SIGMA Cloud : An Open Academic and Research Environment

Parallel Session One – ICT Infrastructure & Security

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Who we are?

SIGMA AIE, is a non-profit higher education consortium created and led **by 10 reference Spanish universities**, to optimize Academic and Research with information technology. Implementing the **best practices of university management** that are reflected in SIGMA's tools and services, given the changing environment of the universities and higher education institutions.

Who we are?

SIGMA

ACADEMIC

Student Information System

SIGMA

RESEARCH

Current Research Information System

Service platform motivation

- Most of SIGMA Universities needs to **upgrade their hardware platforms**.
- SIGMA **invest in training their TIC staff** on new application server and databases administrator.
- **Funds in IT** department each year are **decreasing**.
- **Renew licenses** and its cots is another drawback

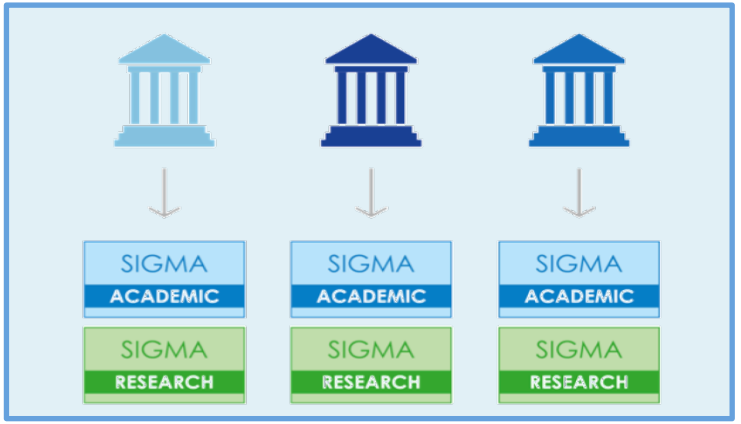
Two different approach

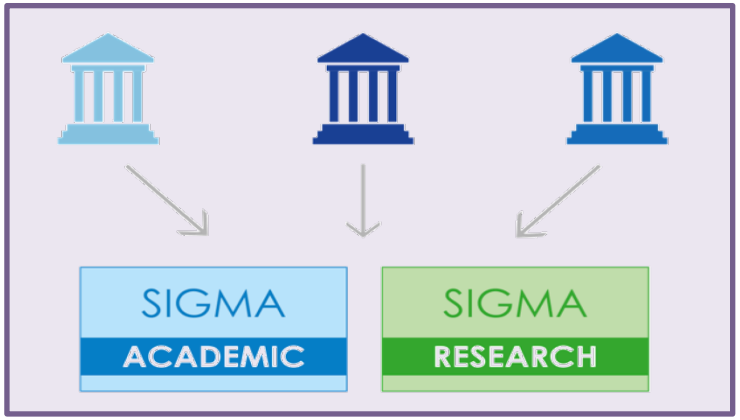
Isolated environment

+ Completely version control deployment

+ Isolated environment

+ Suitable for big public universities





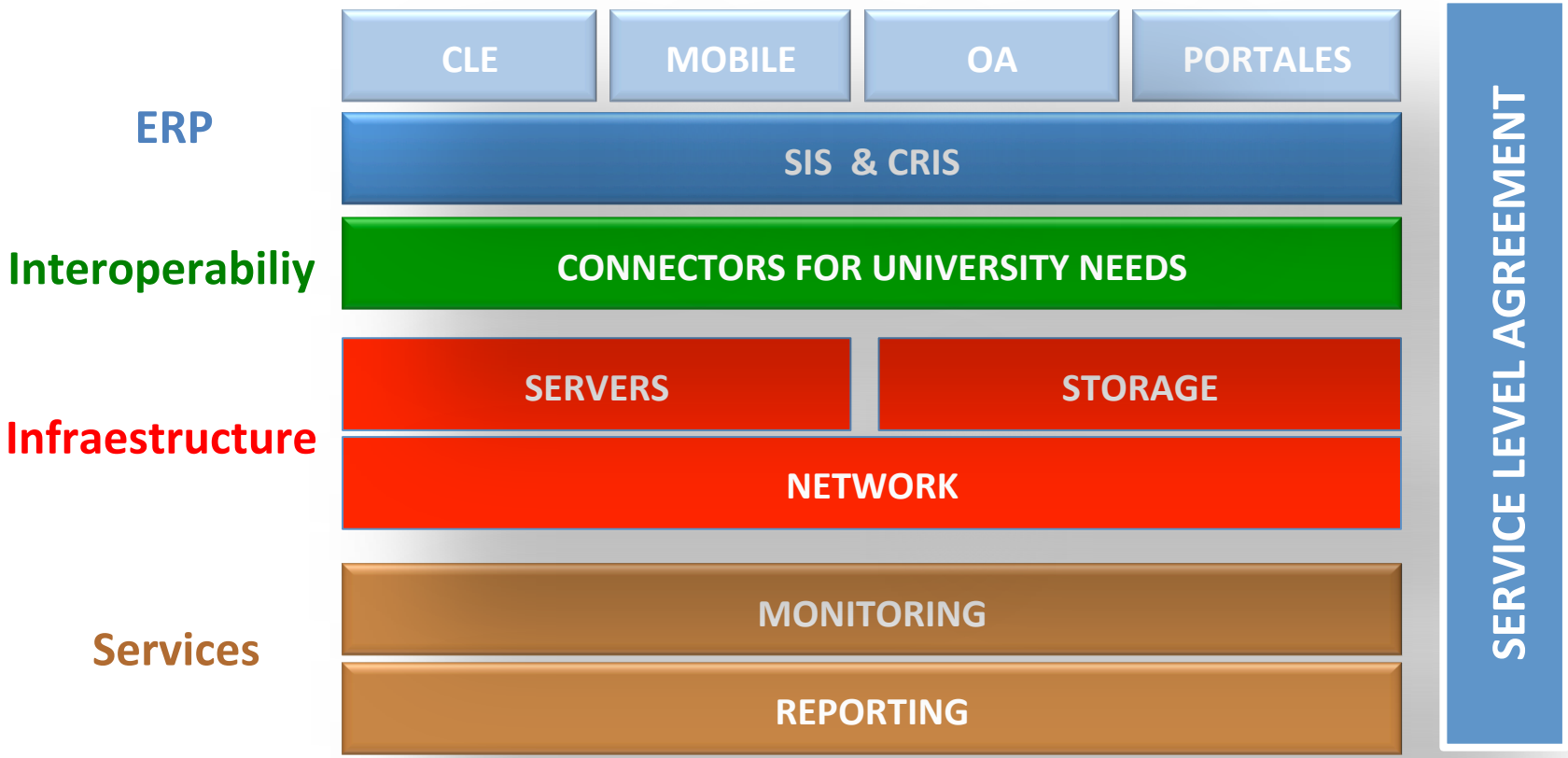
Shared environment

+ Share platform

+ Multi-tenant application environment

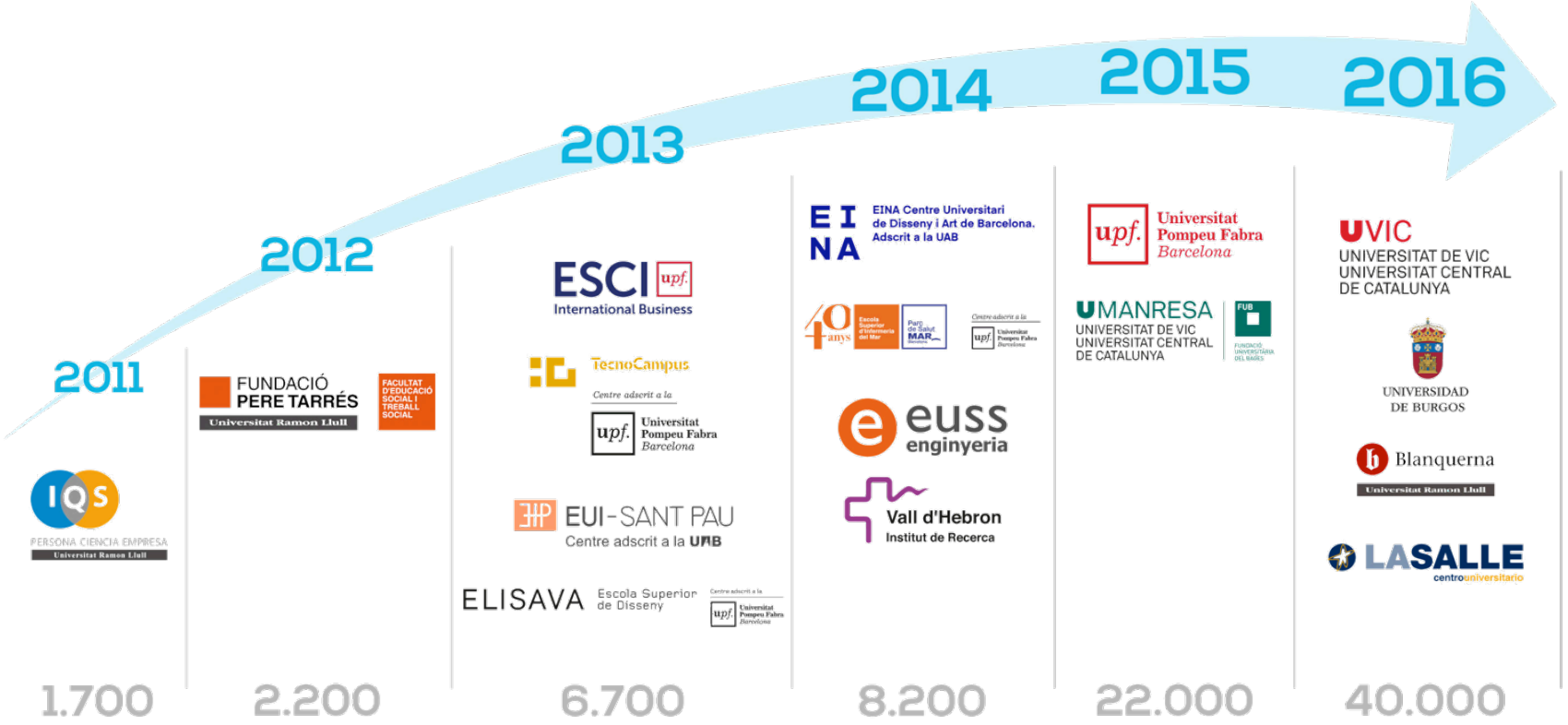
+ Suitable for small institutions and colleges

