



February 10, 2021

Rebecca Dorch
National Telecommunications and Information Administration
U.S. Department of Commerce
325 Broadway
Boulder, CO 80305

RE: 5G Challenge Notice of Inquiry [FR Doc. 210105–0001, RIN 0660–XC04]

Dear Ms. Dorch:

IBM appreciates the opportunity to comment on the *5G Challenge Notice of Inquiry [FR Doc. 210105–0001, RIN 0660–XC04]*. The National Telecommunications and Information Administration (NTIA) and the Department of Defense (DOD) have a critical role to play in promoting U.S. leadership in 5G. The 5G challenge creates a valuable opportunity for the U.S. government to be an early adopter of 5G and both accelerate and shape the growth of the technology.

The inquiry's focus on accelerating the development of an open 5G stack ecosystem is a welcome one. As a hybrid cloud and AI leader, IBM believes that an open and disaggregated model for 5G is the best way to provide flexibility and maximize opportunities for innovation to support DOD's mission. It will enable multiple suppliers to provide different elements of the Radio Access Network (RAN) and core, while running on a common cloud-native architecture.

IBM commends NTIA and DOD for their interest in an ambitious 5G Challenge that will generate significant benefits for DOD's mission, U.S. competitiveness, and the future of 5G technology as a whole.

I. Challenge Structure and Goals

B. How could a Challenge be structured to focus on the greatest impediments to the maturation of end-to-end open 5G stack development?

The single greatest challenge to the adoption of an end-to-end open 5G stack is the concern about support and maturity when compared to a single-vendor integrated stack. Thus, each objective of the Challenge should emphasize interoperability, including a focus on always having at least two participants for each component of the end-to-end open 5G stack.

C. What should be the goals of a Challenge focusing on maturation of the open 5G stack ecosystem? How could such a Challenge be structured to allow for the greatest levels of innovation? What metrics should be used in the assessment of proposals to ensure the best proposals are selected?

A key goal of the 5G Challenge should be to demonstrate interoperability at every level of the open 5G stack. This will provide assurance to users of the stack that they have the ability to select new, innovative components at any layer of the stack, while having the ability to fall back to an alternate solution if required. Openness and interoperability maximize innovation as it allows for any firm to develop competing products with low switching costs for customers, making innovation a competitive differentiator.



D. How will the open 5G stack market benefit from such a Challenge? How could a Challenge be structured to provide dual benefit to both the Government and the open 5G stack market?

The Challenge can serve as a large-scale demonstrator project highlighting the capabilities and maturity of open 5G stack technology. This creates several important benefits. First and foremost, it reduces the perceived risk associated with new technologies, which will accelerate adoption by the Government and private sector alike. This in turn drives investment, competition, and innovation in the open 5G stack market.

To benefit the DOD specifically, the Challenge should include an objective related to demonstrating mission critical communications delivered via an open 5G stack. This will invite greater competition in the mission critical communications industry and provide significant benefits to DOD's mission over time.

II. Incentives and Scope

B. Could a Challenge be designed that addresses the issues raised in previous questions and also includes test and evaluation of the security of the components?

5G security is critical for the DOD mission, as well as for U.S. enterprises and citizens. Confidence in an open 5G stack requires demonstrating resilience in the individual network functions within the open 5G stack, in the automation and orchestration that deploys and manages the open 5G stack on a cloud native infrastructure, and on the end-user service or applications. IBM recommends adding an objective to the 5G Challenge focusing on creating an open source 5G Security test suite. This will increase confidence within DOD in the use and adoption of 5G technology in its mission as well as benefit the 5G ecosystem as a whole.

D. Many open 5G stack organizations have developed partial implementations for different aspects of an open 5G stack. What portions of the open 5G stack has your organization successfully developed with working code? What portions of the open 5G stack does your organization believe can be developed quickly (6 months or less)? What development support would best enable test and evaluation of the different elements of an open 5G stack?

IBM and Red Hat have worked with multiple partners in the open 5G arena. We believe that the container platform that underpins the cloud native infrastructure, and the automation and orchestration are already available today. Many of the individual components are available, but would benefit from a focus on integration and testing as part of the Challenge.

E. What 5G enabling features should be highlighted in the Challenge, such as software defined networking, network slicing, network function virtualization, radio access network intelligent controller, radio access network virtualization?

The Challenge should highlight network function virtualization and cloud-native network function using containerization as essential enabling technologies for 5G. The Challenge should also emphasize edge computing as a key aspect of 5G.

III. Timeframe & Infrastructure

A. What software and hardware infrastructure will be needed to successfully execute this Challenge?

Regardless of the specific infrastructure necessary to execute the Challenge, it will be critical for participants to be able to bring their components of the open 5G stack and test them on an open cloud



infrastructure, using commercial off the shelf (COTS) hardware. Thus, the Challenge should establish an open 5G testbed, with a dedicated staff of program managers and engineers, as well as technical infrastructure and test tools.

Such a testbed should be established in the early stages of the Challenge to provide both regularly scheduled community-wide tests as well as ad-hoc testing for particular configurations of the open 5G stack.

Once again, IBM appreciates the opportunity to comment and we look forward to future engagements. For any questions, please contact Mr. Joshua New at Joshua.New@ibm.com

Sincerely,

A handwritten signature in black ink, appearing to read 'Roslyn Docktor', followed by a horizontal line.

Roslyn Docktor
Director, Technology Policy
Government and Regulatory Affairs