

Orion Context Broker Exercises (Advanced)



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Outline

- CB-15. Pagination
- CB-16. Geolocation (factory)
- CB-17. Geolocation (cities)
- CB-18. Compound attributes
- CB-19. Query entities with compound attributes
- CB-20. Update entities with compound attributes
- CB-21. Custom metadata
- CB-22. Dynamic attributes addition/deletion
- CB-23. Multitenancy
- CB-24. Service Paths (create)
- CB-25. Service Paths (query)
- CB-26. Service Paths (update)

CB-15. Pagination

Medium

•Prerequisites

–Access to Orion instance running in **130.206.81.86** port **1026**

•Steps

–Check how many entities of type **Sensor** are stored in that Orion instance

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

- Asks for a limit and a page number

- Returns the name IDs the entities of type **Sensor** in the corresponding page

–Run and test your program/application

•Hints

–Orion User Manual section [Pagination](#)

(This exercise is temporally disabled, as 130.206.81.86 is no longer reachable. Sorry!)

CB-16. Geolocation (factory)

Medium

•Prerequisites

–Access to Orion instance running in **130.206.81.86** port **1026**

•Steps

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

- Gets all existing types

- Gets all entities of each type in areas Red, Green and Blue (see next slide), printing entity IDs and their attributes which their values

