

HACETTEPE UNIVERSITY DEPARTMENT OF  
COMPUTER ENGINEERING  
BBM 453 LAB EXPERIMENT



Mehmet Taha USTA – 21527472

Çağlar USLU – 21808388

Mehmet Taha USTA Source = 192.168.1.34

Çağlar USLU Source = 192.168.0.10

```
C:\Users\Mehmet Taha USTA>ping -n 10 www.amazon.com

Pinging e15316.e22.akamaiedge.net [95.100.209.92] with 32 bytes of data:
Reply from 95.100.209.92: bytes=32 time=72ms TTL=51
Reply from 95.100.209.92: bytes=32 time=73ms TTL=51
Reply from 95.100.209.92: bytes=32 time=73ms TTL=51
Reply from 95.100.209.92: bytes=32 time=73ms TTL=51
Reply from 95.100.209.92: bytes=32 time=73ms TTL=51
Reply from 95.100.209.92: bytes=32 time=90ms TTL=51
Reply from 95.100.209.92: bytes=32 time=77ms TTL=51
Reply from 95.100.209.92: bytes=32 time=72ms TTL=51
Reply from 95.100.209.92: bytes=32 time=75ms TTL=51
Reply from 95.100.209.92: bytes=32 time=83ms TTL=51

Ping statistics for 95.100.209.92:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 72ms, Maximum = 90ms, Average = 76ms
```

**1. What is the IP address of your host? What is the IP address of the destination host?**

The IP address of my host is 192.168.1.34. The IP address of the destination host is 95.100.209.92.

**2. Why is it that an ICMP packet does not have source and destination port numbers?**

The ICMP packet does not have source and destination port numbers because it was designed to communicate network-layer information between hosts and routers, not between application layer processes. Each ICMP packet has a "Type" and a "Code". The Type/Code combination identifies the specific message being received. Since the network software itself interprets all ICMP messages, no port numbers are needed to direct the ICMP message to an application layer process.

**3. Examine one of the ping request packets sent by your host. What are the ICMP type and code numbers? What other fields does this ICMP packet have? How many bytes are the checksum, sequence number and identifier fields?**

1	0.000000	fe80::15ab:6b75:1f3c:3f59	ff02::16	ICMPv6	90 Multicast Listener Report Message v2
2	0.232853	192.168.1.34	195.175.39.50	DNS	74 Standard query 0xda93 A www.amazon.com
3	0.240479	195.175.39.50	192.168.1.34	DNS	202 Standard query response 0xda93 A www.amazon.com CNAME tp.47cf2c8c9-front
4	0.246272	192.168.1.34	195.122.177.168	TCP	66 57231 → 443 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=256 SACK PERM=1
5	0.251358	192.168.1.34	95.100.209.92	ICMP	74 Echo (ping) request id=0x0001, seq=13817/63797, ttl=128 (reply in 6)
6	0.323486	95.100.209.92	192.168.1.34	ICMP	74 Echo (ping) reply id=0x0001, seq=13817/63797, ttl=51 (request in 5)
7	0.326405	195.122.177.168	192.168.1.34	TCP	66 443 → 57231 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1452 WS=64 SACK P
8	0.326715	192.168.1.34	195.122.177.168	TCP	54 57231 → 443 [ACK] Seq=1 Ack=1 Win=66560 Len=0
9	0.328175	192.168.1.34	195.122.177.168	SSL	352 Continuation Data
10	0.408073	195.122.177.168	192.168.1.34	SSL	189 Continuation Data
11	0.453169	192.168.1.34	195.122.177.168	TCP	54 57231 → 443 [ACK] Seq=299 Ack=136 Win=66560 Len=0
12	0.680926	192.168.1.35	239.255.255.250	SSDP	167 M-SEARCH * HTTP/1.1
13	1.266470	192.168.1.34	95.100.209.92	ICMP	74 Echo (ping) request id=0x0001, seq=13818/64053, ttl=128 (reply in 14)
14	1.339367	95.100.209.92	192.168.1.34	ICMP	74 Echo (ping) reply id=0x0001, seq=13818/64053, ttl=51 (request in 13)
15	1.500180	192.168.1.39	224.0.0.251	MDNS	103 Standard query 0x0018 PTR _233637DE._sub._googlecast._tcp.local, "QM" qu
16	2.290996	192.168.1.34	95.100.209.92	ICMP	74 Echo (ping) request id=0x0001, seq=13819/64309, ttl=128 (reply in 17)
17	2.364370	95.100.209.92	192.168.1.34	ICMP	74 Echo (ping) reply id=0x0001, seq=13819/64309, ttl=51 (request in 16)
18	2.831954	192.168.1.35	239.255.255.250	SSDP	167 M-SEARCH * HTTP/1.1
19	3.306796	192.168.1.34	95.100.209.92	ICMP	74 Echo (ping) request id=0x0001, seq=13820/64565, ttl=128 (reply in 20)
20	3.380216	95.100.209.92	192.168.1.34	ICMP	74 Echo (ping) reply id=0x0001, seq=13820/64565, ttl=51 (request in 19)
21	3.519240	fe80::15ab:6b75:1f3c:3f59	ff02::16	ICMPv6	90 Multicast Listener Report Message v2

