

Convergence

How Policymakers and Regulators are Adapting Frameworks to New Technologies

Mindel De La Torre, President
Telecommunications Management Group, Inc.

Presented at the
*National Seminar on Regulatory Issues
in an Era of Convergence*
June 28-29, 2006
New Delhi, India





Overview

- What is convergence
- Benefits of convergence
- Adapting regulatory frameworks to convergence
- Case studies
- India's way forward



Defining Convergence

No standard definition...

- The ability of different networks and user equipment to carry similar services
 - Cellular networks carrying streaming video in broadcast mode and broadcasters being able to provide data services in unused portions of their spectrum
- The ability of one network or user equipment to carry different services
 - Handsets that carry voice, data, and video services

Impact of convergence is expanding because of emergence of advanced technologies



Benefits of Convergence

- Promotes competition, especially when networks and technologies compete directly with no regulatory or technical restrictions
- Fosters development of increasingly efficient technologies and services
- Reduces costs of telecom services
- Enables operators to tailor offerings to satisfy specific needs of end users

Examples of Technologies and Services that Enable Convergence

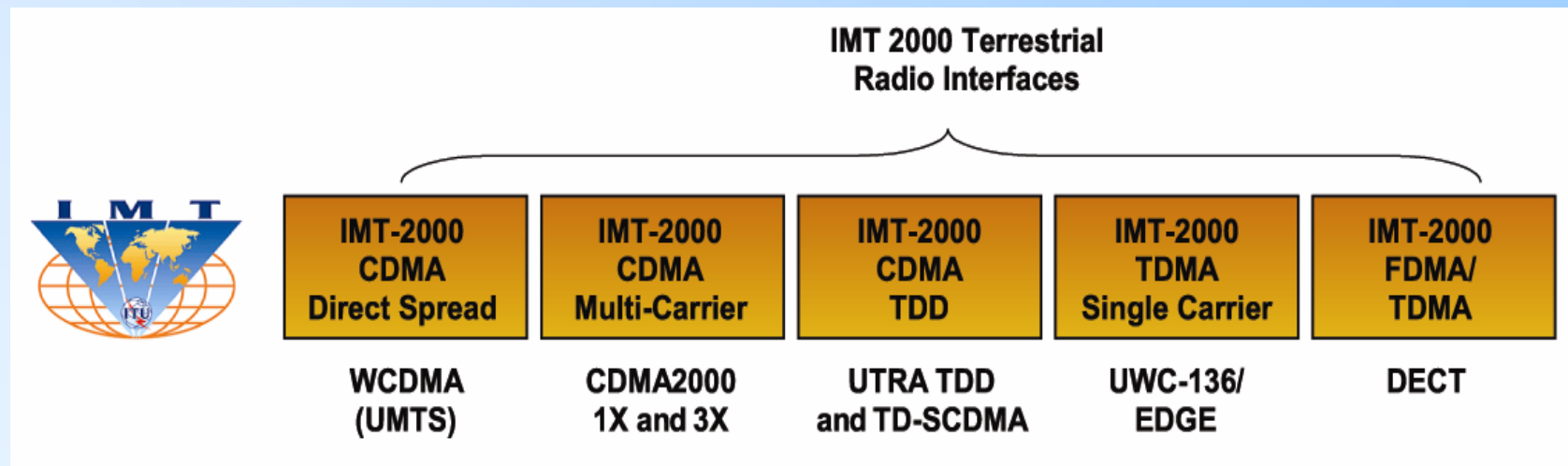
Multiple service provision under different network infrastructures

Infrastructure	Voice	Data	Video
Copper Line	PSTN	DSL, FTTP	VOD, IPTV
Cable (coaxial and fibre optic)	Some (analogue and VoIP)	Cable modem	Analogue, DTV
Mobile	Analogue, 2G, IMT-2000	2.5 G, IMT-2000	DVB-H, Media-FLO
Fixed Wireless	Some (VoIP)	IMT-2000, WiMax, LMDS, MMDS	DVB
Power Lines	VoIP	BPL	VOD, DVB, IPTV

