

3GPP SA2#112

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3GPP SA2: Enhancements to eMBMS for TV Video Service

QUALCOMM®



Background

- SA1 has worked on studying requirements for eMBMS improvements (SID: [SP-150255](#), TR [22.816](#)) to support TV service (including linear TV, Live, Video on Demand and also smart TV, and managed and OTT content).
- Key factors to successful use of eMBMS for TV services are:
 1. Capacity/Coverage (In RAN WGs Realm)
 2. Service layer enhancements (In SA4 Realm)
 3. Enabling new deployment scenarios/business opportunities (SA2)
 - Decoupled eMBMS content, service, and transport
 - Shared Broadcast services among multiple MNOs
 - Simultaneous use of any LTE services from one network and TV service from another network

Motivation – Changing Landscapes (1)

- Changing Landscape for Video and Digital TV consumption:
 - Consumption of **live** and **interactive** content is increasing in mobile devices...and **smart TVs (a.k.a. connected TVs)** is being widely adopted among consumers.
 - More than **70%** of mobile traffic is expected to be video by 2018
 - It was already more than 53% in 2013
 - Trends in mobile devices and traditional linear content
 - More than **50%** of users watch video clips that last **30 minutes** or more (**longer clips**)
 - Increasing consumption of **live video** clips
 - Content viewed **on-the-go** ⇔ **mobility** is key
 - High quality **on-demand** services ⇔ **smart** TVs
 - Increased consumer need for TVs to be connected and watch movies on Tablets anywhere.

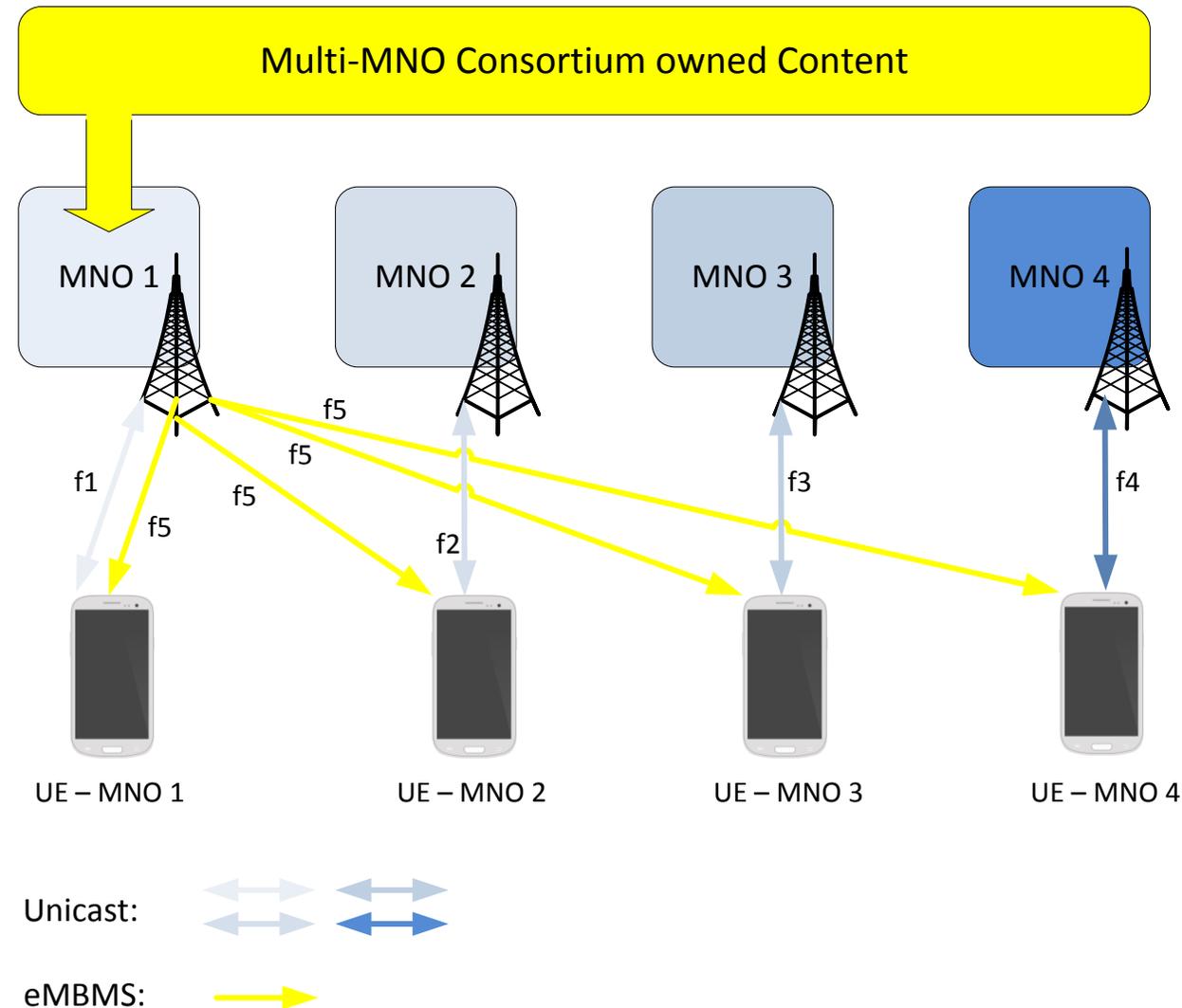
Motivation – Changing Landscapes (2)

