IPTV Standards Perspective

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Introduction
  • What is IPTV?
Current Status
  • Relations to NGN and IMS
IPTV Services Delivery Chain
  • Roles, Functions, Objectives
Standards Map
Conclusion
  • Main Challenges
What is IPTV?

Definition
Scope
What is IPTV?

- IPTV is a (set of) provider to consumer Service(s) including their business and operational aspects.
- IPTV minimal scope is the secure delivery of streamed visual and audio content over a managed IP network to a consumer for display on a TV.
- IPTV is a part of the whole N-play (voice, video, data, wireless, ...).
- IPTV is to cross a chain of networks and domains (e.g. content providers, service providers, core networks, access networks, and the home networks).
The Status

Relations to NGN and IMS
The Status in Brief

- End-to-end Solutions are being implemented, trialed, and deployed
- The solutions are based on a combination of standard and proprietary technologies
- Existing standards don’t cover all IPTV needs; when in existence, multiple standards could “compete” for meeting certain requirements
- Standardization bodies and industry forums are eager to take on the IPTV charter
IPTV Industry Current Consensus

- Use existing technologies whenever it makes sense
- Don’t duplicate work, instead coordinate the numerous standardization efforts
- The TISPAN/ETSI Next Generation Network (NGN) architecture can be a good starting point
- Consider IP Multimedia System (IMS) for transport network and for interactive SIP-based services
IPTV in the IMS/NGN Environment

ITU-T

Based on
3GPP IMS

IP Connectivity
Access Network
and related functionality

IPTV specific

Composite Applications
(Web Services-based, etc.)

IP Multimedia
Component (Core IMS)
(SIP based)

IPTV Component
(Work just started)

Data
Base

Network Attachment
Functionality
NASS

Resource and Admission
Control Functionality
RACS

Service
Stratus

Transport
Stratus

Core Transport
Network

Service Provider
Transport Network

Content Provider
Transport Network

IP Home
Network

IP Access Transport
Network

HGW

IPTV
HNED

IP Home
Network
The IPTV Services Delivery Chain

Functions
Objectives
The commercial and technological relationships between the IPTV players in the chain are often different from the physical boundaries!
Content Provider Perspective

- Owner of Content
- Delivers contents as: Streams (including off-air), Files, Tapes
- Digital Rights Management (DRM) is a MUST
  - Not for “IPTV” only
Service Provider Perspective

- Provides IPTV Services
  - Generates IPTV Streams
  - Ingests and protects IPTV content (DRM)
  - Exposes service portals
  - Manages the services

- Supports Different Commercial Models
  - Free
  - Subscription
  - Pay-per-view

- Responsible for Customer Management
  - Customer Relationship Management (CRM)
  - Billing
  - Customer Profiles
  - Customer Identity, Service
Typical Services in the IPTV Context

- Entertainment
  - Broadcast TV (+ with Trick Modes), PPV, VOD, Interactive TV (polling, ...)
- Regulatory Information
  - Emergency, closed capturing, ...
- Advertising
- Service Information
  - Program Guide, Parental Control, Notifications, ...
- Hybrid Services (i.e. out-of-band Content Delivery)
- 3rd Party Content Services
- Interactive Communications (IM, Voice, Video,)
- Games, Pictures, Etc.
Service Creation and Delivery Challenges

- Cost Reduction ->
  - Services are independent from the physical infrastructure
- Rapid Services Creation ->
  - Easy 3rd party integration
- Smooth transition from the existing solutions ->
  - Translation Functions
    - In home gateways
    - As a stand-alone application
Standard Web Services Interfaces

The Required Interfaces

Applications (Web Services-based, etc.)

IP Multimedia Component (Core IMS) (SIP based)

IPTV Component (Work just started)

Data Base

Network Attachment Functionality NASS

Resource and Admission Control Functionality RACS

IP Home Network

HGW

IPTV HNED

Core Transport Network

Service Provider Transport Network

Content Provider Transport Network

Joint ITU-T Workshop and IMTC Forum 2006 “H.323, SIP: is H.325 next?”
San Diego, 9-11 May 2006
Standard Web Services Interfaces

The Required Interfaces

Applications (Web Services-based, etc.)

Data Base

IP Multimedia Component (Core IMS) (SIP based)

ETSI, Parlay, and 3GPP Parlay X 2.0

Published Mar 2005

- Call/Conference Control
- Notifications
- Short Messaging
- Payment/Account
- Address List
- Management
- Presence, etc.

PacketCable for QoS and Policy

Issued Dec 2005

http://packetcable.com/specifications/multimedia.html

Next Generation Operation Support Systems (NGOSS) / TeleManagement Forum (TM) Forum Order Handling, Service Configuration, etc.
ETSI, Parlay, and 3GPP jointly defined the public Parlay X 2.0 (Third Party Call, Call Notification, Short Messaging, Payment, Account Management, Audio Call, Multimedia Conference, Address List Management, Presence, etc.)

