



**International Telecommunication Union**

# **Middleware, Applications, and Content Platforms for IPTV**

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# Topics

- o Introduction
- o What is Middleware, Application, Metadata?
- o Some of the Use cases
- o Some Standards from DTV and IP Worlds
- o Challenges for MACPf
- o Future directions



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# Introduction

- o Middleware, Application and Content Platforms (MACPf) are important and integral part of IPTV services because they provide the viewer with what is essential to IPTV, the viewing experience.



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## What is MACPf

- o the platform for middleware, applications, content formats that facilitates effective and interoperable use of an IPTV system for presenting and interacting with IPTV services.
- o This typically includes:
  1. Content Presentation and Execution Engines
  2. Content Navigation Applications such as EPG
  3. Metadata and Content Discovery Mechanisms
  4. Audio and Video coding



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# What is Middleware?

- is systems software that resides between the applications and the underlying operating systems, network protocol stacks, and hardware.
- provides a common reusable accessibility for functionality and patterns that formerly were placed directly in applications, but in actuality are application independent and need not be developed separately for each new applications



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# (Multimedia) Application

- An application which involves the presentation of multimedia information to the user. (ITU-T, T.174 (96), 3.1.12)
- A Multimedia Application is an application that requests the handling of two or more representation media (information types) simultaneously, which constitute a common information space. Examples are cooperative document editing, long distance meetings, remote surveillance, medical document remote analysis and tele-training. [0055] (ITU-T, F.700 (00), 1.2.6; F.701 (00), 1.3)



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# Metadata

- descriptive data associated with a content asset package or file.
- may vary in depth from merely identifying the content package title or information to populate an EPG to providing a complete index of different scenes in a movie or providing business rules detailing how the content package may be displayed, copied, or sold.
- Separate uses for metadata have originated from the studios, distribution networks (Cable, Satellite), down to the CPE (STBs, PVRs).

(ITU-T, J.98 (03), 3.1)



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## Some Use Cases

- o Program and Content Guides  
(EPG, ECG, Interactive Program Guides, Advanced Content Guide)
- o Personalized TV
- o PVR-based enhanced viewing (Time-shifting, Digest, high-light viewing, etc.)
- o Integration of Web content and TV Content
- o Coordination with other IP services
- o Emergency Alert Service
- o Enhanced Services





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## Some Standards from DTV worlds

- o **MHP**: defined by DVB for terrestrial, cable, and satellite environments; Java based
- o **DTV Application Software Environment (DASE)**: defined by ATSC for North American terrestrial transmission.
- o **OpenCable Application Platform (OCAP)**: defined by CableLabs for North American cable transmission. Java based
- o **Advanced Common Application Platform (ACAP)**: defined by ATSC for the harmonization between OCAP and DASE standards.
- o **STD-B23/STD-B24**: defined by the Association of Radio Industries and Businesses (ARIB) for Japanese digital television receivers. XML and browser-based



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# Some Standards from IP World

- o HTML (XHTML, CHTML, ...)
- o DOM
- o CSS
- o HTTP
- o JavaScript, ECMAScript
- o XML
- o XSL
- o AJAX



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## Ideal

- [Standards] defines a software layer (middleware) that allows programming content and applications to run on a so-called common receiver.
- Interactive and enhanced applications need access to common receiver features in a platform-independent manner.
- This environment provides enhanced and interactive content creators the specifications necessary to ensure that their applications and data will run uniformly on all brands and models of receivers.
- Manufacturers will thus be able to choose hardware platforms and operating systems for receivers, but provide the commonality necessary to support applications made by many content creators. [Quoted from ATSC DASE]



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# Challenges

- How to harmonize all the different standards and technologies already in the market
- How to give the competitive edge in the market
- How to provide best user experience
- How to present solicit and attract viewers
- How to ensure evolution to even more attractive services



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# Importance of Metadata

- Metadata is important as the “glue” between applications
- Different applications can take in the same metadata and present in various ways
- Different applications can take in various metadata (in the same format) to present in different ways
- Metadata is a good, if not the best, way to attract the viewer, and to discover services
- Metadata can bridge between different platforms, different content formats



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# Key Issues

- o Interoperability is of utmost importance
- o Extensibility should be taken into account

# Future Directions

- Agreement on the simplest scenarios
- Definition of Common Interface
- Mechanism of how to declare, discover, and to adapt to different platforms
- Mechanism to ensure possible and future extensions and modifications
- Interoperability and affinity with other aspects of IPTV



o Thank you very much for your attention!