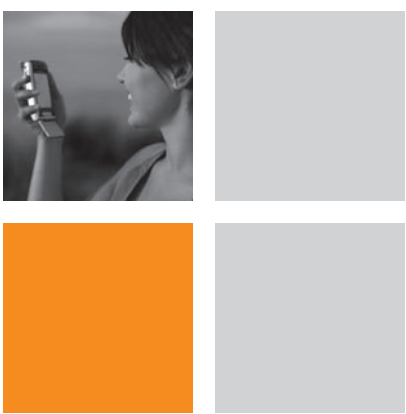
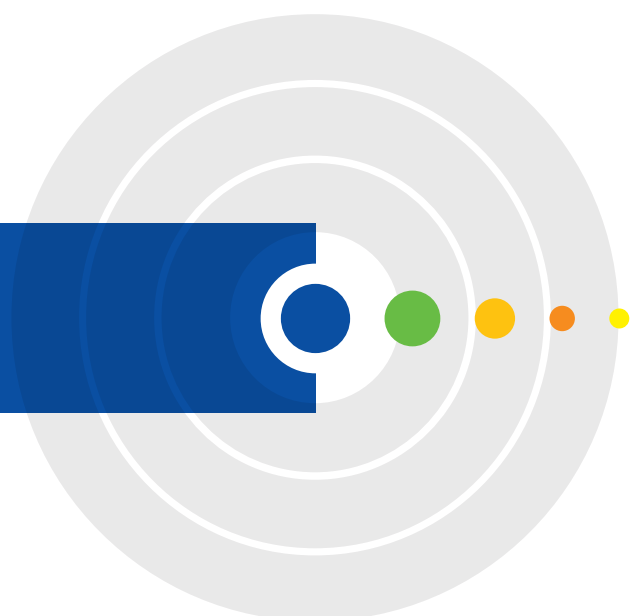


# Intel & Alvarion Demo Mobile WiMAX Delivering True MIMO at Intel's Developer Forum





## Introduction

Operators demand more bandwidth out of mobile WiMAX. They require higher throughputs to support mobile TV, high volume of Voice over IP (VoIP) voice calls, online gaming, and business level file transfer rates. These services and others like them enable operators to offer a variety of premium services to their subscribers as well as maximize the consumption opportunities faced by the subscribers. Subscribers are willing to pay higher fees for premium services enabling operators to collect higher average revenue per user (ARPU). Higher ARPUs result in a substantially shorter return on investment (ROI), reducing deployment risk, and increasing the operators' ability to thrive, succeed, and profit in the highly competitive mobile and fixed telecom environment.

Multiple-Input Multiple-Output (MIMO) technology is designed to deliver significantly higher bandwidth between the WiMAX base-station and the subscriber's WiMAX enabled device. At Intel's Developer Forum (IDF) in Beijing, China, Alvarion once again asserted its technological leadership by showcasing with Intel a working MIMO Matrix B (spatial multiplexing) technology integrated into its BreezeMAX WiMAX radio base stations. Alvarion's BreezeMAX base stations are the most widely deployed WiMAX base stations in the world. This offering will enable operators to deploy superior mobile WiMAX networks with substantial time-to-market (TTM) advantage over the competition.

## Benefits of MIMO Technology for WiMAX

Multiple-Input Multiple-Output is the use of multiple transmitters and receivers (multiple antennas) on both WiMAX base stations and subscriber devices to achieve improved performance in terms of bandwidth and distances. With MIMO, two simultaneous data streams can be sent, which doubles the bandwidth. Multiple receivers alone allow greater distances between devices.



