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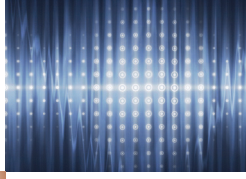
Building Networks for People

white paper



Future-Proofing the Core, the Distribution Layer, and the Wiring Closet of Enterprise Networks

There was a marketing slogan a while back: The Network is the Computer. Well times have changed and these days a more accurate statement would be: The Network is the Business. Take away the network – even for a short period of time – and business operations come to a grinding halt, impacting sales, morale, brand and reputation. Performance issues can have a similar impact. While performance problems don't disconnect your network/productivity access as in a complete but relatively short-lived outage, they can step on it for an extended period of time before the issues are diagnosed and a solution applied.

With so much riding on the availability and performance of the network, businesses of all sizes need a robust, reliable infrastructure that eliminates downtime and is highly redundant, efficient, scalable, modular and flexible to handle the challenges of ever-increasing bandwidth. And, while it's critical that the network addresses today's needs within today's constrained budgets, IT decision-makers must prepare for the future as well.

If your organisation is increasing its use of virtualisation, or if it is consolidating its data centre, or if it is relying more on latency-sensitive applications – think streaming video content, IP Surveillance or VoIP – you definitely need to look hard at performance and quality management capabilities. A solution that can easily add ports, scale to many 10-Gigabit Ethernet connections, and provide advanced QoS and bandwidth management is called for. Gigabit clients driven by larger attachments and streaming are becoming more common and driving faster switching needs

in the core. And even if you are limiting video streaming on your network today and have not adopted video surveillance or VoIP, you don't want your company to be limited by network constraints. As these applications and business video content become absolute business requirements, you don't want to be forced into forklift switch upgrades.

Solving a Range of Business Problems

For IT decision-makers, the foundation for building this type of high-availability future-proof network starts with choosing a modular switching solution that can be adapted to a variety of needs. Modular switching solutions can be chassis-based or logically ganged but stacked in a rack. It makes sense to choose a vendor that offers both alternatives to be able to address specific challenges depending upon the company's size and needs.

- For mid-sized enterprises a richly featured chassis-based modular switching platform can serve as the core network.
- For larger enterprises a similar switching platform can provide a cost-effective, scalable solution at the distribution layer.
- For the largest enterprises a chassis-based switching platform can serve as a compact wiring-closet-in-a-box capable of handling the port densities on the crowded floors of a major corporation.

These modular switches address a wide range of business problems with a highly adaptable and scalable architecture that offers built-in redundancy.

For example, Switches can be fitted with different port types for deployment as a core switch as opposed to a distribution switch. A core switch needs to provide numerous high-speed fiber backbones for a campus, which might mean dozens of SFP and 10-Gigabit uplinks. A distribution switch must provide high-port density connections to hundreds of workstations and other network devices in an office environment, which might be satisfied by compact 10/100/1000BASE-T ports and Power over Ethernet support.

What to Look for in a Solution

Whether your organisation is looking for a core switch or a distribution switch, there are a few important issues to focus on as you think about a future-proof network foundation.

High Availability. If the network is down the business is down. Thus a chassis-based switching solution should be able to provide redundancy and load-sharing via redundant power supplies and hot-swappable control and line cards, switching fabrics and fan modules. You want a solution with two switch fabrics that can run in active mode so that both fabrics support daily operations for better performance, yet should one fail the business continues to run on the remaining fabric. Also look for support of resilient switching and routing technologies such as VRRP and MSTP.

Scalability and Performance. Bandwidth demands will continue to grow at an accelerating pace. One gauge is a recent Nemertes study predicting Internet bandwidth will increase 50 fold by 2015. As corporate networks continue to take on more of this bandwidth, one cost-effective approach is to scale up with additional ports in an existing chassis or add a chassis for their support of multiple types of switches on a common power and switching backplane.

Simply supporting more ports is meaningless if you don't have the performance to deliver the total bandwidth at the quality of service (QoS) needed. Thus a high-performance solution needs to leverage a non-blocking crossbar fabric and multi-layer QoS prioritisation for VoIP and advance multicast routing and switching for video. That solution should ensure wire-speed delivery of IPv4 and IPv6 traffic. State-of-the-art switches also utilise a distribution switching method that has each line card – the port module that directly connects to the network node – able to process L2, L3, L4 switching including ACL and QoS considerations without going to the central control card. With centralised architecture and dumb line cards, even data coming into and back out the same line card need to go through the central control card for permission.

Security. Network security assaults are becoming both more frequent and more sophisticated. The annual Computer Security Institute survey in December 2009 showed 64.3 percent of organisations suffered malware infection, up from 50 percent in 2008; 29.2 percent experienced denial-of-service attacks, compared to 2008's 21 percent. Thus it is increasingly important that your switching solution supports a variety of critical security functions including Access Control that can detect and isolate intruders, spoofing attempts and other threats to your network. A robust security capability must protect against Denial of Service attacks and protocols doctored to conceal threats. While not necessarily malicious, various causes of traffic congestion need to be controlled to prevent them from inhibiting mission critical traffic via bandwidth rate limiting and port mirroring. Security can also be extended to the network management level with functions such as SSH v2 and SNMP v3 that authenticates and encrypts management traffic.

Total Cost of Ownership. The previous section on security defines one key element of TCO. The security available to protect your network needs to be robust enough to avoid the cost of disruption and supported by self-healing automation to minimise the labour required to keep the network secure, and security-focused switching solutions are key.

Another aspect is the ability to expand economically to keep up with demand, both in terms of network traffic and required sophistication. A modular chassis-based switch provides backplane switching capabilities to ease expansion without blocking. The addition of relatively inexpensive port modules handles increased port count and bandwidth demand with an appropriately mixed deployment of transmission media networks combining, say, fiber and copper. Finally, the ability to add modules for new functionality like, say, MPLS and the related need for greater routing and forwarding capacity protect against the day you hit a need to, in this case, lower the overhead of your connection oriented services.

Unified management features should provide administrators with enterprise-wide control of configuration, access and traffic monitoring, and troubleshooting to reduce support costs. Power over Ethernet provides network connectivity to PoE-capable devices such as IP phones and Wireless Access Points without the cost of running power. A capable modular switch also allows your wireless network to be unified into your wired network infrastructure and management with unified switching modules that provide a single point of control for many Access Points.

Choosing a Vendor

When it comes time to choosing a vendor, look for a company that provides a wide range of solutions, has experience in the market, supports standards and provides innovative modular solutions at a highly competitive price performance point. D-Link has been providing both rack-mount and chassis-based modular switching solutions worldwide for a number of years and recently introduced into the European market a new line of chassis-based solutions. The company's switching solutions provide high-performance, state-of-the art technology that delivers energy-efficiency, scalability, maximum security, modular resiliency and high-availability. The features and functions offered by D-Link are typically found only in more expensive competitive products.

If, indeed, the network is the business, then make sure you are making the right business decisions for your network and the right network decisions for your business. Choosing a switch vendor that can deliver a full, robust and future-proof network – without stretching the bottom line – is certainly a good place to start.

For more information: www.dlink.com

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