Using Geni to Create Network Components for Cloud Infrastructure

Create Geni Account to proceed

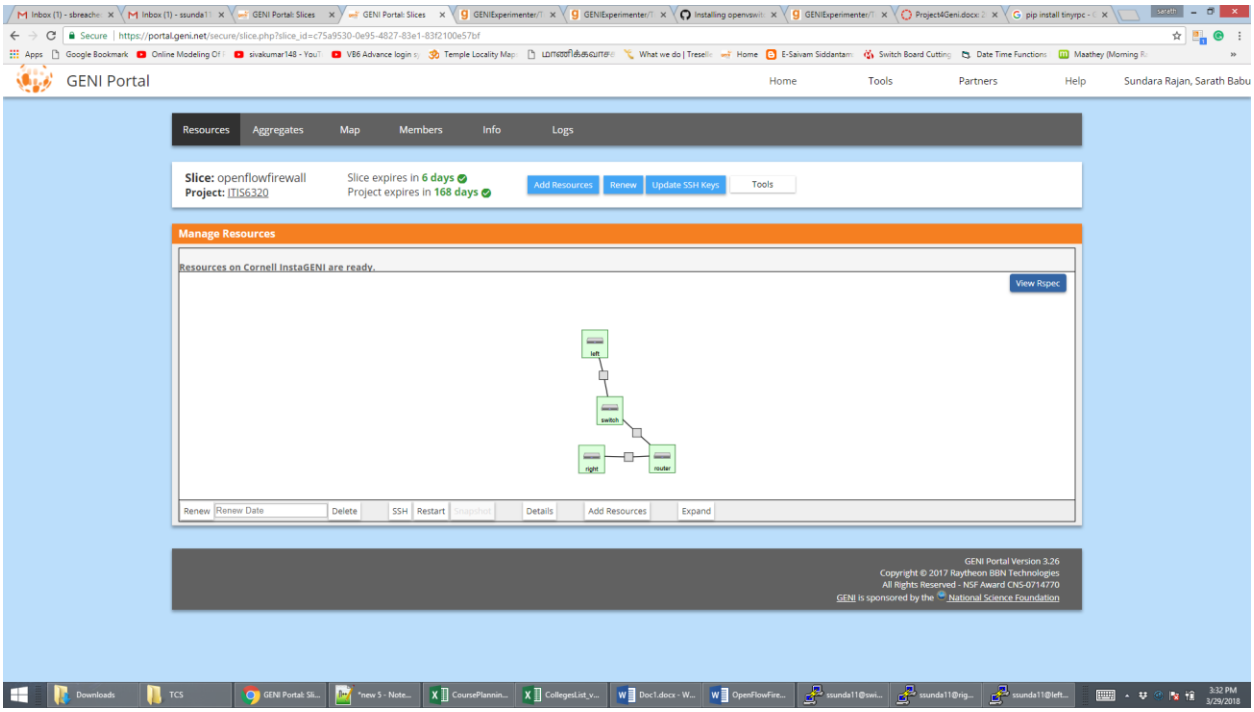
Follow the Instruction from GENIExperiments Tutorials

http://groups.geni.net/geni/wiki/GENIExperimenter/Tutorials/OpenFlowNetworkDevices

