

# PACKET<sup>®</sup>

CISCO SYSTEMS USERS MAGAZINE

SECOND QUARTER 2004

## Communicating in an IP World 30

**How Technology  
Is Transforming Business**

19 Power over Ethernet

65 Service-Driven  
Metro Networks

80 Branch of the Future

57 Business Ready  
Data Center



CISCO SYSTEMS



[cisco.com/packet](http://cisco.com/packet)





IP COMMUNICATIONS IS TRANSFORMING BUSINESS  
AS USUAL IN MANY INDUSTRIES.

## LICENSE TO COMMUNICATE

**WASN'T THAT AIR CANADA** ticket counter a Lufthansa ticket counter earlier in the day? It could be so if you're at Toronto Pearson International Airport in Canada. Until last year, Pearson assigned each airline its own counters, with phones dedicated to the airline's own extension and speed-dial numbers. Now the Greater Toronto Airports Authority (GTAA) management can assign any airline to any unused counter: agents personalize the Cisco IP phones and

BY  
RHONDA  
RAIDER

PCs at the counter in just a few minutes, with a single sign-on. "The inability to shift unused counters to another airline has long been a problem for the airline industry, creating the potential for wasted resources," says Thomas Tisch, the airport's general manager of electronic systems and technology. "Now, with Cisco CallManager and its Extension Mobility feature, we have far more flexibility and can use our space more efficiently."

### IP Network as "Communications License"

Pearson's application is a prime example of innovative uses of IP telephony across the spectrum of industries, including transportation, manufacturing, government, education, insurance, healthcare, and financial services. "In any industry, IP communications is changing the way people work to make them more productive," says Alex Hadden-Boyd, director of marketing for IP communications in the Product and Technology Marketing Organization at Cisco. "Just as a driver's license gives you permission to drive any number of cars, an IP network gives you a license to communicate using any device—phone, PC, fax, or videoconferencing terminal from any location."

### Transportation: "Virtual Gate" Application

The "virtual gate" application at Pearson International Airport runs over the GTAA's optical backbone network, based on the Cisco 7600 Series Router, and was introduced in 2003 to replace 82 separate data, telephony, and video networks. "Agents in our new terminal can customize both the PC and Cisco IP Phone 7960G's at the gate with a single sign-on," explains Ian Grant, manager of electronic systems for the GTAA. The first agent to arrive logs on to the airline's Common Use Passenger Processing System (CUPPS), which runs on a PC. The airport uses the Cisco CallManager application programming interface (API) to instruct CUPPS to alert Cisco CallManager when the airline identity changes, at which time Cisco CallManager automatically pushes the new airline's profile to the Cisco IP phones at the gate. The profile includes the phone number as well as the airline's speed-dial numbers. "Those features make the Cisco IP Phone behave like the phones the agents are accustomed to, which eliminated our airlines' training concerns," says Grant. "Then we took advantage of unique features of Cisco IP communications solutions to add even more value."

For instance, to make the directory more relevant for airline employees, the GTAA divided it into two branches: one with numbers important to "above the wing" employees such as airline agents, and another for "below the wing" employees such as baggage handlers and maintenance staff. And the airport also wrote another Extensible Markup Language (XML) application for the airport's Resource Management Group that lets employees receive calls pertaining to a particular function, such as baggage, simply by logging onto that screen on their Cisco IP phones. "IP telephony has created new application possibilities that weren't possible with standard phones," says Grant. "Cisco CallManager and Cisco IP phones enable the airline industry to take advantage of a common format, XML, to cut costs and to improve service for our passengers."

### Manufacturing: Rapid Response to Change

The ability within IP telephony to quickly set up new phones solved a different business need for Ingersoll-Rand, a leading manufacturer of solutions for security and safety, climate control, and industrial solutions and infrastructure. In late 2003, the company sold a division in Torrington, Connecticut, and needed a quick, cost-effective way to set up a telephony network for the 30

executives who remained behind—with no local IT staff. The company didn't have the luxury of waiting weeks to order and deploy a small PBX and order phone service. Instead, Ingersoll-Rand had a fully functional IP telephony service just days later, by setting up the office as a satellite off of an existing, centralized Cisco CallManager call-processing cluster in the company's Huntersville, North Carolina office. Besides PCs and printers, the only new hardware needed to bring up a fully functional new office was a Cisco 3745 Router and Cisco IP Phone 7960G's. "All routing, switching, and voice and data connections to the IP network and PSTN [public switched telephone network] terminate in that one little router," says Damon Cahill, manager of infrastructure strategy at Ingersoll-Rand.

