Welcome to the World of Standards

ETSI

World Class Standards

ETSI MOBILE BROADCAST

Presented by Adrian Scrase, ETSI IPP VP for ETSI Workshop in Georgia – May 2012

ETSI and 3GPP ACTIVITIES

- JTC BROADCAST
  - Joint Technical Committee between EBU, CENELEC and ETSI since more than 15 years
  - Delivers standards for mobile broadcast technologies such as:
    - DVB-H, DVB-SH, DVB-T/T2
    - DMB
    - DAB/DAB+
    - DRM/DRM+
    - Media Forward Link Only
  - Input directly from DVB and from ETSI Members involved in forum such as WorldDMB, DRM ...
- TC SES has delivered a European multipart standard on Satellite Digital Radio (SDR) physical layer
- 3GPP Working Groups have defined MBMS

MAIN STANDARDS PUBLISHED UP TO NOW

Main JTC Broadcast standards published on Mobile TV (1)

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- DVB-H: Transmission System for Handheld Terminals
- DVB-SH: Hybrid mode terrestrial/satellite for handled devices
  - It delivers video, audio and data services to vehicles and handheld devices.
  - Last revisions define the framing structure, channel coding and modulation for Satellite Services to Handheld devices (SH) below 3 GHz and add new features such as low latency
- Implementation Guidelines for DVB-H and DVB-SH

# Main JTC Broadcast standards published on Mobile TV (2)

- DVB-T: Digital TV Terrestrial system allowing portable, mobile, and even handheld reception
- DVB-T2: with latest modulation and coding techniques it improves the use of terrestrial spectrum for the delivery of audio, video and data services
  - Last revision of DVB-T2 (v1.3.1): a mixed mode introducing « T2-Lite profile »
  - « T2-Lite profile »: allows simpler receiver implementations for very low capacity applications such as mobile broadcasting. May also be received by conventional stationary receivers.
- Forward Link Only Air interface: multimedia multicast
- DMB: supports Mobile TV and Digital Radio

3GPP MBMS Activities

- 3GPP defined MBMS over mobile in UMTS Release 6 (frozen in 2005) and keeps improving this feature since then
  - 3GPP MBMS architecture enables the efficient usage of radio-network and core-network resources, with an emphasis on radio interface efficiency
  - Initial 3GPP architecture:
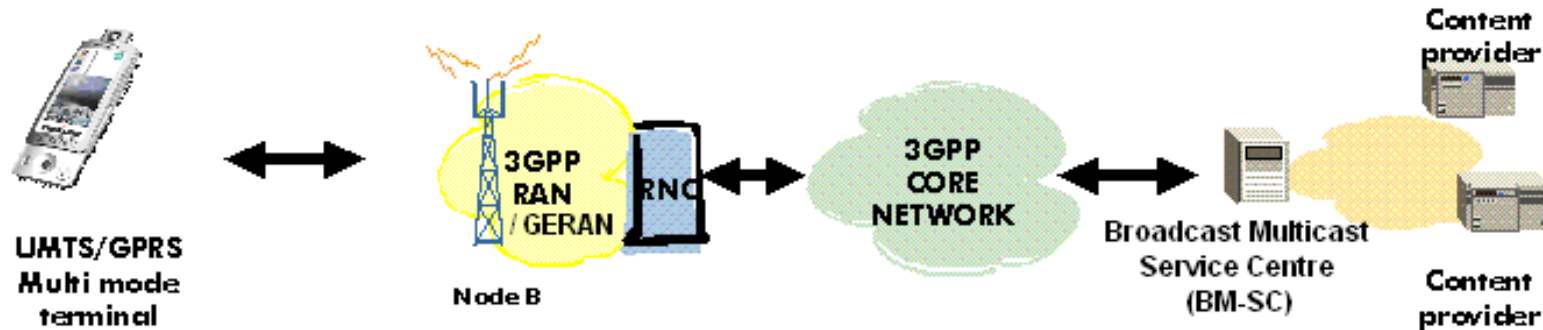
  - Since then, the architecture has evolved as to take into account several improvements (e.g. Improved Video Support, optimized Mobile TV, Service continuity, etc) and interactions with other 3GPP evolutions (e.g. LTE, IMS, etc)

3GPP MBMS evolutions from Rel 8 to Rel 10

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- Rel 8:
  - IMS initiated and controlled PSS and MBMS User Service, led by SA4, impacting TSs 26.237, 26.234, 26.346, 33.246
  - Extending PSS and MBMS User Services for optimized Mobile TV, led by SA4, impacting TSs 26.234, 26.346, 26.946
- Rel 9:
  - MBMS support in EPS/LTE (impacting several TSs)
  - PSS and MBMS extensions , led by SA4, impacting TSs 26.234, 26.346
  - Improved Video Support for PSS and MBMS , led by SA4, impacting TSs 26.234, 26.244, 26.346, new 26.903
  - IMS based PSS and MBMS User Service extensions , led by SA4, impacting TS 26.237
- Rel 10:
  - Optimization of IMS based PSS and MBMS User Service , led by SA4, impacting TS 26.237
  - PSS and MBMS enhancements , led by SA4, impacting TSs 26.234, 26.346
  - Service continuity in connected mode and location information for MBMS for LTE, led by RAN2 (impacting several TSs)
  - Further enhancements to MBMS for LTE , led by RAN2 (impacting several TSs)

