

# Deploying Service Experiments on FIRE: A OpenNebula / RESERVOIR Perspective

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**Future Internet Assembly**  
**Stockholm, November 23-24th 2009**

The research leading to these results has been partially funded by the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 215605.

# Contents

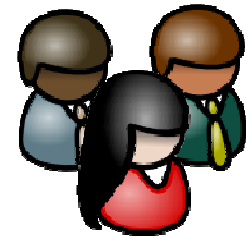
**Show how OpenNebula/ RESERVOIR can be used to build a FIRE IaaS Cloud for Service deployment**

- Requirements on a service level facility**
- FIRE user perspective: preparing a service experiment**
- FIRE infrastructure perspective: how to build a federated service infrastructure on FIRE**
- Example of service deployment**



- **Manage experiments at service level on FIRE**
  - Supporting all phases of an experiment
  - Providing transparent access to FIRE at service level
  - User friendly management of experiments
- **Easy installation and maintenance on FIRE and on user infrastructure**
  - Packaged installation procedure
  - Easy customisation
  - Evolutionary Maintenance process defined with managed user feedback

# Service Deployment in a IaaS Cloud

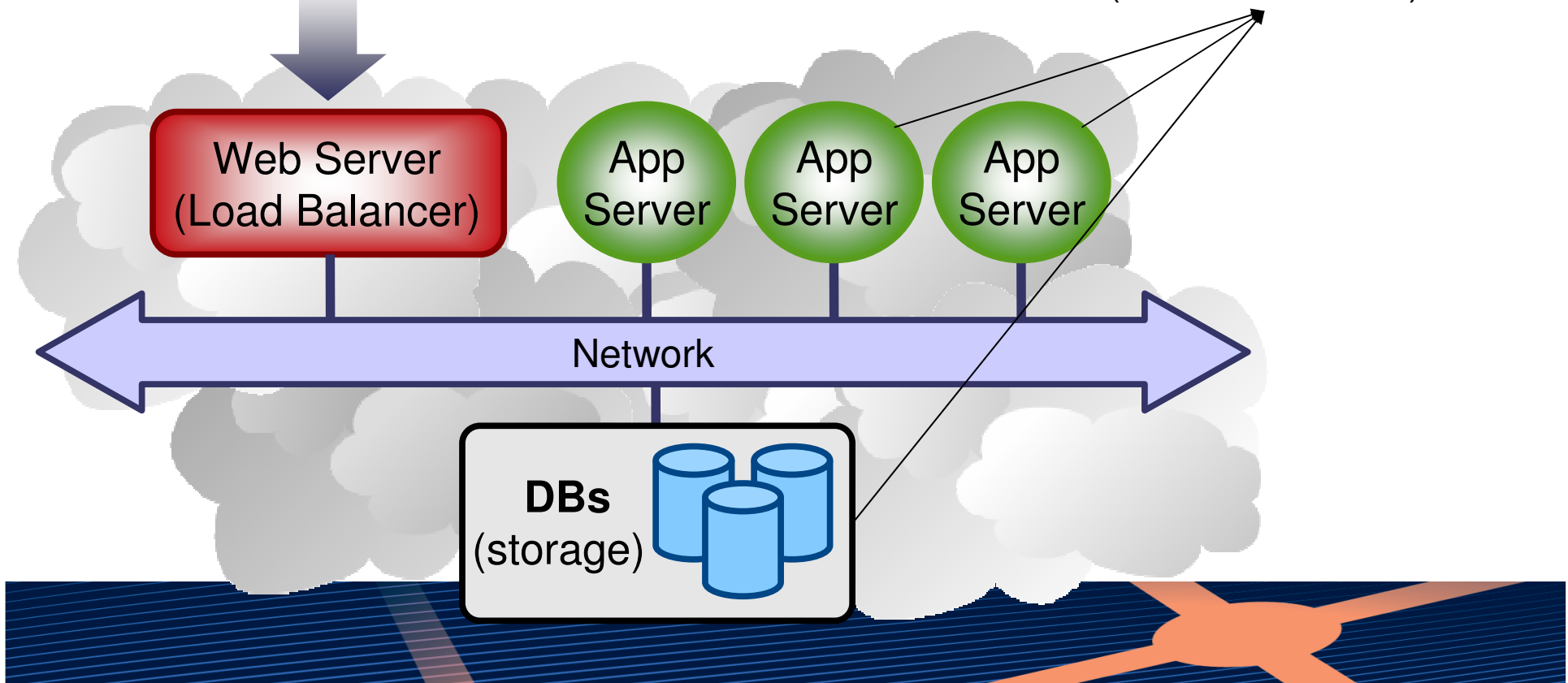


**Service  
End-Users**

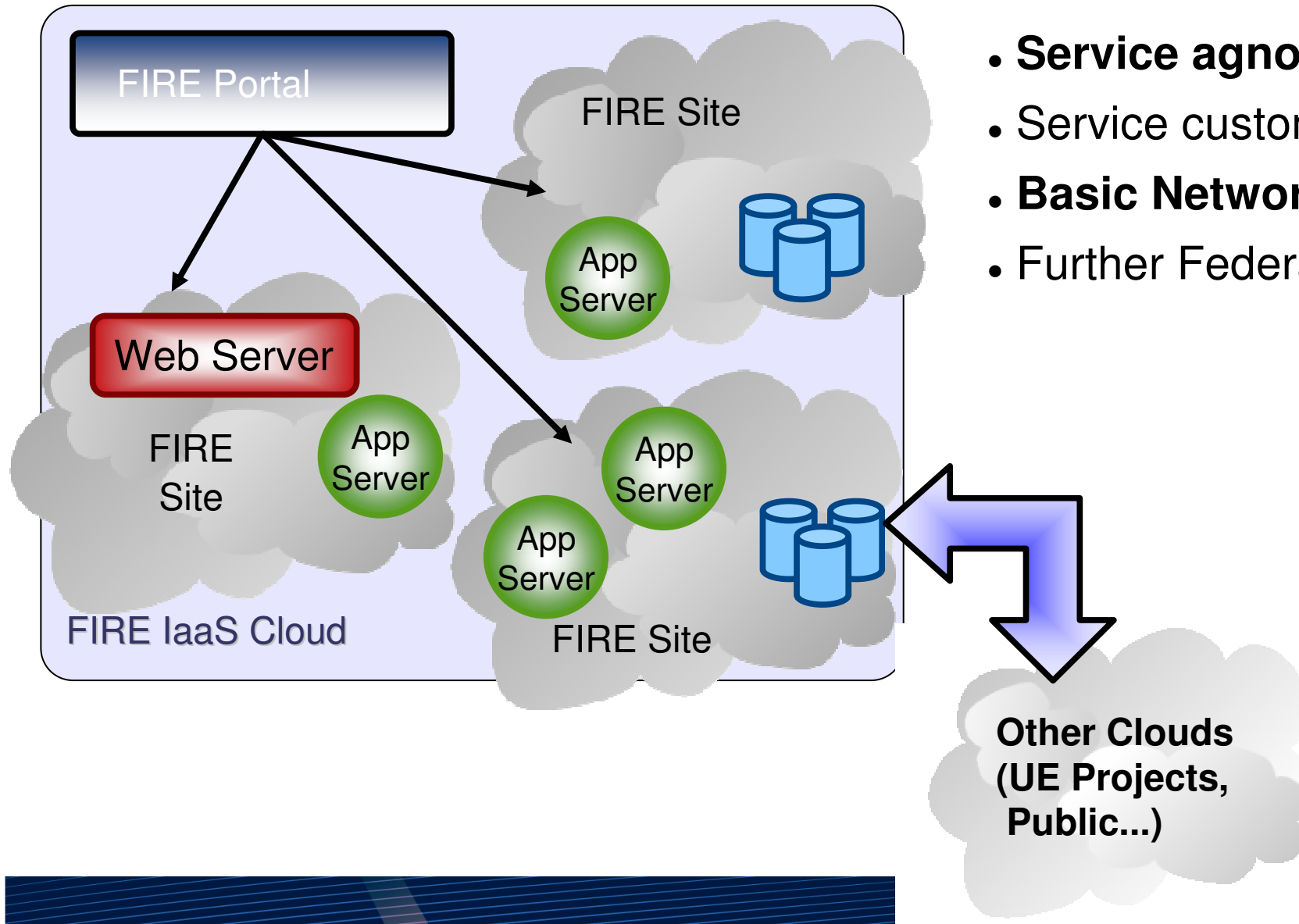
Total control of service layout:

- Software Stack
- Type & Number of components
- Service Elasticity

Virtual Execution Environments  
(Virtual Machines)

