DASH/ HLS Hybrid service

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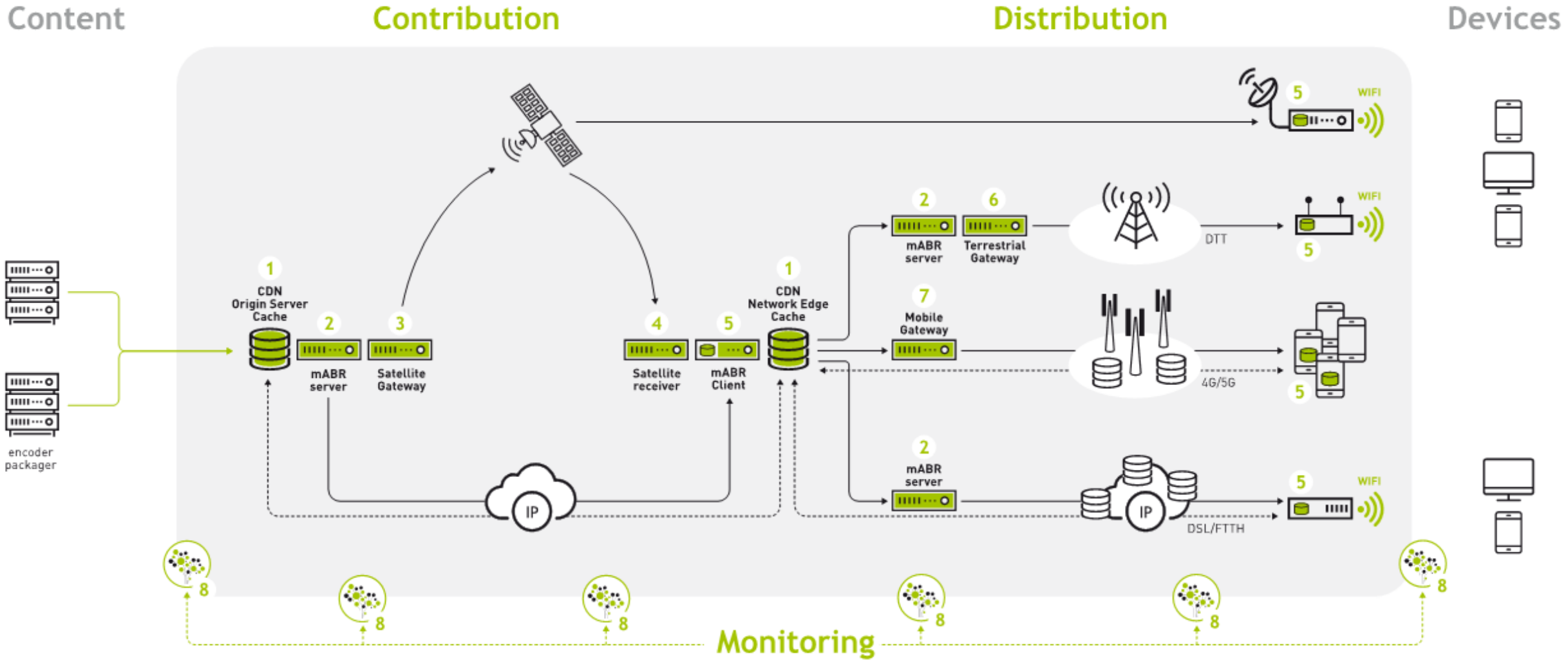


Delivery Servers

1/CDN Caches*

- Live TV and on-demand
- Load balancing
- Cache management
- Scalable and Virtualized
- HLS / DASH / CMAF

*partner servers

2/MediaCast OTT server

- Stream OTT in multicast
- Switch dynamically
- Gather audience logs
- Gather QoS logs
- Compliant DVB / 3GPP

Network Gateways

3/SmartGate S2/S2X

- Select and mux OTT services
- MPE / GSE encapsulation
- Mux and Manage DVB-SI
- Transmit over satellite with DVB-S2/S2X

4/Neptune

- Receive OTT services
- MPE/GSE de-encapsulation
- DVB-S2/S2X compliant

6/SmartGate DTT

- DVB-T/T2, ATSC 3.0
- Inject Multicast OTT streams
- IP Encapsulation
- Signalling

7/Expway SmartGate 4G/5G

- Gateway 4G/5G network
- eMBMS and FeMBMS
- Compatible with 5G
- SFN support

Terminal Software

5/MediaCast Agent

- Receive multicast
- Monitor audience
- Monitor quality
- Supports multiple profile
- API controllable

