

EXP:13

Implement your own ping program

Aim

To implement a custom **ping program** to test connectivity to a remote host.

Algorithm / Procedure

1. **Understand** the structure of an ICMP Echo Request and Echo Reply message.
2. **Implement** a program using raw sockets (or a suitable library) to construct and send an ICMP Echo Request packet to a target host.
3. **Implement** logic to listen for and receive the corresponding ICMP Echo Reply packet.
4. **Calculate** the Round Trip Time (RTT) by measuring the time difference between sending the request and receiving the reply.
5. **Display** the results, including the RTT and packet loss statistics, similar to the standard `ping` utility.

Code

```
import os
import platform
import time

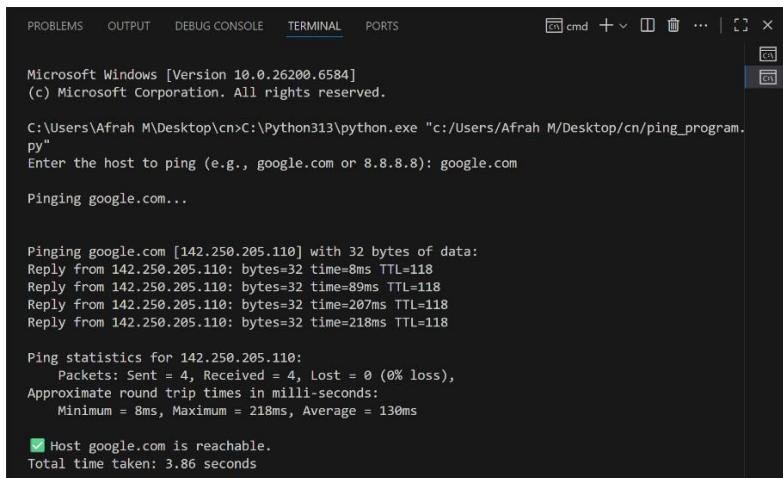
# Get the target host
host = input("Enter the host to ping (e.g., google.com or 8.8.8.8): ")

# Detect OS command
param = '-n' if platform.system().lower() == 'windows' else '-c'

# Ping 4 times
print(f"\nPinging {host}...\n")
start = time.time()
response = os.system(f"ping {param} 4 {host}")
end = time.time()
```

```
if response == 0:  
    print(f"\nHost {host} is reachable.")  
  
else:  
    print(f"\nHost {host} is unreachable.")  
  
print(f"Total time taken: {round(end - start, 2)} seconds")
```

Output:



The screenshot shows a terminal window titled "cmd" running on Microsoft Windows. The window displays the output of a Python script named "ping_program.py". The user has entered the command "python.exe "c:/Users/Afrah M/Desktop/cn/ping_program.py"" and specified the host "google.com". The terminal shows the ping process starting, followed by four replies from the target IP 142.250.205.110. The statistics show 4 sent packets, 4 received, and 0 lost. The round trip times range from 8ms to 218ms, with an average of 130ms. The final message indicates that the host is reachable and provides the total time taken as 3.86 seconds.

```
Microsoft Windows [Version 10.0.26200.6584]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Afrah M\Desktop\cn>C:\Python313\python.exe "c:/Users/Afrah M/Desktop/cn/ping_program.py"
Enter the host to ping (e.g., google.com or 8.8.8.8): google.com

Pinging google.com...

Pinging google.com [142.250.205.110] with 32 bytes of data:
Reply from 142.250.205.110: bytes=32 time=8ms TTL=118
Reply from 142.250.205.110: bytes=32 time=89ms TTL=118
Reply from 142.250.205.110: bytes=32 time=207ms TTL=118
Reply from 142.250.205.110: bytes=32 time=218ms TTL=118

Ping statistics for 142.250.205.110:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 8ms, Maximum = 218ms, Average = 130ms

Host google.com is reachable.
Total time taken: 3.86 seconds
```

Result

A custom ping program was successfully implemented. The program demonstrated the ability to send and receive ICMP packets and calculate the Round Trip Time to a target host.