

## Homework 8: Ping Activity

To get credit for Homework 8, you will have to do the following project on the PING utility (Packet Internet Groper)

1. On a Windows workstation, click the Start button, select All Programs, select Accessories, and then select Command Prompt. The Command Prompt window opens.

(If you are working on a UNIX or Linux client or on Terminal on the MAC , make sure you are at a shell prompt.)

2. Type `ping 127.0.0.1` and press Enter. (Remember that 127.0.0.1 is the loopback address.) The first line of the response reads "Pinging 127.0.0.1 with 32 bytes of data." Following that, you see multiple lines that begin "Reply from 127.0.0.1." If you do not see four positive reply lines, or if you see four lines with the words "Request timed out," check the syntax of your ping command. If you typed the command correctly, check the status of your TCP/IP protocol.

```
$ ping 127.0.0.1
PING 127.0.0.1 (127.0.0.1): 56 data bytes
64 bytes from 127.0.0.1: icmp_seq=0 ttl=64 time=0.067 ms
64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.094 ms
64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.092 ms
64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.093 ms
64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.092 ms
64 bytes from 127.0.0.1: icmp_seq=5 ttl=64 time=0.093 ms
64 bytes from 127.0.0.1: icmp_seq=6 ttl=64 time=0.048 ms
64 bytes from 127.0.0.1: icmp_seq=7 ttl=64 time=0.093 ms
64 bytes from 127.0.0.1: icmp_seq=8 ttl=64 time=0.093 ms
64 bytes from 127.0.0.1: icmp_seq=9 ttl=64 time=0.101 ms
64 bytes from 127.0.0.1: icmp_seq=10 ttl=64 time=0.095 ms
64 bytes from 127.0.0.1: icmp_seq=11 ttl=64 time=0.094 ms
64 bytes from 127.0.0.1: icmp_seq=12 ttl=64 time=0.094 ms
64 bytes from 127.0.0.1: icmp_seq=13 ttl=64 time=0.064 ms
64 bytes from 127.0.0.1: icmp_seq=14 ttl=64 time=0.093 ms
64 bytes from 127.0.0.1: icmp_seq=15 ttl=64 time=0.049 ms
64 bytes from 127.0.0.1: icmp_seq=16 ttl=64 time=0.091 ms
64 bytes from 127.0.0.1: icmp_seq=17 ttl=64 time=0.091 ms
64 bytes from 127.0.0.1: icmp_seq=18 ttl=64 time=0.090 ms
64 bytes from 127.0.0.1: icmp_seq=19 ttl=64 time=0.091 ms
64 bytes from 127.0.0.1: icmp_seq=20 ttl=64 time=0.050 ms
64 bytes from 127.0.0.1: icmp_seq=21 ttl=64 time=0.092 ms
64 bytes from 127.0.0.1: icmp_seq=22 ttl=64 time=0.083 ms
64 bytes from 127.0.0.1: icmp_seq=23 ttl=64 time=0.083 ms
64 bytes from 127.0.0.1: icmp_seq=24 ttl=64 time=0.092 ms
64 bytes from 127.0.0.1: icmp_seq=25 ttl=64 time=0.084 ms
64 bytes from 127.0.0.1: icmp_seq=26 ttl=64 time=0.083 ms
64 bytes from 127.0.0.1: icmp_seq=27 ttl=64 time=0.048 ms
64 bytes from 127.0.0.1: icmp_seq=28 ttl=64 time=0.084 ms
64 bytes from 127.0.0.1: icmp_seq=29 ttl=64 time=0.090 ms
64 bytes from 127.0.0.1: icmp_seq=30 ttl=64 time=0.155 ms
64 bytes from 127.0.0.1: icmp_seq=31 ttl=64 time=0.100 ms
64 bytes from 127.0.0.1: icmp_seq=32 ttl=64 time=0.093 ms
64 bytes from 127.0.0.1: icmp_seq=33 ttl=64 time=0.092 ms
64 bytes from 127.0.0.1: icmp_seq=34 ttl=64 time=0.098 ms
^C
--- 127.0.0.1 ping statistics ---
35 packets transmitted, 35 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 0.048/0.087/0.155/0.019 ms
```

