Use of HLT farm and Clouds in ALICE

pre-GDB Meeting

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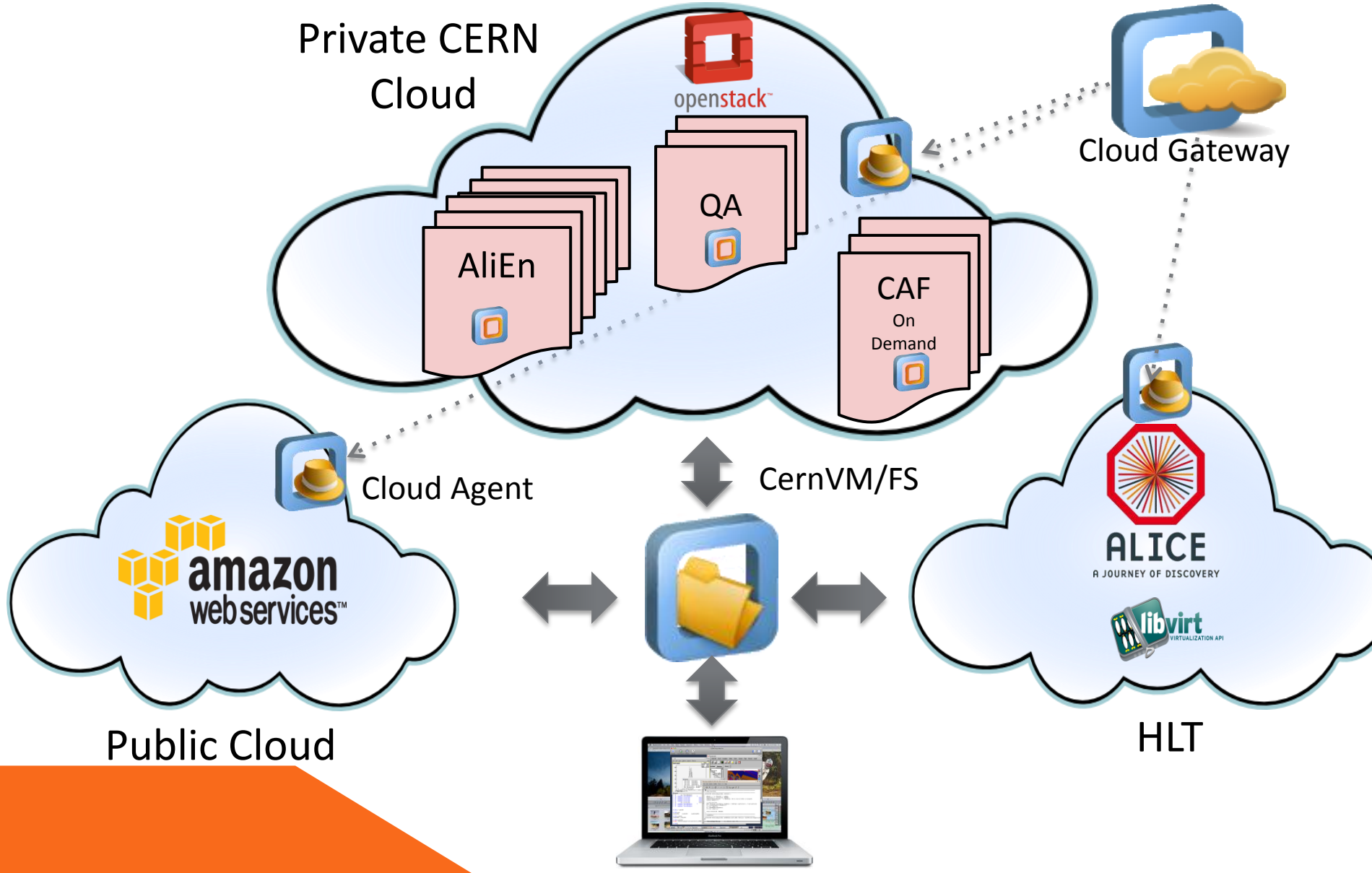
USE OF HLT FARMS AND CLOUDS IN ALICE