Employees in the satellite office have access to all features enjoyed by their corporate counterparts, over the WAN.

Should the WAN link fail, telephony service continues without interruption, thanks to the Survivable Remote Site Telephony (SRST) feature, a standard feature of Cisco IOS® Software that, when enabled, automatically begins routing calls over the public PSTN. "Centralized call processing means we need less hardware at local sites and less administrative burden, which translates to lower costs," Cahill notes.

Ingersoll-Rand plans to use the same centralized call-processing model for its other smaller sales offices. "The business case for centralized call processing with SRST is very compelling for offices with 100 or fewer users, and we can cost-justify it for certain larger sites, as well," says Cahill. "It's simple: the cost of a Cisco router and Cisco IP phones is far less than that of a PBX."

### Unified Messaging Boosts Productivity

The Cisco CallManager cluster at Ingersoll-Rand's Huntersville office also provides Cisco Unity™ unified messaging, which lets employees retrieve both voice mail and e-mail from their IBM Lotus Notes groupware e-mail inbox. "Before I leave for the airport, I replicate my inbox locally so that I can compose responses when I'm on the plane," says Cahill. "Next time I connect to the network I send them out. Now, with Cisco Unity, I can listen to and compose responses to voice-mail messages as well, with my laptop and headset."

Hadden-Boyd of Cisco has a similar approach to productivity during airport layovers, but uses a cell phone instead of a PC. "If I'm in the airport and have ten minutes before my flight, I don't necessarily have time to find an Internet connection to check e-mail from my PC. With Cisco Unity unified messaging, I can call on my cell phone and listen to both voice mail and e-mail using text-to-speech translation."

Unified messaging improves productivity during Ingersoll-Rand's meetings, as well. Come break time, participants use their laptops on the Ingersoll-Rand wireless network to retrieve and respond to e-mail and voice-mail messages. "In this case, people like the fact that they don't have to listen to every voice mail in order, as they would on their phones," says Cahill. "They see all the callers' names or numbers in their inbox and can jump directly to the most urgent."



In addition to unified messaging, the Cisco CallManager cluster at the Ingersoll-Rand Huntersville office supports a 25 to 30-person contact center whose agents field questions about employees' pensions and benefits. "Cisco IPCC Express Edition software provides us more capabilities than we had on our small PBX system, like recording conversations, allowing supervisors to enter a call midstream, and historical reporting," says Cahill. "And we no longer have to pay someone \$250 an hour to add a queue, for instance. Now we can make the change ourselves, using the simple interface. In the manufacturing industry, where it's fairly frequent that we would add or divest ourselves of a company, the ability to make changes easily is very valuable."

#### Measuring the Cost Savings

Organizations in all industries are likely to cite cost savings as a chief benefit of IP communications, and Ingersoll-Rand has the metrics to prove it. For conference calls, the company traditionally has used a managed service. In the Huntersville facility, where executive meetings might have 100-plus participants, the bill amounted to US\$15,000 a month. Now, the company has eliminated the need for that service with Cisco Conference Connection software, which integrates with Cisco CallManager to provide audioconferencing. Total monthly costs have plummeted to US\$4000 for infrastructure. "Employees like being able to go into a Web interface to schedule their own calls instead of calling the carrier," says Cahill. People join the conference call by dialing a four-digit extension, or by scrolling down on their Cisco IP phones to see the call and then pressing the Join button. Callers from outside the network can join over the PSTN.

Ingersoll-Rand determined that the Cisco IP communications system will slash equipment costs by 38 percent, maintenance costs by 18 percent, and conference call costs by 70 percent. Factoring in the one-time installation charges, the company estimates it will save US\$1.17 million over five years.

