Non-Public 5G Networks for Content Production

Non-Public Networks (NPNs) are a feature of 5G technology designed for localized non-public use. For media organizations, NPNs may offer the possibility of deploying fixed and nomadic networks, where fixed networks would cover small areas like studios or extend to the entire premises as a so-called campus network.

What are Non-Public Networks?

Media production facilities are increasingly adopting IP-based infrastructure. The ubiquity of IP networks and technologies enables increasing efficiency and effectiveness in production, process automation, and greater flexibility. Content production and contribution could leverage 5G as a highly reliable wireless technology to enhance existing or enable new workflows in the areas of newsgathering, remote production and live event coverage as well as in dedicated production facilities.

NPNs are a key enabler for the deployment of media production scenarios. They are currently under standardization in 3GPP, with the first functionalities specified in Release 16. NPNs offer the possibility of providing 5G network services to organizations without entirely relying on public mobile networks. The latter may not be able to support certain applications, for example those requiring very low latency, highly robust services or business-critical data privacy – meeting such requirements may not be the primary business focus of public mobile network operators.

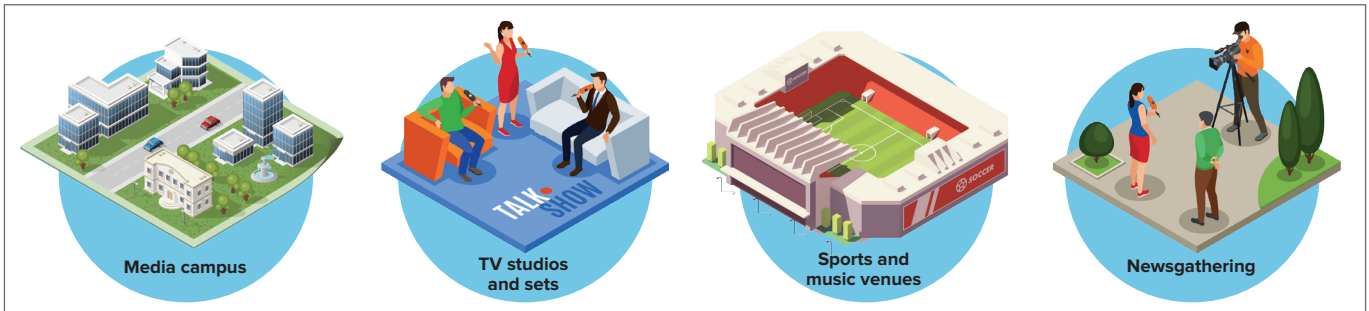
NPNs therefore enable the deployment of 5G to provide services that may not be available in public mobile networks and are tailored to the needs of a specific industry, in this case media organizations. To enable a full degree of interoperability, NPNs should be connected to existing media production network infrastructure.

Applications for the media industry

NPNs may satisfy the demanding performance requirements of content production, such as very low latency and precise synchronization, and with respect to security, privacy and liability, by means of isolation from public networks, using dedicated resources and associated security credentials.

They may be deployed stand-alone or in conjunction with public networks. Different NPN deployment options may be suitable depending on the type and scope of the production events, preferred business models and regulatory options.

NPNs can be deployed as temporary or permanent. Permanent networks may cover a geographically limited area, as small as a small a single building or venue, or an entire campus used by audiovisual media production organizations.



Media application scenarios for NPNs

For nomadic or temporary productions (e.g. touring events, festivals, etc.), the preferred option may be a stand-alone NPN that can support the production anywhere and at any time. It would function independent of public mobile network coverage and avoid the need for negotiation of contracts and service-level agreements with multiple, diverse mobile network operators across country borders.

For productions with less demanding requirements (e.g. newsgathering, low-cost live), service-level agreements and commercial arrangements between different types of network operators will need to be compared in order to obtain the right balance between functionality and cost with respect to the potential use of NPNs.

The choice of deployment options for an NPN will be based on considerations around spectrum availability, network ownership and operation, and security, privacy and liability.

The deployment of NPNs for media production and contribution can:
• Provide traffic isolation from other networks to ensure stable performance, reliability, security, or privacy.
• Meet requirements traditionally out of scope of general-purpose public mobile networks.
• Provide robust security and privacy features through, for example, dedicated credentials for on-boarded equipment.
• Facilitate self-management and operation without the need to rely on third parties.

5G-MAG and Non-Public Networks

5G-MAG is monitoring the standardization of NPNs and their relevant features in 3GPP to understand the road map, timelines and expected support for audiovisual media production applications in both network and user equipment.

5G-MAG analyses different national approaches and emerging licensing models for making spectrum available for NPNs. 5G-MAG believes that the existence, across Europe and possibly worldwide, of a common spectrum range with homogeneous frequency channelization for NPNs in media production would help create economies of scale for their commercial deployment and operation. Furthermore, technical harmonization of protocols and workflows for spectrum access for NPNs in media production would be beneficial for both vendors and users.

5G-MAG believes that access to spectrum for nomadic NPNs and short-term deployments also needs appropriate regulatory frameworks, as the current national regulatory approaches are primarily suitable for stationary and long-term NPN deployments.

Beyond spectrum access, 5G-MAG also studies regulatory aspects that may be relevant for the deployment of NPNs, such as numbering and network identifiers, roaming between public networks and NPNs, network-sharing approaches and site regulations.

Useful Links

- 3GPP TS 22.263 v17.2.0 “Service requirements for Video, Imaging and Audio for Professional Applications (VIAPA)”
- 3GPP TS 23.501 v16.6.0 “System architecture for the 5G System (5GS)”