  

Frame 5: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface \Device\NPF_{D1B4F362-C83D-4147-90E3-E73F2017E46E}, id 0
Ethernet II, Src: IntelCor_3c:ec:18 (d0:7e:35:3c:ec:18), Dst: ZyxelCom_87:a0:5c (b8:ec:a3:87:a0:5c)
Internet Protocol Version 4, Src: 192.168.1.34, Dst: 95.100.209.92
Internet Control Message Protocol
Type: 8 (Echo (ping) request)
Code: 0
Checksum: 0x1762 [correct]
[Checksum Status: Good]
Identifier (BE): 1 (0x0001)
Identifier (LE): 256 (0x0100)
Sequence Number (BE): 13817 (0x35f9)
Sequence Number (LE): 63797 (0xf935)
[Response frame: 6]
Data (32 bytes)

The ICMP type is 8, and the code number is 0. The ICMP packet also has checksum, identifier, sequence number, and data fields. The checksum, sequence number and identifier fields are two bytes each.

**4. Examine the corresponding ping reply packet. What are the ICMP type and code numbers? What other fields does this ICMP packet have? How many bytes are the checksum, sequence number and identifier fields?**

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	fe80::15ab:6b75:1f3c:3f59	ff02::16	ICMPv6	90	Multicast Listener Report Message v2
2	0.232853	192.168.1.34	195.175.39.50	DNS	74	Standard query 0xda93 A www.amazon.com
3	0.240479	195.175.39.50	192.168.1.34	DNS	202	Standard query response 0xda93 A www.amazon.com CNAME tp.47cf2c8c9-front
4	0.246272	192.168.1.34	195.122.177.168	TCP	66	57231 → 443 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=256 SACK_PERM=1
5	0.251358	192.168.1.34	95.100.209.92	ICMP	74	Echo (ping) request id=0x0001, seq=13817/63797, ttl=128 (reply in 6)
6	0.323486	95.100.209.92	192.168.1.34	ICMP	74	Echo (ping) reply id=0x0001, seq=13817/63797, ttl=51 (request in 5)
7	0.326405	195.122.177.168	192.168.1.34	TCP	66	443 → 57231 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1452 WS=64 SACK_P
8	0.326715	192.168.1.34	195.122.177.168	TCP	54	57231 → 443 [ACK] Seq=1 Ack=1 Win=66560 Len=0
9	0.328175	192.168.1.34	195.122.177.168	SSL	352	Continuation Data
10	0.408073	195.122.177.168	192.168.1.34	SSL	189	Continuation Data
11	0.453169	192.168.1.34	195.122.177.168	TCP	54	57231 → 443 [ACK] Seq=299 Ack=136 Win=66560 Len=0
12	0.680926	192.168.1.35	239.255.255.250	SSDP	167	M-SEARCH * HTTP/1.1
13	1.266470	192.168.1.34	95.100.209.92	ICMP	74	Echo (ping) request id=0x0001, seq=13818/64053, ttl=128 (reply in 14)
14	1.339367	95.100.209.92	192.168.1.34	ICMP	74	Echo (ping) reply id=0x0001, seq=13818/64053, ttl=51 (request in 13)
15	1.500180	192.168.1.39	224.0.0.251	MDNS	103	Standard query 0x0018 PTR _2336370E._sub._googlecast._tcp.local, "QM" qu
16	2.290896	192.168.1.34	95.100.209.92	ICMP	74	Echo (ping) request id=0x0001, seq=13819/64309, ttl=128 (reply in 17)
17	2.364370	95.100.209.92	192.168.1.34	ICMP	74	Echo (ping) reply id=0x0001, seq=13819/64309, ttl=51 (request in 16)
18	2.831954	192.168.1.35	239.255.255.250	SSDP	167	M-SEARCH * HTTP/1.1
19	3.306796	192.168.1.34	95.100.209.92	ICMP	74	Echo (ping) request id=0x0001, seq=13820/64565, ttl=128 (reply in 20)
20	3.380216	95.100.209.92	192.168.1.34	ICMP	74	Echo (ping) reply id=0x0001, seq=13820/64565, ttl=51 (request in 19)
21	3.510240	fe80::15ab:6b75:1f3c:3f59	ff02::16	ICMPv6	90	Multicast Listener Report Message v2

