

CONFIGURATION GUIDE

How to Connect *dataFEED OPC Suite* to *IBM Cloud*



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1. Preliminary Remarks

This configuration guide describes how to configure **dataFEED OPC Suite** as **IBM Cloud** device and thus to transfer shopfloor data to the **IBM Cloud** using the MQTT standard.

NOTE:

- This configuration guide reflects the **IBM Cloud** status and operating structure as available in January 2019. Today, **IBM Cloud** is managed in a similar way but detailed steps have been updated since then.

NOTE:

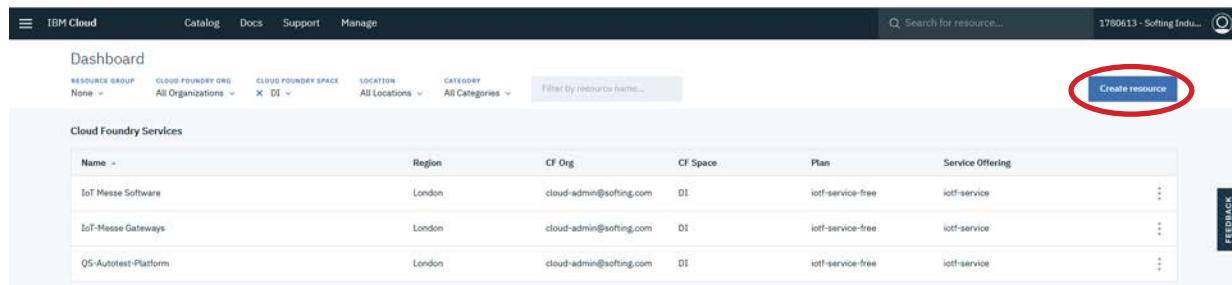
- Additional **dataFEED OPC Suite** information can be found at the according product web pages.
dataFEED OPC UA Suite Extended: <https://industrial.softing.com/products/opc-opc-ua-software-platform/opc-server-middleware/datafeed-opc-suite-extended.html>
dataFEED OPC UA Suite Base: <https://industrial.softing.com/products/opc-opc-ua-software-platform/opc-server-middleware/datafeed-opc-suite-base.html>

2. Configure **IBM Cloud** for Data Exchange With **dataFEED OPC Suite**

2.1 Create *Internet of Things* Resource

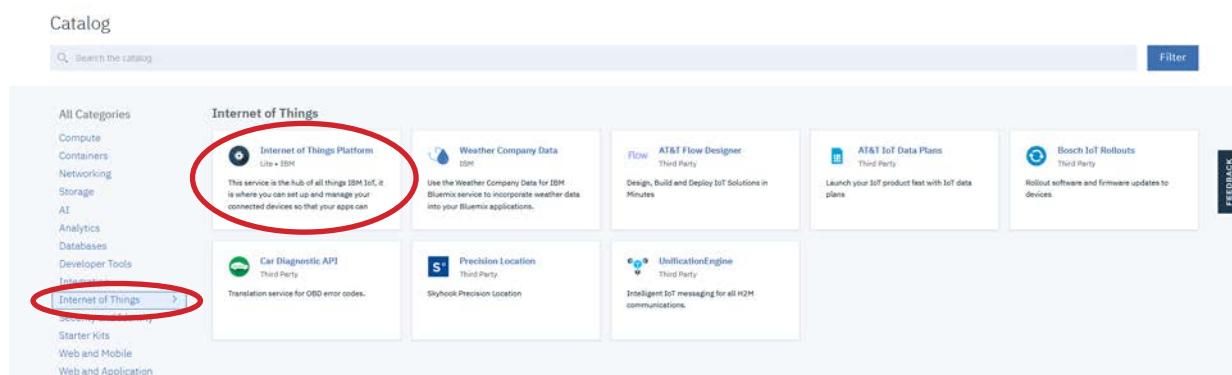
An *Internet of Thing* resource is required for connecting **dataFEED OPC Suite** to **IBM Cloud**.

- Log in to **IBM Cloud** in Internet Browser using URL <https://console.bluemix.net/> using your **IBMid** and password



The screenshot shows the IBM Cloud dashboard. At the top, there are navigation links for Catalog, Docs, Support, and Manage. On the right, there is a search bar and a user ID (1780613 - Softing Indu...). Below the header, there are dropdown menus for RESOURCE GROUP (None), CLOUD FOUNDRY ORG (All Organizations), CLOUD FOUNDRY SPACE (DI), LOCATION (All Locations), and CATEGORY (All Categories). A search bar labeled 'Filter by resource name...' is also present. In the center, there is a table titled 'Cloud Foundry Services' with columns: Name, Region, CF Org, CF Space, Plan, and Service Offering. Three services are listed: IoT Messe Software, IoT-Messe Gateways, and QS-Autotest-Platform, all located in London with the 'iotf-service-free' plan and 'iotf-service' offering. To the right of the table, there is a 'Create resource' button, which is circled in red. A 'Feedback' link is also visible on the right side of the page.

- Press *Create resource* button



The screenshot shows the IBM Cloud Catalog. At the top, there is a search bar labeled 'Search the catalog' and a 'Filter' button. On the left, there is a sidebar with categories: All Categories, Compute, Containers, Networking, Storage, AI, Analytics, Databases, Developer Tools, Infrastructure, Internet of Things, Starter Kits, Web and Mobile, and Web and Application. The 'Internet of Things' category is selected and highlighted with a red circle. Below the sidebar, there are several service tiles. One tile, 'Internet of Things Platform' (Lite + IBM), is circled in red. Other tiles include 'Weather Company Data' (IBM), 'AT&T Flow Designer' (Third Party), 'AT&T IoT Data Plans' (Third Party), 'Bosch IoT Rollouts' (Third Party), 'Car Diagnostic API' (Third Party), 'Precision Location' (Skyhook Precision Location), and 'UnificationEngine' (Third Party). A 'Feedback' link is also visible on the right side of the page.

