



International Telecommunication Union
International Multimedia Telecommunications Consortium



DVB-IP Standardisation

Ralf Schäfer
Thomson
Chair DVB CM-IPTV

- Why and what should be standardized for IPTV
- Activity of the various standardization bodies in relation with IPTV

- The DVB consortium and IPTV
- 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
- DVB-CM: Setting the business case for DVB-IP

- Conclusion



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Why and what should be standardized for IPTV



- Why standardization for IPTV
 - Achieve interoperability
 - Give confidence for investment
 - Avoid confusion in the market
 - Lower costs for everybody
- 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, ...
- However: Leave sufficient space for differentiation, according to market requirements



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Activity of the various standardization bodies in relation with IPTV

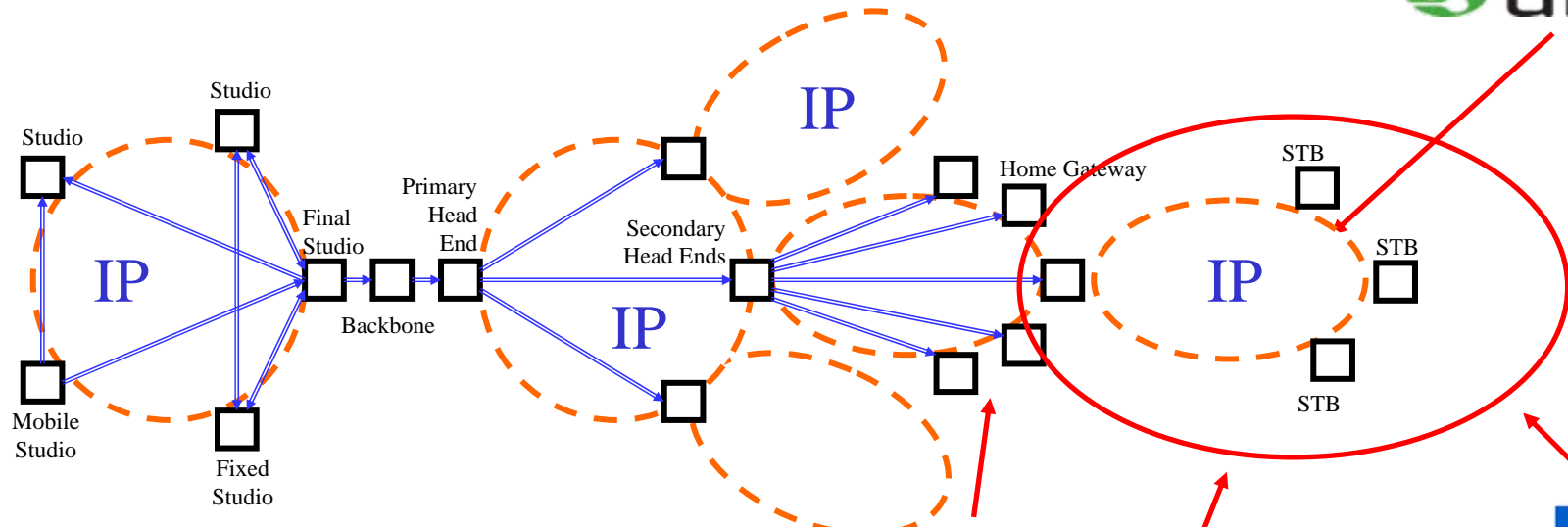


Contribution Network

Distribution Network

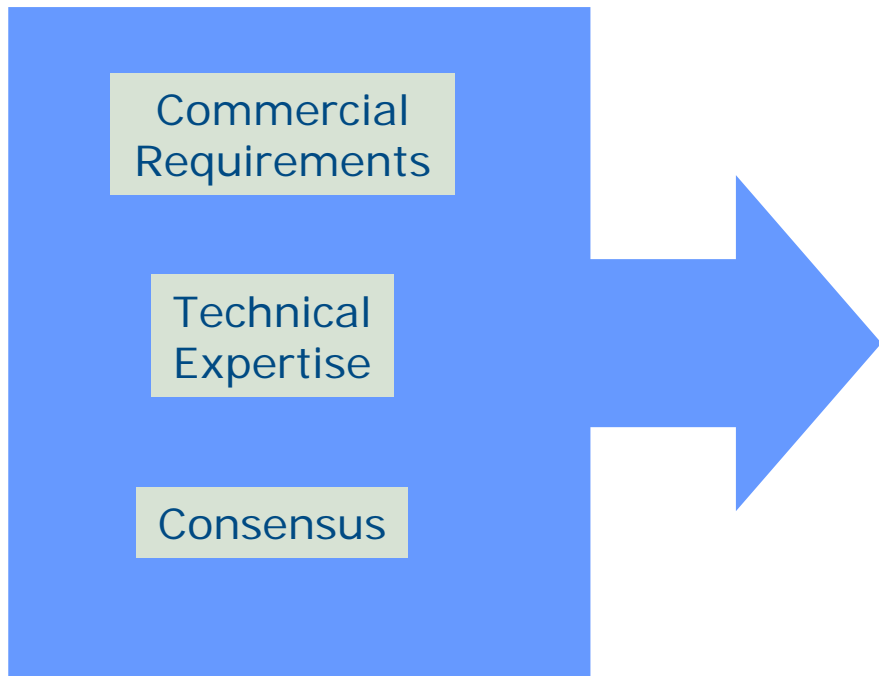
Access Networks

Home Network



Joint ITU-T Workshop and IMTC Forum 2006 "H.323, SIP: is H.325 next?"
San Diego, 9-11 May 2006

How does the DVB project work?



