



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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Experiment: 2

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Branch: BE-CSE

Semester: 5th

Subject Name: Computer Networks

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1. Aim: Study of basic network command and Network configuration commands.

2. Requirements(Hardware/Software):

- 1) Software Requirements: CommandPrompt.
- 2) Hardware Requirements:
 - Processor-any suitable processor e.g.Celeron
 - Hard Disk-minimum 20 GB IDE Hard Disk
 - Main Memory:- 128 MB RAM
 - Removable Drivers-1.44 MB Floppy Disk Drive-52X IDE CDROM Drive
 - PS/2 HCL Keyboard and Mouse

3. Procedure:

Students have to understand basic networking commands eg. Ping, tracertetc. Go to command prompt and type the commands.

- Ping
- Ipconfig
- Tracert
- Nslookup
- Netstat
- Arp
- Rarp



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- Hostname
- Pathping

4. Output:

Hostname:

```
Last login: Thu Aug  1 22:07:41 on ttys000
/Users/harshgopal/.zshrc:10: command not found: gradle-completion
(base) $ hostname
Harshs-MacBook-Air.local
(base) $
```

Ipconfig:

```
harshgopal — -zsh — 128x33
(base) $ ipconfig getifaddr en0
192.168.1.100
(base) $ ifconfig
lo0: flags=8049<UP,LOOPBACK,RUNNING,MULTICAST> mtu 16384
options=1203<RXCSUM,TXCSUM,TXSTATUS,SW_TIMESTAMP>
inet 127.0.0.1 netmask 0xff000000
inet6 ::1 prefixlen 128
inet6 fe80::1%lo0 prefixlen 64 scopeid 0x1
nd6 options=201<PERFORMNUD,DAD>
gif0: flags=8010<POINTOPOINT,MULTICAST> mtu 1280
stf0: flags=0<> mtu 1280
anpi1: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
options=400<CHANNEL_IO>
ether 46:39:f0:af:ee:81
media: none
status: inactive
anpi0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
options=400<CHANNEL_IO>
ether 46:39:f0:af:ee:80
media: none
status: inactive
en3: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
options=400<CHANNEL_IO>
ether 46:39:f0:af:ee:60
nd6 options=201<PERFORMNUD,DAD>
media: none
status: inactive
en4: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
options=400<CHANNEL_IO>
ether 46:39:f0:af:ee:61
nd6 options=201<PERFORMNUD,DAD>
media: none
status: inactive
```



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Nslookup:

```
harshgopal — -zsh — 80x24
Last login: Fri Aug 2 08:42:34 on ttys000
/Users/harshgopal/.zshrc:10: command not found: gradle-completion
(base) $ Nslookup www.google.com
Server:      2401:4900:50:9::7e3
Address:     2401:4900:50:9::7e3#53

** server can't find www.google.com: NXDOMAIN

(base) $
```

Ping:

```
harshgopal — ping www.google.com — 80x24
(base) $ ping www.google.com
PING www.google.com (142.250.77.228): 56 data bytes
64 bytes from 142.250.77.228: icmp_seq=0 ttl=119 time=19.987 ms
64 bytes from 142.250.77.228: icmp_seq=1 ttl=119 time=18.600 ms
64 bytes from 142.250.77.228: icmp_seq=2 ttl=119 time=22.089 ms
64 bytes from 142.250.77.228: icmp_seq=3 ttl=119 time=19.509 ms
64 bytes from 142.250.77.228: icmp_seq=4 ttl=119 time=22.250 ms
64 bytes from 142.250.77.228: icmp_seq=5 ttl=119 time=19.532 ms
64 bytes from 142.250.77.228: icmp_seq=6 ttl=119 time=23.103 ms
64 bytes from 142.250.77.228: icmp_seq=7 ttl=119 time=21.823 ms
64 bytes from 142.250.77.228: icmp_seq=8 ttl=119 time=20.006 ms
64 bytes from 142.250.77.228: icmp_seq=9 ttl=119 time=23.565 ms
Request timeout for icmp_seq 10
64 bytes from 142.250.77.228: icmp_seq=11 ttl=119 time=88.008 ms
64 bytes from 142.250.77.228: icmp_seq=12 ttl=119 time=23.298 ms
64 bytes from 142.250.77.228: icmp_seq=13 ttl=119 time=20.636 ms
64 bytes from 142.250.77.228: icmp_seq=14 ttl=119 time=19.784 ms
64 bytes from 142.250.77.228: icmp_seq=15 ttl=119 time=22.263 ms
64 bytes from 142.250.77.228: icmp_seq=16 ttl=119 time=20.963 ms
```



