Mobility and Fixed-Mobile Convergence

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ITU-T

Alliance for Telecommunications Industry Solutions

Outline

o What does the future look like?

o Mobility is a complex task with too much divergence

o Convergence is happening and is unstoppable

o NGN architecture is based on key concepts and architectures from mobile community

o How Mobility Management and Fixed-Mobile Convergence are being addressed in the ITU-T's NGN-GSI

What's Life Like ….

o **Today …**
- Most people can't do without their mobile phones
- Content is on DVDs or magazines or books or a local hard-disk
- Contact Lists are by application, device, and individual situation

o **In 2010 …**
- Everyone's connected and can't do without being on-line
- The first place people go for content is on-line
- Informal peer groups and sharing are commonplace

o **In 2015 …**
- Everyone and everything is connected all the time, everywhere
- The only place people go for content is on-line
- Dynamic communities of interest without any boundaries

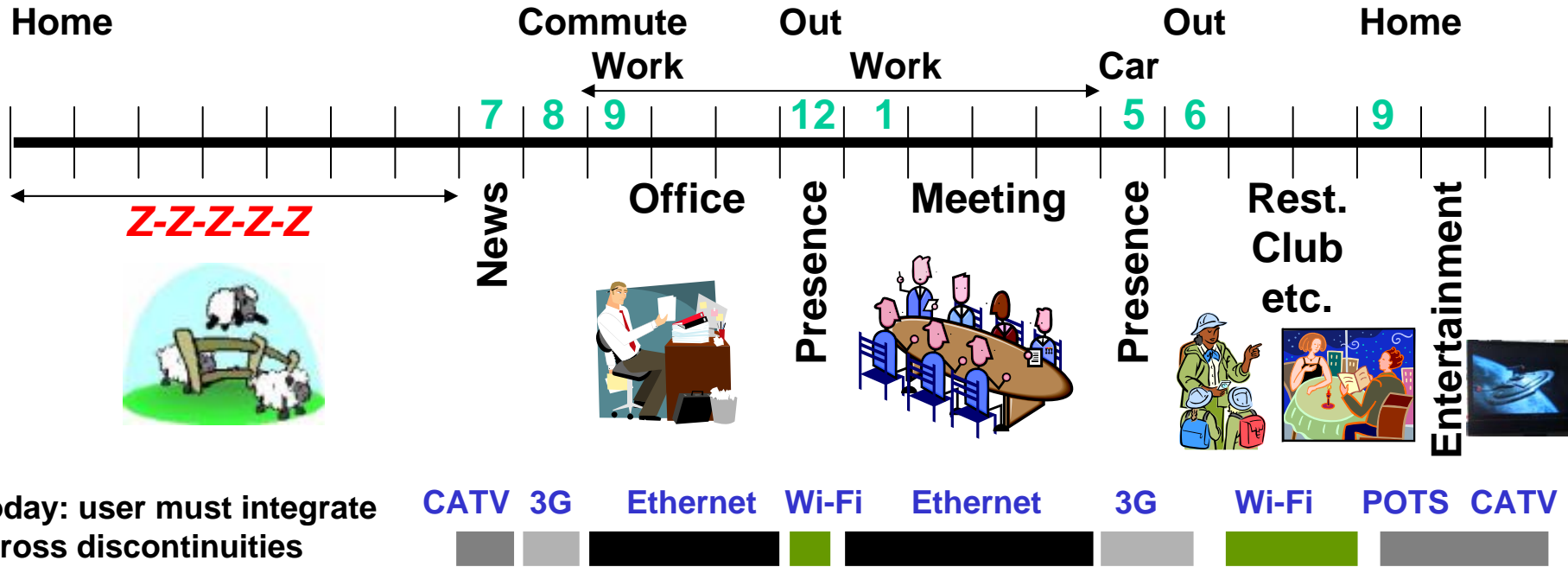**Today's technology savvy young person is tomorrow's decision maker: our target customer!**

ITU-T

ITU-T / ATIS Workshop "Next Generation Technology and Standardization"
Las Vegas, 19-20 March 2006