DVB[®] IP



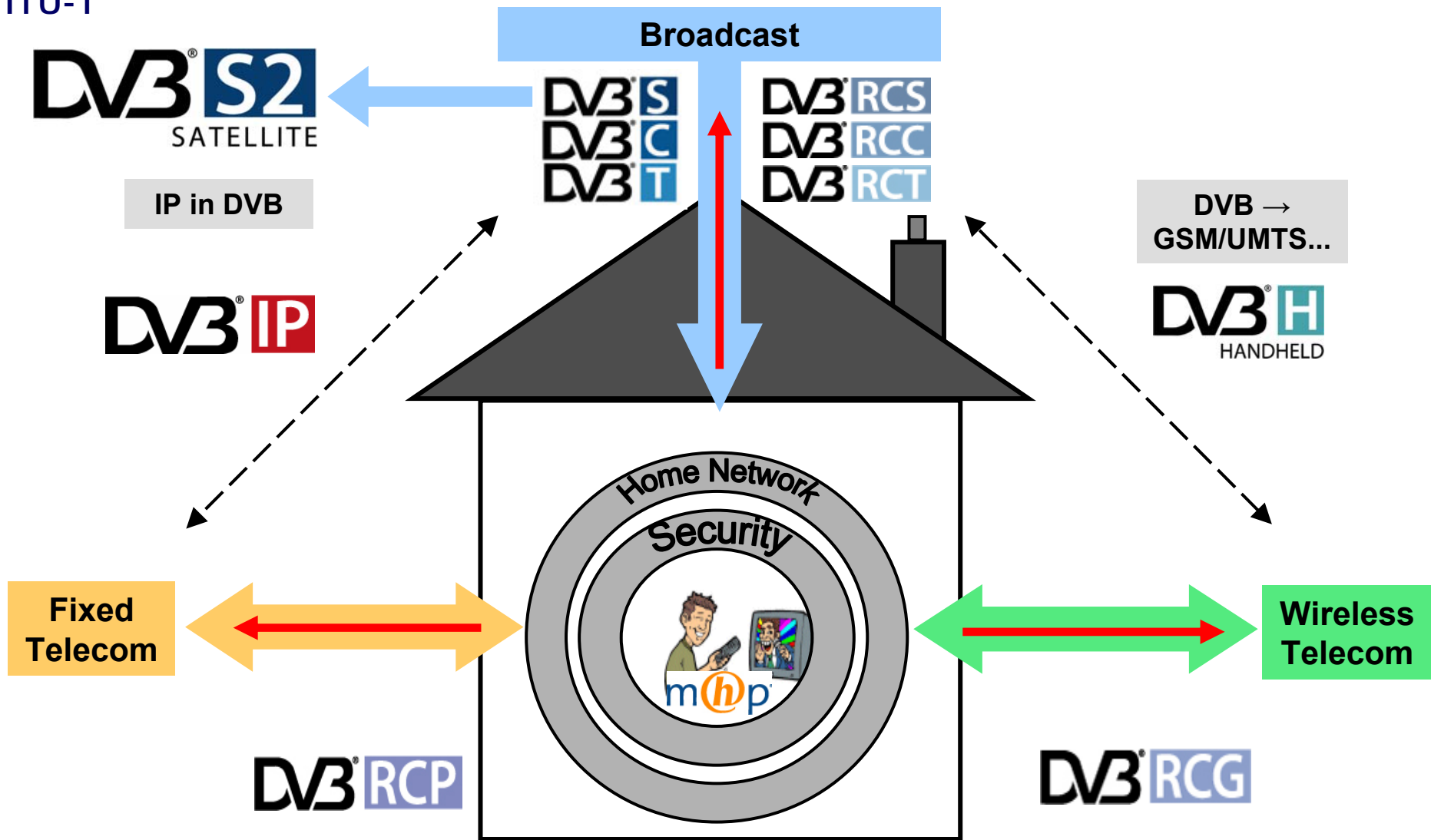
DVB[®]
Digital Video
Broadcasting

DVB produced 44 standards
