ITU Activities on IMT-2000

1.2.1 ITU Structure/ITU-T IMT-2000 Core Network Activities

Regional Workshop for the Arab Region on Guidelines on the Smooth Transition of Existing Mobile Networks to IMT-2000 for Developing Countries

Damascus, Syria 13-15 June 2005

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Objective and Outline

- **Objective**
  - **Set stage for understanding ITU role in global standards**
  - **Provide overview of ITU-T activities on NGN**
- **Outline**
  1. **ITU structure: ITU-R, -T, -D**
  2. **Next Generation Networks**
     - **Demographic and Historical Perspectives**
     - **Definition of NGN**
     - **GII, IMT-2000 and NGN**
     - **Creation of Focus Group NGN**
     - **FG NGN Structure, Leadership**
     - **FG NGN Participation, Deliverables**

1. ITU Structure

3 sectors:

- **Radiocommunication**
- **Telecommunication Standardization**
- **Telecommunication Development**

Membership

- **189 Member States**
- **>650 Sector Members**
- **>50 Associates**

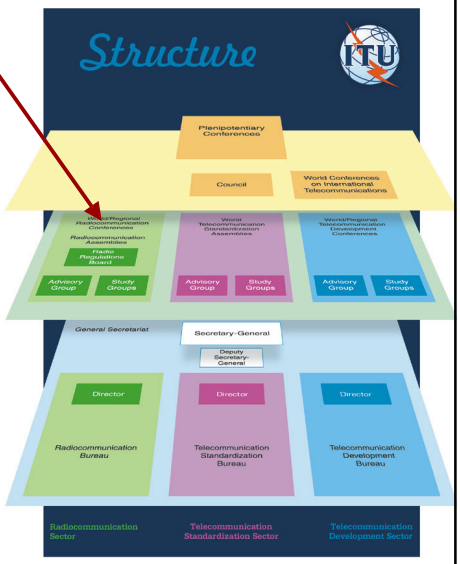
ITU Sector Roles and Mission

- **ITU-R: management of radio-frequency spectrum and satellite orbits**
- **ITU-T: standards covering all fields of telecommunications**
- **ITU-D: facilitate connectivity and access, foster policy, regulatory and network readiness, and expand human capacity through training programs, formulate financing strategies and e-enable enterprises in developing countries**

World Radiocommunication Conference (WRC)

- Held every ~3-4 years
  - WRC-03: 9 Jun - 4 Jul 2003, Geneva
  - WRC-07: 8 Oct - 2 Nov 2007, Geneva
- Role: reviews and revises the Radio Regulations
  - international treaty on use of the radio-frequency spectrum and satellite orbits
  - determines Questions for study by the RA and SGs

Additional details available on ITU web site



Radiocommunication Assembly (RA)

- Meets every ~2-3 years; usually with a WRC
  - RA-03: 2-6 Jun 2003, Geneva
  - RA-07: 1-5 Oct 2007, Geneva
- Sets work priorities, urgency and time-frames
- Approves ITU-R Recommendations, technical studies in support of regulatory work of WRCs

Additional details available in handouts and on ITU web site

Radio Regulations Board (RRB)

- approves Rules of Procedure for applying Radio Regulations and registering frequency assignments made by Member States

Additional details available in handouts and on ITU web site

ITU-R Structure - Study Groups

- SG 1 - Spectrum management
- SG 3 - Radiowave propagation
- SG 4 - Fixed-satellite service
- SG 6 - Broadcasting services
- SG 7 - Science services
- SG 8 - Mobile, radiodetermination, amateur and related satellite services
- SG 9 - Fixed service
- CCV - Coordination Committee for Vocabulary
- CPM - Conference Preparatory Meeting
- SC - Special Committee on regulatory/procedural matters

ITU Sector Roles and Mission

- ITU-R: management of radio-frequency spectrum and satellite orbits
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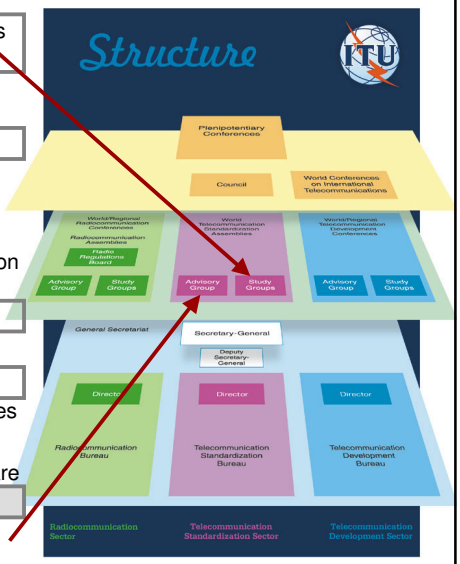
World Telecommunication Standardization Assembly

