Request for Information

Colorado School of Mines

High Performance Computing System
Contents
Confidentiality.................................................................................................................. 3
Introduction and purpose of the RFI............................................................................. 3
Scope............................................................................................................................... 3
Abbreviation and terminology ...................................................................................... 3
RFI procedure.................................................................................................................. 3
How to deliver the answer ............................................................................................. 3
Contacts ......................................................................................................................... 3
Timeframe....................................................................................................................... 3
Background description of what is requested .............................................................. 4
Of the context in which the product or service will be used ........................................... 4
Statement of need ........................................................................................................... 4
Requirements .................................................................................................................. 4
Qualifications ................................................................................................................. 4
Conditions which will be terms for future RFPs or RFQs .............................................. 4
Confidentiality
All information included in this RFI is confidential and only for the recipient knowledge. No information included in this document or in discussions connected to it may be disclosed to any other party.

Introduction and purpose of the RFI
With this RFI we request information regarding your company and your products/services. The same information will be gathered from different companies and will be used to formulate a RFP or RFQ.

Scope
Specific information is requested as discussed below.

Abbreviation and terminology
HPC – High Performance Computing
MPI – Message Passing Interface
CSM - Colorado School of Mines
GECO – Golden Energy Computing Organization
PGAS - Partitioned Global Address Space

RFI procedure
To answer this RFI please send a portfolio describing your company's offerings in HPC that will be available for delivery March 2012. The contact person listed below is available for assistance in case that is needed. Staff from different functions at CSM will evaluate the answers to this RFI. All replies will be held in confidence. NDA agreements will be entered as needed.

How to deliver the answer
Send a portfolio in PDF format describing your company’s technologies or potential solution to tkaiser@mines.edu with the subject line beginning with “GECO RFI RESPONSE”. Contact information should also be contained in the portfolio clearly.

Contacts
For questions regarding this RFI, you are welcome to contact:
Timothy H. Kaiser, Ph.D.
Director – Golden Energy Computing Organization
Director High Performance and Research Computing
tkaiser@mines.edu
Questions should be in an email format with the subject line beginning with "GECO RFI QUESTION"

Timeframe
This is the timeframe for the RFI
10/17/2011 – The RFI is sent out
05/13/2011– Last date for questions
05/20/2011– Last date for submission of response to this RFI
Background description of what is requested

Of the context in which the product or service will be used

The Colorado School of Mines (CSM) has acquired and maintains a high performance computing (HPC) platform, RA.Mines.Edu. RA is administered by the Golden Energy Computing Organization (GECO). RA consists of 2144 processing cores in 268 nodes, an Infiniband interconnect, a 300 Tbytes Lustre disk system, with a peak computation rate of 23 Tflops. This facility is used primarily for computational inquiries aimed at the discovery of new ways to meet the energy needs of our society. RA was first powered on in March of 2008 and is thus over 3 years old.

Statement of need

We are requesting information from vendors on a system to replace RA. The purpose of this request is to familiarize CSM with the current offerings in the HPC world. We are anticipating that the replacement machine will have a peak computational rate of 100-200 Tflops. However, we are more interested in application scalability than theoretical performance. To this end, we are interested in exploring unique architectures which allow for real world application scalability. We are interested in exploring hybrid (MPI and threads) as well as shared memory, and Partitioned Global Address Space (PGAS) programming models. The information obtained as the result of this request will be used, in part, to formulate a Request for Proposal (RFP) for a new HPC platform. We anticipate that the new machine will be functioning March 31, 2012.

Requirements

Our current computational portfolio includes finite difference, finite element, Molecular dynamics, Monte Carlo, and quantum many body simulations. This includes the use of the following programs: ParFlow, MCNPX, ADF, GROMACS, Fluent, VASP, ABINIT, Parse, RGWBS, Siesta, and TEBD.

Energy efficiency will also be important as will physical space. We are planning on using the space currently used by RA, 12 racks, for the new machine.

We are also interested in receiving information from vendors who might bid only on the file system for our new machine.

More information on the Golden Energy Computing Organization can be found at: http://geco.mines.edu. The current hardware description link is http://geco.mines.edu/hardware.shtml

Information on recent and current computational projects can be found at http://geco.mines.edu/summer2010/ and http://geco.mines.edu/winter2011.

A current copy of this document can be found at http://geco.mines.edu/rfi.pdf

Qualifications

To qualify a vendor must have a record of successful installation and support of comparable HPC systems.

Conditions which will be terms for future RFPs or RFQs

Delivery date: March 31, 2012, available for early users
Delivery address(es): Colorado School of Mines, Golden Colorado