



ENTHRONE Integrated Management Supervisor (EIMS)

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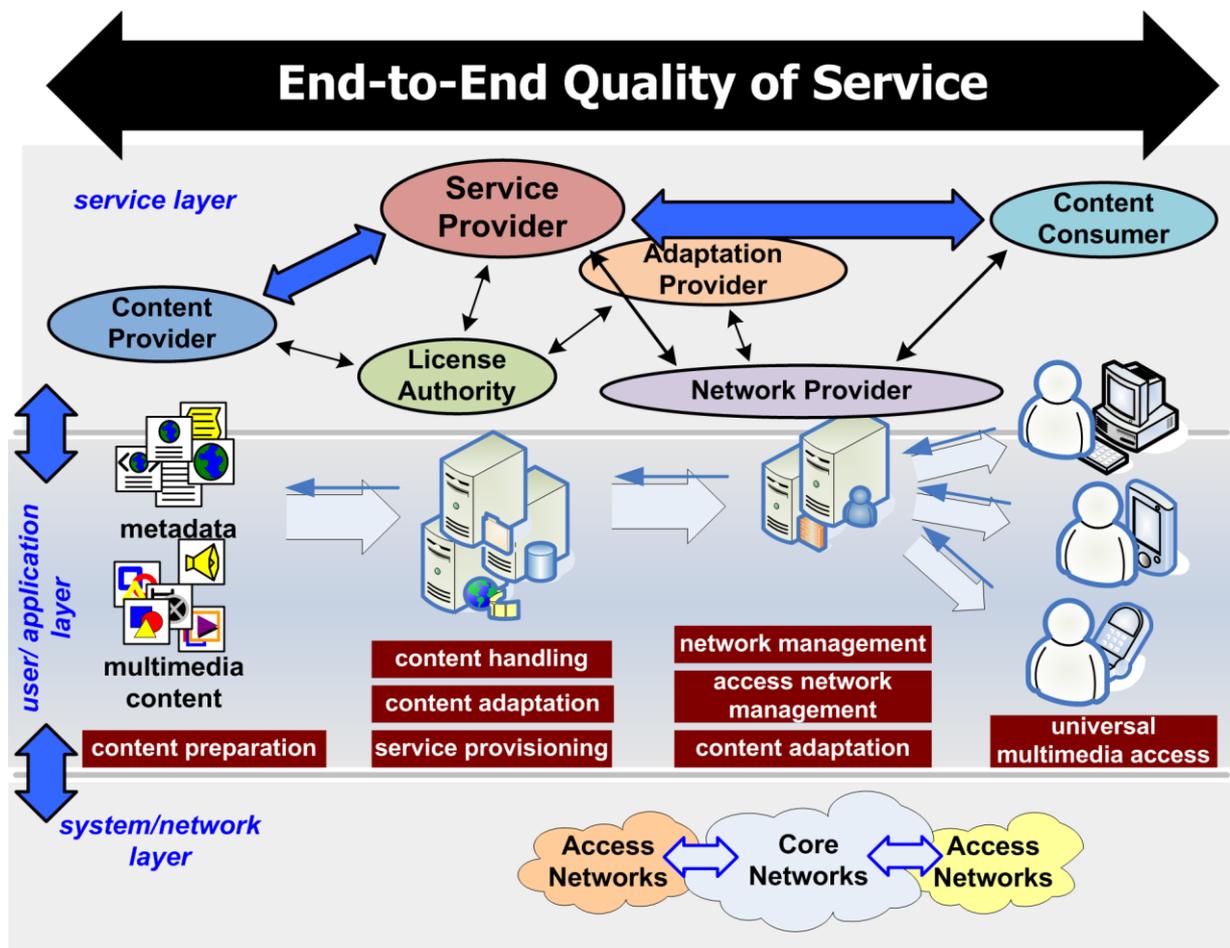
Outline

- Introduction and Overview
- ENTHRONE System Architecture
- ENTHRONE Integrated Management Supervisor (EIMS)
 - Architecture
 - EIMS Managers: Functionality
 - Big Picture
- Conclusions

