

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 and Gen 6 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 6 Fibre Channel, offers technology innovation that is unmatched in the industry. Fabric Vision technology includes:

- **Monitoring and Alerting Policy Suite (MAPS):** Provides 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:** Provides 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.
- **IO Insight:** Enables proactive, non-intrusive, real-time monitoring of device IO, providing greater insight into storage performance and behavior in order to ensure operational stability and service levels.
- **Fabric Performance Impact (FPI) Monitoring:** Leverages predefined MAPS policies to automatically detect and alert administrators to different latency severity levels, and to identify slow drain devices that could impact network performance. This feature pinpoints exactly which devices are causing or are impacted by a bottlenecked port, and quarantines slow drain devices automatically to prevent buffer credit starvation.
- **Configuration and Operational Monitoring Policy Automation Services Suite (COMPASS):** Simplifies deployment, safeguards consistency, and increases operational efficiencies of larger environments with automated switch and fabric configuration services. Administrators can configure a template or adopt an existing configuration as a template and seamlessly deploy the configuration across the fabric. In addition, they can ensure that settings do not drift over time with COMPASS configuration and policy violation monitoring within Brocade Network Advisor dashboards.

- **Dashboards:** Provides at-a-glance views of switch status and various conditions that are contributing to the switch status, enabling administrators to get instant visibility into any hot spots at a switch level and take corrective actions.
- **Brocade ClearLink® Diagnostics:** Helps ensure optical and signal integrity for Gen 5 and Gen 6 Fibre Channel optics and cables, simplifying the deployment and support of high-performance fabrics. Non-Brocade devices require the Fabric Vision technology license.
- **Forward Error Correction (FEC):** Enables recovery from bit errors in Gen 5 links, enhancing transmission reliability and performance. FEC is mandatory in Gen 6 links to support 32 Gbps performance.
- **Credit Loss Recovery:** Automatically detects and recovers buffer credit loss at the Virtual Channel (VC) 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 monitoring, management, and diagnostic 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 leverages the unique Brocade Diagnostic Port (D_Port) mode to ensure optical and signal integrity for Gen 5 and Gen 6 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 32 Gbps or 16 Gbps transceivers in the fabric—either prior to deployment or when there are suspected physical layer issues. With ClearLink Diagnostics, administrators avoid the time-consuming, trial-and-error method of troubleshooting that requires physical access to optics and cables. Also, only the ports attached to the link being tested need to go offline, allowing the rest of the ports to continue operating.

In addition to switch-to-switch link validation, Brocade FOS 8.0.1 supports ClearLink Diagnostics on server-to-switch links through collaboration with industry partners QLogic and Emulex on their Gen 5 and Gen 6 Fibre Channel adapters.

Q. What is MAPS?

A. The Brocade Monitoring and Alerting Policy Suite, or MAPS, is an 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 prebuilt, 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 simply by enabling one of the predefined MAPS policies for their environment and then selecting the alerts for out-of-range conditions.

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 features are supported in Brocade FOS without a Fabric Vision license?

A. Some Fabric Vision technology features and capabilities, such as Brocade ClearLink Diagnostics, are provided as base-level features of Brocade FOS. Other features, such as MAPS and Flow Vision, are available through an optional Fabric Vision license. The following features are supported in Brocade FOS without a Fabric Vision license:

- **MAPS Basic Monitoring:** Monitors system resources, FRU status, Fabric Performance Impact (FPI), and overall switch health status through MAPS basic monitoring policy.

- **Brocade ClearLink Diagnostics:** Helps ensure optical and signal integrity for Gen 5 and Gen 6 Fibre Channel optics and cables, simplifying the deployment and support of high-performance fabrics. Non-Brocade devices require the Fabric Vision technology license.
- **Fabric Performance Impact (FPI) Monitoring:** Leverages predefined MAPS policies to automatically detect and alert administrators to different latency severity levels, and to identify slow drain devices that could impact network performance.
- **Forward Error Correction (FEC):** Enables recovery from bit errors in links, enhancing transmission reliability and performance.
- **Credit Loss Recovery:** Helps overcome performance degradation and congestion due to buffer credit loss.

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 Learning:** Enables administrators to non-disruptively discover all flows that go to or come from a specific host port or a storage port, or traverse ISLs/IFLs to monitor fabric-wide application performance. In addition, administrators can discover top and bottom bandwidth-consuming devices and manage capacity planning.
- **Flow Monitor:** 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 pretesting and validating the SAN infrastructure, including internal connections within a switch, for robustness before deploying applications—without requiring 16 Gbps or 32 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. What is IO Insight?

A. IO Insight is a Brocade Gen 6 Fibre Channel ASIC integrated network sensor capability that helps organizations achieve greater control and insight to quickly identify the root cause of issues, reducing time to resolution so critical SLAs can be met. It non-intrusively gathers IO statistics from any device port on a Gen 6 Fibre Channel platform, then applies this information within an intuitive, policy-based monitoring and alerting suite to configure thresholds and alarms. Integrated application- and device-level latency and IOPS monitoring detects degraded storage performance, allowing administrators to proactively optimize performance and availability to ensure maximum performance. Key capabilities include:

- Provides proactive, non-intrusive, real-time monitoring and alerting with visibility into storage IO health and performance
- Monitors individual storage devices to gain deeper insight into the performance of the network to maintain SLA compliance
- Obtains total IOs, first response time max/average, IO latency (Exchange Completion Time [ECT]) max/average, outstanding IOs max/average, and performance metrics for a specific host or storage device in order to diagnose IO operational issues

Q. What are the IO Insight use cases?

A. The primary use case for IO Insight is to understand storage IO workloads and behaviors to ensure consistent and predictable performance. The second use case is to identify and isolate the source of storage device or network performance degradation so corrective action can be taken. The third use case is to leverage IO statistics and metrics to optimize behavior between host and storage devices.

