BROCADE 6510 AND 6505 SWITCHES FREQUENTLY ASKED QUESTIONS

Introduction

Brocade provides the industry's leading family of Storage Area Network (SAN) switches, including the 16 Gbps Brocade® 6510 and 6505 Switches, and the 8 Gbps Brocade SAN switches. These high-performance, highly reliable Fibre Channel switches address a wide range of business requirements, for small shared storage environments all the way up to the most demanding enterprise data centers.

- For product information, visit: www.brocade.com/products/all/switches/index.page?network=FIBRE_CHANNEL.

General Questions and Answers

Q What is the Brocade 6510 Switch?

A 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 reliability, the Brocade 6510 is configurable in 24, 36, or 48 ports and supports 2, 4, 8, 10, or 16 Gbps speeds in an efficiently designed 1U package. It comes standard with dual redundant power supplies and integrated fans that support optional airflow configurations.

Q What is the Brocade 6505 Switch?

A The Brocade 6505 Switch provides exceptional price/performance value, combining flexibility, simplicity, and enterprise-class functionality in an entry-level switch. Designed to enable maximum flexibility and reliability, the Brocade 6505 is configurable in 12 or 24 ports and supports 2, 4, 8, or 16 Gbps speeds in an efficiently designed 1U package. It comes standard with a single power supply and integrated fans. A second, optional power supply provides additional redundancy for increased resiliency.

Q What distinguishes Brocade 6510 and 6505 Switches from other Brocade switches?

A Brocade 6510 and 6505 Switches were designed to unleash the full potential of private cloud storage and virtualization. With unmatched scalability, 16 Gbps performance, reliability, and functionality, Brocade 6510 and 6505 Switches are the strategic platforms for transforming current SAN fabrics into cloud-optimized SANs.

See the table below for a detailed comparison of these switches.

	Brocade 6510	Brocade 5100	Brocade 6505	Brocade 300
Port Configurations	24, 36, 48 ports	24, 32, 40 ports	12, 24 ports	8, 16, 24 ports
Supported Port Speeds	2, 4, 8, 10, 16 Gbps	1, 2, 4, 8 Gbps	2, 4, 8, 16 Gbps	1, 2, 4, 8 Gbps
Total Bandwidth	768 Gbps	320 Gbps	384 Gbps	192 Gbps
ISL Trunking Bandwidth	128 Gbps	64 Gbps	128 Gbps	64 Gbps
Power Supply	Dual, hot-swappable	Dual, hot-swappable	Single, hot-swappable, optional second power supply	Single, fixed
Airflow	Front-to-back and back-to-front options	Back-to-front	Back-to-front	Back-to-front
Energy Efficiency	0.14 watts/Gbps	0.28 watts/Gbps	0.14 watts/Gbps	0.30 watts/Gbps
Diagnostic Ports	Yes	No	Yes	No
In-Flight Encryption and Compression	Yes	No	No	No
10 Gbps Native Fibre Channel	Yes	No	No	No
Forward Error Correction (FEC)	Yes	No	Yes	No
ASIC-Enabled Buffer Credit Loss Detection and Automatic Recovery at Virtual Channel Level	Yes	No	Yes	No
Concurrent Support for Top Talkers and Fibre Channel Routing	Yes	No	No support for Fibre Channel routing	No support for Fibre Channel routing
E-Port Top Talkers	Yes	No	Yes	No

Transitioning to Private Cloud Storage

Q What comprises a private cloud-based architecture?

A Cloud architectures enable organizations to efficiently pool, automate, and allocate their IT resources, accelerating their ability to meet business needs while realizing capital and operational cost savings. A private cloud resides within an organization's own data center facility. This is in contrast to public cloud infrastructures provided by companies such as Amazon and Google.

Q What is private cloud storage?

A Private cloud storage is a network infrastructure that supports the high-performance demands of server virtualization and provides key capabilities such as increased Virtual Machine (VM) mobility. This type of network is highly available and resilient, and it should enable usage-based tracking, chargeback, and other capabilities to maximize the benefits of virtualized environments.

Q How do I transition my data center to private cloud storage?

