ETSI BROADCAST AND CONTENT DELIVERY TOPICS
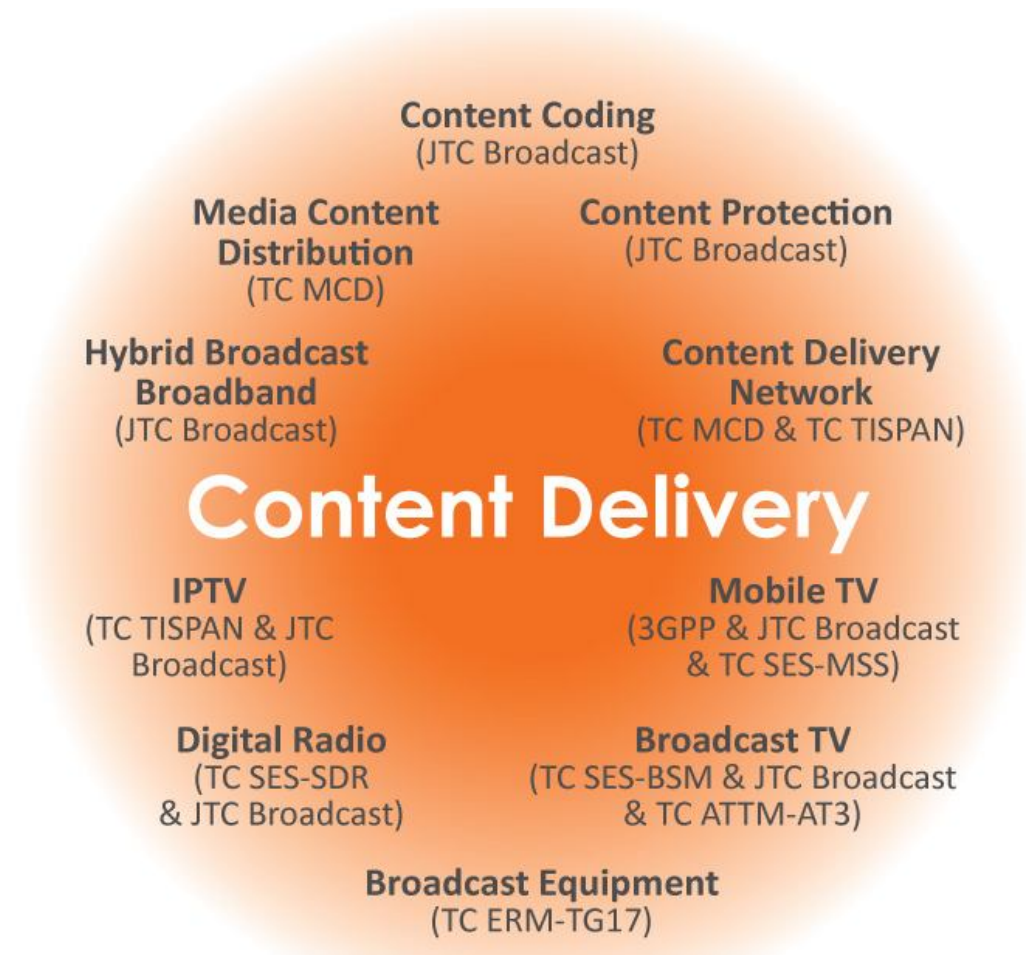
Presented by Michael Sharpe, ETSI ESP VP   for ETSI Workshop in Georgia – May 2012

Main content delivery topics at ETSI

Content Coding
(JTC Broadcast)

Media Content Distribution
(TC MCD)

Content Protection
(JTC Broadcast)

Hybrid Broadcast Broadband
(JTC Broadcast)

Content Delivery Network
(TC MCD & TC TISPAN)

Content Delivery

IPTV
(TC TISPAN & JTC Broadcast)

Mobile TV
(3GPP & JTC Broadcast & TC SES-MSS)