3. At the end of each line of output, a TTL value appears. What is the value of the TTL, and what does this number represent? ( ref. pg 49 in the textbook)

- Time-to-Live (TTL) field. The value in this field is decremented by one every time this packet is routed from one IP network to another. (That is, passes through a router.) If the TTL value ever reaches zero, the packet is discarded from the network. This behavior helps prevent routing loops.

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4. Next, you will try a ping test that can help you determine whether your TCP/IP services are operating successfully. At the command prompt, type `ping www.yahoo.com` (Links to an external site.) and press Enter.

5. What was the response? If you received a “Request timed out” message, why might you have received it? If you received a valid response, with four lines of replies, note the TTL. Why does it differ from the TTL observed when you pinged the loopback address? Also note the number of packets sent and received and the number of packets lost, if any. Finally, note the IP address that responded to your ping test. (Consider that for security purposes some organizations will prevent devices on their networks from responding to ping requests. In that case, a “Request timed out” response does not necessarily indicate a problem on the network.)

```
$ ping yahoo.com
PING yahoo.com (98.138.219.232): 56 data bytes
64 bytes from 98.138.219.232: icmp_seq=0 ttl=48 time=315.208 ms
64 bytes from 98.138.219.232: icmp_seq=1 ttl=48 time=169.596 ms
64 bytes from 98.138.219.232: icmp_seq=2 ttl=48 time=174.170 ms
64 bytes from 98.138.219.232: icmp_seq=3 ttl=48 time=119.261 ms
64 bytes from 98.138.219.232: icmp_seq=4 ttl=48 time=187.776 ms
64 bytes from 98.138.219.232: icmp_seq=5 ttl=48 time=194.673 ms
64 bytes from 98.138.219.232: icmp_seq=6 ttl=48 time=190.110 ms
64 bytes from 98.138.219.232: icmp_seq=7 ttl=48 time=146.029 ms
64 bytes from 98.138.219.232: icmp_seq=8 ttl=48 time=181.177 ms
64 bytes from 98.138.219.232: icmp_seq=9 ttl=48 time=181.939 ms
64 bytes from 98.138.219.232: icmp_seq=10 ttl=48 time=183.118 ms
64 bytes from 98.138.219.232: icmp_seq=11 ttl=48 time=167.066 ms
64 bytes from 98.138.219.232: icmp_seq=12 ttl=48 time=163.670 ms
64 bytes from 98.138.219.232: icmp_seq=13 ttl=48 time=199.065 ms
64 bytes from 98.138.219.232: icmp_seq=14 ttl=48 time=198.079 ms
64 bytes from 98.138.219.232: icmp_seq=15 ttl=48 time=157.877 ms
64 bytes from 98.138.219.232: icmp_seq=16 ttl=48 time=195.048 ms
64 bytes from 98.138.219.232: icmp_seq=17 ttl=48 time=191.993 ms
64 bytes from 98.138.219.232: icmp_seq=18 ttl=48 time=198.185 ms
64 bytes from 98.138.219.232: icmp_seq=19 ttl=48 time=149.667 ms
64 bytes from 98.138.219.232: icmp_seq=20 ttl=48 time=188.191 ms
64 bytes from 98.138.219.232: icmp_seq=21 ttl=48 time=195.427 ms
64 bytes from 98.138.219.232: icmp_seq=22 ttl=48 time=180.356 ms
64 bytes from 98.138.219.232: icmp_seq=23 ttl=48 time=176.318 ms
64 bytes from 98.138.219.232: icmp_seq=24 ttl=48 time=169.622 ms
64 bytes from 98.138.219.232: icmp_seq=25 ttl=48 time=128.366 ms
64 bytes from 98.138.219.232: icmp_seq=26 ttl=48 time=164.104 ms
64 bytes from 98.138.219.232: icmp_seq=27 ttl=48 time=205.528 ms
64 bytes from 98.138.219.232: icmp_seq=28 ttl=48 time=241.588 ms
64 bytes from 98.138.219.232: icmp_seq=29 ttl=48 time=198.181 ms
64 bytes from 98.138.219.232: icmp_seq=30 ttl=48 time=194.366 ms
64 bytes from 98.138.219.232: icmp_seq=31 ttl=48 time=190.346 ms
64 bytes from 98.138.219.232: icmp_seq=32 ttl=48 time=231.401 ms
64 bytes from 98.138.219.232: icmp_seq=33 ttl=48 time=182.310 ms
64 bytes from 98.138.219.232: icmp_seq=34 ttl=48 time=219.442 ms
^C
--- yahoo.com ping statistics ---
35 packets transmitted, 35 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 119.261/186.550/315.208/32.963 ms
```

