



Case Study:

Hopling Technologies Enhances Metro Mesh

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Hopling Technologies was created in 2003 by seasoned executives in the Telecom industry, with a vision to become the global leader in wireless mesh network solutions. Headquartered in the Netherlands, Hopling Technologies is thriving in an environment which is a hotbed of networked applications, next-generation Internet and ranked third in global broadband penetration by the ITU. This marketing driven R&D-centric company has grown rapidly, by following the philosophy that its customers are looking for a solutions partner with a deep understanding of wireless broadband mobility solutions and the practical expertise to optimize their deployment.

Hopling Technologies specializes in wireless mesh routing solutions which include indoor and outdoor mesh routers, WiFi and WiMAX access points, gateways, multi-client bridges and a suite of network management solutions all running on Linux.

Hopling Technologies' metropolitan solutions are self-configuring, centrally managed and controlled. Hopling's wireless mesh multi-hop routing design is based on its HopWARE Mesh Architecture (HMA), which incorporates the sophisticated Hopling Mesh Protocol (HMP) and the unique Hopling Discovery Protocol (HDP) for the 900MHz, 2.4GHz, 2.5-2.6GHz, 3.3-3.5GHz, 4.9GHz and 5GHz bands. These protocols enable automatic coverage for seamless metropolitan and event-based networks, leveraging the advantages of WiFi such as true mobility, high throughput, and ubiquitous connectivity of client devices.

The Hopling Discovery Protocol (HDP) is a means for its range of products to exchange information, thus enabling a device to configure itself for optimal communication with a neighboring Hopling product.

Another major advantage of the employed "mesh" wireless solution over today's traditional implementations is that the different nodes communicate with each other. The mesh network reconfigures itself when a node is installed or removed. Its mesh routing and hotspot



networks provide an advantage over the traditional point-to-point links, in that each node added to the mesh enhances the network as a whole.

Every indoor and outdoor node is capable of relaying traffic coming from any of its neighbor's nodes. By simply adding another node, the range of the wireless mesh network is extended, creating a highly reliable, seamless and ever-increasing broadband network footprint.

These networks offer bandwidth control, roaming, automatic configuration, automatic channel selection, push content functionality, universal access methods, radius services and additional access security. With the self-healing mesh routing algorithms the network has no single point of failure, ensuring a reliable wireless roaming- and VoIP-enabled connection for your customers.

The company's flexible and reliable solutions are deployed for video surveillance, municipal private networks, VoIP, mobile Wi-Fi broadband solutions, wireless LANs, last-mile wireless access connectivity, mesh backhaul/metropolitan area networks and ad hoc/event-based solutions.

Hopling Technologies' latest solution set is the recently launched HopMAX product portfolio, which puts the company on the road to fulfilling the potential of new generation WiMAX end-to-end solutions.

To achieve rapid time-to-market and the engineering flexibility it requires, Hopling worked with Fujitsu Microelectronics and its WiMAX SoC as the silicon foundation for its HopMAX base stations, micro base stations and high-end subscriber units. The Fujitsu SoC is also used for Hopling Technologies' mesh hybrid node system, called the Xnet Raptor-II.

Its first WiMAX products based on IEEE 802.16-2004, the plug & play Linux-based subscriber stations (HopMAX™ 1600 and HopMAX™ 2600) and a mesh-based WiMAX-backbone solution (Xnet Raptor-II hybrid node) will become commercially available in early 2007. The Hopling Mesh Protocol (HMP) will be added as a layer on top of the IEEE 802.16 standard used by the HopMAX™ products.



Hopling Technologies also plans to produce a micro base station (HopMAX™ 4600) and base station (HopMAX™ 6600) based on Fujitsu's upcoming mobile WiMAX SoC. These IEEE 802.16e base station systems, micro base stations and high-end subscriber stations will become commercially available in 2008. WiMAX Forum lab certification and limited production shipments for these systems will start in the second quarter of 2008. HopWARE Mesh Architecture (HMA) will be added later as a layer on top of the IEEE 802.16 standard used by the HopMAX™ products.

Hopling Technologies is an active member of the WiMAX Forum envisioning the next wave of wireless access -personal broadband-based on the IEEE 802.16 standards.

Hopling Technologies has deployed systems for more than 30 service providers in seven countries. Among its prominent customers are the KPN, the national operator in the Netherlands, the National Dutch Rail Authority, which operates 5GHz wireless mesh at 20 rail stations and hotspot coverage at 50 more rail stations, The Cloud in Amsterdam (formerly known as Hotspot Amsterdam) and WebNet CWN (operating wireless broadband networks in Canada and the United States).