Service Model



SIGMA
helping universities succeed

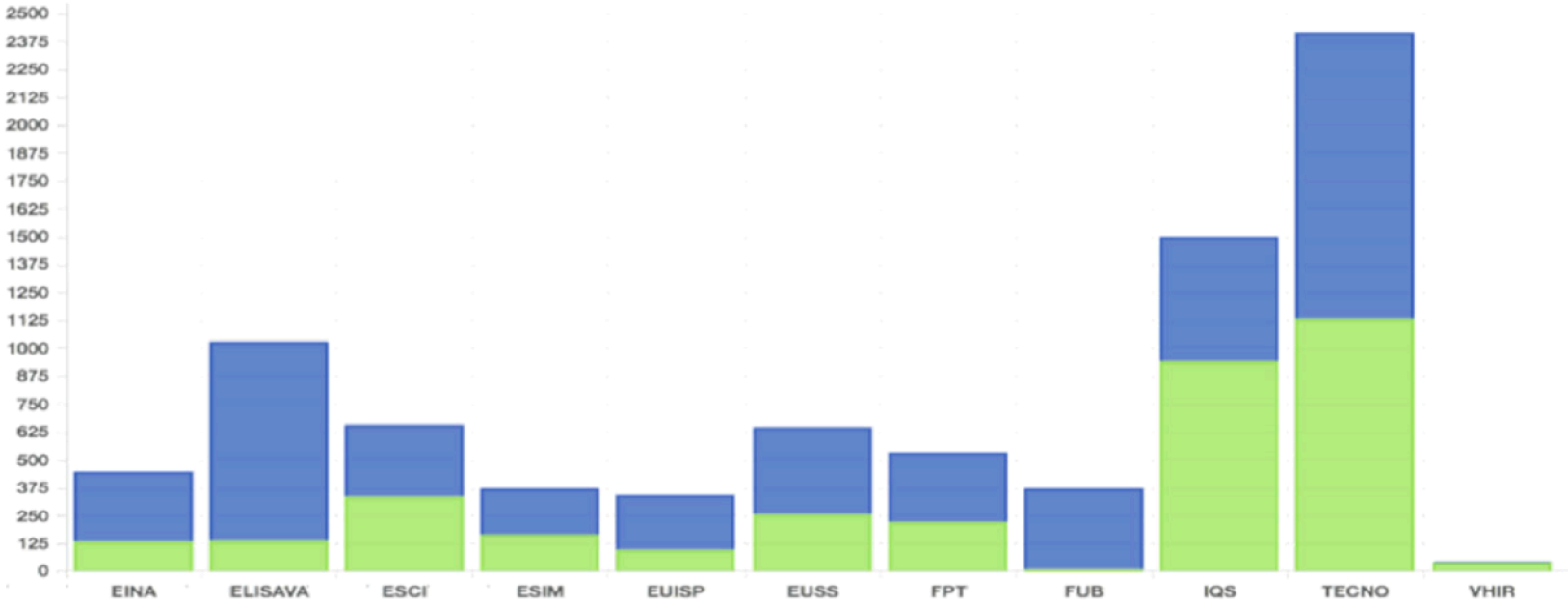
Service platform evolve



Accumulative students enrol

Enrolment period July-October 2015

8.356 students enrol in single **multi-tenant environment**

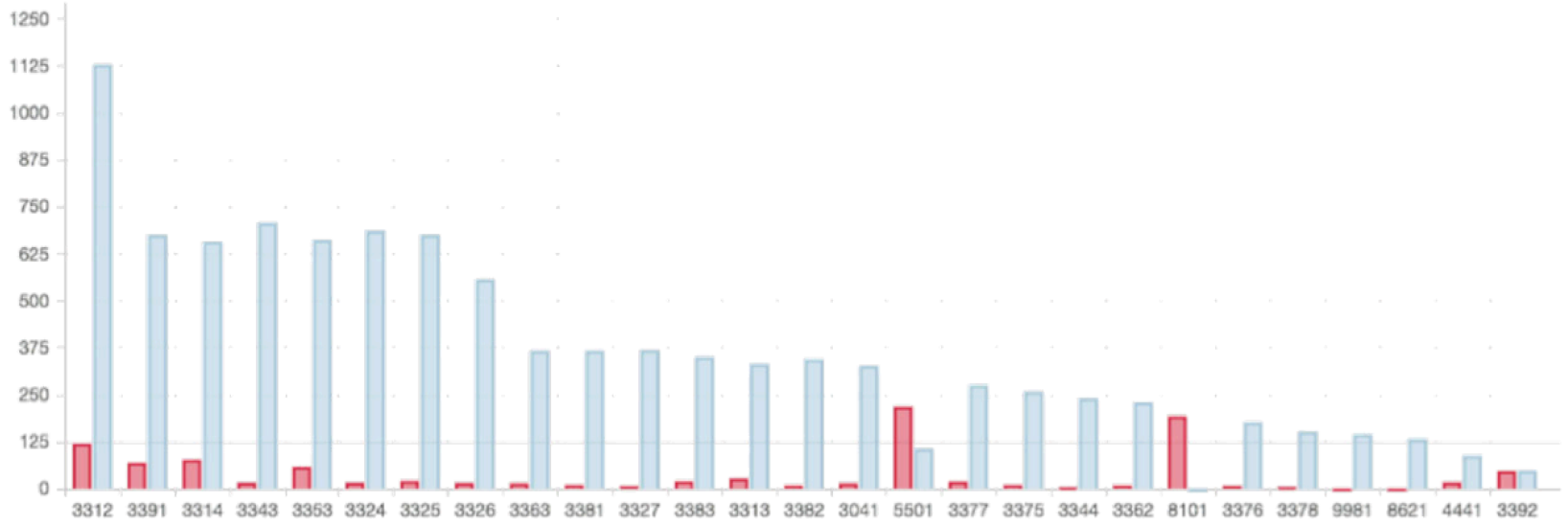


Non in-person process

In person process

