



Continuous Assessment for Laboratory / Assignment sessions

Academic Year 2022-23

Name: Prerna Sunil Jadhav

SAP ID: 60004220127

Course: Computer Networks

Course Code: DJ19CEL405

Year: S.Y. B.Tech.

Sem: IV

Batch: III

Department: Computer Engineering

Performance Indicators (Any no. of Indicators) (Maximum 5 marks per indicator)	1	2	3	4	5	6	7	8	9	10	11	Σ	Avg	Avg	Avg	Σ	Avg
Course Outcome	1	1	2	2	4	3	4	4	5	4	6						
1. Knowledge (Factual/Conceptual/Procedural/ Metacognitive)																	
2. Describe (Factual/Conceptual/Procedural/ Metacognitive)																	
3. Demonstration (Factual/Conceptual/Procedural/ Metacognitive)																	
4. Strategy (Analyse & / or Evaluate) (Factual/Conceptual/ Procedural/Metacognitive)																	
5. Interpret/ Develop (Factual/Conceptual/ Procedural/Metacognitive)	-	-	-	-	-	-	-	-	-	-	-				-	-	
6. Attitude towards learning (receiving, attending, responding, valuing, organizing, characterization by value)																	
7. Non-verbal communication skills/ Behaviour or Behavioural skills (motor skills, hand-eye coordination, gross body movements, finely coordinated body movements speech behaviours)	-	-	-	-	-	-	-	-	-	-	-				-	-	
Total	<u>25</u>	<u>24</u>															
Signature of the faculty member	<u>S. Jadhav</u>																

Outstanding (5), Excellent (4), Good (3), Fair (2), Needs Improvement (1)

Laboratory marks	Assignment marks	Total Term-work (25) =
Σ Avg. =	Σ Avg. =	
Laboratory Scaled to (15) =	Assignment Scaled to (10) =	Sign of the Student:

Signature of the Faculty member:
Name of the Faculty member:

Signature of Head of the Department
Date:



Name:	Prerna Sunil Jadhav
Sap Id:	60004220127
Class:	S. Y. B.Tech (Computer Engineering)
Course:	Computer Networks (DJ12CEL405)
Date of performance:	28 - 02 - 2023
Date of Submission:	28 - 02 - 2023
Experiment No.:	02
Aim:	Study of Basic Networking Commands

1. ifconfig

Purpose

Configures or displays network interface parameters for a network by using TCP/IP.

Syntax

ifconfig -a [-l] [-d] [-u] [protocolfamily]

Description

- o The ifconfig command to assign an address to a network interface and to configure or display the current network interface configuration information.
- o The ifconfig command must be used at system startup to define the network address of each interface present on a system.
- o After system startup, it can also be used to redefine an interfaces address and its other operating parameters.
- o The network interface configuration is held on the running system and must be reset at each system restart.

Options

1. Ifconfig

ifconfig command without any argument displays the details of all the active interfaces. This command also displays the assigned ip address of active interfaces. There could be interfaces that are active but they may not have been assigned an IP address.

2. Ifconfig -s

display all network interfaces on the server even if the network interface is down.

3. Ifconfig -a

display a short list, instead of all the details.

4. Ifconfig *interface_name*

ifconfig command with interface name (wlan0) as an argument displays details of interface configuration.

5. Ifconfig *interface address*

ifconfig command can be used with an interface name (eth0) and ip address to assign an IP address to the specific interface. Use this command with root permissions.

2. ping

Purpose

Sends an echo request to a network host.

Syntax

ping [-d] [-D] [-n] [-q] [-r] [-v] [-R] [-a addr_family] [-c Count] [-w timeout]

Description

- o PING (Packet Internet Groper) command is used to check the network connectivity between host and server/host.



Shri Vile Parle Kelavani Mandal's

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NAAC Accredited with "A" Grade (CGPA : 3.18)



- o This command takes as input the IP address or the URL and sends a data packet to the specified address with the message "PING" and get a response from the server/host this time is recorded which is called latency.
- o Fast ping low latency means faster connection. Ping uses ICMP(Internet Control Message Protocol) to send an ICMP echo message to the specified host if that host is available then it sends ICMP reply message.
- o Ping is generally measured in millisecond every modern operating system has this ping pre-installed.

Options

1. Controlling the number of pings:

Earlier we did not define the number of packets to send to the server/host by using -c option we can do so.

ping -c 15 www.gmail.org

2. Controlling the size of packets send:

Earlier a default sized packets were sent to a host but we can send light and heavy packet by using -s option.

ping -s 40 -c 5 www.geeksforgeeks.org

3. Changing the time interval:

By default ping wait for 1 sec to send next packet we can change this time by using -i option.

ping -i 2 www.geeksforgeeks.org

3. Netstat

Purpose

The netstat command displays the contents of various network-related data structures for active connections.

