Google Summer of Code 2014

MQTT-SN implementation for Wiselib

Functional tests

TEST CASE TC_01	
Name	Gateway saving
Associated requirement	REQ 1
Preconditions	Gateway available in a network
Purpose	1. Verify if gateway information is saved by a client 2. Verify if client will not try to save more gateways then it is set
Test steps	Send 11 ADVERTISE messages to a client Message fields: • Gateway id: 0x01 (+0x01 for every following ADVERTISE) • Duration: 0xFFFF
Expected result	1. Client saves proper gateway id, duration and RSSI 2. Client should not try to add information from 11th message
Actual result	1. Client saved 10 gateway informations 2. At 11th ADVERTISE client communicated that array of gateway connections is full
Status	PASSED

TEST CASE TC_02

Name	Gateway choose
Associated requirement	REQ 2
Preconditions	Five gateways available in networks with different RSSI levels – from 1 to 5 where 1 is the lowest and 5 is the highest • Gateway A - RSSI level 1 • Gateway B - RSSI level 2 • Gateway C - RSSI level 3 • Gateway D - RSSI level 4 • Gateway E - RSSI level 5
Purpose	Verify if client always choose gateway will the strongest signal
Test steps	1. Send ADVERTISE from Gateway A 2. Send CONNACK to a client 3. Send ADVERTISE from Gateway B 4. Send CONNACK to a client 5. Send ADVERTISE from Gateway D 6. Send CONNACK to a client 7. Send ADVERTISE from Gateway C 8. Send ADVERTISE from Gateway E 9. Send CONNACK to a client
Expected result	1. Client connects with Gateway A 2. Client switches to Gateway B 3. Client switches to Gateway D 4. Client saves Gateway C information 5. Client switches to Gateway E
Actual result	Same as expected
Status	PASSED

TEST CASE TC_03

Name	Gateway monitoring
Associated requirement	REQ 3
Preconditions	Two gateways available in a network • Gateway A • Gateway B
Purpose	Verify clients gateway monitoring process
Test steps	1. Send ADVERTISE message to a client from Gateway A 10 times with 1 second interval Message fields: • Gateway id: 0x01 • Duration: 1 sec 2. Send GWINFO message to a client from gateway B Message fields: • Gateway id: 0x02 3. Send ADVERTISE message to a client form gateway B 10 times with 5 seconds interval Message fields: • Gateway id: 0x02 • Duration: 5 sec

Expected result	1. After test step 1 client starts gateway monitoring process for Gateway A 2. After step 2 clients saves Gateway B data 3. After step 3 client start gateway monitoring process for gateway B 4. If client will not receive ADVERTISE message from Gateway A client should delete this gateways from gateway list after 3 seconds 5. After last ADVERTISE message from Gateway B client should delete this gateway from gateway list after 15 seconds
Actual result	Same as expected
Status	PASSED

TEST CASE TC_04

Name	Gateway discovery
Associated requirement	REQ 4
Preconditions	Gateway available in a network, but no ADVERTISE is sent
Purpose	Verify if client will start searching gateways
Test steps	Init a client
Expected result	1. Interval for sending GWINFO is unique for a client

	2. Client start broadcasting GWINFO
Actual result	Same as expected
Status	PASSED

TEST CASE TC_06

Name	Gateway discovery – preventing storm
Associated requirement	REQ 5
Preconditions	Minimum 2 clients in a network • Client A • Client B
Purpose	Verify if Client B will behave like SEARCHGW was sent by itself after receiving it from Client B
Test steps	1. Start gateway discovery on Client A 2. Start gateway discovery on Client B
Expected result	Client B reset a counter for sending next SEARCHGW message after receiving it from Client B
Actual result	Same as expected
Status	PASSED

TEST CASE TC_06

Name	Receiving SEARCHGW
Associated requirement	REQ 6
Preconditions	Minimum 2 clients in a network

