



I D C T E C H N O L O G Y S P O T L I G H T

The Dynamic Datacenter Network in Transition: Building Scalable, Open Fabrics

September 2011

Adapted from *Market Analysis Presentation: Worldwide Datacenter 2010* by Lucinda Borovick, IDC #227595; *Worldwide Datacenter Network 2010–2015 Forecast and Analysis* by Lucinda Borovick, IDC #226224; and *Worldwide Storage Networking Infrastructure 2010–2014 Forecast: Converged IT Infrastructure Changes the Game and Ushers in 10GbE Solutions* by Richard Villars, IDC #225899

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The datacenter network market is ripe with opportunity as organizations continue to invest in IT to support new and emerging business initiatives. IDC research concludes that migrations to fabric-based datacenter architectures will dominate the discussion for this year, but this move must be done in a way that ensures stability for existing mission-critical applications while enabling greater simplicity, reliability, and performance for a growing spectrum of virtualized business-critical applications.

The ability to simplify and consolidate the number of devices in the network, decrease server-to-server communication latency, and increase storage traffic capacity will drive customer adoption. As a result, spending on high-speed (8Gbps and 16Gbps) Fibre Channel (FC) and 10GbE switch ports will reach \$10.7 billion in 2014, representing 90% of the datacenter switch revenue, driven by both fast-growing storage traffic and support for virtualization in all forms from the server to desktops and storage systems.

In this environment, support for virtualized IT on the way to public and private cloud will drive investments in advanced FC and Ethernet datacenter fabrics. IDC expects FC fabric to remain the core storage network infrastructure of most datacenters supporting mission-critical mainframe and RISC-based systems. With the increasing use of server virtualization and open system applications, much of the expansion in IT asset deployments in the coming year will leverage Ethernet fabric for the underlying server and storage interconnect. Enabling consistent and efficient management for both of these critical network environments will be a key requirement for enterprise IT organizations.

This Technology Spotlight discusses the future of datacenter fabrics and how customers can manage this transition gracefully. In addition, this paper explores the role that Brocade plays in supporting organizations dealing with this fast-evolving environment.

Next-Generation Datacenter Fabrics

The enterprise datacenter is undergoing a transition to a more dynamic model that can accommodate frequent and rapid business change. In these datacenters, melding the management and expansion of data and storage networks will be critical as the changing IT landscape drives greater growth in mobility. In addition, an explosion in content and the use of public, private, and hybrid cloud computing are driving the transition to a more dynamic datacenter.

Server, storage and network virtualization will be at the core of most datacenter buildouts during this era. Virtualization will significantly influence the way organizations deploy and manage datacenter networks in today's fast-paced, information-centric environment. Network support of virtualized workloads will continue to drive datacenter network investments. One major challenge for datacenter network managers is architecting a new network that supports and advances application availability on virtualized x86 systems. For an organization to move to the "next level" of virtualized IT, storage and data networks must be active participants in virtual machine policies and service levels.



As organizations move to create a dynamic datacenter enabled by virtualization, they are moving to architectures for new workloads where the network is in tighter alignment with the applications. IDC believes that a network fabric-based approach will be the emerging architecture that addresses these challenges. These fabrics enable resources to move freely throughout the datacenter and at the same time reduce costs and complexity. In this environment, resources are treated as pools to be assigned as needed to business services. IDC believes that the top benefits organizations achieve by implementing fabrics include lower infrastructure costs, simplified management, better availability, increased flexibility, and higher utilization.

IDC believes that cloud computing is becoming the prevailing IT service delivery method and is forecasting ample growth in cloud computing over the next five years. A 2010 IDC survey of IT decision makers found that fully 44% are "considering private clouds." By providing greater levels of automation, orchestration, provisioning, and deployment, cloud computing can help organizations become more nimble while they also reduce operating costs and improve resource utilization.

The evolution in application architectures is also changing the traffic patterns in the datacenter because there is an increasing reliance on the servers, either physical or virtual, to act in a single fabric instead of silos of resources. So instead of traffic flowing from a "single server to the end user" model, traffic is increasingly flowing among multiple servers (both physical and virtual) and data stores before flowing out to the end user. While organizations can benefit from server consolidation, the bandwidth requirements are higher for each physical server because there is more communication between servers for every application. And possible movement of the virtual machines around the datacenter makes network traffic patterns more difficult to predict. High-speed and high-availability datacenter fabrics are at the foundation of these dynamic datacenters.

