

# Comunicación MQTT entre IBM Watson IoT Platform y OPC Router

Nota técnica

www.becolve.com Ctra. de Sant Cugat, 63 - Escalera B Planta 1<sup>a</sup> - 08191 - Rubí - Barcelona Tel: +34 93 588 67 67



#### Introducción

OPC Router es la herramienta software que habilita el intercambio de información entre diferentes plataformas y sistemas.



En esta guía, la plataforma IoT IBM Watson actúa como fuente de datos. En esta plataforma se crearán los dispositivos encargados de enviar la información vía MQTT a OPC Router. Es decir, la arquitectura técnica es la siguiente:

- IBM Watson como MQTT Broker
- Plug-in MQTT de OPC Router como MQTT subscriber

Una vez OPC Router dispone de la información podría enviarla a cualquier otro destino, ya fuera un servidor OPC DA o UA, una base de datos, un ERP como SAP, enviarla por webservices, ...

Para realizar la conexión con IBM Watson IoT Platform hace falta seguir los siguientes pasos:

- 1. Configurar la plataforma de IBM Watson
- 2. Configurar el dispositivo
- 3. Configurar MQTT Client en OPC Router

## Configurar la plataforma de IBM Watson

1. Acceder a la plataforma de IBM e ir al "Dashboard". Entonces, click en "Create" para crear un recurso:





٠.



2. Buscar en la librería "label:lite iot" para encontrar la opción "Internet of Things Platform". Entonces seleccionar y crear



3. Dar nombre (1) y crear (2) la plataforma que se acaba de crear:

| ≡ | IBM Cloud  | Q Catalog   | Docs             | Support   | Manage 🗸      | Sören Rose's Account   | ľ | ٨ |
|---|--|---|------------------|-----------|---------------|------------------------|---|---|
|   | ← view all<br>Internet of Things P<br>Lite • IBM   | Platform  |                  |           |               |                        |   |   |
|   | This service is the hub for IBM Watson<br>IOT and lets you communicate with<br>and consume data from connected<br>devices and gateways. Use the built-in | Service name:<br>OPC Router IoT Service             | $\sum_{i=1}^{1}$ |           |               |                        |   |   |
|   | web console dashboards to monitor<br>your IoT data and analyze it in real<br>time. Then, enhance and customize<br>your IBM Watson IoT Platform           | Choose a region/location to<br>deploy in:<br>London | •                | Choose an | organization: | Choose a space:<br>dev |   |   |
|   | experience by building and connecting<br>your own apps by using messaging<br>and REST APIs.  | Tags: 1<br>Examples: env:dev, versio                | on-1             |           |               |                        |   |   |
|   | View Docs Terms  |   |                  |           |               | 2                      |   | 2 |
|   | Need Help?<br>Contact IBM Cloud Support _ 7  |   |                  |           | Add to est    | limate Create          |   | > |

#### 4. Arrancar la plataforma IoT





## Crear un dispositivo

1. Después de arrancar la plataforma, se abre automáticamente el navegador de dispositivos. Seleccionar "Create a device":

| IBM          | Watso | n IoT Platform                                      |                       |                             |                  | 0   | rose@inray.de<br>ID: 7nahdt | 8    |
|--------------|-------|---|-----------------------|-----------------------------|------------------|-----|-----------------------------|------|
| :::          |       | Browse Action Device Types                          |                       |                             |                  | Ado | l Device 🕂                  |      |
| ۲            |       |   |                       |                             |                  |     |                             |      |
| <u>°</u> °   |       | <b>Browse Devices</b>                               |                       |                             |                  |     |                             |      |
| Å            |       | All Devices Diagnose                                |                       |                             |                  |     |                             |      |
| \$           |       | This table shows a summary of all devices           | that have been added. | It can be filtered, organiz | ed, and searched |     |                             |      |
| $\checkmark$ |       | on using different criteria. To get started, y API. | ou can add devices by | using the Add Device butt   | on, or by using  |     |                             |      |
|              |       |   |                       |                             |                  |     |                             | -    |
| 6            |       | Search by Device ID                                 |                       |                             |                  | _   | 101                         |      |
| ŵ            |       | <   |                       |                             | Device Simulator |     |                             |      |
| Ø            |       | Device ID   | Status                | Device Type                 | Class ID         |     |                             |      |
|              |       |   |                       |                             |                  |     |                             |      |
|              |       |   |                       | ٥Ĝ٥                         |                  |     |                             |      |
|              |       |   | You do                | n't have any devices.       |                  |     |                             |      |
|              |       |   |                       | Create a device.            |                  |     |                             |      |
|              |       |   |                       |                             |                  | C   | Cookie Prefere              | nces |