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Tracert:

```
harshgopal — traceroute 8.8.8.8 — 80x24
Last login: Fri Aug 2 08:48:40 on ttys000
/Users/harshgopal/.zshrc:10: command not found: gradle-completion
(base) $ Tracert www.google.com
zsh: command not found: Tracert
(base) $ traceroute 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 64 hops max, 40 byte packets
 1 192.168.1.1 (192.168.1.1) 31.788 ms 14.691 ms 32.253 ms
 2 223.177.207.255 (223.177.207.255) 45.707 ms 100.337 ms 60.426 ms
 3 nsg-corporate-161.80.186.122.airtel.in (122.186.80.161) 36.889 ms
   nsg-corporate-165.80.186.122.airtel.in (122.186.80.165) 72.976 ms
   nsg-corporate-161.80.186.122.airtel.in (122.186.80.161) 56.729 ms
 4 116.119.52.34 (116.119.52.34) 49.316 ms 48.048 ms 71.924 ms
 5 142.250.161.56 (142.250.161.56) 74.640 ms 95.337 ms 41.639 ms
 6 *
```

Netstat:

```
harshgopal — -zsh — 80x24
(base) $ netstat
Active Internet connections
Proto Recv-Q Send-Q Local Address Foreign Address (state)
tcp6 0 0 2401:4900:1c6f:a.51294 2606:4700:8391:2.https ESTABLISHED
tcp6 0 0 2401:4900:1c6f:a.51293 2606:9000:2658:b.https ESTABLISHED
tcp4 24 0 192.168.1.100.51292 static.188.123.2.https CLOSE_WAIT
tcp4 0 0 192.168.1.100.51291 199.232.22.137.https ESTABLISHED
tcp4 0 0 192.168.1.100.51289 server-18-164-18.https ESTABLISHED
tcp4 0 0 192.168.1.100.51288 server-18-164-23.https ESTABLISHED
tcp4 0 0 192.168.1.100.51285 server-108-158-2.https ESTABLISHED
tcp4 0 0 192.168.1.100.51284 103.180.115.13.https ESTABLISHED
tcp4 0 0 192.168.1.100.51281 server-18-164-18.https ESTABLISHED
tcp6 0 0 2401:4900:1c6f:a.51280 2a04:4e42:42::48.https ESTABLISHED
tcp6 0 0 2401:4900:1c6f:a.51279 2606:4700:8397:2.https ESTABLISHED
tcp6 0 0 2401:4900:1c6f:a.51255 2a04:4e42:42::64.https ESTABLISHED
tcp6 0 0 2401:4900:1c6f:a.51218 whatsapp-cdn6-sh.https ESTABLISHED
tcp4 0 0 192.168.1.100.49963 17.242.13.4.5223 ESTABLISHED
udp6 0 0 2401:4900:1c6f:a.49627 del11s03-in-x0e..https
udp6 0 0 2401:4900:1c6f:a.58753 del11s12-in-x16..https
udp6 0 0 2401:4900:1c6f:a.51263 del12s07-in-x0a..https
udp6 0 0 2401:4900:1c6f:a.56244 del11s03-in-x0e..https
udp6 0 0 2401:4900:1c6f:a.54776 del11s03-in-x0e..https
udp6 0 0 2401:4900:1c6f:a.63025 sg-in-f84.1e100..https
udp6 0 0 2401:4900:1c6f:a.51473 del12s05-in-x04..https
```

