

ESG SHOWCASE

Brocade Gen 7: Enabling a Cyber Resilient Network

Date: June 2022 **Author:** Scott Sinclair, Senior Analyst; and Monya Keane, Senior Research Analyst

ABSTRACT: The storage network plays a foundational role in IT modernization, often determining the performance and flexibility of the data storage environment while also affecting the security posture of the application ecosystem. To keep pace, modern storage networks must deliver the necessary performance and scale, while also helping simplify operations and reduce IT and business risk with improved resiliency and cyber resiliency. Fortunately, Broadcom's Gen 7 networking solution delivers an autonomous SAN with next-level performance, integrated intelligence, and improved cyber resilience, helping provide the accelerated, reliable, and secure foundation that modern data centers need.

Overview

IT is undergoing an unprecedented transformation. Digital services have become central to business operations, leading to increased investments in new application development, increased growth of data and data access, and a pervasive and growing risk of cyber-attacks. As IT decision makers modernize their data infrastructure to increase productivity while ensuring resilient, accelerated, and safeguarded access to data, it is now also imperative to modernize storage networking technology to maximize ROI, stay ahead of the technology curve, and better protect against security vulnerabilities.

With hundreds of IT security vulnerabilities uncovered every year and the definition of success for IT constantly evolving, already overworked IT administrators require more from their infrastructure. When it comes to the storage network, supporting the business's data growth and reliability requirements are no longer enough—investments must automate and optimize operations while also delivering the highest levels of security to help safeguard the storage network. Organizations need cyber resilient storage networking technology that delivers on performance while also providing greater insights and intelligence that simplifies and even automates efforts while improving visibility. If you cannot see it, you cannot manage it—thus, you cannot secure it. In addition, IT administrators need to be able to modernize without disrupting their existing ecosystem by seamlessly integrating new technologies. Otherwise, this will result in unnecessary cost and complexity.

A modern, cyber resilient storage network is essential when creating a data center environment capable of supporting the demands of modern applications and taking full advantage of the value of the infrastructure. A modern storage fabric must:

- **Deliver persistent, essential low latency and bandwidth improvements** to accelerate new and existing applications.
- **Support end-to-end NVMe protocol communication and diagnostics**, allowing NVMe to coexist seamlessly with existing storage protocols. This capability ensures investment protection.
- **Improve the cybersecurity posture of the data storage network** to reduce the risk to valuable data sets and applications as the environment scales.

- Offer integrated intelligence and automation that is built on analytics and telemetry data to further simplify and optimize the environment.

