OCCIware

An extensible, standard-based XaaS Cloud consumer platform to manage everything in the Clouds

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Cloud Expo London 2017 @ OW2

Overview

Speaker

- Marc Dutoo, R&D projects lead at Smile
  - OCCIware coordinator, Data / API / Cloud expert

Schedule

- OCCI(ware) introduction
- Smart City use case – Big Linked Open Data analytics
- Quick demo – Docker Studio, custom Linked Data extension, runtime and Playground
- What's coming up next – and Big news !

OCCI WARE

OCCI(ware) introduction

A quick question...

Who uses multi cloud today ?

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Who uses multi cloud today ?

... everybody

- Docker in devops, and Kubernetes in production
- AWS, except when its Service – Task model of scalability is not fine enough
- National clouds to ensure data jurisdiction
- ... as soon as appears in your application a new need that calls for a cheaper / faster / more robust / more scalable / ... Cloud

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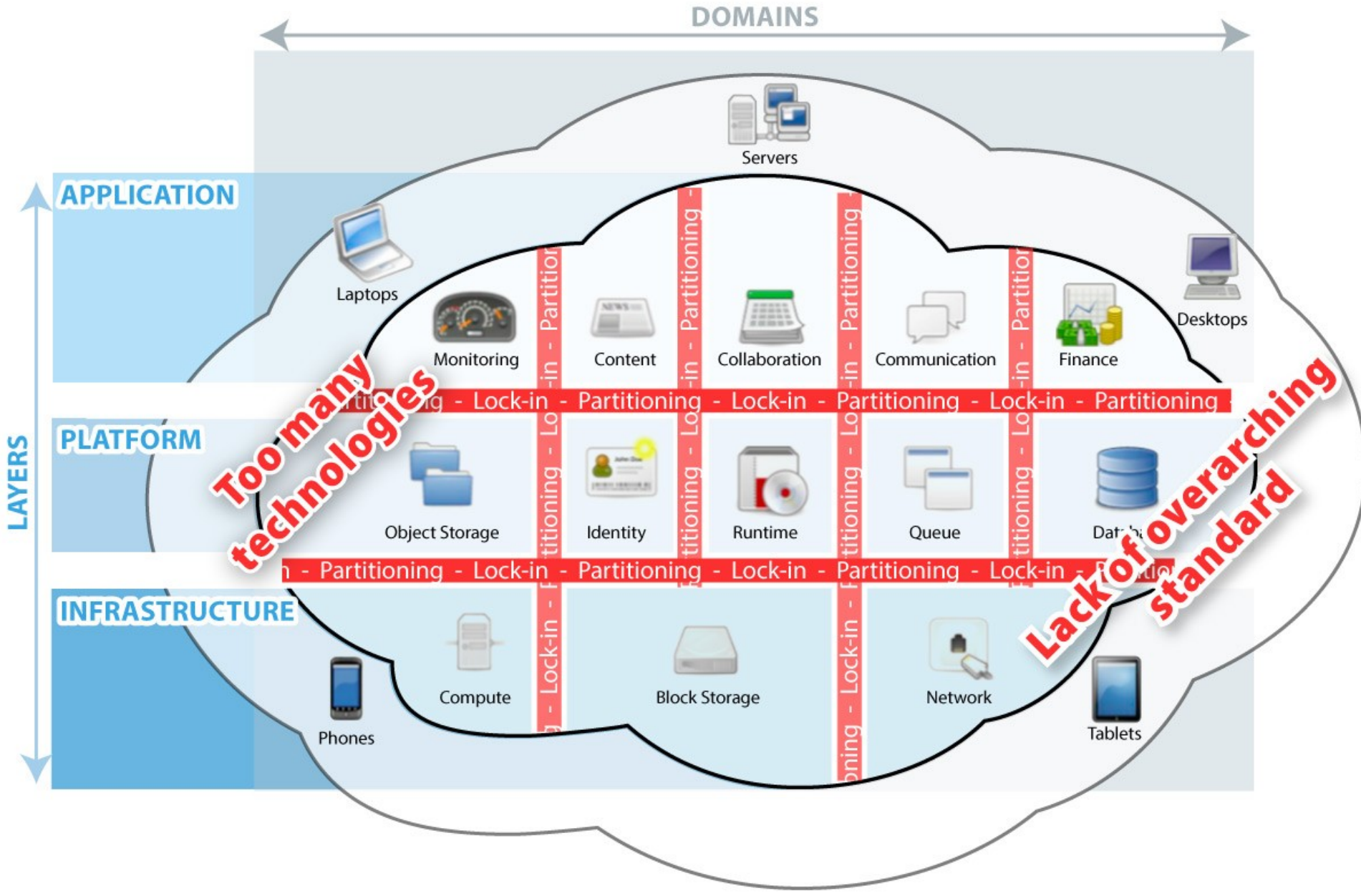
Cloud Computing – the problem



Why OCCI ?

- So this makes for partitioning, lock-in...
- And a lot of **technical glue**, therefore making it all hard to maintain
- The OCCI standard advocates a unified, uniform architectural approach
  - to **separate** this glue (connectors)
  - from business logic consuming them through the standard, generic OCCI REST HTTP API
- ... the rise of the **Cloud consumer platform**

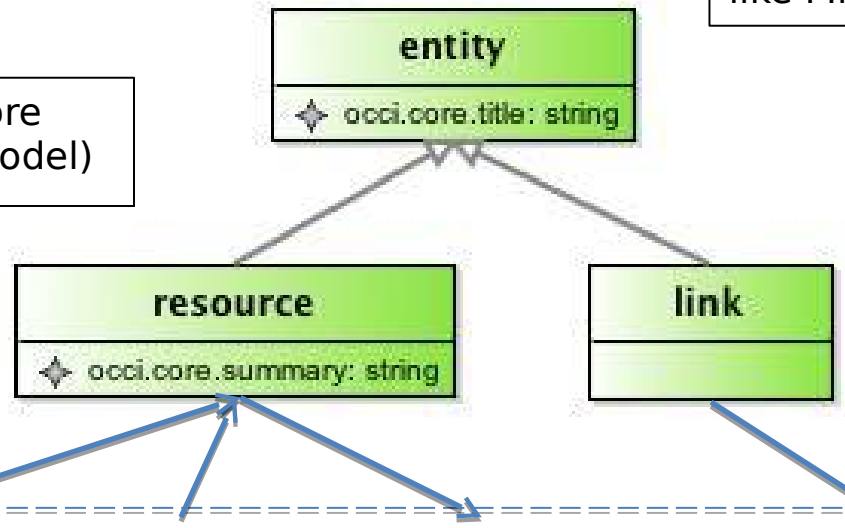
OCCIware Product

OCCI 101

+ flexible typing thanks to Aspect-like Mixins

Everything is **Resource** or **Link**, be it at ...

