

# Open Source Multi-Cloud, Multi-Tenant Automation in the cloud with SlipStream PaaS

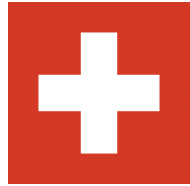
**A professional open source solution**

Robert Branchat, SixSq  
5 July 2014  
Lyon, France



Based in Geneva, Switzerland  
Founded in 2007

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POST TENEBRAS LUX




swiss made  
software




# A European cloud computing partnership: big science teams up with big business






**Strategic Plan**


- ▶ Establish multi-tenant, multi-provider cloud infrastructure
- ▶ Identify and adopt policies for trust, security and privacy
- ▶ Create governance structure
- ▶ Define funding schemes




To support the computing capacity needs for the ATLAS experiment

EMBL 

Setting up a new service to simplify analysis of large genomes, for a deeper insight into evolution and biodiversity










To create an Earth Observation platform, focusing on earthquake and volcano research








To improve the speed and quality of research for finding surrogate biomarkers based on brain images


**Suppliers**








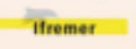












**Adopters**



# SlipStream.

## PaaS

Open Source

Multi-Cloud

Multi-Tenant

...it's all about automation...





**laaS**

laaS



**IaaS**

**PaaS**



**IaaS**

**PaaS**

**SaaS**





IaaS

PaaS

SlipStream.

SaaS



IaaS

PaaS



is a

**SlipStream.**

SaaS



IaaS

PaaS

uses

is a

**SlipStream.**

SaaS



IaaS

PaaS

uses

is a

**SlipStream.**

used as a

SaaS



IaaS

PaaS

The screenshot displays the SlipStream web application interface. At the top, a red navigation bar contains the 'SlipStream' logo and several icons. Below this, a dark grey banner features the text 'Single Click Application Deployment' in blue, followed by 'Coordinate the deployment of any application' in white. A smaller line of text explains that users can self-provision applications. Below the banner is a breadcrumb trail 'login' and a login form with fields for 'Username' (containing 'user') and 'Password' (masked with dots). A green 'Login' button and a 'Register' link are also visible. The footer includes the SixSq logo, copyright information for 2008-2013, and the text 'swiss made software'.

SaaS

DaaS



# IaaS

# PaaS

**SlipStream**

## Single Click Application Deployment

### Coordinate the deployment of any application

With this feature you can *(self-)provision* applications and/or let colleagues. No more chasing down the corridor overworked system administrators.

login

Register

```
$ pip install slipstream-client
Downloading/unpacking slipstream-client
Downloading slipstream-client-1.3-1.tar.gz
Running setup.py egg_info for package slipstream-client
...
$ ss-execute -h
Usage: usage: ss-execute [options] <module-url>

<module-url> Full URL to the module to execute. For example Public/Tutorials/HelloWorld/client_server

Options:
-h, --help            show this help message and exit
-v, --verbose         verbose level. Add more to get more details.
-u USERNAME, --username=USERNAME
                    SlipStream username
-p PASSWORD, --password=PASSWORD
                    SlipStream password
--cookie=FILE         SlipStream cookie
--endpoint=URL        SlipStream server endpoint
--parameters=KEY1=VALUE1,KEY2=VALUE2
                    Deployment or image parameters override. The key must
                    be in a form: <node-name>:<parameter-name>. Several
                    pairs can be provided comma separated.
```



# Features

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# Features

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- Cloud agnostic





# Features

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- Cloud agnostic
- Multi-cloud



# Features

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- Cloud agnostic
- Multi-cloud
- Multi-tenant



# Features

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- Cloud agnostic
- Multi-cloud
- Multi-tenant
- Configuration management agnostic

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- Configuration management agnostic
- Persistent configuration of deployments



# Features

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- Cloud agnostic
- Multi-cloud
- Multi-tenant
- Configuration management agnostic
- Persistent configuration of deployments
- Everything is version-controlled



# Uses cases

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- Deploy simple and complex applications

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- Use the cloud of your choice



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- Build your own app store
- Define quotas per cloud and per user

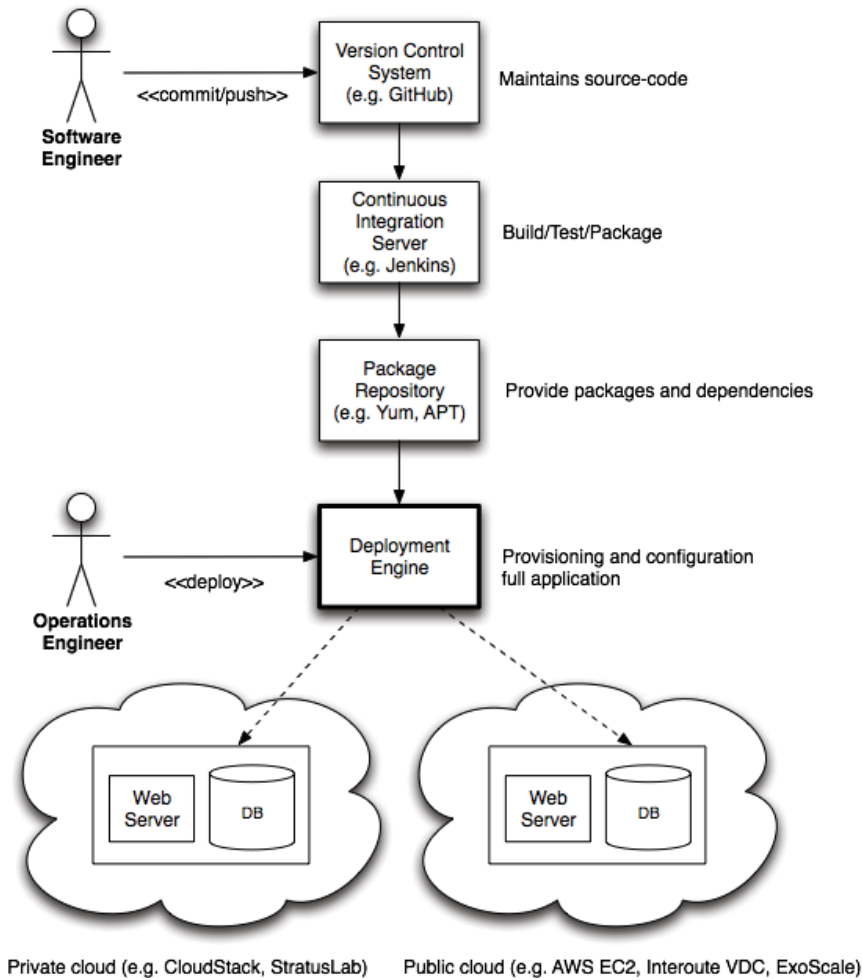
## Uses cases

---

- Deploy simple and complex applications
- Use the cloud of your choice
- Perform multi-cloud deployments
- Facilitate migration from one cloud to another
- Automate your DevOps process
- Build images (templates) on multiple clouds
- Build your own app store
- Define quotas per cloud and per user
- Reduce costs!



