Statement of Requirement

Implementation of Open Network APIs

For Live Broadcast Production and Public Protection and Disaster Relief

Supported by ***BBC, France Télévisions, RAI Radiotelevisione Italiana, Sony, Haivision, Amarisoft, AW2S***

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Scope of this document

This statement of requirement (SoR) is focussed on the use of 5G with open Network APIs to support the broadcast production industry (albeit the impact extends well beyond this vertical).

This endeavour is proposed by Neutral Wireless with support from key partners, including broadcaster end-users the BBC, France Télévisions and RAI Radiotelevisione Italiana; network equipment and software providers Amarisoft and AW2S; and broadcast technology vendors Sony and Haivision — with further support from the International Broadcasting Convention (IBC).

1 Problem Statement

Cellular/Mobile wireless technology has grown from its initial conception to provide wireless telephone services to mobile users into a bona fide wireless IP network technology. The use cases for the latest 5G (and next-generation 6G) technology are extensive and cross a wide range of market verticals, from Internet of Things (IoT) connectivity for smart devices, factories and even cities, to secure offline networks for surveillance, critical infrastructure and defence. There is no one-size-fits-all or '*cookie-cutter*' template to address these disparate opportunities—some require high uplink bandwidth or support for many thousands of devices, while others require ultra-low latency—yet they all have certain requirements in common. A major challenge is maintaining control over quality of service (QoS) and adapting to changing prioritisation requirements, which has become known as quality on demand (QoD). In fact, the QoS possibilities offered by 5G and its advanced resource scheduler are one of the (many) attractors to the technology over other wireless implementations, such as Wi-Fi. Without user control of QoS among their network devices or workflows, there will remain a barrier to adoption of 5G as *the* preferred deployment technology.

2 State of the Broadcast Industry

The broadcast industry presents a set of well-defined use cases for both public and private 5G standalone implementations. The three main wireless production categories can be outlined as follows:

- **Contribution links** – usually provided from remote locations with low bitrate (<10 Mbps) and high latency (>1 s)
- **Supplementary links** – medium quality (around 10 Mbps) and latency (<1 s)
- **Production links** – usually local, with high bitrate and ultra-low latency (<100 ms)

Public networks have already become an industry standard for contribution links. There has been significant investment by broadcasters and production companies in bonded-cellular video transmitters for use on

public 4G/5G networks, which are now regularly used as an alternative to some links for on-location newsgathering. Being IP-based solutions, they can integrate well into existing workflows or modern cloud-based production environments. With the ubiquity of public networks, deployment and operation is very straightforward, but sharing network capacity with the rest of the mobile network operator's customers can become challenging in high-demand density environments.

Production links are currently largely achieved using point-to-point COFDM radio links. Latency requirements typically rule out the use of public cellular/mobile networks, although with network slicing and multi-access edge computing (MEC) there is now the potential to explore support for production links.

2.1 Live Event 5G SA Demonstrations

Private (or non-public) networks have been successfully deployed at major international events to support both contribution and production links for wireless live broadcast production. Recent examples by key organisations supporting this SoR include:

- **Coronation of King Charles III in 2023** – over 60 devices from 20 international media outlets shared an uplink-biased private network to deliver video and radio contribution links.
- **Paris 2024** – multiple uplink-biased private networks were deployed across Paris and Marseille to support both supplementary (200+ feeds) and production links, as well as press photographer image upload.

2.2 Use Case Stacking and QoS

There is growing interest and demand to expand the use of 5G technology for live broadcast production, with many attractive benefits such as use case "stacking" to support many workflows using the same infrastructure. But regardless of the workflow, network provider or technology vendor, the issues of QoS management and QoD persist, and are an obstacle to adoption. The broadcaster or production company *need* to be able prioritise particular devices or data flows, for example:

- Live and preview feeds should be prioritised over other feeds, as they need to be the most resilient
- With use case stacking and resource sharing, some workflows are more latency-critical than others, and production operators need to be able to separate.

This can be *statically* managed using packet data networks (PDNs) with bearers and data flows with different priority levels for use case separation.

2.3 Dynamic QoS Management using Network APIs

In some cases, priority can be *dynamically* managed using proprietary APIs. In practice, this prevents adoption, since network providers aren't incentivised to develop an API that exposes (partial) control of their network to another party and broadcast **hardware vendors cannot implement support for multiple proprietary APIs or design features to work across networks offering differing functionality**. Instead, we have a *causality dilemma* — hardware vendors don't develop features requiring network APIs, as there is uncertainty on API support and functionality; and network providers don't develop APIs, because there may not be hardware vendor uptake.

3 Call to Action

This is where the value of standardised network APIs becomes not only apparent, but required for the adoption of 5G to proliferate and deliver on the many promises that excite both vendors and potential users, in the broadcast industry and beyond. The development and implementation of standardised Network APIs, ensuring interoperability and providing cross-market coverage, gives the broadcast production industry the network functions it needs to design solutions to meet customer demands.

The need to offer standardised network APIs is perhaps most obvious when thinking about private networks, where it might be expected that the user can use QoD to dynamically configure and change their priority on demand. However, they are arguably *more* important for public networks, where there is typically more risk of congestion and devices are more resource constrained (particularly for uplink).

Public network slicing, an example of an API that can increase the quality of a connection in high demand density environments, can provide dedicated resources, but resources are finite and there are only so many slices an operator can provide, with each removing capacity from other customers. Instead, as QoD availability becomes more widespread on public networks, resource allocation can be prioritised between multiple users/devices/services on a public slice to provide connectivity as and when it is needed.

