



# The next generation network: Framework and its potential

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# Focus group on NGN

- ITU-T Director launched NGN Focus Group in June 2004
- Almost every two month meeting : 6, 7, 9, 11/2004 and 3, 4, 7, 8, 11/2005

WG	Area	Deliverables
WG 1	Service requirements	NGN Release 1 scope, services, and requirements
WG 2	Functional architecture and Mobility	Functional requirements and architecture, IMS for NGN, Mobility Management Capability Requirements for NGN, and Framework for Customer Manageable IP Network
WG 3	QoS	TR-123.qos, TR-msnniqos, TR-NGN.qos, TR-NGN.NHNperf, TR-e2eqos.1, TR-enet, TR-atmipa, TR-racs, TR-ipaqos
WG 4	Control and signalling	TRQ.IP QoS.SIG.CS1
WG 5	Security capability	NGN Security Framework
WG 6	Evolution	Evolution of networks to NGN, PSTN evolution to NGN
WG 7	Future packet-based bearer network	Future Packet Network requirements, architecture, and solutions



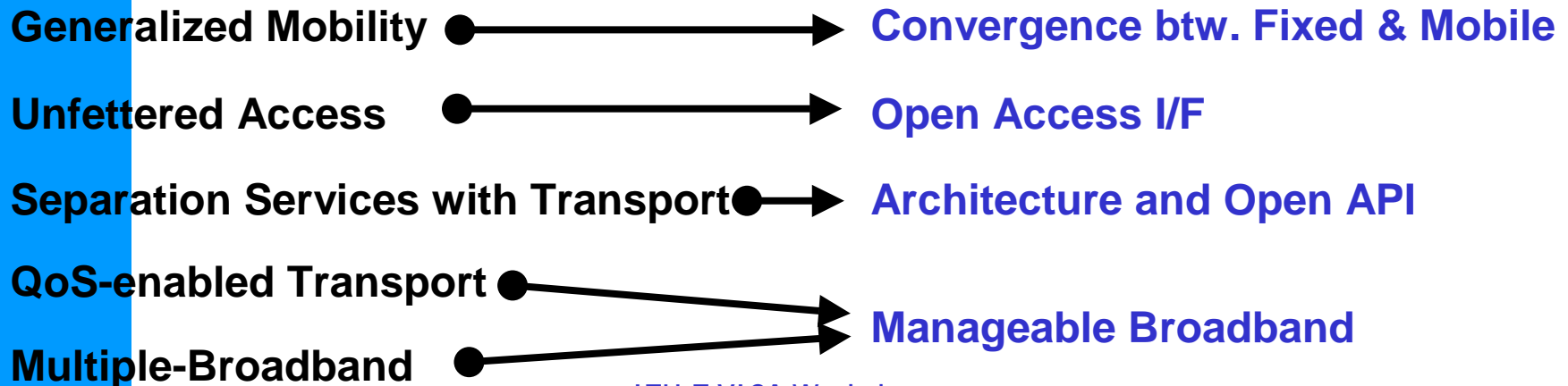
# Definition of NGN

Definition  
of NGN  
(Rec.  
Y.2001)

A 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.

## Target Standards Area





# Services and Capabilities

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## ◆ Service Types

- Multimedia services
- PSTN/ISDN Emulation services
- PSTN/ISDN Simulation services
- Internet access
- Other services (data services etc.)
- Public service aspects (LI, ETS/TDR, etc.)

