



**PROFESSIONAL  
SERVICES**

## **Taking Control of IP Network Infrastructures**

Brocade enables organizations to optimize their network infrastructures to provide the performance, reliability, and scalability required for next-generation IP-based networks.

**BROCADE**

**Today's IT organizations face dwindling resources and rising demands for convergence, consolidation, and virtualization. Many of these organizations are discovering that the performance, redundancy, resiliency, and scalability of their network infrastructures are no longer sufficient to meet their current and future business requirements.**

**To help organizations gain control over their networks, Brocade® IP Network Infrastructure Services leverage unique IP networking expertise and best practices that help maximize the value of existing investments. By reducing operational risks and optimizing networks to achieve greater performance, availability, and scalability, organizations can meet their current business objectives while planning for efficient growth.**

**This white paper describes:**

- The requirements of next-generation IP networks**
- The performance, availability, and scalability issues affecting existing networks**
- Brocade IP Network Infrastructure Services and their benefits**

## **THE GROWING REQUIREMENTS FOR IP-BASED NETWORKS**

For many organizations, IP networks are the lifeline to their businesses, enabling critical communication with co-workers, customers, and suppliers. With reliance on IP networks steadily growing, organizations risk losing revenue and business opportunities with each instance of network downtime or poor application performance.

For this reason, organizations need an effective strategy for gaining greater control over their networks in order to minimize outages as well as more costly, difficult-to-detect service degradation. At the same time, they need to adopt procedures to reduce operational risks and optimize their existing network infrastructures to meet the performance, availability, and scalability requirements of a next-generation IP network infrastructure.

### **Maximizing the Performance of Existing Networks**

Network performance is typically noticed most by end users, who often serve as the barometers for poor performance. For example, they will not hesitate to complain if file copies over distance are slow or inconsistent. To remedy these performance issues—and meet user expectations—organizations must first understand their causes.

Performance issues often arise when organizations underestimate the complexity of implementations—mainly the impact that any additional applications and data traffic will have on the existing network infrastructure. Many organizations do not have the time or resources to properly plan data center growth and simply install new services and applications on the network as needed.

Unfortunately, these additions are not always installed in a manner that optimizes network performance—leading to bottlenecks into which all or most of the application traffic flows. In addition, because they often do not have an effective plan for efficiently balancing the delivery of services, organizations risk overwhelming their application and database servers, resulting in additional performance issues.

To identify performance issues early on, organizations need to monitor more than the “up/down” status of their networks. They need to understand the root causes of any performance issues. To accomplish this, they need a way to monitor and collect a large cross section of data from their IP networks over an extended time period. They then need to be able to evaluate that data in both real time and as a trend.

With a more effective network monitoring solution, organizations can collect meaningful data that they can use to help make logical decisions about current issues and their future impact. Through more comprehensive monitoring and analysis, these organizations have a better chance of isolating specific problems and identifying possible solutions to keep their networks running as efficiently as possible.

## **Minimizing Network Outages and Performance Issues**

Organizations must approach network outages and performance issues differently to minimize or prevent such occurrences. Outages can typically be reduced by using redundancy mechanisms, such as hardware and software, with high availability built into their design, deployment, and connectivity. To further improve network and system uptime, organizations need to ensure proper configuration of the protocols that react to outages, and ensure that their network monitoring system notifies the right people at the right time.

To minimize performance issues, organizations need an accurate and true understanding of traffic patterns, user experience, server loads, and service availability. This requires being able to collect and analyze data over time. By leveraging this information, organizations can make informed decisions about fine-tuning devices or design changes.

## **Improving the Availability of the Network and Applications**

Outages can have a grave financial impact on any organization, regardless of its size. A one-hour outage can cost a small company thousands of dollars. The same outage can cost larger manufacturing and financial institutions more than \$1 million. Improving the availability of networks and applications is therefore critical to businesses, and must be addressed at both the network and service levels.

### ***Network-level redundancy and resiliency***

Single points of failure, both in hardware and in connectivity, have the potential to interrupt or halt business-critical processes. By building predictable redundancy into their network infrastructures, organizations can minimize network-wide outages caused by single points of failure. Resiliency and protocol reconvergence must be well understood and predictable at every point in the network in order for organizations to make informed, logical decisions regarding design changes.

### ***Service-level redundancy and resiliency***

Business systems such as e-mail, Domain Name System (DNS), databases, financial applications, Web-based services, order management, fulfillment systems, and other specialized mission-critical services must be available at all times. Servers that are unavailable due to failure can distract or paralyze a business until the problem is found and resolved. Moreover, decreased performance can lead to longer end-to-end response times and declines in worker productivity.

To combat these issues, organizations should conduct a thorough review of business continuity, focusing on service availability and performance. This assessment should be performed regularly to ensure that corporate objectives can be met even during server/service outages.