Q. How can IO Insight metrics be monitored?

A. The Flow Vision feature provides the IO Insight metrics on Gen 6 switch device ports for a specific initiator-target or initiator-target-LUN flow. Administrators can import the flow into MAPS to configure thresholds on IO latency metrics and receive alerts when those thresholds are exceeded.

Q. What are the differences between IO Insight and Brocade Analytics Monitoring Platform?

A. The table below shows the different features and capabilities of these technologies.

Fabric Vision with IO Insight	Brocade Analytics Monitoring Platform
SCSI Read/Write response/latency monitoring	Full visibility into all SCSI commands
Statically defined initiator-target or initiator-target-LUN flow	Automatic flow learning, including LUN learning
Alerts for host and storage outliers	Alerts for host, fabric, and storage outliers/individual IO
Identifies latency and congestion	Identifies latency and congestion, and provides direct fabric latency monitoring
Monitors only Gen 6 Fibre Channel	Monitors both Gen 5 and Gen 6 Fibre Channel
Storage IO-level monitoring	Large-scale, end-to-end IO monitoring

Q. How does Flow Vision with IO Insight 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 with IO Insight, on the other hand, provides integrated 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 Fabric Performance Impact (FPI) Monitoring?

A. FPI Monitoring automatically detects and alerts administrators to severe levels or transient spikes of latency, and identifies slow drain devices that might impact the network. This feature uses advanced monitoring capabilities and intuitive MAPS dashboard reporting to indicate various latency severity levels, pinpointing exactly which devices are causing or are impacted by a bottlenecked port. This feature also provides automatic mitigation from the effects of slow drain devices through integrated Slow Drain Device Quarantine (SDDQ) and port toggle actions. In addition, Brocade FOS 7.4.0 combines alerts for device and Inter-Switch Link (ISL) congestion with FPI Monitoring. Brocade FOS 8.0.0 or later offers FPI Monitoring in the MAPS default base policy, which can be enabled without a Fabric Vision technology license.

FPI Monitoring 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 integrated capabilities not available through third-party tools.

Q. Is Brocade Fabric Vision technology available now?

A. Yes. Brocade Fabric Vision technology is available today through Brocade OEM and Channel Partners. Contact your OEM for specific details on licensing and pricing.

Q. How do I upgrade to Fabric Vision technology?

A. Organizations that have existing licenses for both Brocade Advanced Performance Monitoring and Brocade Fabric Watch will automatically receive Fabric Vision technology capabilities when they install Brocade FOS 7.2.0 or 7.3.0, without having the optional Fabric Vision technology license installed.

In addition, organizations that 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—simply need to purchase and install the missing Advanced Performance Monitoring or Fabric Watch license. Organizations that do not purchase the other license will continue to have the same functionality when they upgrade to Brocade FOS 7.2.0 or higher.

Finally, organizations that have the Enterprise License Bundle installed will automatically be upgraded to Fabric Vision technology capabilities when they install Brocade FOS 7.2.0 or higher.

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

Q. What Fabric Vision technology capabilities are supported in Brocade 8 Gbps, Gen 5, and Gen 6 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.

Features	8 Gbps Platforms	Gen 5 Platforms	Gen 6 Platforms
Forward Error Correction	No	Yes	Yes
VC-level BB_Credit Recovery	No	Yes	Yes
Brocade ClearLink Diagnostics (D_Port)	No	Yes	Yes
MAPS	Yes	Yes	Yes
Fabric Performance Impact (FPI) Monitoring	Yes	Yes	Yes
Flow Learning	No	Yes	Yes
Flow Monitoring	Yes, with some limitations	Yes	Yes
Flow Mirroring	No	Yes	Yes
Flow Generator	No	Yes	Yes
COMPASS	Yes	Yes	Yes
IO Insights	No	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
- Minimize downtime and accelerate troubleshooting with live monitoring, integrated diagnostics, and point-in-time playback

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

A. Yes. Brocade Network Advisor is integrated with VMware vRealize, providing VM-to-storage LUN visibility and enabling VM-to-storage proactive port monitoring. Brocade Network Advisor also can identify congestion and provide vRealize 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 has developed a SAN analytics pack for VMware **vRealize Operations Management Suite**. The Brocade SAN Analytics Pack for vRealize Operations—leveraging Fabric Vision technology—feeds critical SAN health and performance metrics to vRealize, 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 and later.

Corporate Headquarters

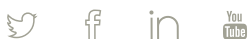
San Jose, CA USA
T: +1-408-333-8000
info@brocade.com

European Headquarters

Geneva, Switzerland
T: +41-22-799-56-40
emea-info@brocade.com

Asia Pacific Headquarters

Singapore
T: +65-6538-4700
apac-info@brocade.com



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