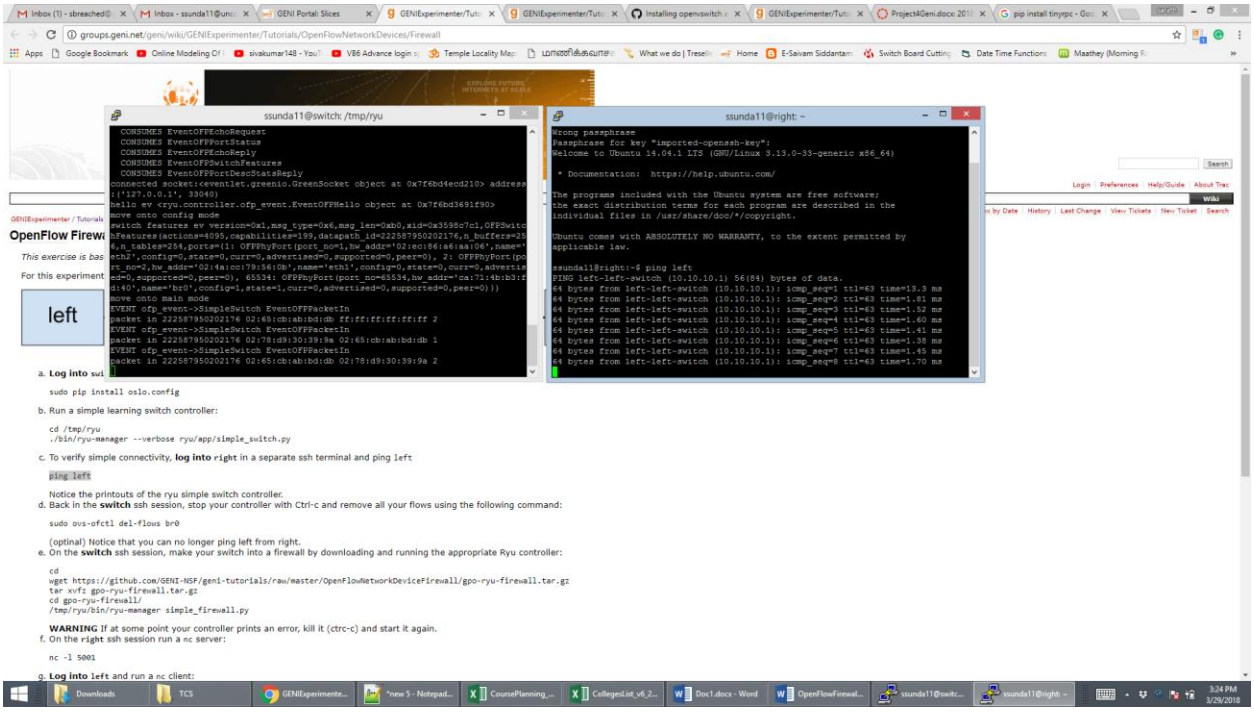
FIREWALL Configuration

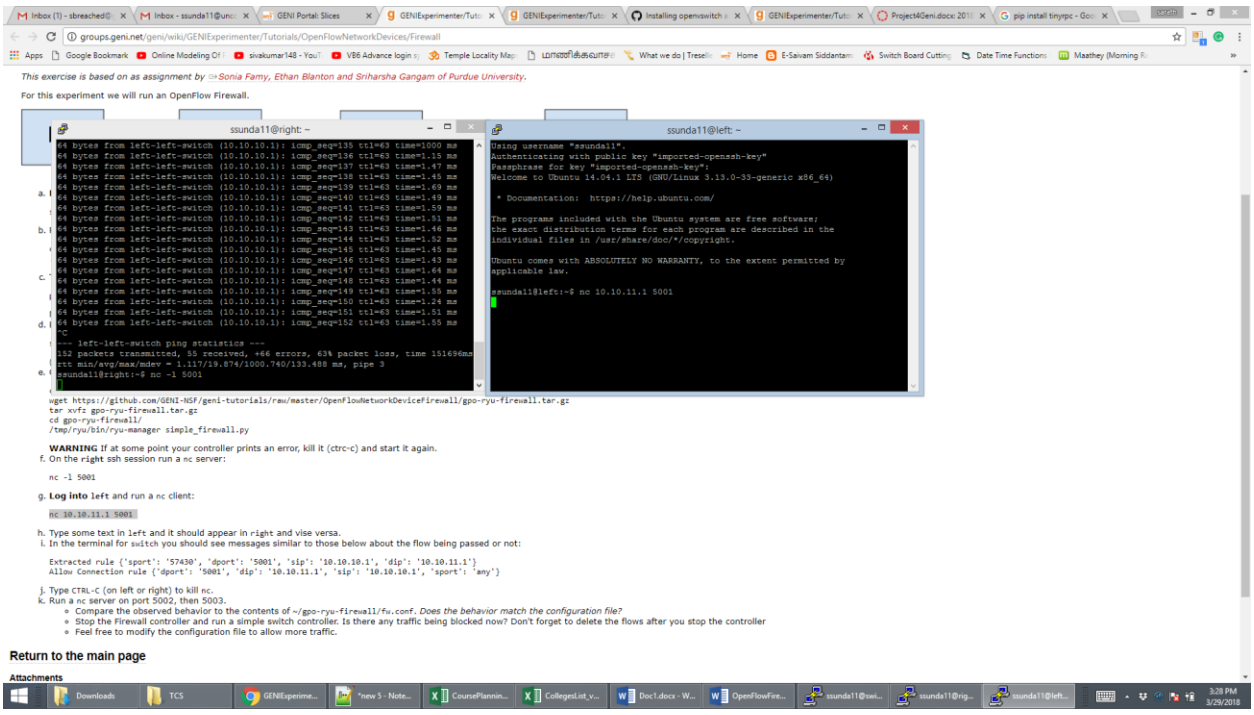
Follow Steps to from below tutorial page

http://groups.geni.net/geni/wiki/GENIExperimenter/Tutorials/OpenFlowNetworkDevices/Firewall