Frame 6: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface Device\NPF\_{D184F362-C83D-4147-90E3-E73F2017E46E}, id 0

Ethernet II, Src: ZyxelCom\_87:a0:5c (b8:ec:a3:87:a0:5c), Dst: IntelCor\_3c:ec:18 (d0:7e:35:3c:ec:18)

Internet Protocol Version 4, Src: 95.100.209.92, Dst: 192.168.1.34

Internet Control Message Protocol

Type: 0 (Echo (ping) reply)

Code: 0

Checksum: 0x1f62 [correct]

[Checksum Status: Good]

Identifier (BE): 1 (0x0001)

Identifier (LE): 256 (0x0100)

Sequence Number (BE): 13817 (0x35f9)

Sequence Number (LE): 63797 (0xf935)

[Request frame: 5]

[Response time: 72.128 ms]

Data (32 bytes)

0000	d0 7e 35 3c ec 18 b8 ec a3 87 a0 5c 08 00 45 00
0010	00 3c ec 18 b8 00 33 01 80 40 5f 64 d1 c0 a8
0020	01 27 00 00 1f 62 00 01 35 f0 61 62 63 64 65 66
0030	67 68 69 6a 6b 6c 6d 6e 6f 70 71 72 73 74 75 76
0040	77 61 62 63 64 65 66 67 68 69

```

C:\Users\Mehmet Taha USTA>tracert www.inria.fr

Tracing route to inria.fr [128.93.162.63]
over a maximum of 30 hops:

  1      2 ms      2 ms      2 ms  192.168.1.1
  2      3 ms      3 ms      2 ms  212.156.201.17.static.turktelekom.com.tr [212.156.201.17]
  3      3 ms      3 ms      3 ms  81.212.86.129.static.turktelekom.com.tr [81.212.86.129]
  4      4 ms      4 ms      4 ms  27-gaziantep-t2-2---80-osmaniye-t3-1.statik.turktelekom.com.tr [81.212.208.144]
  5     15 ms     15 ms     15 ms  06-ulus-xrs-t2-1---27-gaziantep-t2-2.statik.turktelekom.com.tr [81.212.221.165]
  6     15 ms     15 ms     15 ms  06-ebgp-ulus-sr12e-k---06-ulus-xrs-t2-1.statik.turktelekom.com.tr [81.212.217.5]
  7     68 ms     69 ms     68 ms  301-fra-col-1---06-ulus-xrs-t2-1.statik.turktelekom.com.tr [212.156.101.126]
  8     69 ms     70 ms     71 ms  62.157.248.1
  9     72 ms     69 ms     69 ms  pd900cb06.dip0.t-ipconnect.de [217.0.203.6]
 10     68 ms     68 ms     69 ms  80.157.204.62
 11     78 ms     79 ms     78 ms  et-3-3-0.cr4-par7.ip4.gtt.net [213.200.119.214]

 12     82 ms     81 ms     83 ms  renater-gw-ix1.gtt.net [77.67.123.206]
 13     74 ms     74 ms     75 ms  te1-1-inria-rtr-021.noc.renater.fr [193.51.177.107]
 14     95 ms    100 ms     81 ms  inria-rocquencourt-te1-4-inria-rtr-021.noc.renater.fr [193.51.184.177]
 15     75 ms     74 ms     76 ms  unit240-reth1-ufw-ext-dc1.inria.fr [192.93.122.19]
 16     90 ms     80 ms     80 ms  inria-cms.inria.fr [128.93.162.63]

Trace complete.

