



**International Telecommunication Union**

## **IPTV related standardization activities in DVB**



Jean-Francois Fleury

Representing DVB

ITU-T IPTV Global Technical Workshop  
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# Agenda

- o Why and what should be standardized for IPTV
- o Activity of the various standardization bodies in relation with IPTV
  
- o The DVB consortium and IPTV
  
- o DVB-TM: Setting the specifications for DVB-IP
  - What is in ETSI TS 102 034 ?
  - What is in the coming release ?
  - Preparation of MHP-IPTV
  
- o DVB-CM: Setting the business case for DVB-IP
- o Conclusion

# Why and what should be standardized for IPTV

- o Why standardization for IPTV
  - Achieve interoperability
  - Give confidence for investment
  - Avoid confusion in the market
  - Lower costs for everybody
- o What should be standardized
  - Layers in STB (protocols, data structures, application runtime, ...)
  - Parts of Home Network and Home Gateway
  - Parts of the End-to-end system
    - QoS, ...
- o However: Leave sufficient space for differentiation, according to market requirements



# IP video related activities of the various standards bodies

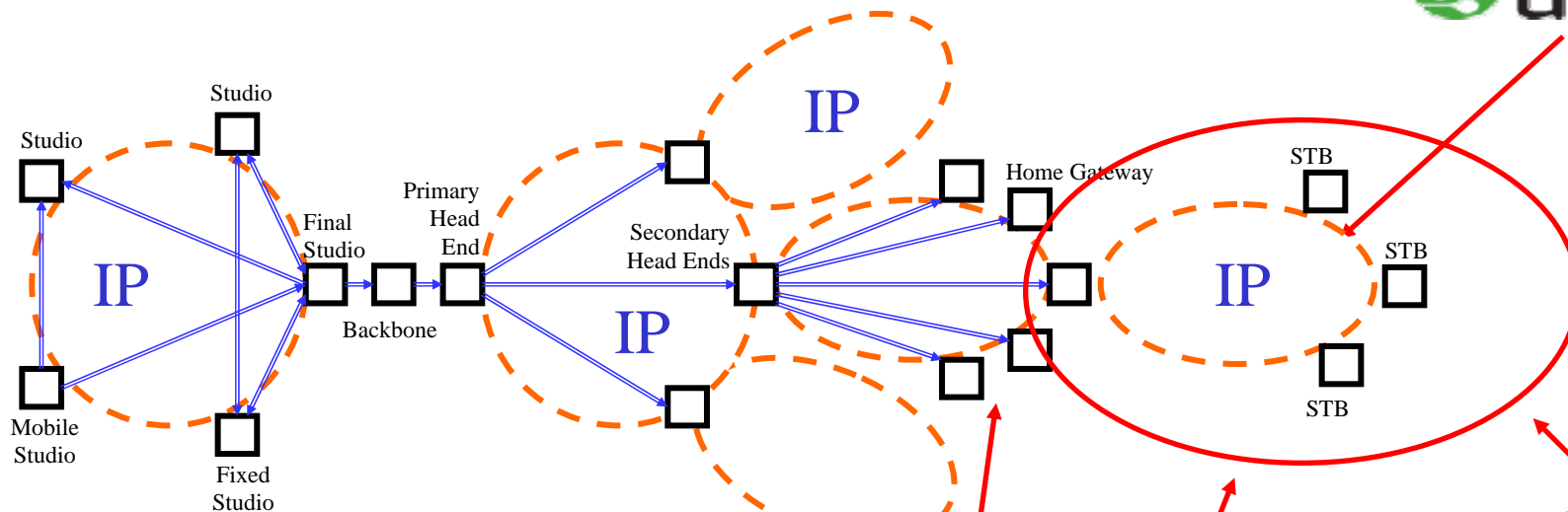
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Contribution Network

