МИНОБРНАУКИ РОССИИ

Федеральное государственное бюджетное образовательное учреждение высшего образования

НИЖЕГОРОДСКИЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ

УНИВЕРСИТЕТ им. Р.Е.АЛЕКСЕЕВА

Институт радиоэлектроники и информационных технологий

Кафедра информатики и систем управления

ОТЧЕТ

По лабораторной работе №3

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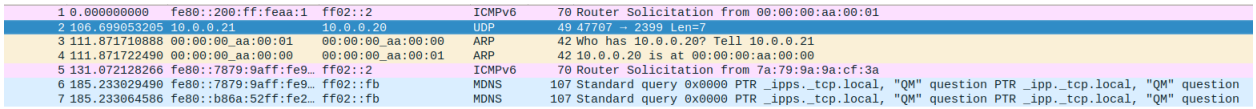
Работа защищена «___» _____

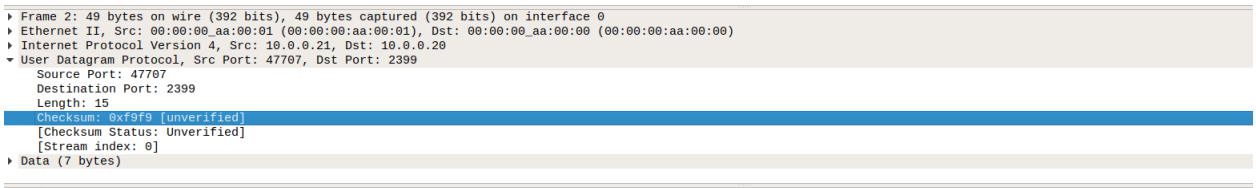
С оценкой _____

Нижний Новгород 2021

--UDP--



```
    1 0.000000000   fe80::200:ff:feaa:1  ff02::2             ICMPv6      70 Router Solicitation from 00:00:00:aa:00:01
    2 106.699053205 10.0.0.21            10.0.0.20           UDP         49 47707 → 2399 Len=7
    3 111.871710888 00:00:00_aa:00:01    00:00:00_aa:00:00   ARP         42 Who has 10.0.0.20? Tell 10.0.0.21
    4 111.871722490 00:00:00_aa:00:00    00:00:00_aa:00:01   ARP         42 10.0.0.20 is at 00:00:00:aa:00:00
    5 131.072128266 fe80::7879:9aff:fe9… ff02::2             ICMPv6      70 Router Solicitation from 7a:79:9a:9a:cf:3a
    6 185.233029490 fe80::7879:9aff:fe9… ff02::fb            MDNS       107 Standard query 0x0000 PTR _ipps._tcp.local, "QM" question PTR _ipp._tcp.local, "QM" question
    7 185.233064586 fe80::b86a:52ff:fe2… ff02::fb            MDNS       107 Standard query 0x0000 PTR _ipps._tcp.local, "QM" question PTR _ipp._tcp.local, "QM" question
```



```
▸ Frame 2: 49 bytes on wire (392 bits), 49 bytes captured (392 bits) on interface 0
▸ Ethernet II, Src: 00:00:00_aa:00:01 (00:00:00:aa:00:01), Dst: 00:00:00_aa:00:00 (00:00:00:aa:00:00)
▸ Internet Protocol Version 4, Src: 10.0.0.21, Dst: 10.0.0.20
▾ User Datagram Protocol, Src Port: 47707, Dst Port: 2399
    Source Port: 47707
    Destination Port: 2399
    Length: 15
    Checksum: 0xf9f9 [unverified]
    [Checksum Status: Unverified]
    [Stream index: 0]
▸ Data (7 bytes)
```

```
0000  00 00 00 aa 00 00 00 00  00 aa 00 01 08 00 45 00   ........ ......E·
0010  00 23 1a 67 40 00 40 11  0c 3b 0a 00 00 15 0a 00   ·#·g@·@· ·;......
0020  00 14 ba 5b 09 5f 00 0f  f9 f9 48 65 6c 6c 6f 21   ···[·_·· ··Hello!
0030  0a                                                ·
```

Псевдозаголовок:

0A00 0014
0A00 0015
0011 0A07

$$(0A00)_{16} + (0015)_{16} + (0A00)_{16} + (0014)_{16} + (AA5B)_{16} + (095F)_{16} + (001F)_{16} + (0A06)_{16} + (0002)_{16} + (0000)_{16} + (4855)_{16} + (6C6C)_{16} + (6F11)_{16} + (000A)_{16} = (20604)_{16}$$