–Run and test your program/application

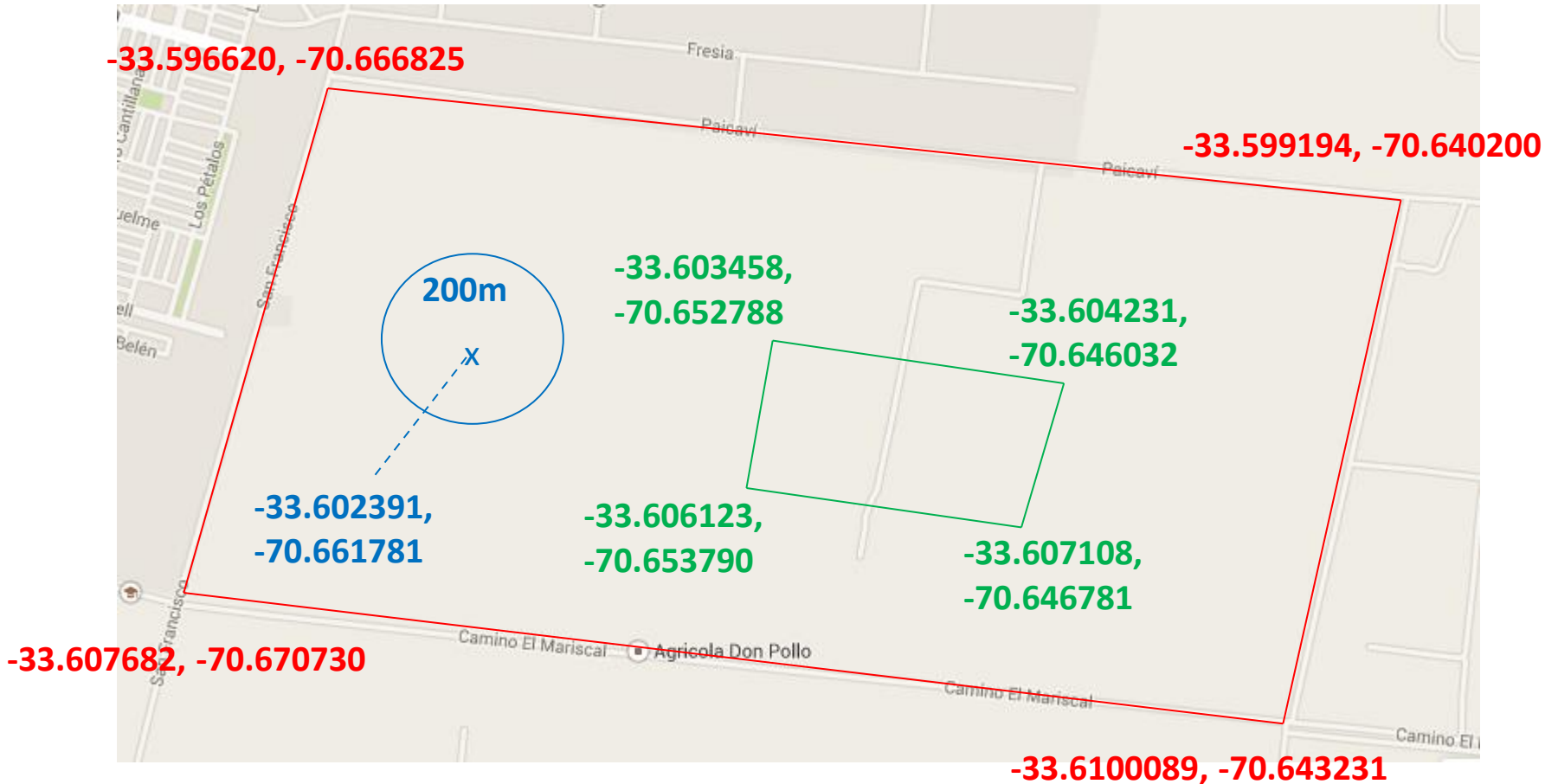
•Hints

–Orion User Manual section [Geolocation](#)

(This exercise is temporally disabled, as 130.206.81.86 is no longer reachable. Sorry!)

CB-16. Geolocation (factory)

Medium



CB-17. Geolocation (cities)

•Prerequisites

–Exercise CB-1

•Steps

–Chose 2 European countries (let's name them A and B)

–Chose 3 cities in each country

–Create one entity for each city, in the following way

- Entity ID: the name of the city

- Entity type: "City"

- The attribute "location" represent the city location (coordinates)

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

- Does a query to get all cities

- Does a query to get all cities in country A

- Does a query to get all cities in country B

–Run and test your program/application

•Hints

–Orion User Manual section [Geolocation](#)

–This page may help to get city coordinates: <http://www.gps-coordinates.net/>

–Use polygons to model countries (the model doesn't need to be very precise). Google Maps may help (<http://maps.google.com/>)

CB-18. Compound attributes

- Prerequisites

- Exercise CB-1

- Steps

- Create the following entities in your Orion instance

- See table in next slide

- Hints

- Orion User Manual section [Structure Attribute Values](#)

CB-18. Compound attributes

Medium

Entity name	Entity Type
Gandalf	Character
Aragorn	Character
Frodo	Character

Entity Type	Attr. Name	Attr. Type	Example value
Character	Name	string	Fooy
	Hitpoints	integer	110
	Class	string	Barbarian
	Abilities	compound	{ "STR": "2", "DEX": "4", "CON": "3", "INT": "1", "WIS": "1", "CHA": "2" }
	Inventory	compound	{ "weapons": ["sword", "dagger"], "potions": { "life": "1", "mana": "0" }, "other": ["shield"] }

CB-19. Query entities with compound attributes

Medium

- Prerequisites

- Exercise CB-18

- Steps

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

- Obtain all attributes of **Aragorn** entity

- Obtain only the **Abilities** attribute of **Frodo** entity

- Run and test your program/application

- Hints

- Orion User Manual section [Structure Attribute Values](#)

CB-20. Update entities with compound attributes

Medium

•Prerequisites

–Exercise CB-18

•Steps

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

- Asks for an object name (e.g. "staff", "hat", etc.)

- Updates **Gandalf's Inventory** attribute to reflect that he now has a that object test your program

–Run and test your program/application

- Query the **Gandalf's Inventory** after that, in order to check that the object has been successfully added

•Hints

–Orion User Manual section [Structure Attribute Values](#)

CB-21. Custom metadata

- Prerequisites

- Exercise CB-18

- Steps

- Update the **Gandalf** entity so that the **inventory** attribute has two new metadatas:

- name="Weight", type="float", value="1.2"

- name="MaxWeight", type="float", value="20"

- Query **Gandalf** again to see the new metadata attached to the corresponding attribute

- Hints

- Orion User Manual section [Attribute metadata](#)

CB-22. Dynamic attributes addition/deletion

•Prerequisites

–Exercise CB-1

•Steps

–Create the following initial entity

- Entity ID: Car1
- Entity Type: Car
- Initial attribute: name=Speed, type=integer, value=70

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

- Asks for an operation type (ADD or DELETE)
- If user chose ADD
 - Ask for an attribute name, type and value
 - Do a query to Orion to check that no other attributes with the same name exists in the entity (in positive case, exit informing the user about the problem)
 - Create the new attribute at the entity
- If user chose DELETE
 - Ask for an attribute name
 - Do a query to Orion to check that an attributes with that name exists in the entity (in negative case, exit informing the user about the problem)
 - Delete the attribute at the entity