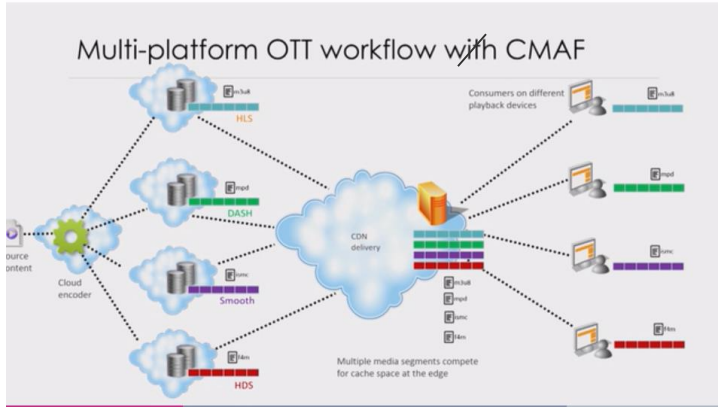
Monitoring Probe

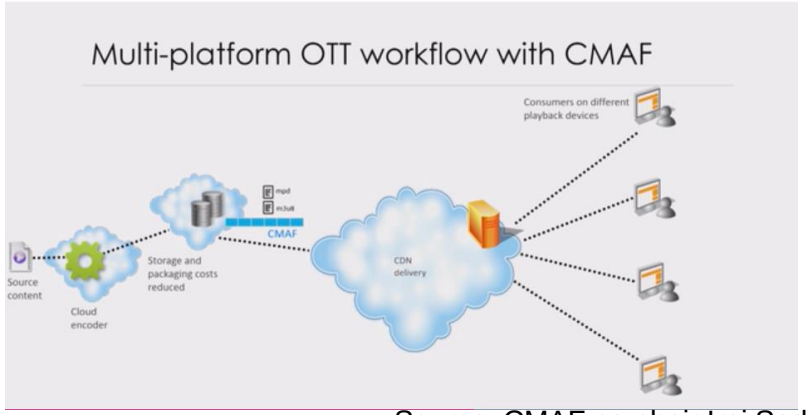
8/TestTree StreamProbe

- Monitor OTT QoS, QoE
- Real-Time detection
- HLS, DASH
- Freeze, Black screen, Audio silent...
- Scalable

Current Context

- **UE Diversity**
  - HLS and DASH are needed
- **Need for abstraction for HLS/DASH.**
- **First part of the answer: CMAF**





Source: CMAF co-chair Iraj Sodagar

DASH / HLS Hybrid Service

- **CMAF unifies segment format, media profiles, timing model..**

- **Next step: How to unify Manifest format ?**
  - without redefining a new manifest format :
    - Be backward compatible with existing HLS, DASH player

DASH / HLS Hybrid Service

- **3GPP has defined a new Work item named DAHOE**
  - A new DASH/HLS Hybrid Service
  - The scope is LTE- Broadcast, Release 16
  - Support: Apple, Enensys, Ericsson LM, Qualcomm Incorporated, Telus

