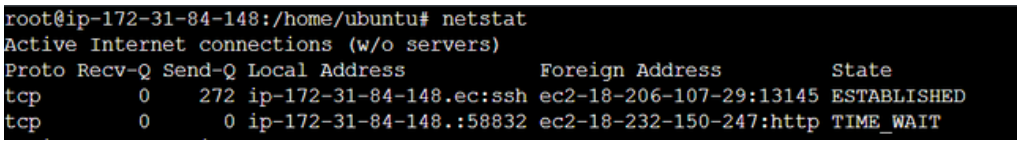
Networking Commands for DevOps

1.ping - To check the reachability of a host on an Internet Protocol (IP) network.

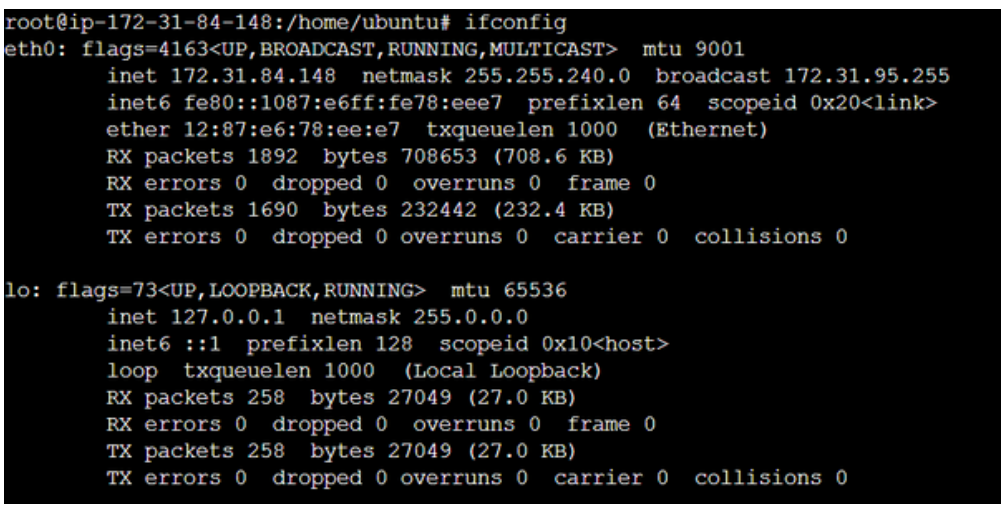
```
root@ip-172-31-84-148:/home/ubuntu# ping google.com
PING google.com (142.251.111.139) 56(84) bytes of data.
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=1 ttl=58 time=1.67 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=2 ttl=58 time=1.66 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=3 ttl=58 time=1.70 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=4 ttl=58 time=1.79 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=5 ttl=58 time=1.73 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=6 ttl=58 time=1.69 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=7 ttl=58 time=1.72 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=8 ttl=58 time=1.73 ms
64 bytes from bk-in-f139.1e100.net (142.251.111.139): icmp_seq=9 ttl=58 time=1.74 ms
```

2. netstat - To display active network connections, routing tables, interface statistics, masquerade connections, and multicast memberships.



```
root@ip-172-31-84-148:/home/ubuntu# netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0    272 ip-172-31-84-148.ec:ssh ec2-18-206-107-29:13145 ESTABLISHED
tcp        0      0 ip-172-31-84-148.:58832 ec2-18-232-150-247:http TIME_WAIT
```

3. ifconfig - To display the configuration of network interfaces.



```
root@ip-172-31-84-148:/home/ubuntu# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 9001
        inet 172.31.84.148  netmask 255.255.240.0  broadcast 172.31.95.255
        inet6 fe80::1087:e6ff:fe78:eee7  prefixlen 64  scopeid 0x20<link>
        ether 12:87:e6:78:ee:e7  txqueuelen 1000  (Ethernet)
        RX packets 1892  bytes 708653 (708.6 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 1690  bytes 232442 (232.4 KB)
        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 258  bytes 27049 (27.0 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 258  bytes 27049 (27.0 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

4. traceroute - To display the route and measure transit delays of packets across an Internet Protocol network

```
root@ip-172-31-84-148:/home/ubuntu# traceroute google.com
traceroute to google.com (142.251.111.139), 64 hops max
  1   3.236.63.255  0.670ms  8.231ms  8.921ms
  2   240.3.20.98  0.442ms  0.366ms  0.326ms
  3   100.66.36.74  3.134ms  8.139ms  8.241ms
  4   240.0.236.7  0.900ms  0.835ms  0.777ms
  5   100.100.36.104  4.867ms  1.190ms  1.420ms
  6   242.2.213.199  0.970ms  1.027ms  0.935ms
  7   99.83.65.1  1.251ms  1.186ms  1.218ms
  8   100.66.52.140  0.871ms  8.230ms  8.100ms
  9   142.251.49.187  2.091ms  2.083ms  2.118ms
 10   172.253.71.206  3.337ms  3.101ms  3.112ms
 11   142.251.67.255  2.813ms  2.712ms  2.819ms
 12   242.2.213.195  7.521ms  0.997ms  1.019ms
 13   142.251.68.23  3.505ms  3.188ms  3.171ms
```

5. mtr - The mtr command is typically used to combine the functionalities of the ping and traceroute commands.

