

HACETTEPE UNIVERSITY
COMPUTER ENGINEERING DEPARTMENT
COMPUTER NETWORKS LABORATORY



EXPERIMENT ICMP

Deniz Ece AKTAŞ 21626901

Ece OMURTAY 21627543

GROUP NUMBER : 12

IP address of our computer: 192.168.1.55

1. IP address of our source computer is 192.168.1.55 and IP address of destination is 23.7.207.228 which is www.mit.edu

```
Komut İstemi
Microsoft Windows [Version 10.0.19041.630]
(c) 2020 Microsoft Corporation. Tüm hakları saklıdır.

C:\Users\pc>ping -n 10 www.mit.edu

Pinging e9566.dscb.akamaiedge.net [23.7.207.228] with 32 bytes of data:
Reply from 23.7.207.228: bytes=32 time=55ms TTL=49
Reply from 23.7.207.228: bytes=32 time=55ms TTL=49
Reply from 23.7.207.228: bytes=32 time=55ms TTL=49
Reply from 23.7.207.228: bytes=32 time=56ms TTL=49
Reply from 23.7.207.228: bytes=32 time=55ms TTL=49
Reply from 23.7.207.228: bytes=32 time=55ms TTL=49
Reply from 23.7.207.228: bytes=32 time=55ms TTL=49
Reply from 23.7.207.228: bytes=32 time=55ms TTL=49
Reply from 23.7.207.228: bytes=32 time=55ms TTL=49

Ping statistics for 23.7.207.228:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 55ms, Maximum = 56ms, Average = 55ms
```

2. Each ICMP packet has type and code information. It provides to communicate network layer information between routers and hosts that's why ICMP packet does not have any source and destination port numbers. The Type/Code identifies the particular 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.

No.	Source IP	Destination IP	Protocol	Length	Info
1116	18.323923	192.168.1.55	23.7.207.228	ICMP	74 Echo (ping) request id=0x0001, seq=2086/9736, ttl=128 (reply in 1122)
1122	18.379135	23.7.207.228	192.168.1.55	ICMP	74 Echo (ping) reply id=0x0001, seq=2086/9736, ttl=49 (request in 1116)
1213	19.338990	192.168.1.55	23.7.207.228	ICMP	74 Echo (ping) request id=0x0001, seq=2087/9992, ttl=128 (reply in 1217)
1217	19.394712	23.7.207.228	192.168.1.55	ICMP	74 Echo (ping) reply id=0x0001, seq=2087/9992, ttl=49 (request in 1213)

> Frame 1116: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface \Device\NPF_{2F86FA23-1860-4715-956B-3A40F810F6C4}, id 0

> Ethernet II, Src: IntelCor_83:5e:f5 (f8:94:c2:83:5e:f5), Dst: Tp-LinkT_62:5c:80 (1c:44:19:62:5c:80)

> Internet Protocol Version 4, Src: 192.168.1.55, Dst: 23.7.207.228

> Internet Control Message Protocol

Type: 8 (Echo (ping) request)

Code: 0

Checksum: 0x4535 [correct]

[Checksum Status: Good]

Identifier (BE): 1 (0x0001)

Identifier (LE): 256 (0x0100)

Sequence number (BE): 2086 (0x0826)

Sequence number (LE): 9736 (0x2608)

[Response frame: 1122]

> Data (32 bytes)

Offset	Hex	ASCII
0000	1c 44 19 62 5c 80 f8 94 c2 83 5e f5 08 00 45 00	-D b\... ..E.
0010	00 3c 65 b3 00 00 00 01 2c 43 c0 a8 01 37 17 07	-<e... ,C...7..
0020	cf e4 08 00 45 35 00 01 08 26 61 62 63 64 65 66	...8... -8abcdef
0030	67 68 69 6a 6b 6c 6d 6e 6f 70 71 72 73 74 75 76	ghijklm opqrstuv
0040	77 61 62 63 64 65 66 67 68 69	wabdefg hi

Checksum (icmp.checksum), 2 bytes

Packets: 2026

ICMP type: 8

Code: 0

Identifier: BE / LE

Checksum, identifier and sequence number are both 2 bytes. An ICMP packet has these fields.