- Select *Internet of Things* category
- Click on *Internet of Things Platform* tile

- At *Internet of Things Platform* page:
 - Select a location in *Select a location* selection list
 - Select a pricing plan in *Select a pricing plan* section
 - Define service name in *Service name* field
 - Press *Create* button for completing resource creation

2.2 Add *dataFEED OPC Suite* as Service

- Click on *IBM Cloud* navigation menu button
- Select *Cloud Foundry Services*

The screenshot shows the IBM Cloud Cloud Foundry Services dashboard. At the top, there are filters for RESOURCE GROUP (None), CLOUD FOUNDRY ORG (All Organizations), CLOUD FOUNDRY SPACE (DI), LOCATION (All Locations), and CATEGORY (All Categories). A search bar says 'Filter by resource name...'. A blue 'Create resource' button is on the right. Below is a table titled 'Cloud Foundry Services' with columns: Name, Region, CF Org, CF Space, Plan, and Service Offering. The table lists four services: IoT Messe Software, IoT-Messe Gateways, Q5-Autotest-Platform, and dataFEED_MQTT_Connection. The last row, 'dataFEED_MQTT_Connection', has its entire row highlighted with a red oval.

Name	Region	CF Org	CF Space	Plan	Service Offering
IoT Messe Software	London	cloud-admin@softing.com	DI	iotf-service-free	iotf-service
IoT-Messe Gateways	London	cloud-admin@softing.com	DI	iotf-service-free	iotf-service
Q5-Autotest-Platform	London	cloud-admin@softing.com	DI	iotf-service-free	iotf-service
dataFEED_MQTT_Connection	London	cloud-admin@softing.com	DI	iotf-service-free	iotf-service

- Click on service to be used for *dataFEED OPC Suite* connection

NOTE:

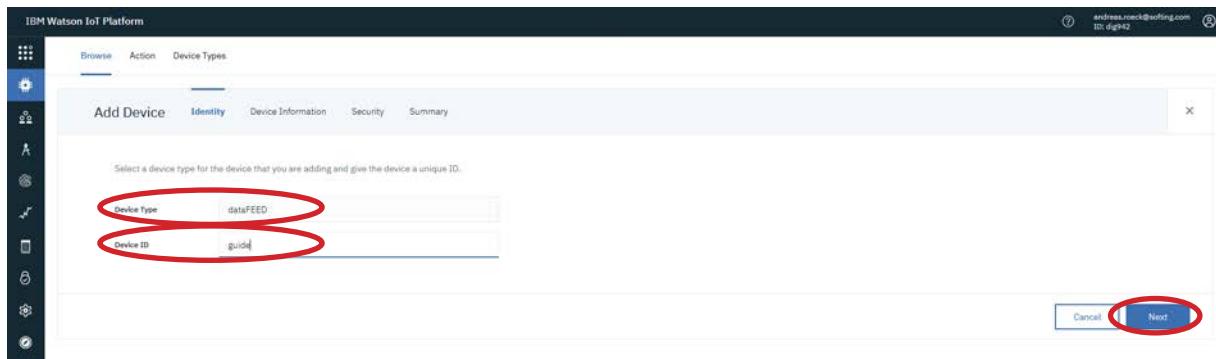
Within the scope of this configuration guide the *dataFEED MQTT Connection* service is used for connecting *dataFEED OPC Suite*.

The screenshot shows the IBM Watson IoT Platform service details page for 'dataFEED_MQTT_Connection'. At the top, it shows the service name with a gear icon, location (London), organization (cloud-admin@softing.com), and space (DI). Below is a summary section with a cloud icon and the text 'Ready for the next level? IBM Watson IoT Platform Journey'. To the right, there's a 'Let's get started with IBM Watson IoT Platform' section with a subtext 'Securely connect, control, and manage devices. Quickly build IoT applications that analyze data from the physical world.' and two buttons: 'Launch' (highlighted with a red oval) and 'Docs'.

- Press *Launch* button
- Select *Devices* menu entry in menu bar on left side



- Press *Add Device* button



- Enter device type in *Device Type* field

NOTE:

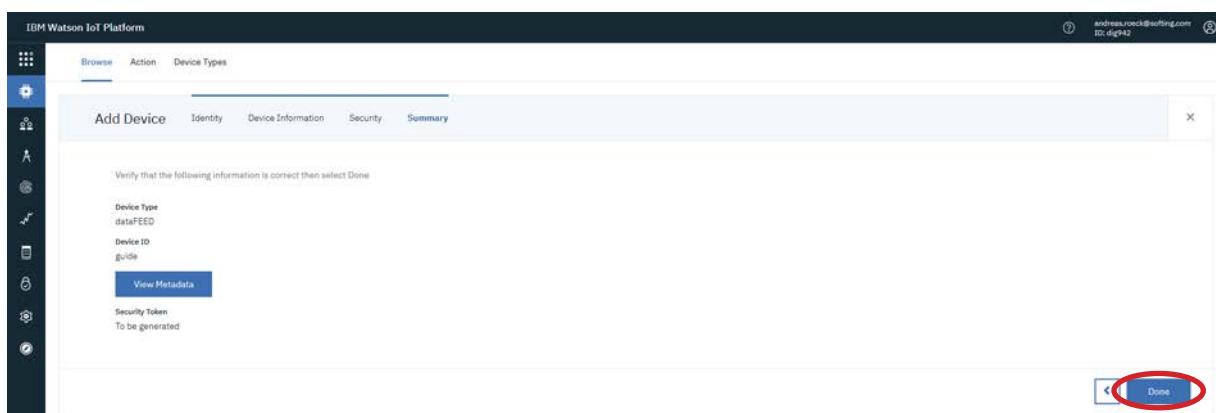
There is no restriction to the defined device type.

