

IoT Final Project 2023 - Project 1

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mqtt.h

mqttC.nc

Variables

- **locked:**
This boolean variable is used to indicate whether a message sending operation is currently in progress. When a message is being sent, this variable is set to TRUE, preventing further message sending until the current operation completes.
- **time_delays[N_CLIENTS]:**
This array holds time delay values associated with each client ID. It's used for setting specific time delays before certain actions occur for each client.
- **n_subscription_sim[N_CLIENTS]:**
This array holds the number of remaining subscriptions each client needs to make. It's decremented as clients subscribe to topics.
- **subscribed_sim[N_CLIENTS][N_TOPICS]:**
This 2D array indicates whether a client is subscribed to a particular topic. It's used to track the subscription status of each client for different topics.
- **panc_table:**
This structure represents the table used to keep track of client connections and topic subscriptions.
- **conn_ack_wait:**
This variable defines the initial waiting time for a CONNACK acknowledgment response from the broker.

- **sub_ack_wait:**
This variable defines the initial waiting time for a SUBACK acknowledgment response from the broker.
- **waiting_CONNACK:**
This structure is used to track the status and sequence number of the CONNECT acknowledgment response that the client is waiting for.
- **waiting_SUBACK:**
Similarly to **waiting_CONNACK**, this structure tracks the status and sequence number of the SUBACK acknowledgment response that the client is waiting for.
- **queued_sub_topic:**
This variable holds the topic that is currently queued for subscription. It's used to ensure that the correct topic is subscribed to after a timer event fires.

Functions

- **init_panc_table:**
Initializes the Panc table structure to track client connections and subscriptions.
- **send_connect_to_PANC:**
Sends a CONNECT message to the PAN Coordinator to establish a connection.
- **send_subscribe:**
Sends a SUBSCRIBE message to the PAN Coordinator to subscribe to a specified topic.
- **send_publish:**
- **create_connection:**
Handles the creation of a connection and sends a CONNACK response to the client.
- **create_subscription:**
Handles the creation of a subscription and sends a SUBACK response to the client.
- **forward_publish:**
Forwards PUBLISH messages to subscribed clients.

- **isConnected:**
Checks if a specific client is connected based on the Panc table.
- **isSubscribed:**
Checks if a specific client is subscribed to a topic based on the Panc table.

Timers

- **Timer0:**
Initiates the process of sending a CONNECT message to establish a connection.
- **Timer_wait_CONNACK:**
Handles timeouts and retries for waiting for a CONNACK response.
- **Timer_wait_SUBACK:**
Handles timeouts and retries for waiting for a SUBACK response.
- **Timer_SUB:**
Initiates the process of sending a SUBSCRIBE message to subscribe to a topic.
- **Timer_PUB:**
Initiates the process of sending a PUBLISH message.

Receive Event

Received messages are handled according to their type:

PANC

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MOTE

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