For the network, a migration to cloud computing means seamless connectivity between data and storage traffic. This is true within the datacenter and between datacenters. As the demand for big data and big content grows, the need to create global fabrics is expanding and drives the need for a unified fabric approach. In this approach, FC- or Ethernet-based storage fabrics can be used to continue delivering support for current and future application workloads, while Ethernet fabric provides the ability to set up, move, and change physical and virtual servers faster to more easily and better respond to changing business needs.

Benefits of Fabrics

The evolution to cloud computing is dictating the need for the network to act as a single fabric instead of silos of resources. This is true due to application architectures changing the traffic patterns in the datacenter as well as the rise in big data and big content. Deploying fabrics to support virtualization enables cloud infrastructures and facilitates the dynamic datacenter. This in turn can enable a datacenter to realize a number of benefits, including the following:

- Reduce operational costs
- Simplify management
- Increase asset utilization
- Improve IT responsiveness to business needs
- Maximize application availability and performance
- Integrate services provisioning and coordinate resource management
- Simplify distance connectivity between datacenters
- Increase infrastructure performance for emerging workloads

The network itself needs to transform to a fabric that facilitates the movement of virtual machines in the datacenter. An open architecture becomes critical to make sure that data is portable and that arbitration between datacenters is possible and cost effective.

Market Trends

There are more devices (think about not only smartphones and iPads but also RFID sensors and WiFi-enabled cars), applications, and digital content (often video based) than ever before. Consumers and businesses want their data on demand and in real time, on any device, in any location.

In this rapidly changing market landscape, datacenters have become the cornerstone of business, required to support new and flexible service delivery models, deliver applications to users in the remotest regions of the world, and enable entirely new Web-based businesses. As a result, the need for high-performance networking has never been greater.

IT organizations need to provide an architecture that enables seamless and transparent global connectivity between clients, servers, and storage. Organizations need tight automation and control to bridge existing investments in FC networks and adoption of Ethernet fabric to better deal with growth in a new type of content as well as lay the foundation for cloud.

IDC expects the worldwide datacenter market will resume normal growth rates in 2011 and be on track to reach \$9.4 billion in 2015. IDC's datacenter network forecast is driven by the following key trends:

- Datacenter evolution to virtualized IT and private cloud architectures
- Customer adoption of fabric-based infrastructures
- Support for a unified network based on Ethernet
- Growth of cloud service providers

Product Profile

Brocade Communications is a \$2 billion network communications company based in San Jose, California, that competes in the \$32 billion enterprise network business. Founded in 1995, Brocade has recently introduced a technology architecture to help customers evolve their datacenters and IT resources to migrate to the virtual enterprise.

According to Brocade, the company's new fabric-based products are designed to deliver the full benefits of virtualization in private clouds and provide the foundation for cloud-optimized networks. Such networks are essential to accommodate the transition to datacenters that support virtualized pools of compute, storage, and network resources; enable fast provisioning of resources; and improve IT asset utilization.

Brocade has introduced cloud-optimized 16Gbps SAN platforms utilizing next-generation FC technology to address the need for reliable, scalable, and high-performance foundations for private cloud storage infrastructures and future workloads such as VDI. New products recently introduced include the following:

- Brocade DCX 8510 Backbone Family
- DCX 8510-8 (8 slots), DCX 8510-4 (4 slots)
- Brocade 6510 Switch
- Brocade 1860 Fabric Adapter

In addition, the company has introduced VCS to deliver the industry's first true Ethernet fabric, according to Brocade. VCS helps organizations achieve higher levels of performance, utilization, and availability to meet the needs of today's virtualized datacenters and public and private clouds.

Challenges

Brocade does face challenges. There is limited institutional knowledge about its services offerings both in the channel and in the end-customer base, and Brocade will need a full-on marketing and direct-touch sales approach to increase awareness of its ability to solve complex customer problems.

Conclusion

As IT organizations look for better ways to build clouds and virtualized datacenters, they are turning to high-performance networking solutions that increase flexibility through leading-edge technologies.

The opportunities ahead for Brocade are clear; the company's new products are designed to provide the network foundation that enables IT to pursue a more systematic investment protection approach to deploying and managing IT assets in the highly virtualized datacenter. IDC believes that the company is bringing to market the right set of technologies to succeed in this market.

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