- Enter device ID in *Device ID* field

NOTE:

The defined device ID has to be unique.

- Press *Next* button
- Add additional optional device information at following pages
- Click *Next* button until verification page is shown



- Verify entries
- Click *Done* button

DEVICE DRILLDOWN

- Device Credentials
- Connection Information
- Recent Events
- State
- Device Information
- Metadata
- Extension Configuration
- Diagnostics
- Connection Logs
- Device Actions

Device guide

Device Credentials

You registered your device to the organization. Add these credentials to the device to connect it to the platform.
After the device is connected, you can navigate to view connection and event details.

Registration ID	data942
Device Type	dataFEED
Device ID	guide
Authentication Method	use-token-auth
Authentication Token	m77E1v84MvD84kY8

⚠ Authentication tokens are non-recoverable. If you misplace this token, you will need to re-register the device to generate a new authentication token.

Find out how to add these credentials to your device: [↗](#)

NOTE:

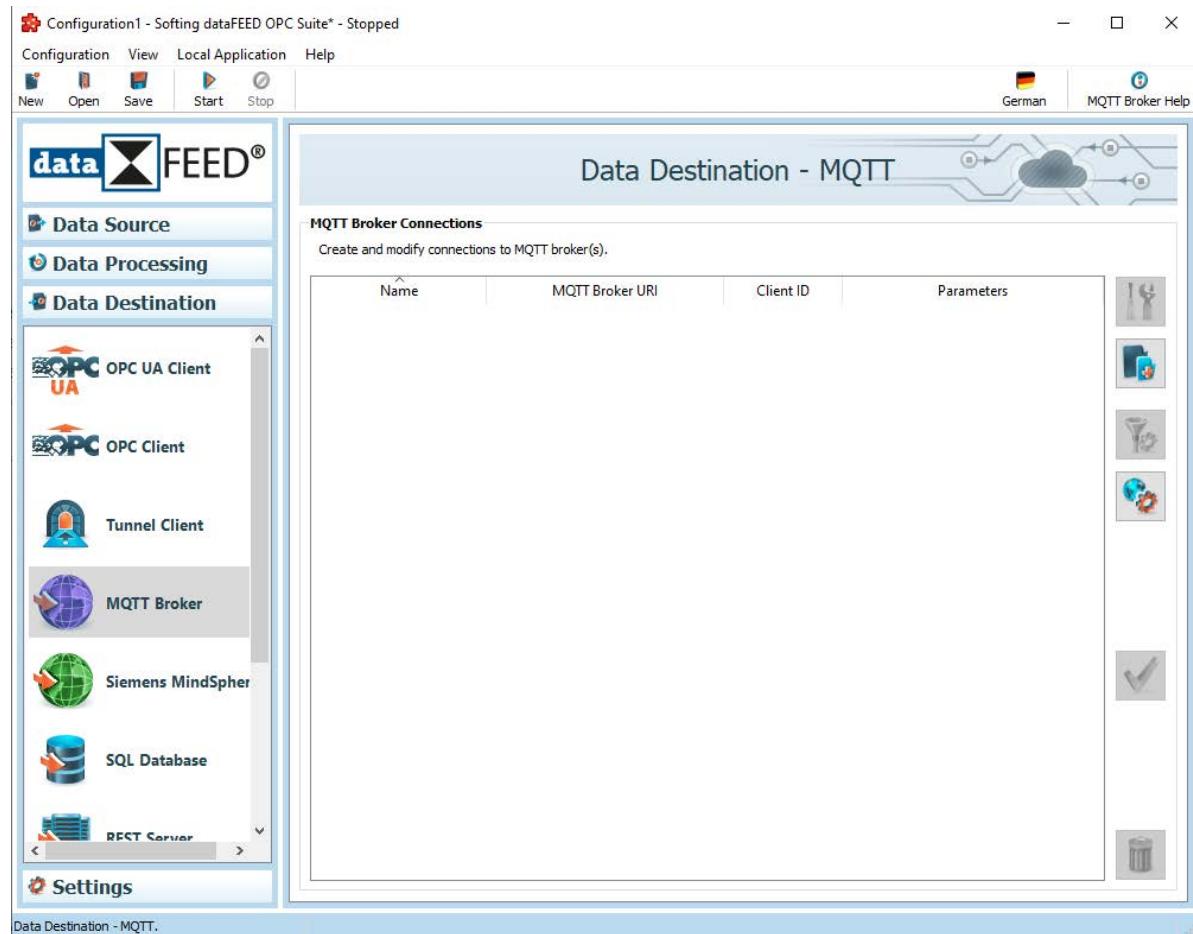
Authentication Token is created automatically.

It is only displayed once at this moment.

