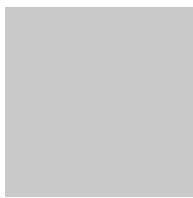
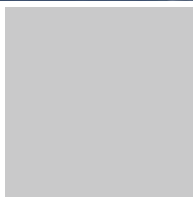




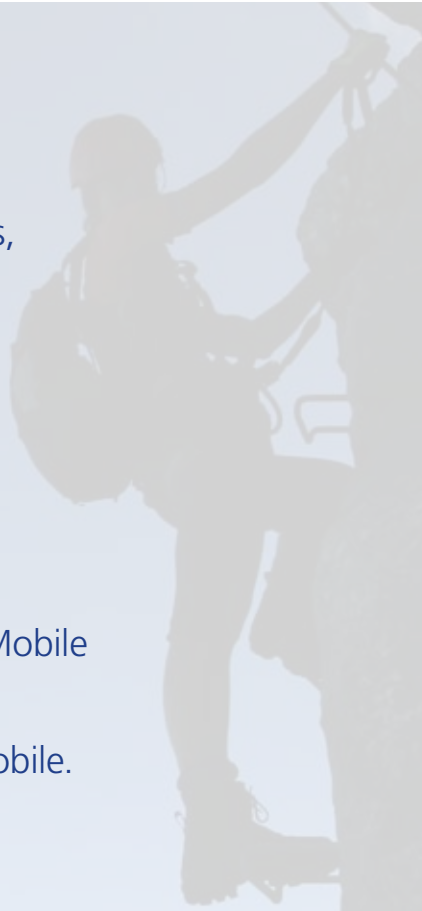
Mobile WiMAX™: Leaving Limits Behind

White Paper





Imagine being able to offer customers access to high-speed Internet services, IPTV, live sports, gaming, video or voice calls and financial updates in real time, in their homes or on the go. Whenever they want, wherever they are, on any device. This anytime, anywhere mobile broadband vision is the Mobile WiMAX™ promise, as fixed and nomadic services converge to mobile.



“After working with the WiMAX™ expert Alvarion® for two years and learning their unique Mobile WiMAX™ technology, it is clear that their 4Motion® offering is the best solution for us. Alvarion’s complete solution enables quick and easy deployment of mobile broadband services.”

Dr. Gin-Kou Ma, Deputy General Director of SoC Technology Center, ITRI

Mobile WiMAX™ offers real, personalized broadband connectivity now

Mobile WiMAX offers continuous connectivity using many types of mobile consumer devices. This allows people to get the most out of work or play while on the go or indoors, taking their broadband connections mobile or making their mobile service broadband.

This merging of broadband and mobility means subscribers can now get mobilized with personal broadband services to greatly enhance their lifestyles while boosting productivity. Potential customers of such a service include subscribers adding high speed data capacity to their existing mobile voice services; fixed users who want mobility; Wi-Fi users seeking additional range; and new users who want the many new applications of personal broadband services.

Two distinct markets for Mobile WiMAX

Until now, the early adopters of WiMAX and other broadband wireless access systems have been operators serving areas not covered by traditional wireline broadband connections. However, the two fundamental technological advantages of WiMAX – superior radio technology and an open IP-based access network infrastructure – are making it the technology of choice for many other applications.

World trends indicate that Mobile WiMAX is targeting two distinct markets: primary broadband services and personal broadband. The **primary broadband services market** addresses both rural/remote areas in the developing world, and developed areas. For rural/remote areas, considered uneconomical by providers to offer broadband and sometimes even voice services, WiMAX offers an excellent solution to cross the digital divide and bridge the gap to areas already receiving these services. For developed areas, WiMAX offers an alternative to DSL, allowing operators to ultimately enable fixed-mobile convergence (FMC) of networks and services.

For the personal broadband market, WiMAX addresses more densely populated areas, such as metro centers and suburbs, providing the opportunity to mobilize broadband connections by offering a DSL-on-the-go service. This is possible because Mobile WiMAX facilitates always-on broadband connectivity, complete with mobility, handover and roaming services, thereby ensuring that subscribers are always connected and on line. It provides many operators with a competitive edge, enabling them to offer unique differentiated services to subscribers seeking to optimize their personal lifestyles, professional lives and productivity habits.

These trends and benefits offered by Mobile WiMAX present a fast and cost effective entry into the broadband wireless market with a unique offering.

Mobile WiMAX offers a new revenue model

Mobile WiMAX is a next generation solution offering different types of service providers the opportunity to enhance their revenues through a better business case and user experience for mobile broadband services.

For **fixed line incumbent operators** faced with intense competition for basic voice services, Mobile WiMAX offers the ability to regain and increase revenues. By offering mobile broadband and voice services while taking advantage of their existing backhauling infrastructure and points-of-presence, incumbents can offer broadband, voice, and other services using a single wireless infrastructure.

