



WiMAX Forum– Enabling Personal Internet

Presented on behalf of WiMAX Forum by:

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Wireless Access for Broadband Applications for
the Arab Region, Algiers (Algeria), June 19-22*

Outline

- Key Messages
- WiMAX Forum Overview
- Personal Internet
- WiMAX Positioning
- Summary



WiMAX Forum Messages

- WiMAX Delivering on its Promise
 - Certified 802.16-2004/HiperMAN products readied in Q1'2006
 - Multiple 3.5GHz TDD and FDD Products during '06
- WiMAX is Getting Market Acceptance
 - WiMAX Forum membership growth accelerating >350
 - Over 150 operators trialing and deploying WiMAX
- WiMAX Fast Forward
 - Mobile WiMAX Certification lab on track to open in Q3'2006 (TTA/Cetecom)
 - Spectrum: 3.3-3.8G, 2.3-2.6G, ?5G, ?<2GHz (5/10/20MHz Channel BW)
 - Personal mobile Internet Terminals Globally '07-'08



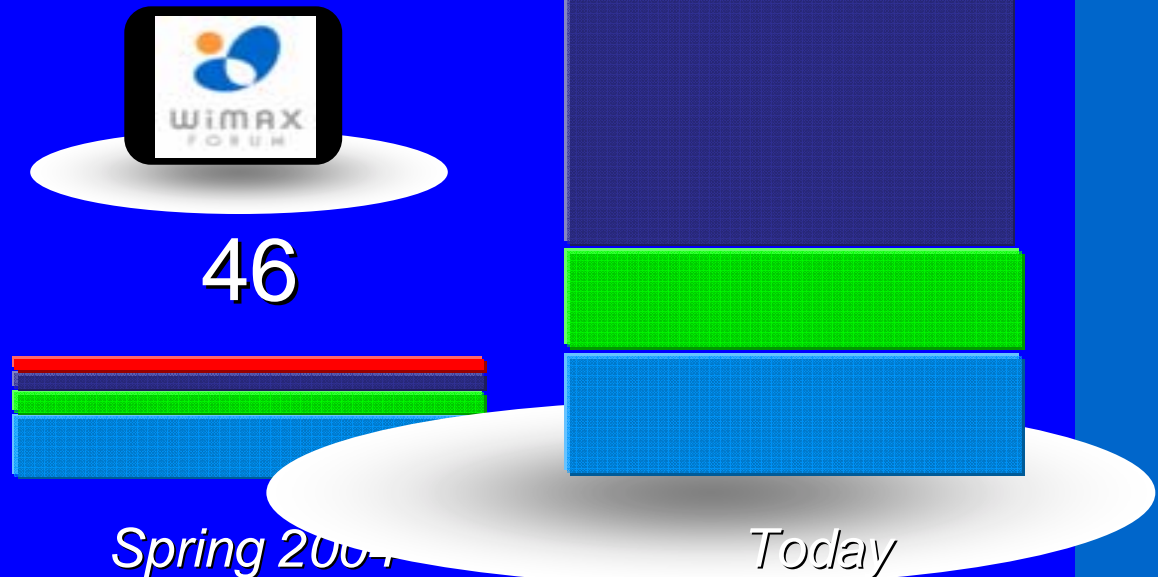
WiMAX Forum Charter

- Promote and accelerate WiMAX deployments to achieve global wireless broadband market leadership
- Develop a framework for a high performance end-to-end IP network architecture supporting stationary, portable, and mobile users
- Deliver a trusted certification process
- Evangelize business model, including favorable IPR policy
- Foster a thriving ecosystem

