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ENTHRONE

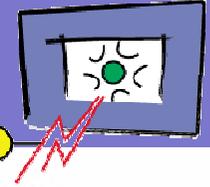


Breakthroughs for the Next Generation in Content ENTHRONE view

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Information Society
Technologies

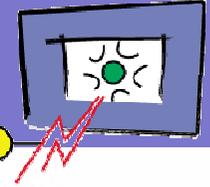


- **A compelling vision driving innovation**

- Creation of new Multimedia experiences and enhance freedom and control, creation and sharing of MM world for all users in the value chain
- Different networks and devices will speak to each other providing content. The future will lie on the heterogeneity of networks, an ecosystem of software including OSS, working in flexible ways with a diversity of devices.
- Multi-technology integration and Convergence of Broadcasting, Telecom and Consumer Electronics -> Home/Extended Home providing user centric media experience

=>The future of multimedia AV environment will be a living AV network

- Every user being able to connect anywhere, anytime, with access to adapted and high quality content and communication services, in a safe and accessible environment



- **Models for unique and living AV content**

- There is a need for content models taking into account integration and convergence at content level (integrated essence/media and metadata/description) in the complete AV content life-cycle, such as to have a living unique AV content;
- There is a need for content adaptation going further than intra-modality adaptation (ie transcoding or scalable content based adaptation), focusing on inter-modality, personalised, semantic and perception driven adaptation in order to provide real quality of experience for the user;
- There is a need for more intuitive content creation tools for the creation of content itself but also for the creation of associated descriptions (metadata) and the information for classification of content;

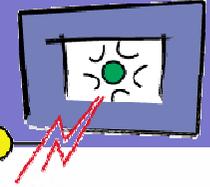
=> Solution

- Providing end-to-end service management at minimal cost;
- Ensuring the creation and management of convergence;
- Moving from product supply to solution provision.



ENTHRONE project proposes:

- an integrated management solution;
- able to support an end-to-end QoS architecture over heterogeneous networks;
- applied to a variety of audio-visual services;
- which are delivered at various user terminals.



- 28 partners from Europe, Israel and Korea representing all actors involved in the delivery chain of multimedia services

- content providers and broadcasters
- network operators
- manufacturers/suppliers for the whole chain of required systems and equipment
- research institutes and universities
- commercial partners

