

BROCADE ENCRYPTION SWITCH

DATA CENTER

HIGHLIGHTS

- High-performance, scalable fabric-based encryption enforces data confidentiality and privacy requirements
- Unparalleled encryption processing at up to 96 Gbps supports heterogeneous enterprise data centers
- Choice of industry-leading key management solutions that help reduce operational costs and simplify management
- Industry-standard AES-256 encryption algorithms for both disk and tape in a single, centralized security platform for SAN environments
- Frame Redirection technology enables easy, non-intrusive deployment of fabric-based security services
- Plug-in encryption and compression services available to all host servers, including virtual machines, attached to data center fabrics
- Scalable performance with on-demand encryption and compression processing power meets regulatory mandates for securing data

Managing operational risk by protecting valuable digital assets has become increasingly critical in today's enterprise IT environments. In addition to achieving compliance with regulatory mandates and meeting industry standards for data confidentiality, IT organizations must also protect against potential litigation and liability following a reported breach.

In the context of data center fabric security, Brocade® provides advanced fabric services for Storage Area Networks (SANs) with the Brocade Encryption Switch. The switch is a high-speed, highly reliable hardware device that delivers fabric-based encryption services to secure data assets either selectively or on a comprehensive basis.

The Brocade Encryption Switch scales non-disruptively, providing from 48 Gbps up to 96 Gbps of encryption processing

power to meet the needs of the most demanding environments with flexible, on-demand performance. It also provides compression services at speeds up to 48 Gbps for tape storage systems. Moreover, it is tightly integrated with industry-leading, enterprise-class key management systems that can scale to support key lifecycle services across distributed environments.

FABRIC-BASED ENCRYPTION

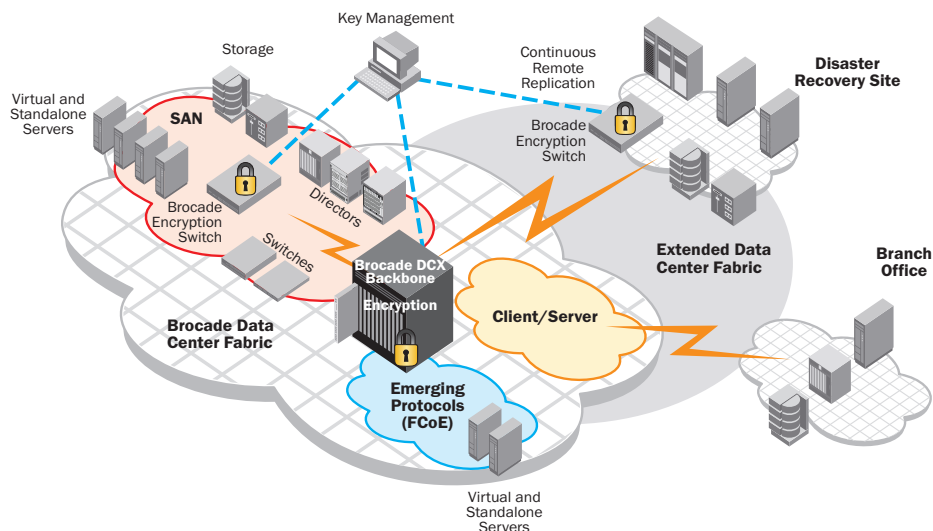
Most sensitive corporate data is stored in the data center, and the vast majority of data from critical applications resides in a SAN—enabling organizations to leverage the existing intelligence layer in the storage fabric. This layer provides a centralized framework in which to deploy, manage, and scale fabric-based data security solutions.



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Figure 1.

The Brocade Encryption Switch plays a vital role in the Brocade One architecture.



The storage fabric enables centralized management to support nearly every aspect of the data center, from server environments and workstations to edge computing and backup environments. As a result, it is an ideal place to standardize and consolidate a holistic data-at-rest security strategy. Organizations can also implement this type of best-practice methodology in other parts of the data center, helping to protect data throughout the enterprise.

Most current industry solutions include either host-based software encryption, device-embedded encryption, or edge encryption—all of which provide isolated services to specific applications but typically cannot scale across extended enterprise storage environments. In contrast, Brocade delivers fabric-based encryption for both disk- and tape-based storage devices as part of the industry-leading Brocade One™ architecture and innovative Brocade Adaptive Networking services (see Figure 1).

