

# **Joint Singapore-UK Research in Cyber Security**

**Call type: Invitation for proposals**

**Closing date: 30 July 2015**

**Call available on Je-S: May 2015**

**Related themes: PaCCS, ICT**

## **Summary**

Singapore's National Research Foundation (NRF), the UK's Cabinet Office (CO) and Engineering and Physical Sciences Research Council (EPSRC) (from here on 'the Agencies') wish to encourage joint research activities in cyber security.

Through a single, shared process which is managed by EPSRC on behalf of the Agencies, we expect to identify and support up to three collaborations, each of which involves leading academic researchers in both the partner countries. While funding for researchers in Singapore and UK will ultimately be provided separately by their respective Governments, the key to success in the call will be the identification of a programme of work which is of high scientific quality and truly collaborative.

Proposals for new projects in any area relevant to cyber security, from new or established partnerships, are welcome. We intend to fund a balanced programme of research in which the individual projects can work together to maximise mutual benefit.

Collaborations will need to prepare a single, unified, proposal which describes a full programme of work in both countries. This will be submitted to EPSRC by the UK lead organisation on behalf of the research partners in both the UK and Singapore. Projects should last between 25 and 36 months, to start in Spring 2016 and end no later than December 2018.

## **Background**

Building on previous initiatives intended to foster stronger research links between Singapore and the UK, the Agencies would like to strengthen collaboration between our nations' best cyber security researchers.

The challenges of cyber security are global and do not respect national boundaries. Solutions to the problems with which we are faced will need to be developed and implemented in a shared way to reflect this fact.

This call is open to proposals, in any area of research, which have real potential to enhance our understanding of cyber security and strengthen relationships between researchers in Singapore and the UK . In particular we welcome projects which address shared challenges in:

- Intrusion: Malware, exploits, intrusion detection and protection
- Data Analytics: Algorithms, machine learning, privacy, trust, and personal/aggregated data issues ('Big Data')
- Human Factors: Usability, behaviours, incentives, and more general economic, social and legal concerns
- Policy Aspects: Issues that directly affect policy, government or business. Includes best-practices (e.g. BYoD), ownership (e.g. copyright, DRM), regulation and compliance
- Sectors and applications (e.g. Internet of Things (IoT)): Targets the concerns of particular sectors or applications. Includes general areas such as healthcare and cities, to specific issues, e.g. smart cities, and detecting extremist activity.

## **Structure of this call**

The Agencies have agreed that project proposals will be written, submitted and assessed as a single, unified proposal to EPSRC, and that funding decisions will be made on that basis: one joint proposal, one common decision.

The joint proposal should be developed together by both the UK Lead and the Singapore Lead. Proposal content is to be developed jointly by both partner researchers in Singapore and the UK. Submission of the full application is through EPSRC's Joint Electronic Submission (Je-S) system, by the UK lead as only UK organisations can access the system.

Some of the guidance on preparing and submitting a proposal in this call document is applicable to the collaboration as a whole and some just to the specific country's lead partner. This document will make it clear where guidance is only relevant to the UK lead responsible for submitting the proposal to EPSRC. This document will also make it clear where guidance is only relevant to the Singapore lead as requirements from NRF. Copies of all the proposals received will be sent to NRF by EPSRC.

If overall project approval is given, funding for researchers in Singapore will be provided by NRF through a separate contract. The Singapore Lead is to submit the required documents through the Research, Innovation and Technology Approval (RITA) system on the research components to be done in Singapore in accordance to NRF rules and regulations. Funding for UK researchers will be provided by the Cabinet Office through EPSRC grants prepared according to the budgets given in the EPSRC proposal.

## Eligibility

Eligibility of UK applicants is covered by the normal EPSRC requirements. For information on the eligibility of organisations and individuals to receive EPSRC funding, see the EPSRC Funding Guide:

<http://www.epsrc.ac.uk/funding/howtoapply/fundingguide/>

As this call is a targeted funding opportunity provided by EPSRC, higher education institutions, and some research council institutes and independent research organisations are eligible to apply. A list of organisations eligible to apply to EPSRC is provided at:

<http://www.rcuk.ac.uk/funding/eligibilityforrcs/>

Principal Investigators (PI) from all Singapore-based institutions of higher learning (IHLs), and research institutions are eligible to apply. For full details, please refer to the National Cybersecurity R&D Programme Funding Guideline in the RITA system (<https://rita.nrf.gov.sg/NCR/default.aspx>).

