Input Presentation for “Tim Study Group Regulasi Postel”

“Convergence: Portrait on Technology Roadmap & Its Impact”

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Telkom R&D Centre
11 Februari 2010
Agenda

1. Technology & Standardization:
   - Fixed-Mobile
   - Telecom-Broadcasting

2. Issues Identified by AWF Conv-WG

3. Concluding Remarks
Convergence Portrait

Source: Kemal Huseinovi et al, "Regulation Impact on Convergence of Services and Technologies", TELFOR 2009, November 2009
Steps to FMC and Its Related Organizations & Standards

**ITU-T (SG-13 & 19)**
- Q 1761
- Q FMC-REQ → Q.1762/Y.2802
- Q FMC-PAU → Q.FMC-PAM → Q.1763/Y.2803
- Q FMC-IMS → Y.2808

**Mobility:**
- Q.MMF → Q.1707/Y.2804,
- Q.HMF → Q.HCF → Q.1709/Y.2806
- Q.LMF → Q.1708/Y.2805
- Q.SMF

**3GPP2**

**WIRELESS/MOBILE**
- CTP
- UMA/GAN
- Femto

**PRE-IMS**
- CSI, VCC

**WIRELINE/FIXED**

**CSI, VCC**
- IMS

**MMD, A-IMS**

**ETSI**

Timeline of NGN Standardization

**ITU-T**
- **SG 13**: Service requirements and architecture
- **SG 11**: Signaling protocols

**ETSi TISPAN**
- Release 1: End of 2003 ~ early 2006
- Release 2: Early 2006 ~ mid 2008
- Release 3: Common IMS

**3GPP**
- Release 6: ~ end of 2004
- Release 7: ~ mid 2007
- Release 8: ~ end of 2008

**IETF**
- SIP standard RFC3261 (Jun. 2002)

Future Network

Source: Hideo IMANAKA, ITU-T Q.1/13 Rapporteur, Service Integration Labs., NTT, “Some topics of NGN-related Standardization in ITU-T”
In NGN Release 2 scope, Y.Sup7, includes some convergence services:

- Mobility support functions, e.g. FMC and seamless handover.
- Converged web browsing services (CWBS)
  - CWBS provides web-browsing services in different NGN devices and various network environments with profile-based content adaptation capabilities.

Horizontal Convergence: services are no more vertically integrated

Source: Hideo IMANAKA, ITU-T Q.1/13 Rapporteur, Service Integration Labs., NTT, “Some topics of NGN-related Standardization in ITU-T”
Current Work in ITU-T

- The latest status of Q.FMC-IMS
  - Q.FMC-IMS was completed in May 2009 as Y.2808
  - Including basic concept of FMC by using FMC

- The latest status of Questions in SG-13:
  - Q.3/13 (Requirements and implementation scenarios for emerging services and capabilities in an evolving NGN)
    - NGN requirements was completed as Y.2201 Rev.1
    - Working on services including service delivery platform (NGN-SIDE)
  - Q4/13 is as follows:
    - Y.2111 rev 2, RACF rev 2 including mobility capabilities, is now developing.
    - Y.IPTV-TM, traffic management architecture for providing IPTV services, is now developing.
  - Q.5/13 (Principles and functional architecture for NGN including ubiquitous networking)
    - Working on NGN architecture to provide content delivery services
  - Q.11/13 (Convergence of existing and evolving IMT and Fixed Network)
    - Working on seamless mobility between WiMAX and WLAN

Source: Hideo IMANAKA, ITU-T Q.1/13 Rapporteur, Service Integration Labs., NTT, “Some topics of NGN-related Standardization in ITU-T”
UMA (Unlicenced Mobile Access)

Source: http://www.umatoday.com/
UMA Network Controller is utilized also for controlling the Femtocell.

