IMT-Advanced: Process and Opportunities

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June 1-3, 2009

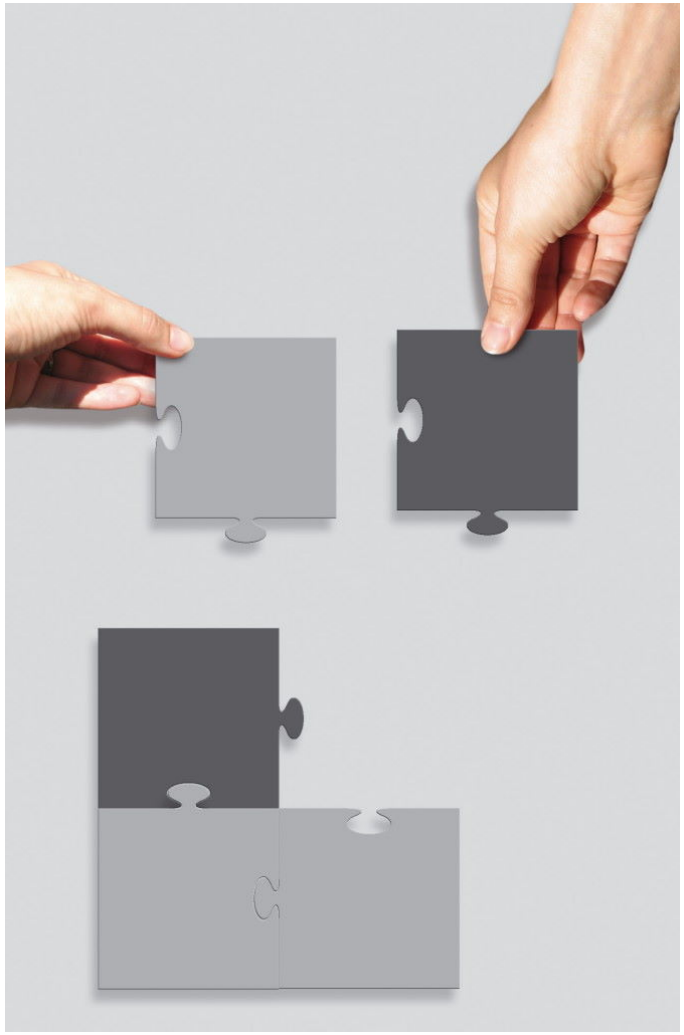
Agenda

1 General introduction

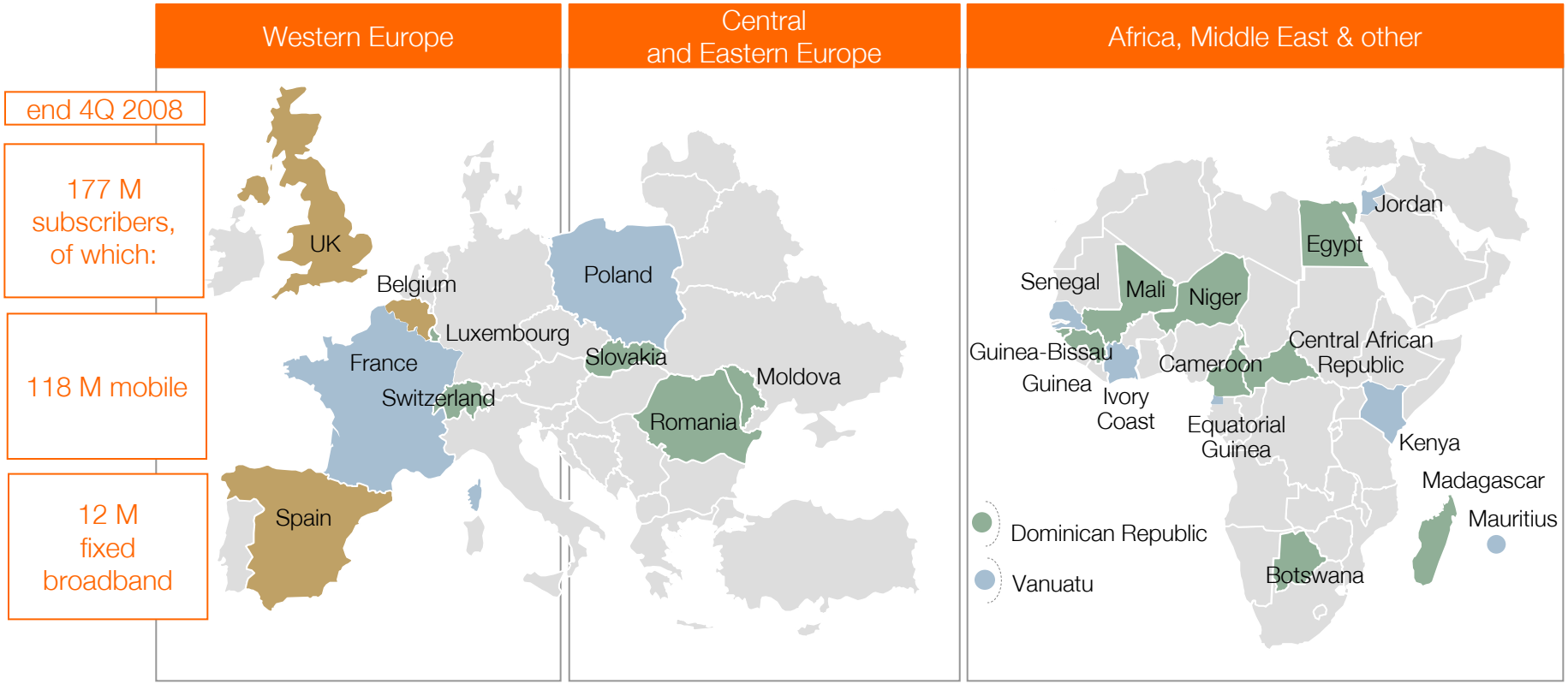
2 IMT-Advanced: Submission process

3 IMT-Advanced: Opportunities

4 Next steps & Conclusion



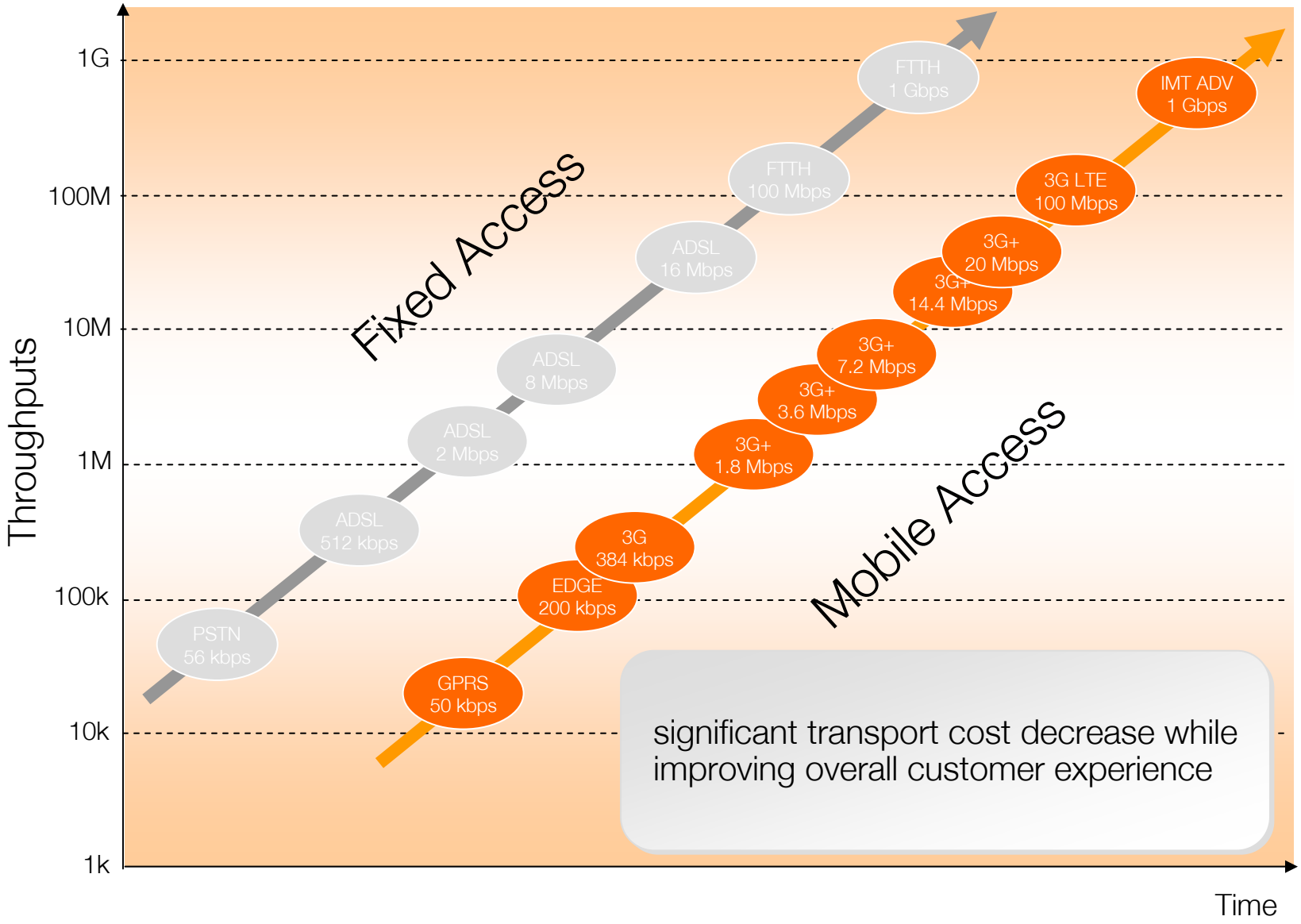
Orange FT Group: serving consumers in 27 countries



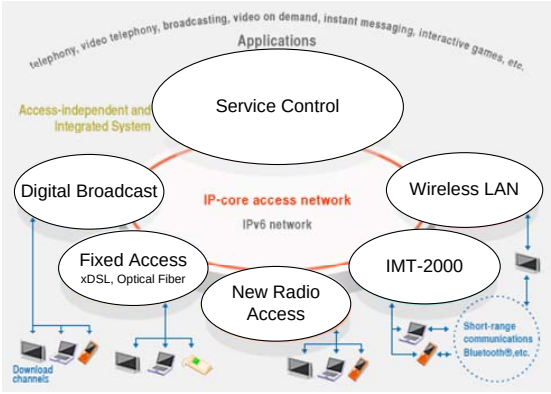
- FT incumbent : mobile & fixed networks
- FT challenger : mobile and fixed networks
- FT challenger : historically mobile network only

➔ also serving corporates in 220 countries and territories

Broadband Everywhere: deploy up-to-date access technologies for very high bit rate

