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WHITE PAPER

Store Your Data with Confidence

Critical Applications Need Dedicated Storage-Optimized Networks

Today's applications are increasingly complex, and they are critical for meeting agency mission objectives. At the same time, agencies continue moving toward shared services models. Does running these bandwidth-intensive, latency-sensitive applications and data on a *shared* IP storage network put storage performance, availability, and data security at risk?

The Storage Environment Today

Global IP data center traffic is predicted to grow to 8.7 zetabytes by 2018—that is 23 percent annually.[1] This growth means increased pressure on the network to deliver data in a reliable and efficient manner.

Brocade commissioned leading government market research firm Market Connections to look at how Federal government agencies are utilizing networks to move and manage critical application data.

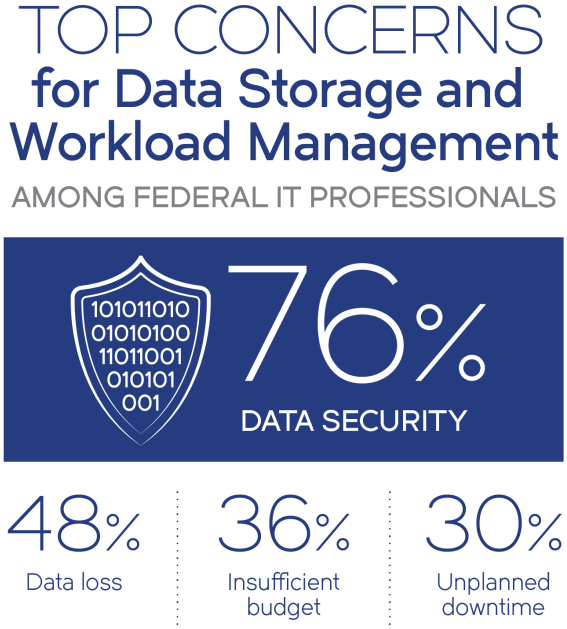
Agency Data Storage Concerns

The study found that Federal IT professionals have several major concerns related to data storage and workload management, with data security (76 percent) leading the list. The next three top concerns are data loss (48 percent), insufficient budget (36 percent), and unplanned downtime (30 percent)—all of which make sense given the dual goals of keeping agency data secure while also making it accessible to those who need it, when they need it.

The Growth of IP Storage

Although IP storage offers a lower cost solution than Fibre Channel storage, it is typically used in non-mission-critical environments, where there is less concern about security, data loss, and uptime. Conversely, the more expensive Fibre Channel SANs offer higher levels of data protection, reduced data loss, and much better reliability. Therefore, they are typically used for mission-critical environments.

Federal agencies are using a combination of these storage solutions, but, on



[1] *Cisco Visual Networking Index Forecast, 2012–2017.*

STORAGE NETWORK OPTIONS

Storage Area Networks (SANs) are defined as high-speed networks that interconnect and present shared pools of storage to multiple network-attached servers. These unique networks address performance issues in a multiserver environment by moving storage resources off the common user network and into an independent, dedicated high-performance network.

Within the SAN is a network switch, or switches, dedicated to connecting servers to shared pools of storage devices. The switch moves storage traffic to and from the application in the most efficient manner possible.

Historically, the term "SAN" has been used to refer to a dedicated Fibre Channel storage network that successfully moves application-sensitive and mission-critical data in a trusted and stable environment.

With the growth of IP storage solutions, the use of IP storage networks to transfer data has also increased. Organizations now have two IP storage options: a shared IP storage network that supports both storage traffic and non-storage traffic, or a dedicated IP storage network that contains only storage traffic.

average, almost half (45 percent) of the total storage capacity is IP-based. More than three-quarters of respondents (78 percent) expect this capacity to grow by at least 10 percent in the next year. The reason? The primary driver is the overall growth in server virtualization (29 percent), followed by growth in unstructured data (19 percent), an increase in converged systems deployment (18 percent), and lower costs (16 percent).

Dedicated or Shared IP Networks?

One surprising trend emerged: Nearly half (44 percent) of respondents use a shared IP storage network for their mission-critical storage workloads, and 36 percent use a combination of SANs and dedicated IP storage networks.

