CloudWatch: Around the World in 45 Minutes
March 9, 2015

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Project ran 2011-2014 and has now concluded!

The Cloud Interoperability Testbed will serve as a mechanism to host interoperability tests for different machine control, data transfer, resource reporting and usage agreement standards and implementations of other new standards efforts. The primary purpose will be to give developers an opportunity to try out implementations of code that implements either server or client functionality for the use of multiple standards from different standards development organizations. The initial effort for this project will be focused on implementations of the Open Cloud Computing Interface (OCCI) from the Open Grid Forum (OGF), Cloud Data Management Interface (CDMI) from the Storage Network Industry Association (SNIA), the Cloud Infrastructure Management Interface (CIMI) and the Open Virtualization Format (OVF) from the Distributed Management Task Force (DMTF). Other standards will be added as the project proceeds.

View Project Details

Intellectual Merit

A large amount of effort is being expended by multiple organizations to develop standards in the area of distributed computing, spanning many specific topics ranging from advanced networking control to infrastructure management to data transfer and packaging protocols. In the absence of a common framework in which these can be tested, development activities for implementations of such standards are necessarily fragmented and limited to those chosen by a particular development team. The use of a virtualized space made available through FutureGrid provides a range of opportunities to streamline tests and coordinate activities to promote common use and interoperability of code written.
Texas Tech University (TTU) is proposing to be added as a site to the existing I/UCRC for Cloud and Autonomic Computing (CAC). TTU site will focus on cloud standards and standards-based software development innovation. It will extend and enhance the activities of the CAC in areas related to cloud computing best practices and standards research, including standards-based software, development and use of software stacks and reference implementations, and industry applications in real-world settings. TTU site will be working with the largest and most active of the computing-oriented Standards Development Organizations and vendors. The research effort will meet the industry need to organize, classify, develop reference implementations and contribute to the standards-based software in advanced distributed computing. Development of appropriate industry- and community-based consensus standards and application of these methods are required to exploit the capacity for transformative change provided by the new techniques for cloud and other advanced distributed computing. Without coordination on interface standards, algorithms and techniques, many potential advantages of these methods may be compromised due to a chaotic multiplicity of approaches, protocols and application programmer interfaces.

The TTU site will leverage contacts with three outreach-oriented organizations with which the PIs are involved: (1) the TTU STEM Education & Outreach project for which the university has been nationally recognized; (2) by extensions of the existing High Performance Computing Center (HPCC) involvement in the SURAgrid regional grid and cloud computing educational dissemination project (including ongoing collaborations with the SURAgrid Virtual Organization and Cloud Computing Options Working Group); and (3) the High Performance Computing Across Texas (HiPCAT) organization, which concentrates on broadening access to grid and cloud computing in the physical sciences. The TTU HPCC and the PIs have extensive involvement with each of these programs. The site will develop an annual targeted workshop to integrate hands-on learning experiences for historically underrepresented population groups into the projects that will be carried out during the performance period of this proposal, as well as activities to engage with the needs of selected non-profit organizations in areas in which they could benefit from the use of cloud computing. Texas Tech University has a number of Science, Technology, Engineering, and Mathematics (STEM) educational outreach programs that overlap in the area of recruiting new students and in the mentoring of STEM students from underrepresented groups. The PIs will leverage these programs to strengthen their recruitment efforts.
NSF CAC Current Participants:

Industry and Gov’t Members as of Feb. 2015:

- Covenant Health System
- DISA
- Happy State Bank
- NimboXX
- Soliel
- Stack Velocity
- TTU
- MSU

Technical Cooperation Agreements:

- The Aerospace Corporation (Existing)
- Cloud Standards Customer Council
- OMG (In Progress)

Others to come!
Project update: Cloud Interoperability Testbed

New CAC project on Chameleon to support standards and software interoperability testing research projects:

Replaces Previous FutureGrid project

Cloud Interoperability Testbed | FG-176

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Abstract
The Cloud Interoperability Testbed will serve as a mechanism to host interoperability tests for different machine control, data transfer, resource reporting and usage agreement standards and implementations of other new standards efforts. The primary purpose will be to give developers an opportunity to try out implementations of code that implements either server or client functionality for the use of multiple standards from different standards development organizations. The initial effort for this project will be focused on implementations of the Open Cloud Computing Interface (OCCI) from the Open Grid Forum (OGF), Cloud Data Management Interface (CDMI) from the Storage Network Industry Association (SNIA), the Cloud Infrastructure Management Interface (CIMI) and the Open Virtualization Format (OVF) from the Distributed Management Task Force (DMTF). Other standards will be added as the project proceeds.
New NSF research facility: "CACnetworking" SDN/NFV interoperability testbed project now approved

Operated by:

- The University of Utah®
- University of Wisconsin–Madison
- Clemson University
- Raytheon
- BBN Technologies
- University of Massachusetts Amherst
- US Ignite
CAC project: XSEDE Standards Prototyping

Standards Prototyping project recently approved!
Conclusions

• The NSF CAC will use its industry/university connections to promote and foster open cloud standards & interoperability testbeds using internal and external resources.

• Specific projects have been proposed and approved on two new NSF computer-science-oriented cloud “testbed as a service” resources, Chameleon and CloudLab, which have recently been funded to replace the FutureGrid project.

• These testbeds will be OPEN TO ALL who wish to cooperate with us on cloud interoperability, performance, standards or general cloud functionality testing within the context of the approved projects.

• *International participants welcome,* as long as you’re willing to work on interoperability topics and share your results.