## **Incorporating Scalability to Account for Growth**

Scalability describes a system's ability to grow and/or adjust to new requirements. Because business decisions usually focus on immediate needs, they do not take into account potential growth—let alone the need for scalability. As a result, networks and data center equipment often have very little room for expansion.

This lack of planning often leads to several scalability issues that can affect performance, including:

- No open slots are available for high-speed modules.
- New services are forced to connect at lower speeds due to the lack of high-speed ports.
- VoIP convergence is put on hold due to lack of adequate infrastructure.
- Bandwidth limitations cause issues with new applications, resulting in unhappy users and customers.

With proper scalability planning and trending awareness, organizations can avoid these delays and emergency situations, and be poised to grow efficiently and with a level of predictability. It is essential that organizations can adjust to changing network demands without impacting current users and services. In other words, each time a new service comes online, a network redesign should not be required to support it.

## **Reducing Operational Risks**

Today's IT environments face many operational risks—all of which have the potential to become financial risks. To understand and address these risks, organizations should be routinely asking themselves the following questions:

- What happens when one engineer has all the knowledge in his head and then leaves the company?
- Is it time to consider a second data center to increase redundancy—and availability—to all users?
- Is that disaster recovery vendor really the best option for business continuity?
- Will the VoIP convergence rollout have a negative impact on other applications?
- How do we prioritize the issues we know about?
- What other issues should we be aware of?

An honest assessment of corporate practices and procedures is critical in order to ensure network efficiency, stability, predictability, and manageability.

## **OPTIMIZING IP NETWORK INFRASTRUCTURE**

Brocade Professional Services can help organizations overcome these challenges while they transition to a dynamic, next-generation IP network infrastructure to meet current and future business requirements. As a global leader in networking solutions, Brocade has the unique experience to help organizations deploy highly scalable, reliable, and high-performance next-generation network infrastructures.

### **Brocade IP Network Infrastructure Services**

Brocade IP Network Infrastructure Services leverage best practices to address performance, scalability, redundancy, and resiliency challenges, enabling organizations to take advantage of new IP-based technologies. These services are designed to help organizations gain control over and maximize the value of their network infrastructures by:

- Providing best-in-class network environments with flexibility for future growth
- Optimizing network performance to address increased data traffic
- Implementing best practices to optimize network configuration and management
- Protecting investments in existing networks
- Utilizing deep technical expertise to build sustainable next-generation networks

Ranging in scope from network assessments and design to implementation and migration, Brocade IP Network Infrastructure Services are designed to help organizations create an environment in which they can focus on their business, rather than their network.

### ***IP Network Assessment***

Brocade Assessment Services can help organizations assess their readiness for building a next-generation network. As part of these services, Brocade will review the network architecture and design based on performance, availability, resiliency, and manageability. Brocade experts will evaluate the network infrastructure to include applications, cabling, and router and switch configurations. Brocade will also assess network performance—including traffic patterns, bandwidth optimization, Internet connectivity, and network vulnerabilities—in order to provide recommendations for design strategy.

### ***IP Network Design***

After analyzing their unique requirements, organizations can begin planning for new networking solutions. Brocade Design Services can help these organizations develop practical design plans that best match their budgets and schedules. Brocade experts will provide design options tailored to each organization's specific needs, whether they need to introduce a partial technology refresh to leverage their existing network infrastructure, or a significant technology changeover.

### ***IP Network Implementation***

With a final design in place, organizations can begin refining their existing network infrastructures or building new infrastructures. Brocade Implementation Services provide unmatched expertise in helping organizations install, configure, and validate Brocade networking solutions. As part of these services, Brocade will provide the design and configuration specifications for the new deployment, help mount equipment into the prequalified racks, connect to adjacent networking equipment, test power and interfaces, load the configuration, migrate the network to the production environment, validate the implementation, and provide detailed as-built documentation.

### ***IP Network Migration***

Brocade understands the critical requirement of migrating network infrastructure in the most timely, secure, and efficient manner. Brocade Migration Services provide deep technical expertise and best-practice methodologies to make migration as simple and non-disruptive as possible. These services help organizations ensure a safe and efficient migration from their existing networks to Brocade networking solutions.

## **GAINING CONTROL OVER IP NETWORK INFRASTRUCTURES**

As organizations begin to embark on their key business initiatives, such as virtualization and consolidation, they will need to ensure that their IP network infrastructures can provide the necessary performance, availability, and scalability to meet current and future requirements.

Brocade IP Network Infrastructure Services leverage best practices and data center networking expertise to help organizations optimize their existing networks to meet their business objectives while planning for efficient growth. Through these services, organizations gain access to the tools and knowledge needed to effectively manage and grow their network environments while minimizing issues that can have a financial impact on their businesses.

For more information about Brocade Global Services, visit [www.brocade.com/globalservices](http://www.brocade.com/globalservices).

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