Distribution Network

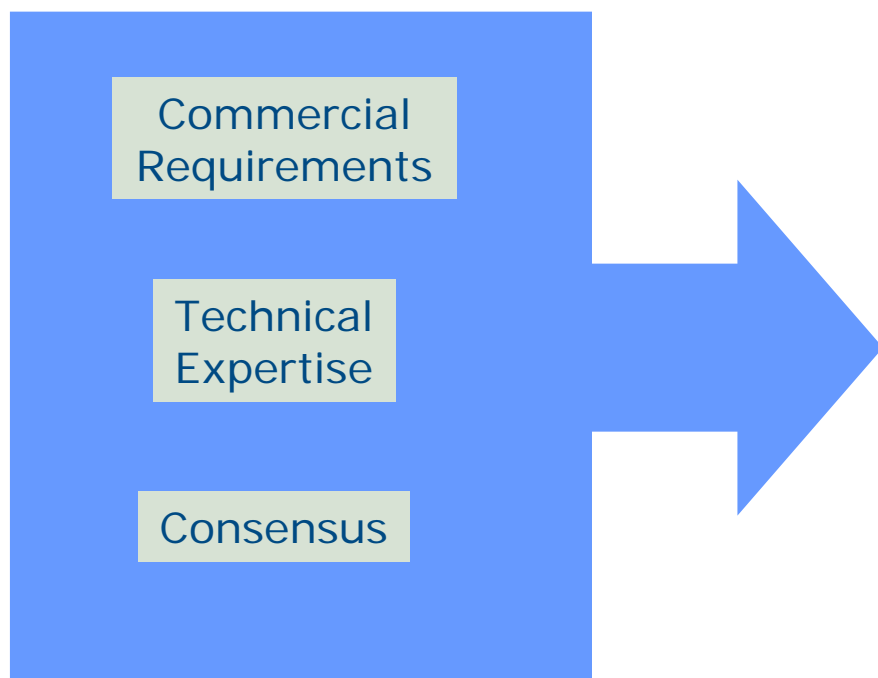
Access Networks

Home Network



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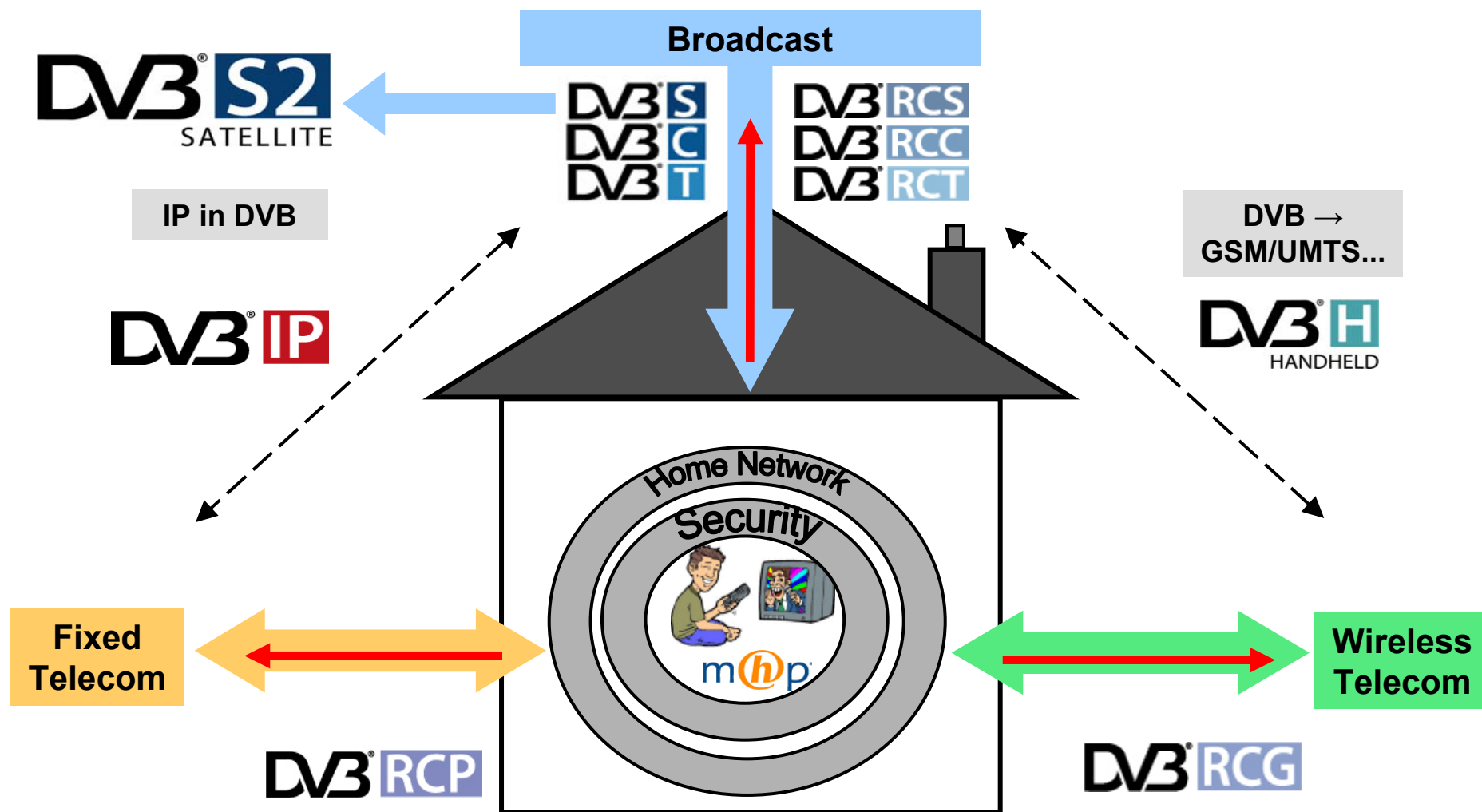
# How does the DVB project work?