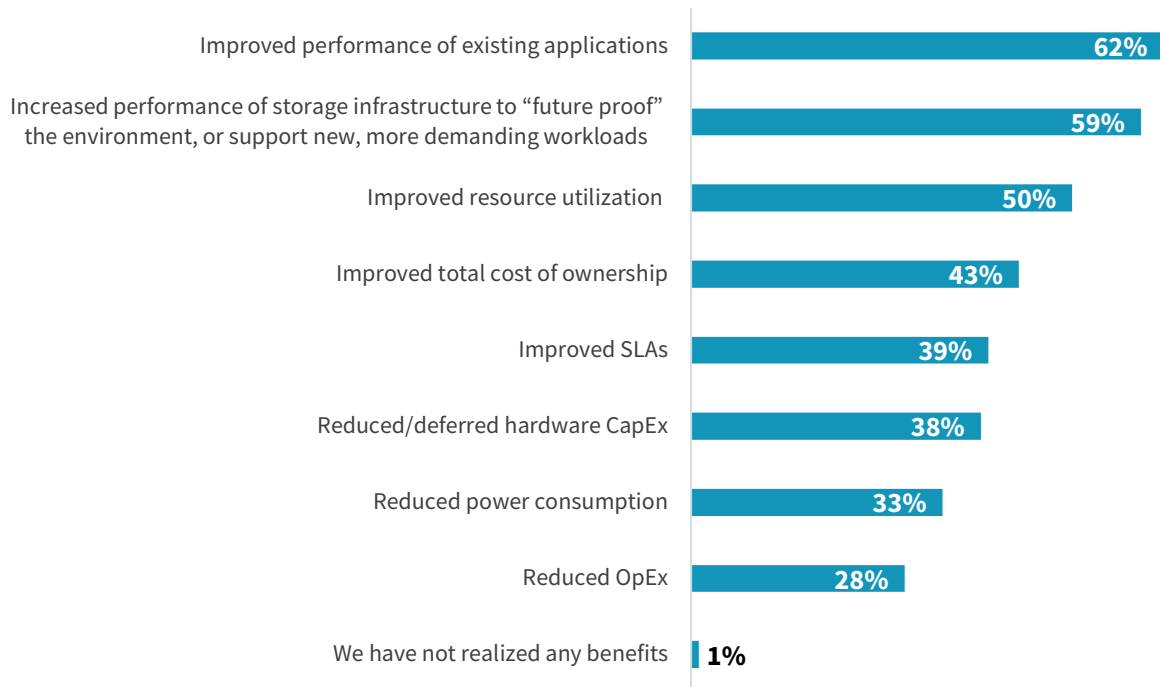
Fibre Channel technology has an established history delivering the performance and availability necessary for enterprise application environments while offering inherent benefits to cyber resiliency. [Broadcom](#)'s latest generation of Brocade SAN network switches, Gen 7, provides this type of strong, modern data center foundation. Brocade Gen 7 substantially augments the performance of NVMe storage by leveraging advanced intelligence and learning techniques that maximize an IT infrastructure's efficiency from end to end. Beyond performance, it safeguards the SAN against cybersecurity and business continuity challenges that threaten to disrupt data center operations. Brocade Gen 7 also protects organizations' SANs from IT disruptions and disasters with autonomous SAN technology that learns, optimizes, and heals on its own. These capabilities automate processes to ensure optimal performance, enable non-stop operations, and maximize management automation, while strengthening the level of security in organizations' networks.

Evolving Application Dynamics Fuel Need for Modern Cyber Resilient Storage Network

Adoption of NVMe and FC-NVMe storage has risen significantly in recent years to meet the low-latency, high-performance requirements of a growing number of data-intensive, business-critical workloads, such as advanced analytics or business intelligence.(see Figure 1).¹ Given the importance of the storage network in defining an organization's ability to scale the performance of its application environment over time, any infrastructure modernization initiative should include in the integration of the NVMe protocol with technologies such as FC-NVMe.

Figure 1. Benefits of NVMe Flash Storage Adoption

Which of the following benefits has your organization realized as the result of deploying on-premises NVMe-based flash storage technology? (Percent of respondents, N=119, multiple responses accepted)



Source: ESG, a division of TechTarget, Inc.

¹ Source: ESG Research Report, [Data Infrastructure Trends](#), November 2021.

The Need for Intelligent, Cyber Resilient Storage Network Infrastructure

Simply increasing performance, however, is not enough to modernize the storage network to keep pace with demands. Enterprise-level resiliency has long been an essential requirement of Fibre Channel technology, but given the persistent and pervasive threat of cyberattacks, the definition of enterprise-level resiliency must be expanded to include improving cyber resiliency as well. Cyber resiliency is a priority in every facet of IT. When IT decision makers were asked to identify the business initiatives that they believe would drive the most technology spending in their organizations in 2022, strengthening cybersecurity (38%) was the most commonly cited response. In addition, considering that nearly half (48%) of IT organizations identified having a problematic skill shortage in the area of cybersecurity,² investments in tools and infrastructure with features that augment an organization's cybersecurity practice are paramount.

Meeting the demands of today's enterprise businesses, however, can quickly exacerbate IT complexity, as 64% of IT decision makers surveyed by ESG agreed that the complexity of their IT infrastructure is slowing operations and hampering digital initiatives.³ Modernization investments, therefore, must offer integrated intelligence to reduce the burden on IT professionals. Without the necessary intelligence to make sure that the *entire data path* is being optimized and utilized to its fullest extent, bottlenecks, abnormal behavior, and spikes in demands can crater application performance, availability, and resiliency.

A way to protect the entire path from these issues is through actionable intelligence, a form of artificial intelligence that leverages telemetry data to automatically optimize performance and ensure reliability across the environment, instantly flagging potential concerns that need to be addressed. IT organizations do not have the personnel or resources to perform that level of continuous optimization, which is why the infrastructure itself must do the job. It must automate this activity, making it nearly transparent to application end-users.

