



PUBLIC

Recommended Settings for the Integration with IoT Platform from Alibaba Cloud SAP Warehouse Insights

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BUSINESS SCENARIO

This guide targets at the audience that wants to set up the integration of SAP Warehouse Insights with IoT Platform from Alibaba Cloud. It provides a step-by-step procedure, containing all the values that have to be entered in IoT Platform in order to obtain a successful integration with SAP Warehouse Insights.

For more detailed information about setting up and using IoT Platform from Alibaba Cloud, see [IoT Platform](#).

BACKGROUND INFORMATION

SAP Warehouse Insights is a product for the optimization of warehouse operations and resource utilization.

You can use SAP Warehouse Insights to achieve the following purposes:

- To optimize the assignment of warehouse orders to resources to minimize empty travel distances
- To analyze KPIs of warehouse operations, such as workload and travel distances of resources
- To visualize the warehouse layout and resource travel paths
- To define and update storage bin coordinates
- To visualize the real-time location of resources

You can integrate SAP Warehouse Insights with SAP Extended Warehouse Management (EWM) as a standalone product, decentralized EWM based on SAP S/4HANA or EWM as a part of SAP S/4HANA. To be brief on the product names, SAP EWM is used for references to these deployments in this guide.

PREREQUISITES

You have set up an Alibaba Cloud IoT instance.

RECOMMENDED SETTINGS

Setting up IoT Platform from Alibaba Cloud

1. Define a Product under *Devices* -> *Products*.
 - 1.1. Create a product.

To create a product, enter a name in the *Product Name* field. For *Category*, choose *Custom Category*.

← Create Product(Device TSL)

* Product Name

* Category
 Standard Category Custom Category

* Node Type
 Directly Connected Device
 Gateway sub-device
 Gateway device

Networking and Data Format

* Network Connection Method

* Data Type

[Checksum Type](#)
[Authentication Mode](#)

1.2. Define features for the product.

Add the following four properties exactly as indicated below:

Name	Data Type
xCoordinate	Float
yCoordinate	Float
zCoordinate	Float
timestamp	Date

ForkLift

ProductKey: a1RB4PwJFYq [Copy](#) ProductSecret: ***** [View](#)
 Devices: 1 [Manage](#)

[Product Information](#) | [Topic Categories](#) | **[Define Feature](#)** | [Data Parsing](#) | [Server-side Subscription](#) | [Device Provisioning](#)

ⓘ What is currently displayed is the function definition that has been posted online. If you need to change it, please click [Edit Draft](#)

Default Module

Feature Type	Feature Name(all) ▾	Identifier ↕	Data Type	Data Definition	Actions
Properties	zCoordinate Custom	zCoordinate	Float	Value Range: -1.4E-45 ~ 3.4028235E38	View
Properties	yCoordinate Custom	yCoordinate	Float	Value Range: -1.4E-45 ~ 3.4028235E38	View
Properties	xCoordinate Custom	xCoordinate	Float	Value Range: -1.4E-45 ~ 3.4028235E38	View
Properties	timestamp Custom	timestamp	Date	-	View

2. Define a device under *Devices* -> *Devices*.
 - 2.1. Add a device for the product that you defined.

Add Device ✕

i Note: You do not need to specify DeviceName. If DeviceName is not specified, Alibaba Cloud will issue a unique identifier under the product as DeviceName.

Products

ForkLift

DeviceName ?

FL01

Alias ?

FL01

OK
Cancel

2.2. Define device tags for each device.

Enter the following values for the 3 required tags:

- objectType: "RESOURCE"
- objectID: Resource ID from EWM
- warehouseId: you can find the warehouse ID in the *Warehouse Numbers* table in *Configure Your Solution* -> *Manage Warehouses*

Warehouse Numbers						
Warehouse Number	Short Description	Warehouse ID	Destination Warehou...	Time Zone	Unit of Length for Tra...	Created On
000_WH	Hi, AAA, I am ahead of you :)1111	5	AAAA	GMT+07:00 (Etc/GMT-7)	Meter	Jul 27, 2020, 12:26:17 PM
0804_WW_BIBLIS		28	NE02	Central European Time (Europe/Amsterdam)	Meter	Aug 4, 2020, 12:11:27 PM
17M2		234		Greenwich Mean Time (Etc/GMT)	Centimeter	Jun 3, 2021, 1:24:59 AM

Edit Tag ✕

Geographic LocationTag

coordinate No Coordinates Available Reset

Device Tag

warehouseId	3	Delete
objectId	FL01	Delete
objectType	RESOURCE	Delete

[+ Add Tag](#)

OK Cancel

3. Define a Data Forwarding Rule under *Rules -> Data Forwarding*.

3.1. Create a consumer group by entering a name.

Create Consumer Group ✕

* Consumer Group Name ?