## ◆ Service Capabilities

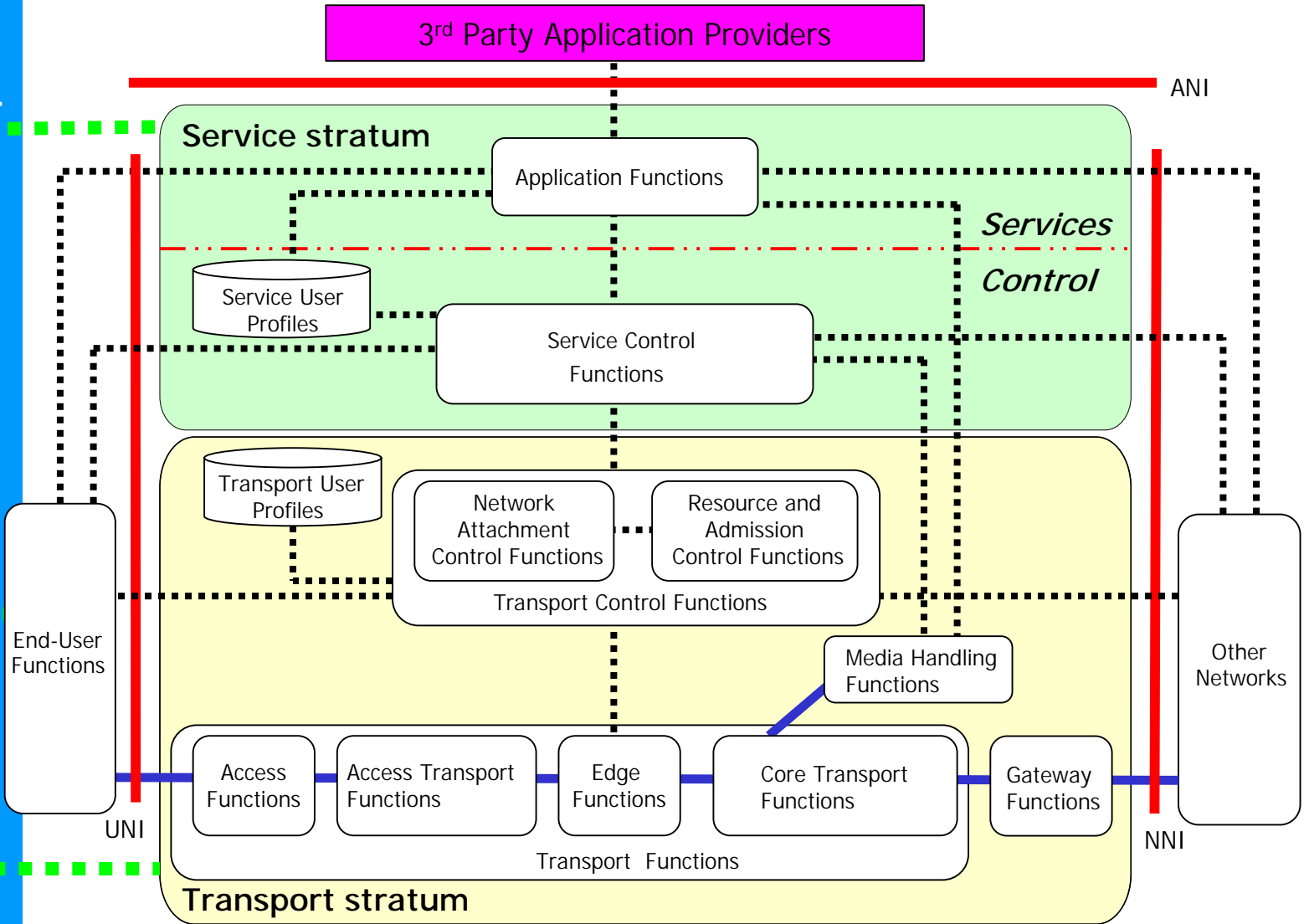
- Basic network capabilities
- Service support capabilities
  - Open Service Environment
  - Service Enablers
  - PSTN/ISDN Emulation support
- Public service support capabilities