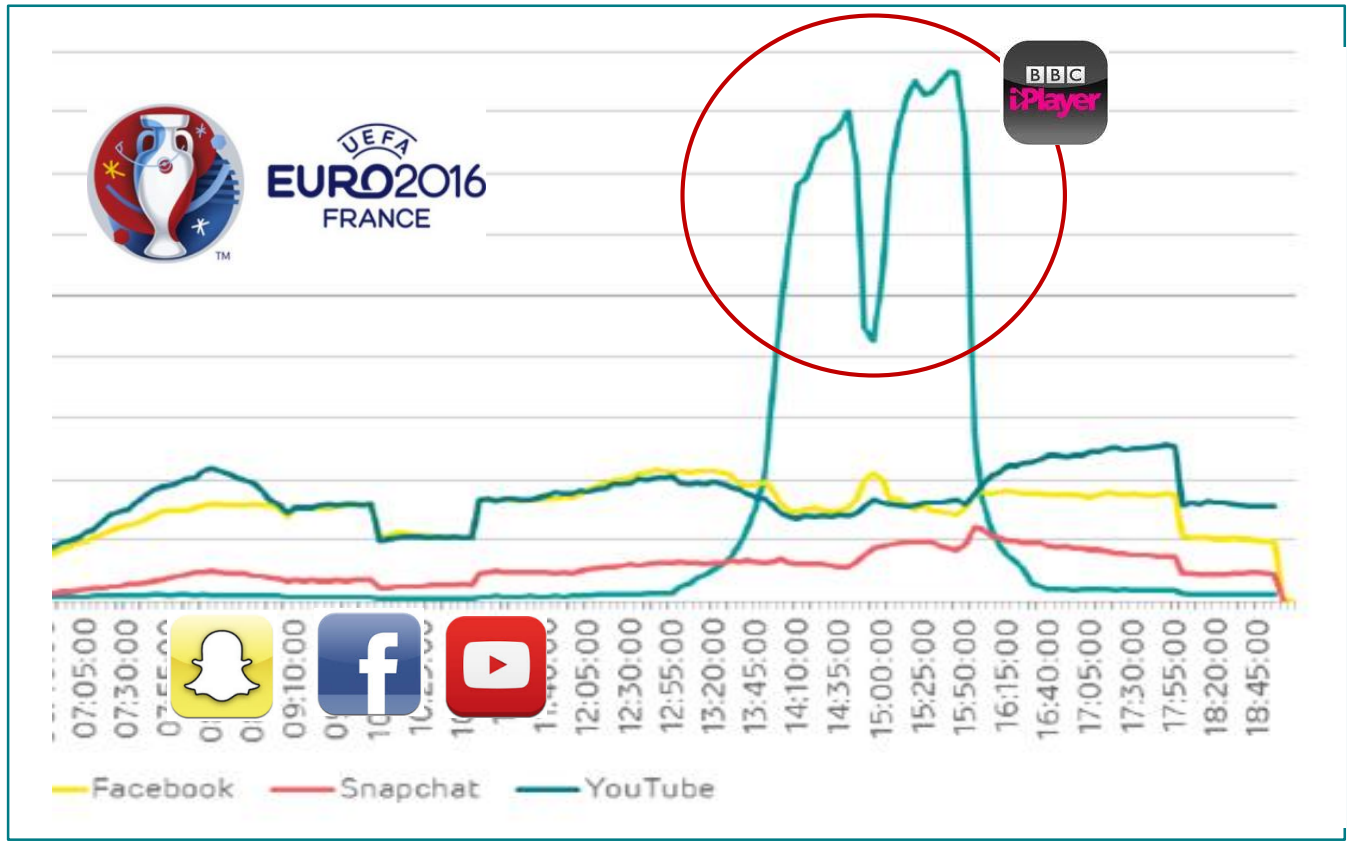
- **Basic Principle:**
  - One segment format based on CMAF
  - DASH / HLS Hybrid services which can be consumed
    - either as a MPEG DASH service
    - or as an HLS service

LTE-Broadcast

Few words

4G Broadcast

Enhances Mobile Networks with Broadcast (eMBMS)



After 3 rebuffering, 78% people quit

Concretely?

