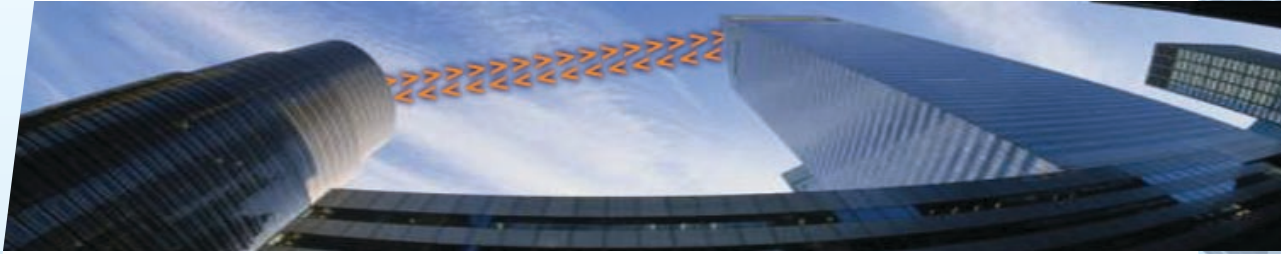




Case Study

MST Holdings, Inc.



MST Gains Rapid Market Momentum with 'Quad Play' Voice, Data, Video and WiFi Services Fueled by BridgeWave's GigE Wireless 'Virtual Fiber'

MST Holdings, Inc., (MST) is a communications technology company that delivers NuVisions™ "quad play" services, including video, voice, Internet and WiFi, to multi-tenant unit (MTU) and multi-dwelling unit (MDU) residential, hospitality and commercial properties in New York and New Jersey. The highly differentiated service provider continually leverages its proven cable television, satellite, wireless, digital compression and telecommunications expertise to offer a customized suite of services that effectively addresses multiple applications and requirements.

MST serves more than 5,000 customers in the New York metropolitan area and northern New Jersey with expansion underway in San Francisco as well as service rollouts planned for other markets nationwide with high concentrations of MDU complexes. According to Frank Matarazzo, CEO and founder, MST's ability to leverage state-of-the-art wireless technology has accelerated the growth rate of its NuVisions Broadband customer base at a cost per subscriber that is far less than traditional carriers or franchise cable operators.

"A GigE wireless network can be established in the sky for a mere fraction of the billions of dollars of assets in the ground. With BridgeWave's virtual fiber, MST can deploy a state-of-the-art network and offer robust services at affordable prices—years ahead of what traditional carriers and cable operators can deliver."

Frank Matarazzo
CEO
Microwave Satellite Technologies Inc.

"MST can deploy services in days, weeks or months instead of years," he says. "As a result, we can be up and running fast and economically while delivering a broader service offering with greater customer value."

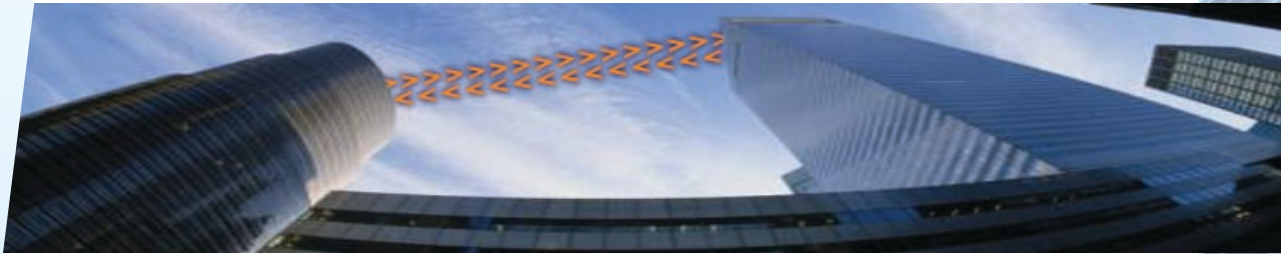
MST has secured access agreements with high-profile property owners and world-class real estate developers such as The Trump Organization, Zeckendorf Development, Equity Residential, The LeFrak Organization, Urban West Development and Becker & Becker. The company also has created a digital metropolitan area network featuring a self-healing multi protocol label switching (MPLS) ring to reach the entire New York City market, including Roosevelt Island, as well as neighboring areas in New Jersey. The company also has plans for further expansion into Westchester, Long Island, Connecticut and other markets nationwide. Additionally, MST has deployed a WiFi "cloud" covering large geographic areas of New York City that can be used by NuVision subscribers with Wi-Fi equipped devices.