Rout Print/netstat-nr

```

harshgopal — -zsh — 80x24
(base) $ netstat -nr
Routing tables

Internet:
Destination          Gateway              Flags                Netif  Expire
default              192.168.1.1         UGScg                en0
127                  127.0.0.1           UCS                  lo0
127.0.0.1            127.0.0.1           UH                   lo0
169.254              link#12             UCS                  en0    !
192.168.1            link#12             UCS                  en0    !
192.168.1.1/32       link#12             UCS                  en0    !
192.168.1.1          b4:a7:c6:1c:14:b0  UHLWIir             en0    1178
192.168.1.8          f0:a7:31:92:51:40  UHLWI               en0    1196
192.168.1.100/32     link#12             UCS                  en0    !
224.0.0/4            link#12             UmCS                 en0    !
224.0.0.251          1:0:5e:0:0:fb      UHmLWI              en0
239.192.152.143      1:0:5e:40:98:8f    UHmLWI              en0
239.255.255.250      1:0:5e:7f:ff:fa    UHmLWI              en0
255.255.255.255/32  link#12             UCS                  en0    !

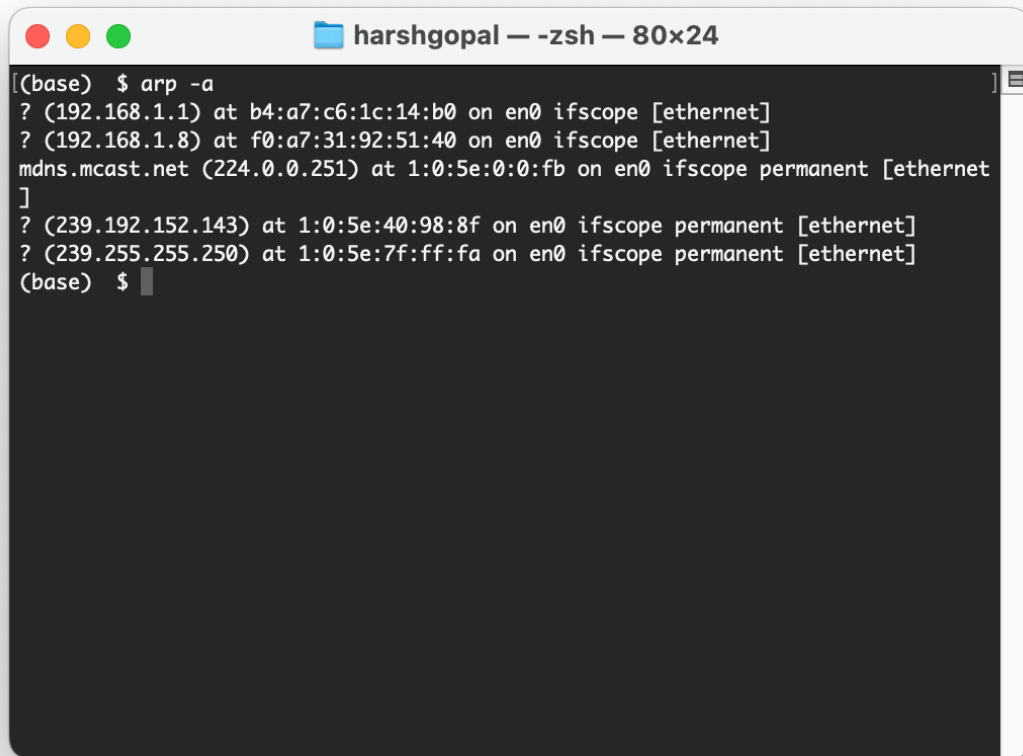
Internet6:
Destination          Gateway              Netif  Expire
default              fe80::1%en0
  
