

SYSTEM PRACTICUM REPORT

CS307 - ASSIGNMENT 4

Group 1

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Question 1 (Exploring IP addresses):

A.

Saloni's Laptop:

IP Address using ipconfig/ifconfig = 172.16.22.203

```
saloni@saloni-HP-Pavilion-Notebook-15-bc5xxx:~$ ifconfig
eno1: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether 80:e8:2c:23:3c:51 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 13565 bytes 1225370 (1.2 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 13565 bytes 1225370 (1.2 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0


virbr0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    inet 192.168.122.1 netmask 255.255.255.0 broadcast 192.168.122.255
    ether 52:54:00:48:ce:b1 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlo1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 172.16.22.203 netmask 255.255.255.0 broadcast 172.16.22.255
    inet6 fe80::6dee:56e4:bd8d:cd9f prefixlen 64 scopeid 0x20<link>
    ether c0:b5:d7:24:1f:6f txqueuelen 1000 (Ethernet)
    RX packets 591893 bytes 507031211 (507.0 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 309621 bytes 52240023 (52.2 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

IP Address using ip2location.com = 14.139.34.5

IP Details For: 14.139.34.5

Decimal:	243999237
Hostname:	14.139.34.5
ASN:	55824
ISP:	Indian Institute of Technology (IIT) Mandi
Services:	None detected
Assignment:	Likely Static IP
Country:	India
State/Region:	Maharashtra
City:	Hinganghat



Latitude: 20.566669 (20° 34' 0.01" N)
Longitude: 78.833328 (78° 49' 59.98" E)

Shubham's Laptop

IP Address using ipconfig/ifconfig = 172.16.8.196

```
Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix  . : gateway.iitmandi.ac.in
Link-local IPv6 Address . . . . . : fe80::b9f2:fe5a:5d75:621f%4
IPv4 Address. . . . . : 172.16.8.196
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 172.16.8.1

Ethernet adapter Bluetooth Network Connection:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix  . :
```

IP Address using ip2location.com = 14.139.34.5

Your IP Address	Domain	Is Proxy
14.139.34.5	iitmandi.ac.in	No
Country	Net Speed	Proxy Type
India	DSL	-
Region	IDD & Area Code	Proxy ASN
Maharashtra	+(91) 080	-
City	ZIP Code	Security Threat
Hinganghat	442307	-
Coordinates	Weather Station	Proxy Last Seen
20.56667, 78.83333	Wardha (INXX0137)	-
ISP	Elevation	Address Type
Indian Institute of Technology (IIT) Mandi	209 m	(U) Unicast

Ravi's Laptop:

IP Address using ipconfig/ifconfig = 192.169.118.36

IP Address using ip2location.com = 205.253.126.104

Observations:

From the above IP Addresses we can say that they are not same in any cases. There is a mismatch between IP addresses obtained from ifconfig/ipconfig and from ip2location.

The reason for this is that there are categories in IP Addresses - Private IPs and Public IPs. Also in the first two cases we can see that Saloni's IP from IP2Location and Shubham's IP from IP2Location are same because they were connected to same WIFI network i.e., IIT Mandi Wifi. The IP provided by ifconfig is Private IP on the network of IIT Mandi and IP obtained from ip2location is the public IP of the IIT Mandi Gateway.

B.

```
C:\Users\91960>tracert 54.36.117.234

Tracing route to ip-54-36-117.eu [54.36.117.234]
over a maximum of 30 hops:

  0  4 ms    1 ms    1 ms  192.168.35.238
  1  *        *        *    Request timed out.
  2  176 ms   45 ms   38 ms  10.72.120.3
  3  201 ms   74 ms  163 ms  172.26.27.131
  4  180 ms  238 ms   49 ms  172.26.127.34
  5  *        *        *    Request timed out.
  6  *        *        *    Request timed out.
  7  *        *        *    Request timed out.
  8  *        *        *    Request timed out.
  9  *        *        *    Request timed out.
 10 *        *        *    Request timed out.
 11 240 ms   187 ms  240 ms  103.198.140.174
 12 284 ms   201 ms  213 ms  103.198.140.213
 13 281 ms   203 ms  210 ms  ovh.mrs.franceix.net [37.49.232.27]
 14 *        *        *    Request timed out.
 15 *        *        *    Request timed out.
 16 *        *        *    Request timed out.
 17 419 ms   285 ms  435 ms  par-gsw-sbb1-nc5.fr.eu [54.36.50.228]
 18 246 ms   377 ms  295 ms  be102.sbg-g2-nc5.fr.eu [91.121.215.218]
 19 228 ms   210 ms  280 ms  be105.fra-fr5-sbb2-nc5.de.eu [91.121.215.197]
 20 291 ms   *        *    fra1-lim1-g2-8k.de.eu [94.23.122.247]
 21 *        *        *    Request timed out.
 22 *        *        *    Request timed out.
 23 *        *        *    Request timed out.
 24 *        *        *    Request timed out.
 25 *        *        *    Request timed out.
 26 *        *        *    Request timed out.
 27 *        *        *    Request timed out.
 28 237 ms   235 ms  238 ms  ip-54-36-117.eu [54.36.117.234]

