

# Converged Services and a New Generation of Networking

*... for discussions only ...*

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## IMS IPTV Standards & interoperability update

- Where are they in the PROCESS?
- What aspects of the ARCHITECTURE and PROTOCOLS are Mature?
- What are the GAPS?

## Outline

- What is IPTV, and Why it is Attractive?
- Implementation Options
- Current Industry and Standards Activities
  - ATIS IPTV Interop Forum (IIF)
  - OpenIPTVForum
  - MSF
  - ETSI/TIPSAN
- Implementation Challenges
- Open Discussions, and Q&A

## What's and Why's of IPTV

- IPTV is a set of consumer-friendly video **Services** delivered over a converged IP infrastructure with provisioning for mobility
  - IPTV must provide an equivalent TV experience (QoS/QoE) with the addition of enhanced accessibility & transportability
  - Early implementations have all been **proprietary**
  - Standardized solutions are now being demanded by **Carriers**, **Consumer Electronics** and the video **Content** owners
- EXPECTATION: Time, Place, and Device Shifting
  - For both Live and On-Demand Contents
- IMS based IPTV can support blended, converged, and personalized services implementation more easily and quickly
  - This allows service providers to adapt **easily** and **quickly** to the customers' requirements, and that can help support sustainable revenue streams

## IPTV Implementation Options

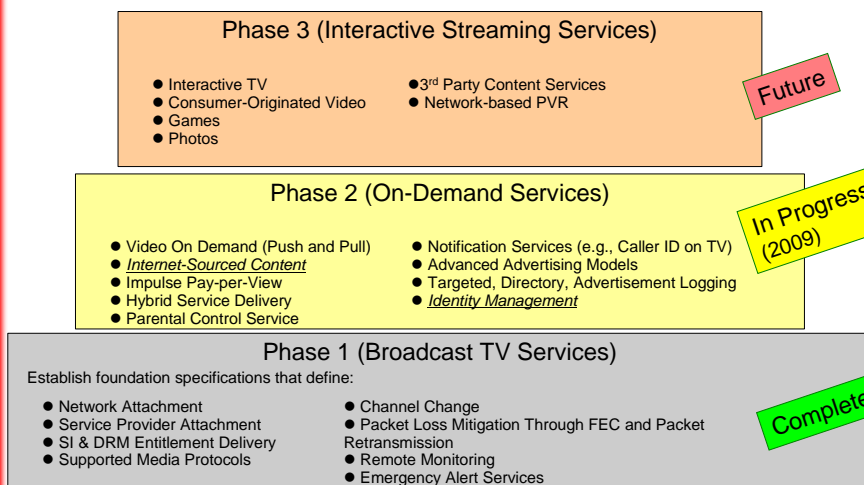
- Classical IPTV
  - For example, peer-to-peer model (Napster, Gnutella, KaZaA, BitTorrent, eDonkey/OverNet)
  - Large Number of Servers, Content is Free, Access & QoS/QoE are Unpredictable
- NGN IPTV
  - IMS, Web and {SOA, SDP, Middleware, SON} based IPTV

