

OpenCloudware

The Cloud application lifecycle management platform

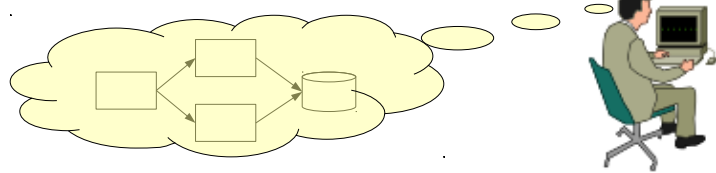
*Delivering a Cloud Platform for Building, Maintaining and
Operating Enterprise PaaS Distributed Applications*

Alexandre Lefebvre
Orange Labs

What is OpenCloudware?

- Co-funded collaborative R&D project, 18 partners
- Development of **software modules** for building a **IaaS-agnostic Dev to PaaS** enterprise-grade infrastructure platform
- Enables to easily build, generate and operate enterprise **distributed applications** for deployment on any cloud
 - Their **modeling, assembly and build**
 - Their **deployment and operation (PaaS)**
 - On multiple infrastructures (**Multi-IaaS**)
- 3 years (Jan 2012 – Dec 2014)
- Supported by the French FSN (Fonds National pour la Société Numérique)
- Co-labeled by the Minalogic, Systematic and SCS Pôles de Compétitivité

- Large Corps
 - Bull
 - France Télécom – Orange
 - Thales Com
 - Thales Services
- SMEs
 - ActiveEon
 - eNovance
 - eXo Platform
 - Peergreen
 - Linagora (prev. Petals Link)
 - UShareSoft
- Academic
 - Armines/Ecole des Mines de Nantes
 - IRIT – INP Toulouse
 - Télécom Paris Tech
 - Télécom Saint Etienne
 - Univ. Joseph Fourier
 - Univ. Savoie - LISTIC
 - Inria (Grenoble, Nice, G5K)
- Open Source organisation
 - OW2

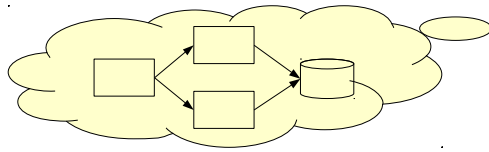


Use case

OpenCloudware Self Service **Portal**

The user wants to deploy a distributed enterprise application (JavaEE, LAMP, ...)

First step: account creation and login (role-based access control)



Use case

vApp
component1
component2
component3
SLA
bindings

OpenCloudware Self Service **Portal**

Template Gallery:
AaaS, JavaEE, OSGi,
Services

End to end Cloud **Modeling**
Meta Data and Modeling Tools

The user builds its virtual app using OpenCloudware tools. S/he expresses elasticity at the right level.

The output is a vApp model (OVF++)