3GPP IMB

- 3GPP IMB (Rel 8):
  - Introduced in Rel-8, "IMB" stands for "Integrated Mobile Broadcast" or, in full, "3.84 Mcps TDD MBMS over a Single Frequency Network (MBSFN) IMB", formerly known as Downlink Optimized Broadcast (DOB)
  - It allows the use of the TDD spectrum (to date, widely unused by the operators) for deployment of broadcast applications, as to offer capacity relief to the FDD channels
  - Alignment with FDD WCDMA is maximised as to allow for simple multimode terminals and to offer smooth handover between IMB and FDD.
  - IMB can be used for all "classical" broadcast services, e.g. interactive TV, podcasting, public safety alerts, etc
  - No further standardization since Rel-8

CURRENT ACTIVITIES

JTC Broadcast on Mobile TV

- 🌐 **DVB-NGH (Next Generation Handled)**
  - Hybrid profile: terrestrial and/or satellite
  - System characteristics: improve performance in mobile/portable environments at reasonable complexity and reduce overhead
- 🌐 **Revision of DVB-T2 Guidelines to reflect changes in v1.3.1 of DVB-T2 (e.g. « T2-Lite profile »)**

3GPP

- **Rel 11:**
  - Radio Improvements lead by RAN2 and RAN3 on Service continuity, counting improvements and location information for MBMS for LTE
  - SA4 has started working on EMM (Enhancements to Multimedia: PSS, MMS, and MBMS Enhancements and Performance Improvements)
    - Among aspects to be improved:
      - video codec
      - Service continuity
      - MBMS application layer FEC
      - Mechanism for optimization of battery life
      - Streaming
    - 10% -15% of the work completed
    - Present target date is September 2012

WHAT IS FORESEEN

Mobile TV

- DVB and 3GPP are pursuing parallel paths, on one side DVB-NGH (Next Generation Handled), on the other side MBMS

- DVB standards regularly revised when appropriate

Supplementary Slides

Definitions (1)

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- **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.

- **DRM+**
  Extension of DRM's frequency range to include the lower VHF band (i.e. below 174 MHz) allowing operation in Bands I and II.

Definitions (2)

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- **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-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.

Definitions (3)

- **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**
  This system 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.

- **FEC MBMS**
  Forward Error Correction for Reliable e-MBMS transmissions in LTE Networks.

- **MBMS**
  Multimedia Broadcast Multicast Services.

- **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)

- 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 Audio Broadcasting (DAB); MOT Slide Show; User Application Specification (TS 101 499)

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

- Digital Video Broadcasting (DVB); Transmission System for Handheld Terminals (DVB-H) (EN 302 304)

Main ETSI published deliverables (2)

- 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); 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)

- 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)

Main ETSI published deliverables (3)

- Digital Video Broadcasting (DVB); Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2) (EN 302 755)
- W-CDMA Radio Interface for Multimedia Broadcast/Multicast Service (MBMS) (ETSI TS 125 306)
- Forward Link Only Air Interface; Specification for Terrestrial Mobile; Multimedia Multicast (TS 102 589)
- Satellite Earth Stations and Systems (SES); Satellite Digital Radio (SDR) Systems (Multipart EN 302 550)

Main ETSI published deliverables (4)

ETSI

- ETSI Technical Specifications resulting from 3GPP TS on MBMS (to obtain corresponding 3GPP TS numbers, remove the initial "1" and change the space into a dot):
  - Multimedia Broadcast/Multicast Service (MBMS) user services; Stage 1 (TS 122.246)
  - MBMS Architecture and functional description (TS 123.246)
  - Introduction of the MBMS in the Radio Access Network; Stage 2 (TS 125.346)
  - MBMS synchronisation protocol (SYNC) (TS 125.446)
  - IP Multimedia Subsystem (IMS) based Packet Switch Streaming (PSS) and MBMS User Service; Protocols (TS 126.237)

Main ETSI published deliverables (5)

ETSI

- ETSI Technical Specifications resulting from 3GPP TS on MBMS (to obtain corresponding 3GPP TS numbers, remove the initial "1" and change the space into a dot):
  - MBMS Protocols and codecs (TS 126.346)
  - MBMS charging (TS 132.273)
  - General aspects and principles for interfaces supporting MBMS within Evolved Universal Terrestrial Radio Access Network (E-UTRAN) (TS 136.440)
  - Layer 1 for interfaces supporting MBMS within E-UTRAN (TS 136.441)
  - Signalling Transport for interfaces supporting MBMS within E-UTRAN (TS 136.442)
  - MBMS in the GERAN; Stage 2 (TS 143.246)

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Thank you!