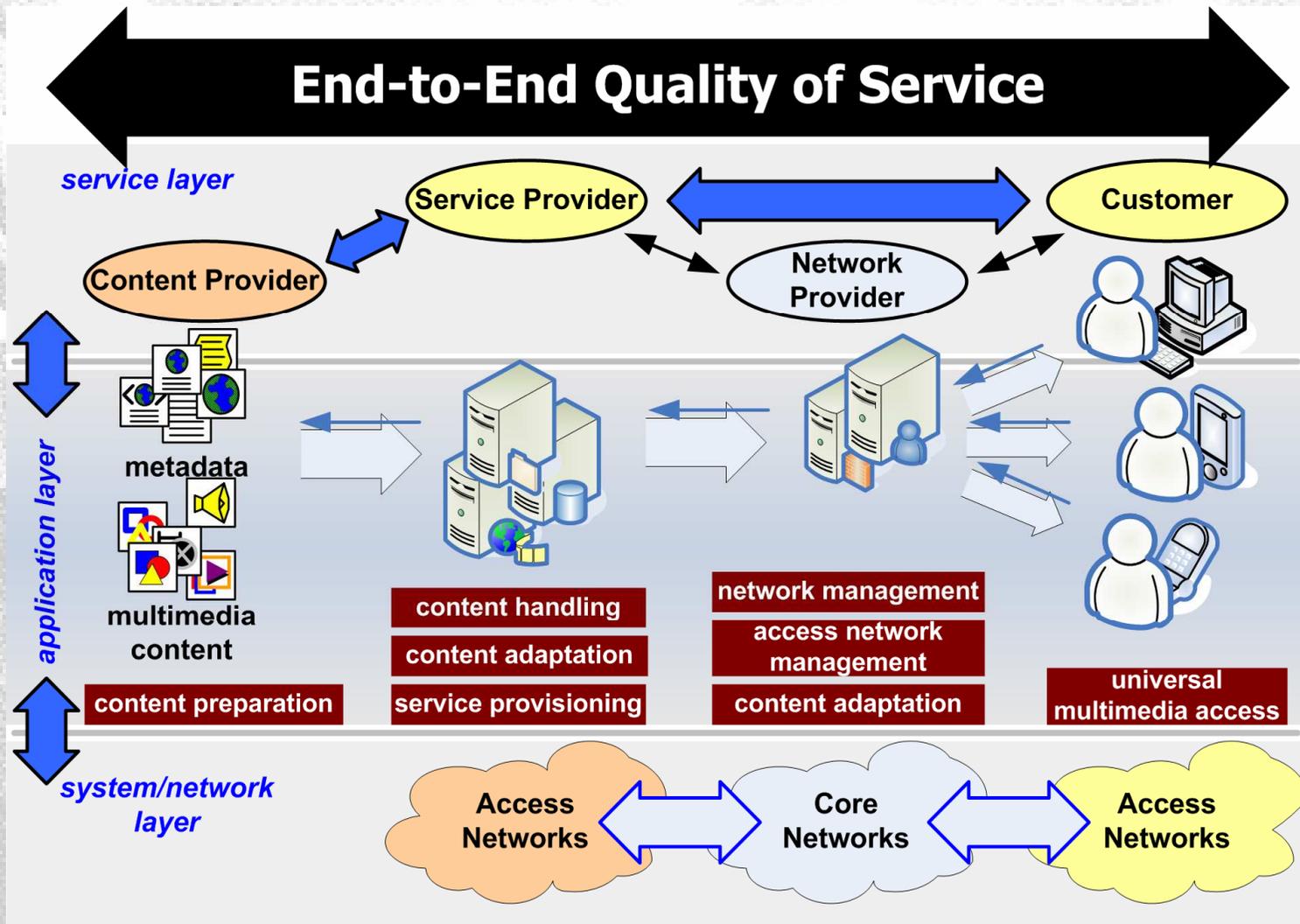


ENTHRONE project objectives



- ... to provide a **dynamic QoS-based MPEG-21 cross-layer media adaptation** in a policy-based management for the **end-to-end heterogeneous delivery chain**.
- ... to demonstrate the **ENTHRONE solution** in a **large-scale pilot**, in preparation for bringing it to the market.