ATIS
Alliance for Telecommunications
Industry Solutions

Usage Patterns are Changing

Convergence, mobility and personalization

Home			Commute Work			Out Work				Out Car			Home	

Z-Z-Z-Z-Z

News | Office | Presence | Meeting | Presence | Rest. Club etc. | Entertainment

7 8 9 12 1 5 6 9

Today: user must integrate across discontinuities

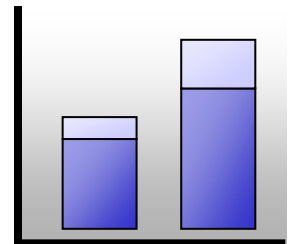CATV   3G   Ethernet   Wi-Fi   Ethernet   3G   Wi-Fi   POTS   CATV

Tomorrow: user enjoys seamless communications

Continuous broadband integrated wireline and wireless technologies

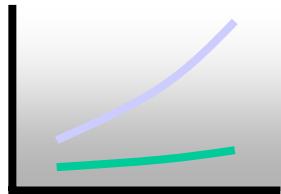# Telecom Market Trends
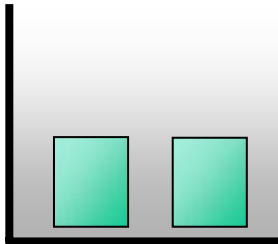
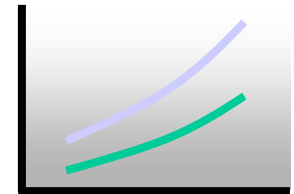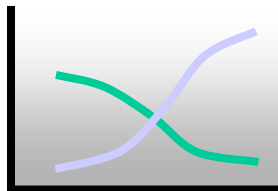**No Subscriber Growth**

Data Traffic Growth

Technology Transition – VoIP/Multimedia

Broadband

Fixed

Wireless

3 Billion

EMC, Yankee, RHK

Growing Subscriptions

Subscriber Growth

Voice & Data Traffic Growth
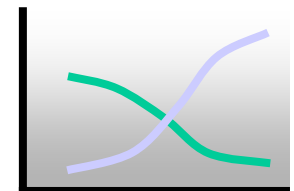
Technology Transition – Multimedia/3G

Mobile and Internet Revolution Well Underway

Mobile overtakes fixed: total subscribers, world, millions

Fixed Lines / Mobile
1993, 1995, 1997, 1999, 2001, 2003 (est)

Users (millions) and penetration per 100 pop.