OCCI Core (metamodel)



OCCI Extensions (models)

Infrastructure level	**Network**	**Compute** - memory - started - start()	**Storage**	**NetworkLink**
Platform level	**Container**	**Database**	**Router**	**DatabaseLink**
Application level	**Environment**	**Application**	**Deployable**	**EnvironmentLink**

OCCIware Objective

Managing Everything as a Service in the clouds

Software as a Service (SaaS)

Big Data as a Service (BDaaS)

Linked Data as a Service (LDaaS)

Platform as a Service (PaaS)

Container as a Service (CaaS)

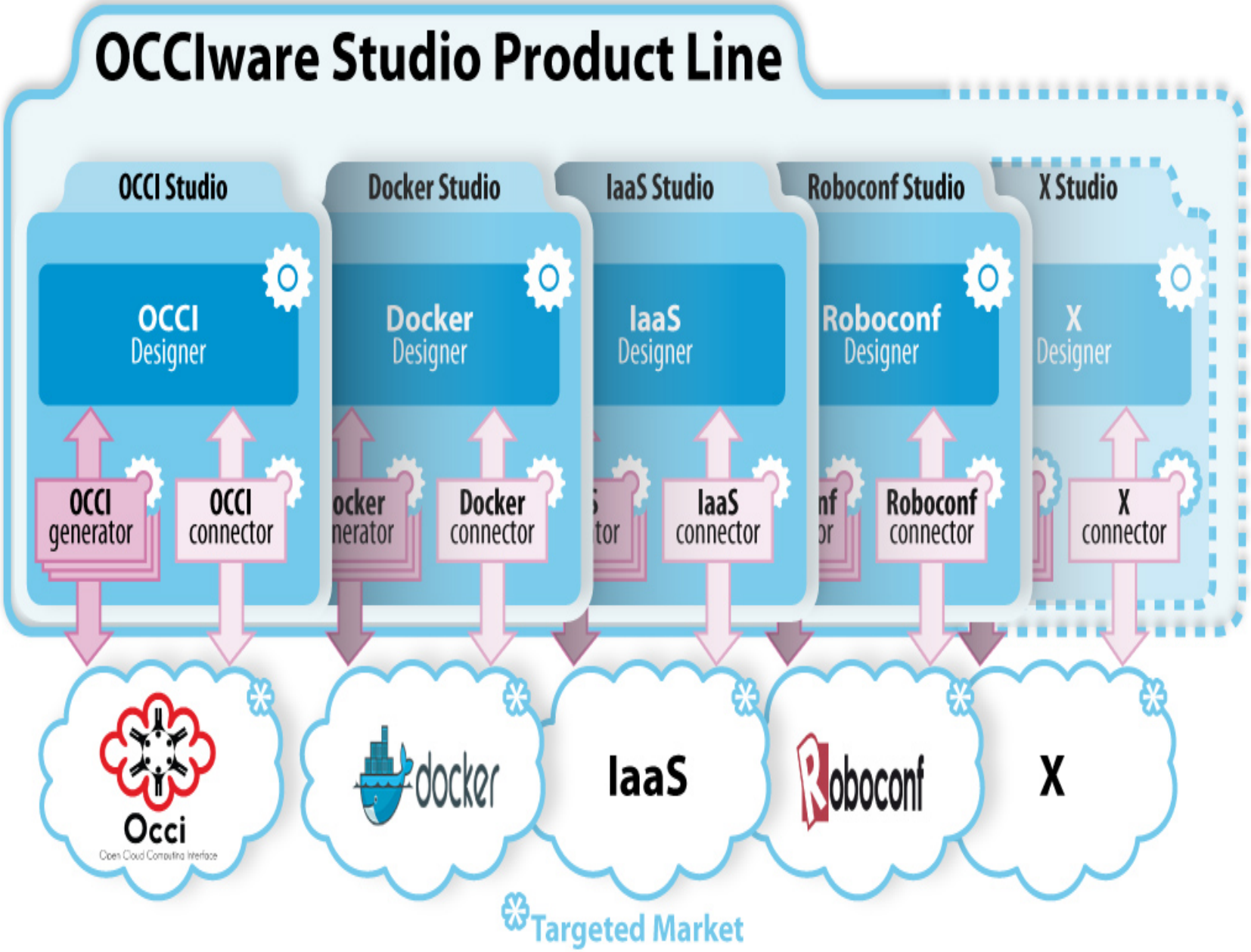
Infrastructure as a Service (IaaS)

DataCenter as a Service (DCaaS)