#### Information Services: Combined Audio and Data Conferencing Cuts Costs

LexisNexis Group, the global legal publishing arm of Reed Elsevier, the Anglo-Dutch world-leading publisher and information provider, uses a large-scale Cisco conferencing solution, Cisco MeetingPlace, both to cut costs and to safeguard its proprietary data presentations. Until 2002, the company had used two different service providers for external audio and data conferencing. "We were paying US\$1.29 million a year," says Jeff Sira, manager of conference services. "As long as we were billed per minute, we knew the costs would grow each year."

The company not only wanted to slash its audio and data conferencing costs, but also wanted to address a key security concern regarding intellectual property. "Our data presentations deal with strategic issues such as acquisitions, confidential communications with major shareholders, and R&D that we wouldn't want our competition to be aware of," says Sira. "It bothered us to upload this type of asset to someone else's server and then just take their word that it was deleted when the meeting ended."

LexisNexis Group found the answer in Cisco MeetingPlace, which it uses to handle both audio and data conferencing. "It's

been extremely cost-effective," says Sira. "We expected to see ROI [return on investment] in 18 months; instead, Cisco MeetingPlace paid for itself in just 7 months, because our conferencing calling volume increased. And because we own MeetingPlace, it won't cost us more to conduct more conferences as the business grows." The company began with 360 seats, recently added another 240, and expects to add another 240 by the end of 2004.

#### Government: Low-Cost Application Delivery

Located 20 miles northwest of Washington, DC, the Town of Herndon, Virginia took up IP telephony for one reason, and now appreciates it most for an entirely different one. "We adopted IP telephony for scalability and to reduce our phone bills," says Bill Ashton, the town's director of IT. "We succeeded: we're already saving 30 percent every month and expect that to rise to 50 percent when we add the police department to the system. But the more remarkable gain is that we're using IP telephony as a low-cost platform to deliver applications."

For instance, the town has begun pushing AMBER alerts, about missing or abducted children, to its employees' Cisco IP Phone 7900 Series, using the PhoneTop AMBER Alerts system from Cisco Premier Certified Partner AAC Inc.

"When we see an AMBER alert for a child within a 50-mile radius, we push it to all Cisco IP phones using XML," says Ashton. A distinctive ring tone sounds, and then employees have the option to press soft keys on their phones to see more information, including suspect and victim pictures, on the phone display. "With the PhoneTop AMBER Alerts application, we suddenly have six times the number of eyes looking for abductees than we have police officers alone," notes Ashton.

The Town of Herndon is also planning to deploy AAC's PhoneTop EAS Alert Service to push other critical information to employees' Cisco IP phones. "If we receive any kind of emergency message from the county into our database—tornado watch, heightened terrorist alert, major accident on a heavily trafficked highway—we can immediately route it to municipal employees who need to see it," says Ashton.

The benefit potential of IP telephony during disasters hit home when Hurricane Isabelle struck in 2003. Local government offices were closed, but the Town of Herndon nonetheless had to call in certain employees to deal with problems with the water system. Ashton plans to install Cisco IP SoftPhones on key employees' home PCs so that they can work from home during hazardous conditions, which will help to ensure their safety and alleviate traffic on the roadways.

"If you give me enough money and time, I can deliver any application you want me to," Ashton continues. "But if you want to save money and time, the Cisco IP Phone is a superior delivery platform. It's low cost, always on, and I already have a phone everywhere in the organization. I have fine control over the applications because I subscribe employees to the service, which runs in the background. To have that level of control if I delivered an application to the computer, I'd have to deal with operating system concerns, and buy and install backend software. This way, everything I need is native to Cisco CallManager."

### Education: Facilitating Communication

The benefits of IP communications extend beyond cost and productivity. In education, IP telephony is changing the way teachers, students, and parents communicate. The impact is especially noticeable at Washington School for the Deaf (WSD) in Vancouver, Washington. Since WSD transitioned from a traditional telephone system to Cisco IP communications with NXi Telephony Services (NTS) text-messaging software from NXi Communications, all WSD employees—hearing and deaf—have enjoyed equal access to communications services.

When WSD relied on a traditional telephone system, a teacher who was deaf and needed to talk to a hearing person by phone either needed to use a relay service or ask another staff member to call the parent and then interpret using American Sign Language. “Apart from the obvious privacy and independence issues, this system increased WSD’s phone bills because the relay service charged more for long-distance calls than the school would pay if the caller had dialed directly using the low-cost, state-controlled access network,” says Lorana Myers, supply officer at WSD.