Mobile subscribers / Internet users / Mobile penetration / Internet penetration
1994 95 96 97 98 99 2000 01 02 2003
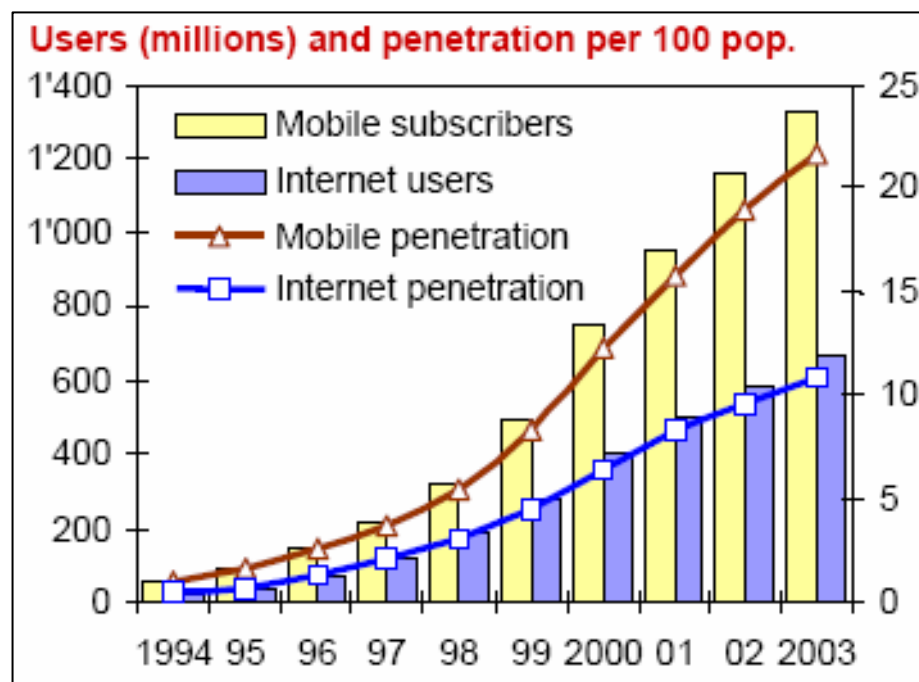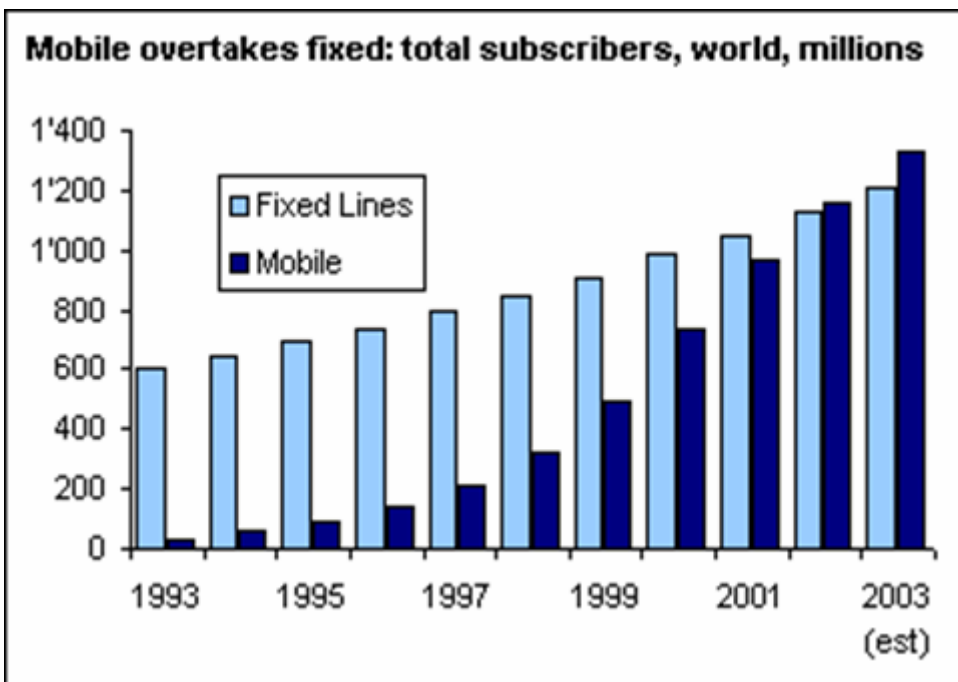
From: "ITU and its Activities Related to IP Networks" (Apr 2004)

Data source: ITU World Telecommunication Development Report, 2002.

From ITU Internet Reports 2004: "The Portable Internet"

Data source: ITU World Telecommunication Indicators Database

Mobile penetration by population
- Jan 2005 UK: >100%: http://www.telecompaper.com/site/news_TA.asp?type=abstract&id=64718&NR=680
- Mar 2005 Ireland: 94%: http://www.rte.ie/business/2005/0318/comreg
- Mar 2005 Singapore: 91%: http://www.w2forum.com/item/singapore_mobile_phone_penetration_past
- Kenya: ~16% of population subscribe, >94% mobile, <6% fixed: http://www.cck.go.ke/statistics/
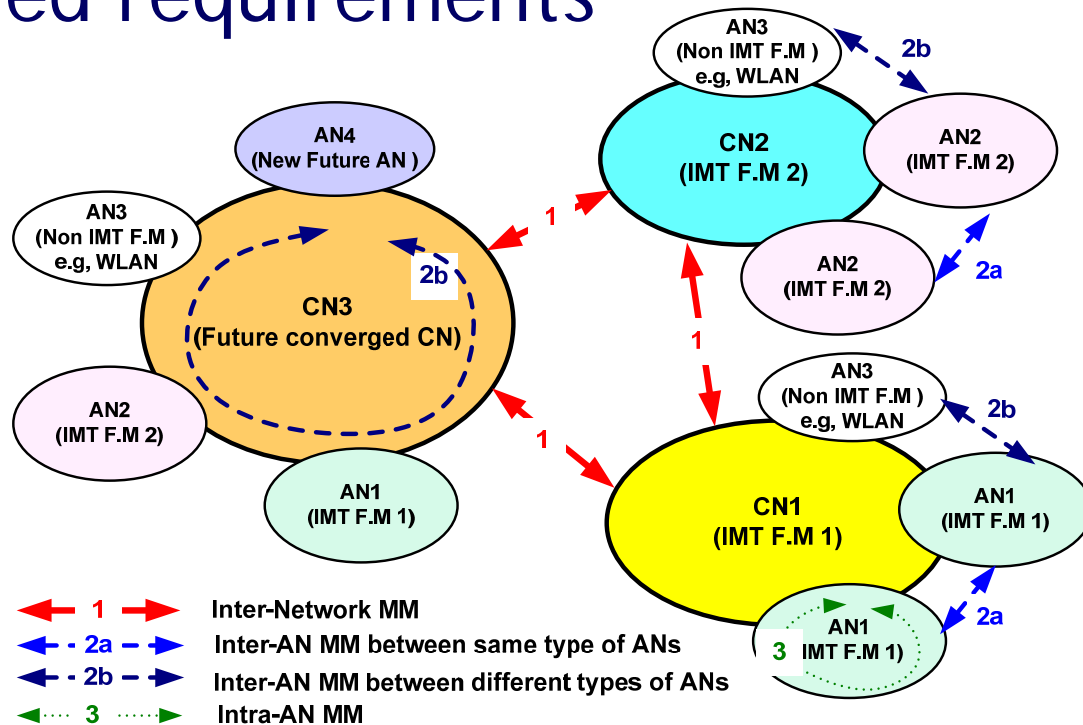
Mobility Management Complexity

