

Architectural Views of NGN and IPTV

Chae Sub Lee

Vice-Chairman of ITU-T SG13
Vice-Chairman of ITU-T FG IPTV

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2. NGN Architectural Frameworks
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Definition of NGN

ITU-T

Rec.

Y.2001

Next Generation Network (NGN):

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.

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Key Principles of NGN

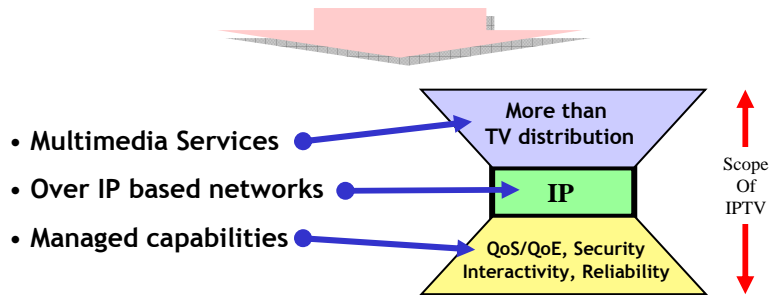
- **Open architecture**: open to support service creation, service updating, and incorporation of service logic provision by third parties and also support “Distributed control” as well as enhanced security and protection.
- **Independent provisioning**: service provision process should be separated from network operation by using distributed, open control mechanism to promote competition.
- **Multiplicity**: The NGN functional architecture shall offer the configuration flexibility needed to support multiple access technologies.

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1. Direction from definition

Definition of IPTV

*IPTV is defined as **multimedia services** such as television/video/ audio/text/graphics/data delivered **over IP based networks managed** to provide the required level of QoS/QoE, security, interactivity and reliability*

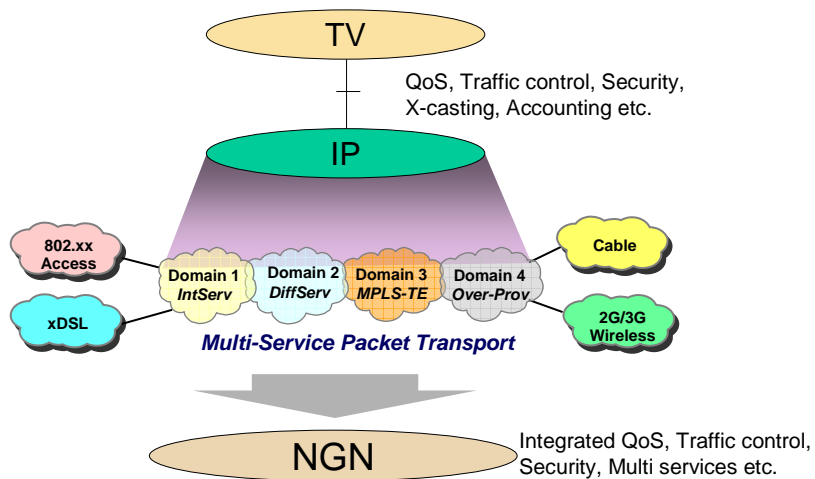


ITU-T IPTV FG 2nd meeting, October 2006, Busan Korea

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1. Direction from definition

