SHARED SERVICES CANADA

Invitation to Qualify
for the HPC Weather Cloud Challenge Demonstration

Invitation to Qualify No.	HPC21-001	Date	October 18, 2021
GCDocs File No.	N/A	GETS Reference No.	PW-21-00967713

This Amendment is issued to extend the ITQ, Publish Canada's Responses to potential Respondent's questions and amend the ITQ. All the terms and conditions of the ITQ remain unchanged.

THIS SOLICITATION AMENDMENT IS ISSUED TO:

1. Extend the closing date of the ITQ
2. Publish Canada's Responses to Bidders' questions.
3. Publish Modifications to the ITQ

NOTE: Respondents` clarification questions are numerically sequenced upon arrival at SSC.

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1. <u>EXTEND THE CLOSING DATE OF THE ITQ</u>

This Invitation to Qualify amendment is issued to extend the closing date of the ITQ from October 20th, 2021 to October 25th, 2021.

2. <u>CANADA'S RESPONSES TO QUALIFIED RESPONDENTS QUESTIONS</u>

Question 8:

Annex A – Qualification Requirements

The top 500 list is not reflective of traditional Cloud partners with HPC competencies. Given that the purpose of this ITQ is to down-select suppliers who can offer "cloud-based solutions for HPC environments for weather", we request that Canada include an R3 option for any certified Cloud Services Provider (CSP) reseller who is authorized to offer CSP HPC services.

Canada's Response to Question 8:

Canada's requirements remain unchanged. Canada will not add an R3 option. For further clarification, to qualify for the ITQ, you must be R1 OR R2, meaning being in the Top500 is not the only way in which to qualify for this ITQ.

Question 9:

3.3 Content of Response, c) Certifications

ITQ p. 6 of 14, Section 3.3 Content of the Response, subsection c) Certifications

Upon review of the ITQ document, we are unable to locate the "Federal Contractors Program for Employment Equity Certification." We also do not see the requested information listed on the Response Submission Form, where vendors are instructed to provide their information. Will

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SSC please clarify if this certification is required as part of our response to the ITQ Phase of the Project and, if so, provide the form to vendors?

Canada's Response to Question 9:

Canada has updated the ITQ document specifically, Form 1 - Response Submission Form. The questions in relation to the Federal Contractors Program for Employment Equity Certification can be found and answered within the modified ITQ document that has been uploaded.

Question 10:

Annex A – Qualification Requirements

Vendor X is contemplating to participate in the subcontractor capacity. We wanted to understand if the requirements R1/R2 are applicable to only the suppliers or prime contractors, or do they extend to sub-contractors as well?

Canada's Response to Question 10:

The R1/R2 requirements apply only to the Respondent.

Question 11:

General Information

Would Canada consider hosting a session with your HPC subject matter expert for proponents to ask questions directly?

Canada's Response to Question 11:

Yes, Canada will host such a session but only as described in the ITQ in section 1.2(a). As qualification in the ITQ does not necessitate any financial commitment nor any penalty for withdrawal, Canada hopes that potential respondents will seek qualification as Qualified Respondents to initiate such discussions.

Question 12:

1.2 Overview of Project

What is the maximum number of cores on which we should run this ITQ benchmark?

Canada's Response to Question 12:

It is up to the respondent to chose the scaling that they wish to demonstrate. The maximum number of cores that can be used for running the benchmark is limited by the overall domain size.

The possible configurations specified in the file TOPOs_possible_for_GY15 go from 200 to 4176 cores.

There are a few more possible configurations above 4176 cores:

TOPO: 72 x 30 NODES= 108.00 CORES= 4320 MPI= 4320 SUBDOMAINS= 28 x 23

TOPO: 72 x 36 NODES= 129.60 CORES= 5184 MPI= 5184 SUBDOMAINS= 28 x 19

TOPO: 87 x 30 NODES= 130.50 CORES= 5220 MPI= 5220 SUBDOMAINS= 23 x 23

TOPO: 87 x 36 NODES= 156.60 CORES= 6264 MPI= 6264 SUBDOMAINS= 23 x 19

Question 13:

1.2 Overview of Project

What is the maximum number of cores that will be required in your Weather Cloud production environment?