# Overall NGN Architecture

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Management Functions



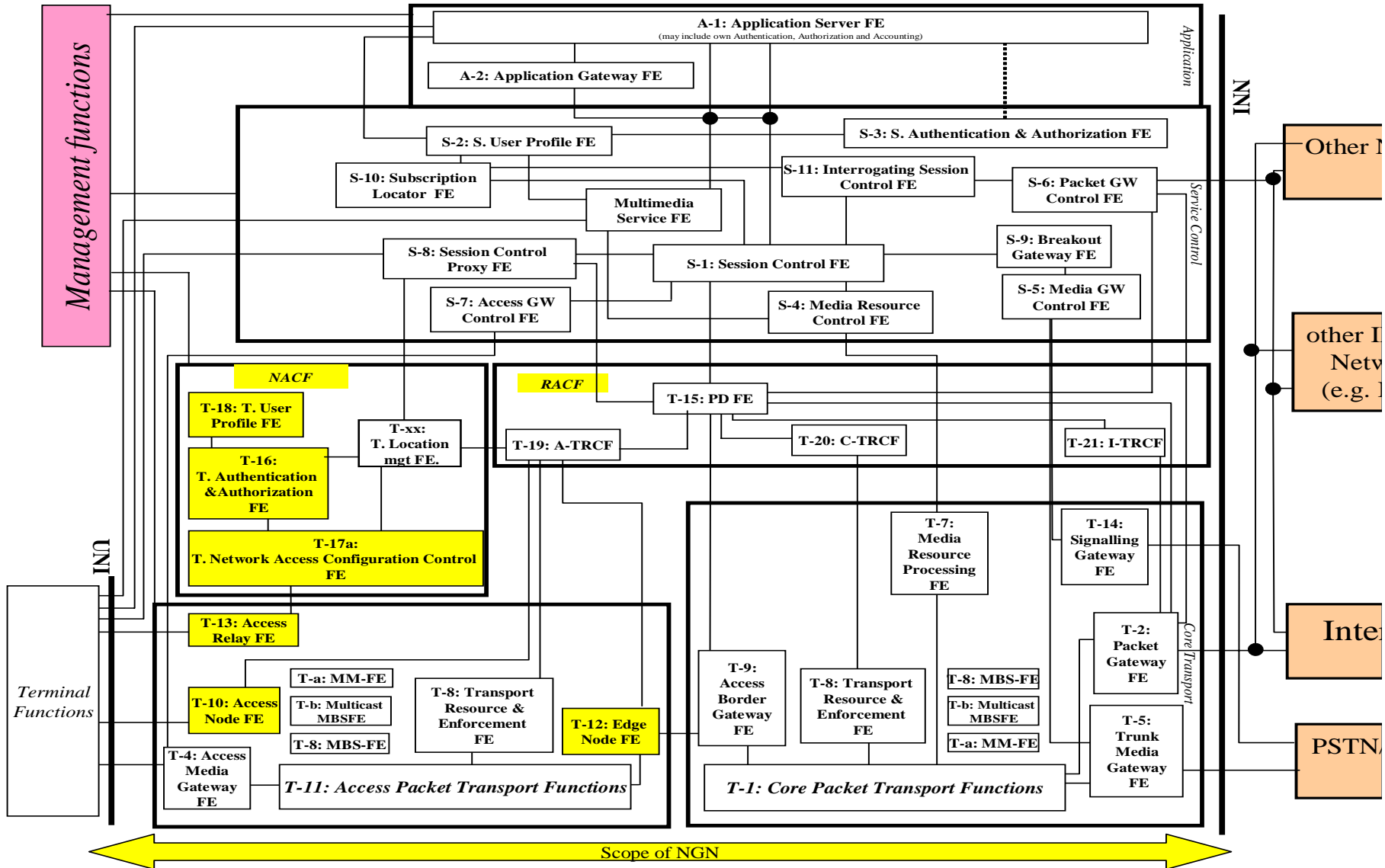
..... Control

Media

Management