since 1993

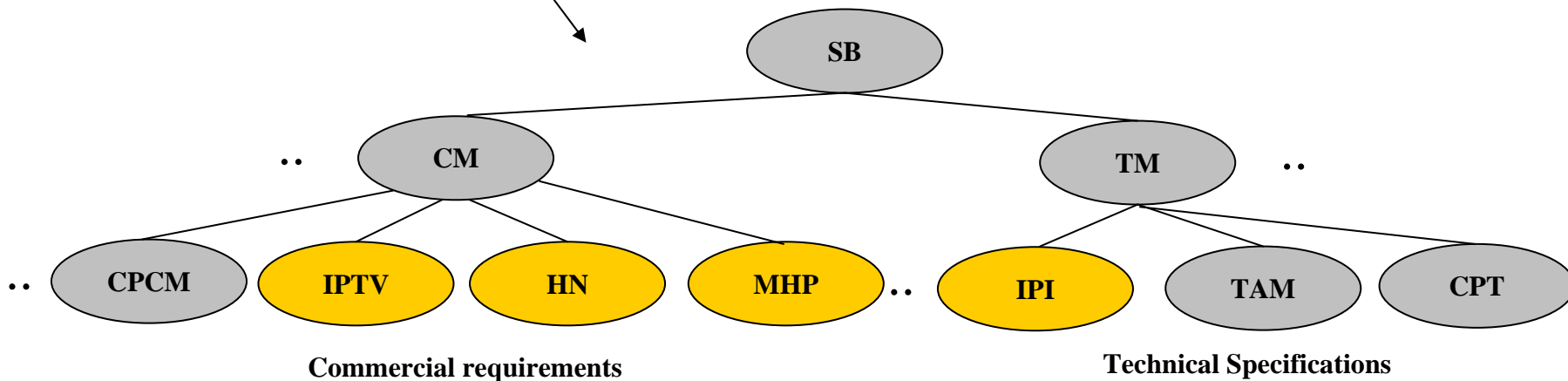
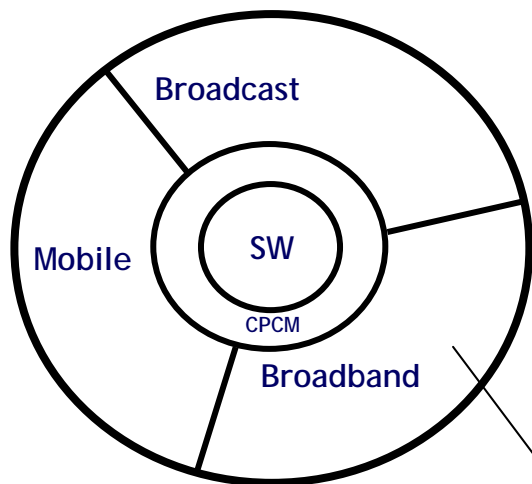