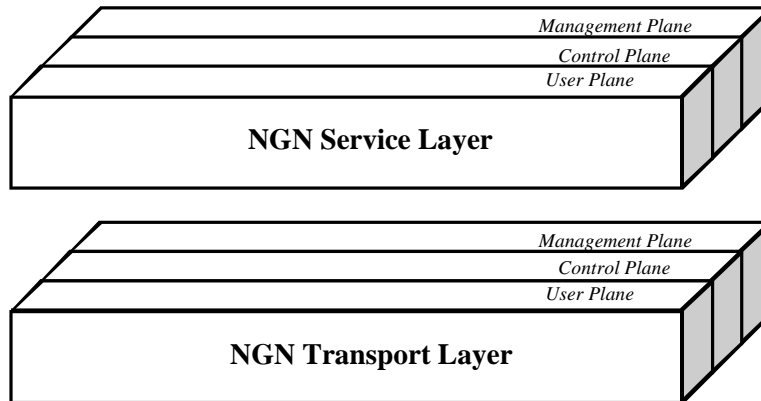
NGN as an Infrastructure for IPTV



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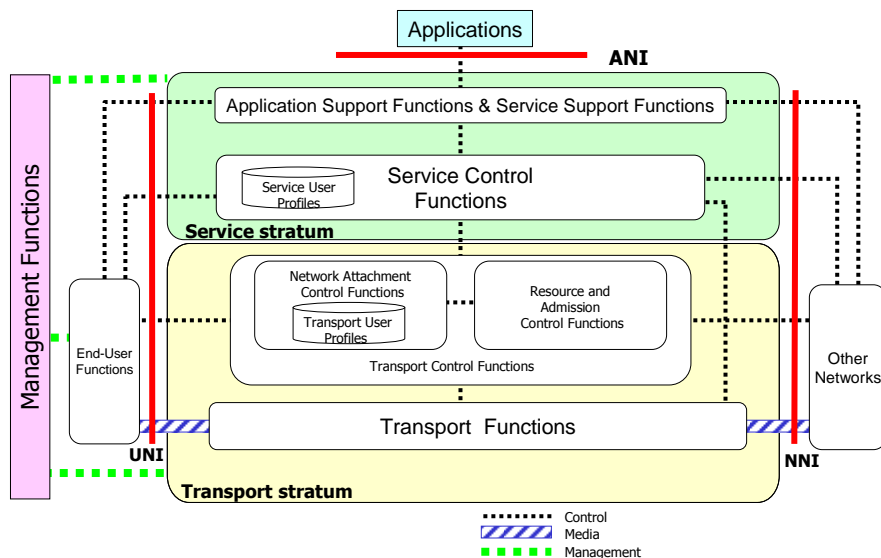
NGN Basic Reference Model

- Separation Transport (Access and Core) from Services
- But keeping 3 Planes for basic function: User, Control and Management



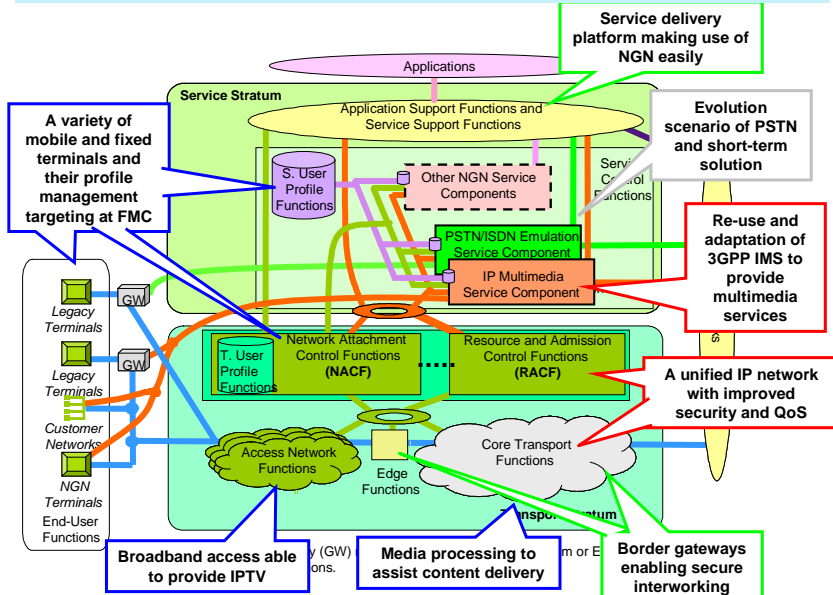
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NGN architecture overview (Rec. Y.2012)