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# DVB phases – The Complete Picture

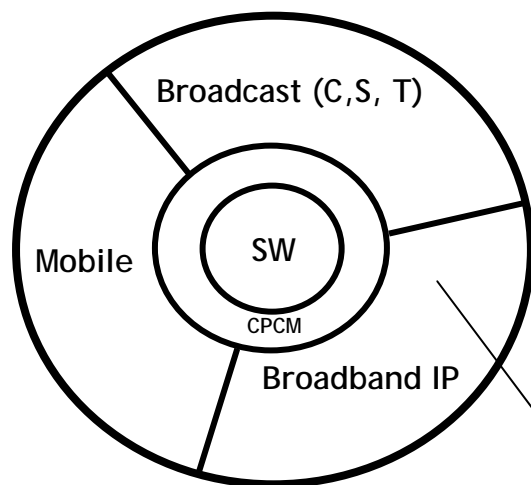




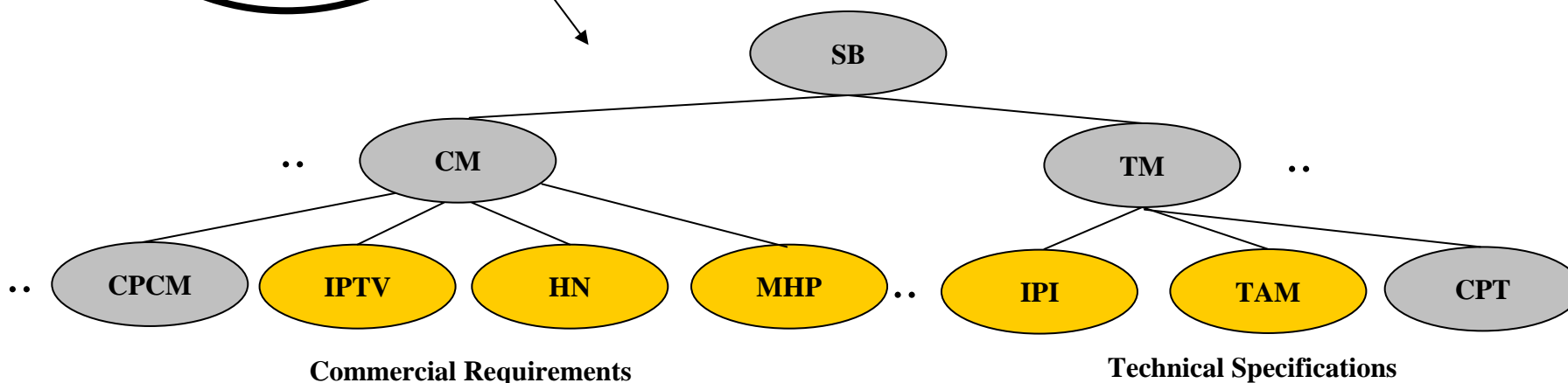
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# DVB's Video over IP initiatives

DVB 3.0



- o IP Datacasting (particularly mobile over DVB-H)
- o IP Television (DVB services over broadband networks)
- o Content Protection Copy Management
- o Multimedia Home Platform / Globally Executable MHP (e.g. PVR, etc.)
- o Maintenance of the existing standards base



# DVB-IP first release: Available now !

ETSI TS 102 034 V1.1.1 (2005-03)

