

# TV / 5G Convergence: A 5G-Xcast Perspective

Dr. Athul Prasad  
Head of 5G Business Modelling & Analysis

**Athul.Prasad@Nokia.com**

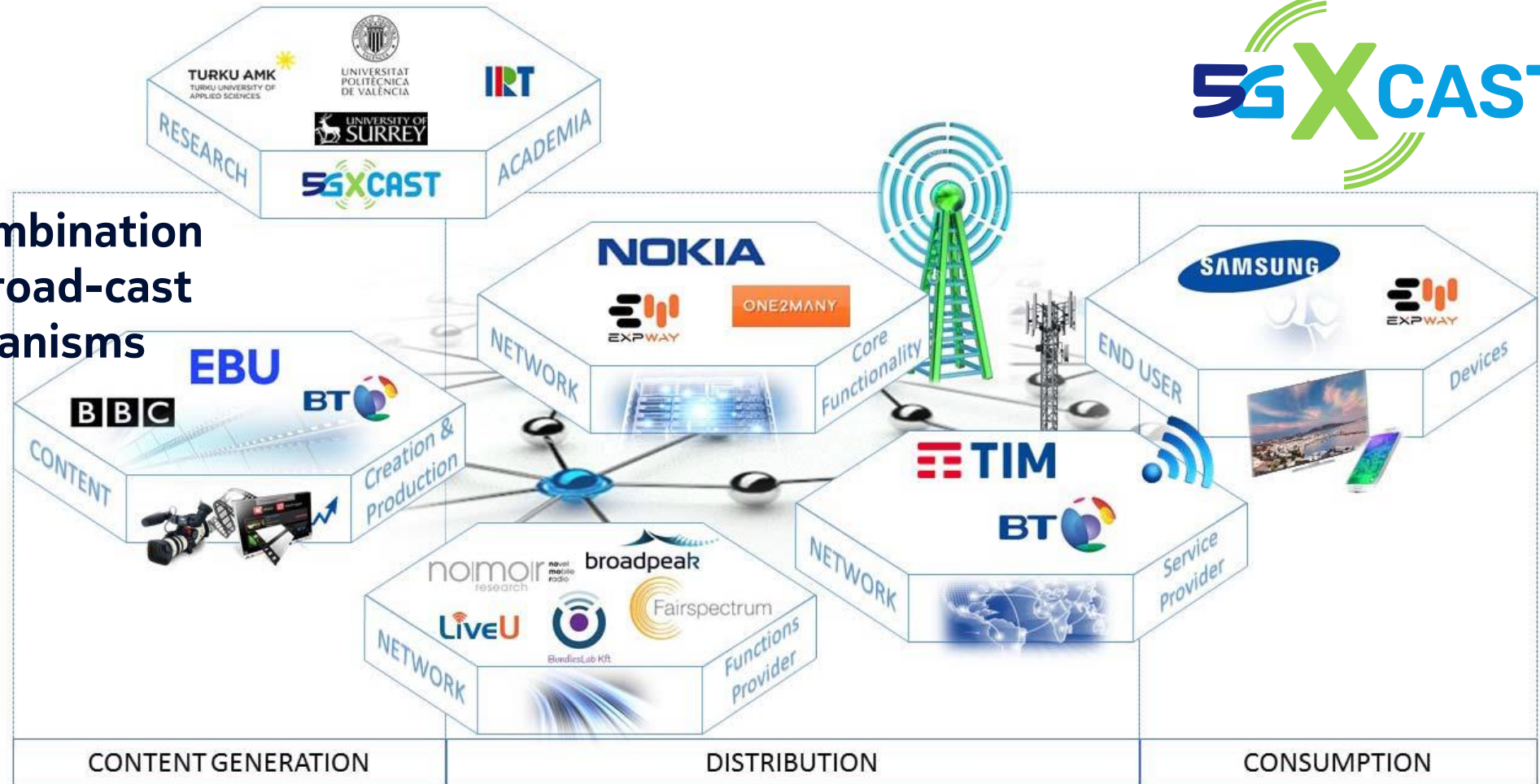
29.Aug.2018