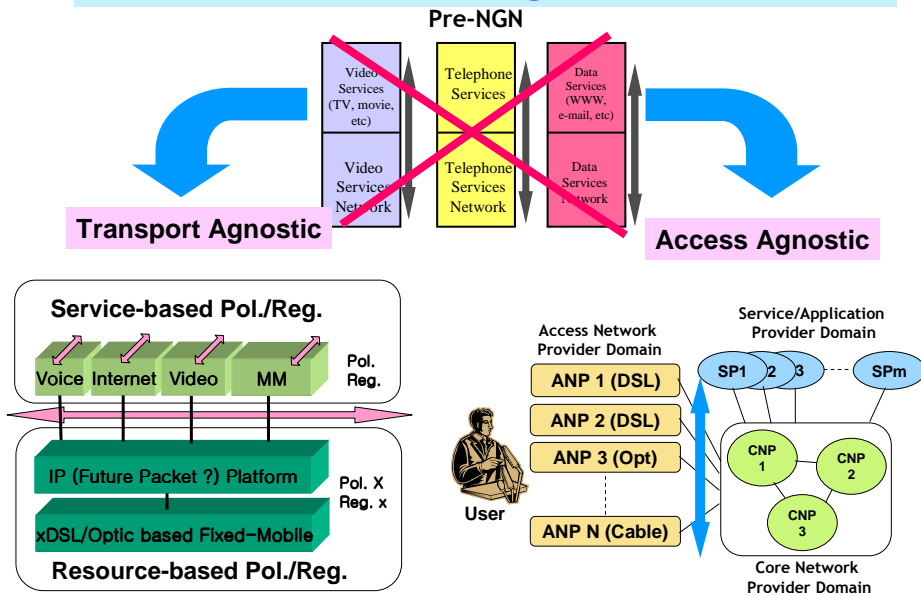
Note: UNI/NNI/ANI are not meant to represent any specific interfaces.

Overview of NGN Release 1



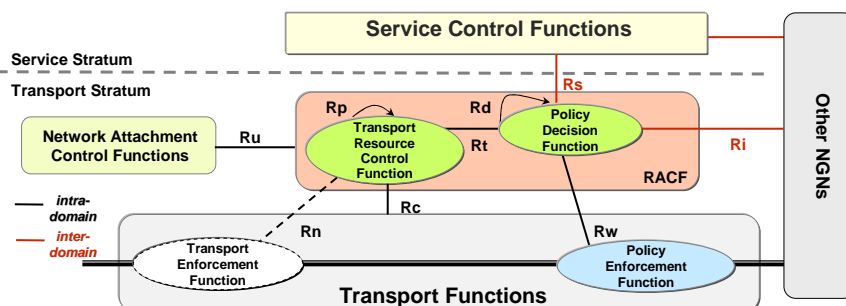
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Towards for Agnostic ...



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Works on RACF in ITU-T



- o Policy Decision Function
service facing, transport independent
- o Transport Resource Control Function
service independent, transport dependent, network-segment specific
- o Policy Enforcement Function
typically part of border transport elements

RACF

- ❖ Augments native transport QoS support
 - ✓ Preempting transport congestion at the service control layer
 - ✓ Protecting ongoing premium traffic

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Key Roles of RACF and Related Entities

Policy Decision Function

- o Makes the overall admission decision based on policy and resource availability (including path and enforcement point selection)
- o Applies resource controls to the transport for bandwidth allocation, packet marking, gating, NAPT, etc.

Transport Resource Control Function

- o Tracks transport resource usage and network topology
- o Resource-based admission control
- o Applies L2 resource controls to the transport