Telstra's Results: 6 months after launch!

Faster Start-Up Time

- **eMBMS users** have < 3 secs start-up time
- **Other users** have > 6 secs start-up time

and Better Quality Video

- **eMBMS users** gets 720p (HD) in most cases
- **Other users** gets 576p (SD) at best

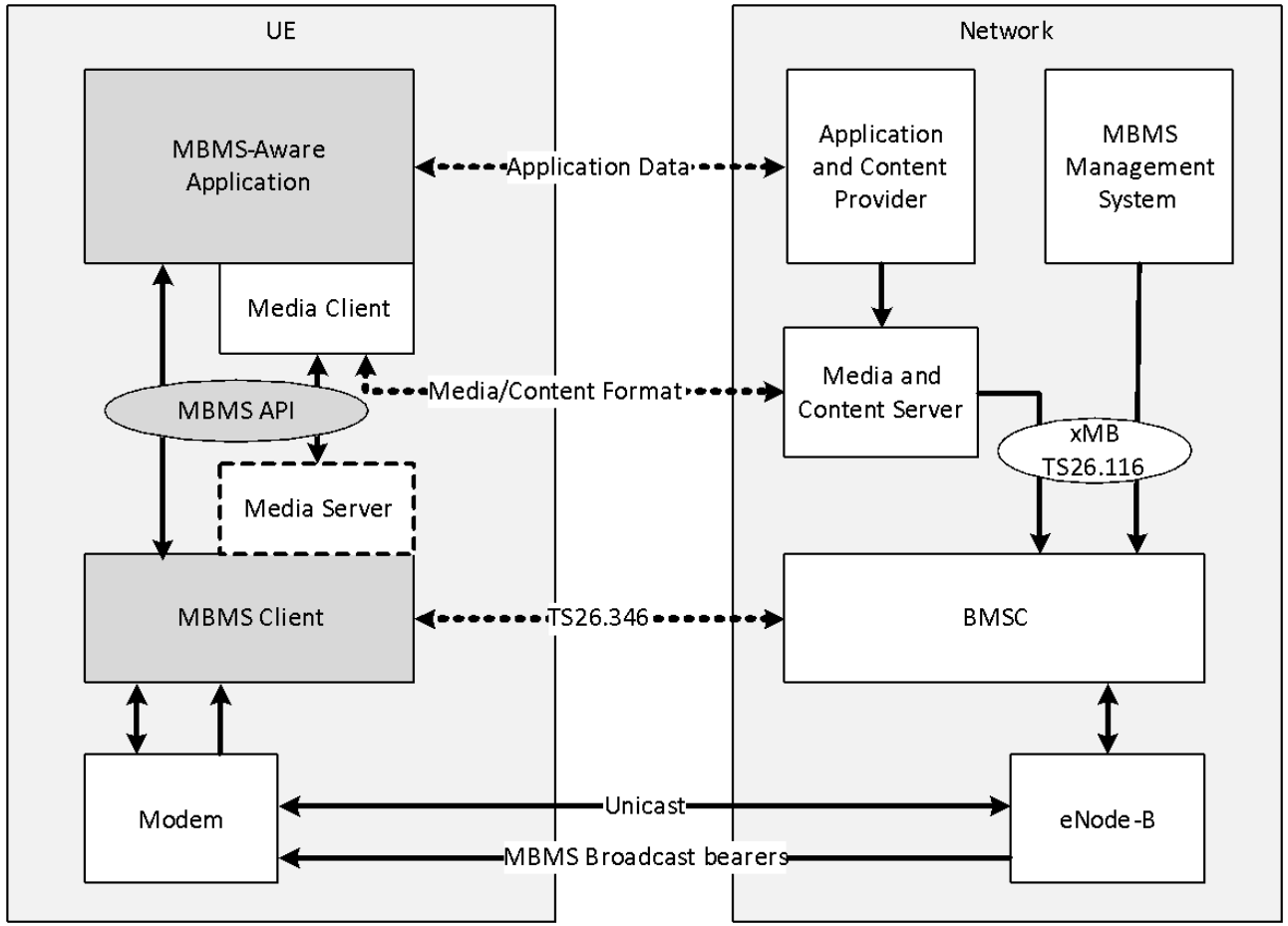
Leads to Longer Users Engagement!

