



S²MARTS Project: 22-02, Dynamic Spectrum Management @ B5G Tactical Edge Request For Solutions (RFS) Question & Answer | Date: March 29, 2022

- 1. Question: "Hi -- happy to see teaming discussions amongst members being initiated. When will we see a draft SoW? The coming soon announcement provides very little information on what the DoN is looking for. When will additional information available about this opportunity? I'm thinking any type of draft SoW, statement of objectives, overall program goals, phases / objectives of each project phase, etc? "**

Answer: NSTXL: All additional information necessary to proposal to this effort will be posted on with the Request for Solutions (RFS).

- 2. Question: Who is the technical POC for this opportunity? What is their contact info?**

Answer: NSTXL: Unfortunately, any personnel contact information involved in the evaluation of solutions can not be provided until after agreement award. Please provide any and all questions through NSTXL and we can provide them to the correct team.

- 3. Question: Our company is interested in proposing a solution for this RFS; however, we have one eligibility question. Section 4 Contents of Response (Cover Page...), section a. states that we MUST identify "Government Cognizant Security Office (CSO) responsible for monitoring the company's National Industrial Security Program Standards compliance (with address, email address and phone number)". As a small business, we do not currently have a Government CSO, does this make us ineligible to submit a solution?**

Answer: NSTXL: The Request for Solutions was modified to add. (If Applicable)

- 4. Question: Do nontraditional defense contractors and/or nonprofit research institutions who are participating as a subcontractor also need to be active NSTXL consortium members?**

Answer: NSTXL: Correct, Sub Performers do not have to be members to participate on any effort, only the prime needs to be a member.

- 5. Question: Are there specific federal radio systems that have been identify for coexistence with commercial 5G in the 3.1 - 3.55 GHz band identified in the RFS? TACNET is mentioned in the figure but no specific comms radios or radar systems are mentioned.**

Answer: TACNET was only used as an example and is not required. No DoD incumbents will be provided and no technical information on the incumbents will be provided. Intent of the project is for each submission to propose a new set of standards that would apply to the DoD incumbents and to the network. Intent is to look to the future and capture proposed standards that would account for the different types of incumbents, radios, radars, EW systems, etc, that may be seen in the band of interest. There is no intent for the proposed solution to integrate into a currently fielded DoD system.

- 6. Question: This program can be scoped at multiple levels, with significant cost variance across those levels. In Section 6, the government states \$6M for each of the first two phases, for a total of \$12M. Section 7 states that the government plans to award at least one OT agreement. It is not clear whether we should be scoping this program at \$12M (one award) or some fraction of \$12M two or more awards). Can the government clarify whether it intends to make multiple awards?**

Answer: Recommend that your team scope for everything needed for your solution set (regardless of if it amounts to the \$12 million). The USG reserves the right to select the entire proposal or independent parts. It is possible that the USG may elect to fully award one team and partially award other teams. The USG is not disclosing how many award(s) it intends to give.



7. Question: Is intellectual property protected NDS and third party coverage?

Answer: Yes, advisers and USG team members are covered by NDAs

8. Question: Will there be mutual NDAs?

Answer: If any company would like additional NDA coverage the USG is open to reviewing the request and possibly doing additional direct NDAs with the awarded teams.

9. Question: For cyber security compliance of CSWF per 8571.01 is it IAT with sec + or IAM with CISSP

Answer: For CSWF Compliance it is designated as a IAT with Security + and the following: CCNA Security, CYSA+, GICSP, GSEC, Security+ CE, SSCP

10. Question: How are risks handled for costs or scheduled risk? Examples would be inflation cost , supply chain delays/ interruptions.

Answer: The USG expects that for any significant risks they be documented in the proposals. The USG also expects that the proposers document assumptions as well.

11. Question: Does dynamic spectrum allocation include frequency hopping and are frequency boundaries defined?"

Answer: This is implementation specific, but frequency hopping may be used on the 5G system as a component of any proposal. There is no restriction on using or not using frequency hopping. Frequency boundaries are in the RFS. is implementation specific, but frequency hopping may be used on the 5G system as a component of any proposal.

