

Open IPTV Forum Release 1 Specification for End-to-End IPTV Solutions

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Outline

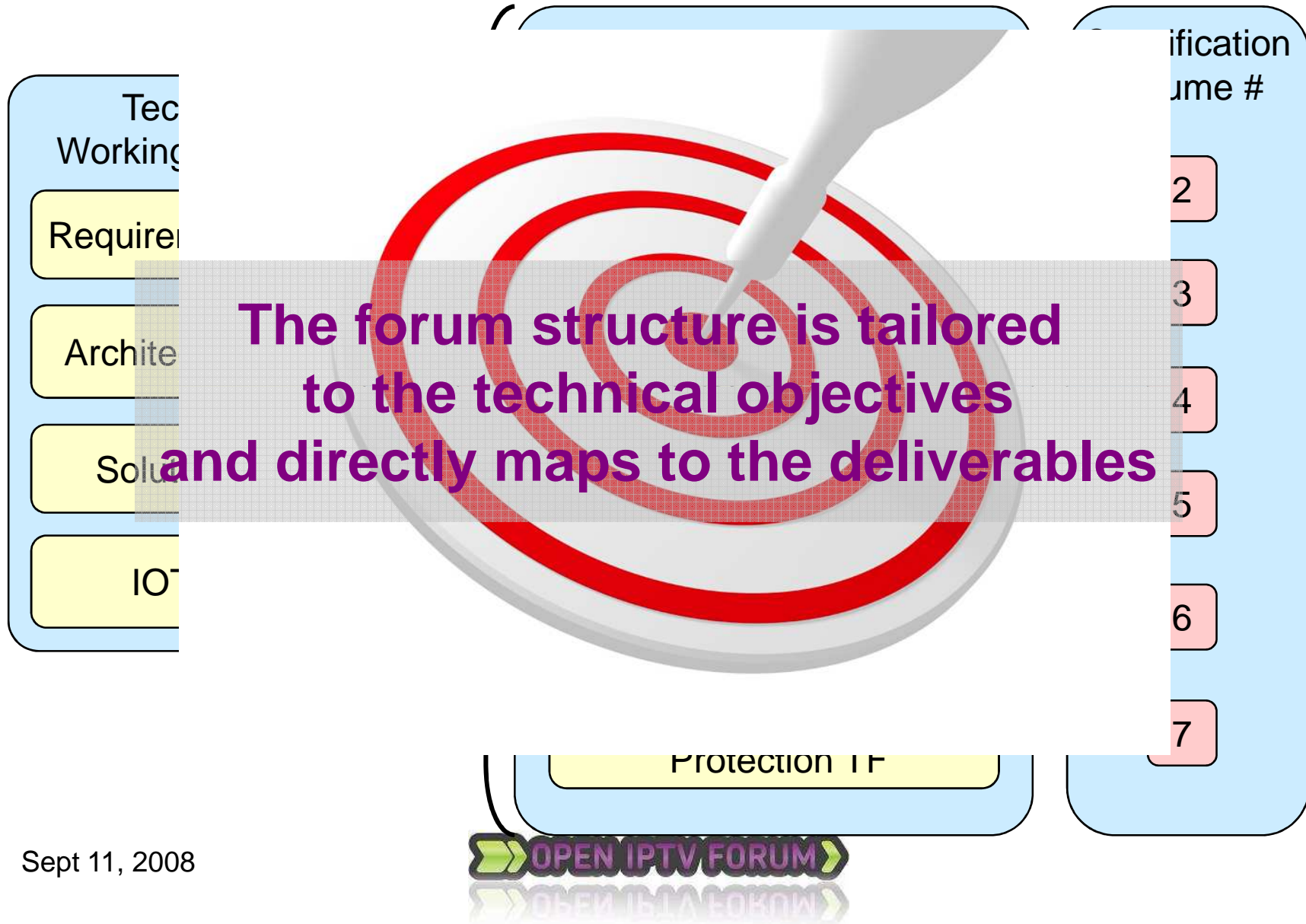
- Forum structure and deliverables
- Specifications structure: the volumes
- Detailed analysis of the volumes content
- Conclusions

