

CELAR

**Automatic, multi-grained elasticity-provisioning
for the Cloud**

Specific Targeted Research Projects (STReP)

FP7 - ICT 2011.1.2



Consortium

- **Research Partners**

Total Budget : 2,6 M €

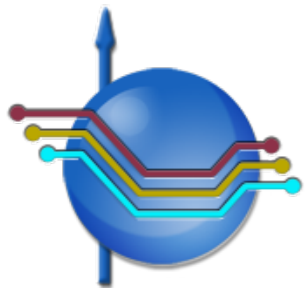
- ATHENA, UCY, TUW

- **Industrial/Technology Providers**

- Flexiant, SixSq, GRNET

- **Users**

- ICR, PlayGen



CELAR issues addressed

- **Cloud Computing:** central paradigm for research, business, everyday computing
- **Elasticity:** refers to the ability of IaaS, PaaS, or SaaS to expand or contract dedicated resources in order to meet the exact demand at runtime.
- Plethora of different apps with various demands:
 - Elastic storage, compute power, platform, VM instances, combinations, etc
- Suboptimal resource allocation:
 - Coarse-grained (usually at the VM level)
 - Static, manual rules for scaling up and down (e.g., Amazon)
 - Limited application-side feedback, poor set of metrics

CELAR Vision

Automated, real-time, fine-grained elasticity for any Cloud application

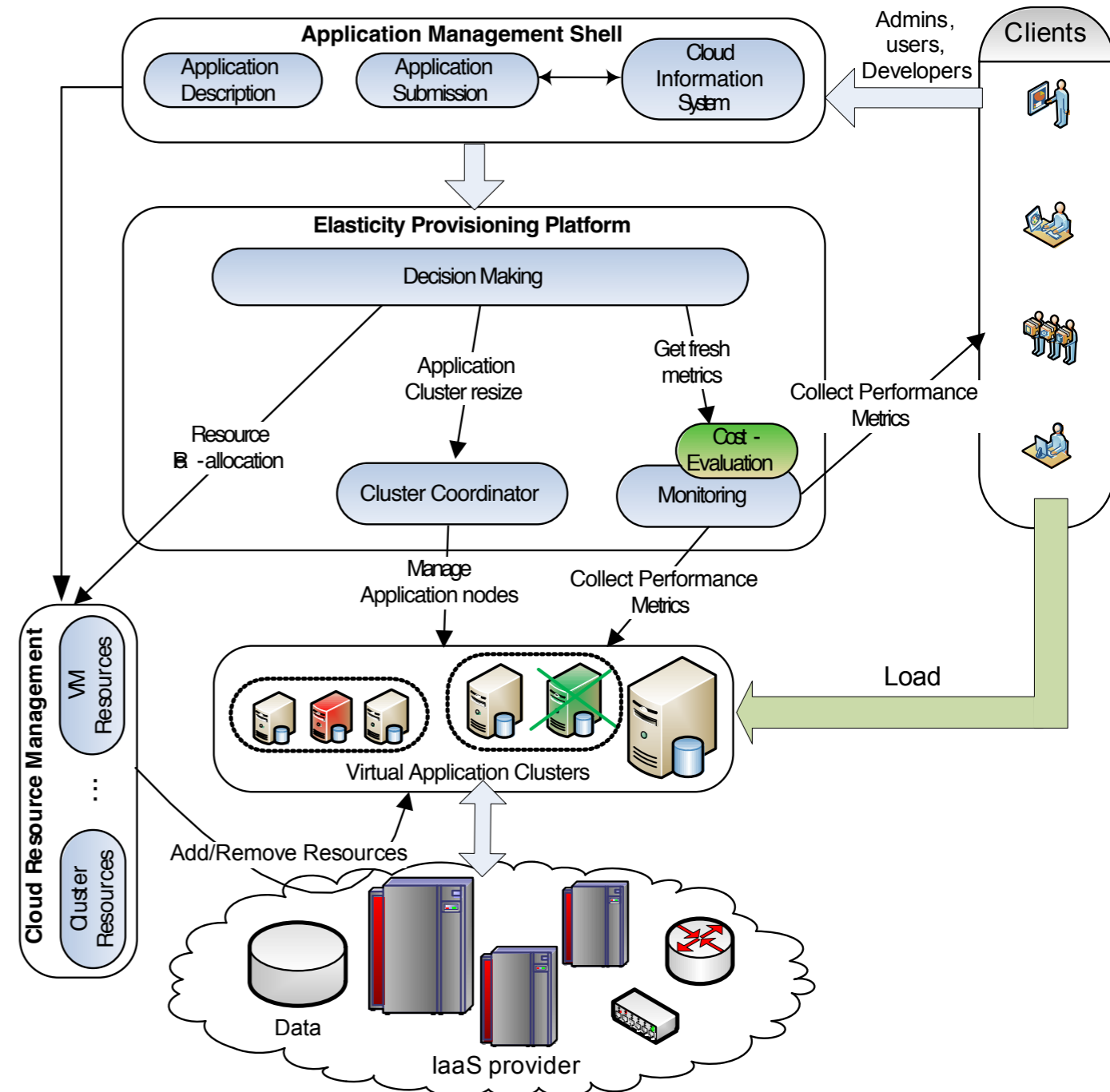
CELAR Objectives

Provide a **complete software stack** that efficiently programs and manages resource allocation to cloud applications in the same way an operating system manages processes