# DevOps





## Deployment Recipes and Coordination Parameters

Execute

Parameters

Standard recipe (fires during Running phase)

```
1  #!/bin/sh
2
3  set -e
4
5  ss-display "Updating package index"
6  apt-get clean
7  apt-get update
8
9  ss-display "Installing Puppet client"
10
11 apt-get install -y puppet-common
12 apt-get install -y rubygems
13 gem install puppet-module
14
15 ss-display "Installing WordPress manifest"
16 cd /etc/puppet/modules/
17 puppet module install jonhadfield/wordpress
18
19 export admin_username=`ss-get admin_username`
20 export admin_password=`ss-get admin_password`
21 export admin_email=`ss-get admin_email`
22 export wordpress_title=`ss-get wordpress_title`
23 export FACTER_mysql_password=`ss-get mysql_password`
24 export public_hostname=`ss-get hostname`
```

Runs

Authorization

Build...

Run...

Edit

Copy...

Publish

# Managing deployed apps



# Managing Deployed Apps

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- Managed (aka mutable deployment)
  - I.e upgrade, migrate (, test?) in situ
  - Need Server / Managed Puppet / Chef support
  - Always needed?
  - Worth the complexity?
- Coordinated (aka immutable deployment)
  - I.e. re-deploy, test, (migrate,) switch, scratch
  - Simpler
  - Data handling constraints

# SlipStream data model

# Data model

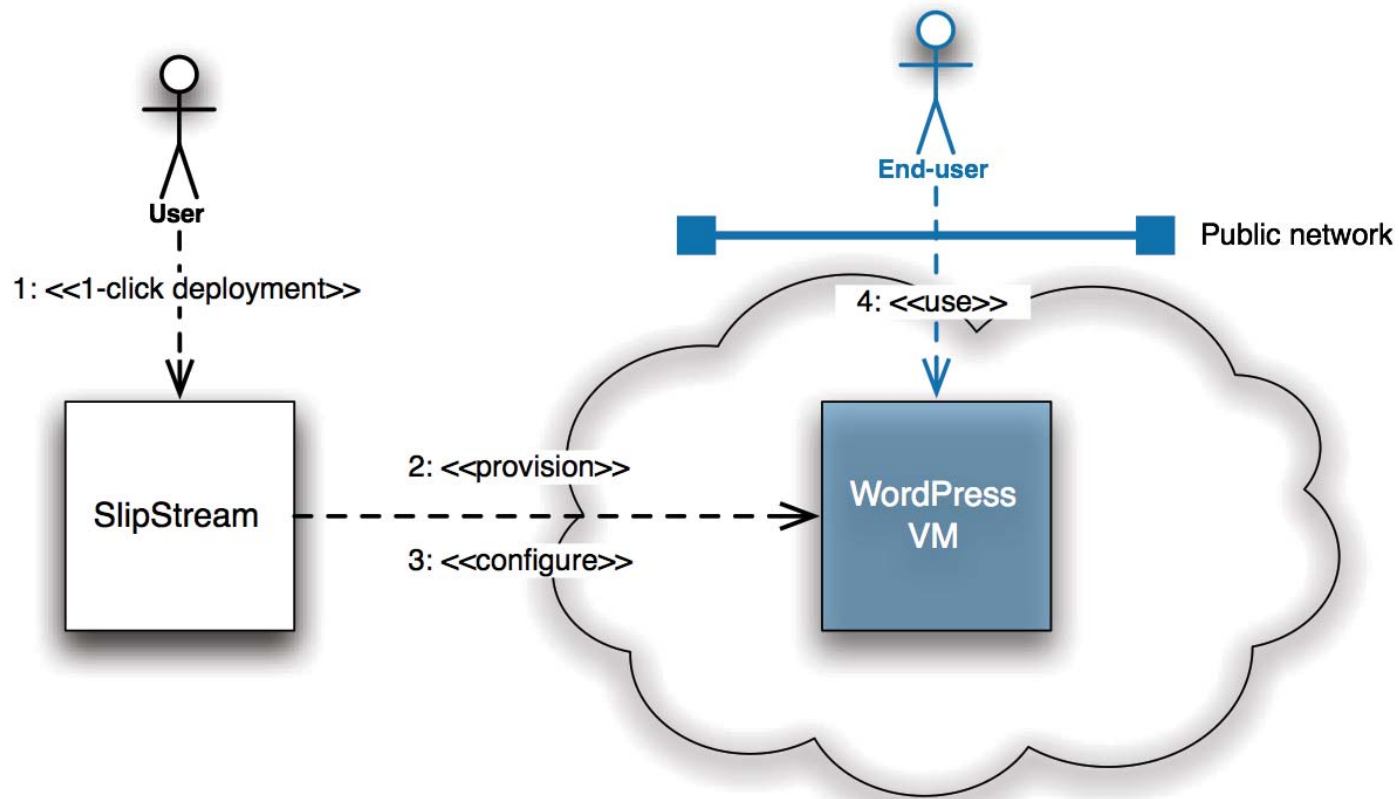
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- **Image:** inheritance
- **Deployment:** aggregation
- **Project:** containment
- **Run:** execution
  
