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Charting the Course to 6G

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The Next Generation Mobile Networks Alliance (NGMN) guides a course for the future of communication networks by taking a proactive stance and emphasizing the need for new paradigms that enable intelligent technological evolution and successful value creation and delivery. NGMN's recently published 6G Position Statement: An Operator View offers clear recommendations from the Mobile Network Operator (MNO) community, challenging the conventional approach of introducing a new technology generation by shining a light on the challenges our industry currently faces, and highlighting the importance of streamlining network operations, prioritizing sustainability and delivering compelling new 6G services and capabilities for the benefit of end-users. Our Position Statement is a call to the industry to embrace this transformative new direction.

A total of 19 strategic precepts were identified in this Position Statement, categorized into four groups. These four groups are:

- Innovations and New Services – including new International Mobile Telecommunications (IMT) 2030 features and seamless integration with fixed and satellite networks.
- Operational Priorities – including a call for network simplification and operational automation alongside absolute energy reductions.
- Guiding Principles – including a call for globally harmonized 6G standards and the clear imperative for no inherent hardware upgrade of the 5G radio access network (RAN) to support 6G.
- Spectrum – Including the licensing of both existing and new IMT spectrum for IMT-2020 and beyond.

This article offers explanation of the details of the visionary stance of each group, highlighting the key insights in the ground-breaking publication.

Fostering Innovations and New Services

The MNO community believes that 6G will be built on and extend beyond the robust foundations of its predecessor, the 5G mobile network. This foundational continuity, however, does not diminish the challenges faced by MNOs. Infrastructure deployment is one such challenge, though in the right context

infrastructure deployment may well be justified when delivering compelling 6G services to end-users. In addition to overcoming these challenges, MNOs are steering towards network disaggregation and an open, interoperable cloud-native architecture. This deliberate move toward network disaggregation and open cloud architecture is not just an operational necessity, but rather a strategic one aimed at enhancing flexibility for both current and future networks, and hence achieving an improved agility in responding to end-user demand.

Beyond the foundational aspects, 6G to is expected to transcend the capabilities of 5G and to continue delivering new innovations and new services, including, e.g., joint sensing and communications, Artificial Intelligence (AI) integration, extended augmented reality (XR/AR) and virtual reality (VR) experiences, as well as enhanced positioning and seamless interoperability of fixed and satellite networks. Moreover, 6G should also continue to inherently support network-related application programming interfaces (APIs), fostering a conducive environment for the development of new service offerings that leverage the full spectrum of network capabilities.

Operational Priorities: Streamlining for Success

The MNO community within NGMN is committed to ensuring that 6G delivers not only tangible benefits and compelling new experiences to end-users, but also to simplifying network operations and ensuring sustainability. The operational priorities of our members serve as guidance for the industry, aiming to address practical challenges and ensure the seamless integration of 6G.

These priorities recognize the importance of network simplification in lowering operational costs through scalable and flexible deployment models. Another key operational priority is the implementation of absolute energy reduction measures across both mobile and fixed networks. This initiative supports a strategic shift towards fostering low-carbon economies. Efficiencies can also be found through the integration of AI-supported automated mobile and fixed network operations and orchestration, enabling more dynamic service provisioning and proactive network management capabilities. This ensures that networks can better predict and address issues before they impact end- users. Additionally, the integration of quantum-safe infrastructure will emerge as a crucial element.

These priorities collectively aim to streamline operations, achieve improved cost-efficiency, significantly improve energy efficiency, and ensure the required network resilience.

Guiding Principles: Forging a Path to 6G

The MNO members of NGMN have formulated a set of guiding principles which provide a blueprint for industry stakeholders to unite around. Global harmonization of 6G network standards is identified and positioned as the first guiding principle, and NGMN has for many years and with previous network generations supported this as a key foundation stone. New principles include avoiding inherent triggers for a hardware refresh of 5G RAN infrastructure and ensuring that decisions to upgrade hardware are both independent of requirements to support 6G and are operator-driven choices based on factors such as end-of-life, improved energy efficiency, or the offering of compelling and novel capabilities to end-users.

Alongside the “no inherent hardware upgrade” guiding principle is the requirement that 6G's introduction must allow certain scenarios to be realized through software-based upgrades of existing network elements. This approach to the deployment of 6G must not compromise the connectivity of customers on 5G networks. It must also maintain the integrity of existing core services. Network performance, flexibility, and backward compatibility, without compromising customer connection to 5G

networks, and without compromising existing core connectivity services such as voice, are also key considerations in our MNO community's vision of 6G deployment.

Addressing the diverse needs of 6G customers across mobile, fixed, and non-terrestrial networks is a cornerstone of this vision. Ensuring interoperability and incorporating robust security measures to counter emerging threats and vulnerabilities are also essential components of the guiding principles.

Spectrum Considerations: Navigating the Wireless Landscape

Mobile Network Operators within NGMN recognize the critical role spectrum considerations play in aligning the industry toward a unified vision, the importance of licensing both existing and new IMT spectrum for IMT-2020 and beyond, and also to explore the potential of new IMT spectrum in the sub-THz bands for adoption in any new IMT-2030 and beyond radio technology.

Conclusion: NGMN's Ongoing Contribution

The NGMN 6G Position Statement is not just a static document, but part of an ongoing commitment to shape the industry through NGMN's impactful and relevant three strategic focus topics of 1) Mastering Disaggregated Networks with a focus on End-to-End Operating Disaggregated Networks, 2) Green Future Networks, and 3) 6G, each building on each other to provide a unique and evolving perspective.

Whatever 6G might become, it will be built on the foundations of 5G. NGMN's 6G vision is forged in collaboration with a diverse range of industry stakeholders, providing another valuable example of how NGMN's Mobile Network Operator community collaborates with the entire value chain within NGMN on 6G end-to-end requirements, and offers the industry invaluable guidance into the future of communication networks and the realization of a graceful path towards 6G.

The traditional way of introducing a new technology generation must evolve. NGMN's ongoing, operator-led provisioning of impactful guidance and recommendations to the industry, facilitating dialogue across the whole value chain of NGMN's membership and external stakeholders, will not only benefit the telecommunication ecosystem, but also lay the groundwork for global 6G deployments that cater to the evolving needs of end-users.

The realization of a graceful evolution towards 6G is not just a possibility but a shared passion actively pursued by NGMN. Following upon NGMN's previous publications, 6G Drivers and Vision, 6G Use Cases and Analysis, and 6G Requirements and Design Considerations, our "6G Position Statement: An Operator View," marks the next step of guidance for developing E2E requirements for 6G. It is another valuable example the global MNO community within NGMN collaborating with our entire Partnership. As NGMN continues this collaborative journey, the industry can anticipate a future where communication networks seamlessly and more easily adapt to emerging technologies, providing tangible benefits to both industry stakeholders and end-users alike.