Based on industry standards, Brocade encryption for data-at-rest provides centralized, scalable encryption and compression services that seamlessly integrate into existing Brocade Fabric OS® (FOS) and Brocade M-Enterprise OS (M-EOS) environments¹.

The Brocade fabric-based approach to data encryption scales to meet performance requirements, provides a centralized point of management for both disk and

tape storage security as well as key management, and supports heterogeneous storage environments. Deployment is simple and non-disruptive: Organizations can encrypt data from any switch port without reconfiguring the fabric.

In addition, organizations can implement provisioning without shutting down applications or changing the Logical Unit Number (LUN) mapping and LUN masking configurations on the target storage arrays. The Brocade Encryption Switch is managed and configured using familiar Brocade Data Center Fabric Manager (DCFM®) and CLI management tools, and is easily integrated into existing network infrastructures.

Key advantages of the Brocade Encryption Switch include:

- The ability to encrypt data at wire speed
- Central management of storage and fabric-based security resources
- Concurrent support for both disk and tape encryption operations from a single device
- Transparent, online encryption of “cleartext” LUNs and rekeying of encrypted LUNs without disruption
- Data compression and integrity authentication for tape backup
- Simplified, non-disruptive installation and configuration

HIGH-VALUE APPLICATIONS AND SOLUTION AREAS

Two of the greatest business benefits of the Brocade Encryption Switch are increased productivity and reduced risk of data exposure. Other key benefits include improved backup performance while deploying encryption/compression and investment protection for existing resources.

The Brocade Encryption Switch is ideal for applications such as:

- Highly sensitive IT applications with secure data-at-rest requirements
- Secure data backups for offsite disk and tape storage and long-term archiving
- Support for heterogeneous disk and tape storage environments from a single device with centralized management
- Decommissioning of disk arrays that require legal validation of the logical destruction and data shredding of devices (the Brocade Encryption Switch helps decommission devices by encrypting an entire LUN and destroying the data encryption key)
- Secure replication of Virtual Tape Library (VTL) backups to remote facilities

¹ Brocade M-EOS fabrics are McDATA switches and directors running McDATA Enterprise OS in McDATA Fabric mode or McDATA Open Fabric mode.

The Brocade Encryption Switch is designed for use in the following SAN environments:

- Large-scale encryption in new data center deployments
- Plug-in storage security services for existing SAN fabrics
- Heterogeneous disk and tape storage environments
- Standalone switches with encryption and compression
- Single and dual SAN fabrics
- Secure fabric-based environments that integrate with existing enterprise key management systems
- Expanding encryption environments that require protection for current data security and key management investments

INVESTMENT PROTECTION AND EFFICIENCY

The Brocade Encryption Switch is the industry's most effective encryption platform in terms of power efficiency and system performance. In fact, it provides several times the encryption and compression processing power of competitive offerings while delivering a significant advantage in rack space utilization.

To help organizations protect their technology investments, the Brocade Encryption Switch features forward and backward compatibility with Brocade B-Series and M-Series fabrics. By adopting an evolutionary strategy rather than a "rip-and-replace" approach, organizations can save significant time, money, and effort while minimizing disruption and risk.

Moreover, strategic relationships with Brocade Partners provide the broadest choice of integrated, best-in-class key management and security solutions. This integration enables organizations to leverage existing key management infrastructure investments and maintain current policies, procedures, and training efficiencies.

BROCADE ENCRYPTION PROFESSIONAL SERVICES

Brocade Professional Services help organizations deploy and address their management, encryption, and security processes in a holistic approach to meet compliance and regulatory requirements for encryption of data-at-rest. A unique end-to-end approach considers the solution design from an architectural, policy, and operational perspective.

Following the design phase, Brocade experts will install and configure the hardware into a new or existing fabric in a highly effective and timely manner according to best practices. Upon completion of the engagement, organizations receive full documentation of the solution. This transfer of information educates IT staff so they can better understand and assume responsibility for the solution.

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.

