



5G RECORDS

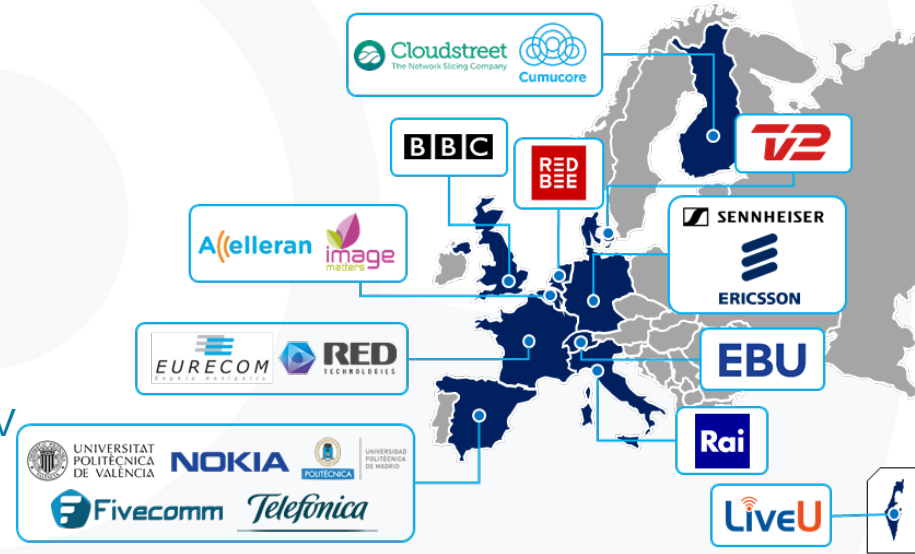
*5G key technology enablers for emerging
media content production services*

ICT-42-2020
5G core technologies innovation

Consortium

11 countries 17 partners

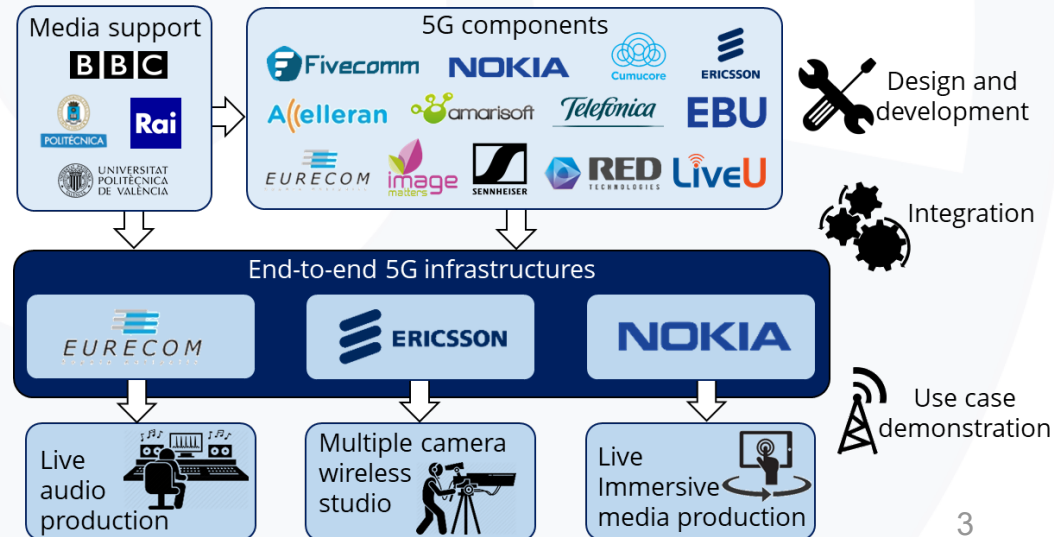
	Accelleran, Image Matters
	TV2
	Cumucore
	Eurecom, RED Technologies
	Ericsson, Sennheiser
	LiveU
	RAI
	Fivecomm, Nokia, Telefonica, UPM, UPV
	EBU
	BBC



- x7 high-tech SMEs, x2 5G infrastructure providers, x1 MNO, x2 media vendors, x4 broadcasters, x3 research centres and universities.