DSL=Digital Subscriber Line, FTTP=Fibre to the premise, VOD=Video on Demand, IPTV=Internet Protocol TV, DVB=Digital Video Broadcasting, 2G = Second generation mobile service, IMT-2000 = International Mobile Telecommunications-2000 mobile service, BPL=Broadband over Power Line, LMDS = Local Multipoint Distribution System, MMDS = Multichannel Multipoint Distribution System.

IMT-2000 (3G)

- Five technologies approved by the ITU:



- IMT-2000 supports all IP networks
- Current plans call for up to 72 Mb/s throughput



IMT-2000 (3G)

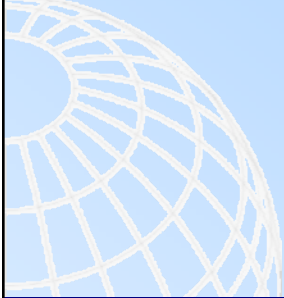
- IMT-2000 frequencies have been identified by ITU Radio Regulations to promote harmonization:
 - 806-960 MHz (Region 1: 862-960 MHz)
 - 1885-2025 MHz
 - 2110-2200 MHz
 - 1710-1885 MHz
 - 2500-2690 MHz
- Can operate in any band allocated to the mobile service
 - WRC-07 will consider additional identifications, much interest in lower bands, including 450-470 MHz



WiFi

- The popularity and availability of WiFi services has been expanding rapidly in the Asia-Pacific region
- Accurate hotspot counts are difficult, but a September 2004 survey of available data reported nearly 22,000 WiFi hotspots across 13 Asia-Pacific countries
- WiFi bands – opened in India in February 2005
 - 2.4 GHz de-licensed for indoor and outdoor use
 - 5.1 GHz de-licensed for indoor use
- One source indicated approximately 300 public hotspots in India at end-2004
 - 80 percent in Bangalore
 - Same report projected more than 1500 hotspots by end-2005

Sources: Telecommunications Management Group, Inc., *Asia Pacific Mobile Multimedia Outlook*, September 2004; KSC Commercial Internet.



WiMAX*

- Projected to carry up to 75 Mbps over distances up to 50 km
 - Touted as a possible alternative to DSL and cable modem technologies
 - Emerging technology
 - Supported by major communications and IT industry stakeholders
 - Based on IEEE 802.16 standards
 - Costs, adoption rate, and revenue potential unknown
 - Developing countries: could be too expensive to deploy
 - Developed countries: may not be inexpensive enough to displace existing broadband alternatives
 - Anticipated market introduction:
 - July 2005: certification testing began
 - Late 2005: certified transmission equipment available for sale
 - 2006: certified consumer/end-user equipment available for sale
- * *WiMAX = Worldwide Interoperability for Microwave Access*



Flash-OFDM*

- Promoted as possible complement for IMT-2000 data technologies
 - Currently not standards-compliant, although proponents are active in standards organizations
- Carries up to 3.2 Mbps to a wide geographic area
- Proponents evaluating potential for including Flash-OFDM technology in:
 - Mobile handsets: would provide access to high-speed Flash-OFDM networks
 - WiFi access points/routers: would act as bridge between wide-area Flash-OFDM network and local WiFi network
- Emerging technology
 - Too early to gauge adoption rate or revenue potential
 - Early deployments include U.S. metropolitan area public safety network and other trial deployments

**OFDM = Orthogonal Frequency Division Multiplexing*



IP Technologies

- VoIP – Voice over IP
 - The routing of voice conversations over the Internet or through any other IP-based network
 - Advantages
 - Low cost
 - Functionality - can facilitate tasks that may be more difficult to achieve using traditional phone networks
 - Mobility – users are not tied to one physical location
- IPTV – IP television (digital)
 - Can be part of video on demand (VoD) and triple play (voice via VoIP, video via IPTV, and data)
 - Point-to-point service rather than broadcasting