## IMS IPTV Simplifies Service Blending & Portability

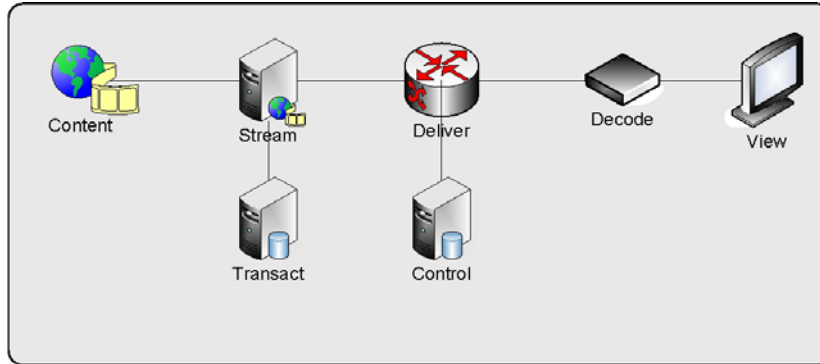


## ATIS IPTV Interop Forum (IIF) (<http://www.atis.org/iif/index.asp>)

## ATIS IIF Service Phases ([www.atis.org/iif/index.asp](http://www.atis.org/iif/index.asp))

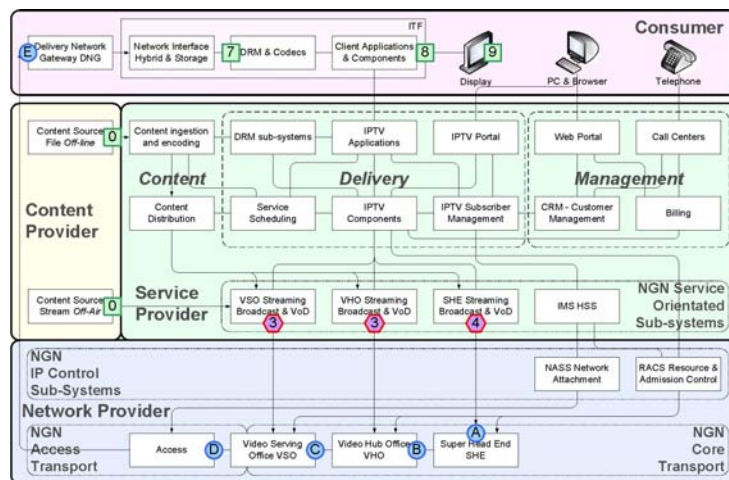


# End to End High Level ATIS IIF IPTV Ecosystem



From: IPTV Architecture Requirements (ATIS 0800002)

# End to End ATIS IIF IPTV Architecture

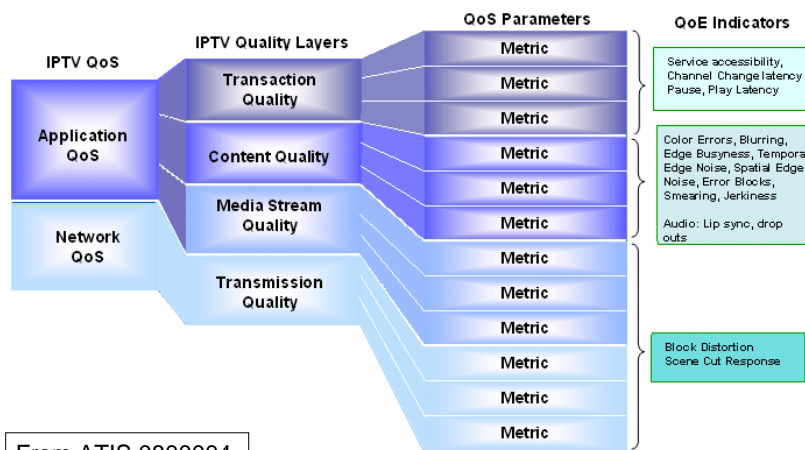


From: IPTV Architecture Requirements (ATIS 0800002)

## Blending IPTV with Other Services (using IMS!)

- Presence
- Identity
- Resource Allocation
- Inter-Service Communications e.g. caller ID, widgets
- Single Sign On determined by Profile Server
  - All related services - network used to access
  - Equipment used to access
- Nomadicity and Path management

## Classifying Quality Layers, QoS Parameters and QoE Indicators



From ATIS 0800004

## IPTV Middleware Items

•Emerging Hi Quality Telco provided IPTV/Video needs Next Gen Standards based platform

- Common standards based API's
- Single IF for Content providers, local and international
- Encouragement for MM apps development
- Facilitates CAS, Metadata and EAS issues
- Allows for multi-lingual options
- Future proof - extendable to CEA and revenue producing home networking options

## IIF Standards Issued in 1H2009

- ATIS-0800013, Media Formats and Protocols for IPTV Services
- ATIS-0800018, IPTV Linear TV Service
- ATIS-0800022, IPTV Consumer Domain Device Configuration Metadata
- **ATIS-0800024, Security Robustness Rules Interoperability Specification (new in 2Q09)**
- ATIS-0800028, IPTV Fault Codes for IPTV
- ATIS-0800029, IPTV Terminal Metadata Specification
- **ATIS-0800032, Metadata for IPTV Fault Codes (new in 2Q09)**

Source: ATIS April-09 Press Release, <http://www.atis.org/PRESS/pressreleases2009/041709.htm>

## IIF Standards Issued in 2008

- ATIS-080009, Remote Management of Devices in the Consumer Domain for IPTV Services
- ATIS-0800010, Emergency Alert Provisioning Specification
- ATIS-0800011, QoS Metrics for Public Services
- ATIS-0800012, IPTV Emergency Alert System Metadata Specification
- ATIS-0800014, Secure Download and Messaging Interoperability Specification
- ATIS-0800015, Certificate Trust Management Hierarchy Interoperability Specification
- ATIS-0800016, Standard PKI Certificate Format Interoperability Specification
- ATIS-0800017, Network Attachment and Initialization of Devices and Client Discovery of IPTV Services
- ATIS-0800020, IPTV Electronic Program Guide Metadata Specification
- ATIS-0800021, EPSNR Trial-Use Standard