- **+25% more minutes for eMBMS users**

Work item DAHOE: DASH / HLS service

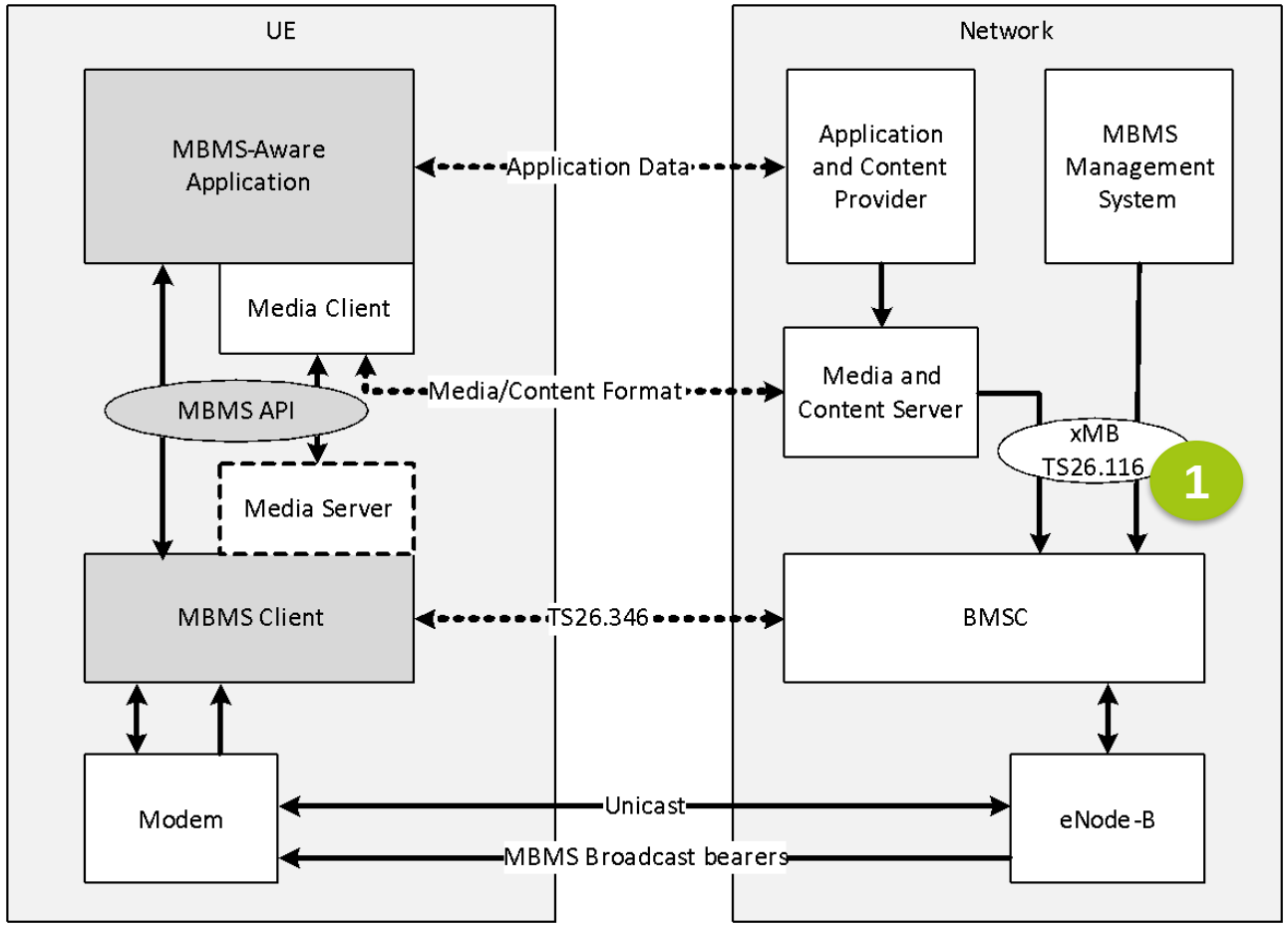
in LTE-Broadcast

Existing LTE B architecture



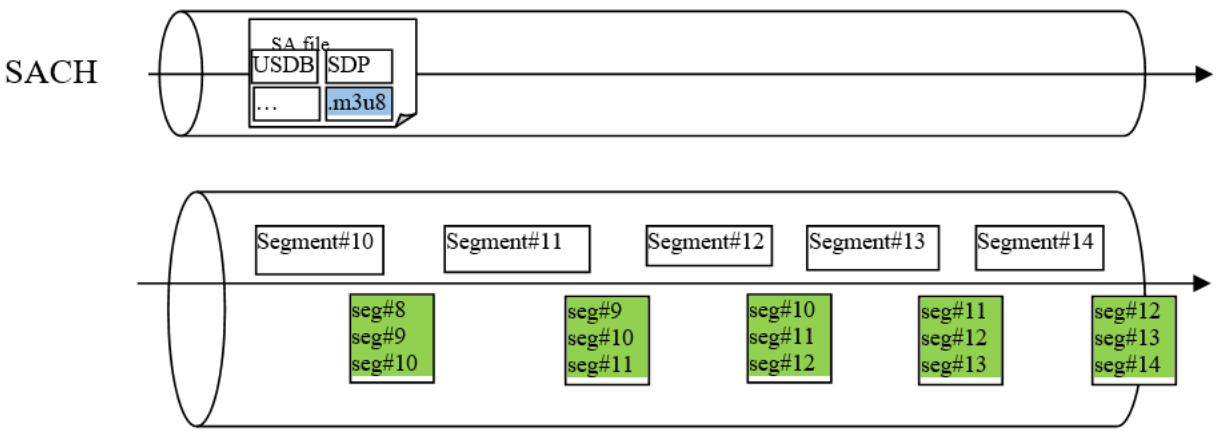
Step 1: Ingestion

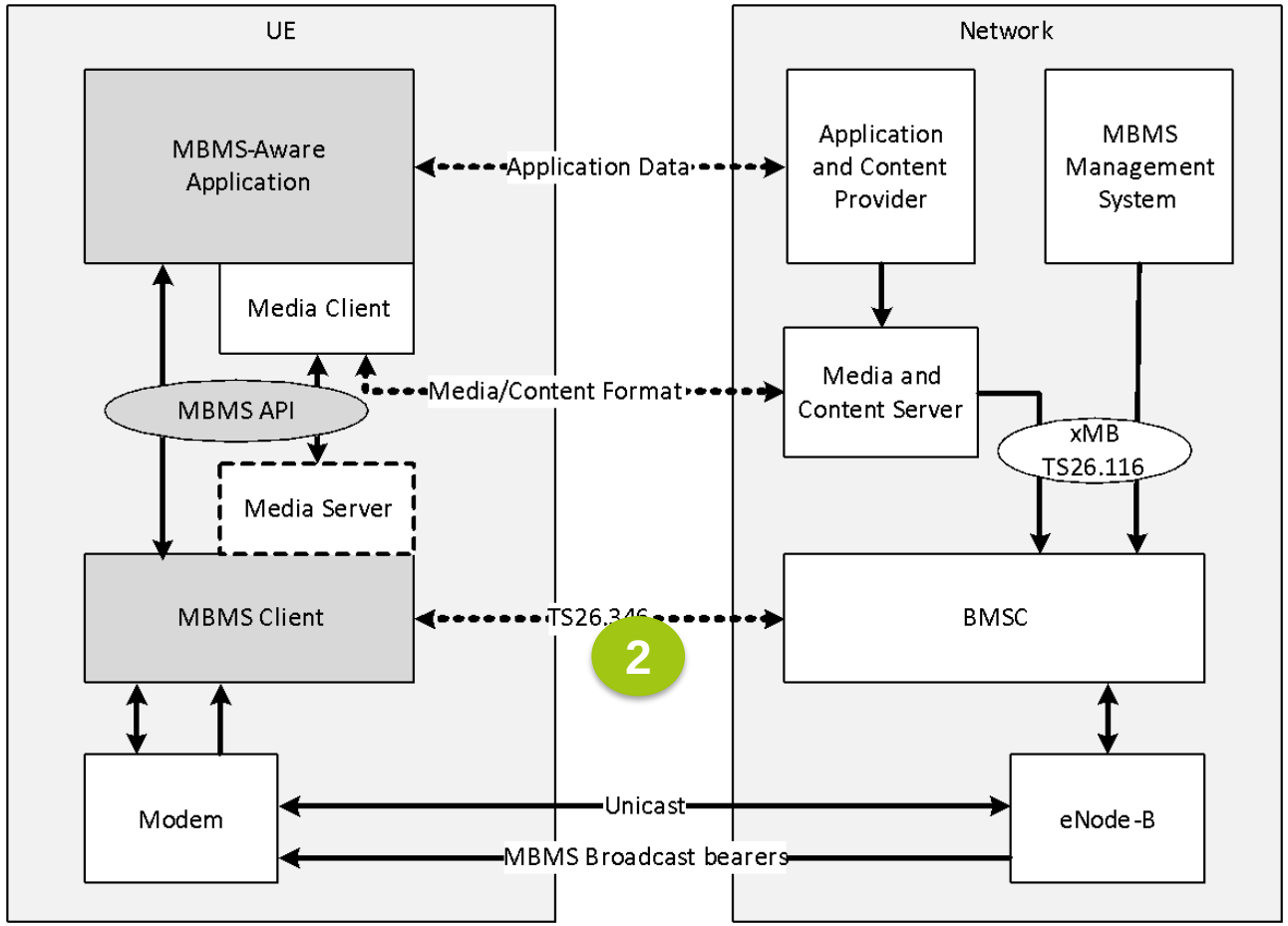
- **Minimize the cost of ingestion**
  - Get the CMAF segment only one time.
- **Based DASH or HLS or Both ?**



Step 2: Transport

- **Metadata which described the different playlists - m3u8 .mpd**
- **Segment are carried in an unique transport mechanism**