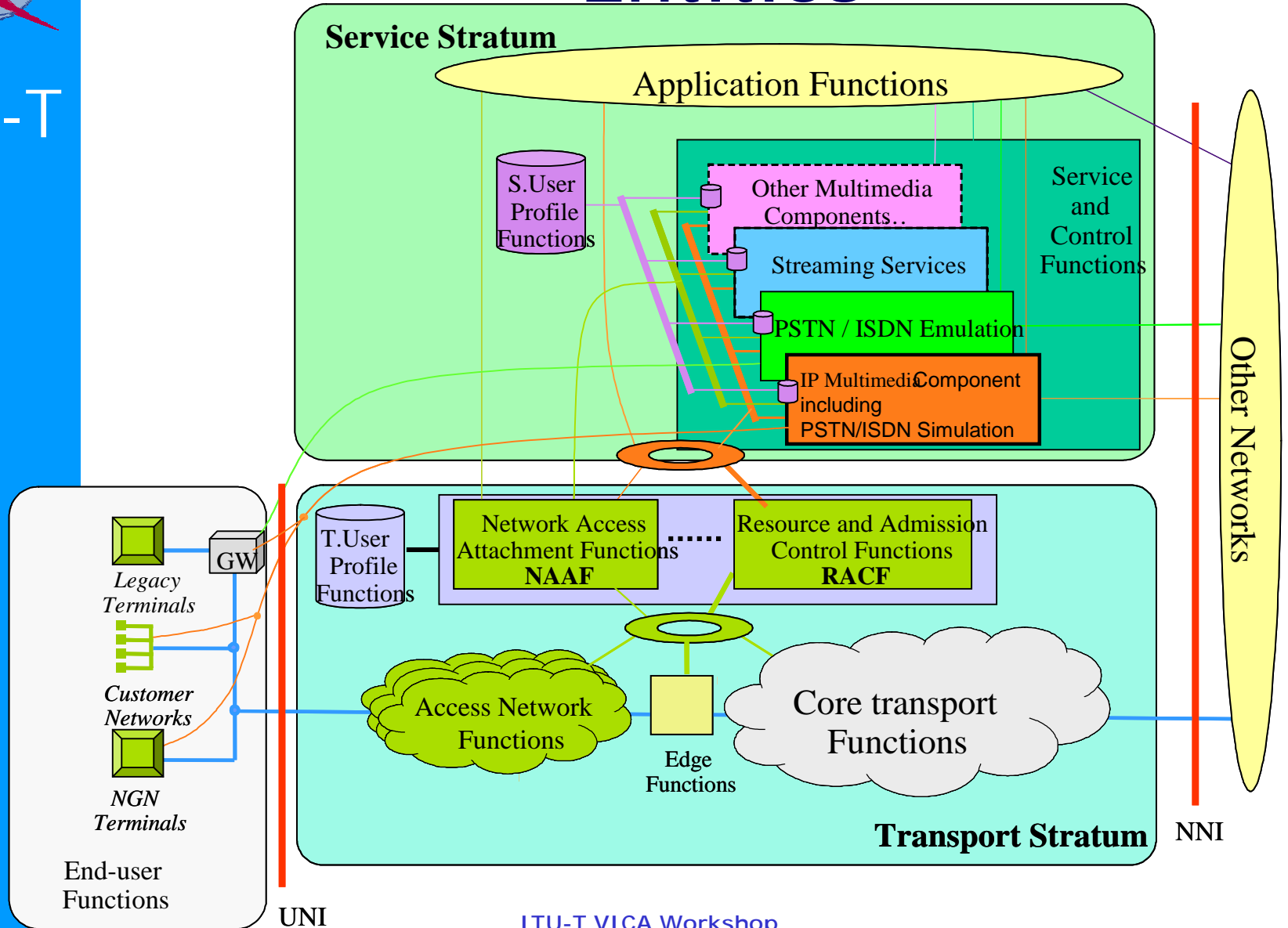
# Functional Architecture Model





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# Grouping of NGN Functional Entities