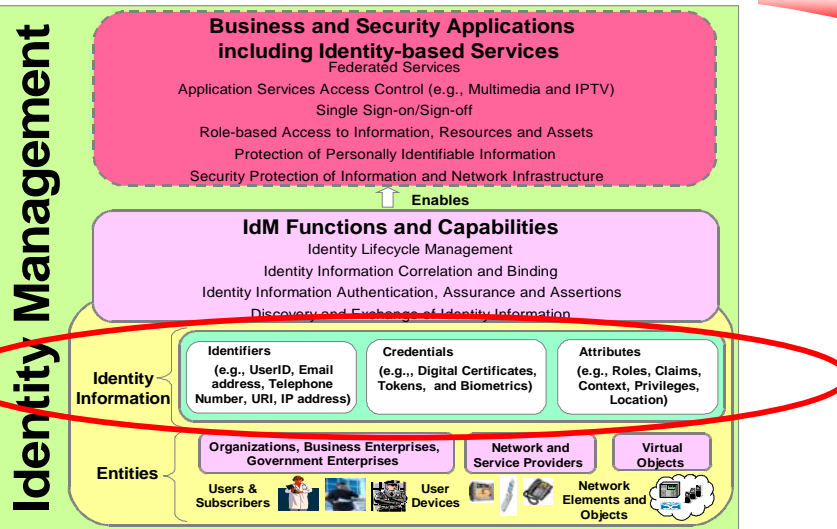


## IIF Standards Issued in 2006-2007

- ATIS-0800001, IPTV DRM Interoperability Requirements
- ATIS-0800002, IPTV Architecture Requirements
- ATIS-0800003, IPTV Architecture Roadmap
- ATIS-0800004, A Framework for QoS Metrics and Measurements Supporting IPTV Services
- ATIS-0800005, IPTV Packet Loss Issue Report
- ATIS-0800006, IIF Default Scrambling Algorithm
- ATIS-0800007, IPTV High Level Architecture
- ATIS-0800008, QoS Metrics for Linear Broadcast IPTV



## IIF Hot Topics (DRM, ID Management, etc.)



**Open IPTV Forum**  
**(<http://www.openiptvforum.org/>)**

## Vision of Open IPTV Forum



## Goals and Objectives of OpenIPTVForum.Org

→The main Open IPTV Forum objective is to produce open e2e specifications for IPTV including:

- Architecture and interfaces
- Network and terminal functionality
- Interactive and personalized services
- Technology choices for all major functionalities
- A common UNI (User-Network Interface) for Open Internet and managed networks
- Certification of equipment including end user devices and service provider offerings

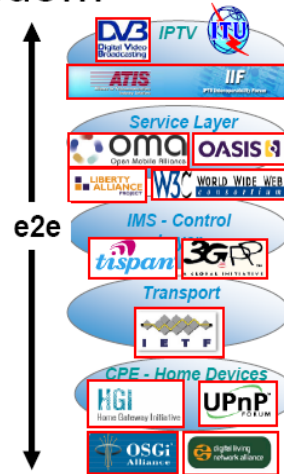
→This e2e specification shall support:

- A variety of IPTV and internet multimedia services
- Managed networks and open Internet
- Integration with communication services
- Convergence of IPTV and multimedia services across different access technologies
- Easy integration of 3<sup>rd</sup> party content offerings
- Various devices in the home network

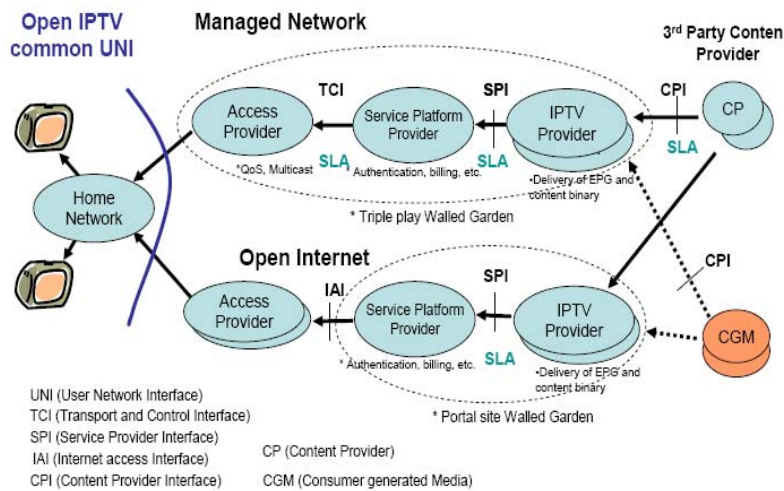
## OpenIPTVForum's Standardization Issues