12. Question: RFS Sec 7. Anticipated Number of Awards states "The Government intends to award at least one (1) Other Transaction Agreement on a fixed-price basis as a result of this RFS." Given the highly developmental nature of this work and to afford the maximum flexibility for the government and performers in execution, will the government also consider cost reimbursable type bids as an alternative?

Answer: Only fixed price proposals are being considered at this time. The USG understands that there is less flexibility this way. Please provide any assumptions your team is using for the proposal and discuss associated risks.

13. Question: Is the estimated \$15M budget per award or split between each awardee?

Answer: Total of \$15 million to be split if there are multiple awardees.

14. Question: Could the Government provide the location for the Phase 3 'At Scale Prototype Demonstration'?

Answer: The USG will provide the required details for phase 3 halfway through phase 2. There will be a separate proposal process for phase 3 in the last half of phase 2.

15. Question: Can the Government provide a description of the OV-1 in Figure 1 in the context of DSM? The figure implies that the only 5G systems are host nation systems, but the solicitation content implies that DoD may use a mix of 5G and non-5G systems in the presence of commercial/host nation 5G.

Answer: Intent of the project is for each submission to propose a new set of standards that would apply to the DoD incumbents and to the network. Intent is to look to the future and capture proposed standards that would account for the different types of incumbents, radios, radars, EW systems, etc, that may be seen in the band of interest.

16. Question: : What is meant by “5G System Accessibility” and “5G System Retainability”? What technical metrics are used to characterize them (availability, link range, etc.)?

Answer: Accessibility is a cellular engineering system Key Performance Indicator (KPI), and refers to the ability of the UE/gNB to obtain services from the 5G system within a defined geographic area, and includes the combined performance of all mechanisms needed to provide such service, including but not limited to: synchronization, authentication, random access, paging, RRC connection setup, and Enhanced Radio Access Bearer (E-RAB) call setup; whereas the failure of any of these mechanisms can cause the service(s) to be inaccessible. Retainability is a cellular engineering system KPI, and refers to the ability of the UE/gNB to retain the E-RAB once it has been successfully established from the 5G system within a defined geographic area, for the desired duration. As the RFS states these KPI's shall be compared in testing between the DSM capability being enabled vs disabled, these comparisons are independent of coverage and measure the improvement of two critical aspects of the system performance when DSM is enabled.

17. Question: Please provide further clarification on intended operating environments. Some aspects of the solicitation focus on CONUS spectrum sharing, while others address contested environments in expeditionary (OCONUS) operations. Is the intent to create a solution that addresses the full span of operations from coexistence among commercial/coalition users to assured access in the presence of jamming?

Answer: Intent is for prototypes to be extendable to all scenarios i.e. congested and contested. However due to time and scope the proposer only needs to demonstrate the novel concept and their approach. Please discuss which scenarios you are designing for and which you plan to emulate or test during phase 1 and phase 2.

18. Question: Could summary descriptions of the systems in the 3.1-3.55 GHz band and their operations be provided? Ref: For purposes of this effort, the target frequency band of interest is 3.1-3.55 GHz band sharing that supports numerous DoD operated fixed/mobile air, shipborne, and terrestrial radar systems for various mission-critical operations.

Answer: Intent is not to integrate with fielded DoD systems. Summary descriptions will not be provided. No DoD incumbents will be provided and no technical information on the incumbents will be provided. Intent of the project is for each submission to propose a new set of standards that would apply to the DoD incumbents and to the network. Intent is to look to the future and capture proposed standards that would account for the different types of incumbents, radios, radars, EW systems, etc, that may be seen in the band of interest.

19. Question: Please define "bi-directional sharing" in the context it is referenced throughout the RFS document. Is this the downlink/uplink spectrum? Is this control of operations from master-client architecture? What is meant by bi-directional near real time?

Answer: Bi-directional sharing in the RFS refers to the ability of both systems to adapt to each other (i.e. 'sharing' seen as adaptation occurring on both networks & not only one network), as opposed to the traditional SAS/ESC approach whereby only one system adapts to the other. The bi-directional sharing system may or may not include actual signaling between the two networks; proposals may focus on novel approaches that maximize the performance of both wireless networks in spectrum coexistence scenarios, when compared to the traditional one-way SAS/ESC system.