# 5G-Xcast Consortium



**Xcast: An efficient combination  
of uni-, multi-, and broad-cast  
transmission mechanisms**

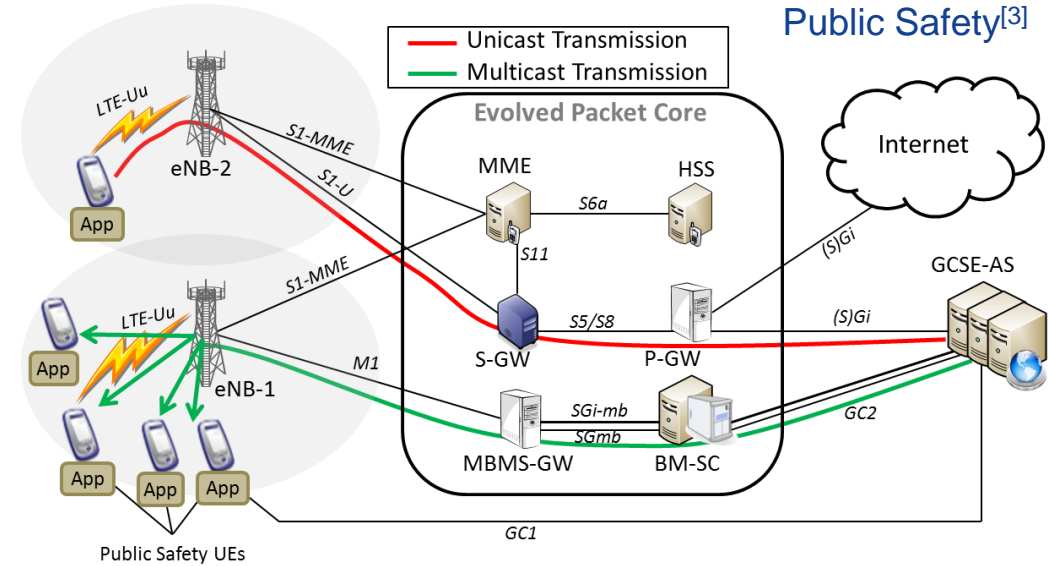
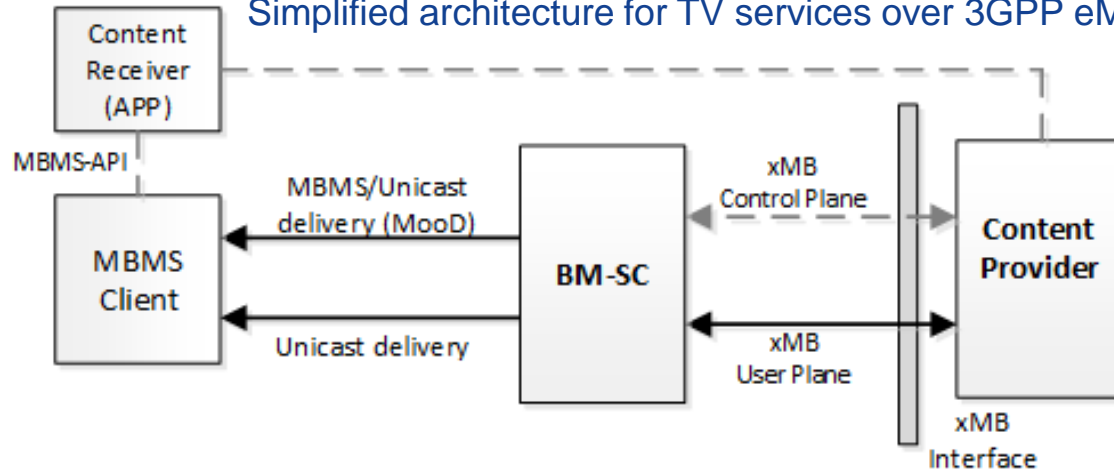


