

June 25, 2020

Mr. Travis Hall
Office of Policy Analysis and Development
National Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 4725
Washington, D.C. 20230

Subject: Oracle's response to the National Telecommunications and Information Administration's (NTIA) request for public comments on *The National Strategy to Secure 5G Implementation Plan* [Docket No. 200521-0144]

Dear Mr. Hall,

Oracle appreciates the opportunity to respond to NTIA's request for public comments on *The National Strategy to Secure 5G Implementation Plan* [Docket No. 200521-0144]. We applaud the U.S. government's continued leadership and focus on 5G. As a global hyperscale cloud services provider whose offerings span from infrastructure to enterprise software and communications solutions that underpin essential services used every day, Oracle has a unique perspective that can help inform the U.S. Government's implementation of its *National Strategy to Secure 5G*.

5G is the ultimate convergence of telecommunications and compute, architected to enable the tidal wave of applications, and innovative services built on the billions of IoT connected sensors and devices, likely generating zettabytes of data.¹ A generational shift to an entirely IT-based infrastructure, 5G replaces purpose-built hardware with software running in hyperscale clouds, thus shifting from a fragile telecommunications equipment supply chain to a more agile, competitive and robust IT technology supply chain while adopting new economic models that can change the game in deployment and future growth.

It is against this backdrop that we respectfully submit our comments, perspectives, and recommendations to inform the *National Strategy to Secure 5G Implementation Plan*.

A Shifting Supply Chain

5G networks are built in data centers and accessed through cloud services, requiring telecommunications-specific technologies and protocols like SS7 and Diameter to be replaced with IT technologies. Shifting to an IT-based supply chain means that there are now a host of trusted vendors who can compete, particularly as 5G technology

¹ <https://www.zdnet.com/article/iot-devices-to-generate-79-4zb-of-data-in-2025-says-idc/>, accessed June 23, 2020

requirements fall in the sweet spot of the U.S. software and IT industry. The result, an agile, secure and diverse vendor ecosystem where carriers and enterprises have choice and competitive pricing.

We offer the following considerations:

- *Recognizing the critical role of software:* U.S. technology vendors are already providing cutting edge products across the 5G stack, particularly in the cloud. Built in the cloud, 5G allows for open and interoperable solutions that are powered by software, breaking the old model in which one vendor provides an end-to-end proprietary solution, locking in its customers. By using software to take over network elements that previously relied on proprietary hardware, 5G opens the door to increased market competition and more frequent innovation cycles, benefiting carriers and enterprises deploying 5G. We encourage the U.S. government to continue emphasizing and championing the critical role that software and the cloud play in 5G and ensure that initiatives consider more than just equipment.
- *Support open Radio Access Network (RAN) solutions:* Innovation and competition are occurring in the RAN space, with new market entrants offering innovative, open, interoperable software-based RAN products and services. Continuing to emphasize the role that software plays and incentivizing the use and deployment of standards-based open and interoperable software-based solutions will allow for new entrants to compete, fueling innovation, increasing market diversity, and driving down the cost of solutions. We point to initiatives such as the funding mechanisms established in accordance with Sec. 501, “Secure and Trusted Technology,” of the Intelligence Authorization Act for FY2021. The resulting Funds would promote technology development – including software – and accelerate the development of open, standards-based interoperable solutions to enhance 5G competitiveness. Such an investment sends a clear signal to industry that the U.S. government believes these types of solutions are viable, helping to accelerate industry investment in developing these types of standards-based, open, interoperable and software-based solutions.
- *Recognize that 5G is access agnostic:* It is important to acknowledge that 5G is access agnostic. 5G is about delivering IoT services with massive connectivity, low latency, extended battery life, and supporting very small devices that do not require SIM cards. It is the 5G core that delivers this functionality, and cellular is just one method to access the core. Broadband, satellite, fixed line, cloud service providers can all access the core to deliver these services, expanding the ceiling of those who can enter the market. We encourage the U.S. government to

consider this point in its future work so as not to unnecessarily limit the solution space.

Prioritizing Applications

Defining leadership in 5G according to infrastructure roll-out metrics is misleading. 5G was designed primarily to enable IoT and the many resulting applications, not for consumers to enjoy faster download speeds to their smartphones. A fully deployed, nation-wide 5G infrastructure is not a necessary precursor for innovation to occur; while carriers continue their infrastructure build out, enterprises are working in parallel with partners to deploy their own 5G networks, configuring and adapting them to meet the exact needs of 5G-enabled applications, which previous technologies like 4G or WiFi could not support. It is this 5G-enabled applications market opportunity that will promote adoption and drive competition, translating to U.S. leadership.

