networks will face even greater demands. The Brocade® 6510 Switch meets the demands of hyper-scale, private cloud storage environments by delivering market-leading 16 Gbps Fibre Channel technology and capabilities that support highly virtualized environments. Designed to enable maximum flexibility and investment protection, the Brocade 6510 is configurable in 24, 36, or 48 ports and supports 2, 4, 8, or 16 Gbps speeds in an efficiently designed 1U package. It also provides a simplified deployment process and a point-and-click user interface—making it both powerful and easy to use. The Brocade 6510 offers low-cost access to industry-leading Storage Area Network (SAN) technology while providing “pay-as-you-grow” scalability to meet the needs of an evolving storage environment.

## **EXCEPTIONAL PRICE/PERFORMANCE FOR GROWING SAN WORKLOAD**

The Brocade 6510 delivers exceptional price/performance for growing SAN workloads through a combination of market-leading throughput and an affordable switch form factor. The 48 ports produce an aggregate 768 Gbps full-duplex throughput; any eight ports can be trunked for 128 Gbps Inter-Switch Links (ISLs). Exchange-based Dynamic Path Selection (DPS) optimizes fabric-wide performance and load balancing by automatically routing data to the most efficient available path in the fabric (see Figure 1). It augments ISL trunking to provide more effective load balancing in certain configurations. Moreover, a 24-port base configuration, easy administration, 1U footprint, and low-energy consumption—0.14 watts per Gbps and 2.3 watts per port—provide a low Total Cost of Ownership (TCO). Enterprise-class capabilities combined with a low TCO yield 40 percent higher performance compared to 10 Gigabit Ethernet (GbE) storage alternatives at a similar cost. **INDUSTRY-LEADING TECHNOLOGY THAT IS FLEXIBLE, SIMPLE, AND EASY TO USE** The Brocade 6510 delivers industry-leading SAN technology within a flexible, simple, and easy-to-use solution. The base configuration includes 24 ports, with up to 48 ports on demand. In addition to providing best-in-class scalability,

The Brocade 6510 is easy to deploy with the Brocade EZSwitchSetup wizard and new “D\_Port” feature, which simplifies setup. For maximum flexibility, the switch also features a 1U case less than 18 inches deep and dual-direction airflow options to support the latest hot aisle/cold aisle configurations.

## **A BUILDING BLOCK FOR VIRTUALIZED, PRIVATE CLOUD STORAGE**

The Brocade 6510 provides a critical building block for today’s highly virtualized, private cloud storage environments. It simplifies server virtualization and Virtual Desktop Infrastructure (VDI) management while meeting the high-throughput demands of Solid State Disks (SSDs). The Brocade 6510 also supports multi-tenancy in cloud environments through Virtual Fabrics, Quality of Service (QoS), and fabric-based zoning features. The Brocade 6510 enables secure metro extension to virtual private or hybrid clouds with Dense Wavelength Division Multiplexing (DWDM) link support, as well as in-flight encryption and data compression. The switch also features on-board data security and acceleration, minimizing the need for separate acceleration appliances to support distance extension. Internal fault-tolerant and enterprise-class RAS features help minimize downtime to support mission-critical cloud environments.



	<b>Green Policy Innovation</b>	<b>Green Product</b>
		This product cleared our company's original evaluation standard which followed global environmental measures.

# Features and benefits

Main features	Benefits
<b>Industry-leading 16 Gbps performance</b>	<ul style="list-style-type: none"><li>■ Meets the demands of hyper-scale, private cloud storage environments</li><li>■ Capabilities of highly virtualized environments</li></ul>
<b>Flexible ports on demand</b>	<ul style="list-style-type: none"><li>■ "Pay-as-you-grow" scalability</li><li>■ The delivered 24 ports can easily upgrade to 36 or 48 by activating the port license</li></ul>
<b>Enterprise-class availability features as hot-plug redundant fans and power supplies</b>	<ul style="list-style-type: none"><li>■ Enterprise-Class availability for disaster recovery and business continuance</li></ul>