Source: [http://www.umatoday.com/](http://www.umatoday.com/)
Architectural Model for Ubiquitous Networking in NGN

End-user

Connecting to Anything
- Personal device, RFID tag, Sensor, Smart card

NGN Service & Transport Stratum

Context-awareness
- User & Environmental Status recognition

Seamlessness
- Any time, Any where, Any device, Any content, Always connected

Multi-networking
- Unicast/Multicast, Multihoming, multi-interfaces, multi-path

Ubiquitous Networking Applications

Web Service Environments
- (IT + vehicle, health, etc)

Open interface (API)

Other Networks
- IPv4/IPv6 Networks
- Broadcasting Networks
- Mobile/Wireless Networks
- PSTN/ISDN

UNI

End-to-end connectivity

Source: Gyu Myoung Lee (ITU-T Q.12/13 Rapporteur), Framework of home network using ubiquitous networking
IMS-based FMC Architecture

- Transfer services between terminals attached to different networks based on reach-ability, user preferences or at the user’s explicit request
- Transfer services from one access to another to provide service continuity for multi-mode terminals that can attach to both fixed and mobile access points

Source: Q.FMC-IMS (Y.2808)
## UMA, VCC and Femtocell Comparison

<table>
<thead>
<tr>
<th></th>
<th>UMA</th>
<th>VCC</th>
<th>Femtocell</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard</strong></td>
<td>3GPP TS43.318(R6)</td>
<td>3GPP 24.260(R7);</td>
<td>3GPP TR 25.820 V8.1.1 (2008-05),</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ETSI TS 182 007 V2.0.0, TISPAN Voice Call</td>
<td>Technical Specification Group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Call Continuity (VCC);</td>
<td>Radio Access Networks;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stage 2;</td>
<td>3G Home NodeB Study Item</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Technical Report (Release 8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Enhanced Home NodeB/</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>eNodeB(EHNB) (Release 9)</td>
</tr>
<tr>
<td><strong>Spectrum</strong></td>
<td>Unlicensed</td>
<td>Unlicensed for WiFi part</td>
<td>Operator existing spectrum</td>
</tr>
<tr>
<td><strong>Key New</strong></td>
<td>UNC/GAN (IP&lt;-&gt;Gb/A)</td>
<td>VCC AS</td>
<td>BSG/BVG etc</td>
</tr>
<tr>
<td><strong>Components</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CPE Support</strong></td>
<td>BT/GSM or WiFi/GSM, quite a lot models</td>
<td>Need high-end smart phone to embed SIP</td>
<td>Existing handsets, but need Femtocell</td>
</tr>
<tr>
<td></td>
<td></td>
<td>client</td>
<td></td>
</tr>
<tr>
<td><strong>Availability</strong></td>
<td>Now</td>
<td>Now</td>
<td>Now</td>
</tr>
<tr>
<td><strong>Potential</strong></td>
<td>Home/Hotspot</td>
<td>Enterprise/Home</td>
<td>Home/SOHO</td>
</tr>
<tr>
<td><strong>Market</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Value</strong></td>
<td>Mature standard, support voice</td>
<td>Wide availability of WiFi AP, IMS</td>
<td>Low cost over DSL backhaul, existing</td>
</tr>
<tr>
<td><strong>Proposition</strong></td>
<td></td>
<td>Evolution</td>
<td>large phone base</td>
</tr>
<tr>
<td><strong>Regulatory</strong></td>
<td>Same as VoIP</td>
<td>Same as VoIP</td>
<td>Who owns Femtocell ?</td>
</tr>
<tr>
<td><strong>Issues</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Challenges</strong></td>
<td>OSS over thousands of WiFi AP</td>
<td>IOT between terminal and VCC AS</td>
<td>Large number of femtocell needs to be managed (OSS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No direct support of 3G(not finalized yet), 2M Gb is small for PS service</td>
<td>No large deployment due to evolution of standard itself</td>
<td>Macro cell radio coordination needs to be architecture carefully</td>
</tr>
</tbody>
</table>