```
                                 My traceroute  [v0.95]
ip-172-31-84-148 (172.31.84.148) -> youtube.com (172.253.122.91)                2024-02-16T03:50:04+0000
Keys:  Help   Display mode   Restart statistics   Order of fields   quit
                                                 Packets               Pings
Host                                            Loss%   Snt   Last   Avg  Best  Wrst StDev
 1. (waiting for reply)
 2. (waiting for reply)
 3. (waiting for reply)
 4. 241.0.5.11                                   0.0%    17    0.5   0.5   0.4   0.5   0.0
 5. 240.0.236.4                                  0.0%    17    1.7   0.8   0.6   1.7   0.2
 6. 100.100.34.98                                0.0%    16    0.7   2.3   0.6  12.3   3.3
 7. 99.83.115.173                                0.0%    16    1.4   1.3   1.2   1.4   0.1
 8. 108.170.240.97                               0.0%    16    2.5   2.1   1.6   2.9   0.4
 9. 108.170.240.112                              0.0%    16    1.2   1.5   0.9   5.6   1.2
10. 216.239.48.95                                0.0%    16    1.9   2.0   1.7   2.4   0.2
11. 142.250.215.195                              0.0%    16    3.1   3.0   2.1   4.6   0.7
12. 172.253.79.84                                0.0%    16    6.7   4.0   1.6  17.8   4.9
13. 172.253.67.65                                0.0%    16    2.7   2.7   2.6   3.1   0.1
14. (waiting for reply)
15. (waiting for reply)
16. (waiting for reply)
17. (waiting for reply)
18. (waiting for reply)
19. (waiting for reply)
20. (waiting for reply)21. (waiting for reply)22. (waiting for reply)23. bh-in-f91.1e100.net  0.0%    16    2.0   1.8   1.8   2.0   0.1
```

6. telnet - The telnet command can be used in one line to establish a connection to a specific host and port

```
root@ip-172-31-84-148:/home/ubuntu# telnet google.com 443
Trying 172.253.63.138...
Connected to google.com.
Escape character is '^]'.
```

7. iwconfig- The iwconfig command is typically used to configure wireless network interfaces on Linux systems.

```
root@ip-172-31-84-148:/home/ubuntu# iwconfig
lo        no wireless extensions.

eth0      no wireless extensions.
```

8. dig - To query DNS name servers for information about host addresses, mail exchanges, name servers, and related information.

```
root@ip-172-31-84-148:/home/ubuntu# dig google.com

; <<>> DiG 9.18.18-0ubuntu0.22.04.1-Ubuntu <<>> google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 43929
;; flags: qr rd ra; QUERY: 1, ANSWER: 6, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;google.com.                    IN      A

;; ANSWER SECTION:
google.com.             83      IN      A       172.253.63.139
google.com.             83      IN      A       172.253.63.100
google.com.             83      IN      A       172.253.63.102
google.com.             83      IN      A       172.253.63.113
google.com.             83      IN      A       172.253.63.101
google.com.             83      IN      A       172.253.63.138

;; Query time: 4 msec
;; SERVER: 127.0.0.53#53(127.0.0.53) (UDP)
;; WHEN: Fri Feb 16 03:54:52 UTC 2024
;; MSG SIZE  rcvd: 135
```

9. whois - The whois command is used to retrieve information about registered domain names, IP addresses, and autonomous system numbers.

```
The Registry database contains ONLY .COM, .NET, .EDU domains and
Registrars.
Domain Name: google.com
Registry Domain ID: 2138514_DOMAIN_COM-VRSN
Registrar WHOIS Server: whois.markmonitor.com
Registrar URL: http://www.markmonitor.com
Updated Date: 2019-09-09T15:39:04+0000
Creation Date: 1997-09-15T07:00:00+0000
Registrar Registration Expiration Date: 2028-09-13T07:00:00+0000
Registrar: MarkMonitor, Inc.
Registrar IANA ID: 292
Registrar Abuse Contact Email: abusecomplaints@markmonitor.com
Registrar Abuse Contact Phone: +1.2086851750
Domain Status: clientUpdateProhibited (https://www.icann.org/epp#clientUpdateProhibited)
Domain Status: clientTransferProhibited (https://www.icann.org/epp#clientTransferProhibited)
Domain Status: clientDeleteProhibited (https://www.icann.org/epp#clientDeleteProhibited)
Domain Status: serverUpdateProhibited (https://www.icann.org/epp#serverUpdateProhibited)
Domain Status: serverTransferProhibited (https://www.icann.org/epp#serverTransferProhibited)
Domain Status: serverDeleteProhibited (https://www.icann.org/epp#serverDeleteProhibited)
Registrant Organization: Google LLC
Registrant State/Province: CA
Registrant Country: US
Registrant Email: Select Request Email Form at https://domains.markmonitor.com/whois/google.com
Admin Organization: Google LLC
Admin State/Province: CA
```

10. wget - The wget command is used for downloading files from the internet.