Digital Radio
(TC SES-SDR & JTC Broadcast)

Broadcast TV
(TC SES-BSM & JTC Broadcast & TC ATTM-AT3)

Broadcast Equipment
(TC ERM-TG17)

ETSI and broadcast

- ETSI involved in broadcast since more than 15 years
  - Initially JTC Broadcast created between EBU, CENELEC and ETSI to deliver standards on broadcast
  - Main standards produced on:
    - DVB technologies
    - DAB, DMB and DRM technologies
    - TV-Anytime
    - MHEG-5
    - Media Foward Link only
    - DTS
    - Hybrid Broadcast Broadband TV
- Today still, and even more with other ETSI TCs dealing with:
  - IPTV, Cable TV, Content Delivery Network (CDN), Multi-screen, CA/DRM interoperability, broadcast equipment …

MAIN STANDARDS PRODUCED UP TO NOW

Main DVB Standards (1)

- ## Terrestrial TV: DVB-T/T2
  - Last revision of DVB-T2 is a mixed mode including « T2-Lite profile » allowing mobile TV (see ETSI mobile broadcast presentation)

- ## Satellite TV: DVB-S/S2
  - DVB-S2 delivers excellent performance, coming close to the Shannon limit
  - DVB-RCS/RCS2 (Return Channel Satellite): DVB-RCS2 covers the Second Generation DVB Interactive Satellite System of a system which provides users with the equivalent of an ADSL or cable Internet connection, without the need for local terrestrial infrastructure.

- ## Mobile TV:
  - DVB-H and hybrid profile with DVB-SH (see ETSI mobile broadcast presentation)

Main DVB Standards (2)

- **Cable TV: DVB-C/C2**
  - Uses the latest modulation and coding techniques for higher efficiency i.e. increase downstream transmission capacity
  - Delivery of VoD and HDTV

- **Interactive TV: DVB-MHP and DVB-GEM**
  - In all versions, a broadcast-only profile can be supported, although most modern deployments include broadband connectivity
  - The core of MHP has also been adopted in a compatible manner by non-DVB systems (i.e. ATSC, ARIB, CABLELABS, Blu-ray Disc Association) through the development of GEM
  - MHP adopted by Italy but also by other countries worldwide (e.g. Finland, Norway, Saudi Arabia)

Main DVB Standards (3)

- Content Protection and Content Management (CPCM)
  - 14 parts including security toolbox, Authorized Domain Management scenarios, system adaptation layers, compliance framework, Content Management Scenarios, Implementation Guidelines ...

- DVB-3DTV
  - First delivery format for 'Plano-stereoscopic' 3D television. Can be used for cable, terrestrial and satellite broadcast and broadband channels.
  - Developed for broadcasters and content deliverers needing a system that works with existing HDTV receivers, provided they are used with a 3D display.

IPTV Standards

- ETSI TC TISPAN solutions focused on the IPTV service delivery for NGN
  - Two solutions (IMS-based and Integrated) for the integration of IPTV in the NGN architecture
- DVB IPTV specifies technologies on the interface between a managed IP network and retail receivers

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Other cable TV standards

- ETSI TC ATTM published a Multipart standard for Third Generation Transmission Systems for Interactive Cable Television Services based on Euro DOCSIS (Data Over Cable Service Interface Specification) 3.0

Other interactive TV standards

- **MHEG-5 broadcast profile**
  - The last published revision includes mainly support for encrypted content delivery by back channel and some changes to the key handling functionality
  - Adopted in UK, Ireland, New Zealand, Australia ...