-The router checks its routing table to determine the best path to reach a network; If the network is accessible through this path, the router will take this path to access the network through this entry; Note: an IP header contains a Time To Live (TTL) field, decremented by one each time the router hops.

6. You have learned that when pinging, you can attempt to contact a host either by IP address or host name. This time, rather than attempting to reach a host, you will attempt to reach an IP address. At the command prompt, type `ping X` where X is the IP address that responded to your ping test from Step 4. Did the response differ from the response you noted in Step 5?

```

$ ping 98.138.219.232
PING 98.138.219.232 (98.138.219.232): 56 data bytes
64 bytes from 98.138.219.232: icmp_seq=0 ttl=48 time=402.700 ms
64 bytes from 98.138.219.232: icmp_seq=1 ttl=48 time=373.974 ms
64 bytes from 98.138.219.232: icmp_seq=2 ttl=48 time=205.606 ms
64 bytes from 98.138.219.232: icmp_seq=3 ttl=48 time=202.445 ms
64 bytes from 98.138.219.232: icmp_seq=4 ttl=48 time=157.550 ms
64 bytes from 98.138.219.232: icmp_seq=5 ttl=48 time=243.321 ms
64 bytes from 98.138.219.232: icmp_seq=6 ttl=48 time=189.139 ms
64 bytes from 98.138.219.232: icmp_seq=7 ttl=48 time=240.917 ms
64 bytes from 98.138.219.232: icmp_seq=8 ttl=48 time=231.431 ms
64 bytes from 98.138.219.232: icmp_seq=9 ttl=48 time=141.670 ms
64 bytes from 98.138.219.232: icmp_seq=10 ttl=48 time=161.091 ms
64 bytes from 98.138.219.232: icmp_seq=11 ttl=48 time=179.957 ms
64 bytes from 98.138.219.232: icmp_seq=12 ttl=48 time=131.406 ms
64 bytes from 98.138.219.232: icmp_seq=13 ttl=48 time=167.556 ms
64 bytes from 98.138.219.232: icmp_seq=14 ttl=48 time=163.071 ms
64 bytes from 98.138.219.232: icmp_seq=15 ttl=48 time=118.209 ms
64 bytes from 98.138.219.232: icmp_seq=16 ttl=48 time=154.250 ms
64 bytes from 98.138.219.232: icmp_seq=17 ttl=48 time=150.207 ms
64 bytes from 98.138.219.232: icmp_seq=18 ttl=48 time=145.862 ms
64 bytes from 98.138.219.232: icmp_seq=19 ttl=48 time=178.352 ms
64 bytes from 98.138.219.232: icmp_seq=20 ttl=48 time=217.982 ms
64 bytes from 98.138.219.232: icmp_seq=21 ttl=48 time=188.856 ms
64 bytes from 98.138.219.232: icmp_seq=22 ttl=48 time=207.776 ms
64 bytes from 98.138.219.232: icmp_seq=23 ttl=48 time=162.709 ms
64 bytes from 98.138.219.232: icmp_seq=24 ttl=48 time=218.178 ms
64 bytes from 98.138.219.232: icmp_seq=25 ttl=48 time=191.934 ms
64 bytes from 98.138.219.232: icmp_seq=26 ttl=48 time=184.761 ms
64 bytes from 98.138.219.232: icmp_seq=27 ttl=48 time=107.525 ms
64 bytes from 98.138.219.232: icmp_seq=28 ttl=48 time=188.737 ms
64 bytes from 98.138.219.232: icmp_seq=29 ttl=48 time=141.725 ms
64 bytes from 98.138.219.232: icmp_seq=30 ttl=48 time=174.386 ms
64 bytes from 98.138.219.232: icmp_seq=31 ttl=48 time=129.108 ms
64 bytes from 98.138.219.232: icmp_seq=32 ttl=48 time=234.585 ms
64 bytes from 98.138.219.232: icmp_seq=33 ttl=48 time=202.890 ms
64 bytes from 98.138.219.232: icmp_seq=34 ttl=48 time=163.736 ms
^C
--- 98.138.219.232 ping statistics ---
35 packets transmitted, 35 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 107.525/190.103/402.700/59.600 ms

