

# **ROS MQTT Client Guide**

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## Installation:

Just run the following command:

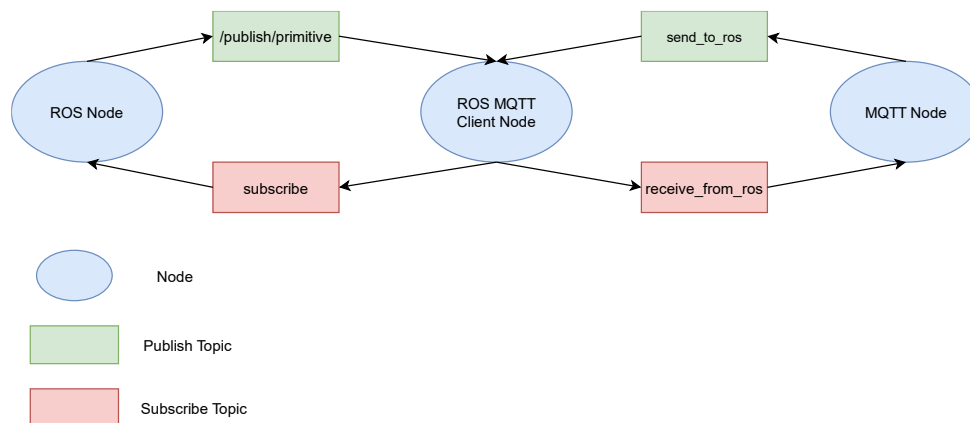
```
sudo apt update
```

```
sudo apt install ros-$ROS_DISTRO-mqtt-client
```

For more information visit the following site: [https://wiki.ros.org/mqtt\\_client](https://wiki.ros.org/mqtt_client)

## Architecture:

Note the following diagram is based on the two yaml files provided regarding the names of the topics



## ROS MQTT Client Settings:

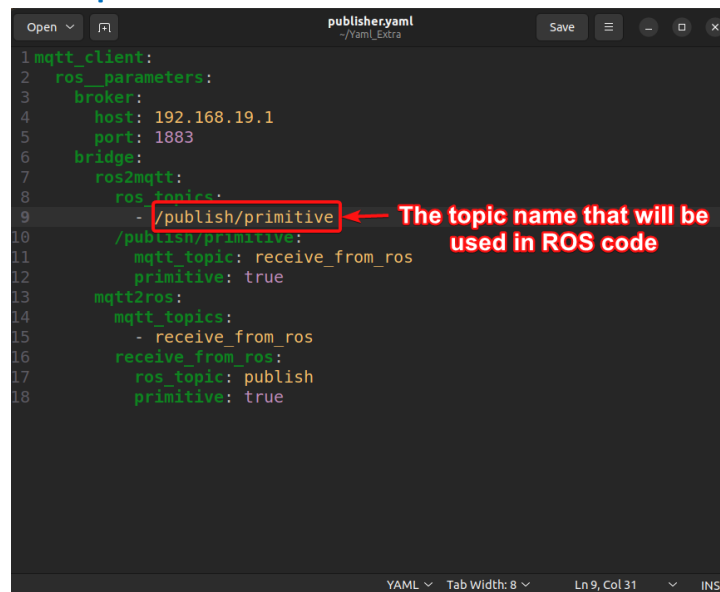
To effectively utilize the ROS MQTT client, you need a YAML file that specifies the topic names and the local host. Since the compiler adheres to a specific YAML file structure, it's advisable to use the provided YAML file as a template. Simply modify the topic names and local host to prevent compilation errors.

### Setting Local Host:

```
Open  publisher.yaml  Save  ~/yaml_extra
1 mqtt_client:
2   ros_parameters:
3     broker:
4       host: 192.168.19.1
5       port: 1883
6     bridge:
7       ros2mqtt:
8         ros_topics:
9           - /publish/primitive
10          /publish/primitive:
11            mqtt_topic: receive_from_ros
12            primitive: true
13          mqtt2ros:
14            mqtt_topics:
15              - receive_from_ros
16            receive_from_ros:
17              ros_topic: publish
18              primitive: true
```

Replace the IP address with host of the broker.