20. Question: Referring to page 1, paragraph B2 in the RFS document, please define coprimary Federal/non-Federal systems from the perspective of Spectrum, and physical radio transmitters and receivers with an example of operational tempo.

Answer: Coprimary federal/non federal systems will not be defined as it is up to the proposer to define. Intent is not to focus on currently fielded systems but to explore the future and propose standards that could work with DoD incumbents if they were designed for it. Operational Tempo is the speed at which a task or mission is carried out.

21. Question: Referring to page 1, paragraph B2 in the RFS document it references a "relevant benchmark". In this "relevant benchmark", what are coprimary systems? Explain coprimary in light of 3 tiers: Incumbents, PAL and GAA.

Answer: CBRS "relevant benchmark" is between the commercial uses and the Incumbent. CBRS is used only as an example and the intent is not to develop another CBRS solution. Intent is to progress past the baseline that CBRS has set. Proposers are left to decide if they want tiers and if applicable how to define them.

22. Question: Referring to page 2, paragraph B2 of the RFS document, "collaborative scenarios that enable bi-directional (near) real-time operation" is discussed. Is Near Real-time the same duration as defined for RIC?

Answer: Yes

23. Question: Referring to page 5, paragraph B3.1 of the RFS document, "In-situ" is discussed. Is it referring to the actual radio transmission site or is it the VCU VDU location?

Answer: In-situ' refers to the use of existing HW; this refers to the use of any receivers within both the 5G system (i.e. either UE or gNB or both), and the DoD system.

24. Question: Referring to page 6, paragraph B3.2 of the RFS document, there are two ways to interpret 1 second latency. One is ESC detection to CBSD vacating the band as directed by SAS. The second is 1 sec latency purely for ESC to detect incumbent and advise SAS. Which interpretation applies?

Answer: Incumbent detection latency as noted.

25. Question: Referring to page 6, paragraph B3.2 of the RFS document, there are two ways to interpret 5 second latency. One is that the ESC triggers activity in the SAS database and necessary computations with channel evacuation requests to the CBSD. The second way to interpret is 5 second latency purely for ESC triggering activity to the SAS database. Which interpretation applies?

Answer: Net latency for all Database/Compute System functions.

26. Question: Do we need to have a GUI to allow users input mission info and requirements or do we only need to consider system components and system interfaces for integrating with existing systems?

Answer: This is left to the proposers to explain and defend.

27. Question: Should we assume the solution will use 3.1-3.55 GHz band, and no need to worry about radar altimeter (4.2-4.4 GHz) operation being impacted by adjacent channel interference (3.7-4.2 GHz) 5G operations (page 3)?

Answer: Yes, focus on 3.1-3.55 Ghz

28. Question: Can we assume there are only Black tactical networks, no need to consider Red networks constraints when set up 5G Radio Access Network (RAN) (Fig. 1)?

Answer: This is left up to the proposer. We recommend that each solution be deployable at least within CONUS. If the proposer wishes to explore use cases that are contested, then the proposers should explain the use case and why it is important. Use of "Black" or "Red" networks is left up to the proposer.

29. Question: Can we assume that the end-to-end system latencies will not include satellite links, do not need to include the case of using MUOS?

Answer: End-to-end system latency guidance provided irrespective of the solution architecture.

30. Question: Can we assume that intel (the presence of adversary operations, e.g. jamming) will be provided, we don't need to detect it in a mission theater (page 2)? Do we need to look into EW, which can be a big topic itself?

Answer: We are leaving this open to the proposers. If you believe that there is a specific use case for a contested environment then we would like to see that and all the assumptions for it in your proposal.

31. Question: Can we assume that we will use existing 5G equipment and hardware, there is no special specifications for SWaP?

Answer: Yes, coexistence is intended for 5G commercial deployments.

32. Question: What will be the targeted network size (number of nodes, access devices)?

Answer: Typical 5G network operation parameters are suggested. The rest is left to the proposer to suggest.