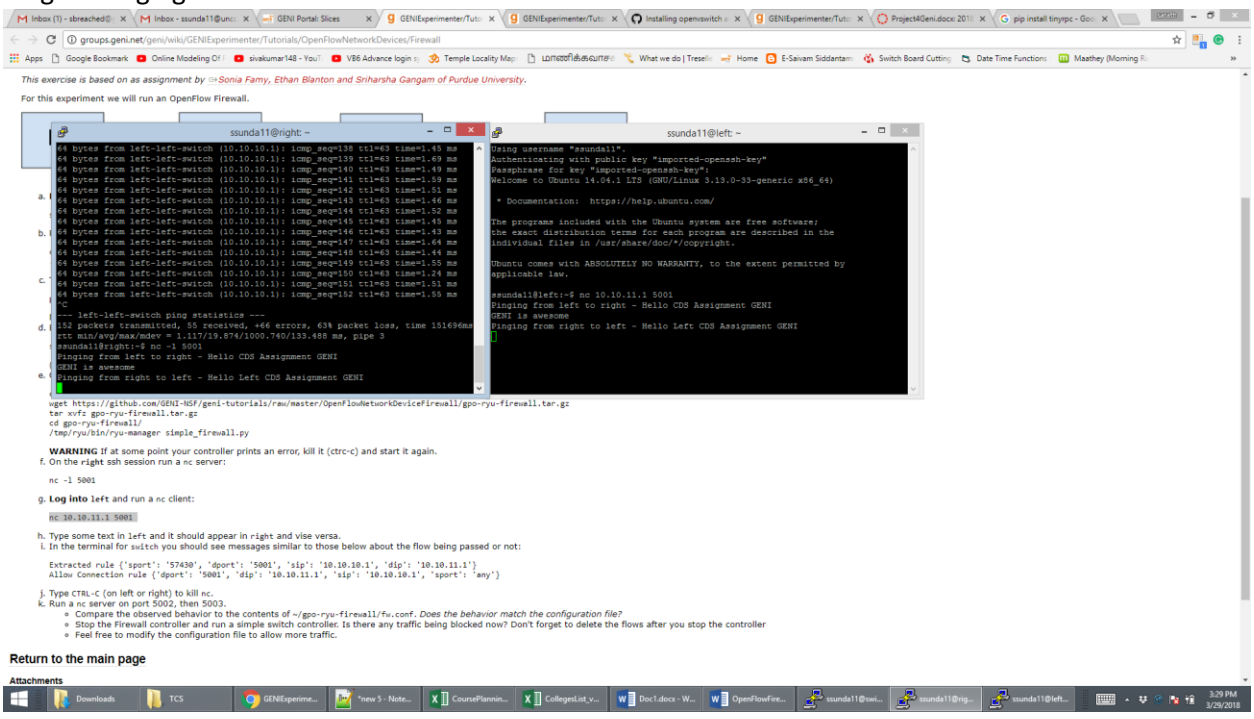


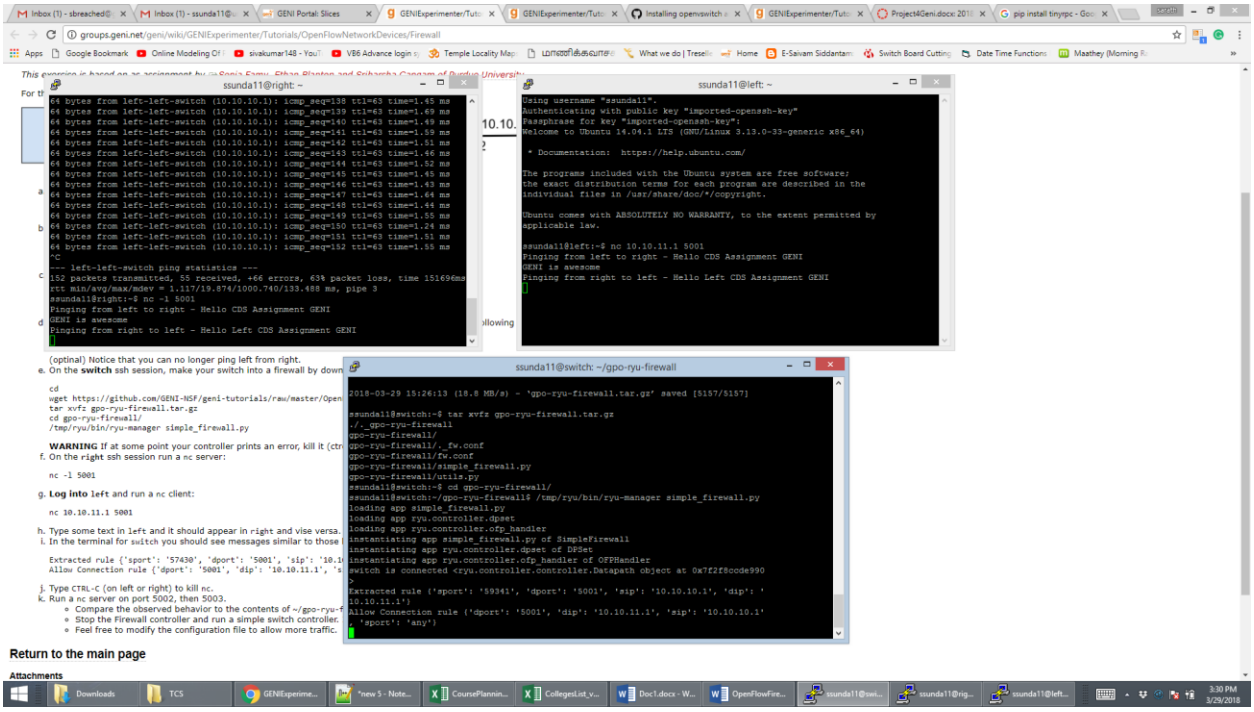
Ping to left from right node





Ping messaging across nodes -





working commands

in switch node

sudo pip install tiny rpc

sudo pip install oslo.config

cd /tmp/ryu

./bin/ryu-manager --verbose ryu/app/simple_switch.py

in right node

ping left

in switch node

sudo ovs-ofctl del-flows br0

cd

wget https://github.com/GENI-NSF/geni-tutorials/raw/master/OpenFlowNetworkDeviceFirewall/gpo-ryu-firewall.tar.gz