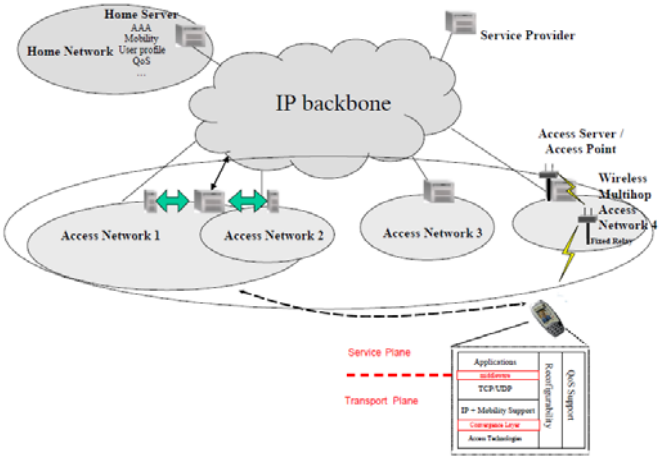


Broadband Access: What is the future?



- Proliferation of technologies
  - Fixed Access: ADSL, ADSL+, Fiber
  - Wireless Access: WiFi, DVB-T
  - Mobile Access: WCDMA, HSPA, HSPA+, LTE, IMT-Advanced

- Complementary access/coverage:
  - Always Best Connected principle
  - Home/Outside
  - Fixe/Mobile/Wireless/Broadcast



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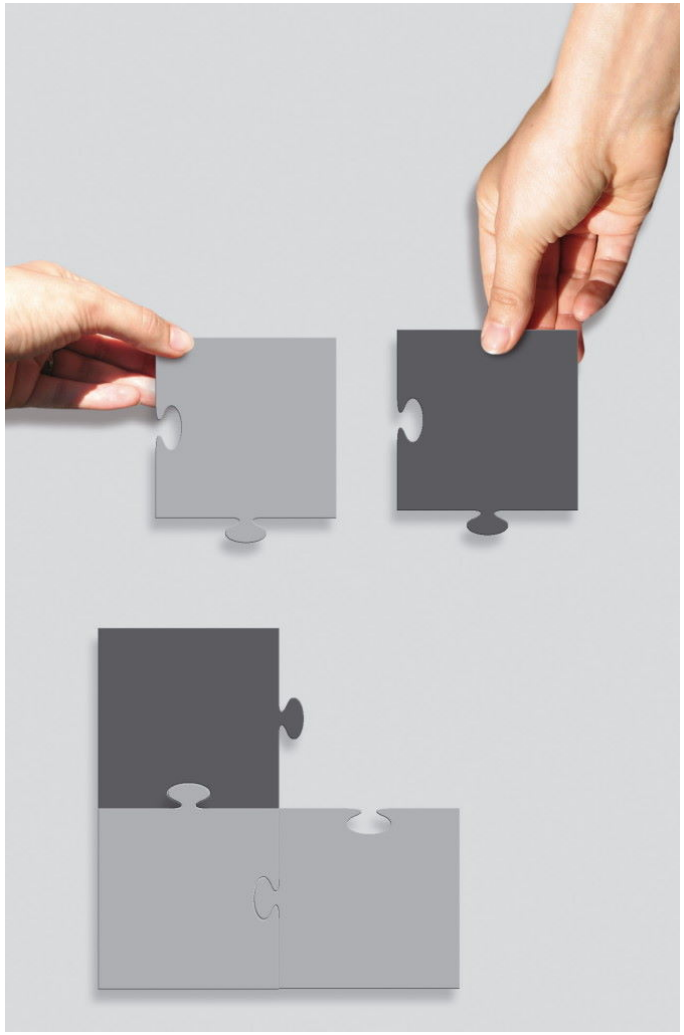
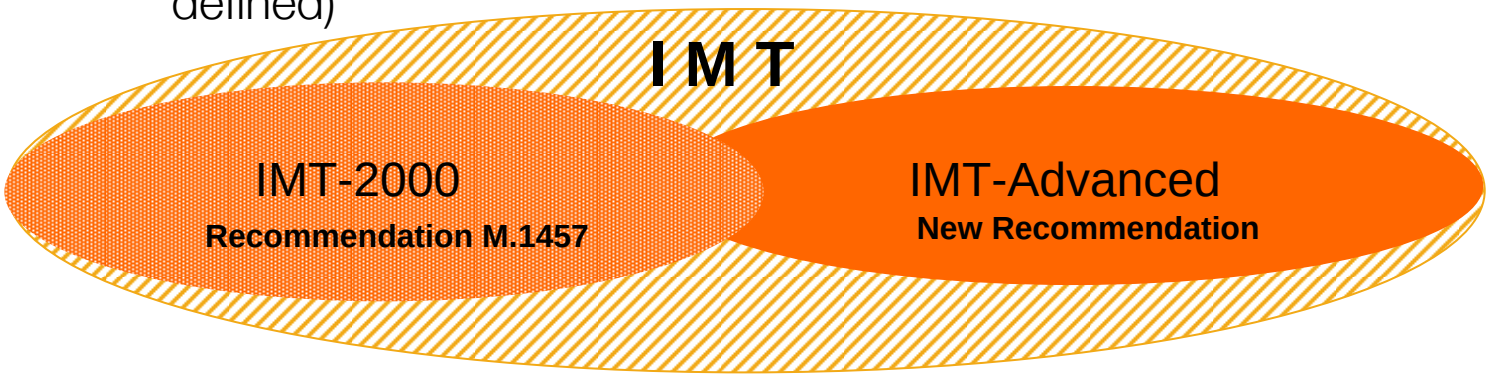