Home-Zone 2.0

Source: Home Zone 2.0 Beyond Cheap Voice, Kineto Wireless, Inc., October 2008
## Common service additions to Home Zone 2.0

<table>
<thead>
<tr>
<th>Usage Locations</th>
<th>orange</th>
<th>T-Mobile</th>
<th>TellaSonera</th>
<th>Cincinnati Bell</th>
<th>Sprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator Broadband</td>
<td>✔️</td>
<td>Not Applicable</td>
<td>✔️</td>
<td>✔️</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Any Broadband</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Operator HotSpots</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Any HotSpot</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>International</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Fixed Line VoIP</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

Source: Marketing Home Zone 2.0 Services, Kineto Wireless, Inc., October 2008
### FMC Deployment Examples

<table>
<thead>
<tr>
<th>Service Provider</th>
<th>FMC Flavor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bell Canada</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>BT</td>
<td>UMA</td>
</tr>
<tr>
<td>Celcom</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>China Unicom</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>Chungwa Telecom</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>Cingular</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>Comfone</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>Eurocom</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>Hello</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>J Com</td>
<td>IMS</td>
</tr>
<tr>
<td>Mobilcom</td>
<td>IMS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Service Provider</th>
<th>FMC Flavor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net2Phone</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>Orange Israel</td>
<td>IMS</td>
</tr>
<tr>
<td>Pelephone</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>Private Mobile Networks</td>
<td>Picocells</td>
</tr>
<tr>
<td>Telefonica</td>
<td>IMS</td>
</tr>
<tr>
<td>Teleglobe</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>Telia Sonera</td>
<td>UMA</td>
</tr>
<tr>
<td>T-mobile Germany</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>WorldCell</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>Yes Optus</td>
<td>SIP based Pre IMS</td>
</tr>
<tr>
<td>Orange</td>
<td>UMA</td>
</tr>
<tr>
<td>Telecom Italia</td>
<td>UMA</td>
</tr>
</tbody>
</table>

Source: iLocus, The Impact of FMC on World Telecom Markets, 2006
Evolution

What is Mobile Multimedia Broadcast / Multicast?

- Providing television (multimedia) on mobile phones – mobile TV

Two competing solutions

- Delivery over the broadcasting network
- Delivery over the cellular network

Source: Nangapuram Venkatesh, “Mobile Multimedia Broadcast and Multicast”, Global Standards Collaboration (GSC) 14, July 2009
ITU-R Study Group 6 (Broadcasting Service) has been studying ‘mobile TV’

- Question ITU-R 45/6 ‘Broadcasting of multimedia and data applications’
- **Recommendation ITU-R BT.1833** ‘Broadcasting of multimedia and data applications for mobile reception by handheld receivers’ responds to the Question
- Report ITU-R BT.2049-2 ‘Broadcasting of multimedia and data applications for mobile reception’ provides up-to-date status

Source: Nangapuram Venkatesh, “Mobile Multimedia Broadcast and Multicast”, Global Standards Collaboration (GSC) 14, July 2009
Present Situation

Technologies Recommended by BT.1833

- ISDB-T – in operation in Japan
- DVB-H - used in Europe, Africa, some countries of Asia
- T-DMB – deployed in S. Korea
- FLO – has attracted support in the US
- MBMS – telecom based (GSM, UMTS) service, included in BT.1833 as informative Appendix

Source: Nangapuram Venkatesh, “Mobile Multimedia Broadcast and Multicast”, Global Standards Collaboration (GSC) 14, July 2009
## Mobile TV Technology