–Run and test your program/application

- Query your entity to check that the attributes are added and deleted as expected

•Hints

–Orion User Manual section [Adding and removing attributes and entities](#)

CB-23. Multitenancy

- Prerequisites

- Exercise CB-1

- Steps

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

- Creates the following entities in your Orion instance at tenant "Customer1"

- See table in next slide

- Creates the following entities in your Orion instance at tenant "Customer2"

- See table in next slide

- Query for the Hammer entity using Customer1 and Customer2 as Fiware-Service alternatively, checking that the result is the right one for the given tenant

- Hints

- Orion User Manual section [Multitenancy](#)

- Orion has to be configured to run with multitenancy enabled

- BROKER_EXTRA_OPS="-multiservice" at /etc/sysconfig/contextBroker

CB-23. Multitenancy

Hard

Entity Type	Attr. Name	Attr. Type	Example value
Tool	stock	integer	1234

Tenant	Entity Name	Stock attribute value
Customer1	Hammer	40
	Screwdriver	23
	Pliers	12
	Ducktape	13
Customer2	HeatGun	109
	Pliers	832
	Hammer	646
	Screwdriver	301

CB-24. Service Paths (create)

- Prerequisites

- Exercise CB-1

- Steps

- Create the following entities

- See table in next page

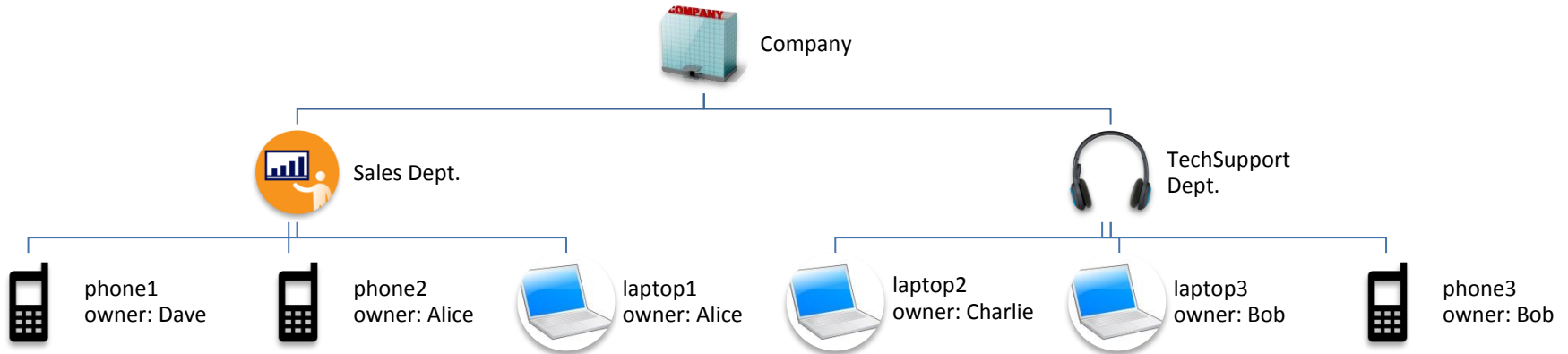
- Keep in mind that they have to use Service Paths according to the figure

- Hints

- Orion User Manual section [Entity Service Paths](#)

CB-24. Service Paths (create)

Entity Type	Attr. Name	Attr. Type	Example value
Laptop	owner	string	Bob
MobilePhone	owner	string	Alice



Service Path	"Fiware-ServicePath" header value
Company	/company
Sales Department	/company/sales
Tech Support Department	/company/tech

CB-25. Service Paths (query)

- Prerequisites

- Exercise CB-24

- Steps

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

- Query all phones in the company

- Query all laptops in the Tech Support department

- Run and test your program/application

- Hints

- Orion User Manual section [Entity Service Paths](#)

CB-26. Service Paths (update)

- Prerequisites

- Exercise CB-24

- Steps

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

- Since Charlie left the Company he has to give back his laptop. Update entity **laptop2**'s **owner** attribute and set it to "nobody".

- Create a new entity **phone3** of type **MobilePhone** in the sales department and set the **owner** attribute to "Alice" (she needs two phones, she works a lot). Notice that as a result of this there will be two entities with the same id in different Service Paths.

- Run and test your program/application

- Query entity **phone3** and see which one you get when querying with the following service paths

- The Sales department

- the Tech Support department

- All the company

- Hints

- Orion User Manual section [Entity Service Paths](#)

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)