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I D C A N A L Y S T C O N N E C T I O N

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Readying Datacenter Networks for the Future

January 2008

The datacenter is at the intersection of a continuous stream of IT innovation that is called upon to meet the real-time demands of business. The future datacenter is larger, more dense, and on path to break free from the IT silos of the past — all the while demanding more bandwidth. The future datacenter must have a network that's flexible enough to both respond to and capitalize on this innovation.

The following questions were posed by Force10 Networks to Cindy Borovick, Program Director of IDC's Datacenter Networks research, on behalf of Force10's enterprise customers.

Q. Why do datacenter networks need to prepare for new Datacenter X.0 applications?

A. The datacenter has become the center of IT innovation. It's where the crown jewels of the IT organization reside. As IT organizations evolve, they focus on becoming much more responsive to the business. They are putting in place programs and services to illustrate the value in what IT delivers. Today, IT is delivering value to all of an organization's end points. Datacenters of the past predominately supported users in the same location as the datacenter itself. Now companies rely on the datacenter to support communications with business partners, often globally, and employees who are increasingly mobile as well as remote.

So the datacenter itself is changing, and the very nature of how the datacenter is connected is changing. As a result, the network is becoming much more critical to the very existence of the datacenter. Consequently, the datacenter network is being connected to multiple types of users, as I mentioned. Plus, these new consolidated datacenters need to support double if not triple the number of transactions and interactions. This pushes demands on the datacenter network in terms of availability and bandwidth that much higher. Essentially the applications are what's driving the business, and the network plays a critical supporting role in the real time availability of the business.

So the network must ensure that it's supporting those applications, whether they're legacy mission-critical apps that may have been deployed 20 years ago and need to be adapting to a new world, or they're new types of mission-critical, collaborative apps built to support a Web X.0 services model. Datacenters need a network architecture that can fluidly meet the needs of both the old and the new.

Q. What, in your view, are important attributes of a datacenter network?

A. When you think of today's business, two things immediately come to mind: 1) the need to be as close to the customer as possible; and 2) the need to respond to changing business demands as they happen. If the network is the lifeblood of these two needs, then the network itself must be up and running at all times.

So there's strong demand for the reliability and availability of datacenter networks, but also for resiliency — not only is the network always up, but how are you architecting your network so that it's resilient in the face of many challenges? How quickly can you respond to problems on the network? Essentially can you protect your IT assets in the datacenter? And, if there is a problem with security, how quickly can your network then respond to and contain that security threat? The resiliency concept is not only about being available, but also being secure.

Additionally, new datacenter network requirements and the new types of applications are creating new operational challenges. For example, as a network manager, do you have intuitive tools to diagnose and troubleshoot the network? Moreover, you need to also manage the devices themselves. Operationally how easy is it for you to make sure that all the network devices are working properly and are, in fact, available?

There's also the issue of addressing the datacenter environment itself. We've seen tremendous consolidation in the number of datacenters, as well as in the number of systems within each datacenter. Very dense computing platforms are evolving, where compute jobs that used to take six separate servers now require only two. But power needs continue to grow, so it's more important than ever for network devices to ensure that they're energy-efficient, and not taxing a datacenter's power usage. Also, that they work with the floor design of the datacenter that is most energy efficient.

Customers must look at both the power needed to run the device, as well as the cooling needed to make sure the device runs properly. I think we'll continue to see more innovation in terms of how network switches, for example, can require less cooling and also don't need as much power to get the job done.

Q. What are best practices for reducing operational expenses on the network?

A. When you think about costs in IT, most are associated with the cost of people, as well as the activities of those people. So, for example, whatever you can do to reduce the time it takes for a network administrator to perform updates on the network, provide patches, or upgrade a piece of equipment, you're reducing your management costs considerably. Therefore, IT organizations tell IDC that a key strategy is to standardize on a particular network platform or device, lowering the complexity of the number of devices that need to be managed on the network.

Similarly, organizations can ease deployment of a new application and reduce equipment costs overall by consolidating the number of devices in a datacenter network, as well as the number of vendors they're working with, to take advantage of potential contract discounts the vendor may offer. We have found that best practices in networking dictate limiting the proliferation of different types of devices making sure to select only the best-of-breed in the categories that are most logical for you — either by layer or by connection type.

Many companies keep spare equipment as a back-up policy in case of downtime. By consolidating devices, the amount of spare inventory is minimized. Likewise, if you

standardize the operating system for your network devices, that can also lower integration costs along with staff-training costs.

Another interesting strategy is the use of server virtualization as a way to reduce network operating expenses. The reason is that you're able, through virtualization, to reduce the number of physical servers, and therefore reduce the number of network connections needed. In fact, many IT organizations tell us that just by virtualizing their servers, they've lowered the complexity of their network.

Q. What is the benefit of a portfolio approach to datacenter network architecture?

A. The idea of a portfolio approach is to have the same network devices for the entire datacenter. For example, if a vendor offers multiple switches that can meet a datacenter's needs across the network, that's how you want to go. The goal is to ensure that, despite the individual needs of the datacenter's servers or storage, you have a single operating system across your network elements.

A single OS across network elements provides greater reliability through fewer software errors or system downtime due to errors. It also enables you to streamline support and maintenance, while automating many network administration tasks. In addition to a single OS, it's important to make sure that specific features like quality of service are implemented consistently across the portfolio. This reduces operating costs, speeds problem resolution (also minimizing downtime), and gains operational savings in training and management.

ABOUT THIS ANALYST

Cindy Borovick is the program director for IDC's Datacenter Networks program. In this position, she provides market analysis, research, and consulting on the datacenter. Her specific research responsibilities include analyzing the impact of application networking, WAN application delivery, blade server networking, 10 Gigabit Ethernet, and storage networking for the datacenter of the future within the enterprise and service provider marketplace. Ms. Borovick is a frequent speaker on datacenter network topics and has presented for many computer and networking vendors as well as at major trade shows.

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