- **Hybrid Broadcast Broadband TV**
  - Specification for the use of web technologies to deliver interactive services to TV related devices using both classical broadcast and broadband connections with application signalling in the broadcast domain.
  - Consumers will be able to access new services from entertainment providers such as broadcasters, online providers and CE manufactures (e.g. VoD, catch-up TV, voting, social networking, games)
  - German/French initiative, being deployed in Spain as well, and announced in other European countries
  - Trials also outside Europe e.g. US, Japan, Australia China

- **Both delivered by JTC Broadcast**

Media Content Delivery (MCD) standards

- TC MCD set up to analyse the need of content providers and not only deliver standards on telecom transport infrastructure

- The following Technical Reports (TRs) were produced to describe the current situation, collect use cases and requirements, and see if any further standardization was needed:

  - Subtitle distribution TR

  - Programme Guide Information distribution TR

  - Audience measurement TR

  - 3D Gaming graphics Delivery TR

- The conclusion was that further work may be needed but lack of contributors (e.g. audience measurement, 3D gaming)

Content Delivery Network (CDN) standard

- A specification on CDN Architecture has been published:
  - Very much linked to an NGN IPTV network but extensible to unmanaged networks and to cope with any kind of content.

Main JTC Broadcast standards published on Digital Radio (1)

- Standards delivered on:
  - DAB/DAB+, DRM/DRM+, DMB
  - Around rich media and convergence
  - A complete and integrated open digital radio platform with solutions for all
- Implementation Guidelines produced as well
- The complementary DAB and DRM standards together provide a complete and integrated open digital radio platform with solutions for all available and prospective frequency bands

Main JTC Broadcast standards published on Digital Radio (2)

- DRM+ has distinct advantages over conventional FM
  - Needs lower transmission power for same coverage
  - Opens up new audio possibilities like surround sound
  - Increases spectrum efficiency
  - Offers electronic data services such as programme guide and supporting information
- DAB+ has additional audio codec for Digital Audio Broadcasting based on MPEG-4

Broadcast equipment

- ETSI TC ERM TG17 - Standards for broadcast and ancillary communications equipment (tuners, domestic aerials and amplifiers)
  - The purpose of TG17 is the preparation of draft ETSI Harmonised Standards covering the essential requirements for Article 3.2 of the R&TTE Directive for broadcast transmitters, sound and vision, using analogue and digital modulation

CURRENT ACTIVITIES

DVB (1)

- **Regular revisions of existing publications such as**
  - Revision of DVB IPTV specification to provide a new functionality like in-home networking, fast channel change or system renewability messages (SRM)

- **Second 3DTV delivery system termed 'Service Compatible'**
  - Solution required by content deliverers that enables the 2D and 3D versions of a programme to be broadcast within the same video signal
    - so that new 3D televisions and next-generation STBs can receive 3D programmes
    - while consumers with existing 2D HDTV receivers and set-top boxes can watch the 2D version. This 2D picture will probably be either the left or right image of the 'stereo pair'.

DVB (2)

- CI Plus
  - CI Plus is a technical specification that adds additional security and features to the proven DVB Common Interface Standard.
    - The Common Interface is a technology which allows separation of conditional access functionality from a digital TV receiver-decoder (Host) into a removable conditional access module (CAM).
  - It will allow CI Plus compatible consumer electronic devices (such as integrated digital televisions and set-top boxes) access to a wide range of Pay TV services via plug-in CI Plus Modules.
- DVB-NGH (see ETSI mobile broadcast presentation)

TV White space in 470 – 862 MHz

🌐 TC BRAN has started to develop a candidate Harmonized standard for Wireless Access Systems (Fixed, Mobile and Nomadic) in the TV Broadcast White Spaces in the 470 MHz to 790 MHz frequency band.

Content Delivery Network

- ## Content Delivery Infrastructure TR
  - Global study on the various CDN solutions
- ## CDN Interconnection specification
  - To identify use cases and requirements
- ## CDN Interconnection Architecture
  - Based on the CDN Interconnection requirements (specification) and taking into account the CDN architecture solutions (published)
- ## CDN protocols
  - Based on the CDN Architecture specification (published)
  - The CDN solution will be designed independent of the connected service delivery system

Multi-screen convergence service

- Scope of this Work Item

  - Define terminology, collect use cases and scenarios, identify requirements, and analyse the impacts and the gaps with current existing standards and specifications for multi-screen convergence services and applications.