<table>
<thead>
<tr>
<th></th>
<th>DVB-H</th>
<th>MediaFLO</th>
<th>T-DMB</th>
<th>ISDB-T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service area</strong></td>
<td>EU, U.S., Asia</td>
<td>U.S</td>
<td>Korea, EU</td>
<td>Japan</td>
</tr>
<tr>
<td><strong>operator</strong></td>
<td>Nokia, Ti, BenQ</td>
<td>QUALCOMM,</td>
<td>Samsung, LG</td>
<td>Panasonic, Sanyo, Sharp, etc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Samsung, LG</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Technology standard</strong></td>
<td>open</td>
<td>Patent</td>
<td>Open</td>
<td>open</td>
</tr>
<tr>
<td><strong>Wireless interface</strong></td>
<td>OFDM</td>
<td>OFDM</td>
<td>OFDM</td>
<td>OFDM</td>
</tr>
<tr>
<td><strong>Spectrum</strong></td>
<td>UHF</td>
<td>700MHz</td>
<td>2.6GHz</td>
<td></td>
</tr>
<tr>
<td><strong>Bandwidth</strong></td>
<td>5/6/8</td>
<td>5/6/7/8</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td><strong>codec</strong></td>
<td>H.264/MPEG-2</td>
<td>H.264/AAC</td>
<td>H.264/MPEG-4</td>
<td>H.264/AAC</td>
</tr>
<tr>
<td><strong>performance</strong></td>
<td>1 – 11Mbps</td>
<td>1 – 11Mbps</td>
<td>1 – 11Mbps</td>
<td>1 – 11Mbps</td>
</tr>
<tr>
<td></td>
<td>15~30fps</td>
<td>15~30fps</td>
<td>25~35fps</td>
<td>15fps</td>
</tr>
<tr>
<td></td>
<td>16CH 8MHz</td>
<td>1520CH, 6MHz</td>
<td>3CH, 1.5MHz</td>
<td>13CH 6MHz</td>
</tr>
<tr>
<td><strong>Investment cost</strong></td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Low-medium</td>
</tr>
<tr>
<td><strong>Indoor coverage</strong></td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>–</td>
</tr>
</tbody>
</table>

Agenda

1. Technology & Standardization:
   - Fixed-Mobile
   - Telecom-Broadcasting

2. Issues Identified by AWF Conv-WG

3. Concluding Remarks
Summary of

“Compilation of Survey Result on the Regulatory Aspect of Fixed Mobile Convergence”
(doc. AWF-6/INP-80)
**Responders**

**Regulators:**
1. Bureau of Telecommunications Regulation (DSRT), MACAO
2. Ministry of Internal Affairs and Communications (MIC), JAPAN
3. Directorate General of Post and Telecommunication (DGPT), INDONESIA
4. Infocomm Development Authority (IDA), SINGAPORE
5. Office of the Telecommunication Authority (OFTA), HONGKONG
6. Telecom Regulatory Authority of India (TRAI), INDIA
7. Bangladesh Telecommunication Regulatory Commission, BANGLADESH
8. Ministry of Information and Communications, VIETNAM
9. Korea Communications Commission (KCC), Rep. of KOREA

**Operators:**
1. Companhia de Telecomunicacoes de Macau S.A.R.L.
2. SmarTone Mobile (Macau)
3. China Unicom (Macau) Co. Ltd *
4. Hutchison Telephone (Macau) Company Limited *
5. PT Telekomunikasi (Telkom) Indonesia
6. PT Telekomunikasi Seluler (Telkomsel) Indonesia
7. LG Dacom Corporation, Korea
8. KT, Korea
9. SK Telecom, Korea *

*) non APT member

**Vendors:**
1. Huawei Technologies, China
2. Samsung Electronics Co., Ltd
3. Ericsson AB
Is there any FMC deployment or plan of deployment in your country?

- No: 1 (11%)
- Planned: 3 (33%)
- Yes: 5 (56%)

*) Responses from Regulators
FMC types that are deployed or intend to be deployed

<table>
<thead>
<tr>
<th>FMC bundles / Commercial</th>
<th>Service Convergence</th>
<th>Network-based FMC</th>
<th>FMC in terminal/devi</th>
<th>Not yet defined</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

*) Responses from Regulators
*) Responses from Regulators
Have you deployed or intend to deploy Particular License or Regulation on FMC?

