

## Extra Credit Assignment for ECE 375

Due: 05/10/2015 at midnight

**Note:** If you get full credits for this assignment you can improve your final grade by 10%

### Preparations:

To be able to carry out this experiment you initially have to carry out the steps listed below.

### Account:

1. Go to <https://portal.geni.net/> press the "Use GENI" button and log in with your UMass OIT credentials.
2. Click "Join a Project" and select "UMASS-ECE374".
3. I will then invite get a notification and invite you to join the project.

### Credentials:

1. Open browser and go to:  
<https://portal.geni.net/>
2. Log in using your UMass OIT credentials.
3. When you are logged in, select "Profiles" from the top, right menu.
4. Next, click on "Generate SSH keypair" and enter your passphrase. **Make sure you remember that passphrase.**
5. On the next page click on "Download Private Key" and save key to `~/.ssh` locally.
6. In the browser, still on the same page under "My Stuff, Configure Omni" click on the link "create an SSL certificate".
7. Download the certificate to `~/.ssl` locally.
8. Make sure the files that hold your secret keys are adequately protected. To make sure that's the case you can execute the following commands:  

```
chmod 0600 .ssh/id_geni_ssh_rsa  
chmod 0600 .ssl/geni-mzink.pem
```

 (remember that your `.pem` file is named differently)
9. Generate a you public ssh key by executing the following command:  

```
ssh-keygen -y -f .ssh/id_geni_ssh_rsa > .ssh/id_geni_ssh_rsa.pub
```

Congratulations. You know have set up everything to get started with carrying out your experiment.

### Setting up you slice

Watch the video at the following link that demonstrate how to setup a slice with the correct topology you need to perform the assignment:

[http://server.casa.umass.edu/~zink/ECE374/recordings/assign1\\_topo\\_setip.mp4](http://server.casa.umass.edu/~zink/ECE374/recordings/assign1_topo_setip.mp4)

**Note:** Select the RSpec ECE374\_UMass\_EG from the dropdown menu on the GENI Portal.

### Experiment

The goal of your final experiment is to setup the routing as indicated in Figure 1. You might want to review the slides on IPv4 addressing and routing (also chapter 4.4 in the book).

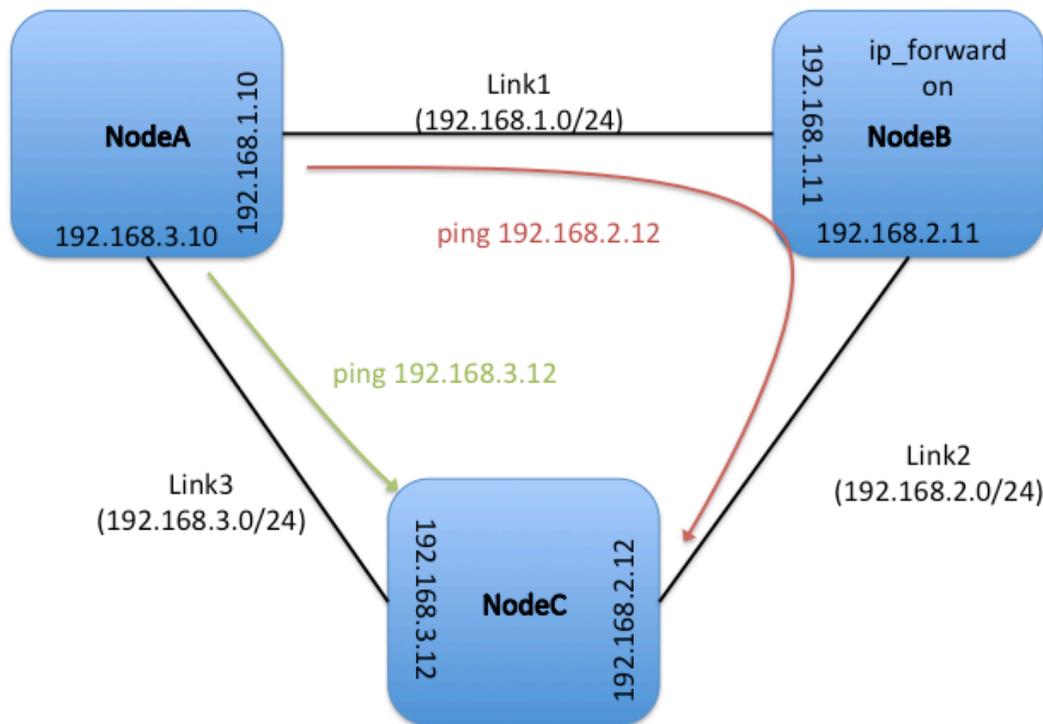


Figure 1 Topology and routing

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After you have set up the routing correctly, packets from A send to IP address 192.168.2.12 on node C should be routed via node B. Packets from A send to IP address 192.168.3.12 on node C should be directly forwarded to C. You will be able to verify the correct route setup through an experiment script that will be introduced in the “LabWiki” section below.

Since we're not using a routing algorithm but set the route statically, we will make use of the "route" command. The following link gives you an introduction on how to use the command:

<http://www.hscripts.com/tutorials/linux-commands/route.html>

To enable forwarding of packets on node B you have to execute the following command:

```
echo 1 > /proc/sys/net/ipv4/ip_forward
```

To demonstrate that you have set up the routing correctly you have to submit a screenshot from node A that shows traceroutes for both IP addresses of node C.

**Note:** You should document the steps you perform to set up the static routes since all configurations will be lost when your slice is deleted. A new slice will always be in its initial state with NO routing set up!

### **LabWiki**

You will actually use a tool called LabWiki to carry out this assignment. To start LabWiki use the following link:

<http://emmy9.casa.umass.edu:4000>

- Login to LabWiki with your UMass credential
- In the leftmost frame in the search field search for "ipfwd\_tutorial.md" and load that file. It has all the instruction (plus a couple of instructional videos) you need for this assignment.