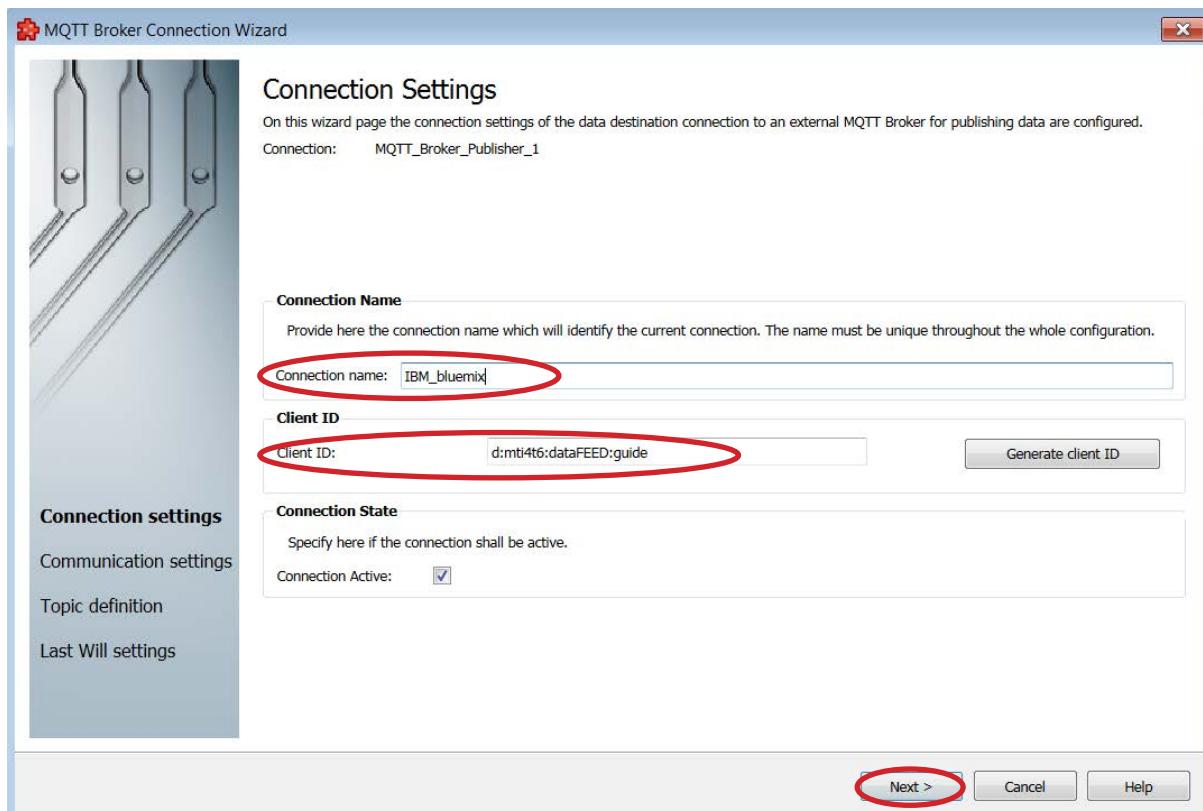
Thus, it is highly recommended to copy shown device details for later use during ***dataFEED OPC Suite*** configuration.

3. Configure *dataFEED OPC Suite*

- Open *dataFEED OPC Suite* configurator
- Navigate to *Data Destination/MQTT Broker*



- Press (*Add a new data source*) button

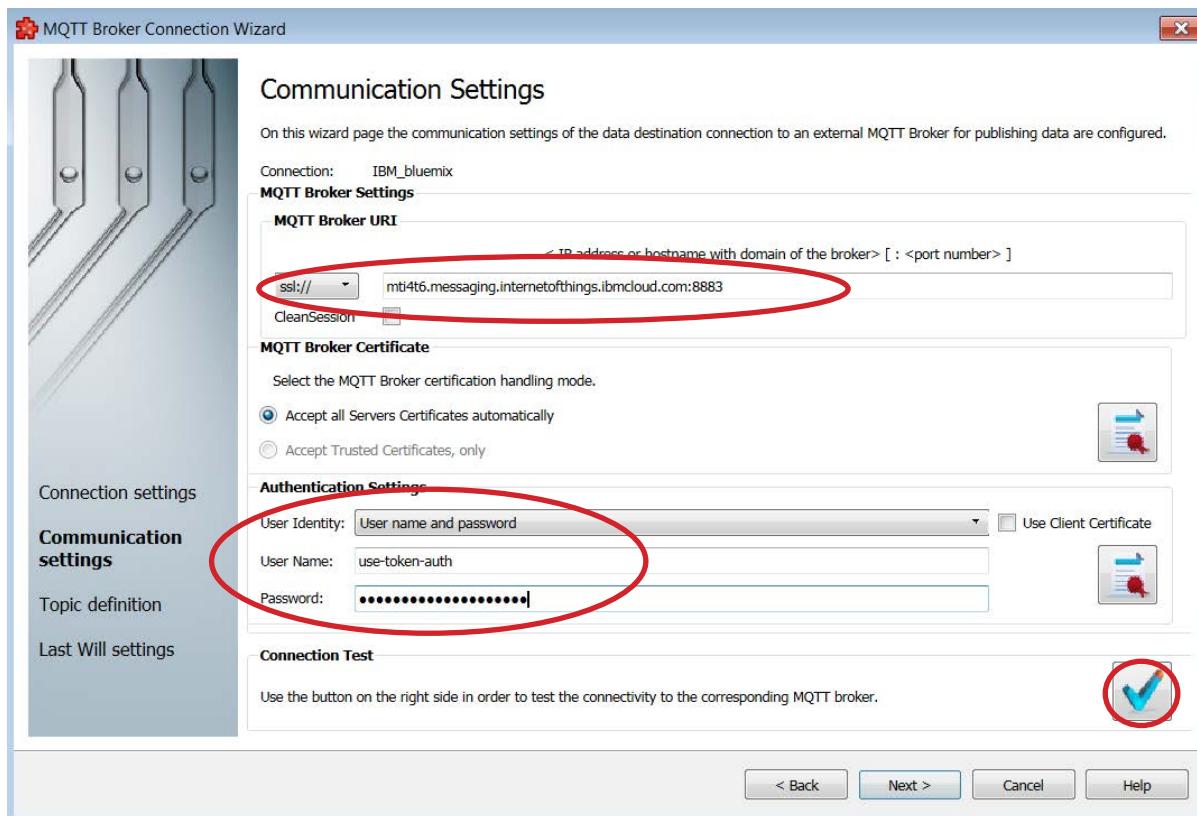


- Enter unique connection name in *Connection Name* field
- Enter client ID based on *IBM Cloud* settings in *Client ID* field

NOTE:

The client ID string is built by *d:<Organization ID>:<Device Type>:<Device ID>*

- Press *Next >* button



- Enter *MQTT Broker URI*

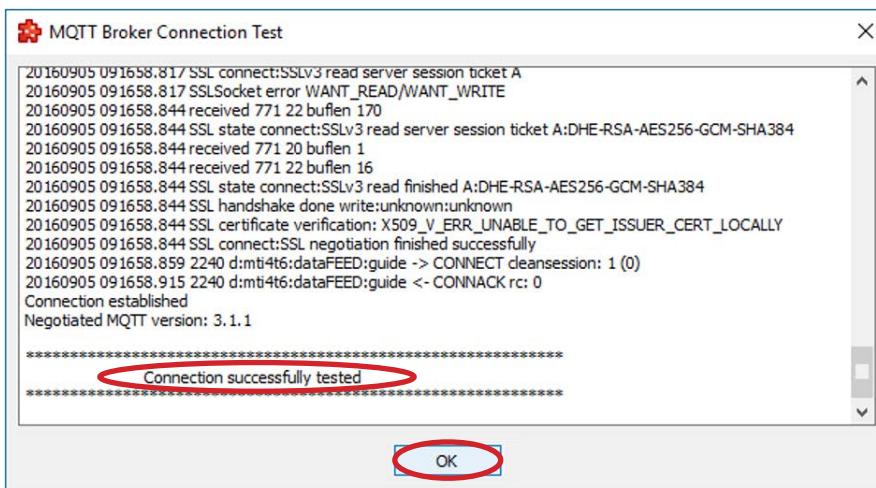
NOTES:

- Select *tcp://* protocol for TCP MQTT Broker URI
and enter IP address *<Organization ID>messaging.internetofthings.ibmcloud.com:1883*
- Select *ssl://* protocol for SSL/TLS MQTT Broker URI
and enter IP address *<Organization ID>messaging.internetofthings.ibmcloud.com:8883*

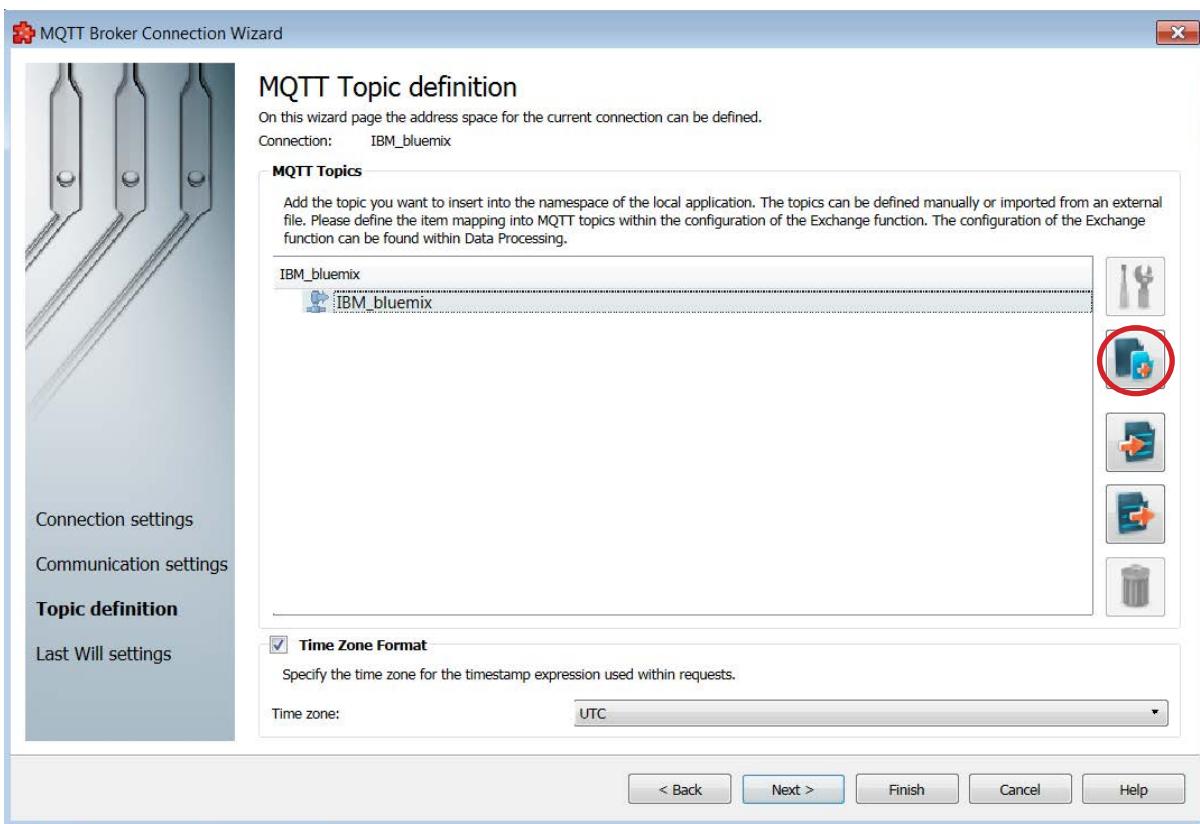
- Define Authentication Settings

- NOTES:

- Select *User name and password* in *User Identity* field
- Enter *use-token-auth* in *User Name* field
- Enter authentication token created during *IBM Cloud* configuration in *Password* field
- Press (*Connection test for the selected data destination*) button



