

# Aplicaciones web para el trabajo colaborativo

Sistema gestor de recursos para una arquitectura **GRID**

# Agenda

- Introduction to distributed systems
- Resource management for GRID architectures
  - Frontend application
  - RESTful API
  - Sending system's information: agent as a service
- Conclusions

# Introduction to distributed systems

- High amount of data daily
- Big computational calculations
- HPC / Vertical Scalability
- Distributed Systems / Horizontal Scalability







# Introduction to distributed systems

## Resource Manager for **GRID** Architectures

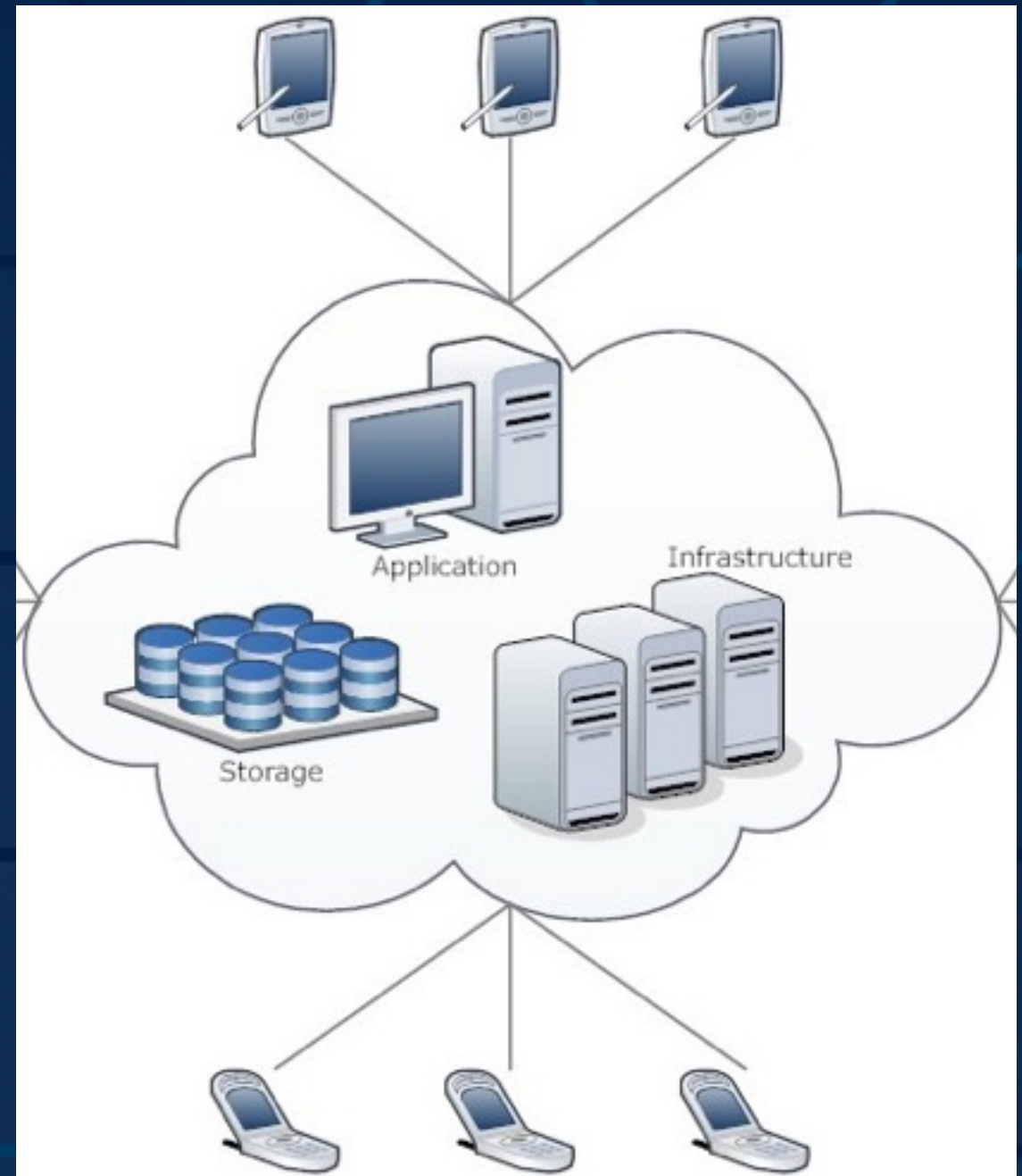


Resource manager for GRID  
architectures

# Resource manager for GRID architectures

## Frontend Application

- Listing all resources easily
- See systems' cpu, ram and hdd
- Deleting unavailable systems
- Role based identification and authorization