Use case



```
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OpenCloudware Self Service **Portal**

Continuous Build,
Maven, Hudson ...

**Service Plan
Builder (vApp++
Creation &
Configurations)**

Template Gallery:
AaaS, JavaEE, OSGi,
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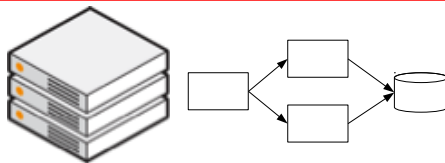
**PaaS Orchestration
Service Logic Install
& Deployment**

Sky Computing (**Provisioning**)

VM Placement VM Multi-Cloud Provisioning

Multi-Cloud IaaS Controller (API)

Federation Layer



End to end Cloud **Modeling**
Meta Data and Modeling Tools

The vApp is built,
and
OpenCloudware
PaaS instantiates
the user vApp on
the infrastructure.

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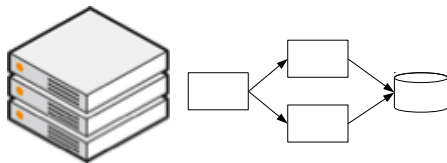
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Billing Logs	VM Placement	VM Multi- Cloud Provisioning
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Multi-Cloud IaaS Controller (API)

Federation Layer



Billing

End to end Cloud **Modeling**
Meta Data and Modeling Tools

The users needs to know how much it will cost.

The OpenCloudware billing component shows the cost for the empty running vApp.

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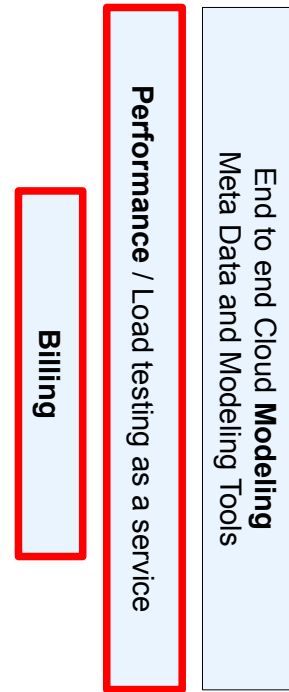
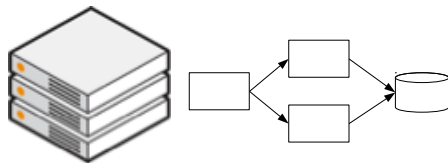
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Billing Logs	VM Placement	VM Multi- Cloud Provisioning
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Multi-Cloud IaaS Controler (API)

Federation Layer



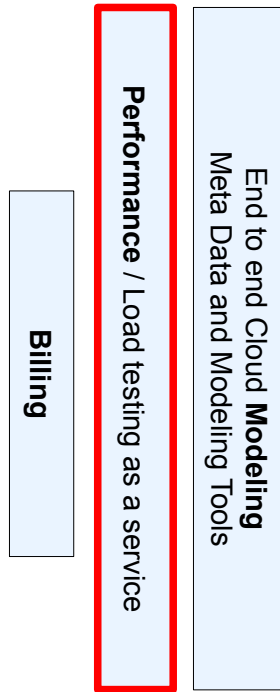
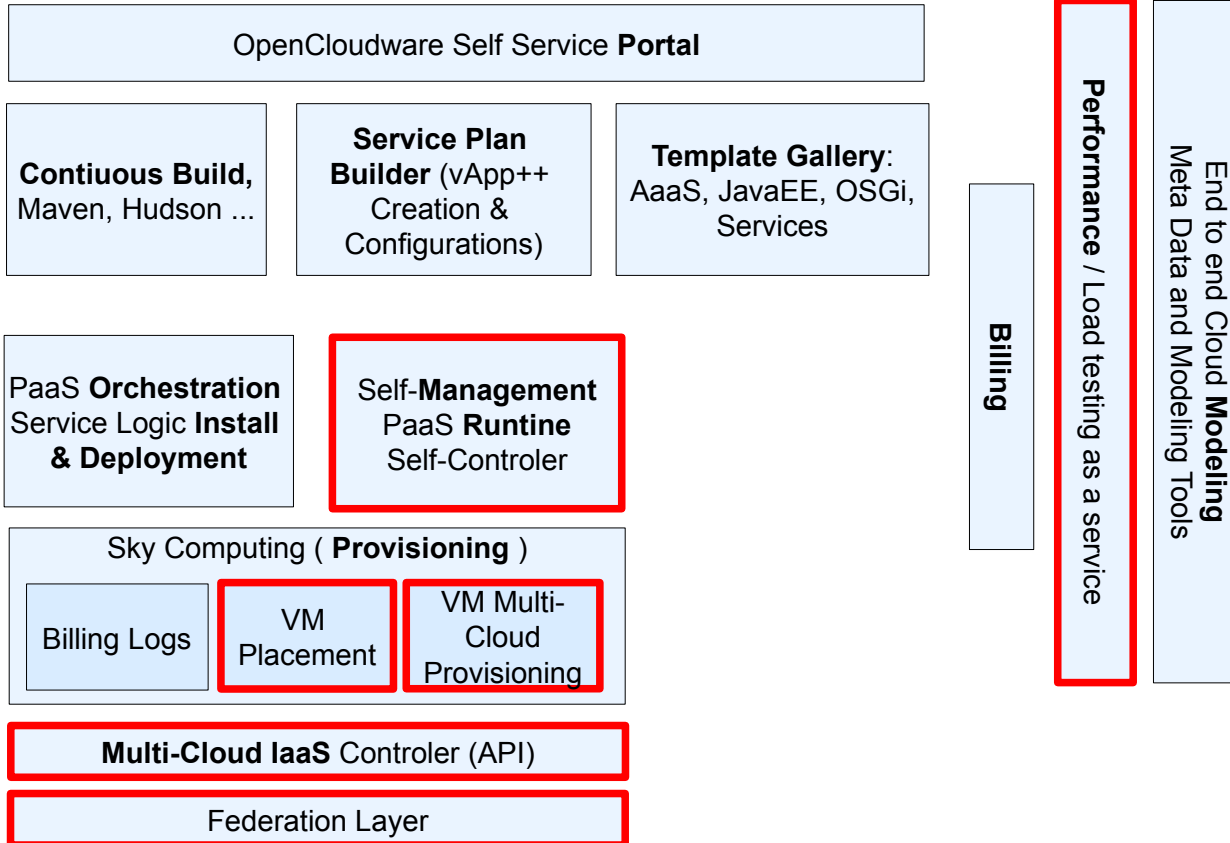
The users uses
OpenCloudware
Performance
testing tools.

The
consequences can
be seen through
the billing tool,
and is given a cost
per hour for a
given workload.

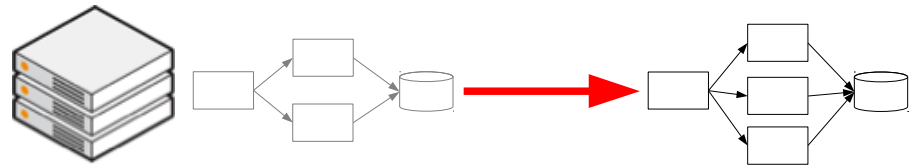
