EINTE LAB 2
IoT

Damian Bukowski 303828

Kacper Zdyb 303845

Task 1

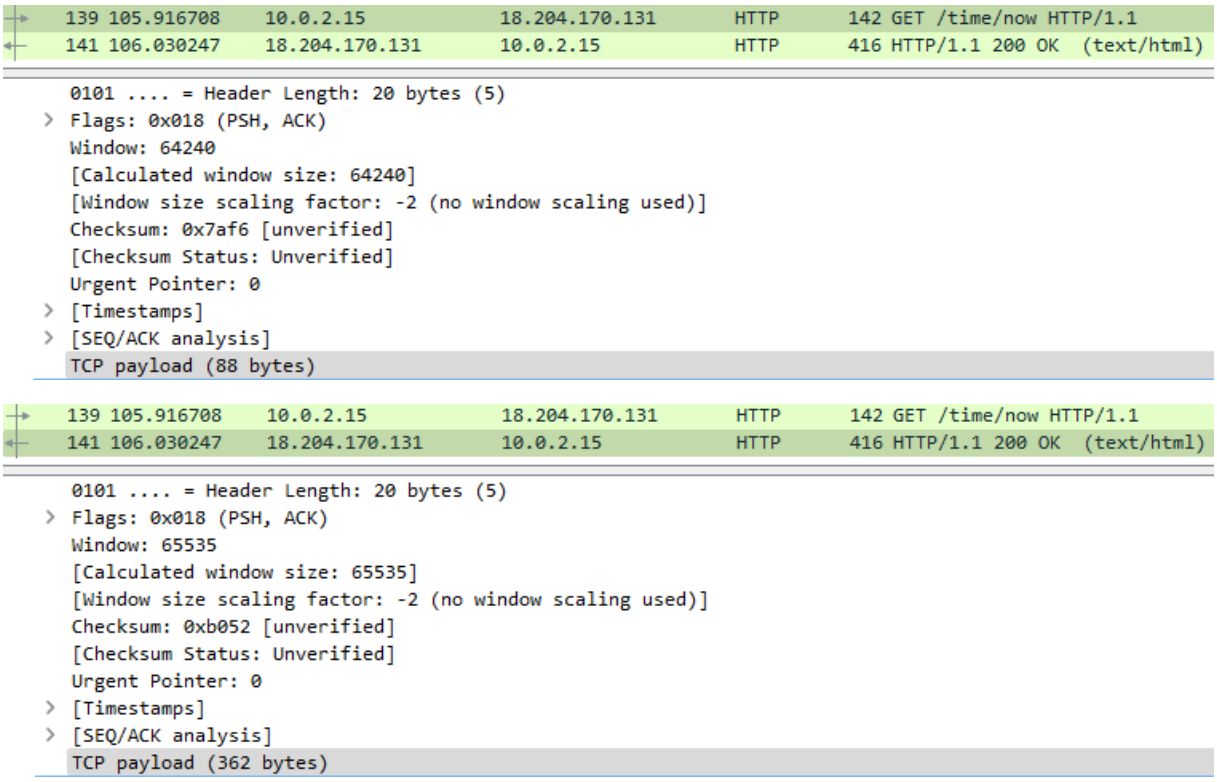
Task 1.a

```
Sat, 16 Apr 2022 14:25:51
```

Console output: Sat, 16 Apr 2022 14:27:10 GMT

Number of characters: 29

Task 1.b



There were 2 HTTP messages exchanged: 1 request and 1 response.

Task 1.c

The transport layer protocol needed to encode 88 bytes of request and 362 bytes of response message.