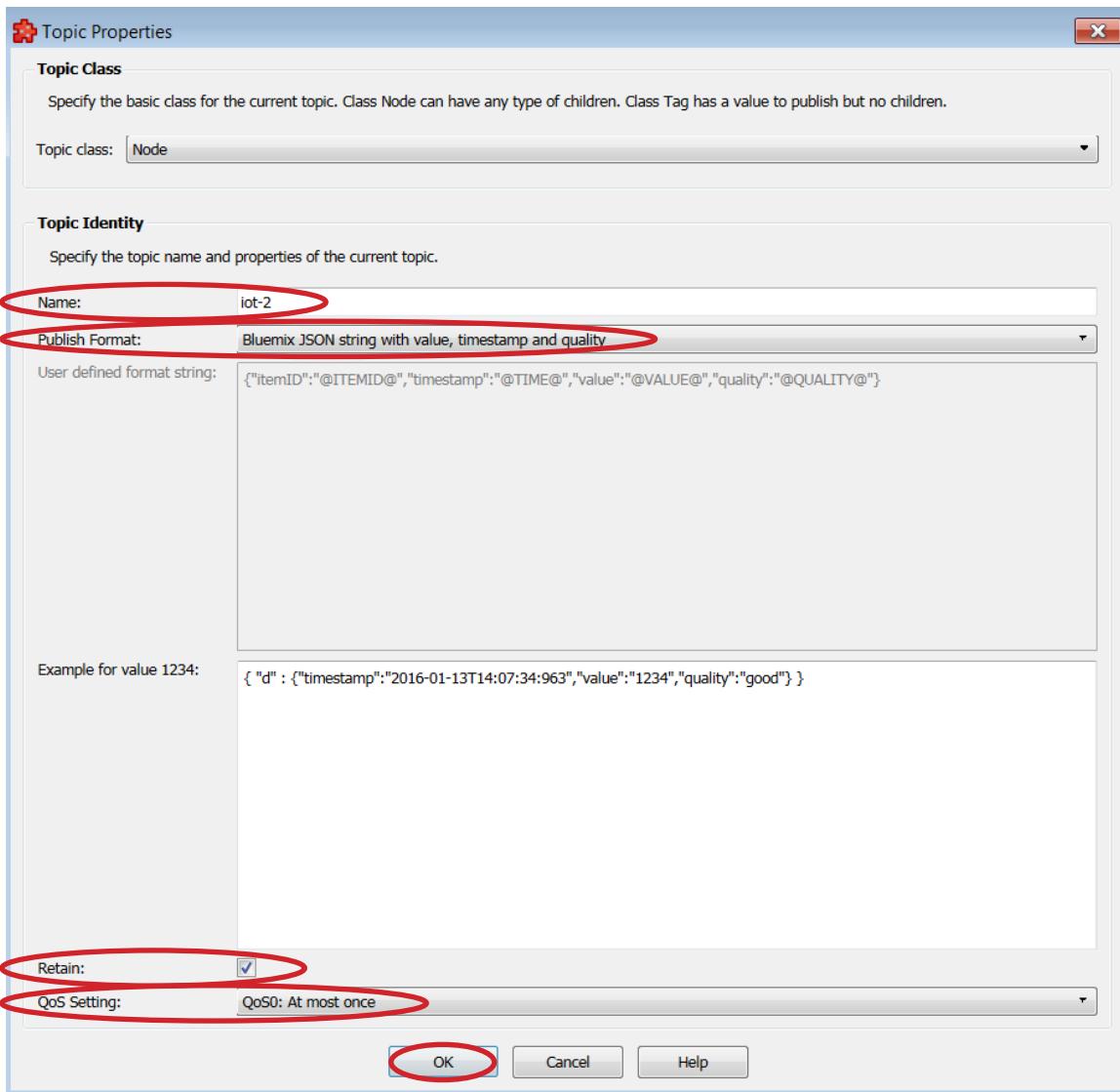
- Press *OK* button
- Press *Next >* button at *Communication Settings* page



- Press (*Add a new item*) button to add all items to be used in the MQTT connection with *IBM Cloud*

NOTES:

- Within the scope of this configuration guide the hierarchical MQTT topic *iot-2/evt/<Event ID>/fmt/json* is used by ***dataFEED OPC Suite*** for publishing values.
- Each level of the hierarchical MQTT topic has to be defined separately.
- There is no restriction to *<Event ID>*.



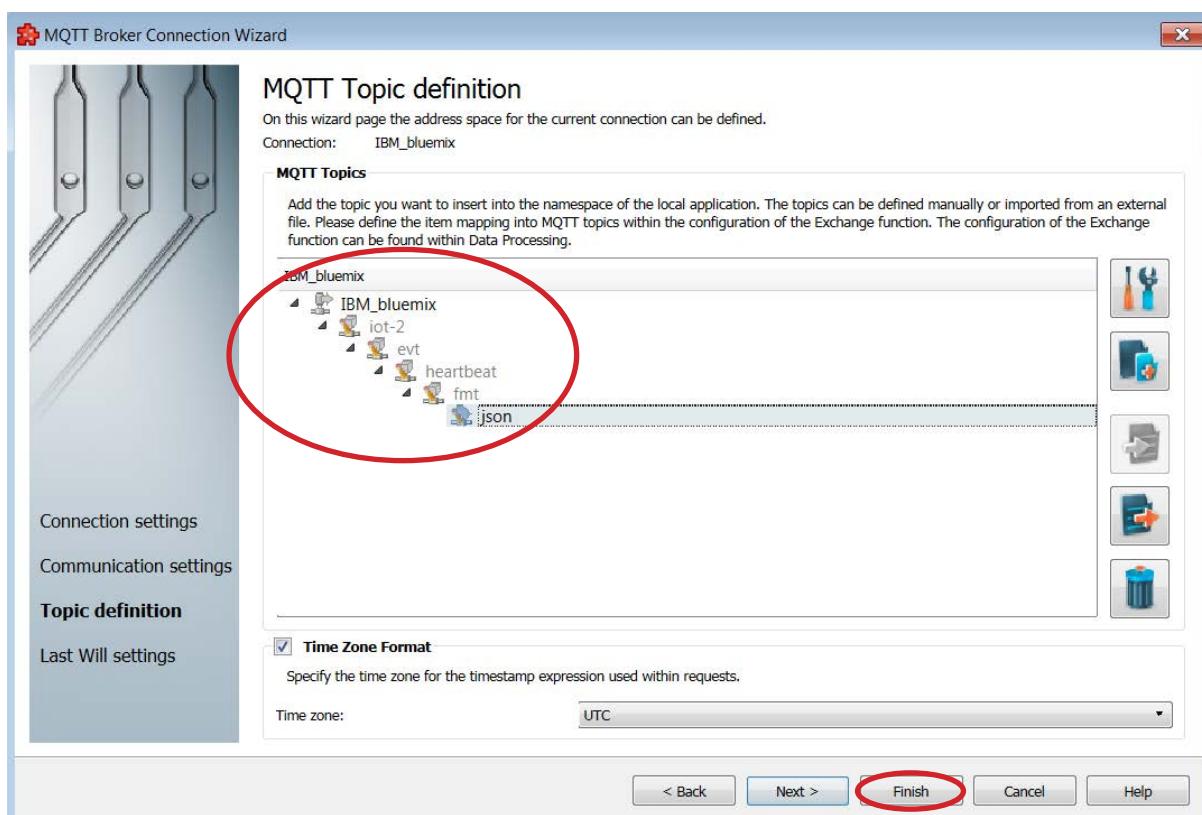
- Enter *iot-2* as top level name of hierarchical MQTT topic in *Name* field
- Select *Bluemix JSON string with value, timestamp and quality* in *Publish Format* field
- Activate/Deactivate *Retain* checkbox as required
- Select QoS setting in *QoS Setting* field as required
- Click *OK* button

