



Basic Network Information

IP Configuration

<code>ipconfig</code> (Windows)	Displays IP address, subnet mask, default gateway, and DNS settings. Example: <code>ipconfig /all</code>
<code>ifconfig</code> (Linux/macOS)	Configures network interfaces and displays IP address information. Example: <code>ifconfig eth0</code>
<code>ip addr</code> (Linux)	Modern replacement for ifconfig, displays detailed IP information. Example: <code>ip addr show eth0</code>
<code>hostname -I</code> (Linux)	Displays the IP address(es) of the host. Example: <code>hostname -I</code>
<code>nslookup</code> <hostname>	Query DNS server to obtain domain name or IP address mapping, or other DNS records. Example: <code>nslookup google.com</code>

Routing Information

<code>route print</code> (Windows)	Displays the routing table. Example: <code>route print</code>
<code>netstat -r</code> (Windows)	Also displays the routing table. Example: <code>netstat -r</code>
<code>route -n</code> (Linux/macOS)	Displays the kernel IP routing table. Example: <code>route -n</code>
<code>tracert</code> <destination> (Linux/macOS)	Traces the route packets take to a network host. Example: <code>tracert google.com</code>
<code>tracert <destination></code> (Windows)	The Windows version of traceroute. Example: <code>tracert google.com</code>

Network Statistics

<code>netstat -a</code>	Displays all active TCP connections and listening ports. Example: <code>netstat -a</code>
<code>netstat -an</code>	Displays active TCP connections and ports (numerical). Example: <code>netstat -an</code>
<code>netstat -tulpn</code> (Linux)	Shows listening TCP and UDP ports with process ID. Example: <code>netstat -tulpn</code>
<code>ss -tulpn</code> (Linux)	Another utility to investigate sockets. Example: <code>ss -tulpn</code>

Connectivity Testing

Ping

<code>ping <destination></code>	Tests connectivity to a network host. Example: <code>ping google.com</code>
<code>ping -t <destination></code> (Windows)	Pings the specified host until stopped. Example: <code>ping -t google.com</code>
<code>ping -c <count></code> <destination> (Linux/macOS)	Sends a specified number of ICMP echo requests. Example: <code>ping -c 4 google.com</code>

Telnet & Netcat

<code>telnet <host></code> <port>	Tests connectivity to a specific port on a host. Example: <code>telnet google.com 80</code>
<code>nc -zv <host></code> <port>	Netcat: versatile tool for network connections. Example: <code>nc -zv google.com 80</code>
<code>nc -l -p</code> <port>	Netcat: Listens on a specific port. Example: <code>nc -l -p 12345</code>

Pathping (Windows)

<code>pathping</code> <destination>	Provides information about network latency and packet loss at intermediate hops between a source and a destination. Example: <code>pathping google.com</code>
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Network Configuration

Interface Configuration (Linux)

<code>ip link set <interface> up</code>	Brings a network interface up. Example: <pre>ip link set eth0 up</pre>
<code>ip link set <interface> down</code>	Brings a network interface down. Example: <pre>ip link set eth0 down</pre>
<code>ip addr add <ip_address>/<cidr> dev <interface></code>	Assigns an IP address to a network interface. Example: <pre>ip addr add 192.168.1.10/24 dev eth0</pre>
<code>ip route add default via <gateway_ip></code>	Sets the default gateway. Example: <pre>ip route add default via 192.168.1.1</pre>

Firewall Management

<code>firewall-cmd --zone=public --add-port=<port>/tcp --permanent</code> (CentOS/RHEL)	Opens a port in the firewall. Example: <pre>firewall-cmd --zone=public --add-port=80/tcp --permanent firewall-cmd --reload</pre>
<code>ufw allow <port></code> (Ubuntu)	Allows traffic on a specific port. Example: <pre>ufw allow 80 ufw enable</pre>
<code>iptables -A INPUT -p tcp --dport <port> -j ACCEPT</code> (Generic Linux)	Adds a rule to accept TCP traffic on a specific port. Example: <pre>iptables -A INPUT -p tcp --dport 80 -j ACCEPT service iptables save</pre>

Wireless Networking

Wireless Information (Linux)

<code>iwconfig</code>	Displays wireless interface configuration. Example: <pre>iwconfig wlan0</pre>
<code>iwlist <interface> scan</code>	Scans for available wireless networks. Example: <pre>iwlist wlan0 scan</pre>
<code>nmcli dev wifi list</code>	Lists available Wi-Fi networks using NetworkManager. Example: <pre>nmcli dev wifi list</pre>

Wireless Connection (Linux)

<code>nmcli dev wifi connect <SSID> password <password></code>	Connects to a Wi-Fi network using NetworkManager. Example: <pre>nmcli dev wifi connect MyNetwork password MyPassword</pre>
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Troubleshooting

When troubleshooting network issues, consider the following:

- Check physical connections:** Ensure cables are properly connected.
- Verify IP configuration:** Confirm correct IP address, subnet mask, and gateway.
- Test connectivity:** Use `ping` to verify basic network reachability.
- Check DNS resolution:** Ensure DNS is resolving hostnames correctly using `nslookup`.
- Inspect firewall rules:** Make sure necessary ports are open.
- Examine routing table:** Confirm packets are being routed correctly.