A Private cloud architectures create unique requirements that today's hierarchical data center networks are simply not designed to support. They require simpler, flatter, and more flexible data center fabrics that deliver higher performance, scalability, and resiliency. Brocade 16 Gbps Fibre Channel solutions are an ideal technology for transitioning smoothly to highly virtualized environments. They deliver unmatched I/O performance, flexible I/O connectivity, and low latency while enabling scale-out network designs and simplified management of virtualized resources. The result is a more flexible data center fabric that supports dramatically higher workloads.

The Future of Fibre Channel Technology

Q Is Fibre Channel still the best infrastructure for data center storage?

A Networks need to evolve in order to support the growing demands of highly virtualized environments and private cloud architectures. Today, Fibre Channel is the de facto standard for storage networking in the data center. The introduction of 16 Gbps Fibre Channel extends the life of this robust, reliable, and high-performance technology. This enables organizations to continue leveraging their existing IT investments as they solve their most difficult business challenges.

Q What is the future of Fibre Channel technology in the data center?

A Fibre Channel will continue to play a vital role in the data center of the future. Its robust capabilities make it the technology of choice today, and organizations around the world have shown their confidence by investing over $50 billion in Fibre Channel infrastructure. These organizations must be able to leverage those investments for the long term as they face new business demands. As the leader in Fibre Channel solutions, Brocade continues to invest heavily in R&D, along with its broad ecosystem of industry partners.

Q Is Fibre Channel better than Fibre Channel over Ethernet (FCoE), iSCSI, or NAS for storage networks and clouds?

A All of these technologies have value for specific use cases. But when it comes to the elevated demands of virtualization and cloud-based architectures, only Fibre Channel is the *proven and trusted* networking technology that meets the stringent requirements for zero-data loss and flow control with enterprise-class, mission-critical storage

applications. Robust Fibre Channel infrastructures are specifically built for the reliability and performance that data centers demand.

Q What value does 16 Gbps port speed provide when I currently have sufficient bandwidth at 4/8 Gbps?

A High-performance, highly reliable 16 Gbps Fibre Channel solutions provide the ideal networking infrastructure to accommodate the growing workloads and transformational changes in storage environments. No other technology is currently capable of supporting the highly demanding requirements associated with growing virtualized and private cloud infrastructures.

Emerging and evolving critical workloads and higher-density virtualization are continuing to push the limits of SAN infrastructure. This trend is driving ever-higher I/O and bandwidth requirements, shortening the time horizon when speeds beyond 8 Gbps are needed. Brocade 6510 and 6505 Switches feature industry-leading 16 Gbps performance, 420 million frames-per-second switching, and 768 Gbps or 384 Gbps switch bandwidth to address these next-generation I/O- and bandwidth-intensive applications.

In addition, 16 Gbps platforms and Brocade Fabric OS® (FOS) 7.0 introduce new functionality—such as Dynamic Fabric Provisioning (DFP), D_Ports, and in-flight compression and encryption—to reduce operational costs and complexity, and improve the reliability and availability of a fabric.

Q What Brocade Global Services offerings are available for Brocade 6510 and 6505 Switches?

A Brocade offers assessment, design, implementation, and Brocade Resident Consultant services as well as Brocade Technical Support for Brocade 6510 and 6505 Switches.

New Features—Questions and Answers

Q How do seventh-generation switching ASICs compare to previous generations?

A The Condor3 ASIC is the industry's most powerful and efficient switching technology. In addition to 16 Gbps speed, it includes more bandwidth (768 Gbps), faster I/O performance (420 million frames switched per second), more functionality (including D_port, in-flight encryption and compression, and Forward Error Correction (FEC)), and higher energy efficiency (less than 1 watt/Gbps).

Q What is integrated metro connectivity?

A Brocade 6510 Switches support integrated SAN extension over native Fibre Channel (metro connections up to 100 km). Native Fibre Channel connections now include in-flight compression and encryption as well as optional support for 10 Gbps Fibre Channel over Dense Wavelength Division Multiplexing (DWDM) and dark fiber.

Q What are the benefits of in-flight compression over Inter-Switch Links (ISLs)?