- Strong request by C-RRB
  - Computing capacity equivalent to US-ALICE share
- Approach based on CernVM
  - No need to be smarter than the others
  - Requires centralized software distribution using CVMFS
    - Universal namespace, easy configuration
    - Deploy and configure once, run everywhere
    - No need to ever remove software
    - Long term data preservation friendly approach
- Extra benefit for ALICE users
  - CernVM on laptop/desktop

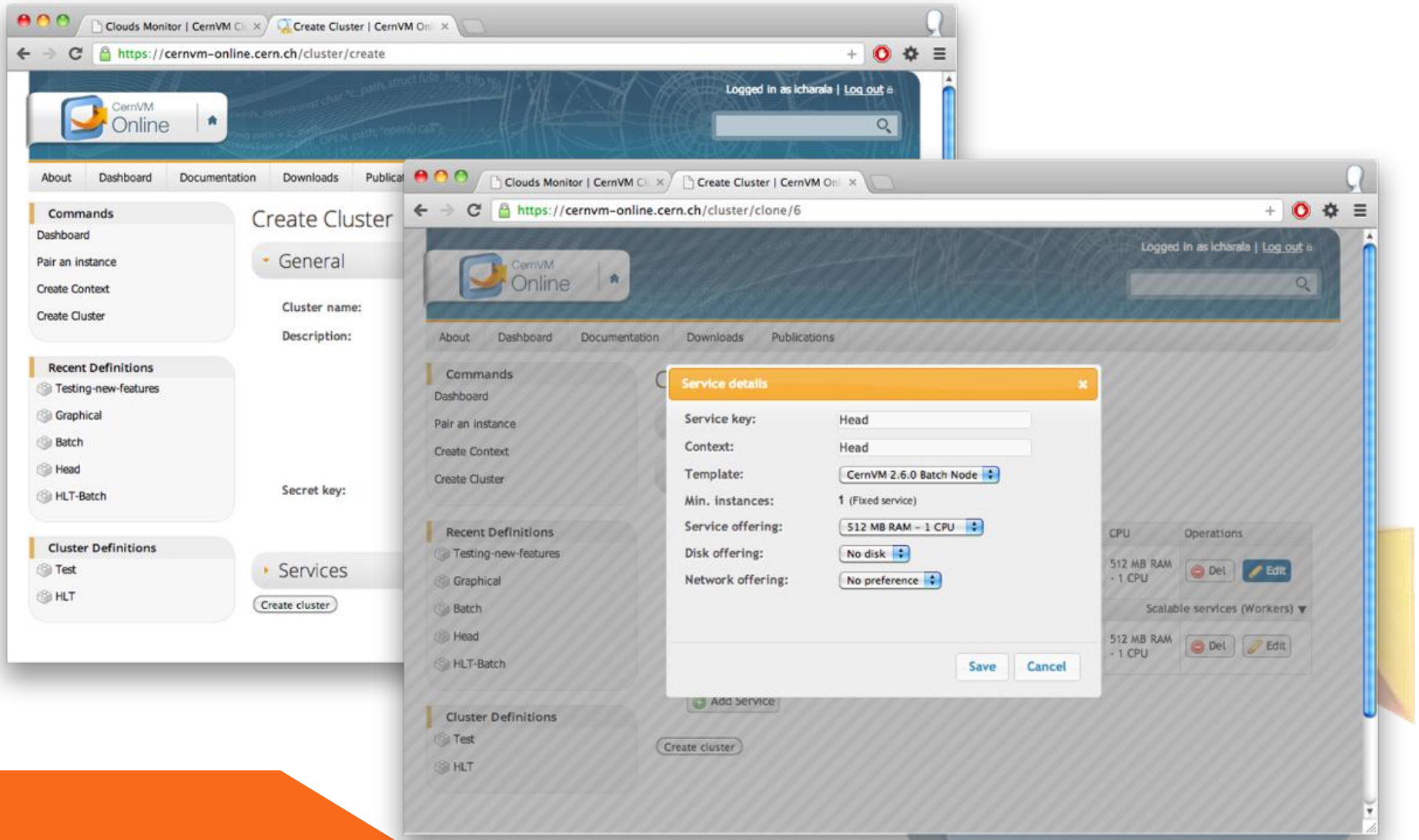
BIG PICTURE


Private CERN Cloud
openstack
AliEn
QA
CAF On Demand
Cloud Gateway
Cloud Agent
CernVM/FS
amazon web services
ALICE
A JOURNEY OF DISCOVERY
libvirt
VIRTUALIZATION API
Public Cloud
HLT