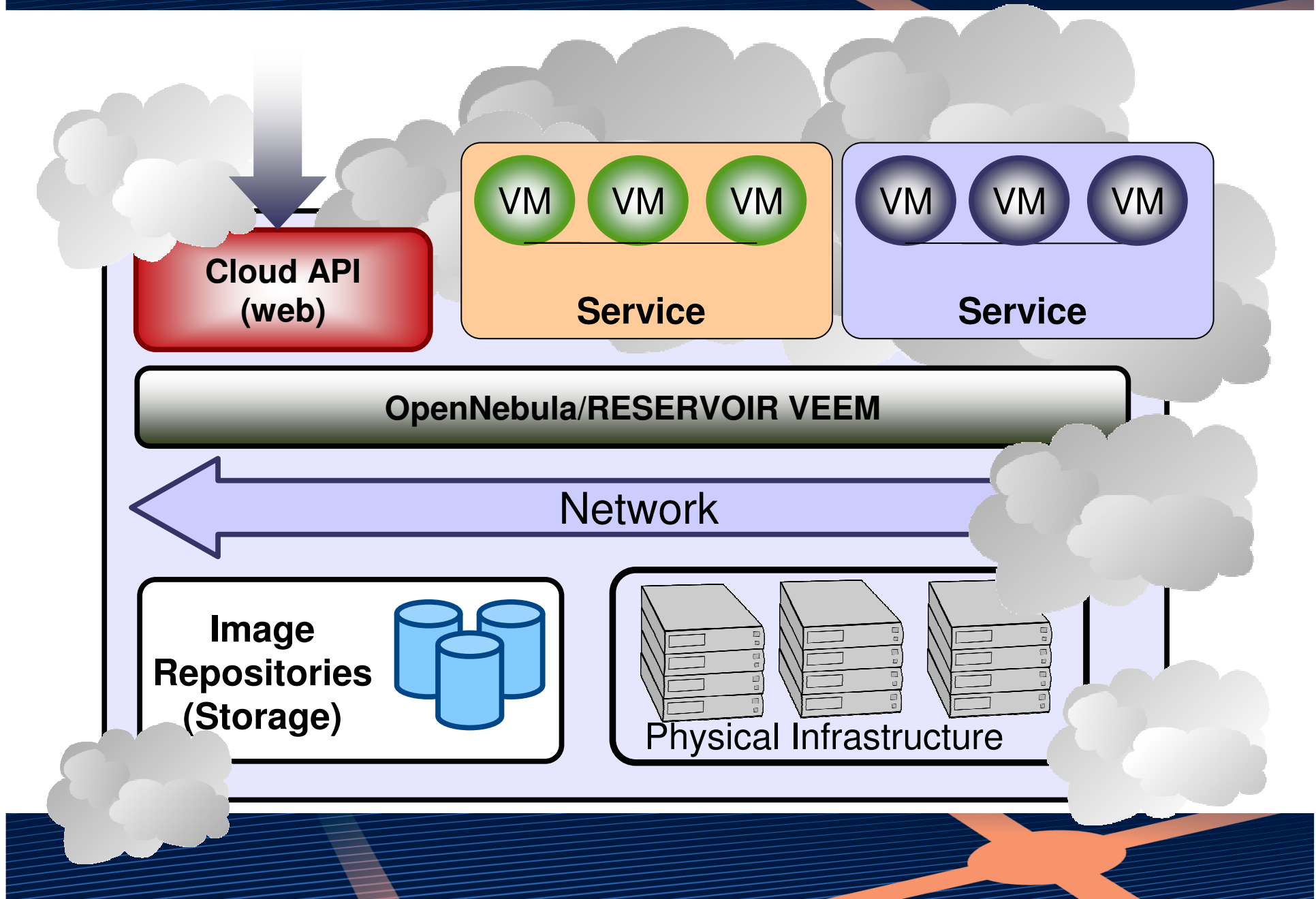


# A Federated IaaS Cloud for FIRE



- **Service agnostic**
- Service customization
- **Basic Networking**
- Further Federated

# The Anatomy of a FIRE IaaS Site



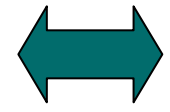
# Service Experimentation in the FIRE Cloud



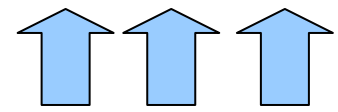
Living Labs

User-based research

Experiment Console



Experiment Monitor



Infrastructure Monitor



Experiment

Virtual Net

Internet (VPN)