```
root@ip-172-31-84-148:/home/ubuntu# wget http://ftp.gnu.org/gnu/wget/wget2-2.0.0.tar.gz
--2024-02-16 04:08:24--  http://ftp.gnu.org/gnu/wget/wget2-2.0.0.tar.gz
Resolving ftp.gnu.org (ftp.gnu.org)... 209.51.188.20, 2001:470:142:3::b
Connecting to ftp.gnu.org (ftp.gnu.org)|209.51.188.20|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3565643 (3.4M) [application/x-gzip]
Saving to: 'wget2-2.0.0.tar.gz.3'

wget2-2.0.0.tar.gz.3                100%[=============================================================================>]   3.40M  18.2MB/s    in 0.2s

2024-02-16 04:08:24 (18.2 MB/s) - 'wget2-2.0.0.tar.gz.3' saved [3565643/3565643]
```

11. route - The route command is used to view and manipulate the IP routing table in a Unix-like operating system. Here's an example of using the route command in one line to display the routing table:

```
root@ip-172-31-84-148:/home/ubuntu# route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         ip-172-31-80-1. 0.0.0.0         UG    100    0        0 eth0
ip-172-31-0-2.e ip-172-31-80-1. 255.255.255.255 UGH   100    0        0 eth0
172.31.80.0     0.0.0.0         255.255.240.0   U     100    0        0 eth0
ip-172-31-80-1. 0.0.0.0         255.255.255.255 UH    100    0        0 eth0
```

12. curl - The curl command is used to transfer data to or from a server, typically using HTTP or HTTPS protocols.

```
root@ip-172-31-84-148:/home/ubuntu# curl -L https://dummy.restapiexample.com/api/v1/employees | jq
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  2561    0  2561    0     0   6482      0 --:--:-- --:--:-- --:--:--  6500
{
  "status": "success",
  "data": [
    {
      "id": 1,
      "employee_name": "Tiger Nixon",
      "employee_salary": 320800,
      "employee_age": 61,
      "profile_image": ""
    },
    {
      "id": 2,
      "employee_name": "Garrett Winters",
      "employee_salary": 170750,
      "employee_age": 63,
      "profile_image": ""
    },
    {
      "id": 3,
      "employee_name": "Ashton Cox",
      "employee_salary": 86000,
      "employee_age": 66,
      "profile_image": ""
    },
    {
      "id": 4,
      "employee_name": "Cedric Kelly",
      "employee_salary": 433060,
```

13. nmap - The nmap is a powerful network scanning tool used for discovering hosts and services on a computer network.

```
Starting Nmap 7.80 ( https://nmap.org ) at 2024-02-16 04:10 UTC
Initiating Ping Scan at 04:10
Scanning google.com (172.253.63.101) [4 ports]
Completed Ping Scan at 04:10, 0.01s elapsed (1 total hosts)
Initiating Parallel DNS resolution of 1 host. at 04:10
Completed Parallel DNS resolution of 1 host. at 04:10, 0.00s elapsed
Initiating SYN Stealth Scan at 04:10
Scanning google.com (172.253.63.101) [1000 ports]
Discovered open port 443/tcp on 172.253.63.101
Discovered open port 80/tcp on 172.253.63.101
Completed SYN Stealth Scan at 04:10, 4.84s elapsed (1000 total ports)
Nmap scan report for google.com (172.253.63.101)
Host is up (0.0013s latency).
Other addresses for google.com (not scanned): 172.253.63.102 172.253.63.113 172.253.63.138 172.253.63.139 172.253.63.100 2607:f8b0:4004:c1d::71 2607:f8b0:4004:c1d::8b
 2607:f8b0:4004:c1d::64 2607:f8b0:4004:c1d::65
rDNS record for 172.253.63.101: bi-in-f101.1e100.net
Not shown: 998 filtered ports
PORT    STATE SERVICE
80/tcp  open  http
443/tcp open  https

Read data files from: /usr/bin/../share/nmap
Nmap done: 1 IP address (1 host up) scanned in 4.94 seconds
           Raw packets sent: 2004 (88.152KB) | Rcvd: 5 (220B)
```

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