We therefore support GSMA's Open Gateway Initiative that aims to drive development and exposure on industry standardised APIs including QoD as certified and released by CAMARA. Only through standardisation will we see widespread adoption by MNOs, enterprises, channel partners, system integrators, vendors and other ecosystem players.

We fully support an open and non-discriminatory system of standard APIs (including QoD) provided by as many MNOs and private network providers as possible to as many verticals as possible, in order to drive scaled adoption and deliver maximum impact.

3.1 Further Opportunities

With developments in MEC (mobile edge computing), there is now the opportunity to deploy a local user plane for a public network onsite. This has huge implications for latency and jitter. Combined with slicing and QoD network APIs, this could allow broadcasters to run production links and essential local services (such as camera control and intercom) on a public network, expanding their capabilities.

The requirement extends well beyond the broadcast industry. For example, there is increasing interest in *sharing* broadcast and public safety infrastructure. Day-to-day operations could prioritise broadcast workflows, but dynamic QoD would allow public protection and disaster relief (PPDR) equipment to have prioritised access to significant wireless resources should the need arise. Even among PPDR devices, there may be a critical link that needs to be protected. These nested layers of ever-changing priority cannot be statically managed; they require dynamic control, and the use of standardised open network APIs is essential to maximise support across vendors, networks and industries.

4 Requirement and Implementation of standardised open QoD APIs

The above highlights only a few examples of the need for dynamic QoD within the broadcast industry, but barely scrapes the surface of the requirement in the wider context of the many other (non-broadcast–related) verticals. However, the network operators provide the required network access, and without an implementation to manage QoD there is no chance for vendor solutions to address the industry needs. The use of standardised, open network APIs maximises impact, resolving the causality dilemma: There is now incentive for both network providers and hardware vendors to support open network APIs — customers *will* prefer to use hardware solutions able to support their priority requirements and network providers that allow them to function.

CAMARA provides a mature implementation of suitable open network APIs. This statement of requirement urges the uptake and integration of the ***Quality on Demand (QoD) API***, and aims to demonstrate the necessity of QoD to manage resources for broadcast production and public safety.

Our priority use cases for QoD API are resiliency and protection of key live broadcast feeds, allowing them to survive network contention when using narrow channels or slices to support multiple cameras or many devices with use case stacking.

With support from the partners named herein, we believe we could start to evaluate their potential through live demonstrations and pilots within six months of go live-dates in each of these applications, with a showcase delivered at the IBC Show in September 2026.

4.1 API Requirements

The broadcast industry needs to ensure reliable connectivity for remote broadcast and production, especially in areas with low bandwidth. Poor connectivity can lead to delays and visual glitches and artifacts resulting in a negative end consumer experience and even violation of SLAs with rights holders. By using

Standardised APIs, like **CAMARA Quality on Demand**, network performance for critical feeds and services can be dynamically enhanced to deliver robust connectivity when and where it is needed. To overcome the high latency and unreliable connectivity associated with broadcasting from remote or crowded locations, this SoR appeals to public mobile operators to implement the **Quality on Demand** and **QoS Profiles** APIs:

- **Quality on Demand API**: Supporting smooth and uninterrupted live broadcasts without compromising quality.
- **QoS Profile API**: Providing a set of predefined QoS profiles, supporting stable latency or throughput for specific data flows.

4.2 Demand Matrix and Timelines

In reference to the Call to Action, we encourage MNOs and other ecosystem players in the following regions to provide the necessary CAMARA APIs by the Target Timeline, which coincides with commercial opportunities surrounding major events.

CAMARA API	Priority Countries	Target Timeline
Quality on Demand and QoS Profile	UK	Q4 2026
	Italy	Q1 2027
	France	Q2 2027
	Netherlands	Q3 2027
	USA	Q3 2028

5 Supporting Partners

Neutral Wireless is an award-winning and Emmy®-nominated private radio communications company based in Scotland. With decades of signal processing, FPGA and software-defined radio (SDR) experience, the team has a proven track record designing and deploying flexible high-performance private 5G standalone networks for a variety of use cases including the broadcast industry. Neutral Wireless specialises in ultra-configurable pop-up and portable networks, which have been used during numerous high-profile international live television broadcasts, including the Coronation of King Charles III and Paris 2024 (above).

Neutral Wireless has a long-standing relationship with the **BBC**, who were recently awarded an Engineering, Science & Technology Emmy® for their profound and sustained contributions to the news and media industry, including the private 5G network deployed with Neutral Wireless for the Coronation. French national broadcaster **France Télévisions** have also been at the forefront of private 5G, deploying a moving private network to support their coverage of the Olympic torch relay as it moved through France and the use of private 5G from an ultralight aircraft to provide wireless connectivity at a cycle race. Italian public broadcaster **RAI Radiotelevisione Italiana** have also actively explored private 5G indoors and outdoors for winter sports. These broadcasters all use bonded-cellular for contribution links and have experienced how network congestion can prevent them going live to air. *QoD to manage QoS on both public and private networks is of significant interest*. **Sony** and **Haivision** are leading names in broadcast hardware and software solutions and have previous experience working with CAMARA APIs. **Amarisoft** is a software-defined radio access network (RAN) and 5G core software vendor, and **AW2S** is a software-defined radio unit manufacturer. The coordinating partner, Neutral Wireless, has an established working relationship with all partners. We are grateful for the support of the **IBC** and its Accelerator Programme.

The supporting organisations cover the end-to-end broadcast workflow, with the end users (broadcasters), a private network provider and vendors, and broadcast hardware and software vendors. The group has external links with public MNOs, government and emergency services, with expressed interest in QoD for public safety and PPDR.