ENTHRONE approach



ENTHRONE EIMS

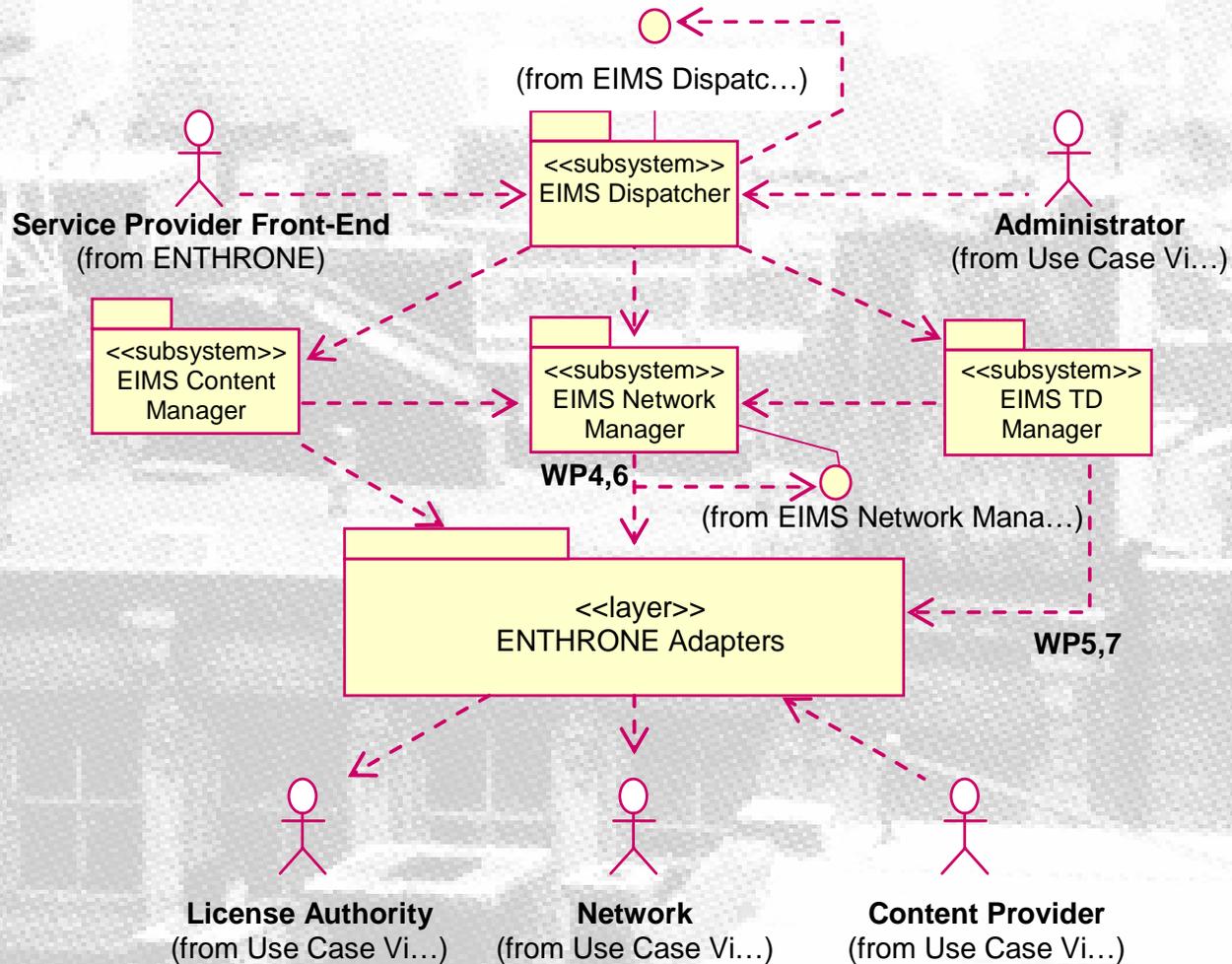
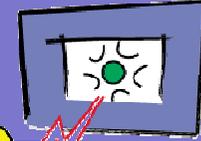