What are the essential storage network capabilities that a modern, cyber resilient data center needs to have?

- **The ability to deliver a modern infrastructure foundation** featuring the highest levels of performance (the levels achievable with NVMe), while supporting existing infrastructure investments, sustainably augmenting performance, and reducing latency across the environment.
- **Integrated security and autonomous SAN technology** to enable cyber resilient networks that safeguard organizations' SANs against vulnerabilities, while learning, optimizing, and healing on their own. These capabilities can automate processes to help strengthen the level of security in organizations' networks, continuously protect against security threats, and help to ensure optimal performance and continuous operations.
- **Self-learning capabilities** to instantly understand the environment. Infrastructure needs to be able to monitor and learn how the application acts across the data storage network environment, and then must be able to utilize that information to improve utilization and performance.
- **Self-optimizing capabilities** that leverage advanced analytics, transforming telemetry data into actionable insights to optimize performance and ensure reliability.
- **Self-healing capabilities** that automate activities to proactively mitigate and resolve issues without intervention.

² Source: ESG Research Report, [2022 Technology Spending Intentions](#), November 2021.

³ Source: ESG Research Report, [Data Infrastructure Trends](#), November 2021.

Brocade Gen 7: The Intelligent, High-performance, Cyber Resilient Foundation of a Modern Data Center

The products that comprise Brocade's Gen 7 portfolio are the Brocade X7 Director, the Brocade G720 Switch, and the Brocade G730 Switch. These solutions are equipped with higher-performing hardware to unleash NVMe technology and can discover and produce comprehensive telemetry data across the fabric. They analyze and take actions based on that data to optimize the storage network automatically.

Modernize with NVMe to Achieve Lower Latency and Higher Bandwidth

According to Broadcom, Brocade Gen 7 technology substantially accelerates a data center environment, offering 50% lower latency than the previous generation, while increasing bandwidth with 64G links. By leveraging NVMe-ready Fibre Channel technology, Brocade Gen 7 not only maximizes the performance of NVMe storage and high-transaction workloads, but it also simplifies the process of integrating higher-performing NVMe storage into the environment without a rip-and-replace process.

Broadcom has simplified IT modernization efforts. The NVMe storage integrates seamlessly with existing ports: Brocade supports the concurrent use of SCSI and NVMe technologies. In fact, with the release of vSphere 7 from VMware, an organization can perform a live migration of an individual virtual machine from SCSI to NVMe in the same Gen 6 or Gen 7 fabric without stopping the application. This result constitutes one of the most low-risk technology transitions in years.

Broadcom provides investment protection by enabling organizations to upgrade their existing Brocade Gen 6 director chassis to Gen 7. Organizations can leverage existing Gen 6 blades in Gen 7 directors, mixing Gen 6 and Gen 7 blades in the same chassis.

In addition, Brocade supports three generations of backward compatibility within the fabric. This is an important feature, as it reduces risk and maximizes the value of the organization's existing IT investments.

Help Secure Mission-critical Workloads with Gen 7 Integrated Security

Fibre Channel fabrics are secure by design, based on controlled access between servers and storage and isolation within the data center. In addition to the inherent benefits of Fibre Channel technology, Brocade Gen 7 technology can secure storage traffic through its controlled-access and isolation technology. Brocade Gen 7 technology automatically monitors when SSL certificates are about to expire and with Brocade SANnav replacement of certificates across switches is a trivial task.

Brocade can help safeguard mission-critical operations by validating the integrity and security of Gen 7 Brocade hardware and software to protect against intrusions in systems upgrades. The solution can also reduce the vulnerabilities from malware and hijacking attacks, as the Brocade Fabric OS (FOS) validates the integrity and security of Brocade hardware and software automatically. Features include: Secure Boot, Brocade Trusted FOS (TruFOS) Certificates, and FOS hardening with removal of root access; Brocade TruFOS Certificates ensure that enterprises running Brocade directors and switches are currently covered by support and securely enabled to perform critical operations without having to worry about potential tampering of the operating system.