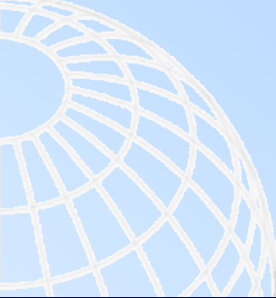
Broadband over Power Line (BPL)

Basics

- Transmits signals over power lines
- High voltage lines and transformers destroy signal, so data must be routed to medium-voltage lines, and around transformers
- No widely accepted standard

Unique Features

- Wiring is already installed
- Speeds up to 3 Mbps (comparable to cable)
- “Last mile” delivery can be via power lines or wireless
- Some regulatory hurdles because of RF emissions



Why Update the Regulatory Framework?

Why should India update its existing regulatory framework?

- Traditional frameworks were designed for an era that has passed:
 - Circuit-switched technology
 - An era when clear functional differences existed between services and infrastructure
- Convergence is eliminating the traditional boundaries separating broadcasting and telecom sectors



Why Update the Regulatory Framework? (cont'd)

- Benefits from convergence and advanced technologies are constrained by existing regulatory frameworks
- The addition of numerous new technologies, and the accompanying proliferation of delivery mechanisms, creates a growing administrative burden for regulators, and underscores the need to separate regulation into two main categories: content and delivery
- To obtain benefits of convergence and advanced technologies, frameworks need to be modified



Benefits of an Updated Regulatory Framework


How will India benefit from updating its framework to address convergence and advanced technologies?

- Economic effects are widespread, because telecommunications are a structural cost for all businesses
- India will be able to compete effectively in today's globally competitive marketplace
- New framework should recognize elimination of old boundaries, and address new reality, where broadcasting, telecom and ICT are becoming ever more interwoven



A Comprehensive Solution

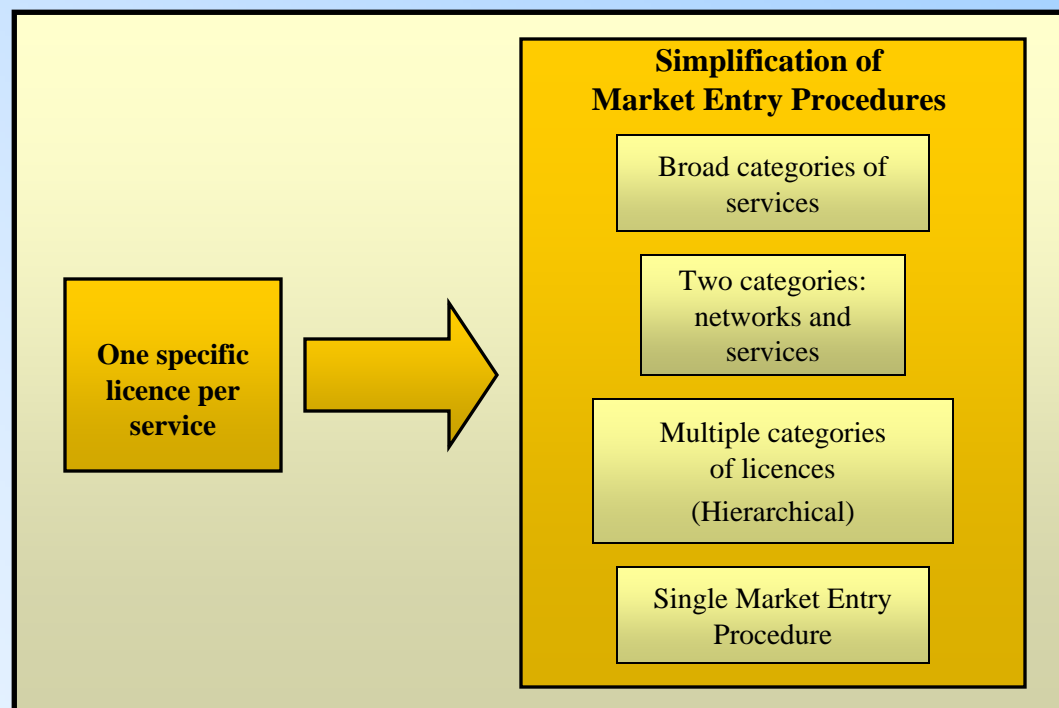
- Convergence impacts the following key areas:
 - Licensing
 - Rights and obligations
 - Spectrum management
 - Broadcasting regulation
- An effective modification of the regulatory framework to address convergence requires an interwoven solution that addresses all key areas and changes to one area will affect other areas
- A comprehensive solution, addressing all key areas, is the only way to ensure all the benefits of convergence and advanced services