- Changing Landscape in EU Regulations
 - EU regulatory bodies are creating a more **mobile friendly** broadcast framework
 - UHF 700 MHz band is currently licensed to and used by TV broadcasters
 - 694-790 MHz ⇔ Digital Terrestrial TV (DTT) uses DVB-T
 - 470-694 MHz ⇔ Used by broadcasters, to be repurposed
 - European Commission initiated industry-wide consultations about the future of this band
 - Proposals on the table call for
 - Traditional HPHT broadcasting services to be **phased** out
 - To be **replaced** with LTE-based cellular DTV broadcast
 - Higher efficiency of cellular DTV broadcast opens up **new unicast spectrum** for MNOs
 - Phase out rate and model depends on level of demand

New partnership opportunities – Example 1

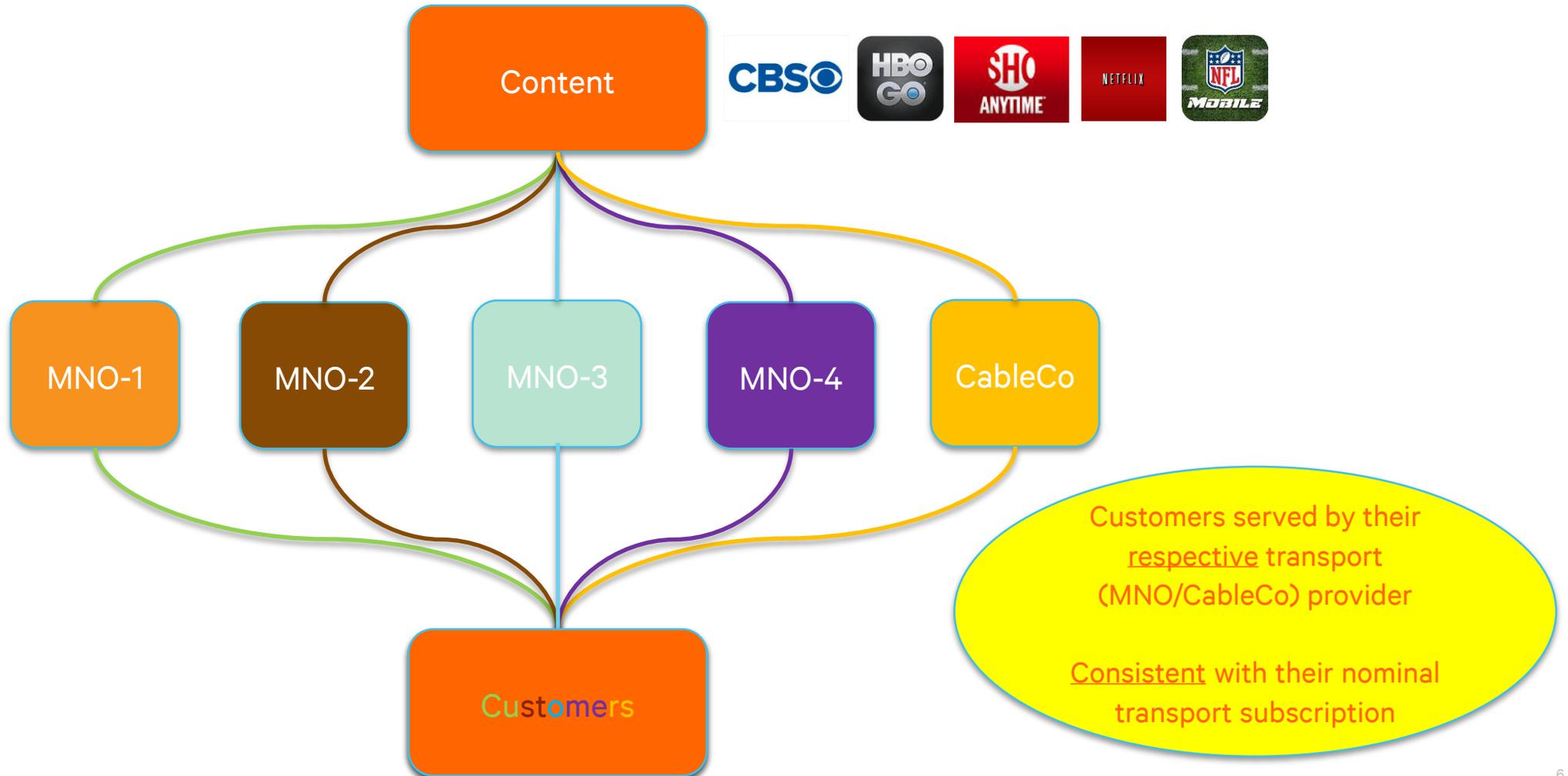
- Shared content ownership across multiple MNOs

- Assumes only UEs with valid SIM from participating MNOs are able to receive service
- UEs from MNO 1 receive both unicast and eMBMS service from MNO 1.
- UEs from MNOs 2,3,4 receive unicast service from MNO 2,3,4 respectively, and eMBMS from MNO 1.
- eMBMS frequency band f_5 could be either owned by MNO1 or shared broadcast spectrum.



New Partnership Opportunities – Example 2

- Enable Content Providers to Partner with multiple MNOs
 - Users can access content regardless of transport subscription



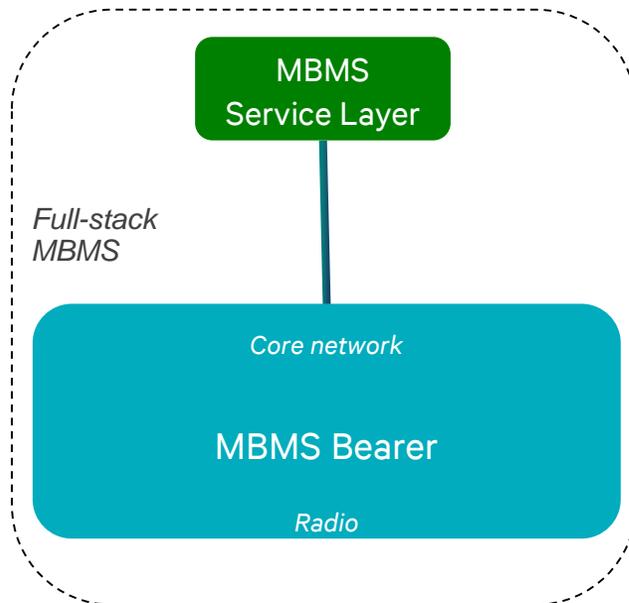
SA2 goals: Provide System Architecture Enablers for new Scenarios