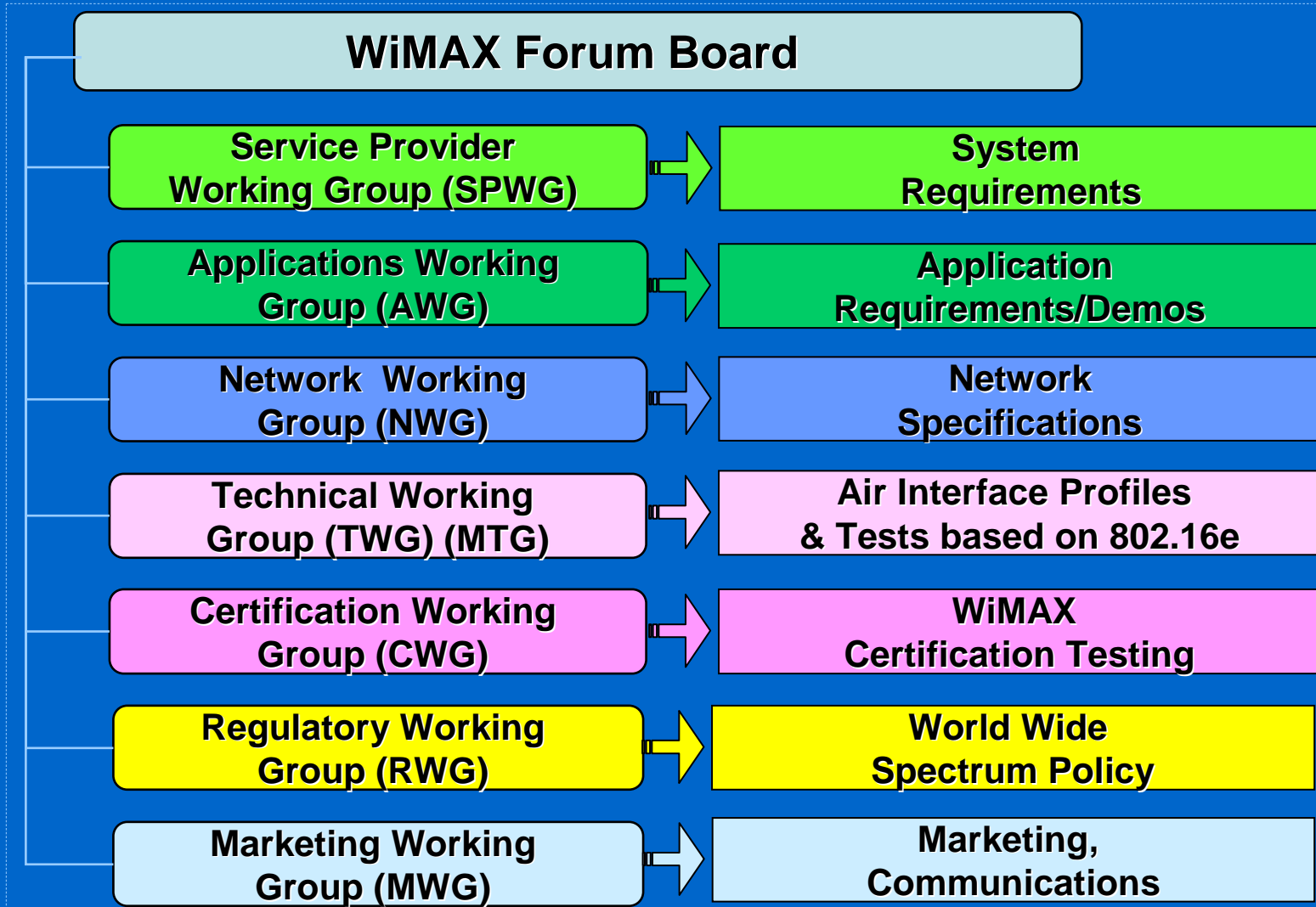
The WiMAX Forum Membership 4 Years and Growing!

356 WiMAX Forum Members

-  86 Ecosystem/Applications/Content
-  121 Service Providers
-  71 System Vendors
-  78 Silicon/Component Suppliers



WiMAX Working Groups



WiMAX Forum Org Structure & Deliverables



Our 2005 Accomplishments

- More than 150 WiMAX trials and early commercial deployments
- Membership doubled to 350+ companies
- Successfully bridged Korean WiBro service to become part of mobile WiMAX
- IEEE 802.16e standard ratified
- Mobile WiMAX network specification phase one completed



