ITU-R mobile convergence issues

ITU-BDT Regional Seminar on Fixed Mobile Convergence and new network architecture for the Arab Region

Tunis
21–24 November 2005

Kevin Hughes
Senior Counsellor, ITU-BR

Contents

• Growth in mobile, Internet and broadband access
• The multiple facets of convergence
• IMT-2000 radio access standards
• Systems beyond IMT-2000
• Spectrum requirements
• Activities of ITU-R Working Party 8F
Growth of mobile and wireline

Figure 1: Global growth of mobile and wireline subscribers

Source: ITU World Telecommunication Indicators Database

Growth of mobile

Fixed lines and mobile subscribers (millions) and countries in which mobile has overtaken fixed

Mobile overtakes fixed total subscribers worldwide (millions)

More mobile countries

Source: ITU World Telecommunication Indicators Database
Growth of Internet

**Penetration rate per 100 inhabitants**

- Mobile penetration (Year 1 = 1990)
- Internet penetration (Year 1 = 1992)

Source: ITU World Telecommunication Indicators Database

Growth of broadband

**Broadband and mobile growth, millions, world**

- Mobile (1989-1992)

Source: ITU World Telecommunication Indicators Database
**Convergence: industry sectors**

- **Telecommunications**
  - Person-person, voice
  - Broadcast
  - Sound & vision, one-way

- **Information Technology**
  - Industrial, commercial, data

Different structures, social obligations, regulatory regimes

**Convergence: services**

- **Voice Video**
  - Email
  - SMS
digital photos/video clips

- **Sound Vision**
  - interactive

- **Software applications**
  - domestic

Person-people, person-things, things-things
Convergence: technology

- Digital
  - Circuit-switched
  - Packet-switched
- Flexible
- Efficient, adaptable, interoperable
- IP-based
- QOS

Convergence: device

- Internet
- Email
- SMS
- Digital photos
- Audio/video clips
- Video games
- Location-based services

- Television / Radio
- Telephone
- Computer
Convergence: Access Networks

THE emerging network of the 21st century
**IMT-2000 Radio Access Standards**

- Designed mainly in response to market, technology & regulatory opportunities & segments
- Many of these standards are already being enhanced

**IMT-2000 Standards Development**

- ITU Recommendations
- ITU Membership
- Forums
- Standards Development Organizations
- Consortium & Partnerships
- CCU
- ARIB
- TTA
- CCSA
- TIA
- 3GPP
- 3GPP2
- ITU
Fusion

Recommendation ITU-R M.1645

"Systems beyond IMT-2000 will be realized by functional fusion of existing, enhanced and newly developed elements of IMT-2000, nomadic wireless access systems and other wireless systems, with high commonality and seamless interworking"

Capabilities (‘The Van’)

Systems beyond IMT-2000 will encompass the capabilities of previous systems

Dashed line indicates that the exact data rates associated with systems beyond IMT-2000 are not yet determined
Radio Access - Three Main Phases

- **New radio interface(s)**
  i.e. research target 100 – 1000 Mbit/s (full to low mobility)

- **Relationship with other radio systems**
  e.g. Digital broadcast, RLAN, etc.

- **Enhancing IMT-2000**
  e.g. “fast packet” up to 30 Mbit/s by 2005 ?

- **2001**
- **2010**
Spectrum

• Prerequisite for development and operation of radio systems is the availability of spectrum

• Most of the usable spectrum is already allocated

• Decisions on global spectrum allocations/identification are taken at ITU World Radiocommunication Conferences

• There is a long lead-time between identification of spectrum and spectrum availability

Resolution 802 (WRC-03)

2007 World Radiocommunication Conference

Agenda item 1.4

“to consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000, taking into account the results of ITU-R studies in accordance with Resolution 228 (Rev.WRC-03)”
Resolution 228 (Rev.WRC-03)

resolves
1 to further study technical and operational issues …;
2 to report to WRC-07 on the spectrum requirements and potential frequency ranges …;
3 to conduct regulatory and technical studies on the usage of frequencies below those identified for IMT-2000 …;
4 to take into consideration the particular needs of developing countries including use of the satellite component of IMT-2000 …;
5 to include sharing and compatibility studies with services already having allocations in potential spectrum …;
6 that WRC-07 should consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000 …,
# WP 8F WRC preparation

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WRC-03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WRC activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future Services / Market Analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future Spectrum Calculation Methodology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future Technology Assumptions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spectrum Survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharing Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Draft text for WRC-07:**
  - Spectrum estimate
  - Candidate freq ranges
  - When
  - What for / name
  - Methods to satisfy agenda
  - Footnote text
  - Pooled / shared / paired / etc. ?

## WP 8F web page

http://www.itu.int/ITU-R/study-groups/rsg8/rwp8f/index.asp
• Mobile, Internet and broadband access is growing rapidly

• Convergence is occurring in many spheres

• IMT is being implemented and will evolve considerably over next 10-15 years - an open and market led process

• New radio interface(s) are expected to be required sometime between 2010-2015

• Spectrum aspects will be considered at WRC-07 - WP 8F is leading the preparatory studies

Summary

Thank you!

ITU-BDT Regional Seminar on Fixed Mobile Convergence and new network architecture for the Arab Region

Kevin Hughes
Senior Counsellor, ITU-BR