Canada's Response to Question 13:

There is no requirement for a Weather Cloud production environment and therefore we cannot answer this question.

Question 14:

1.2 Overview of Project

What are the performance metrics to be documented? How do we capture them? (e.g., just start/end times for rungem.sh or additional parameters from other logs?)

Canada's Response to Question 14:

The required metric will be the sending of the file list_gy produced by mybatch.pbs to a remote location that will be provided during the initial meeting.

Question 15:

1.2 Overview of Project

What is the criteria for a successful run? (e.g., performance KPIs above, other?)

Canada's Response to Question 15:

You can tell that a run was successful if a banner containing the words

"*   END EXECUTION"

appears towards the end of the run text output. For this exercise, numerical accuracy will not be considered. (Note the quotation marks above will not appear in the banner).

Question 16:

1.2 Overview of Project

The MPI wrappers appear to be targeted towards the on-prem machines (XC50) and are very specific to a particular version of MPI/Scheduler. Can we get a point of contact to confirm the accuracy of our updates to the wrappers for running SLURM?

Canada's Response to Question 16:

Please send any questions or concerns to the PVR address (pvrdcprojects-arfprojetscd@ssc-spc.gc.ca) and it will be routed to the appropriate point of contact who will reply.

Note that upon successful qualification, Respondents will have direct email access to technical subject matter experts within SSC and ECCC to ask further questions etc.

Question 17:

1.2 Overview of Project

Do you have a wrapper for Intel MPI that you could share with proponents? Is there a reason the wrapper uses Open MPI currently?

Canada's Response to Question 17:

The github branch benchmark-5.2.0-a7 has been updated and should now work out of the box for Intel MPI libraries. Please update your git working directory or create a new one to obtain these changes.

Question 18:

2.2   *Overview of Project*

What is the recommended method to run parallel jobs (i.e: can we launch multiple parallel jobs from the work* dir)? Currently we see it removes the "tmpdir*" of the on-going run when a second job is submitted, making it difficult to run multiple parallel jobs.

Canada's Response to Question 18:

This is not required as part of the exercise. We are interested in the scalability of various job topologies rather than the number of jobs that can be executed simultaneously.That being said, to run jobs in parallel as described in your question, you will need to run each in a separate directory.

Question 19:

2.3   *Overview of the Project*

Q2. What is the recommended method to identify optimal topology for the NPEX x NPEY? The topology file provided suggests having NPEY as a multiple or divider of number of cores per socket. But even with that, we have different possible combinations for each node count. For example, with 10 nodes (36 cores per node, 18 cores per socket), the possible NPEX x NPEY combinations are show below. Which combination is preferred for your model and why?

NPEX	NPEY	Cores (NPEX x NPEY x 2)	Nodes
60	3	360	10
30	6	360	10
20	9	360	10
10	18	360	10
5	36	360	10

Output of a X node run:
```
DONE LAUNCHING all domains Thu Sep 23 16:38:17 UTC 2021


=====> rungem.sh ends: Thu Sep 23 16:38:17 UTC 2021 ###########

WARNING: r.return.dot executed without previous r.call.dot
NO variable values can be returned
the following values would have been returned
_status='ED';
_endstep='0000000384';
_npe='576';
```

Canada's Response to Question 19:

The topologies given are the only working topologies. When there is a choice, a more square decomposition will tend to work better than an elongated one. It is also best to chose an even number of nodes.

Question 20:

General Information – Extension Request

Vendor X is continuing to review and assess the details contained within the reference Invitation to Quality (ITQ). As part of our initial assessment, we have recognized that some of the ITQ requirements may drive some teaming conversations with Industry to support consideration of a best value and qualifying response for Canada. In order to ensure that we have the time necessary to review options with Industry and to prepare an associated compliant response, we respectfully request your consideration to amend the closing date to allow for an additional four (3) weeks to the response period. As such, we are requesting that the closing date be amended to 10 November 2021 (from 20 October).