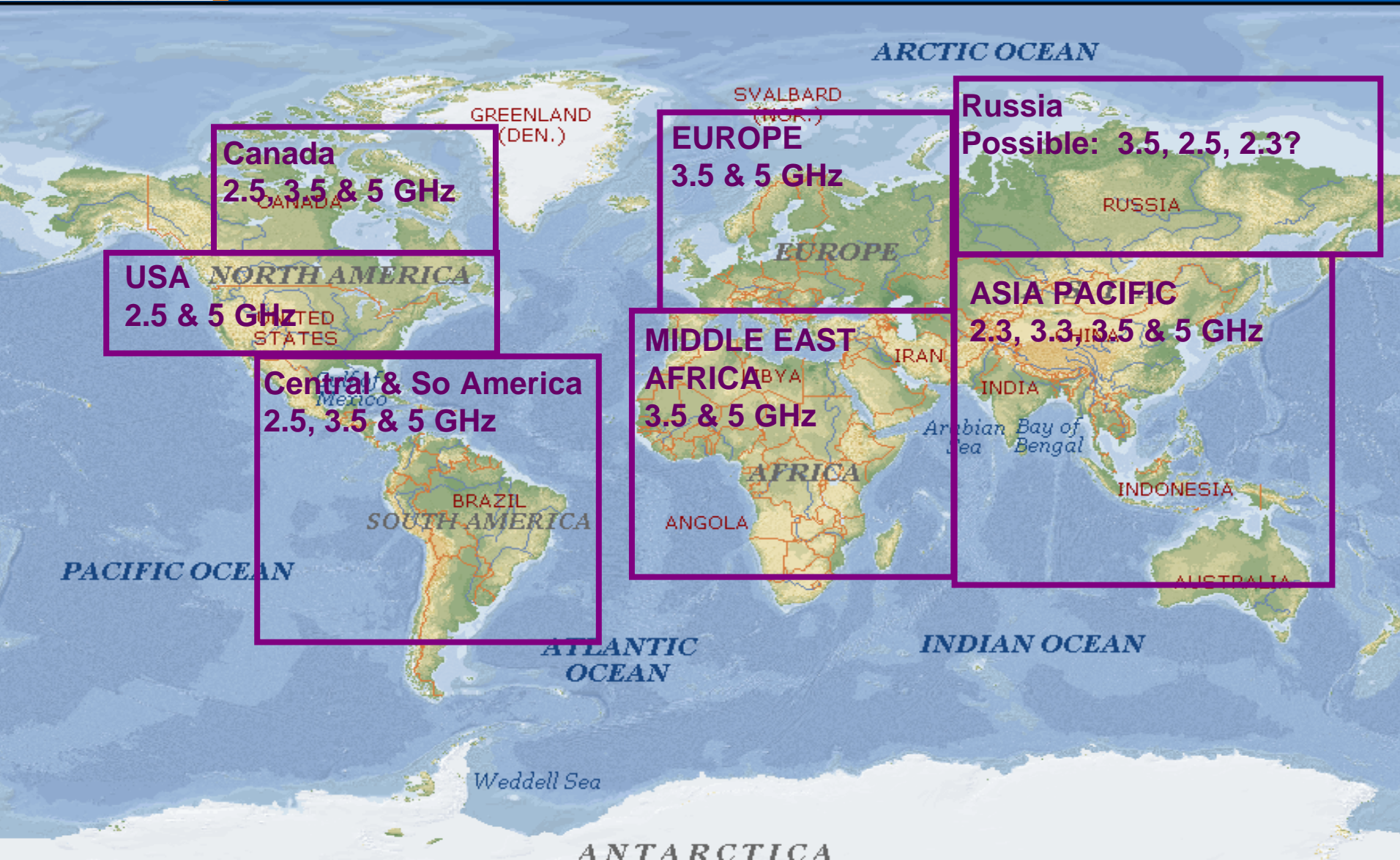
2005 Accomplishments (cont'd)

- Opened first independent WiMAX Forum certification lab (Cetecom Spain)
- Strategic agreement with ETSI in place
- Executed two successful PlugFests
- Completed three global member conferences
- Launched the Network Working Group and Application Working Group

Primary Bands

Licensed 2.3 - 2.6, 3.3 - 3.8 GHz & <2GHz

License exempt 5 GHz





Personal Internet

From Personal Computers to Personal Broadband

	1980's PC	2000 PC	2010 PC	2020 PBs !
Memory	256KB	256MB	8GB	256GB
Disk	10M	10G	320G	10TB
Access Bandwidth	1.2 Kbps (modem)	1.2 Mbps (cable/DSL)	40Mbps	1.2Gbps

- Memory, disk and access bandwidth have all increased by 3 orders of magnitude
- By 2010 “Broadband” access will mean 40 Mbps++ and by 2020 1 Gbps

WiMAX Enhances User's Experience

- Multiple users share a big pipe
 - with (Guaranteed CIR, QOS)
- Applications boundaries are not limited to single network (Multiple Networks Inter-working)
- Open Personal Broadband Application Usage Models
- Mapping Application behaviors to “Radio & network behaviors”



WiMAX – Personal Internet

WiMAX has the opportunity to become one of the main stream solutions for new converged personal Internet services

- Different frequencies ; Wider channel size

WiMAX enables the new personal, true Broadband, real-time applications

- Portable DSL services
- Complementary to fixed access at home with seamless mobility
- Always-on best served
- WiMAX all-IP infrastructure extending wire line broadband innovation & content

