

# Access VPN to the Rescue

ALTERA TURNS TO CISCO SOLUTIONS FOR ON-THE-FLY CONNECTIONS

**T**HE NETWORK STAFF AT ALTERA Corporation ([www.altera.com](http://www.altera.com)) has found some unique ways to use Cisco virtual private network (VPN) solutions in response to dynamic user and business requirements. A fast-growing enterprise, Altera designs, manufactures, and markets a broad range of high-performance, high-density programmable logic devices and associated development tools. Its corporate culture encourages innovation and rapid results.

Altera, based in San Jose, California, has a highly mobile work force, especially in sales and support. Before implementing its Cisco VPN solution, Altera incurred significant monthly telephone bills as users dialed directly into Altera headquarters from around the world. The mobile sales force and remote users require access to e-mail, as well as to the mission-critical Siebel customer information system and a Baan enterprise resource planning (ERP) system. Because the remote-access Siebel application synchronizes potentially large files and because long-distance dial-in connections are often inconsistent in quality, performance across public-access lines can degrade. Broadband access for remote-access users via Digital



Subscriber Line (DSL) or cable modems, however, has helped alleviate that problem.

### Slashing the Telephone Bill

A VPN solution initially appealed to Altera's network planners because they wanted to reduce the monthly telephone network charges racked up by dial-in data users. VPNs reduce telephone charges by enabling remote users to dial into a local point of presence (POP) and then access the Altera

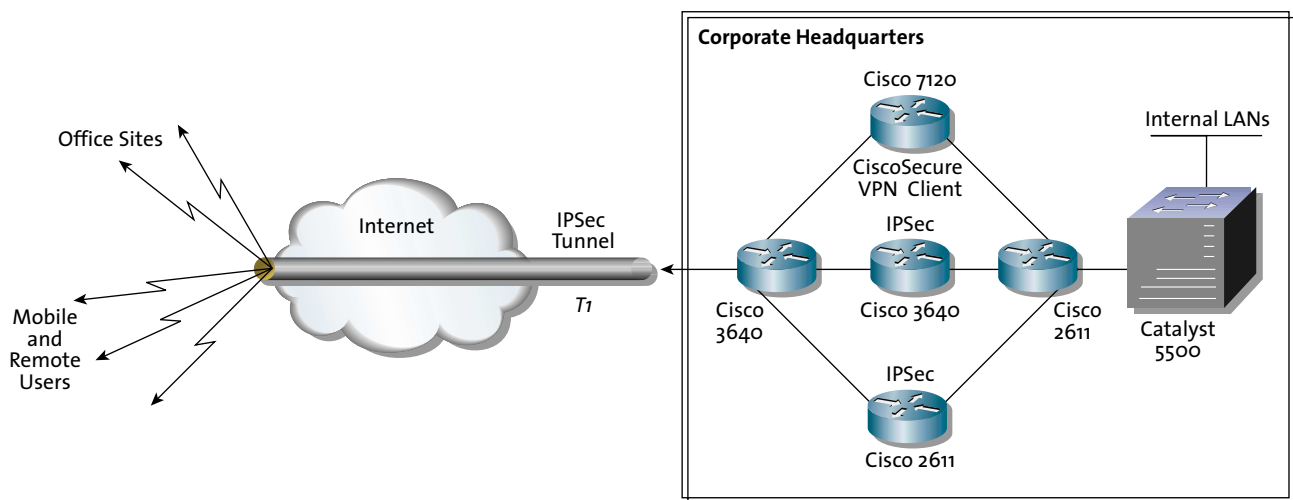
### Alternative during Telecommunications Strike

Altera learned most of its VPN lessons in two rollouts, both inspired by sudden need. "The first lesson was pain-motivated," says Swan. In April 1999, the company needed to provide remote connectivity for an employee near Toronto, Canada—but a local telecommunications strike meant that it could not obtain a Frame Relay line. As hopes for a quick resolution to the strike faded, the team explored other options and found a carrier installing

to its San Jose headquarters. "We had to get them on board quickly," says Steven Doi, Network Engineer and VPN Project Leader at Altera. The Altera team saw an opportunity upon discovering that the site had a 386-kbps Symmetric DSL (SDSL) connection to the Internet. "We grabbed a Cisco router and some switches and went down there. We got them on line in one afternoon."