The concept of IMT family

- Radiocommunication Assembly (RA 2007) approved the ITU-R Rec. M.1457
  - Defines IMT-2000 "family" of technologies
  - RA adopted new naming convention - "IMT" umbrella that includes
    - IMT-2000 – 3G (technologies contained in M.1457)
    - IMT-Advanced – 4G (technology/technologies not yet defined)



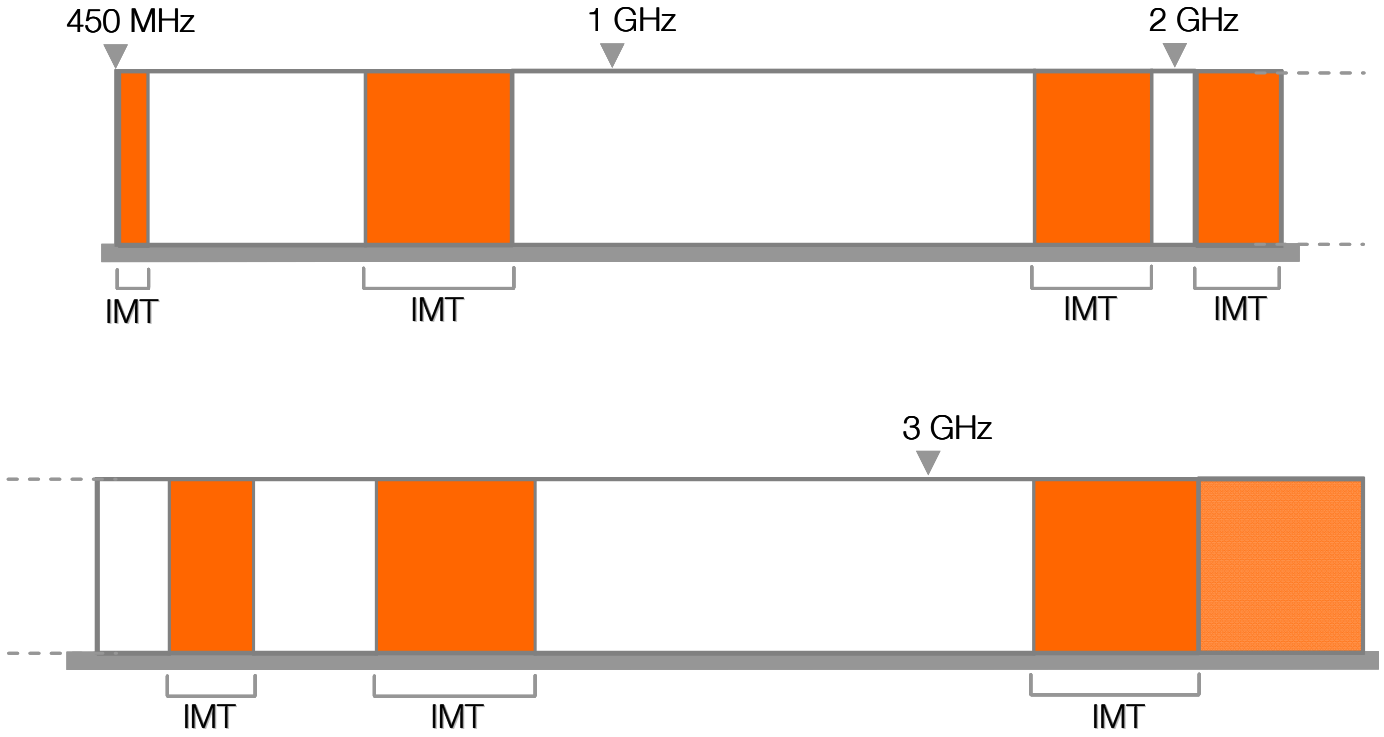
– offers framework to **harmonise spectrum** and to limit the number of radio interfaces for IMT

– defines the **minimum requirements** for a family of technologies

What is IMT-Advanced: General Definition

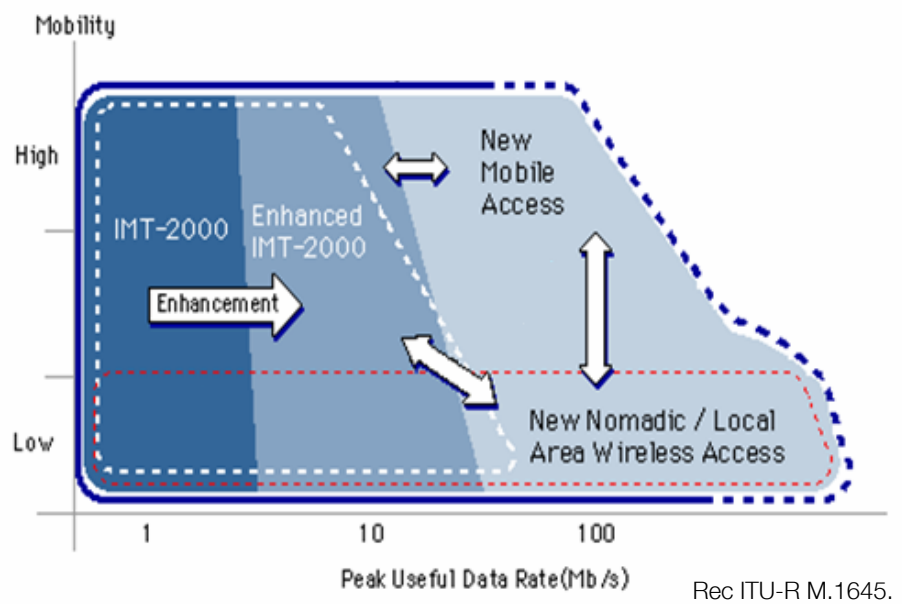
- IMT-Advanced
  - family of technologies providing performances defined by ITU and proposed by existing bodies e.g. 3GPP, IEEE/Wimax Forum

- IMT-Advanced is expected to operate in the bands identified for IMT



IMT-Advanced: Key features

- high degree of functionality
- flexibility to support a wide range of services and applications in a cost efficient manner
- compatibility of services within IMT and with fixed networks
- capability of interworking with other radio access systems
- high quality mobile services
- user equipment suitable for worldwide use
- user-friendly applications, services and equipment
- worldwide roaming capability



Rec ITU-R M.1645.