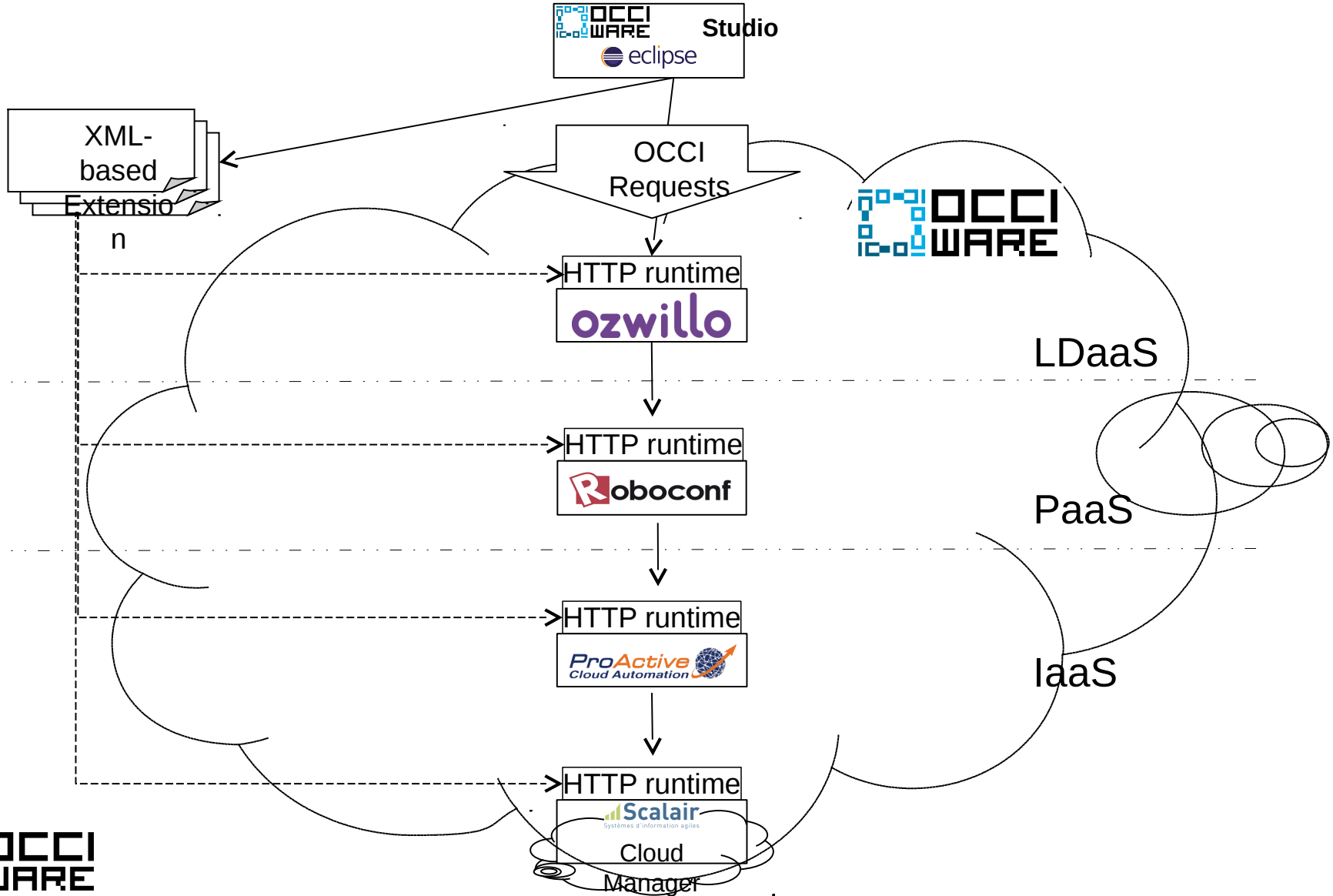
Network as a Service (NaaS)

OCCIware Factsheet

- 72 man year, 5,6m€ budget, sponsored by French ministry of Industry over 2015-2018
- 3 academics, 5 companies, 2 associations
- To lower Cloud Computing adoption costs and **break up barriers** between its various implementations, layers, domains
  - Especially Data Center, deployment, Big Data, Linked Data
- By bringing to OGF's Open Cloud Computing Interface (**OCCI**) the power of **formal** languages and **model** driven engineering (MDE)


OCCIware Studio Product Line
OCCI Studio
Docker Studio
IaaS Studio
Roboconf Studio
X Studio
OCCI Designer
Docker Designer
IaaS Designer
Roboconf Designer
X Designer
OCCI generator
OCCI connector
Docker connector
IaaS connector
Roboconf connector
X connector
Occi
Open Cloud Computing Interface
docker
IaaS
Roboconf
X
Targeted Market

OCCIware runtime end-to-end OCCI API call chain



Use case : Big Linked Open Data Analytics – monitoring energy consumption

Monitor energy consumption

- Not only per user, or per utility provider company,
- but per city, region, country,
  - and per activity, usage, number of children, amount of hair on feet would most probably help also.

Multi-point of view data... that calls for an open world approach of data – that's Linked Data.

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Linked Data Primer

- Linked Open Data ? That's Open Data sets that can be cross-queried because they have been semantically **reconciled** together
- Enter **Ozwillo Datacore** :
  - it holds data that is shared between applications of the Ozwillo app store : geographical elements, organizations, reusable app business data...
  - it stores it in a shardable replicated **MongoDB** and is built in Apache CXF / Spring & **Java**
  - it provides it through a **REST API** that is both web-friendly and semantic web-compatible thanks to JSON-LD, and helps developers with a **Playground**.

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ozwillo **Datacore API** geo_1 (visible : oasis.meta ⇕ Welcome Marc Dutoo (marc.dutoo@openwide.fr)
logout

Datacore API

Allows to manage (CRUD) and find Data Resources and their Models using JSON/HTTP REST calls.

- **Data Resources** are handled in JSON-LD-like (implicit context) format (see also playground) and with **W3C LDP** (Linked Data Platform, see primer and wiki)-like operations (URIs, future collection filtering (1, 2) -inspired finders etc.). **Have a look at existing Resources, at** /dc/type/pli:city_0 for instance for resources in the `pli:city_0` Model type (meaning version 0 of the pli:city Model). In addition to the simpler default native pure JSON format, "true" JSON-LD formats and semantic web formats (such as RDF, see example) are available.

- **Data Models** describe what kinds of Data Resources are allowed in a JSON Schema-like structure (see jsonschema.net playground) with `string, boolean, int, float, long, double, date, map, list, i18n, resource` fields grouped in reusable **Mixin** types. **Have a look at known Models at** /dc/type/dcmo:model_0 and Mixins at /dc/type/dcmi:mixin_0, in their own metamodel where they may be introspected (see how), but also drafted and published (**upcoming**).

See wiki for further examples, FAQ, how to & common use cases, cookbook (writing clients...) and full documentation.

Datacore (`https://data.ozwillo-dev.eu`):

`/dc/type/geon2fr:Région_0` GET | l | dc | ? | RDF | edit | X | H


```
[
   {
      "@id" : "http://data.ozwillo.com/dc/type/geon2fr:R%C3%A9gion_0/FR/FR-S",
      "o:version" : 83,
      "@type" : [
         "geon2fr:Région_0",
         "geon2:Nuts2_0",
```