o 3GPP and 3GPP2 do MM in slightly different ways: not fully compatible

o There are multiple Mobility Management protocols*:

- Mobile IP (MIP); extensions: HMIP and FMIP
- Session Initiation Protocol (SIP)
- Cellular IP (CIP): with MIP for MM; with SIP for MM
- mobile Stream Control Transmission Protocol (mSCTP)
- 3GPP Mobility Management Protocols: MAP
  - MIP and SIP in 3GPP system
- 3GPP2 Mobility Management Protocols
  - MM in the ANSI-41 evolved IP MMD core network
- BRAIN Candidate Mobility Protocol (BCMP)

Q series Supplement 52 - Technical Report on NNI Mobility Management Requirements

Converging on Mobility Management

o MIP (used by 3GPP2 MM), SIP (used by 3GPP IMS), 3GPP MM come closest to meeting all identified requirements

←—1—→ (red)			Inter-Network MM
←- 2a -→ (blue)			Inter-AN MM between same type of ANs
←- 2b -→ (dark blue)			Inter-AN MM between different types of ANs
←···3···→ (green)			Intra-AN MM

MM	Mobility Management	CN	Core Network
AN	Access Network	IMT F.M	IMT-2000 Family Memeber

Convergence Drivers

TECHNOLOGY

- o Multiplicity of access methods
- o Multimedia and real-time networking
- o New standards

COMPETITION

- o Disruptive business models
- o Price pressure
- o Eroding revenue

CONVERGENCE

- o Move to IP infrastructure
- o Intersection IT and Telecom
- o "Value rich services"