# TR-RACS - Functional Requirements and Architecture for Resource and Admission Control in Next Generation Networks

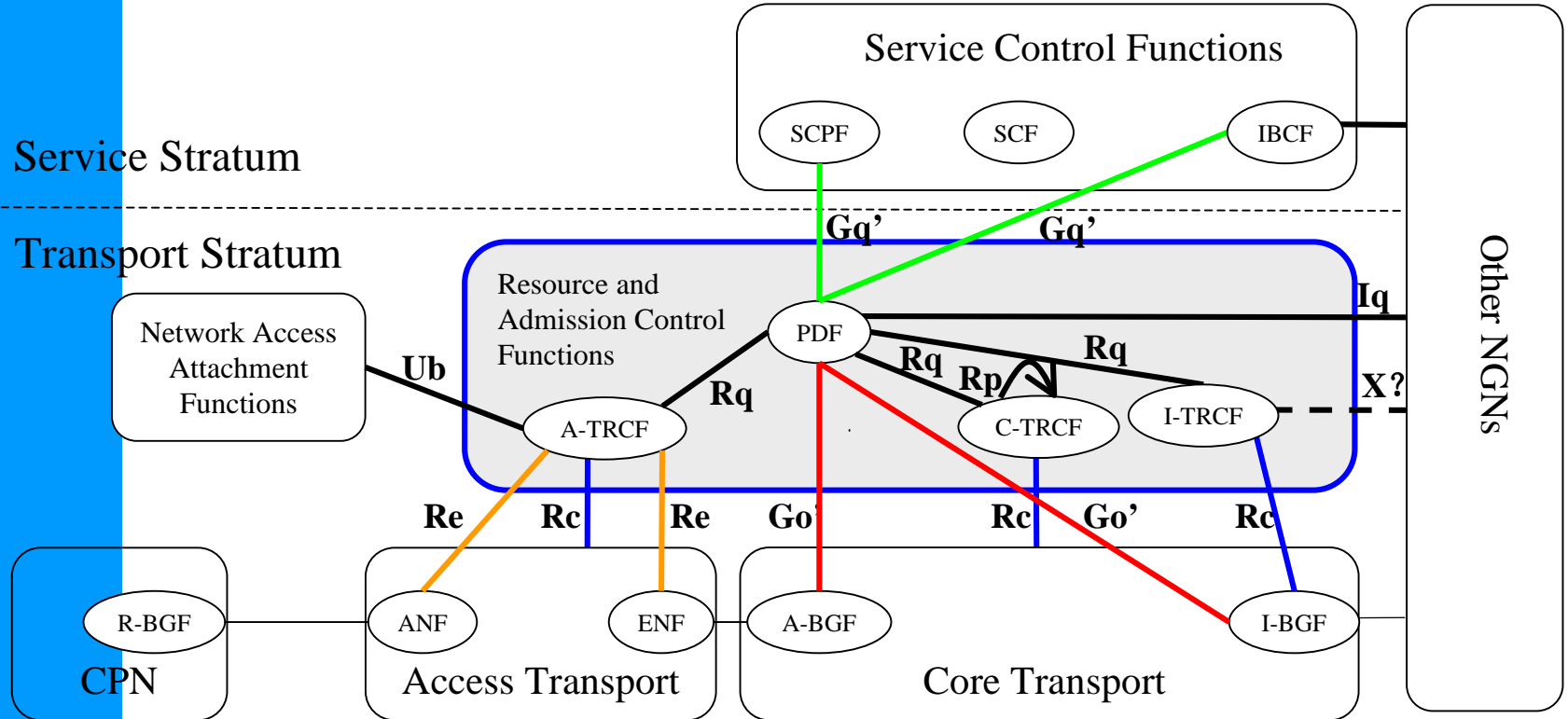
- o Covers procedures for the control of QoS (including resource reservation, admission control and gate control) , control of NAPT and Firewall traversal.
- o Admission control involves checking authorisation based on user profiles, SLAs, operator specific policy rules, and resource availability within access and core transport.
- o Within the NGN architecture, the RACF acts as the arbitrator for resource negotiation and allocation between Application Functions and Transport Functions.
- o Similar to ETSI but wider scope than TISPA Release 1 (e.g. including core network control and inter-domain PDF-PDF communication).

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# Generic Resource and Admission Control functional architecture

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# FGNGN deliverables on NGN performance

- Deliverables on NGN performance aspects are based on Recommendations Y.1540 and Y.1541.
- New aspects for NGN are (1) detailed description, (2) inter-operator aspects, and (3) extension of specified sections into a customer network.

## List of FGNGN deliverables on NGN performance

Deliverable	Status	Target	Title
TR-msnniqos	Draft (Stable)	2005/09	Multi Service Provider NNI for IP QoS
TR-pmm	Draft (Stable)	2005/11	Performance measurement and management for NGN
TR-apo	Draft	2006/04	Algorithms for Achieving End to End Performance Objectives
TR-ngn-qos	Draft	2005/09	General aspects of QoS and network performance in NGN
TR-nhn-perf	Draft	2005/09	Network performance of non-homogeneous networks in NGN

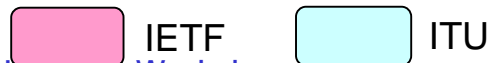


# Position of FGNGN deliverables on NGN performance

FGNGN deliverables;

