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Overview of ITU IPTV standards – the key for the successful development of IPTV

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ITU-T's Work on IPTV

- ITU-T has been spearheading the standardization in IPTV
- Focus Group on IPTV (2006-2007)
 - Responding to market demands for standard
 - First set of draft on Architecture, QoS, Security, End-Systems and Multimedia Application
- IPTV Global Standardization Initiative (GSI) (2008-)
 - Building on the work of Focus Group, Coordinating all ITU-T's IPTV related activities
 - Comprising ITU-T Recommendations approved by six Study Groups (SGs 9,11, 12,13,16,17)
 - Every two to three months



Standardized IPTV means

- Open infrastructure
- Lower cost
- Wider market
- Wider content availability
- Better Quality of Service & Quality of Experience
- Harmonized security
- Increased revenues from ads
- Focus on innovation and new services



IPTV at **ITU**

- 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".
- Three IPTV Architecture Models (Y.1910):
 - Non-NGN IPTV
 - NGN without IMS IPTV
 - NGN with IMS IPTV
- Enables a progressive migration
- Promotes competition and innovation



IPTV Value Chain

ITU-T IPTV standards cover all IPTV value chain

End-to-end solution



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Characteristics of ITU-T IPTV

- End-to-End Solution
- Not to "reinvent the wheels" Use existing standards as much as possible
- Practical approach for faster deployment and for meeting industry demands
- Close collaboration with key IPTV ecosystem players:
 - Other SDOs
 - Broadcasters
 - CE manufacturers
- Conformance and Interop testing events
- Truly interoperable global standard



ITU-T Liaisons on IPTV

ITU-T IPTV is working with many SDOs: ensuring interoperability and quality of standards



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Status



Current Status

- "Basic IPTV Service" Recommendations are ready
 - TV services, VoD & interactivity
- Advanced features actively discussed
 - Audience measurement
 - Digital signage
 - 3D
 - Internet-sourced contents
 - Service over multiple devices
 - Widgets
- Conformance and Interoperability
 - Agenda of interoperability events (2010, 2011, ...)
 - IPTV conformance and interoperability tested
 - Conformance specifications ready, more to come
 - Implementation Guidelines ongoing work



Overview of ITU-T Recommendations for IPTV



H.622.1: Req & Arch for IPTV Home networks



H.750: Metadata for IPTV Services		H.721: IPTV Terminal (Basic)		
H.770 : IPTV Service discovery		[H.76 [′]	1: Ginga-NCL
H.740: Application Event Handling		[H.762	2: LIME
H.763.1: Cascading style sheets for IPTV services			5	H.264: video

Architecture, requirements, network

Y.2007: NGN Capability Set 2

Y.Sup 5: IPTV Service use cases

Y.Sup 7: NGN Release 2 Scope

Y.1910: IPTV Functional Architecture

Y.1901: IPTV Service Requirements

Q.3010: Authentication protocol

Quality of Experience

H.701: Content Error-Recovery

G.1080: IPTV QoE

- G.1081: Performance Monitoring
- G.1082: Improving robustness of IPTV performance

Security and Content Protection

X.1911: Req & arch for IPTV security



IPTV Services discussed in ITU-T

- Linear (Channel Service) Broadcast TV
- Video On Demand (VoD)
- Accessibility: captioning, descriptive audio
- Audio services
- Karaoke, gaming
- Public Services
 - Billboards, disaster alerts, traffic news, etc
- E-*
 - E-government
 - E-publishing (e-Books, Newspaper)
 - E-commerce (banking, etc.)
 - E-learning (distance learning)
 - E-health (telemedicine, tele-healthcare)
- Private and Community Broadcasting (sharing videos)
- Photo albums (sharing photos with your friends)
- TV yellow pages
- ... and much more



Some of the Standards



Y.1910: IPTV Architecture



H.770: IPTV Service Discovery

- General Framework for discovering and selecting service providers and services
- Allows user to enjoy various services and service providers easily
- Must-have for open, managed platform



H.770: IPTV Service Discovery (cont.)

Defines the basic semantics of service discovery elements

- Harmonized with DVB and ATIS
- Close liaison with ATIS-IIF
- Alignment of Syntax is still on-going



H.701: Error Recovery

A method to guarantee the quality of service

- Forward Error Correction (FEC) and Retransmission, two well-known methods, are covered.
 - Retransmission is a way in which to request lost packets to be retransmitted when a packet-loss is detected at the receiving end.
 - FEC is a way to send redundant data with the content so that the receiving side can retrieve information even when there is a packet loss.
- Harmonized with ETSI and IETF (COP3 and Raptor)

Defining Syntax and Configuration Process Committed to Connecting the World Defining t

H.721: Basic Terminal Model

- Defines Terminal supporting VoD and Linear TV
- Targeted at Embedded TV sets in the retail market as well as STB
- Managed network model (agnostic as to IMS) SIPaware HGW friendly
- Network attachment and Service Discovery compliant with H.770
- FEC for Error Recovery, compliant with H.701
- Supports Portal service (MAFR such as H.761 and H.762)
- Implemented and deployed