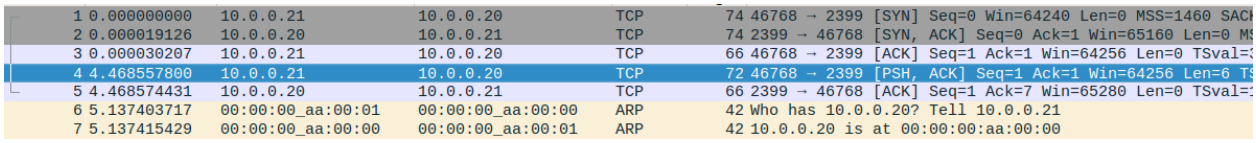
Значение больше 16 бит, значит делаем круговой перенос:

$$0002 + 0604 = 0606$$

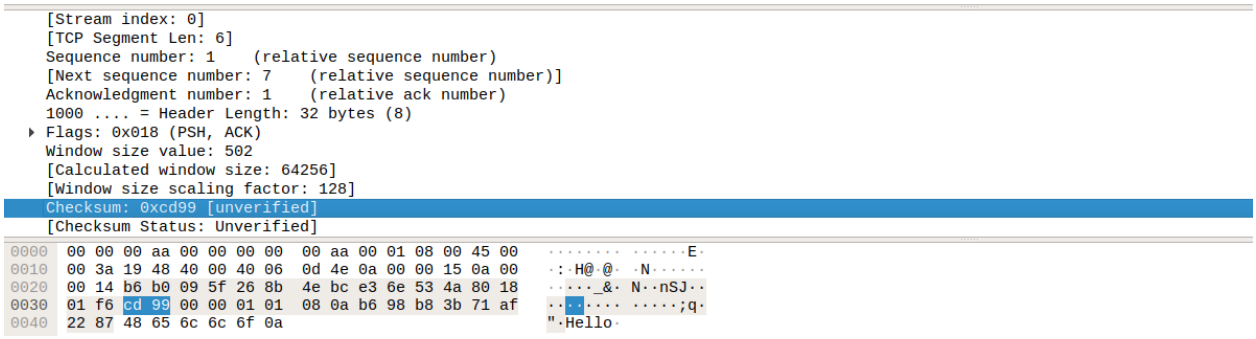
Значение не превышает 16 бит

$$FFFF - 0606 = F9F9$$

--TCP--



1	0.000000000	10.0.0.21	10.0.0.20	TCP	74 46768 → 2399 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SAC
2	0.000019126	10.0.0.20	10.0.0.21	TCP	74 2399 → 46768 [SYN, ACK] Seq=0 Ack=1 Win=65160 Len=0 M
3	0.000030207	10.0.0.21	10.0.0.20	TCP	66 46768 → 2399 [ACK] Seq=1 Ack=1 Win=64256 Len=0 TSval=
4	4.468557800	10.0.0.21	10.0.0.20	TCP	72 46768 → 2399 [PSH, ACK] Seq=1 Ack=1 Win=64256 Len=6 T
5	4.468574431	10.0.0.20	10.0.0.21	TCP	66 2399 → 46768 [ACK] Seq=1 Ack=7 Win=65280 Len=0 TSval=
6	5.137403717	00:00:00_aa:00:01	00:00:00_aa:00:00	ARP	42 Who has 10.0.0.20? Tell 10.0.0.21
7	5.137415429	00:00:00_aa:00:00	00:00:00_aa:00:01	ARP	42 10.0.0.20 is at 00:00:00:aa:00:00



```
[Stream index: 0]
[TCP Segment Len: 6]
Sequence number: 1    (relative sequence number)
[Next sequence number: 7    (relative sequence number)]
Acknowledgment number: 1    (relative ack number)
1000 .... = Header Length: 32 bytes (8)
▸ Flags: 0x018 (PSH, ACK)
Window size value: 502
[Calculated window size: 64256]
[Window size scaling factor: 128]
Checksum: 0xcd99 [unverified]
[Checksum Status: Unverified]
```

```
0000  00 00 00 aa 00 00 00 00  00 aa 00 01 08 00 45 00   ........ ......E·
0010  00 3a 19 48 40 00 40 06  0d 4e 0a 00 00 15 0a 00   ·:·H@·@· ·N·····
0020  00 14 b6 b0 09 5f 26 8b  4e bc e3 6e 53 4a 80 18   ·····_&· N··nSJ··
0030  01 f6 cd 99 00 00 01 01  08 0a b6 98 b8 3b 71 af   ·····... ·····;q·
0040  22 87 48 65 6c 6c 6f 0a                           "·Hello·
```

