

NSTIx OpTech Co-Creation Space

Challenge Form: Transfer data to multiple nodes

Release Date	Proposal Deadline	Expected Start Date	Duration	Indicative Budget
14/08/23	22/09/23	4 – 8 weeks after proposal deadline	12 weeks	Approximately £60K per Solution Provider. Higher budgets available for consortia.

Responding to NSTIx OpTech Co-Creation

The National Security Technology and Innovation Exchange (NSTIx) is a government-led science, technology and innovation partnership that enables coherent and agile delivery of innovative national security outcomes through a co-ordinated and systematic approach to research and capability development.

NSTIx has established a government-led network of themed Co-Creation Spaces (CCS). The CCS' combine the respective power of specialist public and private sector partners in research, capability development and end user requirements. This supports the development of effective, user-driven technology at pace in areas that are critical to national security. For more information, please see the '[NSTIx Leaflet](https://www.gov.uk/government/publications/nstix-information-leaflet)' in digital form (<https://www.gov.uk/government/publications/nstix-information-leaflet>).

The OpTech Co-Creation Space (OCCS) has engaged with a network of key Community Collaborators, to accelerate and leverage access to their existing networks of industry and academic Solution Providers.

By responding to this Challenge (details provided in 'UK Solution Provider Proposals – 'our ask' section) and participating in Co-Creation there is an exciting opportunity for collaboration between National Security, Community Collaborators and Solution Providers.

What is the current state for this Challenge?

National Security often deploy sensors nodes that do a variety of functions to collect data in uncontrolled environments, such as to provide surveillance information in a difficult environment. The data collected could range from audio, video, radio-frequency, and countless other forms. Historically, a sensor node would be deployed, collect data as a single entity, and then be interpreted by a human either in real-time or at a later date.

However, with the rise of cheap low equity sensor nodes, there is the potential to deploy many more sensors in much more complex operational environments to gather significantly more data. Using the historical ways to collect data does not scale as it now becomes way too complex for a human to

manage in the same way. By deploying ever increasing sensor node meshes, there is an opportunity to build intelligence into this system, with this Challenge focused on the secure transport of data within the sensor node mesh.

A related field that could be used for inspiration is a “smart” office environment, citing a study by Deniz Tuzcuoğlu *et al.* (2022) [<https://www.emerald.com/insight/content/doi/10.1108/JCRE-12-2021-0041/full/html>]. “Smart” offices of the future will look at occupancy usage, use sensor data to provide thermal comfort for the occupants, collect behavioural data to avoid occupational stress, adjust lighting and acoustics autonomously depending on the user preferences at that moment in time. This complex system could be used to increase the user experience, leading to a happier and more productive work force. It is clear however with this complexity in a sensor node mesh, the data collected and processed, and then the autonomous adjusting of the physical environment (e.g., thermostat change), that there needs some intelligence in the system in both the compute side but also the communication within the sensor node mesh.

What is the gap?

To be able to maximise an intelligent sensor node mesh, this Challenge focuses on the communication and transport of data between the nodes. At present, when considering nodes used for surveillance, the current processes of a human monitoring a single node does not scale when aiming to use multiple nodes at varying locations. Therefore, to enable automation and efficient communication between multiple nodes, there is development required on the transport of data between the nodes.

At the centre of this gap is scalability, reliability, self-healing, interoperability between a variety of devices, raw data collection flows, device redundancy and mesh issues at scale.

This Challenge

This Challenge offers an indicative budget of £60k for a single Solution Provider, budget increases will be considered for consortiums. The proposal should focus on aiding our understanding of the technology landscape by reporting on existing methods and techniques that could be pivoted or used for our use case. We would also like to work towards working prototype(s) or demonstrations of various technologies and will accept a relatively low TRL. The question of whether a paper study or demonstrator make up the essence of the delivery will be the choice of the pitch supplier but the technical knowledge and quality deliverable is key.

