

Octave MQTT Toolkit 0.0.6

MQTT functions for GNU Octave.

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To download a copy of the GNU Octave MQTT package, please visit <https://gnu-octave.github.io/octave-mqtt/>.

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1 Installing and loading

The toolkit must be installed and then loaded to be used.

It can be installed in GNU Octave directly from the website, or can be installed in an off-line mode via a downloaded tarball.

The toolkit has a dependency on the PAHO-MQTT-C library (<https://www.eclipse.org/paho/>), so it must be installed in order to successfully install the toolkit.

The toolkit must be then be loaded once per each GNU Octave session in order to use its functionality.

1.1 Online Direct install

With an internet connection available, the octave mqtt package can be installed from the octave-mqtt website using the following command within GNU Octave:

```
pkg install -forge mqtt
```

The latest released version of the toolkit will be downloaded and installed.

1.2 Off-line install

With the toolkit package already downloaded (<https://github.com/gnu-octave/octave-mqtt/releases/download/release-0.0.6/octave-mqtt-0.0.6.tar.gz>), and in the current directory when running GNU Octave, the package can be installed using the following command within GNU Octave:

```
pkg install octave-mqtt-0.0.6.tar.gz
```

1.3 Loading

Regardless of the method of installing the toolkit, in order to use its functions, the toolkit must be loaded using the pkg load command:

```
pkg load mqtt
```

The toolkit must be loaded on each GNU Octave session.

2 Basic Usage Overview

The overview connects to the public broker at HiveMQ (<https://www.hivemq.com/public-mqtt-broker/>) and follows this general flow:

2.1 Connection to a broker

Connection to the broker is done using the `mqttclient` function.

Example

```
brokerAddress = "tcp://broker.hivemq.com";
port = 1883;

client = mqttclient(brokerAddress, "Port", port)

client =

    Client with properties
      BrokerAddress: tcp://broker.hivemq.com
        Port: 1883
      ClientID:
      Timeout: 5
    KeepAliveDuration: 60
      Subscriptions: [0x3] table
      Connected: 1
```

Additional properties can be included for Timeout, Username, Password and more.

2.2 Subscribe to a Topic

To get notifications for changes to a topic, subscribe to the topic.

Example

```
topic = "octave/test/field1";

subscribe(client, topic)

ans =

    scalar structure containing the fields:

      Topic = octave/test/field1
      QualityOfService = 0
      Callback =
```

2.3 Write to a Topic

To publish data to the broker, use the `wrote` function.

Example

```
write(client, topic, "hello world")
```

2.4 Read from subscribed Topics

Reading data from a topic can be done using the peek function (which will not clear the data from the received queue) or the read function (that will clear the message from the received queue)

Example

```
# see if there is message
msg = peek(client)

msg =

  scalar structure containing the fields:

    Time = 1.6560e+09
    Topic = octave/test/field1
    Data = hello world

# read message from queue
msg = read(client)

msg =

  scalar structure containing the fields:

    Time = 1.6560e+09
    Topic = octave/test/field1
    Data = hello world
```

2.5 Close the client

To close the client and free any resources, use the clear function.

Example

```
clear client
```

3 Function Reference

The functions currently available in the toolkit are described below;

3.1 MQTT Functions

3.1.1 @octave_mqtt/flush

`flush (obj)`
`flush (obj, topic)`
 Flush a MQTT client connection

Inputs

`obj` A previously created octave_mqtt object
`topic` Optional topic to clear from queue.

Outputs

None

Examples

Open a client and flush the input

```
client = mqttclient("tcp://127.0.0.1");
flush(client);
```

Open a client and flush the input of only 'test' topics

```
client = mqttclient("tcp://127.0.0.1");
flush(client, "test");
```

See also: mqttclient.

3.1.2 @octave_mqtt/peek

`msg = peek (obj)`
`msg = peek (obj, topic)`
 Return the most recent message without removing it from the message queue.

Inputs

`obj` A previously created octave_mqtt object
`topic` Topic value to match.

Outputs

`msg` The most recent message.

If no topic is specified, the last message from any topic will be returned, otherwise the last matching the input topic.

Examples

```
client = mqttclient("tcp://127.0.0.1");
msg = peek(client);
```

3.1.3 @octave_mqtt/read

```
msgs = read (obj)
msgs = read (obj, topic)
```

Read available messages and remove from message queue.

