

5G Challenge Survey Response
InterDigital Communications, Inc.
Questions from NSC Survey
2-10-21

1) How could a Challenge be structured such that it would take advantage of DOD's role as an early U.S. Government adopter of 5G technology to mature the open 5G stack ecosystem faster, encourage more participation in open 5G stack development including encouraging new participants, and identify any roadblocks to broader participation?

- *DoD should survey a list of US companies with pre-existing or partial solutions and offer 50-50 cost share funding for development to worthy candidates. 5G is very vast and a lot of investment is necessary for development.*
- *DoD should support commercial IP rights for the 5G system developed under this challenge.*

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

- *The challenge should allow participants to develop components of 5G system with 3GPP compliant component interfaces.*
- *Acceptance criteria should be satisfied to integrate the components together.*
- *Integration phase will integrate the various 5G components.*
- *Performance metrics must be measured by benchmarking with commercial equipment.*

3) 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?

- *The system should satisfy 3GPP compliance performance requirements.*
- *The system should be equal or better in benchmarking test to commercial equipment.*
- *The system should be deployable.*
- *The system should support enhancements. Source code modifications to satisfy future DoD needs must be supported by the participating companies at a cost to DoD.*

4) 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?

- *Open 5G stack will benefit the DoD community to experiment with 5G enhancements that can make 5G military ready. 5G has lot of technological research and innovation built into it to use the spectrum efficiently.*
- *Use of 5G technology requires royalty payments. A system needs to be put in place to support royalty payments for the use of 5G technology developed under this challenge.*

5) What are the incentives in open 5G stack ecosystem development that would maximize cooperation and collaboration, promote interoperability amongst varied open 5G stack components developed by different participants, and mature desired featured sets faster with greater stability?

- *Well defined, 3GPP based component interfaces.*
- *Periodic unit level integration and testing*
- *Periodic system level integration and testing*
- *Acceptance test and requirements*
- *Benchmarking with commercial equipment*

6) 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?

- *Yes. Cybersecurity test should be part of the acceptance tests.*

7) Could a Challenge be designed that would require participants to leverage software bill of materials design principles in the development of components for an open 5G stack?

- *Software development is often outsourced. Sufficient traceability of code contributors, software verification and security tests by a trusted test house are essential to support zero trust solution. If participants can demonstrate trust of the solution, then a bill of materials design principle can be used.*

8) 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?

- *InterDigital has developed 5G NR PHY solution that supports both FR1 and FR2 bands. InterDigital PHY has been deployed in NSF PAWR platforms. InterDigital also brings a US based partners 5G Stack and jointly provide an end 2 end 5G Platform that can support both – 3GPP compliant implementation and enhancements tailored to DoD needs.*

9) 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?

- *O-RAN (Open-RAN) and SCF (Small Cell Forum) interface compliance*
- *O-RAN components such as RAN intelligent controllers (both near-real time and non-real time)*
- *SDN, Network Slicing, NFV*

10) What software and hardware infrastructure will be needed to successfully execute this Challenge?

- *Frequency band allocation for system operation*
- *Fielding location for testbed deployment and experimentation*
- *Power supply at cell towers*
- *Backhaul links from gNB to 5G Core network. If wireless, then frequency band of operation.*
- *Cloud servers for Core, CU, DU*
- *InterDigital can bring O-RAN compliant RU for sub 6 GHz and mmWave operation.*

11) What is a reasonable timeframe to structure such a Challenge? Should there be different phases for such a Challenge? If so, what are appropriate timelines for each suggested phase?

- *3-4 years.*