

Introduction

In this project we implemented a traceroute application using ICMP request and reply messages. This included correctly forming the header and parsing through the messages received from the host.

a. Instructions

- Program is in Python 3
- Run the program by typing **py -3 Traceroute.py** in a Windows command prompt
- Run in administrator mode

b. Include screenshots of your running code for four different hosts with at least two on different continents.

1. oregonstate.edu

```
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
 1 rtt=0 ms 192.168.1.1
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 28448 ID: 0 seq: 0
 2 rtt=12 ms 50.53.144.1
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 13339 ID: 0 seq: 0
 3 rtt=12 ms 50.46.177.74
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
 4 rtt=0 ms 50.46.176.0
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 33173 ID: 0 seq: 0
 5 rtt=0 ms 50.46.176.5
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 6 rtt=4 ms 204.194.220.5
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 7 rtt=12 ms 107.191.236.116
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 8 rtt=12 ms 107.191.236.115
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 54850 ID: 0 seq: 0
 9 rtt=0 ms 198.32.195.102
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
10 rtt=0 ms 52.93.20.68
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 24443 ID: 0 seq: 0
11 rtt=12 ms 52.93.20.77
0 error code = time to live exceeded in transit
* * * Request timed out.
```

2. gaia.cs.umass.edu

```
E:\SCHOOL\CS\CS372\project_3>py -3 Traceroute.py
Argument List: ['Traceroute.py']
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
  1    rtt=0 ms    192.168.1.1
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 41048 ID: 0 seq: 0
  2    rtt=28 ms    50.53.144.1
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 27485 ID: 0 seq: 0
  3    rtt=36 ms    50.46.177.74
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
  4    rtt=48 ms    50.46.176.0
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 52200 ID: 0 seq: 0 # 2
  5    rtt=52 ms    50.46.176.5
0 error code = time to live exceeded in transit u.
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0 ncs
  6    rtt=64 ms    204.194.220.5
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
  7    rtt=60 ms    107.191.236.116
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
  8    rtt=40 ms    107.191.236.115
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
  9    rtt=36 ms    107.191.236.22
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 10    rtt=40 ms    38.104.105.145
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 11    rtt=72 ms    154.54.42.149
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 12    rtt=84 ms    154.54.44.74
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 13    rtt=88 ms    154.54.41.146
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 14    rtt=88 ms    154.54.5.90
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 15    rtt=152 ms    154.54.42.166
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 16    rtt=136 ms    154.54.6.222
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 17    rtt=88 ms    154.54.26.130
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 18    rtt=88 ms    154.54.27.54
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 40745 ID: 0 seq: 0
 19    rtt=88 ms    38.104.218.14
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 16798 ID: 0 seq: 0
```

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24    rtt=88 ms    128.119.3.32
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 2579 ID: 0 seq: 0
25    rtt=100 ms   128.119.240.253
0 error code = time to live exceeded in transit
*      *      *      Request timed out.
*      *      *      Request timed out.
types: 0 code: 0 checksum: 2183 ID: 49215 seq: 256
26    rtt=212 ms   128.119.245.12
0 error code = echo reply

```

3. Bbc.co.uk

```

E:\SCHOOL\CS\CS372\project_3>py -3 Traceroute.py
Argument List: ['Traceroute.py']
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
1    rtt=24 ms    192.168.1.1
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 60555 ID: 0 seq: 0
2    rtt=0 ms     50.53.144.1
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 60555 ID: 0 seq: 0
3    rtt=4 ms     50.46.177.156
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 62313 ID: 0 seq: 0
4    rtt=12 ms    50.46.176.48
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
5    rtt=12 ms    204.194.220.5
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
6    rtt=12 ms    107.191.236.116
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
7    rtt=12 ms    107.191.236.64
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
8    rtt=12 ms    157.52.127.218
0 error code = time to live exceeded in transit
types: 0 code: 0 checksum: 3794 ID: 24602 seq: 256
9    rtt=12 ms    151.101.0.81
0 error code = echo reply

```



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4. Sony.co.jp

