GENI OpenFlow Experiment

```
$ omni.py createsliver aliceslice myRSpec.xml
INFO:omni:Loading config file omni_config
INFO:omni:Using control framework pgeni
INFO:omni:Slice urn:publicid:IDN+pgeni.gpolab.
          expires within 1 day on 2011-07-07
INFO:omni:Creating sliver(s) from rspec file
INFO:omni:Writing result of createsliver for
INFO:omni:Writing to 'aliceslice-manifest-rspe
INFO:omni: ----------------------------------
INFO:omni: Completed createsliver:

  Options as run:
                aggregate: https://www.emulab.
                framework: pgeni
                native: True

  Args: createsliver aliceslice myRSpec.xml

  Result Summary: Slice urn:publicid:IDN+pgeni
Reserved resources on https://www.emulab.net/p
  Saved createsliver results to aliceslice-man
INFO:omni: ==================================
```

GENI Project Office

GEC 16

March 21, 2013

OpenFlow Experiment

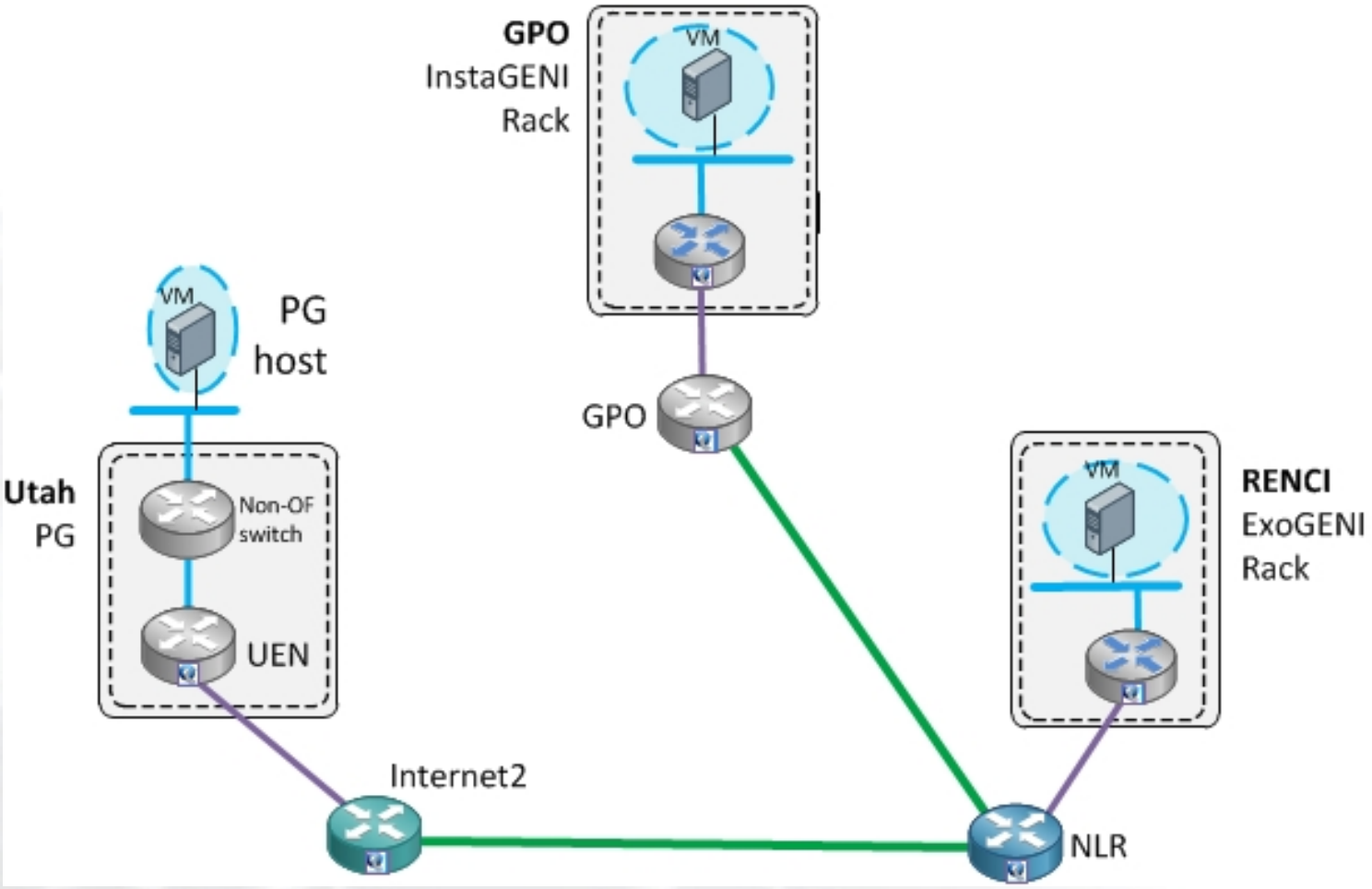
Experiment will demonstrate OpenFlow in GENI using:

- InstaGENI, ExoGENI and ProtoGENI sites OpenFlow resources.
- GENI OpenFlow backbone and Regional resources.
- InstaGENI, ExoGENI and PG sites compute resources.
- This experiment is available at:

http://groups.geni.net/geni/wiki/GENIExperimenter/ExperimentExample-OF

OpenFlow Experiment

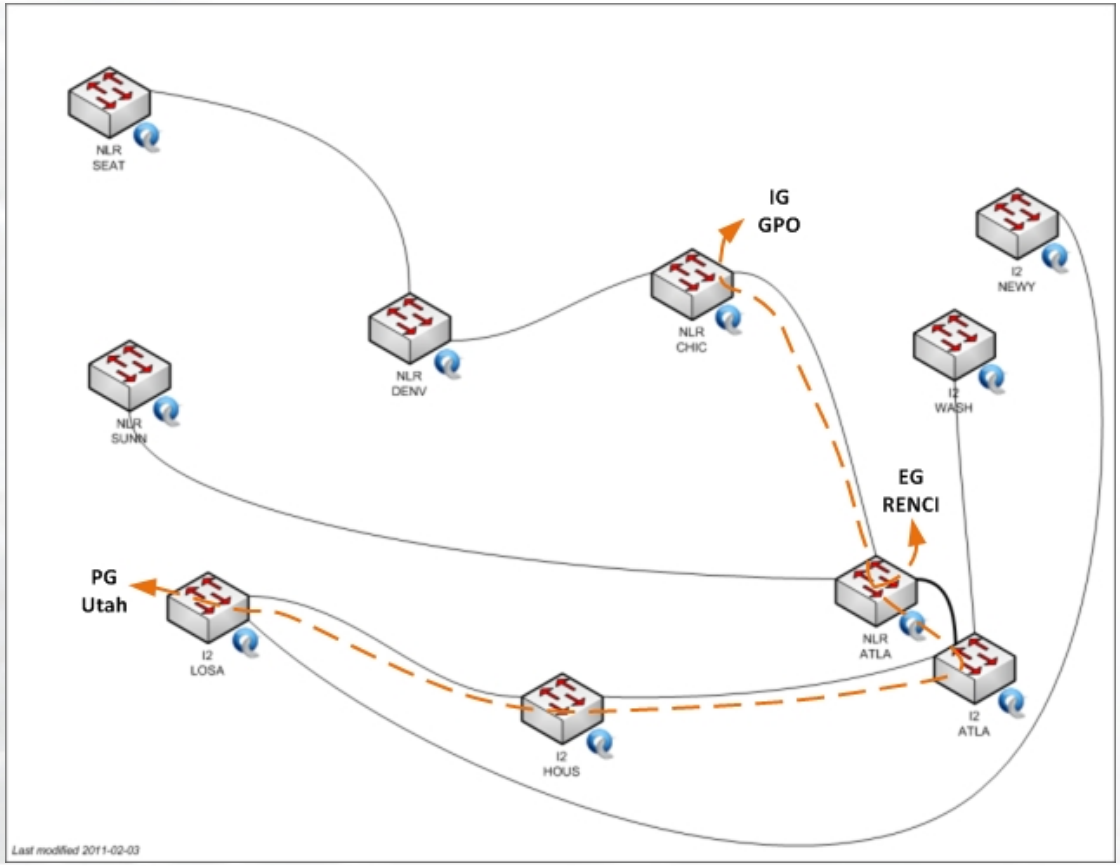
Experiment topology



- **Part I: Design/Setup**
  - **Obtain Resources**
- Part II: Execute
  - Configure and Initialize Services
  - Execute Experiment
- Part III: Finish
  - Teardown Experiment