- enhanced peak data rates to support advanced services and applications (100 Mbit/s for high and 1 Gbit/s for low mobility were established as targets for research)

IMT-Advanced process: Key documents (1/2)

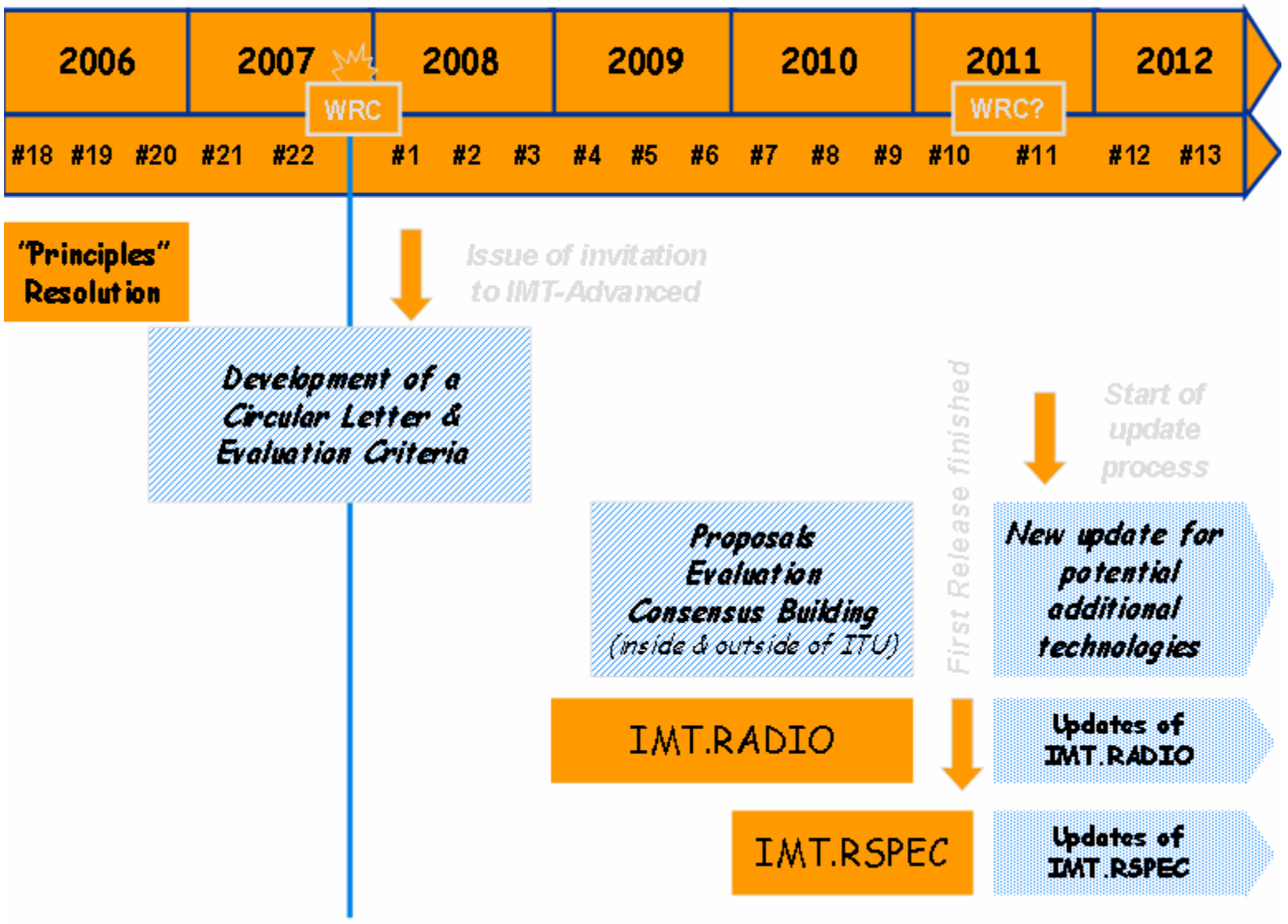
- *Resolution ITU-R 57*
  - outlines the essential criteria and principles which will be used in the process of developing the Recommendations and Reports for IMT-Advanced, including Recommendation(s) for the radio interface specification.
  - approved by the Radiocommunication Assembly in 2007.
- *Circular Letter 5/LCCE/2 and addenda*
  - invites the submission of proposals for candidate radio interface technologies (RITs) or a set of RITs (SRITs) for the terrestrial components of IMT-Advanced.
  - initiates an ongoing process to evaluate the candidate RITs or SRITs for IMT-Advanced, and invites the formation of independent evaluation groups and the subsequent submission of evaluation reports on these candidate RITs or SRITs.
  - Approved in March & Aug 2008
- *Doc. IMT-ADV/1*
  - describes the background on IMT-Advanced
- *Doc IMT-ADV/2 Rev 1*
  - describes the process and activities identified for the development of the IMT-Advanced terrestrial components radio interface Recommendations.