4. Ping reply :

No.	Time	Source	Destination	Protocol	Length	Info
1116	18.323923	192.168.1.55	23.7.207.228	ICMP	74	Echo (ping) request id=0x0001, seq=2086/9736, ttl=128 (reply in 1122)
1122	18.379135	23.7.207.228	192.168.1.55	ICMP	74	Echo (ping) reply id=0x0001, seq=2086/9736, ttl=49 (request in 1116)
1213	19.338990	192.168.1.55	23.7.207.228	ICMP	74	Echo (ping) request id=0x0001, seq=2087/9992, ttl=128 (reply in 1217)
1217	19.394712	23.7.207.228	192.168.1.55	ICMP	74	Echo (ping) reply id=0x0001, seq=2087/9992, ttl=49 (request in 1213)

> Frame 1122: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface \Device\NPF_{2F86FA23-1860-4715-9568-3A40FB10F6C4}, id 0

> Ethernet II, Src: Tp-LinkT_62:5c:80 (1c:44:19:62:5c:80), Dst: IntelCor_83:5e:f5 (f8:94:c2:83:5e:f5)

> Internet Protocol Version 4, Src: 23.7.207.228, Dst: 192.168.1.55

Internet Control Message Protocol

Type: 0 (Echo (ping) reply)
Code: 0
Checksum: 0x4d35 [correct]
[Checksum Status: Good]
Identifier (BE): 1 (0x0001)
Identifier (LE): 256 (0x0100)
Sequence number (BE): 2086 (0x0826)
Sequence number (LE): 9736 (0x2608)
[Request frame: 1116]
[Response time: 55.212 ms]
Data (32 bytes)

0000 f8 94 c2 83 5e f5 1c 44 19 62 5c 80 08 00 45 00^..D..b...E..

0010 00 3c 4a 32 00 00 31 01 96 c4 17 07 cf e4 c0 a8 ...<J2..1-.....

0020 01 37 00 00 4d 35 00 01 08 26 61 62 63 64 65 66 -7..45...-&abcdef

0030 67 68 69 6a 6b 6c 6d 6e 6f 70 71 72 73 74 75 76 ghijklmn opqrstuv

0040 77 61 62 63 64 65 66 67 68 69 wabcdefg hi

Checksum (icmp.checksum), 2 bytesPackets: 202

ICMP type: 0

Code: 0

Identifier: BE / LE

Again, all fields are 2 bytes long.

5. IP address of our source computer is 192.168.1.55 and IP address of destination is 23.7.207.228 which is www.mit.edu

```
Komut İstemi
C:\Users\pc>tracert www.mit.edu

Tracing route to e9566.dscb.akamaiedge.net [23.7.207.228]
over a maximum of 30 hops:

  1  1 ms  1 ms  <1 ms  VOIP [192.168.1.1]
  2  14 ms 19 ms 30 ms 212.156.201.19.static.turktelekom.com.tr [212.156.201.19]
  3  3 ms  4 ms  3 ms 81.212.107.149.static.turktelekom.com.tr [81.212.107.149]
  4  3 ms  3 ms  3 ms 06-balgat-t2-2--06-balgat-t3-2.statik.turktelekom.com.tr [195.175.169.193]
  5  4 ms  3 ms  4 ms 06-ulus-xrs-t2-2--06-balgat-t2-2.statik.turktelekom.com.tr [212.156.108.248]
  6  *      6 ms  4 ms 06-ebgp-ulus-sr12e-k--06-ulus-xrs-t2-2.statik.turktelekom.com.tr [81.212.217.121]
  7  *      20 ms 20 ms 308-buk-col-2--06-ebgp-ulus-sr12e-k.statik.turktelekom.com.tr [212.156.139.6]
  8  55 ms 55 ms 55 ms buca-b2-link.telia.net [62.115.37.72]
  9  56 ms 54 ms 55 ms win-bb3-link.telia.net [62.115.118.48]
 10 61 ms 56 ms 55 ms win-b2-link.telia.net [62.115.114.185]
 11 62 ms 57 ms 56 ms akamai-ic-310694-win-b4.c.telia.net [80.239.192.250]
 12 55 ms 55 ms 54 ms a23-7-207-228.deploy.static.akamaitechnologies.com [23.7.207.228]

Trace complete.

C:\Users\pc>
```

6. No, if ICMP sent UDP packet, IP protocol number should be 0x11

7. Ping query message (request) no response seen in this screenshot:

No.	Time	Source	Destination	Protocol	Length	Info
206	3.553236	192.168.1.55	23.7.207.228	ICMP	106	Echo (ping) request id=0x0001, seq=2132/21512, ttl=1 (no response found!)
207	3.554187	192.168.1.1	192.168.1.55	ICMP	134	Time-to-live exceeded (Time to live exceeded in transit)