Fit for Any Operator

- **Mobile Operators**
 - Expand in areas where 3G spectrum is not available
 - Reduce cost/bit/Hz over the access network
 - New applications
- **Fixed Network Operators**
 - An opportunity to offer subscribers mobile broadband services
 - More economical “Hot Zone” service
 - A mean for fixed mobile convergence
- **Cable companies**
 - Wireless complementary business
 - Fit their MVNO model
- **Satellite**
 - Can use the WiMAX as a return channel problem solver
 - Wireless complementary business (Hot spot / Hot zone)
 - Access to broadband applications and contents



> 200 Operator Trials and Deployments of WiMAX (2005)

Afghanistan	Finland	Peru
Africa	France	Russia Federation
Argentina	Germany	Saudi Arabia
Australia	Greece	Serbia
Austria	India	Belgrade
Belarus	Irish	Singapore
Belgium	Israel	Spain
Brazil	Italy	Sri Lanka
Bulgaria	Ivory Cost	Switzerland
Canada	Japan	Taiwan
China	Korea	Thailand
Columbia	Mauritius	Turkey
Congo	Malaysia	United Kingdom
Czech	New Zealand	US
Dominican Rep.	Norway	Venezuela
England		...

Today's Opportunities and Challenges for Operators

Opportunities:

- Developing and underserved markets.
- DSL and cable modern extension.
- Wireless backhaul in a cellular & WiFi networks
- Enable competitive wireless broadband provider
- Unbundling of access
- Portable or mobile connectivity services.

Challenges:

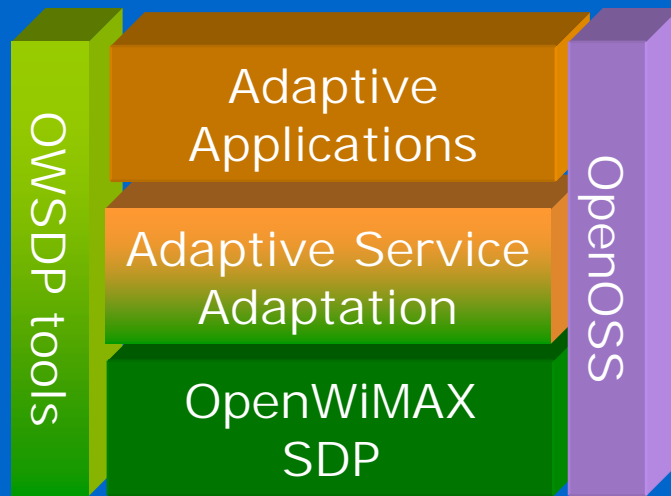
- Lack of competitive environment
- Not a single killer Application
- Definition of Portability / Mobility: ubiquitous and seamless?
- Local Manufactures / Importation Taxes Requirements
- Existing 2/3G investments

WiMAX Applications Being Explored

1. TV Broadcast
2. Homeland Security (Geospatially-Awareness)
3. Video On Demand
4. Highway Patrol
5. Vehicle Tracking
6. Triple-play (video, audio, data)
7. Sports
8. Portable Internet service
9. Mobile Broadband
10. Video Transport/Distribution
11. Video Streaming
12. Mobile (Train)
13. Mobile (Ship), Ad hoc on-demand network
14. Distant Learning
15. Mobile (Airplane)
16. Mobile (Bus)
17. Peer-to-peer video file-sharing
18. Public Safety
19. Security Surveillance
20. Truck Fleet Management
21. Wireless Meter Reading
22. Ad hoc, on-demand network
23. HD Content Delivery
24. Animal care
25. Weather Monitoring, Streaming Video
26. Advertising
27. Sports, POS
28. Oil Rig Connectivity
29. Telematic
30. Wireless Medical PMP (Portable Media Player) Application

Adaptive Application Architecture

- Rich/cheap Multimedia enables new business models
- Applications adapt to per user profile and network real-time behavior

