

# Broadcasters workshop –

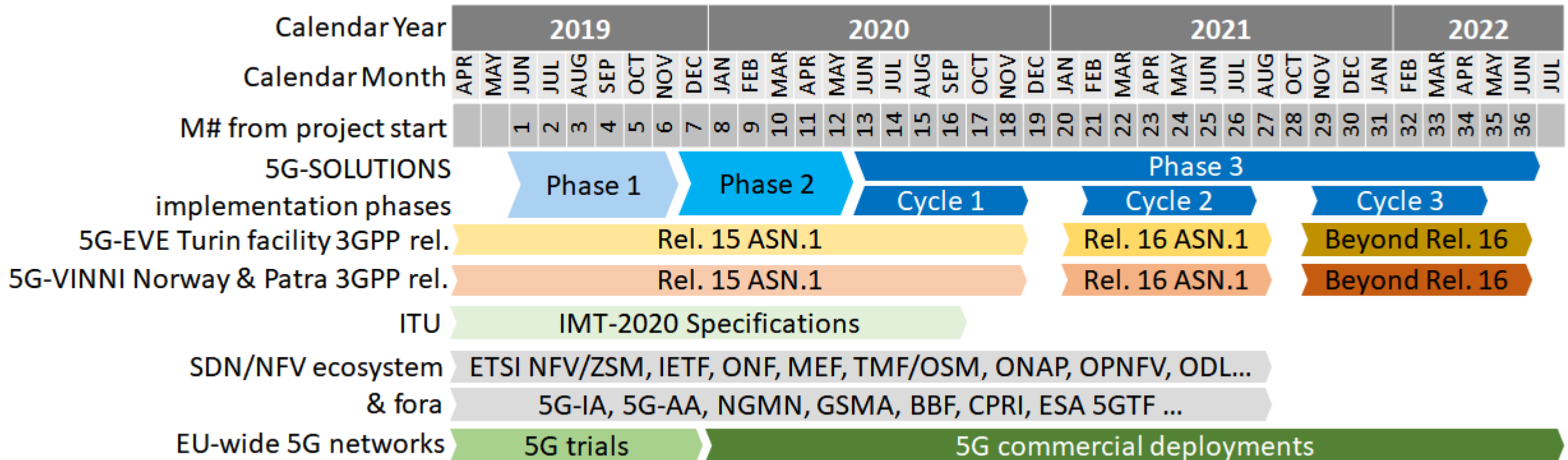
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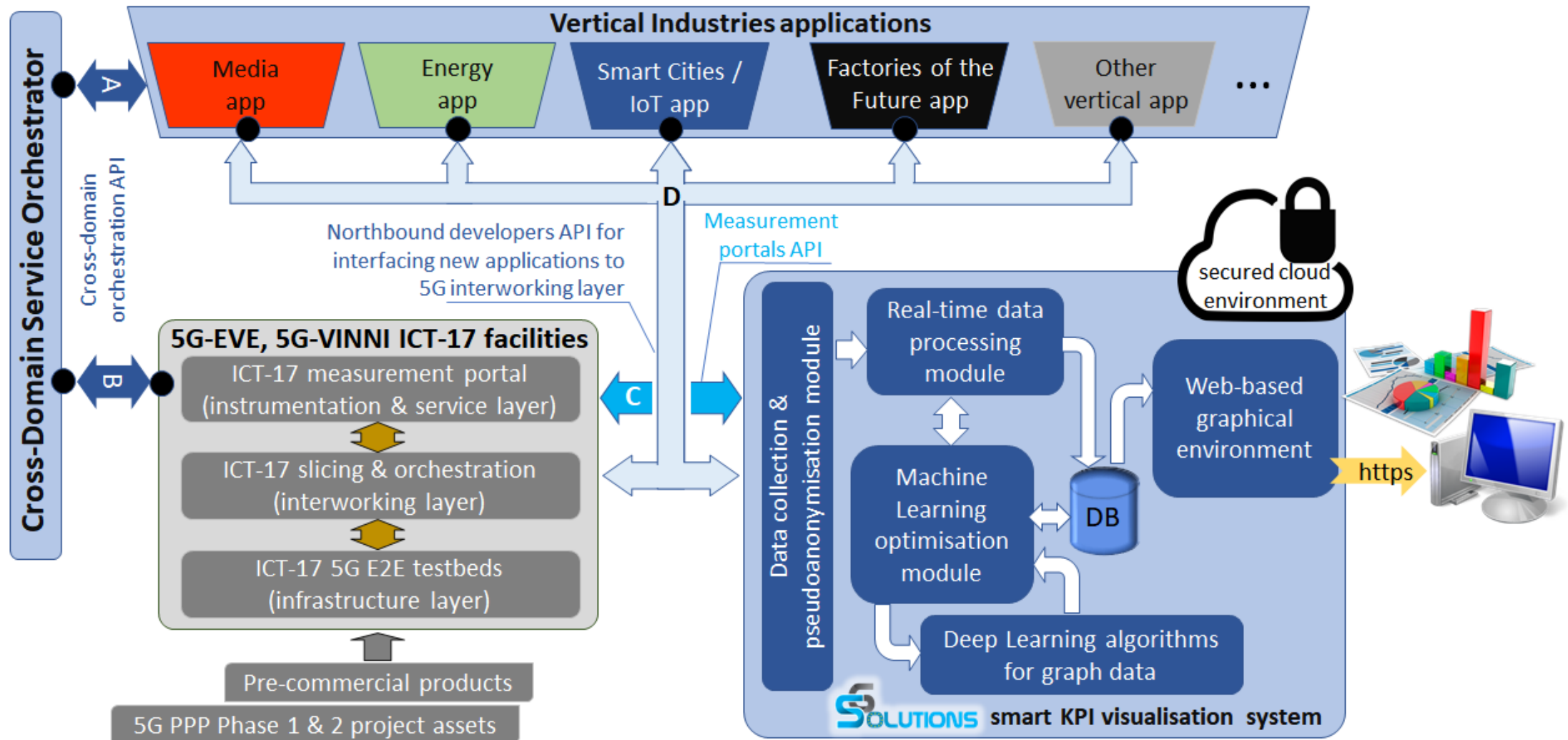
Feb. 2nd, 2022