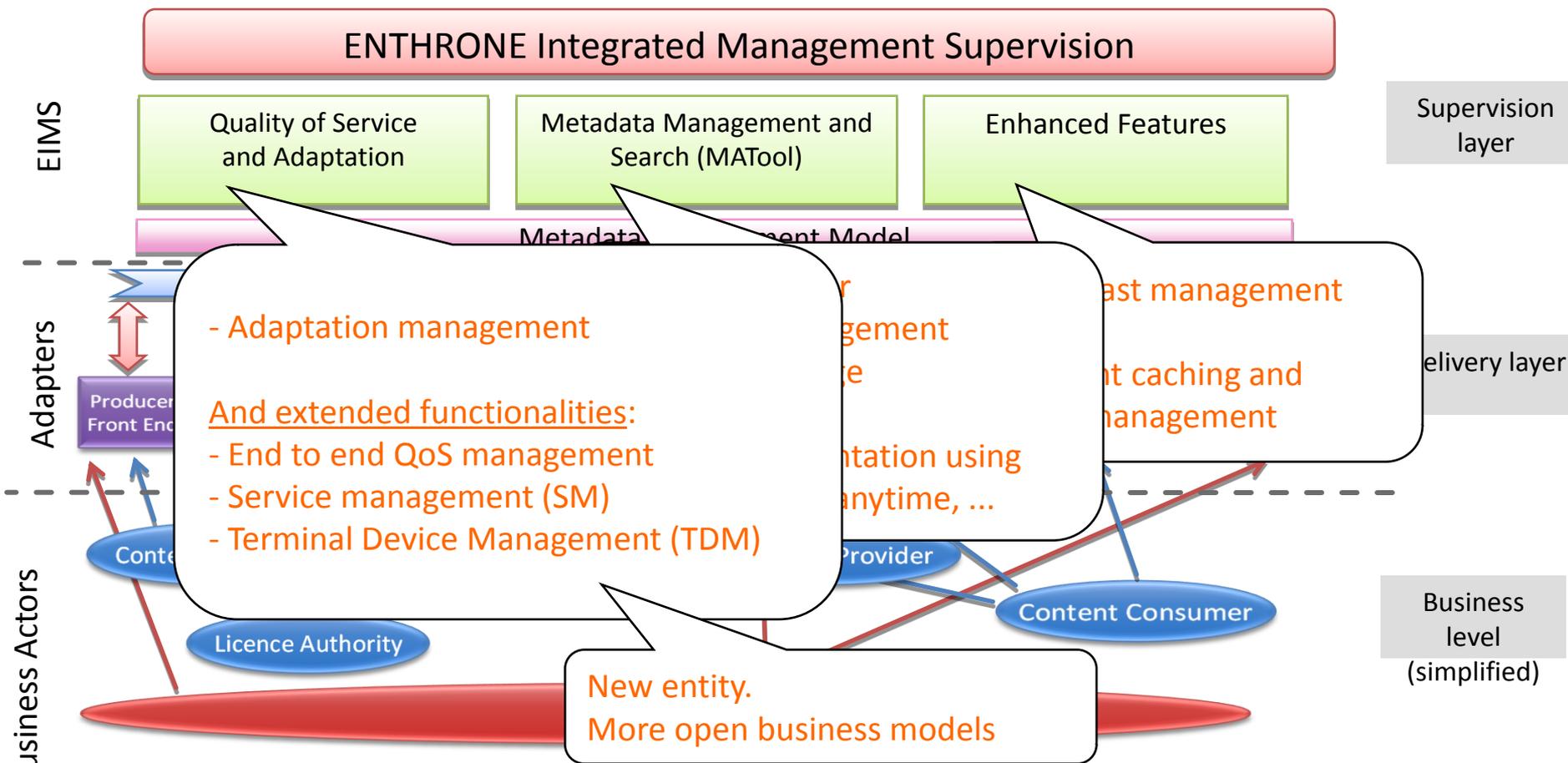
Project Objectives

- To further develop an MPEG-21 based QoS management architecture and solutions for cross-layer adaptation and transport of protected multimedia content over multi-domain heterogeneous network infrastructures to diverse terminals
 - Key elements of the project's activities
 - Research
 - Innovation
 - Standardization
 - New business models
- To demonstrate the ENTHRONE solution in a large-scale pilot, in preparation for bringing it to the market
 - Large scale end-to-end pilot able to demonstrate the capability of ENTHRONE to manage, in an integrated way, the whole chain of protected content handling, transport and delivery to user terminals across heterogeneous networks, while offering QoS-enabled services