tar xvfz gpo-ryu-firewall.tar.gz

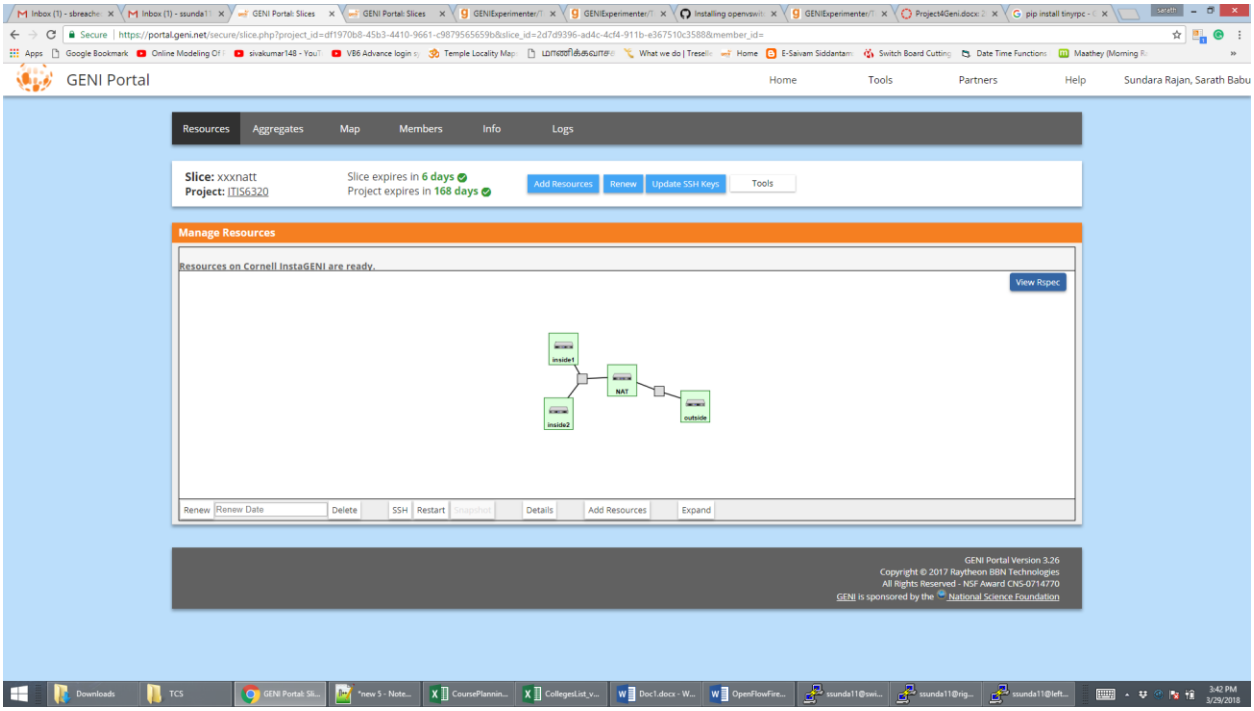
cd gpo-ryu-firewall/

/tmp/ryu/bin/ryu-manager simple_firewall.py

NAT Configuration

Follow Steps in below tutorial

http://groups.geni.net/geni/wiki/GENIExperimenter/Tutorials/OpenFlowNetworkDevices/NAT