IMT-Advanced process: Key documents (2/2)

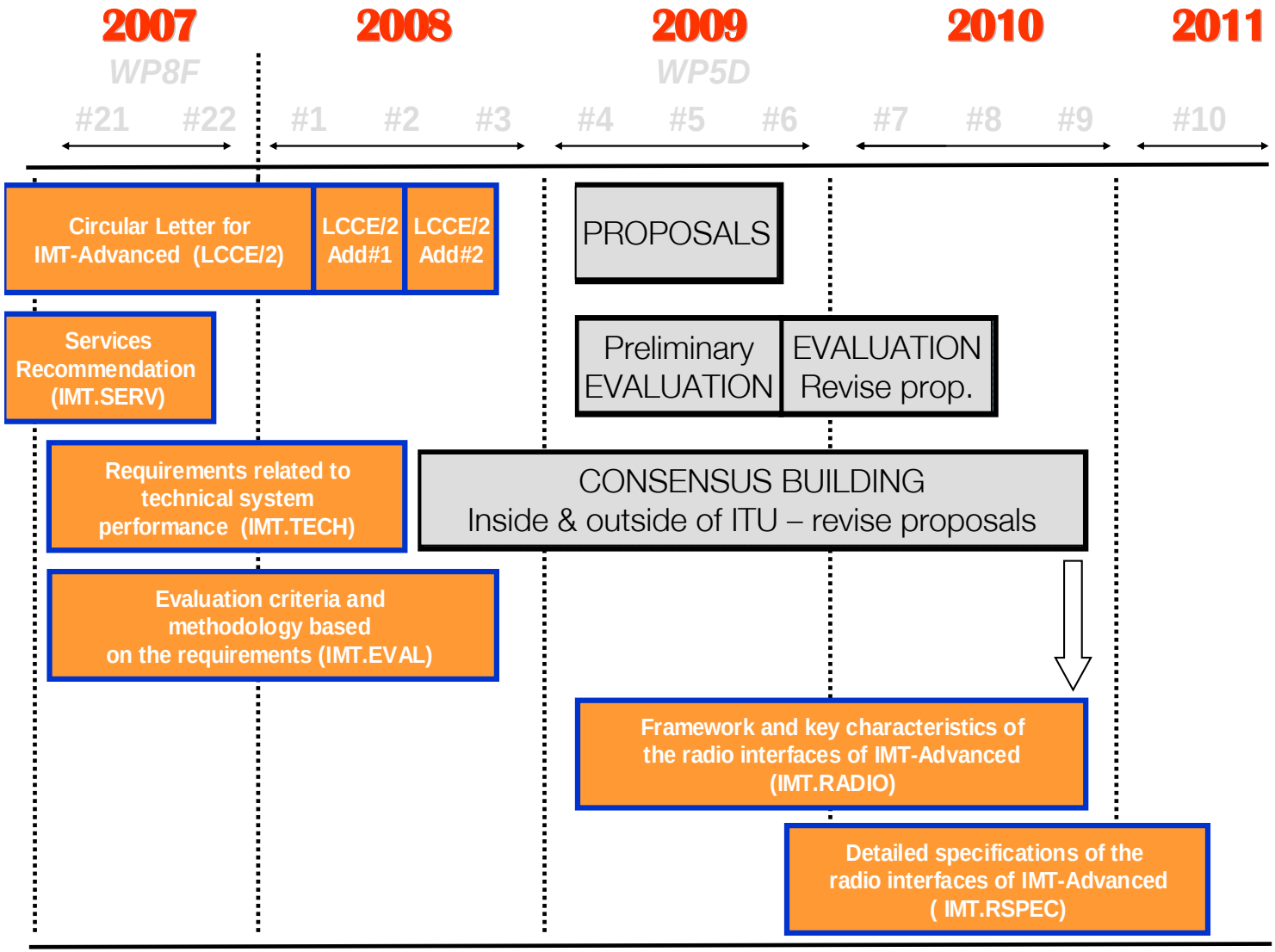
- *REPORT ITU-R M.2133*
  - addresses the requirements, evaluation criteria, as well as submission templates required for a complete submission of candidate radio interface technologies (RITs) and candidate sets of radio interface technologies (SRITs) for IMT-Advanced.
- *REPORT ITU-R M.2134*
  - describes requirements related to technical performance for IMT-Advanced candidate radio interfaces (requirements used in the development of Report ITU-R M.2135).
- *REPORT ITU-R M.2135*
  - provides guidelines for both the procedure and the criteria (technical, spectrum and service) to be used in evaluating the proposed IMT-Advanced radio interface technologies (RITs) or Sets of RITs (SRITs) for a number of test environments and deployment scenarios for evaluation by:
    - Simulation (including system and link-level simulations)
    - Analytical (via a calculation)
    - Inspection (by reviewing the functionality and parameterisation of the proposal)

