

# Networking Project 1

290396

Akash Nadigepu

Date : 15/01/2025

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## Project 1: Tracert and Ping to google.com

### Objective

Analyse the network path and response times to google.com using **tracert** and **ping** commands.

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### Tools Used

- Command Prompt on Windows
  - tracert and ping commands
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### Part 1: Ping Analysis

```
C:\Users\290396>ping google.com

Pinging google.com [142.251.42.46] with 32 bytes of data:
Reply from 142.251.42.46: bytes=32 time=41ms TTL=117
Reply from 142.251.42.46: bytes=32 time=47ms TTL=117
Reply from 142.251.42.46: bytes=32 time=748ms TTL=117
Reply from 142.251.42.46: bytes=32 time=49ms TTL=117

Ping statistics for 142.251.42.46:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 41ms, Maximum = 748ms, Average = 221ms
```

### Analysis:

- **Key Points:**
    - The destination IP is 142.251.42.46.
    - Response times range between 41 ms and 748 ms, with an average of 221 ms.
    - No packet loss occurred, indicating a stable connection.
  - **Observation:** The high maximum latency (748 ms) may be due to temporary network congestion or routing issues.
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## Part 2: Tracert Analysis

```
C:\Users\290396>tracert google.com

Tracing route to google.com [142.250.67.174]
over a maximum of 30 hops:

 1  *      *      *      Request timed out.
 2  28 ms  33 ms  28 ms  136.226.252.98
 3  *      28 ms  *      136.226.252.3
 4  30 ms  30 ms  *      ix-be-26.ecore1.cxr-chennai.as6453.net [180.87.174.45]
 5  29 ms  31 ms  32 ms  209.85.149.232
 6  31 ms  52 ms  29 ms  216.239.43.131
 7  30 ms  29 ms  30 ms  142.251.50.58
 8  31 ms  33 ms  31 ms  172.253.72.136
 9  50 ms  52 ms  55 ms  142.250.212.4
10  57 ms  59 ms  58 ms  192.178.110.199
11  59 ms  56 ms  56 ms  142.250.227.73
12  58 ms  61 ms  59 ms  bom12s07-in-f14.1e100.net [142.250.67.174]

Trace complete.
```

### Analysis:

- The traceroute reveals multiple hops between the source (my system) and the destination (google.com).
  - **Key Points:**
    - Initial hops show private IPs (likely ISP routing).
    - Later hops include Google-owned IPs (e.g., 142.250.67.174).
    - The total time to reach google.com is approximately 58-61 ms in the last hop.
  - **Observation:** One hop timed out (hop 1). This could indicate a firewall or device that does not respond to ICMP packets.
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