Adapting Regulatory Frameworks to Convergence

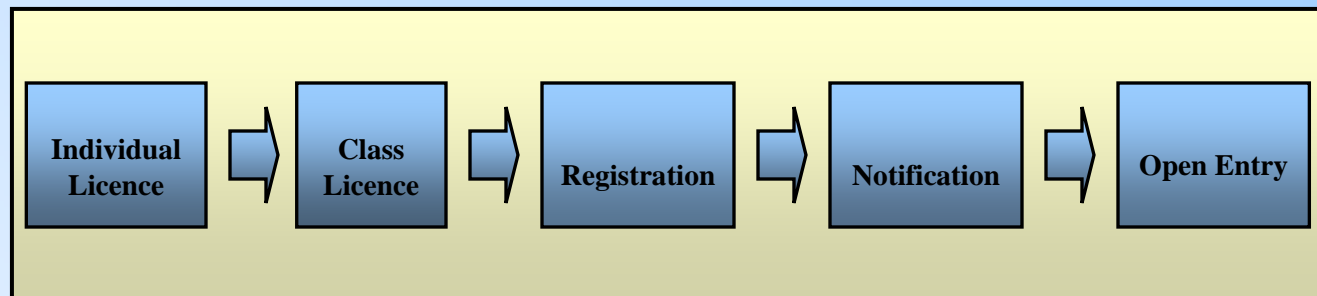
- Modification of licensing regimes
 - From traditional one-service/technology licence to a broad set of categories
 - Unified licence is extreme example of this (one licence for all services)
- Reduction of administrative burdens for obtaining a licence

Simplification of Market Entry Intervention*



** For the purpose of this diagram, "licence" means the regulatory requirements necessary to provide telecommunication services.*

Simplification of Administrative Requirements for Licensees



- Individual licences are less efficient to process, since each licence must be considered individually
- Regardless of level of burden, regulator must ensure full transparency of the process, including consultation with industry, to ensure an efficient market

Examples of Simplification

	Malaysia	Singapore	Argentina	Peru	India (TRAI Proposal)
<i>Licensing Simplification</i>					
- One licence per service					
- Broad categories of services	√				
- Two categories: networks and services		√			
- Multiple categories of license				√	√
- Single licence			√		
<i>Administrative Simplification</i>					
- Individual licence	√	√	√	√	√
- Class licence	√	√			√
- Registration				√	√



Adaptation of Regulatory Conditions

- Convergence affects the regulatory conditions of service providers
- Key principles:
 - Flexibility for new technologies
 - Service and technology neutrality
 - Level playing field among services within same licensing category
- Four key modification areas:
 1. Interconnection
 2. Numbering
 3. Universal service
 4. Consumer protection and information



1. Interconnection

- Traditional interconnection regulation established for switched voice services. New IP-based services require a new approach
- Fundamental principle: any network operator must be able to interconnect to any other operator, regardless of network type
- Changes follow three broad patterns:
 1. Symmetrical interconnection regimes
 2. New types of interconnection – access to parts of infrastructure (ex. local loop or directory services databases)
 3. Capacity-based interconnection – flat-rate charge for a specific capacity of interconnection