# 5G-SOLUTIONS roadmap



# High level architecture implemented for the trials



# Media & Entertainment UCs

UC #	UC title	Class Type	Main participants	UC location	ICT-17 facility to connect to/ additional local RAN equipment	Indicative ultimate end-users
<b>LL4: Media &amp; Entertainment</b>						
4.1	Ultra High-Fidelity Media	eMBB+ mMTC	CTTC, FNET IRT, UOP	Patra-Greece	5G-VINNI Patra facility	Consumers, prosumers
4.2	Multi CDN selection	eMBB	CTTC, IRT, UOP	Patra-Greece	5G-VINNI Patra facility	Consumers, content providers,
4.3	On-site Live Event Experience	eMBB+ mMTC	CTTC, LIVEU, UOP, TNOR	Patra-Greece Norway	5G-VINNI Patra and Norway facilities	educators, broadcasters
4.4	User & Machine Generated Content	eMBB + mMTC	FNET, LIVEU, UOP, CTTC	Patra-Greece	5G-VINNI Patra facility	
4.5	Immersive and	eMBB +	CTTC, NURO,	Patra-Greece	5G-VINNI Patra facility	Online gamers,

# Ultra-High-Fidelity Media

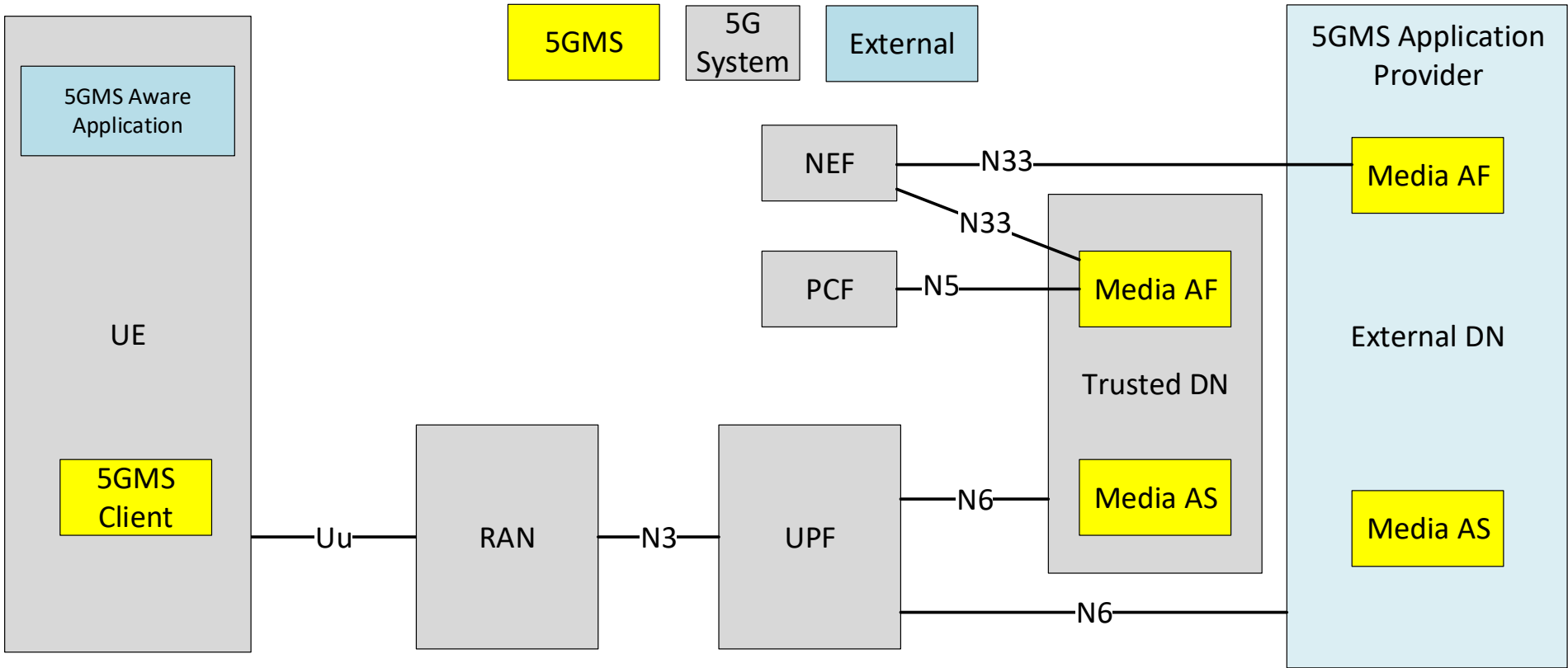
## Objectives

Rapid progress in display and capture technologies is enabling a new, highly immersive production and viewing experience with ultra-crisp, wide-view pictures with deep contrast and multi-channel sound.

Both linear and nonlinear content will be used for testing the Ultra High-Fidelity Media (UHF) experience.

In order to guarantee a high quality of experience for UHF, 5G network should be able to support efficient network management, fair resource allocation, high speed transport capabilities and strategies, e.g. by means of local and network caching of content.