- Fragmented World of Standards
  - No end-to-end perspective
- Proprietary solutions
- Limited interoperability and economics of scale

Issues addressed by Open IPTV Forum



## Scope of OpenIPTVForum's Works



## OpenIPTVForum's List of IPTV Features

- Broadcast TV
- Video on Demand
- Local PVR
- Network-based PVR
- Content Guide (search, browser & meta data based, personalization)
- Advertisement (within content, EPG, other information)
- Information services (associated, unassociated)
- Interactivity and Applications
- Security (authentication, DRM)
- User Management
- Remote ITF Management
- Parental Control
- User Interface
- Service Portability
- Home Networking
- Centralized Charging
- QoS management
- Notification Service
- Interworking with communication services



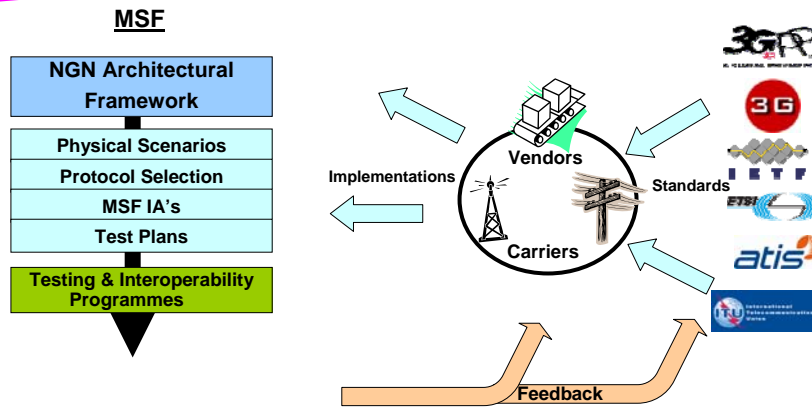
## List of Available Documents

- IPTV Whitepaper
  - [http://www.openiptvforum.org/docs/Open\\_IPTV\\_Forum\\_Whitepaper\\_V2.pdf](http://www.openiptvforum.org/docs/Open_IPTV_Forum_Whitepaper_V2.pdf)
- Release 1 Specifications
  - <http://www.openiptvforum.org/downloads.html>
- Service and Platform Requirements
  - [http://www.openiptvforum.org/docs/OIPF-Platform\\_and\\_Service\\_Requirements\\_v2\\_approved.pdf](http://www.openiptvforum.org/docs/OIPF-Platform_and_Service_Requirements_v2_approved.pdf)
- IPTV Functional Architecture
  - [http://www.openiptvforum.org/docs/OIPF-Functional\\_Architecture-V1.2-APPROVED.pdf](http://www.openiptvforum.org/docs/OIPF-Functional_Architecture-V1.2-APPROVED.pdf)

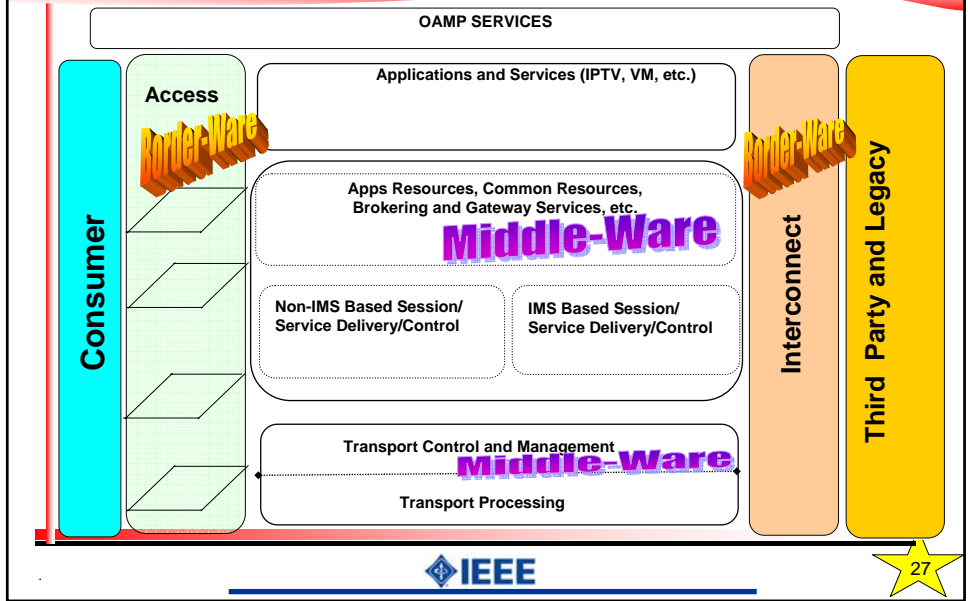
# Multi-Service Forum (MSF) (<http://www.msforum.org/>)