2. Se le tiene que dar un nombre al nuevo dispositivo. Primero escoge el tipo de dispositivo (1), después indica el nombre del dispositivo (2) y pulsa continuar (3).

| IBM        | Watson IoT Platform       |                   |                          |                    |                            | ?  | rose@inray.de<br>ID: 7nahdt | 8 |
|------------|---------------------------|-------------------|--------------------------|--------------------|----------------------------|----|-----------------------------|---|
|            | Browse Action Device Type | es                |                          |                    |                            |    |                             |   |
| ۰          |                           |                   |                          |                    |                            |    |                             |   |
| <u>e</u> e |                           |                   |                          |                    |                            |    | ×                           | - |
| Å          | Add Device                | ()<br>Identity    | Device                   | Security           | Summany                    |    |                             |   |
| \$         |                           | Identity          | Information              | Security           | Summary                    |    |                             |   |
| ~          |                           | Select a device t | type for the device that | you are adding and | give the device a unique I | D. |                             |   |
|            |                           | Device Type       | OPCRouter                |                    |                            |    |                             |   |
| 0          |                           | Device ID         | OPCR-1                   | 2                  |                            |    |                             |   |
| ¢          |                           |                   |                          |                    |                            | 3  |                             |   |
| 0          |                           |                   |                          |                    | Ca                         |    | Next                        |   |





3. En el siguiente paso, añade los metadatos opcionales que estimes oportuno y pulsa "Next":

| Add Device | ⊘<br>Identity Device Se   | curity Summary                                  |
|------------|---|---|
|            | You can modify the default device information<br>identification purposes. | and enter more information about the device for |
|            | Serial Number   | Manufacturer                                    |
|            | Enter Serial Number   | Enter Manufacturer                              |
|            | Model   | Device Class                                    |
|            | Enter Model   | Enter Device Class                              |
|            | Description   | Firmware Version                                |
|            | Enter Description   | Enter Firmware Version                          |
|            | Hardware Version  | Descriptive Location                            |
|            | Enter Hardware Version  | Enter Descriptive Location                      |
|            | Add Metadata 💿  |   |

4. En el próximo paso, configura las opciones de seguridad. Las opciones por defecto suelen ser correctas:

| IBN | 1 Watson IoT Platform |   |   |  |   | 0  | rose@inray.de<br>ID: 7nahdt |
|-----|-----------------------|---|---|--|---|--|-----------------------------|
|     | Browse Action D       | evice Types   |   |  |   |  |                             |
| ۰   |                       |   |   |  |   |  |                             |
| ŝ   |                       |   |   |  |   |  | ×                           |
| Å   | Add Device            | Ø(  | 9   | •  | O   |  |                             |
| 8   |                       | Identity I  | nformation  | Security                                     | Summary   |  |                             |
| ~~~ |                       | There are two options                                 | for selecting a device  | authenticati                                 | on token.   |  |                             |
|     |                       | Auto-generated<br>token (default)                     | authentication  |  | Self-provided authent<br>token  | tication                                     |                             |
| 6   |                       | Allow the service to ge<br>token for you. Tokens a    | nerate an authenticat   | ion  | Provide your own authenticatio  | on token for t                               | this<br>86                  |
| ٢   |                       | contain a mix of alphnu<br>symbols. The token is r    | imeric characters and<br>returned to you at the                       | end  | characters and contain a mix lo<br>uppercase letters, numbers, ar   | owercase and<br>nd symbols, v                | d<br>which                  |
| 0   |                       | of the device registration                            | on process.   |  | can include hyphens, undersco<br>Do not use repeated character:<br>words, user names, or other pr<br>sequences. | eres, and peri<br>s, dictionary<br>redefined | iods.                       |
|     |                       | Authentication Token                                  | Enter an optional   | token  | ۵   |  |                             |
|     |                       | Make a note of ti<br>tokens cannot b<br>being stored. | he generated token. L<br>e recovered. Tokens a<br>Authentication toke | ost authenti<br>ire encryped<br>n are encryp | cation<br>before<br>ted before we store them.   |  |                             |
|     |                       |   |   |  |   | Back   | Next                        |

