CloudifyGateways 2020 Solicitation

I. Introduction

The NSF-funded Science Gateways Community Institute (SGCI) was founded with the mission of providing resources, expertise, community support, and education to the creators of gateways serving science and engineering research and education. Through these channels, we hope to speed the development and application of more robust, less expensive, and more sustainable gateways.

As mentioned in recent solicitations, funding agencies including NSF have supported research and education activities to benefit from access to cloud computing platforms, which provide robust, agile, reliable, and scalable computing infrastructure. Several recent studies illustrate the opportunity that cloud computing presents to advancing research and education. A 2016 National Academies of Sciences, Engineering, and Medicine (NASEM) study, *Future Directions for NSF Advanced Computing Infrastructure to Support U.S. Science and Engineering in 2017-2020*, discussed how cloud computing democratizes the use of complex systems. This study recommended various strategies for making cloud computing more accessible to the research and education community at large.

Additionally, cloud computing facilitates reproducible research through improved sharing, consistent with a recent NSF Dear Colleague Letter, *Encouraging Reproducibility in Computing and Communications Research*.   A 2018 NSF-funded conference on *Enabling Computer and Information Science and Engineering Research and Education in the Cloud* also highlighted the cloud computing needs of the CISE research and education community, with access to cloud computing resources being identified as an "equalizer" for a variety of institutions.

To extend the SGCI mission and continue to democratize and accelerate science, the SGCI, Google, and CloudyCluster teams have created a "Cloudify Gateways" solicitation for the SGCI community. This program invites the community to submit proposals on how they would cloudify their science gateways on the Google Cloud Platform with CloudyCluster.

II. Program Description

This solicitation seeks proposals from the SGCI Community to enable Science Gateways to operate in the public cloud. Participants should look to CloudyCluster and the Google Cloud Platform to provide their computation and storage requirements for this program. In addition to HPC, additional advanced cloud capabilities such as serverless, AI as a service, and massive-scale databases are encouraged to be included as part of the proposals.

The overarching goals of the solicitation are to:
- Extend the reach of gateways beyond their current scope, extending globally to other for-profit and non-profit patrons.
- Enhance gateways to include the cloud, not only for web, database, HPC and HTC, but other cutting-edge cloud technologies such as AI as a service and scalable query engines.
- Enable gateway developers to access cutting-edge cloud technologies to help envision future gateway capabilities and broaden coverage to the public cloud.

III. Information

A pool of GCP credits will be divided among the recipients along with Cloud HPC personnel time from the CloudyCluster team and gateways expertise from the SGCI that will be allocated across the selected proposals. This expertise includes:

- Omnibond will help with:
    - Getting started with GCP and CloudyCluster
    - Supporting integrating your Gateway with CloudyCluster and GCP
    - Adding the gateway software to a CloudyCluster image with GCP
- SGCI will help with:
    - Providing access to short-term consultants in usability, cybersecurity, sustainability, and graphic design.
    - Providing access to long-term Extended Developer Support (EDS) to collaborate with the team on the gateway's development efforts or support the integration of GCP into their gateway.
    - Providing clear mechanisms for teams to obtain other SGCI services, such as student interns, access to gateway sustainability workshops, or list their gateway and/or gateway software in the SGCI catalog.

IV. Eligibility Information

Who may submit Proposals:
The researcher must be at a regionally accredited academic institution in the United States, or degree granting institution in one of the following countries:

Australia, Austria, Belgium, Bulgaria, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, India, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, United Kingdom, United States

Who May Serve as PI:
There are no restrictions or limits.

Limit on Number of Proposals per Organization:
There are no restrictions or limits

Limit Number of Proposals per PI or Co-PI: 1
An individual may appear as PI, co-PI, or Senior Personnel on **no more than one proposal** submitted in response to this solicitation.

V. Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

Proposals should include the following information:

1. A Cover Sheet summarizing the following information:
   - Proposal title beginning with "**Cloudify Gateways:**"
   - The PI and any co-PIs should be indicated along with their institutional affiliations
   - The budget in GCP credits. Utilize the [GCP calculator](#) to estimate your required budget. Omnibond can also help estimate costs for the proposal if needed. For more information on GCP credits: https://edu.google.com/programs/credits/
   - A short abstract describing the scope / goals of the project
   - A short description of how GCP, CloudyCluster, and related technologies may provide unique leverage to the project that other resources may not provide. An overview how how Gateways can leverage CloudyCluster: http://gcp.cloudycluster.com/blog/sgci-cloudify-gateways/
2. Project Description (4-page limit including figures). The Project Description should have the following clearly labeled sections:
   - A concise description of the scope of work for the entity, including how the gateway will integrate with GCP and CloudyCluster. This includes success criteria and any real scientific workflows that will be run in the project.
   - Team experience aligning with scope of work.
   - Project schedule of activities showing the sequence of anticipated goals and milestones. Recipients will be notified of the expiration date of the GCP credits.
   - Justification for the requested amount of GCP credits required to accomplish the proposal and provide enough detail so the reviewers can have a good understanding of what is proposed and how the credits would be used.
   - Intellectual Merit: Similar to National Science Foundation proposals, please describe the intellectual merit of the activity, particularly as it pertains to advancing the knowledge of how platforms such as GCP and related services may impact gateways in the future.
   - Broader Impact: Similar to National Science Foundation proposals, please describe the broader impact of the activity, particularly as it pertains to advancing access to gateway platforms to wide and diverse audiences, solving important problems with high impact on society, and/or advancing the ease with which gateways can be deployed or operated.
3. Biographical Sketch (2-page limit per individual). Biographical sketches are required for the PI, co-PIs, and Senior Personnel. These pages do not count against the 4-page project-description limit.

B. Budgetary Information

Budget requests are for Google Cloud Platform credits and should be justified in the Project Description for both use and quantity.

C. Due and Selection Dates

Proposals are due: **September 16th, 2020** ~~September 4th, 2020~~ 11:59 pm Pacific Time.
Selection announcements will occur at Gateways 2020.

D. Submittal Information

Visit https://easychair.org/my/conference?conf=gateways2020 for more information and to submit your proposal through EasyChair.

VI. Proposal Processing Review Procedures

A. Merit Review Principles and Criteria

In addition to evaluating the Intellectual Merit and Broader Impacts as described above, reviewers will be asked to evaluate the clarity of the proposed project, the methods by which the project will be carried out, the likelihood of success, the soundness of reasoning behind the requested GCP budget, and the ability to measure the success of the project.

B. Review and Selection Process

Reviewers will be asked to evaluate full proposals using merit review criteria. A summary rating and accompanying narrative will generally be completed and submitted by each reviewer. The review team will consider the advice of reviewers and will formulate a recommendation.

Once a selection or declination decision has been made, proposers will be provided feedback about their proposals. In all cases, reviews are treated as confidential documents.

VII. Administration Information

A. Notification

Notification and feedback will be provided via email.

B. Conditions

The selected proposals will receive:
- GCP credits* to be consumed by the participants to develop and test the proposed solution
- GCP technical assistance and training provided by Google
- HPC and parallel computation in GCP leveraging CloudyCluster provided by the CloudyCluster team leveraging CloudyCluster through the GCP Marketplace.
- Gateways expertise provided by SGCI to US-based institutions**

* Any overage of charges beyond the credits allocated is the responsibility of the GCP account owner. The Google and CloudyCluster teams will be available to help participants learn how to track their expenditures to help prevent such overages.

** SGCI is funded by the NSF to provide free support to US-based institutions. International consortia with US-based institutions can be supported.

Account and technical support, answers to conceptual questions, and assistance will be provided by the CloudyCluster and Google teams to help with the success of each participant.

C. Reporting Requirements

At the conclusion of the program, a summary report will be required from each project outlining what was accomplished, what capabilities were used, and suggested improvements for future programs. This report will also be used for public-facing blog posts and other presentations. To help with such items, please include a short paragraph on how the Cloudify Gateways program helped the project grow, accelerate time to science, or incorporate new technologies.

VIII. Key Contacts

SGCI
Claire Stirm, cstirm at ucsd.edu

Google Cloud Platform
Alice Kamens alicekamens at google.com

CloudyCluster
Amy Cannon, amycannon at omnibond.com
Boyd Wilson, boydw at omnibond.com