- normally held every 4 years
  - WTSA-2000, 27 Sep - 6 Oct 2000, Montreal, Canada
  - WTSA-2004, 5-14 Oct 2004, Florianopolis, Brazil
- approves ITU-T work program
- determines priorities, urgency, time-frame for standards work
- approves ITU-T Recommendations
- considers reports of study groups and TSAG
- decides on structure of study groups mandates, allocation of Questions

ITU-T Study Groups, TSAG

2 Operational aspects of service provision, networks and performance
3 Tariff and accounting principles including related telecommunication economic and policy issues
4 Telecommunication management
5 Protection against electromagnetic environment effects
6 Outside plant and related indoor installations
9 Integrated broadband cable networks and television and sound transmission
11 Signalling requirements and protocols
12 Performance and quality of service
13 Next Generation Networks
15 Optical and other transport network infrastructures
16 Multimedia terminals, systems and applications
17 Security, languages & telecommunication software
19 Mobile telecommunication networks
TSAG Telecommunication Standardization Advisory Group

Next Generation Networks

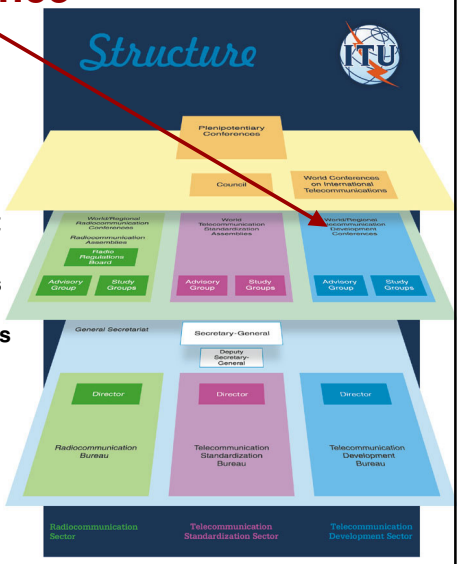


ITU Sector Roles and Mission

- ITU-R: management of radio-frequency spectrum and satellite orbits
- ITU-T: standards covering all fields of telecommunications
- **ITU-D: facilitate connectivity and access, foster policy, regulatory and network readiness, and expand human capacity through training programs, formulate financing strategies and e-enable enterprises in developing countries**

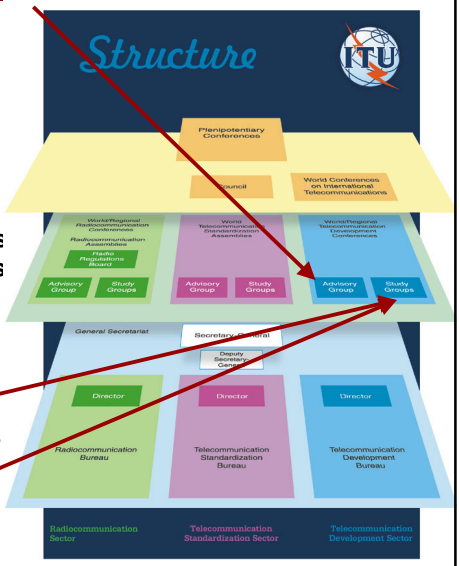
World Telecommunication Development Conference

- held ~4 years:
  - WTDC 2002 in Istanbul, Turkey
  - WTDC 2006 in Doha, Qatar
- fix objectives and strategies for worldwide and regional development of telecommunications
  - priority: expand, modernize networks to boost telecoms penetration and access in the world's poorer countries
- review progress made in telecommunication development in developing countries
- promote international cooperation
- provide direction to BDT
- establish ITU-D study groups and mandates



ITU-D Study Groups, TDAG

- ITU-D is not involved in technical standardization so manages only two study groups
  - serve as forum for developing and developed countries, and public and private sector organizations to meet
  - purpose: devise innovative solutions to address specific problem areas as identified by WTDC
- study focus: telecommunications development strategies
- SG 1 - Telecommunication development strategies and policies
- SG 2 - Development and management of telecommunication services and networks



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2. Next Generation Networks and Services for Next Generation Users

- **today's young person is tomorrow's decision maker**
  - **rising expectations: demands and expects multimedia services, security, personalization and mobility for enhanced productivity and user experience**
  - **rising ability to pay as economies develop**
- **"demographic" shifts**
  - **mobile subscribers outnumber fixed globally, greatly so in some markets: mobility is a key capability of Next Generation Networks**
  - **technology enabling convergence of traditionally discrete areas: telephony, data, entertainment: need common and cost effective solutions now and in the future**