USER PREFERENCES

- o Integrated value rich services
- o Personalized and mobile
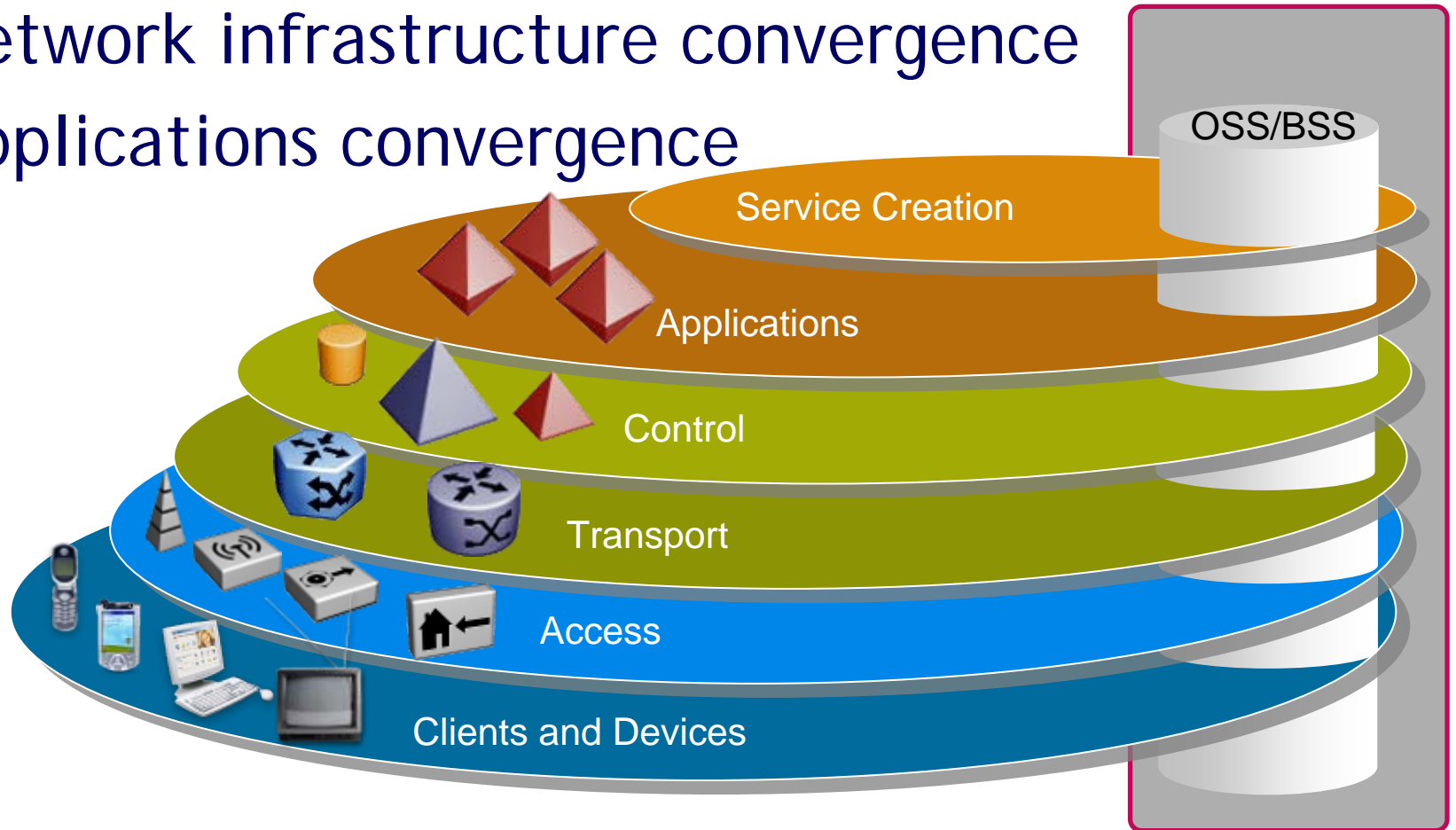- o Secure communications

