GENI Terminology

GENI Project Office

Sponsored by the National Science Foundation

GENI Terminology

project

slice

experimenter

resource

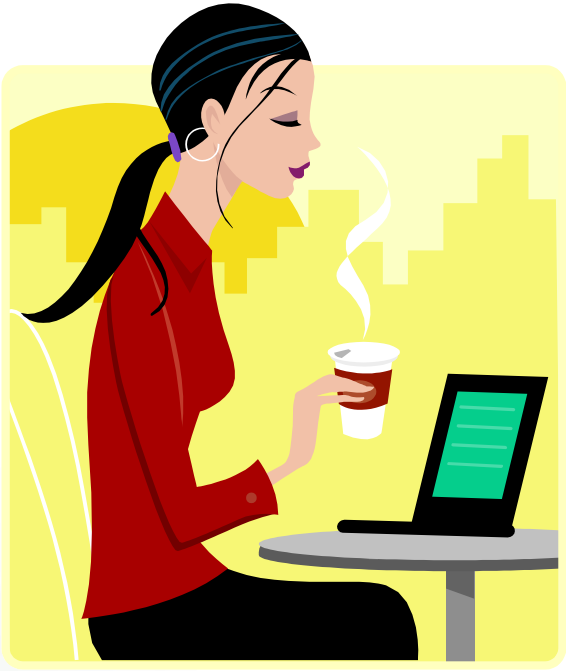
aggregate

Experimenter

An **experimenter** is a researcher who uses GENI resources

Different types of experimenters have different roles and permissions:

- Advisor vs Grad Student
- Teacher vs TA vs Student



Experimenter

Creating a GENI account

- GENI Portal is at:

https://portal.geni.net

- Instructions for creating an account are:

http://groups.geni.net/geni/wiki/SignMeUp

GENI User Authentication

The GENI Portal leverages InCommon for single sign-on authentication

InCommon®

Experimenters from 304 educational and research institutions have InCommon accounts

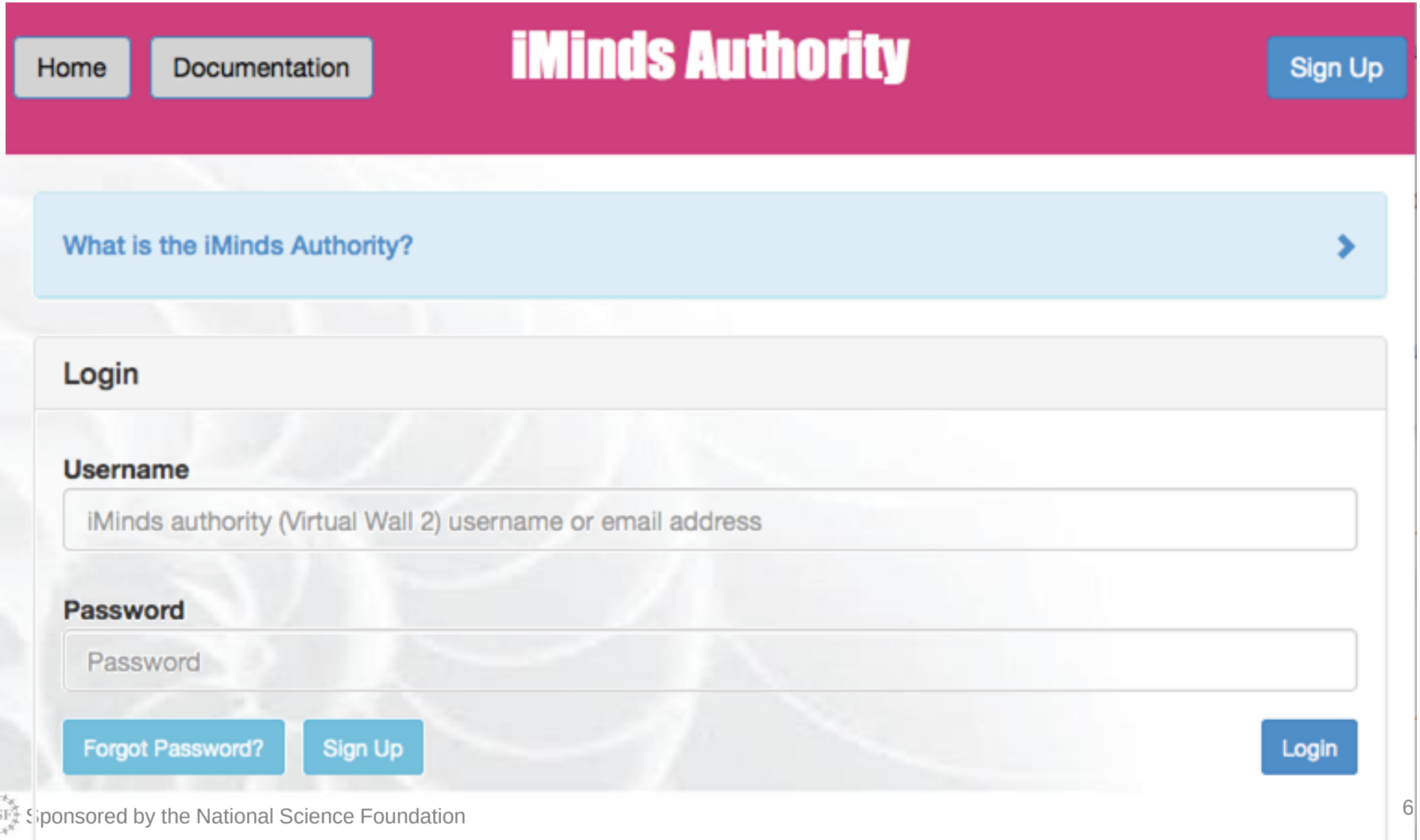
For many experimenters:

- no new passwords
- familiar login screens

GENI Project Office runs a federated IdP to **provide accounts** for non-federated organizations.

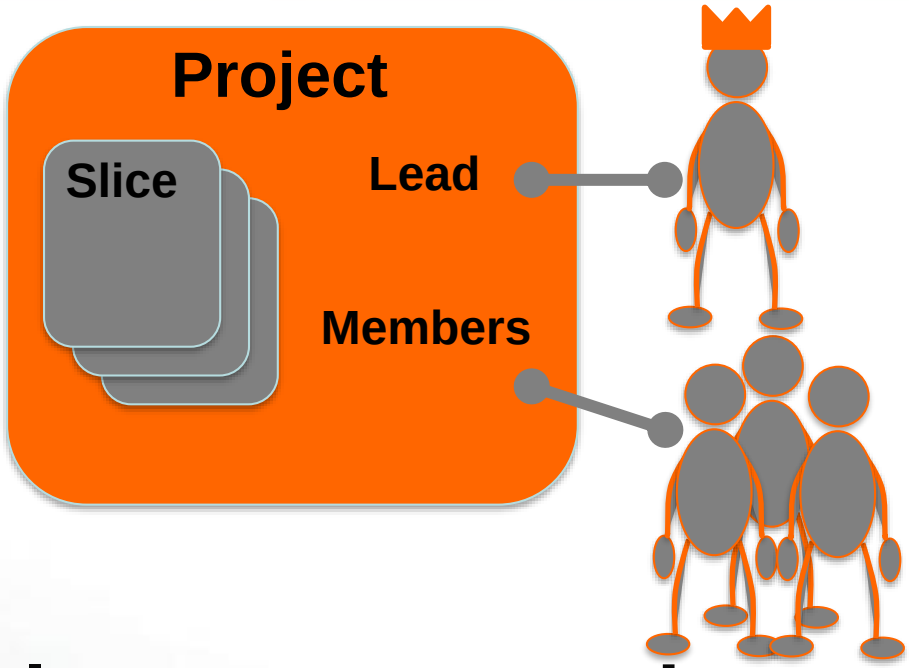
Creating a FIRE account

https://authority.ilabt.iminds.be



Projects

Projects organize research in GENI



Projects contain both **people** and their **experiments**

A project is led by a single responsible individual: the **project lead**

Today we will use a project created for this class

Slice

A **slice** is a *container* of resources used in an *experiment*.

