

S²MARTS Project: Co-Packaged Analog-Drive High-Bandwidth Optical Input/Output (KANAGAWA) Project TalX Question & Answer | Date: June 30, 2022

QUESTION SET 1 – LIVE FROM PROJECT TALX

1. Question: Deliverable for B-1 (B-1.07) says, technical data package to include design files, simulation files, layouts, schematics, specifications, characterization data, etc.? Since phase B-1 is a study phase, what are the expectations of the design files, simulations files, etc.?

Answer: What we want to avoid is – at the end of KANAGAWA – having hardware deliverables become a paperweight on a program manager’s desk, which requires a year of reverse engineering, before they can be transitioned into a new activity. To assuage this concern, the United States Government (USG) intends to pull together a team of cross-service subject matter experts to review deliverables, test hardware, and retain as much of the knowledge/IP generated by USG investment as possible. The motivation for this approach is to accelerate technology transition from one supply chain segment, while steering it towards platform adoption by the Defense Industrial Base (DIB). Please propose whatever documentation makes sense to facilitate these goals. Also, if there is data/IP from other USG investment outside of KANAGAWA, the expectation is that this will be highlighted and included (as necessary) in the knowledge transfer activities supporting technology transition for KANAGAWA. (Also, see response to Question 3.)

2. Question: Is there a particular secure status associated with this program? Any restrictions to be aware of?

Answer: There is a foundational layer of requirements specified in the Request for Solutions (RFS) – e.g., compliance with ITAR, CUI//CTI, etc. However, further security requirements should be proposed by the applicant based on their relationship with the DIB. E.g., one company may be focused on secure packaging for custom DoD technologies and therefore propose more stringent requirements superimposed; while another company may be more focused on dual-use commercial packaging and have less stringent requirements superimposed. Lastly, please note that a preference will be shown towards North American companies who are well positioned to implement trusted foundry process and/or microelectronics assurance framework. (See unpriced option section of the RFS.)

3. Question: Deliverable for B-1 (B-1.09) says USG V&V of testing and validation. What parts are expected to be tested at performer's site?

Answer: There is flexibility. If the deliverable cannot be sent or mailed, the USG can visit the site and step through testing and functionality with onsite engineers. If it can be mailed, it may be appropriate to assign an engineer a short term level of effort to advise the USG on test set up at our facilities and possibly travel expenses for the advising engineer to come work with our SMEs for a short period of time to ensure the test set up is properly operational. At the end of the day, we want to make sure that the USG is capturing the technical performance of the deliverables, so we can verify and communicate technical achievement with DIB and DoD partners – which will hopefully pave the way towards productization the demonstrated technology..

4. Question: Would a parallel bus chiplet interconnect be of interest or earnestly considered?

Answer: The Trusted and Assured Microelectronics (T&AM) program is interested in parallel bus technology. Large USG investments have brought optical I/O chiplets and lasers into the TRL-6 to -8 range. If there is a path towards productization of these investments, the DoD would be interested in a discussion. There are many contractual vehicles which could be considered for such an approach. Presently, the scope of KANAGAWA is focused on expanding USG maturation investments into the analog domain, supporting affordability and proliferation amongst multiple packaging vendors.

5. Question: Task B has a very expensive capital expenditure (CAPEX) requirement. Who is responsible for the CAPEX and how will it be funded given the 3M limitation?



Answer: There is flexibility here. Task B applicants are welcome to include CAPEX which pushes their proposal above \$3M. Task B applicants are also welcome to introduce cost share to make their proposal more competitive. Depending on the scale of CAPEX proposed, it may de-risk a proposal to include a two-offering approach – e.g., offering 1: what can be accomplished under the \$3M threshold and offering 2: what can be accomplished including with \$3M + \$XM CAPEX. If this approach is not desirable or feasible, proposals including CAPEX above the \$3M target will be considered.

6. Question: Who will supply the chipllets/lasers? Is it expected that we source our own or are we to work with Ayar Labs?

Answer: Per the contract structure, the Task A awardee will supply chipllets/lasers to the Task B performers and USG. If for some reason (e.g., an applicant is beginning with Task B-2 or B-3) the Task B proposer wishes to source chipllets and lasers from an alternative vendor than the Task A awardee, this is also acceptable. Please note, the RFS does not point to a specific company for Task A. There is more than one source for Task A technology in North America.

7. Question: Is there a security status associated with KANAGAWA info? Any limitations in terms of US only, DoD Secure, etc.?

Answer: See Question 2.

8. Question: Since a lot of what is being requested has significant IP (process and manufacturing) will we be expected to license the IP if we receive funding?

Answer: Licensing IP strategic to the applicant's technology is recommended. For the technology developed within KANAGAWA, IP/data rights sharing between the performer and the USG are determined by the terms of the final awarded OTA agreement contract. For any technology developed by cost-share with any USG activity, the general rule of thumb is to anticipate Government Purpose Rights as a minimum.