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Introduction

Development of the Specification



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Introduction

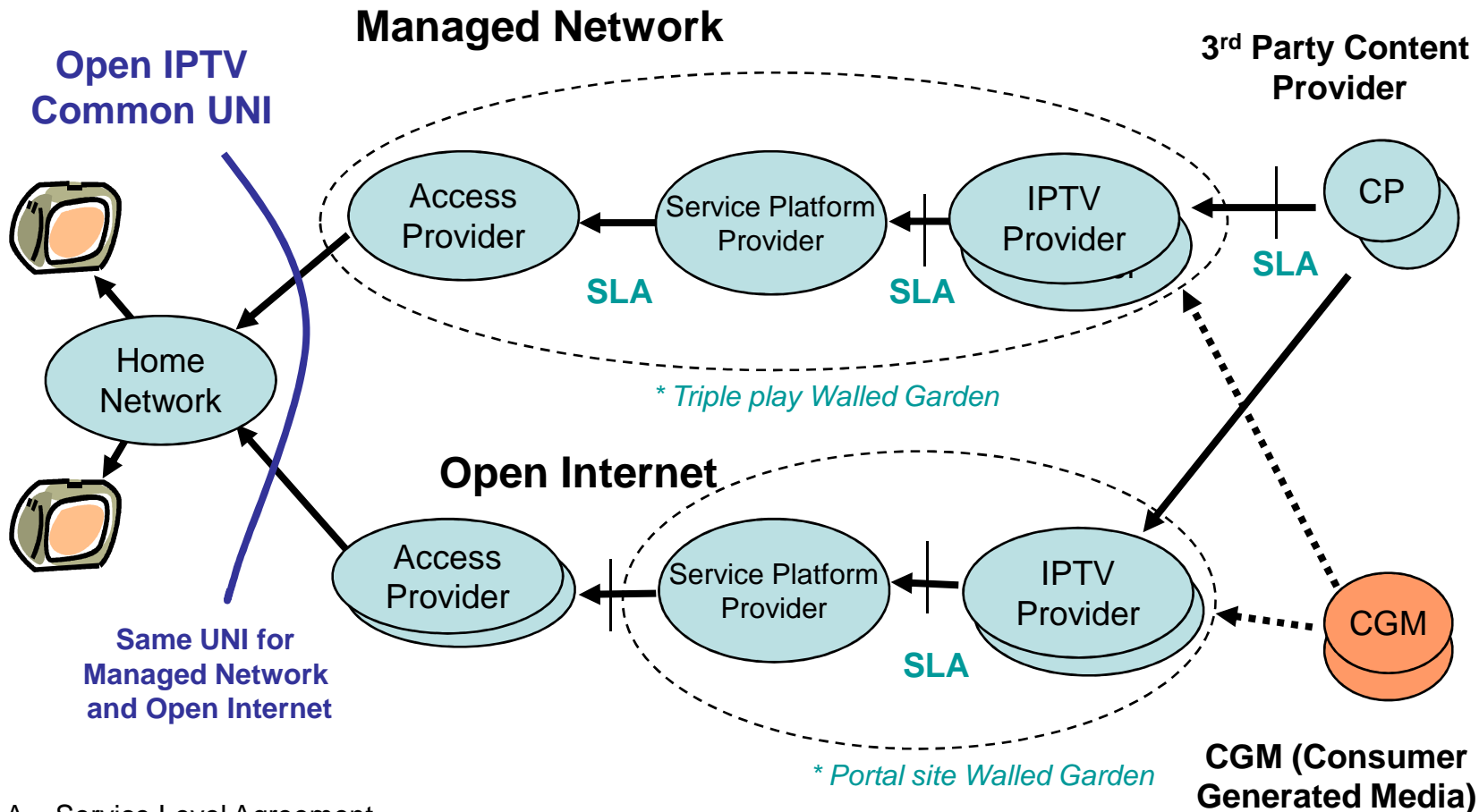
Summary Structure of Specification Document

- Volume 1 – Overview - Architecture
- Volume 2 - Media Formats
- Volume 3 - Content Metadata
- Volume 4 - Protocols
- Volume 5 - Declarative Application Environment
- Volume 6 - Procedural Application Environment
- Volume 7 - Content and Service Protection

Let's look at the outline contents of each volume ...