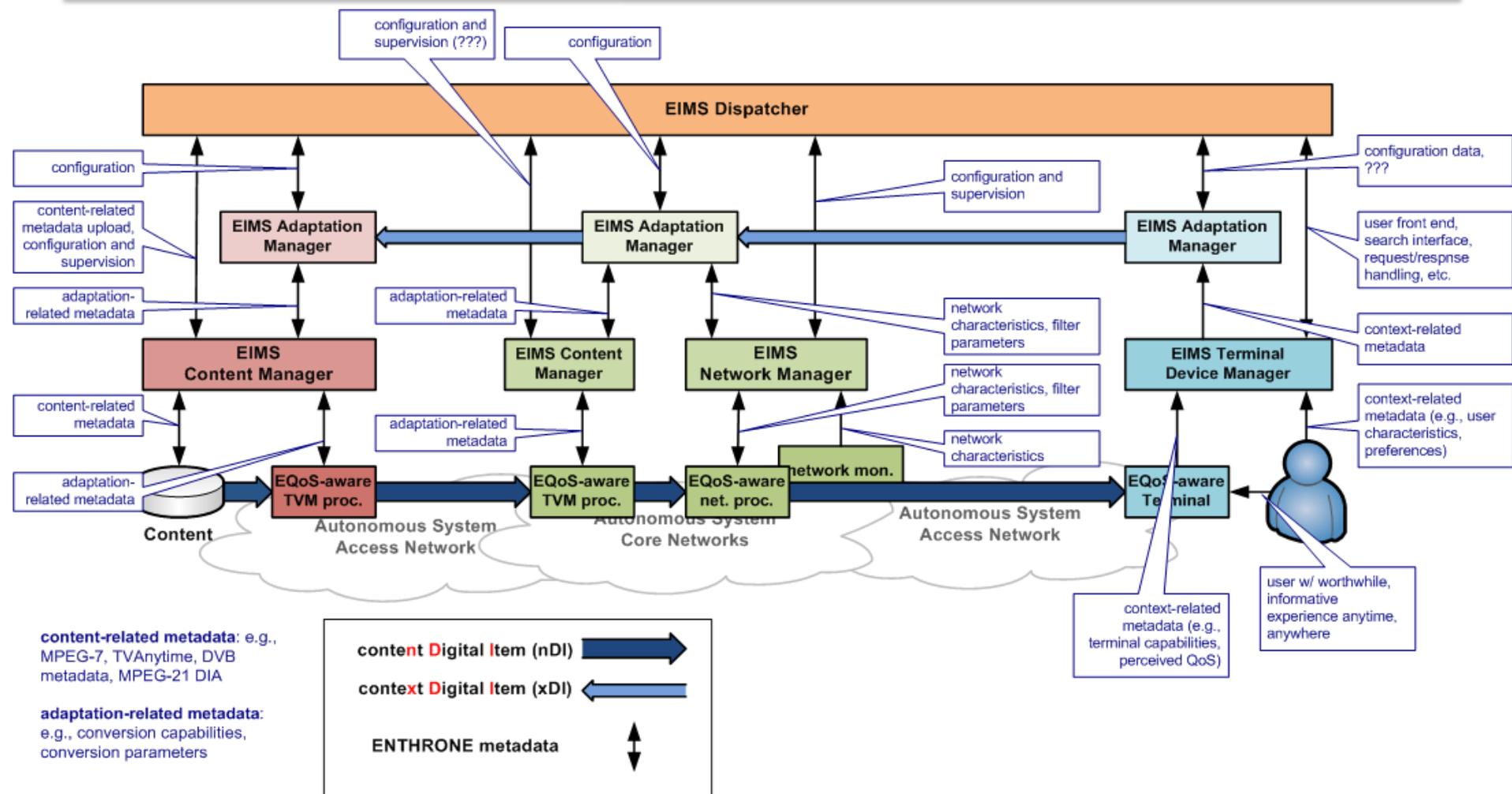
Project Overview



ENTHRONE System Architecture



