

SMART SWITCHES

Simplify Network Operations, Management and Growth.

You Don't Need a Big Network to Benefit From Smart Switches

If your network needs performance and security that your current unmanaged switches can't provide, take a look at today's Web-enabled smart switches.

It's a fact of business that many offices grow or move, and even in those that don't, new applications keep demanding more LAN bandwidth. Until recently, the switches used at the network edge came in two types: unmanaged, which were comparatively inexpensive, but couldn't be configured or easily monitored; and managed, which cost twice as much or more, and offer more features than a network edge device would need.

"An unmanaged switch has the ASIC [application-specific integrated circuit], but no CPU — and no CPU means 'no way to interact with the device,'" says Peter Newton, senior product

line manager, NETGEAR Inc. At best, an unmanaged switch might offer a command-line user interface. "You can't make changes to an unmanaged switch's configuration."

A managed switch includes features which need configuring and controlling, such as traffic management features (the ability to define virtual LANs [VLANs] and do routing between these segments; Quality of Service [QoS] to prioritize time-sensitive traffic, such as Voice over Internet Protocol [VoIP]; and port trunking), security features (support for Access Control Lists [ACLs] and 802.1x authentication) and port mirroring, which lets you duplicate one port's traffic to another, where you can connect a network analyzer.

Historically, managed switches have been monitored and controlled using either a command-line interface, connecting by telnet or an RS-232 cable, or SNMP (Simple Network ▶





Management Protocol)-based management software running on a management console system — often an investment in budget, staff and training beyond what many businesses are ready to commit.

Currently, the installed base of unmanaged and managed switches represents over 700 million ports' worth of "fixed" devices (boxes or 1U rackmounts, versus higher-end, higher-capacity chassis capable of accepting large numbers of line cards), according to Seamus Crehan, senior analyst at the Dell'Oro Group. For IT planners, coping with network growth meant either keeping hardware costs down with unmanaged switches but often having to spend more on the network to compensate for not enough control over network performance and security. Or it meant paying more for managed switches and management software in order to have the subset of switch features needed.

In the past year or so, however, network planners have gained a new option — "smart switches," a.k.a. "Web-managed switches" and "intelligent switches," from vendors including Allied Telesyn, D-Link, Linksys, NETGEAR and SMC. These solutions offer enough of the management, performance and security features you need, at only slightly more than the cost of unmanaged switches. Aggressive vendor development has driven down the cost of low-end switches to the point where they're no more expensive than hubs — and a lot more useful.

Most of these smart switches include an embedded Web server, allowing them to be managed through any Web browser on the company's network — including remote users with secure connections from notebooks, possibly even handhelds or Web kiosks.

"Configuration and management through a Web GUI appeals to the smaller office — you don't have to be an expert," says Patrick Izzo, LAN/WAN Specialist, CDW. Some smart switches also include serial command-line user interfaces.

"Smart switches offer 'management at an unmanaged cost,'" says NETGEAR's Newton. "We were able to do it with a very low-cost CPU. L2 switches were in an escalating features war, so you had a long list of features, but people were using just a few key features as a rule, especially companies with less network technical expertise available."

According to CDW's Izzo, smart switches offer network management features that can include:

- Basic QoS, e.g. traffic on a per-port basis; possibly prioritization (recognizing packets with priority tags, and/or enabling tagging of packets coming in on a certain port)
- Link aggregation, making multiple ports behave like a single "super-port" for trunking and backbones
- Defining VLANs, which segregate traffic for performance and security

- Stackability, which lets interconnected smart switches appear to be, and be managed as, one large device with one IP address.

Smart switches also typically support gigabit speed on several ports, suitable for connecting to servers, to a “distribution” or a “core” switch, to other smart switches or to users needing gigabit network speed.

Some smart switch vendors and models may also offer higher-end features normally found only on managed switches, such as IGMP (Internet Group Management Protocol) “snooping” (useful with multicasting), supporting multiple spanning tree protocols and centralized 802.1x security with RADIUS (Remote Authentication Dial-In User Service) authentication.