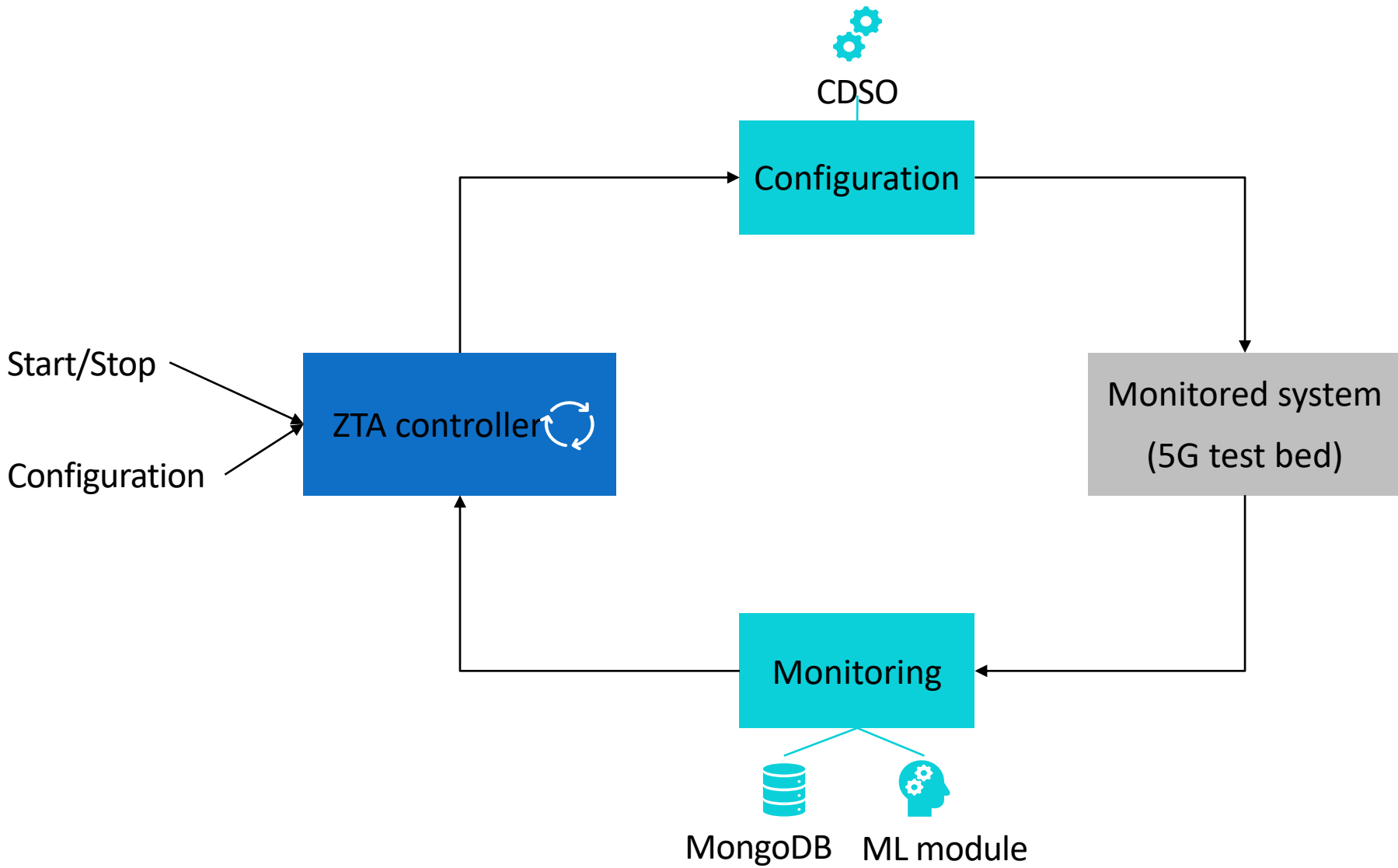
# 3GPP Media Streaming Architecture



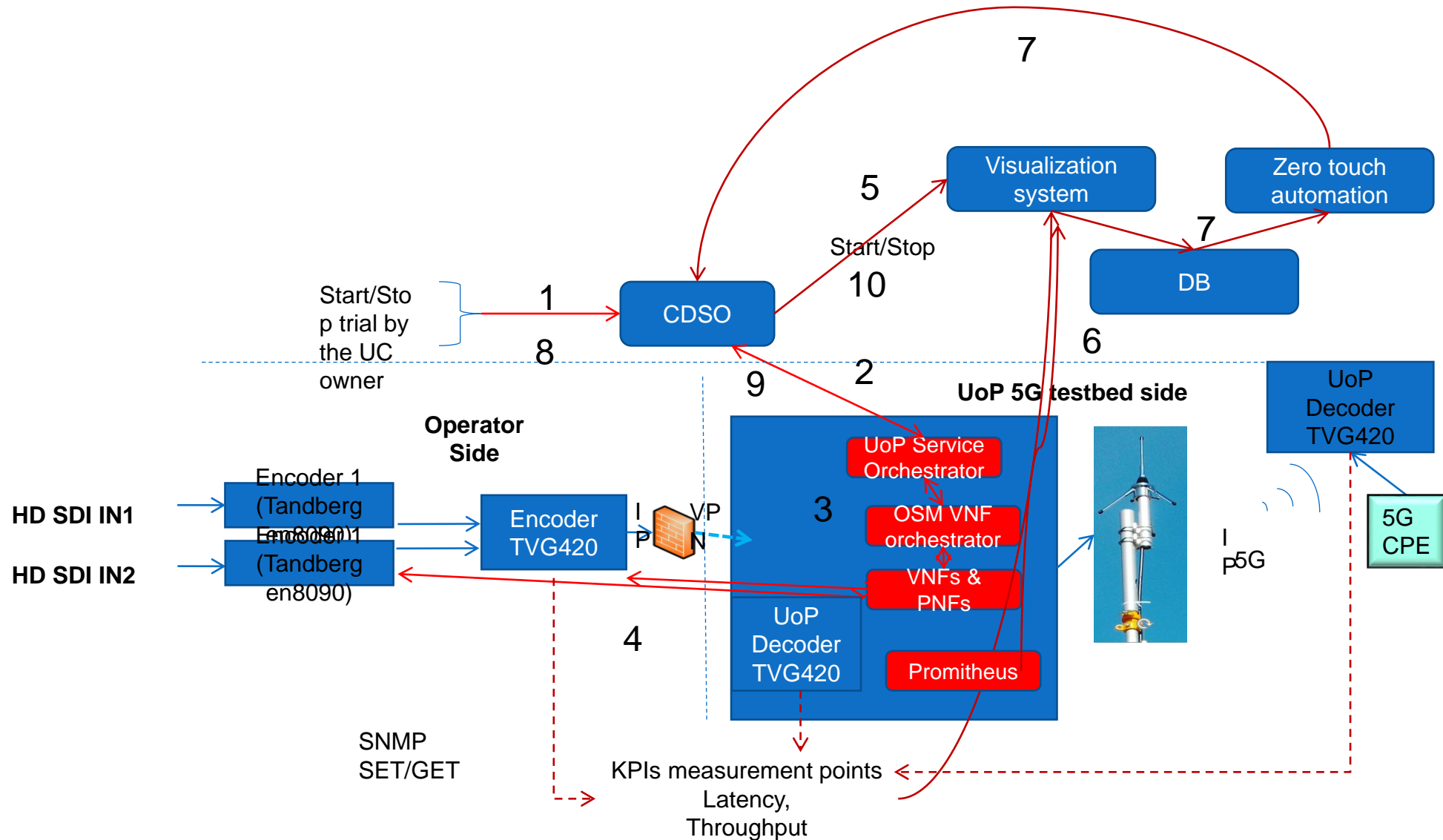
3GPP TS 26.501 V16.2.0 (2019-12) 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 5G Media Streaming (5GMS); General description and architecture (Release 16) - Section 4: Media Streaming General Service Architecture

