

Designing Your Network for the Future

Here are the new products and technologies to consider as you refresh, upgrade and expand.

The demands on most company networks have been growing steadily over the past several years. Increased use of VoIP (Voice over Internet Protocol), premises Wi-Fi, video and multimedia, and server-based applications have upped bandwidth requirements. Between compliance and regulatory requirements, and the growing use of graphic and video data, storage requirements keep increasing.

Meanwhile, emerging technologies keep turning into products, and new products keep getting more powerful and cost-effective. Learn more as leading vendors and experts share their thoughts on technologies and products to consider buying in order to make sure your network will be ready for the future.

Gigabit Keeps Data and Voice Moving Smoothly

With the growing use of VoIP and IP video, even small companies are starting to need more LAN bandwidth than Fast Ethernet's 100Mbps. Gigabit Ethernet — 1 GbpsE — network interface controllers (NICs) are now common on business desktop and notebook computers. It makes sense to start upgrading your LAN to match.

"For some customers, Fast Ethernet is sufficient, but we're seeing more small businesses looking at Gig-E," says David Tucker, senior director, product marketing, connected office business organization at Cisco's Linksys division. "Even small businesses are starting to look at 10-Gigabit Ethernet (10GbE) connections for their backbones. If you put in a network storage device, want to do disk-to-disk backups, or carry more video, that speed comes in handy."

"Gigabit Ethernet switches are so inexpensive now that buying them is practically a no-brainer," says Craig J. Mathias, principal, Farpoint Group, a technology advisory group in Ashland, Mass. "However, you may need to upgrade your wiring. Use CAT 5e or CAT 6 cable," Mathias adds.

Be ready for network growth and management with stackable switches — switches that can be physically stacked and offer 1Gbps Ethernet ports, suggests George Cravens, technical marketing engineer, D-Link.

"Our DXS stackable switch family can get up to 50 ports or 24 Power over

Ethernet (PoE) ports in a 1U, says Cravens. "These can be stacked up to provide hundreds of ports in a single managed stack. You can add 10GbE ports to them, for stacking or connecting to the computer room or data center."

For companies adding or expanding premises wireless LAN (WLAN) service, "Our DWS wireless switches manage 'thin' wireless access points and can be stacked with our DXS switches," he adds. "And if you have DXS switches, you can buy firmware upgrades to turn them into DWS switches."

D-Link's stacked switch units behave, and can be managed, like a unified switch. "You can plug in fiber-optic ports," Cravens says. "So you can spread them across multiple locations, farther than you could with Ethernet, to distribute the power and heating loads while still managing them as one switch."

Unmanaged switches remain an option for budget-conscious companies that don't need any significant network features. "For companies who need some features, like QoS (Quality of Service) and security, our smart switches offer an affordable alternative to our Layer 2 or Layer 3 switches," says Linksys' Tucker.

The growing use of VoIP, premises 802.11 Wi-Fi LANs and digital video security also increases the demand for 802.3af Power over Ethernet. PoE lets IT deliver power for wireless access points, VoIP desksets, security cameras and other devices, directly over LAN cabling. This dramatically reduces the cost of installing power outlets and wiring — and makes it possible to provide central uninterrupted power supply (UPS) for office phones, security and their infrastructure.

To make it easier for SMBs (small- to mid-sized businesses) to add, manage and maintain more network capabilities, "We're integrating as many traditional functions as possible into fewer boxes," says Nikos Koutsoukos, director, product management for SMB group, 3Com.

For example, according to Koutsoukos, 3Com's new Unified Gigabit Wireless PoE Switch 24 includes a 24-port Gigabit Ethernet switch, wireless controller and PoE in a single rack-mount or table-top housing. "This is good for companies with between 20 and 250 users at price points that SMBs are comfortable with. It allows SMBs to converge their wired and wireless, voice



and data infrastructure, running it all in one box, rather than having to buy four or five boxes. And you can start by just using the box as an Ethernet LAN switch and incorporate WLAN, VoIP or IP telephony in the future."

Cisco offers multifunction routers and switches. "Our Catalyst Express products are for SMBs with up to 250 users," says Marie Hattar, senior director, network systems, Cisco. "These have all the capabilities needed to run advanced activities like VoIP, unified communications and QoS, while also being easy to manage through our Cisco Network Assistant management tool, which can also manage firewalls and routers."

As SMBs consolidate servers and storage to a central IT facility, "You have to make sure that remote locations can access data with the same speed and convenience,"

notes Inbar Lasser-Raad, director, product marketing, network systems, Cisco. "Our WAN acceleration on the router helps avoid the need to buy more bandwidth, and tailors optimization to the application, so that the application's performance and quality of experience are consistent."

Terabytes Save Money and Management's Time

It's a fact of IT life that storage needs keep growing: more applications, customers, e-mail, VoIP and IM (instant messaging) — plus growing regulatory and compliance requirements like Sarbanes-Oxley and HIPAA (Health Insurance Portability and Accountability Act) — which require archiving e-mail and other communications, transactions and even logging administrative changes to databases. »

Linksys' new line of network storage appliances, scheduled to be announced in early 2007, come in two- and four-bay models, making it easy for even small companies to provide reliable file serving and storage. "The new Serial ATA (SATA, Serial Advanced Technology Attachment) hard drives are trivial to install or swap," states Linksys' Tucker.