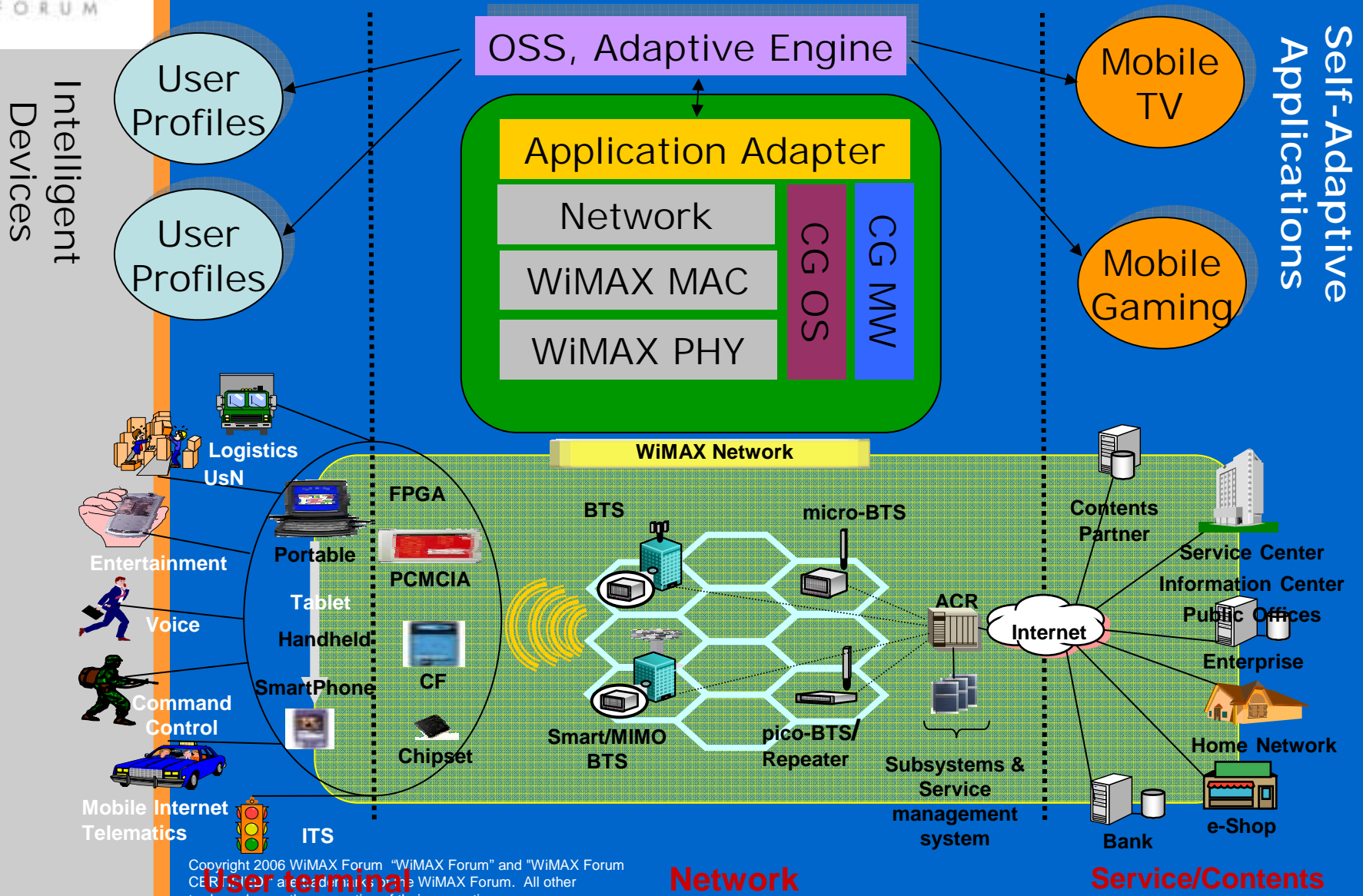


- IMS compliant Architecture
- Open API exposed at every Layer of stacks

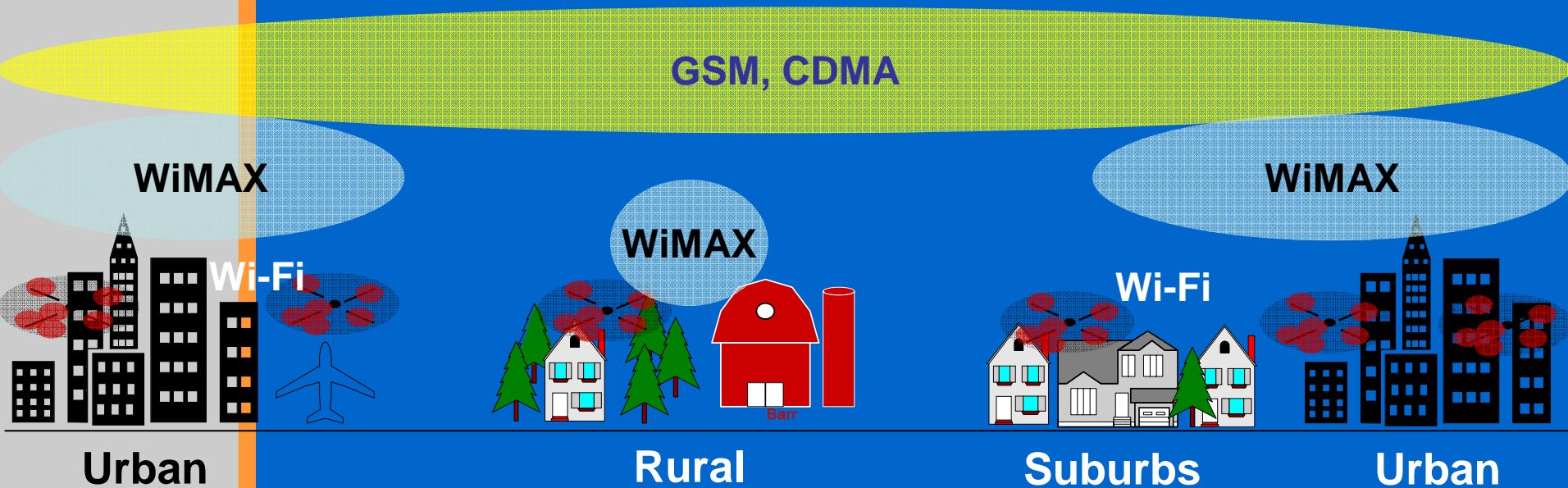


WiMAX Positioning

WiMAX - End to End Adaptive Application Flow



WiMAX is Key to Always Best Connected Broadband Model



Affordable multi Mbps wireless Internet Anywhere

Business Model is Attractive

Lower CapEx

- Open Standard
- Multiple Vendors of Choice
- Economies of scale
- Phased network deployment