Canada's Response to Question 20:

This Invitation to Qualify will extend the closing date of the ITQ from October 20th, 2021 to October 25th, 2021.

Question 21:

General Information

Can the HPC test be executed in a US location?

Canada's Response to Question 21:

Yes.

Question 22:

Annex A – Qualification Requirements

Does the HPC test need to be executed within a qualified cloud service provider from the Framework agreement of the Government of Canada Cloud Services Procurement Vehicle (32099)?

Canada's Response to Question 22:

The HPC test must be executed by a Respondent who qualifies via R1 OR R2. However, the test itself does not need to be executed within a qualified cloud service as per the Framework

agreement (32099). For example, if companies A, B and C are in the Framework agreement but company D qualifies via R2, D can run in D's own cloud environment; they do not have to use A, B, or C environments/services.

Question 23:

1.2 Overview of Project

Can SSC confirm who will handle the migration services of HPC Weather Cloud into the test environment?

Canada's Response to Question 23:

The operational HPC Weather system is out of scope. As specified in 1.2(a)(2), migration/adaptation of ECCC's R&D workflow to the cloud paradigm is exploratory in nature and we are seeking your expertise and input in learning how this can be completed. It is expected that the Respondent will handle the migration of ECCC's R&D workflow in the cloud collaboratively with SSC & ECCC for the purposes of this ITQ.

Question 24:

1.2 Overview of Project

Can HPC provide specs on the size of the test environment needed to meet the needs of the ECCC modeling suites?

Canada's Response to Question 24:

Canada will not be providing a response as we believe this is out of scope..

Question 25:

1.2 Overview of the Project

The documentation points to opensource code on GITHUB. Is it the expectation of SSC that the respondents will build the Linux based VM's and install the code or will SSC be providing their own hardened and customized images that can be used for this phase?

Canada's Response to Question 25:

Neither SSC or ECCC will be providing any VM's or images for this exercise.

Question 26:

1.2 Overview of Project

If it is the expectation that the respondent will build the VM's and install the Linux OS, can SSC provide the specifications for the VM's including RAM / CPU / Drive size as well as patch level and any hardening requirements?

Canada's Response to Question 26:

SSC does not have specifications for this. It is up to the vendor to determine the optimal configuration. Such things can be discussed at the information exchange session referenced in section 1.2(a) of the ITQ.

Question 27:

Response Clarification

Can SSC please confirm if they are expecting a SaaS based solution or IaaS?

Canada's Response to Question 27:

SSC does not have specifications for this. It is up to the vendor to determine the optimal configuration. Such things can be discussed at the information exchange session referenced in section 1.2(a) of the ITQ.

Question 28:

Annex A – Qualification Requirements

Vendor Y notes that the definition of a Respondent, as per section 2.3 (a), restricts it to be "an individual, a sole proprietorship, a corporation, a partnership or a Joint Venture" at the ITQ stage.

ITQ Annex A Qualification Requirements, specifically R2 2.1 and 2.2 will drive teaming conversations in order to provide a fully compliant and best value qualifying response to Canada. These teaming discussions often evolve over the development of a procurement and are typically not commercially and legally solidified until closer to a formal RFP release. In recognition of this fact and to maximize the early stage competitive pool of respondents available to Canada, Shared Services Canada is recommended to expand the definition of "Respondent" to include the "Respondent Team", where credentials can be drawn from any of the named Respondent team members, in the absence of an existing commercial relationship at the time of ITQ closing. It is further recommended that a single member of the Respondent team be identified and named at ITQ closing as being authorized to represent the full Respondent team. Once prequalified, and as the procurement progresses, the "Respondent team" will

solidify a commercial relationship to meet the requirements of a future competitive procurement (RFP).

Canada's Response to Question 28:

Canada will not be expanding the definition of "respondent" for the purpose of this ITQ. Furthermore, there is no plan to issue any RFP as a direct result of this ITQ process.

3. **Publish Modifications to the ITQ**

   Please see an amended version of the ITQ document, specifically Form 1 – Response Submission Form to see the only modifications to the ITQ document.