Opportunity Notice for Parties Interested in Partnering with the National Energy Technology Laboratory (NETL) under FOA 24-3210 Competitive Portfolios for Advanced Scientific Computing Research

Introduction

The National Energy Technology Laboratory (NETL) has submitted one or more applications to the Department of Energy Office of Science (SC) Advanced Scientific Computing Research (ASCR) and is seeking partner organizations to complement its capabilities.

Background

The National Energy Technology Laboratory (NETL), part of the U.S. Department of Energy (DOE) national laboratory system, is owned and operated by the DOE. NETL supports the DOE mission to advance the energy security of the United States.

The mission of SC ASCR is to ensure continued leadership in delivering on the promise of computational science, and drive innovation in energy-efficiency and versatile high-performance computing for science. ASCR seeks to support long-term, high-impact research; aggressively respond to, and take advantage of, emerging science and technology trends; and collaborate with a diverse community of the most-promising academic and industry partners.

NETL invites private sector companies to collaborate with NETL with an anticipated start date of 10/1/24 through 9/30/28. Specifically:

- The partner must be willing and able to operate a wafer scale engine cluster computing with a minimum of 32 CS3 or newer wafer scale engines manufactured by Cerebras Systems as well as X86 support nodes in support of the benchmarking goals of the proposal.
- The partner will provide direct access to development containers to compile and run the Wafer Scale Engine, Field Equation Application Programming Interface in hardware simulation and hardware submission modes. These containers will include the ability to compile assembly language kernels that will run on WSE hardware and will be regularly updated directly from the Cerebras software development branches.
- The partner must be able to directly access Cerebras software development branches, make changes, and supply rebuilt toolsets to support NETL project directives.
- The partner must develop a low level message passing interface that will allow arbitrary message passing from one processing element to another on multiple wafer scale engines. The message passing interface will be integrated directly into the Cerebras development software on the Cerebras development branches.
- The partner must have experience doing development in the Cerebras development software. Specifically, the partner must have experience developing the Tunsgten language, the Angler Language, CASM, CSNODE, and CSL.
- The partner must have experience operating a cluster of Wafer Scale Engines including job management and debugging.

Requirements / Qualifications

NETL has unique expertise in wafer scale engine computing, which has the potential to have long-term impact to understanding of fundamental scientific phenomena. NETL is seeking organizations with the following expertise, capabilities, and facilities:

- The partner must have experience with the Cerebras Assembler.
- The partner must have graph compiler development experience.
- The partner must own and operate a cluster of CS3s.
- The partner must have access to Cerebras Software source code.
- The partner must be able to compile Cerebras tools from Cerebras Software source code.
- The partner must be able to create and distribute containers from Cerebras Software source code.
- The partner must be able provide technical support and modifications to Cerebras Software source code upon request.

Instructions

Each submittal shall include the following: a) Cover Page that identifies the entity name, address, and point of contact information; b) Technical Discussion (not to exceed 4-pages), which addresses the requirements and qualifications

identified above as well as the evaluation criteria identified below including key personnel contributions and facilities and equipment; and c) Budget Page summarizing an estimate of the labor categories (PI, post-doc, student, research fellow, etc.), level of effort for each labor category, supplies and materials and overall proposed project cost.

Please limit responses to a maximum of 6-pages of text, single spaced, 11-point font, with 1-inch margins. Illustrations, maps, figures, and tables may be used to supplement your response; the maximum length of your response including illustrations, maps, figures, and tables is 10 pages. Responses must be provided as a PDF attachment to the email, not to exceed 10 MB in size.

Responses Due

Responses to this Opportunity Notice are due no later than **8:00 PM ET September 4, 2024.** Responses are to be submitted electronically in Adobe Acrobat PDF to the National Energy Technology Laboratory (NETL) at the following e-mail address: RIC-ADVANCED-COMPUTING-COA@NETL.DOE.GOV.

Proposers can expect to receive a response from NETL by **the end of September 2024.**

Evaluation Criteria

Submittals will be evaluated on the following criteria:

(1) Overall technical understanding and merit;
   a. Offeror should demonstrate an understanding of the need for the sought-after technology/expertise; how their experience and capabilities could contribute to achieving the goals outlined by NETL; and discuss options for achieving the project objectives.

(2) Qualifications and experience of proposed key personnel including organizational and management experience;
   a. Offerors should discuss experience with similar projects in the proposed area(s) of investigation including collaborative efforts and the scale and scope of those investigations and the scientific contributions made to the field of study.

(3) Adequacy of proposer's site, facilities and equipment;
   a. Offeror should discuss the equipment and facilities needed to execute the proposed effort.

(4) Adequacy and feasibility (reasonableness) of the proposed budget.
   a. Offerors should identify the necessary labor categories, address the labor effort required (hours or FTEs) for each labor category; and equipment, supplies, materials, and travel.

Criterion 1 will carry a weight of 40%, Criteria 2 through 4 will each be weighted 20%. The selection decision will be weighted toward Technical Merit.

Contacts

For questions regarding this Opportunity Notice, please to contact NETL at RIC-ADVANCED-COMPUTING-COA@NETL.DOE.GOV.

Administration by Federal and Non-Federal Personnel: When considering responses to this Opportunity Notice, Federal employees are subject to the non-disclosure requirements of a criminal statute, the Trade Secrets Act, 18 USC 1905; the Government may also seek the advice of qualified non-Federal personnel. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The respondents, by submitting their response, consent to DOE providing their response to non-Federal parties. Non-Federal parties given access to responses must be subject to an appropriate obligation of confidentiality prior to being given the access. Submissions may be reviewed by support contractors and private consultants.