BridgeWave

Case Study
QX.net

QX.net Delivers Reliable, Secure, High-Capacity Business Internet Services in Lexington, Kentucky with BridgeWave's Gigabit Ethernet Wireless Links

Traditionally, Lexington, Ky. has been known as the "horse capital of the world." Thanks to QX Networking & Design (QX.net), the city also is fast becoming a major hub for ubiquitous, broadband Internet services. QX.net was founded 10 years ago by CEO Jonathan Barker, an entrepreneur who discovered an untapped market need for reliable dial-up Internet services while a student at the University of Kentucky. A decade later, Barker still is at the forefront of Internet service delivery—relying now on a state-of-the-art network powered by Gigabit Ethernet wireless links to transport high-quality voice, video and data services to more than 5,000 businesses.

> ***"This one-time investment will produce a complete ROI in less than one year while generating multiple payback opportunities as we continue to create an epicenter for advanced business communications in the Bluegrass state."***
>
> - Jonathan Barker,
> CEO,
> QX.net

QX.net offers high-speed Internet access, co-location, email and web hosting to some of the state's largest employers, including insurance carriers, financial institutions, universities, government entities as well as local television and radio stations. The company has embraced a variety of wireless technologies to support its rapid network build-out while also forging a cooperative relationship with local exchange carrier (LEC) Windstream to provide a blend of wireless and landline services. "As an equal-opportunity provider, we've deployed wireless, free-space optics, ATM, DSL, T3, etc.," Barker explains. "We've installed redundant, high-speed wireless links as well as primary wireless links with T-3, T-1 or DSL backup. We support Voice over IP (VoIP) and also work with Windstream to provide landline phone service. It comes down to giving our customers the largest variety of cost-effective choices with unmatched reliability."

An unwavering focus on quality service at competitive prices has enabled QX.net to achieve 30 percent growth over the past year to date. The readily available high-bandwidth wireless technologies also receive credit for helping the company keep pace with an expanding customer base. Various wireless solutions deliver bandwidth for accommodating increased traffic from widespread VoIP adoption, large data file downloads, increased use of Virtual Private Networks (VPNs) and remote terminal server solutions such as Citrix. "We need to accommodate large bursts of data traffic without any impact on voice quality," says Barker. "Our customers want 100 percent availability and very low latency as any drop in quality of service is completely unacceptable."

CHALLENGE

Since installing its first wireless bridges five years ago, QX.net consistently increased network backhaul capabilities with an assortment of 10-to-45Mbps fixed wireless bridges operating in the 5.3GHz and 5.8GHz unlicensed frequency spectrum. Over time, however, the frequency range became saturated while additional spectrum was scarce in the busy downtown. At the same time, escalating bandwidth requirements were beginning to overburden the 45Mbps links, creating a need for a more robust solution to backhaul traffic to the QX.net backbone.

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The ISP also wanted to bolster its backbone by establishing a series of "sub PoPs" or multiple points of presence for aggregating and transporting voice and data. "Backhaul becomes a problem once you add more people to the PoP," says Barker. "We have to aggregate a fair amount of traffic so a large enough 'pipe' was needed to support an ever-increasing number of customers on the same backhaul link."

Additionally, QX.net wanted a solution that could be quickly and easily deployed as well as scale seamlessly to handle growing bandwidth. While wireless technologies would provide greater control in expediting network build-outs, QX.net recognized that service level guarantees had to be at least comparable to fiber-optic based services.

SOLUTION

In April 2007, QX.net embarked on an evaluation of high-capacity wireless technologies, quickly honing in on leading 60GHz and 80GHz gigabit wireless solutions that wouldn't compete with lower-frequency links for limited spectrum availability. The company found the 1000Mbps bandwidth extremely appealing as it would provide ample capacity for its "sub PoP" build-out strategy. "With gigabit wireless, we had no concerns about 'filling the pipe' to its limits so we knew it would prove an excellent solution for handling ongoing expansion," says Barker. "Still, we had to be validate how well the links would perform in heavy rain while also ensure they could maintain high availability at longer, multi-mile distances."

QX.net enlisted the support of TESSCO Technologies, a value-added supplier of the product solutions needed to design, build, run, maintain and use wireless systems, to assist in a review of competing gigabit wireless products from Loea Corp., GigaBeam Corp. and BridgeWave Communications. TESSCO also helped QX.net compare and contrast these offerings with the capabilities of other carrier-grade broadband wireless links operating in the 11-to-38 GHz licensed radio frequencies.

QX.net was most impressed with the lightly licensed 80GHz products that delivered full-rate, Gigabit Ethernet speeds without the costs and time delays associated with licensing and installing other high-speed wireless links. The ISP also could leverage BridgeWave's 100Mbps copper port for expedited deployment at PoPs without fiber runs while having an upgrade path to GigE once fiber had been deployed. In comparing the 80GHz offerings, QX.net felt BridgeWave's competitive pricing and advanced features were top differentiators. In particular, BridgeWave's AdaptRate 80GHz Extended Range Gigabit link (AR80X) was unique in being the first point-to-point GigE outdoor wireless product to deliver "five nines" availability at distances over two miles.