Technical Specification

Digital Video Broadcasting (DVB);  
Transport of MPEG-2 Based DVB Services  
over IP Based Networks



## Technical specification structure

- Intellectual Property Rights
- Foreword
- + 1 Scope
- 2 References
- + 3 Definitions, abbreviations and notations
- + 4 Architecture
- + 5 Service Discovery
- + 6 RTSP Client
- + 7 Transport of MPEG-2 TS
- + 8 IP Address Allocation & Network Time Services
- + 9 Identification Agent for the Transport of DVB Services over IP based Networks
- + 10 Network Provisioning (Optional)
- + 11 Ethernet Home Network Segment
- + 12 IEEE 1394 Home Network Segment
- + Annex A (informative): MPEG2 Timing Reconstruction
- Annex B (informative): SD&S Data Model
- + Annex C (normative): Schemas
- Annex D (informative): Bibliography
- History

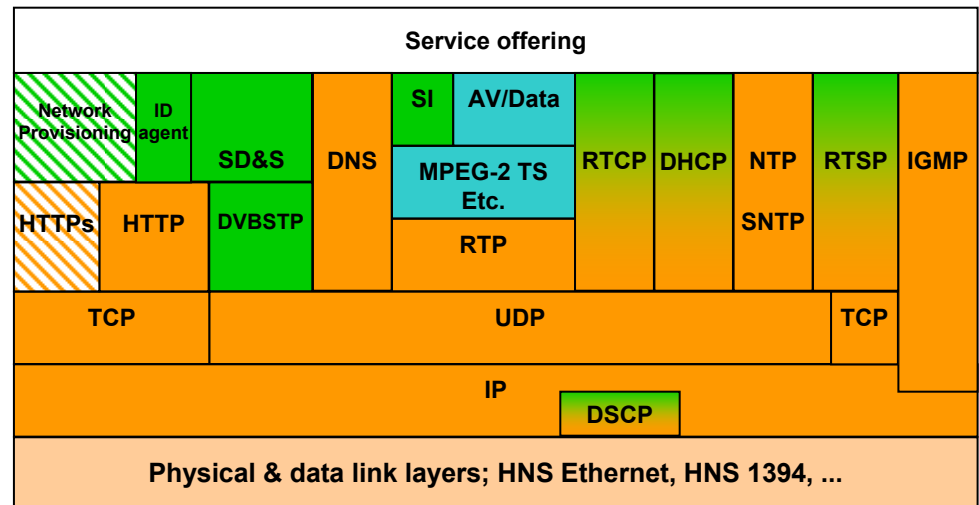




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# Philosophy of DVB-IP Phase 1

- Keep as much as possible from existing DTV standards
- Reuse existing IP specifications where possible
- Focus on data & protocols
  - ➔ Infrastructure layer is independent of high level Applications
- Well known technologies:
  - XML, IP protocols (IETF, ...)
- Optional Network Provisioning
  - Configuration
  - Notification of changes
  - HNED\* inventory



\* Home Network End Device



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# Service Discovery and Selection (SD&S)

- o The SD&S specification covers:
  - Service (and Provider) discovery
  - Service selection
  - Transport of the Discovery information (push and pull modes)
- o Service discovery results in:
  - A list of available providers and services, with sufficient information to make a choice/select (user) and to enable access (system)
- o Two types of Live Media Broadcast
  - TS full SI: DVB-SI embedded in the transport stream
  - TS optional SI: Only PSI must be embedded in the transport stream
- o Service discovery information represented with and carried as XML records
- o XML schemas specified in a normative file



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# Service Selection

- o Live Media Broadcast services:
  - Data sent to a multicast group is only forwarded to receivers which explicitly joined the multicast group using the Internet Group Management Protocol (IGMP, RFC 3376)
  - DVB-IP supports IGMPv3
    - introduces source specific multicast (SSM) to optimise IP multicast network load
    - enables routers to filter on specific source addresses of senders of multicast groups.
  - Optionally RTSP may be used
  
- o Content on Demand services:
  - Delivered over IP unicast
  - Accessed via RTSP, DVB-IP profile specified

## RTSP client (1)

- o Application-level IETF session protocol to control delivery of data with real-time properties
- o Why a DVB client?
  - Because RTSP (RFC2623) is quite complex and huge
  - It is not necessary to implement it all for the DVB service profiles
  - Current RTSP implementations have proprietary extensions to make systems work
- o The specification defines minimal subsets for each profile:
  - Guarantee interoperability among DVB HNEDs
  - Reduce testing effort