A slice can contain resources from one or more aggregates

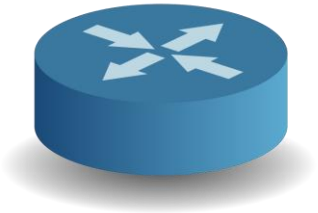
A slice is in a single project

A slice has an ***expiration***

Slice names are ***public***, ***reusable*** and ***unique*** *(within a project)*

Resource

A **resource** is a piece of infrastructure



A resource can be real or virtual.

Resource specifications (aka. **RSpecs**) are used to describe and request resources.

Examples:

- Compute: computer vs virtual machine (VM)
- Wireline Network: VLAN or OpenFlow
- Wireless: WiMAX

Aggregate

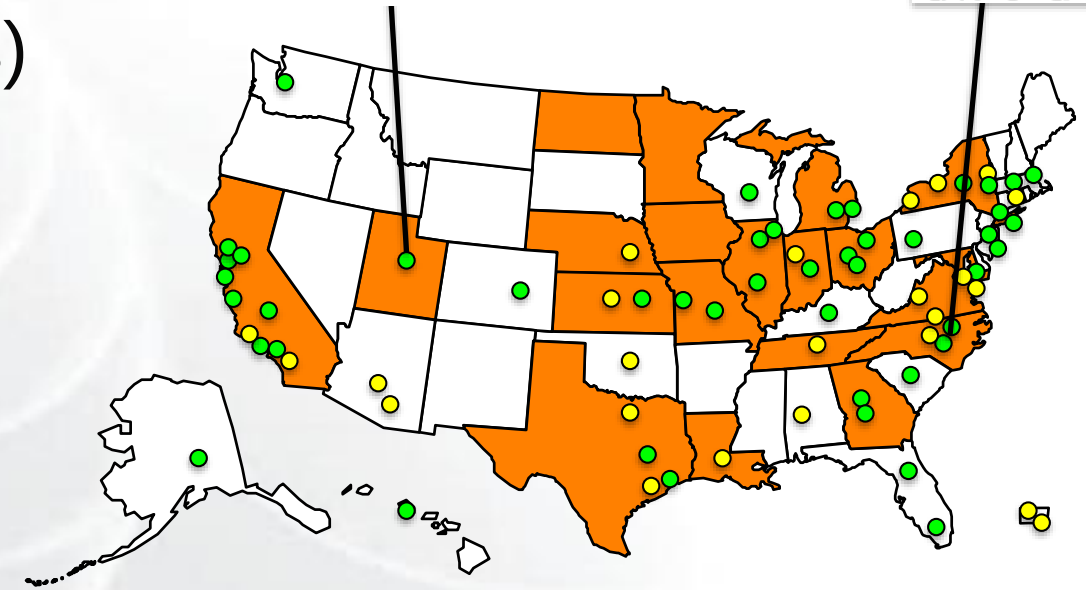
InstaGENI Rack

ExoGENI Rack

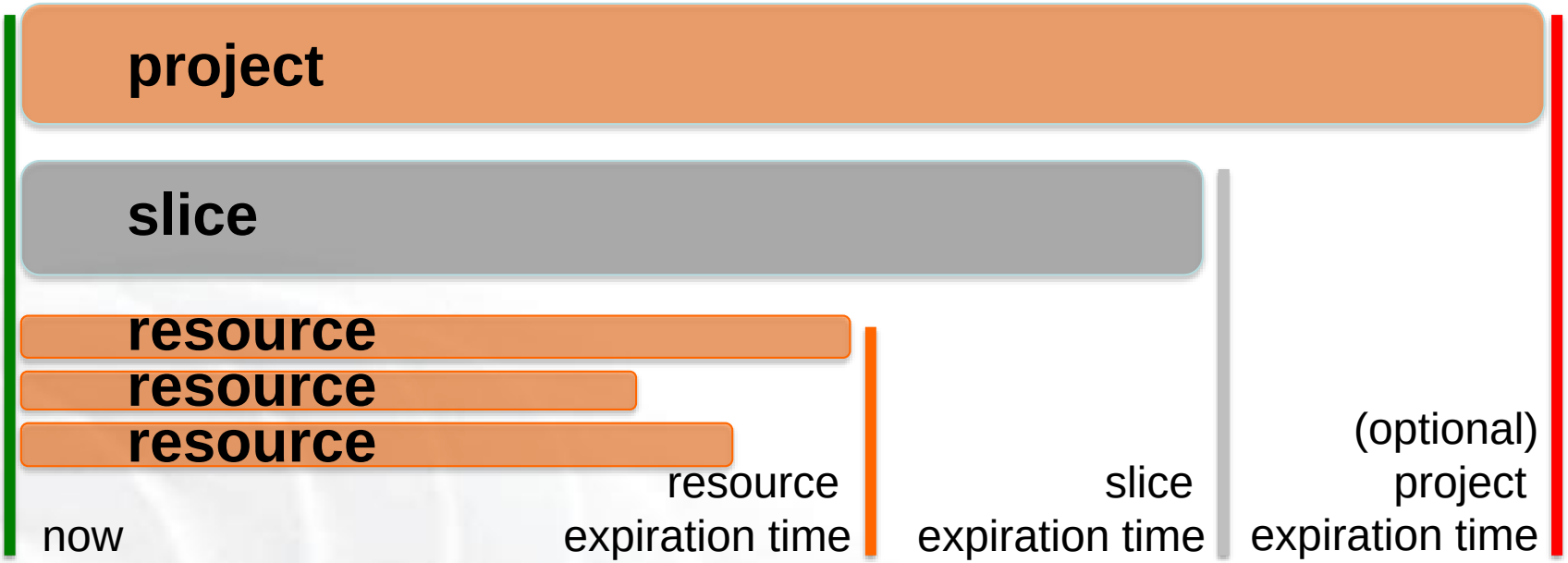
An **aggregate** manages a set of reservable **resources**

