

# Brocade Fabric Vision Technology

## HIGHLIGHTS

- Provides powerful built-in monitoring, management, and diagnostic tools to simplify administration, increase uptime, and reduce costs
- Deploys 15 years of SAN best practices in one click to simplify the deployment of monitoring with pre-defined, threshold-based rules, actions, and policies
- Avoids 50 percent of common network problems with proactive monitoring and advanced diagnostic tools
- Eliminates nearly 50 percent of maintenance costs through automated testing and diagnostic tools
- Helps save up to millions of dollars on CapEx costs by eliminating the need for expensive third-party tools through built-in monitoring and diagnostics

## Breakthrough Analytics for Optimized SANs

IT organizations are looking to build flexible Storage Area Networks (SANs) that adapt to dynamic scalability and performance requirements for high-density virtualization, flash storage, and cloud infrastructures. To achieve these objectives, IT administrators need new tools that can help them ensure non-stop operations, quickly identify potential points of congestion, and maximize application performance, while simplifying administration.

Brocade® Fabric Vision™ technology, an extension of Gen 5 Fibre Channel, provides unprecedented insight and visibility across the storage network with powerful built-in monitoring, management, and diagnostic tools that enable organizations to:

### Simplify monitoring:

- Deploy more than 15 years of SAN best practices in one click to simplify the deployment of monitoring with pre-defined, threshold-based rules, actions, and policies
- Instantly identify latency and congestion issues in the fabric through increased instrumentation and granularity
- Gain comprehensive visibility into network health and performance using browser-accessible dashboards with drill-down capabilities

### Increase availability:

- Avoid 50 percent of common network problems with proactive monitoring and advanced diagnostic tools that address problems before they impact operations
- Identify hot spots and automatically mitigate network problems before they impact application performance through intuitive reporting, trend analysis, and integrated actions

- Minimize downtime and accelerate troubleshooting with live monitoring, integrated diagnostics, and point-in-time playback

### Dramatically reduce costs:

- Eliminate nearly 50 percent of maintenance costs through automated testing and diagnostic tools that validate the health, reliability, and performance of the network prior to deployment
- Save up to millions of dollars on CapEx costs by eliminating the need for expensive third-party tools through built-in monitoring and diagnostics
- Leverage specialized tools for pre-testing and validating IT infrastructure to accelerate deployment, simplify support, and reduce operational costs

## GEN 5 FIBRE CHANNEL

Gen 5 Fibre Channel is the purpose-built, data center-proven network infrastructure for storage, delivering unmatched reliability, simplicity, and 16 Gbps performance. Brocade Fabric Vision technology, an extension of Gen 5 Fibre Channel, provides a breakthrough hardware and software monitoring, management, and diagnostic solution that unleashes the full potential of high-density server virtualization, cloud architectures, and next-generation storage.

## Critical Monitoring, Management, and Diagnostics

Fabric Vision technology includes several critical monitoring, management, and diagnostic capabilities that help to increase fabric resiliency, reduce downtime, and optimize application performance. The following features are included in base Brocade Fabric OS® (FOS) releases:

- **Brocade ClearLink Diagnostics:** Helps ensure optical and signal integrity for Gen 5 Fibre Channel optics and cables, simplifying the deployment and support of high-performance fabrics. Non-Brocade devices require the Fabric Vision license.
- **Bottleneck Detection:** Identifies and alerts administrators about device or ISL congestion, as well as abnormal levels of latency in the fabric.
- **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.
- **MAPS Basic Monitoring:** Monitors system resources, FRU status, and overall switch health status through MAPS basic monitoring policy.

## Advanced Analytics

IT organizations with large, complex, or highly virtualized data center environments often require advanced tools to help them more effectively monitor and manage their storage infrastructures. Developed specifically with these IT organizations in mind, Fabric Vision technology also includes several breakthrough diagnostic, monitoring, and management capabilities that dramatically simplify day-to-day SAN administration and provide unprecedented visibility across the storage network.