- Broadcast and Multicast Communication Enablers for the Fifth-Generation of Wireless Systems (5G-Xcast)
  - Start and end date: June 2017 – May 2019 (24 months)
  - European Union funded project; Call **H2020-ICT-2016-2**; Grant Number: **761498**

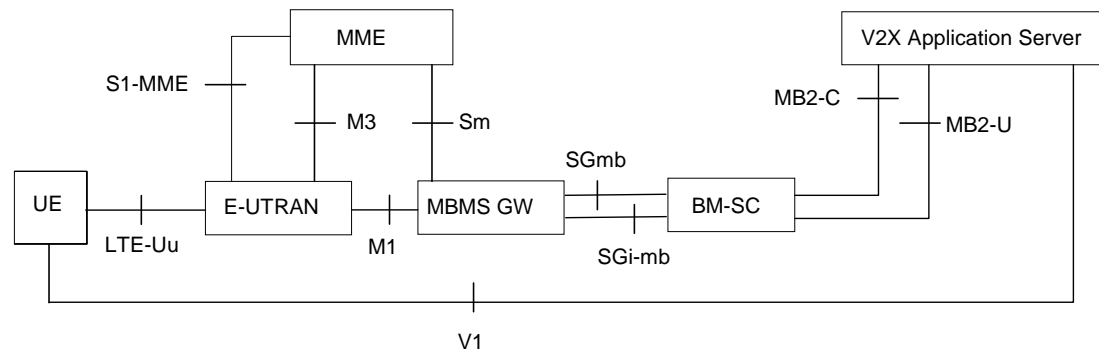
# (e)MBMS in 4G

## Use Case Specific End-to-End Architecture

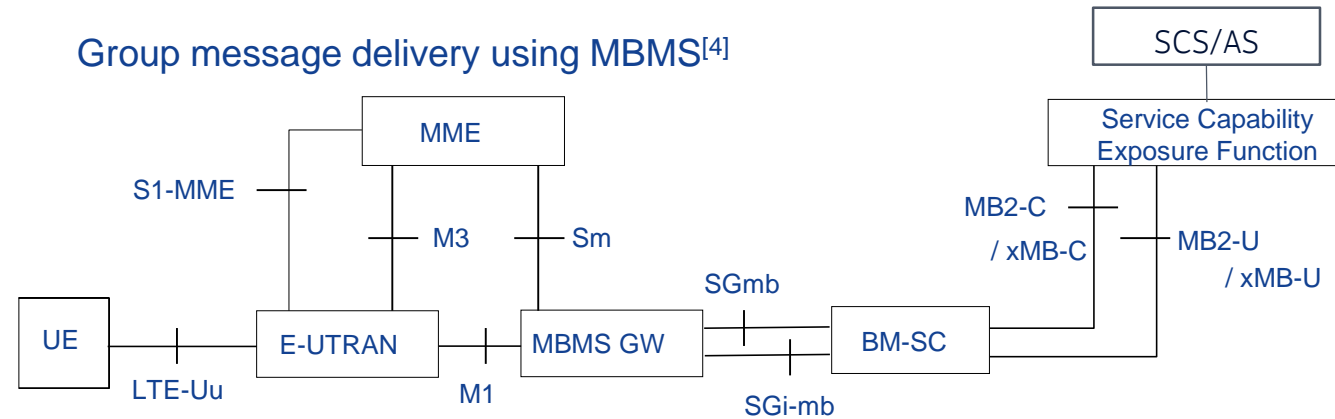
Simplified architecture for TV services over 3GPP eMBMS Rel'14<sup>[1]</sup>



