

EINTE LAB 2

IoT

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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

→	139	105.916708	10.0.2.15	18.204.170.131	HTTP	142	GET /time/now HTTP/1.1
←	141	106.030247	18.204.170.131	10.0.2.15	HTTP	416	HTTP/1.1 200 OK (text/html)
<hr/>							
0101 = Header Length: 20 bytes (5)							
> Flags: 0x018 (PSH, ACK)							
Window: 64240							
[Calculated window size: 64240]							
[Window size scaling factor: -2 (no window scaling used)]							
Checksum: 0x7af6 [unverified]							
[Checksum Status: Unverified]							
Urgent Pointer: 0							
> [Timestamps]							
> [SEQ/ACK analysis]							
TCP payload (88 bytes)							
<hr/>							
→	139	105.916708	10.0.2.15	18.204.170.131	HTTP	142	GET /time/now HTTP/1.1
←	141	106.030247	18.204.170.131	10.0.2.15	HTTP	416	HTTP/1.1 200 OK (text/html)
<hr/>							
0101 = Header Length: 20 bytes (5)							
> Flags: 0x018 (PSH, ACK)							
Window: 65535							
[Calculated window size: 65535]							
[Window size scaling factor: -2 (no window scaling used)]							
Checksum: 0xb052 [unverified]							
[Checksum Status: Unverified]							
Urgent Pointer: 0							
> [Timestamps]							
> [SEQ/ACK analysis]							
TCP payload (362 bytes)							

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

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

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

43703	330.802452	10.0.2.15	134.102.218.18	CoAP	60 CON, MID:51032, GET, coap://coap.me/test
43704	330.842043	134.102.218.18	10.0.2.15	CoAP	123 ACK, MID:51032, 2.05 Content (text/plain)

> Internet Protocol Version 4, Src: 10.0.2.15, Dst: 134.102.218.18

▼ User Datagram Protocol, Src Port: 48864, Dst Port: 5683

Source Port: 48864

Destination Port: 5683

Length: 25

Checksum: 0xd485 [unverified]

[Checksum Status: Unverified]

[Stream index: 23]

> [Timestamps]

UDP payload (17 bytes)

43703	330.802452	10.0.2.15	134.102.218.18	CoAP	60 CON, MID:51032, GET, coap://coap.me/test
43704	330.842043	134.102.218.18	10.0.2.15	CoAP	123 ACK, MID:51032, 2.05 Content (text/plain)

> Internet Protocol Version 4, Src: 134.102.218.18, Dst: 10.0.2.15

▼ User Datagram Protocol, Src Port: 5683, Dst Port: 48864

Source Port: 5683

Destination Port: 48864

Length: 89

Checksum: 0x6a4e [unverified]

[Checksum Status: Unverified]

[Stream index: 23]

> [Timestamps]

UDP payload (81 bytes)

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

Task 2.c

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

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 – Acknowledgement

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 acknowledgement message comes with a response message from the server, whereas in the second case the host first acknowledges the receipt of the request, then sends the response with the message and receives the acknowledgment from the host that it has received the response.