	• Client A • Client B
Purpose	Verify if client will respond with GWINFO for SEARCHGW
Test steps	1. Establish connection with Client A and a gateway 2. Start broadcasting SEARCHGW from Client B
Expected result	Client B after receiving SEARCHGW from Client A should respond with GWINFO with id of current connected gateway.
Actual result	Same as expected
Status	PASSED

TEST CASE TC_07	
Name	Sending CONNECT - ACCEPTED
Associated requirement	REQ 7, REQ10
Preconditions	Gateway available in a network
Purpose	Verify if connection process works properly
Test steps	1. Send ADVERTISE to a client 2. Client sends CONNECT to a gateway 3. Gateway responds with CONNACK with return code equal to ACCEPTED
Expected result	Connection between client and a gateway is established
Actual result	Same as expected
Status	PASSED

TEST CASE TC_08	
Name	Sending CONNECT – Will Flag
Associated requirement	REQ 7, REQ8, REQ9, REQ10
Preconditions	Will topic and will message is set by a client
Purpose	Verify if connection process with will flag works properly
Test steps	1. Send ADVERTISE to a client 2. Client sends CONNECT to a gateway 3. Send WILLTOPICREQ to a client 4. Send WILLMSG to a client 5. Send CONNACK to a client with return code equal to ACCEPTED
Expected result	1. Client responds with WILLTOPIC message with assigned Will Topic after receiving WILLTOPICREQ 2. Client responds with WILLMSG message with assigned Will Msg after receiving WILLMSGREQ 3. Connection between client and a gateway is established
Actual result	Same as expected
Status	PASSED

TEST CASE TC_09	
Name	Sending CONNECT – REJECTED CONGESTION
Associated requirement	REQ 7, REQ11
Preconditions	Gateway available in a network
Purpose	Verify if connection process works properly
Test steps	1. Send ADVERTISE to a client 2. Client sends CONNECT to a

	gateway 3. Gateway responds with CONNACK with return code equal to REJECTED CONGESTION
Expected result	After T_WAIT interval CONNECT message is resent
Actual result	Same as expected
Status	PASSED

TEST CASE TC_10

Name	Sending WILLTOPICUPD
Associated requirement	REQ 12
Preconditions	Gateway available in a network. Established connection with will flag set.
Purpose	Verify if sending WILLTOPICUPD works properly
Test steps	Client sends WILLTOPICUPD with Will Topic set
Expected result	WILLTOPICUPD message is sent by a client
Actual result	Same as expected
Status	PASSED

TEST CASE TC_11

Name	Sending WILLMSGUPD
Associated requirement	REQ 13
Preconditions	Gateway available in a network. Established connection with will flag set.

Purpose	Verify if sending WILLMSGUPD works properly
Test steps	Client sends WILLMSGUPD with Will Data set
Expected result	WILLMSGUPD message is sent by a client
Actual result	Same as expected
Status	PASSED

TEST CASE TC_12

Name	Deleting Will Data
Associated requirement	REQ 14
Preconditions	Gateway available in a network. Established connection with will flag set.
Purpose	Verify if deleting Will Data works properly
Test steps	Client sends empty WILLMSGUPD
Expected result	Empty WILLMSGUPD message is sent by a client
Actual result	Same as expected
Status	PASSED

TEST CASE TC_13

Name	Registering topic - ACCEPTED
Associated requirement	REQ 15, REQ 16
Preconditions	Gateway available in a network. Connection with gateway is established.
Purpose	Verify if registering topic works

	properly
Test steps	1. Client sends REGISTER to a gateway with assigned Topic Name 2. Send REGACK message to a client with return code equal to ACCEPTED
Expected result	Client assumes that topic was successfully registered
Actual result	Same as expected
Status	PASSED