"SATA drives are currently up to 750GB, with terabyte sizes coming in 2007. This means our two-drive NAS (network attached storage), starting in the \$500-\$600 price range plus drives, can offer 750GB of RAID (redundant array of independent disks) storage. We support RAID Levels 1 through 5 — and the four-bay up to a terabyte and a half, which is ideal for a 100-and-up company that needs the capacity and performance."

For SMBs, iSCSI — SCSI (Small Computer System Interface) over IP — lets IT network storage use the familiar Ethernet technology, rather than Fibre Channel, which adds hardware and learning-curve costs.

"Our D-Link xStack Storage Area Network Array DSN products hold 15 Serial ATA (SATA) drives, supporting RAID 0 through 5, and either eight 1Gb or one 10GbE ports in a 3U rack-mount, which makes it ideal for nearline storage, or as a backup and recovery device," says Cravens. "For SMBs moving from DAS (direct attached storage) to NAS or SAN (storage area network), this is much more cost effective than Fibre Channel, and this is a good first step into the SAN world."

Year of the Server Retrofit

"Server hardware has never been cheaper," points out Tom Henderson, managing director of Extremelabs.com, an Indianapolis, IN technology consultancy.

"Fast multicore CPU servers are appearing in the marketplace with awesome performance, due to the fierce competition between AMD, Intel and Sun. The drop in price on high-capacity, high-RPM disk drives, gigabyte and bigger DDR memory modules and fibre-channel cards means that this is the year that many organizations retrofit their servers. Add the trend toward virtualizing the operating systems with VMware's ESX/GSX products, and many new OS updates, and servers will be strong sellers in 2007."

IP Surveillance for Security and Management

"You can have the best digital security money can buy — firewalls, spyware and spam filters, multifactor authentication — but if you don't pay attention to the physical threats, you're not secure," says Chris Gaskins, product line manager, security and environmental products, at APC.

Today's surveillance security is increasingly based on IP video — digital cameras (Webcams) that connect directly to the LAN rather than the traditional analog closed-circuit TV (CCTV) video security systems. While CCTV cameras have no built-in intelligence, IP video cameras include embedded Web servers and other programmable intelligence. "A smart camera can detect motion, like somebody walking by the camera, and use that to trigger video capture," says Robert Muehlbauer, national channel manager with Axis Communications.

"Intelligent video applications can count people, for example, how many customers went through the door on a sale day at your store. They can also determine if people driving down the highway are going in the wrong direction."

The new IP video cameras are also getting simpler and more reliable, according to Axis' Muehlbauer. "Our new AXIS 212 has a 140-degree, wide-angle lens and a three-megapixel sensor, so you can do virtual Pan/Tilt/Zoom (PTZ). Since the AXIS 212 has no moving parts, it's about half the price of our lowest cost mechanical PTZ-capable cameras. The chances of something breaking are much less."

Even if your company is not ready to retire some or all of its existing CCTV cameras, "We can turn an analog camera into an IP camera, and companies can then write software for the signals," Muehlbauer notes.

Physical threat monitoring of IT spaces includes people issues, as well as environmental and power, cautions APC's Gaskins. "Wiring closets and distributed spaces are at risk, since people often don't go into them more than once a quarter, if there's an upgrade or a problem. And a lot can happen. If the landlord cuts the air conditioner flow, the temperature can go up to 100 degrees Fahrenheit for hours at a time. Or people you don't know can go into these closets."

Network-connected Webcams, like APC's NetBotz line, let IT monitor for a variety of physical and environmental events, like temperature, water, smoke, motion and noise. "It's like having a security guard on duty who can alert and alarm you in multiple ways," says Gaskins.

One new security feature from APC is rack-level access control, using their Rack Access PX (proximity) locks. "Even though you have badged entry into your data



center, you may still want to add security at the rack level. For example, many servers have hot-swap drives for problem resolutions. But that makes it easy to steal them. Cameras with integrated motion detectors can make sure you get a picture of who's walking down the aisle, and access locks. Rack Access PX is a browser-accessible appliance that allows control and management of access privileges to our NetShelter SX enclosures. As companies contract out more services there are more nonemployees in the IT spaces. Having this additional access capability on racks, or on wiring closets that used to just have a lock and key, along with physical surveillance, is important," adds Gaskins.

Being able to see live video also lets IT talk a nontechnical person through some procedures, with visual-based directions like "Toggle the red switch over to your right," he says.

Integration Simplifies Management

Today's companies need more IT capabilities, but IT doesn't want more boxes and applications to manage, if it can be avoided.

"Linksys' connected office strategy means that all our hardware products will include software letting them do plug-and-play installation and be managed as a system — even do automatic software and firmware upgrades. Their configurations will be backed up to a management portal," says Linksys' Tucker. "Working together is also important. It means, for example, if someone's at an office door, an alert can be sent to my phone using VoIP, followed by an image

sent from a Webcam, while data also gets sent to and stored on the NAS."

Cisco's Integrated Services Routers (ISRs) are being well received by SMBs, according to Cisco's Lasser-Raad, "because they integrate all services, like voice, video, wireless and security on the router. Often, when you deploy security capabilities separately, things will conflict if you don't configure carefully. By having all the services on the router, you know they'll interoperate and won't break each other."

"The network will continue to grow more complex," states Cheryl Currid, president of Currid & Company, a high-tech research firm in Houston. "It seems that everything's gone IP — the phones, security cameras and a gaggle of new tech appliances like storage servers. Small- to mid-sized companies might be surprised by how fast the complexity can grow. I know of very complicated networks that serve less than 30 people. So size of the company doesn't dictate the complexity of the network." ◇

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