**Future Grid Report July 11 2011**

*Geoffrey Fox*

**Introduction**

This report is the forty-sixth for the project and now continues with status of each committee and the collaborating sites.

**Summary**

**Operations and Change Management Committee**Preparations for 2nd User Advisory Board at TG’11 finalized.

Invoice processing for all partners on-going. Summary totals to date provided.

NSF PY2 Q2 and Q3 reports in progress.

**Software Team (includes Performance and Systems Management Teams)**Substantial Progress was made in Image management, dynamic provisioning and OpenStack deployment

**Hardware and Network Team**

* FutureGrid network peering with XSEDE has been established
* The IU GRNOC is configuring systems for PerfSonar monitoring of the network
* A new large memory Linux cluster will be integrated into FG, Bravo

**Training, Education and Outreach Team**

The TEOS team added and updated tutorials, coordinates TG’11 activities and added content to the portal to guide new users on using cloud and map/reduce frameworks on FG. We have initiated interactions with XSEDE (through Scott Lathrop) to identify synergistic activities.

**User Support Team**Continued work on portal

**Site Reports**

**University of Virginia**

Genesis II on TACC and preparation for XSEDE. Note over last 2 weeks, University of Virginia domain scientists ran 12000 jobs totaling 34000 hours on FutureGrid.

**University of Southern California Information Sciences**

Unicore and Genesis II highlight of continued activities

**University of Texas at Austin/Texas Advanced Computing Center**

Continued work with highlight as Alpha version of host list manager available

**University of Chicago/Argonne National Labs**This reporting period was dominated by activities around the new Nimbus release candidate (RC) and its improvement as well as preparations for various FG outreach events; we had some bad luck with an Argonne-wide unplanned power outage.

**University of Florida**

The UF team created an OpenStack-compute appliance for FutureGrid, updated Grid appliance images on Eucalyptus and Nimbus, helped coordinate TG’11 activities and added content to the portal to guide new users on using cloud and map/reduce frameworks on FG.

**San Diego Supercomputer Center at University of California San Diego**

UCSD made a small fix to the myHadoop installations, helped debug and resolve a Nimbus problem, and continued to assist with the perfSONAR deployment.

**University of Tennessee Knoxville**This period was preoccupied with preparations for TG11 and the FG Advisory board meeting that will be occurring there.

**Detailed Descriptions**

**Operations and Change Management Committee**Operations Committee Chair: Jose Fortes  
Change Control Board Chair: Gary Miksik, Project Manager

* Preparations finalized for 2nd User Advisory Board meeting, to be held on Monday, July 18th, at TG’11. Agenda under development, but all room logistics have been finalized.

Current roster of attendees:

UAB Members:

Morris Riedel (Jülich Supercomputing Centre)

Rich Wolski (Eucalyptus.com)

Ruth Pordes (FermiLab)

Steven Newhouse (EGI)

John Towns (NCSA)

Nancy Wilkens-Diehr (SDSC)

Shantenu Jha (LSU)

Jon Weissman (Minnesota)

FutureGrid Project Members:

Geoffrey Fox (IU)

Gary Miksik (IU)

Gregor von Laszewski (IU)

Shava Smallen (UCSD)

Andrew Grimshaw (Virginia)

Renato Figuiredo (Florida)

Warren Smith (Texas)

Kate Keahay (Chicago)

Ewa Deelman (USC)

Jens Voelker (USC)

Piotr Luszczek (Tennessee)

* Invoice processing for all partners. Summary totals to date:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | PY1 Carryover | PY2 Invoices thru | PY2 Invoice Amt | PY1 Remain | # Months |
| UC | 156,767 | Feb 2011 | 139,801 | 16,966 | 0.7 |
| UCSD | 102,814 | Mar 2011 | 101,185 | 1,629 | 0.1 |
| UF | 101,069 | Feb 2011 | 48,362 | 52,707 | 6.3 |
| USC | 45,229 | Dec 2010 | 45,229 | 0 | 0 |
| UT | 128,158 | Apr 2011 | 81,453 | 46,705 | 6.6 |
| UV | 57,918 | Apr 2011 | 57,597 | 321 | 0 |
| UTK | 0 | None | 0 | 0 | 0 |

**Software Team**

Lead: Gregor von Laszewski

**EXPERIMENT MANAGEMENT**

**Experiment Harness (TACC Warren)**

A tutorial has been created for the Host List Management tool.