## RTSP client (2)

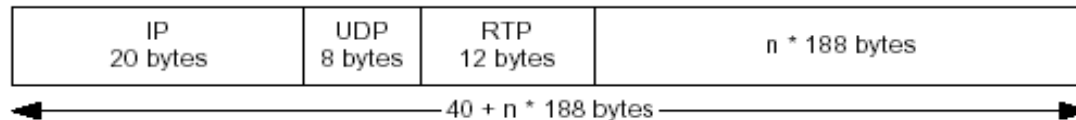
- o Subsets for three DVB-IP profiles:
  - Live Media Broadcast
  - Live Media Broadcast with trick modes (pause, fast forward, ...)
  - On Demand delivery of audio and video (user initiated + trick modes)
- o DVB-specific usage of RTSP methods
  - Announce, Describe, Get\_Parameter, Setup
- o Methods specified for Unicast and multicast
  - Methods in tables, differences with IETF usage clearly marked



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## Delivery of DVB-MPEG-2 based services

- Based on IETF protocols
- MPEG2 TS encapsulated in RTP/UDP/IP according to RFC 3550 and RFC2250



- Delivery Control Protocol: RTCP – associated with RTP – for sending information on transmission statistics
  - No reports to be sent by receivers, in view of scalability
  - Sender reports used to accurately synchronize independent TSs
- Network requirements and QoS
  - Defines key quality of experience guidelines e.g. jitter and multicast join timings
  - Defines Quality of Service markings to allow prioritization of IPTV carriage



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## ETSI TS 102 034 V1.2.1 (2006-09)

- Adds support for new advanced codecs in addition to MPEG-2 (e.g. H264, VC-1, E-AC3, AC3, AAC, HE-AAC,...)
- Enables the use of a Broadband Content Guide compliant with TV-Anytime to describe content via a separate specification (DVB Bluebook A106)
- As in the first release of ETSI TS 102 034, the phase 1.2 work is limited to DVB services encapsulated in MPEG-2 TS and covers Live Media Broadcast services , Media Broadcast with Trick Modes and Content on Demand services

New!



## June 2006 - DVB Bluebook A106: Carriage of BCG information over IP

- o BCG Definition
  - The term Broadband Content Guide (BCG) refers to a Content Guide that is delivered over an always-on bi-directional IP network
  - However, it can be used to describe content that is delivered over any network (e.g. IP, DVB-S, DVB-T...)
- o BCG data model:
  - Based on TV-Anytime XML Schema (ETSI TS 102 822)
- o BCG encapsulation:
  - All BCG data is segmented and carried inside Data Delivery Units
  - A Data Delivery Unit is composed of a compression wrapper and a BCG data structure
- o BCG transport:
  - Uses existing DVB-IP transport for SD&S, i.e.
    - DVBSTP for push mode
    - HTTP for pull mode
  - Defines an optional query mechanism for BCG metadata acquisition, based on TV Anytime part 6-1, i.e. SOAP over HTTP

NEW!



## June 2006 - DVB Bluebook A106: Carriage of BCG information over IP

- o Describes content, including:
  - Programme Information (title, synopsis, genre, keywords, cast...)
  - Service Information (name, genre, description, URL...)
  - Schedules (time, date, channel, reruns, free/encrypted...)
  - Purchase Information (price, currency, link to a price server...)
  - Segmentation Information (chapters of a movie, highlights of a sports event...)
  - Program Reviews, Credits Information...
- o Compliant with the TV-Anytime XML schema
- o Indexes may be transmitted to accelerate access to metadata
- o BiM-encoded

New!

