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Multimedia processing **Display** processing

LTE modern

# Multicast, DASH and 5G

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### MBMS/LTE eMBMS/enTV History

Building upon a strong 3GPP technology foundation



**Terrestrial broadcast for next-gen digital TV delivery** enTV<sup>1</sup> – part of 3GPP Rel-16 – meets terrestrial TV broadcast requirements

#### Radio access enhancements



- ~15km ISD (optimized for higher speeds, e.g. audio)
- 50km ISD+ (rooftop reception, limited outdoor depending on Tx power)

System layer enhancements

• 250km ISD (TBC)

### **ETSI JTC Broadcast**

ETSI TS 103 720: 5G Broadcast System for linear TV and radio services

- A single overview and system specification that profiles and restricts existing 3GPP specifications in the context of 5G in order to enable the deployment of linear TV and radio services.
- The work item is aligned with ongoing 3GPP standardization work, in particular the "LTE-based 5G terrestrial broadcast

#### Main features

- radio network comprising only MBMS-dedicated cells as transmitters;
- Receive-Only-Mode (ROM) devices and UEs supporting FeMBMS [x23.246] as receivers;
- A down-stripped EPS dedicated to TV and Radio Services with E-UTRAN;
- A down-stripped MBMS User Service [x26.346] dedicated to TV and Radio Services;
- A set of MBMS-APIs [x26.347] that permits to use third-party service layers.



### **Rel-17 Multicast Broadcast Considerations**

#### LTE MBMS

### 5G Mixed Mode

#### Multiple Services Targeted **Initial Service Targeted** C2VX, public safety, I-IoT, IP Multicast Video Content and Streaming Multiple Services with different characteristics Focus on one type of service Common Transport/Separate Service Layer Joint Transport/Service Layer Service have unicast and broadcast components Service independent of unicast Transport integrated with 5GS unicast Separate core network Enable high reliability + low latency Service oriented architecture Functionality provided at the transport • Functionality at the core network RAN Reliability, unicast/Broadcast decision Reliability, unicast/Broadcast decision Security: encryption at either RAN or UPF Security also on application layer Transport oriented architecture Service oriented architecture Flow identified by MB-QoS flow ID • Flow identified by TMGI (service) Maps to Radio Bearer in RAN Maps to MBMS bearer



## Low-Latency and Multicast

Low-Latency DASH output

- CMAF Chunks are aggregated into Segments
- How to signal presence and position of Random Access in Segments on MPD level?

How to map this to ROUTE Sending?

- Fragments start a new object
- Random Access Chunks may be be signalled on ROUTE level



### More fun ...





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## Thank you!



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