Policy Enforcement Function

- o Enforces controls applied by PDF

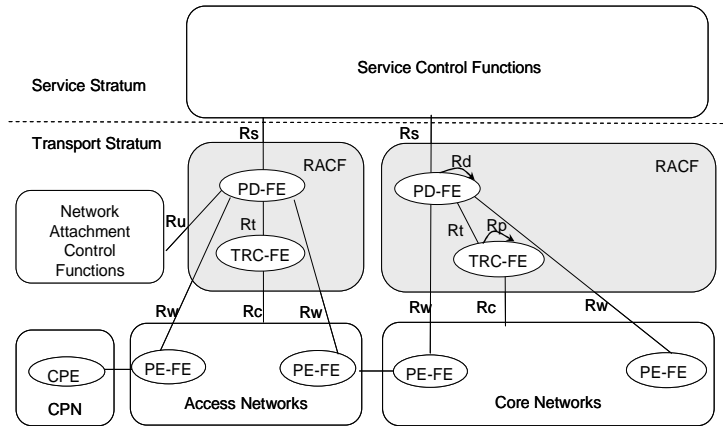
Overall, RACF supports

- ❖ *Relative* and *absolute* QoS, including *priority*
- ❖ Endpoints of varied QoS control capabilities
- ❖ *Push* and *pull* modes for policy installation
- ❖ Multiple transaction models for resource requests
- ❖ Various resource management methods based on *accounting*, *measurement* and *reservation*
- ❖ *Existing* and *emerging* transport QoS mechanisms

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Implementation Scenario 1

Scenario 1: the access network and the core network belong to different administrative domains, and the RACFs at both sides interact with the SCF with no information exchanged in the between.

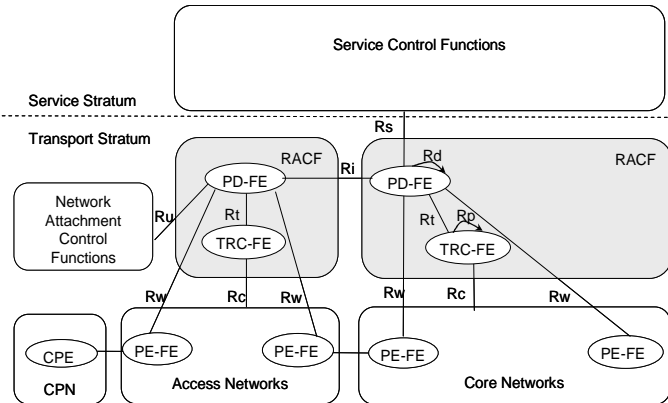


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Implementation Scenario 2

Scenario 2: The access and the core belong to different administrative domains, and the SCF interacts with either of the RACFs at the two sides. The RACFs in the core and the access exchange information via the Ri reference point.

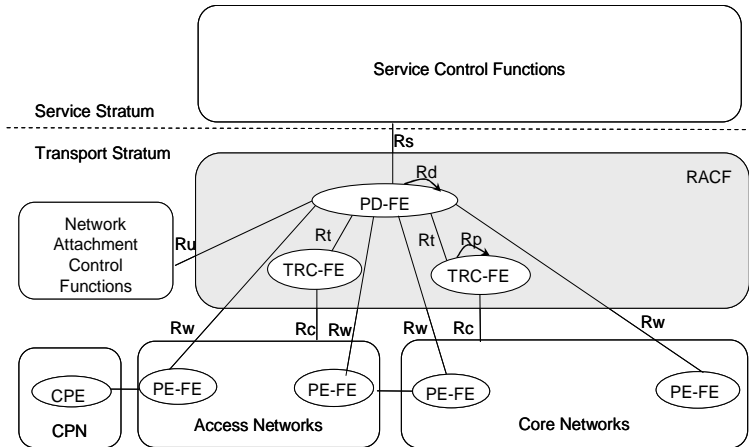
Note: The Ri reference point is to be detailed in R2.



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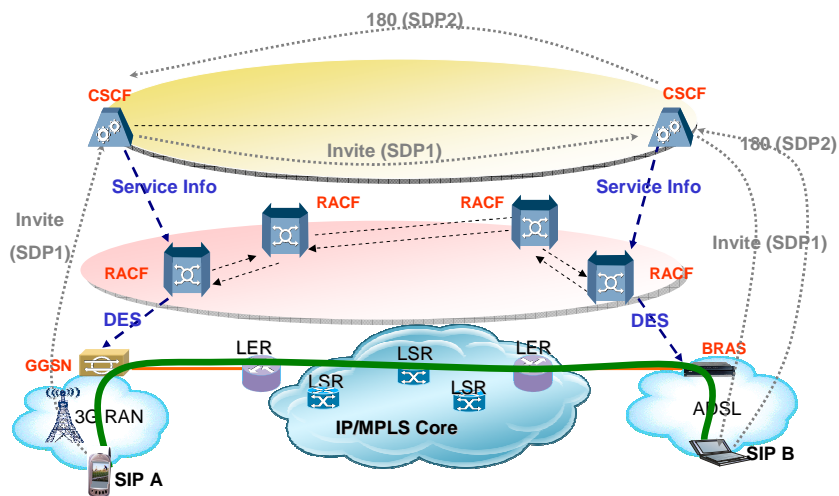
Implementation Scenario 3