(1) TR-msnniqos, (2) TR-pmm, (3) TR-apo, (4) TR-NGN-QoS, (5) TR-nhn-perf

Network performance	Measurement	Objectives and classes	Evaluation	Management	Control
IP packet transport performance	IETF IPPM	ITU-T SG13 (till 2004)	IETF BMWG (benchmark)	IETF RMON MIB	IETF <ul style="list-style-type: none"> <li>• Diffserv</li> <li>• MPLS</li> <li>• CCAMP</li> <li>• TEWG traffic engineering and protection</li> </ul>
Connection/session performance	ITU-T SG12 (extended since 2005.)			ITU-T SG4	
Reliability/availability					



# QoS classes and performance objectives (Y.1541)



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Table 1/Y.1541 Provisional IP network QoS class definitions and network performance objectives

Network performance parameter	Nature of network performance objective	QoS Classes					
		Class 0	Class 1	Class 2	Class 3	Class 4	Class 5 Unspecified
<b>IPTD</b>	Upper bound on the mean IPTD (Note 1)	100 ms	400 ms	100 ms	400 ms	1 s	U
<b>IPDV</b>	Upper bound on the 1 – 10 <sup>-3</sup> quantile of IPTD minus the minimum IPTD (Note 2)	50 ms (Note 3)	50 ms (Note 3)	U	U	U	U
<b>IPLR</b>	Upper bound on the packet loss probability	1 × 10 <sup>-3</sup> (Note 4)	1 × 10 <sup>-3</sup> (Note 4)	1 × 10 <sup>-3</sup>	1 × 10 <sup>-3</sup>	1 × 10 <sup>-3</sup>	U
<b>IPER</b>	Upper bound	1 × 10 <sup>-4</sup> (Note 5)					U

Table 2/Y.1541 – Guidance for IP QoS classes

QoS class	Applications (examples)	Node mechanisms	Network techniques
0	Real-time, jitter sensitive, high interaction (VoIP, VTC)	Separate queue with preferential servicing, traffic grooming	Constrained routing and distance
1	Real-time, jitter sensitive, interactive (VoIP, VTC).		Less constrained routing and distances
2	Transaction data, highly interactive (Signalling)	Separate queue, drop priority	Constrained routing and distance
3	Transaction data, interactive		Less constrained routing and distances
4	Low loss only (short transactions, bulk data, video streaming)	Long queue, drop priority	Any route/path
5	Traditional applications of default IP networks	Separate queue (lowest priority)	Any route/path



# Future Issues

## 1) Architecture Point of view

- Incorporation of fixed network requirements into IMS based architecture
- Combination with Optic based Architecture
- Develop Fixed-Mobile convergence model

## 2) Control and Protocol aspects

- Identify and develop of protocols to meet NGN control mechanism
- NGN signalling for NGN services or use/updates of SIP
- Control capabilities to support billing and charging

## 3) QoS aspects

- Interconnection requirements for supporting End-End QoS services
- QoS parameter mappings among different standards
- Extension of Session Control Protocols

## 4) Evolution and Interworking aspects

- Evolution scenarios from PSTN/ISDN to NGN
- Interworking requirements and specification for IWF
- Identify protocols for interworking

## 5) Security aspects

- SIP hop-by-hop (vs. end-to-end) security
- Firewall traversal
- Security management and controls



# Meeting plan in 2005

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- 5th FG NGN : 14 ~ 22 March, Jeju-island Korea
  - NGN Technical Workshop : 12 ~ 13 Korea
- 6th FG NGN : 26 April ~ 30 April, Geneva Swiss
  - ITU-T and IETF Joint NGN Workshop 1 ~ 2 May, Geneva, Swiss
- 7th FG NGN : 27 June ~ 1 July, Beijing, China
- 8th FG NGN : 24 August ~ 2 September, Geneva Swiss
- 9th FG NGN : 14 November ~ 18 November, London UK



**Transfer all tasks to SGs (SG11, 12, 13, 19)**

ITU-T VICA Workshop  
22-23 July 2005, ITU Headquarter, Geneva



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**Thank you  
for your attention !!!**