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Set Up the Internet of Things Edge Platform - SigFox

SAP IoT services for SAP BTP

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1 Get Started

This document describes how to set up the Internet of Things Edge Platform with the SigFox adapter and how to send data to the SAP IoT services for SAP BTP.

You can access the SigFox server (from where you can manage the SigFox devices simulated or real, depending from your contract) here:

- <https://backend.sigfox.com> ➡
- <https://backend-demo.sigfox.com> ➡ (use this one to access the demo instance, allowing you to work with simulated devices)

You can log in with your SigFox username and password (if you don't have a user, please contact the SigFox support to obtain it).

Prerequisites

- You need a user for downloading software from the [SAP Software Center](#) (SAP Support Portal → [Download Software](#)).
- You need an instance of the SAP IoT services for SAP BTP.
- You need the <HOST_NAME>, the <INSTANCE_ID>, and the <TENANT_ID>, which you can use to access the system.
- You need a user with **administrator** role. For more information, please refer to the tutorial.
- You need to install Java SE Runtime Environment 8 to run the [Internet of Things Edge Platform](#) (SAP Software Center).

→ Tip

For ease of use, we recommend that you add **JAVA_HOME** to your **PATH** environment variables to point to where the JDK software is located.

- To manage SigFox devices you need a user to access the SigFox server at:
 - <https://backend.sigfox.com>

ⓘ Note

Please contact the SigFox support if you don't have a SigFox user.

- <https://backend-demo.sigfox.com> (use this one to manage demo instances, if you want to work with simulated devices)
- You need SigFox API credentials required from the adapter to recall the SigFox services (for example, Login and Password).

ⓘ Note

If you don't have one, you should logon the SigFox server and:

- Create a new Group (if you don't have one).
- Create a new API Access (if you don't have one) associated to a specific Group, with corresponding Login and Password info.
- You need to have at least a SigFox device type registered on the portal.

ⓘ Note

If you don't have one, you should log in on the SigFox server and:

- Create a new device type associated to your Group from the SigFox portal.

ⓘ Note

If you are accessing the SigFox portal on <https://backend-demo.sigfox.com> you can create a 'Device Type messages simulation'. This allows you to manage some simulated devices (you can do this from the DEVICE TYPE – SIMULATOR page).

- You need to have some SigFox devices (simulated or real) associated to a specific SigFox device type.

	 Note If you don't have any device registered, please contact the SigFox support to register them or, for example, to obtain a list of Devices ID - PAC you can use to register them manually. To set up the Internet of Things Edge Platform and publish data, you need to provide the data model required by the protocol as described below → Data Model.
Notes	Basic authentication credentials must be used as follows: - name = <user>, for example max - password = <password>
URL Scheme	- Internet of Things Service Cockpit: <a href="https://<HOST_NAME>/<INSTANCE_ID>/iot/cockpit/">https://<HOST_NAME>/<INSTANCE_ID>/iot/cockpit/ - Internet of Things API Service: <a href="https://<HOST_NAME>/<INSTANCE_ID>/iot/core/api/v1/doc/">https://<HOST_NAME>/<INSTANCE_ID>/iot/core/api/v1/doc/
References	- User Guide for the Internet of Things Service Cockpit on the SAP Help Portal (Logon required). Glossary Internet of Things Edge Platform SigFox documentation - Useful SigFox links: https://support-agents.sigfox.com/ ➡ https://backend.sigfox.com ➡ https://backend-demo.sigfox.com ➡
Tool Downloads	Internet of Things Edge Platform ➡ (SAP Software Center)

Data Model

To set up the Internet of Things Edge Platform and publish data, you need to provide the data model required by the protocol. You can do so manually or by performing the following steps:

1. Checkout (with Git) or download the complete repository archive of the [IoT Starter Kit](#) and unzip it.
2. Navigate to `/cf/protocols` where you find the shell script `protocol-model.sh`, the configuration file `protocol-config.sh` as well as protocol-specific folders (for example, `/sigfox`).
3. Adjust the `protocol-config.sh` file with your instance information (`<host_name>`, `<instance_id>` and `<tenant_id>`), credentials, and the protocol information.
4. Save the file.
5. Execute the shell script `protocol-model.sh` using the Bash Unix shell. Bash is the default shell on macOS and available for installation on Windows, for example, through Git for Windows.