Scenario 3: The access and the core belong to the same administrative domain.



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RACF supporting End-End QoS



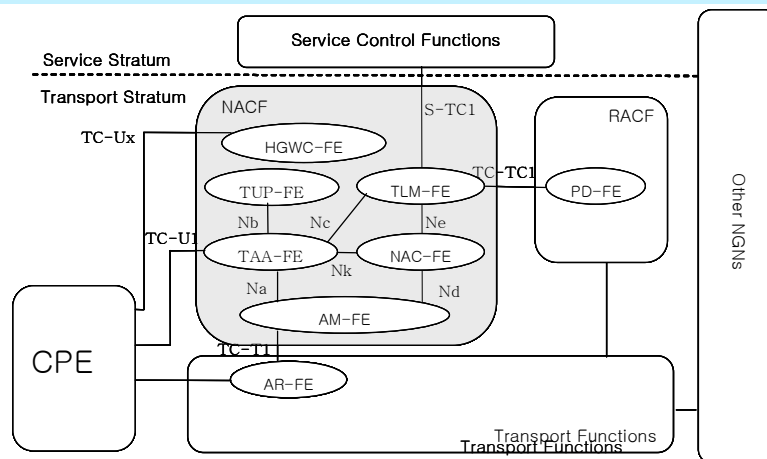
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High Level Requirements of NACF

- Dynamic provision of IP address and other user equipment configuration parameters (e.g. using DHCP).
- User authentication, prior or during the IP address allocation procedure.
- Authorization of network access, based on user profile.
- Access network configuration, based on user profile.
- Location management.

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Functional Architecture of NACF



NAC-FE (Network Access Control Functional Entity)
 AM-FE (Access Management Functional Entity)
 TLM-FE (Transport Location Management Functional Entity)
 TAA-FE (Transport Authentication and Authorization Functional Entity)
 TUP-FE (Transport User Profile Functional Entity)
 HGWC-FE (Home GateWay Configuration Functional Entity)
 AR-FE (Access Relay Functional Entity)