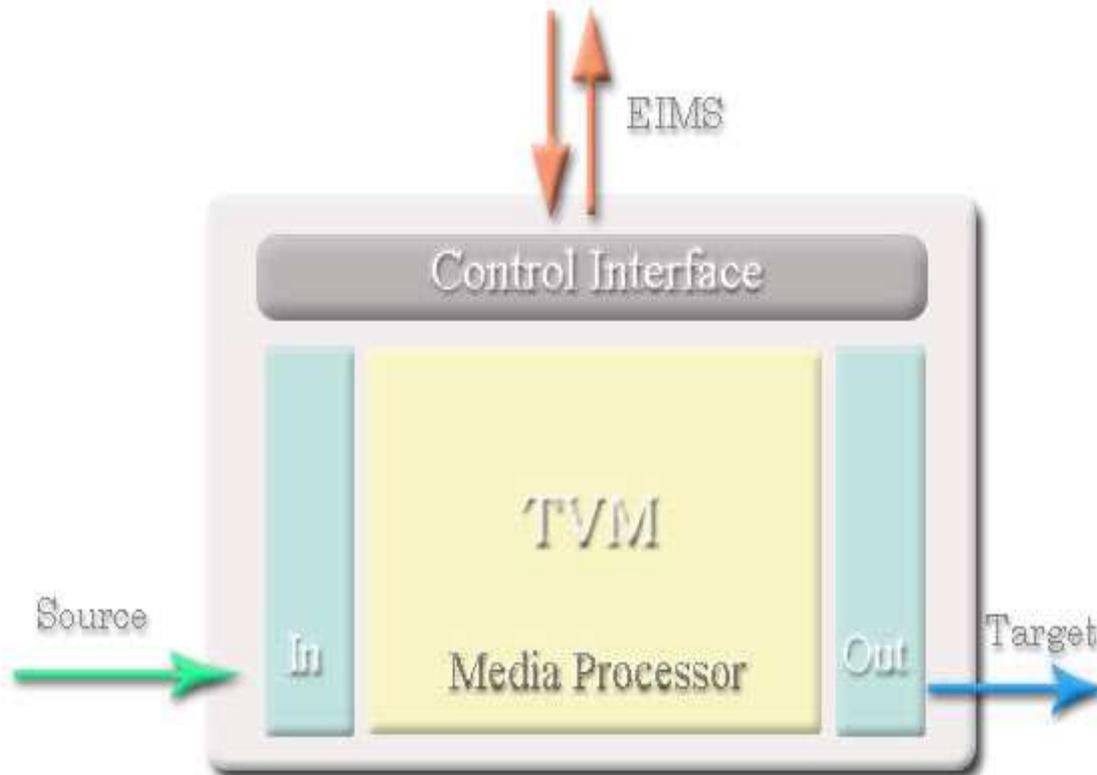
Figure 24. EIMS Subsystems

End-to-End QoS through Integrated Management of Content, Networks and Terminals

ENTHRONE : TVMs



The TVM is a processing module responsible for a stream treatment action inside the distribution process, like content generation, adaptation, metadata manipulation, etc.



- Enhanced scalable audio-visual content coding and streaming TVM
- Real time AVC/SVC Video Coding and streaming TVM
- FEC and error protection TVM
- SVC network adapter TVM
- Broadcast re-purposing Mobile TVM
- Broadcast re-purposing IPTV TVM
- SVC to AVC transcoding TVM
- Ingest TVM

