

Orion Context Broker Exercises (Basic)



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CB-1. Deploy your own Orion instance

- Prerequisite

- To have a FIWARE Lab account

- Steps

- Go to Orion catalogue page

- Follow the steps in “Deploying a dedicated GE instance based on an image” in the “Creating Instances tab”

- Check Orion is working using the “/version” operation from your local computer

- Hints

- Image should be orion-psb-image-R5.2, installed in all FIWARE Lab regions. **If you don't find it ask us**

- Minimum recommended size: m1.small

- Remember to set the security group properly (typically to port 1026)

CB-1(b). Deploy your own Orion instance

- Alternative in the case you already have a VM in FIWARE Lab and don't want to deploy another one
- Prerequisite
 - CentOS 6.x VM
- Steps
 - Set FIWARE yum repository
 - Install Context Broker and MongoDB using yum
- Hints
 - See [Orion Admin Guide](#)
 - Remember to set the security group properly (typically to port 1026)

CB-1(c). Deploy your own Orion instance

- Alternative, you can install in your local computer using a pre-created VirtualBox image
- Prerequisite
 - VirtualBox installed in your computer
- Steps
 - Download from bit.ly/fiware-orion-024-vbox
 - Install the image in your VirtualBox
 - User: fiware/fiware (root password: fiware)

CB-1(d). Deploy your own Orion instance

- You can also deploy using Docker
- Prerequisite
 - Docker installed in your computer
 - (Optional) Docker-compose
- Steps
 - Follow the instructions provided in this [link](#).

CB-2. Create entities

- Prerequisites

- Exercise CB-1

- Steps

- Create the following entities in your Orion instance

- See table in next slide

- Hints

- Orion User Manual section [Entity Creation](#)

CB-2. Create entities

Easy

| Entity | Entity Type |
|-----------|-------------|
| Bedroom1 | Room |
| Bedroom2 | Room |
| Kitchen | Room |
| Frontdoor | Door |
| Backdoor | Door |

| Entity Type | Attr. Name | Attr. Type | Example value |
|-------------|-------------|------------|---------------|
| Room | Temperature | float | 27.8 |
| | Presence | boolean | true |
| | Status | string | OK |
| Door | Locked | boolean | false |
| | Closed | boolean | false |

CB-3. Query entities

- Prerequisites

- Exercise CB-2

- Steps

- Write a program (or web/mobile application) that does the following queries and prints the result

- Obtain all attributes of **Bedroom1** entity
 - Obtain all attributes of **Kitchen** entity
 - Obtain all attributes of **Bedroom2** entity
 - Obtain only the **Temperature** attribute of **Kitchen** entity
 - Obtain all attributes of entities that match the pattern **Bedroom.***
 - Find out whether the doors are closed using the pattern **.*door** and the **Closed** attribute

- Run and test your program/application

- Hints

- Orion User Manual section [Query Context](#).

CB-4. Update entity

- Prerequisites

- Exercise CB-2

- Steps

- Write a program (or web/mobile application) that

- Asks for user input (one value)

- Updates **Locked** attribute of **Frontdoor** entity using that input

- Queries the entity and check the result

- Run and test your program/application

- Hints

- Orion User Manual section [Update Context](#).

CB-5. Batch operations

- Prerequisites

- Exercise CB-2

- Steps

- Write a program (or web/mobile application) that

- Asks for user input (two values)

- Updates the **Temperature** attribute of **Bedroom1** and **Bedroom2** entities using that input with a single update operation

- Queries the entities with a single query operation and check the result

- Run and test your program/application

- Hints

- Orion User Manual sections [Batch operations](#)

CB-6. Update two attributes same entities

- Prerequisites

- Exercise CB-2

- Steps

- Write a program (or web/mobile application) that

- Asks for user input (two values)

- Updates the **Locked** and **Closed** attributes of **Frontdoor** entity using that input with a single update operation

- Queries the entities and check the result

- Run and test your program/application

- Hints

- Orion User Manual sections [Update Context](#)

CB-7. Browsing entity types

- Prerequisites

- Exercise CB-2

- Steps

- Write a program (or web/mobile application) that

- Lists all entity types

- Provides detailed information of type **Door**

- Run and test your program/application

- Hints

- Orion User Manual section [Browsing all types and detailed information on a type.](#)

CB-8. Basic subscription/notifications

- Prerequisites

- Exercise CB-2

- Steps

- Write a program that

- Starts a REST server to receive notifications from Orion

- Prints the value of the **Temperature** attribute of **Bedroom1** entity each time a notification is received

