Brocade® Silkworm 3014 Fibre Channel Switch
for the Dell™ PowerEdge™ 1855 Blade Server

**Key Points**

- Dell has partnered with Brocade, a leading supplier of Fibre Channel technology, to give customers excellent performance, scalability, and cost savings for SAN deployments.
- Easily integrate Fibre Channel technology into existing or new SAN environments using the PowerEdge 1855 blade server, Brocade Silkworm 3014 Fibre Channel switch, and Dell/EMC storage.
- Utilize Brocade’s advanced software tools to ease SAN management while increasing availability and performance.

**Overview**

Organizations are deploying rack dense blade servers more frequently and in larger quantities because of a blade server’s ability to help solve many of
the most common challenges presented in a data center: intensified scrutiny on capital expenditures, limited real estate, increased workload for IT resources, inadequate power and cooling, and unmanageable cable sprawl. Another challenge faced in many data centers is the ability to manage the growing needs of storage. While the PowerEdge 1855 offers up to 600GB\(^1\) of internal storage capacity using two 300GB hard drives, there are still many reasons, such as management and TCO, to consider a consolidated storage approach. The PowerEdge 1855 can offer an end-to-end solution using Qlogic HBA daughtercards, Brocade Fibre Channel switches or Pass-Throughs, and Dell/EMC storage.

**Product Details**

The Brocade Silkworm 3014 is offered in a fully redundant configuration by utilizing I/O Module Bays three and four in the rear of the PowerEdge 1855 chassis or a non-redundant configuration by simply populating I/O Module Bay three. Each of the ten internal ports on the Brocade Silkworm 3014 communicates over the midplane from the Dell 2342M Fibre Channel HBA daughtercard that can reside on each blade server to the Brocade Silkworm 3014 fibre channel switch module. High-speed access is provided to business-critical data by featuring ten internal fabric ports as well as four external 1Gbps and 2Gbps auto-sensing ports.

Fibre Channel traffic is aggregated in this switch from a daughtercard on each blade to four uplink ports that connect directly to Dell/EMC storage or to additional Fibre Channel switches. Each switch comes in a full fabric option for maximum performance and scalability or a VL2 option for
exceptional value. Other software options such as ISL Trunking, Performance Monitoring, and Fabric Watch are available and fully supported in a full fabric infrastructure. Providing full integration of the Brocade enterprise fabric into the Dell PowerEdge 1855 architecture, the Brocade Silkworm 3014 Fibre Channel switch helps improve system manageability and simplify SAN infrastructures.

**Easing SAN Management**

The Brocade Silkworm 3014 SAN switch provides an extensive range of standard and optional management features and functions—helping streamline administration, reduce IT costs and provide flexibility. The Fabric OS, which comes standard on all Brocade Fibre Channel switches, offers several standard features that improve overall systems management:

- A command line interface (CLI), offering flexible, remote switch management via a Telnet connection or a Web browser
- Support for SNMP, providing easy access to switch information
- Port naming and port-swapping capabilities, helping to ease data management and provisioning

By helping make the most of IT resources, advanced zoning features included with Brocade Silkworm 3014 switches help further streamline systems management:
• Automatically arrange fabric oriented devices into logical groups across the fabric, facilitating resource optimization by grouping them into specific zones

• Help simplify the management of homogeneous Brocade fabrics by assigning them logical, symbolic names

• Improve access management of SANs and devices through automatic, fabric-wide distribution of zone updates

• Leverage central administration (Management)

Administrators can also enjoy flexible, simplified systems management and maintenance using a standard browser-based application or Internet connection for managing Brocade devices from a remote location. This standard online tool enables administrators to configure, monitor and manage switch and fabric parameters from a central, online access point. Administrators can also work more efficiently by taking advantage of a single view of all switches in the fabric.

Optional Software Management Tools

In addition to the robust features that are offered standard with the Brocade Silkworm 3014, there is also a variety of advanced software tools that can help ease management while increasing performance. These tools included Advanced Performance Monitoring, Fabric Watch, and ISL Trunking.

Advanced Performance Monitoring

The Brocade Silkworm 3014 also provides an optional Advanced Performance Monitoring feature to help maintain optimum performance. This comprehensive tool monitors the performance of networked storage resources. By enabling SAN performance-tuning, reports of service level agreements and reduction in over-provisioning, Advanced Performance Monitoring helps reduce Total Cost of Ownership (TCO). And by increasing visibility into the fabric, this tool helps shorten troubleshooting time, improve resource optimization and promote better capacity planning—all leading to greater administrator productivity.

