

GENI Desktop Tutorial

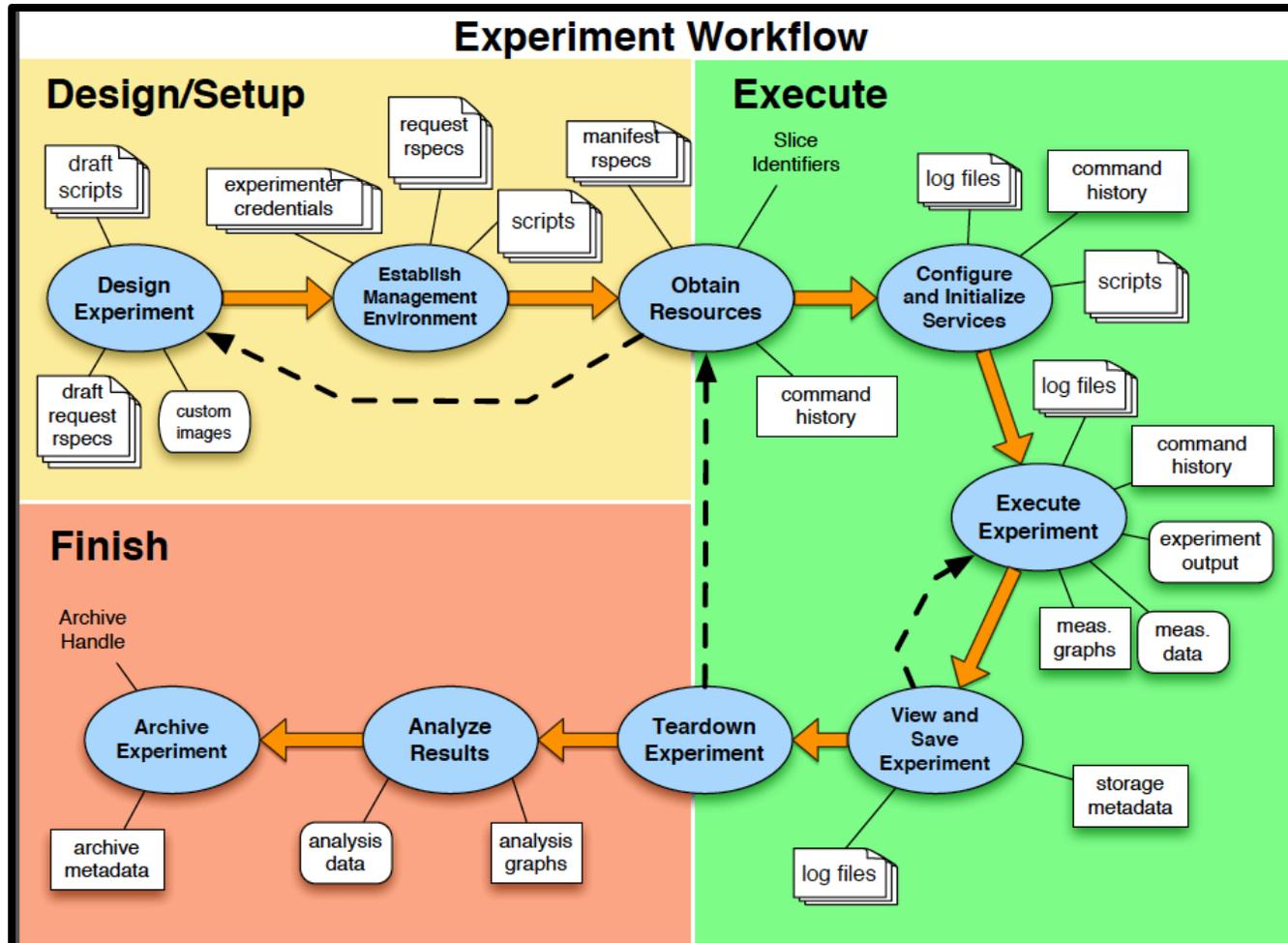
GEC 21

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Collaborators