The only glitch was reconciling static IP route addresses with the service provider, a

## ALTERA'S VPN LAYOUT



**REDUCING COSTS:** The Altera access VPN network accepts connections from a variety of remote user equipment and access lines, including dial, ISDN, DSL, and cable modems. IPsec clients enable triple DES-encrypted tunnels across the Internet with additional security from the Cisco IOS Firewall Feature Set and NAT.

network via the Internet.

"However, the benefits turned out to be slightly different than what we expected," says David Swan, Manager of Network Operations at Altera

Initially, Altera had intended to replace its entire dial-access system with a VPN. The company discovered, however, that for local calls, using the Internet did not save the company money compared with direct dial-in. So the company implemented the access VPN solution only in remote sites that would incur long-distance charges when dialing into centralized Altera data resources, explains Swan.

ISDN lines despite the strike. Altera shipped a Cisco 2610 router to Canada and established a triple DES IP Security (IPsec) VPN tunnel over ISDN to its San Jose headquarters. The VPN solution also uses Network Address Translation (NAT) and the Cisco IOS® Firewall Feature Set to prevent possible "back door prowlers" from entering the Altera network. It worked so well that the company never bothered to order a Frame Relay line after the strike ended.

### Acquisition Drives Connectivity Demands

The second lesson came in July 1999, when Altera needed to connect engineers at a newly acquired business in Santa Cruz, California,

routine fix. A router-to-router IPsec tunnel between a Cisco 2621 router in Santa Cruz and a Cisco 7120 router in San Jose required no client software installation. After the connection was up, the Altera team upgraded the SDSL speed to 1 Mbps.

### Cisco 800 Eliminates Client VPN Software Requirement for ISDN Access

The VPN network has since grown to include remote-access user sites in eight US cities. Users run CiscoSecure VPN Client software on their PCs. While remote sites run access equipment from various vendors, Altera is upgrading that equipment to Cisco 800 series routers for ISDN access because of their additional security and ease-of-management features. Especially attractive are

*Continued on page 79*

the Cisco IOS Firewall Feature Set, NAT, and IPSec router-to-router tunneling and encryption software. With triple DES-encrypted IPSec on the router, the Altera staff no longer needs to install or maintain VPN client software on remote user PCs. The Cisco 800 and other routers with IPSec capabilities also allow users with Macintosh or UNIX computers to enjoy the benefits of VPN connections. For simplicity, branch office and "important user" VPN traffic is routed through a Cisco 7120 router, and traffic from home users is routed into a Cisco 3640 router.

**Partners in Problem-Solving**

The Altera staff encountered minor obstacles while testing the Cisco 800 series router for remote-access use. They were surprised by lower transfer speeds compared with their previous direct-dial solution, which used a proprietary compression algorithm. Overcoming this discrepancy while transitioning from direct dial to VPN access can be complex. With VPNs connecting to public networks, Swan explains, "You can't guarantee anybody that they're going to get compression of any type."

Altera began testing Cisco 800 routers with static IP addresses and found that call setup took as long as two minutes. "That was a big shock," says Doi. Fixing the problem required several steps, and Cisco engineers worked closely with Altera to take them. They found that unique to the Cisco 800 series, the clock must be synchronized with

the network access server upon initial bootup to reduce call setup time by about 30 seconds. A single Simple Network Timing Protocol (SNTP) configuration command solved that.

Further, static IP accounts cost US\$130 per month from the service provider versus US\$20 per month for a Dynamic Host Configuration Protocol (DHCP) account. To save money, the Altera team wanted to use DHCP, but doing so would have disabled their access control lists (ACLs), which are vital for filtering out unwanted traffic. The answer was a VeriSign certificate authority (CA), which works well with dynamic IP addressing, IPSec filtering, and authentication. Cisco delivered the Cisco IOS software upgrades required to enable DHCP/CA interaction on the Cisco 800 series router. To complete the hookup, Altera activated NAT, DHCP, and the Cisco IOS Firewall Feature Set on the Cisco 800 routers and the Cisco 3640 router in the central office.