Task 1.d

$$\frac{Characters\ displayed}{Bytes} = \frac{29}{362} = 0{,}08$$

Task 2

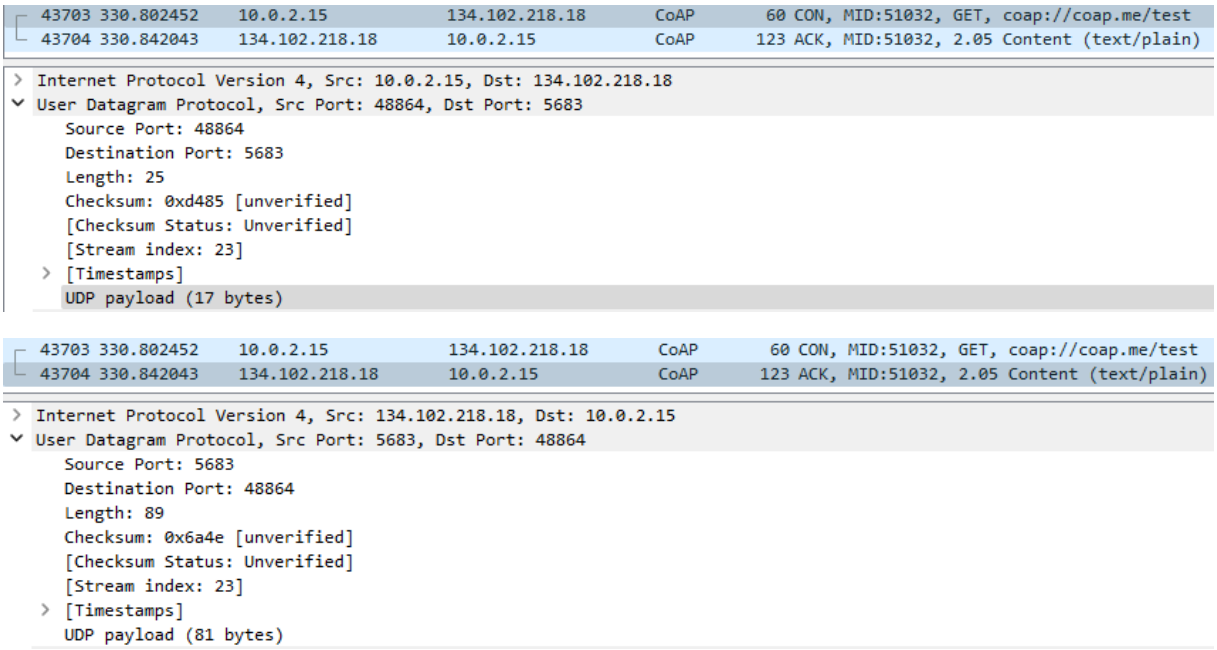
Task 2.a

```
welcome to the ETSI plugtest! last change: 2022-04-16 14:31:28 UTC
```

Console output: welcome to the ETSI plugtest! last change: 2022-04-16 14:31:28 UTC

Number of characters: 66

Task 2.b



The transport layer protocol needed to encode 17 bytes of request and 81 bytes of payload.

Task 2.c

$$\frac{Characters\ displayed}{Bytes} = \frac{66}{81} = 0{,}814$$

Task 2.d

CoAP is a lot more efficient than http.

Task 3

Task 3.a

Response in case 1: That took a long time

```
That took a long time
```

Response in case 2: That took a long time

```
That took a long time
```

Task 3.b

For the first request there were 4 messages exchanged.

```
 83 59.564475    10.0.2.15          134.102.218.18     CoAP    63 CON, MID:4426, GET, coap://coap.me/separate
 84 59.598290    134.102.218.18     10.0.2.15          CoAP    46 ACK, MID:4426, Empty Message
 85 64.648949    134.102.218.18     10.0.2.15          CoAP    69 CON, MID:53487, 2.05 Content (text/plain)
 86 64.649158    10.0.2.15          134.102.218.18     CoAP    60 ACK, MID:53487, Empty Message
```

CON – Confirmable

ACK – Acknoledgement

For the second request there were only 2 messages exchanged.

```
 92 90.218718    10.0.2.15          134.102.218.18     CoAP    63 NON, MID:28895, GET, coap://coap.me/separate
 93 95.305515    134.102.218.18     10.0.2.15          CoAP    69 NON, MID:33650, 2.05 Content (text/plain)
```

NON – Non-confirmable

Since in the second case the request was sent with **-N** parameter neither message had to be confirmed, thus only 2 messages were exchanged.

Task 3.c

Case 1:

Bytes transmitted: 63 + 46 + 69 + 60 = 238

Case 2:

Bytes transmitted: 63 + 69 = 132

$$\frac{238 - 132}{238} * 100\% = 45\%$$

In the second case we are using 45% less bytes than in case 1.

Since the second case we specified that there is no need for ACK frames, there weren't sent, thus less data had to be transmitted.

Task 4

From Task 2:

```
118 1470.451688   10.0.2.15          134.102.218.18     CoAP     60 CON, MID:23682, GET, coap://coap.me/test
119 1470.485401   134.102.218.18     10.0.2.15          CoAP    123 ACK, MID:23682, 2.05 Content (text/plain)
```

From Task 3:

```
 83 59.564475    10.0.2.15          134.102.218.18     CoAP    63 CON, MID:4426, GET, coap://coap.me/separate
 84 59.598290    134.102.218.18     10.0.2.15          CoAP    46 ACK, MID:4426, Empty Message
 85 64.648949    134.102.218.18     10.0.2.15          CoAP    69 CON, MID:53487, 2.05 Content (text/plain)
 86 64.649158    10.0.2.15          134.102.218.18     CoAP    60 ACK, MID:53487, Empty Message
```

The number of confirmable requests in Task 2 (1 confirmable request) is different than the amount of confirmable requests in Task 3 (2 confirmable requests). The reason being that in the first case the acknoledgement message comes with a response message from the server, whereas in the second case the host first acknoledges the receival of the request, then sends the response with the message and receives the acknoledgment from the host that it has received the response.