```

Curl:

```

harshgopal — -zsh — 80x24
(base) $ curl www.google.com
<!doctype html><html itemscope="" itemtype="http://schema.org/WebPage" lang="en-IN"><head><meta content="text/html; charset=UTF-8" http-equiv="Content-Type"><meta content="/images/branding/google/1x/google_standard_color_128dp.png" itemprop="image"><title>Google</title><script nonce="sbgx162RHVqU01JIOP4LUg">(function(){$g={kEI:'1VGsZqfo0Naj3Q0i48_BAg',kEXPI:'0,2504524,1195761,664,432,5,535950,2709,2872,2891,43028,30022,6397,9708,18161,19872,125826,2,16737,21266,1758,6699,28950,12996,57737,2,2,1,10957,13669,2006,8155,23350,22436,9781,45598,17057,33566,39613,3030,15816,1804,7734,13277,5397,8861,13447,9709,19568,11106,3075,12902,5203210,8574,892,996,28,38,18,3,19,23,5991305,2840786,2,6,9,2,7,7,3,7,205,66,26675393,1305642,16672,43887,3,318,4,1281,3,2124363,23029351,8163,3394,6942,10736,27312,2631,6721,47381,22622,7553,7612,8182,149,10658,7068,2839,28715,9235,36,814,7766,3824,6749,155,2,2482,13504,7736,6597,2,1036,1504,779,3820,206,122,1543,1674,4,3004,10418,9255,410,518,5719,1010,6,654,5633,687,930,1819,2,3926,1119,3,5,1766,1244,2695,2757,253,1465,975,4259,853,216,5568,548,134,451,208,5406,441,339,2494,5027,1927,286,2,9,623,1375,1214,2,1,782,3,5,812,3750,294,4547,1650,731,367,3,194,918,799,182,274,33,221,1858,2,907,3993,96,2765,117,2000,704,1221,357,1674,30,3,2,877,1727,277,850,1184,69,718,6,376,127,592,513,71,843,407,641,134,565,54,44,2236,152,156,93,882,26,6,5,557,4,2,4,952,702,1413,1033,4,2349,748,712,58,442,122,3,496,102,64,30,190,50,5,122,99,500,3,629,413,388,821,297,1382,345,4710,4,483,1088,549,279,125,393,1,8,1,1,4,1,14,238,585,4,35,41,215,161,156,1027,360,4,3,490,369,56,187,949,2,5,2,186,148,208,332,1948,691,12,276,25,3,325,7,13,332,434,13,3,39,51,192,308,1,869,281,685,3,1024,4,2,3,277,348,542,687,4,2,3,126,119,827,370,295,475,374,26,251,106,462,1011,21513415,3,14475,3,7053,1112,47,616,229,2712,115,
  
```

Arp:



```
harshgopal — -zsh — 80x24
(base) $ arp -a
? (192.168.1.1) at b4:a7:c6:1c:14:b0 on en0 ifscope [ethernet]
? (192.168.1.8) at f0:a7:31:92:51:40 on en0 ifscope [ethernet]
mdns.mcast.net (224.0.0.251) at 1:0:5e:0:0:fb on en0 ifscope permanent [ethernet]
]
? (239.192.152.143) at 1:0:5e:40:98:8f on en0 ifscope permanent [ethernet]
? (239.255.255.250) at 1:0:5e:7f:ff:fa on en0 ifscope permanent [ethernet]
(base) $
```

5. Learning Outcome:

- i) Understand how to display and configure IP addresses, subnet masks, and other interface settings.
- ii) ii) Learn to manage network interfaces, routing tables, and IP addresses.
- iii) Identify active connections and troubleshoot network issues.
- iv) Verify the reachability of a network device and measure round-trip time for messages sent.
- v) Diagnose routing issues and identify the path packets take across the network.