

# Network Architecture I

## Project Report

### Part I. GENI/Socket programming Warm-up

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## **Introduction:**

In this project, we have developed a simple TCP client and server programs using GENI for simple message exchanges and simple file transfers.

## **Project participation:**

## **Initial setup:**

**Sri Harsha Chennavajjala, Teja Garidepally and Raj Kiran reddy Munnangi**

- Geni account creation
- Slice creation
- Resource allocation.

## **Part I**

**Sri Harsha Chennavajjala, Teja Garidepally and Raj Kiran reddy Munnangi**

- Client and server java code
- Initial lookup for part 2.

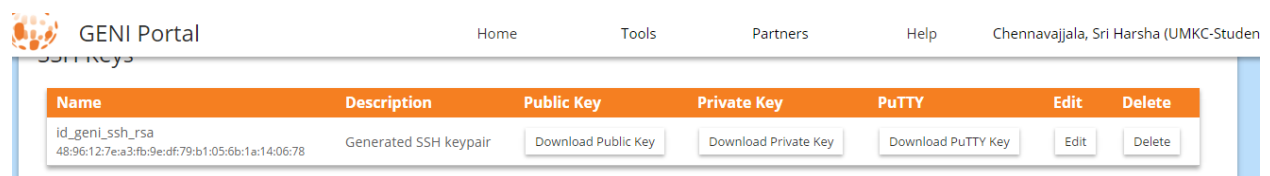
## **Requirements:**

- Geni account and a slice to add resources where we can work on.
- SSH Keypairs for logging in to nodes and running scripts.
- Java scripts for communication between client and server.

## **Steps involved:**


### **Step 1:**

After logging in to GENI Portal, we have downloaded the SSH keypairs for authentication purposes.



## Step 2:

Created a slice “HTP” and added two resources i.e two VM’s and named them as client and server, established connection between the two resources.

 GENI Portal

HomeToolsPartnersHelpChennavajjala, Sri Harsha (UMKC-St

**Slice:** HTP  
**Project:** NA-1-Spring16Course

Slice expires in **35 days** ✓  
Project expires in **57 days** ✓

Add ResourcesRenewTools

**Manage Resources**

Resources on RENCi ExoGENI are ready.

View RSpec

Name

client

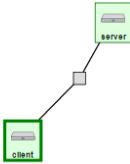
SSH to hhgc77@152.54.14.18:22,  
choibye@152.54.14.18:22,  
sc9v9@152.54.14.18:22,  
root@152.54.14.18:22


Node Type

Other...

xo.small

Hardware Type



 GENI Portal

HomeToolsPartnersHelpChennavajjala, Sri Harsha (UMKC-St

**Slice:** HTP  
**Project:** NA-1-Spring16Course

Slice expires in **35 days** ✓  
Project expires in **57 days** ✓

Add ResourcesRenewTools

**Manage Resources**

Resources on RENCi ExoGENI are ready.

View RSpec

Name

server

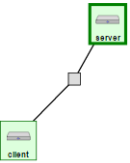
SSH to hhgc77@152.54.14.17:22,  
choibye@152.54.14.17:22,  
sc9v9@152.54.14.17:22,  
root@152.54.14.17:22

Node Type

Other...

xo.small

Hardware Type



### Step 3:

Logged in to our client and server nodes using SSH command to the client IP address and server IP address.