5. En el último paso, se muestra un resumen de las configuraciones. Crea el dispositivo pulsando "Finish":







 El dispositivo creado se muestra juntamente con la información de acceso por MQTT. Estos datos son importantes para configurar el cliente MQTT. Aquí puedes encontrar el Identificador de la organización (1), el tipo asignado (2), el identificador del dispositivo (3) y el token de autenticación (4):

| IBM         | Watson IoT Platform   | ⑦ <sup>rose@</sup> inray.de ⑧<br>ID: 7nahdt   |
|-------------|---|---|
| :::         | ← Back  |   |
| ۰           | Device Drilldown  |   |
| <u>°</u>    | Device Drittdown  | - 0FCK-1  |
| ا<br>≪<br>√ | Device Credentials<br>Connection Information<br>Recent Events                     | Device Credentials<br>You registered your device to the organization. Add these credentials to the device to connect it to the platform. After<br>the device is connected, you can navigate to view connection and event details. |
| 0<br>\$     | State<br>Device Information<br>Metadata<br>Extension Configuration<br>Diagnostics | Organization ID Znahdt 1   Device Type OPCRouter 2   Device ID OPCR-1 3   Authentication Method Use-token-auth 4  |
|             | Device Actions  | Authentication tokens are non-recoverable. If you misplace this token, you will need to re-register the device to generate a new authentication token.  |

#### Configuración del cliente MQTT en OPC Router

En la configuración del cliente MQTT se debe configurar con los datos de los pasos anteriores:

- **Broker connection:** el ID de la organización ("7nahdt" en nuestro caso) se combina con ".messaging.internetofthings.ibmcloud.com" para construir la dirección del bróker MQTT.
- **Client ID:** el ID de cliente consiste en combinar el ID de la organización (1), el tipo de dispositivo (2) y el ID del dispositivo (3). El formato es "d:<Device-Type>:<Device-ID>".
- **Username:** La cadena "use-token-auth" (4) se utiliza como usuario.
- **Password:** La contraseña es el token de autenticación que se da en la información del dispositivo (5).

|                          | Mqtt   |
|--------------------------|--|
| Name:                    | IBM Watson MQTT                                |
| Broker connection:       | 7nahdt.messaging.internetofthings.ibmcloud.com |
| Port:                    | 8883 🗘 🗹 SSL 🗸 Continuous session              |
| SSL Protocols:           | SSLv2, SSLv3, TLSv1, TLSv1.1, TLSv1.2          |
| Client ID:               | d:7nahdt:OPCRouter:OPCR-1 Create new Client ID |
| Username:                | use-token-auth                                 |
| Password:                |  |
| Certificate:             | Without + - @                                  |
| Trusted certificates:    | All  |
| MQTT version:            | V3_1   |
| Quality of Service type: | 2 - exactly once                               |
| ✔ Wait for transfer      |  |
| First will Last will     |  |
| Activate first will      |  |
| Topic:                   |  |
| Payload:                 |  |
| Quality of Service:      | 2 - exactly once 🗸                             |
| - Hold                   |  |
| Check connection         | OK Cancel                                      |





#### Ejemplo



7



#### Información Adicional

Nota Importante: Esta Nota Técnica se entrega "as is", es decir, como complemento a la documentación del producto, pero no incluido dentro del ámbito del Soporte Técnico. Por tanto, cualquier mal funcionamiento derivado del contenido de esta nota técnica no es responsabilidad de Becolve Digital.