Volume 1 - Overview

What the Specifications Cover – A Simplified View



SLA = Service Level Agreement

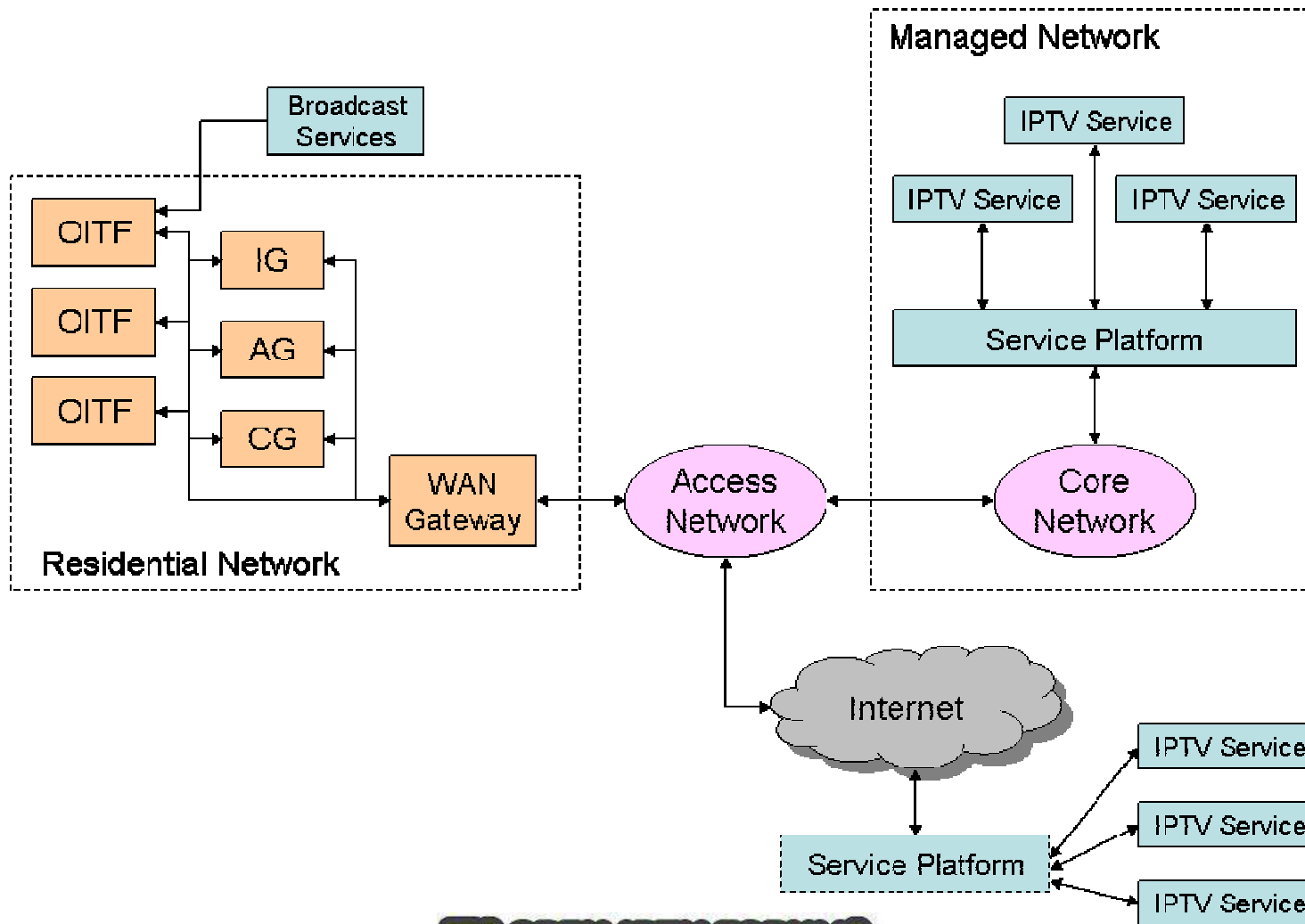
UNI = User Network Interface

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Volume 1 - Overview

What the Specifications Cover – A Simplified View

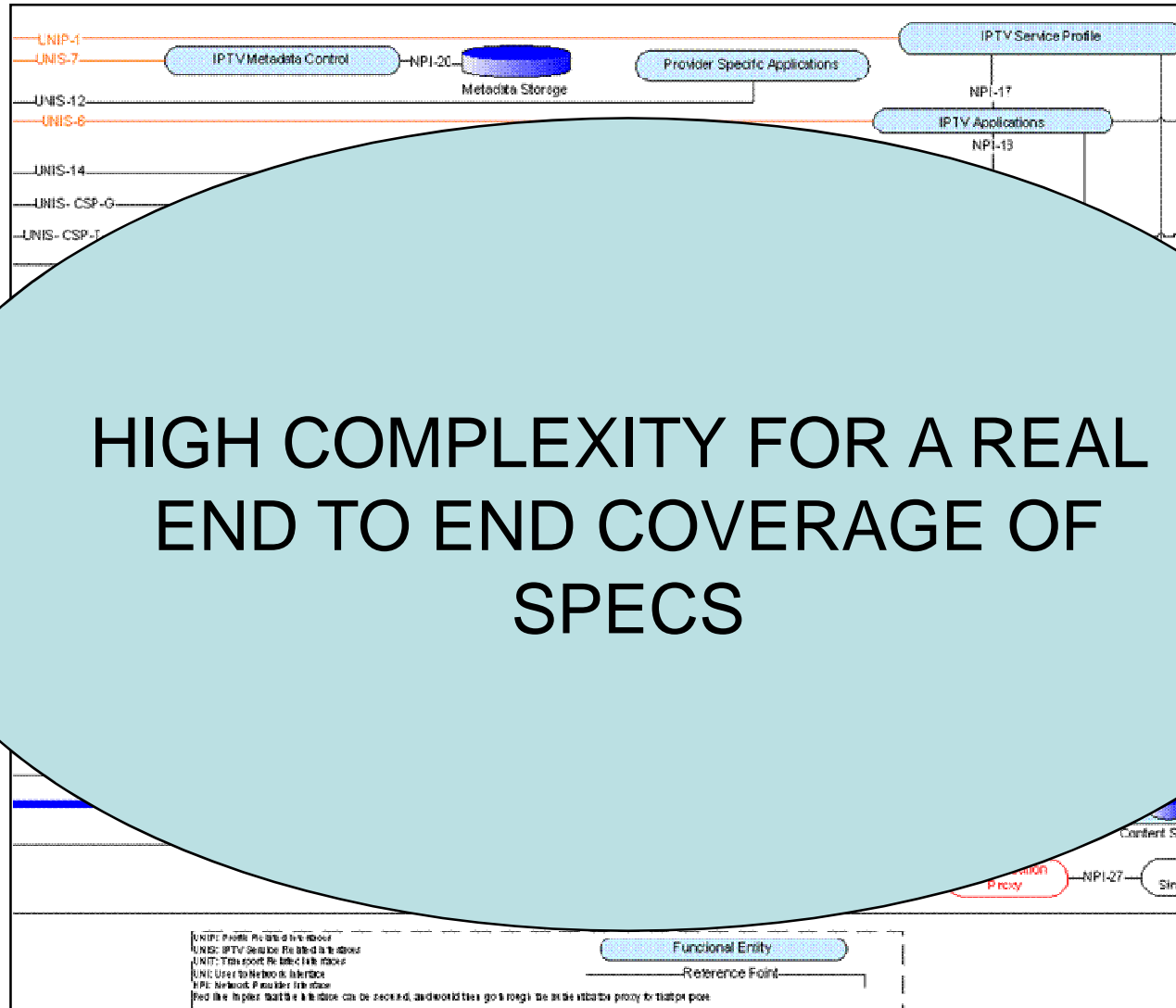


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Volume 1 - Overview

The Basis for the Workgroup Activities



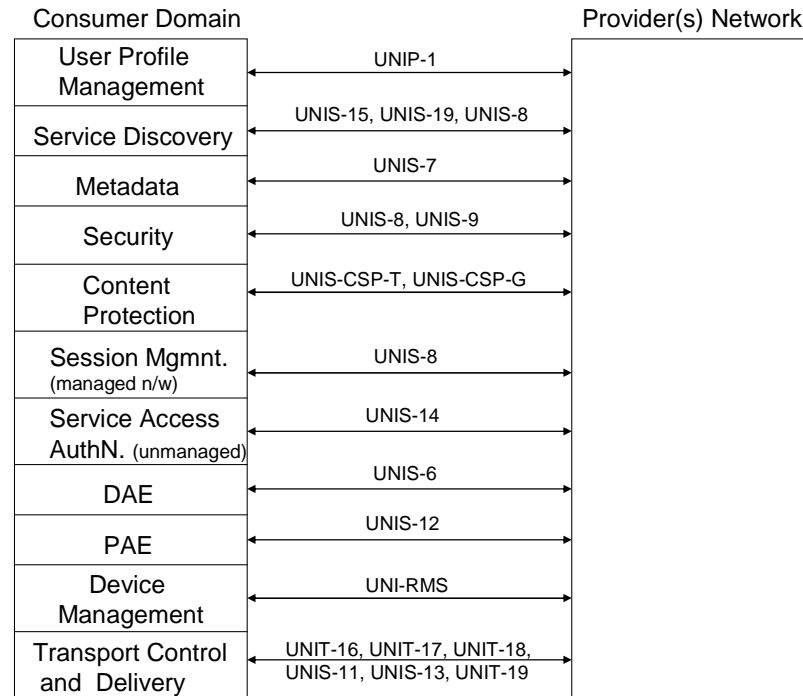
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Volume 1 - Overview

Mapping Functional Entities to UNI Ref Points