Screenshots showing client and server login:

```
harsha@chakram-pc: ~/.ssh
harsha@chakram-pc:~/.ssh$ ssh sc9v9@152.54.14.18
Welcome to Ubuntu 14.04.3 LTS (GNU/Linux 3.13.0-68-generic x86_64)

* Documentation:  https://help.ubuntu.com/

System information as of Thu Mar 24 10:40:24 EDT 2016

System load:  0.02                Processes:            77
Usage of /:   11.8% of 10.80GB    Users logged in:     0
Memory usage: 10%                IP address for eth0: 10.103.0.14
Swap usage:   0%                 IP address for eth1: 10.1.1.1

Graph this data and manage this system at:
  https://landscape.canonical.com/

Last login: Thu Mar 24 10:40:25 2016 from cpe-69-76-178-194.kc.res.rr.com
$ hostname
client
$
```

```
harsha@chakram-pc: ~/.ssh
harsha@chakram-pc:~/.ssh$ ssh sc9v9@152.54.14.17
Welcome to Ubuntu 14.04.3 LTS (GNU/Linux 3.13.0-68-generic x86_64)

* Documentation:  https://help.ubuntu.com/

System information as of Thu Mar 24 10:40:00 EDT 2016

System load:  0.0                Processes:            81
Usage of /:   11.8% of 10.80GB    Users logged in:     1
Memory usage: 10%                IP address for eth0: 10.103.0.15
Swap usage:   0%                 IP address for eth1: 10.1.1.2

Graph this data and manage this system at:
  https://landscape.canonical.com/

Last login: Thu Mar 24 10:33:06 2016 from cpe-69-76-178-194.kc.res.rr.com
$ hostname
server
```

#### Step 4:

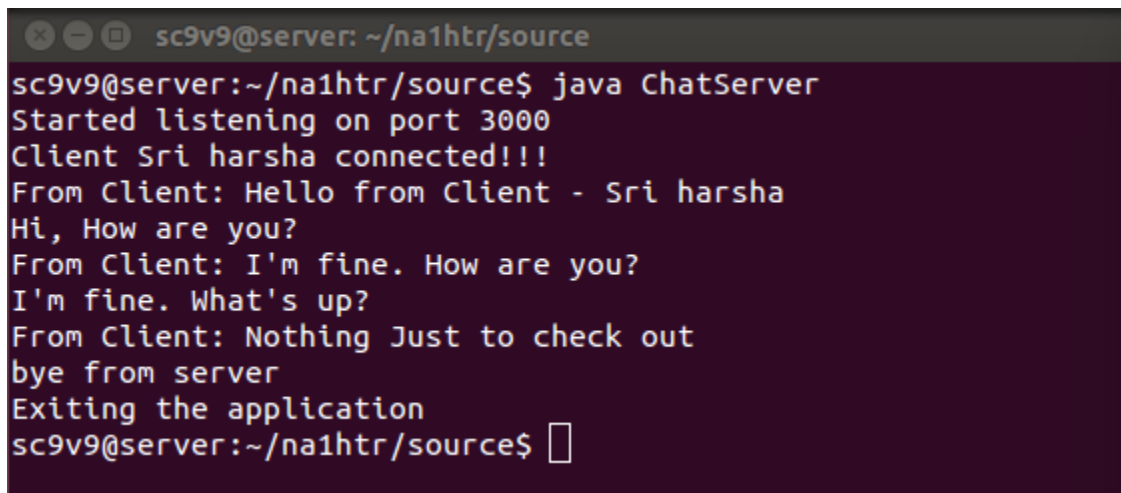
Part 1 contains two tasks, communication through simple messages and file exchanges.

For task 1 communication through simple messages we developed two java files ChatClient.java and ChatServer.java.

The mechanism in ChatClient.java and ChatServer.java is as follows:

- Running ChatServer.java starts server and waits for the client to connect to it.
- After connection establishment client can send message to server and server can send message to client.
- Server or client needs to send “bye from server” or “bye from client” message to terminate the connection.

Below are screenshots of simple chat between client and server:



```
sc9v9@server: ~/na1htr/source
sc9v9@server:~/na1htr/source$ java ChatServer
Started listening on port 3000
Client Sri harsha connected!!!
From Client: Hello from Client - Sri harsha
Hi, How are you?
From Client: I'm fine. How are you?
I'm fine. What's up?
From Client: Nothing Just to check out
bye from server
Exiting the application
sc9v9@server:~/na1htr/source$
```

```
sc9v9@client: ~/na1htr/source
sc9v9@client:~/na1htr/source$ java ChatClient
Type and press Enter key
Hello from Client - Sri harsha
From Server: Hi, How are you?
I'm fine. How are you?
From Server: I'm fine. What's up?
Nothing Just to check out
From Server: bye from server
Server is exiting, hence exiting the client application
sc9v9@client:~/na1htr/source$
```

```
sc9v9@client: ~/na1htr/source
sc9v9@client:~/na1htr/source$ java ChatClient
Type and press Enter key
Hello from Client - Sri Harsha
From Server: Hai
I gotta go
From Server: ok
bye from client - harsha
Exiting the application
sc9v9@client:~/na1htr/source$
```