Enrolment period July-October 2015

12.295 students enrol in single **isolated environment**



Non in-person process

In person process

First step achieved

Platform 2015

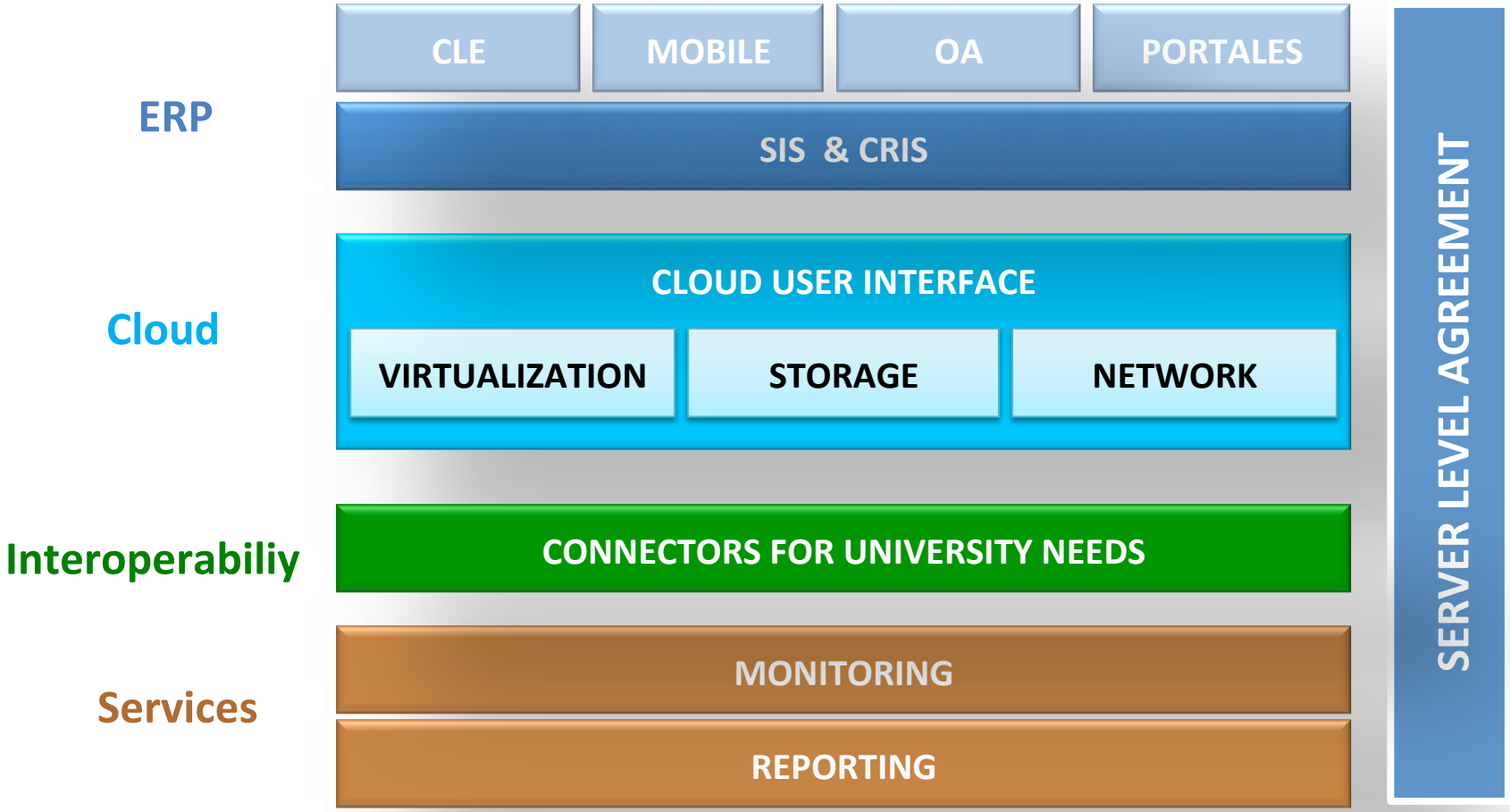
- Availability 24x7
- Deployment without stopping service
- Service Level Agreement
- A platform and a service mature