MBMS for LTE-Uu based V2X communication via MB2<sup>[2]</sup>



Group message delivery using MBMS<sup>[4]</sup>



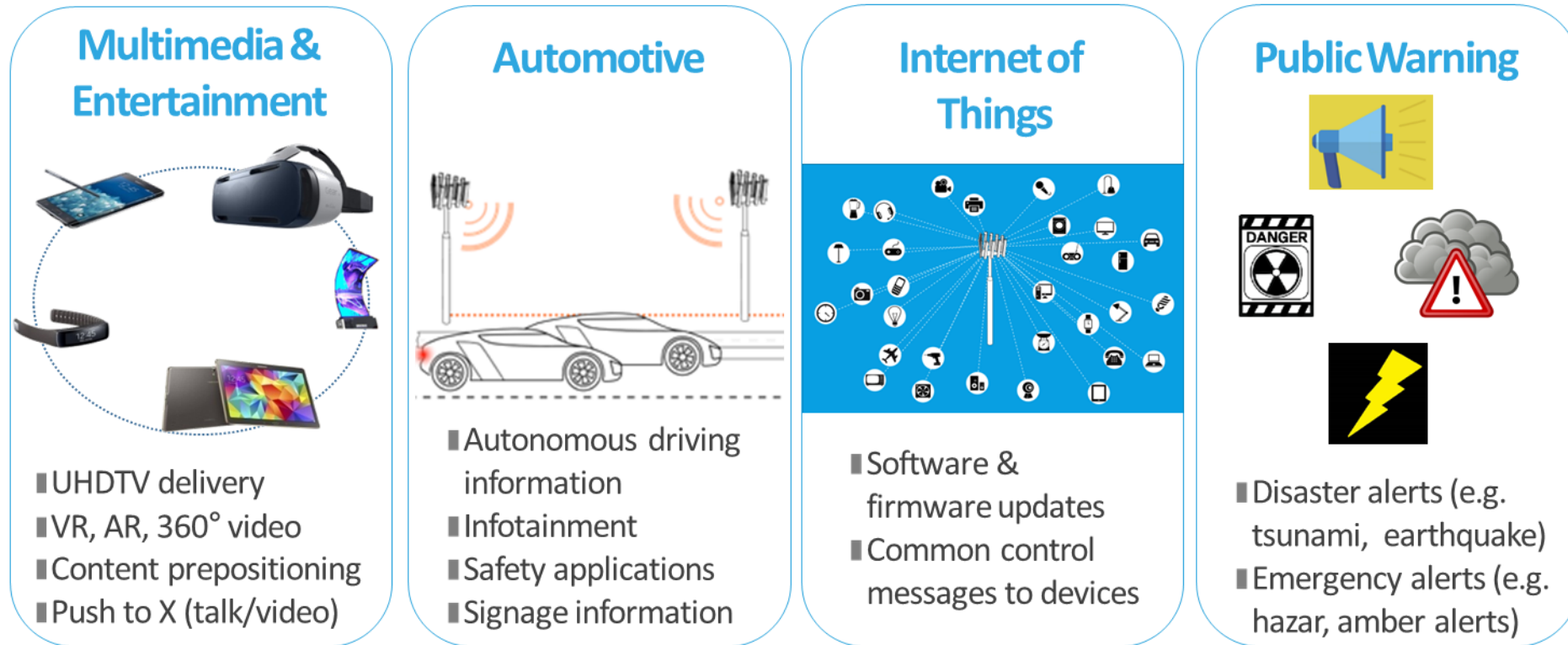
Source: [1] D. Vargas, D. Mi, et al., "5G-Xcast Deliverable D3.1: Performance of LTE Advanced Pro (Rel'14) eMBMS," Nov. 2017.  
 [2] 3GPP TS 23.285, ver. 15.1.0.  
 [3] A. Prasad, A. Maeder, K. Samdanis, A. Kunz, G. Velez, "Enabling Group Communication for Public Safety in LTE-Advanced Networks," Elsevier - Journal of Computer and Network Applications, vol. 62, Page 41-52, Feb. 2016.  
 [4] 3GPP TS 23.682, ver. 15.5.0.