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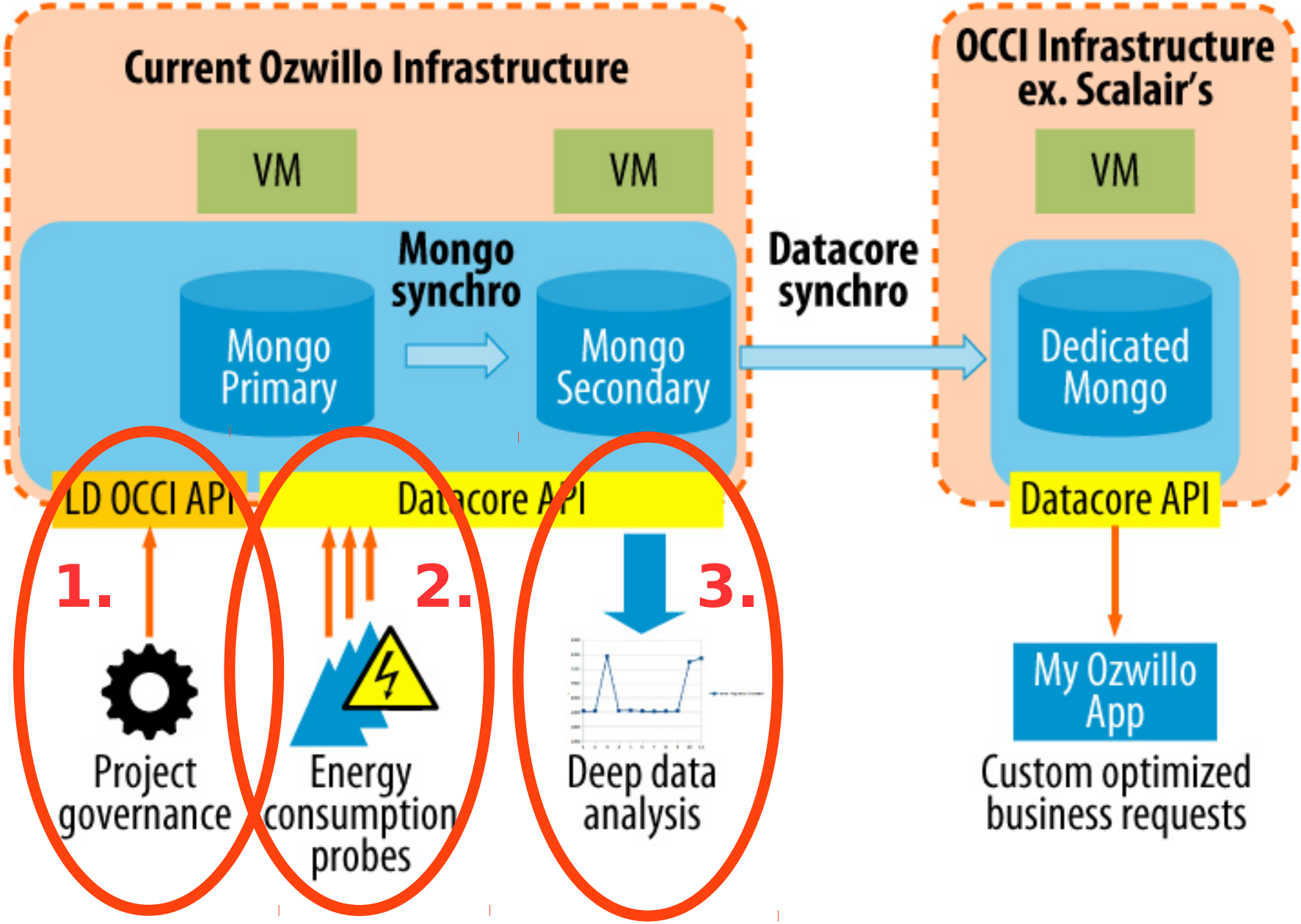
Linked Data as a Service (LDaaS)

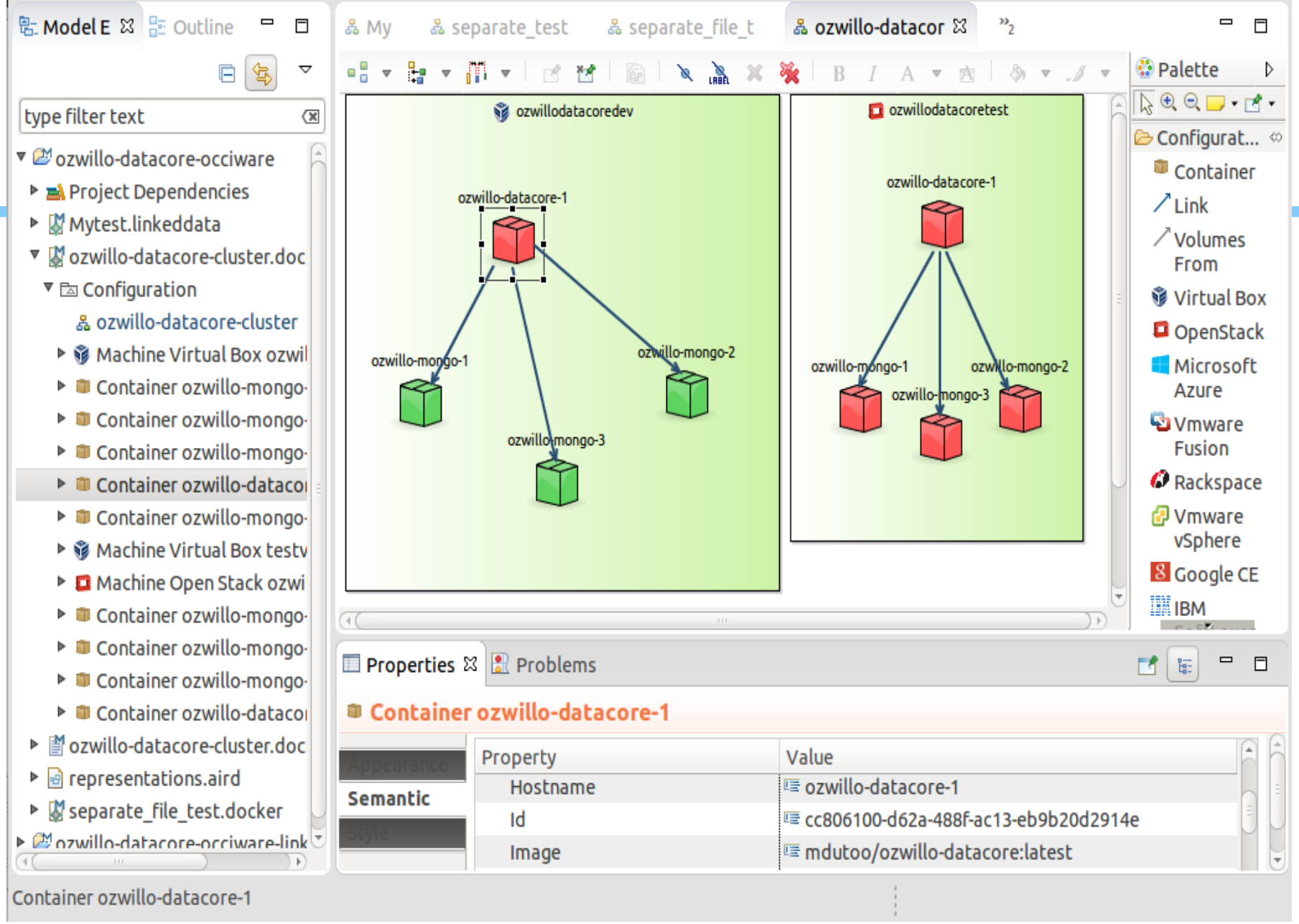
But not your dad's Linked Data. If you want it to save the world, it has to **scale up the whole way :**