Note

The created capabilities are not unique across protocols. If you already created a protocol-specific data model, you must remove the created `sensorTypes` and capabilities before executing the script. This can best be done in the Internet of Things Service Cockpit.

Related Information

[Download the Internet of Things Edge Platform \(and Adapters\) \[page 6\]](#)

[Set Up the Internet of Things Edge Platform SigFox \[page 7\]](#)

[Publish Data Using SigFox \[page 15\]](#)

1.1 Download the Internet of Things Edge Platform (and Adapters)

Step	Description	Additional Data
Download Software		
You can download the Internet of Things Edge Platform from the SAP Software Center. The downloaded software includes the adapters for all protocols supported.		

Step	Description	Additional Data
1.	Log on to the SAP Software Center.	Note You need a user for downloading software from the SAP Software Center (SAP Support Portal). For more information on how to get authorization to download software, please refer to SAP Note 1037574.
2.	Search for IoT Services Edge or use the direct link Internet of Things Edge Platform .	Note A valid license is required to download the software from SAP Software Center.
3.	Download the ZIP archive.	A ZIP archive (for example: IOTCHCP**_*-70002561.ZIP) is downloaded to your local machine.
4.	Extract the downloaded archive.	
5.	Inside the extracted folder, you can find another ZIP file. Please extract this gateway-<version>.zip .	

1.2 Set Up the Internet of Things Edge Platform SigFox

Step	Description	Additional Data
Set Up the Internet of Things Edge Platform		
1.	Open the terminal (macOS) or command-line tool CMD (Windows) and change the directory to the path of the extracted ZIP file Internet of Things Edge Platform.	The directory must contain the following files: build.bat or build.sh (executable).

Step	Description	Additional Data
2.	Launch build.bat (Windows) or build.sh (macOS) in the extracted folder.	For Windows: <pre>build.bat rest-sigfox</pre> For macOS: <pre>./build.sh rest-sigfox</pre> A new file config_gateway_rest.xml is created in the /config folder.
3.	Optional: Copy custom OSGi bundles from a former installation of the Internet of Things Edge Platform by adding its file path as a build parameter. Launch build.bat (Windows) or build.sh (macOS) in the extracted folder. Note All previously installed custom OSGi bundles of the Internet of Things Edge Platform are automatically installed to the new version.	For Windows: <pre>build.bat rest-sigfox "path\to\your\previous\i nstallation"</pre> For macOS: <pre>./build.sh rest-sigfox "path/to/your/ previous/installation"</pre>
4.	In the config folder, open the config_gateway_rest.xml with a text editor.	

Step	Description	Additional Data
5.	Enter the <HOST_NAME> for the connectionString by replacing 127.0.0.1 and for the address element in the coreConnection by replacing the address with the URL of the target instance. The URL must include the <INSTANCE_ID> as well as the <TENANT_ID>.  Note For HTTPS, fill in the default port 443.  Sample Code <pre>https:// <HOST_NAME>:443/ <INSTANCE_ID>/iot/ core/api/v1/tenant/ <TENANT_ID></pre>	 Sample Code <pre><cnf:connectionString>failover:(nio+ssl:// <HOST_NAME>:61616? daemon=true&soTim eout=60000)</ cnf:connectionString></pre>  Sample Code <pre><cnf:coreConnection> <cnf:address>https:// <HOST_NAME>:443/ <INSTANCE_ID>/iot/ core/api/v1/tenant/ <TENANT_ID></ cnf:address> <cnf:timeout>60000</ cnf:timeout> <cnf:authentication>B ASIC_AUTH</ cnf:authentication> <cnf:mutual>false</ cnf:mutual> </cnf:coreConnection></pre>
6.	Enter the address of the SigFox server (for example: <code>https://backend.sigfox.com</code> or <code>https://backend-demo.sigfox.com</code>) in the section containing the socket_host, in place of default <code>https://server_host</code>.	 Sample Code <pre><cnf:gateway> <cnf:technology>rest< /cnf:technology> <cnf:vendor>sigfox</ cnf:vendor> <cnf:gateway_comm> <cnf:media>API</ cnf:media> <cnf:useAsServer>true </cnf:useAsServer> <cnf:socket_host>http s://backend- demo.sigfox.com</ cnf:socket_host> <cnf:socket_port>80</ cnf:socket_port> ...</pre>