Researchers from both countries must enter into a Research Collaborative Agreement (RCA) which should be submitted with the Je-S application. All agreements must also conform to the Collaborator Guidelines specified in the National Cybersecurity R&D Programme Funding Guideline in the RITA system.

## Funding available

The Agencies will make available enough funding to support up to three projects. Either both national elements of a joint project will be funded or none at all – there will be no funding for just one country's component of any project.

Proposals must request funding for a new programme of concurrent research activity in both Singapore and the UK. Contributions to existing programmes of work funded from other sources, or projects which are resourced disproportionately in either country, are not allowed. Proposals should have parallel activities in both the UK and Singapore, starting and finishing at roughly the same time in both countries.

International collaborations require time to develop effectively and may gain momentum more slowly than those which have no geographical barriers to overcome. To reflect this, in this call the Agencies expect to support projects which involve less intense activity over a longer period. This will ease critical time pressures and help ensure that there is genuine long-lasting added value from the collaboration.

The total funding for this Call is up to £1200k (~S\$2520k); that is around £600k (~S\$1260k) in each partner country. Given the differing absolute costs of research in the UK and Singapore, the Agencies cannot specify exact funding maxima for applications. We expect to see proposals requesting funding from the Agencies in each country of around £200k ± £10k. (In the UK £200k will be the 80% fEC (Full Economic Costs) amount actually awarded to the university by EPSRC; in Singapore funding is

capped at S\$420k inclusive of 20% overheads. In the event of fewer than three collaborations being supported, the Agencies are entitled to reduce the total funding for this Call proportionately.

Funding for the approved projects depends on the availability of funds in the state budget of both countries. The agencies reserve the right to cancel this call, even after projects have been approved, and/or not to fund a second year of work for scientific-professional, administrative, budgetary or policy reasons.

## **Funded Expenses**

Projects are able to request support for:

- **In the UK** a mixture of permanent academic time and research staff working specifically on this project as per the usual RCUK rules. PhD students are not allowed. **In Singapore**, similar levels of activities of research effort shall be conducted. This may comprise of academic time and research staff from Singapore-based institutions of higher learning (IHLs), and research institutions as per NRF rules and regulations.
- minor consumables
- small scale equipment
- travel costs and in-country living expenses between the UK and Singapore, in accordance with the relevant NRF and RCUK rules and regulations.
- reasonable periods of co-located working in the form of exchanges of research staff between the collaborating institutions.
- adequate dissemination to a range of audiences in both countries

All of this to take place over a period of between 25 and 36 months.

Given the potential complexity introduced by the international dimension of this work we do not expect that more than one research organisation from each country will be involved in a single application. Multiple separate applications to the call from the same organisation or individual, with the same or different partners, are however allowed.

## **How to apply**

### **Submitting application**

The UK lead applicant is responsible for final submission of the proposal using the UK Research Councils' Joint electronic Submission (Je-S) System (<https://je-s.rcuk.ac.uk/>).

When adding a new proposal, you should select:

- Council 'EPSRC'

- Document type 'Standard Proposal'
- Scheme 'Standard'
- On the Project Details page you should select the 'Joint Singapore-UK Research in Cyber Security' call.

This call will not be visible in Je-S until mid-May 2015. You will not be able to create a new application until that date.

Note that clicking 'submit document' on your proposal form in Je-S initially submits the proposal to your host organisation's administration, not to EPSRC. Please allow sufficient time for your organisation's submission process between submitting your proposal to them and the call closing date. EPSRC must receive your application by 16:00 on 30 July 2015.

Costs sought by the research partners in Singapore and the UK must conform to the rules applying in their respective home country.

For UK applicants, guidance on the types of support that may be sought and advice on the completion of the research proposal forms are given on the EPSRC website (<http://www.epsrc.ac.uk/funding/howtoapply/routes/>) which should be consulted when preparing all proposals.

For applicants in Singapore, for guidance on the types of support that may be sought, please refer to the National Cybersecurity R&D Programme (NCR) funding guide in the RITA System.

## Guidance on writing application

Responsibility for producing the content of the combined application is shared by all the researchers involved in the collaboration, in both Singapore and the UK.

While the proposal as a whole will need to present to reviewers a unified, cohesive summary of a combined research programme, the completed Je-S form (which sets out the request for funding for the UK component of the project to EPSRC) and other application documents submitted to EPSRC will need to conform to the normal EPSRC requirements.