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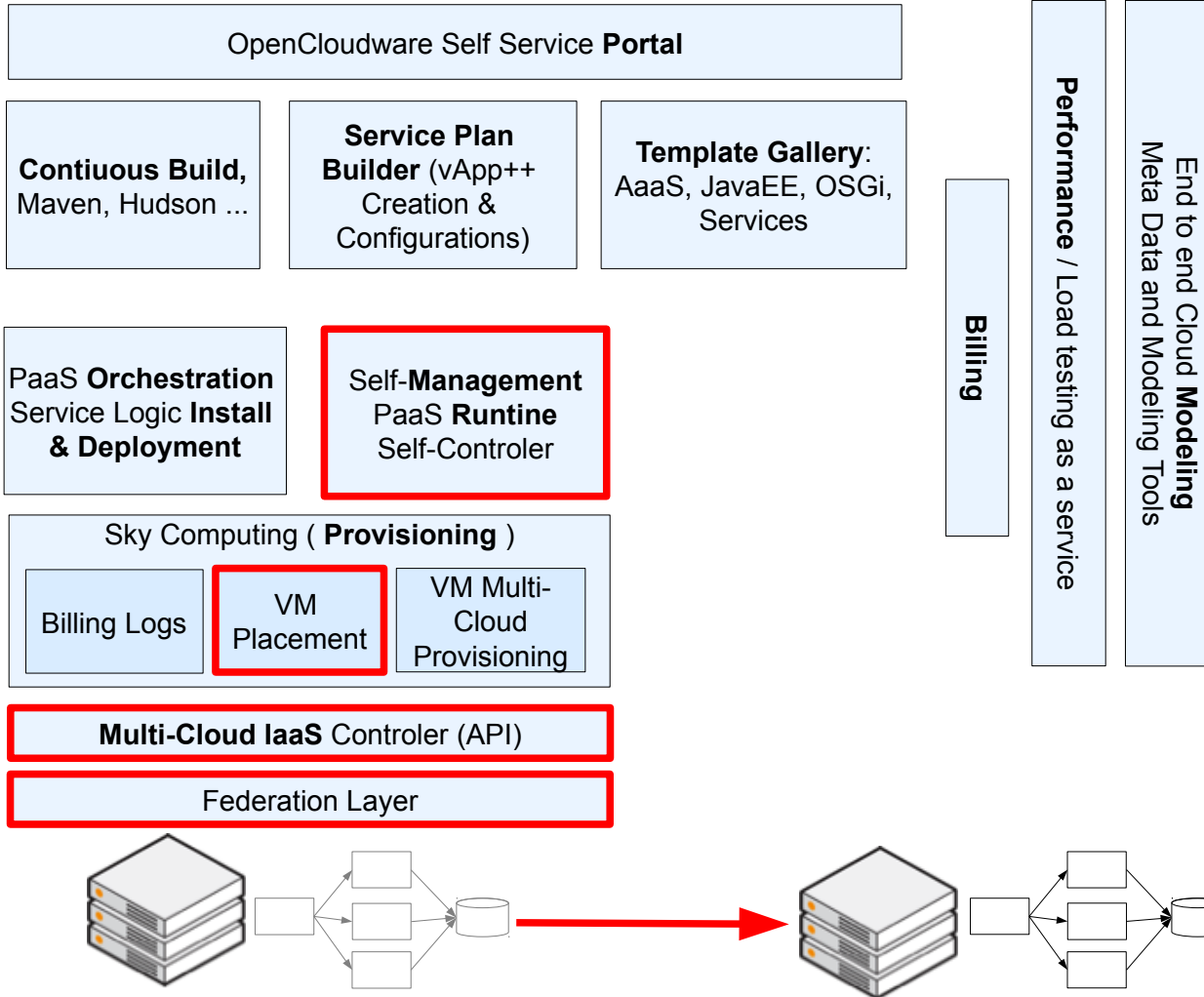
While the performance testing tool is running, the user observes elasticity (the application goes beyond what 2 nodes could have done).



Use case



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Testing is over.
The user needs a public IP, modifies the vApp description and redeploys.

He then adds data to the DB, tests the performance with this public instance.

Latency changes, which indicates that OpenCloudware has moved VMs to a closer IaaS

Performance / Load testing as a service

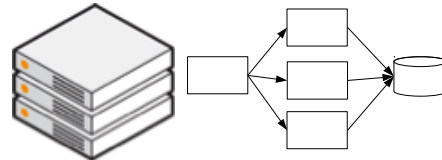
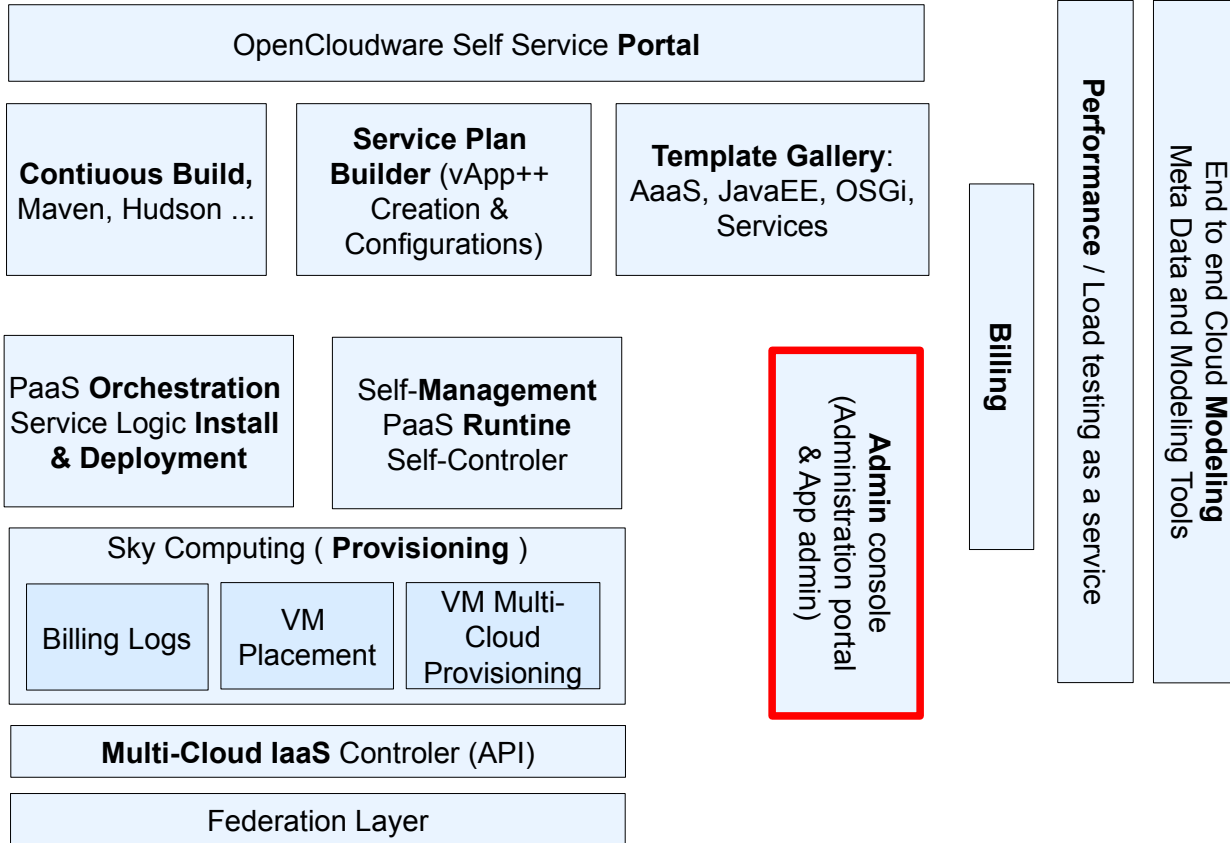
End to end Cloud Modeling
Meta Data and Modeling Tools

Billing

Use case



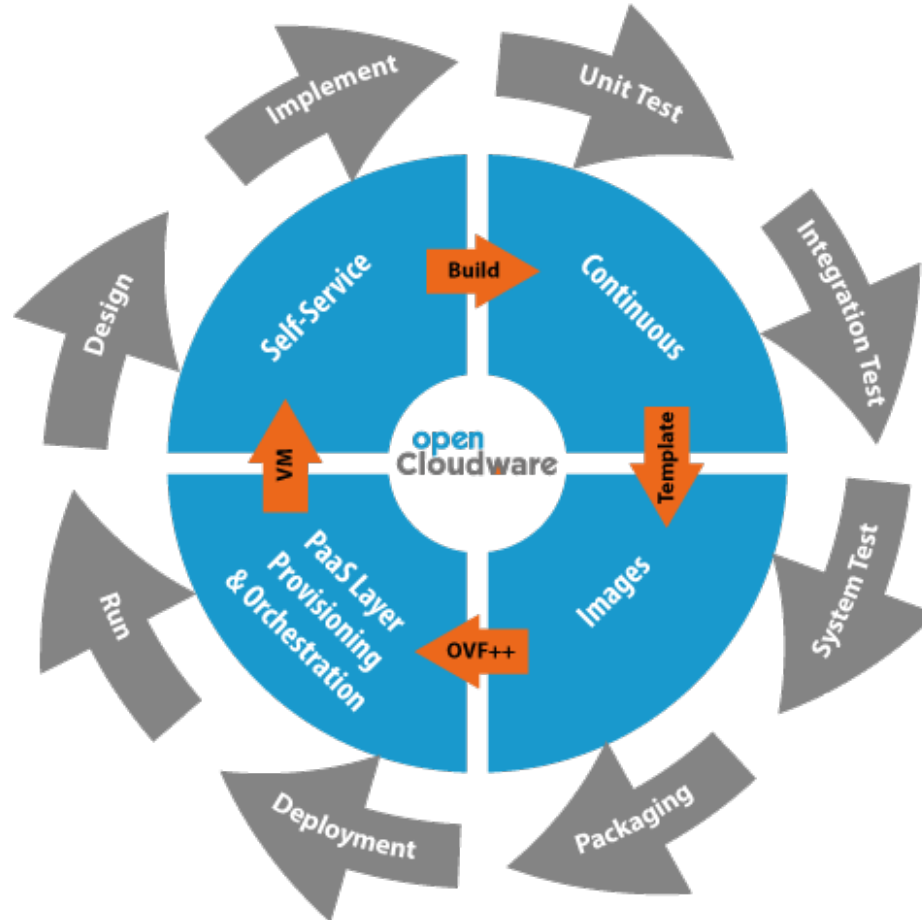
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The application goes to production.

OpenCloudware monitoring tools provide the necessary information.