Trace complete.
```

Traceroute to Server In France

Traceroute to 54.36.117.234 from 🇫🇷 France



Hop	IP Address	Hostname	Location	Time
1	109.123.66.1	hosted.by.uk2group.com	🇫🇷 France, Ile-de-France, Paris	0.368 ms
4	212.78.74.4	212.78.74.4	🇩🇪 Germany, Hessen, Frankfurt am Main	0.286 ms
5	80.81.193.209	decix2.ovhcloud.com	🇩🇪 Germany, Hessen, Frankfurt am Main	0.717 ms
6	80.81.193.209	decix2.ovhcloud.com	🇩🇪 Germany, Hessen, Frankfurt am Main	0.648 ms
18	54.36.117.234	ip-54-36-117.eu	🇩🇪 Germany, Hessen, Limburg an der Lahn	4.394 ms

Traceroute using ip2location service

C.

a. Running the *jupyter notebook* at the specified port,
jupyter notebook --no-browser --port 1234
This will start the jupyter notebook at the host without the browser open.

b. Establishing the connection from the host machine,
ssh 4321:localhost:1234 remote@<IP of Remote>
This will establish a ssh connection to the *remote* user and create a tunnel that will bind the **4321** port of the *localhost* to the **1234** port of the *remote* user.

The screenshot displays a Jupyter Notebook interface in a web browser. The browser's address bar shows `localhost:4321/notebooks/Demo.ipynb`. The Jupyter interface includes a top bar with the 'jupyter Demo (autosaved)' title, a 'Logout' button, and a 'Python 3' kernel selector. Below this is a menu bar with options: File, Edit, View, Insert, Cell, Kernel, Widgets, and Help. A toolbar contains icons for file operations and a 'Run' button. The notebook area shows three input cells: the first contains `import platform`, the second contains `platform.uname()`, and the third is empty. The output of the second cell is displayed as `Out[2]:` and shows the result of `platform.uname()`: `uname_result(system='Linux', node='prashantk', release='4.18.0-15-generic', version='#16~18.04.1-Ubuntu SMP Thu Feb 7 14:06:04 UTC 2019', machine='x86_64', processor='x86_64')`. Below the notebook area, a terminal window is open, showing a series of commands and their outputs. The terminal window title is `prashant@prashantk: ~`. The commands and outputs are as follows:

```
bash: /usr/local/bin/virtualenvwrapper.sh: No such file or directory
ravi@ravi:~$ sudo apt purge unity
[sudo] password for ravi:
Reading package lists... Done
Building dependency tree
Reading state information... Done
Package 'unity' is not installed, so not removed
0 upgraded, 0 newly installed, 0 to remove and 122 not upgraded.
ravi@ravi:~$ ssh 4321:localhost:1234 prashant@192.168.118.11
ssh: Could not resolve hostname 4321:localhost:1234: Name or service not known
ravi@ravi:~$ ssh -L 4321:localhost:1234 prashant@192.168.118.11
prashant@192.168.118.11's password:
Permission denied, please try again.
prashant@192.168.118.11's password:
Welcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.18.0-15-generic x86_64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

* Canonical Livepatch is available for installation.
- Reduce system reboots and improve kernel security. Activate at:
  https://ubuntu.com/livepatch
```

Question 2 (Client-Server File Transfer):

Server

```
Server started listening on port 1110 ...
Client 1 connected.
In MAIN LOOP
DEBUG: read - 1024
DATA - reqFile try.txt
arg 1: reqFile
arg 2: try.txt
In fread 1024
file send complete
In MAIN LOOP
```

Client

```
t_folder$ ./client 127.0.0.1
Connection with Server 127.0.0.1 at port 1110
reqFile try.txt
hello!!
filename 1 : try.txt
Requested file try.txt is available. Do you want to downlaod the file? [Y/N]
Y
filename 1 : try.txt
In send_start
We are sending the file

filename - try.txt
In fwrite while loop
data_len: 24
In fwrite while loop
File  successfully sent!
```

Question 3 (Error Control):

Server

```
Server is on  
Listening for incoming connections at port 2001  
Connection Accepted  
;) No Error  
;) No Error  
█
```

Client

```
Connected to 127.0.0.1:2001  
6  
Binary String: 101111001110110101101101000010110101000111101101001110100111111101000011  
Successful transmission :)  
8  
Binary String: 10101001011000011101111101011101010101001011111000001111110100001000010001100010011111010000101  
Successful transmission :)  
█
```