BROCADE FABRIC VISION TECHNOLOGY FREQUENTLY ASKED QUESTIONS

Introduction

This document answers frequently asked questions about Brocade® Fabric Vision technology.

For more information about Fabric Vision technology, visit www.brocade.com/FabricVision.

General Questions and Answers

Q   **What is Brocade Fabric Vision technology?**

A   Brocade Fabric Vision technology is an advanced hardware and software solution that combines capabilities from the Brocade Gen 5 Fibre Channel ASIC, Brocade Fabric OS® (FOS), and Brocade Network Advisor to help administrators address problems before they impact operations, accelerate new application deployments, and dramatically reduce operational costs.

Fabric Vision technology provides unprecedented visibility and insight across the storage network through innovative diagnostic, monitoring, and management technology.

Q   **What features and capabilities does Brocade Fabric Vision technology offer?**

A   Brocade Fabric Vision technology, an extension of Brocade Gen 5 Fibre Channel solutions, offers technology innovation that is unmatched in the industry. Fabric Vision technology includes:

- **Brocade ClearLink Diagnostics:** Leverages the unique Brocade Diagnostic Port (D_Port) mode to ensure optical and signal integrity for Gen 5 Fibre Channel optics and cables, simplifying deployment and support of high-performance fabrics.

- **Monitoring and Alerting Policy Suite (MAPS):** A policy-based monitoring and alerting suite that proactively monitors the health and performance of the SAN infrastructure to ensure application uptime and availability.

- **Flow Vision:** A comprehensive tool that allows administrators to identify, monitor, and analyze specific application and data flows in order to maximize performance, avoid congestion, and optimize resources.

- **Bottleneck Detection:** Identifies and alerts administrators to device or Inter-Switch Link (ISL) congestion as well as device latency in the fabric, providing visualization of bottlenecks and identifying exactly which devices and hosts are impacted.

- **At-a-glance dashboard:** Includes customizable health and performance dashboard views, providing all critical information in one screen.

- **Forward Error Correction (FEC):** Automatically detects and recovers from bit errors, enhancing transmission reliability and performance.

- **Virtual Channel-level BB_Credit Recovery:** Automatically detects and recovers buffer credit loss at the Virtual Channel level, providing protection against performance degradation and enhancing application availability.

Q What are the advantages of Brocade Fabric Vision technology?

A Brocade Fabric Vision technology maximizes uptime, simplifies SAN management, and provides unprecedented visibility and insight across the storage network. Offering innovative diagnostic, monitoring, and management capabilities, Fabric Vision technology helps administrators avoid problems, maximize application performance, and dramatically reduce operational costs.

Q What is Brocade ClearLink Diagnostics?

A Brocade ClearLink Diagnostics, a patent-pending technology, leverages the unique Brocade Diagnostic Port (D_Port) mode to ensure optical and signal integrity for Gen 5 Fibre Channel optics and cables, simplifying deployment and support of high-performance fabrics. By proactively verifying the integrity of critical transceivers, organizations can quickly address any physical layer issues without the need for special optical testers.

ClearLink Diagnostics allows users to automate a battery of tests to measure and validate latency and distance across the switch links, as well as verify the integrity of the fiber and 16 Gbps transceivers in the fabric—either prior to deployment or when there are suspected physical layer issues. With ClearLink Diagnostics, only the ports attached to the link being tested need to go offline, leaving the rest of the ports to operate online.

In addition to switch-to-switch link validation, Brocade FOS 7.1 provides several enhancements, including:

- Dynamic ClearLink Diagnostics support between Gen 5 Fibre Channel switches and Brocade 1860 Fabric Adapters when running at 16 Gbps speed, allowing administrators to initiate tests simply by enabling from the adapter

- Support for Gen 5 Fibre Channel switches running in Brocade Access Gateway mode

- Support for Brocade UltraScale chassis connectivity links on Brocade DCX® 8510 Backbones

Through collaboration with industry partners, Brocade will extend ClearLink Diagnostics to additional end devices and adapters, providing end-to-end physical layer diagnostics and validation.

Q   What is MAPS?