Project Overview

- 5G-RECORDS is about the development, integration, validation and demonstration of **5G components** for **professional media content production**.
 - Developed within previous 5G-PPP projects and earlier R&D investments
 - To be deployed specifically for content production
 - Business-to-business (B2B) perspective
- **3 end-to-end 5G infrastructures:**
 - 5G Core (5GC)
 - Radio Access Network (RAN)
 - End devices
- **3 use cases:**
 - Live audio production
 - Multiple camera wireless studio
 - Live immersive media production
- **Duration: 24 months**
 - Sept. 2020 – Aug. 2022
- **Budget: ~7.4 M€**



5G Technology Enablers

Non-public networks



Exclusive mobile networks that enable to use resources independently of other users, due to their exclusive use.

Network slicing



Enables a dedicated part of the network to be made available for a dedicated set of users. Different network slices are tailored to specific use cases.

Edge computing



Key technology for real-time processing capabilities at the edge of the network, guaranteeing specific requirements.

Open and virtualised RAN



Open and interoperable interfaces, complementary to 3GPP, supporting a multi-vendor ecosystem for future intelligent 5G vRAN platforms.

NR-Lite air interface



New air interface to address specific use cases with lower latency, longer battery life and wider coverage than NB-IoT.

Dynamic spectrum access



Process of increasing spectrum efficiency and network capacity via the real-time adjustment of radio resources.

Mm-wave antennas/devices



New radio bands between 30-300 GHz, based on line-of-sight paths, to provide extreme capacity for the busiest locations.

Orchestration



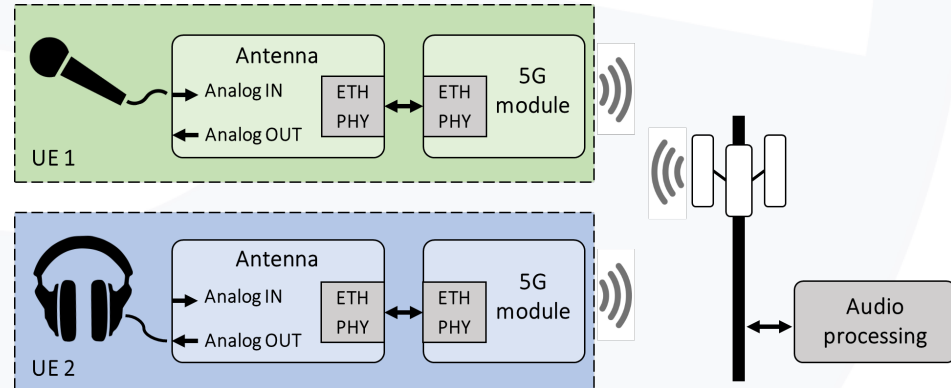
Professional media applications require the development of an additional orchestration layer above the 5G infrastructure capabilities.

Use case Live audio production

- **Main partners:**



- In a live audio production setup (e.g. music concerts, music festivals, TV shows), the artists are equipped with professional Programme Making and Special Events (**PMSE**) equipment
 - 5G wireless **microphones**
 - In-Ear Monitor (**IEM**) systems
 - **Control tools** and gateways between 5G and traditional audio infrastructure domains.
- **4 main areas of work:**
 - Capturing of live audio data
 - Temporary spectrum access
 - Automatic setup of wireless equipment
 - Use of a local NPN
- **Requirements:**
 - End-to-end delay < 4 ms
 - User data rate ~500 kbps
 - Synchronization of all audio sources ± 500 ns



Use case Multiple camera wireless studio

Main partners:



LiveU EBU

BBC



Rai

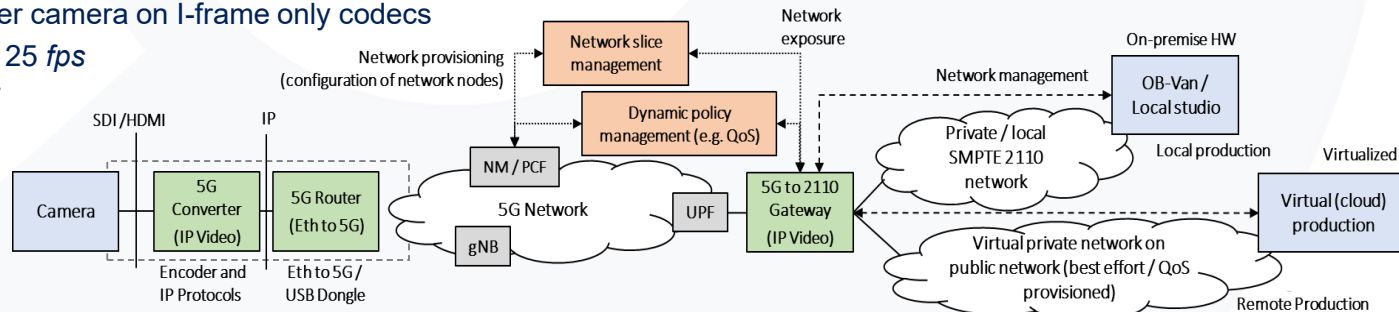


Fivecomm







UNIVERSITAT
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- The best of an **IP studio** combined with the super-fast and highly reliable wireless 5G connections
- 5G will facilitate new types of workflows addressing 3 core requirements:
 - Flexibility and reduction cost in setting up productions
 - Scalability from small to large events
 - Shareability of content along the production chain and between creative stages
- 2 sub use-cases:**
 - Multiple cameras (~5) in a wireless studio. Wired/wireless functionalities will be combined using a fully IP system
 - Outdoor production scenario with 2 or more 5G-enabled cameras and sound capture devices connected to NPN
- Requirements:**
 - Bandwidth: 200-400 Mbps per camera on I-frame only codecs
 - Latency: less than 40 ms for 25 *fps*
or less than 20 ms for 50 *fps*
 - High reliability is expected



Use case live immersive media

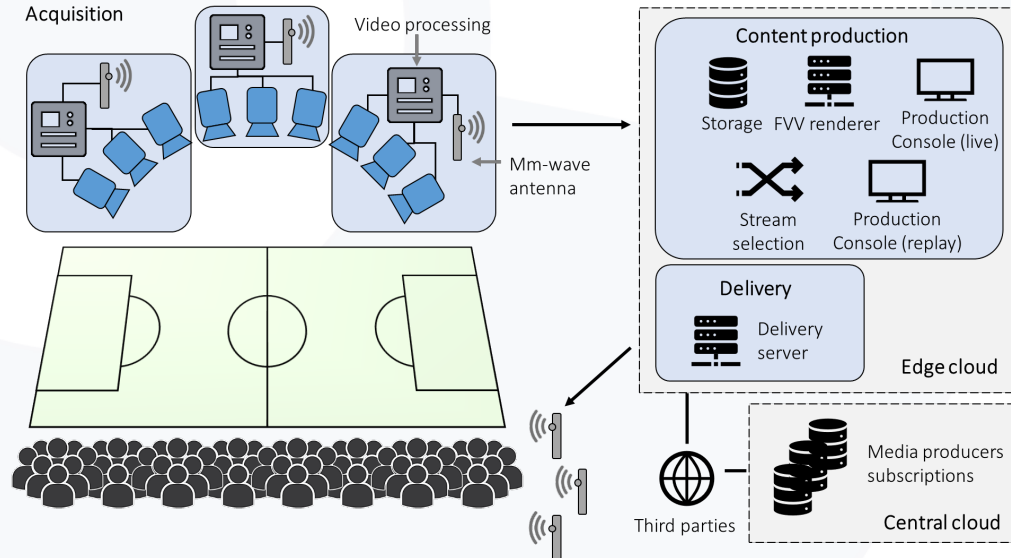
- **Main partners:**  *Telefonica*    **leader**
- Real-time end-to-end free-viewpoint video (**FVV**) system that includes capturing, 5G contribution, virtual view synthesis on an edge server, 5G delivery and visualization on user terminals.
- The 5G connectivity allows a portable FVV system to operate in real time with reduced deployment cost and high flexibility.

- **Video workflow in 3 stages:**

- Capturing.
- Encoding and transmission.
- Synthesis and visualization.

- **Requirements:**

- Media acquisition: up to 1.5 Gbps per camera.
- Radio uplink speeds of 20-200 Mbps.
- Downlink speeds of 2-20 Mbps per user.
- Connected end-users: 10-100 per 1000 m².
- Reliability: 1 error every 10 min.



The Role of the EBU

- **Technical coordinator**
- **Lead - Regulatory framework and business models**
- **Lead - Exploitation, regulation and standardisation**
- **ST2110-5G gateway and media orchestration**



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5G-RECORDS Group



5G-RECORDS Channel

Thank you!