```

7. Now try the ping command using the following syntax: `ping -c 5 X`, where X is the same IP address you used in Step 6.

```

$ ping -c 5 98.138.219.232
PING 98.138.219.232 (98.138.219.232): 56 data bytes
64 bytes from 98.138.219.232: icmp_seq=0 ttl=48 time=245.378 ms
64 bytes from 98.138.219.232: icmp_seq=1 ttl=48 time=322.769 ms
64 bytes from 98.138.219.232: icmp_seq=2 ttl=48 time=222.238 ms
64 bytes from 98.138.219.232: icmp_seq=3 ttl=48 time=301.948 ms
64 bytes from 98.138.219.232: icmp_seq=4 ttl=48 time=196.871 ms
^C
--- 98.138.219.232 ping statistics ---
5 packets transmitted, 5 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 196.871/257.841/322.769/47.542 ms

```

7. Now try the ping command using the following syntax: `ping -c 5 X`, where X is the same IP address you used in Step 6.

8. If you are using a Windows computer, type `exit` and then press Enter to close the Command Prompt window. To get full credit for this assignment, you will have to submit two documents.

A. A screenshot of the Command Prompt Window with the result of the ping test you have made at step 5.

```
PING yahoo.com (98.138.219.232): 56 data bytes
64 bytes from 98.138.219.232: icmp_seq=0 ttl=48 time=315.208 ms
64 bytes from 98.138.219.232: icmp_seq=1 ttl=48 time=169.596 ms
64 bytes from 98.138.219.232: icmp_seq=2 ttl=48 time=174.170 ms
64 bytes from 98.138.219.232: icmp_seq=3 ttl=48 time=119.261 ms
64 bytes from 98.138.219.232: icmp_seq=4 ttl=48 time=187.776 ms
64 bytes from 98.138.219.232: icmp_seq=5 ttl=48 time=194.673 ms
64 bytes from 98.138.219.232: icmp_seq=6 ttl=48 time=190.110 ms
64 bytes from 98.138.219.232: icmp_seq=7 ttl=48 time=146.029 ms
64 bytes from 98.138.219.232: icmp_seq=8 ttl=48 time=181.177 ms
64 bytes from 98.138.219.232: icmp_seq=9 ttl=48 time=181.939 ms
64 bytes from 98.138.219.232: icmp_seq=10 ttl=48 time=183.118 ms
64 bytes from 98.138.219.232: icmp_seq=11 ttl=48 time=167.066 ms
64 bytes from 98.138.219.232: icmp_seq=12 ttl=48 time=163.670 ms
64 bytes from 98.138.219.232: icmp_seq=13 ttl=48 time=199.065 ms
64 bytes from 98.138.219.232: icmp_seq=14 ttl=48 time=198.079 ms
64 bytes from 98.138.219.232: icmp_seq=15 ttl=48 time=157.877 ms
64 bytes from 98.138.219.232: icmp_seq=16 ttl=48 time=195.048 ms
64 bytes from 98.138.219.232: icmp_seq=17 ttl=48 time=191.993 ms
64 bytes from 98.138.219.232: icmp_seq=18 ttl=48 time=198.185 ms
64 bytes from 98.138.219.232: icmp_seq=19 ttl=48 time=149.667 ms
64 bytes from 98.138.219.232: icmp_seq=20 ttl=48 time=188.191 ms
64 bytes from 98.138.219.232: icmp_seq=21 ttl=48 time=195.427 ms
64 bytes from 98.138.219.232: icmp_seq=22 ttl=48 time=180.356 ms
64 bytes from 98.138.219.232: icmp_seq=23 ttl=48 time=176.318 ms
64 bytes from 98.138.219.232: icmp_seq=24 ttl=48 time=169.622 ms
64 bytes from 98.138.219.232: icmp_seq=25 ttl=48 time=128.366 ms
64 bytes from 98.138.219.232: icmp_seq=26 ttl=48 time=164.104 ms
