GENI Shared Operational Monitoring Data
GEC16 Status Report

Chaos Golubitsky, GPO
March 20, 2013
www.geni.net

GENI Shared Operational Monitoring Data

Overview

Recent progress

Next steps during Spiral 5

Overview: operational monitoring data

- Monitoring data provides visibility into the state of:
  - GENI experiments and slices
  - Operational GENI resources, campuses, and aggregates
  - GENI-controlled networks, and non-GENI networks which GENI uses
- Audiences for monitoring data:
  - Experimenters who use GENI (and the staffers, instructors, and operators who help them)
  - Operators who run GENI infrastructure (especially when GENI runs on shared networks)

http://gmoc-db.grnoc.iu.edu

- Shared database for relational and measurement information about the state of GENI aggregates

- Aggregates submit new data periodically using a common API

- Users can view data:
    - Via a web UI: http://gmoc-db.grnoc.iu.edu/protected/
    - By downloading recently-reported structured GENI data

- **Client utility (gmoc.py) simplifies reporting of:**
  - Relations:
    - What GENI objects exist? Slices, Aggregates, Slivers, Resources, etc
    - How are GENI objects connected? (slices to slivers, slivers to resources, etc)
  - Measurements:
    - Operational metrics related to the health of GENI objects
    - May be aggregate-specific (e.g. FlowVisor message counts) or generic (e.g. CPU idle percentage)

Progress: reporting participation

- ## Active reporting from:
  - 2 ExoGENI racks
  - 4 InstaGENI racks
  - 26 FOAM servers

Aggregate Name		Type	Version	Operator	AM API Status	Last Updated
rci-hn.exogeni.net:11443	[Details]	orca	4.0	urn:publicid:IDN+gmoc.geni.net+organization+RENCI	Unknown	2013-03-19 01:51:02
bbn-hn.exogeni.net:11443	[Details]	orca	4.0	urn:publicid:IDN+gmoc.geni.net+organization+ExoGENI	Unknown	2013-03-19 01:51:02
utah.geniracks.net:12369	[Details]	protogeni	7e584af01b968c18b7d87fe7e78a5dde3549c47f	urn:publicid:IDN+gmoc.geni.net+organization+InstaGENI	Unknown	2013-03-19 01:50:45
lan.sdn.uky.edu:12369	[Details]	protogeni	7e584af01b968c18b7d87fe7e78a5dde3549c47f	urn:publicid:IDN+gmoc.geni.net+organization+InstaGENI	Unknown	2013-03-19 01:50:44
instageni.gpolab.bbn.com:12369	[Details]	protogeni	7e584af01b968c18b7d87fe7e78a5dde3549c47f	urn:publicid:IDN+gmoc.geni.net+organization+InstaGENI	Unknown	2013-03-19 01:50:43
instageni.northwestern.edu:12369	[Details]	protogeni	7e584af01b968c18b7d87fe7e78a5dde3549c47f	urn:publicid:IDN+gmoc.geni.net+organization+InstaGENI	Unknown	2013-03-19 01:50:42
foam.utah.geniracks.net:3626	[Details]	foam	8ea56b139ec9-0.8.2-FIX	urn:publicid:IDN+gmoc.geni.net+organization+InstaGENI	Unknown	2013-03-19 01:50:30
of.cs.washington.edu:3626	[Details]	foam	0.8.2	urn:publicid:IDN+gmoc.geni.net+organization+UW	Unknown	2013-03-19 01:50:29
foam.wail.wisc.edu:3626	[Details]	foam	foam-0.10.3,flowvisor-0.8.17	urn:publicid:IDN+gmoc.geni.net+organization+Wisconsin	Unknown	2013-03-19 01:50:28
foam.noc.iu.edu:3626	[Details]	foam	foam-0.10.3,flowvisor-0.8.17	urn:publicid:IDN+gmoc.geni.net+organization+Indiana	Unknown	2013-03-19 01:50:27
foam-cotn-1.lam-hyper-1.cenic.org:3626	[Details]	foam	foam-0.10.3,flowvisor-0.8.17	urn:publicid:IDN+gmoc.geni.net+organization+CENIC	Unknown	2013-03-19 01:50:26
foam.sox.net:3626	[Details]	foam	foam-0.10.3,flowvisor-0.8.17	urn:publicid:IDN+gmoc.geni.net+organization+SOX	Unknown	2013-03-19 01:50:26
						2013-03-19

- Download and view GENI relational objects from recent operational data

- Usable by campus operators (same credential as data upload)

- Experimenter access to some data is planned

```
>>> import gmoc
>>> client = gmoc.GMOCClient( … )
>>> urn = 'urn:publicid:IDN+' + \
    'pgeni.gpolab.bbn.com+slice+tuptymon'
>>> tuptymon = client.load(gmoc.Slice(urn))
>>> len(tuptymon.slivers)
14
>>> print min([s.expires for s \
                in tuptymon.slivers])
2013-03-26 02:00:40
```

- GPO nagios alerts on values obtained from downloaded AM data

- Examples:
  - Check aggregate versions, and alert if AMs are running versions which haven't been tested in GENI
  - Compare FlowVisor slices to FOAM slivers, and alert if we detect FV and FOAM state have gotten out of sync

- Similar checks could be done for any GENI aggregate which is reporting data

http://monitor.gpolab.bbn.com/nagios/cgi-bin/status.cgi?hostgroup=tango-geni&style=detail

Progress: performance and data cleanup

- Streamline gmoc-db database usage and reduced load on server

- With help from GMOC Service Desk, used data download to audit and sanitize existing reported data

- Modernize measurement data download, and tie it to GENI relations, using python client

- Define ACLs for data download so that experimenters can safely access operational data about their experiments

- Add relations and measurements for GENI network devices and circuit topology

- Improve user-interface tools to make data browsing easier

- Continue improving reported data and adding more reporting aggregates, resources, SAs

- We're interested in:
  - Early adopters for data download
  - GENI operational metrics to add to standard set
  - GENI health tests that people would like to see run
  - Feedback!

- Contacts:
  - GENI operational monitoring list: monitoring@geni.net
  - GMOC: Dan Doyle (daldoyle@grnoc.iu.edu), Mitch McCracken (mrmccrac@grnoc.iu.edu)
  - GPO: Sarah Edwards (sedwards@bbn.com), Chaos Golubitsky (chaos@bbn.com),