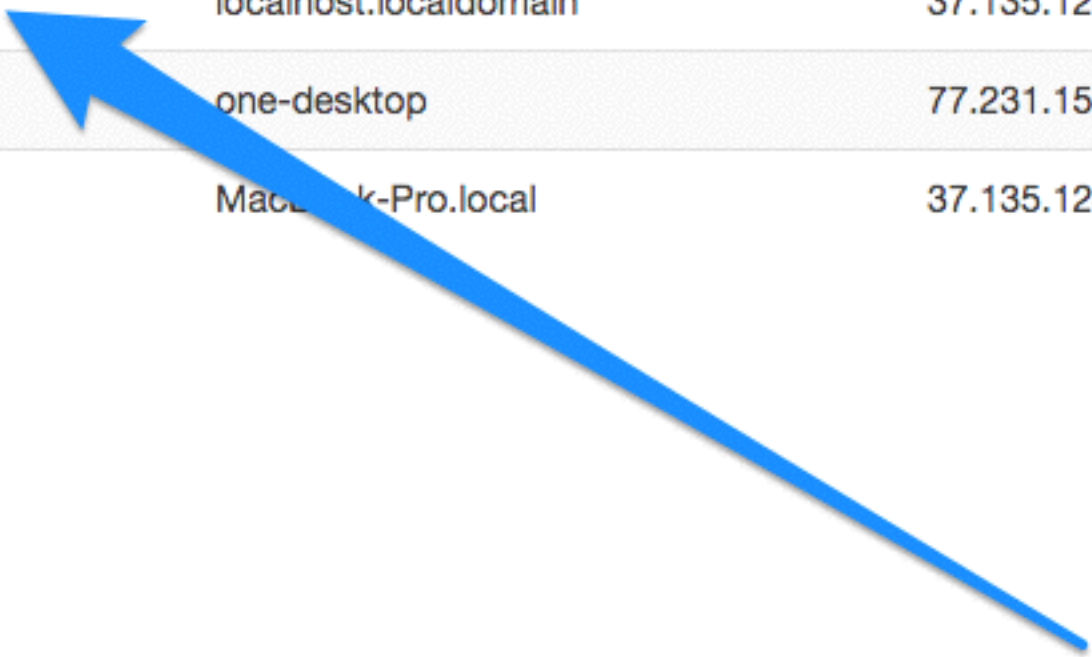
# Dashboard

Status	Hostname	IP	CPUs	Ram	HDD
✔	MacBook-Pro.local	37.135.124.191	4	16.00GiB	232.62GiB
✘	air.local	37.133.80.37	4	4.00GiB	111.86GiB
✘	javimartin.local	62.83.253.68	4	16.00GiB	232.62GiB
✔	localhost.localdomain	37.135.124.191	1	458.41MiB	38.46GiB
✘	one-desktop	77.231.153.124	4	15.64GiB	39.09GiB
✘	MacBook-Pro.local	37.135.124.191	4	16.00GiB	232.62GiB



