

## Задание 2

1. Да, отличия присутствуют:

- У ping-пакета размер поля data составляет 32 байта, у tracer – 64
- Поле ttl: у ping было всегда ttl = 64, а здесь значение этого поля меняется в соответствии с правилом, описанным в задании (в моем случае, от 1 до 17)

3804	166.881295	192.168.1.63	2.16.186.185	ICMP	106 Echo (ping) request id=0x0001, seq=52/13312, ttl=14 (reply in 3805)
3805	166.913761	2.16.186.185	192.168.1.63	ICMP	106 Echo (ping) reply id=0x0001, seq=52/13312, ttl=53 (request in 3804)
3817	167.004371	192.168.1.63	192.168.1.1	ICMP	177 Destination unreachable (Port unreachable)
4371	178.582221	23.210.52.177	192.168.1.63	ICMP	70 Time-to-live exceeded (Time to live exceeded in transit)
7866	297.969758	192.168.1.63	192.168.1.1	ICMP	210 Destination unreachable (Port unreachable)

Internet Control Message Protocol

Type: 8 (Echo (ping) request)  
Code: 0  
Checksum: 0xf7ca [correct]  
[Checksum Status: Good]  
Identifier (BE): 1 (0x0001)  
Identifier (LE): 256 (0x0100)  
Sequence Number (BE): 52 (0x0034)  
Sequence Number (LE): 13312 (0x3400)  
[Response frame: 3805]  
> Data (64 bytes)

2. Добавилась информация об ICMP исходного эхо-запроса, а также данные IPv4:

1611	44.417625	172.29.194.27	192.168.1.63	ICMP	70 Time-to-live exceeded (Time to live exceeded in transit)
1612	44.419058	192.168.1.63	184.31.15.178	ICMP	106 Echo (ping) request id=0x0001, seq=670/40450, ttl=3 (no response found!)
1613	44.419997	172.29.194.27	192.168.1.63	ICMP	70 Time-to-live exceeded (Time to live exceeded in transit)
1614	44.420714	192.168.1.63	184.31.15.178	ICMP	106 Echo (ping) request id=0x0001, seq=671/40706, ttl=3 (no response found!)
1615	44.421509	172.29.194.27	192.168.1.63	ICMP	70 Time-to-live exceeded (Time to live exceeded in transit)
1799	54.469256	192.168.1.63	184.31.15.178	ICMP	106 Echo (ping) request id=0x0001, seq=672/40962, ttl=4 (no response found!)
1800	54.470729	172.29.193.142	192.168.1.63	ICMP	70 Time-to-live exceeded (Time to live exceeded in transit)
1801	54.471903	192.168.1.63	184.31.15.178	ICMP	106 Echo (ping) request id=0x0001, seq=673/41218, ttl=4 (no response found!)
1802	54.472778	172.29.193.142	192.168.1.63	ICMP	70 Time-to-live exceeded (Time to live exceeded in transit)
1803	54.473641	192.168.1.63	184.31.15.178	ICMP	106 Echo (ping) request id=0x0001, seq=674/41474, ttl=4 (no response found!)
1804	54.474730	172.29.193.142	192.168.1.63	ICMP	70 Time-to-live exceeded (Time to live exceeded in transit)

> Frame 1611: 70 bytes on wire (560 bits), 70 bytes captured (560 bits) on interface \Device\NPF\_{45939136-9508-4A86-B5D2-5B4810D20A35}, id 0

> Ethernet II, Src: Keenetic\_1e:95:c8 (50:ff:20:1e:95:c8), Dst: HewlettP\_0e:f2:25 (84:a9:3e:0e:f2:25)

> Internet Protocol Version 4, Src: 172.29.194.27, Dst: 192.168.1.63

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: 192.168.1.63, Dst: 184.31.15.178

Internet Control Message Protocol

3. 3 наших последних запроса были успешно доставлены до адресата, time-to-live-exceed не произошло, адресат нам ответил. Отличия от пакетов с ошибками:

- Другой ICMP-тип: 0 (Echo (ping) reply)
- Отсутствует информация об ICMP исходного эхо-запроса, и данные IPv4
- ttl = 50

