InformationWeek 500: Feeling The Heat, Sempra Scrambles To Restore Power

Amid last year's wildfires in Southern California, the utility company's IT team establishes communications for a dozen temporary command centers.

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As wildfires raged across southern California last year, San Diego Gas & Electric and Southern California Gas faced the daunting challenge of restoring electrical service to the fire-ravaged area. The task at hand: fixing more than 35 miles of overhead electrical wires and repairing 1,800-plus utility poles while thick smoke filled the air.

Sempra Energy, the utilities' parent company, had been through something like this four years earlier, when wind-whipped fires ripped through San Diego County. But last year's inferno was much worse. It burned 300,000 acres, and a half-million people were forced to evacuate their homes and take shelter in hotels, churches, and Qualcomm Stadium, home of the San Diego Chargers football franchise.

Sempra's IT team moved quickly to establish a dozen or so military-style command and communications centers in the area. One overarching requirement was to ensure that there was adequate infrastructure and bandwidth to support the response effort; the utility company's data requirements had more than doubled since the previous fires.

Workers in the field used cell phones, BlackBerrys, and satellite phones for voice calls, while a Motorola DataTac network supported basic data communications. Where available, Sempra also used 802.11a Wi-Fi hotspots operated by telecom carriers to give workers network connectivity. The company had recently upgraded to Gigabit Ethernet, so its backbone network was in good shape.

Yet, even more bandwidth and on-the-go capacity were needed to support the emergency effort. For example, a mapping program that churns data to give real-time updates on power line status required high throughput. Within hours, Sempra's Internet service provider bumped up data capacity by 25%. Verizon Wireless and Sprint, meanwhile, delivered nearly 200 AirCard cell modems to enable mobile broadband access over the carriers' EV-DO data networks.

The radio system was critical to crews in the field. Sempra deployed a Motorola SmartZone 900-MHz voice radio system with solar-powered repeaters. The company had previously worked with local police and fire departments to ensure interoperability with their radios.

IMPROMPTU PIPES

Advance preparation and ongoing research and development put Sempra in a good position to respond when it had to. Prior to the blazes, the company had been working with Proximetry, a specialist in wireless network management, on a pilot program that involved the use of long-

range Wi-Fi to give distant facilities broadband access. As the firestorms tore through the area, that program was pushed into production.

From a data center in Rancho Bernardo, Calif., a point-to-point 802.11a link was established with a hub on Mount Woodson nearly 8 miles away. It was a "relatively straight shot," says Mike Calcagno, IT architect with Sempra. From the mountaintop, an AirTegrity antenna and router provisioned point-to-multipoint links to two of the temporary command centers, also equipped with AirTegrity antennas. With average connections of 5 Mbps, those impromptu pipes provided up to 10 times the bandwidth of EV-DO cell services to the command centers, where Wi-Fi hotspots operated at 2.4 GHz.

The increased bandwidth allowed workers to directly access information from the data center, as well as communicate using a hosted voice-over-IP service. Within each command center's LAN, the VoIP and data traffic were put on different subnets to ensure that traffic could be prioritized. Proximetry's AirSync software enabled Sempra to manage and provision its bandwidth according to needs.

"Technically, the solution met our security requirements, provided excellent throughput, and was compatible with our existing standards for end user equipment," says Calcagno.

In The Backcountry

While voice and data were available in most of the mobile command centers, there were locations in remote regions with limited access. These backcountry sites either had no cellular coverage or the existing communications infrastructure had been destroyed by fire. In these situations, Sempra turned to satellite communications equipment from Tachyon Networks for its uplink and backhaul needs.

LESSONS LEARNED

PREPARATION PAYS Be sure to pilot test long-range Wi-Fi and network upgrades.

EMPOWER EMPLOYEES Give front-line workers the tools they need for real-time decision making.

BE RESOURCEFUL Solutions to problems can be found in unexpected places. In Sempra's case, retail stores proved a valuable source of important supplies.

STAY AWARE In stressful environments, it's important to pay close attention to how your colleagues are holding up.

Tachyon has experience providing services during a disaster, having worked with relief organizations, government agencies, and commercial enterprises during Hurricane Katrina and other emergencies. But the wildfires hit the satellite company close to home—its San Diego headquarters had been deemed too dangerous to occupy because of dense smoke. The company managed to offer its satellite IP service, T-Force, without degradation from a mirrored facility on the East Coast. "We had done our due diligence on Tachyon," says Calcagno.

Although Sempra was a first-time customer, Tachyon crews were on site with equipment at one of its command centers within 14 hours. A satellite dish was attached to the roof of the trailer at

one remote location, and a hasty infrastructure of coaxial cables and routers was installed. Because Tachyon's equipment is TCP/IP-compliant, Sempra was able to access Web-based applications in the field with little concern for security or application compatibility.

The geosynchronous satellite system provided 1.5-Mbps downloads and 512-Kbps uploads, and a Linksys router created a wireless LAN for the command center. Overall, Tachyon's T-Force package included network connectivity, on-site installation and support, VoIP phones (from Cisco) and services, and an Internet-hosted DNS.

The satellite broadband service eventually was deployed in three locations, where it was used by Sempra employees to order equipment, track shipments, and keep in contact with field personnel and headquarters. As a result of that experience, Sempra now has an agreement in place to have Tarchyon's T-Force package available at "a moment's notice," says Jeffrey Nichols, Sempra's director of network and communications services. Sempra's IT team was forced to improvise, as well. Staffers swarmed Best Buy, Fry's Electronics, and Home Depot for eight-port switches, 802.11 wireless routers, batteries, flashlights, and more. "Never underestimate the importance of power strips and long cables," says network architect David Webber.

During the twice-daily conference calls with headquarters, field leaders were reminded this wasn't "business as usual." Beyond the practical tasks like accounting for personnel, managers were asked to be situationally aware and on the lookout for colleagues who might be feeling stressed and fatigued. "As you keep hearing the continuous reports of more fires and more houses lost, it wears on you in ways you never thought possible," says Webber.

Looking back, there were some times during the fires when the outlook was bleak, Nichols says. Then he adds that the company's previous experience and faith in its employees are what got it through.

Illustration by Brian Stauffer