For **innovative challenger operators**, mobile broadband offers the opportunity to avoid use of incumbent infrastructures, while providing services at competitive prices with low initial investment. Using Mobile WiMAX, they can offer services in population-dense urban areas or rural areas where there is no coverage by the incumbent, as well as to offer backhaul to Wi-Fi hotspot services.

Cable operators are looking to mobile services to gain market share in broadband and voice services towards the overall convergence of services on their networks, and the offering of triple play voice, video and data services with the convenience of mobility. This combination enables them to offer mobile users increased in-home coverage and the ability to switch calls between their mobile and fixed infrastructure, including the use of in-home Wi-Fi connections. In areas where cable operators do not have a cable network installed, Mobile WiMAX enables cable operators to offer services in public places or rural environments, with the high bandwidth required for real-time demand of mobile video applications.

Finally, **mobile operators** are focusing on and investing in third generation technology as an adjunct to their current GSM or CDMA network systems. The result is two different networks – one for voice calls and one for broadband – running simultaneously, since adding broadband to the voice network which was designed for point-to-point voice applications may result in network overload. Mobile WiMAX allows these operators to reduce congestion on their networks, add more capacity and enjoy the benefits of an all-IP architecture. Leveraging their existing base stations, RF knowledge, field equipment and personnel, mobile operators can quickly and easily deploy a Mobile WiMAX network.

The Mobile WiMAX business case, based on all-IP network architecture, has clear advantages over other core network designs. It offers operators the opportunity to enjoy the flexibility to use any WiMAX product and the price reduction resulting from interoperability economics.

Taiwan tests Mobile WiMAX to create barrier-free online environment

Proof of the significance of the Mobile WiMAX concept has recently been shown in Taiwan, where the government sought a solution to create a barrier-free online environment that would improve the country's mobile Internet penetration and position Taiwan as one of the top countries worldwide with the most cost effective access fees. Targeted at expanding the communications and service industries in Taiwan, the government also sought to aggregate the efforts of cell phone manufacturers, content providers and telecom companies to develop a broadband and wireless infrastructure which would reduce the digital divide by increasing coverage in urban and rural areas.

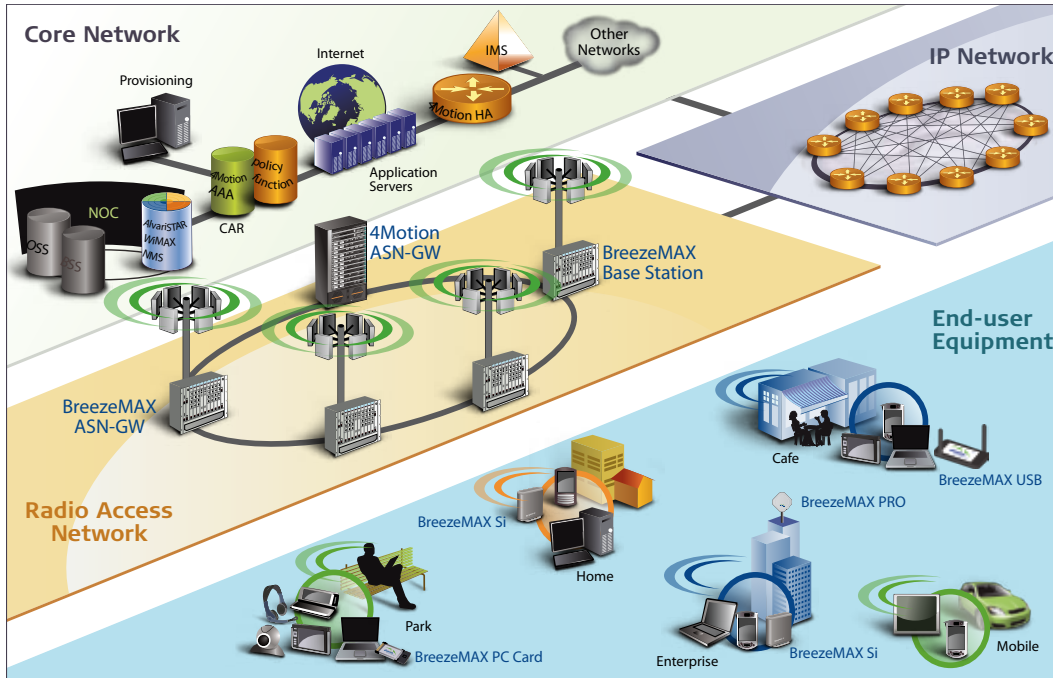
WiMAX technology was selected for execution of this national program to realize the national broadband coverage vision. For proof of concept, the Industrial Technology Research Institute (ITRI) founded by the Taiwanese Ministry of Economic Affairs in 1973 as a non-profit R&D organization for applied research and technical service was used. Together with the WiMAX Forum®, ITRI established the M-Taiwan WiMAX Application Lab (MTWAL) – a proof-of-concept (PoC) lab at the ITRI campus in Hsinchu – for testing and developing innovative Mobile WiMAX applications. Alvarion was selected as the sole supplier of WiMAX equipment for the lab, because it was the only vendor able to meet ITRI's timeline and stringent requirements for Mobile WiMAX equipment.