CernVM Cloud

- Provides a simple interface to deploy any number of VM instances in arbitrary cloud infrastructures
  - Cloud Aggregator
- Composed of three components:
  - CernVM Online Portal
  - CernVM Cloud Agents
  - CernVM Cloud Gateway

CernVM Online



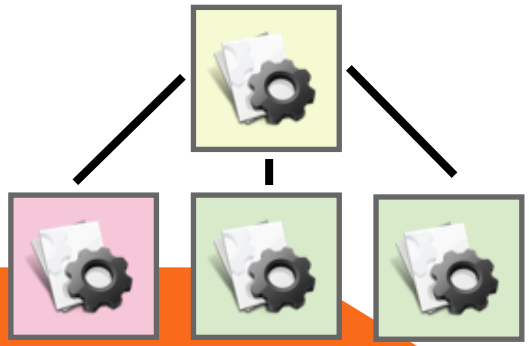
Cluster definition

CernVM Cloud Gateway

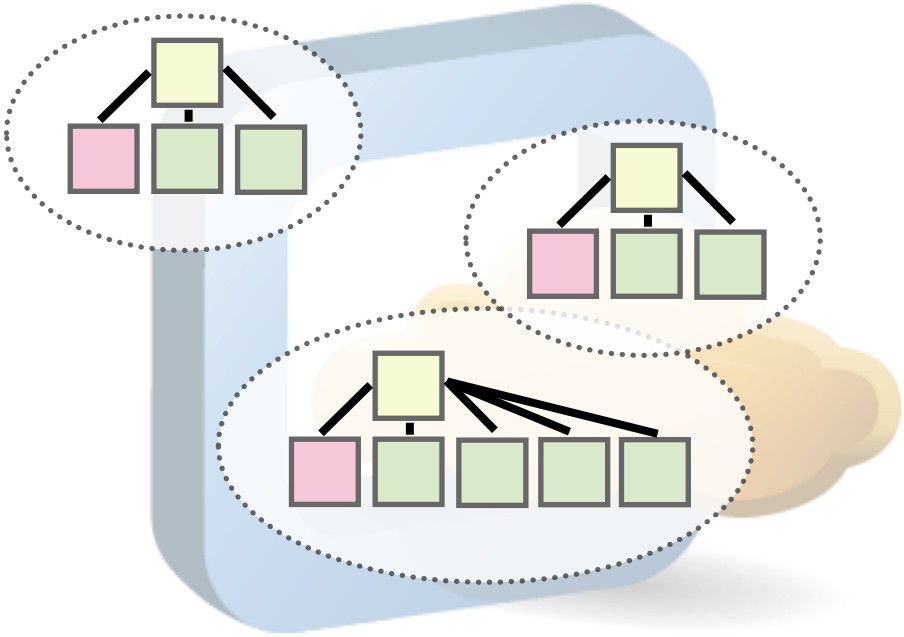
CernVM Online

CernVM Gateway

- Create context definition for each service
- Create a cluster definition :
  - Required offerings (compute, disk, etc…)
  - Minimum number of instances
  - Dependencies on other services