NGN Historical Perspectives

- Everyone working on standards is working on "the next generation"
  - The "current generation" is already specified and deployed
- ITU-T SG 13 traditionally forward looking, visionary:
  - ISDN
  - Global Information Infrastructure
  - NGN 2004 Project
- Other SGs have turned vision into reality
  - SG 11: CCS7, ISDN protocols, Intelligent Networks, ...
  - SSG (now SG 19) separated from SG 11 in recognition of rapidly increasing importance of mobility as a high utility feature for users, global predominance of mobile subscribers, innate deployment efficiencies of wireless

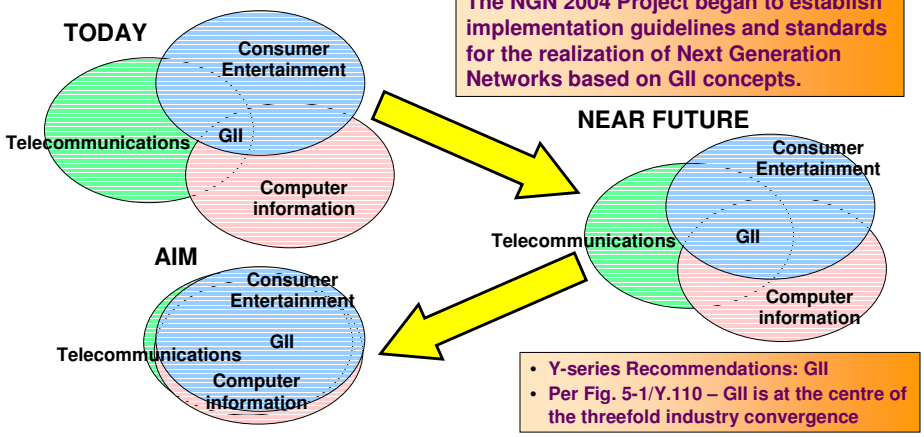
Definition of NGN

Rec. Y.2001 "General overview of NGN" (Dec 2004):

- An NGN is a packet-based network able to provide Telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.

Global Information Infrastructure is all about convergence

Internet, Broadcasting, Telephony, ...

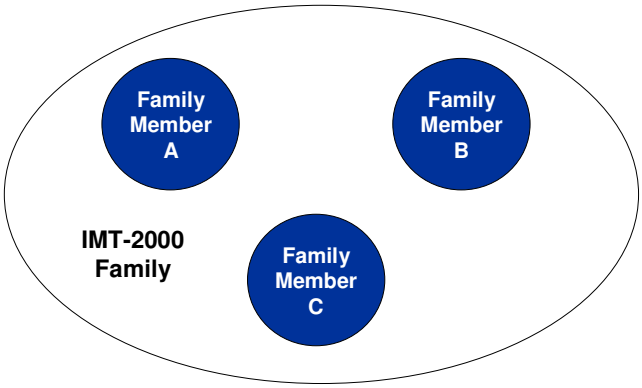


The NGN 2004 Project began to establish implementation guidelines and standards for the realization of Next Generation Networks based on GII concepts.

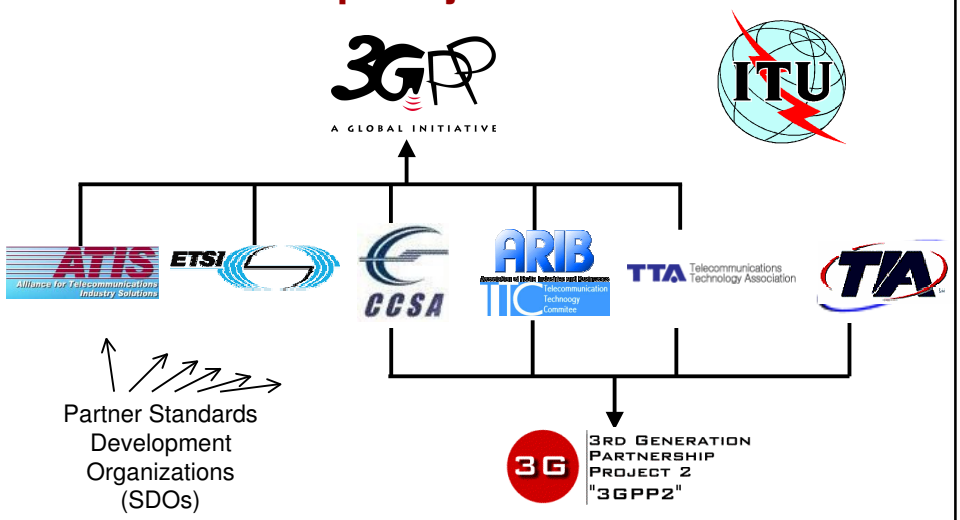
- Y-series Recommendations: GII
- Per Fig. 5-1/Y.110 – GII is at the centre of the threefold industry convergence

