



10GbE in the data center: It's no longer a question of when

Over the last decade, large enterprises have been migrating data center infrastructures from 100MB Ethernet to 1/10 Gigabit Ethernet (GbE) to support high-bandwidth, mission critical applications. However, many mid-market companies found themselves restricted from this migration to 10GbE technology due to cost, low port density and high power consumption. For many of these companies, the explosive growth of technologies, data and applications is severely taxing existing 1GbE infrastructures and affecting performance. Organizations rely on data center infrastructure as a mission critical highway that provides access to all applications and services needed to function on a daily basis. Can you afford to have your data center infrastructure be the bottleneck? Fortunately, 10GbE technology, price, and performance are now within reach for mid-market organizations through a wide variety of offerings.

Why you need a 10GbE infrastructure today

There are a multitude of reasons why moving to a 10GbE infrastructure now within your data center makes sense. For this discussion we'll cover three: 10GbE proliferation, virtualization and convergence.

Both the technology and processing capabilities embedded in today's server and storage platforms are advancing quickly. It's not uncommon to find organizations utilizing servers with multi-core processors which can overwhelm 1GbE I/O interfaces. Many manufacturers are now shipping servers and storage platforms that include 10GbE I/O natively.

IT departments of mid-market organizations are implementing server virtualization to better leverage server processors and increase efficiency. The challenge with a highly virtualized environment is each virtualized OS expects exclusive use of the physical resources including the network adaptor, which can result in oversubscription of I/O resources. Implementation of desktop virtualization across an enterprise can add to the burden, requiring the network to rapidly transport large amounts of data and handle the real-time mapping of network resources between VMs.

Your organization may have implemented multiple, discrete networks within your data centers to serve specific needs. Gigabit Ethernet technology is used for the data center Local Area Network (LAN) and Fibre Channel (FC) and Internet SCSI (iSCSI) are being used to meet storage area network (SAN) performance levels. The emergence of affordable 10GbE LAN technology and standards-based technologies like Data Center Bridging (DCB) are making it possible for organizations to converge separate LAN and SAN networks into a single, multi-purpose infrastructure.

Let's consider the wide range of 10GbE solutions that you can integrate into your data center based on your environment.

A range of cost-effective 10gbE switches available today

For data centers that use a rack-based environment for their servers, there are many 1/10/40GbE Top of Rack (TOR) Ethernet aggregation switches available. These high-performance switches help aggregate many 1/10GbE interconnects within the rack while also providing a 40GbE uplink to the data center fabric. When looking for a TOR switch, be sure to choose one that provides port density, oversubscription values, and CPU processing to insure maximum network performance for your data center environment.

Other data centers use infrastructure convergence to help reduce capital and operational costs by deploying blade systems. These systems provide extremely reliable, flexible and efficient platforms to help combat data center sprawl and IT complexity. There are 1/10/40GbE blade switches for these systems which support internal 1/10GbE ports as well as 1 or 2 fixed 40GbE uplink ports. When evaluating blade switches look for solutions that have the enhanced bandwidth, performance and flexibility to satisfy the changing demands of mid-market data centers.

To help IT managers combine separate Ethernet LAN and storage SAN networks, there are multiple LAN/SAN converged switches. These 1/10/40GbE switches provide support for a wide range of services including Ethernet, iSCSI, native FC, and Fibre Channel over Ethernet (FCoE). Look for LAN/SAN switches that also support standards like DCB, which help deliver the ability to classify and prioritize different traffic flows, enabling the combining of Ethernet LAN traffic and high-performance demanding SAN traffic across a single infrastructure.

Migrating to 10GbE at your pace

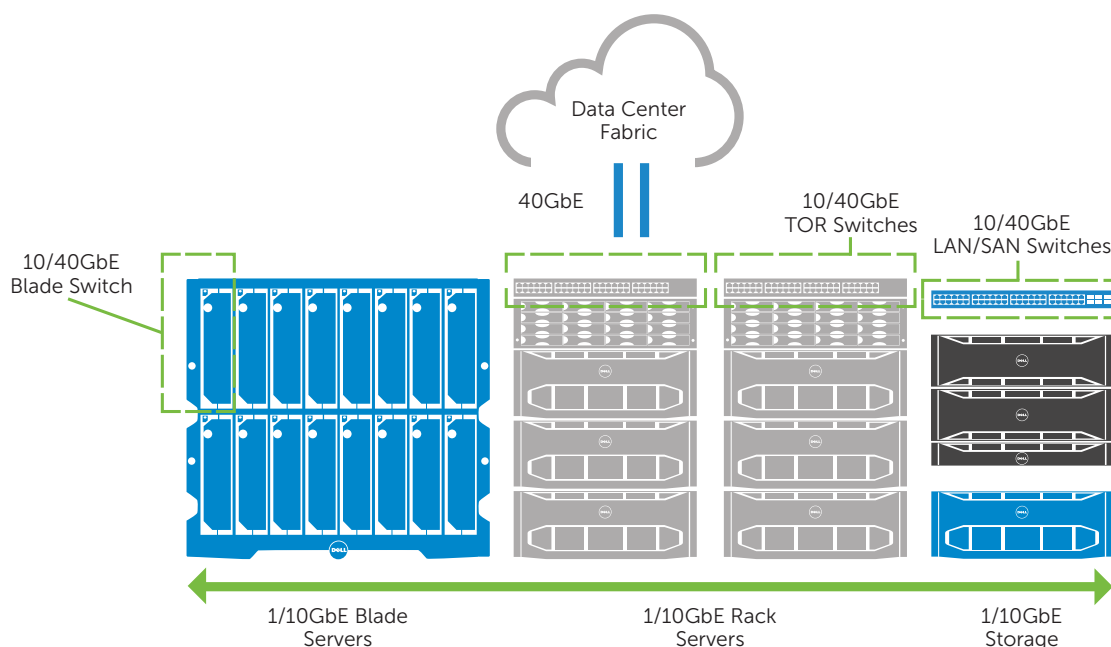
An ongoing challenge for many IT managers is how to implement new technology into their data centers with minimum disruption of daily services. Fortunately, with 10GbE there are several options available to help ease that migration.

New 10GbE switches can be a challenge since many of these switches connectors use the Small Form-Factor Pluggable (SFP+) cables. Connection to these 10GbE switches becomes a challenge as the SFP+ connector is not backward compatible with existing 1GbE RJ-45 connectors. To help make this migration easier, you should consider 10GBASE-T switches that offer RJ-45 connector thereby allowing the deployment of 10GbE in an evolutionary manner.

For data centers with parallel, redundant Ethernet LAN and storage SAN, new 10GbE LAN/SAN switches provide IT administrators with the ability of slowing migrating storage devices on iSCSI and FC SANs onto the Ethernet LAN.

Summary

It's a safe assumption that application and user demand within mid-market data centers will continue to grow. Fortunately, improvements in 10GbE technology, price and performance has extended to the mid-market to help combat these demands. There is a variety of choices to choose from based on your unique environment. When looking at 10GbE solutions, seek solution providers that can offer a wide selection of products, has products that help ease the 10GbE migration, and most importantly has the experience and services to provide an end-to-end solution.



10GbE Infrastructure for East-West traffic

- Server/VM to Server/VM
- Server to Storage

For more information visit: www.DellNetworking.com