- All changes are **version controlled**

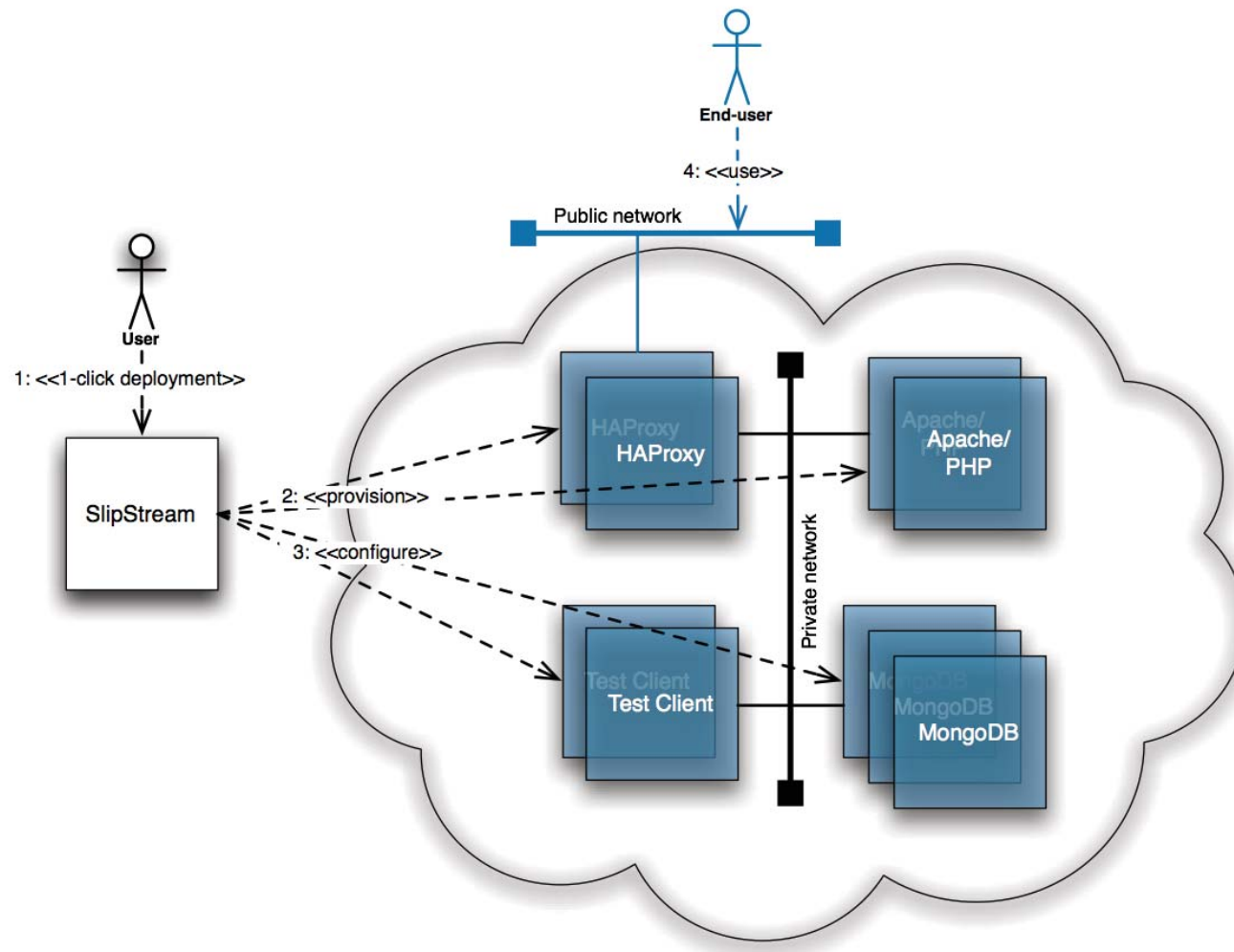
# Application Deployment Examples



# WordPress deployment - simple

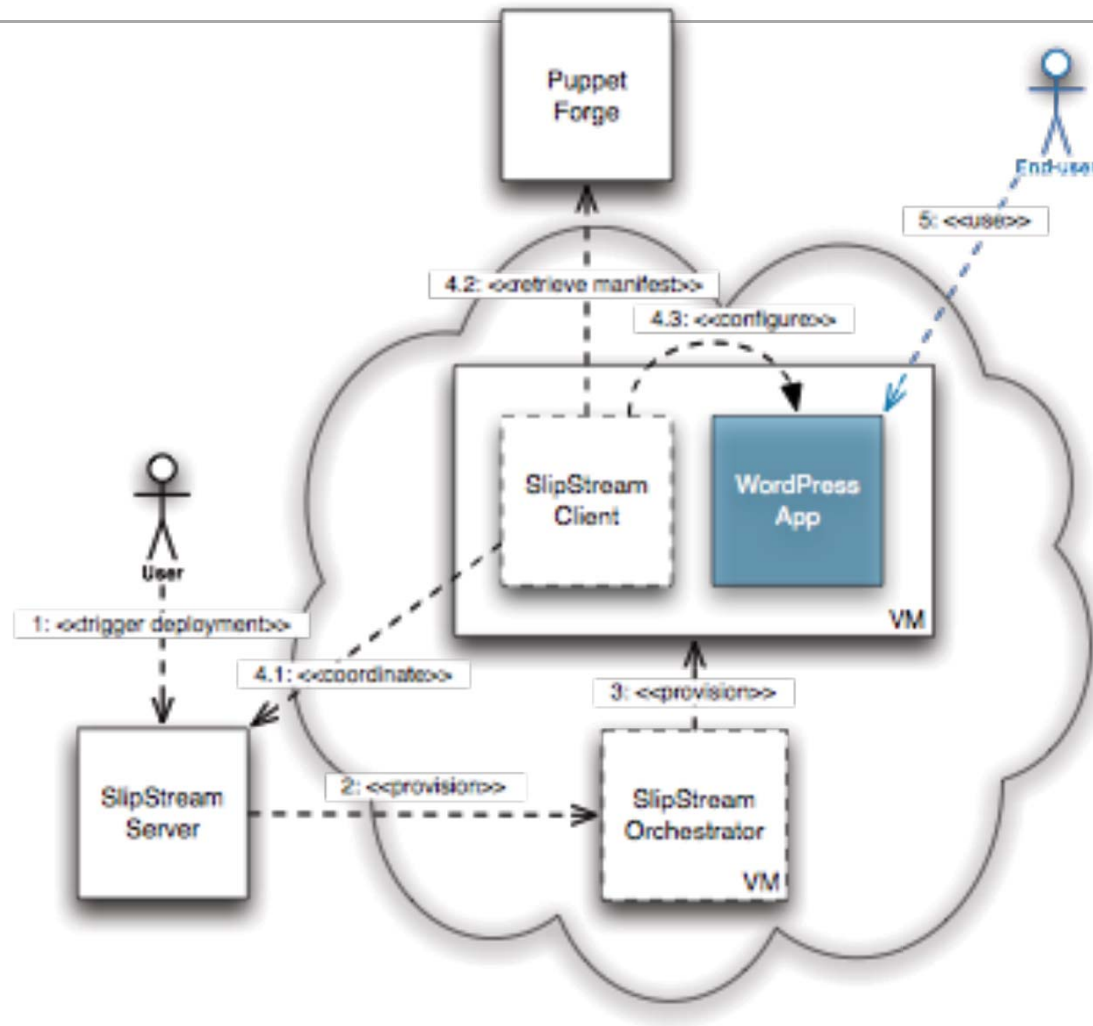