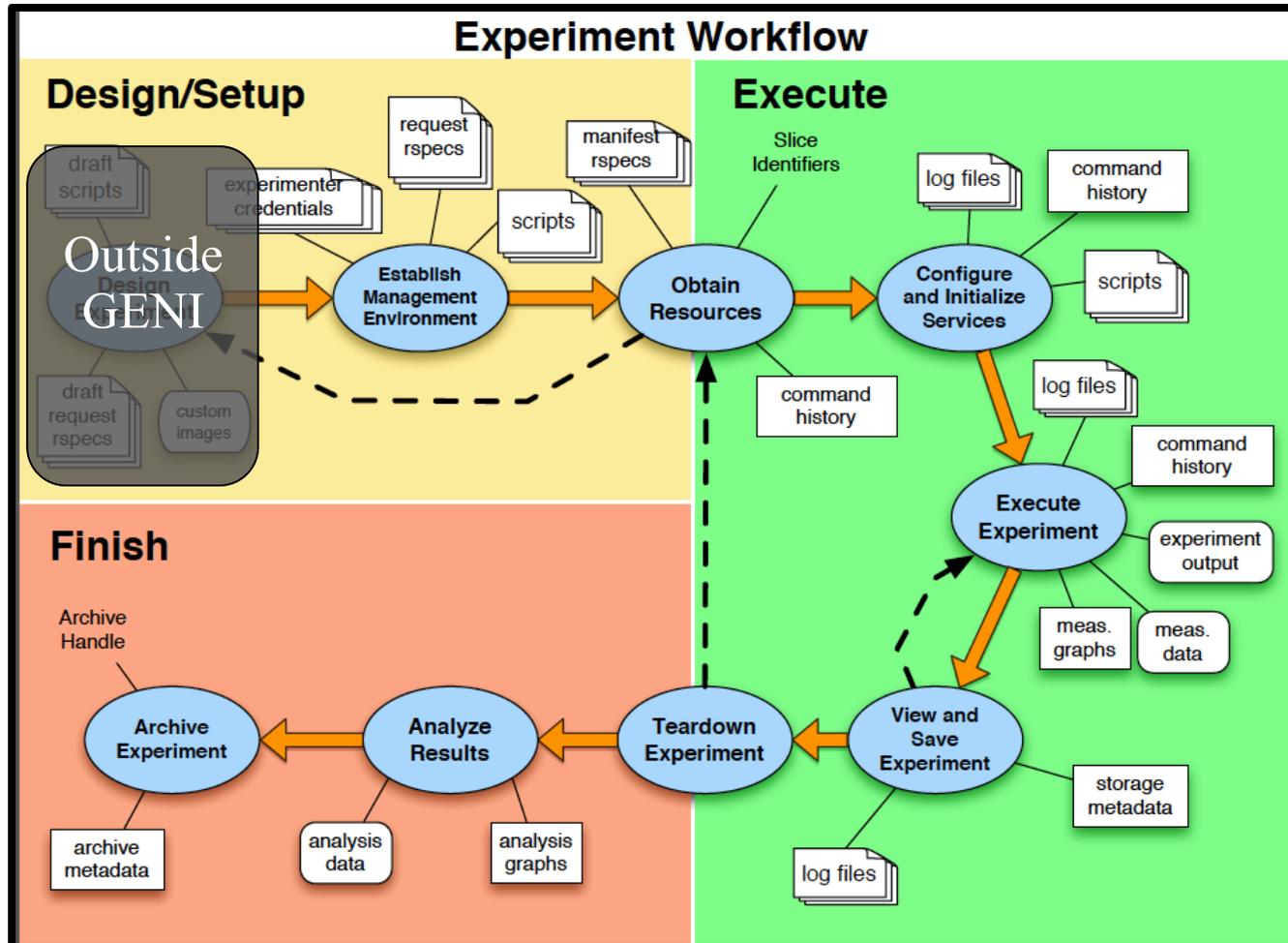
- Indiana University - GEMINI
- University of Utah - Flack, Jacks, InstaGENI
- GPO - GENI Portal
- UNC RENCII - iRods, ExoGENI