For task 2 we have developed two scripts FileClient and FileServer, running FileClient sends a text file to server and server first displays the contents of received file and saves the file in local system.

```
sc9v9@server: ~/na1htr/source
sc9v9@server:~/na1htr/source$ java FileClient
Getting updated file from the server....
Printing the file contents to screen:

Lorem ipsum dolor sit amet, quis nostrud mel ei. Vide debet in has, diceret apei
rian his no, ei vidisse electram vim. Quo ex audire utroque placerat. Ne ius nib
h nulla percipitur. Singulis interesset vis in.

Homero legimus eleifend pri eu, quo vocibus accusata ad, et salutandi rationibus
qui. Inani oporteat sed ne, ullum veniam everti sit et. Rebum accumsan eos in.
Latine saperet cu mel, discere corpora et nam, ea ius iusto pericula principes.
Duo at omnis legere omnium, in commodo molestiae nec. Dolore recteque salutandi
nec in.

Ut eam dolorem propriae theophrastus. Eleifend iracundia ex pro, qui facer nulla
similique at. Nam utroque appellatur in in vivendo atomorum delicata vis. Ma
```

```
sc9v9@client: ~/na1htr/source
sc9v9@client:~/na1htr/source$ java FileServer
Printing the file contents to screen:

Lorem ipsum dolor sit amet, quis nostrud mel ei. Vide debet in has, diceret apei
rian his no, ei vidisse electram vim. Quo ex audire utroque placerat. Ne ius nib
h nulla percipitur. Singulis interesset vis in.

Homero legimus eleifend pri eu, quo vocibus accusata ad, et salutandi rationibus
qui. Inani oporteat sed ne, ullum veniam everti sit et. Rebum accumsan eos in.
Latine saperet cu mel, discere corpora et nam, ea ius iusto pericula principes.
Duo at omnis legere omnium, in commodo molestiae nec. Dolore recteque salutandi
nec in.

Ut eam dolorem propriae theophrastus. Eleifend iracundia ex pro, qui facer nulla
similique at. Nam utroque appellantur in, in vivendo atomorum delicata vis. Mag
na mollis vocibus sed no. Purto rationibus at qui, ornatus meliore officiis id v
im, fabulas offendit rationibus has ad. Modo nullam consulatu his cu, accusata m
aluisset conceptam eam ne.
```

Server appends the one more line to received file and sends the updated file back to client. Client now displays the file on screen after receiving the full updated file.

```
sc9v9@client: ~/na1htr/source
im, fabulas offendit rationibus has ad. Modo nullam consulatu his cu, accusata m
aluisset conceptam eam ne.

Eu his ipsum utinam ceteros, iusto nostro splendide cu mea. Omnis electram an qu
i, primis maiestatis mnesarchum mel no, nisl molesti
Appending the text to the file
Sending file back to client
sc9v9@client:~/na1htr/source$
```

```
sc9v9@server: ~/na1htr/source
similique at. Nam utroque appellantur in, in vivendo atomorum delicata vis. Magna mollis vocibus sed no. Purto rationibus at qui, ornatus meliore officiis id v
im, fabulas offendit rationibus has ad. Modo nullam consulatu his cu, accusata m
aluisset conceptam eam ne.

Eu his ipsum utinam ceteros, iusto nostro splendide cu mea. Omnis electram an qu
i, primis maiestatis mnesarchum mel no, nisl molesti
This line is added by the Server
^Csc9v9@server:~/na1htr/source$
```