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Developed World's FIRST Implementable, Verifiable, and Interoperable Physical Realization Architecture (MSF R4) for IMS-Based IPTV



# MSF Rel.4 Architecture Template

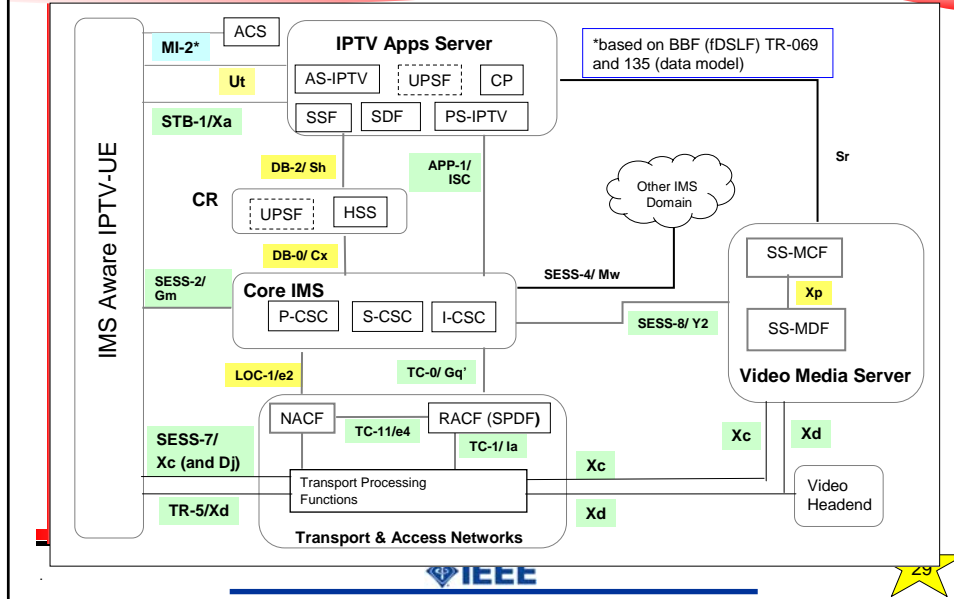


# High-Level Description of IPTV Functions

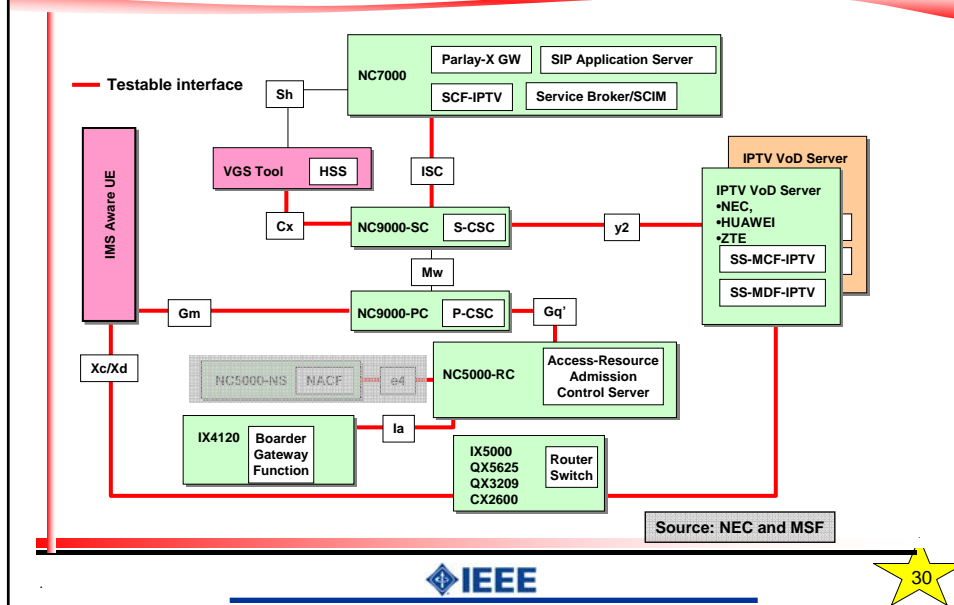
- **Program Guide**
  - Provides Program Guides to the User Devices (Endpoints); includes Profile-based Access and Rights Management
- **Media Delivery**
  - Provides Media Content to User Devices (Endpoints)
- **Media Delivery Control**
  - Processes Media Delivery Control requests
- **Multicast Control Point**
  - Processes Multicast (join/leave) Requests
- **IPTV Service Control**
  - Resolves logical content reference into a real reference to a reserved media server that will deliver the content
  - Identifies media servers based on knowledge or discovery of terminal location, server location and network topology
  - Requests the allocation and release of media server resources
- **IMS Core is Utilized to**
  - Request the allocation and release of network resources between terminal and media server
  - Provide admission control based on authorities established by IPTV applications
- **IPTV Profile**
  - Maintain and Delivers Customer and Service Profiles