ENTHRONE : TVMs

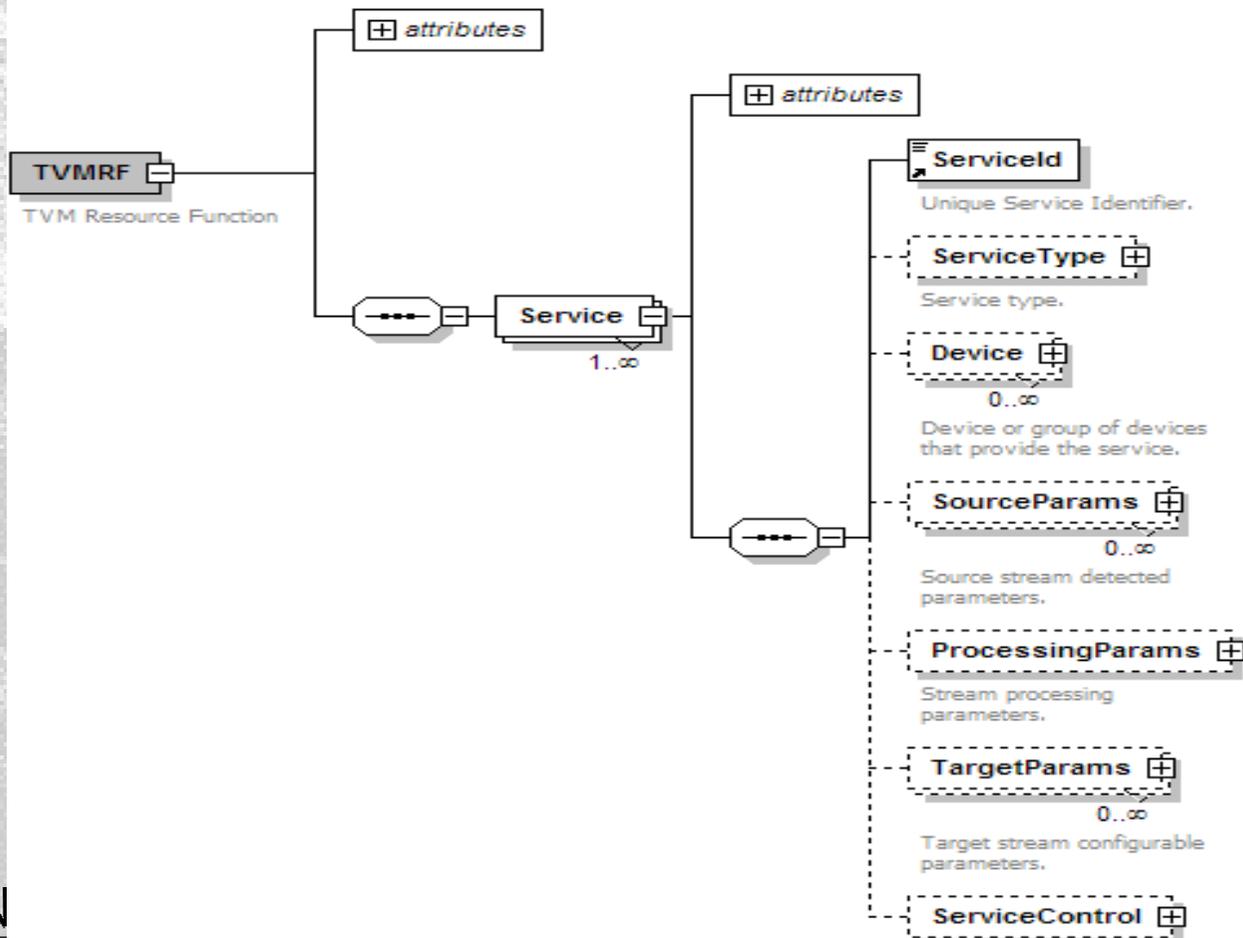


The TVM device can be configured through the TVMRF interface, as follows:

SourceParams - physical interface receiving the signal.

ProcessingParams - operations to be performed on the stream: as this section is common for all TVM, it contains only most important parameters;

