

Socket program4 – ICMP Traceroute Lab

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Lab environment:

Answer: My PC uses macOS Catalina 10.15.6, shows the following setting with *ifconfig*:

```
(base) JesLeedeMBP:~ jeslee$ ifconfig
lo0: flags=8049<UP,LOOPBACK,RUNNING,MULTICAST> mtu 16384
    options=1203<RXCSUM,TXCSUM,TXSTATUS,SW_TIMESTAMP>
    inet 127.0.0.1 netmask 0xff000000
    inet6 ::1 prefixlen 128
    inet6 fe80::1%lo0 prefixlen 64 scopeid 0x1
    nd6 options=201<PERFORMNUD,DAD>
gif0: flags=8010<POINTOPOINT,MULTICAST> mtu 1280
stf0: flags=0<> mtu 1280
en0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether ac:bc:32:7b:7f:83
    inet6 fe80::1c81:c11c:970e:3b33%en0 prefixlen 64 secured scopeid 0x4
    inet 192.168.1.155 netmask 0xfffff00 broadcast 192.168.1.255
    nd6 options=201<PERFORMNUD,DAD>
    media: autoselect
    status: active
en1: flags=8963<UP,BROADCAST,SMART,RUNNING,PROMISC,SIMPLEX,MULTICAST> mtu 1500
    options=460<TSO4,TSO6,CHANNEL_IO>
    ether 82:13:09:8a:17:40
    media: autoselect <full-duplex>
    status: inactive
en2: flags=8963<UP,BROADCAST,SMART,RUNNING,PROMISC,SIMPLEX,MULTICAST> mtu 1500
    options=460<TSO4,TSO6,CHANNEL_IO>
    ether 82:13:09:8a:17:41
    media: autoselect <full-duplex>
    status: inactive
bridge0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=63<RXCSUM,TXCSUM,TSO4,TSO6>
    ether 82:13:09:8a:17:40
    Configuration:
        id 0:0:0:0:0:0 priority 0 hellotime 0 fwddelay 0
        maxage 0 holdcnt 0 proto stp maxaddr 100 timeout 1200
        root id 0:0:0:0:0:0 priority 0 ifcost 0 port 0
        ipfilter disabled flags 0x0
        member: en1 flags=3<LEARNING,DISCOVER>
            ifmaxaddr 0 port 5 priority 0 path cost 0
        member: en2 flags=3<LEARNING,DISCOVER>
            ifmaxaddr 0 port 6 priority 0 path cost 0
        nd6 options=201<PERFORMNUD,DAD>
        media: <unknown type>
        status: inactive
p2p0: flags=8843<UP,BROADCAST,RUNNING,SIMPLEX,MULTICAST> mtu 2304
    options=400<CHANNEL_IO>
    ether 0e:bc:32:7b:7f:83
    media: autoselect
    status: inactive
awdl0: flags=8943<UP,BROADCAST,RUNNING,PROMISC,SIMPLEX,MULTICAST> mtu 1484
    options=400<CHANNEL_IO>
    ether e2:8b:ae:0c:af:c5
    inet6 fe80::e08b:aeff:fe0c:afc5%awdl0 prefixlen 64 scopeid 0x9
    nd6 options=201<PERFORMNUD,DAD>
    media: autoselect
    status: active
llw0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether e2:8b:ae:0c:af:c5
    inet6 fe80::e08b:aeff:fe0c:afc5%llw0 prefixlen 64 scopeid 0xa
    nd6 options=201<PERFORMNUD,DAD>
    media: autoselect
    status: active
utun0: flags=8051<UP,POINTOPOINT,RUNNING,MULTICAST> mtu 1380
    inet6 fe80::f58d:6031:ca37:b987%utun0 prefixlen 64 scopeid 0xb
    nd6 options=201<PERFORMNUD,DAD>
utun1: flags=8051<UP,POINTOPOINT,RUNNING,MULTICAST> mtu 2000
    inet6 fe80::af3a:6b7e:729f:e148%utun1 prefixlen 64 scopeid 0xc
    nd6 options=201<PERFORMNUD,DAD>
utun2: flags=8051<UP,POINTOPOINT,RUNNING,MULTICAST> mtu 1380
    inet6 fe80::888b:4408:7f6e:76ea%utun2 prefixlen 64 scopeid 0xd
    nd6 options=201<PERFORMNUD,DAD>
utun3: flags=8051<UP,POINTOPOINT,RUNNING,MULTICAST> mtu 1380
    inet6 fe80::2b53:b72c:6e42:c414%utun3 prefixlen 64 scopeid 0xe
    nd6 options=201<PERFORMNUD,DAD>
```

Here are the traceroute results for different hosts:

```
(base) JesLeedeMBP:computer_networking jeslee$ sudo python2 traceroute.py
---- Traceroute output for "www.google.com" located in US, North America-----
1 rtt=2 ms 192.168.1.1
1 rtt=1 ms 192.168.1.1
2 rtt=11 ms 142.250.80.14
---- Traceroute output for "www.baidu.com" located in China, Asia -----
1 rtt=1 ms 192.168.1.1
1 rtt=1 ms 192.168.1.1
2 rtt=3 ms 39.156.69.79
---- Traceroute output for "www.bbc.co.uk" located in UK, Europe -----
1 rtt=1 ms 192.168.1.1
1 rtt=1 ms 192.168.1.1
2 rtt=4 ms 212.58.233.252
---- Traceroute output for "lornajane.com.au" located in Australia, Oceania-----
* * * Request timed out.
1 rtt=3 ms 192.168.1.1
2 rtt=7 ms 175.45.125.230
---- Traceroute output for "www.gov.za" located in South Africa, Africa -----
1 rtt=2 ms 192.168.1.1
1 rtt=2 ms 192.168.1.1
2 rtt=12 ms 164.151.129.20
---- Traceroute output for "www.ypf.com" located in Argentina, South America-----
1 rtt=2 ms 192.168.1.1
* * * Request timed out.
2 rtt=11 ms 200.1.118.183
(base) JesLeedeMBP:computer_networking jeslee$
```

‘google.com’--- IP address is located in US, North America

‘baidu.com’ --- IP address is located in China, Asia

‘www.bbc.com’ --- IP address is located in UK, Europe

‘lornajane.com.au’ --- IP address is located in Australia, Oceania

‘www.gov.za’--- IP address is located in South Africa, Africa

‘www.ypf.com’--- IP address is located in Argentina, South America