- Subscribe your program to changes in the **Temperature** attribute of **Bedroom1** entity

- Update the **Temperature** attribute of **Bedroom1** entity and check that your program prints the updated value

- Hints

- Orion User Manual section [Context Subscriptions](#)

- Your program has to run in a machine with network access to Orion's to be able to send notifications

CB-9. Advanced subscription/notification

Hard

•Prerequisites

–Exercise CB-8

•Steps

–Write a program that

- Starts a REST server to receive notifications from Orion

- If the **Temperature** attribute of **Kitchen** entity is equal or greater than 30 then update the **Status** attribute of **Kitchen** entity with string **TEMP_ALARM**

- If the **Temperature** attribute of **Kitchen** entity is lower than 30 then update the **Status** attribute of **Kitchen** entity with string **OK**

–Subscribe your program to changes in the **Temperature** attribute of **Kitchen** entity

–Update the **Temperature** attribute of **Kitchen** entity with 20, 30, 32, 25, etc. and checks that the **Status** attribute is modified accordingly

•Hints

–This exercises combines subscriptions/notifications with updates

–Modify the program already developed in Exercise CB-11

–Check exercise CB-4 about updating entities

CB-10. Expert subscription/notification

•Prerequisites

–Exercise CB-8

•Steps

–Write a program that

- Starts a REST server to receive notifications from Orion

- If the **Temperature** attribute of **Kitchen** entity is greater than 30 then update the **Intensity** attribute of **Ligth3** entity with the current value of **Intensity** plus 0.10 (with a maximum value of 1.0)

–Subscribe your program to changes in the **Temperature** attribute of **Kitchen** entity

–Update the **Temperature** attribute of **Kitchen** entity with 20, 30, 32, 25, etc. and checks that the **Intensity** attribute of **Ligth3** is modified accordingly

•Hints

–This exercises combines subscriptions/notifications with queries and updates

–Modify the program already developed in Exercise CB-11

–To get the current value of Intensity attribute of Light3 your program has to do a query operation. Check exercise CB-3 about querying entities

–Check exercise CB-4 about updating entities

CB-11. Get X-Auth-Token

- Prerequisites:

- To have a FIWARE Lab account

- Steps

- Use your login/password to get the token

- Hints

- Use the script described and available at [Orion Quick Start](#).

CB-12. Browse types at Orion Global instance

Easy

- Prerequisites:

- Auth token obtained in exercise CB-11

- Steps

- Write a program (or web/mobile application) that

- Lists all entity types

- Provides detailed information of type **Taxi**

- Run and test your program/application

- Hints

- Orion global instance runs at **orion.lab.fiware.org** port **1026**

- Similar to exercise CB-7 but adding the “X-Auth-Token” HTTP header (set with the auth token)

CB-13. Query entities at Orion Global instance

Easy

- Prerequisites:

- Auth token obtained in exercise CB-11

- Steps

- Write a program (or web/mobile application) that does the following queries and print the result

- All the attribute of entity **MeteoLo** (type **MeteoLo**)

- All the entities of type **Node**

- Attribute batteryCharge of entity **OUTSMART.NODE_3506** (type **Node**)

- All the entities of type **Taxi** which id ends in **7**

- Run and test your program/application

- Hints

- Orion global instance runs at **orion.lab.fiware.org** port **1026**

- Similar to exercise CB-3 or but adding the "X-Auth-Token" HTTP header (set with the auth token)

CB-14. Subscribe to public information

•Prerequisites

–Auth token obtained in exercise CB-11

•Steps

–Write a program that

- Starts a REST server to receive notifications from Orion

- Prints all the attributes of entities of type **santander:device** each time a notification is received

–Subscribe your program to all attributes of every entity of type **santander:device** each time **TimeInstant** attribute changes using throttling of 10 seconds

–Check that entities information arrives each 10 seconds and your program prints it

•Hints

–Orion global instance runs at **orion.lab.fiware.org** port **1026**

–Orion User Manual section [Context Subscriptions](#)

–Your program has to run in a VM/machine reachable from **orion.lab.fiware.org**. The port you use in the reference field in the subscription has to be open in your security group

–Differently from exercises CB-8/9/10, you don't need to update the subscribed entities, as **santander:devices** entities are automatically updated by IoT devices interacting with the Orion global instance

Thanks!



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(References to Orion manual sections and links in this presentation are valid at time of writing this –September 16th, 2016- but they may change along time)