

UDP Lab

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For this lab we created a client that pings a server over UDP. A connection is not needed for UDP so we have to check for timeouts.

```
(base) jacobarmiger ECE453_Lab2 % python3 UDPPingerServer.py
Server listening on port 12000
[]

(base) jacobarmiger ECE453_Lab2 % python3 clientUDP.py
PING 127.0.0.1 0.293 ms
Request timed out
Request timed out
PING 127.0.0.1 0.192 ms
Request timed out
PING 127.0.0.1 0.387 ms
PING 127.0.0.1 0.167 ms
PING 127.0.0.1 0.161 ms
Request timed out
PING 127.0.0.1 0.372 ms
Max RTT:      0.39 ms
Min RTT:      0.16 ms
Average RTT:  0.26 ms
Packet loss:  40.00%
(base) jacobarmiger ECE453_Lab2 %
```

1. Once the client program starts running, it attempts to send a ping to the server over UDP.
2. Above you can see that the successful pings are put in uppercase and sent back to the client. The client prints these pings.
3. A Round Trip Time(RTT) is calculated and printed after each successful ping message.
4. When a ping is not recieved from the server “Request timed out” is printed.

Extra Credit

```
(base) jacobarmiger ECE453_Lab2 % python3 UDPPingerServer.py
Server listening on port 12000
Heartbeat: no longer recieving packets
Heartbeat: no longer recieving packets
[]

(base) jacobarmiger ECE453_Lab2 % python3 clientUDP.py
PING 127.0.0.1 0.293 ms

Request timed out

Request timed out

PING 127.0.0.1 0.192 ms

Request timed out

PING 127.0.0.1 0.387 ms

PING 127.0.0.1 0.167 ms

PING 127.0.0.1 0.161 ms

Request timed out

PING 127.0.0.1 0.372 ms

Max RTT:      0.39 ms
Min RTT:      0.16 ms
Average RTT:   0.26 ms
Packet loss:  40.00%
(base) jacobarmiger ECE453_Lab2 %
```

1. After all ping messages are sent, the RTT stats are printed out to the client
2. When the server does not receive a ping for a period of time, the heartbeat lets the server know that no data has been received