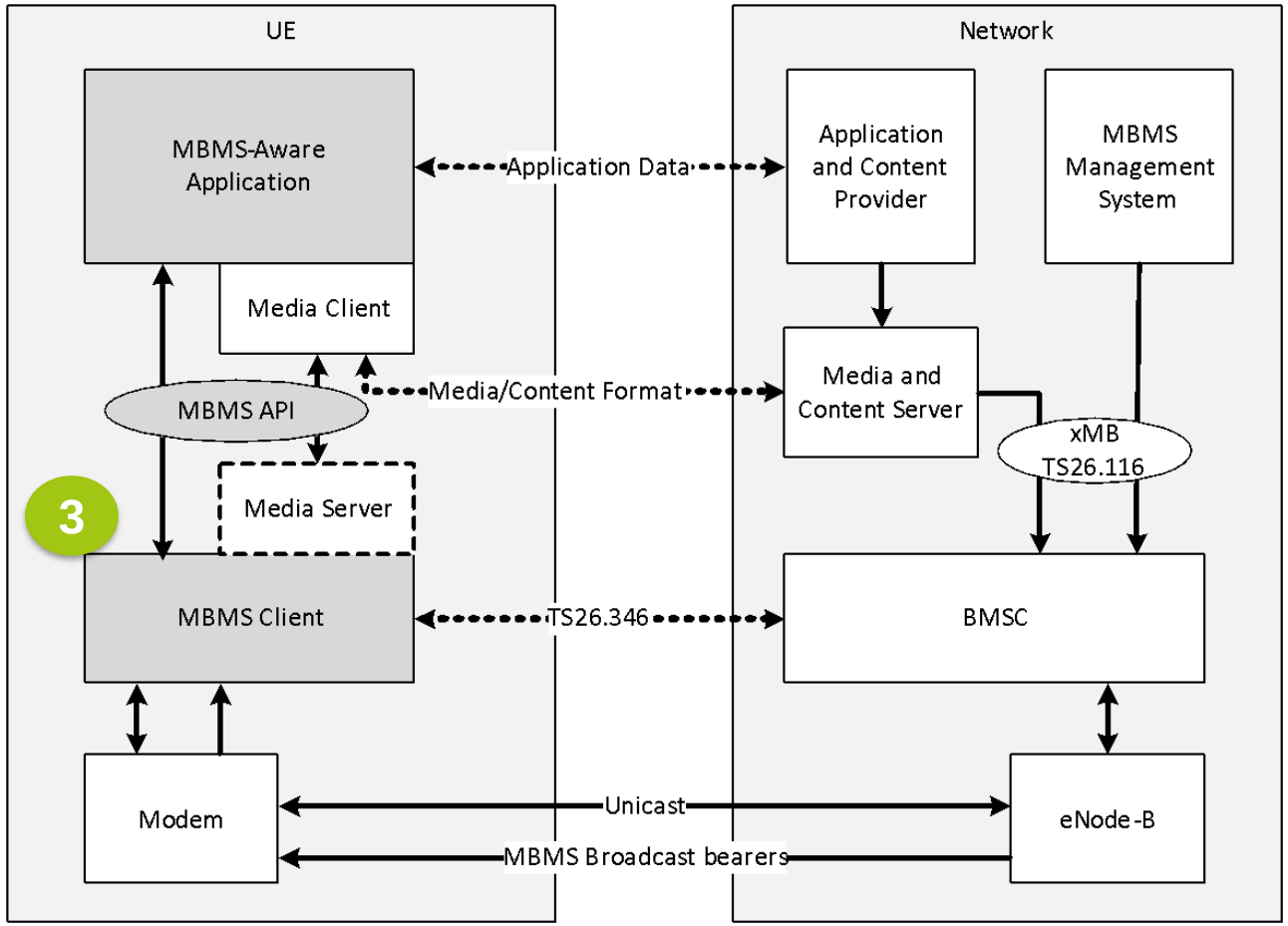
Step 3: User Equipement Side

- **An application can select which mode will be used – DASH or HLS**

- **Other option being discussed**
  - Playlist creation at the MBMS client.
    - From m3u8 to MPD.
    - From MPD to m3u8

