

GEC 19 Tutorial Part 3

GENI Desktop and GEMINI I&M Services

Jim Griffioen, Zongming Fei, Hussamuddin Nasir
Laboratory for Advanced Networking
University of Kentucky
Lexington, KY

Collaborators

- Indiana University - GEMINI
- University of Utah - Flack, Insta/ProtoGENI
- GPO - GENI Portal
- UNC RENCII - iRods, ExoGENI

GENI Desktop Uses

- Basic Services
 - Login to "GENI"
 - Create slices/Create Slivers
 - View slice topology
 - Ssh to slivers (nodes)

GENI Desktop Uses

○ Basic Services

- Login to "GENI"
 - Create slices/Create Slivers
 - View slice topology
 - Ssh to slivers (nodes)
-

○ I & M Services

- "Instrumentize" a slice (with measurement services)
- View measurement data
- Archive measurement data

GENI Desktop Features

- Single sign-on to various GENI tools
- Interoperates with the GENI Portal, Flack, and iRods
- Supports InstaGENI and ExoGENI racks and cross-aggregate stitching
- Access to all slices owned by user
- Slice creation/modification via Flack, the Portal, or RSPECs
- A windowing system interface
- Logical, Geographic, and List view of slice
- Single abstraction for interacting with a slice.
- Can be used with/without instrumentation (active or passive)
- Quick access to (instantiated) resource details.
- Ssh access to a set of nodes.
- Ability to run commands across sets of nodes.
- Ability to upload files to sets of nodes.
- Optional instrumentation of a slice
- Quick access to, and visualization of, commonly used measurement data.
- Ability to drill down to additional measurement information
- Ability to control active and passive measurements
- Ability to record notes about an experiment via a CMS
- and several other features.

GENI Desktop Login Page



Welcome Page and Slice List



gec17dem ch_geni_net [account](#) | [log off](#) | [Feedback/Bug Report](#)

Work With Your Slices Select Project

Click the slicename to open the GENI Desktop for that slice,
or Select an Action to apply to all the checked slices.

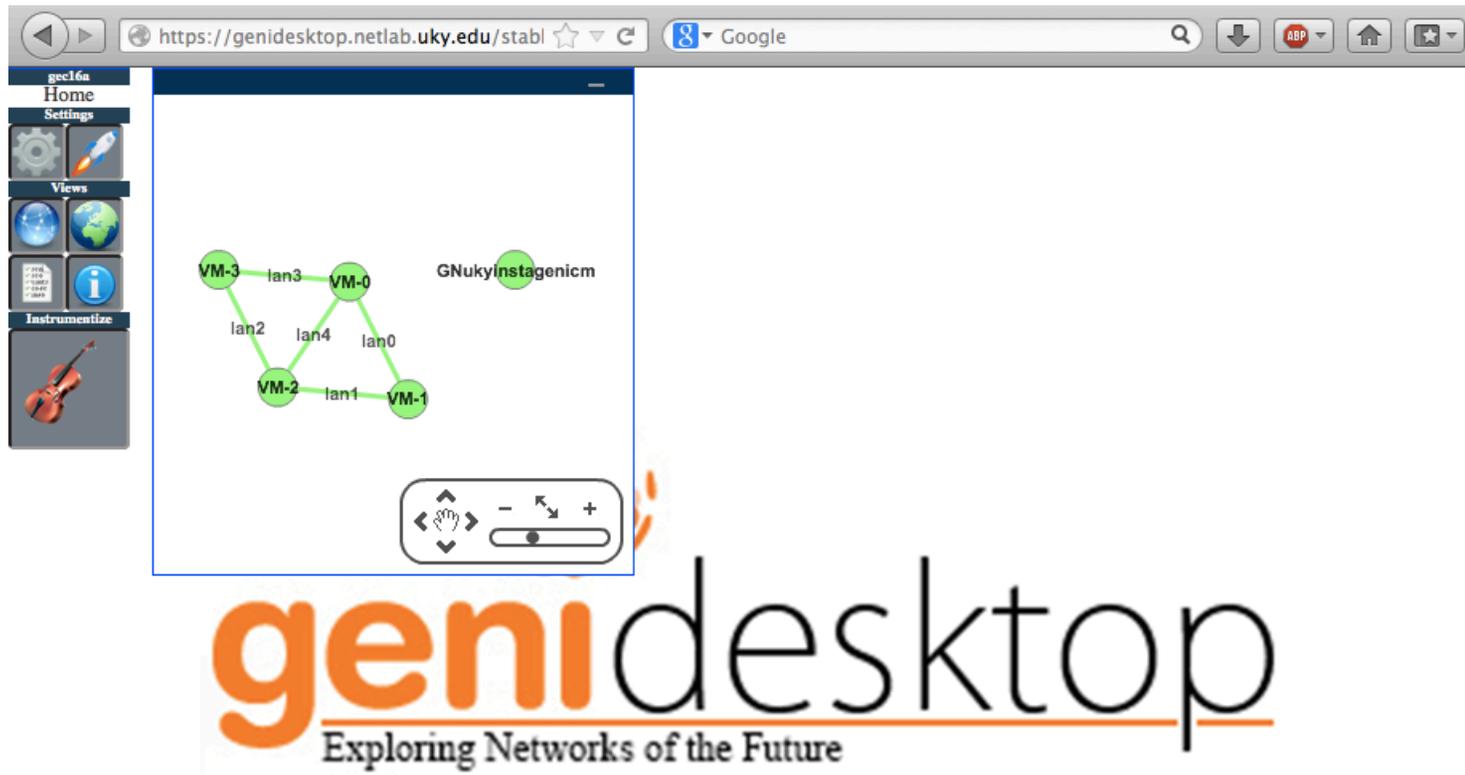
CheckName	TopologyRSPEC	AMsStatus	Auto Renew Slice/Sliver Expires	Next Action
<input type="checkbox"/> UKGENI:gec19a	GEC19 GEMINI for Kentucky Instageni	1	Has Resources NEVER	6 days 22:02:16 / 6 days 22:02:16 Initialize