TargetParams - network target (or file) for the output

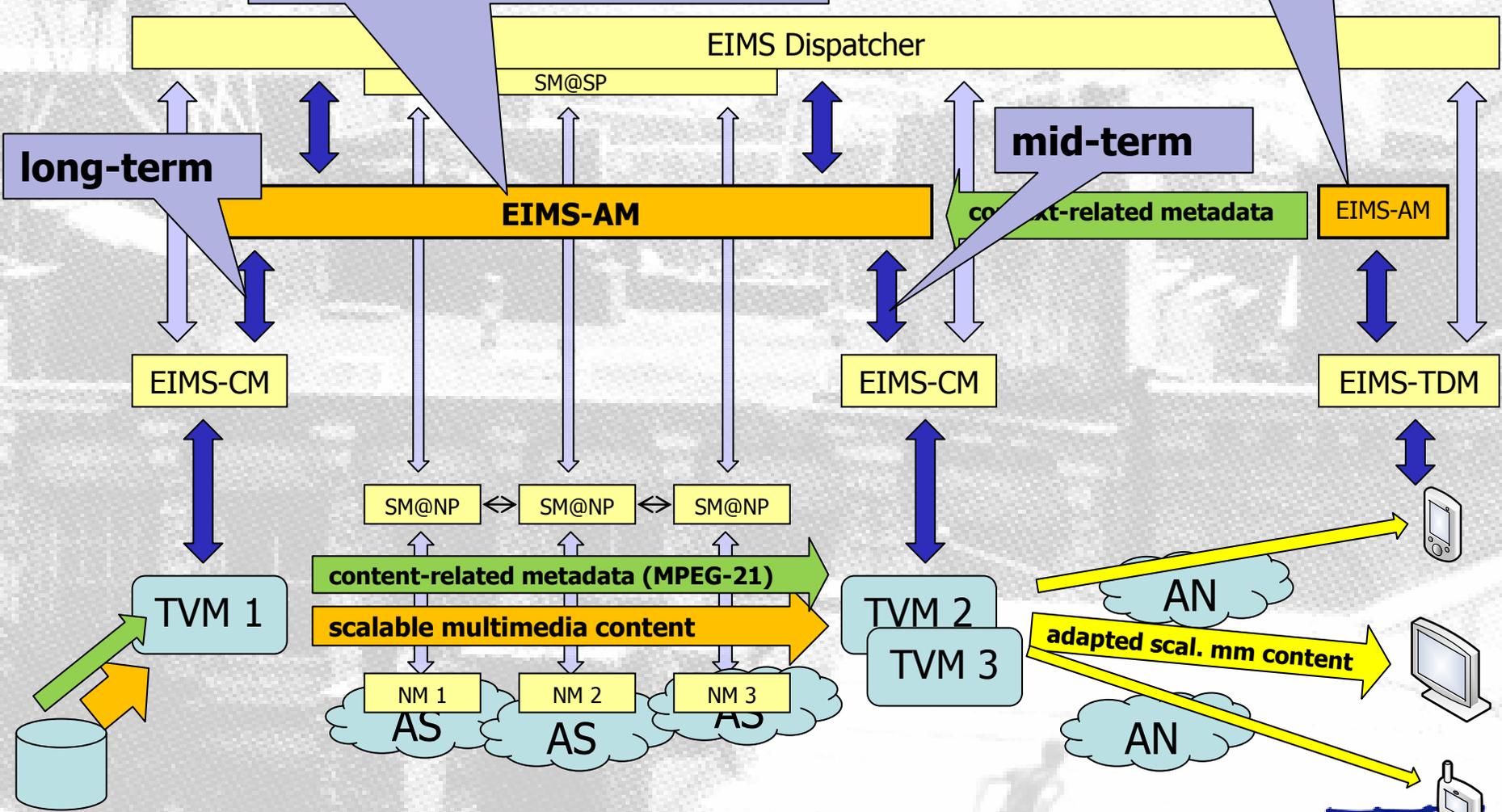


Dynamic QoS-based MPEG-21 cross-layer media adaptation

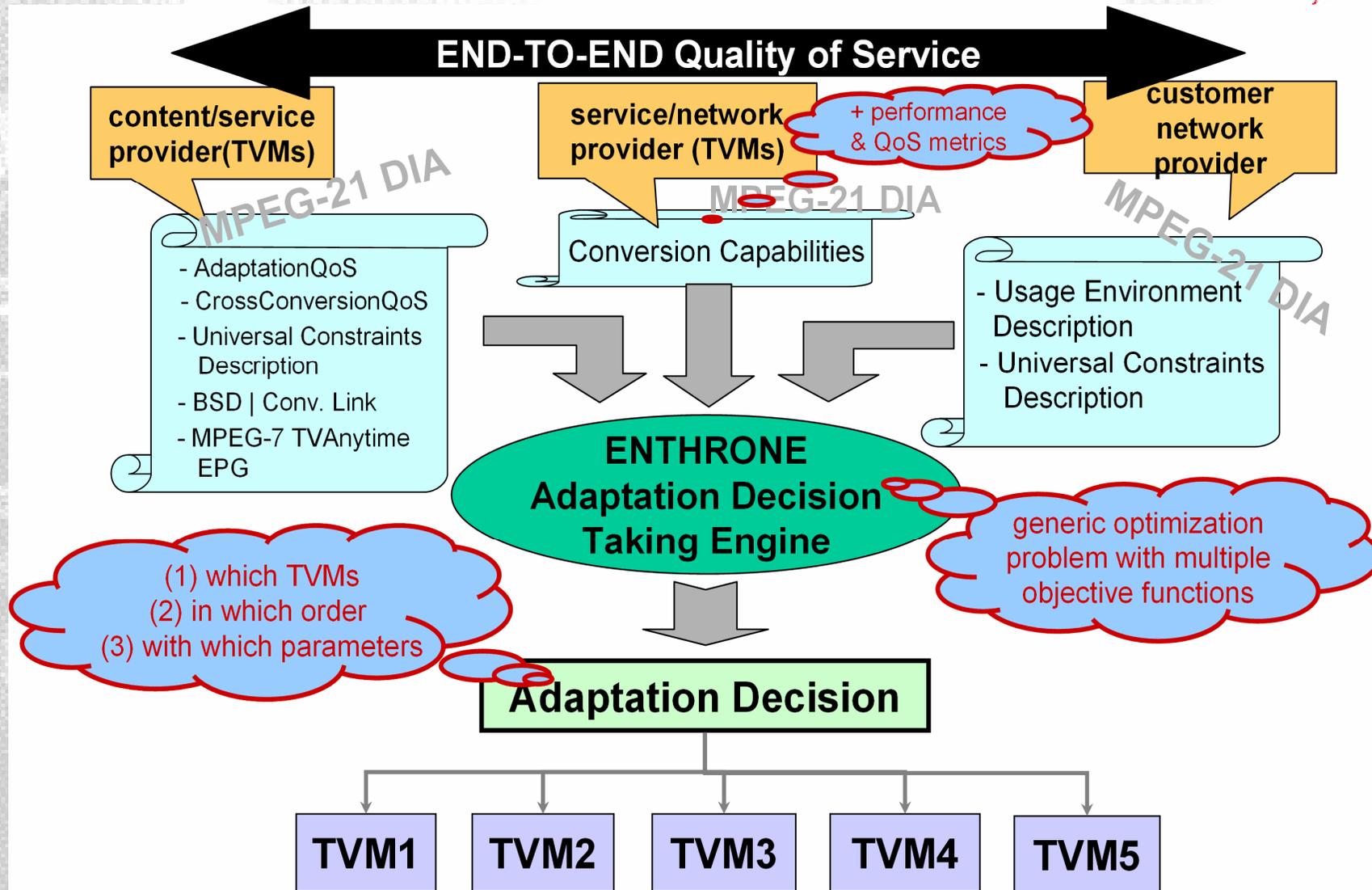


(a) context-collection/management