# 5G-Xcast

## Introduction



- 5G enables a natural convergence of verticals
  - A unified, use case and access agnostic architecture for Xcasting



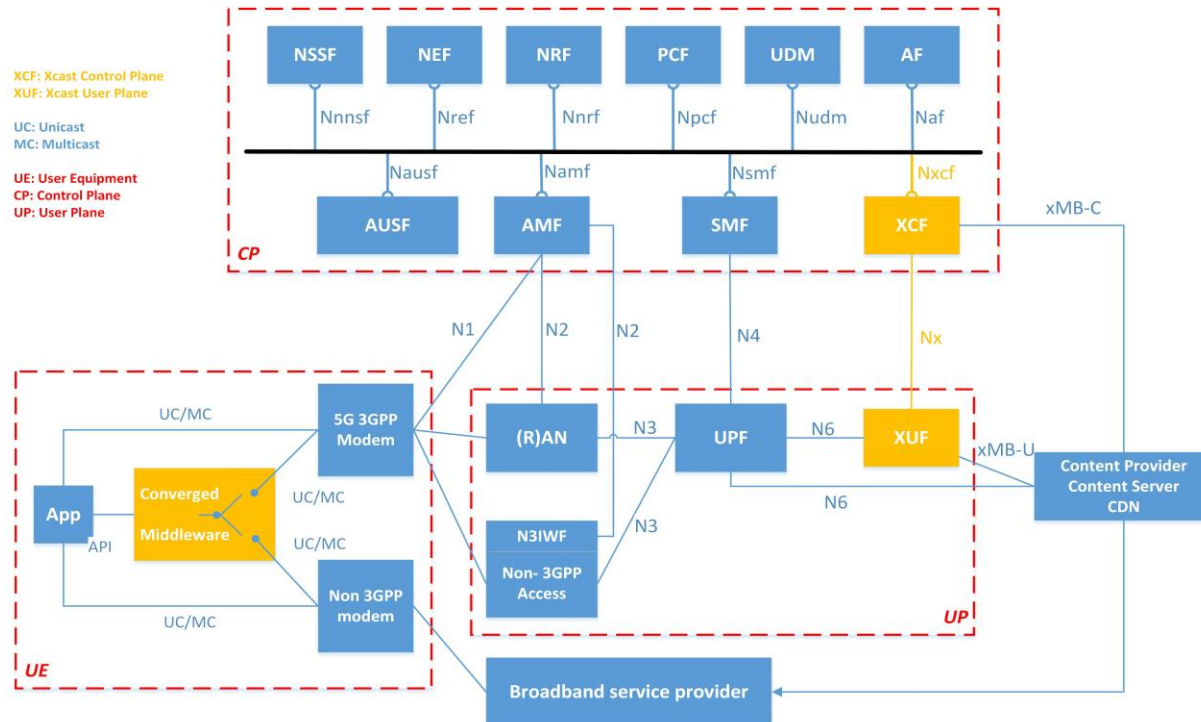
# 5G-Xcast

## E2E Architecture Options

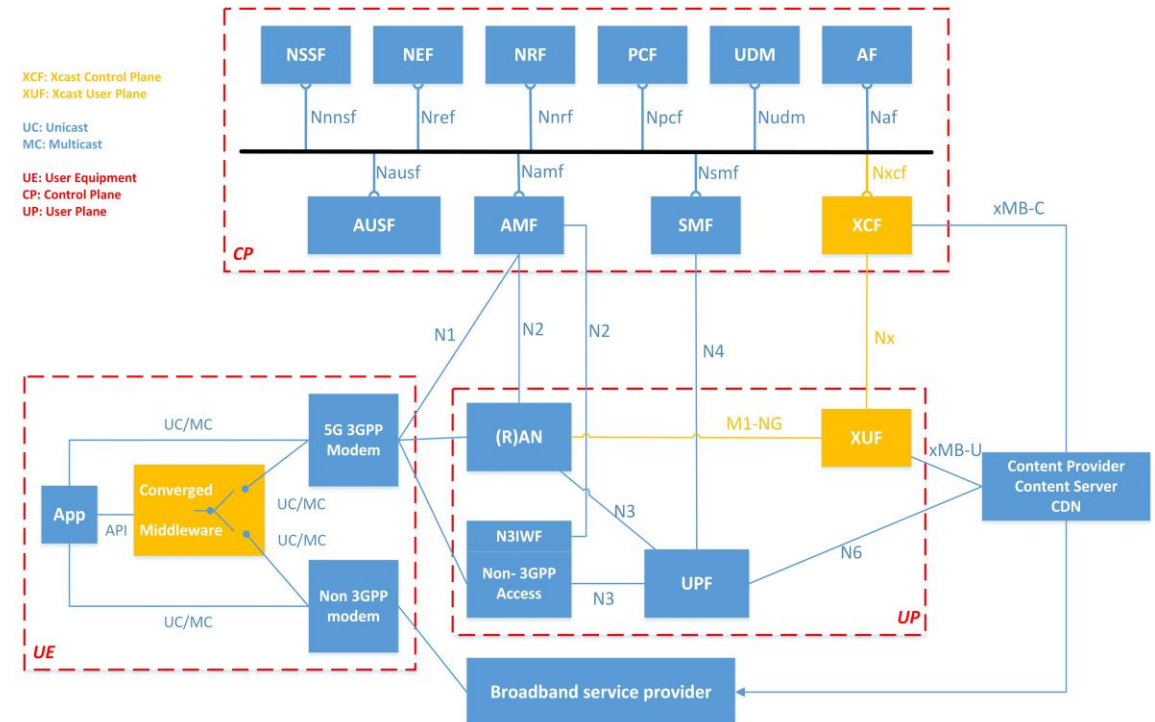


Based on Release 15 5G Service Based Architecture (SBA)  