"Our goal is to provide ubiquitous access to our full suite of broadband services while becoming the preferred service provider for property owners," adds Matarazzo.



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THE CHALLENGE

Since time-to-market is crucial to MST's aggressive expansion plans, MST chose high-speed wireless as a way to link buildings to its NuVision network while avoiding the challenges of leased-line fiber-optic services, including:

- Excessive time delays and expenses securing municipal rights-of-way and trenching in major metropolitan areas.
- Monthly fees of \$8,000 to \$13,000 to lease GigE fiber-optic services.

"We wanted to avoid digging up streets and paying recurring monthly fees," explains Keith Scarzafava, chief technology officer for MST. "More important, however, we wanted to deploy high-speed wireless so MST could leverage the rooftops of all the buildings in our network to create a 'virtual fiber network' in the sky."

A long list of hurdles had to be cleared by the optimal high-speed wireless solution, including:

- Substantial network capacity to support a robust backbone capable of accommodating a current and evolving blend of bandwidth-intensive services.
- "Five Nines" availability to support MST's high Quality of Service (QoS) requirements.
- Ultra-low latency performance to ensure jitter-free delivery of VoIP, IPTV and Video-on-Demand (VOD) services.
- Interference immunity to avoid frequency saturation problems in crowded metropolitan areas.
- Ease of installation and radio alignment to expedite deployments.

"MST had stringent requirements for a high-speed wireless solution since no one does 'quad play' the way we do," Scarzafava adds. "We wanted to cover a large area and build a backbone that would be more robust than any current WiMax play. The right high-speed wireless backhaul solution was an essential element of this plan."

THE SOLUTION

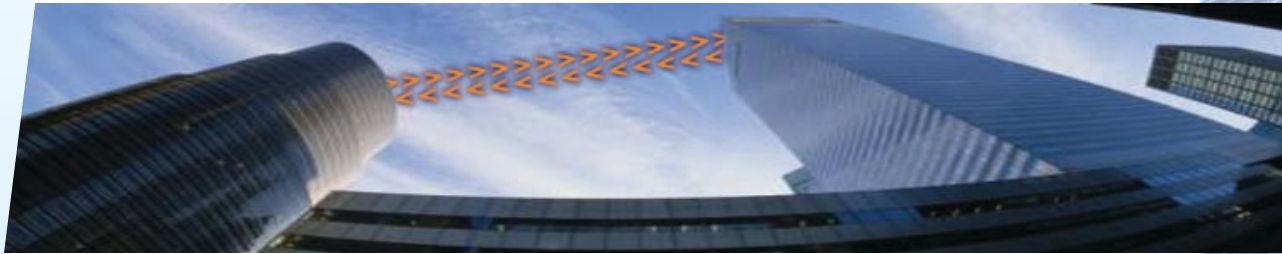
In reviewing options, MST quickly focused its evaluation on 80 GHz gigabit wireless technology, as it provided the highest bandwidth capacity available and promised to satisfy the company's strict requirements for network availability, low latency and interference immunity. The company then embarked on a thorough review of gigabit wireless products from BridgeWave Communications and GigaBeam.

Previously, MST had deployed some early GigaBeam links as part of a pilot project, but had mixed results. In July 2007, the network operator initiated a side-by-side test of its GigaBeam links with BridgeWave's AR80



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product as well as its AR80X, an extended range offering that features a two-foot antenna supporting up to 40 percent greater link distances. Both companies' products involved in the test operate in the licensed 80 GHz frequency spectrum and deliver full-rate Gigabit Ethernet speeds. In both cases, the links feature extremely narrow antenna beamwidths, offering enhanced data security as well as interference and interception immunity.