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DVB phases – The Complete Picture



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



Commercial requirements

Technical Specifications

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



- 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



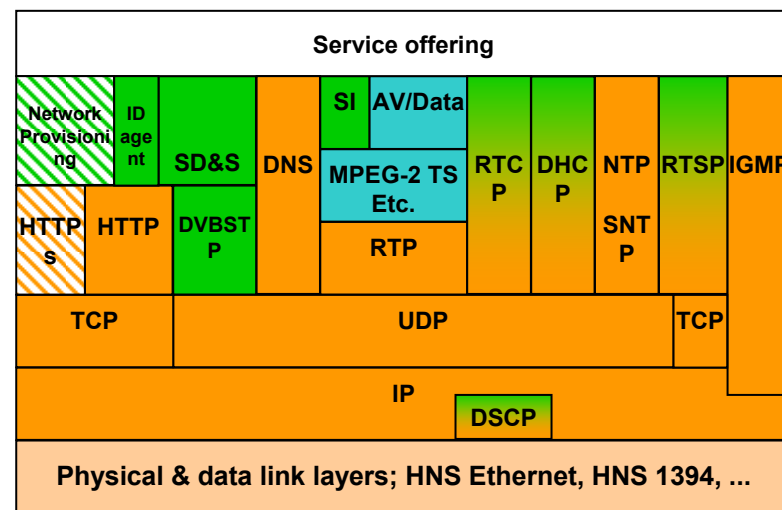
Philosophy of DVB-IP Phase 1



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- 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



- 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

- 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

- Application-level IETF session protocol to control delivery of data with real-time properties
- 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
- The specification defines minimal subsets for each profile:
 - Guarantee interoperability among DVB HNEDs
 - Reduce testing effort



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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

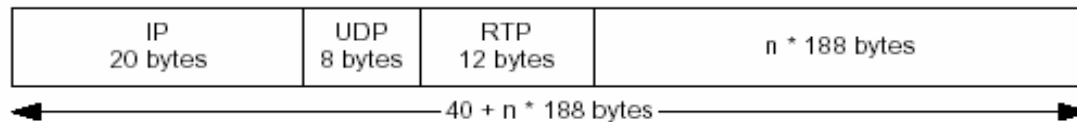


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Delivery of DVB-MPEG-2 based services



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



- o 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
- o 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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- 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...)
- BCG data model:
 - Based on TV-Anytime XML Schema (ETSI TS 102 822)
- 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
- 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

- 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...
- Compliant with the TV-Anytime XML schema
- Indexes may be transmitted to accelerate access to metadata
- BiM-encoded

- o Release in Q1/2006: SD&S extensions (AVC)
 - Signaling of new A/V content formats (e.g. H.264, E-AC3, AC3, AAC, HE-AAC,...)
- o Pending:
 - Signaling of Logical Channel Numbers
 - Signaling of Regional Services (deployment facility for SD&S servers)
 - Application Layer FEC
- o On-going: DVB-Home Network based on DLNA
 - Architecture
 - Mapping with DLNA
 - Identification of DVB complement
 - Content protection using DVB-CPCM

- o 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
- o Technical Module -TAM/MUG
 - Defining how to add IPTV to the MHP specification
 - Includes notably the connection from the MHP APIs to SD&S and BCG
 - 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