CPGA

- Services for higher ARPU revenue
- Scalable Network

Lower OpEx

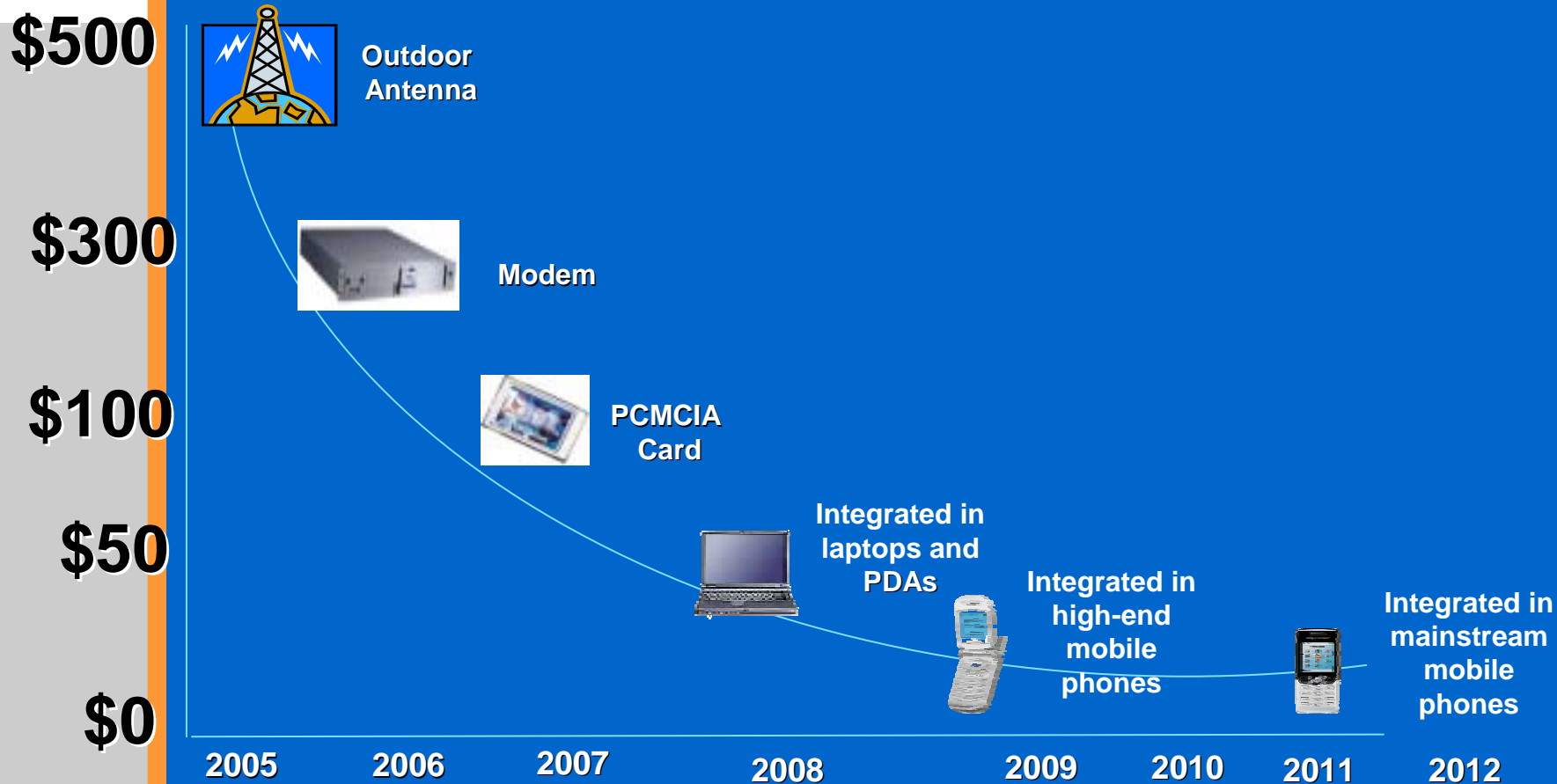
- Lower Maintenance cost

OFDM Performance

- Latency
- Spectral Efficiency