A In-flight compression optimizes network performance within the data center and over long-distance links. Data is compressed at the source and uncompressed at the destination. Performance varies by data type, but Brocade uses an efficient algorithm to generally achieve 2:1 compression with minimal impact on performance. Compression

can be used in conjunction with in-flight encryption. In-flight compression is available only on the Brocade 6510 Switch and 16 Gbps port blades for the Brocade DCX® 8510 Backbone.

Q What are the benefits of in-flight encryption over ISLs?

A In-flight encryption minimizes the risk of unauthorized access for traffic within the data center and over long-distance links. It is switch-to-switch encryption, not device or data-at-rest encryption. Data is encrypted at the source and decrypted at the destination. Encryption and decryption are performed in hardware using the AES-GCM-256 algorithm, minimizing any impact on performance. Encryption can be used in conjunction with in-flight compression. In-flight encryption is available only on the Brocade 6510 Switch and 16 Gbps blades for the Brocade DCX 8510, and is complementary to data-at-rest encryption provided by the Brocade Encryption Switch and the Brocade FS8-18 Encryption Blade.

Q How can Dynamic Fabric Provisioning simplify server deployment?

A Dynamic Fabric Provisioning (DFP) allows organizations to eliminate fabric reconfiguration when adding or replacing servers through the virtualization of host World Wide Names (WWNs). It combines Brocade switch and adapter technology to reduce or eliminate the need to modify zoning or Logical Unit Number (LUN) masking. In addition, DFP enables pre-provisioning of virtual WWNs, helping organizations eliminate time-consuming steps when deploying new equipment or moving devices within a switch. DFP currently requires Brocade adapters in the host.

Q What are Diagnostic Ports (D_Ports)?

A Diagnostic Ports (D_Ports) are a new port type supported on Brocade 6510 and 6505 Switches. They enable administrators to quickly identify and isolate optics and cable problems, reducing fabric deployment and diagnostic times. Organizations also can use D_Ports to run a variety of tests through Brocade Network Advisor or Command Line Interface (CLI) to test ports, Small Form-Factor Pluggables (SFPs), and cables for faults, latency, and distance. This requires Condor3 ports and Brocade-branded 10 Gbps or 16 Gbps SFPs.

Q What other enhancements and diagnostic features are included in Brocade FOS 7.0?

A Brocade FOS 7.0 includes: additional RASlogs messages for optics failures; Frame Viewer for Class 3 discards; Forward Error Correction (FEC) on ISLs; additional Audit Log support for Brocade Fabric Watch events; user-defined Role-Based Access Control (RBAC) and other security enhancements; the addition of E_Ports to Top Talkers; and port fencing due to CRC errors, transmission errors, and invalid Traffic Isolation Zones.

Q What power management features are included?

A Brocade 6510 and 6505 Switches support real-time power measurement, providing insight on power consumption in the fabric.

Brocade 6510 and 6505 Hardware—Questions and Answers

Q Can an existing 8 Gbps Brocade switch be upgraded to 16 Gbps functionality?

A No. An 8 Gbps switch will not support 16 Gbps capabilities.

Q What types of encryption are available?

A There are generally two approaches to encryption: data-at-rest and data-in-flight. Data-at-rest encryption encrypts the data so that it is stored on the destination storage media in an encrypted form. Data-in-flight encryption (Brocade 6510 only) encrypts data as it travels between two points in a network. Data is encrypted as it leaves a source port and decrypted as it arrives at the destination port. Technologies that provide encryption for data-in-flight include IPSec and MACsec (802.1AE) for Ethernet, and FC-SP for Fibre Channel. Data-at-rest and data-in-flight encryption are complementary technologies that serve different purposes, and each may be required in order to achieve regulatory compliance.

Q Are Brocade Small Form-Factor Pluggables (SFPs) required for the 16 Gbps switches?

A Yes. Brocade 6510 and 6505 Switches require Brocade-branded SFPs.

Q Why do Brocade 6510 and 6505 Switches require Brocade SFP optics?

A This provides quality control that in turn avoids application downtime. The higher the port speed—especially 16 Gbps—the less tolerance that switches have for out-of-spec wavelengths that lead to port failure and application interruption.