> Frame 206: 106 bytes on wire (848 bits), 106 bytes captured (848 bits) on interface \Device\NPF_{2F86FA23-1860-4715-956B-3A40FB10F6C4}, id 0

> Ethernet II, Src: IntelCor_83:5e:f5 (f8:94:c2:83:5e:f5), Dst: Tp-LinkT_62:5c:81 (1c:44:19:62:5c:81)

> Internet Protocol Version 4, Src: 192.168.1.55, Dst: 23.7.207.228

> Internet Control Message Protocol

- Type: 8 (Echo (ping) request)
- Code: 0
- Checksum: 0xeffa [correct]
- [Checksum Status: Good]
- Identifier (BE): 1 (0x0001)
- Identifier (LE): 256 (0x0100)
- Sequence number (BE): 2132 (0x0854)
- Sequence number (LE): 21512 (0x5408)

> [No response seen]

> Data (64 bytes)

ICMP error packet:

No.	Time	Source	Destination	Protocol	Length	Info
206	3.553236	192.168.1.55	23.7.207.228	ICMP	106	Echo (ping) request id=0x0001, seq=2132/21512, ttl=1 (no response found!)
207	3.554187	192.168.1.1	192.168.1.55	ICMP	134	Time-to-live exceeded (Time to live exceeded in transit)

> Frame 207: 134 bytes on wire (1072 bits), 134 bytes captured (1072 bits) on interface \Device\NPF_{2F86FA23-1860-4715-956B-3A40FB10F6C4}, id 0

> Ethernet II, Src: Tp-LinkT_62:5c:80 (1c:44:19:62:5c:80), Dst: IntelCor_83:5e:f5 (f8:94:c2:83:5e:f5)

> Internet Protocol Version 4, Src: 192.168.1.1, Dst: 192.168.1.55

> Internet Control Message Protocol

- Type: 11 (Time-to-live exceeded)
- Code: 0 (Time to live exceeded in transit)
- Checksum: 0xf4ff [correct]
- [Checksum Status: Good]
- Unused: 00000000

> Internet Protocol Version 4, Src: 192.168.1.55, Dst: 23.7.207.228

> Internet Control Message Protocol

- Type: 8 (Echo (ping) request)
- Code: 0
- Checksum: 0xeffa [unverified] [in ICMP error packet]
- [Checksum Status: Unverified]
- Identifier (BE): 1 (0x0001)
- Identifier (LE): 256 (0x0100)
- Sequence number (BE): 2132 (0x0854)
- Sequence number (LE): 21512 (0x5408)

> Data (64 bytes)

A ping query packet contains type, code and checksum information besides an ICMP error message has more fields like error ping information.

8. According to screenshot below, the delay of Balgat – Ulus link takes long time .

```
Komut İstemi
C:\Users\pc>tracert www.mit.edu

Tracing route to e9566.dscb.akamaiedge.net [23.7.207.228]
over a maximum of 30 hops:

  1    1 ms    1 ms    <1 ms  VOIP [192.168.1.1]
  2   14 ms   19 ms   30 ms  212.156.201.19.static.turktelekom.com.tr [212.156.201.19]
  3    3 ms    4 ms    3 ms  81.212.107.149.static.turktelekom.com.tr [81.212.107.149]
  4    3 ms    3 ms    3 ms  06-balgat-t2-2---06-balgat-t3-2.statik.turktelekom.com.tr [195.175.169.193]
  5    4 ms    3 ms    4 ms  06-ulus-xrs-t2-2---06-balgat-t2-2.statik.turktelekom.com.tr [212.156.108.248]
  6    *        6 ms    4 ms  06-ebgp-ulus-sr12e-k---06-ulus-xrs-t2-2.statik.turktelekom.com.tr [81.212.217.121]
  7    *       20 ms   20 ms  308-buk-col-2---06-ebgp-ulus-sr12e-k.statik.turktelekom.com.tr [212.156.139.6]
  8   55 ms   55 ms   55 ms  buca-b2-link.telia.net [62.115.37.72]
  9   56 ms   54 ms   55 ms  win-bb3-link.telia.net [62.115.118.48]
 10   61 ms   56 ms   55 ms  win-b2-link.telia.net [62.115.114.185]
 11   62 ms   57 ms   56 ms  akamai-ic-310694-win-b4.c.telia.net [80.239.192.250]
 12   55 ms   55 ms   54 ms  a23-7-207-228.deploy.static.akamaitechnologies.com [23.7.207.228]

Trace complete.

C:\Users\pc>
```