A non-exhaustive list of considerations to be made are:

- Sensors will be low equity and commercially off the shelf. The data transported must be treated as agnostic, as it could be a blend of different sensors.
- The data rates will be low and infrequent.
- Must work over a wide meshed network, perhaps tens of sensors and along a distance of a medium sized office block.
- The transport of data must not be reliant on existing communication infrastructure.

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- There must be a strong focus on low Size, Weight and Power (SWaP).
- The transport of data must be reliable, secure and have a strong focus on privacy.
- The sensor and back-end processing is out of scope for this Challenge, therefore the communication system will be part of a larger end to end system.
- The end users are unlikely to be technical so there must be minimal training to operate.
- The meshed nodes must have a degree of autonomy and self-healing.
- Bluetooth technology will be considered if presented in an appropriate and unique context, included as part of the delivery solution.

This Challenge will be run over a period of up to 12 weeks in total. As a Solution Provider, you will be part of an agile team working collaboratively with the Project Sponsor and Agile Delivery Manager. We expect the 12-week funding period to test, iterate and prove a concept.

We would also encourage suppliers to consider a phase 2 of this Challenge, how would the findings of this phase 1 be moved into a robust demonstration and ultimately into a product? Consider future planning of how long that may take and how much it may cost.

What we don't want

A survey of commercially available multi point data transfer technology.

Far out solutions that cannot be realised with a timescale of a few years, and without a plan for exploitation into a product.

Follow-on project

If this initial project shows the concept to be feasible, and the Co-Creation team agree, follow-on project funding will be likely.

Solution provider proposals – 'our ask'

A Solution Provider may be a single academic, a micro-SME or a corporate giant. All proposals will be marked on their merit listed under Evaluation Criteria.

Proposals are requested by the deadline of **Friday 22/09/23**

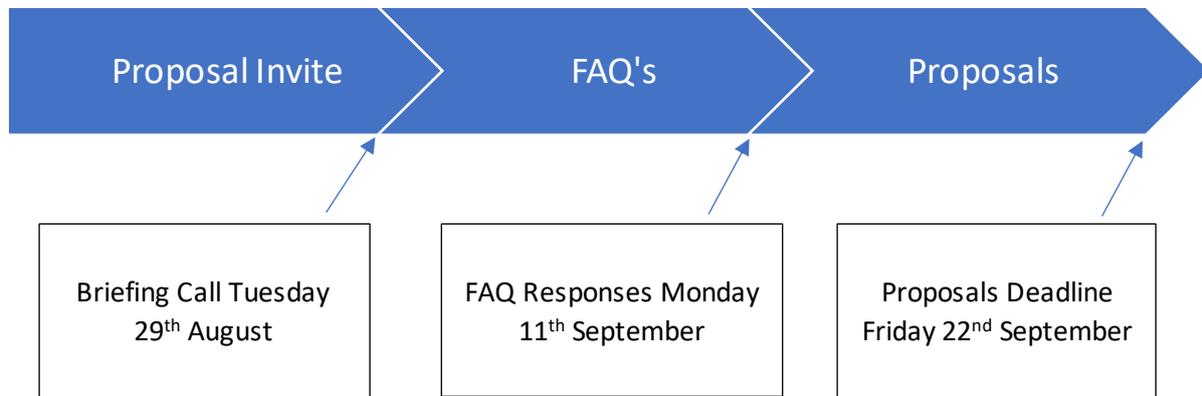
An agile approach over the **12 week** period is preferred, i.e. with sprints designed to work with the National Security and Defence community to iteratively define the solution. We have an indicative budget of £60k for a single Solution Provider, budget increases will be considered for consortiums.

Evaluation criteria

Proposals will be scored 1 – 5 on the following criteria:

- Timescale – will the proposal deliver a Minimum Viable Product within the time period defined within this Challenge Form?
- Does the proposal fit within the Challenge scope, taking into consideration cost and benefits?
- Is the organisation / delivery team credible in this technical area?
- Is the technical solution credible?
- Will the proposal deliver a full or partial solution? Has the proposal identified collaborators if a partial solution or is willing to work collaboratively with others?
- Is it innovative?

Next Steps



Confidentiality: All proposals will be subject to commercial confidentiality and a maximum protective marking of OFFICIAL. Please do not submit any materials above this classification.