**Image Management and dynamic provisioning**

We have been developing a secure socket connection between the services needed fro the image deployment. In addition we split up the functionality due to the systems group decision to separate the XACT and the Moab services so they run on different machines. We have offered our help to the systems group. We had several phone conversations with Adaptive computing in regards to our future deployment of Moab because the software team identified that the code we obtained from the company had an important set of scripts missing. We were given access to these scripts and it was recommended to us nit to install the version 6.0.4 of Moab but instead to use 6.0.1.

In addition we were alerted that based on our feedback a version 6.1 will include the missing scripts. Adaptive Computing anticipates this version to be available by July 21st. On the current system a version incompatibility was removed that prevented one of the needed services  to by started.

**FG SUPPORT SOFTWARE AND FG CLOUD SERVICES**

**Nimbus**

The nimbus group has delivered a monitoring system via inca. The IU team is collaborating with the Nimbus team to identify how we can leverage from this effort to address also Openstack and Eucalyptus monitoring needs.

**Eucalyptus**

Responsibilities for managing Eucalyptus have been transitioned to Sharif Islam from IU

**OpenStack**

We have now an Openstack appliance available for FG. Tutorials on how to use this have been made available.  
Sharif Islam is also working on the deployment of Openstack. The IU software team has identified two solutions on how to integrate with the portal user creation process for handling LDAP entries. We have offered the systems team that deploys Open Stack to advise on changes that must be conducted before Openstack is deployed in an integrated fashion into FG.

**Pegasus**

The ISI group has focused on the following major activities:

* USC investigates cloudinitd as a means to run-time configure remote virtual machines.
* USC investigates Unicore and Genesis-II as means to gain access to bare-metal nodes on a FG site.
* USC is preparing for the user-advisory board that will be held adjacent to the TeraGrid 2011 conference.

**Inca**

During the past few weeks, we continued to work with the Nimbus group, who found that upgrading to a newer DHCP client fixed a periodic hanging problem on two of the FutureGrid machines found by the Inca cluster provisioning test for Nimbus.  A new Inca test to verify myHadoop installations was also added.  Accounts were also acquired for Unicore and Genesis II so that we could start developing tests for those services.

**Virtual Appliance:**

The UF team worked on converting a VirtualBox-based OpenStack-compute appliance to a nimbus-compatible appliance. OpenStack-compute appliance requires “nested virtualization”, i.e., the ability to run a hypervisor on a VM. QEMU on KVM has been successfully tested, and since nimbus on alamo cluster supports KVM, a KVM-based OpenStack appliance has been created. The appliance was made accessible to all FutureGrid users, and a tutorial is available at <https://portal.futuregrid.org/tutorials/os1>

**SYSTEMS SERVICES**

The systems group is continuing to set up the minicluster for delivery.

**WEB SITE AND SUPPORT**

**Portal and Web Site**

IU has developed a projects statistics view.

**PERFORMANCE**

**Performance Group**During the past few weeks, the performance group has continued work with the IU GNOC group to decide on the initial configuration of the perfSONAR deployment for gathering cross-site network measurements.  The IU GNOC group has finished the initial perfSONAR configuration of the machines and shipped them out this week to sites.  Also, we made a few changes to the performance group's Web server so that weekly usage reports the Nimbus group is generating are visible to staff members at <http://inca.futuregrid.org/nimbus-stats>.  The group is also working on slides for the upcoming User Advisory Board meeting at TG'11.

**MISC**

MyHadoop - A small bug fix was deployed to the MyHadoop installations on India and Sierra to ensure that Java environment variables were set properly.

**Outreach**

G. von Laszewski participated in a panel about service business opportunities for clouds at the IEEE Cluster 2011 conference. We reported our experiences gathered from FG and emphasized the need for service consistency and interoperability in the cloud.