The specified interfaces enable the two model support and connect different functional blocks that can be combined to support the needed functionalities



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Volume 2 - Media Formats (1)

- Purpose:
 - Defines the set of media formats available for the implementation of compliant services and devices.
 - Specification also defines the usage of these media formats

- The set of media formats comprises:
 - Audio-video media formats (combinations of the formats below)
 - Systems layer formats
 - Video codecs and their usage
 - Subtitle formats and their usage
 - Teletext formats and their usage
 - Audio codecs and their usage
 - Graphics and still image codecs and formats

Volume 2 - Media Formats (2)

Optional codecs and usage of features are available

- Device capabilities are specified
- For optimal service provision, it should be possible to recognise media format specific capabilities of terminals
- The method of signaling terminal capabilities is specified in Volume 5 (Declarative Application Environment)

Media formats are specified at the content (A/V) layers and at the systems layer.

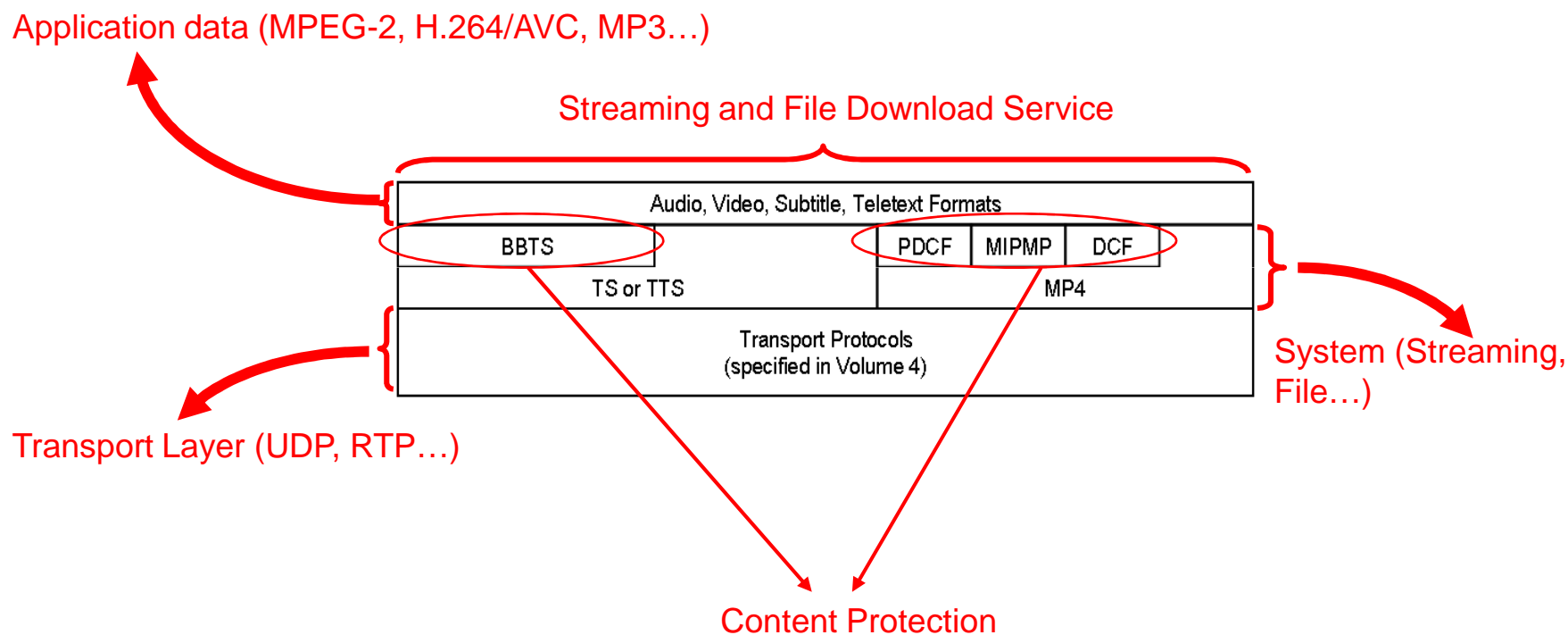
- Transport protocols below the systems layer are specified in Volume 4 (Protocols)

