Linux Networking Commands

Linux provides a wide range of networking commands to manage interfaces, test connectivity, monitor traffic, and configure services. Below are essential and advanced networking commands with examples and explanations.

```
$ ifconfig
eth0: flags=4163 mtu 1500
inet 192.168.1.10 netmask 255.255.255.0 broadcast 192.168.1.255
ether 08:00:27:4a:6b:9c txqueuelen 1000 (Ethernet)
RX packets 10234 bytes 1540234 (1.5 MB)
TX packets 9823 bytes 1423990 (1.4 MB)
```

Displays network interface configuration. Deprecated in modern systems but still widely used.

```
$ ip addr show
2: eth0: mtu 1500
inet 192.168.1.10/24 brd 192.168.1.255 scope global dynamic eth0
valid_lft 86389sec preferred_lft 86389sec
```

Displays IP address and network information using the modern 'ip' command.

```
$ ping -c 4 google.com
PING google.com (142.250.190.14) 56(84) bytes of data.
64 bytes from del03s08-in-f14.1e100.net (142.250.190.14): icmp_seq=1
ttl=118 time=22.6 ms

--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
```

Tests network connectivity by sending ICMP echo requests to a remote host.

```
$ traceroute google.com
traceroute to google.com (142.250.190.14), 30 hops max
1 192.168.1.1 (192.168.1.1) 1.123 ms
2 10.0.0.1 (10.0.0.1) 10.654 ms
3 * * *
4 142.250.190.14 (142.250.190.14) 20.234 ms
```

Shows the path packets take to reach a destination, useful for diagnosing routing issues.

```
$ netstat -tuln
Proto Recv-Q Send-Q Local Address Foreign Address State
TCP 0 0 0.0.0.0:22 0.0.0.0:* LISTEN
UDP 0 0 0.0.0.0:68 0.0.0.0:*
```

Displays open ports and active listening services.

```
$ ss -tuln
Netid State Recv-Q Send-Q Local Address:Port Peer Address:Port
udp UNCONN 0 0 0.0.0.0:68 0.0.0.0:*
```

```
tcp LISTEN 0 128 0.0.0.0:22 0.0.0.0:*
```

Modern replacement for netstat, showing socket statistics and network connections.

```
$ nslookup example.com
Server: 8.8.8.8
Address: 8.8.8.8#53

Non-authoritative answer:
Name: example.com
Address: 93.184.216.34
```

Performs DNS lookup for the specified domain to find its IP address.

```
$ dig example.com
;; ANSWER SECTION:
example.com. 86400 IN A 93.184.216.34
```

Detailed DNS query showing authoritative and non-authoritative responses.

```
$ curl -I https://www.google.com
HTTP/2 200
content-type: text/html; charset=ISO-8859-1
cache-control: private, max-age=0
expires: -1
```

Fetches headers from a web server, useful for checking response codes and headers.

```
$ wget https://example.com/sample.txt
--2025-10-31-- https://example.com/sample.txt
Resolving example.com... 93.184.216.34
Connecting to example.com|93.184.216.34|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2048 (2.0K) [text/plain]
Saving to: ‘sample.txt’
```

Downloads files from the internet directly from the command line.

```
$ ssh user@192.168.1.15
user@192.168.1.15's password:
Welcome to Ubuntu 22.04 LTS
$ hostname
server1
```

Connects securely to a remote machine via SSH (Secure Shell).

```
$ scp notes.txt user@192.168.1.15:/home/user/
notes.txt 100% 2048 2.0KB/s 00:00
```

Copies files securely to a remote host using SSH-based secure copy protocol.