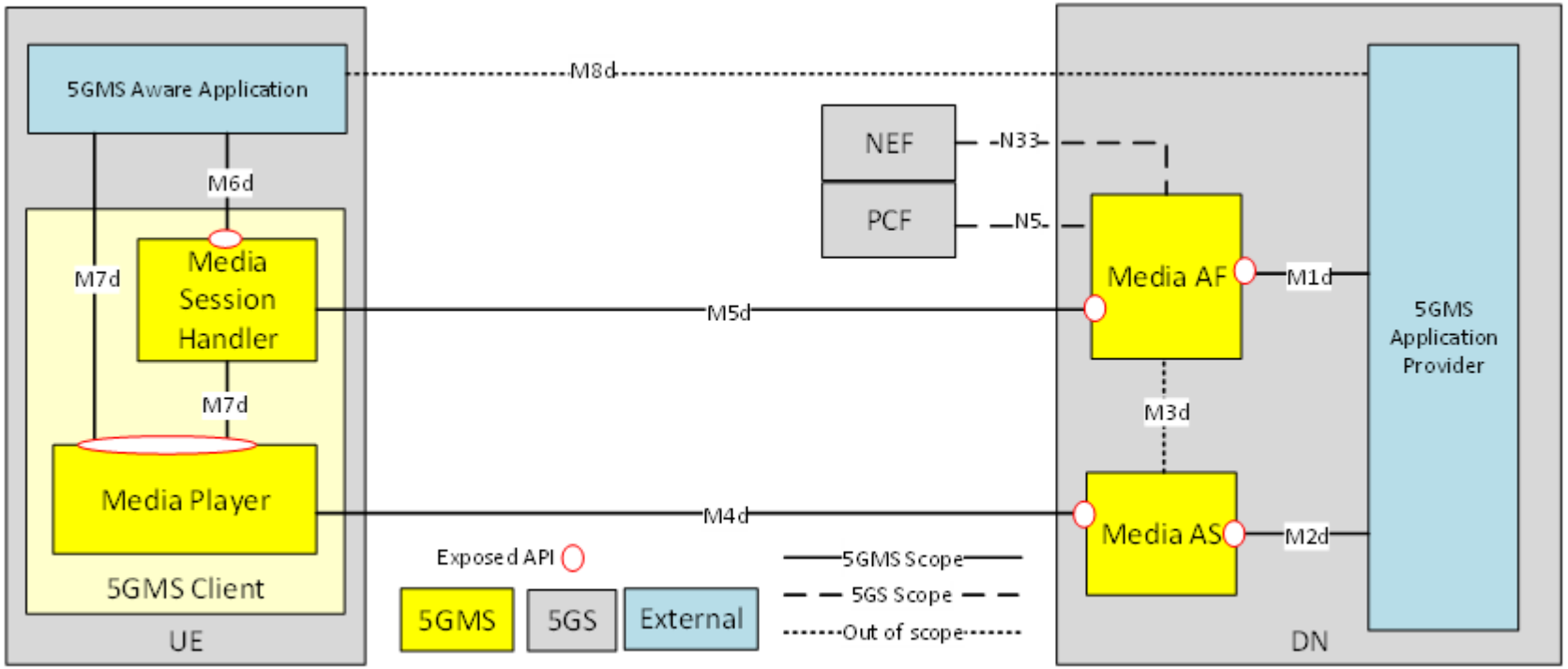
How to switch unicast ← → broadcast

- Losses, end of broadcast transmission,..

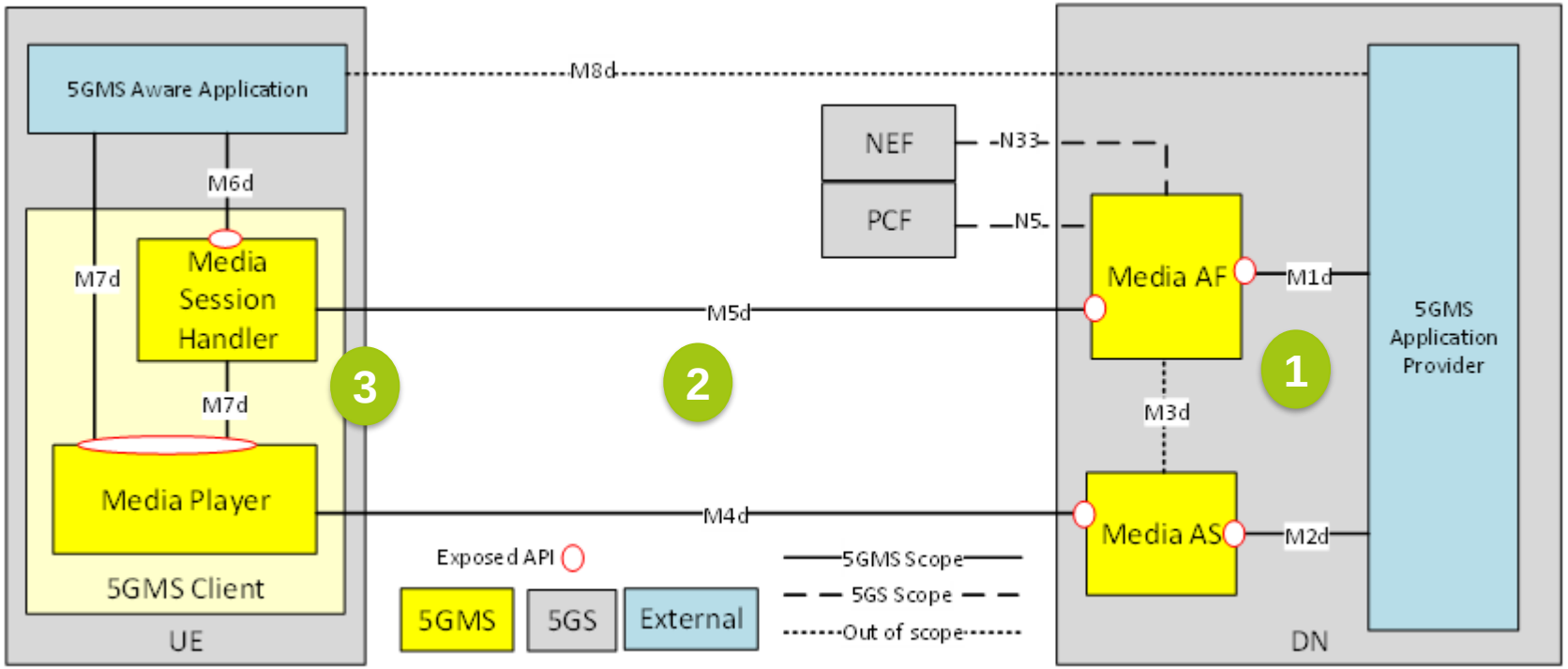


in 5G, 5GMSA ;
What could be the next step

5GMS Architecture



5GMS Architecture: potential next step



Step 1 Ingestion

Step 2 Transport – metadata – session description

Step 3 discovery, selection, consumption.

Discussion

- **On going work in 3GPP**
- **CMAF has unified segments format**
- **DASH/HLS hybrid service aims to hide manifest format diversity.**
- **What Next:**
  - integration in 5GMSA, low latency , ...

Thanks