ITRI tests prove viability of Mobile WiMAX

After successful completion of extensive indoor and lab tests, ITRI and Alvarion moved on to mobile usage test scenarios, which included the testing of various applications such as VoIP, video streaming, IPTV and document exchange while driving and walking. These test scenarios produced impressive results, including:

- Excellent service quality during connectivity
- Successful high speed service handover between sectors and base stations
- High quality video streaming, IPTV voice services, including handover, at speeds higher than 80 km/hour
- High speed broadband performance at more than 12 Mbps

Testing then continued with the expansion of network coverage throughout the Hsinchu Science Park, National Chiao Tung University, and National Tsing Hua University. In trials run over 18 sectors along 6 km of road, performance was excellent with clear handover at up to 80 km/hour and enhanced user experience.



A typical Alvarion Mobile WiMAX network deployment, which consists of four fundamentals: (1) end user equipment (2) a radio access network (3) an IP access network (4) the operator's core network

Mobile WiMAX is leaving the limits behind

In the fixed/portable broadband market, WiMAX is a low-risk, attractive opportunity, especially in emerging markets. In the mobile broadband market, the opportunity is expected to be much bigger, as mobile broadband enables a shift towards multiple devices and multiple services per subscriber, and permits operators to move beyond the one-subscriber, one-ARPU, one-device model.

The impressive results in the ITRI Mobile WiMAX customer benchmarks show how Mobile WiMAX is leaving the limits behind, paving the way for Taiwan to go mobile and realize the vision of a country with a nationwide Mobile WiMAX solution. They prove the capabilities of Mobile WiMAX in general, and of Alvarion's 4Motion OPEN™ WiMAX solution which is powered by Alvarion's innovative SentieM™ technologies in particular. Setting new levels for the entire industry, the results are also proof of the added value that Alvarion's Mobile WiMAX products and technologies offer both providers and consumers, enabling Taiwan to benefit from a range of mobile and fixed service applications over a WiMAX service network, as well as reach remote, rural areas.

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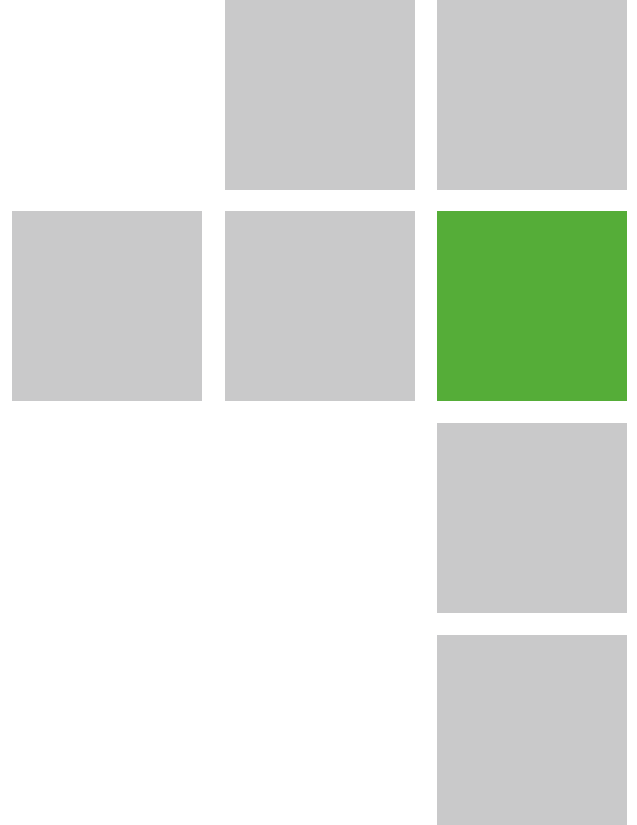
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About Alvarion

Alvarion is the largest WiMAX pure player, ensuring customer's long-term success with fixed and mobile solutions for the full range of frequency bands. Based on its OPEN WiMAX strategy, Alvarion offers a superior wireless broadband infrastructure and an all-IP best-of-breed ecosystem in cooperation with its strategic partners. Alvarion has more than 200 commercial WiMAX deployments worldwide.