As a minimum the application will need to include the following documents:

- 1) A completed 'Proposal form'

As it will be used to create a grant offer letter for successful UK applicants **this form must only include the costs requested by the UK partners**. Costs ultimately sought for the components of the project which will be carried out in Singapore should be detailed in a separate document (see below).

All travel and subsistence costs incurred by UK partners must be included in this form, including those associated with extended research visits by UK researchers to Singapore. If desired, partners

from Singapore participating in staff exchanges may be included as 'Visiting Researchers' on this form and their associated travel and subsistence costs may be requested. Salary costs of Visiting Researchers will not be met by both countries.

Where there are costs associated with shared activities (for example a final project dissemination event) these may either be included in the request from just one partner or divided and shared by both. In any case it is expected that the overall resource requirements should be reasonably balanced between the partner countries.

Please note that the total costs requested in support of the research component hosted in Singapore should be included on the Je-S proposal form as a 'Project Partner' contribution from Singapore.

## 2) A 'Case for support'

Written in English, **this document should seamlessly describe the complete programme of research in both countries.** It will be the main source of evidence used to evaluate the project proposal and so must contain all the information that the reviewers will require to do so effectively.

Limited to nine pages in total (no annexes/appendices allowed) it should contain two sections:

- i) a two page summary of the applicants and their track records in research
- ii) a further seven pages which describe the research project in detail. An additional page, above the normal six allowed under EPSRC rules, is allowed within this limit to accommodate a more detailed explanation of the collaboration itself. For example: any previous joint work, the added value from the collaboration, details of how it will be managed etc.

For the benefit of the reviewers we advise you to summarise the full costs of the project somewhere in the 'Case for support' and to explain why the costs in the complete Je-S form do not match them.

## 3) A diagrammatic 'Workplan'

As for a normal EPSRC application, and to summarise the entire project

## 4) An 'Impact plan'

As for a normal EPSRC application, and to summarise the entire project

## 5) A 'Justification of resources'

As for a normal EPSRC application, and to summarise the entire project including the resources in Singapore

- 6) An NRF document under 'Additional document' which clearly describes the research project in detail and the breakdown of total costs to be sought from NRF for the components of the project which will be carried out in Singapore. This should be in the form of the template as published in RITA system (Template for Full Proposal & Proposed Budget). All travel and subsistence costs incurred by Singapore researchers are to be included. If desired, partners from UK participating in staff exchanges may be included as 'Visiting Researchers'. NRF will not meet Visiting Researchers' salary costs. This document shall contain sufficient detail for NRF to prepare a contract to the successful organisation without further information.
- 7) Research Collaborative Agreement (RCA) is to be submitted together with full proposal as an 'Additional document'. All agreements must conform with the Collaborator Guidelines specified in National Cybersecurity R&D Programme Funding Guideline in the RITA system.

Depending on the content of the proposal, other documents may need to be added as a result of the usual EPSRC requirements (which might include CVs for named researchers or letters of support from Project Partners as detailed on the EPSRC website and in the Funding Guide) or key requirements from Singapore. These should not include letters from the academic organisations applying for funding as it is already assumed that they support the collaboration. No other documentation will be accepted.

If the attachments are uploaded as Word documents, please be aware that once the application has been submitted to the Council, all the attachments will be converted and held as an Adobe Acrobat file (PDF). Also please note, that whilst we support a wide range, **we do not support all MS Word font types**. Therefore if an unsupported font type is used a different font type may be substituted which may result in changes to the layout of the document. For this reason we recommend that the documents are converted to PDF files before uploading.

For advice on writing proposals see:

<http://www.epsrc.ac.uk/funding/howtoapply/preparing/>

## **Assessment**

### **Assessment process**

In order to facilitate the process, it has been agreed that EPSRC will manage the process of the current Call on behalf of the Agencies.

Following basic checks on receipt by EPSRC, each proposal will be sent out to anonymous reviewers for comments. As is usual with EPSRC proposals,

we require suggestions for three reviewers from the applicants themselves, and we guarantee that we will request a review from at least one of these. The remaining reviewers will be identified by the Agencies in Singapore and the UK jointly.

All proposals considered by the Agencies, on the basis of the reviewers' comments received, to be of sufficient quality to progress to the next stage will be further assessed by an expert panel. Proposals not meeting a minimum standard may be rejected before the expert panel stage.

Applicants will be invited to respond to their reviewers' comments before the panel meeting, and the panel will see this response. As is generally the case for this call, while the responsibility for producing a response is shared across the collaboration as a whole, the UK lead is ultimately responsible for submitting the document to EPSRC.