9. Question: What is driving the July 27th proposal deadline? Any flexibility in the due date?

Answer: The July 27th deadline is being driven by OUSD(R&E) leadership obligation metrics. Flexing this due date could cause the entire project's funding to be put at risk.

10. Question: How much funding is available for task B2 and B3?

Answer: Notionally, \$5M and \$10M, respectively. This is dependent on the multi-chip packages (MCP), and can be flexible.

11. Question: What are the functional wavelengths? The illustrations show xWDM.

Answer: The RFS does not specify an operating wavelength or WDM grid. While O band and C band are common choices in the industry, proposers may choose wavelengths to support their particular fiber link solution.

12. Question: Should task B cost proposals include phase 2 and 3 costs or just phase 1?

Answer: In response to this RFS, Tasks B applicants should apply to only one of the following phases: B-1, B-2, or B-3. With that said, it is acceptable/recommended that a B-1 proposal discuss how B-1 work will lay the groundwork for future (notional) execution of B-2 and B-3 activities. If requested by the USG, applicants could anticipate authoring notional B-2 or B-3 follow-on technical and cost proposals approximately 5 months prior to the desired start date of any follow-on activity. (This will hopefully provide enough lead time for the contracting processes to complete, and also avoid a stop-work scenario in between phases.)

13. Question: Is the temp requirement junction or case?



Answer: Temperature refers to the ambient environment.

14. Question: On page 21 of the RFS, it stated 2 awardees for Task B. Other places are 2-3. Curious what that number is?

Answer: It is anticipated that a minimum of two Task B awards will be provided. However, the USG is interested in awarding three Task B awards if possible.

15. Question: What is the expected lifetime of the chiplets in each iteration?

Answer: The RFS does not specify a lifetime requirement for chiplets; however, applicants are encouraged to disclose their own internal metric as part of their proposal.

16. Question: Are any specific integration technologies considered not scalable for this effort, such as die attach lasers?

Answer: No.

17. Question: Is there a need to demonstrate SerDes chiplet as part of the Task A?

Answer: No. Task A parts may be tested using laboratory equipment in lieu of a co-packaged SerDes chiplet.

18. Question: Will this presentation be uploaded to the Kanagawa opportunity on S2MARTS.org?

Yes, The slides will be posted at the opportunity site at <https://nstxl.org/opportunity/co-packaged-analog-drive-high-bandwidth-optical-input-output-kanagawa/>

19. Question: Lead time for capex may exceed period of performance for B-1. Will there be any schedule flexibility to accommodate CAPEX lead time?

Answer: Variance in schedule is acceptable for any proposal to Task B-1, B-2, or B-3. See Question 5 regarding more comments on CAPEX. See Question 12 regarding how extending schedule could push out the timeline for submitting full cost proposals for notional follow-on phases (e.g., Task B-2 or B-3).

20. Question: Can we demonstrate >3.2TB at very low power?

Answer: The RFS is open to any concepts that can enable fiber links meeting the performance metrics within the specified link margin.

21. Question: Is 10Gbps the only performance requirement for the 50 proxy dies?

Answer: There is no performance requirement for the proxy die.

22. Question: To be clear, is the B-1 optional CAPEX to be included in this cost proposal - as opposed to a separate budget outside of the \$3M award?

Answer: Yes, include B-1 CAPEX within the B-1 proposal. See Question 5 regarding comments on CAPEX.

23. Question: Is there an optical power requirement on 10 proxy laser dies?

Answer: No. The laser power should support generating the fiber link between chiplets meeting the performance metrics within the specified link margin.

24. Question: What is the scope of CapEx for B1? Is the B1 CapEx intended include CapEx needs in B2 & B3?



Answer: It is left up to the applicants' discretion how to divide CAPEX between tasks. You know your internal processes and capabilities best, so please propose what is most reasonable for your companies' approach. Though not guaranteed, there may be a potential to discuss in "Conversations" after solution submission. See Question 5 regarding more comments regarding CAPEX.

25. Question: Will these slides be made available?

Answer: Yes, The slides will be posted at the opportunity site at <https://nstxl.org/opportunity/co-packaged-analog-drive-high-bandwidth-optical-input-output-kanagawa/>.

26. Question: On page 7 of the RFS, Phase 1 section e, is this the same as the proxy integration experiment on your slide?

Answer: Yes.

27. Question: Do you have a teaming page in case possible participants want to discuss collaborations?

Answer: Yes. You can go to community.nstxl.org.

28. Question: Regarding the fiber can it be MM and if yes, what OM rating? OM3/OM4 etc.

Answer: The RFS does not specify a fiber type. Proposers should choose an orientation the satisfied specified performance metrics and stated project goals.