Step	Description	Additional Data
7.	Enter your SigFox API credentials (Logon and Password associated to the API Access on the SigFox portal) in place of default username and password in the section containing data about the SigFox server. Note Please find more information on how to get the necessary credentials in section Get Started [page 3] → Prerequisites.	Sample Code <pre> <cnf:gateway> <cnf:technology>rest< /cnf:technology> <cnf:vendor>sigfox</ cnf:vendor> <cnf:gateway_comm> <cnf:media>API</ cnf:media> <cnf:useAsServer>true </cnf:useAsServer> <cnf:socket_host>http s://backend- demo.sigfox.com</ cnf:socket_host> <cnf:socket_port>80</ cnf:socket_port> <cnf:apiUsername>user name</ cnf:apiUsername> <cnf:apiPassword>pass word</ cnf:apiPassword> <cnf:disableGatewayCo ntentSent>true</ cnf:disableGatewayCon tentSent> </ cnf:gateway_comm> </pre>
8.	Add attribute gatewayAlternateId to the <cnf:gateway> tag.	Sample Code <pre> <cnf:gateway gatewayAlternateId="1 122334455667788"> </pre> Note The gatewayAlternateId is a mandatory attribute and must be unique for each gateway. Set the attribute value to a valid alphanumeric string.

Step	Description	Additional Data
9.	Save your changes to the file.	
Verify the SigFox Server Access to Manage Your Devices		
For more information on how to access the SigFox server, please refer to the Get Started [page 3] . The SigFox server access is required to manage SigFox devices (for example. to start and stop or change data format for simulated devices etc.)		
1.	Log on to the SigFox server here: • https://backend.sigfox.com/ ➡ • or https://backend-demo.sigfox.com/ ➡ with your SigFox credentials.	
2.	Select your <i>GROUP</i> .	
3.	Select the <i>ASSOCIATED DEVICE TYPES</i> and choose the device type you are interested in.	Copy the id of the device types you are interested in (you will need them to properly configure the adapter through the <code>sigfox.json</code> config file).
4.	Go to the <i>ASSOCIATED DEVICES</i> and verify that you have some devices up and running and sending data to the SigFox backend.	If you are using simulated devices, you can manage them from the DEVICE TYPE – SIMULATOR page (accessing to https://backend-demo.sigfox.com). Use this page to: • start simulation • change the period of the messages • set the payload of the simulated messages, and so on
Additional Configuration of the Internet of Things Edge Platform		
1.	Open the <code>sigfox.json</code> file with a text editor.	The <code>sigfox.json</code> file is located in the folder <code>config/restConfig</code> .
2.	Modify the <code>deviceTypes</code> array, adding the <code>id</code> of the device types you are interested in.	 Sample Code <pre> { ... "deviceTypes" : [{ "id" : "56f16036e4b02027a92459cf", ... </pre>

Step	Description	Additional Data
3.	If you are using a custom format for the data sent from the devices, please modify the parsing info section associated to the device type in the sigfox.json config file. To fully understand how to change it, please refer to the Internet of Things Gateway SigFox documentation. Note Please note, that the template <code>sigfox.json</code> config file contains the parsing info already predisposed to properly manage devices sending a data message like: <code>02E002aa080000000030000000</code> If you are using some SigFox simulated devices, you can easily change the format of the data sent from the devices, the data periodicity and other settings from the SIMULATOR page.	Sample Code <pre>{ ... "deviceTypes" : [{ "id" : "56f16036e4b02027a92459cf", "iotServiceDeviceType": "WaterMeter", "pollingApiInterval": 60000, "sensorTypeAlternateId" : "4", "stringMeasure" : false, "msbFirst": false, "frameSelectionByteStart": 0, "frameSelectionBitStart": 7, "frameSelectionBitSize": 8, "frameSelectionParsing": "Integer", "frameParsingData": [{ "frameSelectionValue": "2", "sensorAlternateId": ["1", "1", "1", "1", "1", "1", "1", "1"], "arrayChunkByteStart": [1, 1, 1, 1, 1, 2, 3], "arrayChunkBitStart": [0, 1, 2, 3, 4, 7, 7], "arrayChunkBitSize": [1, 1, 1, 1, 4, 8, 32], "measureByteSize":</pre>