- at **Infrastructure** level - that's IaaS : provision enough CPU & storage, for each city
- at **Platform** level - that's PaaS : deploy code - java and data - mongo replicated cluster shards on each of them
- at **Software** level - that's SaaS : configure Linked Data governance i.e. models and kinds of use :
  - **high write**, non-robust data collection (home energy consumption sensor notifications)
  - read/**query-heavy** data analysis (aggregation per energy consumer, provider, city, region, country)

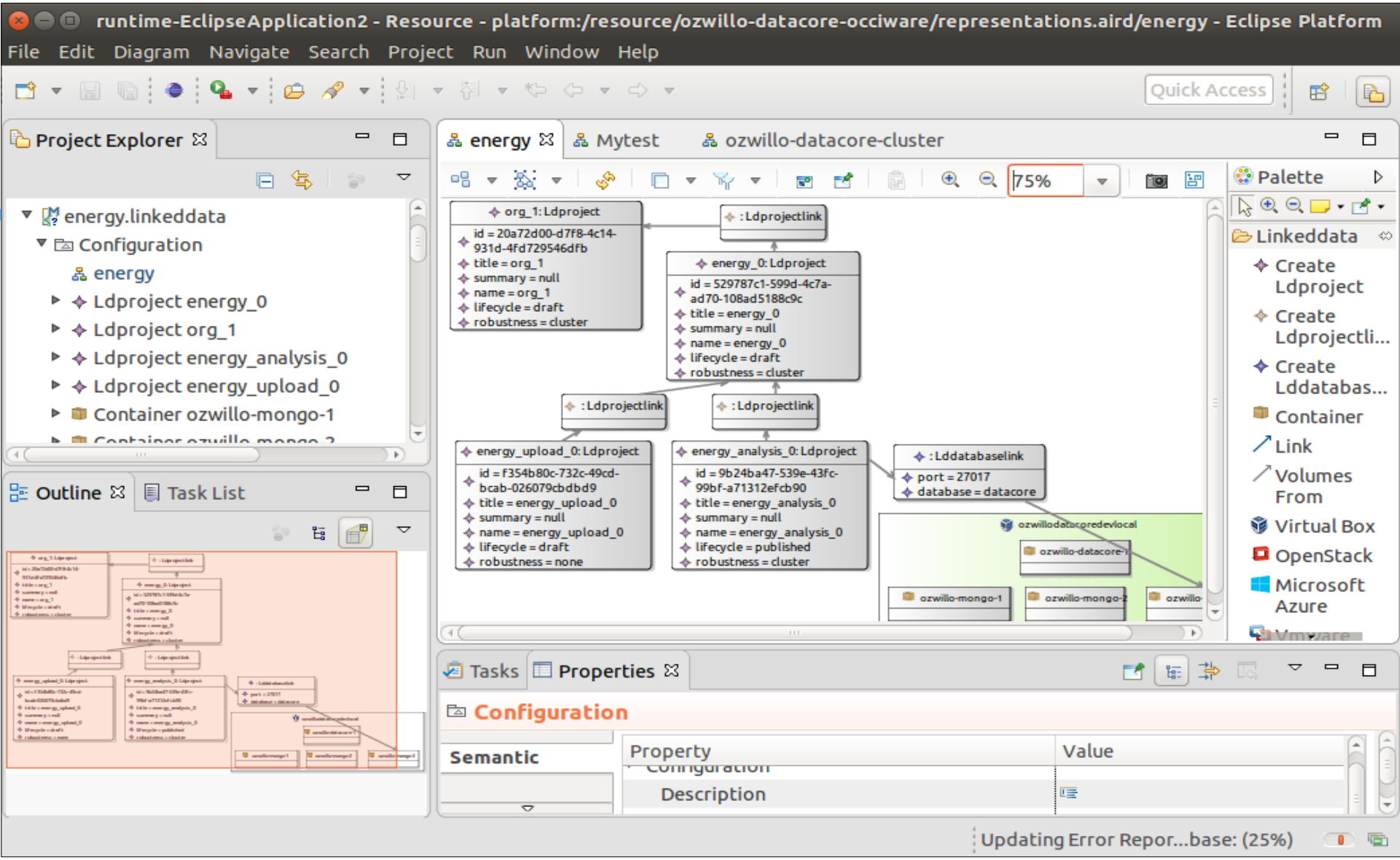
Linked Data – 3 target scenarii



Quick demo – Docker Studio, custom Linked Data extension

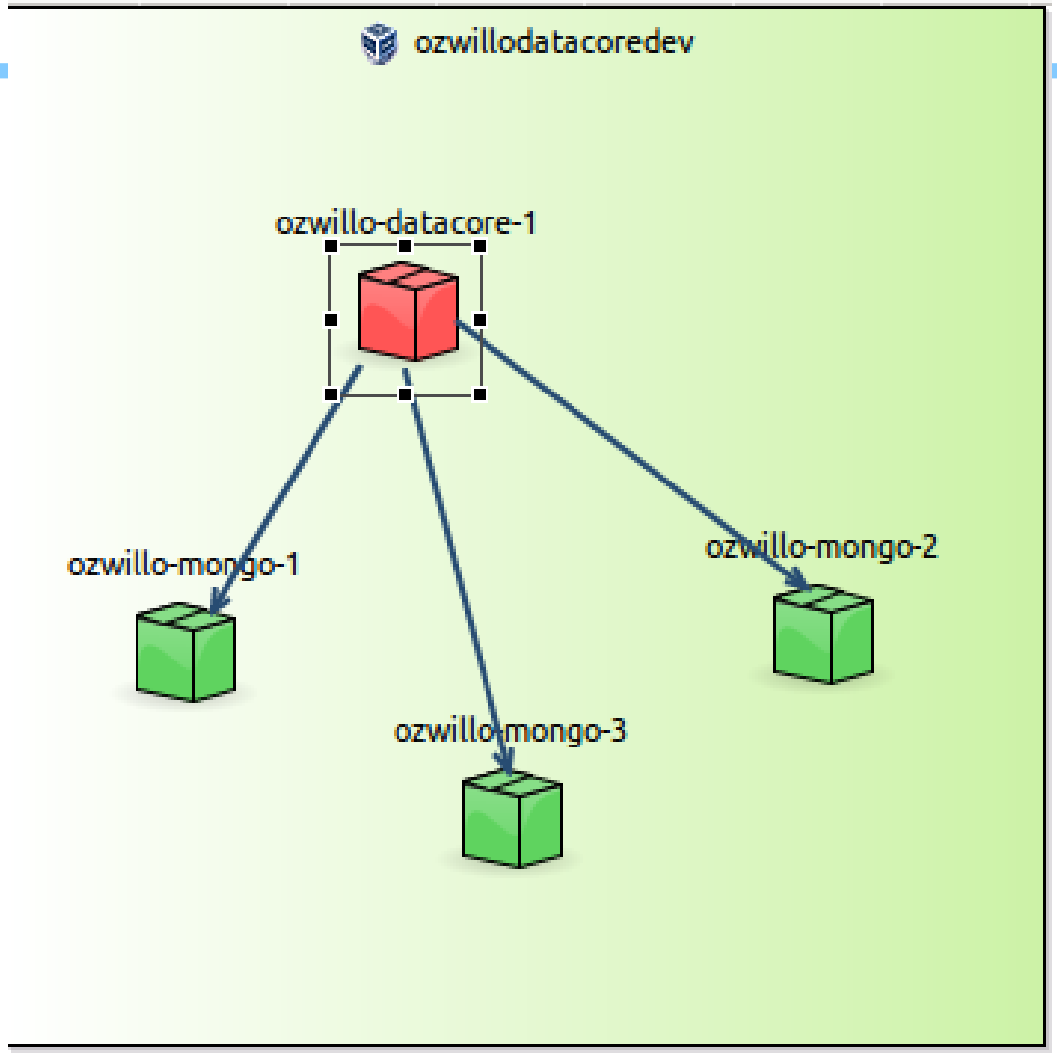


Cloud Studio, with Docker



Custom Studio for LdaaS (Linked Data as a Service)

IaaS - Virtual Box machine



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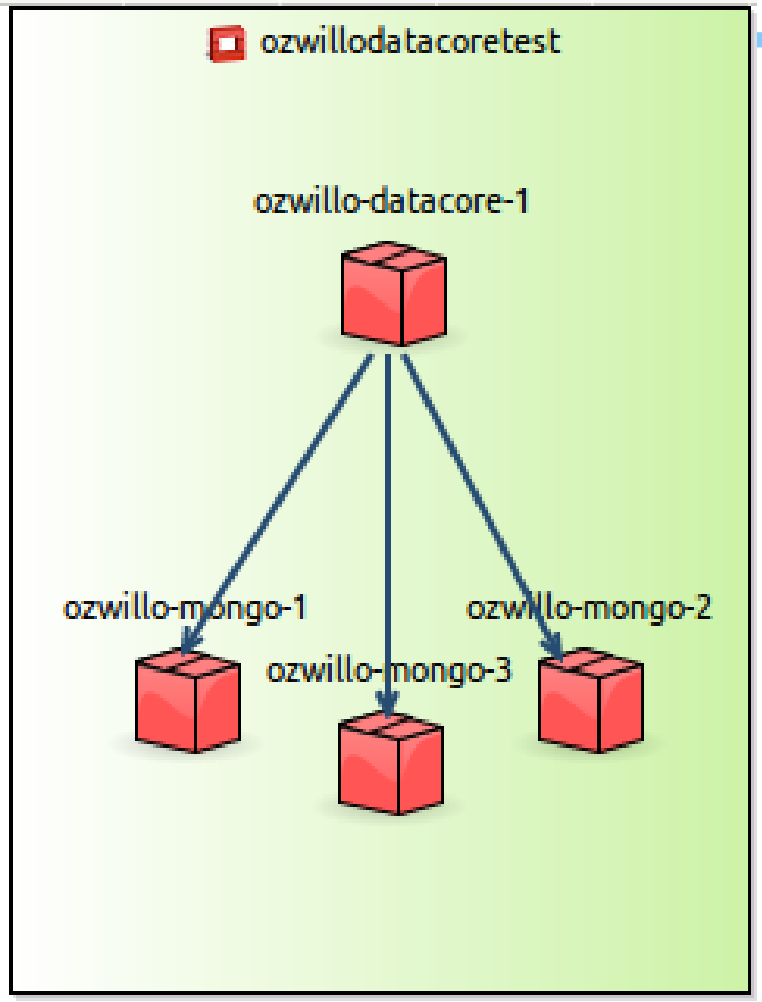
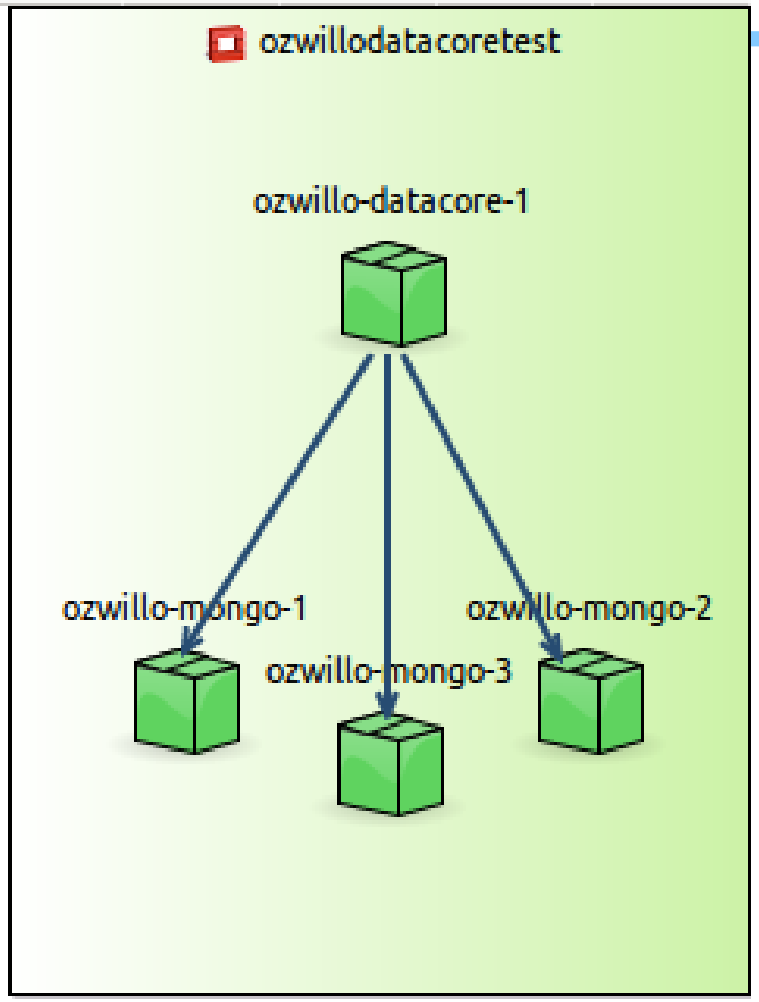
Docker Studio