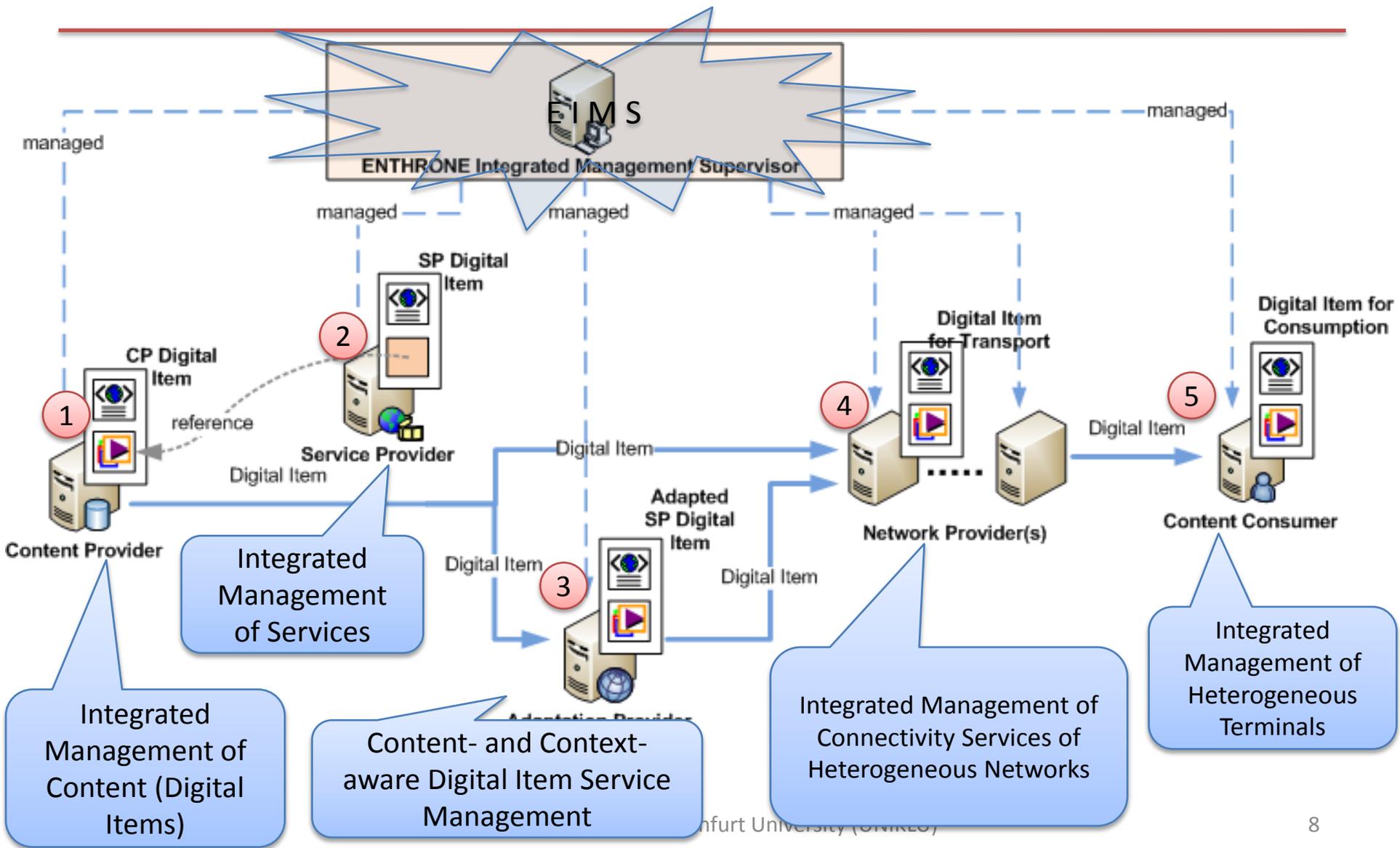
Project Overview – (Too) Detailed (?)