- Pre-Rel12

“MBMS” is a full stack vertical => usage of the MBMS transport implies usage of the MBMS service layer (framing, security, encapsulation, etc)

3rd party

MNO



- Rel12

MBMS transport “opened up”, as an option, to *Public Safety* applications without going through the MBMS Service Layer



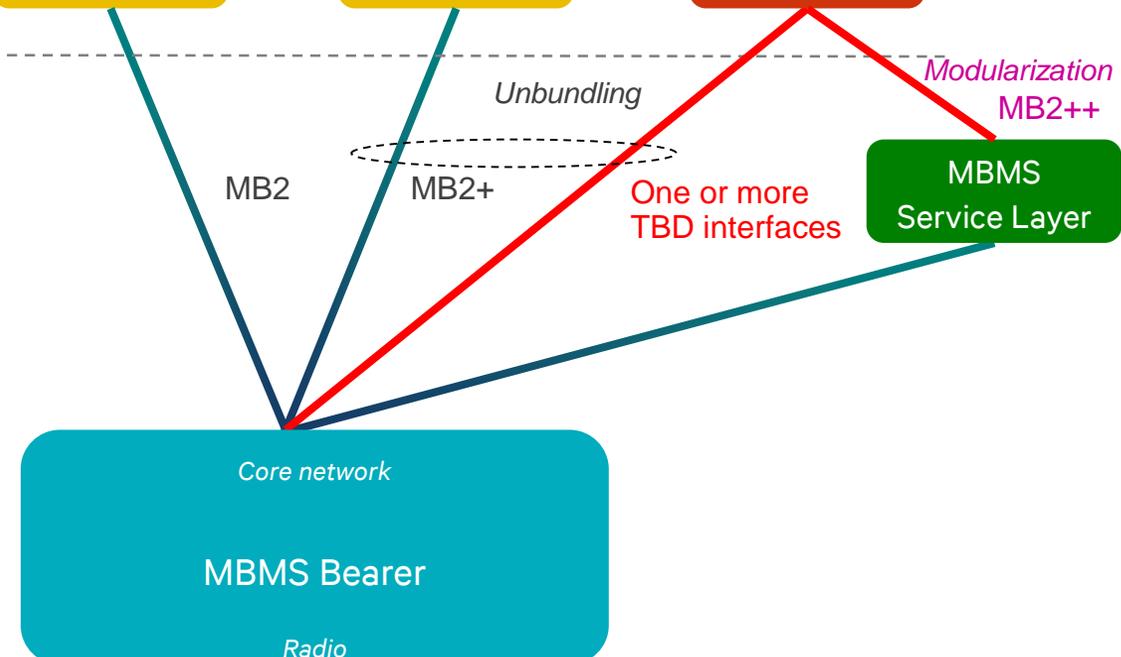
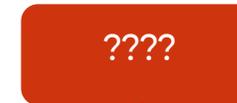
- Rel13

Same for *GROUP E* (eg direct access from SCEF to MBMS transport)



- Rel14

Open up options for direct access to MBMS transport, as well as modularized usage of MBMS service layer for flexible support of TV/Video service delivery use cases



NOTE: corresponding architecture exists in the UE (not displayed for simplicity), i.e. “MB2” or its variants correspond to “APIs” from “apps” into modem functionalities

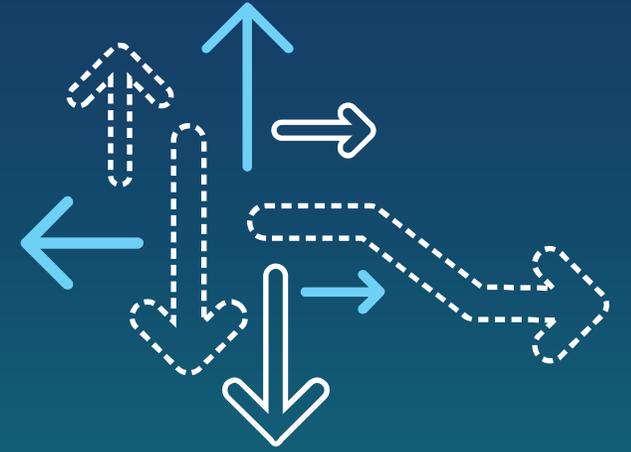
SA2 goals: enhance eMBMS for various service models