Syntax

netstat [-a][-l]

Description

- o The netstat command is used to show network status. Traditionally, it is used more for problem determination than for performance measurement.
- o However, the netstat command can be used to determine the amount of traffic on the network to ascertain whether performance problems are due to network congestion.
- o The netstat command displays information regarding traffic on the configured network interfaces, such as the following:
 - The address of any protocol control blocks associated with the sockets and the state of all sockets
 - The number of packets received, transmitted, and dropped in the communications subsystem
 - Cumulative statistics per interface
 - Routes and their status

Options

1. -a-all

Show both listening and non-listening sockets. With the -interfaces option, show interfaces that are not up

2. -at

To list all tcp ports.



3. -au
To list all udp ports.
4. -pt
To display the PID and program names.

4. Arp

Purpose

Displays and modifies address resolution, including ATM (Asynchronous Transfer Mode) interfaces.

Syntax

To Display ARP Entries

```
arp [-v] [-i if] [-H type] -a [hostname]
```

Description

- o The arp command displays and modifies the Internet-to-adapter address translation tables used by the Address in Networks and communication management.
- o The arp command displays the current ARP entry for the host specified by the HostName variable.
- o The host can be specified by name or number, using Internet dotted decimal notation.

Options

1. -v, -verbose: This option shows the verbose information.
2. -n, -numeric: This option shows numerical addresses instead of symbolic host, port or usernames.
3. -H type, -hw-type type, -t type: This tells arp which class of entries it should check for. Default value is ether.

5. Nslookup

Purpose

Queries internet domain name servers interactively.

Syntax

```
nslookup [ - option ] [ name | - ] [ server ]
```

Description

- o The nslookup command queries internet domain name servers in two modes. Interactive mode allows you to query name servers for information about various hosts and domains, or to print a list of the hosts in a domain.
- o In non-interactive mode, the names and requested information are printed for a specified host or domain.

Options

1. nslookup -type=any gmail.com : Lookup for any record
We can also view all the available DNS records using the -type=any option.
2. nslookup -type=txt ibm.com : Lookup for an txt record
TXT records are useful for multiple types of records like DKIM, SPF, etc. You can find all TXT records configured for any domain using the below command.

6. Tracert

Purpose:

traceroute command in Linux prints the route that a packet takes to reach the host.



Syntax:

traceroute [options] host_Address [pathlength]

Description:

- o We need to install it by the following command:
sudo apt-get install traceroute
- o This command is useful when you want to know about the route and about all the hops that a packet takes.
- o The first column corresponds to the hop count.
- o The second column represents the address of that hop and after that, you see three space-separated time in milliseconds.
- o traceroute command sends three packets to the hop and each of the time refers to the time taken by the packet to reach the hop.

Options:

1. -F: Do not fragment packet
2. -m: Set the max number of hops for the packet to reach the destination. Default value is 30
3. -n: Do not resolve IP addresses to their domain names