End-to-end Platform Dev to Run



OpenCloudware Software as a Service

Project Goals

- Produce a middleware platform based on components
 - open platform for cloud software engineering
 - for collaborative development of distributed Cloud applications
 - targeting primarily enterprise JavaEE - OSGi virtual appliances but extensible to other middleware
 - for IaaS-agnostic Cloud Server application provisioning and deployment, orchestration and operation
 - self-service management, elasticity, green IT optimisation
 - with interoperable execution on multiple major Cloud IaaS (incl. hybrid)
- The OpenCloudware platform will be available online as a SaaS

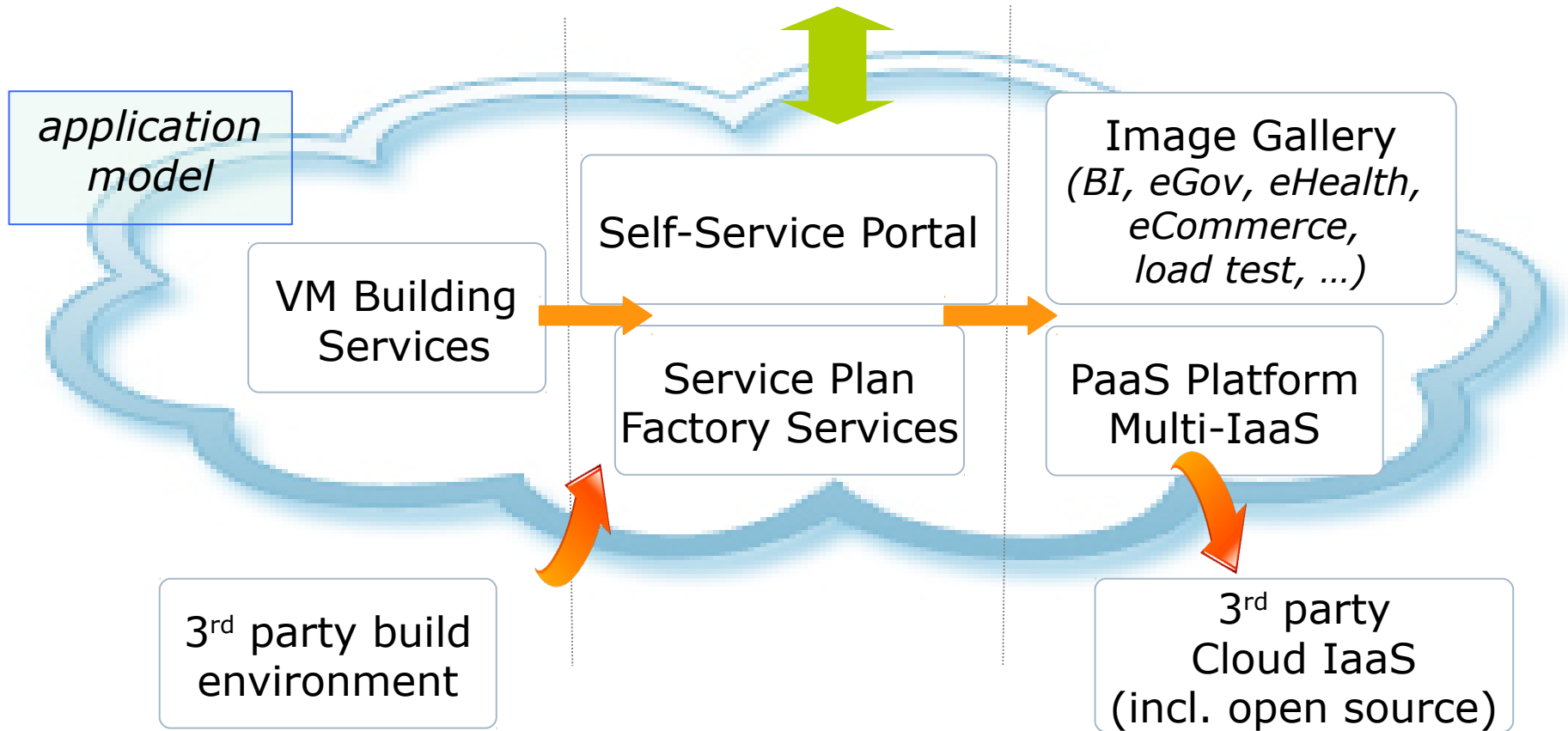
Project Scope

OW2
projects

OW2
Open Source
Cloudware
Initiative

CompatibleOne

+ other collaborative
projects

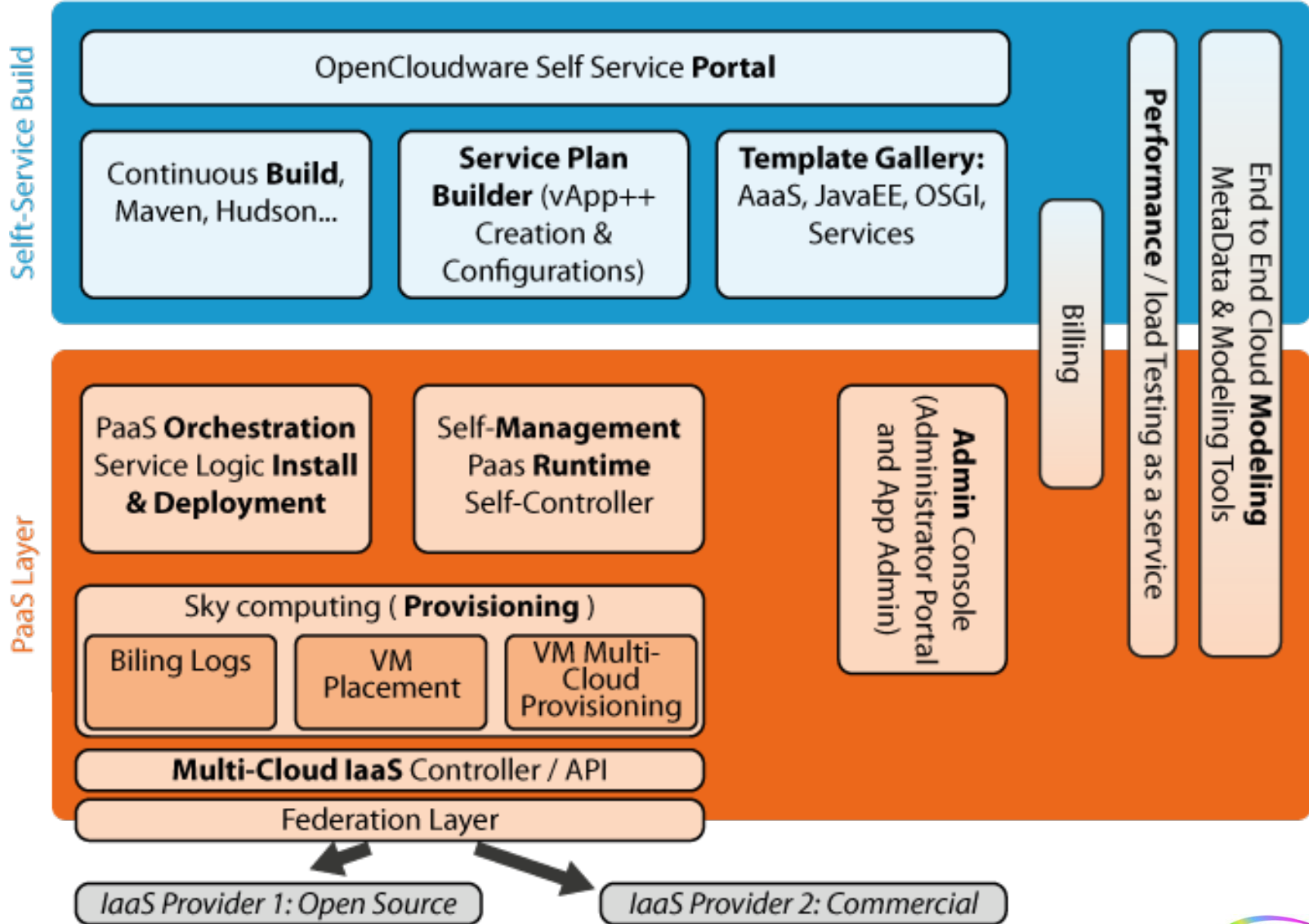


- Extensive re-use and development of **OW2 software**
