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Seamless content production for live TV broadcasting with urban mobility

As a leading international broadcaster, TV2 Denmark A/S seeks to provide exciting, dynamic, and high-fidelity content wherever that may be.

Ericsson's world-first macro network implementation, an Enterprise e2e Service Level Agreement solution (Enterprise e2e SLA solution), uses network slicing to deliver reliable, on-demand 5G video contribution stream for live TV broadcast. The solution has enabled TDC NET and TV2 to deploy a 5G live video transmission virtual private network from remote camera in-field to production center, specifically catering to their various needs, such as uninterrupted real-time camera and network performance monitoring of critical communications during live crowded events.

ERICSSON

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CASE STUDY LEAD: **ERICSSON**

CHALLENGE

Current media industry content production relies mostly on traditional fibre, bonded cellular and satellite methods. However, this practice provides limited performance monitoring and is extremely resource-intensive for each production often costing TV2 millions of Euro each year. TV2 required an alternative solution to transmit live video streams from their onsite cameras to their production centre which guaranteed bandwidth in typically network-intensive and mobile scenarios, such as congested public events.

SOLUTION

The Digital Service Solutions function in Ericsson worked with TDC NET to develop a compatible Enterprise e2e Service Level Agreement solution (Enterprise e2e SLA solution) that TV2 could use as a macro production network to provide a seamless live TV broadcast. Requiring a relatively low investment entry point, this solution uses Ericsson's radio access network (RAN) and core technology to enable slicing with guaranteed radio resource partitioning for defined devices. The solution connected TDC NET Edge and TV2 office in Master Control Room (MCR) in Odense with secure SD-WAN technology, provided by Fortinet.

IMPACT & STATISTICS

The solution has cut preparation and planning time from weeks to days. Moreover, Content producers now have minimized setup costs and moreover allowed journalist/camera personnel to be truly mobile; they can now roam freely in the field to dynamically capture the news/events wherever it moves. The real-time performance information on video signal data transmission enables the production centre and camera personnel to act on the spot for live broadcast.

WIDER IMPLICATIONS

This solution will lower the entry point and cost for professional content providers and give them lower and more predictable overheads. The effect of this will be to widen the broadcast industry and make it easier to access IP-based production technologies. It also enables innovative way and imagination of content production by providing the seamless video signal transmission with urban mobility.

STAKEHOLDERS

TV2 Denmark A/S, TDC NET, Fortinet

SOURCES & FURTHER INFORMATION

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Current TV production **challenges for live broadcasting**

As a leading international broadcaster, TV2 Denmark A/S seeks to provide exciting, dynamic, and high-fidelity content wherever that may be. Current contribution methods are accompanied by all the difficulties of cables and satellites, which include lengthy and expensive setup times, limited performance monitoring and reduced mobility. As such, they sought to modernise how they stream live content data from their onsite cameras to production studio with urban mobility. The new solution had to enable guarantee high bandwidth from mobile camera device to production centre with urban mobility, even in congested areas.

By combining TDC Net's world class 5G network with Ericsson's innovative latency and visibility solution, TV2 explored how 5G could be used to bring fundamental improvements to its content production for live broadcasting by partnering with TDC NET and Ericsson. In doing so, they outlined three objectives the project needed to meet:

- To provide a reliable uplink service with efficient on-demand radio usage on a macro network
- To provide an end-to-end service from remote camera to production centre with a means of real-time performance analysis and secured connectivity
- A means to enable broadcaster and onsite camera operator to understand and adapt to the performance of the network in real time

Introducing macro 5G networks to **enable dynamic content creation**

The Enterprise e2e Service Level Agreement solution (Enterprise e2e SLA solution) is ideal for wide-area critical communication applications and provides premium service capability via an enterprise-level controllable network provided by an operator macro network. The solution enables real-time device-level observability and connectivity security tunnelling with relatively modest investment.

By using network slicing with guaranteed radio resource partitioning for defined devices, powered by Ericsson radio access network (RAN) and 5G core technology, the macro network can cater to TV2's precise needs. In addition, the radio resource is completely dynamic, allowing for added flexibility within mobile broadband sharing the same frequency.

The solution features a bespoke dashboard allowing for single-user observability and performance monitoring down to the level of a single-camera which can be studied for throughput, latency, jitter, and packet loss – all of which can be reported in real time. The E2E SLA solution supplies valuable data on network quality throughout live video content production, connecting TDC NET Edge and TV2 MCR in Odense with secure SD-WAN technology, provided by Fortinet.

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Results

During proof-of-concept trials – in which high-quality live footage was required of the birthday celebrations of the Queen of Denmark – TV2's internal production network was seamlessly connected to the TDC NET mobile network, which gave the camera team priority connection to master control room in production center over 5G. Although many people gathered during the transmission and used the same mobile network as the camera, TV2 were able to obtain a secure and stable connection through a dedicated share of the total network's capacity.

This ensured that video data would transmit to the exchange without delay and gave TV2 a new tool to monitoring network performance in real-time. The monitoring tool – or in the future API- has potential to allow video encoder/decoder to run more efficient and with even lower latency. Prioritised connectivity was provided end-to-end, extending TV2's internal production network into TDC NET's mobile network, creating a faster, more secure and stable connection for live video transmission. The result was excellent quality footage, gathered and disseminated flexibly, and with certainty of reliable transmission – without the need for heavy cables.

Wider **impacts**

This solution could provide a basis for a far more mobile and flexible AV production industry, capable of capturing footage that has hitherto not been feasible.

An example of this is what TV2 was able to achieve during the winner's parade of Tour De France 2022, during which the car containing winner Jonas Vingegaard acted as a rolling remote production site – with three mounted cameras transmitting footage live back to TV2 MCR via 5G, where it was cut together with feed from helicopter and motorcycle cameras for the finished TV signal. Guaranteed reservation of upload capacity in that crowded scenario, with many onlookers drawing on the mobile network, is what allowed transmission of the signal with certainty.

Wider deployment would mean an industry populated by increasing numbers of producers able to rapidly report news and create compelling entertainment content at short notice wherever they are, without needing to rely so heavily on specialised technical setups – which would in turn, over time, stimulate entirely new types of content. The solution could also serve a range of other sectors relying on critical communications services, such as remote safety solutions in industrial settings and emergency services.

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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.

For more information, please visit the GSMA corporate website at **www.gsma.com.**

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GSMA 5G Transformation Hub

The GSMA 5G Transformation Hub is a source of information on some of the most innovative 5G solutions in the world. This portal contains case studies detailing design, benefits, key players, measured value and the future impact of scaling up these 5G solutions worldwide. The 5G Era is now firmly established and this family of standardised GSM technologies, including mmWave, are being rolled out successfully across the globe. The GSMA 5G Transformation Hub, launched at MWC Barcelona in 2022, provides details of how 5G is best placed to deliver real value for a range of key sectors including manufacturing, energy, transportation, media and live entertainment, smart cities and construction.. Many more case studies will be added, in the coming months, covering even more industries and the GSMA is asking Members to nominate innovative 5G case studies to add to this global digital showcase. The 5G Transformation Hub is sponsored by Qualcomm.

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