## Setting ROS Publisher Topic:

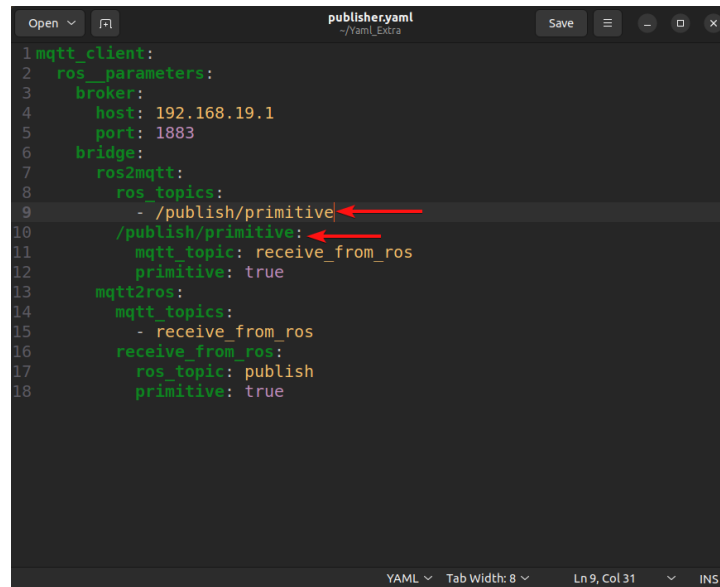


```
1 mqtt_client:
2   ros_parameters:
3     broker:
4       host: 192.168.19.1
5       port: 1883
6     bridge:
7       ros2mqtt:
8         ros_topics:
9         - /publish/primitive
10      /publish/primitive:
11        mqtt_topic: receive_from_ros
12        primitive: true
13      mqtt2ros:
14        mqtt_topics:
15        - receive_from_ros
16      receive_from_ros:
17        ros_topic: publish
18        primitive: true
```

The topic name that will be used in ROS code

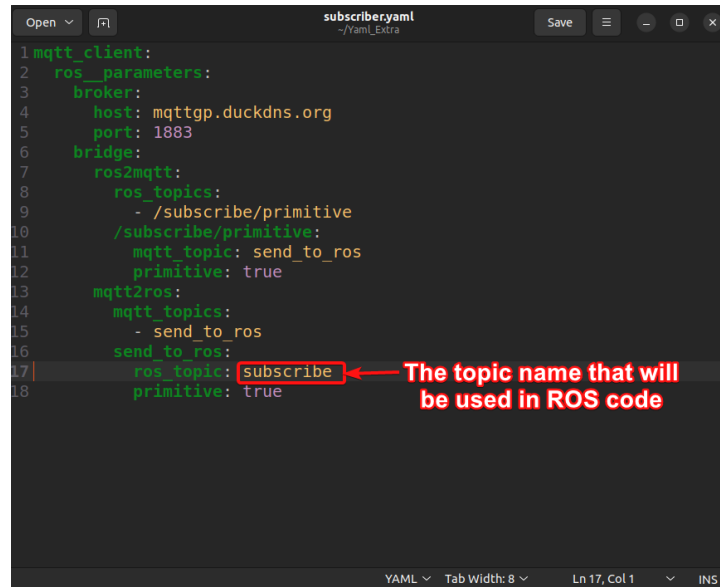
```
self.esp_publisher_ = self.create_publisher(String, "/publish/primitive", 10)
```

To change topic name, edit the following:



```
1 mqtt_client:
2   ros_parameters:
3     broker:
4       host: 192.168.19.1
5       port: 1883
6     bridge:
7       ros2mqtt:
8         ros_topics:
9         - /publish/primitive
10      /publish/primitive:
11        mqtt_topic: receive_from_ros
12        primitive: true
13      mqtt2ros:
14        mqtt_topics:
15        - receive_from_ros
16      receive_from_ros:
17        ros_topic: publish
18        primitive: true
```

