

Is it time to cut back on now-idle Ethernet?

BY JOHN COX

A range of companies with wireless LANs are discovering that 50% to 90% or more of Ethernet ports go unused because Wi-Fi has become so prevalent.

They look at racks of unused switches, ports, Ethernet wall jacks, the cabling that connects them all, the yearly maintenance charges for unused switches, electrical charges and cooling costs. So why not formally drop what many users have already discarded — the Ethernet cable?

"There's definitely a right-sizing going on," says Michael King, research director, mobile and wireless, for Gartner. "By 2011, 70% of all net new ports will be wireless. People are saying, 'we don't need to be spending so much on a wired infrastructure if no one is using it.'"

Many of these issues were predicted in fall 2007 by Burton Group Analyst Paul DeBeasi, in a report provocatively titled "The end of Ethernet?" In it, he argued that the demand for mobility and the advent of 802.11n networks with shared throughput of 150M to 180Mbps would lead enterprises to cut the Ethernet access cord.

"We're struggling a bit to wrap our heads around what amounts to a pretty significant change in culture," says the lead wireless technologist for a big East Coast university, who requested anonymity. Cisco is the wired and wireless network vendor. Like many other schools, this one has a wired port for every student bed, and 80% to 90% of these ports are idle. "Many students are clueless about what to do with a patch cord to begin with. They grew up with wireless," he says. "So how do we react to the change, without shooting ourselves in the foot?"

More companies are debating that very question, as they face replacing older switching gear, or deciding on the switching infrastructure for new buildings. And there is no clear or simple answer.

Many are unconvinced that enterprise Wi-Fi networks, even the high-throughput draft 802.11n flavor, can offer the reliability, security, and bandwidth demanded by current applications. Others are equally convinced that they can. Some insist that future IP-based television services require a wire; others are not so sure and wonder if IPTV justifies having hundreds of idle switches on yearly maintenance contracts, which can run hundreds of dollars per box.

"It depends on the application," says Dave Dully, CTO, Baptist Health of Northeast Florida, a network of five hospitals, with Cisco as the wired and wireless vendor. The WLAN supports several applications to facilitate clinical workflow and a separate visitors' network. "But if you talk about 24/7 applications and critical access, everything from security to guaranteed access in a power outage...we're still building robust wired networks for that," he says.

"The question is: when can you consider wireless the primary network?" asks John Turner, Director for Networks and Systems, Brandeis University, Waltham, Mass., and an Aruba Networks WLAN site. Facing a tough cabling challenge in a new campus science building, Turner concluded that a mix of 802.11abg and 802.11n access points, with new Aruba software for optimizing radio signals, would adequately support most user access. The building was completed with less cabling and fewer switches than originally planned.

Looking ahead to a looming switch upgrade, Turner is rethinking conventional assumptions. "If I converge the wired and wireless edge technologies, reduce the edge port count, disconnect jacks on the wall, and potentially use some of the older switches for spares, we think we're going to see a \$1 million to \$1.4 million in savings," he says.

Analyzing port usage

The percentage of unused ports, or the level of activity on ports, varies widely with the nature of the company's business, or even within a company. Many IT managers are only now taking audits. "I don't think everyone is aware of what's happening 'on the ground,'" says Philippe Hanset, IT manager, University of Tennessee, Knoxville, which has a campus-wide Aruba WLAN. "If ports are not being used, can I then change my distribution layer, to save on energy, and on support [costs] for all these switches?"

Workers at an insurance company might spend nearly all of their day at their desk. So would the staff of a company's call center department. But where a premium is put on mobility and convenience, the WLAN impact on port use is dramatic.

California State University, a federation of 23 universities, did a port-by-port analysis of Ethernet use in preparing a rollout of Aruba 802.11abg (upgradeable to 802.11n) WLANs on all campuses. IT directors insisted that the chancellor's office was vastly underestimating the growth in Ethernet ports. Using a network monitoring program called StatSeeker, Michel Davidoff, CalState's director of cyberinfrastructure services, recorded port use over a period of months. In no case

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were more than 50% of the ports being used, and in most cases it was far less, he reports.

"We knew there were some extra ports available, but this was mind-boggling," Davidoff says. His careful calculations, vetted by CalState math professors, showed that by reducing Ethernet ports to reflect usage, eliminating 2,500 switches, CalState would save over five years about \$30 million in hardware spending, staging and installation costs. That doesn't count savings in electricity and heating.

Those savings are about two times the cost of the WLAN rollout for the entire CalState system.