Production-scale rollout to remote-access users started in late 1999. The network will continue to support CiscoSecure VPN Client connections for Altera's mobile users. At this stage, it is too early to determine exactly how much the VPN solution will save Altera over direct-dial costs, but Swan says he predicts a rapid return on investment.

Mobile users with the CiscoSecure VPN Client also encountered some challenges. Initial testing revealed that during the tunnel setup time, users would receive a

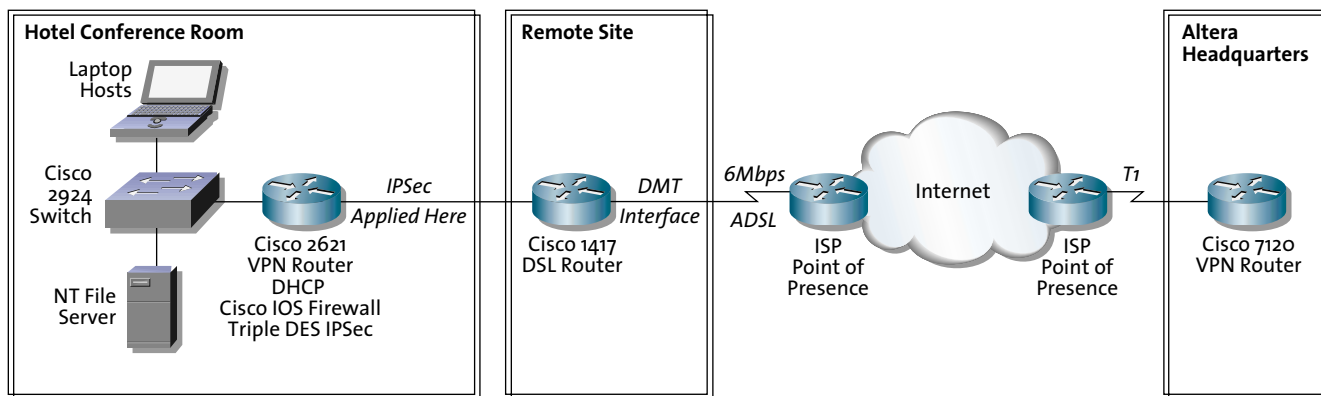
"domain not found" login error message. Patching the NetLogin registry to time out after 30 seconds eliminated the error message. Altera's IPSec solutions use triple DES encryption, which has a negligible impact on performance. "We were pleasantly surprised about that," says Swan.

**VPN in a Box**

The culmination of everything his team learned about VPNs, says Swan, was inventing what Altera calls the "VPN in a box." "It sets a precedent for deploying rapid, temporary network access," he says. Altera's field account engineers (FAEs) wanted intranet connectivity during their global sales conference in October 1999. Using lessons learned in Santa Cruz, Doi and his team packed a preconfigured Cisco 2621 router and Cisco Catalyst® 2924 switch into an Anvil case. Using the DSL connection provided by the hotel where the conference took place, they found that they had a "plug-and-play" setup. They were able to establish a VPN to San Jose within 15 minutes of opening the case. FAEs connected their laptop PCs to the switch via Ethernet. Router-based DHCP enabled easy IP addressing of each laptop, while NAT and the Cisco IOS Firewall Feature Set provided additional security.

Altera plans to keep its VPN in a box for special events and for use as a disaster-recovery tool. "It's so simple, it's silly," says Swan. "It's a classy, elegant solution to something every business needs." ▲▲

**ALTERA'S "VPN IN A BOX"**



**VPN IN A BOX:** Residing inside an Anvil case, Altera's mobile VPN setup can go anywhere that there's a DSL line for rapid, secure ad-hoc or disaster-recovery connections. Router-based DHCP makes it easy for end users to connect their laptops to the network.