Pre-run steps before executing the commands

IN NAT NODE

sudo apt-get update && sudo apt-get install --only-upgrade openssl

sudo apt-get update && sudo apt-get install --only-upgrade libssl-dev

wget https://bootstrap.pypa.io/ez_setup.py -O - | sudo python

sudo -s easy_install pip==7.1.2

sudo pip install oslo.config

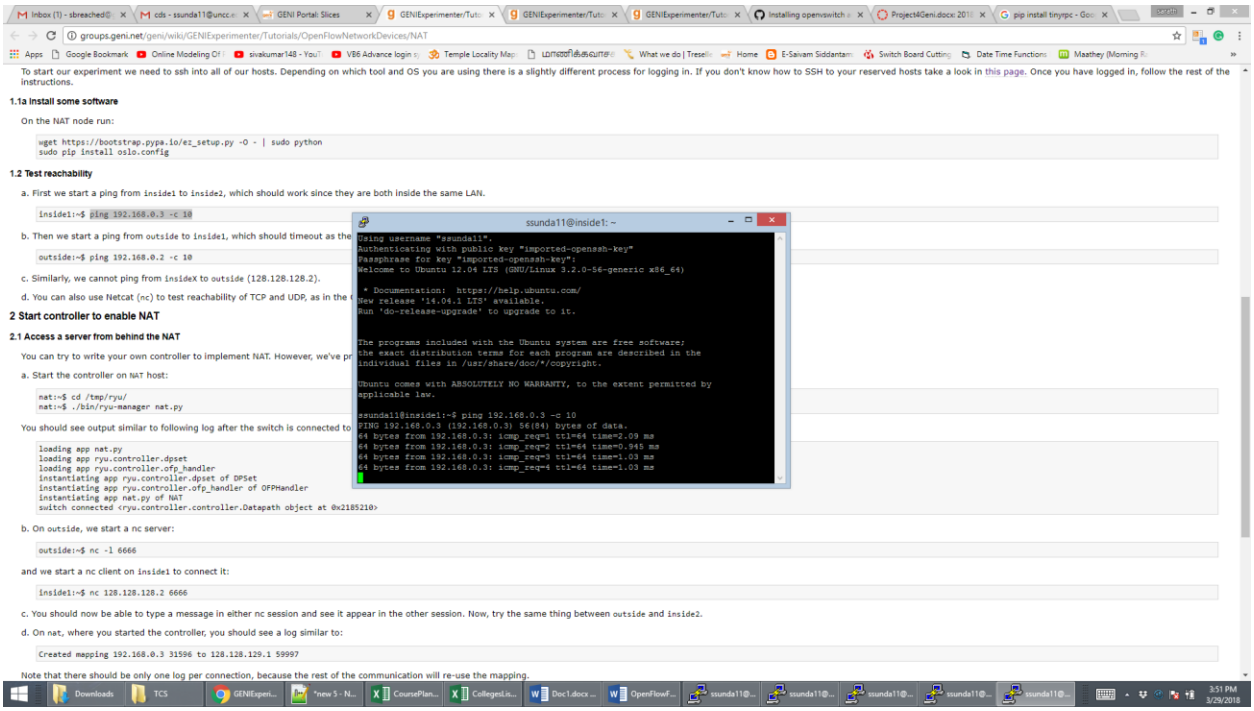
cd /tmp/ryu/

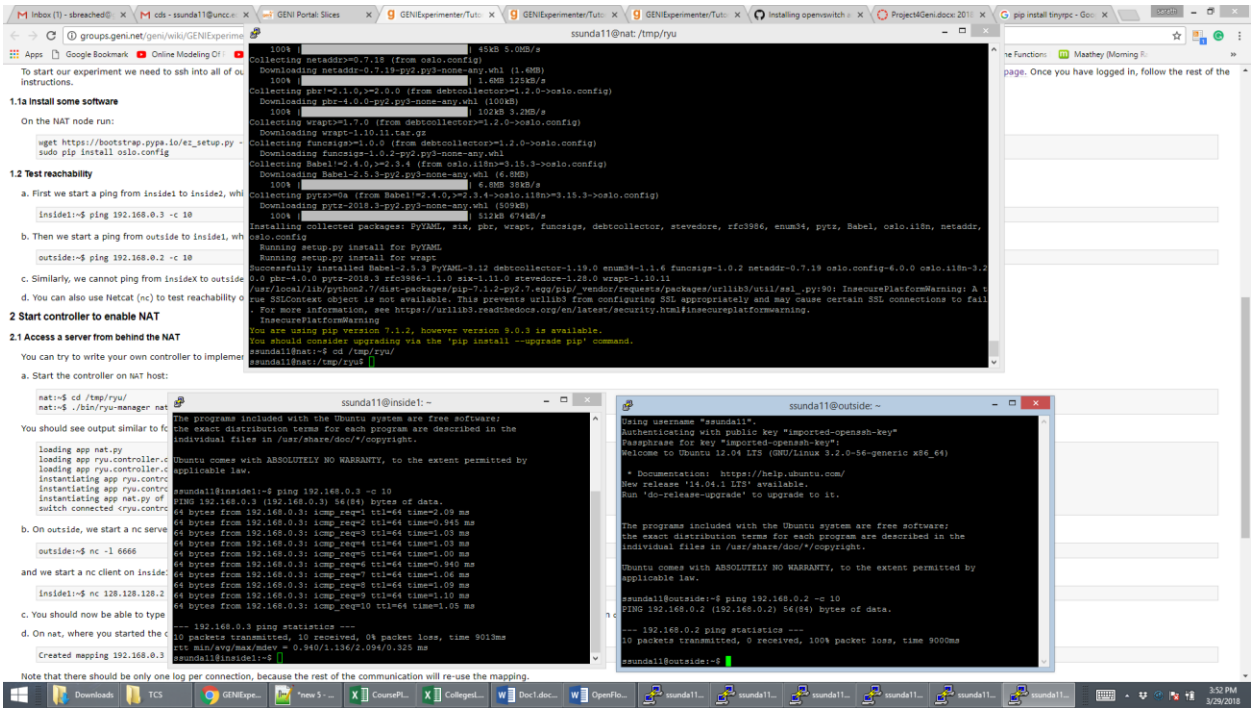
ls