# Technical details

---

## Systems Architecture

<b>Fibre Channel ports</b>	Switch mode (default): 24-, 36-, and 48-port configurations (12-port increments through Ports on Demand [PoD] licenses); universal (E, F, M, D, EX) ports Brocade Access Gateway default port mapping: 40 F_Ports, 8 N_Ports
<b>Scalability</b>	Full fabric architecture with a maximum of 239 switches
<b>Certified maximum</b>	6000 active nodes; 56 switches, 19 hops in Brocade Fabric OS® fabrics; 31 switches, three hops in Brocade M-EOS fabrics; larger fabrics certified as required
<b>Performance</b>	Auto-sensing of 2, 4, 8, and 16 Gbps port speeds
<b>ISL Trunking</b>	Frame-based trunking with up to eight 16 Gbps ports per ISL trunk; up to 128 Gbps per ISL trunk. Exchange-based load balancing across ISLs with DPS included in Fabric OS. There is no limit to how many trunk groups can be configured in the switch.
<b>Aggregate bandwidth</b>	768 Gbps end-to-end full duplex
<b>Fabric latency</b>	Latency for locally switched ports is 700 ns; encryption/compression is 5.5 µsec per node; Forward Error Correction (FEC) adds 400 ns between E_Ports (enabled by default).
<b>Maximum frame size</b>	2112 byte payload
<b>Frame buffers</b>	8192 dynamically allocated
<b>Classes of service</b>	Class 2, Class 3, Class F (inter-switch frames)
<b>Port types</b>	D_Port (Diagnostic Port), E_Port, EX_Port, F_Port, M_Port (Mirror Port); self-discovery based on switch type (U_Port); optional port type control Brocade Access Gateway mode: F_Port and NPIV-enabled N_Port
<b>Data traffic types</b>	Fabric switches supporting unicast
<b>Media types</b>	Hot-pluggable, industry-standard Small Form-Factor Pluggable (SFP+), LC connector; Short-Wavelength (SWL), Long-Wavelength (LWL); Extended Long-Wavelength (ELWL); distance depends on fiber optic cable and port speed. Supports SFP+ (2, 4, 8, 6 Gbps) optical transceivers.
<b>Fabric services</b>	Brocade Advanced Performance Monitoring (APM) (including Top Talkers for E_Ports, F_Ports, and Fabric mode); Brocade Adaptive Networking (Ingress Rate Limiting, Traffic Isolation, QoS); Bottleneck Detection; Brocade Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning); Dynamic Fabric Provisioning (DFP); Dynamic Path Selection (DPS); Extended Fabrics; Enhanced BB credit recovery; Brocade Fabric Watch; FDMI; Frame Redirection; Frame-based Trunking; FSPF; Integrated Routing; IPoFC; ISL Trunking; Management Server; NPIV; NTP v3; Port Fencing; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Server Application Optimization (SAO); Simple Name Server (SNS); Virtual Fabrics (Logical Switch, Logical Fabric)
<b>Extension</b>	Fibre Channel, in-flight compression (Brocade LZ0) and encryption (AES-GCM-256); Fibre Channel DWDM MAN connectivity

## Management

<b>Supported management software</b>	HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog; Brocade Advanced Web Tools, APM, Brocade Fabric Watch; Brocade Network Advisor SAN Enterprise or Brocade Network Advisor SAN Professional/Professional Plus; Command Line Interface (CLI); SMI-S compliant; Administrative Domains; trial licenses for add-on capabilities; Fujitsu ETERNUS SF Storage Cruiser
<b>Security</b>	AES-GCM-256 encryption on ISLs; DH-CHAP (between switches and end devices), FCAP switch authentication; FIPS 140-2 L2-compliant, HTTPS, IPsec, IP filtering, LDAP with IPv6, Port Binding, RADIUS, User-defined Role-Based Access Control (RBAC), Secure Copy (SCP), Secure RPC, SFTP, SSH v2, SSL, Switch Binding, Trusted Switch
<b>Management access</b>	10/100 Mbps Ethernet (RJ-45), in-band over Fibre Channel, serial port (RJ-45), and one USB port
<b>Diagnostics</b>	D_Port offline diagnostics, including electrical/optical loopback, link traffic/latency/distance; POST and embedded online/offline diagnostics, including environmental monitoring, FCping and Pathinfo (FC traceroute), frame viewer, non-disruptive daemon restart port mirroring (SPAN port), optics health monitoring, power monitoring, RAStrace logging, and Rolling Reboot Detection (RRD)