*It is assumed that the IPTV User Agent with Appropriate Adapter already Exists in or Added to the Consumer Domain*

## MSF's IMS Based IPTV Service Implementation



## nPVR Configuration in GMI 2008



## IPTV Implementation Challenges

- Identity, Security, and Simplification
  - Access (CAS) and Rights (DRM and Copyright) Management
  - May need to Enable 3<sup>rd</sup> party Security Solution
  - May consider offering Different Level of Protection (based on Content, Situation, etc.)
- Quality of Service and Experience
- Scalability of Services
- Interoperability and Blending of services
- Revenue (Billing) and Performance Management



... a report from a real-life  
**Implementation & Interoperability event (GMI08) ...**  
**World's FIRST IMS-IPTV Interop**

Source: [http://www.msforum.org/interoperability/02-MGS81044-MFS\\_Whitepaper.pdf](http://www.msforum.org/interoperability/02-MGS81044-MFS_Whitepaper.pdf)

## IMS-Based IPTV Interop. during GMI08

- Covers a variety (linear/broadcast **TV**, **VoD/CoD**, and **nPVR**) of IMS base IPTV testing and Interop scenarios
- IMS based **IPTV** test demonstrates the following
  - session initiation and bandwidth reservation capabilities of IMS
  - program guide and service control capability by “SSF and Apps-Server” (modules within IPTV Apps Server)
  - high quality video transmission capability between IMS-IPTV-UE and MDF (a part of **VMS**) or head ends

## IMS-Based IPTV Interop. during GMI08 (... /2)

- The test scenario includes both M1 and M2 variants (i.e. the mechanism by which the **RTSP** channel and the associated media channel is negotiated)
- ATIS IIF-based IPTV **conformance** tests that focused on key IIF standards covering authentication and initialization of IPTV Terminal Function (ITF) and validation of **QoS** metrics as outlined in ATIS specifications
- **All of these tests were Conducted at the Verizon (Waltham, MA) site**

## IMS-Based IPTV Service Implementation and Interop. during GMI08

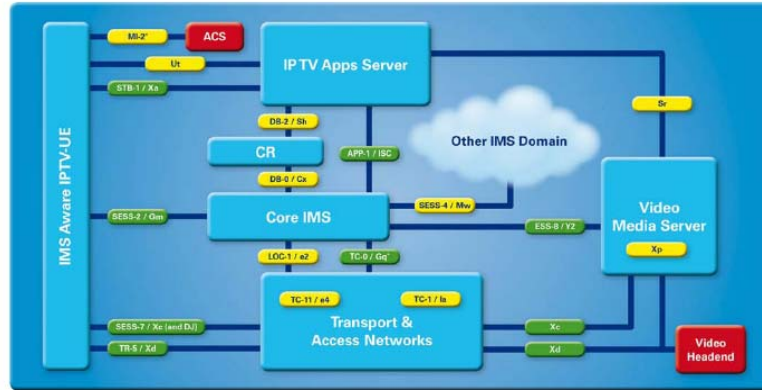


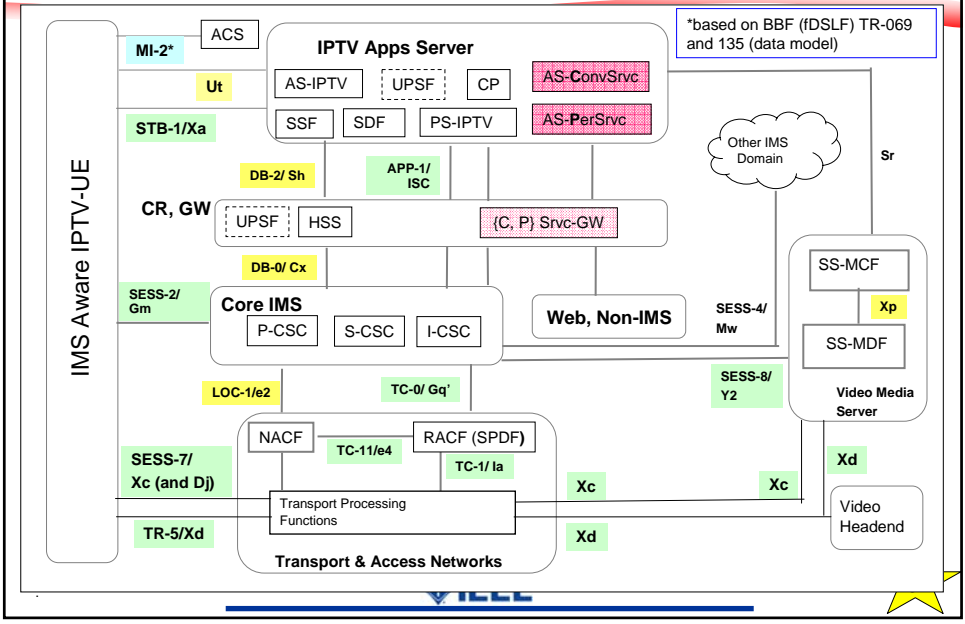
Figure 7 The IAs for this test scenario are shown in green.