Step	Description	Additional Data
		<pre>[1, 1, 1, 1, 1, 1, 8], "measureCapabilityAlternateId" : ["22", "23", "24", "25", "26", "6", "8"] }...</pre>
4.	Optional: If you want to increase or decrease the interval used from the adapter to fetch the devices data from the SigFox server, please modify the field pollingApiInterval. Note The field is expressed in milliseconds.	Sample Code <pre>{ ... [{ ... "pollingApiInterval": 60000, ... } }</pre>
5.	Optional: If you want to enable a timer task to discover new devices associated to your device types at runtime, please modify the field discoveryDevicesPollingInterval, setting it to the interval used from the timer task. Note The field is expressed in milliseconds.	Sample Code <pre>{ "discoveryDevicesPollingInterval": 60000, "deviceTypes" : ... }</pre>

Download Certificate

1.	Log on to the Internet of Things Service Cockpit with your user credentials.	
2.	On the home page, select the tenant with your <TENANT_ID> .	
3.	In the Certificate section, choose Generate Onboarding Certificate .	The system starts to download a JSON file, named <tenant_name>-tenant_certificate.json containing the certificates.

Step	Description	Additional Data
4.	Rename the downloaded file to <code>gateway-registration-certificate.json</code> and place it into the <code>config/certificates</code> folder of the extracted Internet of Things Edge Platform. 📘 Note If the folder <code>config/certificates</code> does not exist, create it manually.	
Start the Internet of Things Edge Platform		
1.	Open the terminal (macOS) or command-line tool CMD (Windows) and change the directory to the path of the extracted ZIP file Internet of Things Edge Platform.	The directory must contain the following files: <code>gateway.bat</code> (Windows) or <code>gateway.sh</code> (macOS) (executable)
2.	Launch <code>gateway.bat</code> (Windows) or <code>gateway.sh</code> (macOS) located in the root of the extracted folder.	For Windows: <code>gateway.bat</code> For macOS: <code>./gateway.sh</code> 📘 Note You must be connected to public Internet. Most corporate networks do not work due to port and protocol restrictions. If the Internet of Things Edge Platform is started successfully, you see the following message <i>Initialization successfully finished, start loading API endpoint.</i>

1.3 Publish Data Using SigFox

Step	Description	Additional Data
Prerequisites: Verify that you have some SigFox devices up and running on the SigFox backend.		
After the startup of the Internet of Things Edge Platform, periodic tasks are started to access the SigFox backend-server, fetching SigFox devices messages: data messages are mapped onto measures of newly created devices in the Internet of Things Service Cockpit.		
Validation of Data from the SigFox Server		
1.	Open the Internet of Things Service Cockpit and check that the devices are associated to the SigFox network.	You can verify that the devices visible on the Internet of Things Service Cockpit correspond to the SigFox devices on which you have visibility. If you look at the custom properties of the devices, you can see some properties related to the corresponding SigFox <code>deviceType</code>, <code>SigfoxDeviceTypeDescription</code>, <code>SigfoxGroupId</code>, <code>SigfoxName</code>, <code>SigfoxId</code> and <code>SigfoxDeviceType</code>.
2.	You can check the incoming values using the Data Visualization of the device in the Internet of Things Service Cockpit or the Device Management API.	For more information, please refer to the tutorial .
📌 Note In the Data Visualization section, choose capability and property named WaterVolume for sensor 1.		

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