



**BROCADE**

# EXTRAORDINARY NETWORKS

## SOLUTIONS

Brocade extraordinary networks provide a scalable, reliable, and high-performance foundation to save money and extend virtualization throughout the data center.

## Facilitating a Holistic Virtualization Solution for the Data Center

Interested in achieving a wide range of business advantages and significant cost savings, today's IT organizations are implementing server and storage virtualization at an unprecedented pace. As they do so, they quickly realize that virtualization requires an IT infrastructure capable of providing the highest levels of performance, scalability, flexibility, and investment protection. Based on years of experience in the world's most demanding IT environments, Brocade® understands these challenges—and is delivering industry-leading solutions that provide a reliable foundation for cost-effective virtualization across the data center.

### THE ADVENT OF VIRTUALIZATION

In the world of business, less really is more.

On the one hand, today's IT organizations are facing untold pressure to reduce costs and improve efficiencies. On the other hand, they are being tasked with expanding globally while improving the business's ability to react to changing demands in an atmosphere of unprecedented data growth.

Something's got to give, right? Not necessarily.

An organization's ability to improve agility, reduce costs, and improve efficiencies hinges on building a powerful, flexible IT infrastructure that gives employees the tools and information they need to react quickly to changing market conditions. At the same time, this infrastructure needs to be consolidated, saving on capital expenditures and operational costs such as administration, power, cooling, and data center real estate.

Virtualization technology can help organizations achieve both objectives, eliminating redundant hardware and reducing complexity while enabling a sleek, dynamic, and powerful business environment. The acceleration of server virtualization, in particular, has started to transform the way organizations deliver applications to end users—enabling IT organizations to build dynamic pools of compute power that can be allocated on demand as business needs fluctuate. In fact, many organizations that used to run dozens of applications on dozens of commodity servers have been able to consolidate down to just a handful of virtualized servers—each capable of running multiple applications on multiple operating systems.

Organizations are also starting to realize even more benefits by extending virtualization beyond the server environment to the rest of the data center, transforming their IT infrastructures into next-generation data centers. Not happy with simply virtualizing compute resources, these organizations have found innovative solutions that pool other IT resources—storage, desktops, I/O, networks—allowing them to leverage many components of the data center as commodities that they can cost-efficiently allocate on demand wherever and whenever needed. This flexibility helps organizations fully utilize technology as a powerful and cost-effective enabling tool, rather than an inhibitor to meeting business goals.

However, implementing holistic virtualization across the data center is not yet a simple, straightforward task. Organizations cannot visit the data center store, purchase a virtualization solution, and transform their business into a sleek and agile organization overnight. This type of holistic solution simply doesn't exist.

## **THE CHALLENGES OF REALIZING HOLISTIC DATA CENTER VIRTUALIZATION**

There are several factors that are preventing organizations from realizing true and holistic data center virtualization today.

The first factor is performance. If organizations look at the data center as a supply chain (each layer working in tandem to produce and deliver a product), they can start to understand that making the compute environment faster and more efficient doesn't necessarily make the entire process of delivering information to end users faster and more efficient. They might actually create a bottleneck as the network—still saddled with static connections and configurations—struggles to keep up. The true benefits of virtualization cannot be fully realized without a holistic solution that touches each layer of the data delivery process throughout the entire data center.

Organizations are also finding it expensive to deploy new infrastructure that is flexible and capable of delivering virtualization benefits. They have spent millions of dollars in building powerful—albeit static—data centers and are reluctant to give up on that investment. In addition, interoperability issues make it hard to deploy a flexible infrastructure that is capable of supporting multiple platforms, protocols, and hardware brands—all key components in building a flexible and virtualized environment.

The third and perhaps most pressing issue is complexity. Virtualized environments are inherently complex, relying on constant movement of resources to meet rising and falling traffic levels. While virtualization certainly reduces the physical number of hardware devices, the connections between servers, networking components, and storage can become much more complex. Through virtualization a system can be a Web server one minute and a transaction server the next—or even both at the same time—leading to a major increase in multiple domains with each requiring separate connections that need to be set up, monitored, and managed. Often, the reduction in operational costs that result from less hardware is effectively cancelled out from the additional administration requirements due to the increase in connections per device.

This complexity can also affect performance, availability, data integrity, and security while inhibiting the ability to recover quickly from a system outage or to ensure business continuity.

## **CHARACTERISTICS OF DYNAMIC DATA CENTER INFRASTRUCTURES**

Fortunately, some vendors have recognized the need for a holistic data center solution and are attempting to solve these performance, price, interoperability, and complexity issues. While there is no “magic solution” yet, organizations can work with these vendors to deploy dynamic data center infrastructures that are ideally suited for a complete data center virtualization strategy.