Псевдозаголовок:

0A00 0015
0A00 0014
0006 002C

$$(0A00)_{16} + (0015)_{16} + (0A00)_{16} + (0015)_{16} + (B6B0)_{16} + (095F)_{16} + (268B)_{16} + (4EBC)_{16} + (E36E)_{16} + (533A)_{16} + (8018)_{16} + (01E6)_{16} + (0030)_{16} + (0002)_{16} + (0000)_{16} + (0000)_{16} + (0101)_{16} + (080A)_{16} + (B698)_{16} + (B83B)_{16} + (71BF)_{16} + (2287)_{16} + (4755)_{16} + (6C6C)_{16} + (6F0A)_{16} = (63260)_{16}$$

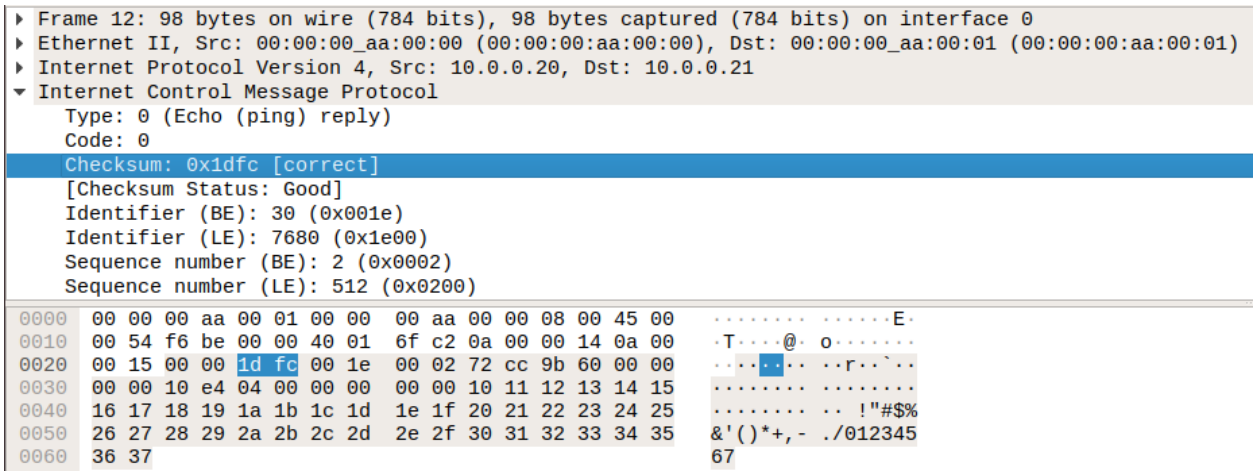
Значение больше 16 бит, значит делаем круговой перенос:

$$0006 + 3260 = 3266$$

Значение не превышает 16 бит

$$FFFF - 3266 = CD99$$

--ICMP--



Псевдозаголовок:

0A00 0014
0A00 0015
0001 00A1

$$(0A00)_{16} + (0024)_{16} + (0A00)_{16} + (0015)_{16} + (0000)_{16} + (0000)_{16} + (0001)_{16} + (00A1)_{16} + (001E)_{16} + (0002)_{16} + (72CC)_{16} + (9CA0)_{16} + (0000)_{16} + (0000)_{16} + (12E4)_{16} + (0400)_{16} + (0000)_{16} + (0000)_{16} + (1011)_{16} + (1213)_{16} + (1415)_{16} + (1617)_{16} + (1819)_{16} + (1A1B)_{16} + (1C1D)_{16} + (1E1F)_{16} + (2021)_{16} + (2223)_{16} + (2425)_{16} + (2627)_{16} + (2829)_{16} + (2A2B)_{16} + (2C2D)_{16} + (2E2F)_{16} + (3031)_{16} + (3233)_{16} + (3435)_{16} + (3637)_{16} = (4E1FF)_{16}$$

Значение больше 16 бит, значит делаем круговой перенос:

$0004 + E1FF = E203$

Значение не превышает 16 бит

$FFFF - E203 = 1DFC$