ITU-T H.721 IPTV Terminals

- Terminals based on ITU-T H.721 are available in the retail market
- Customer can buy a TV or PC at a shop, connect to network, and receive an IPTV service
- Conformance Tests ongoing to ensure conformance and interoperability



ITU-T H.721 connected IPTV





- Supports service discovery and IPTV portal (Interactive pages)
- requires no difficult configuration just plug and watch
- Supports H.770



H.761 Ginga-NCL for IPTV

- ITU-T H.761 (Ginga-NCL) is an adaptation of Ginga-NCL, the middleware standard for Brazilian digital TV broadcasting
- Syntactically based on XML and LUA (script language), which is used in games and widgets (e.g. Verizon)
- Similar implementation to W3C SMIL
- Often used as a glue language for other multimedia frameworks, such as HTML and H.762 (LIME).
- Good integration with Video streaming
- Can be used for mobile as well as fixed



H.762: LIME

- ITU-T H.762 LIME (Lightweight Interactive Multimedia Environment)
- Based on simple HTML and JavaScript
 - Just like very Simple Web designing
- Not a new "language" but a simple profile of HTML and Javascript for creating Interactive content
- Some specific features for IPTV APIs for VOD, Remote control, color buttons, focus control, etc.
- Suitable for any type of terminals, esp. resourcelimited ones like TV sets
- Mobile as well as Fixed
- Integration of Web technologies and Multimedia



H.740: Application Event Handling and Audience Measurement for IPTV

 "IPTV application event handling (H.740)" defines higher level concepts of audience measurement (AM) and includes the scenario of AM



ITU-T H.750 - Metadata for IPTV

- Metadata: Structured, encoded data that describe characteristics of information-bearing entities to aid in the identification, discovery, assessment, and management of the described entities
- H.750 Covers:
 - Discovery, Transport and Delivery of Metadata
 - IPTV Service and Content Metadata
 - User metadata
 - Metadata for Content Provisioning and Management
 - Rights and Security related Metadata for IPTV
 - Metadata for Public Interest Services
- Content Metadata based on TV-Anytime (ETSI TS 102 822-3) and is harmonized with ATIS-IIF and DVB Broadband Content Guide



Internet- Sourced Content

- Content servers are on the Internet; content is (selected) from the Internet
- IPTV-HE works as "gateway" into Managed NW
- Managed NW is independent of the Internet
- Terminals are protected from viruses and other dangers.
- No free ride on the NW



Adoption and deployment

- UK's DTG (Digital TV Group) has adopted ITU-T Y.1910 as its Connected TV Architecture
- ITU-T H.264 widely adopted and used as IPTV video content format
- ITU-T IPTV Recommendations implemented, sold in the open market & deployed over 4 million terminals (set-top boxes, TVs, PCs):
 - ITU-T H.721 (terminal device)
 - ITU-T H.701 (error recovery)
 - ITU-T H.762 (LIME interactive framework)
 - ITU-T H.770 (service discovery)
 - ITU-T H.750 (metadata)



And many more things ...



Interop Events



- Geneva, July 2010
- Singapore, September 2010
- Pune, India, December 2010
- Rio de Janeiro, Brazil, 18-22 July 2011
 - At Sofitel Copacabana Hotel
 - Hosted by Pontifical University of Rio de Janeiro (PUC-Rio) and the Brazilian Internet Steering Committee (CGI.br)
 - Testing: 18-20 July 2011
 - Showcasing: 21-22 July 2011 (open to the public)
 - Seminar on 22 July 2011
 "ITU-T Recommendations on IPTV and video distribution trends in Brazil"



Interop Events



 Companies like Cisco, Mitsubishi, NEC, NTT, OKI, Panasonic, Sumitomo, TVStorm

- Tested products conforming to ITU-T Recommendations
- Showcased their solutions
- Attracting numerous participants from many countries from Africa, Asia, Europe, and Americas
- The events called the attention of various international organizations – e.g. EBU, WHO, WIPO



Interop event for IPTV in Geneva









IPTV App challenge

 Open call: promote original and creative IPTV applications compliant to ITU's suite of IPTV standards



IPTV Application Challenge

- ITU-T H.761 (Ginga-NCL) and H.762 (LIME) platforms
- Criteria: Degree of innovation, level of engagement, ease of use, value to society
- Award ceremony and demo during ITU Telecom World event (Geneva, October 2011)
- Sponsorship opportunities
 - http://itu.int/en/ITU-T/challenges



Conclusion



Conclusions

- ITU IPTV Recommendations will encourage innovation, ensure interoperability and –ultimately– help players remain competitive
- They are enablers of innovation on broadband and Next Generation Networks
- ITU IPTV (e.g. H.721) are already implemented and deployed
 - Turnkey solutions
- Interoperability events in 2010, more in 2011 and beyond
- Open architecture of ITU IPTV standards are truly global & open standards that can be deployed across a wide range of applications



International Telecommunication Union