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IPTV – NGN Mapping

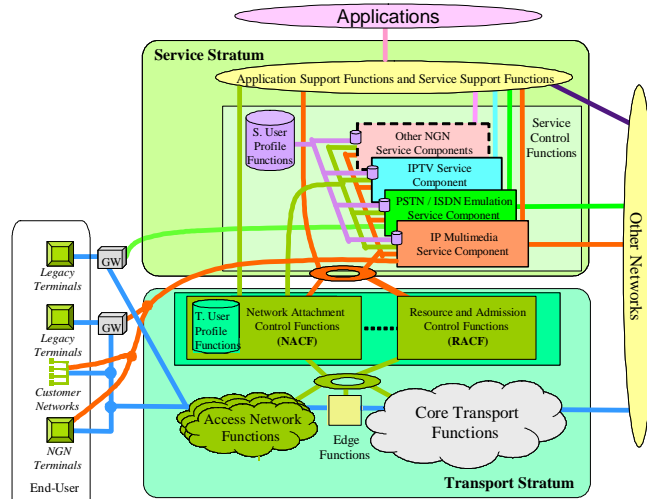


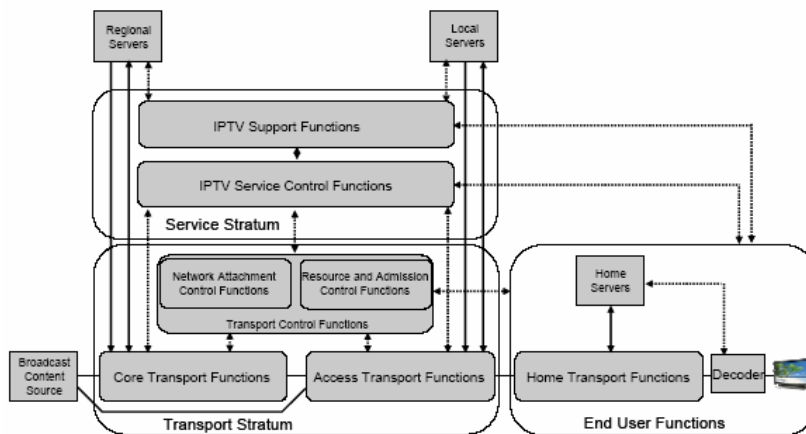
Figure 1.

Future revision of Figure 8/Y.2012: NGN components including IPTV service component

* Ref: NGN-GSI Output Document T05-NGN.GSI-0067R1

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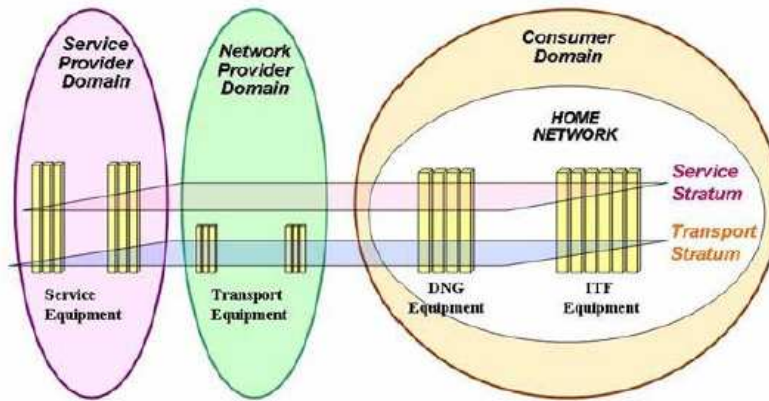
IPTV on NGN with distributed servers



* Ref: ATIS-0800002, IPTV Architecture Requirements

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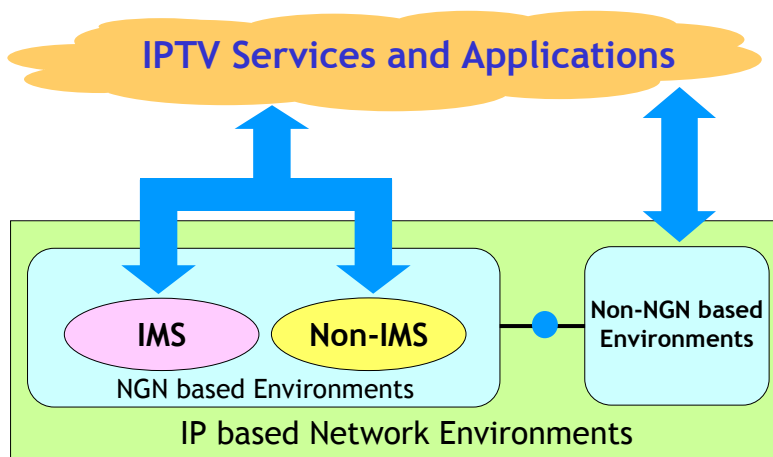
High level view of IPTV over NGN