A   The Brocade Monitoring and Alerting Policy Suite, or MAPS, is a new, easy-to-use, policy-based threshold monitoring and alerting suite that proactively monitors the health and performance of the SAN infrastructure to ensure application uptime and availability. By leveraging pre-built, pre-validated rule-/policy-based templates, MAPS takes the guesswork out of defining appropriate rules and actions, simplifying threshold configuration, monitoring, and alerting. With MAPS, organizations can apply thresholds and alerts via a simple two-step process:

1. Define all host, storage, and E_Ports that belong to a specific group, or use the pre-defined default groups.

2. Go to the list of pre-defined policies (each with more than 170 highly tuned rules) and select one to apply to that group, or create a custom policy.

Organizations can configure an entire fabric (or multiple fabrics) at one time using common rules and policies, or customize rules for specific ports—all through a single dialog. The integrated dashboard displays a switch health report, along with details on out-of-policy conditions, to help administrators quickly pinpoint potential issues and easily identify trends and other behaviors occurring on a switch or fabric.

Q   What is Flow Vision?

A   The Brocade Flow Vision tool suite allows administrators to identify, monitor, and analyze specific application and data flows in order to maximize performance, avoid congestion, and optimize resources. Flow Vision includes:

- **Flow Monitoring:** Provides comprehensive visibility into flows in the fabric, including the ability to automatically learn (discover) flows and non-disruptively monitor flow performance. Users can monitor all flows from a specific host to multiple targets/LUNs or from multiple hosts to a specific target/LUN; monitor all flows across a specific ISL; or perform LUN-level monitoring of specific frame types to identify resource contention or congestion that is impacting application performance.

- **Flow Generator:** Provides a built-in test traffic generator for pre-testing and validating the SAN infrastructure, including internal connections within a switch, for robustness before deploying applications—without requiring 16 Gbps hosts, targets, or external traffic generators.

- **Flow Mirroring:** Provides the ability to non-disruptively create copies of specific application and data flows or frame types that can be captured for in-depth analysis.

Q   How does Flow Vision differ from third-party tools? What are its competitive advantages?

A   Using third-party tools to troubleshoot performance issues is expensive, disruptive, and can degrade the optical signal. To deploy third-party diagnostic tools, administrators must identify the ports to be monitored, take the selected ports offline (bring them down), install taps, and then bring the ports back up to start monitoring with an external analyzer. When administrators want to monitor another port, they have to repeat this process. The only alternative is to leave the expensive taps in place indefinitely, resulting in a permanently degraded signal where the tap is installed. In addition, third-party

diagnostic tools can add excessive CPU load on the system, resulting in performance and reliability problems.

Brocade Flow Vision, on the other hand, provides built-in capabilities that allow non-intrusive, non-disruptive monitoring of performance conditions and metrics on any data flow in the fabric with no external hardware or software—and with no impact on fabric performance. With Brocade Flow Vision, third-party tools are redundant and an unnecessary expense.

Q What is Bottleneck Detection?

A Bottleneck Detection identifies and alerts administrators to device or ISL congestion as well as abnormal levels of latency in the fabric. When applied to F_Ports, Bottleneck Detection can continuously monitor for medium or high levels of latency on a device port and provide notification on the nature and duration of the latency. Bottleneck Detection can also serve as a confirmation to host information when storage latencies are suspected as the cause of poor host performance. The reverse (eliminating the storage as the source of poor performance) is also true. When applied to E_Ports, Bottleneck Detection can alert administrators when it detects high levels of latency on an ISL, often the result of congestion or latency from elsewhere in the fabric, but also a condition that can occur as a result of device latencies from multiple flows.

Brocade Network Advisor works in conjunction with Bottleneck Detection to automatically monitor and detect network congestion and latency in the fabric, providing visualization of bottlenecks in a connectivity map and product tree. Brocade Network Advisor also can show exactly which devices and hosts are impacted by a bottlenecked port.

Bottleneck Detection is an invaluable tool for SAN administrators, helping them to avoid problems that can impact application performance. At the same time, it provides Brocade users with capabilities not available through third-party tools.