Source: 3GPP TS 23.501

### (1) LTE Evolution



### (2) 5G Unicast Evolution – Transparent Mode

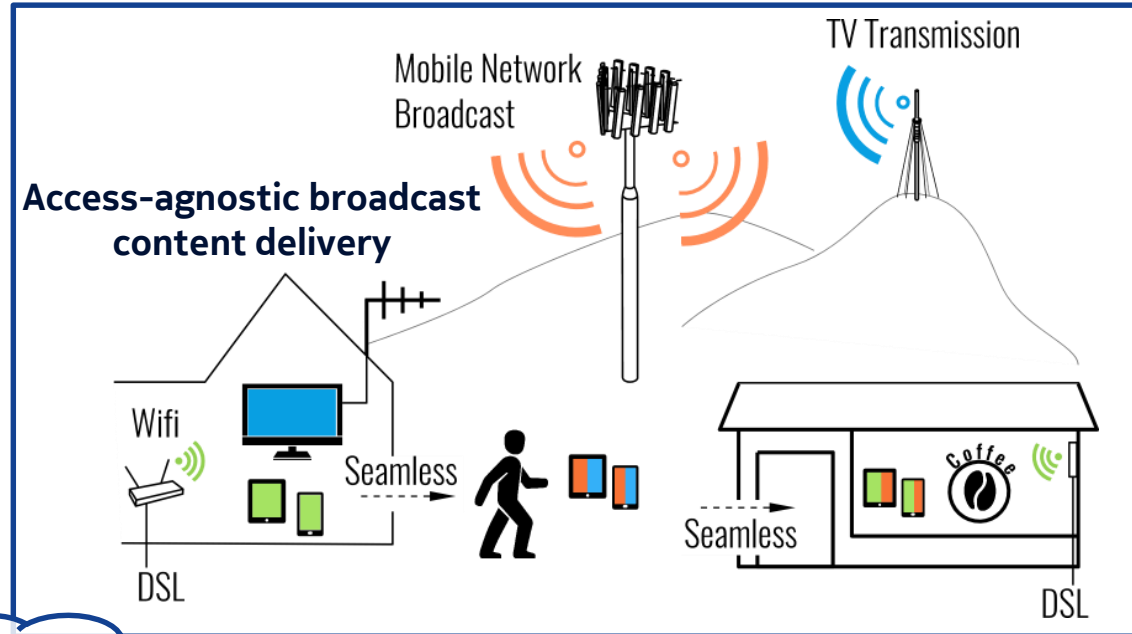


NEF: Network Exposure Function  
XUF/XCF: Xcast User / Control Function  
Figure Source: 5G-Xcast Deliverable D3.1  
<http://5g-xcast.eu/documents/>



# 5G-Xcast

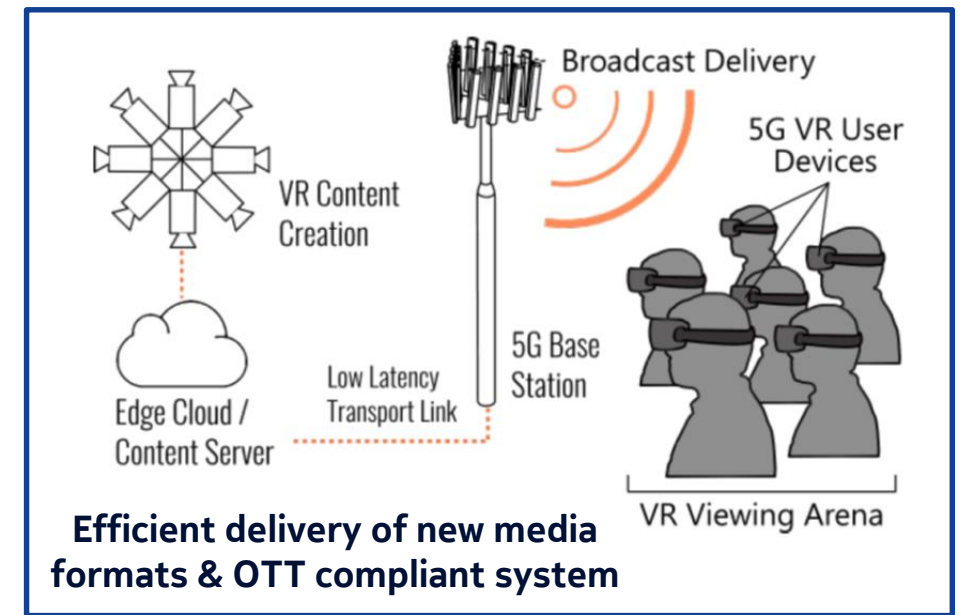
## Value Proposition for Broadcasters



Flexible and Cloud-native Architecture



- Flexible deployments with low TCO
- Access to wide variety of devices and related ecosystem
- Flexible setup of wide / limited / configurable-area single frequency networks
- Seamless mobility and controllable quality-of-experience