This volume specifies formats for the A/V content provided by IPTV services

- But not for the broadcast channel input of hybrid devices

Volume 2 - Audio-Video Media and Transport Formats (3)

- Media Formats Stack



Volume 3 - Content Metadata

- Metadata content is defined as data associated with the Content Guide, including:
 - Linear TV metadata
 - CoD metadata
 - Interactive Services metadata
 - Stored content metadata
- Document contains Metadata definition and extended schema for:
 - Service Discovery and Selection (SD&S)
 - Metadata allows retrieval of info to select LinearTV metadata (i.e Multicast address, Channel name, Package, ...) or URI to select BCG information (For Linear TV or Content on Demand)
 - Data defined in the DVB specification: "Transport of MPEG 2 TS Based DVB Services over IP Based Networks" .
 - Broadband Content Guide (BCG)
 - Data related to the description of LinearTV events and/or CoD
 - As defined in the DVB specifications "Carriage of BCG information over Internet Protocol"
- Also contains Metadata control and delivery functions

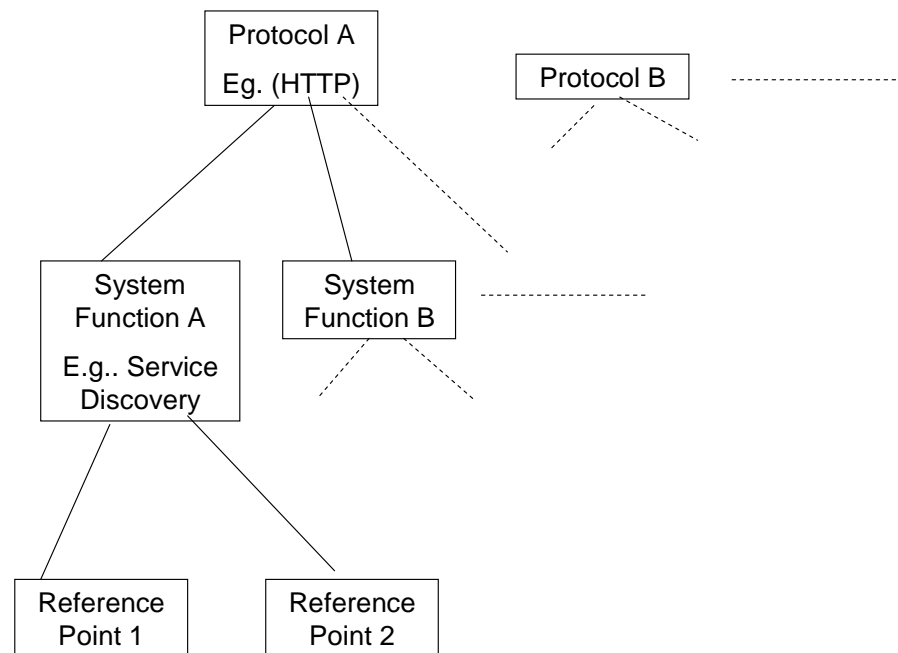
Volume 4 – Protocols (1)