## Current focus in technical TM-IPI group

- o On-going:
  - Application Layer FEC
  - DVB-IP Profiling
  - SD&D extensions for Logical Channel Numbers and Regional Services
  - Remote Management System – Firmware Upgrade System
  - Content Downloading System
  - Guidelines on DVB-IP 1.2
- o On-going: DVB-Home Network based on DLNA
  - DVB-HN Architecture
  - Mapping with DLNA
  - Identification of DVB complement
  - Content protection using DVB-CPCM

## 0 Commercial Module-MHP

- Released commercial requirements for extending the MHP to IPTV
- These requirements include
  - Hybrid devices supporting both DVB broadcast and DVB-IP devices
  - DVB-IP only devices

## 0 Technical Module –TAM/MUG

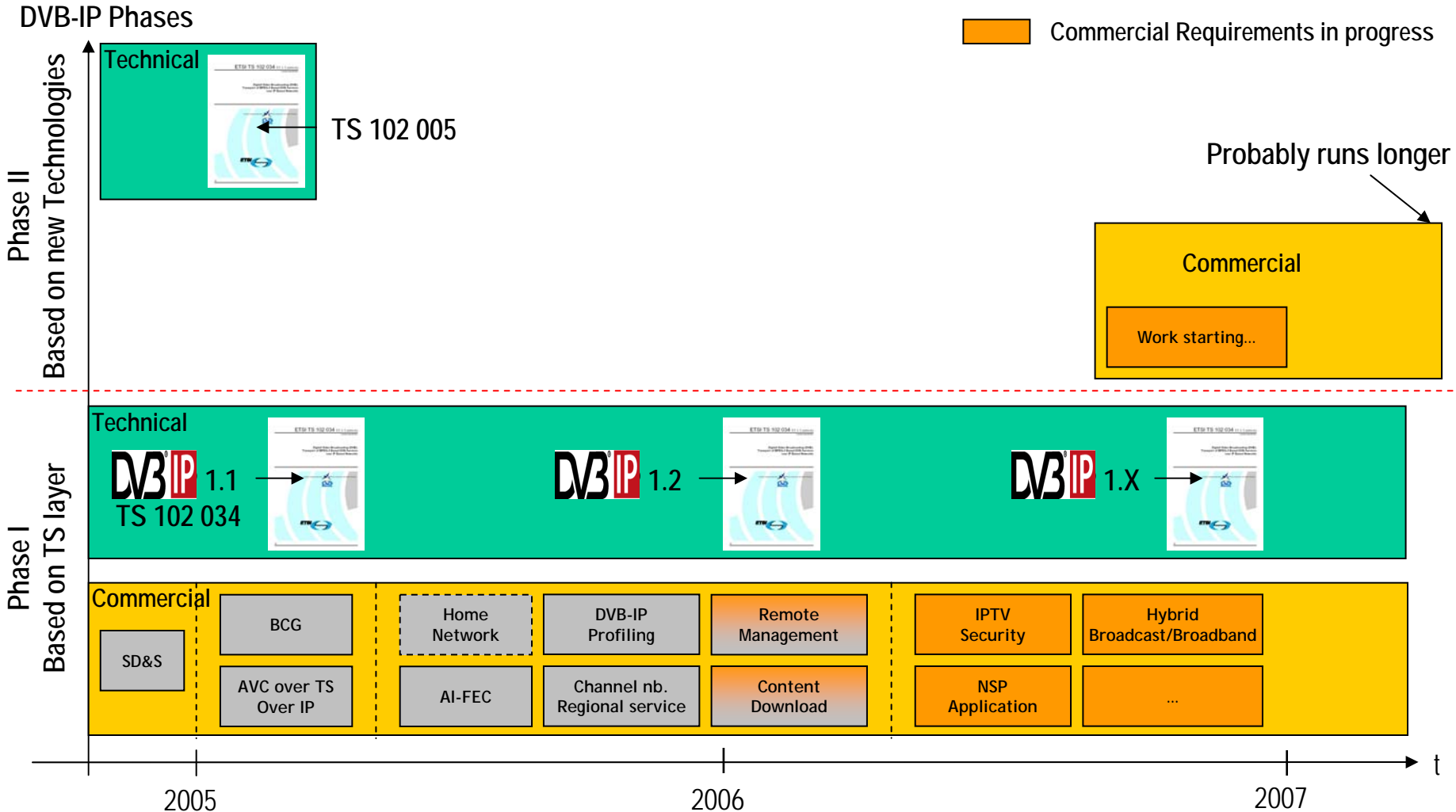
- Draft MHP-IPTV specification produced, aligned with DVB-IP profiles
- Includes notably the connection from the MHP APIs to SD&S and BCG and extended life cycle model
- Defining a subset of the MHP-IPTV specification to be used by applications for markets which are using IPTV protocols defined by organizations other than DVB or which are not using standardized protocols at all