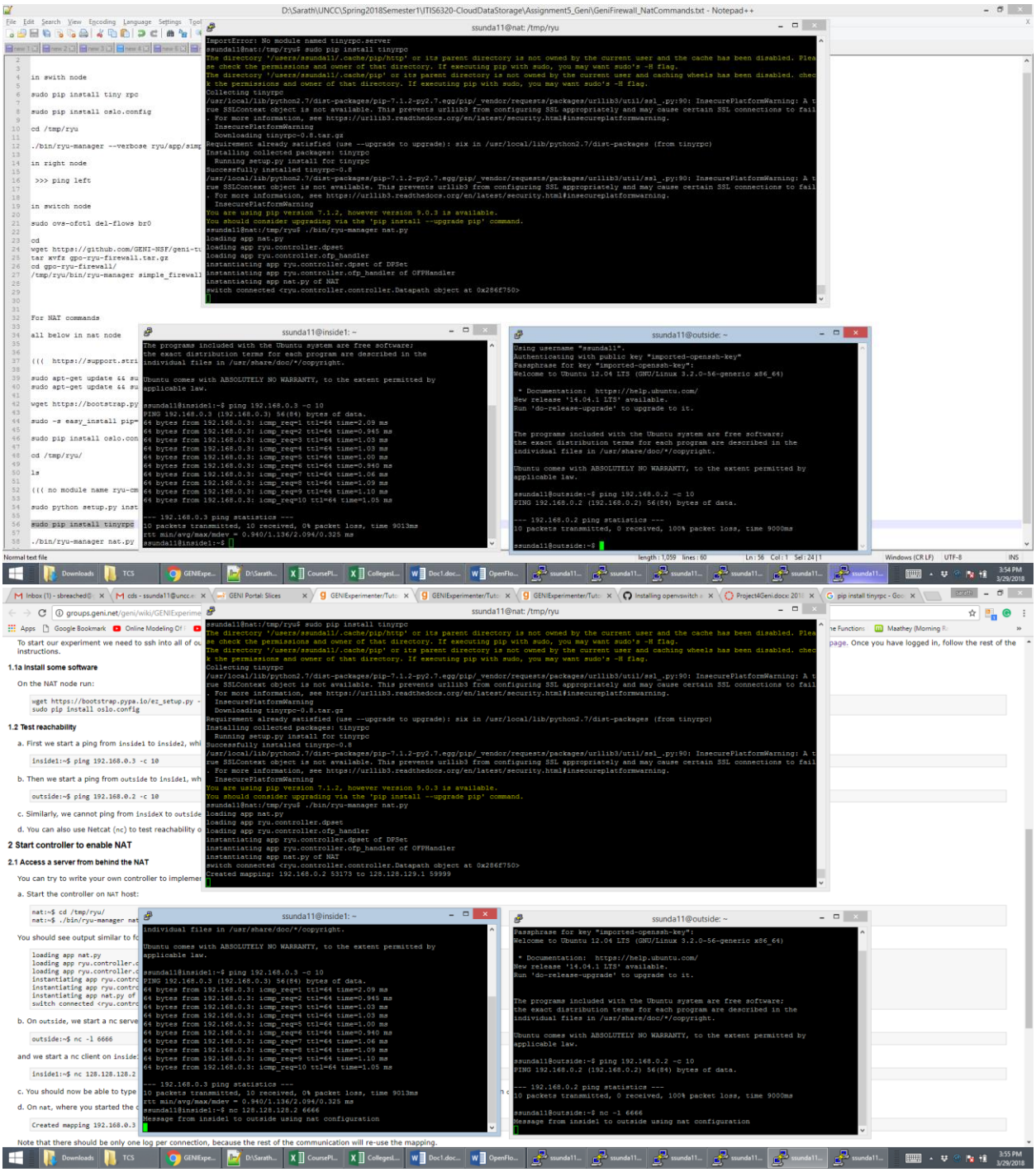
sudo python setup.py install

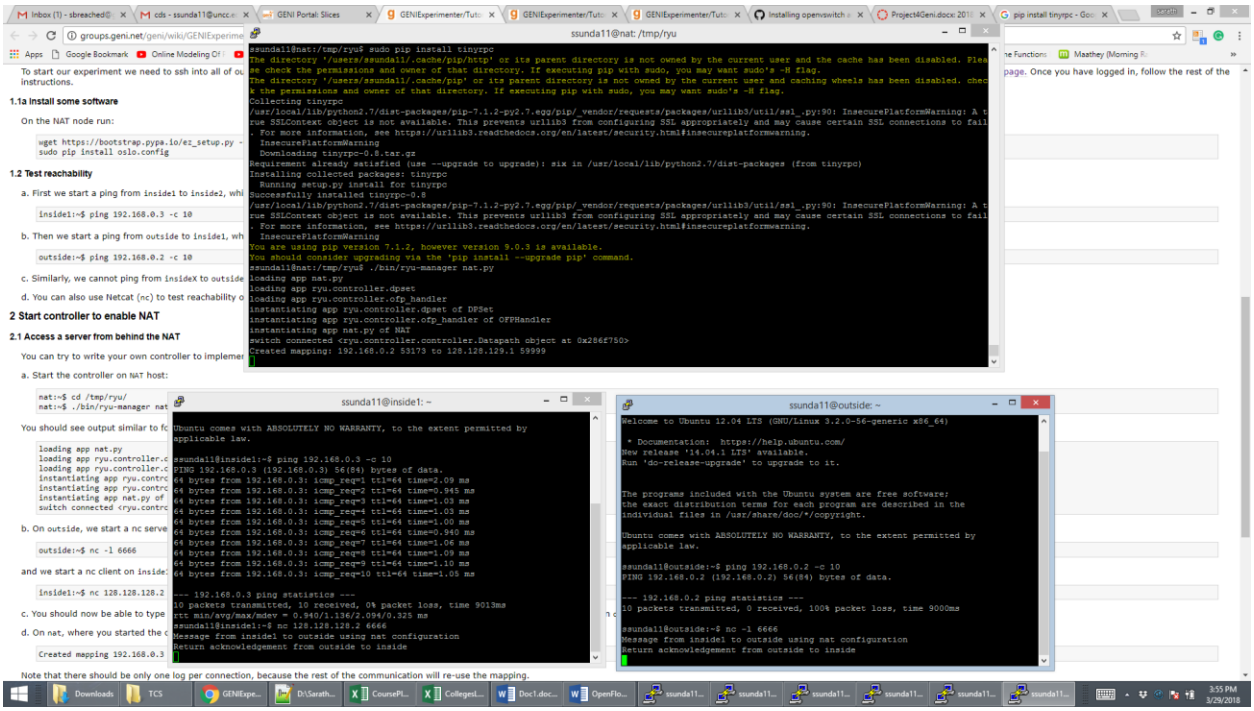
sudo pip install tinyrpc

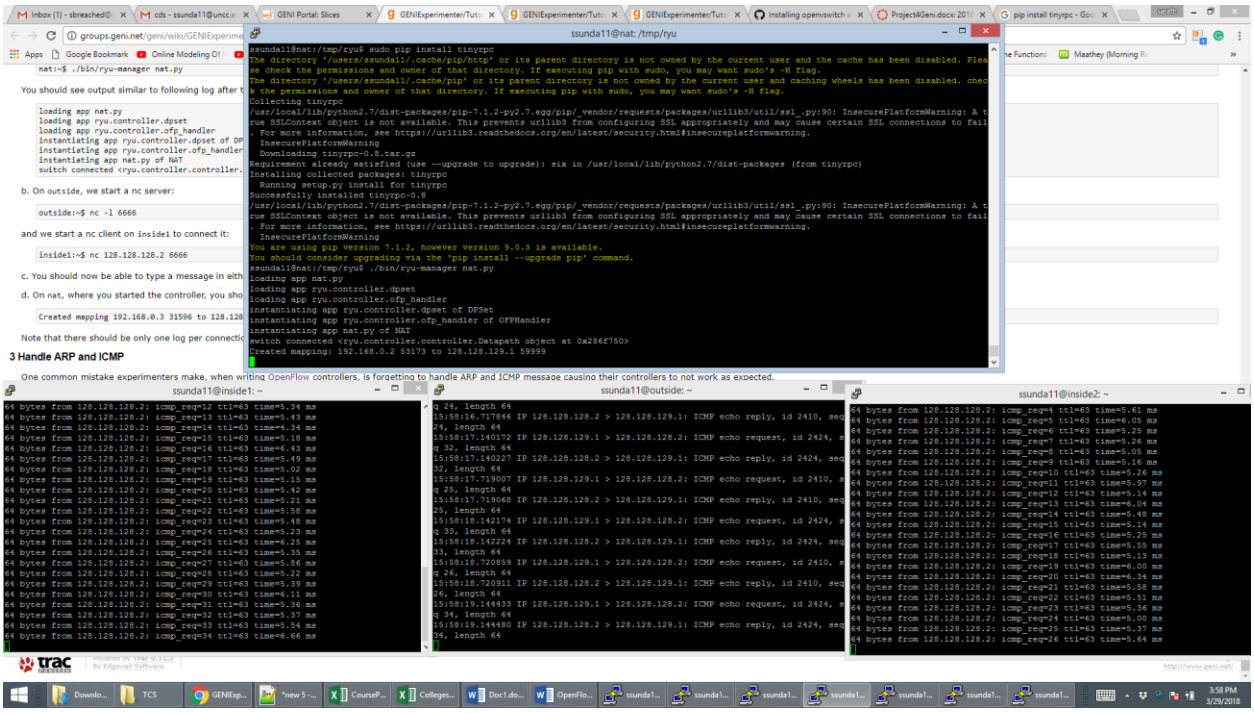
./bin/ryu-manager nat.py

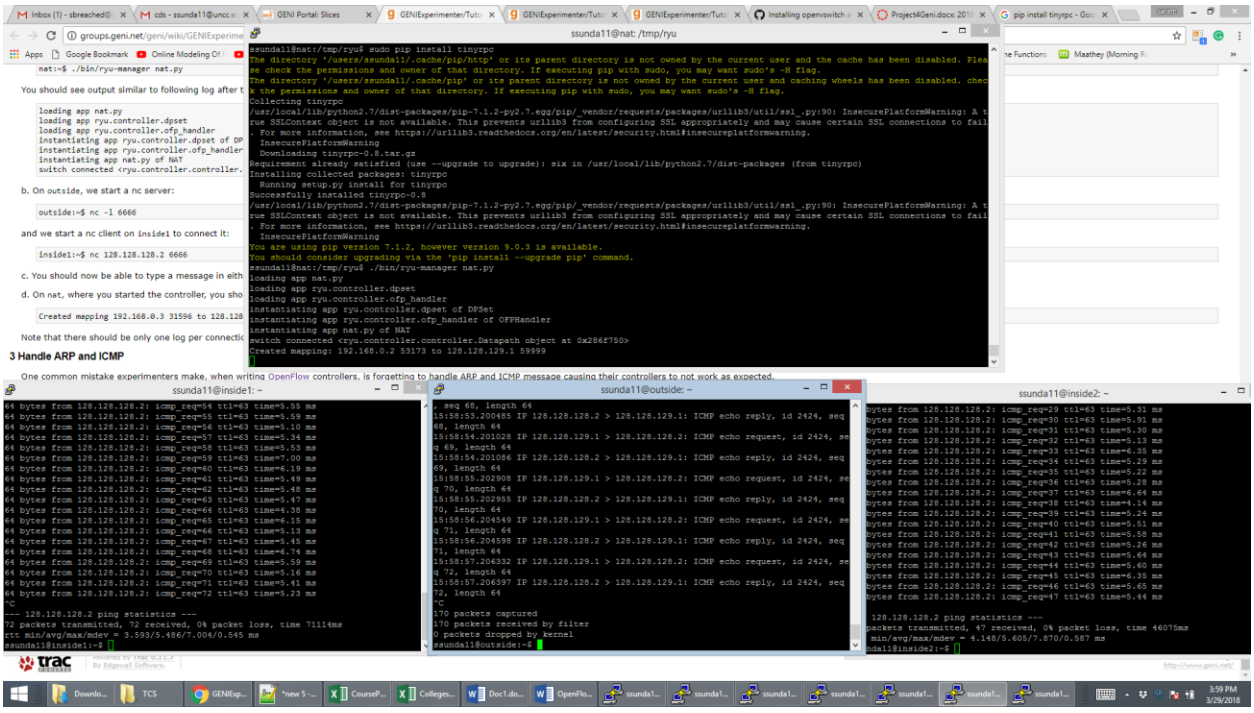

ssunda11@inside1: ~
Using username "ssunda11".
Authenticating with public key "imported-openssh-key"
Passphrase for key "imported-openssh-key":
Welcome to Ubuntu 12.04 LTS (GNU/Linux 3.2.0-56-generic x86_64)
* Documentation: https://help.ubuntu.com/
New release '14.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
ssunda11@inside1:~$ ping 192.168.0.3 -c 10
PING 192.168.0.3 (192.168.0.3) 56(84) bytes of data.
64 bytes from 192.168.0.3: icmp_req=1 ttl=64 time=2.09 ms
64 bytes from 192.168.0.3: icmp_req=2 ttl=64 time=0.945 ms
64 bytes from 192.168.0.3: icmp_req=3 ttl=64 time=1.03 ms
64 bytes from 192.168.0.3: icmp_req=4 ttl=64 time=1.03 ms


