



5G Enables Reliable Real-Time Video Transmission

A standalone 5G network and edge compute deliver robust and responsive connectivity to Barcelona

For television crews covering crowded live events, transmitting live footage can be a problem. When large numbers of people are uploading video and images from a single location, the public cellular networks can become very congested. As a result, television crews sometimes have to switch from cellular network to cellular network in the hope of finding sufficient bandwidth.

To explore how a private 5G network can overcome these challenges, the 5G Catalunya (5G CAT) consortium ran a pilot in Barcelona during December 2022. Led by Cellnex Telecom and the mobile operator Masmovil, the consortium worked with Barcelona's public television station (Betevé) to transmit live television images in HD resolution over a private 5G connection. During the testing, five simultaneous live signals were transmitted using the 5G CAT network to the TV producer. This deployment achieved a network latency of 30 milliseconds, from the camera to the network, according to Cellnex. "If we include the encoding and transmission to a remote server, the whole system registered less than 500 milliseconds," says Jose Antonio Aranda Legazpe, Innovation Director at Cellnex.

Once the footage reaches the server, the remote production system selects the screen composition and mixes the incoming streams from the different

cameras. The final result can be distributed through the internet and social networks, or it can be downloaded from the server to the Betevé studios to be integrated with the rest of the content being broadcast digitally.

"At the moment, the camera crew go with a backpack with multiple SIM cards - several per mobile operator - combining the connection from the different SIMs to achieve a stable throughput" says Xavi Redon, leader of the XAL/Betevé use-case. "Through a private network, we can provide a reliable transmission with a single SIM, avoiding the use of a congested network. Thanks to 5G backpacks and mobile applications, it has been possible to synchronise, on a cloud server, the different cameras and contributions of mobile phones."

The flexibility of this kind of solution should make it much easier for television crews to cover a wide range of outdoor events, such as concerts and festivals. Private 5G networks could be particularly valuable for coverage of unpredictable breaking news in which a film crew has little time to set up outside broadcast equipment.

The advanced standalone 5G network being used for the project was designed and deployed by Cellnex,

and is supported by Lenovo's edge computing solutions. The 5G standalone core enables the partners to harness the low latency and high throughput of a pure 5G architecture. Following the pilot, Betevé and Spanish Television (RTVE) have shown interest in a commercial deployment of this kind of private 5G solution, according to Cellnex.

"5G private networks will enable Xarxa TV to use portable backpacks for the TV contribution service in crowded locations and in areas with insufficient coverage, facilitating the broadcasting experience," explains Marc Melillas, CEO of the Xarxa TV.

Oriol Icart, the technical director of Betevé, adds: "the virtualized production tools in combination with 5G Private networks and the backpack contribution services allow us to work flexibly and reliably by mitigating bandwidth availability challenges during live transmissions."

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Marc Melillas - CEO of the Xarxa TV

5G Working with public and private stakeholders

Cellnex is using the open RAN (radio access network) architecture in seven base stations it has deployed in different locations across Barcelona to test different use cases through the 5G Catalunya consortium. Each of the base stations is supported by an edge data centre that is located close to the antenna to reduce latency.

The other use cases in the pilot encompass automated transportation, augmented shopping, manufacturing applications, remote learning, security and emergency management and robust connectivity in tourist areas that see large numbers of seasonal visitors.

Cellnex built the network specifically for the 5G Catalunya project, which is supported by Red.es (an entity attached to the Spanish Ministry of Economic Affairs and Digital Transformation). The 5G Cataluña Pilot involves a consortium of eight companies led by Cellnex and the Masmovil Group. Parlem Telecom, Aumenta Solutions, the engineering company Atos, the consultancy Nae, the technology company Lenovo and the start-up Nearby Computing, a spin-off of the Barcelona Supercomputing Center, are also supporting the project, which is co-financed by the European Regional Development Fund.





In a speech in April 2022, Alberto Martínez Lacabra, General Director of Red.es, described 5G as “a technology with a transformative power that will mark a revolution and is an essential vector in the digitalisation drive envisaged in the Spanish Government’s Recovery, Transformation and Resilience Plan and is one of the pillars of the Digital Spain 2025 strategy.”

By proving the viability of a wide range of use cases, Cellnex is aiming to help mobile operators to make a return on their 5G investments. “5G pushes for a technology ramp up with high complexity and scale, which requires mobile operators to make high capex investments in new infrastructure,” notes Jose Antonio Aranda Legazpe. “Over the last few years, the ARPU (average revenue per user) has been decreasing, which aggravates mobile operators’ pressure to find monetising solutions.”

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Jose Antonio Aranda Legazpe - Innovation Director at Cellnex

One way to improve the economics of 5G is for multiple mobile operators to share infrastructure. Through a neutral host model, supporting sharing of both active and passive infrastructure, Cellnex is looking to give operators the flexibility and scalability they need to support a wide range of 5G use cases.

About the GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry, and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

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The GSMA Foundry is the go-to place for cross-industry collaboration and making positive change happen, supported by leading technology organisations and companies. By bringing together members and key industry players, engaging, and unifying the end-to-end connectivity ecosystem, the GSMA is solving real-world industry challenges.

Our vision is to unlock the full power of connectivity so that people, industry, and society thrive. This enables the mobile industry's mission: to connect everyone and everything to a better future.

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About Cellnex Telecom

The efficient deployment of next-generation connectivity is essential to drive technological innovation and accelerate inclusive economic growth. Cellnex Telecom is the independent wireless telecommunications and broadcasting infrastructures operator that enables operators to access Europe's most extensive network of advanced telecommunications infrastructures on a shared-use basis, helping to reduce access barriers for new operators and to improve services in the most remote areas.

Cellnex manages a portfolio than 138,000 sites –including forecast roll-outs up to 2030– in Spain, Italy, the Netherlands, France, Switzerland, the United Kingdom, Ireland, Portugal, Austria, Denmark, Sweden and Poland. Cellnex's business is structured in four major areas: telecommunications infrastructure services; audiovisual broadcasting networks, security and emergency service networks and solutions for smart urban infrastructure and services management (Smart cities and the "Internet of Things" (IoT)).

The company is listed on the continuous market of the Spanish stock exchange and is part of the selective IBEX 35 and EuroStoxx 100 indices. It is also present in the main sustainability indices, such as Carbon Disclosure Project (CDP), Sustainalytics, FTSE4Good and MSCI.

<https://www.cellnex.com/>

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