Networking (Core)

Linux Commands Course · Section 12

Goal

Learn to inspect, test, and interact with network connections on Linux.

You'll explore interfaces, routing, sockets, connectivity tests, DNS, HTTP tools, and remote access.

Network Interfaces — ip a

Show all network interfaces and their IP addresses:

ip a

Example output:

2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 inet 192.168.1.10/24 brd 192.168.1.255 scope global eth0

- eth0, wlan0 interface names
- inet IPv4 address
- inet6 IPv6 address
- state interface status (UP/DOWN)

Bring an interface up or down (root required):

sudo ip link set eth0 up
sudo ip link set eth0 down

Routing Table — ip r

View the system routing table:

Example output:

default via 192.168.1.1 dev eth0 192.168.1.0/24 dev eth0 proto kernel scope link src 192.168.1.10

- default via → default gateway
 dev eth0 → which interface is used
- src → local source IP

Add or delete temporary routes:

sudo ip route add 10.10.0.0/16 via 192.168.1.1 sudo ip route del 10.10.0.0/16

Active Connections — ss (modern tool)

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ss (socket statistics) shows open ports and connections.

ss -tulpn

t + TCP

u - UDP

l + listening sockets

p - show process using port

n + show numeric addresses

Example:

Netid State Recv-Q Send-Q Local Address:Port Peer Address:Port Process
tcp LISTEN 0 128 0.0.0.0:* users:(("sshd",pid=745,fd=3))

Legacy tool (if available):

netstat -tulpn
```

Connectivity - ping

Test reachability of a host.		
	ping 8.8.8.8	
Send a limited number of packets:		
	ping -c 4 example.com	
Interrupt anytime with Ctrl+C.		

Tracing Network Path — traceroute / tracepath

Show each hop between you and a destination.		
	traceroute example.com	
If not installed, try:		
	tracepath example.com	
Output shows latency at each hop — useful for debugging routing or latency issues.		

DNS Lookups — dig and host



HTTP & File Transfers — curl and wget



Remote Access — ssh

Securely log into another machine:		
	ssh user@192.168.1.50	
Use a key file instead of a password:		
	ssh -i ~/.ssh/id_rsa user@host	
Exit remote session with exit or Ctrl+D.		
Copy files securely using SSH:		
	scp report.txt user@192.168.1.50:/home/user/	
Copy entire directories recursively:		
	<pre>scp -r project/ user@host:/backup/</pre>	

Legacy Tool — telnet

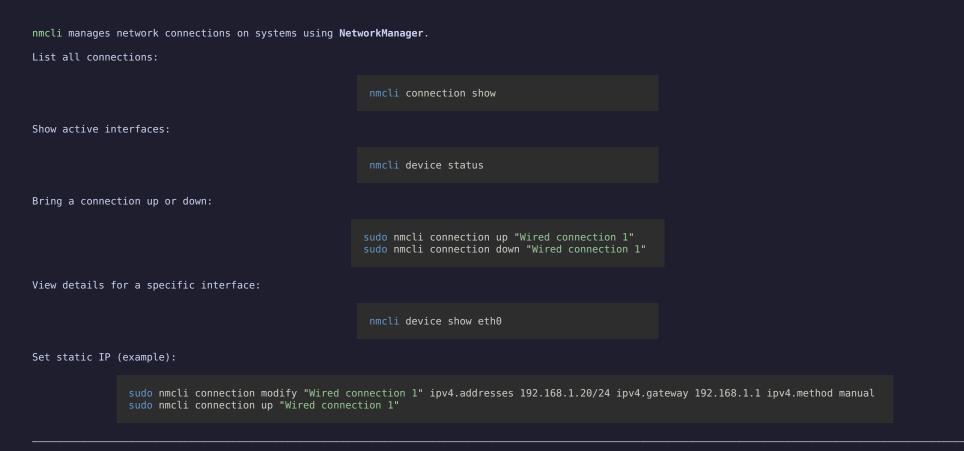
Used for basic connectivity testing (not secure).

telnet example.com 80

If it connects, the port is open.

Use only for debugging — not for remote login.

NetworkManager CLI - nmcli



Recap

- ip a, ip r view interfaces and routes
 ss -tulpn active sockets and ports
- ping, traceroute, tracepath connectivity testing
- dig, host DNS queries
- curl, wget HTTP and file transfers
- ssh, scp, telnet remote access and copy
 nmcli manage connections via NetworkManager

These tools form the backbone of network troubleshooting and configuration.

Practice

- 1. List your current IP address and default route.
- 2. Show which services are listening on ports.
- Show which services are tistering on ports.
 Test connectivity to google.com and view the route it takes.
 Query DNS for the MX records of example.com.
 Download a web page with curl and wget.
 Copy a local file to a remote system using scp.
 Bring your wired connection down and up again with nmcli.

Next Up

Packages & Software Management (Core) — installing, updating, and removing software.