ENTHRONE Integrated Management Supervisor (EIMS)

- ENTHRONE Integrated Management Supervisor (EIMS)
 - Various subsystems (called Managers) with dedicated functionality interconnected via Web Services, e.g., EIMS **Adaptation Manager**
 - Add'l management subsystems for **multicasting**, **dynamic service management**, **caching** and **content distribution networks**
- **Metadata Management**
 - Automated **extraction**, **gathering**, and **generation of metadata** from real-time/offline audio-visual streams and manifold metadata sources
 - Metadata-assisted content **search**
 - Efficient approaches for **management**, **transport** and **processing** of content and context descriptive metadata
- **MPEG-21-based Cross-Layer Adaptation Decision-Taking**
 - Definition of a **Cross-Layer Adaptation Model**
 - Implementation of an interoperable **Cross-Layer Adaptation Decision-Taking Engine (XL-ADTE)**
 - **DRM support** for XL-ADTE (in terms of permissible adaptations)
- **Service Management and Monitoring**
 - MPEG-21 for **service level agreements** and MPEG-21 **Event Reporting** for Service Monitoring
 - **NQoS-to-PQoS mapping**
 - Support for **multicast-based services** and enabling QoS in access networks
- **Caching and Content Distribution Networks**
 - Integration of caching strategies in **dynamic multimedia Caching Nodes**
 - Support for **Content Distribution Network (CDN)** deployment and management

EIMS: Overview



EIMS Architecture

- Revised EIMS Architecture feat. **Adaptation Manager** and **Caching/CDN**, **Multicasting**, and **Dynamic Serv. Mgmt.**

ENTHRONE Integrated Management Supervisor

Quality of Service, Adaptation, and Service Management

EIMS End-to-End QoS Manager

EIMS Service Manager

EIMS Adaptation Manager

EIMS Terminal Device Manager

Metadata Management and Search (MATool)

EIMS Metadata Manager

EIMS Search Manager

Enhanced Features

EIMS Multicast Manager

EIMS Caching and CDN Manager

Interfaces

ENTHRONE Adapters

EIMS Managers: Overview

- EIMS **End-to-End QoS Manager** – E2EQoSMgr
 - Provisioning of the **best Digital Item configuration** (content, metadata, structure) towards the content consumer ...
 - ... by utilizing several information assets (mainly metadata) from all business actors along the delivery chain
 - Available **content variations** and description thereof
 - Characteristics of the available **Television and Multimedia (TVM) processors**
 - Capabilities and conditions of **networks** and **end-user terminals**
- EIMS **Adaptation Manager** – AdaptMgr
 - Provisioning of **adaptation decisions** according to **dynamically changing** context conditions (across service/network layers)
 - Cross-Layer Adaptation Decision-Taking Engine (XL-ADTE)
 - Steers exactly **one TVM** (in a possible chain of TVMs)

