

## Bulgarian Telco Pioneers Mobile “Triple-Play” Services over WiMAX

Max Telecom uses Navini Smart WiMAX and Cisco Carrier Ethernet solutions to deliver nationwide mobile services.

### EXECUTIVE SUMMARY

#### Max Telecom

- Industry: Telecommunications
- Location: Bulgaria
- Number of Employees: 125

#### BUSINESS CHALLENGES

- Rapidly and cost-effectively expand service coverage to all of Bulgaria
- Enable capacity for “triple-play” services (data, voice, and video)
- Stand out from the competition with WiMAX innovations for any-time, any-where services

#### NETWORK SOLUTIONS

- Navini Smart WiMAX base stations and antennas
- Cisco aggregation solution, making use of third-party transport (Cisco Catalyst 3750 Metro Ethernet switches at base stations; Cisco 7600 Series at headquarters)
- Architecture integrating 802.16e solutions for maximum mobility indoors and outside

#### BUSINESS RESULTS

- Increased capacity to 2 Mbps (5 Mbps in early 2008), with the ability to support up to 100,000 subscribers by year end 2008
- Added new revenue streams from enabled wholesale services
- Expanded “triple-play” services portfolio, including IPTV over WiMAX, to sustain subscriber growth and reduce churn

### Business Challenges

Max Telecom entered the telecommunications market in Bulgaria just two and a half years ago and quickly established itself as a new-generation operator by adopting the latest network and business innovations and giving subscribers industry-leading services and capabilities. The “greenfield” company is garnering international attention with its nationwide network based on mobile WiMAX™ technology. The ambition of Max Telecom is to extend its modern, highly efficient network to the entire population of the country within the next few years. The aggressive build-out has challenged the company to select technology partners that can deliver the required hand-held devices as well as help Max Telecom deliver its vision of mobile access for all services. The company currently offers Internet access, VPNs, voice services, video, and IPTV.

Having already selected Cisco® for the core network, Max Telecom evaluated radio vendors to determine the best possible foundation to meet its goal of delivering all services using mobile WiMAX. The company simultaneously evaluated all alternatives for an efficient access/aggregation solution. To shorten time to market and keep costs low, Max Telecom decided to lease parts of the network. A third-party provides Ethernet to the home (ETTH) for access to base stations in various cities, and Metropolitan Area Network (MAN) lines to connect its headquarters with the smaller cities. To build out the mobile access network, Max Telecom looked for base station equipment and an overall architecture that could scale aggressively and help ensure security within its leased transport environment. The company aims to cover 90 percent of the 7.5 million residents of Bulgaria by the end of this year.

The major requirements for the base station selection and overall design included:

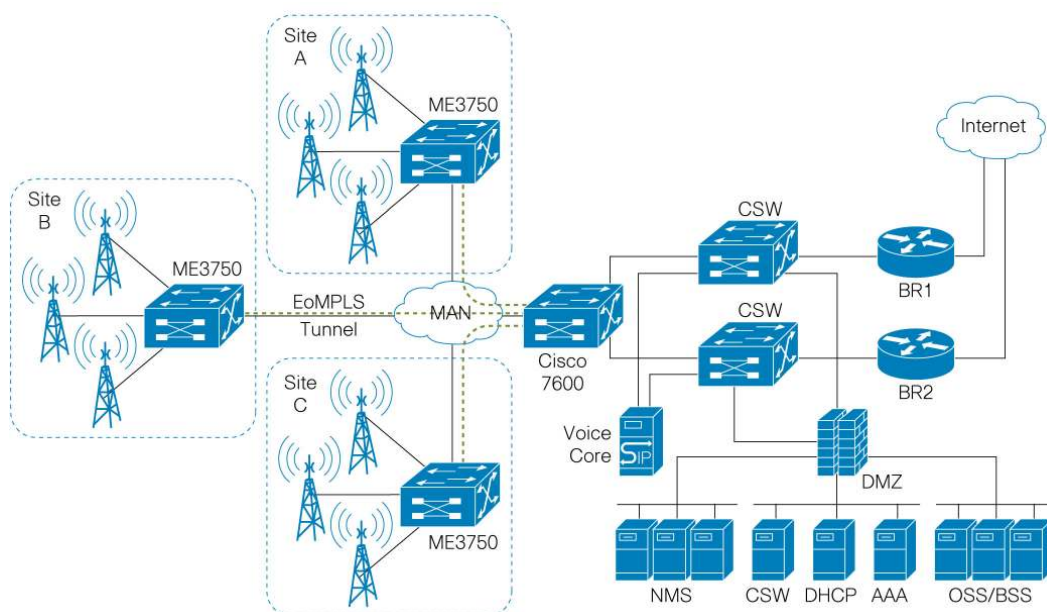
- Controlling capital expenses and operating expenses by minimizing cell counts and improving in-building coverage.

- Evolving from fixed services (desktop modems, PCs) to mobile services (handheld and embedded devices) as new 802.16e wireless broadband devices become available
- Enabling a broad range of services for competitive differentiation and to gain market share

## Network Solutions

Aiming to pioneer mobile WiMAX services, Max Telecom focused its selection process on a rigorous evaluation of the leading WiMAX technologies. The company identified Smart Beamforming as a breakthrough that could enable its aggressive goals. This led the operator to Navini, the global leader for broadband wireless access solutions. With an established relationship with Cisco, Max Telecom also had confidence in Cisco as a partner that could enable a fast deployment. (See Figure 1.)