## Setting ROS Subscriber Topic:

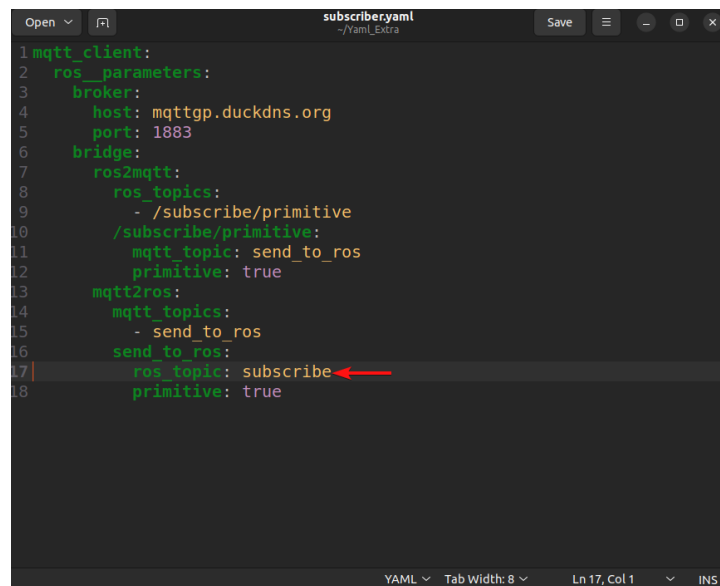


```
1 mqtt_client:
2   ros_parameters:
3     broker:
4       host: mqttgp.duckdns.org
5       port: 1883
6     bridge:
7       ros2mqtt:
8         ros_topics:
9           - /subscribe/primitive
10          /subscribe/primitive:
11            mqtt_topic: send_to_ros
12            primitive: true
13          mqtt2ros:
14            mqtt_topics:
15              - send_to_ros
16          send_to_ros:
17            ros_topic: subscribe
18            primitive: true
```

The topic name that will be used in ROS code

```
self.pose_subscriber_1_ = self.create_subscription(String, "subscribe", self.pose_callback, 10)
```

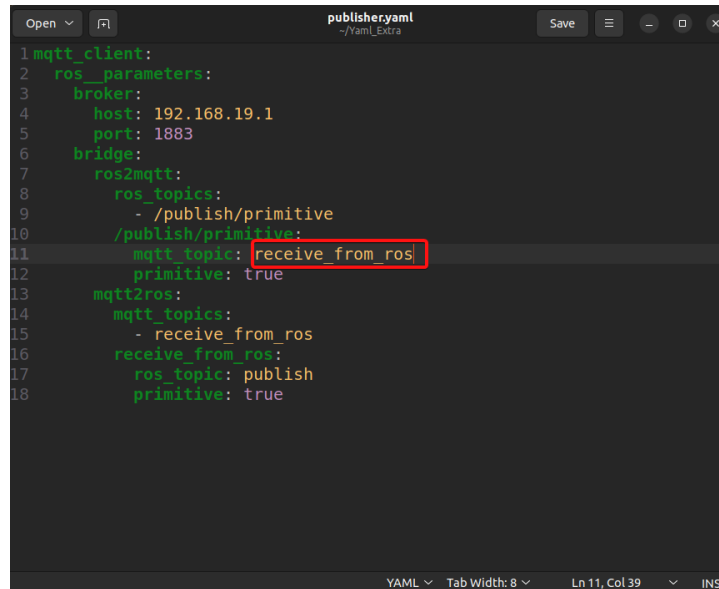
To change topic name, edit the following:



```
1 mqtt_client:
2   ros_parameters:
3     broker:
4       host: mqttgp.duckdns.org
5       port: 1883
6     bridge:
7       ros2mqtt:
8         ros_topics:
9           - /subscribe/primitive
10          /subscribe/primitive:
11            mqtt_topic: send_to_ros
12            primitive: true
13          mqtt2ros:
14            mqtt_topics:
15              - send_to_ros
16          send_to_ros:
17            ros_topic: subscribe
18            primitive: true
```