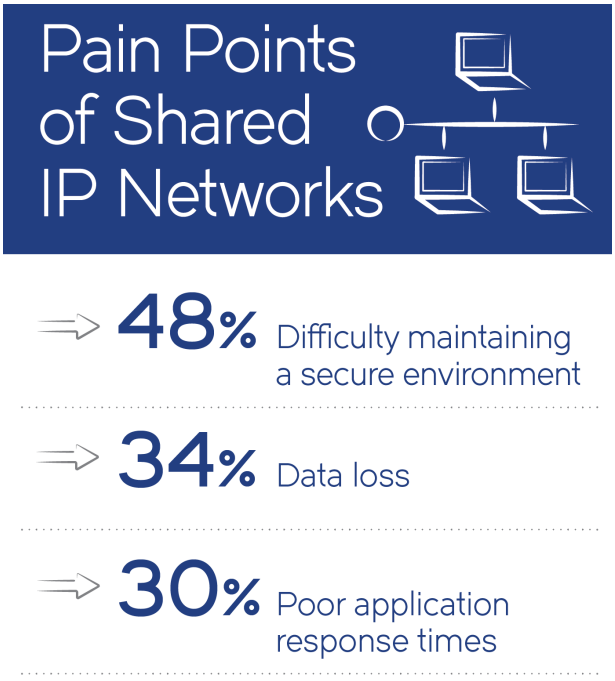
Given that security is the top network storage concern, the number of agencies relying on shared IP storage networks is high. Shared networks have proven to be less secure than dedicated networks, putting mission-critical data at risk for those agencies.

It is also interesting to note that more defense agencies use dedicated IP storage networks than civilian agencies for their mission-critical data—75 percent versus 47 percent[2]—indicating an understanding of the security risks inherent in using shared network storage.

IP storage networks clearly offer an attractive option—albeit risky in shared IP environments—for budget-conscious agencies, but that does not mean data security and system performance need to be compromised. It is important to understand when a *dedicated* IP storage network is appropriate versus a *shared* IP storage network. A dedicated storage network contains only IP traffic related to the data flowing to and from IP storage components. A shared network, however, supports both storage-related IP traffic and general, non-storage-related IP traffic.

To protect both mission- and business-critical data, agencies should be using a dedicated storage network. A dedicated, fabric-based network (based on traditional Fibre Channel or Ethernet fabric) is—and always has been—the best-practice solution for storage networking within and between data centers. Dedicated storage networks enable agencies to future-proof their application infrastructure in terms of performance and security. These networks provide a physically separate device (separated via a dedicated network switch, or switches, from all other IP traffic) that delivers predictable performance while providing dedicated security for storage-specific data flows. Such benefits can reduce operational costs and mitigate risk because, once in place, they require

[2] Note: Numbers do not add up to 100 because respondents could select more than one answer.



minimal operator intervention, reducing potential downtime and unexpected operator errors.

Pain Points of a Shared IP Storage Network

The survey reveals several clear pain points of a shared IP storage network: difficulty maintaining a secure environment (48 percent), data loss (34 percent), and poor application response times (30 percent). Using a dedicated network storage infrastructure can help address these pains.

Studies have consistently shown that Ethernet fabric technology can simplify and help alleviate some of the operational expenses normally required to implement and operate dedicated IP storage networks. But there are reasons agencies are not deploying dedicated network switches for their IP storage. The primary reason is budget (54 percent), but the fact that nearly one-third of management does not understand the benefits (31 percent) is also an important barrier to using dedicated switches. Despite the fact that Ethernet fabrics simplify implementation and management, more than one-quarter (27 percent) of respondents also feel that their agencies do not have enough personnel to implement the technology.

Benefits of a Dedicated Storage Network

A dedicated storage network might initially seem like the more costly choice (due to the upfront investment); however, the long-term benefits it provides make it the most secure and cost-effective solution. Regardless of whether they are using dedicated storage networks, respondents agree that a dedicated IP storage network delivers numerous benefits. The top three benefits alone are worth the investment:

MISSION-CRITICAL AND BUSINESS-CRITICAL DATA

To ensure that respondents consistently and accurately conveyed the critical nature of their storage data, the study provided definitions for two key terms:

- **Mission-critical data:** Defined as essential to the survival of an agency—a failure or loss would result in the agency's inability to complete its mission.
- **Business-critical data:** Defined as data that, in the event of a loss or failure, would render the agency unable to perform a specific function important to its business operations.

Approximately 9 out of 10 respondents (87 percent) mention that in a mission-critical (Tier 1) and/or business-critical (Tier 2) capacity, their agency has deployed workloads/applications on IP storage networks.

WHY USE A DEDICATED STORAGE NETWORK

"With dedicated storage networking, IT professionals are better able to manage critical workloads, predict what's needed to keep business- and mission-critical applications up and performing, and scale to support future needs. It's an all-around win for the agency."

— Steve Wallo, Federal Chief Solutions Architect, Brocade

increased security (57 percent), better application performance (35 percent), and reduced costs (35 percent).