CONSOLIDATION

- o Lower costs
- o Bigger brands
- o Media/entertainment into Telecom/IT

Delivering an End-to-End Converged Solution

o Ecosystem of partners

o Network infrastructure convergence

o Applications convergence

OSS/BSS

Service Creation

Applications

Control

Transport

Access

Clients and Devices

Convergence

o Telecoms, data, entertainment, …

Call Feature Servers

Mobility Servers

Application & Content Servers

Legacy Networks

Media Gateway

IP Network

Multiple Mobile Access Standards

Fixed MM Access
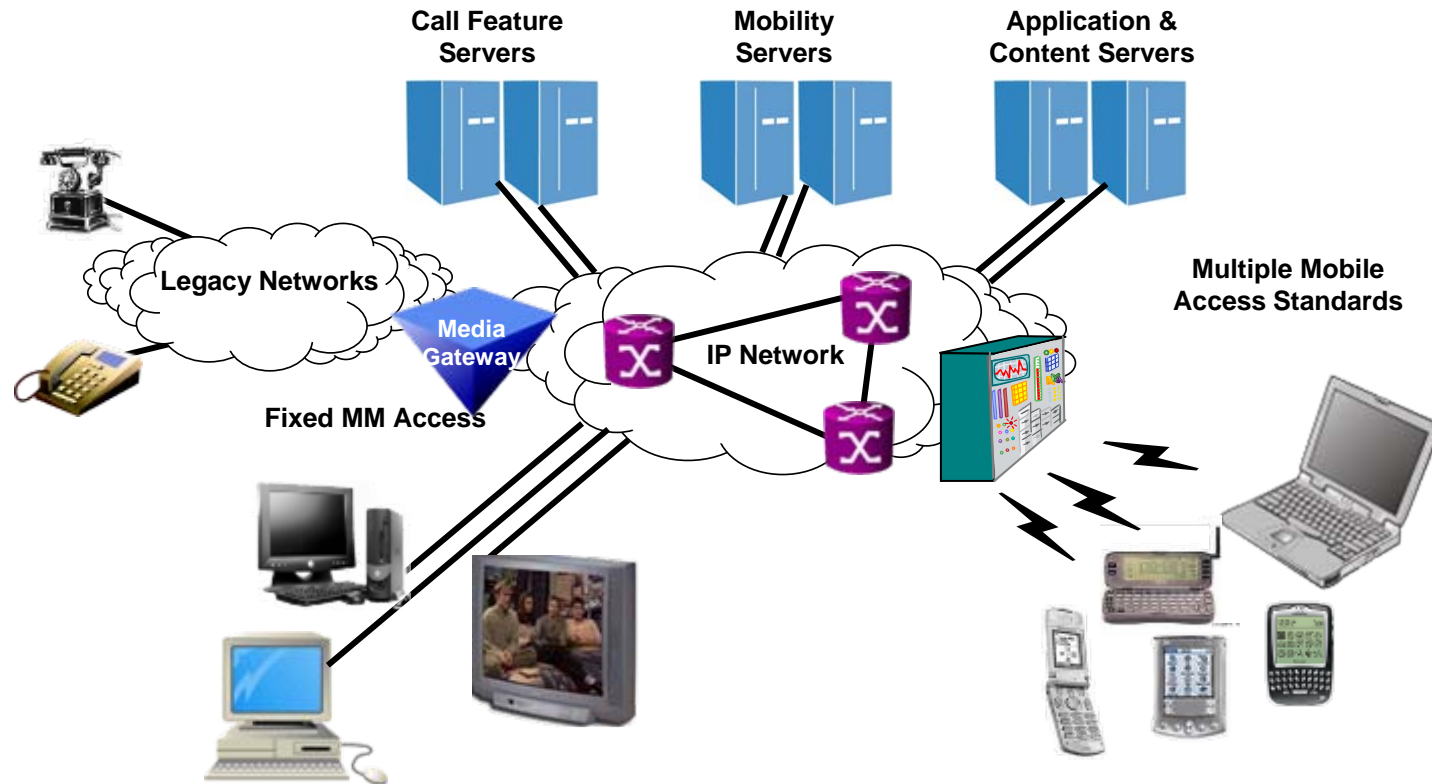
Mobility + Convergence: Requirements & Standards

- Harmonization across boundaries increasingly important: consistent user experience
- Underlying transport converging on IP/SIP and IMS network architecture
- Revenues increasingly driven by content and services rather than type of network
- "One size does not fit all!"
 - Must meet diverse and customer-segment-specific markets require a range of solutions

o 4 closely related co-operating Questions:

- Q.2/19 Mobility management
- Q.5/19 Convergence of evolving IMT-2000 networks with evolving fixed networks
- Q.6/13 NGN mobility and fixed-mobile convergence
- Q.19/16 Mobility for Multimedia Systems and Services

Coordinated Joint Deliverables

o Rec.MMR: Mobility Management Requirements (Stage 1)

o Rec.MMF: Mobility Management Framework (Stage 2)

o Rec.LMF: Location Mobility Management Framework (Stage 2)

o Rec.HMF: Handover Management Framework (Stage 2)

o Rec.FMC Req: FMC general requirements from NGN point of view, identifying the fundamental characteristics, requirements and capabilities that a FMC should be able to support

o Rec.FMC PAU: FMC service scenario by using PSTN as the fixed Access network for UMTS network

o Rec.FMC IMS: Stage 2 of fixed mobile convergence with a common IMS session control domain