- Press  (*Add a new item*) button and repeat step above for definition of each level of hierarchical MQTT topic:
 - evt*
 - <Event ID>*

NOTE:

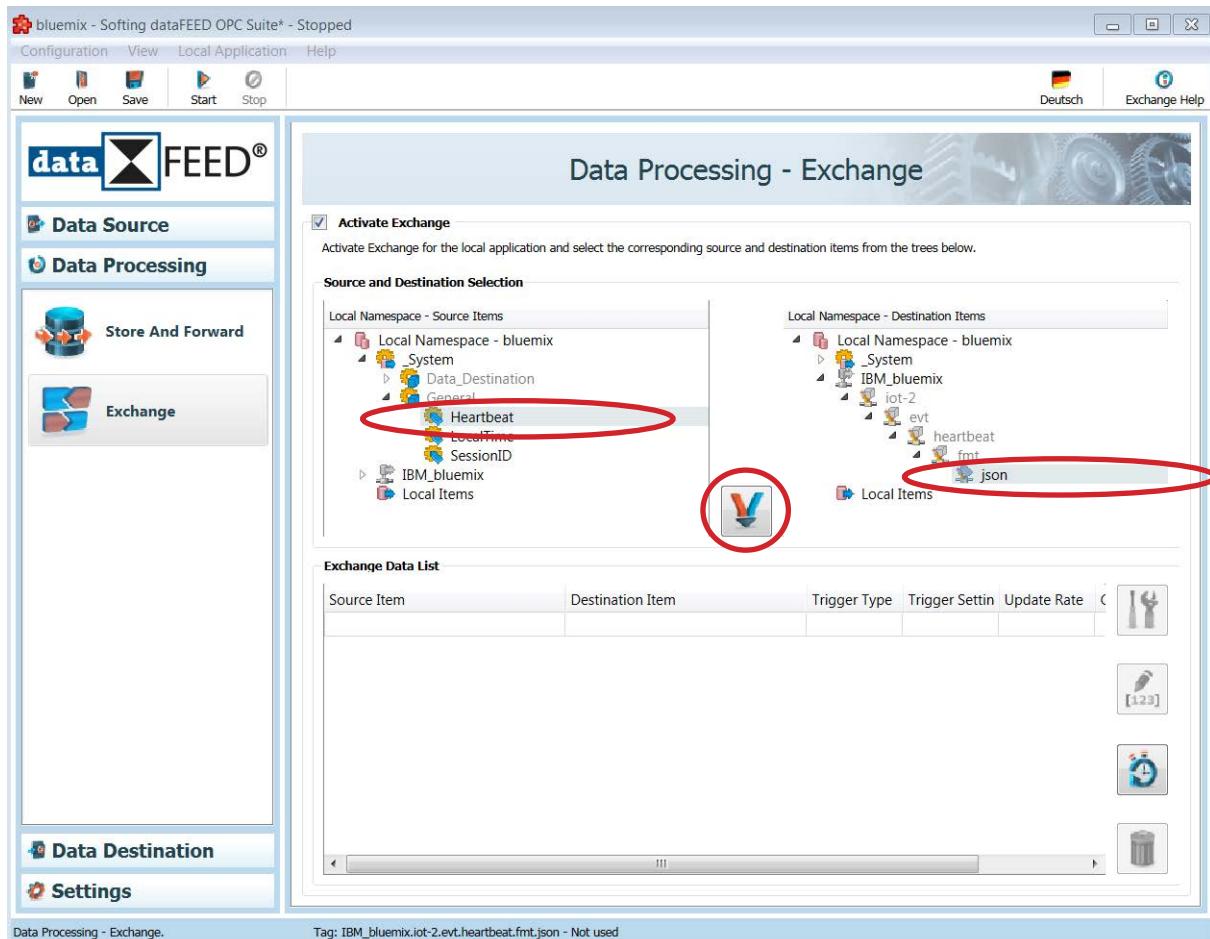
Within the scope of this manual *heartbeat* is used as *<Event ID>*.

- fmt*
- json*



- Once all items are configured press *Next >* button to proceed to the next MQTT Broker settings or press *Finish* button to finish the MQTT Broker configuration.