## Setting MQTT Topics:

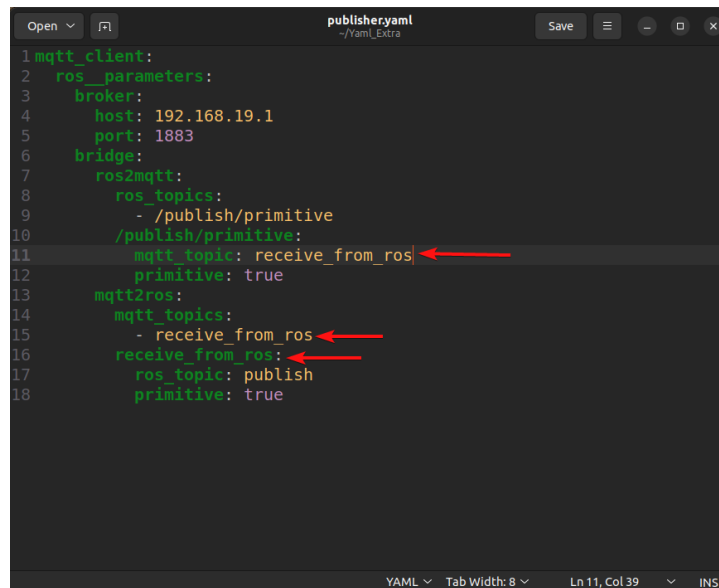
Subscribe to the following topic to receive data published by ROS (ROS → MQTT)



A screenshot of a code editor window titled 'publisheryaml' with a subtitle '~Yaml\_Extra'. The editor shows a YAML configuration for an MQTT client. The configuration includes a 'mqtt\_client' section with 'ros\_parameters' (broker, host, port, bridge) and 'ros2mqtt' (topics, mqtt\_topic, primitive). The 'mqtt2ros' section includes 'mqtt\_topics' (receive\_from\_ros), 'receive\_from\_ros' (ros\_topic, primitive), and 'primitive'. The 'mqtt\_topic' is highlighted with a red box.

```
1 mqtt_client:
2   ros_parameters:
3     broker:
4       host: 192.168.19.1
5       port: 1883
6     bridge:
7       ros2mqtt:
8         ros_topics:
9           - /publish/primitive
10          /publish/primitive:
11            mqtt_topic: receive_from_ros
12            primitive: true
13          mqtt2ros:
14            mqtt_topics:
15              - receive_from_ros
16            receive_from_ros:
17              ros_topic: publish
18              primitive: true
```

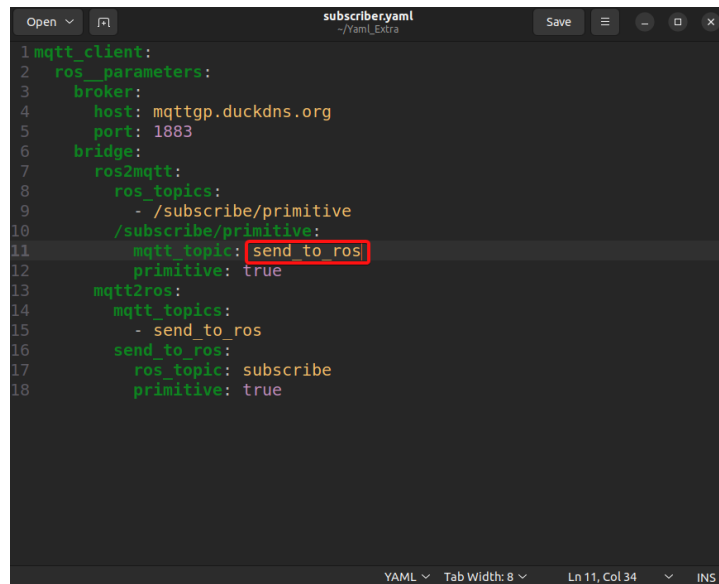
To change topic name, edit the following:



A screenshot of the same code editor window showing the same YAML configuration. Red arrows point to the 'receive\_from\_ros' topic names in the 'mqtt\_topic', 'mqtt\_topics', and 'receive\_from\_ros' sections to indicate where to edit the topic name.

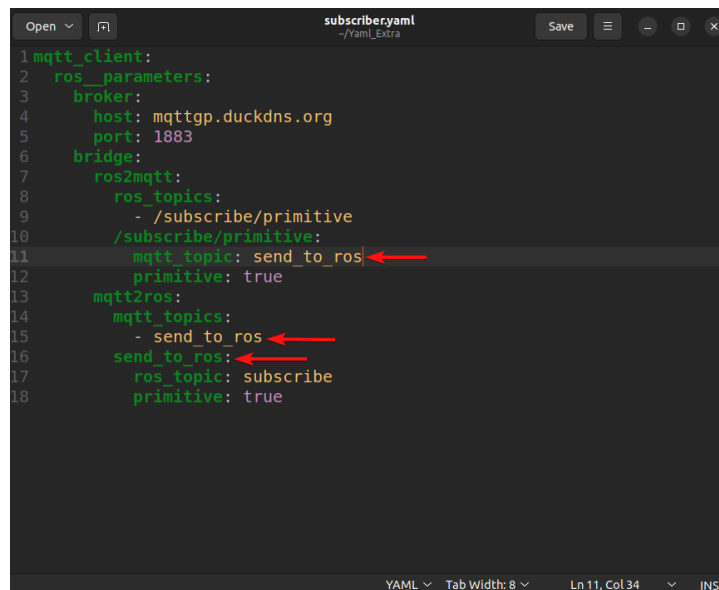
```
1 mqtt_client:
2   ros_parameters:
3     broker:
4       host: 192.168.19.1
5       port: 1883
6     bridge:
7       ros2mqtt:
8         ros_topics:
9           - /publish/primitive
10          /publish/primitive:
11            mqtt_topic: receive_from_ros
12            primitive: true
13          mqtt2ros:
14            mqtt_topics:
15              - receive_from_ros
16            receive_from_ros:
17              ros_topic: publish
18              primitive: true
```

Publish to the following topic to send data to ROS (**MQTT → ROS**)



```
1 mqtt_client:
2   ros_parameters:
3     broker:
4       host: mqttgp.duckdns.org
5       port: 1883
6     bridge:
7       ros2mqtt:
8         ros_topics:
9           - /subscribe/primitive
10          /subscribe/primitive:
11            mqtt_topic: send_to_ros
12            primitive: true
13       mqtt2ros:
14         mqtt_topics:
15           - send_to_ros
16         send_to_ros:
17           ros_topic: subscribe
18           primitive: true
```

To change topic name, edit the following:



```
1 mqtt_client:
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7       ros2mqtt:
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10          /subscribe/primitive:
11            mqtt_topic: send_to_ros
12            primitive: true
13       mqtt2ros:
14         mqtt_topics:
15           - send_to_ros
16         send_to_ros:
17           ros_topic: subscribe
18           primitive: true
```