Analytics and Automation for Application Acceleration

The self-learning and self-optimizing capabilities of Brocade Gen 7 automatically ensure that storage performance and other SAN-related activities are optimized. The collected telemetry data is composed of billions of data points. The

Brocade technology automatically leverages it to learn application flows, and then creates a baseline of each application's performance from end to end, across the fabric, to detect when something is abnormal.

With Virtual Machine Identification (VMID) tagging, telemetry data is collected on a frame-by-frame basis to the VM. The Brocade systems then provide I/O profiles at the application level, rather than simply on a port basis. The analysis happens within the ASIC integrated circuit to ensure that performance is not impaired. With VMID+ in FOS 9.1, VM Insight is available end-to-end across the fabric regardless of the array type involved.

Brocade Gen 7 directors/switches are not only able to identify the root causes of data traffic congestion, but they also can automatically remediate that congestion, thus avoiding application-performance degradation. The solution guarantees application performance levels by proactively monitoring and actively shaping traffic without human intervention.

Thanks to the systems' ability to track I/O per application, IT admins can identify which application is generating the traffic, not just which port is being affected. And when performance conflicts arise, the admins can quickly identify who is the "victim" and who is the "culprit." This type of rapid recognition of performance issues/causes, along with fast, automated mitigation, is crucial today.

The Brocade solutions even support DevOps activities, as their automation technology speeds up resource provisioning and reduces the risk of human or process errors.

Save Time, Optimize Operations with Autonomous SAN Technology

The Gen 7 systems use the collected data to automate configuration, optimization, and issue-resolution activities. For example, Brocade Gen 7 can automatically:

- Instantly identify and notify IT staff when something goes wrong or changes, thereby simplifying troubleshooting.
- Identify exactly where an impact is occurring, even if the impact occurs at an endpoint (host bus adapter or storage device) because these solutions monitor both the fabric and the endpoints.
- Leverage self-healing capabilities, identifying and addressing issues automatically without human intervention.

The Bigger Truth

This is the time for organizations to modernize and safeguard their SANs for next-generation storage. NVMe and applications that are built for performance should be allowed to take advantage of the increased performance and lower latency that Gen 7 directors and switches deliver. Improved performance is not enough, though. Any modernization investment must also help to better secure and automate your IT environment as well.

Fibre Channel architecture continues to reign. Broadcom continues to drive innovation in Fibre Channel-based storage environments that support mission-critical applications—ensuring that customers' environments don't go down. Broadcom has been working continuously to make SAN management easier and securing your SAN Fabric automatic. Broadcom also simplifies IT environments by eliminating another extra box/license to manage, as well as lessening confusion about who to call if servicing support is needed.

Automation fuels success in IT operations. And Broadcom is taking a big first step toward delivering an autonomous SAN to its customers. That autonomous SAN comes as an integral part of Gen 7. The Brocade infrastructure hardware that Broadcom has created enables IT organizations to apply new autonomous capabilities that safeguard their SANs—complete with powerful analytics and automation.



All product names, logos, brands, and trademarks are the property of their respective owners. Information contained in this publication has been obtained by sources TechTarget, Inc. considers to be reliable but is not warranted by TechTarget, Inc. This publication may contain opinions of TechTarget, Inc., which are subject to change. This publication may include forecasts, projections, and other predictive statements that represent TechTarget, Inc.'s assumptions and expectations in light of currently available information. These forecasts are based on industry trends and involve variables and uncertainties. Consequently, TechTarget, Inc. makes no warranty as to the accuracy of specific forecasts, projections or predictive statements contained herein.

This publication is copyrighted by TechTarget, Inc. Any reproduction or redistribution of this publication, in whole or in part, whether in hard-copy format, electronically, or otherwise to persons not authorized to receive it, without the express consent of TechTarget, Inc., is in violation of U.S. copyright law and will be subject to an action for civil damages and, if applicable, criminal prosecution. Should you have any questions, please contact Client Relations at cr@esg-global.com.



Enterprise Strategy Group is an integrated technology analysis, research, and strategy firm that provides market intelligence, actionable insight, and go-to-market content services to the global IT community.



www.esg-global.com



contact@esg-global.com



508.482.0188