```
E:\SCHOOL\CS\CS372\project_3>py -3 Traceroute.py
Argument List: ['Traceroute.py']
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
 1 rtt=0 ms 192.168.1.1
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 28844 ID: 0 seq: 0
 2 rtt=12 ms 50.53.144.1
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 13638 ID: 0 seq: 0
 3 rtt=4 ms 50.46.177.166
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 30597 ID: 0 seq: 0
 4 rtt=12 ms 50.46.176.48
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 5 rtt=12 ms 204.194.220.5
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 6 rtt=12 ms 107.191.236.116
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 7 rtt=12 ms 107.191.236.115
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 35422 ID: 0 seq: 0
 8 rtt=12 ms 62.115.187.146
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
 9 rtt=28 ms 62.115.115.24
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 57061 ID: 0 seq: 0
10 rtt=60 ms 62.115.61.163
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
11 rtt=76 ms 150.222.206.201
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 38228 ID: 0 seq: 0
12 rtt=64 ms 15.230.48.4
0 error code = time to live exceeded in transit
* * * Request timed out.
* * * Request timed out.
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
14 rtt=88 ms 52.93.131.124
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
15 rtt=84 ms 150.222.243.125
0 error code = time to live exceeded in transit
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
* * * Request timed out.
```


d. Indicate if you worked the extra credit, and if so which part?

- Completed Extra credit #2

```
if types == 11:
    bytes = struct.calcsize("d")
    timeSent = struct.unpack("d", recvPacket[28:28 + bytes])[0]
    print(" %d rtt=%.0f ms %s" %(ttl, (timeReceived - t)*1000, addr[0]))
    if code == 0:
        print("0 error code = time to live exceeded in transit")
    if code == 1:
        print("1 error code = fragment reassembly time exceeded")

elif types == 3:
    bytes = struct.calcsize("d")
    timeSent = struct.unpack("d", recvPacket[28:28 + bytes])[0]
    print(" %d rtt=%.0f ms %s" %(ttl, (timeReceived - t)*1000, addr[0]))
    if code == 0:
        print("0 error code = net unreachable")
    elif code == 1:
        print("1 error code = host unreachable")
    elif code == 2:
        print("2 error code = protocol unreachable")
    elif code == 3:
        print("3 error code = port unreachable")
    elif code == 4:
        print("4 error code = fragmentation needed and DF set")
    elif code == 5:
        print("5 error code = source route failed")

elif types == 0:
    bytes = struct.calcsize("d")
    timeSent = struct.unpack("d", recvPacket[28:28 + bytes])[0]
    print(" %d rtt=%.0f ms %s" %(ttl, (timeReceived - t)*1000, addr[0]))
    print("0 error code = echo reply")
    return

else:
    print("error, types is " + str(types))
```

EXTRA #2

```
* * * Request timed out.
types: 0 code: 0 checksum: 29860 ID: 58433 seq: 256
35 rtt=24 ms 35.161.98.54
0 error code = echo reply
```



```
E:\SCHOOL\CS\CS372\project_3>py -3 Traceroute.py
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types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
  1    rtt=0 ms    192.168.1.1
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 28448 ID: 0 seq: 0
  2    rtt=12 ms    50.53.144.1
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 13339 ID: 0 seq: 0
  3    rtt=12 ms    50.46.177.74
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
  4    rtt=0 ms    50.46.176.0
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 33173 ID: 0 seq: 0
  5    rtt=0 ms    50.46.176.5
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
  6    rtt=4 ms    204.194.220.5
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
  7    rtt=12 ms    107.191.236.116
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 61172 ID: 4352 seq: 0
  8    rtt=12 ms    107.191.236.115
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 54850 ID: 0 seq: 0
  9    rtt=0 ms    198.32.195.102
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 65524 ID: 0 seq: 0
 10    rtt=0 ms    52.93.20.68
0 error code = time to live exceeded in transit
types: 11 code: 0 checksum: 24443 ID: 0 seq: 0
 11    rtt=12 ms    52.93.20.77
0 error code = time to live exceeded in transit
*      *      *      Request timed out.
```