New needs

- Align cost on demand automatically
- Scalability
- Flexibily in growing in services

THE NEXT
STEP

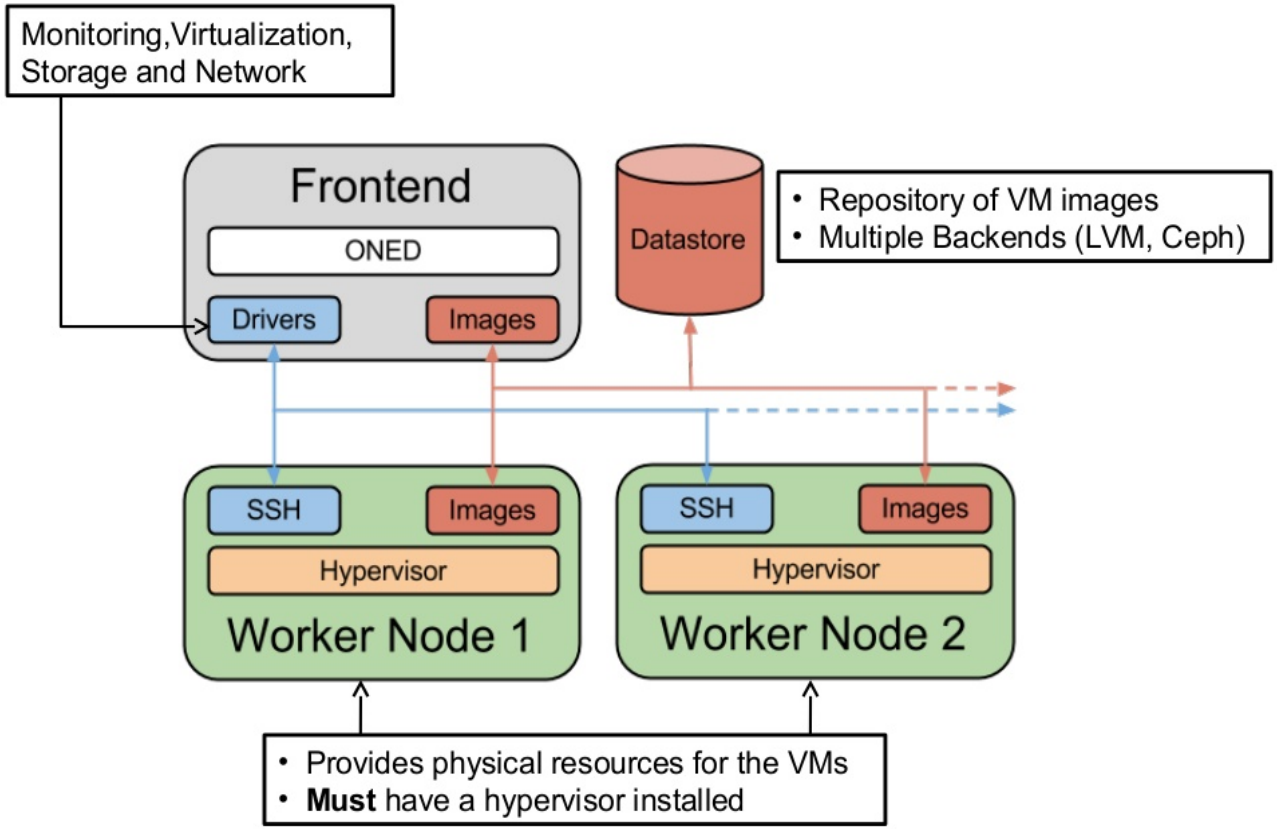
Service Model

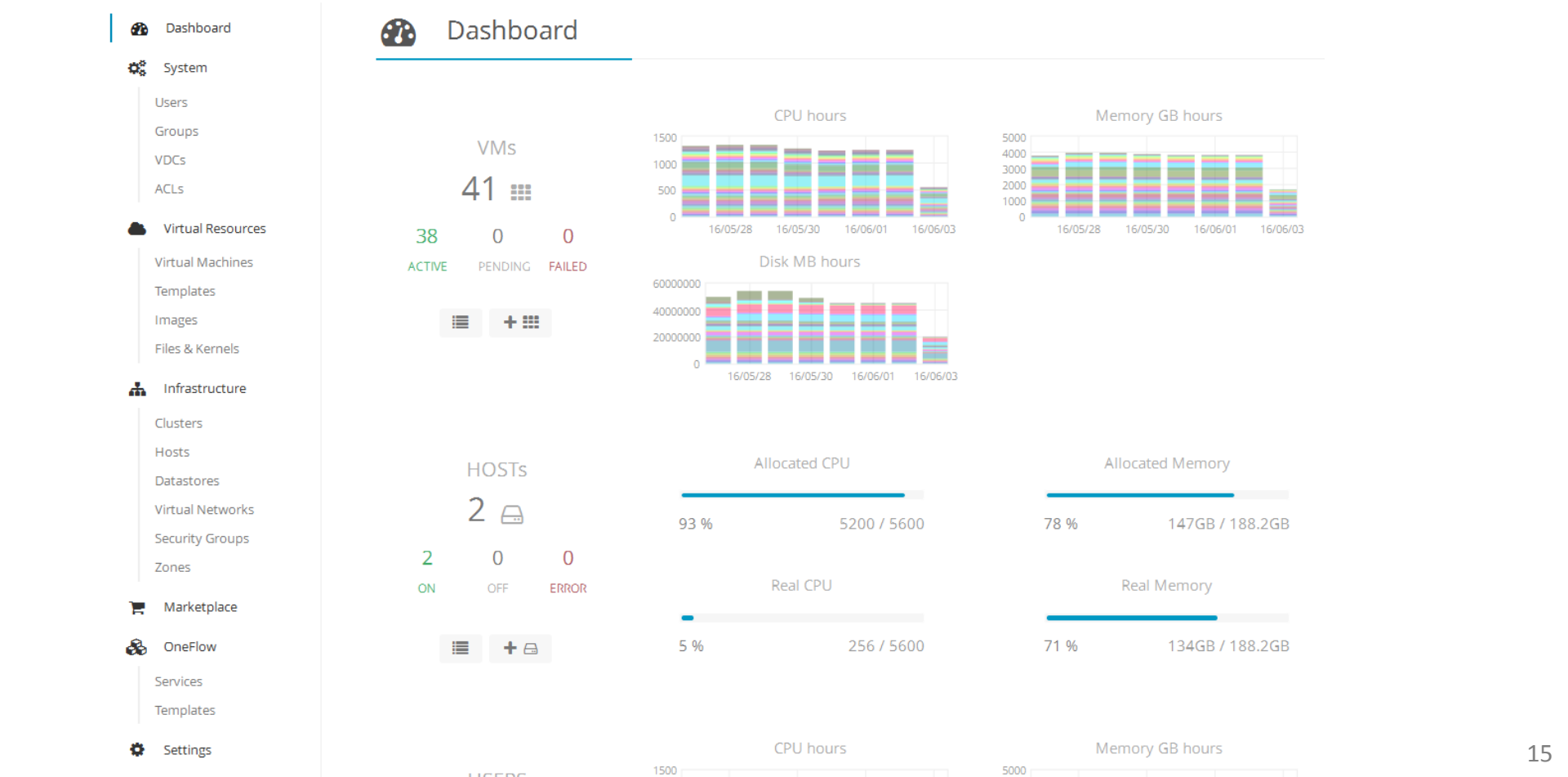


Features

- **Fully open source**
- **Avoid vendor lock-in**, platform independent
- Simple, is **very** easy to install and update
- Mature, since 2008 this project is growing driven by user needs
- **Enterprise-class product**
- **Cloud Bursting**, extension of private clouds with resources from remote clouds
- **Multiple zones**, centralized management of multiple instances for scalability and isolation