### Single-Input Single-Output (SISO)

Single transmit antenna on the base-station and single receive antenna on the subscriber device



### Multiple-Input Multiple -Output (MIMO)

Two transmit antenna on the base-station and two receive antenna on the subscriber device

**"The mobile WiMAX services based on Alvarion's 4Motion solution with enhanced MIMO technology, coupled with Intel's WiMAX technology showcased today, is proof of the performance and bandwidth capacity of mobile WiMAX. Our strong and ongoing relationship with Alvarion is helping to broadly demonstrate performance of WiMAX technology to the industry."**

**Sriram Viswanathan**  
VP, Intel Capital and General  
Manager of WiMAX Program Office



**"The demonstration of enhanced MIMO and the available capacity for high performance personal broadband services further proves Alvarion's leadership in WiMAX. We are proud of our long-standing role with Intel in promoting the WiMAX revolution and believe that it will enable operators to offer innovative WiMAX services."**

**Tzvika Friedman**  
president and CEO of Alvarion



Figure 1: MIMO vs SISO:  
Significant increase in bandwidth capacity using MIMO

MIMO is supported in two ways in the 802.16e (mobile WiMAX) standard:

**MIMO Matrix B** – the more significant of the two MIMO implementations, and the more technologically advanced, Alvarion's OPEN™ WiMAX 4Motion solution using spatial multiplexing technology is expected to almost double the bandwidth capacity, reducing wireless infrastructure expenditures for operators. MIMO Matrix B is a key feature in the WiMAX Forum™ Mobile WiMAX Wave 2 specifications and essential for supporting video and other bandwidth demanding applications. Alvarion's IEEE 802.16 compliant BreezeMAX™ system together with Intel-based chipset mobile WiMAX Express Card for 2.5 GHz provide a compelling offering for operators.

**MIMO Matrix A** – the use of multiple transmit antennas and Space–Time codes (STC) to improve the reliability of data transmission in mobile WiMAX systems. This feature is currently a standard part of the Alvarion 4Motion OPEN WiMAX solution for mobile and fixed WiMAX deployments.

## The MIMO showcase at Intel's Developer Forum (IDF)

At the IDF in Beijing Alvarion and Intel continue their long-time collaboration in providing technologically superior 802.16e-based Mobile WiMAX solutions. Alvarion's demonstrated its 4Motion™ solution using MIMO Matrix B. The solution using MIMO Matrix B technology is expected to almost double the bandwidth capacity, reducing wireless infrastructure expenditures for operators.

The demonstration, orchestrated and executed by Alvarion together with Intel's Mobility Group, was presented during the keynote address at the IDF. The demonstration featured the transmission of one live High-Definition (HD) video conferencing stream link and one Standard Definition (SD) video conferencing steam link from the Olympic stadium to the IDF keynote hall.

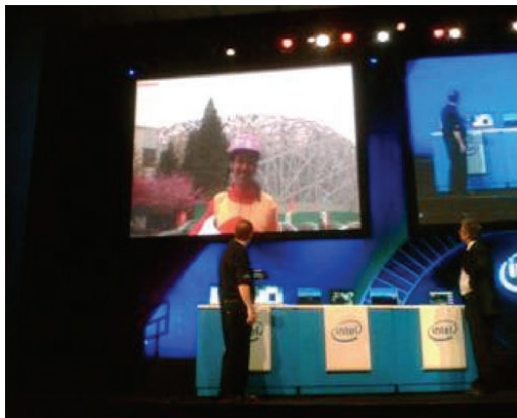


Figure 2: Live video conferencing using mobile WiMAX with MIMO at IDF Beijing

At the keynote hall, an Alvarion BreezeMAX WiMAX base-station with MIMO technology transmitted the video conference streams to a laptop computer and an Ultra Mobile PC (UMPC) equipped with an Intel MIMO-enabled WiMAX express card.