Briefing Call: All parties will be invited to an open Briefing Call via MS Teams on **Tue 29th August at 10.00**, where members of the OCCS Challenge Team will be available to provide additional context and information on this Challenge, and where attendees can ask Clarification Questions. A calendar invite for this call can be found below. NB; please note that failure to attend the Briefing Call does not exclude Community Collaborators and suppliers from submitting a proposal by the deadline stated below.

Briefing call – Tuesday 29th August at 10.00

Microsoft Teams meeting

Join on your computer, mobile app or room device

[Click here to join the meeting](#)

Meeting ID: 380 347 038 887

Passcode: 5kUTND

Frequently Asked Questions – responses (FAQ): All enquiries from the Briefing Call will be collated, and responses sent to all parties in an FAQ document by close of business on **Mon 11th September**.

Deadline: The deadline for proposals to be submitted is close of business on **Fri 22nd September**. Please include the title of the Challenge ‘**Transfer data to multiple nodes**’ in your email. Please note that shortlisted Community Collaborators and/or Suppliers may be invited to pitch prior to contract award.

Selection and notification of finalists: The OCCS Challenge Team aims to select a shortlist of successful proposals by the **week commencing Mon 2nd October**, who will be invited to a pitch day. All applicants will be provided with written feedback via the Community Collaborator.

Pitch day: Please hold in your diary, a pitch day will be held on the **Thurs 12th October**. An option to attend face to face and online will be made.

Technology Readiness Level (TRL): A cross-section of all TRLs will be considered for this Challenge.

Format: Final responses for this challenge are to be provided in MS Office (Word, PowerPoint, Excel) or PDF format to the following email address: cocreation@hmgcc.gov.uk with cc to the coordinating Community Collaborators who introduced the Challenge.

Alternative Formats: If you wish to discuss other forms of response such as a video presentation or live demonstration please contact us via the Clarification process to discuss your approach.

Feedback: All applicants will be provided with written feedback via the Community Collaborator once both technical and commercial assessments have been concluded. We will endeavour to provide feedback within 2 weeks of the competition deadline.

Commercial Engagement: The OCCS challenge team will select Solution Providers for this Challenge on the technical and commercial merit of the proposal received, commercial contracts and funding will be engaged through Cranfield University. Intellectual Property deliverables will be engaged with the OCCS under the terms attached.

Pricing: Solution Providers are invited to submit **Fixed Price** proposals for the **12 week** engagement. When preparing pricing please provide pricing against 3 monthly payment points in line with the sprint-profile of your project.

Commercial Considerations – Regardless of the Commercial Route Selected the following terms apply:

Please note that by submitting a proposal in response to this challenge you are agreeing to the terms and conditions of contract as issued and are thereby making a formal offer of contract, from which the Authority shall have the right to accept in part or in full should your proposal be deemed acceptable.

#	Category	Consideration
1	IP	Intellectual Property (IP) will be managed in accordance with the attached Terms & Conditions.
2	NDA	It is the responsibility of the Community Collaborator to propagate and adhere to the agreed Non-Disclosure Agreements (NDAs).
3	IT Systems	The Community Collaborator and/or Solution Provider IT system will be used as the collaboration platform for developing solutions to this challenge (including for example MS Teams, SharePoint, plus any required development and test

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		environments). Systems must be capable of holding documents marked at OFFICIAL.
4	Data	All data will be managed in accordance with UK Data Protection legislation. This includes commercial & project documentation, and any data utilised in developing, testing and implementing the solution for this challenge.
5	Scope	Solution providers for this challenge may be from the UK or 5EYES geographies. Other geographies will be considered on a case-by-case basis.
6	Clearance	All work will be classified at no higher than OFFICIAL. It is desirable for resources working on the project from Community Member organisations to have BPSS or SC (or equivalent) clearance, however this is not essential at this stage. Collaborators are asked to please state the clearance levels of their proposed Project Team within their submitted proposals.

*On boarding of a company onto our commercial Terms & Conditions can take up approximately 4 weeks.