**Figure 1.** The Max Telecom 802.16e WiMAX Network



## Leading-edge WiMAX

Navini Smart WiMAX combines both Smart Beamforming and beamformed multiple-input multiple-output (MIMO) technologies, two advancements uniquely combined by Navini to push the capabilities of broadband wireless networks. The unique combination doubles the data throughput for mobile WiMAX, extends the range, and enhances the signal strength. By using both Smart Beamforming and MIMO technologies, Navini offers base station and smart antenna solutions that enable data transmissions at rates up to six times faster than other WiMAX solutions. Smart WiMAX also extends coverage. In many places where standard signals cannot be received, the enhanced beamformed MIMO signal has the power and performance to break through. The results are better mobility, higher throughput rates, and better coverage both indoor and outside. The Navini technology also enables fewer cell sites while increasing overall network capacity.

“In terms of technology, Navini was clearly the best for our WiMAX deployment,” says Kroum Manoilov, chief operating officer for Max Telecom. “Now that Navini has been acquired by Cisco, we feel even better about the solution. Cisco and Navini have extensive worldwide deployment experience, and we have relied on their knowledge of the WiMAX space to help us meet our fast-paced rollout of mobile services.”

Smart WiMAX service has enabled Max Telecom to begin rolling out mobile services. The company offers fixed and nomadic services today, and will enhance mobility when IEEE 802.16e-compliant CPE and hand-held devices are available in early 2008. Max Telecom has already built out more than 150 base stations and introduced fixed and nomadic WiMAX service to more than 10 cities.

### Cisco Aggregation

The WiMAX network officially went live in October 2007, allowing transfer speeds of up to 2 megabits per second (Mbps). Max Telecom plans to increase that rate to 5 Mbps in early 2008. To aggregate traffic from the base stations, the operator decided to use Ethernet over Multiprotocol Label Switching (EoMPLS) and Hierarchical Virtual Private LAN Service (H-VPLS). This Carrier Ethernet solution allows Max Telecom to efficiently and securely tunnel all WiMAX traffic over the leased transport connections.

Max Telecom selected the Cisco Catalyst<sup>®</sup> 3750 Metro Ethernet switch for aggregating base station traffic. The Cisco Catalyst 3750 nodes are connected to Cisco 7600 Series routers (over the EoMPLS/H-VPLS network) for a complete aggregation solution. With greater intelligence at the edge, the Cisco Catalyst 3750 metro switches enable more differentiated Ethernet services and give Max Telecom hierarchical quality of service (QoS), traffic shaping, intelligent 802.1Q tunneling, VLAN mapping, and EoMPLS support. This robust feature set helps Max Telecom offer different service-level agreements (SLAs) and flexible service options.

### End-to-End Solution

Cisco and Navini products provide a complete mobile WiMAX solution for Max Telecom. The open, flexible design can accommodate Access Service Network (ASN) gateways as the mobile service subscriber base grows, and a full suite of features help to differentiate the carrier from the competition. End-to-end QoS, over-the-air activation, and self-provisioning contribute to a cost-effective business model and enable a growing portfolio of services.

#### PRODUCT LIST

##### Routing and Switching

- Cisco Catalyst 3750 Metro Ethernet Switches
- Cisco 7600 Series

##### Wireless

- Navini BTS-MX8 Base Station
- Navini BTS-MX2 Base Station
- Navini Smart Antenna systems

### Business Results

WiMAX has fulfilled its promise and enabled Max Telecom to rapidly and cost-effectively achieve national coverage. The Navini and Cisco solutions have created the WiMAX foundation for mobile services, and put Max Telecom in an enviable position for service innovations. As soon as mobile equipment vendors introduce new handsets and other devices, Max Telecom can give subscribers

anytime, anywhere voice over IP (VoIP) and IPTV as well as the full suite of other broadband services.

The new network gives the operator a build-as-they-grow solution, with the current plans for expanding capacity for up to 100,000 subscribers by the end of 2008. To compete against larger DSL and cable players, Max Telecom has also adopted an aggressive wholesale strategy. The operator is developing relationships with LAN service providers, and will pass through its voice and other services that can be bundled with the data services from these providers. The 802.16e WiMAX network enables this business, and is also enabling Max Telecom to expand its “triple-play” business by teaming up with a Bulgarian satellite TV provider to bring more content to subscribers.

Within the first few months after deploying the new mobile WiMAX solution, the results are promising:

- Capital expenses will come down from about US\$430 per potential subscriber to less than US\$200 within three years.
- Data subscribers are expected to grow from less than 10,000 to between 50,000 and 100,000 by the end of 2008 (depending on the availability of mobile WiMAX devices).
- Scalable capacity can support more services, with plans in place for creative service bundles. For example, Max Telecom plans to bundle mobile VoIP and broadband.
- The low operating expenses achieved with the WiMAX solution will enable differentiating services including a free TV service (MaxTV), rebranded Google applications (mobile MaxApps), and a mobile e-mail service (MaxMail).

“Cisco has helped us establish a very strong market position,” says Manoilov. “We have hit all of our schedule targets and are confident that our WiMAX network can help us bring exceptional service quality to our subscribers. The combination of Navini WiMAX and Cisco Carrier Ethernet technologies put us ahead of the incumbent providers and other competitors.”

### For More Information

To find out more about Cisco Carrier Ethernet solutions, go to: [www.cisco.com/go/cedesign](http://www.cisco.com/go/cedesign).

To find out more about the Navini WiMAX solutions, go to: [www.cisco.com/go/wimax](http://www.cisco.com/go/wimax).



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