RESERVOIR Stack

Cloud API Scheduler

OpenNebula

Physical Infrastructure

Cloud API

FIRE Site

Cloud API

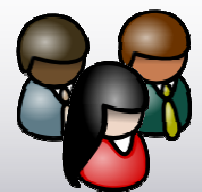
FIRE Site



# Service Experimentation in the FIRE Cloud

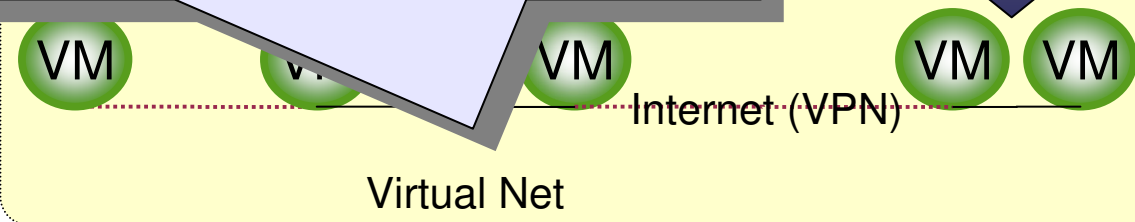
- Custom Experiment VMs
- Custom Network Topology (*Regular Internet-based*)
- The Experiment is responsible for:
  - Preparing the VMS
  - Set-up intra-site connectivity and topology
  - Provide FIRE appliances to ease the deployment
- Service-specific monitoring probes.

Living Labs

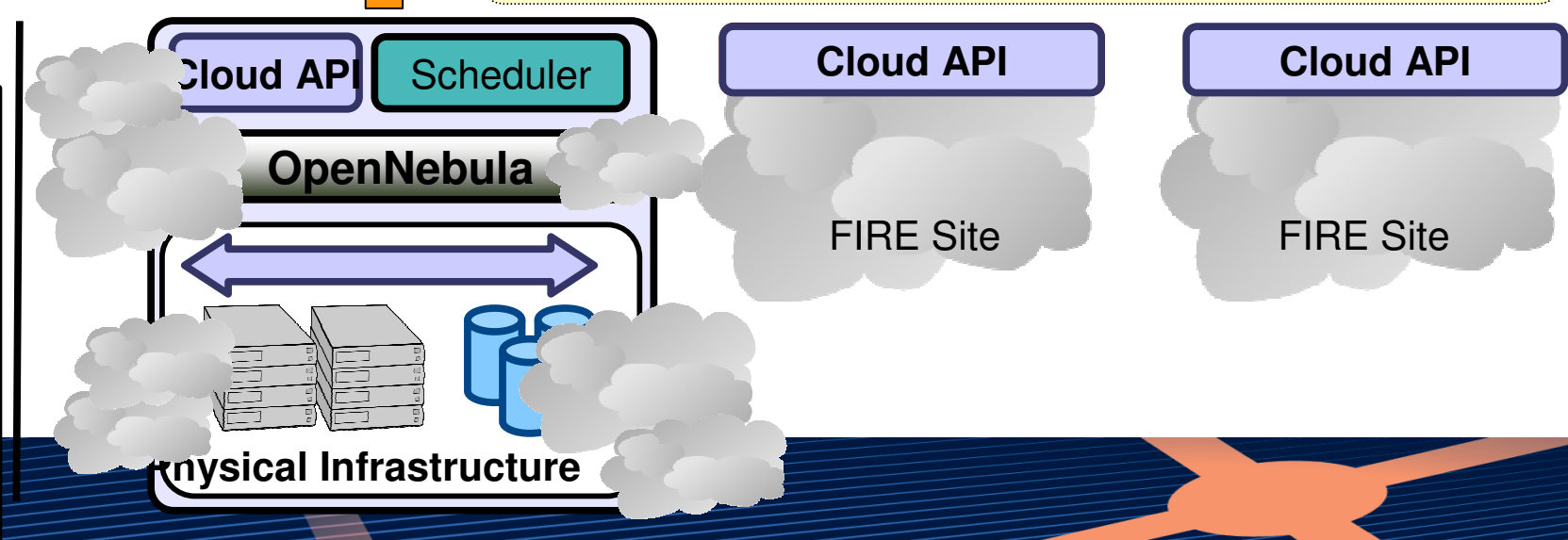


User-based research

Infrastructure Monitor



RESERVOIR Stack



- **Availability of OpenNebula** (<http://www.opennebula.org/>) as Open Source (Apache licence)
- **Potential extensions based on the RESERVOIR project**
  - Service manager for managing SLA/Service Manifests, and providing a user interface
  - Policy engine for optimising the resources with respect to the service manifest
  - Virtual Area Network for Management of multi-tier applications (specification only)
  - Accounting and billing module

- Solution for service level based FIRE experiments: available today
  - Based on OpenNebula with future extensions from RESERVOIR (Open Source)
- User perspective: preparing a service experiment
- FIRE perspective:
  - Installing OpenNebula on FIRE sites
  - Providing an experimental portal to prepare and manage experiments