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# CM-IPTV / TM-IPI roadmap

- Commercial Requirements done
- Commercial Requirements in progress



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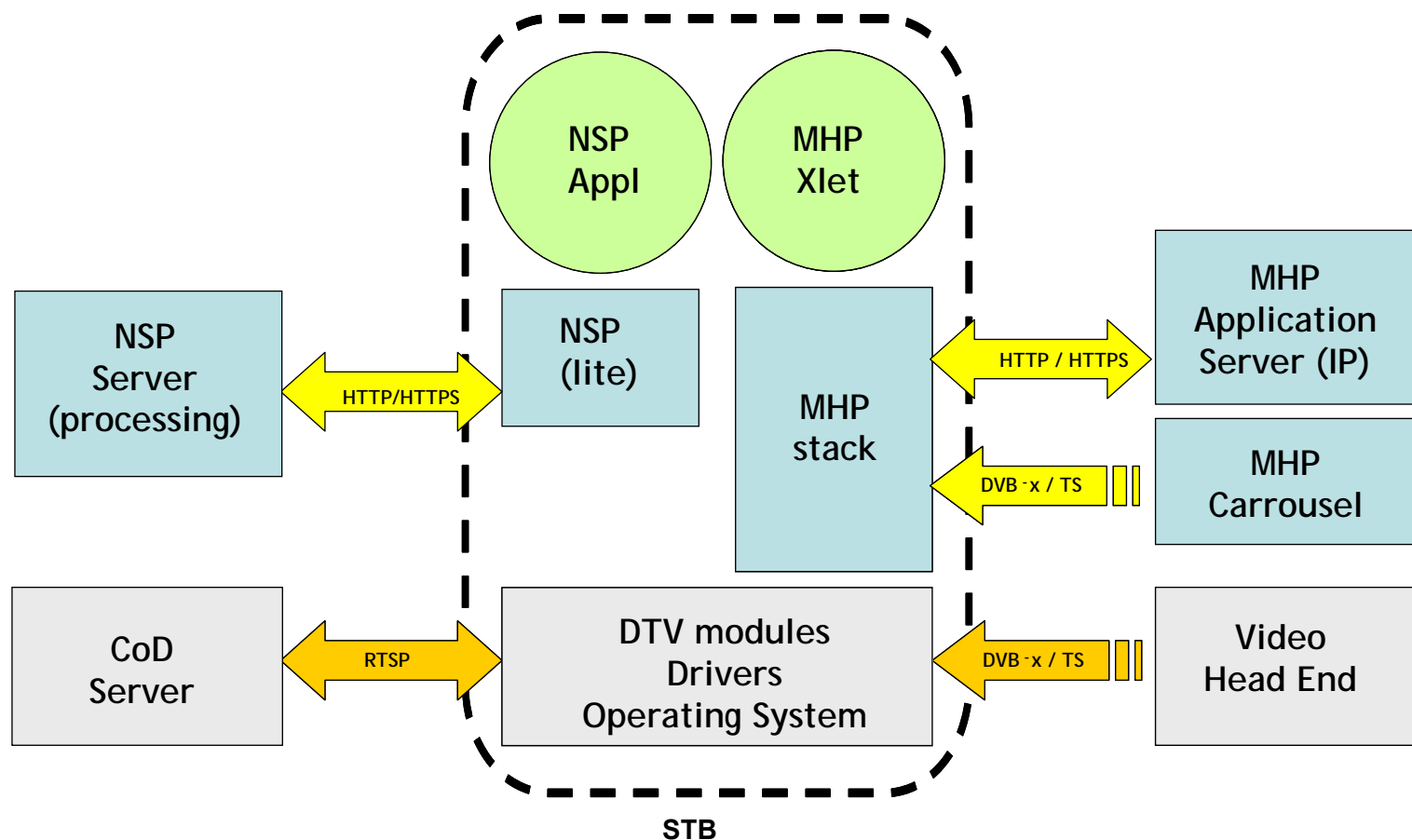
## Finalizing in CM-IPTV: DVB - Remote Management System

- o Remote management covers the following aspects:
  - Configuration and firmware upgrade (unicast & multicast mechanisms)
  - Device management including alarms
  - Troubleshooting including diagnostics
- o RM includes the management of devices on the HN
- o Efforts should be made
  - To align with existing standards where possible (e.g. DSL-Forum)
  - To support all kinds of Broadband Networks
  - Support different kinds of Broadband Devices (e.g. Modems, Gateways, STB, ...)
  - To align with RM Systems for other broadband applications e.g. voice etc

## Finalizing in CM-IPTV: DVB - Content Downloading System

- o Enable delivery of non real time IPTV services
  - To a local cache over non real-time broadband IP channels
  - Data rate can be variable and even intermittent.
- o Targets the downloading
  - DVB A/V formats and modes
  - Pure audio content
  - Metadata
- o Both push and pull delivery models are in the scope. Multicast and Unicast delivery should be supported.
- o The system should be aligned with the DVB BCG specification, based on TV-A metadata format for the description of services.