- Advanced Antenna Support
- Path to 4G



WiMax CPE Availability and CPE Costs

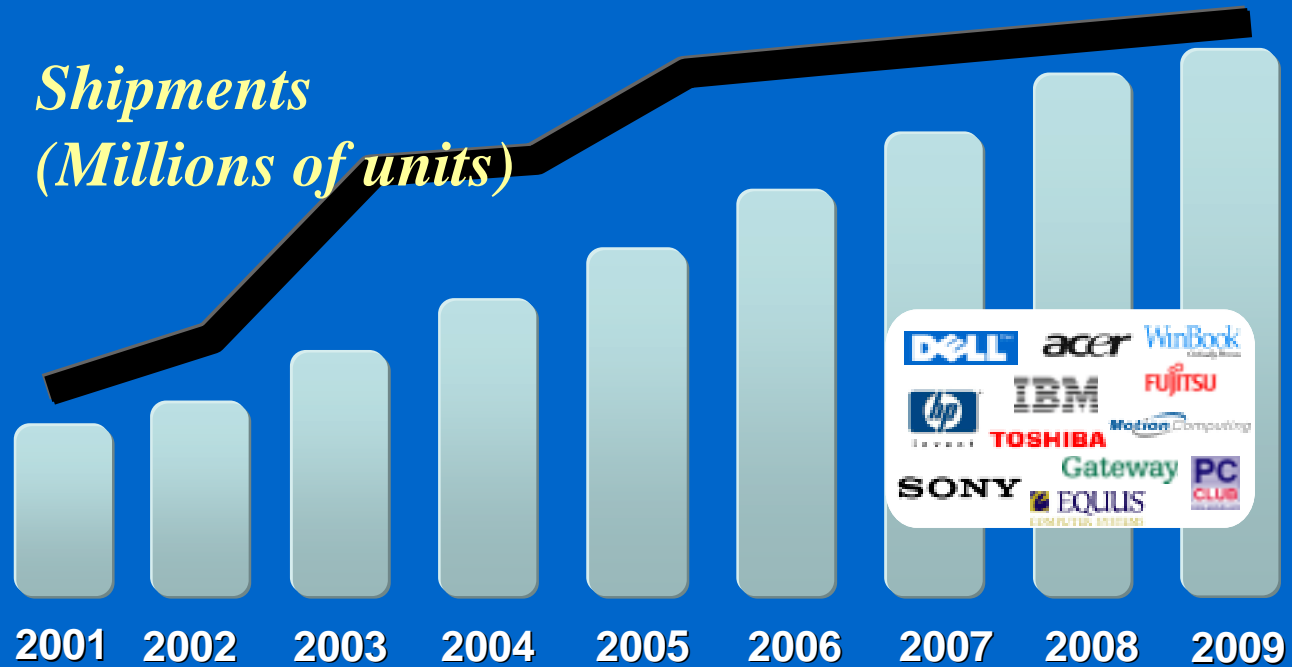


*Source for cost estimates: Alcatel, Alvarion and Intel

Zero Cost CPE!