WarehouseObjectConsumerGroup

OK
Cancel

3.2. Define a data forwarding rule.

3.2.1. Go to *Rules -> Data Forwarding* and choose *Create Rule*.
Enter a *Rule Name* and choose *JSON* under *Data Type*.

Create Data Forwarding Rule ✕

i After you create a data forwarding rule, IoT Platform processes the data reported by your device and forwards the processed data to other topics or Alibaba Cloud services in a JSON file or binary file.

* Rule Name ?

ForkLiftPosition

Data Type

JSON Binary

Rule Description

Enter a rule description

0/100

OK
Cancel

3.2.2 Define details in the data forwarding rule.

← WarehouseObjectPosition
Edit

Data Type: JSON Rule ID: 843025

Rule Description: -

Data Processing ?

SQL Syntax
Debug SQL
Write SQL

Rule Query Expression:

```
SELECT items.XCord.time as time, items.XCord.value as xCoordinate, items.YCord.value as yCoordinate, items.ZCord.value as zCoordinate, attribute('ObjectType') as objectType, attribute('WarehouseId') as warehouseId, attribute('ObjectId') as objectId FROM "/a1EB2yXuOVW/+thing/event/+post"
```

Data Forwarding ? Add Operation

Data Destination	Actions
Operation ID: 769217, Publish to AMQP Subscribed Consumer Group:WarehouseObjectGroup	Edit Remove
Operation ID: 776089, Publish to AMQP Subscribed Consumer Group:WarehouseGroupForCanary	Edit Remove

Forward Error Data ? Add Error Operation

Data Destination	Actions

3.2.2.1 Choose *Write SQL*.

For *Field*, enter the following:

```
items.timestamp.value as time,
items.xCoordinate.value as xCoordinate,
items.yCoordinate.value as yCoordinate,
```

items.zCoordinate.value as zCoordinate,
attribute('objectType') as objectType,
attribute('warehouseId') as warehouseId,
attribute('objectId') as objectId

In the drop-down lists for *Topic*, choose the following values one by one:

TSL Data Reporting
The Product Name (defined in Step 1.1)
All equipment(+)
thing/event+/post

Write SQL

FROM "/a1EB2yXuOVW/+/thing/event+/post"
WHERE

Field
items.XCord.time as time, items.XCord.value as xCoordinate, items.

Topic
TSL Data Reporting

Resource

All equipment (+)

thing/event+/post

Conditions (Optional)
You can use Rules Engine functions, such as: deviceName()=mydev

OK Cancel

3.2.2.2 Choose *Add Operation*.

- For *Select Operation*, choose *Publish to AMQP Subscribed Consumer Group*.
- For *Consumer Group*, choose the consumer group that you created in step 3.1.
- For *Tag*, enter "POSITION".

Add Operation [X]

i If the destination cloud service is invalid, data forwarding fails. In this case, IoT Platform retries data forwarding after one second, three seconds, and ten seconds. You can specify the retry strategy as needed. If all retries fail, the data is discarded.
If you require high message reliability, you can add an error operation. After you add the error operation, error messages are forwarded to other cloud services. If the error messages fail to be forwarded, no retry is performed.

Select Operation ?
Publish to AMQP Subscribed Consumer Group

* Consumer Group
WarehouseObjectGroup
[Create Consumer Group](#)

Tag
POSITION

OK Cancel

3.3. Define a data forwarding rule for status messages.

3.3.1. Create a data forwarding rule for status messages.

Go to *Rules -> Data Forwarding* and choose *Create Role*.
Enter a *Rule Name* and choose *JSON* under *Data Type*.