The panel membership will be decided jointly by the Agencies. The panel will use the evidence contained in the reviewers' reports, the collaboration's response to these comments, and their own judgement of the balance of the proposals received to prioritise them and make a final funding recommendation to the Agencies.

## **Assessment criteria**

Proposals will be assessed in light of the following criteria:

- Scientific quality and excellence
- Importance (NB reviewers will be directed to disregard specific references to the UK, Singapore, NRF and EPSRC when completing this section on the reviewers' form, and instead to take a more general view of the stated benefits of the research)
- Impact
- Applicant
- Resources and management
- Collaboration (to be carried out under the 'Proposal assessment' heading)

Further advice on the interpretation of each of these criteria can be found at: <https://www.epsrc.ac.uk/newsevents/pubs/standard-calls-reviewer-helptext/>

## **Moving forward**

Researchers in the UK: a grant offer based on the resources requested in the completed Je-S form will be prepared for successful applicants in the UK. This offer and the subsequent grant will be governed by the standard RCUK terms and conditions.



Researchers in Singapore: NRF will issue Letter of Award and Statement of Acceptance to successful applicants in Singapore. This award will be governed by NRF rules and regulations.

We expect that work will start in Singapore and the UK promptly and as near to simultaneously as possible, and that the research activities in each country will be of similar duration. UK applicants please note that if work in Singapore needs to start before work in the UK, the Je-S application should make that clear in the text while indicating the UK start date on the proposal form as this date will be used to prepare the grant offer letter.

Projects should start in Spring 2016 at the latest.

## **Guidance**

### **Guidance for reviewers**

Reviewers will be sent the following additional guidance for use when assessing proposals:

This proposal has been received by the UK's Engineering and Physical Sciences Research Council in response to a call run jointly with the UK Cabinet Office and Singapore's NRF. Given the international nature of the work, when assessing the research against the 'Importance' criterion please disregard all mention of the UK, Singapore, NRF and EPSRC and instead focus on more general benefit offered to society, industry and economy in both countries. In the 'Proposal assessment' section, please comment specifically on the viability and potential added value of the collaboration between Singapore and the UK.

Information about the EPSRC peer review process and guidance for reviewers can be found at:

<http://www.epsrc.ac.uk/funding/peerrev/review/>

### **Additional grant conditions**

No specific conditions will be added to grants issued in the UK.

In Singapore all grant will be governed by NRF Terms and Conditions.

### **Key dates**

<b>Date</b>	<b>Activity</b>
Beginning May 2015	Call issued
01 July 2015	Call live in Je-S
30 July 2015	Call closes
Aug- Sep 2015	Proposals assessed by reviewers

<b>Date</b>	<b>Activity</b>
Sep 2015	Applicants respond to reviews; Agencies decide which proposals, if any, should not be sent to panel
mid Oct 2015	Panel meets; funding recommendations made
Early Nov 2015	Approvals for the recommended projects
Dec 2015	Preparation of offers to successful applicants
Spring 2016	Projects start

## **Contacts**

Any queries regarding the submission of proposals through Je-S should be directed to the UK Je-S helpdesk:

[JeSHelp@rcuk.ac.uk](mailto:JeSHelp@rcuk.ac.uk), tel. 01793 444164

UK lead applicants with enquiries about technical areas of the call, the assessment process or the format of proposals should contact:

Alex Hulkes ([alex.hulkes@epsrc.ac.uk](mailto:alex.hulkes@epsrc.ac.uk)), tel. 01793 444116

Please contact your university research office for help and advice on writing your proposal and allow enough time before the closing date for your organisation's submission process.

Partners in Singapore with enquiries about technical areas, eligibility of costs or the process for award should contact:

- National Cybersecurity R&D Directorate ([NRF\\_NCR\\_Directorate@nrf.gov.sg](mailto:NRF_NCR_Directorate@nrf.gov.sg))
- Shu Su Yen ([shu\\_su\\_yen@nrf.gov.sg](mailto:shu_su_yen@nrf.gov.sg)), tel: +65 6694 5157
- Jerry Khoo ([jerry\\_khoo@nrf.gov.sg](mailto:jerry_khoo@nrf.gov.sg)), tel: +65 6694 5025

## **Change log**

<b>Name</b>	<b>Date</b>	<b>Version</b>	<b>Change</b>
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<b>Name</b>	<b>Date</b>	<b>Version</b>	<b>Change</b>
Alex Hulkes	8/5/15	1	New document
Alex Hulkes	4/6/15	2	Broken links corrected