Lifecycle of a GENI Experiment



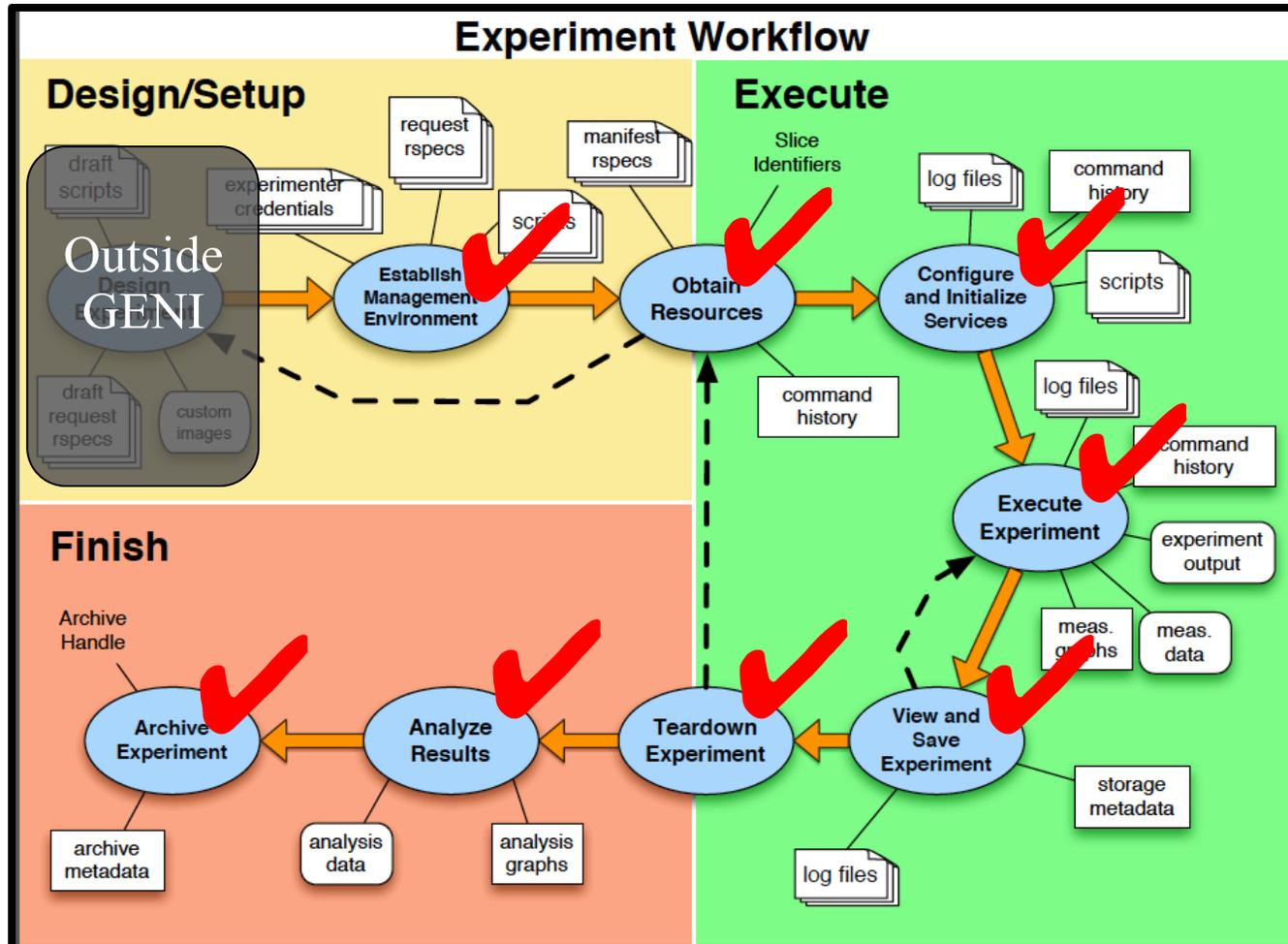
<http://groups.geni.net/geni/wiki/ExperimentLifecycle>