* Ref: ATIS-0800002, IPTV Architecture Requirements

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Architectural Approach

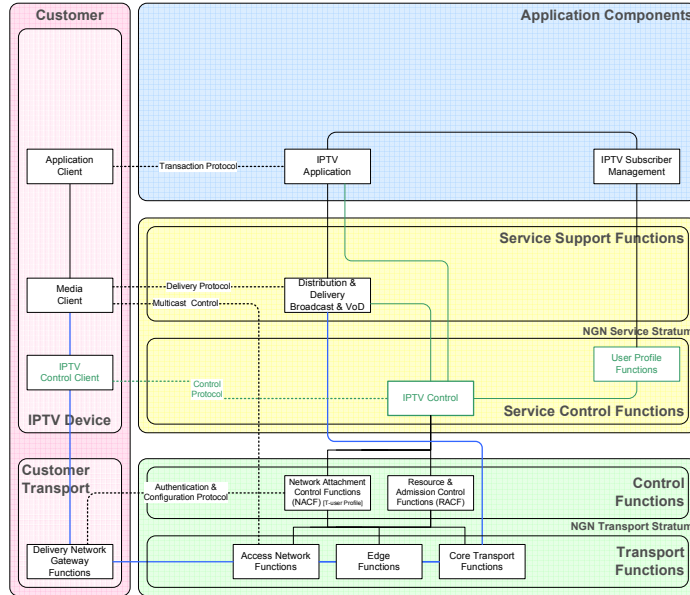


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3. IPTV Architectural Frameworks



NGN (but non-IMS) Based IPTV Delivery Architecture



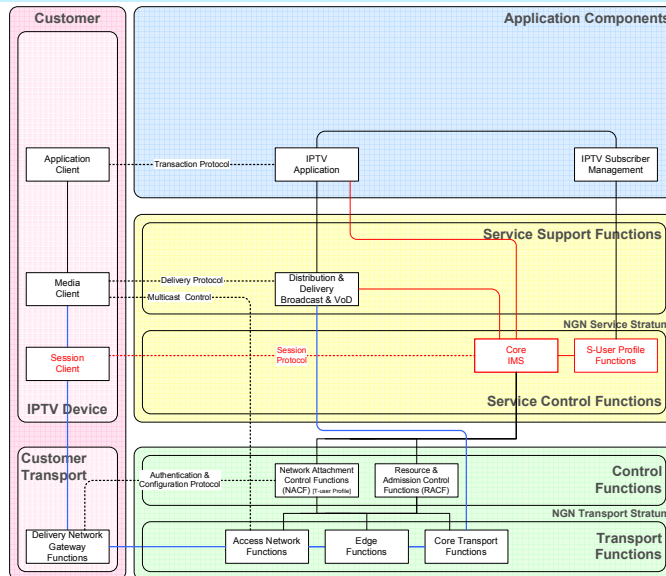
On-going Discussion

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3. IPTV Architectural Frameworks



IMS Based IPTV Delivery Architecture



On-going Discussion

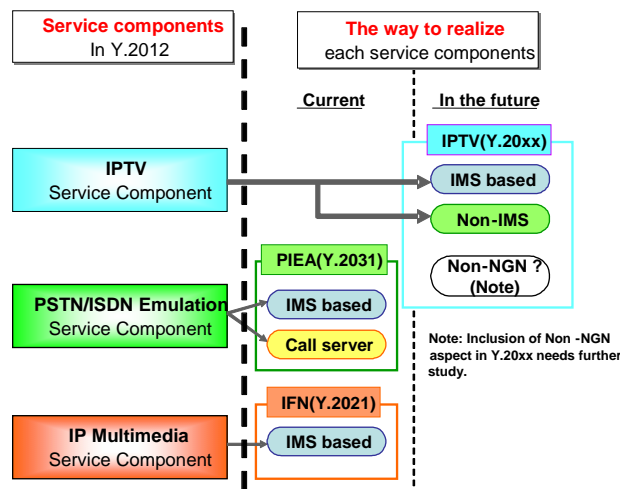
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Remaining Works in NGN and IPTV

- o NGN R1 frameworks are almost finished
 - Protocol developments has been started:SG11
 - NGN R2 Requirements are being developed
 - FRA 2, RACF 2 and NACF also started for R2
 - **Need more works to support Services/Applications over NGN**
- o IPTV is just being developed
 - Definition, Requirements and Architecture
 - **Need more detailed functional studies; IPTV service components, Middleware PF, STB etc.**

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NGN Architecture Standard Roadmap (incorporating IPTV architecture)



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

