

Homework 2: Network Tools and Analysis

CN Sec A 2025

Instructions

1. For each question below, execute the required commands on your system, carefully record the output, and analyze your findings.
2. This homework should be done in your assigned group, the group report should be submitted by all group members to Google classroom.

Questions

Q1. Exploring Network Interfaces with `ifconfig` (5 Marks)

Run the `ifconfig` command on your machine.

- Identify all available network interfaces (wired, wireless, loopback, etc.).
- For your active interface, report:
 - IP address (IPv4 and IPv6 if available)
 - MAC address (if available)
 - RX/TX packet counts and errors
- Add a screenshot of `ifconfig`'s output.

Q2. Tracing Routes with `traceroute` and `mtr` (5 Marks)

Use both `traceroute` and `mtr` command to trace the route to `google.co.in`.

- Add a screenshot to report for both commands.
- How many hops or intermediate IP addresses do you observe in each command?
- If you observe “* * *” in a hop in `traceroute`'s output, then research and report a few possible reasons for it?
- Lookup your IP address and geolocation using “www.whatismyip.com” website and report it.
- If there are any non-local IP addresses in the `traceroute` or `mtr`, i.e. IP addresses not in ranges 10.0.0.0 to 10.255.255.255, 172.16.0.0 to 172.31.255.255, 192.168.0.0 to 192.168.255.255, then report their geolocation using “check-host.net” website, and the netname, descr attributes using `whois` shell command. In case `traceroute` doesn't show any non-local IP address or geolocation isn't available then mention that in the report.

Q3. DNS Analysis with nslookup and dig (5 Marks)

Use nslookup and dig to query the IP addresses of google.com.

- Compare the outputs of both tools. Do they report the same IP address? When you use this IP address as URL in browser, does it open Google's home-page?
- Find IP address of an *Authoritative Nameserver* of "google.com" using command "nslookup -type=NS google.com". Then query the authority name server using command "nslookup google.com - <IP address of authoritative name server >". Attach screenshot of this step in the report.

Q4. Measuring Traffic with iftop (5 Marks)

Run iftop while browsing or streaming content on your browser.

- Add a screenshot of the top 3 connections consuming bandwidth to the report.
- Report the source/destination IPs and bandwidth usage.
- What type of applications might be generating this traffic?