ssunda11@nat: /tmp/ryu
Collecting netaddr>=0.7.18 (from oslo.config)
Downloading netaddr-0.7.19-py2.py3-none-any.whl (1.6MB)
Collecting pbr!=2.1.0,>=2.0.0 (from debtcollector>=1.2.0->oslo.config)
Downloading pbr-4.0.0-py2.py3-none-any.whl (100kB)
Collecting wrapt>=1.7.0 (from debtcollector>=1.2.0->oslo.config)
Downloading wrapt-1.10.11.tar.gz
Collecting funcsigs>=1.0.0 (from debtcollector>=1.2.0->oslo.config)
Downloading funcsigs-1.0.2-py2.py3-none-any.whl
Collecting Babel!=2.4.0,>=2.3.4 (from oslo.i18n>=3.15.3->oslo.config)
Downloading Babel-2.5.3-py2.py3-none-any.whl (6.8MB)
Collecting pytz>=0a (from Babel!=2.4.0,>=2.3.4->oslo.i18n>=3.15.3->oslo.config)
Downloading pytz-2018.3-py2.py3-none-any.whl (509kB)
Installing collected packages: PyYAML, six, pbr, wrapt, funcsigs, debtcollector, stevedore, rfc3986, enum34, pytz, Babel, oslo.i18n, netaddr, oslo.config
Running setup.py install for PyYAML
Running setup.py install for wrapt
Successfully installed Babel-2.5.3 PyYAML-3.12 debtcollector-1.19.0 enum34-1.1.6 funcsigs-1.0.2 netaddr-0.7.19 oslo.config-6.0.0 oslo.i18n-3.20.0 pbr-4.0.0 pytz-2018.3 rfc3986-1.1.0 six-1.11.0 stevedore-1.28.0 wrapt-1.10.11
/usr/local/lib/python2.7/dist-packages/pip-7.1.2-py2.7.egg/pip/_vendor/requests/packages/urllib3/util/ssl_.py:90: InsecurePlatformWarning: A true SSLContext object is not available. This prevents urllib3 from configuring SSL appropriately and may cause certain SSL connections to fail. For more information, see https://urllib3.readthedocs.org/en/latest/security.html#insecureplatformwarning.
InsecurePlatformWarning
You are using pip version 7.1.2, however version 9.0.3 is available.
You should consider upgrading via the 'pip install --upgrade pip' command.
ssunda11@nat:~$ cd /tmp/ryu/
ssunda11@nat:/tmp/ryu$
ssunda11@inside1: ~
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
ssunda11@inside1:~$ ping 192.168.0.3 -c 10
PING 192.168.0.3 (192.168.0.3) 56(84) bytes of data.
64 bytes from 192.168.0.3: icmp_req=1 ttl=64 time=2.09 ms
64 bytes from 192.168.0.3: icmp_req=2 ttl=64 time=0.945 ms
64 bytes from 192.168.0.3: icmp_req=3 ttl=64 time=1.03 ms
64 bytes from 192.168.0.3: icmp_req=4 ttl=64 time=1.03 ms
64 bytes from 192.168.0.3: icmp_req=5 ttl=64 time=1.00 ms
64 bytes from 192.168.0.3: icmp_req=6 ttl=64 time=0.940 ms
64 bytes from 192.168.0.3: icmp_req=7 ttl=64 time=1.06 ms
64 bytes from 192.168.0.3: icmp_req=8 ttl=64 time=1.09 ms
64 bytes from 192.168.0.3: icmp_req=9 ttl=64 time=1.10 ms
64 bytes from 192.168.0.3: icmp_req=10 ttl=64 time=1.05 ms
--- 192.168.0.3 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9013ms
rtt min/avg/max/mdev = 0.940/1.136/2.094/0.325 ms
ssunda11@inside1:~$
ssunda11@outside: ~
Using username "ssunda11".
Authenticating with public key "imported-openssh-key"
Passphrase for key "imported-openssh-key":
Welcome to Ubuntu 12.04 LTS (GNU/Linux 3.2.0-56-generic x86_64)
* Documentation: https://help.ubuntu.com/
New release '14.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
ssunda11@outside:~$ ping 192.168.0.2 -c 10
PING 192.168.0.2 (192.168.0.2) 56(84) bytes of data.
--- 192.168.0.2 ping statistics ---
10 packets transmitted, 0 received, 100% packet loss, time 9000ms
ssunda11@outside:~$


D:\Sarath\UNCC\Spring2018Semester1\ITIS6320-CloudDataStorage\Assignment5_Geni\GeniFirewall_NatCommands.txt - Notepad++
ssunda11@nat: /tmp/ryu
ssunda11@inside1: ~
ssunda11@outside: ~
groups.geni.net/geni/wiki/GENIExperime
pip install tinyrpc - Goo
1.1a Install some software
1.2 Test reachability
2 Start controller to enable NAT
2.1 Access a server from behind the NAT


ssunda11@nat: /tmp/ryu
ssunda11@inside1: ~
ssunda11@outside: ~


ssunda11@nat: /tmp/ryu
ssunda11@inside1: ~
ssunda11@outside: ~
ssunda11@inside2: ~


ssunda11@nat: /tmp/ryu
ssunda11@inside1: ~
ssunda11@outside: ~
ssunda11@inside2: ~

References: -

http://groups.geni.net/geni/wiki/GENIExperimenter/Tutorials/OpenFlowNetworkDevices

https://portal.geni.net