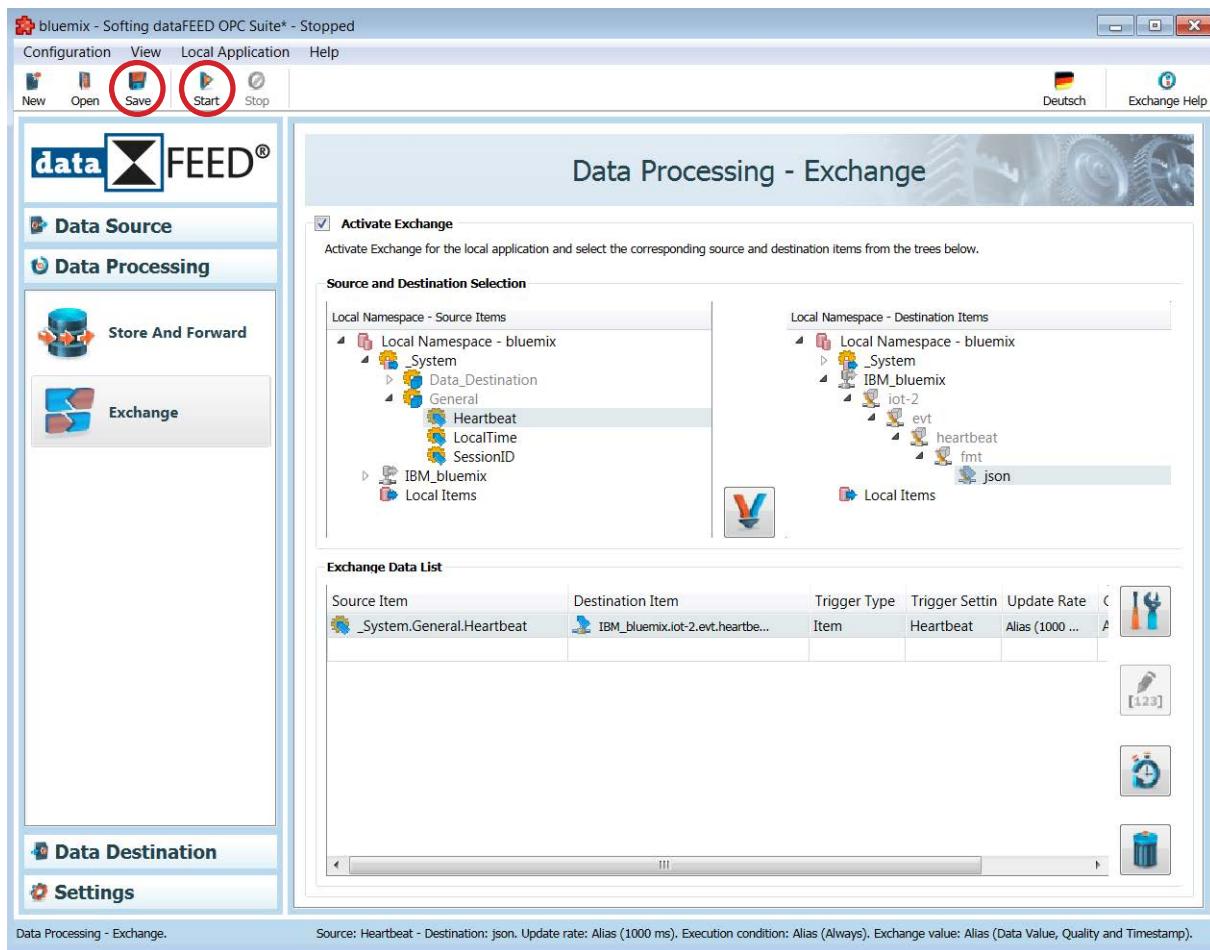
- Navigate to *Data Processing/Exchange*



- Define mapping of source items (shopfloor data) to destination items (configured MQTT Broker items) by selecting the appropriate combinations in the *Local Namespace - Source Items* tree and the *Local Namespace - Destination Items* tree and afterwards by pressing the (Use the selected items as a new Exchange action) button

Example:

- Select *System.General.Heartbeat* item as data source
- Select *json* level of hierarchical *IBM Cloud* MQTT topic as data destination



- Press **Save (Save)** button to store ***dataFEED OPC Suite*** configuration
- Press **Start (Start)** button to start ***dataFEED OPC Suite***

4. Test MQTT Connection and Data Exchange

- Restart *IBM Cloud* dashboard
- Select *Devices* menu entry in menu bar on left side

The screenshot shows the 'Browse Devices' interface. At the top, there's a header with 'IBM Watson IoT Platform' and tabs for 'Browse', 'Action', and 'Device Types'. On the left, a sidebar has icons for 'All Devices', 'Datalogger', and 'Logs'. The main area is titled 'Browse Devices' and shows a summary of devices. A specific device, 'dataFEED', is listed with its details: Device ID, Device Type (dataFEED), and Class ID (Device). Below this, there are tabs for 'Identity', 'Device Information', 'Recent Events' (which is highlighted with a red circle), and 'Logs'. A note says 'Showing Raw Data | The recent events listed show the live stream of data that is coming and going from this device.' A table then lists five recent temperature events:

Event	Value	Format	Last Received
Temperature	[{"d": {"timestamp": "2018-12-12T13:52:42.38..."}]	json	a few seconds ago
Temperature	[{"d": {"timestamp": "2018-12-12T13:52:37.38..."}]	json	a few seconds ago
Temperature	[{"d": {"timestamp": "2018-12-12T13:52:32.38..."}]	json	a few seconds ago
Temperature	[{"d": {"timestamp": "2018-12-12T13:52:27.38..."}]	json	a few seconds ago
Temperature	[{"d": {"timestamp": "2018-12-12T13:52:22.38..."}]	json	a few seconds ago

- Green dot indicates active data source
- Click *Recent Events* link for seeing live stream of data coming from *dataFEED OPC Suite*

NOTE:

For data visualization select *Boards* menu entry in menu bar on left side.

Afterwards connect data items with cards created for an individual board.

NOTE:

The given URLs have last been checked on Feb 02, 2022.

