IoT Challenge #2

CoAP and MQTT Traffic Analysis

Home Challenge #2

- Download the **challenge2.pcapng** file <u>here</u> or from WeBeep: You find the file in the VM already in path:
   Desktop/IoT Examples/pcap/example1.pcapng

- Analyse the traffic with Wireshark or writing simple scripts (Python, C++)

- Answer the following questions (in a **pdf** and fill the **form**) (IGNORE MALFORMED PACKETS)

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Questions (1-2)

1a. How many **different CoAP clients** sent a GET request to a temperature resource (.../temperature)? (**0.3pt**)

1b. **For each of the clients** found in 1a), write the **MID of the longest CoAP response** (any response) received by the client (**0.3pt**)

2a. How many **CoAP POST requests** directed to the "**coap.me**" server did **NOT** produce a successful result?***** (**0.4pt**)

2b. How many **requests** from 2a) are directed to a "weird" resource? (resources like /weirdXX)? (**0.2pt**)

***HINT**: DNS converts Domain names to IP addresses

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Questions (3-4)

3a. How many **MQTT Publish messages** with qos=2 are **RECEIVED by the clients** running in the machine capturing the traffic? **(0.3pt)**

3b. How many **clients** are involved in the messages found in 3a)? **(0.1pt)**

3c. What are the **MQTT Message identifiers** (ID) of the subscribe requests that let the client receive the messages found in 3a)? **(0.2pt)**

4a. How many **MQTT clients** sent a subscribe message to a public broker using atleast one wildcard? **(0.3pt)**

4b. Considering clients found in 4a), **how many** of them **WOULD** receive a publish message directed to the topic: "metaverse/facility4/area0/light" **(0.3pt)**

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Questions (5-7)

5. How **many MQTT ACK messages** in total are received by clients who connected to brokers specifying a client identifier shorter than 15 bytes and using MQTT version 3.1.1? **(0.5pt)**

6a. How many **MQTT subscribe requests** with message ID=1 are directed to the HiveMQ broker?***(0.3pt)**

6b. How many publish messages are received by the clients thanks to the subscribe requests found in 6a) **(0.3pt)**

7a. How many **MQTT-SN (on port 1885) publish messages** sent after the hour 3.59PM (Milan Time) are directed to topic 6? **(0.3pts)**

7b. Explain possible reasons why messages in 7a) are not handled by the server **(0.2pts)**

***HINT:** DNS converts Domain names to IP addresses

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Protocol Ports

Be sure to refer to the proper ports in Wireshark!

Edit the port in Edit->Preferences->Protocols and add the port to your protocol

- **HTTP**: 80

- **CoAP**: 5683

- **MQTT** 1883

- **MQTT-SN** 1885

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Challenge deliverable

What to deliver:
- A **PDF** containing **motivated responses** with all filters used and comments of any additional code (if used)
- Specify your **names + person codes** in the pdf!
- **ALSO Fill [this form](#) with the numerical values of the responses**
  (in the form follow the requested format)

How?
- Upload the .pdf file on the **folder #2** on WeBeep "Consegne" folder
  The PDF should be named as follows:
  2/3-teams: <personcode1>_<personcode2>_<personcode3>.pdf
  Single: <person_code>.pdf
  E.g. 10692911.pdf or 10692911_10692912.pdf

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PLEASE NOTE

1. Files without name and personcode or in a weird format won't be corrected (=0 points)

2. Always make clear and highlight your answer.
   The answer **should be clear and unique!**
   Example, answers like this:
        "If ……… then the answer is 4, but if instead …………. then answer is 5"
   Will get 0 points. **If you have doubts on questions ask before submitting**

3. Try to produce **small but effective answers**, write only useful things and if required upload images taken e.g. from wireshark. Final answers should be written as text. (not like, "see image for the answer")

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For 2/3 people teams:

- Choose your team leader and name the file as:
    <leader_personcode>_<other_personcodes>.pdf
- If you have more files (e.g. code), create a zip and use the same naming logic

- **Only the teamleader** should upload the challenge in WeBeep
Do note upload the same challenge more times!

- *Can I take the challenges with the other class students (Prof. Redondi)*?
YES, **but** only the team leader should upload the challenge in WeBeep

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Delivery Deadline

- **FIRM** Deadline:

  April 7, 2024   h 23.59

- Max 3 people
- **Up to 4 points**

Good Luck!

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