**Hardware and Network Team**

Lead: David Hancock

**Networking**

* All FutureGrid network milestones are complete and networking is in a fully operational state.
* The migration of FutureGrid’s peer connection from TG to XSEDE was completed on 7/7 from 4:01 AM – 6:37 AM UTC, peering with XSEDE was initiated on 6/29 and during the maintenance window on 7/7 peering with TG was deactivated. The 10Gb circuit to peer with XSEDE will be shared with the connection to UF so no new circuit costs will be incurred.
* The Chicago PerfSonar monitoring system was installed, systems are being shipped to SDSC, TACC, UC, and UFL.
* IU’s FutureGrid connection was briefly unavailable on 7/7 for 15 minutes due to a low power RX problem that was resolved by cleaning/replacing fibers.

**Compute & Storage Systems**

* IU iDataPlex (india)
  + More IP addresses have been allocated for virtual machines on the system
  + Internal network problems occurred on 6/14 that required a reboot of the system, HPC and Eucalyptus services were unavailable for 2 hours.
  + RHEL6 is being tested for future deployment across FutureGrid
  + System operational for production users.
* IU Cray (xray)
  + New memory arrived on 6/6 for the system to replace a batch of 24 faulty DIMMs on the system. It will be installed during the next planned maintenance.
  + System operational for production users
* IU HP (Bravo)
  + Bravo is a cluster of 16 large memory (192GB) and large local storage (12TB) and will be integrated into the FutureGrid environment.
  + The networking for the Bravo cluster has been configured.
* SDSC iDataPlex (sierra)
  + System operational for production users
  + The SDSC FG connection was unavailable on 7/6 for 15 minutes
* UC iDataPlex (hotel)
  + System operational for production users
  + The UC network was temporarily unavailable on 7/6 for 2 hours due to a local power outage.
* UF iDataPlex (foxtrot)
  + System operational for production users
* Dell system at TACC (alamo)
  + System operational for production users

**Training, Education and Outreach Team**

Lead: Renato Figueiredo

A new tutorial on an OpenStack-compute virtual appliance has been added to the FutureGrid tutorial page, available at: https://portal.futuregrid.org/tutorials/os1. TEOS team members have also reviewed and updated the MyHadoop and Grid appliance tutorials.

The TG’11 and OGF schedules have been finalized and FG-related activities are consolidated in the following page: https://portal.futuregrid.org/teragrid11

The TEOS team discussed approaches to better provide guidance to users with respect to key target topics of interest – starting with cloud computing and MapReduce – because there are multiple ways of using the frameworks on FutureGrid. Pages have been created to give users context and pointers to tutorials on how to use FG resources for cloud and MapReduce uses – these are linked from the “User information” menu:

<https://portal.futuregrid.org/using/clouds>

<https://portal.futuregrid.org/using/mapreduce>

**User Support Team**Lead: Jonathan Bolte

**FG Knowledgebase:** 1 new document on Project information for FutureGrid  
0 revised documents

**FG Portal:** 12 pages reviewed and/or revised in the FG Portal

**Tickets**  
Lead: Greg Pike

**Tickets (past 2 weeks):**

23 new tickets created

24 tickets resolved

**Current Totals:**

121 tickets open

62 new tickets

54 open tickets

5 stalled tickets

63 unowned tickets

**Site Reports**

**University of Virginia**

Lead: Andrew Grimshaw

Brought Genesis II up on Alamo at TACC. Tested. Will make accessible to science jobs the week of July 11.

Began discussions with XSEDE Software Development and Integration team about requirements for XSEDE system integration testing on FutureGrid.

Resource usage by University of Virginia Domain Scientists:

India: ~5,000 jobs, ~16,000 CPU hours

Sierra: ~7,000 jobs, ~18,000 CPU hours

**University of Southern California Information Sciences**

Lead: Ewa Deelman

* USC continued to participate in the following conference calls: FG AHM, FG OCMC, FG Performance, FG TEOS and FG-Software.
* USC investigates *cloudinitd* as a means to run-time configure remote virtual machines.
* USC investigates *Unicore* and *Genesis-II* as means to gain access to bare-metal nodes on a FG site.
* USC is preparing for the user-advisory board that will be held adjacent to the TeraGrid 2011 conference

**University of Texas at Austin/Texas Advanced Computing Center**

Lead: Warren Smith

**Dell cluster Alamo:**

* Installed myHadoop on the HPC partition.
* Requested DNS records for the public IP addresses of nodes in the HPC partition. IU has created these for us.
* Installed version control software (CVS, Subversion, git)

**Experiment harness:**

* The Alpha version of the host list manager continues to be available.
  + It has been updated based on feedback from FutureGrid members.
* Created a tutorial on interactive experiment management that includes how to use the host list manager and TakTuk to run distributed experiments.
  + This tutorial has been provided to FutureGrid members for feedback but is not yet publicly available.