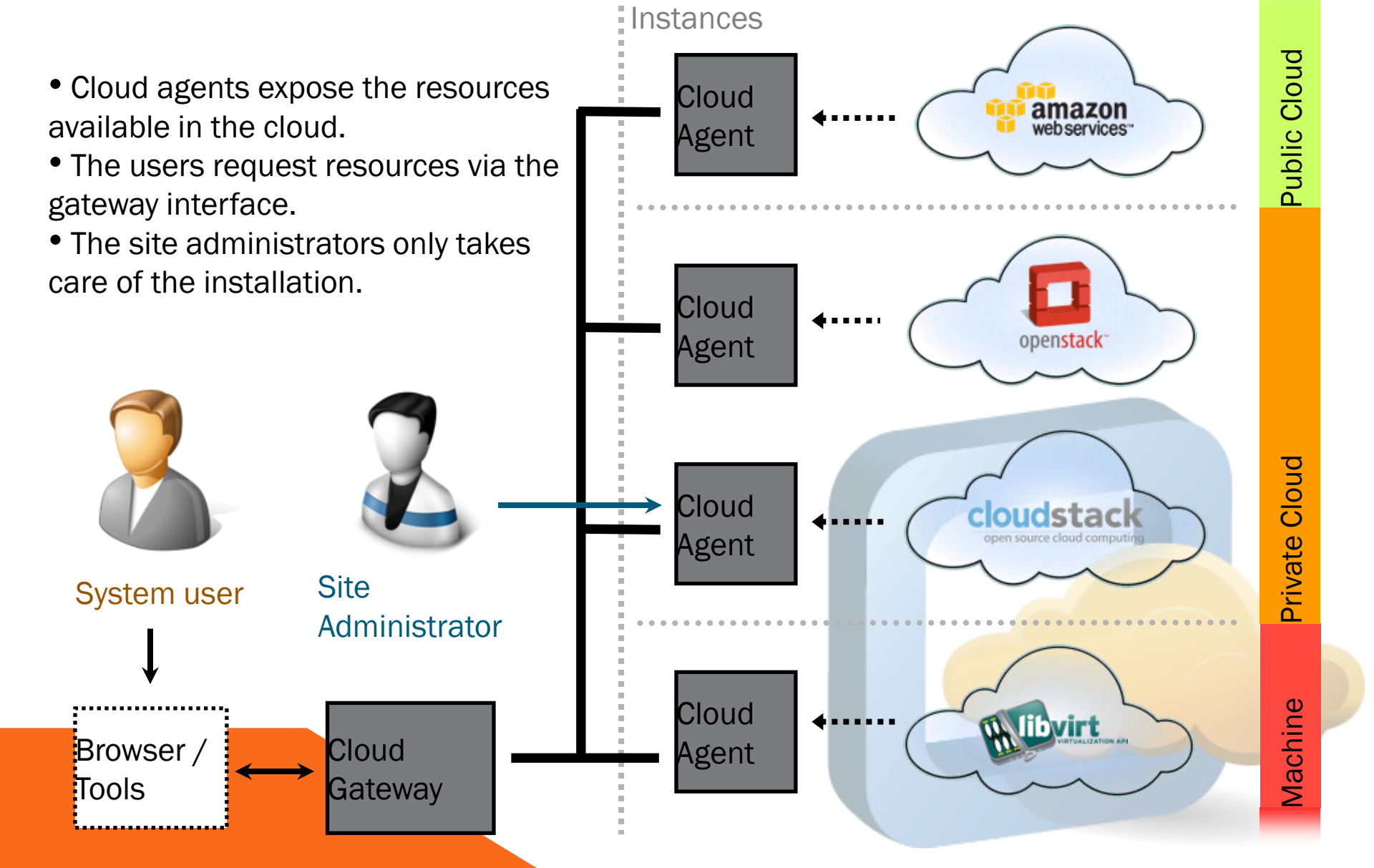


- Instantiate a cluster based on it's definition
- Scale individual services (REST API)



Overview

- Cloud agents expose the resources available in the cloud.
- The users request resources via the gateway interface.
- The site administrators only takes care of the installation.