  - Multi-screen capabilities mean having the same content and services available through multiple screens connected via different access technologies (fixed, wireless, mobile) with different network characteristics (e.g. unmanaged/best effort, over broadcast) and potentially utilising a combination of broadcast and broadband in the end user equipment.

  - Also different usage rights may apply.

Interoperable CA/DRM solutions

- The intention is to make an analysis on the architecture, the requirements and the mechanisms for interoperable and exchangeable Conditional Access/Digital Rights Management (CA/DRM) systems, suitable for multimedia platforms in a convergent environment.

- It will cover an overview of existing standards, development of requirements, architecture, mechanisms, reference points and flow charts.

ETSI

- Revised specification of Hybrid Broadcast Broadband TV

  - It includes mainly the support for MPEG DASH (adaptative streaming) which allows adaptation of quality according connexion bandwidth.

- Last revision of MHEG-5

  - Small number of corrigenda identified that will improve the comprehension of the specification.

  - Additional parts to promote co-existence of MHEG with other Connected TV APIs such as HbbTV™, along with an ETSI published MIME type for MHEG.

Cable TV (non DVB)

- A Technical Report assessing potential migration scenarios of cable networks to IPv6 is being prepared.
  - Due to the depletion of the IPv4 address space such a migration is absolutely necessary in a mid-term view.

JTC Broadcast on Digital Radio

- DAB new specifications
  - Revision of the DAB user application "slide show" which describes the protocol required
    - Allows a service provider to deliver a sequence of slides which carry information in the form of images
  - New specification on DAB user application file casting
    - Filecasting allows a service provider to deliver files to an end user with metadata to identify the files
  - New specification on DAB rules of implementation (service information features)
    - A detailed description of the requirements for broadcasters and receiver manufacturers to implement various service information features to ensure interoperability

WHAT IS FORESEEN

- DVB:
  - Believes in terrestrial TV (such as DVB-T2 integrating the mobile TV module) and tries to federate other organisations worldwide e.g. FOBTV (Future Of Broadcast TeleVision) intiative http://www.nercdtv.org/fobtv2012
  - Revision of publications when needed
- Regarding other activities in ETSI TCs:
  - The main focus is on CDN, multi-screen and CA/DRM interoperability
  - Trying to coordinate with other organisations or European projects involved in these topics, to avoid duplication of standards

Digital radio

- Standards, including guidelines,have been produced and are updated when necessary

- The aim is to allow content providers to deliver content in the most efficient way to their audiences along with enhanced interactivity

- Roll-out digital radio across Europe, with the digital receiver profiles providing the first step of unifying the market, continues

Supplementary Slides

Definitions (1)

- **DAB: Digital Audio Broadcasting**
  Method for the digital transmission of radio signals for mobile reception, developed by EUREKA project 147.

- **DAB+:** additional audio codec for 'Digital Audio Broadcasting', based on the new audio coding technology HE-AAC v2 (also known as AAC+ or MPEG-4). DAB+ is backwards compatible to the current DAB standard.

- **DMB: Digital Multimedia Broadcasting**
  Method for the digital transmission of multimedia signals (especially video services) for mobile reception. DMB is part of the same family of standards as DAB and DAB+.

- **DRM: Digital Radio Mondiale**
  Method for the digital transmission of radio signals in traditional spectrum (AM, FM), developed by the DRM Consortium.

- **DTS: Digital Theatre Sound**
  High quality audio like the Dolby Digital system but with a different compression factor.

Definitions (2)

- **DVB-C: Digital cable television**
  The standard is deployed worldwide in systems ranging from the larger cable television networks (CATV) down to smaller satellite master antenna TV (SMATV) systems. DVB-C is also integrated as the physical layer for the European version of DOCSIS, Data Over Cable Service Interface Specification (EuroDOCSIS: ITU J.222.1).