## Mechanicals

<b>Enclosure</b>	Back-to-front airflow; power from back, 1U
<b>Size</b>	Width: 438 mm (17.23 in.) Height: 43 mm (1.7 in.) Depth: 443 mm (17.45 in.)
<b>System weight</b>	9.16 kg (20.20 lb) with two power supply FRUs, without transceivers

## Environments

<b>Temperature</b>	Operating: 0°C to 40°C Non-operating: -25°C to 70°C
<b>Humidity</b>	Operating: 10% to 85% (non-condensing) Non-operating: 10% to 95% (non-condensing)
<b>Altitude</b>	Operating: up to 3000 meters Storage: up to 12 km
<b>Shock</b>	Operating: 20G, 6 ms half-sine Non-operating: 33G, 11 ms, Half sine
<b>Vibration</b>	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
<b>Heat dissipation</b>	48 ports at 338 BTU/hr

---

<b>Power</b>	
<b>Power supply</b>	Dual, hot-swappable redundant power supplies with integrated system cooling fans
<b>AC input</b>	85 V to 264 V ~5 A to 2.5 A
<b>Input line frequency</b>	47 to 63 Hz
<b>Power consumption</b>	110 watts with all 48 ports populated with 16 Gbps SWL optics 72 watts for empty chassis with no optics

---

---

<b>Safety</b>	
<b>The 6510 complies with the following safety certifications:</b>	Bi-Nat UL/CSA 60950-1 2nd Ed or latest EN60950-1: 2006+A11:2009 IEC60950-1: 2005 or latest GB4943-2001 and GB9254-1998 or latest(DCX 8510 Power supplies) CNS 14336(94) or latest

---

# More information

## Fujitsu platform solutions

In addition to Brocade 6510 Fibre Channels switch, Fujitsu provides a range of platform solutions. They combine reliable Fujitsu products with the best in services, know-how and worldwide partnerships.

### Dynamic Infrastructures

With the Fujitsu Dynamic Infrastructures approach, Fujitsu offers a full portfolio of IT products, solutions and services, ranging from clients to datacenter solutions, Managed Infrastructure and Infrastructure-as-a-Service. How much you benefit from Fujitsu technologies and services depends on the level of cooperation you choose. This takes IT flexibility and efficiency to the next level.

### Computing products

[www.fujitsu.com/global/services/computing/](http://www.fujitsu.com/global/services/computing/)  
- PRIMERGY: Industry standard server  
- SPARC Enterprise: UNIX server  
- PRIMEQUEST: Mission-critical IA server  
- ETERNUS: Storage system

### Software

[www.fujitsu.com/software/](http://www.fujitsu.com/software/)  
- Interstage: Application infrastructure software  
- Systemwalker: System management software

## More information

Learn more about Brocade 6510 Fibre Channels switch, please contact your Fujitsu sales representative, Fujitsu business partner, or visit our website.  
[www.fujitsu.com/eternus/](http://www.fujitsu.com/eternus/)

## Fujitsu green policy innovation

Fujitsu Green Policy Innovation is our worldwide project for reducing burdens on the environment. Using our global know-how, we aim to resolve issues of environmental energy efficiency through IT. Please find further information at:  
[www.fujitsu.com/global/about/environment/](http://www.fujitsu.com/global/about/environment/)



## Copyright

© Copyright 2011 Fujitsu Limited. Fujitsu, the Fujitsu logo are trademarks or registered trademarks of Fujitsu Limited in Japan and other countries. Other company, product and service names may be trademarks or registered trademarks of their respective owners.

## Disclaimer

Technical data subject to modification and delivery subject to availability. Any liability that the data and illustrations are complete, actual or correct is excluded. Designations may be trademarks and/or copyrights of the respective manufacturer, the use of which by third parties for their own purposes may infringe the rights of such owner.

## Contact

FUJITSU Limited  
Website: [www.fujitsu.com/eternus/](http://www.fujitsu.com/eternus/)  
2011-07-29 WW-EN