# Dashboard

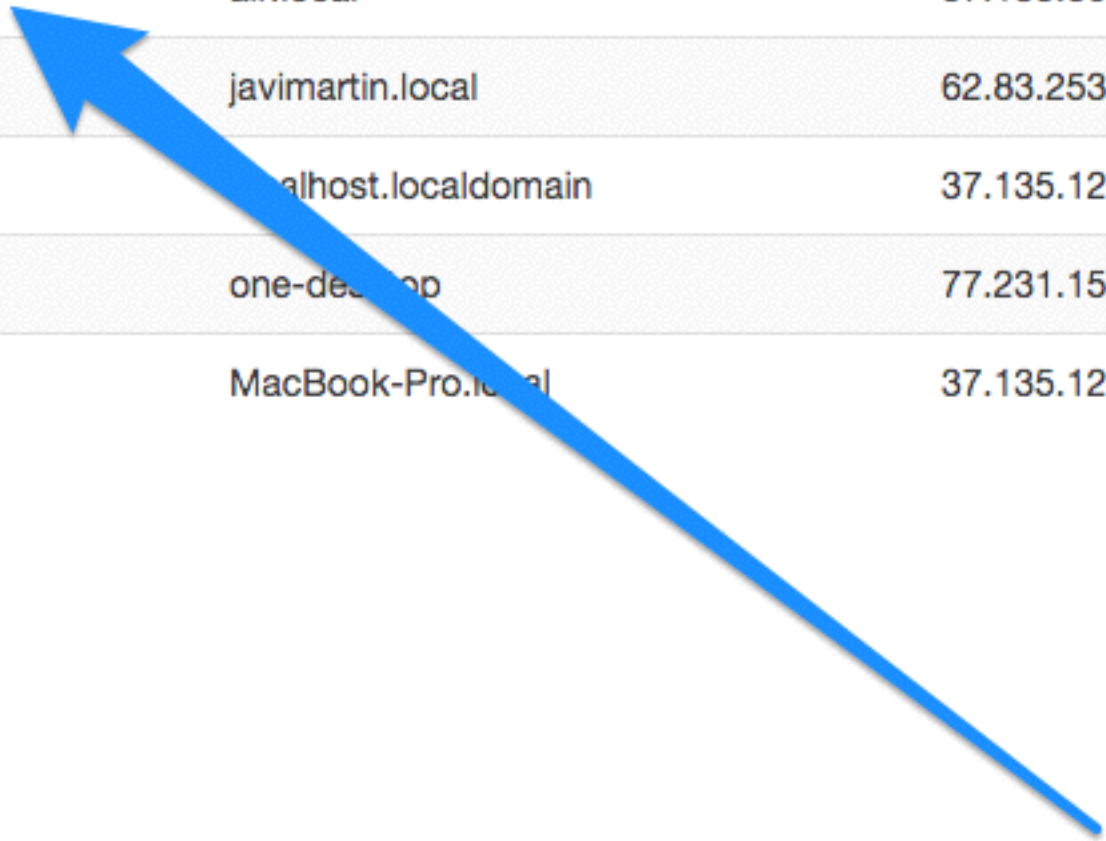
Status	Hostname	IP	CPUs	Ram	HDD
✔	MacBook-Pro.local	37.135.124.191	4	16.00GiB	232.62GiB
✘	air.local	37.133.80.37	4	4.00GiB	111.86GiB
✘	javimartin.local	62.83.253.68	4	16.00GiB	232.62GiB
✔	localhost.localdomain	37.135.124.191	1	458.41MiB	38.46GiB
✘	one-desktop	77.231.153.124	4	15.64GiB	39.09GiB
✘	MacBook-Pro.local	37.135.124.191	4	16.00GiB	232.62GiB



**System that sent information in last 30 minutes**

# Dashboard

Status	Hostname	IP	CPUs	Ram	HDD
✔	MacBook-Pro.local	37.135.124.191	4	16.00GiB	232.62GiB
✘	air.local	37.133.80.37	4	4.00GiB	111.86GiB
✘	javimartin.local	62.83.253.68	4	16.00GiB	232.62GiB
✔	localhost.localdomain	37.135.124.191	1	458.41MiB	38.46GiB
✘	one-desktop	77.231.153.124	4	15.64GiB	39.09GiB
✘	MacBook-Pro.local	37.135.124.191	4	16.00GiB	232.62GiB