- Intelligent decision-making module
- Real-time, fully scalable, elastic cloud monitoring system
- Open source ecosystem based on Eclipse
- Cloud information system
- Dynamic resource management
- Two applications (cloud gaming, scientific computing)

CELAR overview

1. Elasticity provisioning subsystem
 - Adaptive decision-making
 - Fine-grained, platform-independent
2. Cloud Monitoring tool
 - Elastic, multi-layer
 - Metrics cost-evaluation
3. Application Framework
 - c-Eclipse for user and app management
4. Cloudification framework



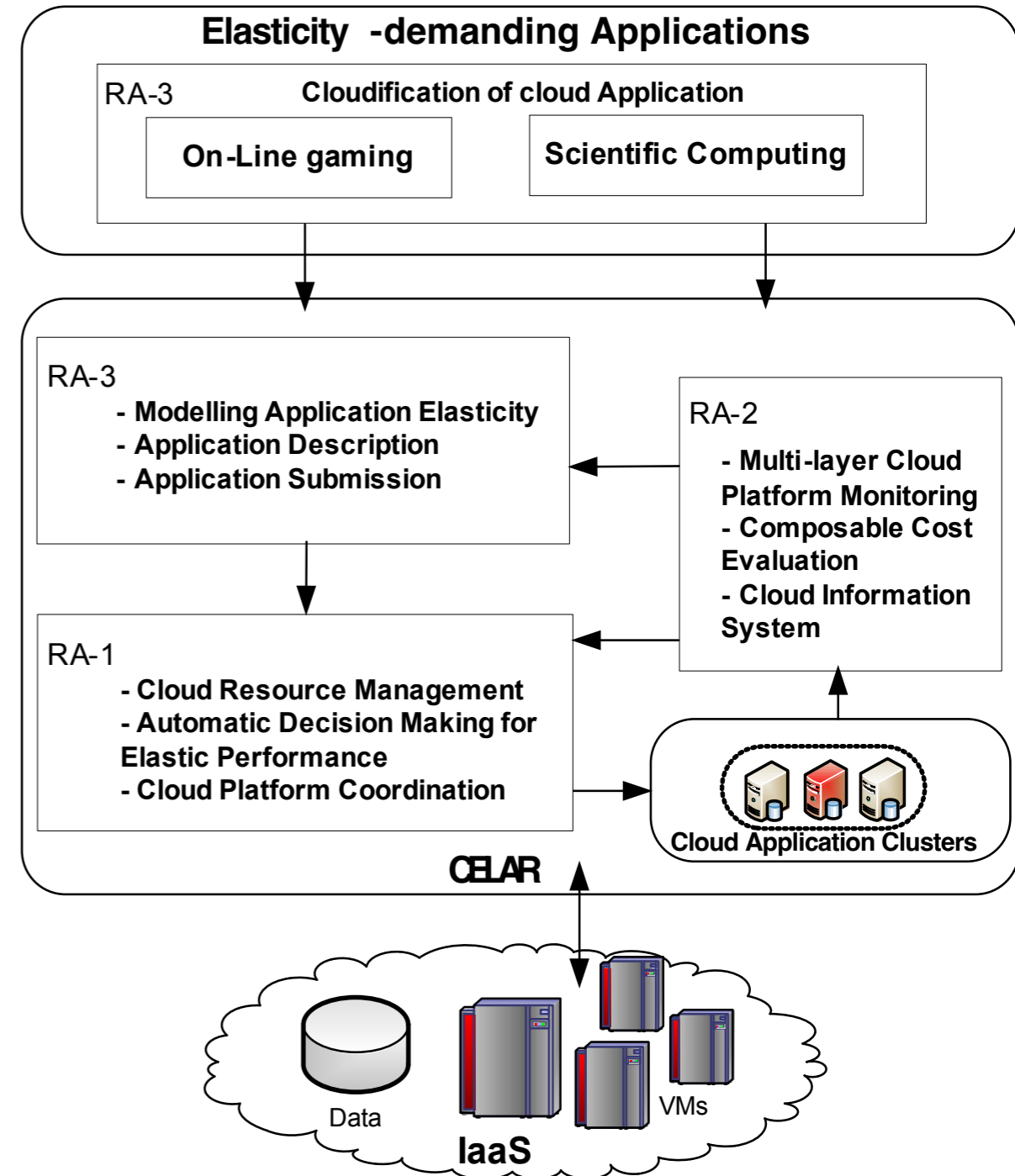
Work Structure

- **Research Areas**

- Elasticity Provisioning Middleware
- Cloud Monitoring
- Application Management

- **Applications:**

- Cloud Gaming
- Translational Cancer Detection pipeline (SCAN)



CELAR Impact

- PaaS providers
 - Offer optimal management, increase profit
 - Globally applicable (modular, platform independent)
- Users
 - Actual pay-as-you-go
 - Remove admin burden, enhanced interaction
- Administrators
 - Advanced monitoring and description framework
- Cloud Community
 - Open-source tools, standards

Thank You