

US National Science Foundation Cloud and Autonomic Computing Industry/University Cooperative Research Center And Related NSF Cloud Activities Overview



CloudWatch: Around the World in 45 Minutes

March 9, 2015

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Texas Tech University

Cloud Interoperability Testbed

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

Project Number:
FG-176

Project Lead:
Alan Sill

Institution:
Texas Tech University

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Project Members

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**Award Made
April 15, 2014**

ABSTRACT

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 SURAgriid regional grid and cloud computing educational dissemination project (including ongoing collaborations with the SURAgriid 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.

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NSF CAC Current Participants:

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



TTU

MSU

Technical Cooperation Agreements:



(Existing)



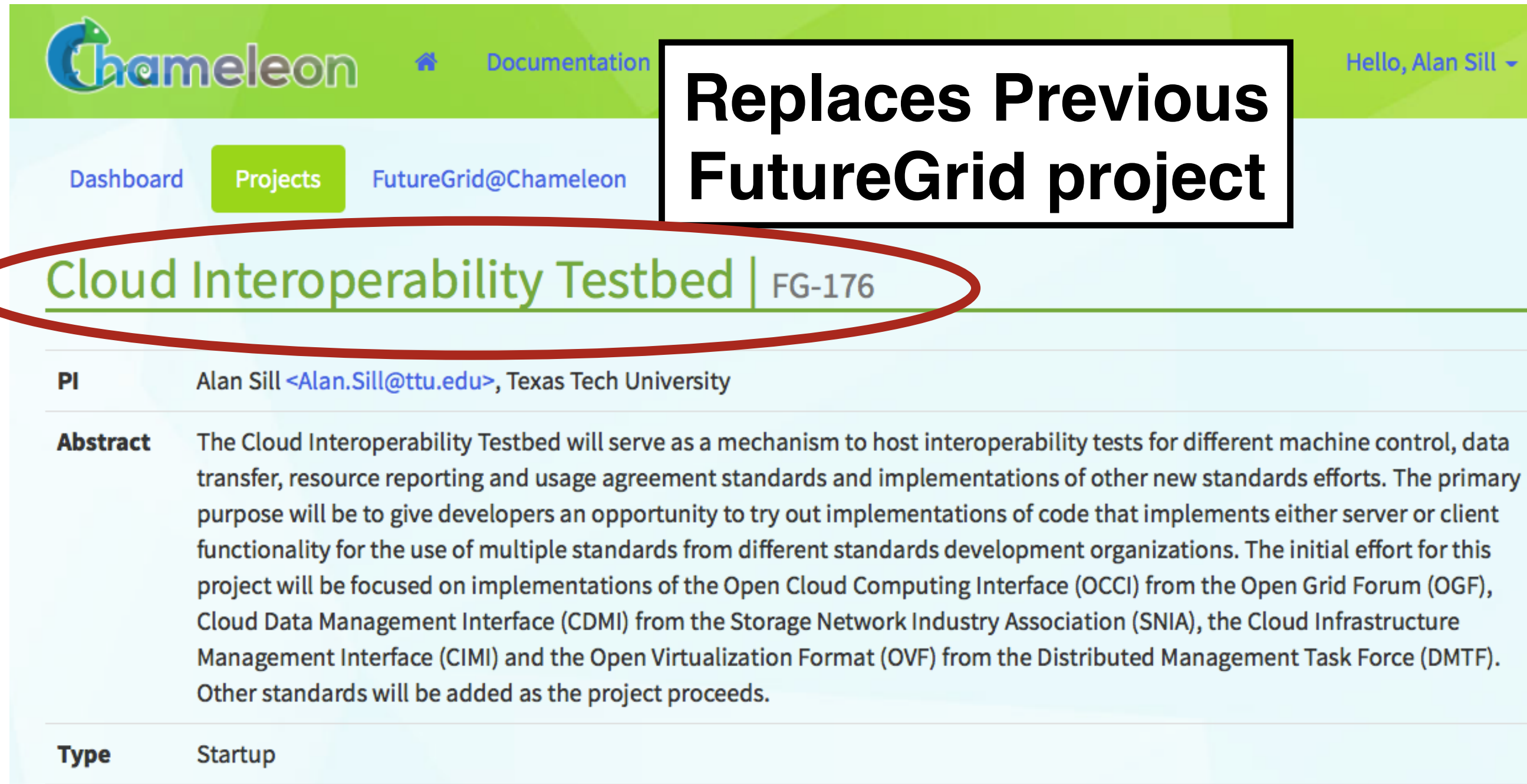
(In Progress)

...

***Others
to
come!***

Project update: Cloud Interoperability Testbed

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



The screenshot shows the Chameleon project management interface. At the top, there's a green header with the Chameleon logo, a home icon, a 'Documentation' link, and a user greeting 'Hello, Alan Sill'. Below this is a navigation bar with 'Dashboard', 'Projects' (highlighted in green), and 'FutureGrid@Chameleon'. A large black-bordered box with white text states 'Replaces Previous FutureGrid project'. The main content area features a red oval around the project title 'Cloud Interoperability Testbed | FG-176'. Below the title, the 'PI' field lists 'Alan Sill <Alan.Sill@ttu.edu>, Texas Tech University'. The 'Abstract' section describes the project's goal to host interoperability tests for various standards like OCCI, CDMI, CIMI, and OVF. The 'Type' field is set to 'Startup'.

Chameleon [Documentation](#) Hello, Alan Sill

Dashboard **Projects** FutureGrid@Chameleon

Replaces Previous FutureGrid project

Cloud Interoperability Testbed | FG-176

PI Alan Sill <Alan.Sill@ttu.edu>, Texas Tech University

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.

Type Startup



New NSF research facility:

“CACnetworking” SDN/NFV
interoperability testbed
project now approved

CloudLab

Operated by:



Raytheon
BBN Technologies



UMASS
AMHERST



CAC project: XSEDE Standards Prototyping

XSEDE USER PORTAL
Extreme Science and Engineering
Discovery Environment

Search XSEDE...

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Summary | **Allocations/Usage** | Accounts | Jobs | Profile | Publications | Tickets | Change Password | Add User | Community Accounts | SSH Terminal

XSEDE Allocations Usage

Show Inactive Projects

Standards Prototyping project recently approved!

Cloud Standards and Pre-Standards Prototyping | TG-CCR140048

Allocations | Show Expired/Inactive Allocations | Manage users | View Project Usage

Principal Investigator: Alan Sill

Resource	Active Until	Used	My Usage	Burn Rate
Oasis Active/new	Aug 11, 2015	0.0 / 500.0 GBs View usage	0.0 GBs	
Data Supercell Active/new	Aug 11, 2015	0.0 / 100.0 GBs View usage	0.0 GBs	
Ranch Active/new	Aug 11, 2015	0.0 / 500.0 GBs View usage	0.0 GBs	
Stampede Active/new	Aug 11, 2015	0.0 / 10000.0 SUs View usage	0.0 SUs	0% of recommended average

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.