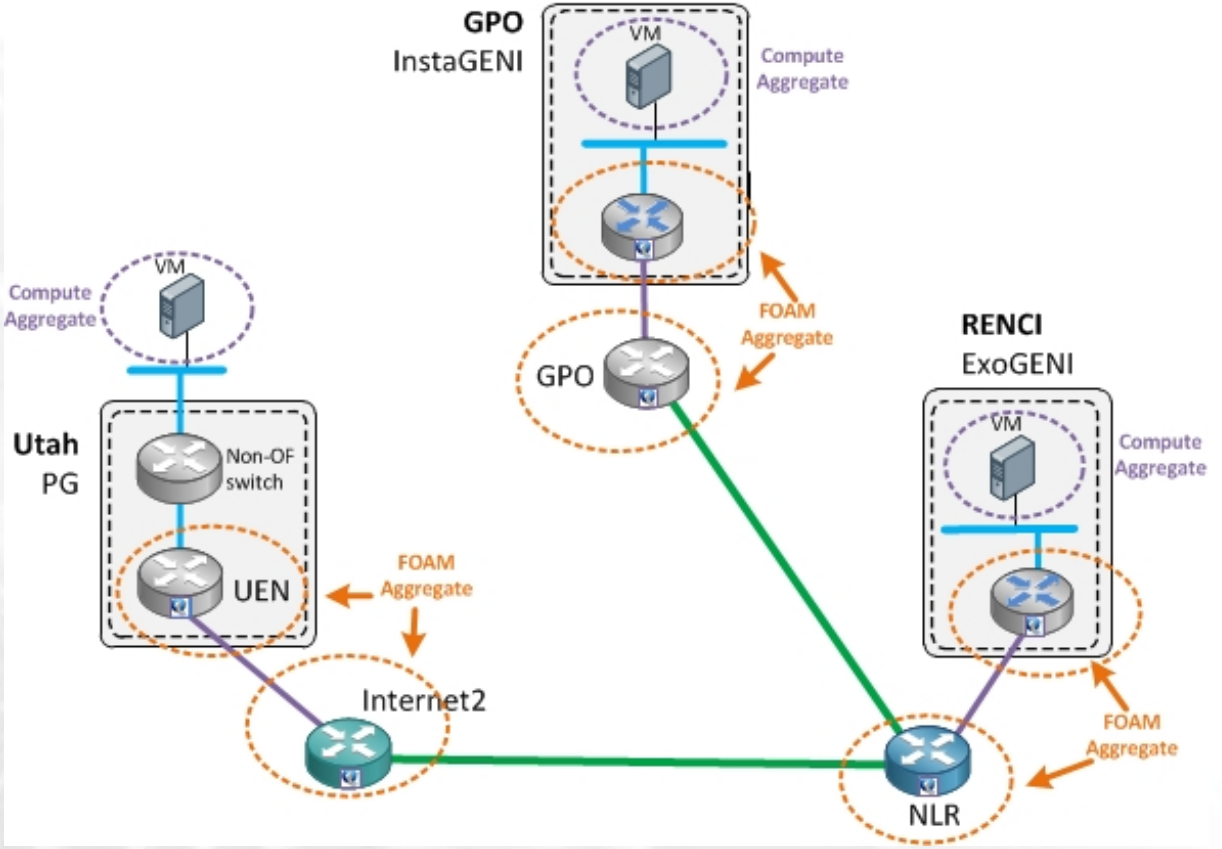
Obtain Resources

- **Determine OpenFlow resources for the experiment sites:**
  - http://groups.geni.net/geni/wiki/GeniAggregate
- **Determine Core Network to use:**
  - http://groups.geni.net/geni/wiki/NetworkCore



Obtain Resources

- Write OpenFlow request RSpecs (GPO InstaGENI, RENCI ExoGENI, PG Utah UEN, NLR and Internet2).
- Write compute resources request RSpecs (GPO InstaGENI, RENCI ExoGENI, Utah PG)



Note: Request IP address range http://groups.geni.net/geni/wiki/NetworkCore/SubnetReservations

Request Resources:

1. **Create a slice:**

   $ omni.py createslice 3sites-OF

2. **Request resources at each FOAM aggregate:**

   $ for aggregate in gpo ig-gpo eg-renci uen nlr i2
   > do
   > omni.py –a of-$aggregate createsliver 3sites-OF $aggregate-of.rspec
   > done

   Note: Approval email is sent from each FOAM site, some auto-approve.

3. **Request compute resources:**

   $ for aggregate in ig-gpo eg-renci pg-utah
   > do
   > omni.py –a $aggregate createsliver 3sites-OF $aggregate-cr.rspec
   > done

- Part I: Design/Setup
  - Obtain Resources
- **Part II: Execute**
  - **Configure and Initialize Services**
  - Execute Experiment
- Part III: Finish
  - Teardown Experiment

Configure and Initialize Services

Determine login information to connect to hosts:

$ *readyToLogin.py -a ig-gpo 3sites-OF*

….

User lnevers logins to gpo-ig using:

xterm -e ssh -p 30522 -i /home/lnevers/.ssh/id_rsa lnevers@pc1.instageni.gpolab.bbn.com &

$ *readyToLogin.py –a eg-renci 3sites-OF*

….

User root logins to renci-eg using:

xterm -e ssh -i /home/lnevers/.ssh/id_rsa root@152.54.14.17 &

$ *readyToLogin.py –a pg-utah 3sites-OF*

….

User lnevers logins to utah-pg using:

xterm -e ssh -p 30010 -i /home/lnevers/.ssh/id_rsa lnevers@pc522.emulab.net &

- Part I: Design/Setup
  - Obtain Resources
- **Part II: Execute**
  - Configure and Initialize Services
  - **Execute Experiment**
- Part III: Finish
  - Teardown Experiment

Execute Experiment

Experiment is a simple ping to show connections are possible between the sites:

- Login into each host and start a ping to a remote site – This should fail, as no controller is running!
- Start your OpenFlow controller, in this example the NOX controller is used.
- Review the windows were pings had been failing and now you will see ping traffic is flowing!

- Part I: Design/Setup
  - Obtain Resources
- Part II: Execute
  - Configure and Initialize Services
  - Execute Experiment
- **Part III: Finish**
  - **Teardown Experiment**

Teardown Experiment

When the experiment is done, archive your data and release the resources by deleting the slivers at each aggregate:

$ for aggregate in of-gpo of-nlr of-i2 of-uen eg-of-renci ig-of-gpo ig-gpo eg-renci pg-utah
> do
> omni.py -a $aggreate deletesliver 3sites-OF
> done

The resources have been released, you are now done!