A recent switch analysis at St. Bonaventure University near Buffalo, N.Y., another Cisco site, found that 92% of the ports on the wired Ethernet are unused by the school's 2,600 students, who rely on the 802.11abg WLAN. "It makes us question the economic viability of this [wired] service," says Brian Kellogg, the school's network services manager.

Can WLANS deliver?

There is debate over whether WLANs, including the high-throughput 802.11n networks, will be able to deliver enough bandwidth.

"Most user applications, whether mobile or fixed, remain transaction-oriented and fit well within a 1Mbps per user bandwidth [requirement], such as e-mail, Web surfing, file transfer and database access," says Brad Noblet, a former IT executive and now a Lebanon, N.H., consultant who specializes in wireless networking. "Even for real-time, latency-sensitive traffic such as voice and video, compression techniques like MP4 coupled with smart buffering techniques have enabled an excellent user experience while constraining traffic to as little as 1Mbps."

That's the case at St. Bonaventure. "The vast majority of students find that 11g [with about 20M to 25Mbps throughput] is fine for everything they're looking to do," Kellogg says.

The school's 10/100Mbps Ethernet plant is nearly 10 years old, and Kellogg estimates it will cost about \$250,000 to upgrade it. He's in the midst of surveying students about their WLAN experience. If that's positive, with minimal problems, it will add weight to restructuring the network edge.

Aruba Networks has an entire outreach program, dubbed "rightsizing," built around these claimed financial benefits. Chris

Does it make sense to move to wireless?

The growing use of wall-to-wall 802.11 wireless LANs, coupled with the growth of enterprise laptops, means that expensive switch ports are going unused, in some cases 50% to 90% of them. Here's how you can start getting your arms around this issue:

- What percentage of users have wireless laptops, and how many more will have them in the next 12 to 18 months? What percentage use another type of Wi-Fi client, such as dual-mode smartphone?
- What kinds of applications are they using, and what are the bandwidth requirements?
- Do a port audit to find how many switch ports are in use, and how much they're used: a manual inspection can give you rough idea of in-use ports; a network monitoring program like StatSeeker can give you many more details.
- Tally up the yearly maintenance fees for your access switches.
- Look at your hardware depreciation schedule: what are your yearly costs to replace or upgrade these boxes?
- Check the spec sheets for power consumption for the switch models. Ask your vendor to help calculate a yearly total and check your utility company for rate information to approximate electrical costs. Allocating HVAC costs for big switches that require cooling might be more of a challenge.

Harget, head of enterprise marketing, has been the point person for the effort, which includes a calculator, in glossy cardstock, that lets you spin several wheels to see projected savings, and an Excel spreadsheet that Aruba makes available to customers. The tools, and the entire marketing pitch, are the fruit of a detailed cost-benefit analysis done in November 2008 with a big prospective customer.

A key variable, Harget says, is the number of users with laptops. "Most offices have 40% to 60% laptop users," he says. "But the trend is increasing." Citing market research data, Harget says by the end of 2009, more than 50% of all PCs will be laptops, and the majority of those will have 802.11n wireless built into them. The netbook trend may accelerate it even more. The implication is clear: why would these users need an Ethernet cable?

Cisco continues to maintain that an Ethernet cable is exactly what it needs. The vendor advocates what it calls a "unified network" —wired and wireless, with a 3G cellular overlay. While there are some use cases where 802.11n can work as the primary access network, a "wireless only" model is inflexible and the cost benefits exaggerated, says Chris Kozup, senior manager for Cisco's mobility solutions group. Aruba's right-sizing is a "shortsighted message from a wireless-only provider. It's penny-wise and pound-foolish," he says.

But one college was able to compare the relative costs of the two approaches. Morrisville State College (MSC) in New York, site of the first large-scale draft 802.11n deployment, with Meru Networks gear, has two recently built four-story dorms, which are owned by the college's auxiliary corporation. The corporation decided to deploy both a full wired network, with at least one port per bed, and two or three in the common area of each suite of bedrooms, and a wall-to-wall 802.11n WLAN, says Matt Barber, MSC's network analyst.

A wireless-only deployment would have needed two 48-port switches for the WLAN access points, which are cabled to the switches. The combined wired and wireless access network required 10 switches, with correspondingly more cabling. He estimated the difference in the "tens of thousands" of dollars.

The older MSC dorms offer only wireless, and the college has been phasing out what are now superfluous ports for classrooms, leaving typically one or two for such gear as a projector, Barber says. "If we don't have to put in wired ports, we won't," he says.

"The driver always comes down to economics, in my experience," St. Bonaventure's Kellogg says. "That's almost always the reason something either gets axed or pushed through. If you can't show the benefit for the extra cost, it just isn't going to happen." ■