33. Question: Will you be able to provide spectrum sensing and management training datasets based on current systems?

Answer: This will not be part of this effort. We are not integrating with current DoD fielded systems. Rather we are asking for novel approaches to sharing spectrum with DoD and commercial users. If your proposal includes machine learning and/or AI then please explain what inputs are needed and how they will help with spectrum sharing.

34. Question: Will you be able to provide system interface information for the integration?

Answer: As these research studies are early research (i.e. 6.2 money), there is no standardized interface at this time.

35. Question: Will the target systems be classified?

Answer: The proposal should assume for demo purposes that the DoD systems are unclassified, although these systems are not provided as GFE. The entirety of each project award will be entirely unclassified.

36. Question: What is the entry and exit TRL for the expected technology? What are the adversarial operations of interest? Any others besides EW?

Answer: TRL 3, TRL 4/5

37. Question: Can you elaborate on bidirectional sharing expectations/requirements?

Answer: This is left to the proposer to explain and defend. The DoD systems and the 5G networks have different needs so each team will need to develop a plan and defend it.

38. Question: Is the 5G network assumed to be trusted or untrusted? Are zero-trust security solutions of interest?

Answer: Main goal of this RFS is spectrum sharing. While zero trust security solutions are of interest, the main intent of the proposal should be to provide spectrum sharing.

39. Question: Administrative/Logistical: Regarding section E1a/b: The link in the document is not secure. Is this the correct link for submitting questions/submissions? <https://nstxl.org/opportunities/>

Answer: "Refer to RFS section E. 1. a. To submit questions, please visit the opportunities page located at www.nstxl.org/opportunities, select "current" tab, locate the respective project, and select "Submit a Question." "

40. Question: ESC: Will an existing ESC be available to provide incumbent sensing data and adversarial data? If not, then would a non-classified envelope be provided in order to have our sensors trained on those?

Answer: Intent is not to integrate with fielded DoD systems. Summary descriptions will not be provided. If your solution set includes current ESC systems then please state so and explain why you are including them in your proposal.

41. Question: Electronic Warfare: We fully understand the sensing use case for incumbent detection, but can you describe the use case for EW sensing by the 5G network? Will the solution be used in a Tactical environment?

Answer: "Unsure of the first question. It is important for the 5G network to know about the DoD systems so they can use DSM to mitigate interference to the DoD systems. Depending on the use case it may also be important for the DoD system to know about the 5G system so that it can mitigate interference. It is left to the proposer to suggest use in a tactical environment. The RFS does state that it will be used in congested and contested environments. These are not always "tactical" environments. "

42. Question: Electronic Warfare: Can the solution expect that TACNET will provide any real-time indication/information about adversarial/EW emitters?

Answer: TACNET was provided as an example and is not required to be included. If the proposer wishes to employ TACNET to provide their system data then in their proposal it is expected that they discuss the employment of TACNET and how it will interact with their solution.

43. Question: Bi-Directional Interface between 5G & TACNET: Is the bidirectional 5G to TACNET protocol an extension for an existing protocol? Or is a new protocol to be designed?

Answer: TACNET was only used as an example and is not required. The rest is left to the proposer.

44. Question: Bi-Directional Interface between 5G & TACNET: Is the bidirectional interface required with a single centralized TACNET network element or with multiple network elements?

Answer: TACNET was only used as an example and is not required. The rest is left to the proposer.

45. Question: : Equipment/Configuration: Is it acceptable to use equipment that is 3GPP band compliant, however doesn't cover all of the 3.1-3.55 GHz band?

Answer: Yes, this is acceptable, provided the supported frequency range of the systems is large and sufficient to demonstrate the novel approaches of the proposed technology(ies), and provided KPI's and system scalability can also be sufficiently demonstrated.

46. Question: Network Slicing: Network slicing in 5G shares resources between different operators/applications. We assume the term 'spectrum slices' used here is in context similar to CBRS/SAS where 'spectrum slices' are allocated in time, frequency, space, and bandwidth. Is this interpretation correct?

Answer: Yes, this interpretation is correct.