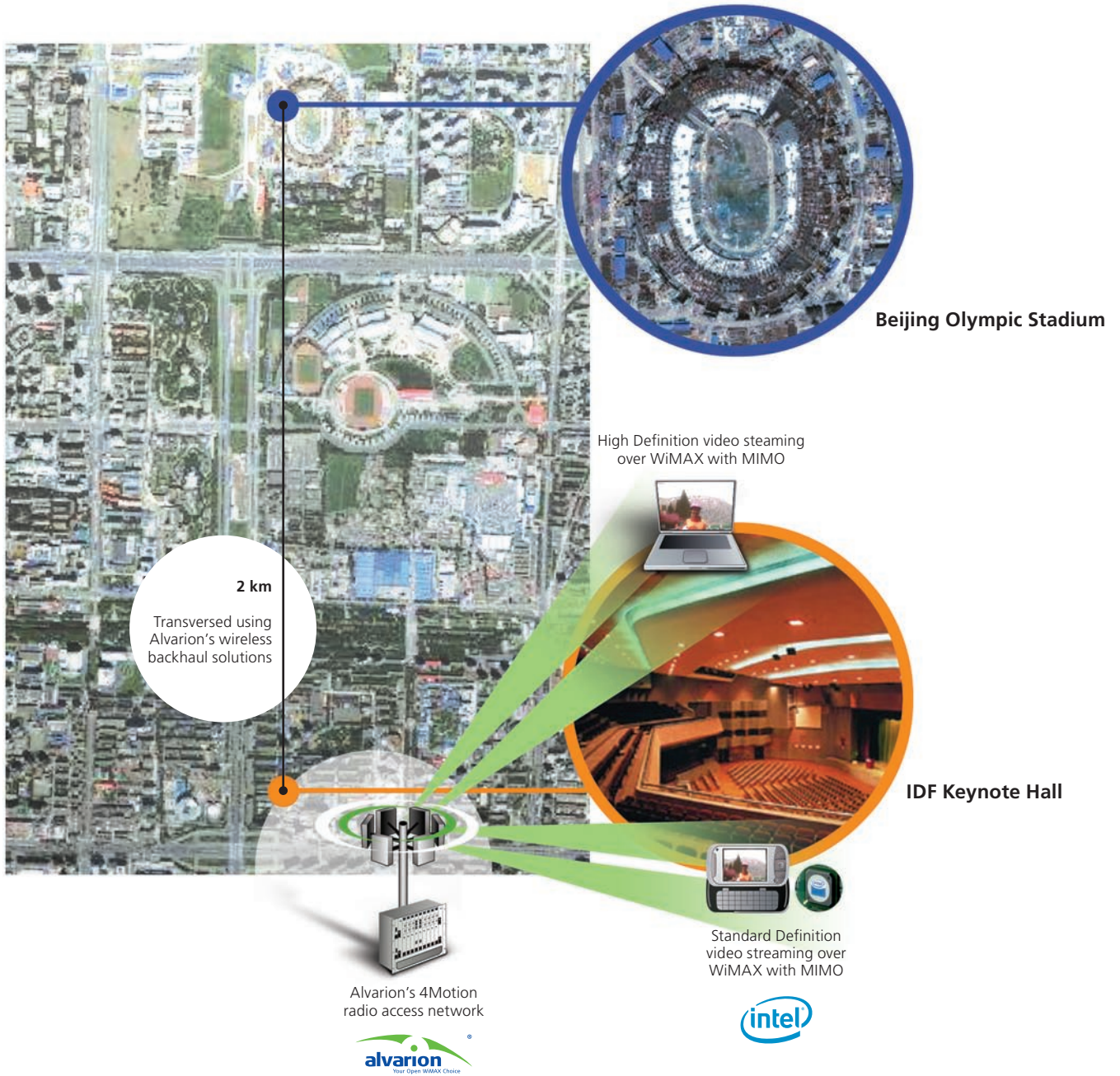


Figure 3: Delivering True MIMO for mobile WiMAX

## Conclusion

Leading the market with the most widely deployed WiMAX system in the world, Alvarion is leading the market to Open WiMAX solutions with the most extensive deployments and proven product portfolio in the industry covering the full range of frequency bands with both fixed and mobile solutions.

Finding and implementing ways to increase bandwidth for WiMAX systems is of paramount importance to providing operators with a superior solution and achieving technological leadership in the mobile WiMAX market. This is precisely what Alvarion and Intel have done at the Intel Developer Forum in Beijing, China in April 2007.

At the IDF, Alvarion has once again demonstrated its technological leadership in mobile WiMAX further advancing the WiMAX market with live demonstration of working MIMO Matrix B in cooperation with Intel, a long-time partner in the WiMAX space.

This demonstration of MIMO Matrix B clearly positions Alvarion as the leader in mobile WiMAX technology enabling operators to reap the tremendous benefits of Alvarion's OPEN WiMAX solution offering and early Time-To-Market.



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