100 M

*Shipments
(Millions of units)*



By 2008:

**70 million
notebooks
shipped
Annually
With WiFi**

**350
thousand
Hotspots
World-wide**

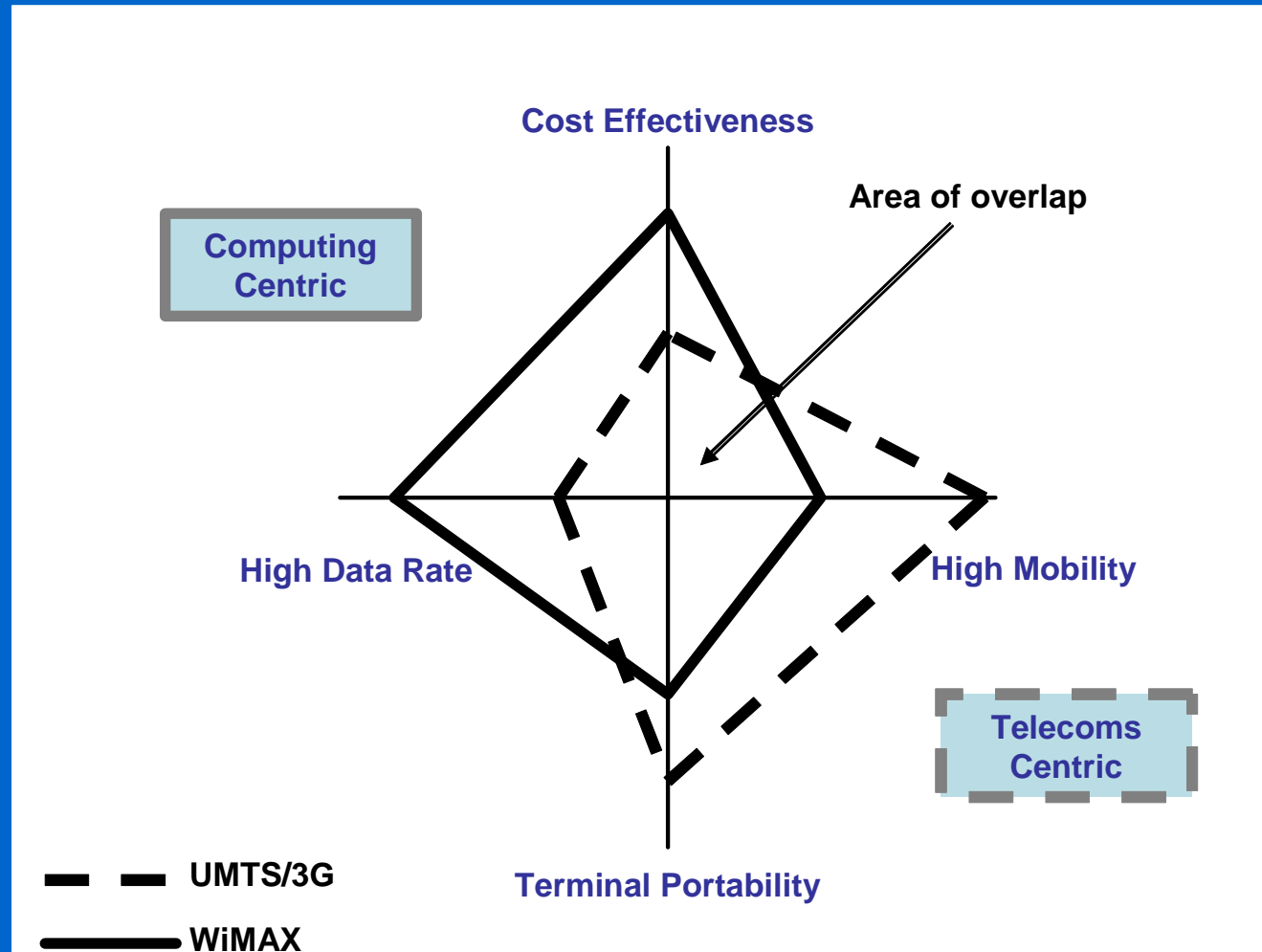
**700 million
WiFi
users**

0%

Replicate with WiMAX... & Build Handset Presence

Sources: Allied Business Intelligence, Inc Q4'03, Pyramid Research Report Nov '03, In-Stat/MDR, Jan '04

A view of the complementary nature of WiMAX and 3G





Summary



Summary

- Fixed WiMAX Certified Equipment is getting to the market
- WiMAX is REAL and being deployed worldwide
- Pent up consumer demand for personal broadband services
- WiMAX is rolling out in stages – To allow operators and vendors to make money as industry is growing
- WiMAX will compliment WiFi and Wireline deployments
- Mobile technologies are evolving to OFDMA, the foundation for 4G that is ideal for delivering cost-effective wireless data services (WiMAX is an early adaptor)
- WiMAX Open Service Platform and ecosystem is being developed