# LAMP++ deployment - more complex

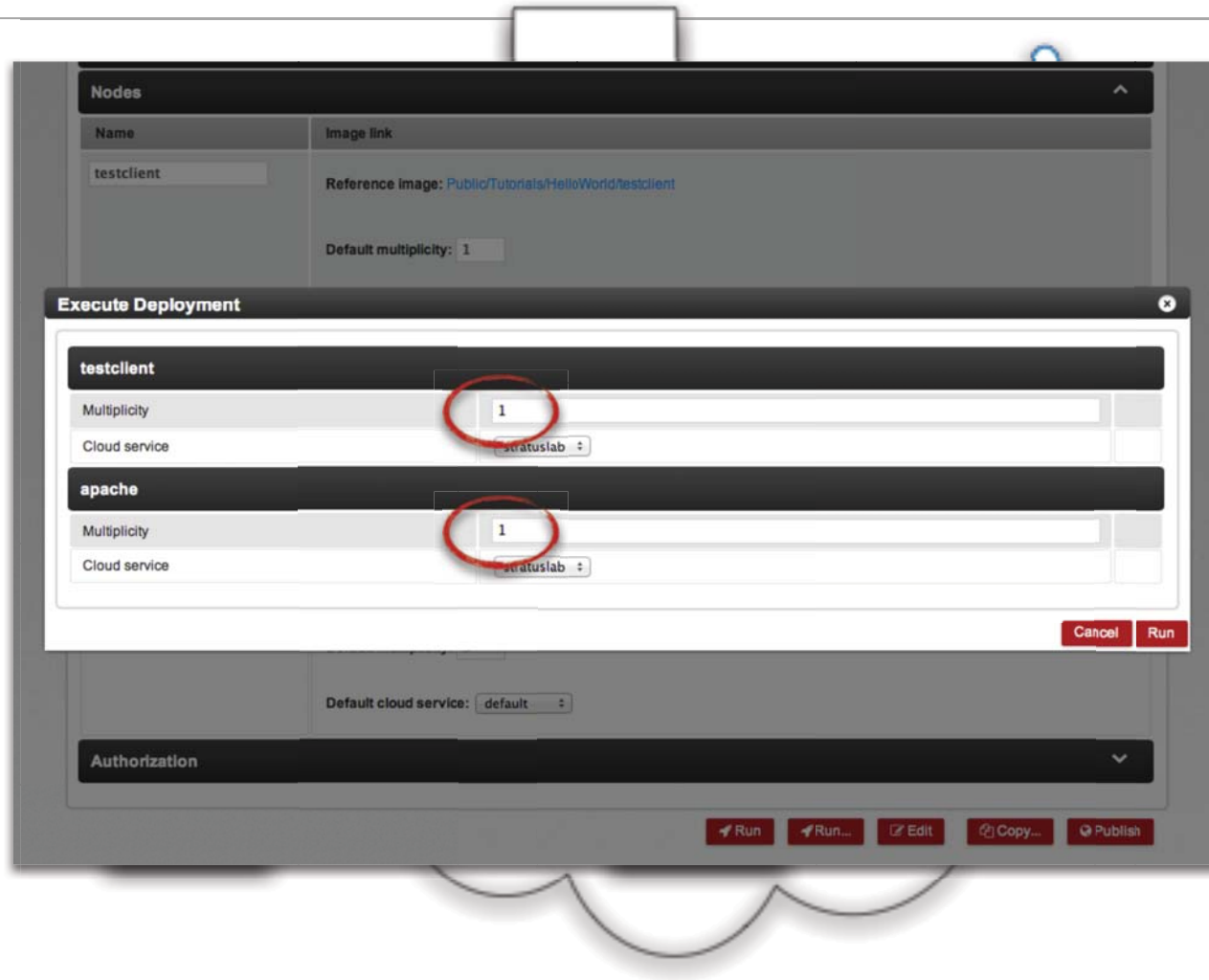




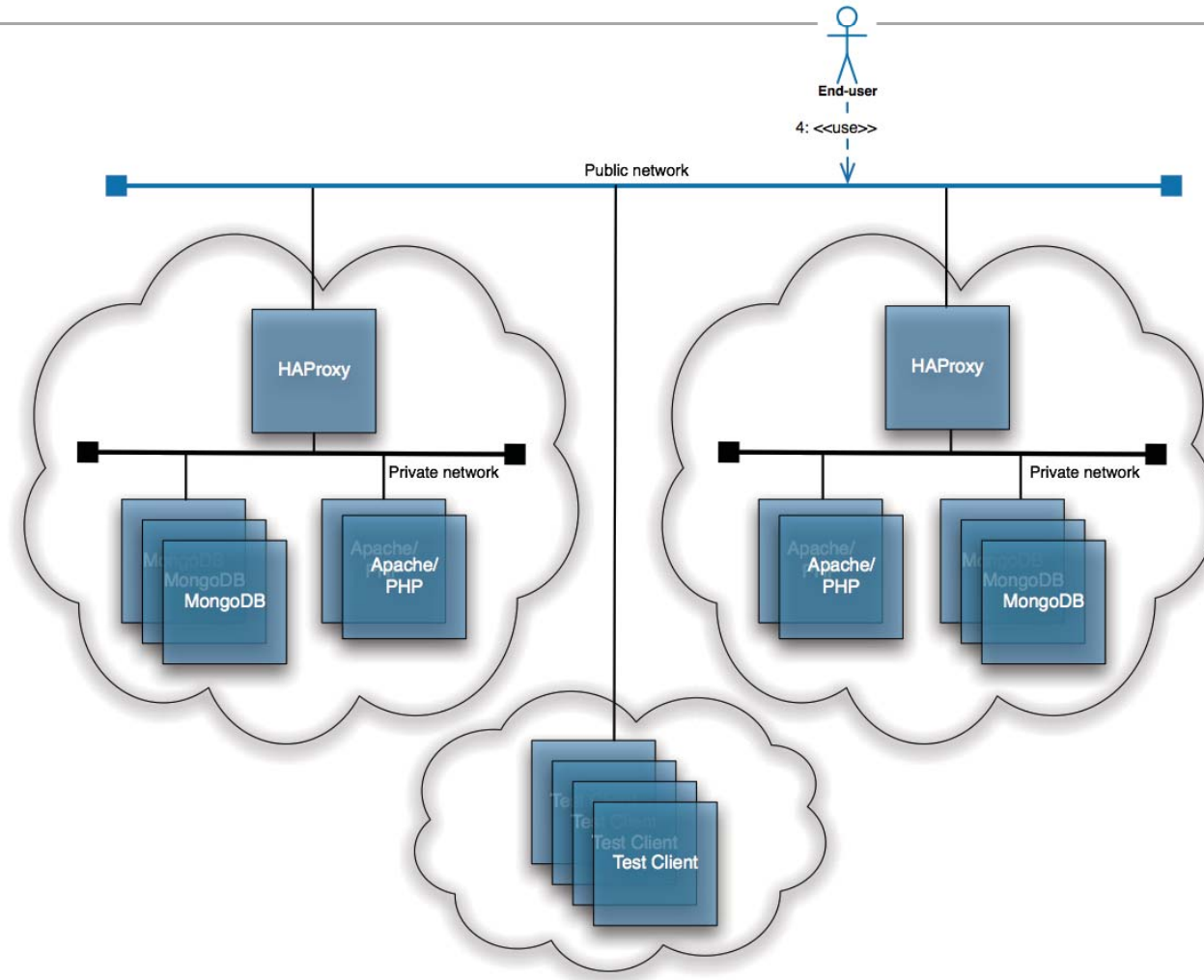
# WordPress Deployment (detailed)