	MBMS/no UICC e.g. unconnected TV	MBMS/UICC e.g. connected/smart TV	Unicast/no UICC e.g. unconnected TV	Unicast/UICC e.g. connected/smart TV
Free-to-air	Requires Enhancements	Requires Enhancements	Lots of changes (out of scope)	Would need change to preserve anonymity
Free-to-view	Requires Enhancements	Requires Enhancements	N/A	Existing procedures
MNO Subscribed or OTT	Requires Enhancements	Requires Enhancements	N/A	Existing procedures

SA2 study proposal

- Enable decoupled content, service, and transport
 - eMBMS may only be served as a transport to accelerate eMBMS utilization
 - Flexible use of MBMS Service Layer (not all or nothing as is right now)
- Enable eMBMS receive only devices
- Allow Video/TV services over eMBMS to devices:
 - With no subscription (for Free TV – EU use case)
 - With content/3rd party service provider subscription only
- Shared Broadcast Services amongst multiple MNOs:
 - Enable content sent over eMBMS channel in a shared spectrum as SCell or Standalone Pcell
 - SA2 to focus on eMBMS System Architecture enhancements to enable such scenarios.

Annex



Expected Complementary Study in SA4 (separate study)

- Modular design of MBMS service layer to use subset of functionalities including
 - Network-side interfaces and APIs
 - Client-side decomposition including APIs and Web-friendly access methods
- Integration of different service layer concepts
 - BMSC/MBMS-centric service layer concept
 - TV Application Layer centric service layer concept
- Flexible combination of unicast and broadcast distribution for service and transport enhancement
- Integration of existing service layers to 3GPP transport delivery
- TV Service Layer Aspects:
 - Service Announcement and Discovery
 - Generic Service Layer functionalities (Reporting)
 - TV-centric codecs and transport formats
 - Multi-service offerings (multiplexing, channel change, etc.)
 - Metadata and Accessibility aspects
 - DRM and Security Aspects (possibly in combination with SA3)
 - Targeted and flexible ad insertion concepts

Decoupling Content and Transport

Subscription	DL and/or UL	Additional radio access technologies
Cellular subscription	DL only	eMBMS only (no unicast)
Content Subscription	DL + UL	+ Wi-Fi
No Subscription		+ LTE (incl. LAA)

Provisioning	eMBMS Service protection	Content Protection
Embedded in device	Disabled	Protected
Offline provisioning	Enabled – (Applies only to cellular subscription)	Unprotected
Online provisioning		

Flexible Use Cases

Example 1: Free-to-air DTV

Subscription	DL and/or UL	Additional radio access technologies
Cellular subscription	DL only	eMBMS only (no unicast)
Content Subscription	DL + UL	Wi-Fi
No Subscription		LTE (incl. LAA, LTE-U)

Provisioning	eMBMS Service protection	Content Protection
Embedded in device	Disabled	Protected
Offline provisioning	Enabled – (Applies only to cellular subscription)	Unprotected
Online provisioning		

Free-to-air DTV

Example 2: Interactive Digital TV

Subscription	DL and/or UL	Additional radio access technologies
Cellular subscription	DL only	eMBMS only (no unicast)
Content Subscription	DL + UL	+ Wi-Fi
No Subscription		+ LTE (incl. LAA)

Provisioning	eMBMS Service protection	Content Protection
Embedded in device	Disabled	Protected
Offline provisioning	Enabled – (Applies only to cellular subscription)	Unprotected
Online provisioning		

Interactive DTV