As organizations move to implement this type of infrastructure, they should consider key characteristics such as:

- Flexibility
- Scalability
- Utilization of existing resources
- Cost efficiency
- Support for existing business continuity strategies
- Centralized management

### **Flexibility**

The data center architecture should be able to dynamically meet varying demands in traffic load and support multiple applications, protocols, and hardware brands. This flexibility allows an organization to meet any type of business challenge by implementing the right solution without having to worry about past infrastructure investments or interoperability issues.

Hardware should be interchangeable and capable of meeting new requirements on demand as market, customer, and internal demands dictate. And it shouldn't stop with compute resources. This flexibility should extend to storage, applications, the network, and the components that tie these environments together. This virtual connectivity is essential in supporting applications that weren't designed to rely on shared networks.

### **Scalability**

The data center architecture should be scalable, giving organizations the ability to grow IT resource pools in line with both predicted growth and unpredictable business demands. In addition to the server and storage environments, configurations between systems and throughout the network can be scaled efficiently as well, eliminating unnecessary administration while reducing power and cooling costs.

### **Utilization of Existing Resources**

Any data center virtualization strategy should leverage existing IT resources, eliminating the need to rip out and replace existing assets. Organizations can protect capital investments by choosing an evolutionary virtualization strategy that builds upon the solid purchasing decisions they've already made. The solution should be forward-looking as well, minimizing future risk.

### **Cost Efficiency**

The ultimate goal of any virtualization strategy should be to increase agility while lowering capital expenditures and reducing operational costs. Reducing the physical hardware in the data center is only one part of the equation. By streamlining basic administrative tasks and by automating repetition, organizations can significantly reduce the time the IT staff spends configuring and monitoring connections. Simple is better—especially when it comes to IT management.

### **Support for Existing Business Continuity Strategies**

Regardless of the virtualization solution, it should support any existing disaster recovery and business continuity strategies—and complement any replication technology that is already deployed. Localized failover in case of a single system failure is inherent in most virtualization strategies, but organizations need to make sure that entire data centers can fail over to another facility in case of widespread data loss.

### **Centralized Management**

Perhaps most important, it is essential that the IT staff can monitor and maintain all IT commodities from a common management framework, centralizing the deployment, monitoring, administration, and allocation of IT resources. This proactive management strategy through a single, consolidated console enables a healthy infrastructure and allows administrators to head off potential problems before they become major issues or lead to downtime. It also helps reduce network complexity that is inherent in virtualized environments, providing a snapshot of available resources and how they relate to each other.

Centralized management also gives administrators a platform to dynamically and quickly allocate resources as needed, ensuring that the organization remains agile and employees have the tools and information they need to run the business. Centralized management can also streamline the provisioning of new resources—a process that used to take weeks and required input from up to five departments—into a process taking only several hours or even a few minutes.

## **COMPREHENSIVE BROCADE SOLUTIONS**

Brocade extraordinary networks provide a strategic foundation for transforming today's IT infrastructures into next-generation data centers with reduced costs, increased flexibility, and minimized risk. Brocade has more than a decade of experience and the breadth of products to help organizations extend virtualization benefits across the data center as part of a complete, holistic strategy. Brocade also works with the broadest range of industry leaders—server, storage, networking, and software vendors—facilitating a best-in-class solution backed by extensive compatibility testing.

Above all, Brocade facilitates holistic data center virtualization strategies, providing a framework in which to build flexible, scalable, cost-effective, and powerful data center infrastructures. Brocade provides the “enabling” layer—including multiprotocol connectivity, fabric and application services, and extension services—and leverages its strategic partner relationships for unified management across the data center and beyond.

Brocade networking solutions are optimized to facilitate expanding virtual environments by leveraging built-in fabric intelligence. The underlying fabric is capable of optimizing server virtualization in regard to data access and application mobility. In addition, the fabric provides seamless access to virtualized, shared resources and network services.

These solutions are also designed to support multiple protocols—including Fibre Channel, Ethernet, Converged Enhanced Ethernet (CEE), and Fibre Channel over Ethernet (FCoE). At its foundation, the Brocade strategy avoids risky rip-and-replace data center upgrades by providing built-in investment protection for existing infrastructure. It is also designed to incorporate new technologies over time, allowing organizations to choose how and when to upgrade their data centers in the most cost-effective manner.

## **SUMMARY**

Virtualization technologies are transforming the way organizations deliver data to employees and customers, enabling a dynamic and agile business strategy while optimizing IT resources and reducing costs. Organizations can extend virtualization benefits by implementing a more holistic data center strategy, a process that begins and ends with creating dynamic pools of IT resources—servers, storage, applications, networks, and the interconnect layers—that can be allocated automatically or on demand as business requirements dictate.

These evolving infrastructures need to be flexible, scalable, and cost-effective while leveraging existing resources, supporting existing business continuity strategies, and allowing for centralized management of IT resources. Brocade extraordinary networks provide a reliable foundation for implementing virtualization throughout the data center—enabling organizations to keep up with unprecedented growth while reducing costs, increasing flexibility, and minimizing risk.

To learn more, visit [www.brocade.com/extraordinary](http://www.brocade.com/extraordinary).

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