The following advanced technologies and capabilities are available with the optional Fabric Vision technology license:

- **Monitoring and Alerting Policy Suite (MAPS):** Provides a new, easy-to-use solution for policy-based threshold monitoring and alerting. MAPS proactively monitors the health and performance of the SAN infrastructure to ensure application uptime and availability. By leveraging pre-built rule-/policy-based templates, MAPS simplifies fabric-wide threshold configuration, monitoring, and alerting. Administrators can configure the entire fabric (or multiple fabrics) at one time using common rules and policies, or customize policies for specific ports or switch elements—all through Brocade Network Advisor. Brocade MAPS offers the following:
  - Policy-based monitoring, including:
    - › Pre-defined monitoring groups and pre-validated monitoring policies that users can leverage. Pre-defined monitoring groups include switch ports attached to servers, switch ports attached to storage, E\_Ports, short-wavelength SFPs, long-wavelength SFPs, and more. Pre-defined monitoring policies include aggressive, moderate, and conservative policies based on monitoring thresholds and actions.
    - › Flexibility to create custom monitoring groups—such as switch ports attached to high-priority applications and another group of switch ports attached to low-priority applications—and monitor each group according to its own unique rules.
    - › Flexible monitoring rules to monitor a given counter for different threshold values, then take different actions when each threshold value is crossed. For example, users can monitor a CRC error counter at a switch port and generate a RASlog

- when the error rate reaches two per minute, send an e-mail notification when the error rate is at five per minute, and fence a port when the error rate exceeds ten per minute.
- › Ability to monitor both sudden failures and gradually deteriorating conditions in the switch. For example, MAPS can detect and alert users if a CRC error counter suddenly increases to five per minute, or gradually increases to five per day.
  - › Support for multiple monitoring categories, enabling monitoring of the overall switch status, switch ports, SFPs, port blades, core blades, switch power supplies, fans, temperature sensors, security policy violations, fabric reconfigurations, CPU and memory utilization, traffic performance, FCIP health, scalability limits, and more.
  - › Support for multiple alerting mechanisms (RASlogs, SNMP traps, e-mail notifications) and actions such as port decommissioning and port fencing when errors exceed the specified threshold. Administrators can tailor the frequency of alert messages to reduce duplicate notifications.
- Fabric Performance Impact (FPI) Monitoring:
- › Uses pre-defined thresholds and alerts in conjunction with MAPS to automatically detect and alert 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 impacted by a bottlenecked port. FPI monitoring also provides the ability to automatically mitigate the effects of slow drain devices or even resolve the slow drain behavior at the source.
- CLI dashboard:
- › Dashboard of health and error statistics provides at-a-glance views of switch status and various conditions that are contributing to the switch status, enabling users to get instant visibility into any hot spots at a switch level and take corrective actions.
  - › Overall status of the switch health and the status of each monitoring category, including any out-of-range conditions and the rules that were triggered.
  - › Historical information on the switch status for up to the last seven days; automatically provides raw counter information for a variety of error counters.
- 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.
- Proactive flow monitoring using MAPS:
- › MAPS can monitor flows that are established within Flow Vision and generate alerts based on user-defined rules, enabling users to monitor and be alerted when established thresholds are exceeded.
- **Flow Vision:** Enables administrators to identify, monitor, and analyze specific application flows in order to simplify troubleshooting, maximize performance, avoid congestion, and optimize resources. Flow Vision includes:
- Flow Monitor: Provides comprehensive visibility into flows within the fabric, including the ability to automatically learn flows and non-disruptively monitor flow performance. Administrators can monitor all flows from a specific host to multiple targets/LUNs, from multiple hosts to a specific target/LUN, or across a specific ISL. Additionally, they can perform LUN-level monitoring of specific frame types to identify resource contention or congestion that is impacting application performance. Flow Monitor provides the following capabilities:
    - › Comprehensive visibility into application flows in the fabric, including the ability to learn (discover) flows automatically.
    - › Monitoring of application flows within a fabric at a given port.
    - › Pre-defined flow to discover all application flows going through all device ports on a switch for network provisioning and planning.
    - › Statistics associated with the specified flows to gain insights into application performance, such as transmit frame count, receive frame count, transmit throughput, receive throughput, SCSI Read frame count, SCSI Write frame count, number of SCSI Reads and Writes per second (IOPS), and more.
    - › When NPIV is used on the host, users can monitor Virtual Machine (VM)-to-LUN-level performance.
    - › Monitoring of various frame types at a switch port to provide deeper insights into the storage I/O access pattern at the LUN level, reservation conflicts, and I/O errors. Examples of frame types include SCSI Read, SCSI Write, SCSI Reserve, ABTS, and BA\_ACC.
  - › Flow Monitor is integrated with Brocade MAPS to enable threshold-based monitoring and alerting of flows.