- Specifies the protocols over the following reference point interfaces
 - UNI interfaces, between the network or service provider domains and the consumer domain
 - HNI interfaces, between the functional entities in the consumer network domain
 - NPI interfaces, between the functional entities in the network and service provider domains
 - Interfaces to external systems, including DLNA networks in the consumer domain

Volume 4 – Protocols (2)

- Protocols specified are:

- HTTP
- SIP/SDP
- RTSP
- IGMP and Multicast protocols
- RTP/RTCP
- UPnP
- DLNA
- DHCP
- UDP



The sections have a common section and subsection structure, similar to that used for the IMS IPTV Protocols specification developed in TISPAN

Volume 5 – Declarative Application Environment (1)

- Part of the functionality of the Open IPTV Terminal Function (OITF) defined in the Functional Architecture specification
- Declarative language based environment (browser) based on the CEA “Web-based Protocol Framework for Remote User Interface on UPnP Networks and the Internet (Web4CE)” (CEA-2014)
 - For presentation of the user interface
 - including scripting support for interaction with network server-side applications and access to the APIs of the other OITF functions.
- DAE Applications are associated collections of documents (typically JavaScript, CSS and HTML or SVG documents)
 - When loaded, an additional application object is accessible to the browser
 - Provides capabilities which exceed those of standard web pages

Volume 5 – Declarative Application Environment (2)

- DAE specification includes detailed consideration of the following:
 - Application Model
 - including Lifecycle, Signalling and Event Notifications
 - Formats
 - Including HTML, SVG, DOM access
 - APIs for various supported functionality
 - Download and Streaming CoD
 - Tuner Control and Scheduled Content
 - PVR Control and Media Playback
 - IMS interface
 - Metadata interface
 - Configuration and Settings
 - Managed Networks
 - Capabilities presented by the terminal (OITF) to DAE
 - Application and Service Security and User Authentication

Volume 6 - Procedural Application Environment (1)

- PAE is a local procedural language execution environment based on Java Connected Device Configuration (CDC) for IPTV Service Provider specific downloaded applications.
- Two deployment options:
 - In devices without a local UI, these applications can present a UI via the OITF's DAE
 - In devices with a local UI, these applications can present a UI directly

Volume 6 - Procedural Application Environment (2)

- The PAE is a multipurpose execution environment capable of supporting many IPTV-specific and general services.
- These capabilities include support of the following service provider specific applications:
 - Media Control:
 - Enables local interception of the media stream (media, control, CSP) for content add or insertion
 - Content Guide:
 - Discovery and description of available services and content.
 - IPTV Service Discovery:
 - Discovery of available service providers.
 - Discovery and description of available services and content.
 - Fully blended communication services:
 - Possibly requiring additional hardware to support advanced applications
 - PVR and content download

Volume 6 - Procedural Application Environment (3)

- In common with other GEM terminal specs such as OCAP, ACAP and Blu-ray, the PAE specification follows the structure of the “DVB Bluebook A108: Globally Executable MHP (GEM) Version 1.2.1”
- Specification includes:
 - High level architecture and positioning of the PAE in OITF
 - Supported transport protocols
 - Static and streaming media formats for the representation of images, sound, videos, colors and fonts
 - Application Model for Java applications for the PAE
 - Features of the Java platform
 - Security aspects of the platform
 - Graphics reference model
 - Aspects of System Integration

Volume 7 - Content and Service Protection

- Defined with the aim to combine well defined technology with business model flexibility and adaptation with existing deployments
- Specifies Content and Service Protection functionality, comprising:
 - Terminal-Centric Approach
 - Mappings from all relevant functions and interfaces in the Functional Architecture to specific sections of the Marlin specifications
 - Includes supported protected file formats
 - Includes encryption of MPEG Transport Streams
 - Gateway-Centric Approach
 - Elaborates on the Content and Service Protection Gateway functional entity and associated reference points

Conclusions

- The structure of the specifications is reflecting the forum organisation, that aims to optimise the results in terms of both timing and quality
- As needed requirements and architecture are defined before the specification of the individual technical features
- The architecture is defined in deep detail providing interfaces to support the different business models addressed
- The technical specifications are developed in parallel for all the architectural components
- This allows optimising timing and the technical value of the specs since problems are resolved in parallel in the different areas