As the testing soon revealed, however, there were many more differences than similarities between BridgeWave's and GigaBeam's products. For MST, one of the most compelling differentiators was BridgeWave's exclusive AdaptRate™ technology, which momentarily switches transmissions from GigE to 100 Mbps data rates during periods of intense rain downpours. This would ensure continuous operation even when severe rain cells occasionally pass through the region.



Moreover, MST found the extended reach of BridgeWave's AR80X product extremely appealing for ensuring better link availability at distances beyond two miles.

"Our shortest link is a quarter of a mile yet our longest is just over two miles," adds Matarazzo. "We had to ensure the same 'five nines' availability regardless of distance and BridgeWave's adaptive rate and extended range capabilities provided the elevated levels of network availability MST demanded."

BridgeWave's GigE wireless links also were much easier to install and align than their GigaBeam counterparts.

"It was much easier to align BridgeWave's product using their fine-adjust mount, which requires only one wrench size for all adjustments," notes Scarzafava. "Network status monitoring also was far superior with BridgeWave. We were able to seamlessly integrate its management functionality with our network monitoring software and provide automated reports to technicians, which is a big plus."

At the end of a comprehensive six-month evaluation, MST declared BridgeWave the winner, purchasing two AR80 and five AR80X radios to replace existing GigaBeam links while also bolstering its NuVisions Broadband network backbone.

"Clearly, BridgeWave is ready for primetime—with very stable GigE wireless radios, innovative features and 'plug and play' installation, which will prove instrumental during our next phase of rapid growth," says Matarazzo.

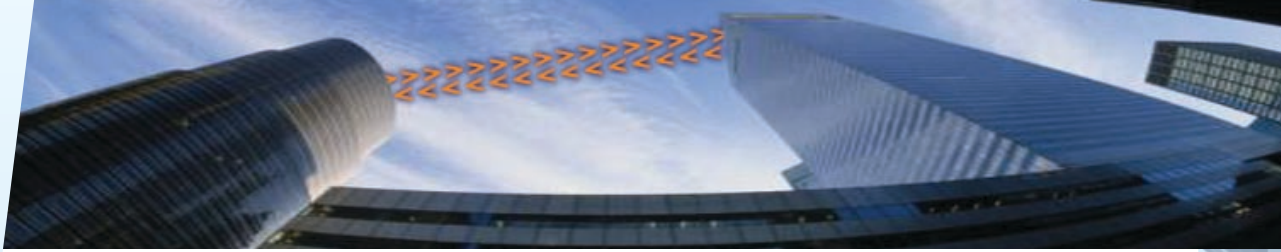
THE BENEFITS

In late 2007, MST implemented its initial BridgeWave links without incident or complication. Installation and support has lived up to all expectations. In particular, the network operator has taken



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advantage of BridgeWave's inclusion of a secondary "add/drop" Ethernet port to provision 100 Mbps subscriber site service drops without the need for additional Ethernet switches and cabling.

"The ability to leverage the same radio and launch 100 Mbps service drops without the expense of additional Ethernet switches and cabling makes a lot of sense from a cost/benefits analysis while also facilitating organic network growth," explains Matarazzo.

BridgeWave's gigabit radios continue to perform flawlessly while the adaptive rate feature automatically and transparently throttles back transmission to 100 Mbps during intense weather without any network performance degradation for high priority traffic. As a result, MST has been able to sustain its QoS standards for voice, video and data services.

"BridgeWave's products deliver 'five nines' and stays there," comments Scarzafava. "A lot has to do with the accuracy of the alignment process, transmit power levels and superior receive threshold levels as well as the ability to automatically adjust the transmission speed in inclement weather."

Another benefit of BridgeWave's 80 GHz radios is the "pencil thin" beamwidth, letting MST install up to three radios on the same mast with no interference. Also appreciated is the extra layer of data security provided by the narrow beamwidth, which when combined with the use of licensed spectrum, delivers the highest levels of service availability and data protection.