IMT-2000 Family Concept

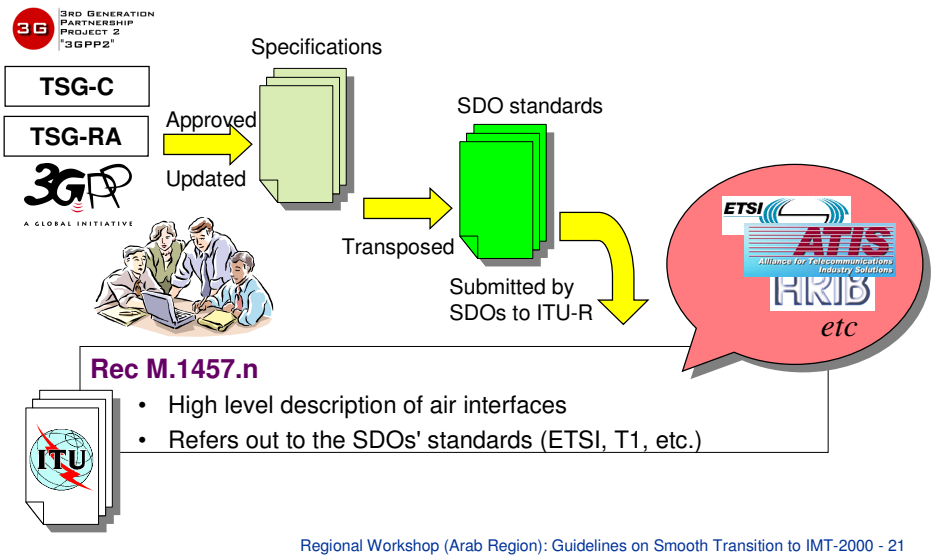
- **ITU-T Rec. Q.1701 (03/99) Figure 2: Framework for IMT-2000 networks**



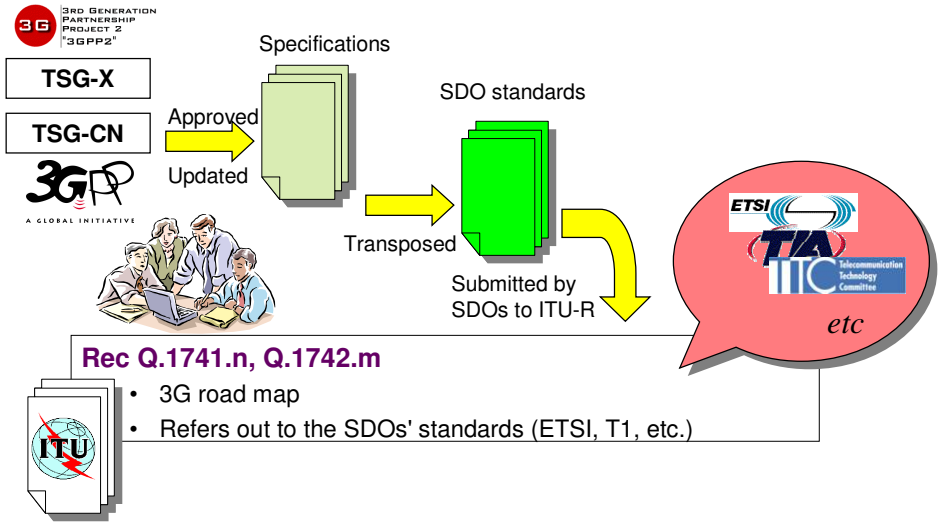
ITU and the SDO partners of the 3G Partnership Projects