- Flow Generator: A built-in traffic generator for pre-testing and validating the data center infrastructure—including route verification and integrity of optics, cables, ports, back-end connections, and ISLs—for robustness before deploying applications. Flow Generator allows users to:
  - › Configure a Gen 5 Fibre Channel-capable port as a simulated device that can transmit frames at 16 Gbps line rate
  - › Emulate a Gen 5 Fibre Channel SAN without actually having any hosts or targets or SAN testers, and pre-test the entire SAN fabric

### Simplified Management and Reporting

Brocade Network Advisor simplifies Gen 5 Fibre Channel management and helps users proactively diagnose and resolve issues to maximize uptime, increase operational efficiency, and reduce costs. The wizard-driven interface dramatically reduces deployment and configuration times by allowing fabrics,

switches, and ports to be managed as groups. Customizable dashboards graphically display performance and health indicators out of the box, including all data captured using Brocade Fabric Vision technology. To accelerate troubleshooting, administrators can use dashboard playback to quickly review past events and identify problems in the fabric. In addition, dashboards and reports can be configured to show only the most relevant data, enabling administrators to more efficiently prioritize their actions and maintain network performance.

### Superior Investment Protection

Organizations that have both Brocade Advanced Performance Monitoring and Brocade Fabric Watch installed will automatically receive Brocade Fabric Vision technology capabilities with Brocade FOS 7.2.0 or higher, without having the Fabric Vision technology license installed. Organizations that have either Fabric Watch or Advanced Performance Monitoring installed (but not both) and want Fabric Vision technology capabilities—including MAPS and Flow Vision—can upgrade to Fabric Vision technology by purchasing and installing the other license.

### Brocade Global Services

Brocade Global Services has the expertise to help organizations build scalable, efficient cloud infrastructures. Leveraging 15 years of expertise in storage, networking, and virtualization, Brocade Global Services delivers world-class professional services, technical support, and education services, enabling organizations to maximize their Brocade investments, accelerate new technology deployments, and optimize the performance of networking infrastructures.

### Maximizing Investments

To help optimize technology investments, Brocade and its partners offer complete solutions that include professional services, technical support, and education. For more information, contact a Brocade sales partner or visit [www.brocade.com](http://www.brocade.com).

#### Corporate Headquarters

San Jose, CA USA  
T: +1-408-333-8000  
[info@brocade.com](mailto:info@brocade.com)

#### European Headquarters

Geneva, Switzerland  
T: +41-22-799-56-40  
[emea-info@brocade.com](mailto:emea-info@brocade.com)

#### Asia Pacific Headquarters

Singapore  
T: +65-6538-4700  
[apac-info@brocade.com](mailto:apac-info@brocade.com)



© 2015 Brocade Communications Systems, Inc. All Rights Reserved. 04/15 GA-DS-1794-02

ADX, Brocade, Brocade Assurance, the B-wing symbol, DCX, Fabric OS, HyperEdge, ICX, MLX, MyBrocade, OpenScript, The Effortless Network, VCS, VDX, Vplane, and Vyatta are registered trademarks, and Fabric Vision and vADX are trademarks of Brocade Communications Systems, Inc., in the United States and/or in other countries. Other brands, products, or service names mentioned may be trademarks of others.

Notice: This document is for informational purposes only and does not set forth any warranty, expressed or implied, concerning any equipment, equipment features, or service offered or to be offered by Brocade. Brocade reserves the right to make changes to this document at any time, without notice, and assumes no responsibility for its use. This information document describes features that may not be currently available. Contact a Brocade sales office for information on feature and product availability. Export of technical data contained in this document may require an export license from the United States government.