✓

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1. Ifconfig

```
student@ubuntu:~$ ifconfig
eth0      Link encap:Ethernet HWaddr 00:0c:29:e7:f5:24
          inet addr:192.168.64.128 Bcast:192.168.64.255 Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fee7:f524/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:236 errors:0 dropped:0 overruns:0 frame:0
            TX packets:214 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:41319 (41.3 KB) TX bytes:22716 (22.7 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
            UP LOOPBACK RUNNING MTU:65536 Metric:1
            RX packets:226 errors:0 dropped:0 overruns:0 frame:0
            TX packets:226 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1
            RX bytes:22126 (22.1 KB) TX bytes:22126 (22.1 KB)

student@ubuntu:~$ ifconfig -s
Iface    MTU  Met  RX-OK RX-ERR RX-DRP RX-OVR    TX-OK  TX-ERR TX-DRP TX-OVR Flg
eth0     1500  0    240     0     0     0       218     0     0     0 BMRU
lo      65536  0    234     0     0     0       234     0     0     0 LRU
student@ubuntu:~$ ifconfig -a
eth0      Link encap:Ethernet HWaddr 00:0c:29:e7:f5:24
          inet addr:192.168.64.128 Bcast:192.168.64.255 Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fee7:f524/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:240 errors:0 dropped:0 overruns:0 frame:0
            TX packets:218 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:41876 (41.8 KB) TX bytes:23076 (23.0 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
            UP LOOPBACK RUNNING MTU:65536 Metric:1
            RX packets:234 errors:0 dropped:0 overruns:0 frame:0
            TX packets:234 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1
            RX bytes:22931 (22.9 KB) TX bytes:22931 (22.9 KB)
```



```
student@ubuntu:~$ ifconfig eth0
eth0      Link encap:Ethernet HWaddr 00:0c:29:e7:f5:24
          inet addr:192.168.64.128 Bcast:192.168.64.255 Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe7:f524/64 Scope:Link
             UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
             RX packets:264 errors:0 dropped:0 overruns:0 frame:0
             TX packets:229 errors:0 dropped:0 overruns:0 carrier:0
             collisions:0 txqueuelen:1000
             RX bytes:43950 (43.9 KB) TX bytes:23976 (23.9 KB)

student@ubuntu:~$ sudo ifconfig eth0 192.162.72.228
[sudo] password for student:
student@ubuntu:~$ sudo ifconfig eth0 192.162.72.228
student@ubuntu:~$ ifconfig eth0
eth0      Link encap:Ethernet HWaddr 00:0c:29:e7:f5:24
          inet addr:192.162.72.228 Bcast:192.162.72.255 Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe7:f524/64 Scope:Link
             UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
             RX packets:312 errors:0 dropped:0 overruns:0 frame:0
             TX packets:266 errors:0 dropped:0 overruns:0 carrier:0
             collisions:0 txqueuelen:1000
             RX bytes:48380 (48.3 KB) TX bytes:29247 (29.2 KB)

student@ubuntu:~$
```

2. Ping

```
student@ubuntu:~$ ping www.gmail.com
PING www.gmail.com (142.250.194.5) 56(84) bytes of data.
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=1 ttl=128 time=75.8 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=2 ttl=128 time=153 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=3 ttl=128 time=147 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=4 ttl=128 time=141 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=5 ttl=128 time=137 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=6 ttl=128 time=137 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=7 ttl=128 time=125 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=8 ttl=128 time=225 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=9 ttl=128 time=139 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=10 ttl=128 time=107 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=11 ttl=128 time=180 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=12 ttl=128 time=127 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=13 ttl=128 time=176 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=14 ttl=128 time=107 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=15 ttl=128 time=137 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=16 ttl=128 time=98.4 ms
64 bytes from del12s01-in-f5.1e100.net (142.250.194.5): icmp_seq=17 ttl=128 time=165 ms
^C
--- www.gmail.com ping statistics ---
18 packets transmitted, 17 received, 5% packet loss, time 17030ms
rtt min/avg/max/mdev = 75.822/140.231/225.260/33.868 ms
student@ubuntu:~$ ping -c 10 www.ibm.com
PING e7817.dsrx.akamaiedge.net (23.57.199.57) 56(84) bytes of data.
64 bytes from a23-57-199-57.deploy.static.akamaitechnologies.com (23.57.199.57): icmp_seq=1 ttl=128 time=58.6 ms
64 bytes from a23-57-199-57.deploy.static.akamaitechnologies.com (23.57.199.57): icmp_seq=2 ttl=128 time=179 ms
64 bytes from a23-57-199-57.deploy.static.akamaitechnologies.com (23.57.199.57): icmp_seq=3 ttl=128 time=57.3 ms
64 bytes from a23-57-199-57.deploy.static.akamaitechnologies.com (23.57.199.57): icmp_seq=4 ttl=128 time=96.7 ms
64 bytes from a23-57-199-57.deploy.static.akamaitechnologies.com (23.57.199.57): icmp_seq=5 ttl=128 time=100 ms
64 bytes from a23-57-199-57.deploy.static.akamaitechnologies.com (23.57.199.57): icmp_seq=6 ttl=128 time=127 ms
64 bytes from a23-57-199-57.deploy.static.akamaitechnologies.com (23.57.199.57): icmp_seq=7 ttl=128 time=99.9 ms
64 bytes from a23-57-199-57.deploy.static.akamaitechnologies.com (23.57.199.57): icmp_seq=8 ttl=128 time=193 ms
64 bytes from a23-57-199-57.deploy.static.akamaitechnologies.com (23.57.199.57): icmp_seq=9 ttl=128 time=107 ms
64 bytes from a23-57-199-57.deploy.static.akamaitechnologies.com (23.57.199.57): icmp_seq=10 ttl=128 time=81.1 ms
^C
--- e7817.dsrx.akamaiedge.net ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9015ms
rtt min/avg/max/mdev = 57.357/110.299/193.789/43.256 ms
```



```
student@ubuntu:~$ ping -s 40 -i 2 -c 3 www.google.com
PING www.google.com (142.250.194.132) 40(68) bytes of data.
48 bytes from del12s05-in-f4.1e100.net (142.250.194.132): icmp_seq=1 ttl=128 time=172 ms
48 bytes from del12s05-in-f4.1e100.net (142.250.194.132): icmp_seq=2 ttl=128 time=91.0 ms
48 bytes from del12s05-in-f4.1e100.net (142.250.194.132): icmp_seq=3 ttl=128 time=102 ms

--- www.google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 4004ms
rtt min/avg/max/mdev = 91.095/122.291/172.827/36.062 ms
student@ubuntu:~$
```