3GPPs and ITU-R WP 8/F



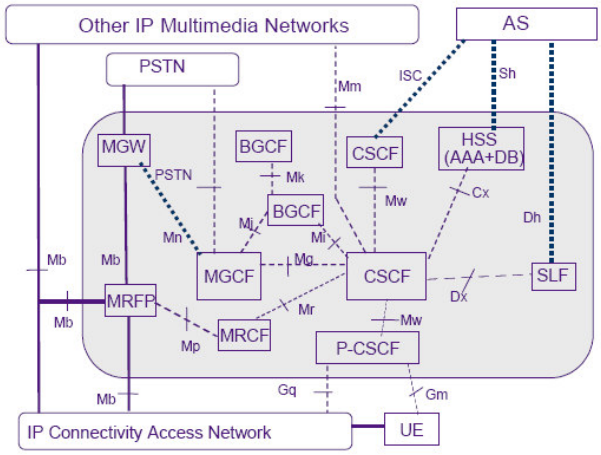
3GPPs and ITU-T SSG / SG 19



3GPP IMS and 3GPP2 MMD: essential alignment

- **IMS: a set of core network FEs to support access to operator provided SIP based services**
- **Builds on IETF protocols: SIP, SDP, DIAMETER, ...**
- **Vertical interfaces to transport level provide:**
  - **QoS**
  - **Media gating**
  - **Correlated Accounting/Charging**
- **Coordinated network interfaces provide:**
  - **Improved security, single authorization point for user**
  - **Enhanced user service experience: single sign-on**
  - **Common interfaces to Application Servers**

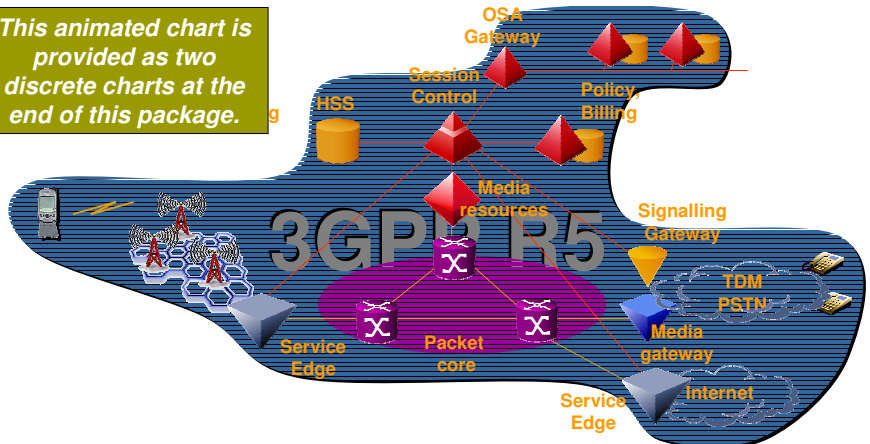
Harmonized IMS Functional Architecture



For a good tutorial on the IMS and how it works, go to http://www.itu.int/ITU-T/worksem/ngntech/details.html and download presentation 1-3 given at the NGN Technical Workshop (14-15 March 2005, Jeju, Korea)

3GPP R5 network architecture

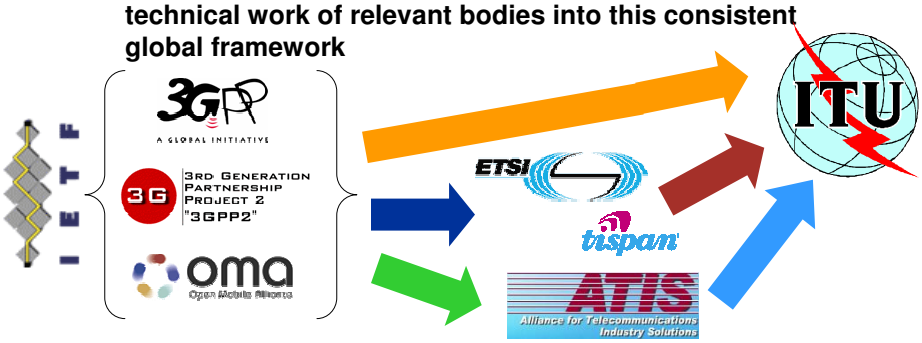
This animated chart is provided as two discrete charts at the end of this package.



- **3GPP R5 IM Subsystem provides a SIP and H248 framework for the applications and control environment of converged wireless networks**
- **Applications creation environment permits extending applications to users independently of their means and point of access**

Global NGN Standards

- Many organizations working on NGNs, future generation technologies, ...
  - ITU providing global perspectives for an overall framework
  - ITU leveraging near term detailed and well-focussed technical work of relevant bodies into this consistent global framework



ITU-T Focus Group on Next Generation Networks

- Launched by ITU TSB Director in May 2004
  - TSB Circular 236, 7 May 2004 http://www.itu.int/md/meetingdoc.asp?type=sitems&lang=e&parent=T01-TSB-CIR-0236
- Initial meeting: June 2004
  - Subsequent meetings: Jul, Sep, Nov 2004, Mar, Apr 2005
  - Future meeting plans: Jul, Sep, Nov 2005
- Key topics being addressed:
  - Functional architecture, nomadicity
  - QoS (including xDSL Access)
  - Security Capabilities (Authentication, ...)
  - Control and Signaling Capabilities
  - Evolution to NGN