**FutureGrid user portal:**

* Working with IU to configure the portal development server as needed.
* Started discussing how to improve the outage announcements generated by the portal.
* Updated the format of the URLs that are generated for new forum topics.

**User support:**

* Started creating additional content for the Alamo portion of the user manual.

**University of Chicago/Argonne National Labs**

Lead: Kate Keahey

This reporting period was dominated by activities around the new Nimbus release candidate (RC) and its improvement as well as preparations for various FG outreach events; we had some bad luck with an Argonne-wide unplanned power outage.

* Released RC1 of a new Nimbus release. The release includes several features requested by FG partners in the Nimbus Infrastructure component (the RC1 of Nimbus Infrastructure 2.8) as well as the first release of Nimbus Platform cloudint.d, the multi-cloud coordiantion tool that will facilitate repeatable provisioning of environments for distributed experiments. Much of this reporting period was also spent working on RC2: improving documentation, testing, functionality improvements,etc.
* Patched cloudclient to allow any user to upload a common image
* Preparations for TeraGrid11
* The SC11 tutorial proposal on clouds for science got accepted
* The SC11 workshop proposal on experimental technologies with FutureGrid got accepted
* The administrators and the Nimbus team debugged DHCP issues on hotel (we determined that the DHCP client in a stock nimbus image was broken -- upgraded the image and tested)
* We recovered from an unplanned power outage and started preparing for the planned power outage next week.

**University of Florida**

Lead: Jose Fortes

The UF team worked on converting a VirtualBox-based OpenStack-compute appliance to a nimbus-compatible appliance. OpenStack-compute appliance requires “nested virtualization”, i.e., the ability to run a hypervisor on a VM. QEMU on KVM has been successfully tested, and since nimbus on alamo cluster supports KVM, a KVM-based OpenStack appliance has been created. The appliance was made accessible to all FutureGrid users, and a tutorial is available at: https://portal.futuregrid.org/tutorials/os1. The appliance allows a user to experiment with OpenStack Nova and run simple virtual machines within a single-node virtual cloud; it is intended as a resource for education and training. The UF team also published updated images of the Grid appliance on Alamo/Nimbus and India/Eucalyptus. TG’11 activities and new content to the portal are described in the TEOS report.

**San Diego Supercomputer Center at University of California San Diego**

Lead: Shava Smallen

During the past two weeks, UCSD made a small maintenance fix to the new myHadoop installations on India and Sierra. UCSD also continued to debug and resolve a problem with the Nimbus group, added an Inca test for myHadoop, and acquired accounts for Unicore and Genesis II as described further in the Inca section of the Software section of this report. UCSD also continues to lead the performance group activities and led a group call on June 29th. Particularly, we continue to coordinate with the IU GNOC team about the perfSONAR deployment as described further in the Software section of this report and worked on slides for the User Advisory Board meeting at TG’11.

**University of Tennessee Knoxville**

Lead: Jack Dongarra

We have been disseminating the paper we recently submitted —“Evaluation of HPC Challenge Benchmarks in Virtualized Environments”— to other Future Grid participants. We received an especially good response from Andrew Younge at Indiana University. We are planning to get together during TG11 conference in Salt Lake City and discuss possible future directions of this effort and further opportunities for collaboration on this front among FG participants. This work should directly feed into work on Grid Benchmark Challenge and performance evaluation on Future Grid.

We are also preparing our tutorial materials for the TG11 conference and the User Advisory Board meeting in particular. Piotr Luszczek is leading these efforts. Piotr is working with Shava Smallen to have the Performance Working group materials ready. This will include our work so far on benchmarking on various hypervisors.

**Other Sites not reported**

Center for Information Services and GWT-TUD from **Technische Universtität Dresden** and **Purdue University** (unfunded)