- **DVB-CPCM: Content Protection and Copy Management**
  System for Content Protection and Copy Management of commercial digital content delivered to consumer products. Possible sources for commercial digital content include broadcast (e.g., cable, satellite, and terrestrial), internet-based services, packaged media, and mobile services, amongst others.

- **DVB-GEM: Globally Executable MHP**
  DVB open middleware specification which enables the deployment of interactive applications over broadcast and broadband networks as well as for Blu-ray discs. It is based on Java and offers a platform-independent application execution environment, which is used to create interactive content for different devices and markets.

Definitions (3)

- **DVB-H: Broadcasting to Handheld**
  Digital Terrestrial Mobile TV; extension of DVB-T with some backwards compatibility. Technical specification for the transmission of digital TV to Handheld receivers such as mobile telephones and PDAs.

- **DVB-IPDC: Internet Protocol Datacast**
  Complete Specifications for the Delivery of Mobile TV Services. DVB-IPDC is a set of systems layer specifications which defines what is delivered, how it is delivered, how it is described, and how it is protected.

- **DVB-MHP: Open Middleware for Interactive TV**
  Collective name for a compatible set of middleware specifications developed by the DVB Project. MHP was designed to work across all DVB transmission technologies.

- **DVB-RCS: Return Channel Satellite**
  Defines a complete air interface specification for two-way satellite broadband VSAT (very small aperture terminal) systems. DVB-RCS provides users with the equivalent of an ADSL or cable Internet connection, without the need for local terrestrial infrastructure

Definitions (4)

- **DVB-S: Digital Satellite Broadcasting**
  Satellite transmission was the first area addressed by the DVB Project in 1993.

- **DVB-SH: Satellite services to Handheld**
  Mobile TV over advanced Hybrid Satellite/Terrestrial Networks. Transmission system standard designed to deliver video, audio and data services to vehicles and handheld devices; services based on a TDM/OFDM radio interface and derived from the terrestrial broadcast DVB-H radio interface technology.

- **DVB-T: Digital Terrestrial TV**
  Flexible system that allows networks to be designed for the delivery of a wide range of services, from HDTV to multichannel SDTV, fixed, portable, mobile, and even handheld reception

- **DVB-T2**
  DVB-T2 introduces the latest modulation and coding techniques to enable highly efficient use of valuable terrestrial spectrum for the delivery of audio, video and data services to fixed, portable and mobile devices.

- **Media Forward Link Only**
  It is a technology to transmit data to portable devices such as cell phones and PDAs, used for mobile TV.

Main ETSI published deliverables (1)

- Access, Terminals, Transmission and Multiplexing (ATTM); Third Generation Transmission Systems for Interactive Cable Television Services - IP Cable Modems (Multipart EN 302 878)

- Radio Broadcasting Systems; Digital Audio Broadcasting (DAB) to mobile, portable and fixed receivers (EN 300 401)

- Digital Audio Broadcasting (DAB); Transport of Advanced Audio Coding (AAC) audio (TS 102 563)

- Digital Audio Broadcasting (DAB); Data Broadcasting - MPEG-2 TS streaming (TS 102 427)

- Digital Audio Broadcasting (DAB); DMB video service; User application specification (TS 102 428)

- Digital Audio Broadcasting (DAB); Guide to DAB standards; Guidelines and Bibliography (TR 101 495)

- Digital Radio Mondiale (DRM); System Specification (ES 201 980; version v3.1.1 corresponds to DRM+)

- Digital Video Broadcasting (DVB); Frame Compatible Plano-stereoscopic 3DTV (DVB-3DTV) (TS 101 547)

Main ETSI published deliverables (2)