3. Netstat

```
student@ubuntu:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp6      1      0 ip6-localhost:55958    ip6-localhost:ipp      CLOSE_WAIT
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type      State         I-Node      Path
unix    19      [ ]     DGRAM          10461      /dev/log
unix    3      [ ]     STREAM   CONNECTED    14422      /var/run/dbus/system_bus_socket
unix    3      [ ]     STREAM   CONNECTED    14380
unix    3      [ ]     STREAM   CONNECTED    16003
unix    3      [ ]     STREAM   CONNECTED    15805      @/dbus-vfs-daemon/socket-mbI0qrFU
unix    3      [ ]     STREAM   CONNECTED    13866      /var/run/dbus/system_bus_socket
unix    3      [ ]     STREAM   CONNECTED    10914
unix    3      [ ]     STREAM   CONNECTED    14448
unix    3      [ ]     STREAM   CONNECTED    16084
unix    3      [ ]     STREAM   CONNECTED    14500      @/tmp/dbus-EQbggWQU89
unix    3      [ ]     STREAM   CONNECTED    15999      @/tmp/dbus-EQbggWQU89
unix    3      [ ]     STREAM   CONNECTED    15023      @/tmp/.X11-unix/X0
unix    3      [ ]     STREAM   CONNECTED    13865
unix    3      [ ]     STREAM   CONNECTED    10813      /var/run/dbus/system_bus_socket
unix    2      [ ]     STREAM   CONNECTED    16313      @/tmp/dbus-wfONIXQs
unix    3      [ ]     STREAM   CONNECTED    14577      @/tmp/dbus-EQbggWQU89
unix    3      [ ]     STREAM   CONNECTED    14230      /var/run/dbus/system_bus_socket
unix    3      [ ]     STREAM   CONNECTED    14072
unix    3      [ ]     STREAM   CONNECTED    15022
unix    3      [ ]     STREAM   CONNECTED    13936      @/tmp/dbus-EQbggWQU89
unix    3      [ ]     STREAM   CONNECTED    14993
unix    3      [ ]     STREAM   CONNECTED    14350      @/tmp/.X11-unix/X0
unix    3      [ ]     STREAM   CONNECTED    14199
unix    3      [ ]     STREAM   CONNECTED    15941
unix    3      [ ]     STREAM   CONNECTED    14445
unix    3      [ ]     STREAM   CONNECTED    14427
unix    3      [ ]     STREAM   CONNECTED    14360      @/tmp/dbus-EQbggWQU89
unix    3      [ ]     STREAM   CONNECTED    16263      @/tmp/.X11-unix/X0
unix    3      [ ]     STREAM   CONNECTED    15025
unix    3      [ ]     STREAM   CONNECTED    14100      @/tmp/dbus-EQbggWQU89
unix    2      [ ]     DGRAM          11305
```



```
student@ubuntu:~$ netstat -at
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 ubuntu:domain          *;*
tcp        0      0 localhost:ipp          *;*
tcp6       0      0 ip6-localhost:ipp      [::]:*
tcp6       1      0 ip6-localhost:55958    ip6-localhost:ipp      CLOSE_WAIT
student@ubuntu:~$ netstat -au
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 *:47308              *;*
udp        0      0 *:ipp                *;*
udp        0      0 *:mdns               *;*
udp        0      0 *:40336              *;*
udp        0      0 ubuntu:domain        *;*
udp        0      0 *:bootpc             *;*
udp6       0      0 [::]:mdns            [::]:*
udp6       0      0 [::]:11535            [::]:*
udp6       0      0 [::]:38806            [::]:*
student@ubuntu:~$ netstat -pt
(Not all processes could be identified, non-owned process info
 will not be shown, you would have to be root to see it all.)
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State      PID/Program name
tcp6       1      0 ip6-localhost:55958    ip6-localhost:ipp      CLOSE_WAIT  -
student@ubuntu:~$
```