# WordPress Deployment (detailed)



# Simultaneous Multi-Cloud Provisioning



# Dashboard: one view to all



# Dashboard

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- Monitoring VM activities on a regular basis: all users x all clouds (~4 minutes)
- More often for online users: all clouds (~10 seconds)
- Pull implementation works for all clouds
- Push would be great!

# Dashboard

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# Dashboard

**SlipStream** Home Info Help meb User Logout

## Dashboard

Control and monitor your cloud activity  
This page provides you with an overview of the activities on each cloud you have access to

[Home](#) > [dashboard](#)

- Deployments / Runs / Builds
- Virtual Machines
- Metering

Virtual Machines | CPU | Memory | Disk

Last hour

Time	Usage
06:40	0.00
06:45	0.00
06:50	0.00
06:55	0.50
07:00	1.00
07:05	0.50
07:10	0.00
07:15	0.00
07:20	1.00
07:25	0.50
07:30	0.00

Usage



**SlipStream** Dashboard

Control and monitor your cloud activity

This page provides you with an overview of the activities on each cloud you have access to

Home > dashboard

- Deployments / Runs / Builds
- Virtual Machines
- Metering
- Usage

Virtual Machines CPU

Last hour

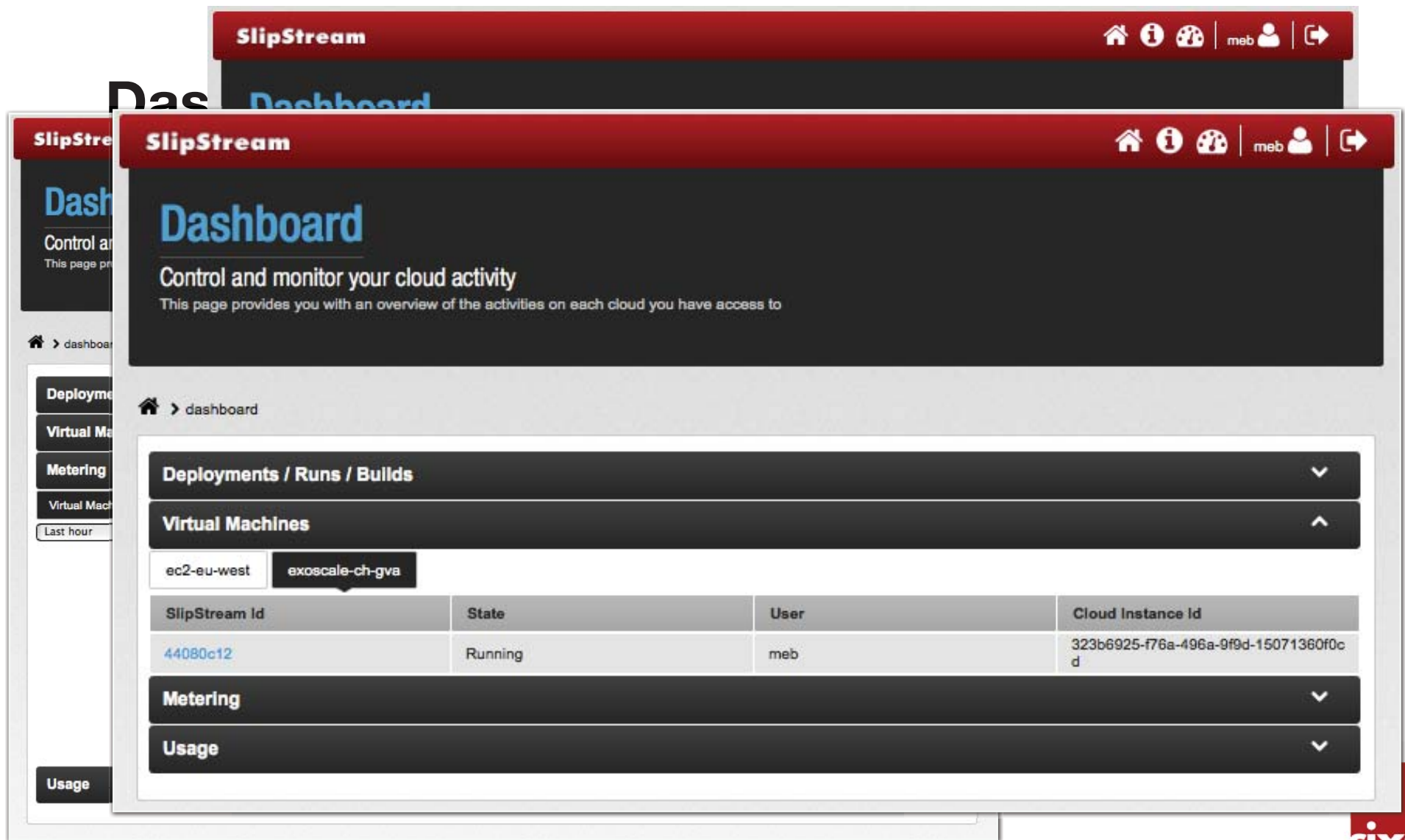
exoscale-ch-gva: 1

ec2-eu-west: 0

Usage graph (06:40 - 07:30):

