

Case Study

City of Temple

City of Temple Deploys BridgeWave's Gigabit-Upgradeable Wireless Links to Deliver Voice, Data and Video Services



The city of Temple is a thriving metropolis in the heart of central Texas with one of the leading medical centers in the Southwest as well as home to large nationally recognized corporations, an acclaimed historic district and an array of public parks and recreational areas. Temple has gained recognition for its progressive adoption of innovative technologies to deliver public services, including online payment options for its 60,000 residents and a state-of-the-art mobile public safety communications system. Alan DeLoera, IT director for the city of Temple, and an experienced 18-member team oversee the IT needs of 650 employees working at 32 buildings and facilities across a sprawling 70-square mile footprint. A data center located at city hall serves as the hub for computing and network operations.

While city hall and major facilities, including the police station, fire department, library, public works, court and fleet maintenance center, are connected via fiber optic links, the remaining sites initially were linked in a network star topology using an ad hoc combination of low-speed wireless, T1, ISDN, DSL and cable. For Brandon Harris, assistant IT director for the city of Temple, this patchwork quilt of bandwidth-constrained connectivity was incapable of supporting the city's migration to a converged, high-speed voice, data and video infrastructure.

"We're poised to save hundreds of dollars in network deployment costs and access fees. Most importantly, this forward-looking solution protects our network infrastructure investments while ensuring Temple delivers superlative services to the city's employees, residents and businesses."

- Alan DeLoera
IT Director
City of Temple

"We were eager to roll out additional e-government applications, deploy city-wide VoIP and video surveillance solutions, which meant we needed to upgrade our network substantially," he says.

THE CHALLENGES

- Deliver voice, data and video connectivity to 32 city-wide locations.
- The city of Temple desired a robust yet cost-effective approach for scaling its network to accommodate ever-increasing applications.

"We weren't looking for a quick fix," recalls DeLoera. "Our overarching objective was to deploy a best-of-class wireless backbone that would support all our networking needs for the next decade, which meant being able to extend network capacity over time and pay for additional bandwidth as needed."

- Deteriorating service availability: Temple needed to replace nine aging Proxim 5.8GHz point-to-multipoint radios that had reached end-of-life and were increasingly unreliable. A robust,



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highly-available solution was required.

- Network congestion and bandwidth limitations: Users frequently complained about slow application performance due to network congestion over limited-speed ISDN, DSL and cable modem connections.
- Lack of acceptable leased-line alternatives: Landline service was only available to 18 of the sites, and the cost of even limited 3-Mbps service to these sites was prohibitive at \$64,000 per year. The cost of running fiber to the sites was out of the question.

"The traditional landline solution was too costly and would only cover about half of our locations," notes Harris. "We really wanted a higher speed solution that would support every location, handle our evolving video requirements and deliver more bang for the buck."

THE SOLUTION

In exploring options for the network upgrade, Temple's IT team reviewed a variety of network access and backhaul technologies for connecting its dispersed sites and transporting traffic over a high-speed backbone. While some of the city's buildings were located in close proximity, others were miles apart and situated in rural areas. The team determined that Temple's 10 water towers, which formed a ring around the city, provided an excellent line-of-sight solution for reaching most locations.

Temple then enlisted the assistance of Redmoon Inc., a leading wireless solutions provider based in Plano, Texas, to offer technical guidance and installation support. Redmoon proposed an overall network solution based on integrating a high-capacity backbone using products from BridgeWave Communications with a 5.8GHz mesh access system. They recommended BridgeWave's FE80U point-to-point wireless links, which provide full-rate 100Mbps point-to-point backhaul capacity with software-key field upgradability to full Gigabit Ethernet capacity, when needed to support emerging applications.

"The narrow antenna beamwidth of BridgeWave's GigE and 100Mbps links provide superior interference immunity while delivering enhanced data security," says Harris. "What's more, the highly scalable links were half the price we anticipated for this level of performance."

After discovering that BridgeWave was a viable backhaul solution, the city of Temple opted for a mesh-ring network topology, which created a self-healing network with built-in redundancy for maximum service availability. The design called for installation of seven BridgeWave field-upgradeable, FE80U, 80GHz, 100Mbps point-to-point wireless bridges, which would be mounted on six water towers and city hall at link distances between 1.5 and 3.5 miles. These connections aggregate and backhaul traffic from the mesh access nodes as well as other applications to be rolled out in the coming months.



