CISE Research Infrastructure: Midscale Infrastructure - NSFCloud NSF 13-602 Webinar

Arlington, VA, September 25, 2013

Goals of this Solicitation

This solicitation comprises a long-term and comprehensive program seeking infrastructure that will specifically enable the academic research community to

a) develop and experiment with novel cloud architectures and
b) pursue architecturally-enabled novel applications of cloud computing.

CISE recognizes that (b) will introduce new requirements from, and interactions with, communities that have not been members of the traditional Computer Systems Research or Networking Research communities.

For example, Cyber Physical Systems, High Performance Computing

Goals (continued)

We seek to support both:

    Research on novel cloud architectures

    Research on new cloud applications that advance the use of cloud computing

We believe that there is considerable opportunity for cross-fertilization and sharing between the Cloud and other communities.   However:

    This solicitation *is focused on the cloud.*

    This solicitation is not a mechanism to provide computing cycles that are not directly supporting the innovation goals.

NSFCloud is a Two-Phase Program

Phase I: Infrastructure design, software construction (as needed) and early community engagement
[**This Solicitation**]

Phase II: Infrastructure build out and full staffing for proposed mission

Key Points to Remember

Focus is on building the infrastructure and the user communities surrounding the infrastructure. It is intended to build a community resource supporting a diverse range of academic institutions.

This program does not support individual research enabled by the infrastructure.

Individual research will be funded by existing and new solicitations.

Please Read the Solicitation

This Webinar will not cover all elements of the solicitation.

Proposers should read the solicitation carefully.

Award Information

All organizations described in the Grant Proposal Guide, Chapter I, Section E are eligible to propose

Due: December 17, 2013 (note change)

Anticipated number of Awards: 2

Anticipated Funding Amounts: $20M total subject to availability of funds
> This does not mean that winning proposals will receive exactly $10M!

Maximum project length is 4 years.
> Can be shorter!

Awards will be in form of Cooperative Agreements
> Proposers should carefully consider management plans and possible collaborative proposals in terms of the requirements
>> To interact with NSF on a regular basis
>> To deliver an useable infrastructure as opposed to doing fundamental research

Proposal Review

Panel or ad-hoc review, or both.

At NSF's discretion, following the initial review process there may be Reverse Site Visits.

Additional Review Criteria (part 1)

In addition to the standard NSF **Intellectual Merit** and **Broader Impact** criteria:

- The qualifications of the team and its ability to deliver the infrastructure;

- The completeness of the management plan, including how well the proposed project structure and management plan provides adequate community participation in the development, governance and use of the facility;

- The success metrics and plan for periodic evaluation of the project against those metrics; and

- How well the proposal describes project risk factors and strategies for overcoming these aspects.

Additional Review Criteria (part 2)

- How well the proposal addresses currently understood cloud research problems, and the likelihood that the proposal will support new research challenges;

- How well the proposed project leverages existing NSF investments and other opportunities;

Phase I Budget Will Support (part 1)

The NSFCloud program will support:

1. acquisition and/or development of new software tools, equipment, testbeds, resources, platforms, etc.;

2. enhancement (through acquisition and/or development) of existing software tools, equipment, testbeds, resources, platforms, etc.;

3. technical personnel essential to the successful design, acquisition, development, and deployment of the proposed research infrastructure;

4. postdocs as well as graduate and/or undergraduate students to participate in the design, acquisition and/or development of the proposed research infrastructure;

Phase I Budget Will Support (part 2)

The NSFCloud program will support:

5. travel expenses necessary for coordination of multi-institutional projects;

6. support for professional staff critical to the operation of the infrastructure, including providing effective user support;

7. postdocs, or graduate or undergraduate students to participate in the operation (including providing user support) and assessment of the infrastructure;

8. outreach and participation activities such as workshops or training activities that broaden participation and prepare researchers, educators and students to use the proposed infrastructure effectively; and

9. assessment activities that evaluate project outcomes.

Past CISE Infrastructure Activities

NSFCloud builds on a base of prior midscale investments: GENI, FutureGrid, CC-NIE, and many others

Some of these are ACI programs. The center of NSFCloud is in the CISE/CNS research community but we hope and expect that proposers will describe engagement and leveraging of other communities.

NSF Cloud proposals are encouraged to consider leveraging existing NSF investments
- Cost reduction
- Time to completion
- Risk reduction
- Capturing existing user bases

Key "Must Accomplish" Goals

NSFCloud projects must accomplish the following:

1. Present an architecture and deployment plan that will support multiple experiments, each of sufficient size so as to enable meaningful evaluation of different cloud computing configurations.

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2. Support the construction of experiments consisting of communications, computation and data resources that may span real-time and safety-critical systems. The NSFCloud must support both experiments involving novel cloud computing architectures and experiments involving novel applications of cloud computing.

3. Engage the relevant research and education communities as developers and users. Projects must also present plans addressing broader participation and development of persistent infrastructures.

Proposal Project Description Section

The solicitation contains a list of topics that *must* be addressed in the Project Description.

The discussion order does not necessarily need to be the same as in the solicitation.

    Build a coherent and compelling narrative!

This solicitation allows the Project Description to be up to 20 pages in length.

    Please read the Grant Proposal Guide restrictions on font size and formatting.

Proposal Project Description

1. Project Vision
2. Architecture and Infrastructure
3. Research Enablement
4. Community Engagement
5. Team Qualifications
6. Project Management
7. Risk Management
8. Metrics and Performance Tracking
9. Long Term Vision

Project Vision

Innovation in and with cloud computing means that both the classical systems and networking communities and new domains (such as CPS) will use (and possibly fund parts of) the infrastructure.

Architecture and Infrastructure

Components, how they fit together, and how they leverage existing NSF investments or commercial software …

Discuss tools, instrumentation, federation issues, and user experience

Research Enablement

The purpose is not to do research but to show how the architecture and infrastructure will *enable* exciting research and education opportunities.

Community Engagement

Remember to consider community diversity, fairness, long-term sustainability concerns, broader impact

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Team Qualifications

This is a big infrastructure project, not a research project. Project management skills will be needed.

Project Management

This is a large infrastructure project that will require well organized management and coordination.

Remember that the awards will be issued as cooperative agreements and that NSF will actively engage the awardees. Proposers are strongly encouraged to describe how their management structures will support the cooperative agreement.

Risk Management

We are not expecting you to run a risk-free program.   However, we are expecting that the risk associated with organizations, new architectural ideas, software, hardware or tools be carefully and professionally managed.

We do not require conformance to risk management standards, e.g. ISO 31000/31010.

We **do** seek thoughtful assessment that highlights a critical part of the proposer's project management skills.

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Metrics and Performance Tracking

Success Metrics: The proposal must identify an initial set of metrics for both short- and long-term progress toward a shared infrastructure, as well as a plan for periodically updating and tracking progress metrics.

Remember: You need to be able to communicate the value of the infrastructure to the larger CISE community.

Long Term Vision

Long-term Vision: The proposal must describe a longer-term vision for transition to community governance and sustainability, and the associated management aspects. Proposers must also describe the management aspects associated with scaling to a larger infrastructure should the infrastructure advance to Phase II with additional funding.

Remember: Over the long term, there will be users/ participants and infrastructure providers other than NSF.

Conclusion

- Please read the solicitation carefully to

  - Understand the goals of this solicitation

  - Understand the proposal requirements

  - Understand the review criteria

- http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504951&org=NSF

- Questions ?

jlyles@nsf.gov   Bryan Lyles
gebrown@nsf.gov   Geoffrey Brown