PacketCable Multimedia Web Service Interface
http://packetcable.com/specifications/multimedia.html
- Issued on December 21, 2005
- Defines Web Services Interface between a generic Application Server (AS) and a Multimedia Application Manager (AM) for requesting network resources (QoS and others)
Web Services for Application Management and Interactions

- Next Generation Operation Support Systems (NGOSS) / TeleManagement (TM) Forum
  - Order Handling, Service Configuration, etc.
- Organization for the Advancement of Structured Information Standards (OASIS)
  - Web Services Distributed Management (WSDM) - Model for managing distributed services
  - WSDM Management Using Web Services (WSDM-MUWS)
  - Universal Description, Discovery, and Integration (UDDI) - a method for publishing and discovering network-based software components in a Service-Oriented Architecture (SOA)
  - Etc.
CSF from Microsoft
Connected Services Framework

- A Service Delivery Platform (SDP)
  - .NET serves as SLEE and SCE
- 3rd Party Interfaces
  - World Wide Web Consortium (3WC) Web Services compliant
  - SLEE and SCE independent
- Standard Interfaces Implemented and Demonstrated
  - Parlay-X for Billing
  - NGOSS for Order Handling
  - IMS to follow
Network Provider Perspective

- **Function**
  - Delivers IP streams from Service Provider to Consumer (Multicast and Unicast)

- **Transport**
  - Fixed (DSL, Fibre, Cable)
  - Mobile

- **Responsible for Control & Quality of service**
  - IPTV is to use a common infrastructure shared with other applications in terms of transport, QoS, etc. (e.g. IMS)
End User / Consumer Perspective

- Wants to select and consume content and
  - Is willing to pay bills
- IPTV content is not terminated in a TV box; data needs to be shared and distributed across devices and users ->
  - Easy to use Digital Rights Management (DRM) is needed and is a positive thing!
- “Set-top box” Functionality
  - Government regulations around consumer choices are expected
  - The functionality can be in any home equipment
- Choice of Delivery Networks
  - Providers of different types: telecoms, cables, satellite, and Internet
  - Even multiple Network Providers in parallel
- “Network Neutrality”
  - Multiple “Service Providers” over a common network
  - Open “Service”/”Content” publishing and discovery
MPEG: Origin in TV and Video, Moving to IPTV
A DRM candidate: MPEG-21 “Multimedia Framework”

- Purposely does NOT define: key management, encryption algorithms, certification infrastructures, etc.
- Defines a structured (hierarchal) Data Model: Digital Item Declaration (DID)
- Allows for various inclusive identification schemas: Digital Item Identification (DII)
TR-069 Remote Management Protocol
- Access technology neutral
- Bi-directional SOAP/HTTP-based messaging
- Bootstrap communication and discover device capabilities
- Ability to set/get configuration information, diagnostics, status and performance info
- SW/firmware version management
- DSLF wants to push TR-069 for other access technologies, such as fibre

TR-098 QoS

Etc.
Home Network and Equipment

Content Provider
- Content

Service Provider
- Stream
- Transact

Network Provider
- Deliver
- Control

Consumer
- Decode
- View

DLNA
Digital Living Network Alliance

CEA
Consumer Electronics Association

Joint ITU-T Workshop and IMTC Forum 2006 “H.323, SIP: is H.325 next?”
San Diego, 9-11 May 2006
Digital Living Network Alliance (DLNA)

- [http://www.dlna.org](http://www.dlna.org)
- Established by the Consumer Electronics Association (CEA)
- Origin in networking, now embracing IPTV
- Specifications
  - “Home Networked Device Interoperability Guidelines” Version 1.5
  - UPnP for Device Discovery & Control and Media Management
Digital Video Broadcasting (DVB/ETSI)

- Origin in TV and Video, Moving to IPTV
  - [http://www.dvb.org/](http://www.dvb.org/)
- The TV over IP-based networks effort launched Nov 2000
  - V.1 has been completed
  - More TV broadcast than Internet in spirit
- In the next version plans to align with
  - the DLNA Home Network architecture
  - IIF/ATIS
Wider Focus Standards Embracing IPTV
The IPTV Interoperability Forum/ Alliance for Telecommunications Industry Solutions (IIF/ATIS)
- [http://www.atis.org/IIF/](http://www.atis.org/IIF/)
- Established June 2005
- Provider-to-consumer oriented architecture

ITU-T IPTV Focus Group formed Apr 13th 2006 to coordinate the IPTV global standardization efforts

Strong push from Korea, China, and Japan
- Korea: Telecommunications Technology Association (TTA)
- China Communication Standards Association (CCSA)
- Japan: Association of Radio Industries and Businesses (ARIB)

IETF candidates are IGMP, SIP, RTP, RTSP, ...
To Conclude...

The Main Challenges
To Conclude:
The Main Challenges

- Bridge between Providers and Home Network objectives and technologies
  - Home Network Gateway for management, QoS, etc.
  - End-to-end formats and protocols for TV applications

- Bridge DRM (Digital Rights Management) Technologies
  - Address both Secure Access and Data Replication Protection (e.g. content owner protection)
  - Lay out a graduated approach to allow using existing solutions by pluggable HW and downloadable SW

- Coordinate Web Services activities in terms of
  - Harmonizing and/or translating data models
  - Laying out interfaces (Management, Control, QoS, etc.)

  — **ITU-T can be very helpful in promoting the definition of the IMS Web Services interfaces !!!**