

# Motorola Provides Reliable, Secure Solution in NLoS Environment

Shanghai, China



## Customer

Guomai Communications Co., Ltd., a subsidiary of China Satcom Inc., provides mobile digital wireless communication services in the Shanghai province. Its network uses Integrated Digital Enhanced Network (iDEN) technology developed by Motorola to provide clear, high-quality voice communications while ensuring privacy and security.

## Solution Provider

ROOTS Communications, with headquarters in Singapore and a subsidiary office in China, has established itself as a reputable value-added distributor and solutions provider in the Asia Pacific region. The company provides engineering solutions and infrastructure deployment ranging from system/network design, engineering survey services and deployment planning to project management, installation, testing and commissioning. Its clientele primarily lies in the telecommunications, commercial, industrial and government markets.

## The Situation and Challenge

Guomai was in need of a solution for a Shanghai customer that could backhaul T1 traffic from Xu Jing to Feng Xi, a distance of 7.8 km (4.8 miles).

Leased-line connectivity was not only cost-prohibitive, but required a lead time for installation that was unacceptable to Guomai Shanghai and its customer. Broadband wireless solutions were a consideration, but tall buildings

prevented a clear line-of-sight path, and products tested could not provide a reliable connection in the non-line-of-sight (NLoS) environment. In addition, the adjacent Hong Qiao Shanghai Airport presented another challenge – high levels of RF interference that adversely affect data rates.

## Technical Requirements

- In excess of 10 Mbps throughput to carry multiple T1 connections
- Intuitive installation and management features for quick deployment
- Carrier-grade reliability
- Ability to operate in NLoS environments
- Interference-mitigation features
- Security

## Deployment Detail and Interoperability

In less than three hours, ROOTS Communications personnel had installed the Motorola Point-to-Point Wireless Ethernet Bridges – 400 Series with integrated antennae, and traffic was passing between the two end-points. The Xu Jing site radio was installed on a 1.8-metre (six-foot) mast atop a seven-story building and connected to the Feng Xi site radio, which was installed on a tower mast atop a four-story factory, and connected directly to Guomai's network. The 7.8 km (4.8-mile) wireless link path was obstructed by multiple buildings.

*"This is the first and only time that we have been able to achieve the reliability and bandwidth needed to backhaul T1 traffic in an NLoS environment. The Motorola PTP 400 Series unit has self-installing and self-management features that made the installation quick and easy. And no additional antennae meant there was no additional cost or extra time to install."*

~ Koh Nai, ROOTS Communications Managing Director

Excessive interference combined with NLoS made this deployment particularly challenging. With the Hong Qiao Airport only 5 km (3.1 miles) from the installation, there were heavy periods of interference. While running at 64 QAM (2/3), the link was attaining 21 Mbps, but the periodic interference was resulting in packet loss on the network and unacceptable reliability levels. By resetting the modulation rates to 16 QAM, the link stabilised to 99.999% reliability. The trade-off was lower throughput, but the link still maintained 10.5 Mbps of throughput, more than enough bandwidth for several T1 circuits

### The Results

Since installation in September 2004, the 7.8 km (4.8-mile) link has been running error-free with no interference at an average of 10.5 Mbps, even adjacent to the airport. The customer estimates the ROI to be 10 months and has since installed three additional Motorola PTP 400 Series wireless platforms on its network to backhaul T1 traffic.

### Why Motorola?

- The Motorola PTP 400 Series bridge was the only broadband wireless platform that could achieve a carrier-grade connection in the NLoS, high-interference environment
- The alternative was leased-line connectivity – the Motorola solution was much more cost-effective, paying for itself in 10 months
- The ease of installation and management enabled the link to be up and running quickly, with stability and without requiring manual operations

### About Motorola

Motorola is known around the world for innovation and leadership in wireless and broadband communications. Inspired by our vision of Seamless Mobility, the people of Motorola are committed to helping you get and stay connected simply and seamlessly to the people, information, and entertainment that you want and need. We do this by designing and delivering "must have" products, "must do" experiences and powerful networks – along with a full complement of support services. A Fortune 100 company with global presence and impact, Motorola had sales of US \$36.8 billion in 2005. For more information about our point-to-point products and services, visit our website at [www.motorola.com/ptp](http://www.motorola.com/ptp).



*Xu Jing Site about 5 km (three miles) from Hong Qiao Airport*

*"Because our customers demand highly-available connections, we were very pleased to finally find a broadband wireless platform that can provide reliable performance in high-interference and highly-obstructed areas. We plan to roll out this platform in other cities as well."*

~ Guo Gang, Guomai Shanghai General Manager

At the time of this installation, the products deployed were the Orthogon Systems OS-Gemini point-to-point wireless Ethernet bridges. With Motorola's acquisition of Orthogon Systems, the OS-Gemini products were renamed as the PTP 400 Series bridges. They are now part of Motorola's **MOTOwi4™** portfolio of innovative wireless broadband solutions that create, complement and complete IP networks. Delivering IP coverage to virtually all spaces, the **MOTOwi4** portfolio includes Fixed Broadband, WiMAX, Mesh and Broadband-over-Powerline solutions for private and public networks.

**MOTOwi4™**



**For more information about the Motorola Point-to-Point Solutions:**

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