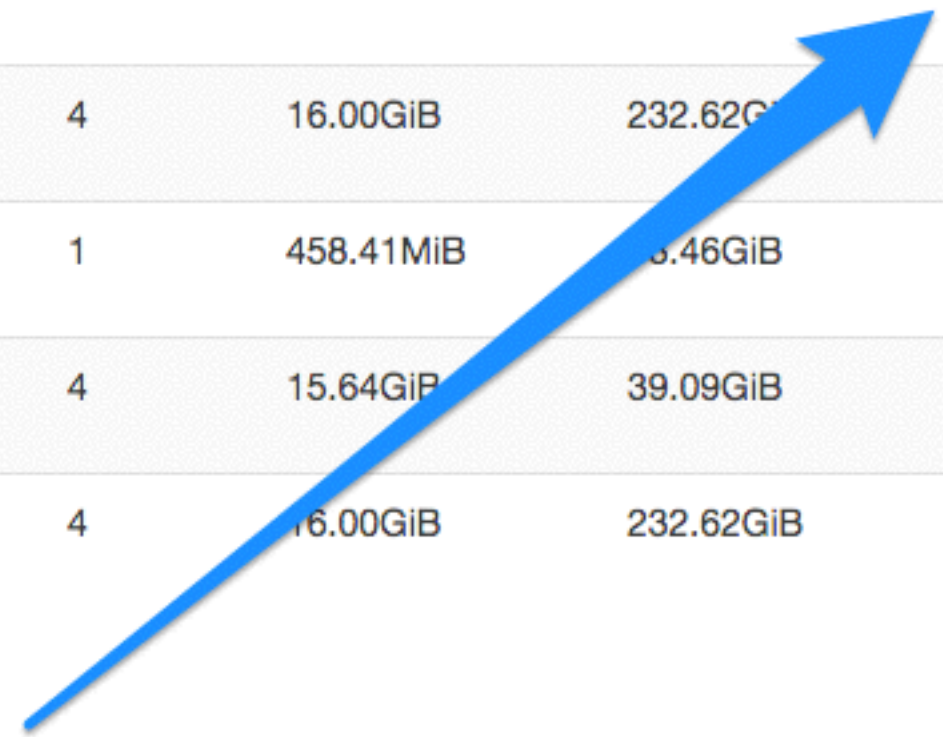


**Unavailable System**



# Dashboard

Status	Hostname	IP	CPUs	Ram	HDD	Actions
✔	MacBook-Pro.local	37.135.124.191	4	16.00GiB	232.62GiB	Delete
✘	air.local	37.133.80.37	4	4.00GiB	111.86GiB	Delete
✘	javimartin.local	62.83.253.68	4	16.00GiB	232.62GiB	Delete
✔	localhost.localdomain	37.135.124.191	1	458.41MiB	3.46GiB	Delete
✘	one-desktop	77.231.153.124	4	15.64GiB	39.09GiB	Delete
✘	MacBook-Pro.local	37.135.124.191	4	16.00GiB	232.62GiB	Delete



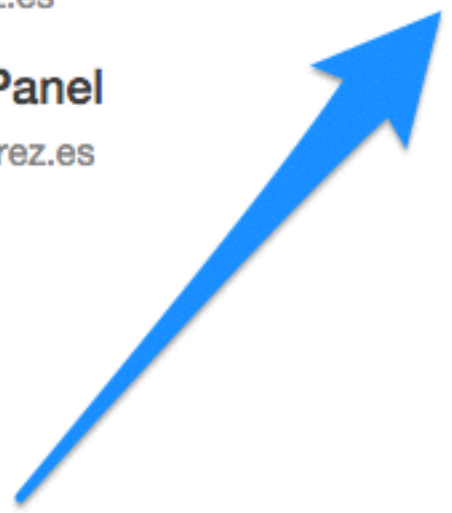
**Admin users can delete unavailable systems**

# List users

2 users found. Showing 1 - 2.

-  **Alberto Ramirez**  
alberto@aramirez.es
-  **Grid Admin Panel**  
adminpfc@aramirez.es

Admin User



**Admin users may promote other user to Admin role**



# Resource manager for GRID architectures

## RESTFuI API

- Gather all systems' information
- Expose systems' information to the front end application
- Safe communications with both, front end application and resident agent

### Systems

#### Operations

- **GET /systems** Retrieve the collection of systems.
- **POST /systems** Create new system.
- **GET /systems/{id}** Get information about system resource with ID {id}.
- **PUT /systems/{id}** Update a system's full representation or created new one.
- **DELETE /systems/{id}** Remove the system with ID {id} from the collection.

#### Model representation

```
{  
  id: "0AE82C63-3158-4D11-9613-DE4B55142CCD",  
  hostname: "MacBook-Pro.local",  
  ip: "37.135.124.191",  
  cpus: 4,  
  ram: "16.00GiB",  
  hdd: "232.62GiB",  
  os: "darwin",  
  _link: "https://api.pfc.aramirez.es/systems/0AE82C63-3158-4D11-9613-DE4B55142CCD"  
}
```

# Resource manager for GRID architectures

## **RESTFuI API**

- Apache server listening port 443
- Self-signed server certificate
- PHP, Silex, Ports and Adapter and Unit Testing
- MongoDB data storage



# Resource manager for GRID architectures

## Resident Agent

- Send system's information periodically
- Safe communication
- High performance while being light in the user's machine
- Working in several OS



# Resource manager for GRID architectures

## **Resident Agent**

- Golang
- Event Loop
- Operating System Service
- Multiplatform





# Linux

## Debian based distributions

```
$ curl -s -O http://admin.pfc.aramirez.es/agents/linux/x86_64/pfcaramirezagent-1.0.5-1.x86_64.deb && \
sudo dpkg -i pfcaramirezagent-1.0.5-1.x86_64.deb && \
rm -f pfcaramirezagent-1.0.5-1.x86_64.deb
```

## RHEL based distributions

```
$ sudo yum install http://admin.pfc.aramirez.es/agents/linux/x86_64/pfcaramirezagent-1.0.5-1.x86_64.rpm
```

## Other distributions

Download the [compiled binary](#) and then:

```
$ mv agent /usr/local/bin
$ agent
```



# Mac OS X

Just donwload de package and install it.

[Install](#)

# Conclusions

- Distributed systems are funny besides powerful
- Learning to package and distribute for different operating systems
- Go back to work with security issues
- Golang is powerful
- More ideas to the future as working on distributed systems algorithms such like Gossip Protocol



Demo time



Thanks