

GEC 20 Tutorial  
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 RENC I - iRods, ExoGENI

# GENI Desktop Uses

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

# GENI Desktop Uses

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## ○ I & M Services

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

# GENI Desktop Login Page

(<http://genidesktop.netlab.uky.edu>)



# 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 <b>Initialize</b>

Action =

**Create A New Slice**  Project

[Show/Hide Log](#)

# 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.

# 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



# Initialized View

The screenshot shows a web browser window with the URL <https://genidesktop.netlab.uky.edu/stabl>. The browser's address bar includes a search icon, a download icon, and a home icon. The page content is organized into a sidebar on the left and a main content area. The sidebar contains sections for 'Home', 'Settings', 'Views', and 'Instrumentize', each with corresponding icons. The main content area displays a network diagram with four virtual machines (VM-0, VM-1, VM-2, VM-3) and their interfaces (lan0, lan1, lan2, lan3, lan4). VM-3 is connected to VM-0 via lan3. VM-0 is connected to VM-1 via lan0 and to VM-2 via lan4. VM-2 is connected to VM-1 via lan1 and to VM-3 via lan2. A node labeled 'GNukyinstagenicm' is also present. Below the diagram is a control panel with a hand icon for panning, a zoom slider, and a zoom in (+) button.

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# 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 'GNukyinstagenicm' node is also present. The bottom-right section contains a grid of performance monitoring graphs for VM-0 and VM-2. The graphs include:

- VM-0: PCMI-13 Total CPU Utilization (MultiCore / Multi-Processor), PCMI-13 IOP Traffic, PCMI-13 IP Traffic, and PCMI-21 Total CPU Utilization (MultiCore / Multi-Processor).
- VM-2: PCMI-21 IOP Traffic and PCMI-21 IP Traffic.

The graphs show CPU usage and traffic patterns over time, with a legend for 'User CPU Usage' and 'System CPU Usage'.

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grec13sc GEMINI Graphs 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?

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