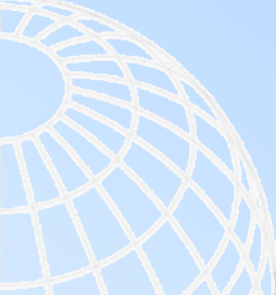
2. Numbering

- Originally developed for switched voice telephony, and thus divided numbering into geographic areas
- IP-based technologies force an update to this model
- Some countries grant specific numbering rights to VoIP services (Japan, South Korea, some EU states), some assign traditional geographic numbering, and some allow a mixture of the two
- Number portability must address inter-modal portability (fixed-to-mobile and vice versa), as well as any geographic restrictions on phone numbers (area codes), and potential technical and economic effects to existing interconnection configurations
- ENUM, a suite of protocols to unify the telephone system with the Internet, is under study by some regulators



3. Universal Service

- Intended to provide telecommunications services to underserved areas and populations
- Originally included only voice service
- Convergence changes scope to include other services (ex. data)
- Contributions to universal service fund (USF) are being expanded beyond just voice service providers
- Provision of advanced services to underserved areas/people will allow access to a variety of previously unavailable services



4. Consumer Protection and Information

- Goal is consumer protection and informed decision-making
- Regulators have introduced requirements that service providers inform consumers of differences between new services and traditional telecom services
- Example: VoIP providers in Hong Kong, US, and UK operate under more flexible rules compared to traditional voice providers, but must disclose differences regarding emergency calls



Spectrum Management Rules

- As with licensing regimes, convergence requires a new approach to spectrum management
- Goal is a framework that is service and technology neutral
- More efficient spectrum use is necessary for fully converged services to realize their advantages:
 - Mobile television
 - 3G data services
 - New service and applications
 - Reduction of prices through innovation and competition
- More details in spectrum management presentation



Adaptation of Broadcasting Regulation

- Convergence has blurred boundaries between TV broadcasting and telecom sectors
- IP networks carry broadcasting services that compete for customers of traditional TV broadcasting services
- Broadcasting regulatory frameworks must be adapted to convergence:
 - Split regulation of transmission network from regulation of content
 - Regulation of transmission network should be technology-neutral
 - Regulation of broadcasting services covers only content
 - The EU’s “Television without Borders” directive follows this model



700 MHz Band Case Study (I)

- A converged environment fosters advanced new services, and requires regulatory frameworks with technology and service neutrality
- Some countries are establishing a framework that ensures complete technology and service neutrality for spectrum management regimes
- Other are still establishing these principles in specific bands, to allow the advanced services to develop as the market requires
- For instance, the transition of analogue to digital TV in the 700 MHz band in the US and Canada



700 MHz Band Case Study (II)

- US and Canada plan to use 700 MHz band for the following purposes:
 - **Advanced wireless systems (IMT-2000, public safety, broadband wireless access, mobile broadcasting systems)**
- US has auctioned 24 MHz of the 84 MHz recovered from the broadcasters in the lower 700 MHz band
 - **C block (710-716/740-746 MHz) and D block (716-722 MHz)**
 - **QUALCOMM, which owns licenses covering the entire United States on Channel 55 (716-722 MHz), has announced plans to deploy a nationwide “mediacast” network on the spectrum to deliver multimedia content to mobile phones**



700 MHz Band Case Study (III)

- Regional Americas organization CITEC recommendation divides the 700 MHz spectrum:
 - 764-776 MHz and 794-806 MHz bands for public safety systems
 - 698-764 MHz and 776-794 MHz bands for advanced wireless systems
- Example of cross-border cooperation, regionally harmonized frequency bands/ranges, and modification of framework to allow for development of advanced services in the market