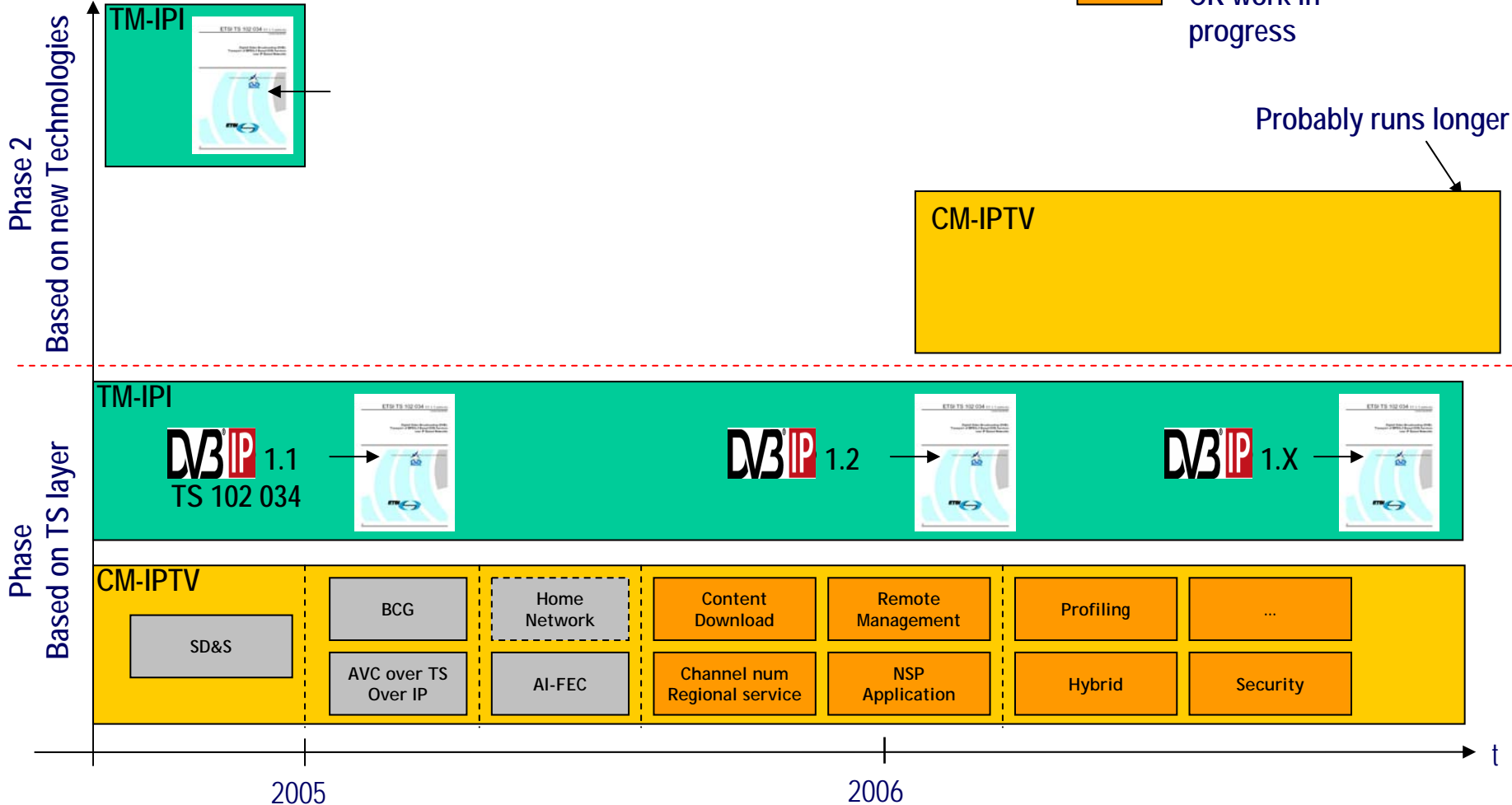
CM-IPTV / TM-IPI roadmap



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- CR done
- CR work in progress