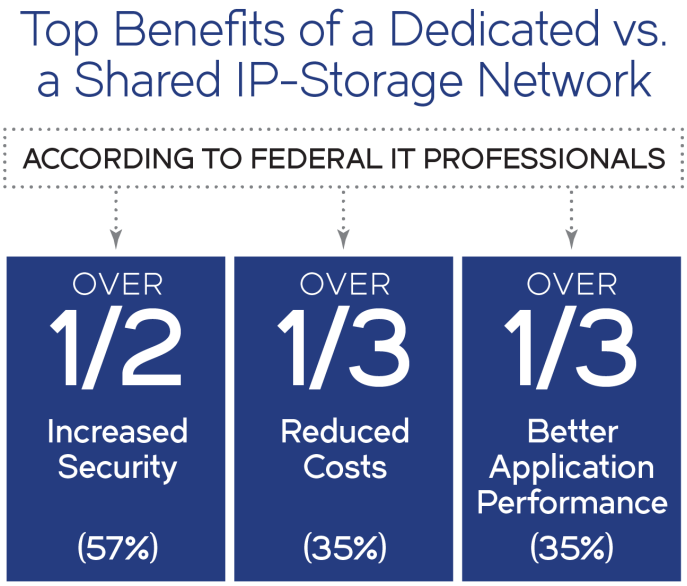
An agency can expect to achieve all of these benefits with dedicated storage networks:

- Build a high-performance and resilient IP storage network with little to no CLI commands via an automated, self-provisioning network architecture
- Scale the number of switches and the bandwidth by simply adding cables—no network configuring required
- Automatically create high-performance trunks between switches for better performance and resiliency
- Enjoy built-in Quality of Service (QoS) for NAS traffic in the event of congestion with minimal or, in some cases, no commands
- Handle bursty and non-deterministic storage-related traffic with embedded on-chip tunable buffering
- Maximize fabric health and performance, as well as proactive troubleshooting and issue resolution, via advanced monitoring and alerts

The Network Matters for Storage Traffic

A physically separate IP storage network delivers predictable performance, provides security for storage data flows between data centers, and contains smaller failure domains—all of which maximize uptime. These features are essential for managing growth, mitigating risk, and reducing costs.

Brocade® solutions remove the complexity of managing storage in either a dedicated IP storage network or Fibre Channel storage network by giving administrators the insight, control, and confidence they need. Mission-critical applications require the advanced security that dedicated storage networks provide. And today, more business-critical applications need the same level of performance and protection. Brocade dedicated storage networks deliver predictable performance, provide security for storage data flows between data centers, contain failure domains, and maximize uptime. These attributes are essential for managing growth, mitigating risk, and reducing costs.



The Importance of Analyzing the Network

Regardless of whether a dedicated IP storage network or Fibre Channel SAN is the answer, having the right analytics tool to monitor performance and manage data workloads is important. Brocade Network Advisor is a full network-lifecycle tool that brings all network information together into one simple, easy-to-use command-and-control application. Just turn it on and start working—all of Brocade's best practices are built in. This tool allows agencies to get ahead of potential problems before they have a chance to affect the network's performance; find bottlenecks; and identify, monitor, and analyze data flows at the application level to manage their network capacity more efficiently.

Summary

Agencies running critical applications need dedicated storage-optimized networks to manage storage traffic effectively. By leveraging Brocade solutions, agencies can build dedicated IP storage networks or Fibre Channel storage networks that provide the data protection, uptime, and visibility they need to meet their objectives.

About the Study

Brocade commissioned Market Connections to survey Federal government agencies about the types of storage solutions that they are deploying, workload management, as well as their use and perceptions of storage networks. The blind online survey included 200 respondents from 57 Federal agencies. Job roles included Network Manager, Architect, or Administrator; Data Center Manager, Director, or CIO; and Storage Engineer or Architect. More than two-thirds (67 percent) were on a team that makes decisions regarding data storage solutions; 64 percent evaluate or recommend data storage solutions; and 53 percent manage or implement data storage solutions.

Download the full survey report, here: http://info.brocade.com/SN-IPS-FED-16Q2-RPT-WS-MktConnectionsStor-LP.html?src=WS&lsd=BC&lst=Banner&cn=SN-IPS-FED-16Q2-RPT-MktConnectionsStor.

About Brocade

Since 1995, Brocade has empowered government agencies to accomplish their missions through leading-edge networking solutions. Today, Brocade is helping these agencies realize the benefits of cloud computing, mobility, and Big Data by enabling them to build open, multivendor, user-driven, and software-centric New IP networks to improve services to citizens and soldiers alike.

For more information about Brocade solutions, visit www.brocade.com.

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