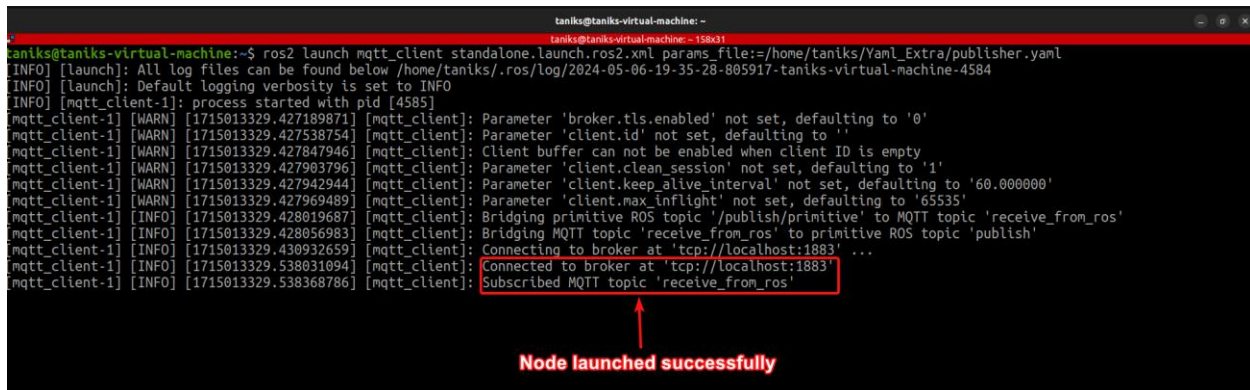
## Starting ROS MQTT Client:

We need 2 ROS\_MQTT\_Client, one for sending from ROS to MQTT and the other for sending from MQTT to ROS. If you doing only one of them no need to launch the other.

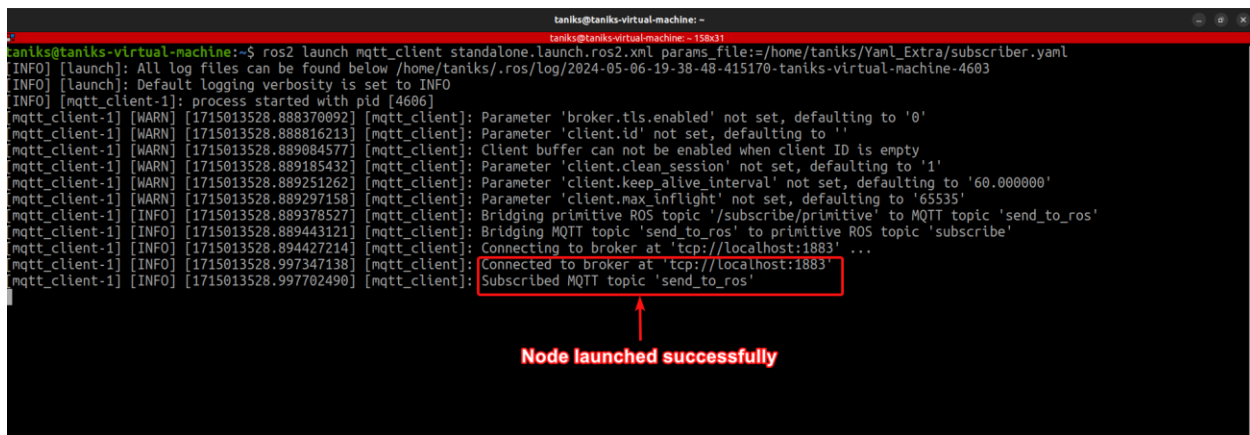
In your terminal run the following command to launch a ROS\_MQTT\_Client.

`ros2 launch mqtt_client standalone.launch.ros2.xml params_file:= YAML File Directory`