Create Data Forwarding Rule [X]

i After you create a data forwarding rule, IoT Platform processes the data reported by your device and forwards the processed data to other topics or Alibaba Cloud services in a JSON file or binary file.

* Rule Name ?
ForkLiftPosition

Data Type
 JSON Binary

Rule Description
Enter a rule description
0/100

OK Cancel

3.3.2 Define details in the data forwarding rule.

3.3.2.1 Choose *Write SQL*.

For *Field*, enter the following:

```
utcLastTime as time,  
status,  
attribute('objectType') as objectType,
```

attribute('warehouseId') as warehouseId,
attribute('objectId') as objectId

In the drop-down lists for *Topic*, choose the following:

Device Status Change Notification
The Product Name (defined in Step 1.1)
All equipment(+)

3.3.2.2 Choose *Add Operation*.

- For *Select Operation*, choose *Publish to AMQP Subscribed Consumer Group*.
- For *Consumer Group*, choose the consumer group that you created in step 3.1.
- For *Tag*, enter "STATUS".

For more information, see the help page of Alibaba Cloud on <https://www.alibabacloud.com/help/doc-detail/68677.htm>

Destination Settings in SAP BTP

1. Create a new destination and fill in the properties.

Name	Enter a name
Type	Choose "HTTP"
URL	Enter any string starting with http:// or https://. The field will not be used for the IoT integration, but it is a mandatory property for the destination.
Proxy Type	Choose "Internet"
Authentication	Choose "BasicAuthentication"
User	Enter the accessKey (*)
Password	Enter the accessSecret (*)

Note: For the properties marked with (), see [Connect an AMQP client to IoT Platform](#) from Alibaba Cloud.

2. Add the following additional properties.

Property	Value/Description
consumerGroupId	Enter the consumerGroupId (*)
iotHost	Enter the host (*)
iotInstanceId	Enter the iotInstanceId (*). (Only necessary when you use a purchased instance.)

iotService Enter "ALI_IOT"

Note: For the properties marked with (), see [Connect an AMQP client to IoT Platform](#) from Alibaba Cloud.

Your destination configuration should look like this:

Name:*	ali-iot	Additional Properties	
Type:	HTTP	consumerG...	pm15T7lqpDMgSXS...
Description:		iotHost	2140390149062571...
URL:*	http://ali-iot.com	iotService	ALI_IOT
Proxy Type:	Internet		
Authentication:	BasicAuthentication		
User:*	LTAI5t64dfFZbijxgwdASYgp		
Password:	*****		

Message Format Definition

The format of the messages sent to SAP Warehouse Insights is JSON.

1. Position
Enter the following for the position messages:

```
{  
  "time": 1621410553378,    //UTC  
  "xCoordinate": 3.5,  
  "yCoordinate": 4.5,  
  "zCoordinate": 5.5,  
  "warehouseId": "WH01",  
  "objectType": "RESOURCE",  
  "objectId": "RSRC01"  
}
```

Property Name	Type	Description	Sample value
time	Long	The time that the device sends out the data (in Unix time, represented as milliseconds since January 1, 1970)	1621410553378
xCoordinate	Float	The value of the x-coordinate of the device	
yCoordinate	Float	The value of the y-coordinate of the device	
zCoordinate	Float	The value of the z-coordinate of the device	

warehouseId	String	The warehouseId in SAP Warehouse Insights (See "Configure Your Solution" -> "Manage Warehouses" -> "Warehouse Number" table)	1
objectType	String	The object type	RESOURCE
objectId	String	The resource ID in EWM	RSRC01

2. Status

Enter the following for the status messages:

```
{
  "time": "2018-08-31T07:32:28.195Z", //UTC
  "status": "online" or "offline",
  "warehouseNumber": "WH01",
  "objectType": "RESOURCE",
  "objectId": "RSRC01"
}
```

Property Name	Type	Description	Sample value
time	String	The time that the device sends out the data (in ISO-8601 format)	"2018-08-31T07:32:28.195Z"
status	String	The device status	"online" or "offline"
warehouseId	String	The warehouse ID in SAP Warehouse Insights (See "Configure Your Solution" -> "Manage Warehouses" -> "Warehouse Number" table)	1
objectType	String	The object type	RESOURCE
objectId	String	The resource ID in EWM	RSRC01

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