Focus Groups:
- a highly flexible means to progress technical work
- further details in handout/CD

FG NGN Structure

WG	Area of work
• WG 1	Service Requirements
• WG 2	Functional Architecture and Mobility
• WG 3	Quality of Service
• WG 4	Control & Signalling
• WG 5	Security
• WG 6	Evolution
• WG 7	Future Packet-based Bearer Network

FG NGN Leadership (1/2)

Chairman:	**Chae-Sub Lee**	**ETRI, Korea**
Vice-Ch:	**Dick Knight**	**BT, UK**
Vice-Ch:	**Neil Seitz**	**US DoC/NTIA, USA**
• WG 1	Marco Carugi	Nortel, France
	Brent Hirschman	Sprint, USA
• WG 2	Keith Knightson	Canada
	Tom Towle	Lucent, USA
	Naotaka Morita	NTT, Japan
• WG 3	Hui-Lan Lu	Bell Labs, USA
	Keith Mainwaring	Cisco, USA
	Hyungsoo Kim	Korea Telecom

FG NGN Leadership (2/2)

• WG 4	Rainer Muench	Alcatel, Germany
	Cagatay Buyukkoc	ZTE, USA
	Wei Feng	Huawei, China
• WG 5	Igor Faynberg	Lucent, USA
• WG 6	Ghassem Koleyni	Nortel, Canada
	Dongyang Fan	SCNB Tel. Stds., China
• WG 7	Jiang Lintao	MII, China
	David Meyer	Cisco, USA
	Keith Dickerson	BT, UK

Participation, Input Statistics

Meeting	Inputs	Participants
Jun 04	39	99
Jul 04	66	66
Sep 04	141	121
Nov 04	125	123
Mar 05	168	144
Apr 05	131	144

- NGN work is clearly a "going concern" and high interest area for standards development: attracting significant volume of input material, significant participation

FG NGN Work Plan - Deliverables

WG 1 Service Requirements

WG	Deliverable Title	Current Draft	Target Date	Release	Status	Target SG*
1	NGN Release 1 Scope	FGNGN-OD-00097	2Q05	1	S	13
1	NGN Release 1 requirements	FGNGN-OD-00098	3Q05	1	D	13
1	NGN release-independent requirements	(none)	4Q05	RI	P	13
1	NGN general services and capabilities (release independent)	(none)	4Q05	RI	P	13

Plan as of 29 April 2005

Release

- **TBD To Be Determined**
- **RI Release Independent**
- *** Proposed**

Status:

- **P Planned: document not yet available**
- **D Draft: draft available, under review**
- **S Stable: reviewed, some additional review needed for full consensus; new text not anticipated**
- **A Approved**

FG NGN Work Plan - Deliverables

WG 2 Functional Architecture and Mobility

WG	Deliverable Title	Current Draft	Target Date	Release	Status	Target SG*
2	Requirements & Architecture for NGN (FRA)	FGNGN-OD-00093	2Q05	1	D	13
2	Functional Requirements for NGN Mobility (FRMOB)	FGNGN-OD-00094	2Q05	1	D	13 / 19
2	Functional Requirement for Soft Router		**TBD**	2	D	13
2	Customer Manageable IP Network	FGNGN-OD-00096	2Q05	2	D	13
2	IMS for Next Generation Networks (IFN)	FGNGN-OD-00095	2Q05	1	D	13
2	Digital Multimedia Broadcast	(none)	**TBD**	2	P	13
2	Converged Services Fabric	(none)	**TBD**	2	P	13

FG NGN Work Plan - Deliverables

WG 3 Quality of Service

WG	Deliverable Title	Current Draft	Target Date	Release	Status	Target SG*
3	A QoS control architecture for Ethernet-based IP access networks (TR-123.qos)	FGNGN-OD-00106	Mar 05	1	A	13
3	Multi Service Provider NNI for IP QoS (TR-msnniqos)	FGNGN-OD-00107	Jul 05	1	D	13
3	General aspects of QoS and network performance in NGN (TR-NGN.QoS)	FGNGN-OD-00108	Jul 05	RI	D	13 / 12
3	Network performance of non-homogeneous networks in NGN (TR-NGN.NHNperf.).	FGNGN-OD-00109	Jul 05	RI	D	13 / 12
3	Requirements and framework for end-to-end QoS in NGN (TR-e2eqos.1)	FGNGN-OD-00110	Sep 05	1	D	13
3	A QoS architecture for Ethernet networks (TR-enet)	FGNGN-OD-00111	Sep 05	1	D	13
3	Resource and admission control sub-system (TR-racs)	FGNGN-OD-00112	July 05	1	D	13
3	A QoS Framework for IP-based access networks (TR-ipaqos)	FGNGN-OD-00113	Sep 05	1	D	13
3	Performance measurement and management for NGN (TR-pmm)	FGNGN-OD-00114	Jul 05	1	D	12