Q What version of Brocade Fabric OS is required to obtain MAPS and Flow Vision capabilities?

A MAPS and Flow Vision are available in Brocade FOS 7.2.

Q Is Brocade Fabric Vision technology available now?

A Yes. Brocade Fabric Vision technology is available today through select Brocade OEM and Channel Partners, and will be rolled out by other Brocade OEM and Channel Partners later in 2013 and beyond. Refer to your OEM for specific availability details.

Q How will Brocade Fabric Vision technology be offered?

A Some Fabric Vision technology features and capabilities, such as Brocade ClearLink Diagnostics, are provided as base-level features of Brocade Fabric OS. Other features, such as MAPS and Flow Vision, are available through an optional Fabric Vision license. Refer to your OEM for specific details on licensing and pricing.

Q How do I upgrade to Fabric Vision technology?

A Customers who have existing licenses for both Advanced Performance Monitoring and Brocade Fabric Watch will automatically receive the Fabric Vision capabilities when they install Brocade FOS 7.2.0 or higher, without having the optional Fabric Vision license installed.

Customers who have either Brocade Fabric Watch or Advanced Performance Monitoring installed (but not both) and want Brocade Fabric Vision technology capabilities—including MAPS and Flow Vision—can upgrade to Fabric Vision by purchasing and installing the other license. Customers who do not purchase the other license will continue to have the same functionality when they upgrade to Brocade FOS 7.2.0 or higher.

Customers who have the Enterprise License Bundle installed will automatically be upgraded to Fabric Vision capabilities when they install Brocade FOS 7.2.0 or higher.

Refer to your OEM for specific details on upgrading to Fabric Vision capabilities.

Q Does Fabric Vision technology support Brocade 8 Gbps platforms?

A Some Fabric Vision technology features are supported on Brocade 8 Gbps platforms; others are available only on Brocade Gen 5 Fibre Channel platforms. The chart below shows the various Fabric Vision technology features supported on each generation of products:

Feature	8 Gbps Platforms	Gen 5 Platforms
Latency Bottleneck Detection	Yes	Yes
Forward Error Correction	No	Yes
VC-level BB_Credit Recovery	No	Yes
Brocade ClearLink Diagnostics (D_Port)	No	Yes
MAPS	Yes	Yes
Flow Monitoring	Yes, with some limitations	Yes
Flow Mirroring	No	Yes
Flow Generator	No	Yes

Q Is Fabric Vision technology integrated with Brocade Network Advisor?

A Yes. Brocade Fabric Vision technology is integrated with Brocade Network Advisor, providing customizable health and performance dashboard views to simplify SAN configuration and management, enable proactive management by pinpointing problems faster, and reduce operational costs.

With Fabric Vision technology integrated into Brocade Network Advisor, organizations can:

- Quickly and easily configure and monitor data center fabrics based on MAPS groups and policies
- Identify, monitor, and analyze data and application flows to maximize performance
- Reduce time spent on repetitive tasks by deploying MAPS policies and rules across the fabric, or multiple fabrics, from a single dialog
- Run diagnostic tests on optics and cables to quickly identify and isolate potential fabric issues
- Automatically monitor and detect network congestion in the fabric, and identify which devices or hosts are impacted by a bottlenecked port

Q Can Brocade Network Advisor provide latency information related to Virtual Machines (VMs)?

A Yes. Brocade Network Advisor is integrated with VMware vCenter, providing VM-to-storage LUN visibility and enabling VM-to-storage proactive port monitoring. Brocade Network Advisor also can identify congestion and provide vCenter administrators with performance and latency statistics. Additionally, Brocade Network Advisor displays VM alarms, including VM total disk latency and the number of latency violations.

Brocade is also developing a SAN analytics pack for VMware vCenter Operations Management Suite (vCOPS). The Brocade SAN Analytics Management Pack for vCOPS—leveraging Fabric Vision technology—feeds critical SAN health and performance metrics to vCOPS, helping administrators to quickly correlate SAN health to VM performance.

Q What version of Brocade Network Advisor supports MAPS and Flow Vision capabilities?

A MAPS and Flow Vision are integrated into Brocade Network Advisor 12.1.

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