Now WSD staff and faculty, both deaf and hearing, can make and receive calls independently using either their Cisco IP phones or NTS client software on their PC or laptop. “One of our deaf teachers used to e-mail me if she had questions during her prep time,” says Myers. “Sometimes we barely had enough time to resolve the issue before class started—and that’s if I received and opened her e-mails

platform can handle voice-mail sessions for both hearing and deaf users. When a hearing person calls a deaf person’s extension, the system issues a voice prompt that the person called does not accept voice messages, and offers the caller the option to either insert the telephone handset into the teletypewriter (TTY) coupler to leave a text message or be routed to a hearing operator, who takes a TTY message. Either way, the message is delivered to the deaf user’s NTS client software on the desktop. “With Unity and NTS, parents and others without TTY devices for the first time have the ability to leave messages for deaf staff and faculty,” says Myers.

### Freedom to Innovate

“Before we built our Cisco IP communications network, I was in the business of saying ‘no’ to requests for telecommunications service changes, because they were too costly and time-consuming,” says Ashton, from the Town of Herndon. “Now I’m in the business of saying ‘yes.’” Case in point: the town is engaged in an ongoing debate about extending rail service to Dulles International Airport. The train would roll just outside the town limits, so at one point the town became a focal point for the media, and Ashton needed a media center for the major news services—and in a hurry. “Six months ago I would have declined,” he says. “But with the Extension Mobility feature in Cisco CallManager, I just grabbed a few phones from stock,

**“IF YOU GIVE ME ENOUGH MONEY AND TIME, I CAN DELIVER ANY APPLICATION YOU WANT ME TO. BUT IF YOU WANT TO SAVE MONEY AND TIME, THE CISCO IP PHONE IS A SUPERIOR DELIVERY PLATFORM. IT’S LOW COST, ALWAYS ON, AND I ALREADY HAVE A PHONE EVERYWHERE IN THE ORGANIZATION.”**

BILL ASHTON, DIRECTOR OF IT, TOWN OF HERNDON, VIRGINIA

immediately. Now she uses her NTS client software to call me and we can converse in real time, resolving questions much more quickly. With our Cisco IP communications solution we can now do all the things that hearing people take for granted.”

Two redundant Cisco CallManager servers form the core of the solution, providing telephony services throughout the school’s 12-building campus fiber network. One Cisco CallManager server includes Cisco IPCC Express Edition software, which provides automatic call distribution (ACD) of calls from hearing and non-hearing callers. People who call the school’s main number are given a voice prompt to press 1 to continue. “Callers who don’t press 1 are presumed deaf and are automatically transferred to the NTS server,” Myers explains.

Both the Cisco IP Phone and NTS client provide visual indicators not only for dial tone, but also for ringing, hold, call termination, message waiting, and the like. A strobe light connected to the Cisco ATA 186 Analog Telephone Adapter provides another indication of incoming calls. The dial-tone indicator enables deaf employees to use the two-stage dialing required to access the low-cost, state-controlled access network.

Remarkably, WSD now provides equal access to voice mail, as well. A Cisco Unity server residing on a Cisco MCS 7835

plugged them into a conference room, and added the newscasters and their phone numbers to the system. Within 20 minutes we had our media center.”

Communications is the lifeblood of many industries and, like Ashton, IT people are waxing creative with new, IP-based solutions for improving productivity. For instance, when Cisco recently had a power outage, the company broadcast instructions on how to leave the building to employees’ Cisco IP phones, which remained on because they drew inline power from Cisco routers.

“IP is the universal translator that integrates voice, video, and data,” according to Hadden-Boyd. “The end user has the freedom to choose what media they want, and what device they want to use to receive it. Hearing about some of these applications, people might ask, ‘Weren’t they possible ten years ago?’ The answer is yes. The difference is that today, technologies like IP and XML have made it so much easier. Something that used to be either impossible or incredibly complicated, like walking down the hall talking on a Cisco Wireless IP Phone 7920 and then switching to a Cisco IP Phone 7970G, with color touch-screen, when you arrive in your office, or adding video to a call midstream with Cisco VT Advantage software, can now be done with the press of a button. What once was very difficult is now casual and ad hoc.” ▲▲