Action =

Create A New Slice Project

[Show/Hide Log](#)

Logical Topology View



genidesktop
Exploring Networks of the Future

Two Phase Initialization

- **Phase I: Initialize access to MP nodes**
 - Load software onto GN to allow it to act as a proxy for reaching MP nodes
 - GENI Desktop does this step for you if it has not yet been done.
 - Available services include:
 - ◆ Slice visualization
 - ◆ MP information visualization
 - ◆ Ssh access
 - ◆ File upload
 - ◆ Run commands
- **Phase II (Optional) : Initialize Instrumentation and Measurement Services**
 - Load software on GN and MPs needed to instrumentize and view measurement data
 - Available services include:
 - ◆ View commonly used active and passive traffic graphs
 - ◆ View detailed node information and less frequently used graphs
 - ◆ Configure instrumentation and measurement system
 - ◆ Archive measurement data

I&M Traffic View

The screenshot displays the GeniDesktop web interface. On the left, a navigation sidebar includes links for 'Home', 'Settings', 'Views', and 'Renew Cert'. The main content area is divided into two sections. The top-left section shows a network diagram with nodes labeled VM-0, VM-1, VM-2, VM-3, and VM-4, connected by links labeled lan1, lan2, lan3, and lan4. A legend identifies the nodes as 'GNukyinstagenicm'. The top-right section contains a grid of performance graphs for three VMs: VM-0, VM-2, and VM-2. The graphs include: 'PCWI-13 Total CPU Utilization (MultiCore / Multi-Processor)', 'PCWI-13 IOP Traffic', 'PCWI-13 IP Traffic', 'PCWI-21 Total CPU Utilization (MultiCore / Multi-Processor)', 'PCWI-21 IOP Traffic', and 'PCWI-21 IP Traffic'. Each graph shows data over time from 08:50 to 08:55. The bottom of the interface features the 'geni desktop' logo with the tagline 'Exploring Networks of the Future'. The browser's address bar shows the URL 'https://genidesktop.netlab.uky.edu/stable/...' and the taskbar at the bottom includes 'gree13sc', 'GEMINI Graphs', and 'Graphs'.

The GENI Desktop

Unifying Abstraction

- **Goal:**
 - Support multiple ways to “visualize” a slice, and
 - Make it easy to apply an operation to a subset of resources within a slice.
- **Common Requirement:**
 - **Select Resources:** Provide a unified well-known way to select resources, regardless of the “view” of the slice.
 - **Apply Operations:** Provide a unified well-known way to apply an operation to a set of resources.
- **Idea:** Use an abstraction familiar to users
- **Solution:** Model the interface after the well-known file browser interface. The analogy is selecting files in a file browser and applying an operation (regardless of the “view” - e.g., list view, icon view, detailed view, etc.)

Slice/Topology "Views"

○ Three types of Views

□ Logical View

- ◆ Provides a logical view of the topology and links between nodes. Nodes and links can be selected to identify a set of nodes/links.

□ Geographic/Map View

- ◆ Provides a map view of the topology showing the geographic location where nodes are located and the links connecting them. Nodes and links can be selected to identify a set of nodes/links.

□ List View

- ◆ A textual list of the nodes and links in a slice. Nodes and links can be selected to identify a set of nodes/links. The list can be filtered (searched) to reduce the number of nodes/links displayed.

○ Observations

- There is a single unified interaction model
- Selecting nodes/links in one view selects the same nodes/links in another view.
- Logical and Geographic views make it easy to visualize the topology and interconnections between nodes.
- The List view is useful for large topologies because the topology can be quickly filtered to nodes/links of interest.

Demonstration

Tutorial and Exercises

You will work through a set of exercises. We will give you an overview and examples, but **NOT** step-by-step instructions. The goal is for you to try out things on your own.

Thank You!

Questions?

This material is based upon work supported in part by the National Science Foundation under grant number CNS-0834243. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of GPO Technologies, Corp, the GENI Project Office, or the National Science Foundation.