Q Are supported cable distances affected by 16 Gbps?

A Yes. Supported distances are reduced as Fibre Channel speed increases. See the table below.

Link Distance with Speed and Fiber Type (meters)

Transceiver Type	Form Factor	Speed	Multi-Mode Max Distance				Single Mode Max Distance
			OM1	OM2	OM3	OM4	9 µm
SWL	SFP+	16 Gbps	15 m	35 m	100 m	125 m	Not applicable
	SFP+	10 Gbps	33 m	82 m	300 m	550 m	
	SFP+	8 Gbps	21 m	50 m	150 m	190 m	
	QSFP	64 Gbps	Not applicable	50 m	50 m	50 m	
LWL	SFP+	16 Gbps	Not applicable				10 km
	SFP+	10 Gbps					10 km
	SFP+	8 Gbps					10 km, 25 km

Q Will Brocade 6510 and 6505 Switches work with existing firmware versions in current fabrics?

A Brocade 6510 Switches require Brocade FOS 7.0 or higher. Brocade 6505 Switches require Brocade FOS 7.0.1 or higher. Brocade 6510 and 6505 Switches are compatible with all 8 Gbps platforms and 4 Gbps platforms operating with the appropriate firmware. All other legacy devices running prior versions of Brocade FOS are only supported through Fibre Channel routing. For complete support information, please refer to the respective Brocade FOS release notes.

Q Can Brocade 6510 or 6505 Switches be connected to legacy McDATA devices?

A Connecting Brocade 6510 or 6505 Switches to legacy McDATA devices is supported only through Fibre Channel routing.

Brocade 6510 and 6505 Switch Software—Questions and Answers

Q What optional software licenses are available for the Brocade 6510 Switch?

A Optional value-add licenses for the Brocade 6510 include: Integrated Routing, 10 Gbps Fibre Channel extension, Ports on Demand (PoD), Brocade Adaptive Networking, Brocade Advanced Performance Monitoring, Brocade Extended Fabrics, Brocade Fabric Watch, Brocade Server Application Optimization (SAO), and Brocade ISL Trunking.

Optional value-add licenses for the Brocade 6505 include: Ports on Demand (PoD), Brocade Adaptive Networking, Brocade Advanced Performance Monitoring, Brocade Extended Fabrics, Brocade Fabric Watch, Brocade Server Application Optimization (SAO), and Brocade ISL Trunking.

Q What key SAN management capabilities are provided by Brocade Network Advisor?

A Brocade Network Advisor provides comprehensive management of data center SAN fabrics, including configuration, monitoring, diagnostics, best-practices validation, and management of Brocade DCX 8510 Backbones, Brocade DCX Backbones, Brocade SAN directors and SAN switches (including Brocade 16 Gbps SAN platforms), Host Bus Adapters (HBAs), and Converged Network Adapters (CNAs).

Brocade Network Advisor also provides out-of-the-box support for leading data center management solutions from IBM, HP, and EMC, as well as seamless support for leading hypervisors from VMware and Microsoft.

Q What other simplified management tools are available for Brocade 6510 and 6505 Switches?

A Brocade 6510 and 6505 Switches support EZSwitchSetup for intuitive “plug-and-play” deployment.

Q What is Brocade Access Gateway mode?

A Brocade Access Gateway mode can make a switch appear transparent to hosts or the network fabric. With a switch configured in Access Gateway mode, F_Ports connect to the fabric as N_Ports rather than E_Ports. This allows more hosts (and VMs) to access the fabric without increasing the number of switches—thereby simplifying configuration and reducing the number of Domain IDs to manage. Access Gateway enhancements also include frame-based trunking, QoS, and interoperability with multivendor fabrics.

Q What switches support Access Gateway mode?

A Brocade 6510, 6505, 5100, and 300 Switches, as well as Brocade 50xx and 40xx Blade Server Switches support Access Gateway mode.

Q Do I need a license to utilize Brocade Virtual Fabrics features?

A No. Brocade Virtual Fabrics capabilities for the Brocade 6510 Switch are included as part of the base Brocade FOS software (not supported on the Brocade 6505).

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