- **Yes, deployed**: 1 (11%)
- **Planned**: 4 (45%)
- **No**: 3 (33%)
- **Undefined**: 1 (11%)

*) Responses from Regulators
Do you apply or plan to apply Technology Neutral spectrum policy?

- Yes: 3 (33%)
- No: 4 (45%)
- Planned: 1 (11%)
- Undefined: 1 (11%)

*) Responses from Regulators
How do you manage the Spectrum / Frequency Allocation in terms of FMC

- Most of the answers, they do not manage particular spectrum for FMC
- Others are not defining it yet

*) Responses from Regulators
Most of the answers, they do not manage particular license & spectrum fee for FMC

Others are not defining it yet / under study

*) Responses from Regulators
One responder uses particular numbering for “one number and one call” by combining two or more mobile networks and fixed networks.

Two responders applied number portability.

Others are not defining it yet / under study.

*) Responses from Regulators
A new model for FMC interconnection charging i.e. Bill and Keep is introduced, please give your opinion for that model

- Two responders consider that this model would be suitable in converged network
- Other responders are studying this model

*) Responses from Regulators
Summary of

"Report on Survey Result of the Telecommunication and Broadcasting Convergence“ (doc. AWF-4/INP-26 (Rev.3))
Responders

Administrations from:
- Afghanistan
- Hong Kong
- Indonesia
- Japan
- Papua New Guinea
- Republic of Korea
Do you have wireless convergence services which have been started in your administration?

- Four responders have already started various services such as mobile TV via 3G, ISDB-T and S-DMB & T-DMB
- Others have no deployment yet
Do you have the results of market analysis on the wireless convergence services?

- **As of May 2007:**
  - 7 millions segment broadcasting receivers are already shipped in Japan
  - 6.4 million subscribers (T-DMB: 5.3 million, S-DMB 1.1 million) enjoy Mobile TV services in Korea. The major types of receivers are car installable (44.2%) and cellular phone (38.5%)
Most of the responders have two separate wireless telecommunication & wireless broadcasting regulatory laws / bodies.

However, some of them have already studied and plan to have a new integrated regulatory law / body.
Do you have any regulatory or policy Challenges to introduce the wireless convergence services in your administration?

- Some challenges are:
  - Different viewpoints of the new convergence services (as it was manage separately)
  - Acceptable standard suitable for viewing by the general public
  - Foreign ownership limitation
Do you have plan for terrestrial wireless digital TV transition?

- Three responders have been implementing digital TV
- One responder plan to do so
- Two others have not been defining yet
What do you think about the use of the Digital Dividend as a harmonized spectrum band for wireless convergence services in Asia-Pacific region?

Most responders are studying this issue and considering that:

- It can be used by various service types such as broadcasting, telecommunication, wireless convergence service
- This band has good characteristics on not only the radio propagation aspects but also economic value aspects
- UHF band needs to be used in most efficient way
Benchmark: Target of China’s Restructuring

- To solve the severe unbalance situation in the telecom market competition
- Optimize the telecom resource distribution among the operators
- Realize full services for all operators

*(An essential condition for FM convergence)*

Source: Xie Feibo, Deputy Director General Bureau of Radio Regulation China, AWF-5, August 2008
Benchmark: China from 6 to 3 Operators

- China Telecom: Fixed 280 million + China Satcom + 42 million CDMA (ex China Unicom)
- China Netcom: Fixed 120 million + China Unicom: 120 million GSM
- China Mobile: 420 million GSM + China Tietong(Railcom): Fixed 6 million

Restructuring to

Source: Xie Feibo, Deputy Director General Bureau of Radio Regulation China, AWF-5, August 2008
Concluding Remarks

- The deployment of Fixed-Mobile Convergence and Telecom-Broadcasting Convergence have been started.
- There are several related issues that need to be anticipated & resolved.
Thank you for your time