That’s not to suggest a smart switch can do everything that a managed switch can. “Managed switches do have more features, like IP multicasting, ACLs and Layer 3 routing,” notes Rocky Rosas, senior technical marketing manager, D-Link.

“If it’s time to replace or upgrade a switch, or if an application’s use is growing, it might be time to consider smart switches.”

Price differences for a smart switch versus an unmanaged switch average from \$35 to \$50 per switch. For example, pricing for a 24-port unmanaged switch might be in the \$200 to \$250 range, with a managed switch around \$1000. A 24-port smart switch could run in the \$350 to \$500 range, especially with Gigabit Ethernet on all its ports. “That extra few tens of dollars per switch lets you get the features you really want,” says NETGEAR’s Newton.

“If you need comparatively simple products to do a few things fast and well, these intelligent switches fit customer requirements without straining the budget,” agrees Shirley Hunt, strategic analyst, Frost & Sullivan. “A lot of companies can’t afford the higher-end, full-feature products but still need these basic networking features.” Smart switches can also save your company the need to invest in additional management software and the training in how to use it.

“It’s likely that most of the ports in those markets will migrate to smart switches in the next few years,” says Dell’Oro Group’s Crehan. “Some people need the features now. For the others, it’s future-proofing at a very small price premium.”

When to Consider Smart Switches

According to CDW’s Izzo, “if it’s time to replace or upgrade a switch, or if an application’s use is growing,” it might be time to consider smart switches.

A physical move, even just from one floor to another, is also a good opportunity, Izzo points out. “The network has to be in place before you move — the core, cabling and switches. And you can’t move everything over a weekend.” The old switches

won’t have worn out, “but applications keep growing, so your old network speeds aren’t enough anymore.”

More than likely, the increased demands on your network will necessitate your move to smart switches. But meeting these demands will bring a variety of benefits:

- **Add network management**

“Streaming applications require having a view into the network through a management interface,” D-Link’s Rosas points out. “You need to be able to identify where you might need more bandwidth — to upgrade from Fast Ethernet to gigabit, or add QoS control. With unmanaged switches, you have no visibility into the network to know where the network isn’t performing well enough for your applications.”

And, notes NETGEAR’s Newton, smart switches’ entry-level management features provide “a good way to step into network management.” CDW’s Izzo agrees: “If you’re deploying a network that needs to be managed, this helps you stretch your management switch budget.”

- **Get more bandwidth**

“Gigabit switching has come down in price significantly,” states Izzo. “You won’t want your network to be running exclusively on 10/100Mbps in 2010, especially since every new PC and server you buy will have gigabit built in. So why not take advantage of it?”

- **Segment the network, manage bandwidth and QoS requirements**

“You may want to separate your LAN into departmental segments, and each department may have different bandwidth and QoS requirements,” says D-Link’s Rosas. “A smart switch lets you provide this.”

- **Take advantage of Power over Ethernet**

Some smart switches include Power over Ethernet (802.3af), which lets you deliver power over LAN cabling to run low-voltage devices like wireless access points and security cameras, and monitor and control the power being sent from each switch port via a Web browser.

- **New applications driving upgrades**

While VoIP itself isn’t bandwidth-intensive, “you do need QoS, since other applications on your network are bandwidth-intensive,” CDW’s Izzo points out. “You need to be able to preserve bandwidth for voice traffic so it doesn’t degrade. If you’re thinking you may have VoIP in a few years, upgrading now will let you be ready for it.”

Will you need to replace cabling along with the switches? “Any cabling products in the last five years will be certified for gigabit,” says Izzo. “If your cable is six years old or more and you plan to support gigabit speeds, you may need to replace the cabling.”

Also, Izzo notes, “A copper switch may let you add some 10GB ports, with the transceivers for it, when you’re ready.” And while 10GB is still a ways away, and fiber much more expensive than copper cabling, “there may be some places, e.g. from switch to switch, or floor to floor, where you want to consider running fiber now, so you’ll be ready for 10GB ports when it’s time.”



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