64 bytes from 98.138.219.232: icmp_seq=27 ttl=48 time=205.528 ms
64 bytes from 98.138.219.232: icmp_seq=28 ttl=48 time=241.588 ms
64 bytes from 98.138.219.232: icmp_seq=29 ttl=48 time=198.181 ms
64 bytes from 98.138.219.232: icmp_seq=30 ttl=48 time=194.366 ms
64 bytes from 98.138.219.232: icmp_seq=31 ttl=48 time=190.346 ms
64 bytes from 98.138.219.232: icmp_seq=32 ttl=48 time=231.401 ms
64 bytes from 98.138.219.232: icmp_seq=33 ttl=48 time=182.310 ms
64 bytes from 98.138.219.232: icmp_seq=34 ttl=48 time=219.442 ms
^C
--- yahoo.com ping statistics ---
35 packets transmitted, 35 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 119.261/186.550/315.208/32.963 ms
```

B. A word document answering the questions:

Step 3. What is the value of the TTL and what does it represent?

- The TTL field in an IP header is decremented once for each router hop. Therefore, if the value in a TTL field is reduced to 0, a router discards the frame and sends a time exceeded ICMP message back to the source.

Step 5. What was the response? If you received a "Request timed out" message, why might you have received it? If you received a valid response, with four lines of replies, note the TTL. Why does it differ from the TTL observed when you pinged the loopback address? Also note the number of packets sent and received and the number of packets lost, if any. Finally note the IP address that responded to your ping test.

-If you receive a 'Request timed out' message, this might be the result of an unsuccessful trace. I received a valid response with at least four lines of replies. The TTL did not differ from the ping of the loopback address. All packets sent equal to the amount of packets received and none were lost. The IP address that responded to my ping tests include 127.0.0.1 and 98.138.219.232.

Step 6. Did the response differ from the response you noted in Step 5?

-There was not difference in the response. The ping test from name of address versus IP address did not change the output.

Step 7. Use of parameter "-c" (if you use ping in UNIX ) or "-n" (if you use Microsoft ping) with the ping command. Observe the result and explain in your own words the concept of parameters (also referred as switches) for command line commands ( you may refer to the text on page 348).

- The parameter "-n" has the purpose of not resolving addresses to hostnames.
- The parameter "-c" (count) has the purpose of the option to specify the number of pings to send.
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-When I used the ping command, "-c" with the ping for Step 7, I received a certain amount of pings, rather than a continuous flow of pings. The ping include '5' and I received 5 ping results, 5 packets transmitted and 5 packets received. This command appears to limit the number of packets resulted, transmitted and received, thus count.