(b) MPEG-21 Cross-Layer ADTE

context-collection



ENTHRONE adaptation

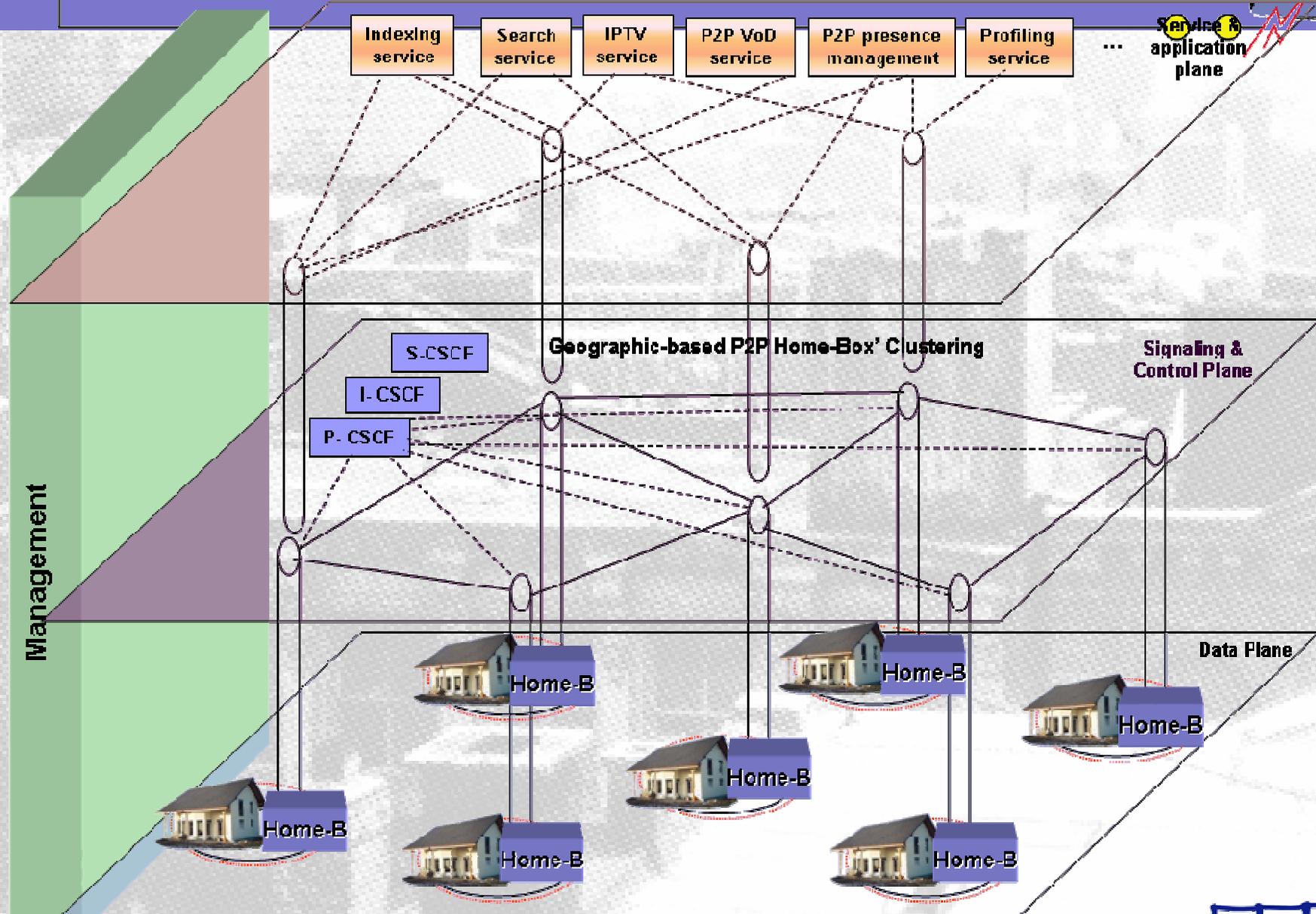


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Evolution in Service Provision