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"We'd been building the network plan for a year, but it only took two weeks to make a decision on BridgeWave's 'future proof' backhaul technology," adds DeLoera. "We were really excited about the potential of the upgradeable BridgeWave products, both to support today's applications as well as ensuring support for future initiatives." The city expects that its growing network traffic levels will lead to upgrading the 100Mbps links to full GigE rates within the next few years.

Since the city of Temple experiences frequent torrential downpours and occasional tornados, weather was a lingering concern in deploying the wireless network. However, after working with Redmoon and BridgeWave to conduct rain-fade calculations, the IT team concluded that the BridgeWave solution would exceed Temple's requirement for "four nines" network availability. Additionally, it was determined that the ultra-low latency links met all necessary criteria for delivering low-latency, jitter-free voice and video transmissions.

THE BENEFITS

In September 2007, the city of Temple completed its high-speed, wireless network upgrade to meet current requirements while creating seemingly endless possibilities for the future.

"We have tons of flexibility to help city employees better serve their customers over an incredibly fast network," says Harris. "At the same time, we can accelerate a range of public safety, security and disaster recovery initiatives."

Employees in outlying areas, who once grappled with basic connectivity, are ecstatic over the ease and speed with which they can access, transmit and download city-wide data. In several of the outlying parks and recreational facilities, for instance, employees now can handle credit-card transactions for the first time. Meanwhile, Temple's IT team has developed a long list of applications to be deployed over the new network.

Topping the list are VoIP, unified messaging and video surveillance, which are being rolled out in various stages. Within the next six months, the city plans to extend VoIP and unified messaging to all city locations. In addition, a major effort to install video surveillance cameras on all city buildings and public works facilities is moving forward rapidly now that ample capacity is available.

"We're getting a jump on various public safety and security applications leveraging IP video surveillance," explains Harris. "We've started doing around-the-clock remote monitoring using multiple video cameras at the airport and plan to install video cameras on our water towers and water treatment plants as part of a Homeland Security requirement slated for 2009."

Additionally, Temple will begin migrating traffic from its previously separate, traffic signal monitoring, public safety and fresh water infrastructure monitoring applications onto the high-speed wireless network, improving connectivity and reducing network complexity. Other plans call for



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adding a series of Wi-Fi “hot spots” around the city to provide police, fire department and city employees with field access to city servers over the high-speed network. Since new network nodes can be quickly and easily deployed, the city also has identified an opportunity to set up temporary mobile data locations around the city as part of a far-reaching disaster recovery plan.

The city of Temple forecasts a complete ROI in less than three years on its new state-of-the-art wireless network. The overall cost savings also are quite compelling. *“We estimate saving \$100,000 annually by connecting our existing facilities over a wireless network,” concludes DeLoera. “In the long run, we’re poised to save hundreds of thousands of dollars in network deployment costs and access fees. Most importantly, this forward-looking solution protects our network infrastructure investments while ensuring Temple delivers superlative services to the city’s employees, residents and businesses.”*

CUSTOMER: City of Temple, Tex., www.ci.temple.tx.us

INDUSTRY: City Government

CHALLENGES:

- Remote areas suffered from network congestion and bandwidth limitations
- Wanted to deliver voice, data and video connectivity to 32 city-wide locations
- Aging Proxim 5.8GHz point-to-multipoint radios were unreliable
- Traditional landline solution was too costly and wouldn’t cover about half the locations

SOLUTION: Seven BridgeWave FE80U 80GHz wireless links.

CHANNEL PARTNER: Redmoon, Inc., www.redmoonbroadband.com

BENEFITS:

- High-speed transport of bandwidth-intensive data and video to all locations
- Low-latency performance supports VoIP, video and unified messaging applications
- Ability to upgrade easily to Gigabit Ethernet as capacity needs warrant; provides “future-proof” solution
- Endless flexibility to support current and future applications
- ROI in less than three years, saving hundreds of thousands of dollars in network deployment costs and access fees



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