The U.S. government should prioritize and sponsor the development of 5G-enabled applications, spurring industry innovation, just as DARPA's grand challenges pushed the needle for autonomous vehicles.² Specific recommendations include:

- *Champion use cases:* The U.S. government is in a unique position to drive innovators to focus on 5G-enabled applications, where the market opportunity and leadership stake is tremendous, with some estimates placing it at \$2.2 trillion USD.³ As nation-wide 5G infrastructure is being deployed, prioritizing the “what” gives us an opportunity to jumpstart the ecosystem that 5G and future generations enable. We strongly support the Department of Defense's approach in its 5G pilots, conducting large scale experimentation and prototyping. We encourage other departments and agencies to take a similar approach to work with industry and explore how 5G-enabled applications can help them meet their mission objectives.
- *Test ranges:* Test ranges provide useful environments to actually test 5G solutions and applications, turning the hypothetical to the real, and serve as a safe place to identify and resolve challenges that arise in delivering 5G applications including how integration works best. Such trials will also ensure that policy can be informed by the art of the possible, not the other way around. We encourage the U.S. government to consider broadening their use of test ranges in partnership with industry to test solutions.
- *Be clear but not overly prescriptive:* As departments and agencies release 5G related requests for information, prototypes, or proposals, we strongly encourage

² <https://www.darpa.mil/news-events/2014-03-13>, accessed June 23, 2020

³ https://www.gsma.com/wp-content/uploads/2019/04/The-5G-Guide_GSMA_2019_04_29_compressed.pdf, accessed June 23, 2020

them to clearly describe what they would like to achieve in using 5G and enabled applications, but not be overly prescriptive on defining how industry should build their solutions as this unnecessarily limits choice. We urge caution that agencies not use overly restrictive language in requests, which could both risk alienating potential partners from even submitting a response or cause an evaluator to negatively assess an innovative proposal because it offered a unique approach that did not fit neatly into the stringent request language. We point to the State Department's recent "5G Clear Path" request for information⁴ as a good example of clearly explaining the "what" but leaving the "how" to the responder's creativity and innovation.

5G Security and the Cloud

5G's transition from purpose-built hardware to software and cloud presents a new opportunity to shift the security advantage. Built in the cloud, 5G inherits the cloud's scale, reliability and security, allowing capabilities to be rapidly deployed, scaled, and segmented with tailored security measures applied to each. Embedded artificial intelligence and machine learning capabilities can autonomously prevent, detect, respond to, and predict sophisticated threats. As the network functions are carried out in software, there are additional tools such as network slicing, containerization, and zero-trust software defined perimeters to further enhance security. Additionally, because 5G is an IT-based infrastructure, the supply chain shifts from a fragile telecommunications equipment supply chain to an agile, secure, and diverse IT supply chain where there are many trusted vendors that can develop critical capabilities. We encourage the U.S. government to factor in these unique security attributes that can now be brought to bear in 5G technology.

Leveraging the Scale of the Cloud

The underlying technology shift in 5G permits carriers and enterprises to apply the unique scale, performance, security, and economics of cloud business models. With 5G networks being built in data centers and accessed through cloud services, 5G service providers consume cloud resources as operating expenditures (OpEx), not capital expenditures (CapEx). Using this model, service providers of all types can recoup investments in infrastructure on a pay-as-you-go basis, ensuring the revenue model for new 5G applications can evolve in parallel with expenses. Technology providers already offer commercial cloud services at scale, at low cost, and are rapidly building new 5G applications to support carriers and enterprises. In other words, the entire ecosystem shifts to a pay-as-you-go model with the initial burden of the network core buildout largely moving from the carrier to the cloud provider. As future network services and features are likewise delivered by the 5G network "as a service," innovators can provide innumerable capabilities to end users, monetized by countless

⁴ Department of State RFI Notice ID 19AQMM20N1000
https://beta.sam.gov/opp/7596e843e6984ea8ac9eaf3c480132ea/view?keywords=19AQMM20N1000%20&sort=-relevance&index=&is_active=true&page=1, accessed June 23, 2020

new business models. We encourage the U.S. government to factor in the role of the cloud and not limit potential solutions to physical equipment, to take advantage of new business models and innovative 5G applications.

Driving Leadership in Standards

Active engagement in relevant standards development bodies for 5G technologies is critical to leadership. We offer the following recommendations:

- *Clear policies on engagement:* The U.S. government should ensure that policies on engaging in standards development organizations are clear and supportive of full participation, and they should not inhibit U.S. stakeholders from representing and advocating for U.S. interests.
- *Regular engagement with private sector stakeholders:* We recommend that the U.S. government regularly engage with the private sector outside of the standards development activities. This would help ensure all stakeholders – government and the U.S. private sector – have awareness of progress, concerns, strategies, and displace any incorrect information about ongoing efforts.
- *Consider engaging to support national and economic security objectives:* While the U.S. government traditionally engages in standards development when they have procurement interests or technical expertise, agencies should also consider engaging in standards activities to support their objective of enhancing national and economic security.

Closing

Oracle appreciates the opportunity to submit our comments, perspectives, and recommendations to assist in developing *The National Strategy to Secure 5G Implementation Plan*, and we look forward to continued engagement. Should you have any questions or would like further information, please contact Ms. Cheryl Davis at cheryl.davis@oracle.com.

Respectfully,

Peter Lord
Vice President, Strategic Initiatives
Oracle Corporation