The Development of WiMAX
Sep. 2005

Broadband Access Solutions

IP (v6) based Backbone

- Cable
- DSL
- Fiber
- Power Line
- Satellite
- Broadband Wireless

Deployment factors:
- Existing network and evolution
- Requirements of service
- Cost
- Etc.
A Glance of WiMAX

**WHAT**
- WiMAX is to 802.16/e what WiFi is to 802.11
- Based on IEEE 802.16 and ETSI HIPERMAN standards
- Metropolitan area network (MAN) technology

**APPLICATION**
- Hotspot connectivity
- Wireless backhaul
- Last-mile broadband access
- Portable broadband
- Future Mobile broadband

**BENEFIT**
- Unified standard
- Conformance and Interoperability Certification
- Lower Cost CPE and multiple vendor
- Lower investment risk
Standard and Industrial Status

- **IEEE 802.16 standard status**
  - 16e is expected to be launched in September, 2005.

- **WiMAX Forum status**
  - Now 330 members, more than 120 members are carriers.
  - Certification test will start at Oct., 2005.

- **Industrial chipset roadmap**
  - Chipset based on 16d launched in April, 2005.
  - 16e chipset will be launched in 2006Q3.

- **Industrial equipment roadmap**
  - WiMAX 16d-based equipment will be trial in 2005H2, mass commercial application in 2006.

WiMAX v.s MMDS

<table>
<thead>
<tr>
<th></th>
<th>MMDS</th>
<th>WiMAX</th>
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</thead>
<tbody>
<tr>
<td>PHY layer</td>
<td>Single carrier</td>
<td>OFDM/OFDMA</td>
</tr>
<tr>
<td>Standard</td>
<td>Private</td>
<td>802.16d/e</td>
</tr>
<tr>
<td>Certification</td>
<td>No</td>
<td>WiMAX</td>
</tr>
<tr>
<td>Coverage</td>
<td>LOS</td>
<td>NLOS</td>
</tr>
<tr>
<td>Application</td>
<td>Fixed</td>
<td>Fixed/Potable/Mobile</td>
</tr>
<tr>
<td>Price</td>
<td>High(1000$/CPE)</td>
<td>Low(&lt;500$/CPE)</td>
</tr>
<tr>
<td>Evolution</td>
<td>No</td>
<td>16d/16e portable/16e mobile</td>
</tr>
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WiMAX proportion of total PMP market

![WiMAX proportion of total PMP market graph]

**Real Low cost on FBWA......only after there is WiMAX (802.16d/e standard & Conformance and Interoperability Certification). WiMAX proportion will be 60% of total PMP market in 2008.**
WiMAX Spectrum

Projected BWA Spectrum Mix
2006 Forecast

Source: Skylight Research, Q2’03

3.5GHz (3.3—3.8), 2.5GHz (2.5-2.8), 5.8GHz (5.25—5.85)

Spectrum Condition

WiMAX profiles available
Other Bands
WiMAX Application Segments

1. Multi-Point BACKHAUL
   - BACKHAUL for BASESTATION HOTSPOTS

2. SMB BUSINESS
3. SME ENTERPRISE
4. WiMAX 16e

WiMAX Deployment Strategy

Various deployment strategy is possible and may be chosen by different players according to specific business conditions and future planning.

<table>
<thead>
<tr>
<th>WiMAX Deployment strategy</th>
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<tbody>
<tr>
<td>Service</td>
</tr>
<tr>
<td>Option 1</td>
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<tr>
<td>Option 2</td>
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<td>Option 3</td>
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<td>Option 4</td>
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<td>Option 5</td>
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<td>Option 6</td>
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<tr>
<td>Option 7</td>
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</tbody>
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Opportunity 1: Fixed Wireless Access

Phase 1 (16d based):
✓ Fixed, 2005–2006
  ✓ 16d support SME/SMB broadband access
  ✓ 16d support WiFi/base station backhaul
  ✓ Complement of existing network

Opportunity 2: Portable & Mobile Broadband Access

Phase 2 (16e based):
✓ Portable, 2006–2007
  ✓ Existing mobile network support voice and mobile data access
  ✓ 16e portable support broadband access for SOHO and Residential
  ✓ Indoor CPE, PCMCIA
✓ Mobile in the future
  ✓ Mobile broadband
  ✓ Dual-mode PCMCIA or PDA
Huawei’s effort on WiMAX

- Jun2001  802.16 standard tracking, key technology research, OFDM/OFDMA/MIMO...
- Dec2002  IEEE802.16 prototype products research
- Aug2004  Joined WiMAX Forum
- Jan2005  Hosted IEEE802.16 Session #35 in Sanya, China
- Jun2005  Chairman of T Gneman
- Coordinator from IEEE802.16 to CCSA (China Communications Standard Association)

A Promising Wireless Solutions Provider

- WCDMA
- CDMA2000
- TD-SCDMA
- GSM / GPRS/EDGE (GSM-Trunking/GSM-R)
- WiMAX
- WLAN
Thanks

Technology Changes Communication Last