```

**5. What is the IP address of your host? What is the IP address of the target destination host?**

The IP address of my host is 192.168.1.34. The IP address of the destination host is 128.93.162.63.

**6. If ICMP sent UDP packets instead (as in Unix/Linux), would the IP protocol number still be 01 for the probe packets? If not, what would it be?**

No. If ICMP sent UDP packets instead, the IP protocol number should be 0x11



The ICMP error packet is not the same as the ping query packets. It contains both the IP header and the first 8 bytes of the original ICMP packet that the error is for.

8. Within the traceroute measurements, is there a link whose delay is significantly longer than others? Refer to the screenshot in your figure, is there a link whose delay is significantly longer than others? On the basis of the router names, can you guess the location of the two routers on the end of this link?

```
C:\Users\Mehmet Taha USTA>tracert www.inria.fr

Tracing route to inria.fr [128.93.162.63]
over a maximum of 30 hops:

  0  0 ms  0 ms  0 ms  192.168.1.1
  1  2 ms  2 ms  2 ms  212.156.201.17.static.turktelekom.com.tr [212.156.201.17]
  2  3 ms  3 ms  2 ms  81.212.86.129.static.turktelekom.com.tr [81.212.86.129]
  3  3 ms  3 ms  3 ms  27-gaziantep-t2-2---80-osmaniye-t3-1.statik.turktelekom.com.tr [81.212.208.144]
  4  4 ms  4 ms  4 ms  06-ulus-xrs-t2-1---27-gaziantep-t2-2.statik.turktelekom.com.tr [81.212.221.165]
  5  15 ms  15 ms  15 ms  06-ebgp-ulus-sr12e-k---06-ulus-xrs-t2-1.statik.turktelekom.com.tr [81.212.217.5]
  6  68 ms  69 ms  68 ms  301-fra-col-1---06-ulus-xrs-t2-1.statik.turktelekom.com.tr [212.156.101.126]
  7  69 ms  70 ms  71 ms  62.157.248.1
  8  72 ms  69 ms  69 ms  pd900cb06.dip0.t-ipconnect.de [217.0.203.6]
  9  68 ms  68 ms  69 ms  80.157.204.62
 10  78 ms  79 ms  78 ms  et-3-3-0.cr4-par7.ip4.gtt.net [213.200.119.214]
 11  82 ms  81 ms  83 ms  renater-gw-ix1.gtt.net [77.67.123.206]
 12  74 ms  74 ms  75 ms  te1-1-inria-rtr-021.noc.renater.fr [193.51.177.107]
 13  95 ms  100 ms  81 ms  inria-rocquencourt-te1-4-inria-rtr-021.noc.renater.fr [193.51.184.177]
 14  75 ms  74 ms  76 ms  unit240-reth1-ufw-ext-dc1.inria.fr [192.93.122.19]
 15  90 ms  80 ms  80 ms  inria-cms.inria.fr [128.93.162.63]

Trace complete.
```

There is a link between steps 6 and 7 that has a significantly longer delay. The link is clearly in Ankara (ulus) city .