3959	104.212326	192.168.1.63	184.31.15.178	ICMP	106 Echo (ping) request	id=0x0001, seq=711/50946, ttl=17 (reply in 3960)
3960	104.236633	184.31.15.178	192.168.1.63	ICMP	106 Echo (ping) reply	id=0x0001, seq=711/50946, ttl=50 (request in 3959)
3961	104.238336	192.168.1.63	184.31.15.178	ICMP	106 Echo (ping) request	id=0x0001, seq=712/51202, ttl=17 (reply in 3962)
3962	104.268175	184.31.15.178	192.168.1.63	ICMP	106 Echo (ping) reply	id=0x0001, seq=712/51202, ttl=50 (request in 3961)
3963	104.271411	192.168.1.63	184.31.15.178	ICMP	106 Echo (ping) request	id=0x0001, seq=713/51458, ttl=17 (reply in 3964)
3964	104.297198	184.31.15.178	192.168.1.63	ICMP	106 Echo (ping) reply	id=0x0001, seq=713/51458, ttl=50 (request in 3963)
3971	104.375799	192.168.1.63	192.168.1.1	ICMP	179 Destination unreachable (Port unreachable)	
5848	160.417501	192.168.1.63	192.168.1.1	ICMP	222 Destination unreachable (Port unreachable)	
10888	238.739325	192.168.1.63	192.168.1.1	ICMP	210 Destination unreachable (Port unreachable)	

> Frame 3964: 106 bytes on wire (848 bits), 106 bytes captured (848 bits) on interface \Device\NPF\_{45939136-950B-4A86-B5D2-5B4810D20A35}, id 0  
 > Ethernet II, Src: Keenetic\_1e:95:c8 (50:ff:20:1e:95:c8), Dst: HewlettP\_0e:f2:25 (84:a9:3e:0e:f2:25)  
 > Internet Protocol Version 4, Src: 184.31.15.178, Dst: 192.168.1.63  
 > Internet Control Message Protocol  
   Type: 0 (Echo (ping) reply)  
   Code: 0  
   Checksum: 0xfd35 [correct]  
   [Checksum Status: Good]  
   Identifier (BE): 1 (0x0001)  
   Identifier (LE): 256 (0x0100)  
   Sequence Number (BE): 713 (0x02c9)  
   Sequence Number (LE): 51458 (0xc902)  
   [Request frame: 3963]  
   [Response time: 25,787 ms]  
 > Data (64 bytes)

4. Сравнительно большая разница в задержках наблюдается между запросами 11 и 12. Хост 87.245.250.65 находится в Польше, хост 87.245.233.91 – в Швеции (определено с помощью <https://www.reg.ru/web-tools/geoip> )

Трассировка маршрута к rediff.com [184.31.15.178]  
с максимальным числом прыжков 30:

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 1  <1 мс    <1 мс    <1 мс    192.168.1.1
 2  1 ms     <1 мс    <1 мс    217-79-5-113.obit.ru [217.79.5.113]
 3  1 ms     1 ms     <1 мс    172.29.194.27
 4  1 ms     1 ms     1 ms     172.29.193.142
 5  1 ms     1 ms     <1 мс    172.29.194.181
 6  1 ms     1 ms     1 ms     172.29.194.171
 7  1 ms     1 ms     1 ms     172.29.194.188
 8  1 ms     2 ms     1 ms     vi-xx-0150.brc1.spb.obit.ru [85.114.1.12]
 9  1 ms     2 ms     1 ms     censor-02.obit.ru [85.114.3.53]
10  2 ms     1 ms     2 ms     vi-xx-1874.brc1.spb.obit.ru [85.114.3.56]
11  1 ms     2 ms     6 ms     ae1-144.RT.OV.SPB.RU.retn.net [87.245.250.65]
12  11 ms    12 ms    11 ms     ae2-7.RT1.M9.MSK.RU.retn.net [87.245.233.91]
13  15 ms    15 ms    15 ms     GW-Telia.retn.net [87.245.255.43]
14  21 ms    21 ms    21 ms     s-bb1-link.ip.twelve99.net [62.115.143.24]
15  21 ms    22 ms    21 ms     s-b3-link.ip.twelve99.net [62.115.118.107]
16  22 ms    22 ms    23 ms     akamai-svc072700-lag003500.ip.twelve99-cust.net [62.115.173.119]
17  24 ms    30 ms    26 ms     a184-31-15-178.deploy.static.akamaitechnologies.com [184.31.15.178]

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Трассировка завершена.