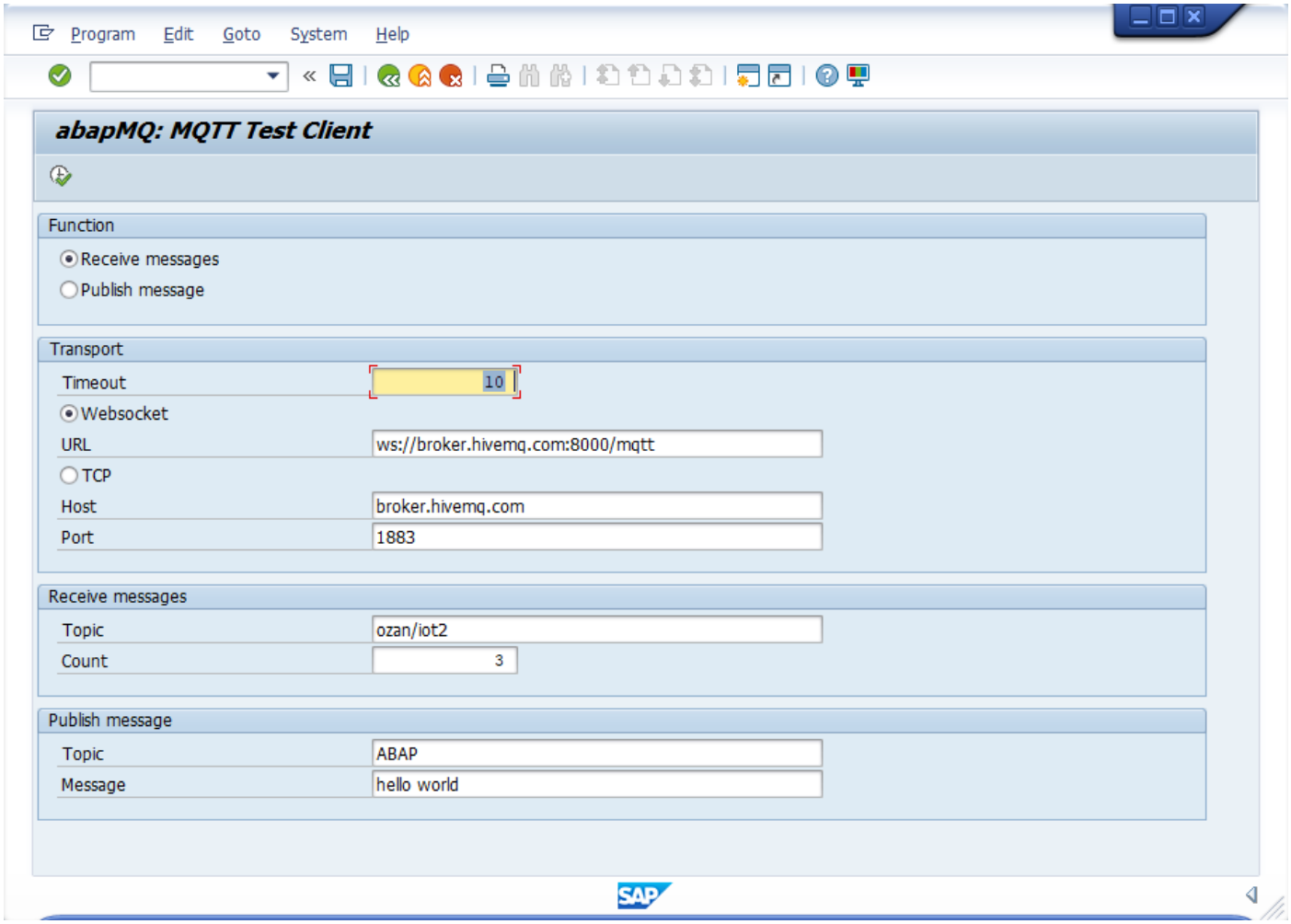
Lars Hvam
September 8, 2018 2 minute read