FG NGN Work Plan - Deliverables

WG 4 Control & Signalling

WG 5 Security

WG 6 Evolution

WG 7 Future Packet-based Bearer Network

WG	Deliverable Title	Current Draft	Target Date	Release	Status	Target SG*
4	Signalling requirements for IP QoS TRQ.IP QoS.SIG.CS1	Q Series Supplement 51	Dec. 04	1	A	11
5	Guidelines for NGN Security	FGNGN-OD-00083	2Q05	**TBD**	D	17
5	Security Requirements for R1	FGNGN-OD-00082	1Q05	1	S	17
6	Evolution of Networks to NGN	FGNGN-OD-00085	3Q05	1	D	13
6	PSTN/ISDN evolution to NGN	FGNGN-OD-00086	3Q05	1	D	13
6	PSTN/ISDN emulation and simulation	FGNGN-OD-00087	3Q05	1	D	13
7	Problem Statement	FGNGN-OD-00028	4Q04	2	S	13
7	Requirements	FGNGN-OD-00088	3Q05	2	D	13
7	High Level Architecture	FGNGN-OD-00089	4Q05	2	D	13
7	Candidate Technologies	(none)	3Q05	2	P	13

Coordination essential: multiple Study Groups involved

- Principle SGs:
  - 2 Operational aspects of service provision, networks and performance
  - 4 Telecommunication management
  - 11 Signalling requirements and protocols
  - **13 Next Generation Networks**
  - 19 Mobile telecommunication networks
- Other SGs:
  - 12 Performance and quality of service
  - 16 Multimedia terminals, systems and applications
- All SGs have some degree of involvement

X-Study Group Coordination: Joint Coordination Activity (JCA)

- NGN is a major activity
  - SG 13 is designated the Lead Study Group on NGN
- Many other SGs involved
  - Ref. the list of deliverables
- JCA created to coordinate activities across the involved SGs
  - first, second meetings: Dec 2004, May 2005
  - next meeting: Sep 2005; email correspondence ongoing
- FG NGN provides regular updates on its work to ensure all involved SGs are fully informed
  - enables SGs to review provide input outside FG NGN cycle
  - avoid "surprises" when going to SGs for approvals

ITU-T / IETF NGN Workshop 1-2 May 2005

- ITU-T aims to engage all interested parties for development of worldwide standards for NGN
  - 3GPP IMS is at the heart of NGN
  - IMS uses IETF protocols
  - ∴ essential that ITU-T, IETF and 3GPP work together effectively to deliver needed standards
- Overall workshop objective:
  - Explore specific NGN issues that impact both the ITU-T and the IETF to better understand the work underway in the two organizations and to identify areas where actions could be taken ... to further coordinate their work

Differences in Perspective: ITU-T and IETF

Topic	ITU-T NGN	IETF
Nomadicity, mobility	Converging wireless, wireline control architectures; maintain public service requirements	Builds specific nomadicity, mobility protocols to fit many architectures
QoS, session signalling	Basic network feature	Add-ons to best effort service with no signalling
Network management	End to end systems management	Device monitoring, configuration
Security	X.805: Security architecture for end-to-end communications	Multiple efforts addressing security of Internet technologies

- Further details: http://www.itu.int/ITU-T/worksem/ngn/200505/index.html

Summary

- ITU Structure: 3 sectors
  - ITU-R: manage radio spectrum, satellite orbits
  - ITU-T: standards covering all fields of telecoms
  - ITU-D: facilitate telecoms in developing countries
- ITU-T and NGN
  - Demographics and new technologies drive NGN
  - NGN: unfettered access to networks and competing service providers, with mobility as an essential component for consistent, ubiquitous provision of services to users.
  - Creation of Focus Group NGN to progress work: clearly a "going concern" and high interest area

Much interesting and challenging work still to be done!

Thank you!