TEST CASE TC_14	
Name	Registering topic – REJECTED CONGESTION
Associated requirement	REQ 15, REQ 17
Preconditions	Gateway available in a network. Connection with gateway is established.
Purpose	Verify if registering topic works properly
Test steps	1. Client sends REGISTER to a gateway with assigned Topic Name 2. Send REGACK message to a client with return code equal to REJECTED CONGESTION
Expected result	After T_WAIT interval REGISTER message is resent
Actual result	Same as expected
Status	PASSED

TEST CASE TC_15	
Name	Registering topic – one message
Associated requirement	REQ 15, REQ 18
Preconditions	Gateway available in a network. Connection with gateway is established.
Purpose	Verify if registering topic works properly
Test steps	1. Client sends REGISTER to a gateway with assigned Topic Name 2. Client sends REGISTER message again
Expected result	Client is not allowed to send another REGISTER message before receiving REGACK message from gateway
Actual result	Same as expected
Status	PASSED

TEST CASE TC_16	
Name	Publishing data - ACCEPTED
Associated requirement	REQ 19, REQ 20
Preconditions	Gateway available in a network. Connection with gateway is established. Minimum one topic is registered.
Purpose	Verify if publishing data works properly
Test steps	1. Client sends PUBLISH to a gateway with assigned Topic

	Name 2. Send PUBACK message to a client with return code equal to ACCEPTED
Expected result	Client assumes that message was successfully published
Actual result	Same as expected
Status	PASSED

TEST CASE TC_17

Name	Publishing data – REJECTED CONGESTION
Associated requirement	REQ 15, REQ 17
Preconditions	Gateway available in a network. Connection with gateway is established.
Purpose	Verify if registering topic works properly
Test steps	1. Client sends PUBLISH to a gateway with assigned Topic Name 2. Send PUBACK message to a client with return code equal to REJECTED CONGESTION
Expected result	After T_WAIT interval PUBLISH message is resent
Actual result	Same as expected
Status	PASSED

TEST CASE TC_18

Name	Publishing data – one message
Associated requirement	REQ 19, REQ 21

Preconditions	Gateway available in a network. Connection with gateway is established.
Purpose	Verify if publishing data works properly
Test steps	1. Client sends PUBLISH to a gateway with assigned Topic Name 2. Client sends PUBLISH message again
Expected result	Client is not allowed to send another PUBLISH message before receiving PUBACK message from gateway
Actual result	Same as expected
Status	PASSED

TEST CASE TC_19

Name	Topic subscription – ACCEPTED
Associated requirement	REQ 27, REQ 28
Preconditions	Gateway available in a network. Connection with gateway is established.
Purpose	Verify if topic subscription works properly
Test steps	1. Client sends SUBSCRIBE to a gateway with assigned Topic Name 2. Send SUBACK message to a client with return code equal to ACCEPTED
Expected result	Client assumes that topic was successfully subsribed

Actual result	Same as expected
Status	PASSED

TEST CASE TC_20

Name	Topic subscription – REJECTED CONGESTION
Associated requirement	REQ 27, REQ 29
Preconditions	Gateway available in a network. Connection with gateway is established.
Purpose	Verify if topic subscription works properly
Test steps	3. Client sends SUBSCRIBE to a gateway with assigned Topic Name 4. Send SUBACK message to a client with return code equal to REJECTED CONGESTION
Expected result	After T_WAIT interval SUBSCRIBE message is resent
Actual result	Same as expected
Status	PASSED

TEST CASE TC_21

Name	Topic Subscription – One Message
Associated requirement	REQ 30
Preconditions	Gateway available in a network. Connection with gateway is established.
Purpose	Verify if topic subscription works properly
Test steps	1. Client sends SUBSCRIBE to a gateway with assigned Topic Name 2. Client sends SUBSCRIBE message again
Expected result	Client is not allowed to send another SUBSCRIBE message before receiving SUBACK message from gateway
Actual result	Same as expected
Status	PASSED