Currently, the BridgeWave links backhaul network traffic for residential, commercial and hospitality properties in New York City with plans for additional deployments throughout the metropolitan area.

"With BridgeWave's high-speed wireless links, we have the capacity to cover large geographic areas and still have sufficient capacity to deploy WiFi off the backbone, which is huge," Scarzafava adds.

Additionally, MST plans to replicate the "Manhattan model" in other locales in New Jersey and San Francisco.

BridgeWave's technology has proven itself—and helped MST validate its growth projections as additional links will easily support forecasted business expansion. While MST initially projected a payback on its BridgeWave links in less than one year, the timeframe now may be measured in months.

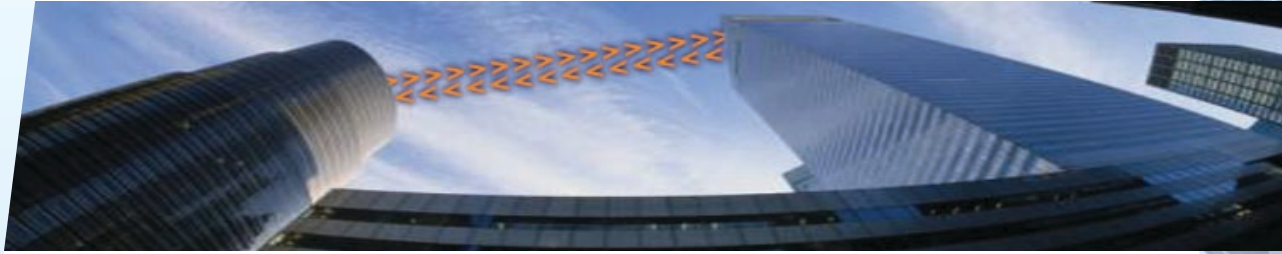
"A GigE wireless network can be established in the sky for a mere fraction of the billions of dollars of assets in the ground," says Matarazzo. "With BridgeWave's virtual fiber, MST can deploy state-of-the-art networking and offer robust services at affordable prices—years ahead of what traditional carriers and cable operators can provide."

In addition to voice, data and video offerings, MST now has the bandwidth to drive deployment of innovative, differentiated services all residing on a single backbone. For example, the operator is poised to add services ranging from energy management and e-concierge amenity portals for hospitality properties



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to surveillance and building-wide intercom services for residential properties, along with web hosting, offsite data storage and videoconferencing for local businesses.

"We see 2008 is going to be a big year for MST," concludes Matarazzo. "With BridgeWave's gigabit wireless links in place, we now have the right backbone elements to scale our network to tens of thousands of customers."

CUSTOMER: Microwave Satellite Technologies Inc., a carrier-class communications technology company based in Hawthorne, NJ; www.mst-online.com

INDUSTRY: Telecommunications

CHALLENGES:

- Excessive time delays, excessive trenching costs and high recurring monthly fees for fiber-optic leased services prompted review of high-speed wireless technologies.
- Substantial bandwidth was required to support aggressive network expansion.
- "Five Nines" network availability was needed to sustain QoS.
- Ultra-low latency performance to ensure jitter-free delivery of voice and video services.
- Ease of installation and alignment processes to facilitate rapid deployment.

SOLUTION: Two BridgeWave AR80 and five AR80X gigabit wireless links

BENEFITS:

- AdaptiveRate technology and extended range antennas ensure "five nines" network availability.
- Narrow antenna beam-width provides interference immunity, allowing multiple radios to be deployed on the same mast.
- High-capacity, reliable backbone links facilitate the delivery of differentiated services while providing sufficient network scalability to support tens of thousands of subscribers.
- Ability to easily replicate initial network model in other urban areas.
- "Add/Drop" copper Ethernet port simplifies service drops off the virtual fiber backbone.
- ROI in less than one year will continue to decrease as more services and subscribers are added.



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