Aggregates (testbeds) include:

- iMinds virtual wall
- GENI racks
- OpenFlow
- WiMAX



Expiration and renewal



slice expiration time ≤ project expiration time

each resource expiration time ≤ slice expiration time

each resource expiration time ≤ aggregate's max expiration

In general, to extend the lifetime of your resource reservation, you must renew the **slice** and **all resources**

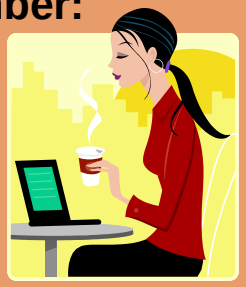
Putting it all together

project

Lead:

Experimenter (aka Professor)

Member:



Experimenter (aka Student)

slice

aggregate

Layer 2

Using SSH with a public/private keypair

Login to all GENI compute resources using

ssh with a private key

1. The public key is loaded onto the node when you reserve resources.
2. You provide the private key when you log into the node.

There are several ways to offer your private key to ssh.

No password!

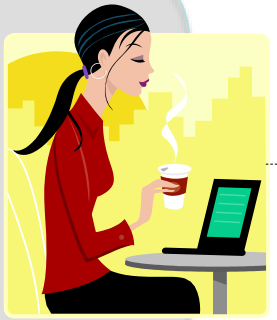
You should *never* be prompted for a password to log into a compute node.

If you are, something has *always* gone wrong.

SSH with a *password*

*nix-based system (Windows behavior may vary)

```
local> ssh jdoe@remote.edu
jdoe@remote.edu's password:
########
Welcome to remote!
jdoe@remote> exit
local> ssh jdoe@remote2.edu
jdoe@remote2.edu's password:
########
```



Experimenter

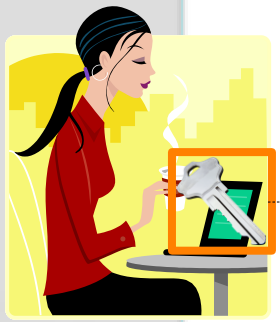
User enters password once for *each* connection to *each* machine

Hash of password stored on each remote machine

SSH with a *private key*

*nix-based system (Windows behavior may vary)

```
local> ssh-add ~/.ssh/id_rsa
Enter passphrase for ~/.ssh/id_rsa:
########
local> ssh jdoe@remote.edu
Welcome to remote!
jdoe@remote> exit
local> ssh jdoe@remote2.edu
Welcome to remote2!
jdoe@remote2> exit
local> ssh jdoe@remote3.edu
Welcome to remote3!
jdoe@remote3> exit
```



Experimenter

User enters passphrase to unlock private key for *all* connections to *all* machine

Private key is stored only on local machine

Public key is stored on each remote machine