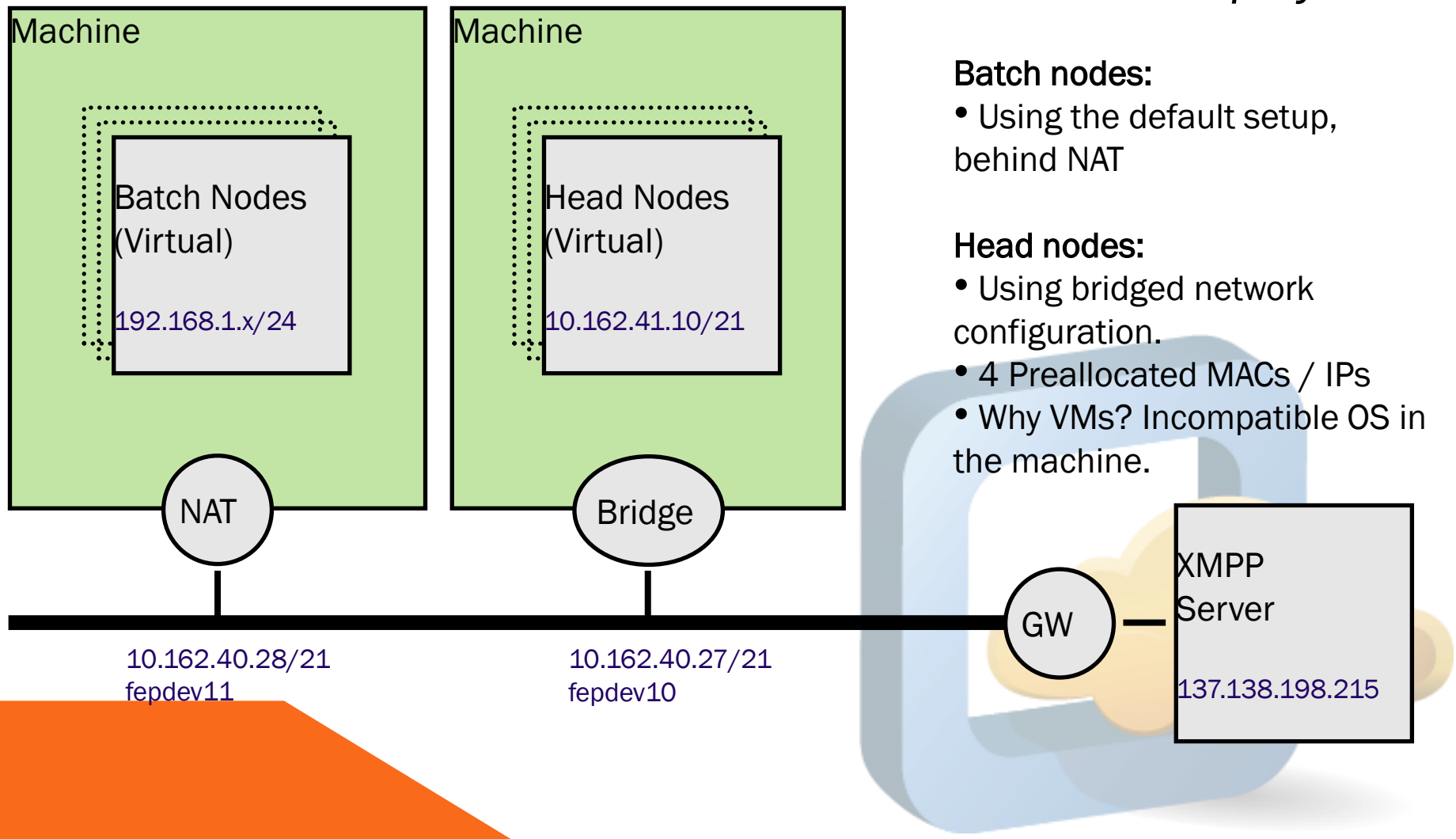
CernVM Cloud Agent

- Implemented adapters for:
  - CloudStack (native API)
  - libvirt (XEN, KVM, VirtualBox, …)
  - EC2 tools (command-line tools wrapper)
  - *OCCI API in development*

✓ CloudStack adapter tested with our infrastructure

✓ Libvirt adapter tested on Alice HLT

Testing deployment on ALICE HLT



Alice HLT Deployment

Batch nodes:

- Using the default setup, behind NAT

Head nodes:

- Using bridged network configuration.
- 4 Preallocated MACs / IPs
- Why VMs? Incompatible OS in the machine.

Conclusions

- ✓ We managed to successfully start a cluster and control instances.
- ✓ We have set-up a CVMFS repository
- Need to adapt AliEn to use CVMFS
  - Simulation, reconstruction, calibration…
- Similar solution can be applied to
  - badly needed on-demand QA cluster(s) for release testing
  - CAF on demand
  - T3 in the box
- Willing to work with other experiments and CernVM team towards a common solution