Time	Usage
06:40	0.00
06:45	0.00
06:50	0.00
06:55	0.25
07:00	0.25
07:05	0.25
07:10	0.00
07:15	0.25
07:20	0.25
07:25	0.25
07:30	0.00





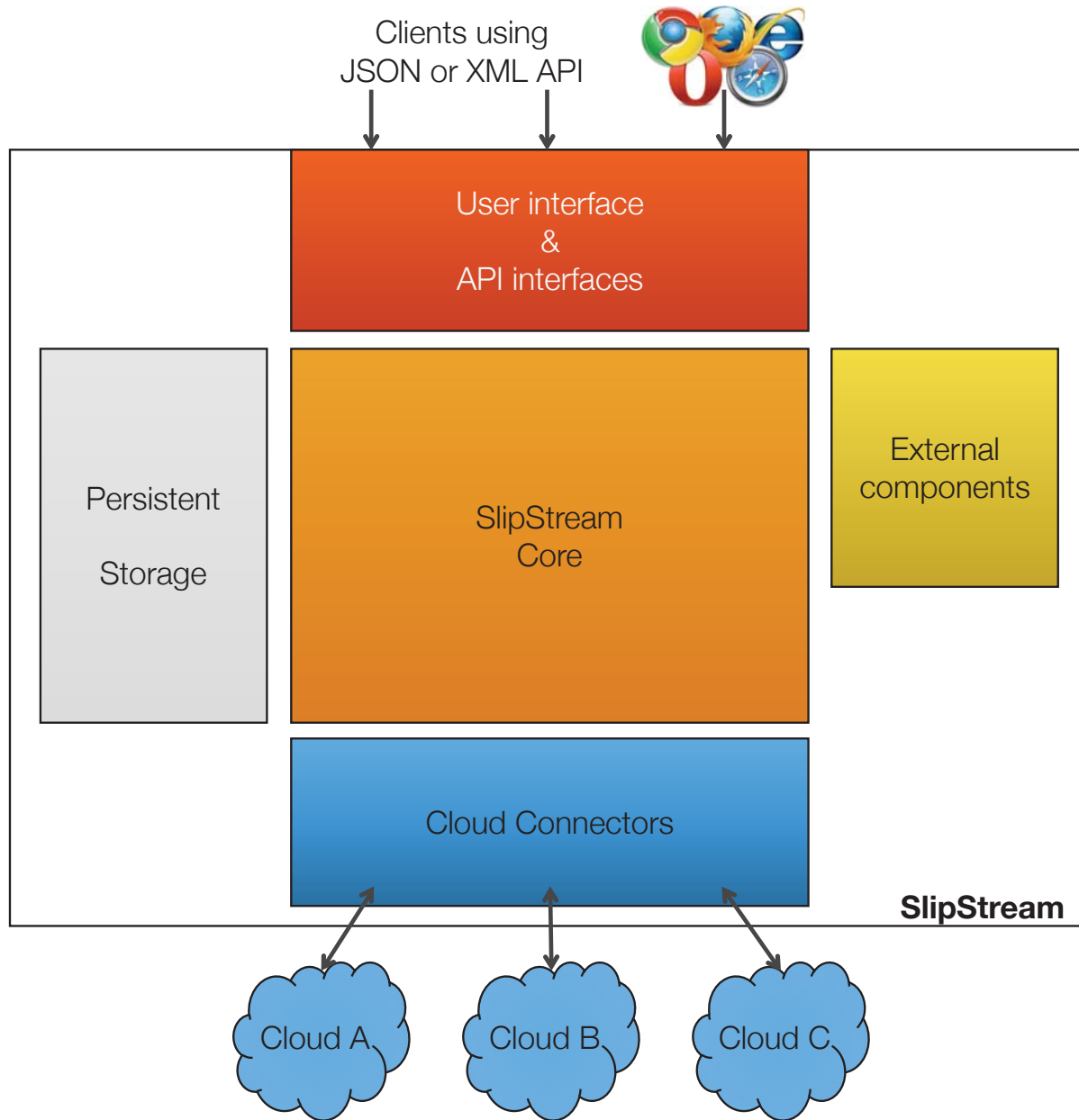
The screenshot displays the SlipStream dashboard interface. At the top, there are three overlapping header bars with the 'SlipStream' logo and navigation icons. The main dashboard area has a dark header with the title 'Dashboard' and the subtitle 'Control and monitor your cloud activity'. Below this, a breadcrumb trail shows 'home > dashboard'. A sidebar on the left contains navigation options: 'Deployments', 'Virtual Machines', 'Metering', and 'Usage'. The central content area is titled 'Deployments / Runs / Builds' and features two tabs: 'ec2-eu-west' (selected) and 'exoscale-ch-gva'. Below the tabs is a table with the following data:

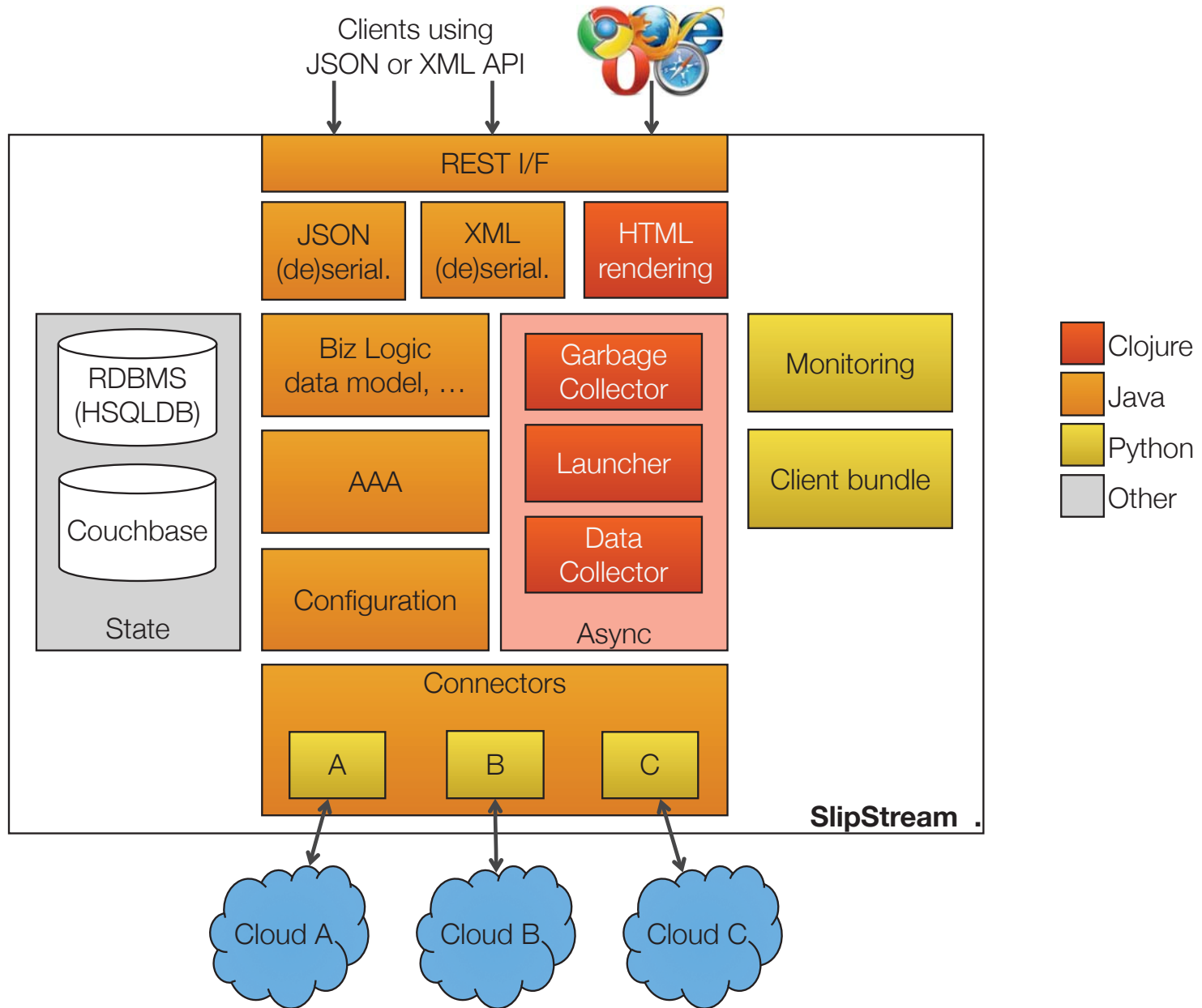
	Run Id	Module	State	Start Time	User	Tags
	0b6c98d5	examples/images/ubuntu-12.04/167	Cancelled	2014-01-30 12:09:11.207 UTC	meb	
	e444212f	SlipStream/client-server-deployment/208	Done	2014-01-28 14:39:22.837 UTC	meb	
	112ff1ab	examples/images/ubuntu-12.04/167	Cancelled	2014-01-28 14:28:20.732 UTC	meb	
	40d5d158	examples/tutorials/wordpress/wordpress/180	Done	2014-01-28 14:25:07.667 UTC	meb	
	cdf2e6b5	SlipStream/all-in-one-slipstream/202	Inactive	2014-01-28 13:51:34.38 UTC	meb	

Below the table are three expandable sections: 'Virtual Machines', 'Metering', and 'Usage'. On the right side of the dashboard, there are several vertical panels with dropdown menus and a search bar containing the text 'id-15071360f0c'. The 'sixsq.' logo is visible in the bottom right corner.

# Architecture







# Open Source



# Open Source

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- License: Apache 2.0
- Hosted: GitHub - <http://github.com/slipstream>
- Dev Community:
  - Coordinated (and mainly contributed) by SixSq
  - Contribution from enterprise and academia
  - Growing!
- Building, testing and deploying:
  - We use Jenkins and... SlipStream :-)

# Open / Close Source Model

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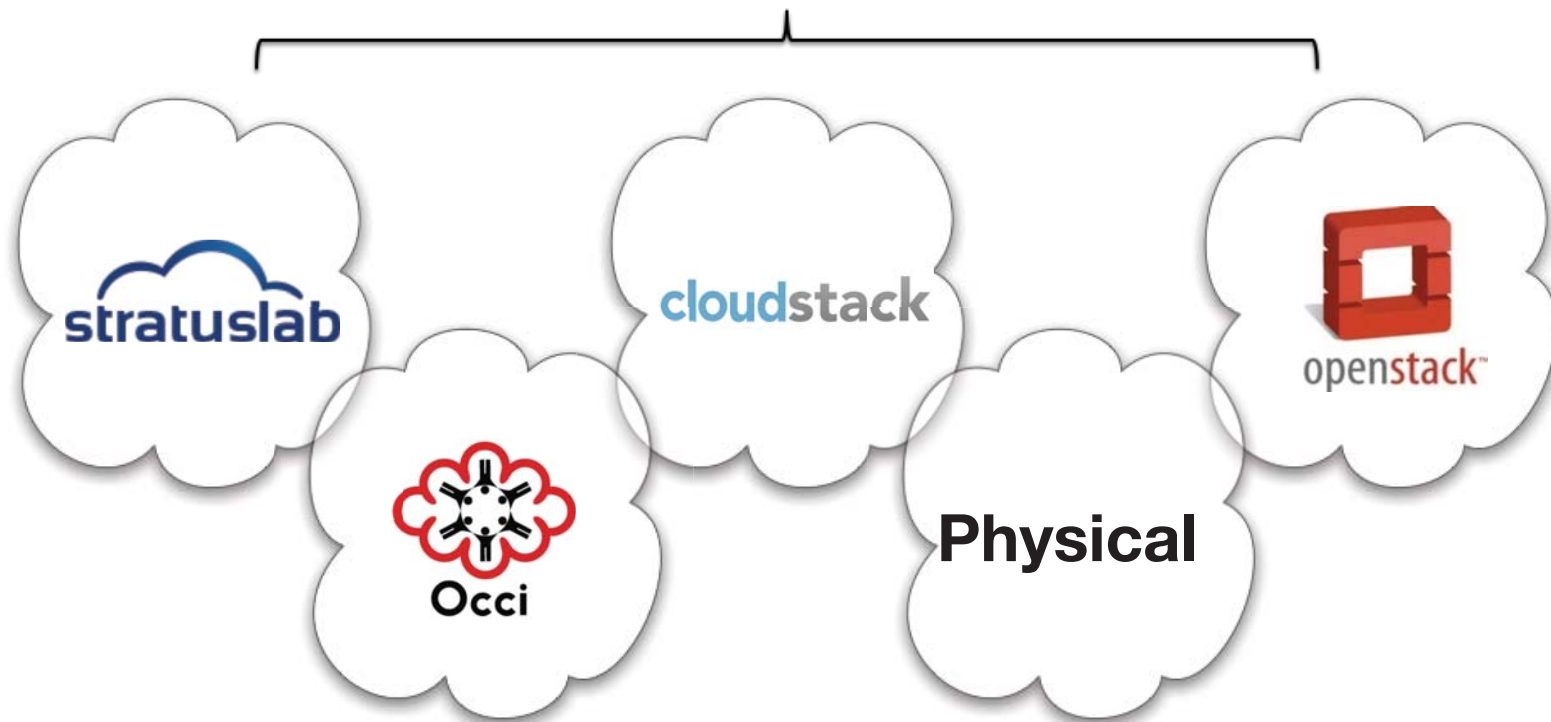
- Open Source
  - Core Systems
  - Connectors interfacing with open source IaaS solutions
- Proprietary
  - Connectors interfacing with proprietary IaaS solutions