Example:



```
taniks@taniks-virtual-machine: ~  
taniks@taniks-virtual-machine: ~$ ros2 launch mqtt_client standalone.launch.ros2.xml params_file:=/home/taniks/Yaml_Extra/publisher.yaml  
[INFO] [launch]: All log files can be found below /home/taniks/.ros/log/2024-05-06-19-35-28-805917-taniks-virtual-machine-4584  
[INFO] [launch]: Default logging verbosity is set to INFO  
[INFO] [mqtt_client-1]: process started with pid [4585]  
[mqtt_client-1] [WARN] [1715013329.427189871] [mqtt_client]: Parameter 'broker.tls.enabled' not set, defaulting to '0'  
[mqtt_client-1] [WARN] [1715013329.427538754] [mqtt_client]: Parameter 'client.id' not set, defaulting to ''  
[mqtt_client-1] [WARN] [1715013329.427847946] [mqtt_client]: Client buffer can not be enabled when client ID is empty  
[mqtt_client-1] [WARN] [1715013329.427983796] [mqtt_client]: Parameter 'client.clean_session' not set, defaulting to '1'  
[mqtt_client-1] [WARN] [1715013329.427942944] [mqtt_client]: Parameter 'client.keep_alive_interval' not set, defaulting to '60.000000'  
[mqtt_client-1] [WARN] [1715013329.427969489] [mqtt_client]: Parameter 'client.max_inflight' not set, defaulting to '65535'  
[mqtt_client-1] [INFO] [1715013329.428019687] [mqtt_client]: Bridging primitive ROS topic '/publish/primitive' to MQTT topic 'receive_from_ros'  
[mqtt_client-1] [INFO] [1715013329.428056983] [mqtt_client]: Bridging MQTT topic 'receive_from_ros' to primitive ROS topic 'publish'  
[mqtt_client-1] [INFO] [1715013329.430932659] [mqtt_client]: Connecting to broker at 'tcp://localhost:1883' ...  
[mqtt_client-1] [INFO] [1715013329.538031094] [mqtt_client]: Connected to broker at 'tcp://localhost:1883'  
[mqtt_client-1] [INFO] [1715013329.538368786] [mqtt_client]: Subscribed MQTT topic 'receive_from_ros'  
  
Node launched successfully
```



```
taniks@taniks-virtual-machine: ~  
taniks@taniks-virtual-machine: ~$ ros2 launch mqtt_client standalone.launch.ros2.xml params_file:=/home/taniks/Yaml_Extra/subscriber.yaml  
[INFO] [launch]: All log files can be found below /home/taniks/.ros/log/2024-05-06-19-38-48-415170-taniks-virtual-machine-4603  
[INFO] [launch]: Default logging verbosity is set to INFO  
[INFO] [mqtt_client-1]: process started with pid [4606]  
[mqtt_client-1] [WARN] [1715013528.888370092] [mqtt_client]: Parameter 'broker.tls.enabled' not set, defaulting to '0'  
[mqtt_client-1] [WARN] [1715013528.888816213] [mqtt_client]: Parameter 'client.id' not set, defaulting to ''  
[mqtt_client-1] [WARN] [1715013528.889084577] [mqtt_client]: Client buffer can not be enabled when client ID is empty  
[mqtt_client-1] [WARN] [1715013528.889185432] [mqtt_client]: Parameter 'client.clean_session' not set, defaulting to '1'  
[mqtt_client-1] [WARN] [1715013528.889251262] [mqtt_client]: Parameter 'client.keep_alive_interval' not set, defaulting to '60.000000'  
[mqtt_client-1] [WARN] [1715013528.889297158] [mqtt_client]: Parameter 'client.max_inflight' not set, defaulting to '65535'  
[mqtt_client-1] [INFO] [1715013528.889378527] [mqtt_client]: Bridging primitive ROS topic '/subscribe/primitive' to MQTT topic 'send_to_ros'  
[mqtt_client-1] [INFO] [1715013528.889443121] [mqtt_client]: Bridging MQTT topic 'send_to_ros' to primitive ROS topic 'subscribe'  
[mqtt_client-1] [INFO] [1715013528.894427214] [mqtt_client]: Connecting to broker at 'tcp://localhost:1883' ...  
[mqtt_client-1] [INFO] [1715013528.997347138] [mqtt_client]: Connected to broker at 'tcp://localhost:1883'  
[mqtt_client-1] [INFO] [1715013528.997702490] [mqtt_client]: Subscribed MQTT topic 'send_to_ros'  
  
Node launched successfully
```