[https://www.3gpp.org/ftp/Specs/archive/26\\_series/26.501/26501-g20.zip](https://www.3gpp.org/ftp/Specs/archive/26_series/26.501/26501-g20.zip)

# 5G-SOLUTIONS innovations



# UC Detailed Architecture



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02/02/2022



# Service KPIs Overview

According to “5G Trial and Testing Initiative Precommercial Network Trials Framework Definition v2.0” the quality of video services (user experience) is determined by:

SKPI Id	SPKI Name/Description
ME-SKPI-1	the server accessibility (application accessibility)
ME-SKPI-2	the waiting time (time to first picture)
ME-SKPI-3	user defined timeout (emulates the user’s patience) leads to a “fail”
ME-SKPI-4	very importantly the picture quality (MOS for each 10s interval of a video, and certainly as the average MOS for the whole video)
ME-SKPI-5	freezing / stalling of the video in %
ME-SKPI-6	lost streams (constant freezing)
ME-SKPI-7	jerkiness in % (if frame rate is not high enough, e.g. < 20 fps, the video is not perceived as fluent)

Definition of the Testing Framework for the NGMN 5G pre-commercial Networks Trials [https://www.ngmn.org/wp-content/uploads/Publications/2019/190111\\_NGMN\\_PreCommTrials\\_Framework\\_definition\\_v2\\_small.pdf](https://www.ngmn.org/wp-content/uploads/Publications/2019/190111_NGMN_PreCommTrials_Framework_definition_v2_small.pdf)

Service performance measurement methods over 5G experimental networks DOI: 10.5281/zenodo.4748385

URL: <https://doi.org/10.5281/zenodo.4748385>

# Key Technical and Business KPIs

Technical KPIs		
KPI	Target	Measurement method/formula
Peak Data Rate	20 Gbps downlink	Measure peak data rate under full load.
Latency	<5 s (Content delivery network) < 5 ms (Live-TV distribution) <1 ms (6DoF VR) 30 ms (Crowdsourced Video)	Measure latency using packet tracer.
area traffic capacity	DL: 3.75 Tbps/Km <sup>2</sup>	Measure total throughput when X devices within an area download content.
Throughput per 4K video stream	~15 Mbps	Measure throughput per device for 4K video stream.
Mobility	Content Delivery network: 0-5 Km/h for pedestrians. 60-100 Km/h for users in vehicles. Live-TV distribution: 3 Km/h for pedestrians. 50 Km/h for vehicles. 6DoF VR: 10 Km/s	Check whether eMBB.8 is achieved under different mobility scenarios.
connection density	10K devices per cell	Increase cell load by simultaneous request of the same TV service.
Media request response time	<1 sec	Measure the time between the user input request and the actual content delivery to the user.

Business KPIs		
KPI	Target	Measurement method/formula
QoE-based user profiles	To provide reliable service based on the user profile.	Throughput measurement at device per user profile. Compare with the expected user profile throughput (e.g., VIP).
SLA cost	Understand the cost of an SLAed profile with guaranteed SLA.	Cost, depending on SLA levels and quantities (number of devices, areas etc.).

thank you!

Q&A