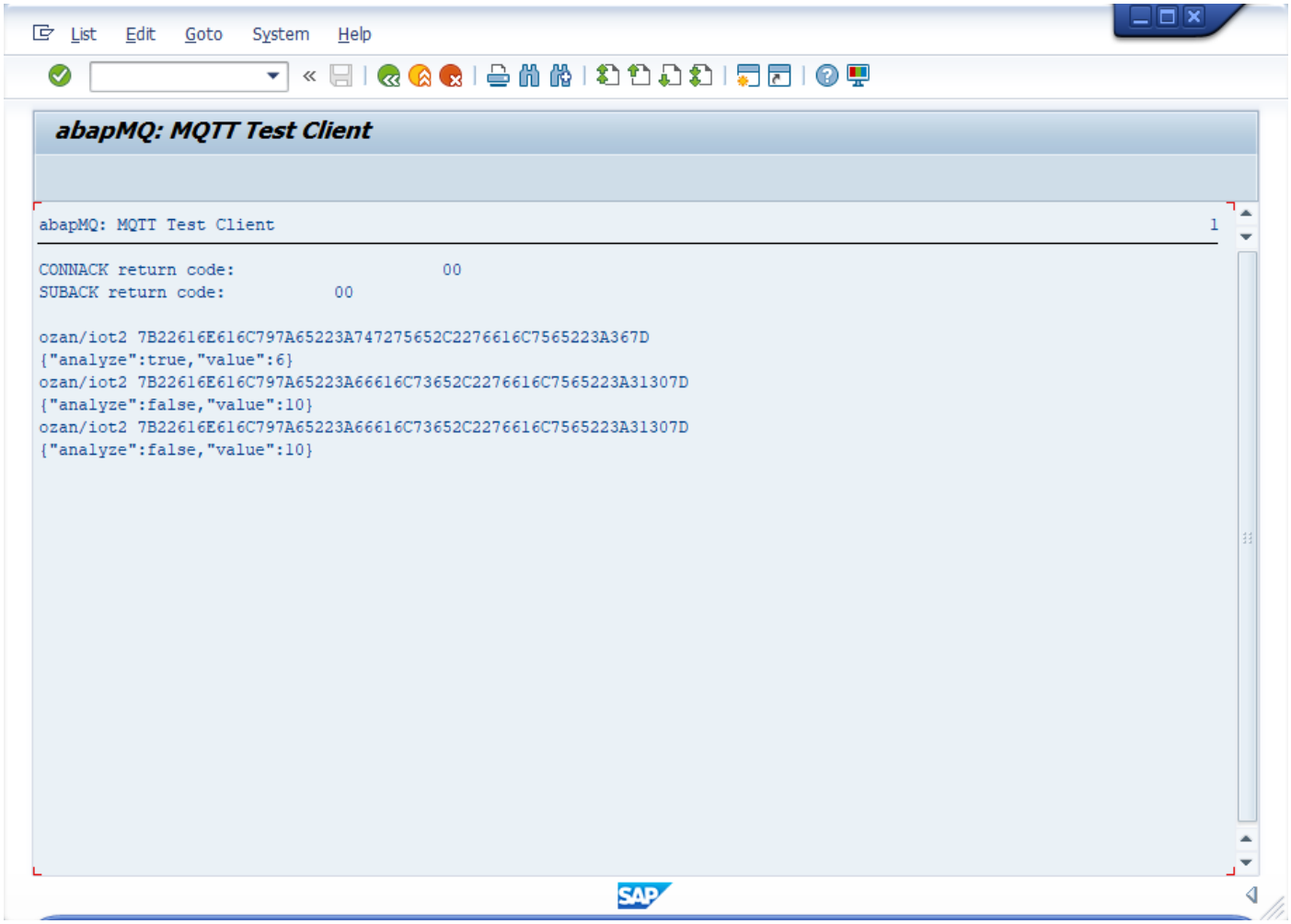
Custom MQTT client in ABAP

abapMQ

abapMQ is a custom open source implementation of MQTT 3.1.1, it currently implements all the packages defined in the protocol, and works over websockets and TCP., it works on 750sp01 and up.

It is now possible to connect to brokers on the internet and send or receive messages via the MQTT protocol:


Program Edit Goto System Help
abapMQ: MQTT Test Client
Function
Receive messages
Publish message
Transport
Timeout
10
Websocket
URL
ws://broker.hivemq.com:8000/mqtt
TCP
Host
broker.hivemq.com
Port
1883
Receive messages
Topic
ozan/iot2
Count
3
Publish message
Topic
ABAP
Message
hello world


List Edit Goto System Help
abapMQ: MQTT Test Client
abapMQ: MQTT Test Client 1
CONNACK return code: 00
SUBACK return code: 00
ozan/iot2 7B22616E616C797A65223A747275652C2276616C7565223A367D
{"analyze":true,"value":6}
ozan/iot2 7B22616E616C797A65223A66616C73652C2276616C7565223A31307D
{"analyze":false,"value":10}
ozan/iot2 7B22616E616C797A65223A66616C73652C2276616C7565223A31307D
{"analyze":false,"value":10}

There is still some work to be done, but the basics are in place, you can now connect your dishwasher(or other IoT devices) to your ABAP instance.

