Written evidence submitted by Telecom Infra Project

Subject: Security of 5G and Open Radio Access Networks

We are grateful for the opportunity to contribute to the UK 5G policy debate at this critical time. We welcome the committee's inquiry into the important question of how to ensure a more secure connectivity landscape for the future.

The Telecom Infra Project (TIP) comprises several hundred members, drawn from manufacturers, mobile network operators, other connectivity stakeholders, academia and government. Our diverse membership allows us to offer this inquiry a perspective drawn from the broadest possible industry base, on the potential for reforming the market for telecom network equipment to improve security.

We wish to direct our submission to the role that open radio access network (OpenRAN) paradigms can play in improving network security in the UK, in current 3G, 4G and 5G networks, as well as subsequent generations of network technologies. We also wish to draw your attention to the leading role that UK companies are playing in this innovation.

About Telecom Infra Project

With UK mobile network operators such as Vodafone, BT and Telefónica at its heart, TIP is taking an innovative approach to building and deploying the technology that improves global connectivity. A community of manufacturers, software makers, network operators, integrators, and others work to make the telecom supply chain more diverse, innovative, and open, so that future digital infrastructure is brought more quickly to market for everyone.

We are an engineering-led organisation focused on technological solutions and providing alternative and complementary options for connectivity. One of the central components of our organisation is our TIP Community Labs - physical spaces that enable collaboration between member companies to develop new solutions. We host one of our community labs in Ipswich, sponsored by BT.

Across the world, TIP is working to develop and expand solutions based on technologies including OpenRAN, Open RAN 5G NR, Crowd Cell, Wi-Fi, Open Cellular, Open Optical and Packet Transport, Non-Terrestrial Connectivity Solutions, mmWave Networks, Wireless Backhaul, Open Core Network, Edge Application Developer and End-to-End Network Slicing.

One of the most mature technologies used by TIP members to develop solutions is OpenRAN, an innovative, disaggregated way of designing a significant section of telecom networks.

OpenRAN in brief

OpenRAN is the term used to describe a new way of structuring the radio access network (RAN) equipment in mobile networks. RAN equipment comprises the masts, antennas and associated parts that mobile network operators use to connect wirelessly with mobile devices like smartphones. The core, by contrast, coordinates how these signals are sent and received, as well as tracking usage for billing and authentication. Today, there is a high level of vendor concentration in the RAN market, with figures[1] from industry analysts Analysys Mason

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[1]https://www.analysysmason.com/Research/Content/Reports/RAN_market_share_RMA18

suggesting the top three vendors held around 75% of the market in 2018.

OpenRAN separates the hardware and software components of this equipment and standardizes the interfaces between them. This makes it easier for different companies to make and sell RAN equipment, which gives mobile network operators more choice in how they build this network, providing better value for money for operators and end-users alike. OpenRAN is non-proprietary, providing a route to market for smaller companies who can specialise in certain components where previously the barriers to entry were extremely high.

OpenRAN changes the security question

We believe trust in network security is best achieved from open scrutiny of development practices.

OpenRAN makes the development process more transparent and accessible. Because the specifications enabling interoperable and interchangeable hardware and software are open, development within TIP also takes place in a transparent and open manner. This means that independent security experts, government departments, national security agencies and other vendors have much greater transparency into the development process, not just the subsequent performance, and can gain greater assurance.

A more diverse market has direct security implications, as it provides greater incentives to compete on security and trust, as well as greater flexibility to mobile network operators.

OpenRAN's deployment and next steps

To date, Vodafone has launched trials of OpenRAN in the UK, Ireland, Mozambique and the Democratic Republic of the Congo. Telefónica will

launch OpenRAN trials for 4G and 5G in the UK, Germany, Spain and Brazil this year. Internationally, Etisalat has completed its first deployment in the UAE and will now start trials of OpenRAN solutions in other regions. In Indonesia, Indosat Ooredoo and Smartfren will soon conduct the first OpenRAN field trials.

OpenRAN is emerging from a mature ecosystem and full deployments are due in the near term. Support from policymakers can assist this process by creating the enabling environment for a more innovative ecosystem.

Policy recommendations

The security and market benefits of widespread adoption of OpenRAN in the UK can be accelerated. We would have two recommendations for the committee's consideration:

1. The UK should provide support for innovative British companies in radio access networks. The Budget indicated an ambitious agenda around modernisation, which could well support this aim. In this regard, the proposal to create a "UK ARPA", modelled after the US Advanced Research Projects Agency, could be relevant.

2. The Government should consider ways to make it easier for mobile network operators to procure from outside the established vendors. Although this regime is likely outside the committee's immediate area of interest, having the right environment for this market to flourish is indispensable to gaining the security advantages inherent in that diverse marketplace. Other countries have been able to successfully design nimble regimes which enable earlier deployment of OpenRAN. We are intending to provide further detail on this to other committees' inquiries but can do so to this committee on request.

Conclusion

The UK has an opportunity to improve long-term security not just for 5G but previous and subsequent generations of telecom networks. We believe the structure of the network equipment ecosystem is an important factor in achieving this goal, and the approach offered by OpenRAN solutions can provide a more secure, diverse and innovative sector that will realise the UK's technological ambitions. Moreover, with targeted support from policymakers, the UK can play a leading role in this and subsequent generations of network technologies.

TIP looks forward to supporting the work of policymakers in this regard. We thank you for your consideration of this submission and are available for further consultation.

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