# In preparation: Applications in IPTV



## In preparation...

- o Hybrid IPTV services
  - The aim of this task force is to provide use cases and commercial requirements for hybrid TV services (Broadband/Broadcast)
- o Security (focus on content security in collaboration with CM-SEC)
- o DVB-IP Phase II
  - The aim of DVB-IP Phase I was to build an IPTV system widely based on proven technologies from the broadcast world (e.g. TS layer, DVB-SI, ...).
  - The aim of DVB-IP Phase II is to build on new technologies such as direct IP streaming, supporting the convergence of fixed – mobile TV networks, web services, ... (indicative)





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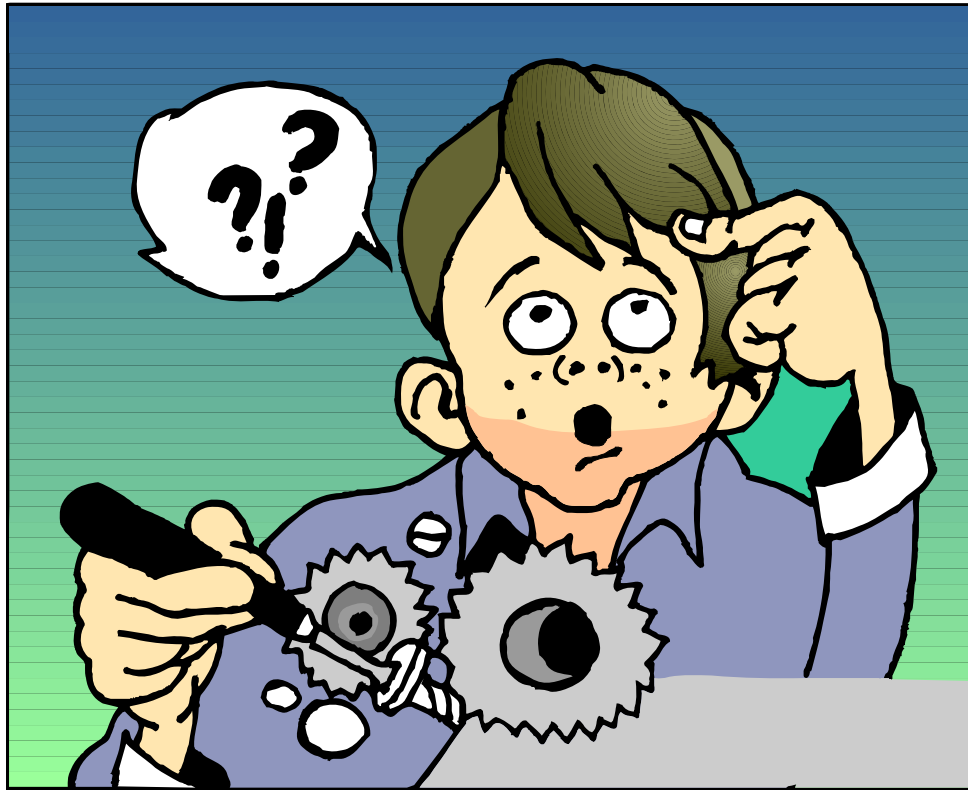
## Conclusion

- o Today there is a rising call for worldwide standardization of IPTV, where DVB was one of the first to start work
- o The DVB project builds a complete ecosystem for IPTV complementing existing industry achievements and standards
- o Establishing liaisons with the right partners is seen as key in DVB
- o DVB-IP's base layer enables IPTV industry players to create competitive differentiated offers while addressing interoperability needs



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# Questions



[muriel@microsoft.com](mailto:muriel@microsoft.com)

[ralf.schaefer@thomson.net](mailto:ralf.schaefer@thomson.net)

[jean-francois.fleury@thomson.net](mailto:jean-francois.fleury@thomson.net)