DVB IP Phases





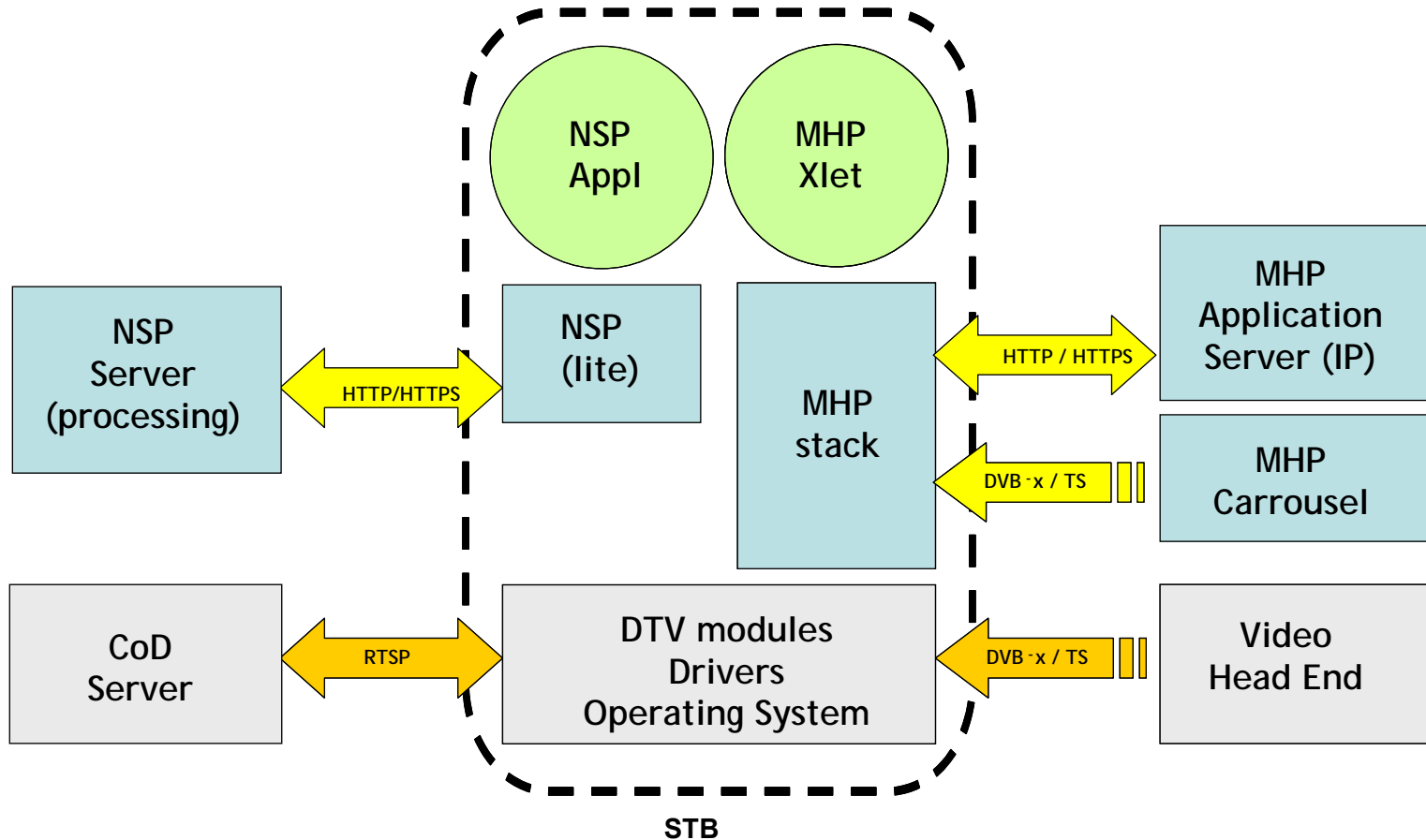
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Next: DVB - Content Downloading System



- 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.
- Targets the downloading
 - DVB A/V formats and modes
 - Pure audio content
 - Metadata
- Both push and pull delivery models are in the scope. Multicast and Unicast delivery should be supported.
- The system should be aligned with the DVB BCG specification, based on TV-A metadata format for the description of services.

- Remote management covers the following aspects:
 - Configuration and firmware upgrade (unicast & multicast mechanisms)
 - Device management including alarms
 - Troubleshooting including diagnostics
- RM includes the management of devices on the HN
- 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





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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 DVB-IP Phase I profiling
 - The aim of the profiling task force is to group elementary DVB-IP building blocks to profiles reflecting the deployment needs of IPTV service providers. At least one of the profiles enable the transport of A/V over MPEG-2 TS without the need for an RTP/RTCP layer
- 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)



Conclusion



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