Fabric Watch

Using optional Fabric Watch, you can proactively monitor the end-to-end health, performance and security of the SAN fabric from a central point,
improving availability and simplifying management. Fabric Watch tracks multiple fabric elements in real time and automatically notifies administrators when switch and fabric elements exceed thresholds—helping to improve critical system uptime.

**ISL Trunking**

To further enhance management, performance and reliability, ISL Trunking is offered as an optional feature on the Brocade Silk worm 3014 SAN switch. ISL Trunking combines multiple links between switches in the Dell PowerEdge 1855 chassis to form a single, logical ISL. This enables the implementation of fewer ISLs, thereby simplifying management. ISL Trunking also helps improve system reliability by maintaining in-order delivering of data and avoiding rerouting if one link within the trunk fails.

**Exceptional Scalability**

In addition to providing compatibility with other systems and devices, the Brocade Silkworm 3014 Fibre Channel switch for the PowerEdge 1855 blade server can also simplify SAN infrastructures. As illustrated below, the number of hardware components and cables can be reduced drastically when deploying Dell blade servers in a SAN environment versus deploying traditional 1U and 2U rack servers in a SAN environment.
**Conclusion**

Backward and forward compatibility with other Brocade switches and Dell/EMC SAN switches can help organizations integrate new and existing switches with ease while providing the freedom and flexibility to add additional switches, storage capacity and new SAN devices. The Brocade Silkworm 3014 Fibre Channel switch is one of many additions to the growing Dell PowerEdge 1855 I/O infrastructure. By providing both entry- and enterprise-level models in the Brocade Silkworm 3014, Dell is able to offer affordable options for small, medium and large organizations to help address mid-range and enterprise class computing needs.

**Brocade Silkworm 3014 Adheres to Fibre Channel standards and protocols:**

**Fibre Channel standards:**

- FC-AL ANSI X3.272: 1996
- FC-AL-2 NCIT S 332: 1999
- FC-FLA NCIT S TR-20: 1998
- FC-GS-4 ANSI INCITS 387-2004 (Includes FC-GS-2 and FC-GS-3)
- FC-PH ANSI X3.230: 1994 (Included in FC-FS)
- FC-PH-2 ANSI X3.297: 1997 (Included in FC-FS)
- FC-PH-3 ANSI X3.303: 1998 (Included in FC-FS)
- FC-SW-3 INCITS 384:2004 (Includes FC-SW and FC-SW-2)
- FC-VI INCITS 357:2002
- FC-DA INCITS TR-36:2004
- FC-SP Rev 1.6 (Under Development)
- FC-MI INCITS/TR-30:2002
- FC-MI-2 Rev 2.5 (Under Development)
- FC-PI INCITS 352:2002
- FC-FS INCITS 373:2003
- FC-BB-2 INCITS 372:2003 (Includes FC-BB)
- FC-SB-3 INCITS 374-2003 (Replaces FC-SB, FC-SB-2)
- RFC 2625 IP and ARP Over FC
- RFC 2837 Fabric Element MIB
- RFC 3643 FC Frame Encapsulation
- MIB-FA INCITS TR-32-2003
- FCP ANSI X3.269: 1996
- FCP-2 INCITS 350:2003
- SNIA Storage Management Initiative Specification Version 1.02 (*ANSI INCITS 388-2004*)
Fibre Channel protocols:

- Fibre Channel service classes: Class 2 and class 3.
- Operation modes: Fibre Channel class 2 and class 3, connectionless.
- External port type:
  - F_port, FL_port, E_port.
  - Self-discovery based on switch type U_port, an optional port type.
- Internal port type: 2Gbps is the default setting.
- Port characteristics: External ports are automatically detected and self-configuring.
- Number of Fibre Channel ports: 4 external ports and 10 internal ports.
- Buffer credits: 16 buffer credits per port.
- Media type: Small form-factor pluggable (SFP) module.
- Fabric port speed: 1.0625 or 2.125Gbps.
- Maximum frame size: 2148 bytes (2112-byte payload).
- System processor: PPC405GP.
- Fabric latency: Less than 2.1 µsec from any port to any port at 2Gbps, cut-through routing.
- Fabric point-to-point bandwidth: 2Gbps or 4Gbps at full duplex.
- Fabric aggregate bandwidth: 64Gbps if all 14 ports are running 2Gbps at full duplex.
- Non-blocking architecture shared-memory switch to prevent latency.

Fabric management:

- Web interface through Advanced Web Tools.
- Command-line interface (CLI) through Telnet program.
- Application program interface (API).
- Brocade Fabric Manager for Dell PowerEdge 1855.
- Management information base (MIB).
- Switch simple network management protocol (SNMP) agent.

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1For hard drives, GB means 1 billion bytes; actual capacity varies with preloaded material and operating environment and will be less.

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