- **Autoscaling**, creation of application flows with auto-scaling policies based on performance metrics and schedule

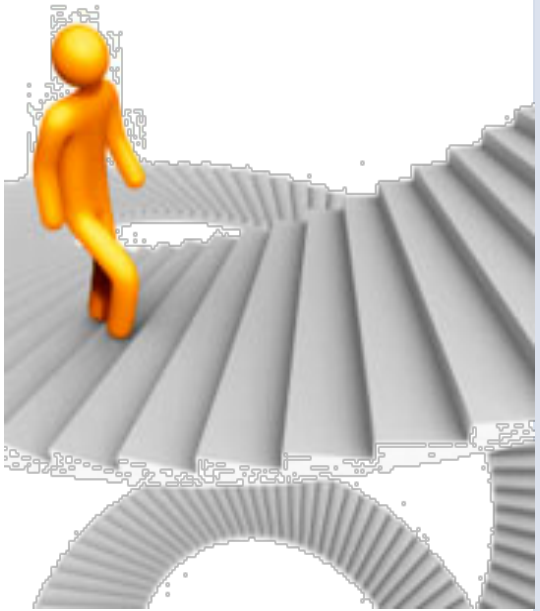
Architecture




Dashboard
System
Users
Groups
VDCs
ACLs
Virtual Resources
Virtual Machines
Templates
Images
Files & Kernels
Infrastructure
Clusters
Hosts
Datastores
Virtual Networks
Security Groups
Zones
Marketplace
OneFlow
Services
Templates
Settings
Dashboard
VMs
41
38
ACTIVE
0
PENDING
0
FAILED
CPU hours
1500
1000
500
0
16/05/28
16/05/30
16/06/01
16/06/03
Memory GB hours
5000
4000
3000
2000
1000
0
16/05/28
16/05/30
16/06/01
16/06/03
Disk MB hours
60000000
40000000
20000000
0
16/05/28
16/05/30
16/06/01
16/06/03
HOSTs
2
2
ON
0
OFF
0
ERROR
Allocated CPU
93 %
5200 / 5600
Allocated Memory
78 %
147GB / 188.2GB
Real CPU
5 %
256 / 5600
Real Memory
71 %
134GB / 188.2GB
CPU hours
Memory GB hours

Open Nebula Users

Conclusions



- The **implementation of an open cloud** management infrastructure enables us to **achieve the scalability** that we need and **strengthen the service**
- Lets us to **offer to our community of partners and users more services**
- **Continue adjusting the budget**.
- In the next years we've **planned to deploy an infrastructure over different geographical locati**ons and OpenNebula will help us to achieve this objective

Thank you for your attention

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