IaaS - Open Stack machine



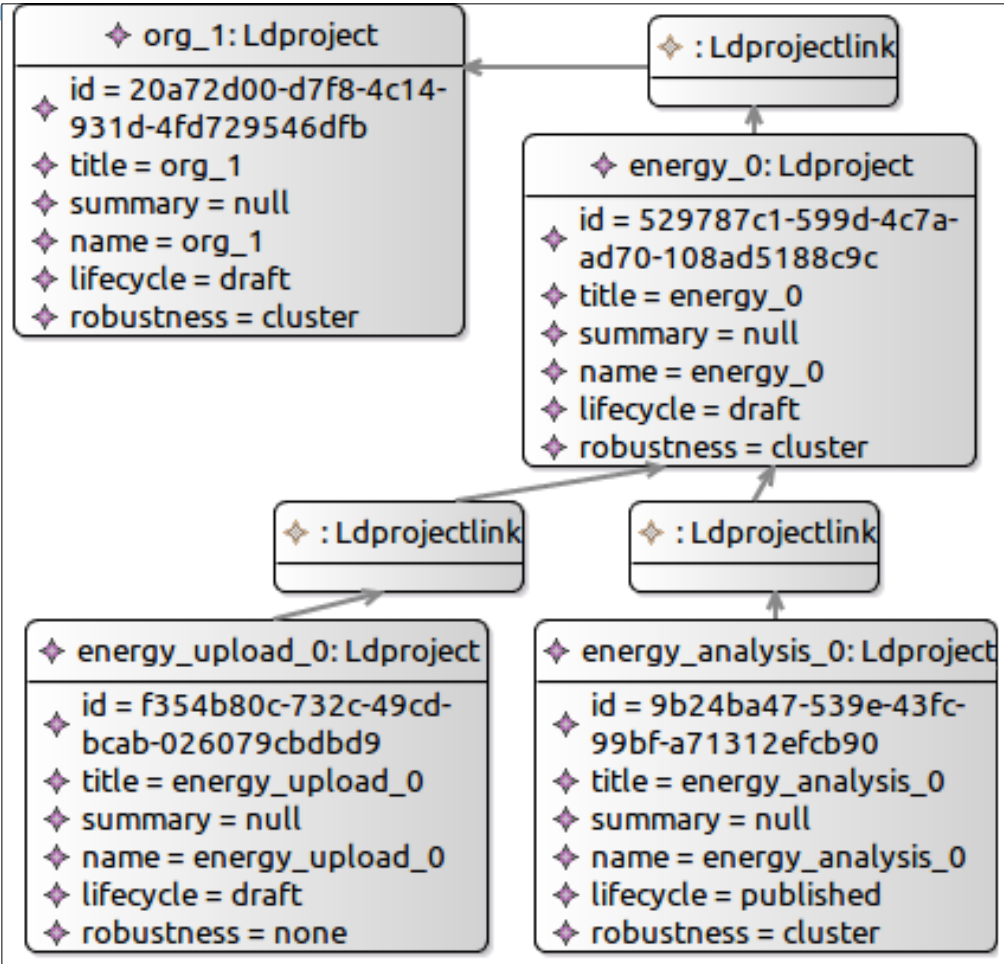
Docker Studio

... started !