- Indexing service
- Search service
- IPTV service
- P2P VoD service
- P2P presence management
- Profiling service
- ...
- Service application plane



Management

Geographic-based P2P Home-Box' Clustering

Signaling & Control Plane

Data Plane

Home-B

Home-B

Home-B

Home-B

Home-B

Home-B

Home-B

End-to-End QoS through Integrated Management of Content, Networks and Terminals

Evolution: Home and Extended-Home



Extended-Home

3G, 3G+, WiMAX, DVB-H, GPS

Requested Service

Seamless

Seamless

Mobile User

Mobile Environment (Car, Bus, Train)

3G, 3G+, DVB, WiMAX, WiFi

Fixed Environment

UMTS reception
Telephony, ADSL
Internet reception
Digital TV
reception
(DVB-S-T-T-C)

Bluetooth

ZigBee

IRDA

RFD

PCs & peripherals

Consumer electronics

Home-Box

OSGi

PLC

Home automation

Sensor Devices

UPnP

DLNA

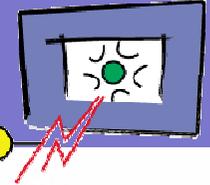
FGI

WiFi

WiFi

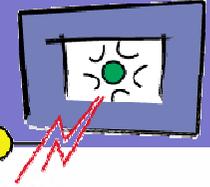
WiFi

Office, Hotels, Restaurant, café, airport or stations, park, entertainment centers, public areas, other users' home



- **Ambient assisted living environment and services:**

- Fixed/mobile environment;
- In home management for ambient and intelligent Home Automation;
- Multi-services adaptation for heterogeneous terminals according to the user profile;
- Sensors and mesh networks auto-deployment and auto-configuration;
- Three-D processing and rendering;
- Easy and accessible, effective and trustworthy
- Immersive and sensory experience
- Voice, video and data convergence in an invisible way for users
- User access to services whenever they want, anywhere and anyhow
- Ambient and context sensitive services
- Personalized to individual and social needs
- Available to communities of users, including ALL citizens



- **Distributed management and control of heterogeneous networks configuration and services:**

- Construction of unified network planes through horizontal interconnections across network provider domains;
- Devising a multi-topology cross-domain routing mechanism as a suitable platform for supporting service differentiation across many domains;
- Introducing parallel virtual internets (network planes) on top of a base heterogeneous network for achieving service differentiation;
- Person-to-person and Multicast (n-to-m) communications;
- Secure access and control;
- Impact on traffic management; edge networking;
- Towards context awareness, event driven middleware;
- Data fusion;
- Impact on broadband requirements.



• Networking, the current Landscape

- Convergence and Internet are at the heart of the strategic initiatives of industry to evolve their networks, beyond silos;
- Key issue: how to “keep control” of the end user?
- NGN (today) mainly driven from a Telco perspective, towards “integrated” or “total solution” providers (e.g. Telco 2.0) ;
- High expectation on IPTV; VoIP = commodity service; possibly HDTV supporting plan towards FTTx technologies in the access;
- Convergence technologies becoming available;
- Open system architecture based on broadband access and Home networking.



- **Supporting full convergence and multiplicity of business models requires breaking of Internet barriers:**

- Scalability: in the future, Internet should be able to sustain a tripling of the number of people connected and the addition of billions – perhaps even hundreds of billions – of devices;
- Internet mobility – not yet a satisfactory answer;
- From QoS to QoE;
- Addressing for distributed services;
- Broadband limitations of underlying protocols;
- Security.



- **End-to-end experienced QoS for audiovisual and multimedia services delivery:**

- Seamless adaptation and delivery;
- Optimised high quality audiovisual/multimedia streams generation and transport;
- End-to-end metadata based management;
- Peer-to-peer multi layered architecture;
- The role of middleware is crucial in order to ensure a seamless service provision user experience;
- Need for an independent distributed management architecture;
- Multi-source services storing, adapting and streaming;

=> Multi-dimensional services

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Networked Media Ecosystem



Thank you