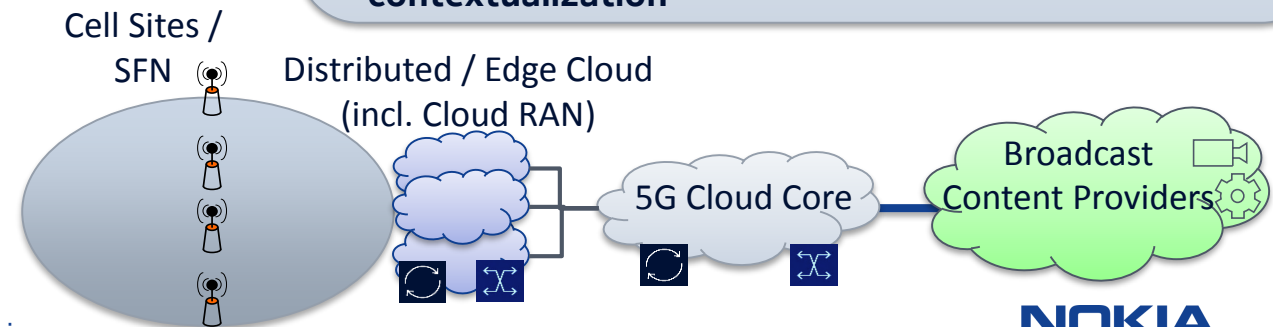
External Data Sources

NEF

Open APIs

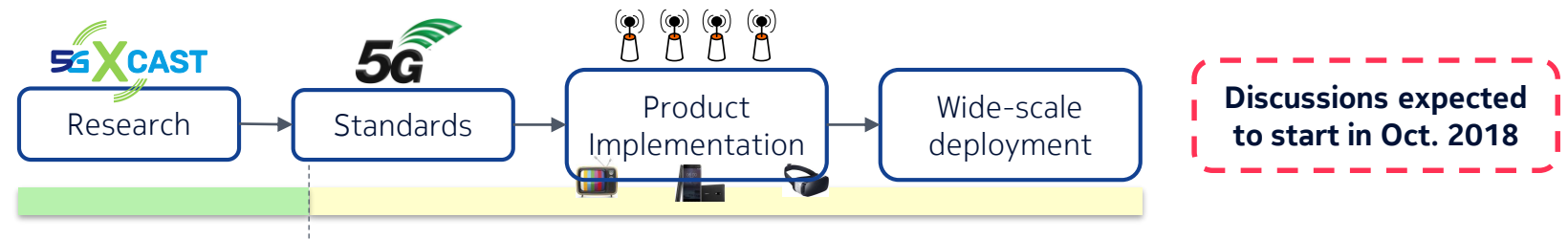
### Enabling Personalized Broadcast

- New ecosystem partnerships, higher availability and utilization of user data
- New business models and revenue streams enabled through dynamic ad-insertion and user-specific contextualization



# 5G-Xcast

## From Vision to Reality



- New study on "LTE-based 5G Terrestrial Broadcast" approved in 3GPP RAN meeting (June 2018)
  - Supported by a wide range of partners from 5G-Xcast consortium and advisory board
- Core Objective [Source: 3GPP TDoc RP-181342, Qualcomm Inc.]
  - "For the broadcast requirements in 3GPP TR 38.913, and taking as baseline Rel-14 LTE:
    - Identify which of the broadcast requirements in TR 38.913 are relevant for dedicated terrestrial broadcast networks.
      - Capture the gap analysis and potential solutions (if needed) to meet the broadcast requirements in a TR."
    - Rel-14 LTE eMBMS have been expanded to include terrestrial broadcasting (the feature also referred to as "EnTV" include features such as dedicated eMBMS, deployments with larger inter-site distance (with new cyclic prefix of 200μs), network sharing and receive-only mode.
      - Further requirements for the 5G radio access were defined in TR 38.913.
    - LTE-based eMBMS has undergone a deep transformation in the Rel-14 such that many of the 5G requirements for dedicated broadcast networks may be already fulfilled, thereby requiring gap-analysis
      - The gap analysis will compare the current LTE broadcasting capabilities with the requirements for 5G dedicated broadcast networks in TR 38.913

Public deliverables, scientific papers, presentations:

<http://5g-xcast.eu/documents/>

**Website:**

[www.5g-xcast.eu](http://www.5g-xcast.eu)

**Twitter:**

[@5Gxcast](https://twitter.com/5Gxcast)



**NOKIA**

**LinkedIn:**

<https://linkedin.com/company/5g-xcast>

**Videos:**

<https://www.youtube.com/channel/UCCI2iSgTDx42UiLoRcDyDBg>

<https://youtu.be/daFOf30NG2U>

DISCLAIMER: This work was supported in part by the European Commission under the 5G-PPP project Broadcast and Multicast Communication Enablers for the Fifth-Generation of Wireless Systems 5G-Xcast (H2020-ICT-2016-2 call, grant number 761498). The views expressed in this contribution are those of the authors and do not necessarily represent the project.