BridgeWave's AdaptRate feature momentarily switches the link from GigE to 100Mbps transmission to overcome the effects of intense rain downpours. "The link had to operate continuously, even during the strong thunderstorms typical of our region," adds Barker. "Only BridgeWave's GigE links meets all our criteria. Loea's products, at six figures per link, were far too expensive and GigaBeam's solutions didn't have anything comparable to BridgeWave's highly innovative AdaptRate and extended range functionality."

QX.net installed a test link between its headquarters and Barker's home, which was more than four miles from downtown. The company also worked with BridgeWave to predict maximum potential downtime based on link length and annualized forecasted rainfall. The virtual LAN extension exceeded all expectations, with no discernible difference in network latency, bandwidth or performance at the headquarters or remote location. The fact the link maintained predicted uptime despite several very severe thunderstorms with hail helped clinch the deal for BridgeWave.

BENEFITS

In May 2007, QX.net deployed 10 BridgeWave links, including two license-free GE60 60GHz, two licensed GE80 80GHz and six AR80X 80GHz products, as part of a hybrid star/ring network topology. The links garnered immediate high marks for streamlined implementation. "These high-speed bridges are simple to install and I love the graphical user interface," says Barker. "The straightforward installation requires no specially trained technicians and ongoing management is minimal."

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QX.net leverages one of its GE60 bridges as a redundant link to a fiber run that connects the company's headquarters to the Lexington Financial Center, the city's tallest building. QX.net avoids all interference with lower frequency radios as the building's rooftop is overcrowded with a mix of QX.net's own 5 Ghz antennas, a nearby 350,000 watt 5.625GHz Doppler radar, as well as a TV and a radio station. "With BridgeWave, we can be more efficient with limited spectrum by using a different frequency to bypass our completely saturated 5GHz range," notes Barker. "We also didn't need to bring a laptop to the roof to set up the link, which would have required powering down the TV and radio stations. Instead, we simply plugged in a volt meter and adjusted the beam accordingly."

For a customer struggling with the dwindling capacity of a dedicated 45Mbps link, another BridgeWave GE60 link is used to replicate mission-critical data to QX.net's co-location facility for disaster recovery purposes. In a similar fashion, QX.net re-deployed its first BridgeWave AR80X test link to replicate mission-critical corporate and customer data to a remote site every four hours as part of its own business continuity planning. The remaining BridgeWave links backhaul traffic to the company's various "sub PoPs" while offering substantial room for network expansion and the delivery of additional services. Moreover, the ultra-low latency links ensure the highest levels of quality voice and data transmission while also positioning QX.net for the deployment of emerging services.

"We'll be able to double, triple or quadruple network capacity to deliver even more diverse services to our customers in the future," says Barker. "With this vast amount of bandwidth, we'll be able to compete effectively with the cable companies in accelerating the delivery of video on demand (VOD) services. BridgeWave's GigE wireless products open a lot of potential doors for QX.net."

The ISP also appreciates the inherent security of the BridgeWave links, resulting from the narrow width of the GigE wireless beams. "BridgeWave's incredibly narrow radio beams provide our customers with a safe, impenetrable network," says Barker. "We can better safeguard our customers' most sensitive traffic because these links aren't susceptible to interference or interception, which makes them far more secure than inter-building fiber runs."

QX.net leverages BridgeWave's minimal licensing requirements to facilitate fast deployments while avoiding onerous fees. "It costs a lot to license some frequencies," explains Barker. "For example, one of the 18GHz products we looked at cost up to $3,000 to license plus months of FCC processing time to deploy. With our 70/80/90 national license, it costs $75 to register a BridgeWave link, which takes all of five minutes, and we can deploy the link the same day."

Perhaps the overarching benefit of BridgeWave's full-rate GigE links is the ability to cost-effectively stay ahead of the technology curve while ensuring the highest levels of network availability. The links also work seamlessly with 5.4GHz radios to supply full network redundancy. In the future, QX.net plans to add 3.625GHz point-to-multipoint backup links to decrease the overcrowding in the 5GHz frequency spectrum.

For QX.net, BridgeWave's high-capacity, secure and affordable wireless links play an important role in offering the highest quality voice, data and video services at the best value. "BridgeWave's GigE wireless links support our unfolding vision by accelerating QX.net's backhaul and build-out plans," concludes Barker. "This one-time investment will produce a complete ROI in less than one year while generating multiple payback opportunities as we continue to create an epicenter for advanced business communications in the Bluegrass state."

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CUSTOMER:
QX.net, an Internet Service Provider, based in Lexington, Ky. www.qx.net

INDUSTRY:
Telecommunications

CHALLENGES:

- Rapid network expansion was hampered by limited spectrum availability in busy downtown.
- Creation of multiple PoPs for backhauling traffic required substantial bandwidth to accommodate growing customer base.
- Low-latency wireless was needed for jitter-free VoIP while accommodating large bursts of data traffic.

SOLUTION:
10 BridgeWave GigE wireless links combining GE60, GE80 and AR80X products

CHANNEL PARTNER:
TESSCO, a value-added provider of wireless solutions, based in Hunt Valley, Md.

BENEFITS:

- Simple installation using a volt meter, intuitive GUI and light licensing accelerate deployments while lowering overall costs.
- Unique AdaptRate capability ensures continuous operation in heavy rain; easy integration with lower-frequency radios facilitate full network redundancy as needed.
- Ample bandwidth to support emerging services, including VOD.
- Complete ROI in less than three years.

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