TEST CASE TC_22

Name	Topic Unsubscription
Associated requirement	REQ 31, REQ 32
Preconditions	Gateway available in a network. Connection with gateway is established.
Purpose	Verify if topic unsubscription works properly
Test steps	1. Client sends UNSUBSCRIBE to a gateway with assigned Topic Name 2. Send UNSUBACK message to a client
Expected result	Client assumes that topic was

	successfully unsubscribed
Actual result	Same as expected
Status	PASSED

TEST CASE TC_24

Name	Topic Unsubscription – One Message
Associated requirement	REQ 34
Preconditions	Gateway available in a network. Connection with gateway is established.
Purpose	Verify if topic subscription works properly
Test steps	1. Client sends UNSUBSCRIBE to a gateway with assigned Topic Name 2. Client sends UNSUBSCRIBE message again
Expected result	Client is not allowed to send another UNSUBSCRIBE message before receiving UNSUBACK message from gateway
Actual result	Same as expected
Status	PASSED

TEST CASE TC_25

Name	Registering global callback
Associated requirement	REQ 23
Preconditions	Gateway available in a network. Connection with gateway is established. Minimum one topic is subscribed.

Purpose	Verify if registering a global callback works properly
Test steps	1. Client registers a test global callback function 2. Send PUBLISH message to a client
Expected result	When client receives PUBLISH message global callback function should be called
Actual result	Same as expected
Status	PASSED

TEST CASE TC_26

Name	Unregistering global callback
Associated requirement	REQ 24
Preconditions	Gateway available in a network. Connection with gateway is established. Minimum one topic is subscribed.
Purpose	Verify if unregistering a global callback works properly
Test steps	1. Client registers a test global callback function 2. Client unregisters a test global callback function 3. Send PUBLISH message to a client
Expected result	Previously registered global callback function should not be called
Actual result	Same as expected
Status	PASSED

TEST CASE TC_27

Name	Registering callback for specific topic
Associated requirement	REQ 25
Preconditions	Gateway available in a network. Connection with gateway is established. Minimum one topic is subscribed.
Purpose	Verify if registering a callback for specific topic works properly
Test steps	1. Client registers a callback function for specific, subscribed topic 2. Client registers a global callback function 3. Send PUBLISH message connected with topic for which callback has been registered
Expected result	When client receives PUBLISH message callback for specific topic should be called instead of global callback
Actual result	Same as expected
Status	PASSED

TEST CASE TC_28

Name	Unregistering global callback
Associated requirement	REQ 26
Preconditions	Gateway available in a network. Connection with gateway is established. Minimum one topic is subscribed.
Purpose	Verify if unregistering a callback for specific topic works properly

Test steps	1. Client registers a callback for specific topic 2. Client unregisters a callback for specific topic 3. Send PUBLISH message connected with topic for which callback has been registered
Expected result	Previously registered callback for specific topic should not be called
Actual result	Same as expected
Status	PASSED

TEST CASE TC_29

Name	Monitoring connection
Associated requirement	REQ 35, REQ 37
Preconditions	Gateway available in a network.
Purpose	Verify if keep alive procedure works properly
Test steps	1. Send CONNECT to a gateway 2. Send CONNACK to a client with duration field equal to 5000 3. Send PINGRESP to a client 5 times with 5 seconds interval
Expected result	1. After receiving CONNACK message client should start process of monitoring connection. 2. When client receives PINGRESP message it should reset its keep alive counter 3. If client will not receive PINGRESP message from gateway for N consecutive times it assumes that gateway is not active and should first try to connect to another gateway before trying to re-connect the

	current one
Actual result	Same as expected
Status	PASSED

TEST CASE TC_30

Name	Monitoring connection
Associated requirement	REQ 36
Preconditions	Gateway available in a network. Connection with gateway is established
Purpose	Verify if keep alive procedure works properly
Test steps	Send PINGREQ message to a client
Expected result	Client should respond with PINGRESP message to a gateway
Actual result	Same as expected
Status	PASSED