 - PaaS: JavaEE, JASMINe, JORAM, Petals ESB
 - Security: AuthzForce
 - Performance: CLIF
 - Multi-iaaS: Sirocco, ProActive, Entropy
 - Portal: eXo
- Use of **other open source** software
 - Hudson, Maven, Jenkins, sunxacm, jclouds etc.
- UForge for cloud image template management and VM generation

Expected Results

- **Open platform for cloud software engineering**
 - accessible to cloud architects and developers for easy cloud solutions build, deployment and operation for multi-iaaS
 - through a **Self-Service portal**
- Open and integrated **software components** for
 - end-to-end modeling (**THINK**)
 - development and server template factory (**BUILD**)
 - multi-iaaS compatible PaaS platform (**RUN**)
 - **application tests** (fonctional, performance)
- OpenCloudware results will be disseminated in **open source**
 - within the OW2 Open Source Cloudware initiative (OSCi)

Architecture



- End-to-end **Modeling**: Full stack from OS to applications and configurations incl. SLA, PaaS services and IaaS services
- End-to-end **Automation**: Life cycle automation from Dev to Cloud to Cloud orchestration
- **Build vApps**: Service Factory for visual design and automated generation of multi-tier server templates
- **Autonomic management**: Dynamic cloud software (VMs) evolutions, allowing elasticity, Green IT optimisation, reliability...
- **Multi-IaaS**: Portability at the IaaS level, IaaS Agnostic services
- **Security**: Isolation of applications and security, identity and access control management
- Links with other open source cloud projects such as FUI CompatibleOne, FP7 Contrail, ... (Other identified projects: ANR/FUI SelfXL, ANR MyCloud, ITEA EasiCloud, FP7 4Caast, FUI CoolIT, FUI Energetic, FUI AGOS, ANR OMD2)

Working Groups

- 1: **Modeling**: applications, PaaS Services, IaaS capabilities
- 2: **Service Plan** Builder; creation of distributed application templates (OVF, IaaS agnostic)
- 3: **PaaS** management Middleware: Enables Autonomic Optimization and VM Management
- 7: Enterprise Grade Multi-tenant PaaS **Middleware**
- 4: **Multi-IaaS** Interoperability & Orchestration
- 5: Multi-Tenant **Portal** Services with RBAC support
- 6: **Use Cases**
- 8: **Dissemination**

Cooperation with CompatibleOne

- Develop a CIMI personality of OCCI CompatibleOne
 - Will allow OpenCloudware to use the CompatibleOne broker
- Develop an OCCI PROCCI on top of OpenCloudware (Sirocco)
 - Will allow CompatibleOne to use the OpenCloudware multi-cloud controller
- OpenCloudware will extend CompatibleOne initial JPaaS

Q&A

OpenCloudware

A Cloud Software Platform for Building and Operating Enterprise PaaS to Multi-IaaS Applications

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