			ITU-R IMT-Advanced Minimum requirements	
Average spectrum efficiency (bit/s/Hz/cell)	Indoor		3 (4x2)	2.25 (2x4)
	Microcellular		2.6 (4x2)	1.8 (2x4)
	Base coverage urban		2.2 (4x2)	1.4 (2x4)
	High speed		1.1 (4x2)	0.7 (2x4)
Peak spectrum efficiency (bit/s/Hz)			15 (4x4)	6.75 (2x4)
Cell-edge user spectrum efficiency (bit/s/Hz)	Indoor		0.1 (4x2)	0.07 (2x4)
	Microcellular		0.075 (4x2)	0.05 (2x4)
	Base coverage urban		0.06 (4x2)	0.03 (2x4)
	High speed		0.04 (4x2)	0.015 (2x4)
Latency	C-plane, U-plane		< 100 msec, 10 msec	
Mobility (bit/s/Hz/cell)	Indoor@10 km/h		1.0 (UL 2x4)	
	Microcellular@30 km/h		0.75 (UL 2x4)	
	Base coverage urban@120 km/h		0.55 (UL 2x4)	
	High speed@350 kmh/h		0.25 (UL 2x4)	
HO interruption time	Intra-frequency		27.5 msec	
	Inter-frequency	Within a spectrum band	40 msec	
		Between spectrum bands	60 msec	
VoIP capacity (Active users/cell/MHz)	Indoor		50	
	Microcellular		40	
	Base coverage urban		40	
	High speed		30	

IMT-Advanced: Process in ITU-R WP5D



IMT-Advanced: Schedule



External evaluation groups registered at the ITU-R

– ARIB Evaluation Group	Japan
– ATIS WTSC	USA
– Canadian Evaluation Group (CEG)	Canada
– Chinese Evaluation Group (ChEG)	China
– ETSI	Europe
– IEG	Israel
– TCOE India	India
– TR-45	USA
– TTA PG707	Korea
– UADE	Argentina
– WCAI	USA
– WINNER+	Europe

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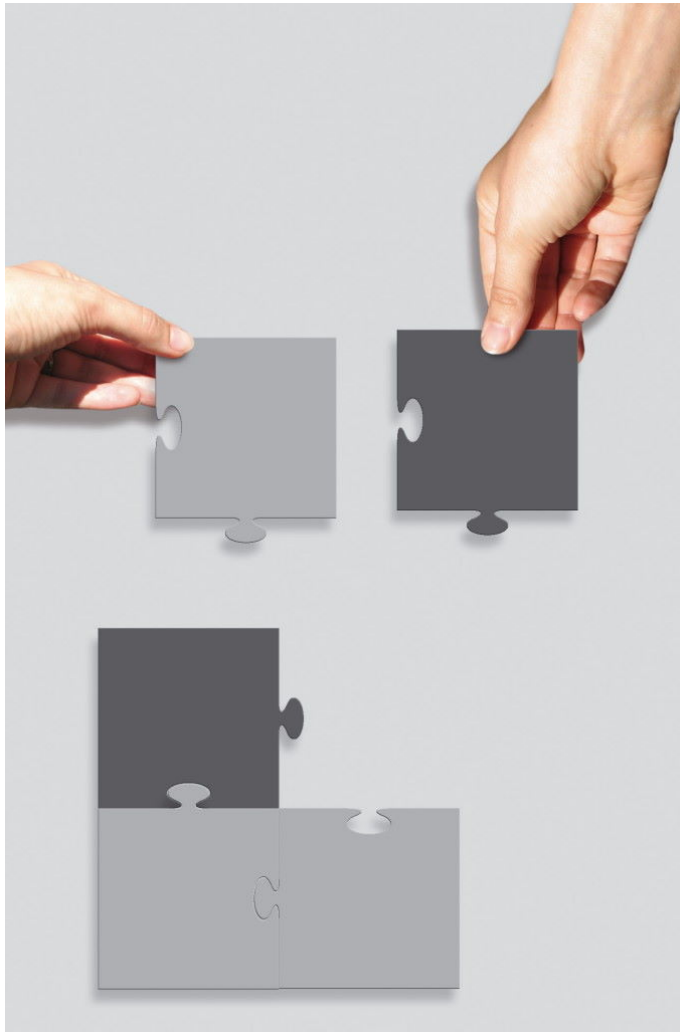


Mobile Broadband: Opportunities for the consumers

consumer needs segments

voice centric

voice and web majors

voice and advanced web user

business needs segments

voice centric

voice and remote access

applications-centric mobility

Next Generation mobile communication as part of the future of Fixe Mobile Convergence (FMC):

-Easy & Broadband access to the contents

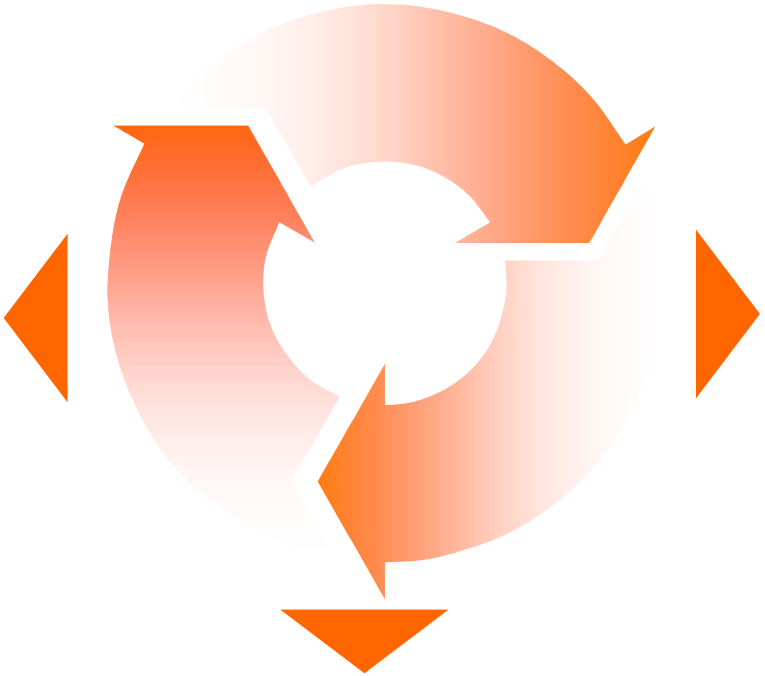
-Personalization of the services

- Evolution of the Device

- Natural convergence
  - Fixed/Mobile/Broadcast
  - Video services
  - Need for customer to create own communities (SNS, UGC)