BROCADE ENCRYPTION SWITCH SPECIFICATIONS

Systems Architecture			
Fibre Channel ports	32 ports, universal (F/FL/E/EX/M)	Fibre Channel 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
Ethernet ports	Two redundant 1000BaseT Ethernet ports for clustering and I/O synchronization during rekeying operation	Fibre Channel scalability	Full-fabric architecture of 239 switches
Smart cards	Master key recovery, quorum authorization, and system recovery operations	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
Compression for tape	Hardware-based data compression prior to encryption	ISL Trunking	Frame-based trunking with up to eight 8 Gbps ports per ISL trunk; up to 64 Gbps throughput per ISL trunk
Compatibility	IEEE 1619 standard-based mode (disk and tape) DataFort-compatible mode (disk and tape)	Maximum frame size	2112-byte payload for Fibre Channel
Data rekeying	Online or offline conversion of data from cleartext to ciphertext; manual or automated rekeying sessions	Classes of service	Class 2 (unencrypted traffic), Class 3 (encrypted and unencrypted), and Class F (inter-switch frames)
Crypto scalability	Up to 256 target devices and initiators; per engine	Data traffic types	Fabric switches supporting unicast, multicast (255 groups), and broadcast
Crypto engine	Maximum 96 Gbps hardware processing for disk* Maximum 48 Gbps hardware processing for tape with compression*	USB	One USB port for system log file downloads or firmware upgrades

BROCADE ENCRYPTION SWITCH SPECIFICATIONS (CONTINUED)

Media types	8Gbps; Utilizes Brocade hot-pluggable SFP+, LC connector; Short-Wavelength Laser (SWL); distance depends on fiber-optic cable and port speed
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), N_Port ID Virtualization (NPIV), FDMI, Management Server, FSPF, Enhanced Group Management, IPFC, Frame Redirection, Port Fencing, BB credit recovery Optional fabric services: Fabric Watch, Extended Fabrics, ISL Trunking, Advanced Performance Monitoring, Adaptive Networking (per-data flow QoS, Ingress Rate Limiting, Traffic Isolation, Fabric Dynamics Profiling), and Integrated Routing
FIPS certification	FIPS 140-2 Level-3 Validated Cryptographic Module
Management	
Administrator roles	Administrator, fabric administrator, security administrator, recovery officer
Management	Telnet, HTTP, LDAP, Syslog, SCP, auditing, IP filtering; SNMP v1/v3 (FE MIB, Fibre Channel Management MIB); Brocade Advanced Web Tools; Brocade Data Center Fabric Manager (DCFM) Enterprise; SMI-S compliant, SMI-S scripting toolkit, Administrative Domains
Management protocols and access controls	SSL, SSH v2, HTTPS, RADIUS, Role-Based Access Control (RBAC)
SAN security	DH-CHAP (between switches and end devices), port binding, switch binding, secure RPC, trusted switch, change tracking
Management access	10/100/1000 Ethernet (RJ-45); in-band over Fibre Channel; serial port (RJ-45); USB; call-home integration enabled through Brocade DCFM
Diagnostics and supportability	POST and embedded online/offline diagnostics, including RAStracing logging, environmental monitoring, non-disruptive daemon restart, FCping and Pathinfo (FC traceroute), Port Mirroring (SPAN port)
Key management	NetApp LKM 4.0 or later; RSA Key Manager Appliance 2.6/2.7; HP SKM 1.1; Thales Encryption Manager for Storage 1.0

Mechanicals	
Enclosure	Non-port to port side airflow; 2U, 19-inch EIA-compliant, power from non-port side
Size	Width: 42.9 cm (16.9 in) Height: 8.7 cm (3.4 in) Depth: 64.8 cm (25.5 in)
System weight	22.4 kg (49.4 lbs) with two power supply FRUs, without SFP/SFP+ transceivers
Environmentals	
Temperature	Operating: 0 to 40° C (32 to 104° F) Non-operating: -25 to 70° C (-13 to 158° F)
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
CO ₂ emissions	1048.57 kg per year (with eight ports)
Airflow	Maximum 76 CFM (cu. ft./min); nominal 53 CFM
Power	
Power inlet	C13
AC input range	85 to 264 VAC
Frequency range	47 to 63 Hz
Power consumption	285 watts with 32 8 Gbps ports
Configurations	
Base crypto model	Brocade Encryption Switch, 32 Fibre Channel ports, 48 Gbps* maximum encryption processing
Advanced crypto model	Brocade Encryption Switch, 32 Fibre Channel ports, 96 Gbps* maximum disk encryption processing

* Actual encryption performance levels vary based upon user configuration and environment.

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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