TCP Hacky Hack

ABAP supports 3 approaches for defining the TCP frame length,

"A TCP frame can be of one of the following frame types, which has to be specified using the attribute frame_type in the frame structure (of type APC_TCP_FRAME).

- *Frame type is IF_APC_TCP_FRAME_TYPES=>CO_FRAME_TYPE_TERMINATOR: The TCP frame (message) is terminated by one or several bytes, e.g. line feed (LF) or carriage return line feed (CRLF). The terminator bytes have to be passed as hex code (00-FF) representation, e.g. for LF is this 0A or for CRLF is this 0D0A, to the terminator*attribute *of the frame structure.*
- *Frame type is IF_APC_TCP_FRAME_TYPES=>CO_FRAME_TYPE_FIXED_LENGTH: The TCP frame (message) has a constant length in bytes. The frame length in bytes has to be passed to the attribute fixed_length of the frame structure (as* decimal *number).*
- *Frame type is IF_APC_TCP_FRAME_TYPES=>CO_FRAME_TYPE_LENGTH_FIELD: The frame length in bytes is part of the frame (message) itself and in a fixed position of the frame, i.e. a length field exists with a predefined offset and a predefined size. This type of frames (as an example RFC 1006) have the length field in position x of the frame, i.e. offset is x, and the length of the field length is of fixed length, i.e. 1,2,4 or 8 bytes. The length field specifies the whole/gross frame length. In this* case *the offset in bytes has to be passed to the attribute length_field_offset and the length of the length field in bytes has to be passed to the attribute length_field_length of the of* frame *structure."*

However, in MQTT 3.1.1 the length of the package varies so none of the above can be used directly. To solve this I have set the frame length of all TCP packages to 1 byte, this is very evil, but it works, take care if you choose to use this in a productive environment. Websockets does not have this problem.

```
DATA(ls_frame) = VALUE apc_tcp_frame(
  frame_type   = if_apc_tcp_frame_types=>co_frame_type_fixed_length
  fixed_length = 1 ).

lo_tcp->mi_client = cl_apc_tcp_client_manager=>create(
  i_host          = iv_host
  i_port          = iv_port
  i_frame         = ls_frame
  i_event_handler = lo_tcp ).
```

Over'n'out

abapMQ is MIT licensed and can be found via http://abapmq.org, pull requests welcome :o)

Find more open source ABAP on http://dotabap.org

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6 Comments

Rohit Gupta

September 8, 2018 at 3:40 pm

I have been looking for this

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 Lars Hvam | Post author

September 8, 2018 at 4:30 pm

Also see https://blogs.sap.com/2018/08/14/abap-at-sap-teched-2018/, looks like SAP also have some MQTT in store for TechEd

And Jörg Müller has developed a message broker, https://twitter.com/MDJoerg/status/1034570697752895488

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 Frank Radmacher

November 19, 2018 at 5:11 pm

That's right. SAP offers a native MQTT Client API as of ABAP Platform 1809. For further information, I recommend the Blog "MQTT client in ABAP Platform 1809". There you can also find a link to the official documentation and to a tutorial that teaches how to use the provided ABAP API.

Btw, a recording of one of the TechEd lectures is also available.

Best regards,
Frank

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 Simone Milesi

September 12, 2018 at 8:07 am

Great job as usual Lars!

It's really cool!

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 Lars Hvam | Post author

September 12, 2018 at 9:06 am

thanks ☺ also as usual, there is a lot missing, but this is a start

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Jelena Perfiljeva

September 13, 2018 at 7:57 pm

Thanks for sharing. For those who're also wondering what the heck is MQTT here is a summary (source):

> *MQTT is a machine-to-machine (M2M)/"Internet of Things" connectivity protocol. It was designed as an extremely lightweight publish/subscribe messaging transport.*

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