# Open Source Connectors

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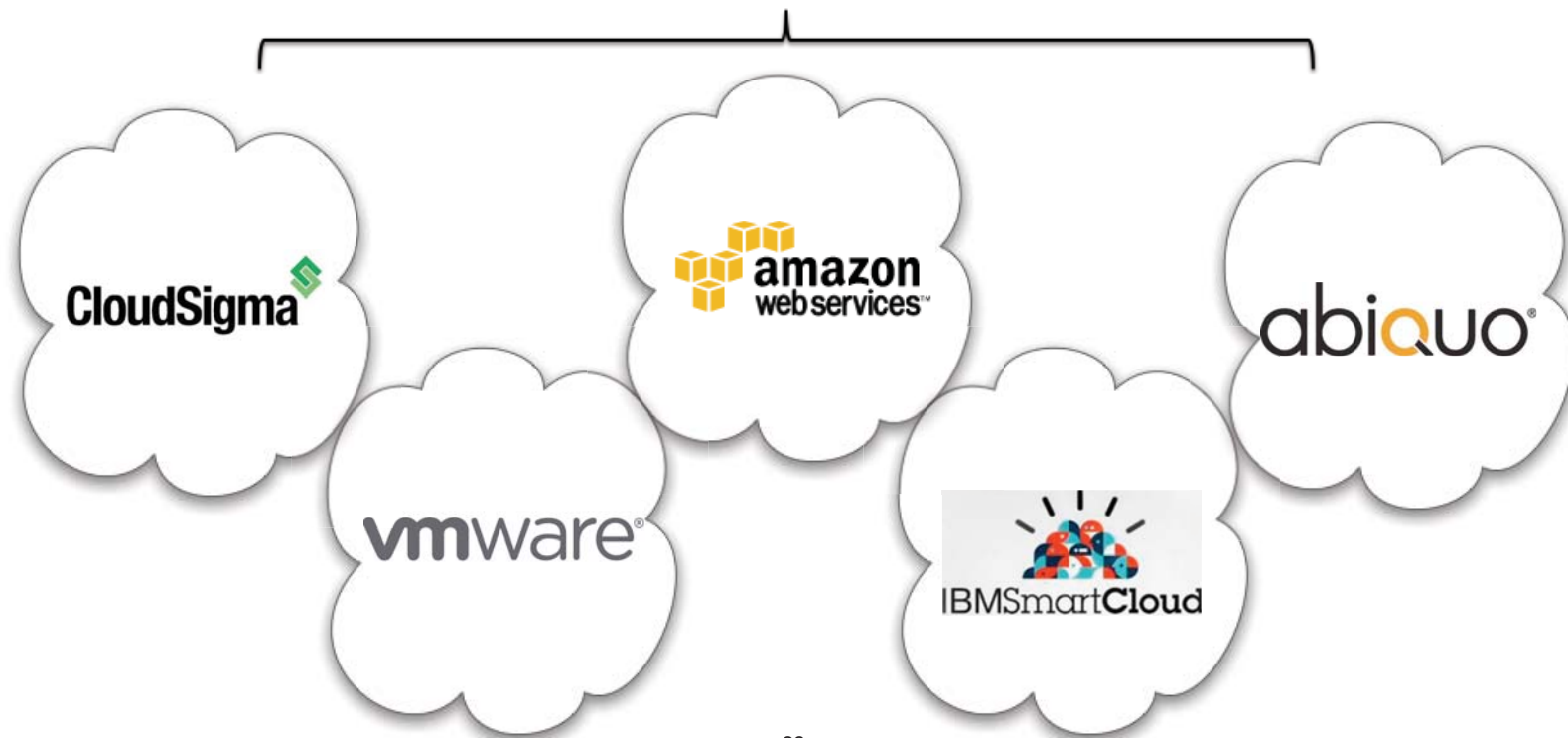
## SlipStream.



# Proprietary Connectors

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**SlipStream.**



**Where next?**

# Technology Roadmap

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- Connectors
  - Microsoft Windows Azure
  - CIMI
- Auto-scale/Elastic support
- Unified Monitoring
- Advanced Roles for Enterprise deployment (e.g. Account Managers)
- Billing
- We are listening :-)

## ➔ Version Controlled Image Factory

← Create installation recipes and let SlipStream do the rest →

Using your favourite recipes (e.g. bash, Puppet, Chef) you can now create version controlled custom images on the clouds of your choice.

Home > login

Login

Username

Password

➔ Login

Reset Password

Register

## Products and Technologies

**SlipStream.**

  
**stratuslab**



# Products and Technologies



# Products and Technologies

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# Products and Technologies

**NuvlaBox.**



# Products and Technologies





# Products and Technologies



# Demo



# SlipStream SaaS - It's free... Try it!!

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[slipstream.sixsq.com](http://slipstream.sixsq.com)



# SlipStream SaaS - It's free... Try it!!

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[slipstream.sixsq.com](http://slipstream.sixsq.com)



# Resources

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- **SixSq Blogs:** [sixsq.com/blog](https://sixsq.com/blog)
  - See Through Cloud series
  - Tech Corner series
- **SlipStream product description:**  
[sixsq.com/products/slipstream.html](https://sixsq.com/products/slipstream.html)
- **SlipStream documentation:**  
[slipstream.sixsq.com/documentation](https://slipstream.sixsq.com/documentation)
- **SlipStream client:** `pip install slipstream-client`
- **GitHub:** [github.com/slipstream](https://github.com/slipstream)

# Call for Action

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- **Contribute**
  - Looking for community support for new connector
  - Bug fixes
  - Enhancements
- **Download, install, shout and share!!**



A blue sky with white clouds and several birds flying. The birds are scattered across the sky, some in the foreground and some in the background. The sun is visible in the center, creating a bright glow. The overall scene is peaceful and uplifting.

**Thanks!**

**[support@sixsq.com](mailto:support@sixsq.com)**