Source: [http://www.msforum.org/interoperability/02-MGS81044-MFS\\_Whitepaper.pdf](http://www.msforum.org/interoperability/02-MGS81044-MFS_Whitepaper.pdf)

## Ongoing Work Areas of MSF SWG

Services Work Area (SWA)	High-Level Description	Context
SWA-1	Blended/Converged IPTV Services (MM Services <i>Anytime</i> and <i>Anywhere</i> to <i>Any Device</i> )	IMS
SWA-2	Priority and Emergency Services (Emergency Alerts, GETS, SCIP, etc.)	All
SWA-3	QoS over NG-CI (voice and MM services)	Any
SWA-4	Personalized Converged Services (e.g., Caller ID on TV)	IMS
SWA-5	Multimedia Services Continuity ( <u>F</u> ixed- <u>M</u> obile voice/ <u>D</u> ata/ <u>V</u> ideo <u>C</u> onvergence)	Any
SWA-6	Location- and Presence-Based Services ( <i>Targeted</i> Ads, Session Requests, etc.)	All

# Highlights of IPTV Arch. Enhancement



## ETSI/TISPAN

([http://www.etsi.org/plugtests/IMS3\\_IPTV1/IMS\\_IPTV.htm](http://www.etsi.org/plugtests/IMS3_IPTV1/IMS_IPTV.htm))

# ETSI TISPAN IMS-IPTV Architecture

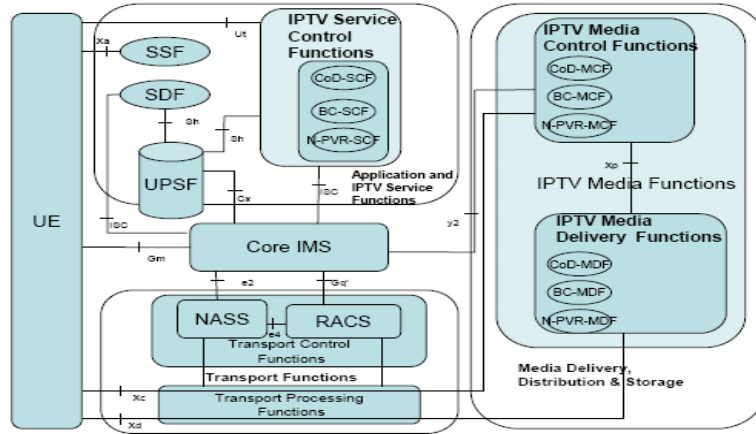
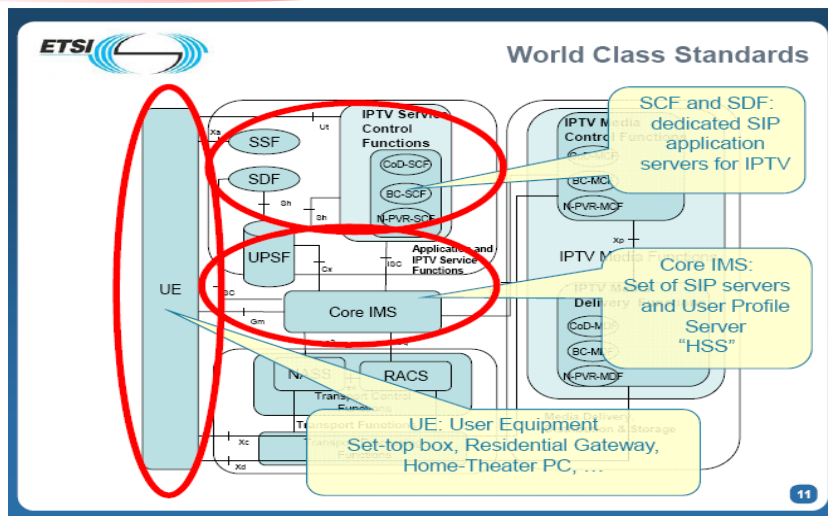
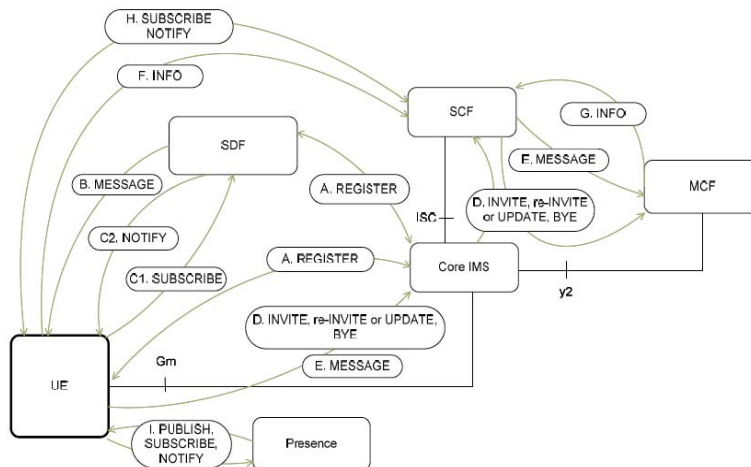