Timetable
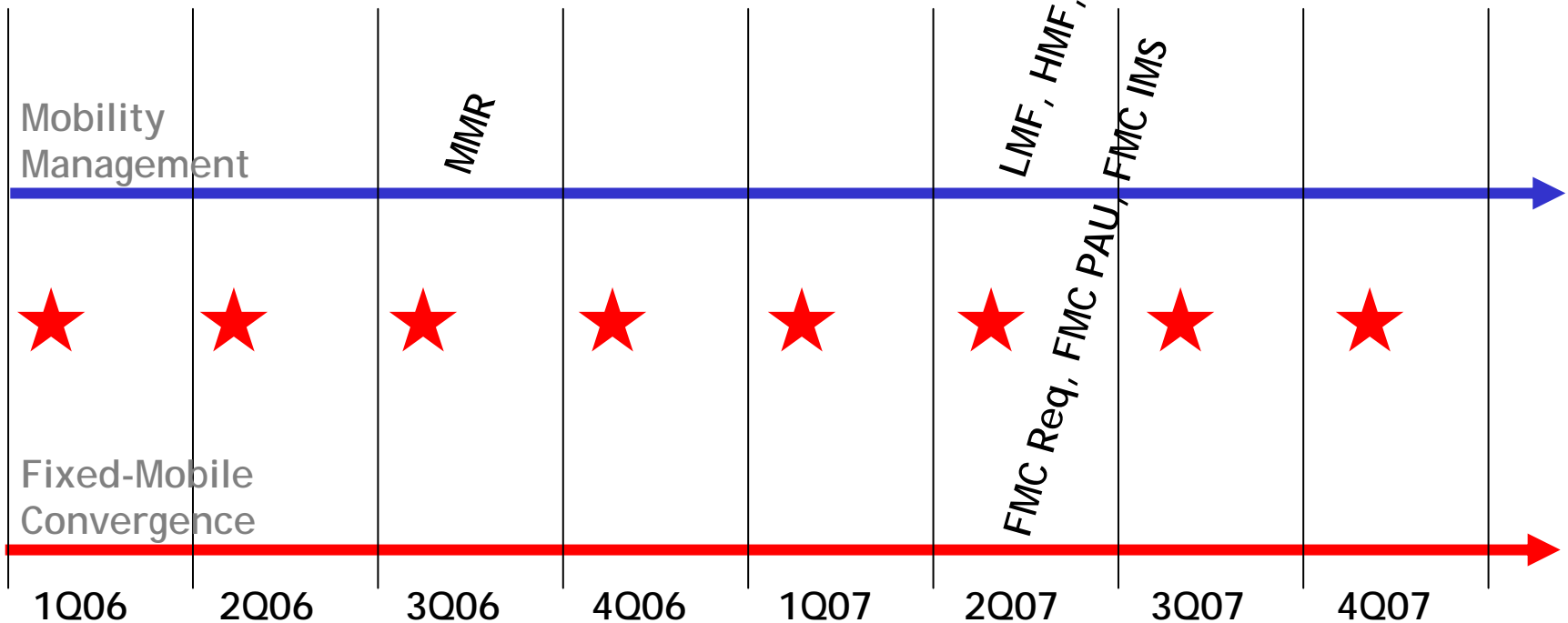
Converged Services on the Next Generation Network

- **Always on**
- **Anytime, anywhere and in any form**
- **Voice and multimedia**
- **Self service, intuitive**
- **Simple for the end user**
- **Secure, trusted and reliable**

Selected Acronyms

BCMP	BRAIN Candidate Mobility protocol
BRAIN	Broadband Radio Access for IP based Networks (RACE project)
CATV	Community Antenna Television (aka Cable TV)
CIP	Cellular IP
FMC	Fixed-Mobile Convergence
FMIP	Fast Handover for MIP
GSI	Global Standards Initiative
HMF	Handover Management Framework
HMIP	Hierarchical MIP
IMS	IP Multimedia Subsystem
LMF	Location Mobility Management Framework
MAP	Mobile Application Part
MIP	Mobile IP

MM	Mobility Management
MMD	Multimedia Domain
MMF	Mobility Management Framework
MMR	Mobility Management Requirements
NGN	Next Generation network
PAU	PSTN as fixed access to UMTS
POTS	Plain old telephone Service
PSTN	Public Switched Telephone Network
RACE	Research into Advanced Communications in Europe
SIP	Session Initiation Protocol
UMTS	Universal Mobile Telephone System