ITU-T Focus Groups: a highly flexible means to progress technical work (1/3)

- Objective of focus groups
  - Help advance work of ITU-T parent study group
  - Encourage participation of experts and individuals who may not be members of ITU
- Establishment
  - Based on a proposal (incl. terms of reference)
  - A study group has authority to approve formation, become parent SG
  - May be established at or between study group meetings
  - Proposal may be submitted by any member to focus group review committee: parent SG leadership, TSAG Chairman, TSB Director
  - Once agreed, info posted on ITU-T web site and work may proceed
- Terms of reference
  - Must include plan of action, expected deliverables, time schedule
  - Relationship to work of parent SG must be indicated
  - Focus Group term and scope may be renewed, extended by parent SG as needed

ITU-T Focus Groups: a highly flexible means to progress technical work (2/3)

- Leadership
  - Chairman, vice-chairman initially appointed by parent SG
  - Further appointments made within focus group as needed
- Participation
  - Open to any individual from a country which is a member of ITU
  - Should not be used as an alternative to ITU membership
  - List of participants to be maintained for reference purposes
- Financing
  - Determines own method of financing
  - Does not draw on ITU-T resources except use of TIES
  - Non-ITU members pay a fee determined by TSB for use of TIES
  - Financing of meetings: volunteer hosting similar to Rapporteur groups, or per financial arrangements determined by the Focus Group
- Administrative support
  - May establish own method of providing, financing admin support
  - If TSB admin services used, costs to be covered by Focus Group

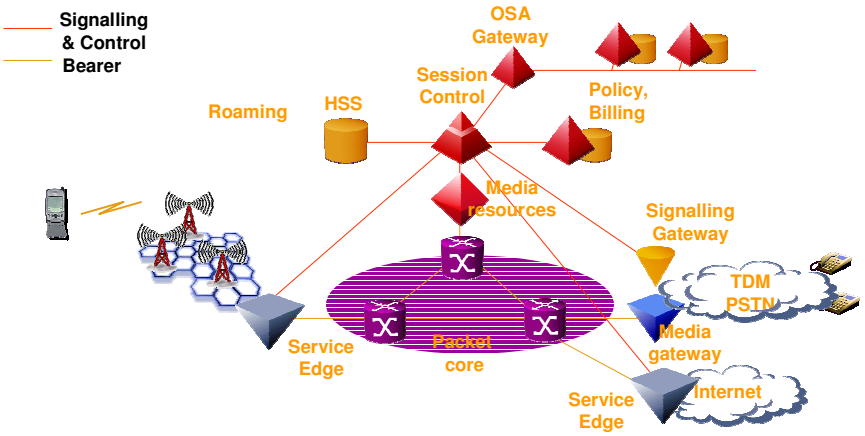
ITU-T Focus Groups: a highly flexible means to progress technical work (3/3)

- **Meeting logistics**
  - **Frequency, location, duration decided by Focus Group**
  - **Use of EDH encouraged**
- **Patent policy**
  - **TSB patent policy to be used (RAND)**
- **Deliverables**
  - **May be in form of technical specifications, reports, etc.**
  - **Expected to form input to the work of the parent SG**
  - **Parent SG may convert to ITU-T Recommendations (AAP process)**
  - **May establish own rules of approval: expected generally by consensus**
- **Progress reports**
  - **To be provided to each parent SG meeting; to include:**
    - **updated work plan and status, schedule of planned meetings**
    - **summary of contributions considered; list of attendees**
- **Working guidelines**
  - **May develop additional internal working guidelines as required**
- **Reference: ITU-T Rec. A.7 Focus groups: Working methods and procedures**

Selected Acronyms

3GPP	Third Generation Partnership Project
3GPP2	Third Generation Partnership Project 2
AAA	Authentication, Authorization and Accounting
AS	Application Server
BGCF	Breakout Gateway Control Function
CCS7	Common Channel Signalling System No. 7
CSCF	Call Session Control Function
DSL	Digital Subscriber Line
FG	Focus Group
GII	Global Information Infrastructure
HSS	Home Subscriber Server
I-CSCF	Interrogating CSCF
IMS	IP Multimedia Subsystem
IMT-2000	International Mobile Telecommunications 2000
IP	Internet Protocol
ISDN	Integrated Services Digital Networks
JCA	Joint Coordination Activity
MGCF	Media Gateway Control Function
MGW	Media Gateway
MRFC	Media Resource Function Controller
MRFP	Media Resource Function Processor
NGN	Next Generation Network
P-CSCF	Proxy CSCF
QoS	Quality of Service
R5	Release 5
RAND	Reasonable And Non-Discriminatory
RTP	Real Time Protocol
S-CSCF	Serving CSCF
SDO	Standards Development Organization
SDP	Session Description Protocol
SG	Study Group
SIP	Session Initiation Protocol
SSG	Special Study Group
TIES	Telecom Information Exchange Services
TSAG	Telecommunication Standardization Advisory Group
TSB	Telecommunication Standardization Bureau
TSG	Technical Specification Group

3GPP R5 network architecture 1/2



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- Applications creation environment permits extending applications to users independently of their means and point of access

3GPP R5 network architecture 2/2