The broadband strategy: content everywhere

PC



TV

mobile

focus on contents: the new TV experience

contents

services

TV experience

events

premium offer

on demand TV
24*24 TV

partners packages

multi-écrans

Rewind TV

Interactive
chanels

dynamic TV
programs guide

VOD, SVOD

Web TV

VoD rich offer

Orange Sports TV

OL à la demande

themes packages

time
control

high definition

Orange Cinéma Séries

Football

multi-thématiques

mes chaînes Ciné

Orange Sports

mes chaînes orientales

mes chaînes mandarines

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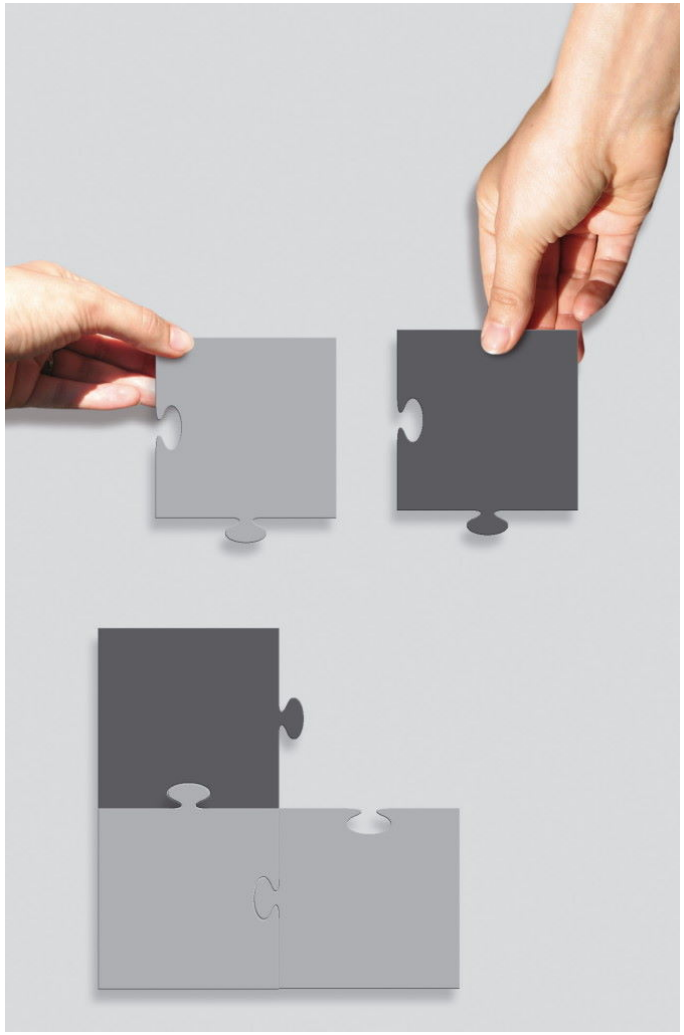
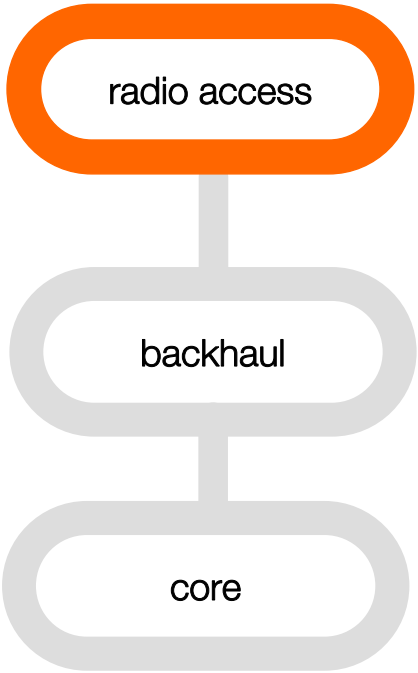


Key topics for WRC 2011: Mobile Service



- WRC-11 RESOLUTION [COM6/7] (WRC-07)
  - Agenda Item 1.17

    to consider results of sharing studies between the mobile service and other services in the band 790-862 MHz in Regions 1 and 3, in accordance with Resolution [COM4/13] (WRC 07), to ensure the adequate protection of services to which this frequency band is allocated, and take appropriate action
  - Agenda Item 1.25

    to consider possible additional allocations to the mobile-satellite service, in accordance with Resolution[COM6/21] (WRC-07)
- WRC-15 RESOLUTION [COM6/22] (WRC-07)
  - Agenda Item 1

    to take appropriate action in respect of those urgent issues that were specifically requested by WRC 11
  - Agenda Item 7

    to identify those items requiring urgent action by the Radiocommunication Study Groups

Conclusion

- On-going process for IMT-Advanced
  - Vision
  - Market/services view, technology view, spectrum view
  - Proposals, evaluation & consensus building
  - Radio framework & specifications

- Spectrum requirements for IMT / IMT-Advanced have been defined
- WRC-07 was a major milestone for the spectrum assignment for IMT systems, but there's still a way to go

thank you