Figure 2: Functional architecture for IPTV services

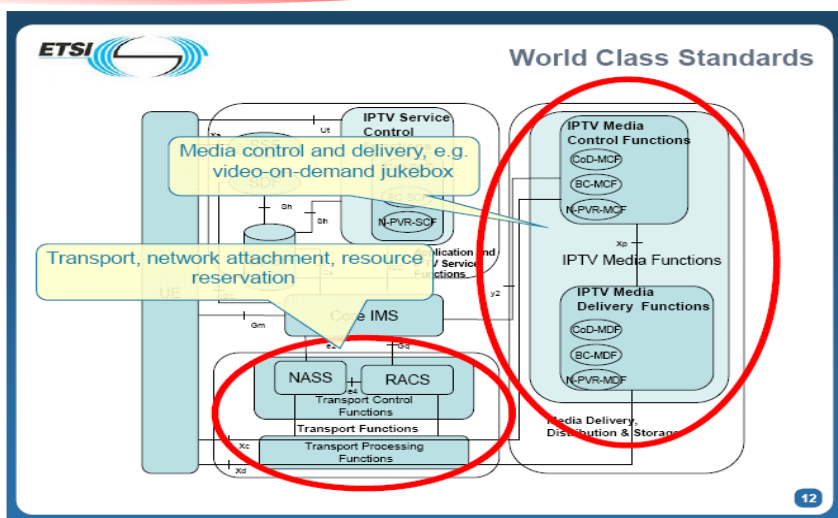
# ETSI TISPAN IMS-IPTV Functional Components



## SIP-based Control of IMS-IPTV Session



## ETSI TISPAN IMS-IPTV Functional Components

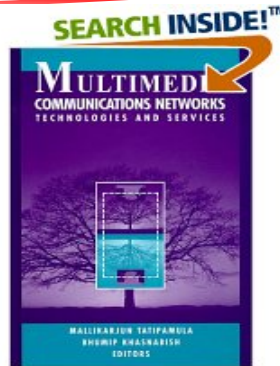
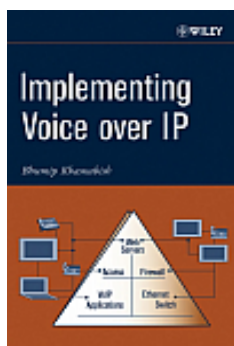


## ETSI/TISPAN IMS IPTV Plugtest



[http://www.etsi.org/plugtests/IMS3\\_IPTV1/IMS\\_IPTV.htm](http://www.etsi.org/plugtests/IMS3_IPTV1/IMS_IPTV.htm)

## A Few Useful Books



[1] Chapter 2 & Appendix-C of "*Implementing Voice over IP*," by Bhumip Khasnabish, Published by Wiley-IEEE, 2003, ISBN 0471216666, 9780471216667, 208 pages.

[2] Chapter 3, 4, and 6 of "*Multimedia Communications Networks: Technologies and Services*," Edited by by Mallikarjun Tatipamula, and Bhumip Khasnabish, Artech House, 1998, ISBN 0890069360, 9780890069363, 631 pages.

# Thanks for Your Attention and Participation!



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