Inputs

obj A previously created octave_mqtt object

topic Topic to match.

Outputs

msgs Messages from the message queue

If no topic is specified, messages from any topic will be returned, otherwise from the matching input topic.

Examples

```
client = mqttclient("tcp://127.0.0.1");
msgs = read(client, "test");
```

3.1.4 @octave_mqtt/subscribe

```
subs = subscribe (obj, topic)
subs = subscribe (obj, topic, [propname, propvalue ....])
```

Subscribe to a topic

Inputs

obj A previously created octave_mqtt object

topic String topic to subscribe to.

propname, propvalue
Optional property name / value pairs.

Known property name / value pairs:

QualityOfService
Numeric QualityOfService [0-2] (default 0)

Callback Callback function name or handle (default "")
If provided, the callback will be called with the topic name and message as arguments.

Outputs

subs a list of current subscriptions for this client.

Examples

Subscribe to topic 'Test':

```
client = mqttclient("tcp://127.0.0.1");
subs = subscribe(client, "Test");
```

Subscribe to topic 'Test' and display any changed via callback:

```
# define simple function to show callback data
function showmessage(t,v), printf("Topic: %s Message: %s\n", t, v); endfunction

client = mqttclient("tcp://127.0.0.1");
subs = subscribe(client, "Test", "Callback", @showmessage);
```

See also: `mqttclient`, `unsubscribe`.

3.1.5 @octave_mqtt/unsubscribe

`unsubscribe (obj, topic)`

Unsubscribe from *topic*

Inputs

`obj` A previously created `octave_mqtt` object

`topic` string topic name.

Outputs

None

Examples

```
client = mqttclient("tcp://127.0.0.1");
subscribe(client, "test1");
unsubscribe(client, "test1");
```

See also: `mqttclient`, `subscribe`.

3.1.6 @octave_mqtt/write

`write (obj, topic, value)`

`write (obj, topic, value, [propname, propvalue])`

Write *value* to *topic*.

Inputs

`obj` A previously created `octave_mqtt` object

`topic` String topic to write to.

`value` String value to write to topic.

`propname, propvalue`

Optional property name / value pairs.

Known property options are:

QualityOfService Numeric QualityOfService [0-2] (default 0)

Retain Boolean flag value for retaining message (default false)

Outputs

client A octave_mqtt object.

Examples

Open a client connection and write some values.

```
client = mqttclient("tcp://127.0.0.1");
write(client, "mytopic", "test1");
write(client, "mytopic", "test1", "QualityOfService", 1);
```

See also: mqttclient.

3.1.7 mqttclient

```
client = mqttclient (brokerAddr)
client = mqttclient (brokerAddr, [name, value ....])
```

Create a MQTT client connection

Inputs

brokerAddr
Name or IP address with protocol. ie: tcp://127.0.0.1.

name, value
Optional name / value pairs.

Known options are:

Port Numeric port number to connect to (default 1883)

Timeout Numeric timeout value in seconds (default 5)

KeepAliveDuration
Numeric keep alive value in seconds (default 60)

ClientID String client Id

Username String username

Password String password

CARootCertificate
String full file path to a root certificate file when using a secure connection

ClientCertificate
String full file path to a client certificate file when using a secure connection

ClientKey
String full file path to a private client key file when using a secure connection

SSLPassword
String Password to decrypt the client key file

LastWillTopic

String Last Will Topic. Must be set to a non empty string to enable LastWill.

LastWillMessage

String Last Will Message. (Default "")

LastWillQOS

Numeric 0|1|2 Last Will QOS Value (Default 0)

LastWillRetain

Logical 0|1 Last Will Retain Value (Default 0)

Outputs

client a octave_mqtt object

Properties

A octave_mqtt object has the following properties:

BrokerAddress

Broker URL

Port

Numeric port number to connect to (default 1883)

Timeout

Numeric timeout value in seconds (default 5)

KeepAliveDuration

Numeric keep alive value in seconds (default 60)

ClientID String client Id

Connected

logical 0|1 for connection status

Subscriptions

List of topics currently subscribed to

Examples

Create a new mqttclient

```
client = mqttclient("tcp://127.0.0.1");
```

Appendix A GNU General Public License

Version 3, 29 June 2007

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