- Digital Video Broadcasting (DVB); Frame structure channel coding and modulation for a second generation digital transmission system for cable systems (DVB-C2) (EN 302 769)
- Digital Video Broadcasting (DVB); Content Protection and Copy Management (DVB-CPCM) (TS 102 825 multi-part)
- Digital Video Broadcasting (DVB); Transmission System for Handheld Terminals (DVB-H) (EN 302 304)
- Digital Video Broadcasting (DVB); DVB-H Implementation Guidelines (TR 102 377)
- Digital Video Broadcasting (DVB); IP Datacast: Implementation Guidelines for Mobility; Part 1: IP Datacast over DVB-H (TS 102 611-1)
- Digital Video Broadcasting (DVB); Transport of MPEG-2 TS Based DVB Services over IP Based Networks (DVB-IPTV) (TS 102 034)
- Digital Video Broadcasting (DVB); Guidelines for the implementation of DVB-IP Phase 1 specifications (DVB-IPTV Guidelines) (Multipart TS 102 542)
- Digital Video Broadcasting (DVB); Multimedia Home Platform (MHP) Specification 1.2.2 (DVB-MHP 1.2.2) (TS 102 727)

Main ETSI published deliverables (3)

- Digital Video Broadcasting (DVB); Globally Executable MHP (GEM) Specification 1.3 (including OTT and hybrid broadcast/broadband) (DVB-GEM 13) (TS 102 728)

- Digital Video Broadcasting (DVB); GEM Profile for Plano-Stereoscopic 3DTV (DVB-GEM 3D API) (TS 101 600)

- Digital Video Broadcasting (DVB); Interaction channel for satellite distribution systems (DVB-RCS) (EN 301 790)

- Digital Video Broadcasting (DVB); Second Generation DVB Interactive Satellite System (DVB-RCS2) (Multipart: TS 101 545-1&3, EN 301 545-2)

- Digital Video Broadcasting (DVB); IP Datacast: Implementation Guidelines for Mobility; Part 2: IP Datacast over DVB-SH (TS 102 611-2)

- Digital Video Broadcasting (DVB); Framing Structure, channel coding and modulation for Satellite Services to Handheld devices (SH) below 3 GHz (EN 302 583)

- Digital Video Broadcasting (DVB); DVB-SH Implementation Guidelines (TS 102 584)

Main ETSI published deliverables (4)

- Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for 11/12 GHz satellite services (DVB-S) (EN 300 421)

- Digital Video Broadcasting (DVB); Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications (DVB-S2) (EN 302 307)

- Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems (EN 300 468)

- Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for digital terrestrial television (DVB-T) (EN 300 744)

- Digital Video Broadcasting (DVB); Implementation guidelines for DVB terrestrial services; Transmission aspects (TR 101 190)

- Digital Video Broadcasting (DVB); Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2) (EN 302 755)

Main ETSI published deliverables (5)

- Forward Link Only Air Interface; Specification for Terrestrial Mobile; Multimedia Multicast (TS 102 589)
- Hybrid Broadcast Broadband TV (TS 102 796)
- Media Content Distribution (MCD); MCD framework; Part 1: Overview of interest areas (TR 102 688-1)
- Media Content Distribution (MCD); MCD framework; Part 2: Views and needs of content providers (TR 102 688-2)
- Media Content Distribution (MCD); MCD framework; Part 3: Regulatory issues, social needs and policy matters (TR 102 688-3)
- Media Content Distribution (MCD); MCD framework; Part 8: Audience Measurement (TR 102 688-8)
- Media Content Distribution (MCD); 3D Gaming Graphics Delivery Overview (TR 102 794)
- Media Content Distribution (MCD); Programme guide information distribution, situation and perspective (TR 102 988)

Main ETSI published deliverables (6)

- Media Content Distribution (MCD); Subtitles distribution, situation and perspectives (TR 102 989)

- MHEG-5 Broadcast Profile (ES 202 184)

- Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Peer-to-peer for content delivery for IPTV services: analysis of mechanisms and NGN impacts (TR 182 010)

- Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Content Delivery Network (CDN) Architecture (TS 182 019)

- Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IPTV Architecture; IPTV functions supported by the IMS subsystem (TS 182 027)

- Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN integrated IPTV subsystem Architecture (TS 182 028)

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