Orion Context Broker Exercises (Basic)

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(Reference Orion Context Broker version: 1.3.0)

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CB-1. Deploy your own Orion instance

Easy

- 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

Medium

- 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

Easy

- 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

Medium

- 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

Easy

- 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

Easy

- 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

Easy

- 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

Medium

- Prerequisites
  - Exercise CB-2
- Steps
  - Write a program (or web/mobile application) that
    - Asks for user input (two values)
    - Updates the **Temperature** attribute of **Beedroom1** 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

Medium

- 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

Easy

- 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

Medium

- 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

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 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

Easy

- 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

Hard

- 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 you 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 update 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)