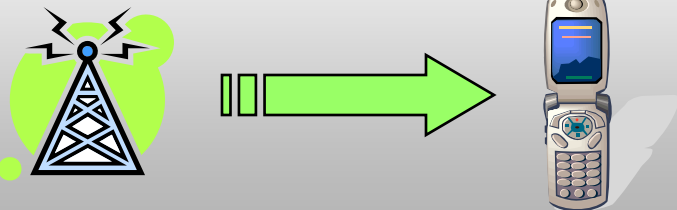
700 MHz Band Case Study (IV)

- Public safety services, mobile services, and broadcast services all use 700 MHz band
- Technologies driving convergence are allowing disparate applications to operate co-channel and adjacent channel in the UHF band
- It is to be expected that many of these services will migrate to IMT

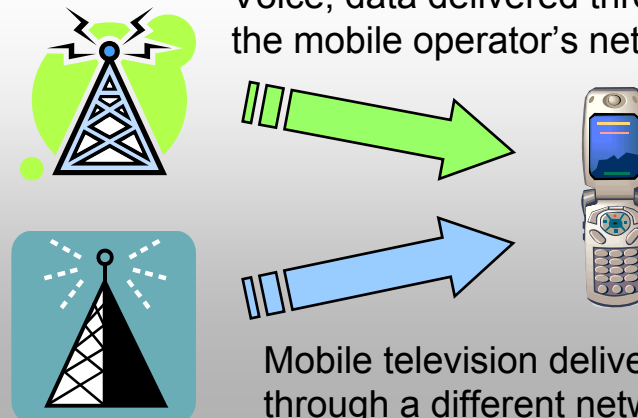
Mobile Television Case Study (I)

- Mobile television is an advanced service not yet defined by regulations
- Regulators generally consider mobile television as part of mobile 3G services -- an enhancement of existing mobile video services
- But this definition does not cover mobile television provided by a non-mobile operator's network

Voice, data and mobile television delivered through the mobile operator's network



Voice, data delivered through the mobile operator's network



Mobile television delivered through a different network

- The same service delivered through different networks may fall under different regulatory treatments if frameworks have not been adapted to convergence



Mobile Television Case Study (II)

- Convergence forces regulators to confront several mobile television issues:
 - Are mobile operators allowed to provide enhanced mobile services (e.g., mobile television) through their networks?
 - How is mobile television regulated if provided through the mobile operator's network?
 - Do the spectrum rules allow for the provision of mobile television services through different spectrum than the one assigned to mobile operators?
 - Are the spectrum rules service-neutral?
 - Do any content/broadcasting regulations apply to mobile television?



Mobile Television Case Study (III)

- The response of regulators to these questions depends on the framework's degree of:
 - Technology neutrality
 - Service neutrality
 - Regulatory flexibility
- Regulators must also resolve the issue of how content rules are applied to the same services provided through different networks
 - Traditional difference between broadcasting and telecom services no longer applies to the converged world
- Regulatory framework not incorporating these principles risks limiting ability to develop advanced services by:
 - Impeding the delivery of mobile television services, and/or
 - Discriminating against mobile television services because of the transmission network



India's Way Forward

- Convergence can have a powerful positive effect on:
 - Innovation
 - Competition
 - Connectivity
 - Economic growth
- But only to the extent that regulators and policymakers do the following:
 - Observe service and technology neutrality
 - Update regulatory frameworks appropriately
 - Coordinate efforts with complementary spectrum policy
 - Establish and enforce appropriate licensing rights and obligations
 - Establish a transparent process



Final Thought

Technology will always change faster than policy or regulations; the challenge is for policymakers and regulators to design a system flexible enough to meet national goals and accommodate technological change

Thank You

Mindel De La Torre
President

Telecommunications Management Group, Inc.
1600 Wilson Boulevard, Suite 710
Arlington, VA 22209
USA
+1.703.224.1501
mindel@tmgtelecom.com
www.tmgtelecom.com