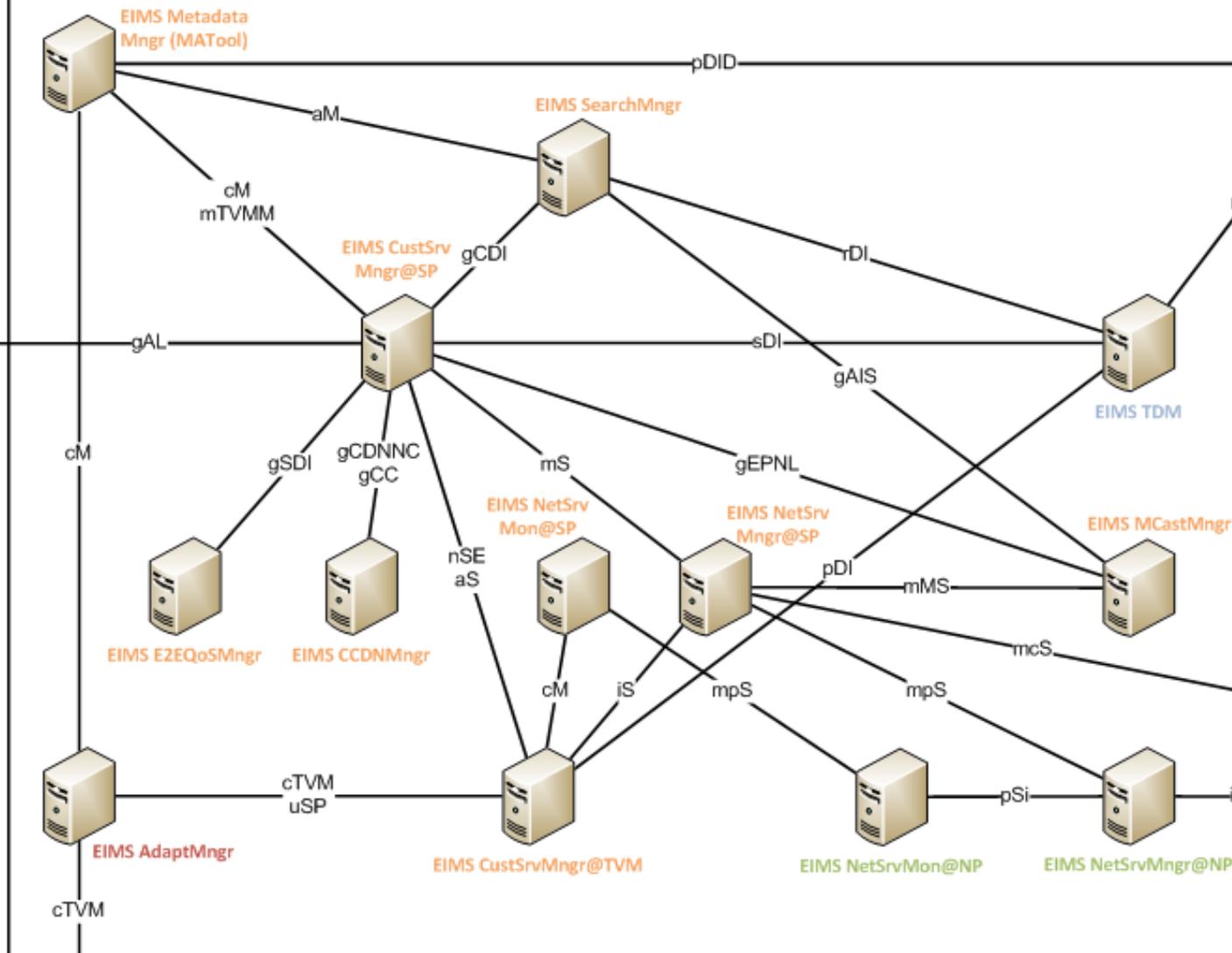
EIMS Managers: Overview (cont'd)

- EIMS **Caching and CDN Manager** – CCDNMngr
 - Provisioning of content (Digital Items) in a CDN including **ranking, placement, distribution**, etc
 - Definition of **Caching Policies** to define local cache provisioning parameters
- EIMS **Multicast Manager** – MCastMngr
 - Provisioning of **multicast communication services**
 - Multicast **overlay network**
 - Cross-Layer multicast agent to take advantage of **IP multicast** in the last core network domain (towards the content consumer)
- EIMS **Metadata Manager** – MetadataMngr
 - Central component (MATool) responsible for **metadata collection, aggregation, conversion**, etc.

EIMS Managers: Overview (cont'd)

- EIMS **Service Manager** – SrvMngr
 - Customer Service Manager (CustSrvMngr): **service logic**
 - Network Service Manager (NetSrvMngr): **network connectivity service**
 - Service Monitoring (ServMon): keep track of **end-to-end QoS level** of a particular service
- EIMS **Terminal Device Manager** – TDM
 - Management of **heterogeneous end-user devices**
 - Capturing the **capabilities** of the terminal
 - **PQoS probe** configuration and alarm handling
 - **License handling**
- EIMS **Search Manager** – SearchMngr
 - **Searching/Browsing** for Digital Items (see also DIBrowser)
 - Utilizing a **data model** specifically developed within ENTHRONE
 - Supports **high-/low-level features** associated to audio-visual content

ENTHRONE Integrated Management Supervisor (EIMS)



WP-4: TVMRF

WP-5: License Server

WP-7: DDIBrowser

WP-6: ANMngr

WP-6: NetMngr

Conclusions

- ENTHRONE Integrated Management Supervisor
 - Distributed (not centralized!!!)
 - Integrated end-to-end QoS management
 - Heterogeneous contents, networks, and terminals
 - Based on open standards (MPEG-7/-21)
- EIMS Managers
 - Subsystems with well-defined functionality and interfaces
 - Interconnected through Web Services
- Next steps
 - Pilot integration, demonstration
 - Evaluation and test \Rightarrow publications

Thank you for your attention

... questions, comments, etc. are welcome ...

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