Lifecycle of a GENI Experiment



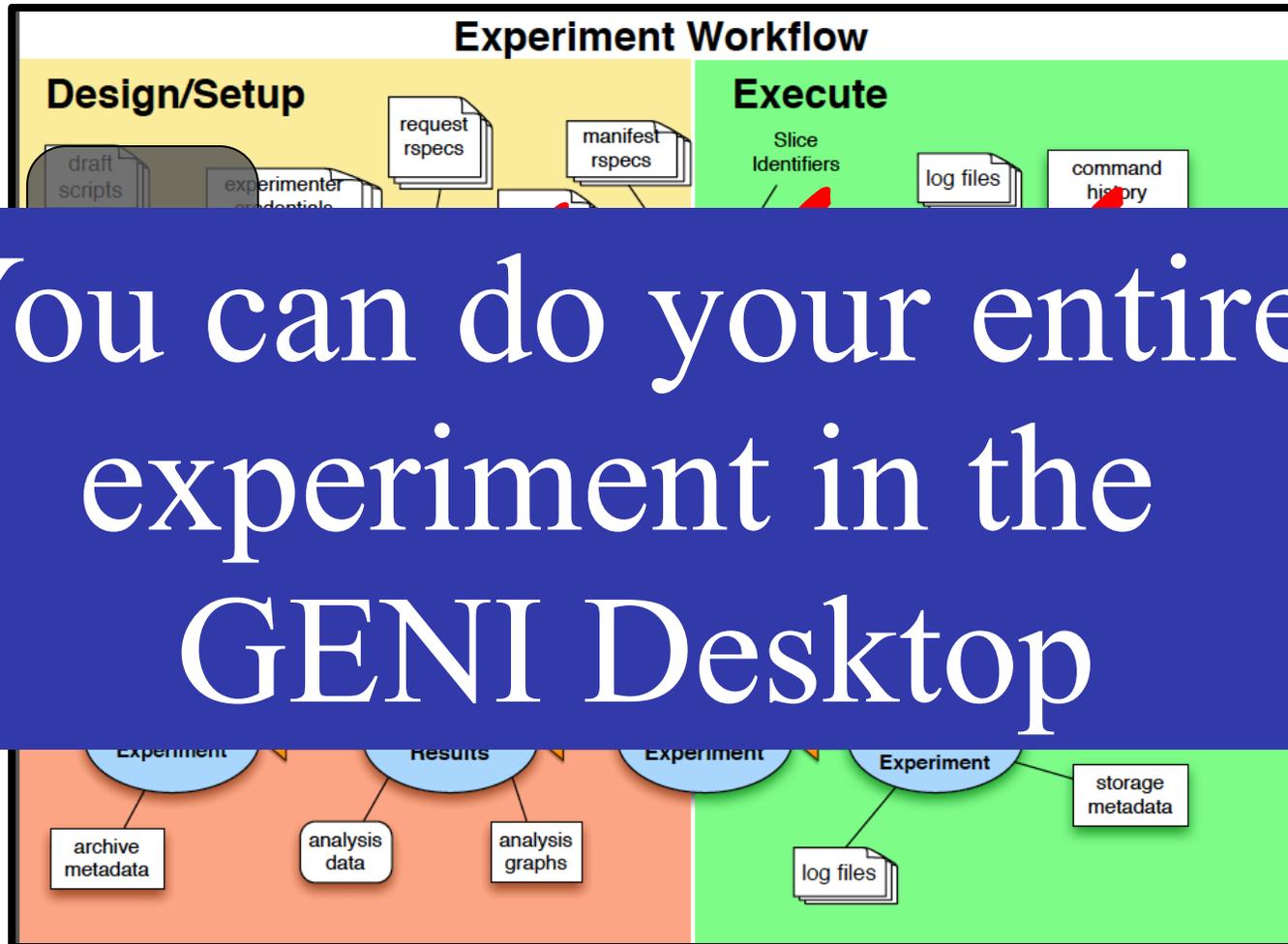
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GENI Desktop Helps With:



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GENI Desktop Helps With:



You can do your entire experiment in the GENI Desktop

<http://groups.geni.net/geni/wiki/ExperimentLifecycle>

Simple (but typical) Lifecycle

- Login to GENI Desktop
- Specify a slice name and create an (empty) slice
- Design a new slice topology, or select from a predefined set of topologies (RSPECs)
- Bind an RSPEC to resources (e.g., AMs)
- Create Slivers (i.e., reserve the resources)
- View information about the newly created slice and its resources
- Login (ssh) to the slice nodes
- Configure and load software onto the nodes
- Run experiments on the nodes
- Capture traffic graphs generated by the experiment
- View the traffic being sent in the experiment
- Archive the traffic graphs
- Teardown the slice

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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 (slice) 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
- Ability to create super slices
- and several other features.

GENI Desktop Login Page

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



The GENI Desktop requires your authorization in order to act on your behalf. This requires that you sign a credential authorizing the GeniDesktop to speak for you when interacting with GENI services.

[Authorize the GeniDesktop](#)

[FAQ/Help](#) | [Feedback/Bug Report](#)

GENI Desktop Login Page

GENI Authorization Tool

The GENI Authorization Tool allows you to authorize applications to speak on your behalf to allocate slices or slivers. Your GENI certificate and private key are stored in your web browser and your passphrase is never transmitted over the network.

You can download your GENI certificate and private key from a GENI Member Authority or paste your GENI certificate and private key into the box below.

Identity Provider Certificate

Where is your account?



OR

GENI Desktop Login Page

GENI

Please sign in using your account at one of our partners:

Enter your college, university, or organization's name

Continue

[Allow me to pick from a list](#)

[Get Help](#)



Can't login via any of the above organizations?

[Request a login from the GPO](#)

Need help? [Contact GENI Help](#)

[Web Design by](#)

GENI Desktop Login Page

GENI Authorization Tool

To authorize this tool, enter the passphrase for your GENI private key below. Once you authorize, the tool will be able to act on your behalf when talking to GENI infrastructure. Only authorize if you trust the tool.

Tool ID

urn:publicid:IDN+ch.geni.net+authority+genidesktop-uky

Show Advanced

Authorize



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](#)

Two Phase Initialization

- **Phase I (Automatic): 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
 - ◆ Verify the slice is operating correctly
 - ◆ Archive measurement data

Initialized View

The screenshot displays the Geni Desktop web interface. At the top, a browser window shows the URL <https://genidesktop.netlab.uky.edu/stabl>. The main content area features a network diagram with four virtual machines (VM-0, VM-1, VM-2, VM-3) and a node labeled GNukyinstagenicm. The connections are as follows: VM-3 is connected to VM-0 via interface lan3; VM-0 is connected to VM-1 via interface lan0 and to VM-2 via interface lan4; VM-2 is connected to VM-1 via interface lan1 and to VM-3 via interface lan2. A sidebar on the left contains navigation options: Home, Settings, Views, and Instrumentize. The Geni Desktop logo is prominently displayed at the bottom, with the tagline "Exploring Networks of the Future".

I&M Traffic View

The screenshot displays the GENI Desktop web interface. At the top, a browser window shows the URL <https://genidesktop.netlab.uky.edu/stable/>. On the left, a sidebar contains navigation options: Home, Settings, Views, and Renew Cert. The main area is divided into two sections. On the left is a network diagram titled "GNukyinstagenicm" showing four virtual machines (VM-0, VM-1, VM-2, VM-3) connected via interfaces (lan1, lan2, lan3, lan4). On the right is a "Traffic View" window containing eight performance graphs for VM-0 and VM-2. The graphs include:

- PCMI-13 Total CPU Utilization (MultiCore / Multi-Processor)
- PCMI-13 IOP Traffic
- PCMI-13 IP Traffic
- PCMI-21 Total CPU Utilization (MultiCore / Multi-Processor)
- PCMI-21 IOP Traffic
- PCMI-21 IP Traffic

The graphs show metrics such as User CPU Usage, System CPU Usage, Incoming Traffic, and Outgoing Traffic over time. The GENI Desktop logo, "Exploring Networks of the Future", is visible at the bottom of the interface.

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.