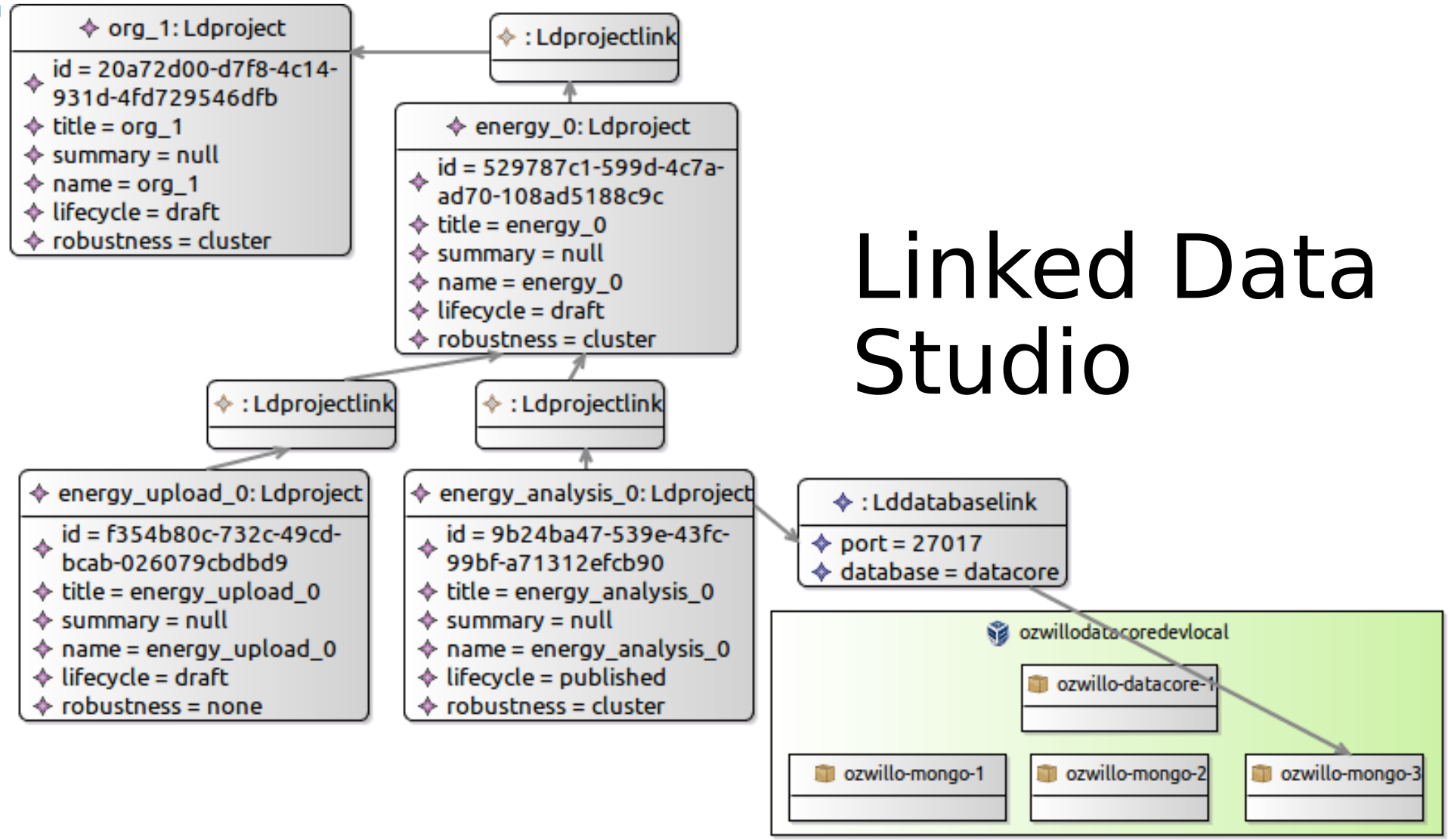
Docker Studio

SaaS - Linked Data with dedicated analytics entry point



Linked Data Studio

… using a specific mongodb replica within its cluster !



Linked Data Studio

Allowing to **not hamper data collaboration performance** when aggregating energy consumption - results shown here :

Deploying connectors

- The same connectors - for Docker, VMWare, OpenStack, but also Roboconf, Datacore...
- Can be deployed embedded in the OCCIware **Studio** during **development**
- But also exposed as OCCI **HTTP** in **production**
  - either in the full Java **MART server** (Model@RunTime)
  - or behind the scalable, erlang-based **erocci server**
- Where they can be tested, introspected and **managed** using the OCCInterface **web playground**
  - works with any OCCI API implementation – try yours !

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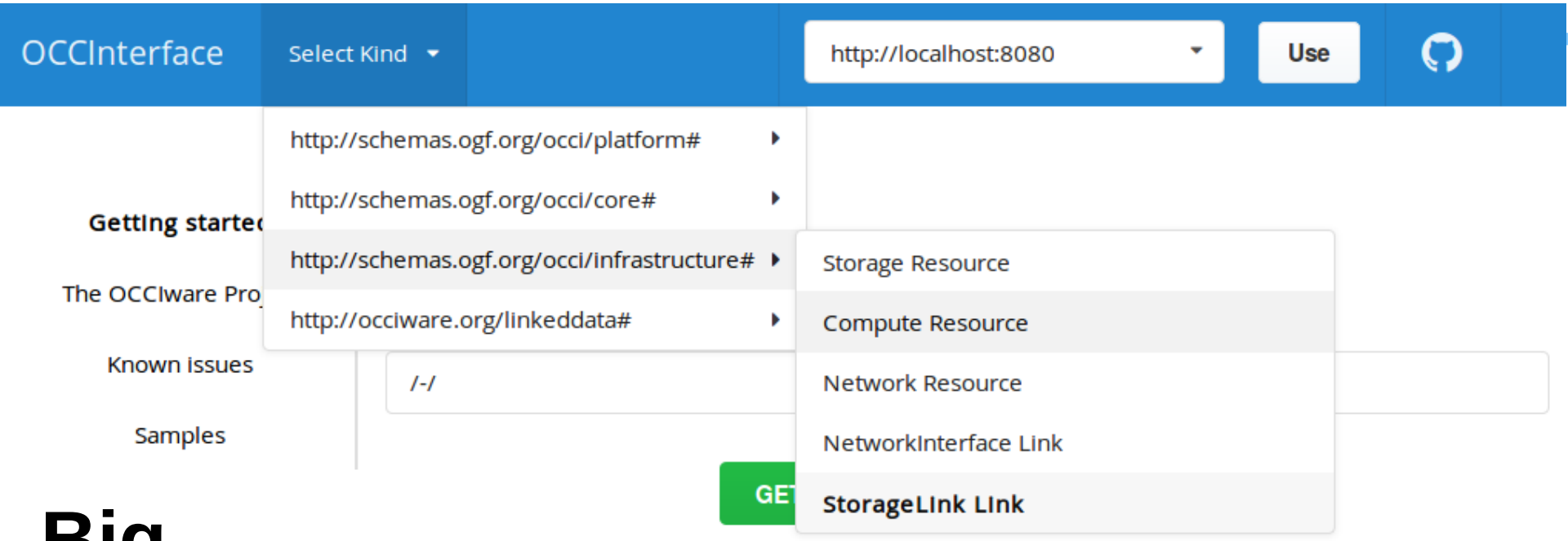
OCCI web Playground

http://occinterface.herokuapp.com/



Big news – soon an OW2 project !


```
{
  "actions" : [
    "http://schemas.ogf.org/occi/infrastructure/compute/action#restart",
    "http://schemas.ogf.org/occi/infrastructure/compute/action#save",
    "http://schemas.ogf.org/occi/infrastructure/compute/action#start",
    "http://schemas.ogf.org/occi/infrastructure/compute/action#stop",
    "http://schemas.ogf.org/occi/infrastructure/compute/action#suspend"
  ],
  "attributes" : {
    "occi.compute.architecture" : {
```

Ongoing in OCCIware

- **Studio** : **contribute to Eclipse.org**, integrate simulator, migration decision-making tool… http://github.com/occiware/ecore

- **Runtime :** complete end-to-end, SaaS-to-PaaS-to-IaaS OCCI call chain with ActiveEon **OW2 ProActive** Multi-IaaS connector and Linagora **OW2 Roboconf** PaaS manager

- **Console : contribute to OW2** live Playground – http://occinterface.herokuapp.com/

- Develop specified OCCI **monitoring** solution using OCCIware's Java OCCI monitoring framework (Tinom)

- Complete **use cases** : Datacenter, Big Data, Deployment, Linked Data

- … and contribute back to **OCCI 2.0** standard !

Any questions ?

Thanks for your attention !

Contact : http://www.occiware.org - philippe.merle at inria.fr, marc.dutoo at smile.fr, christophe.dorothee at smile.fr

Source : https://github.com/occiware

Partners :

Sponsors :

DGE (PIA) & System@tic, SCS, Images & Réseaux, PICOM, Minalogic clusters