4. Arp

```
student@ubuntu:~$ arp
Address          HWtype  HWaddress          Flags Mask          Iface
192.168.64.254  ether   00:50:56:eb:f5:22  C          eth0
192.168.64.2    ether   00:50:56:f0:78:8f  C          eth0
student@ubuntu:~$ arp -v
Address          HWtype  HWaddress          Flags Mask          Iface
192.168.64.254  ether   00:50:56:eb:f5:22  C          eth0
192.168.64.2    ether   00:50:56:f0:78:8f  C          eth0
Entries: 2     Skipped: 0     Found: 2
student@ubuntu:~$ arp -n
Address          HWtype  HWaddress          Flags Mask          Iface
192.168.64.254  ether   00:50:56:eb:f5:22  C          eth0
192.168.64.2    ether   00:50:56:f0:78:8f  C          eth0
student@ubuntu:~$ arp -H ether
Address          HWtype  HWaddress          Flags Mask          Iface
192.168.64.254  ether   00:50:56:eb:f5:22  C          eth0
192.168.64.2    ether   00:50:56:f0:78:8f  C          eth0
student@ubuntu:~$
```



5. Nslookup

```
student@ubuntu:~$ nslookup www.google.com
Server:      127.0.1.1
Address:     127.0.1.1#53

Non-authoritative answer:
Name:   www.google.com
Address: 142.250.192.4

student@ubuntu:~$ nslookup 209.132.183.181
Server:      127.0.1.1
Address:     127.0.1.1#53

Non-authoritative answer:
181.183.132.209.in-addr.arpa    name = origin-www2.redhat.com.

Authoritative answers can be found from:

student@ubuntu:~$ nslookup -type=any ibm.com
;; Truncated, retrying in TCP mode.
Server:      127.0.1.1
Address:     127.0.1.1#53

Non-authoritative answer:
ibm.com nameserver = asia3.akam.net.
ibm.com nameserver = usw2.akam.net.
ibm.com nameserver = usc2.akam.net.
ibm.com nameserver = usc3.akam.net.
ibm.com nameserver = ns1-99.akam.net.
ibm.com nameserver = eur2.akam.net.
ibm.com nameserver = ns1-206.akam.net.
ibm.com nameserver = eur5.akam.net.
ibm.com has AAAA address 2600:140f:d800:1ad::3831
ibm.com has AAAA address 2600:140f:d800:196::3831
ibm.com mail exchanger = 5 mx0b-001b2d01.phhosted.com.
ibm.com mail exchanger = 5 mx0a-001b2d01.phhosted.com.
Name:  ibm.com
Address: 104.85.150.168
ibm.com
        origin = asia3.akam.net
        mail addr = dnsadm.us.ibm.com
        serial = 1564135723
```



```
student@ubuntu:~$ nslookup -type=txt gmail.com
Server:      127.0.1.1
Address:     127.0.1.1#53

Non-authoritative answer:
gmail.com      text = "globalsign-smime-dv=CDYX+XFHUw2wml6/Gb8+59BsH31KzUr6c1l2BPvqKX8="
gmail.com      text = "v=spf1 redirect=_spf.google.com"

Authoritative answers can be found from:
```

6. Traceroute

```
student@ubuntu:~$ traceroute www.ibm.com
traceroute to www.ibm.com (23.57.199.57), 30 hops max, 60 byte packets
 1  192.168.64.2 (192.168.64.2)  0.250 ms  0.240 ms  0.227 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * * *
13  * * *
14  * * *
15  * * *
16  * * *
17  * * *
18  * * *
19  * * *
20  * * *
21  * * *
22  * * *
23  * * *
24  * * *
25  * * *
26  * * *
27  * * *
28  * * *
29  * * *
30  * * *

student@ubuntu:~$
```



```
student@ubuntu:~$ traceroute -F www.ibm.com
traceroute to www.ibm.com (23.57.199.57), 30 hops max, 60 byte packets
 1  192.168.64.2 (192.168.64.2)  0.251 ms  0.306 ms  0.163 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * * *
```

```
student@ubuntu:~$ traceroute -m 5 www.yahoo.com
traceroute to www.yahoo.com (202.165.107.50), 5 hops max, 60 byte packets
 1  192.168.64.2 (192.168.64.2)  0.245 ms  0.303 ms  0.172 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *

student@ubuntu:~$ traceroute -n www.yahoo.com
traceroute to www.yahoo.com (202.165.107.49), 30 hops max, 60 byte packets
 1  192.168.64.2  0.182 ms  0.165 ms  0.083 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
```