



ALICE


A JOURNEY OF DISCOVERY

Use of HLT farm and Clouds in ALICE

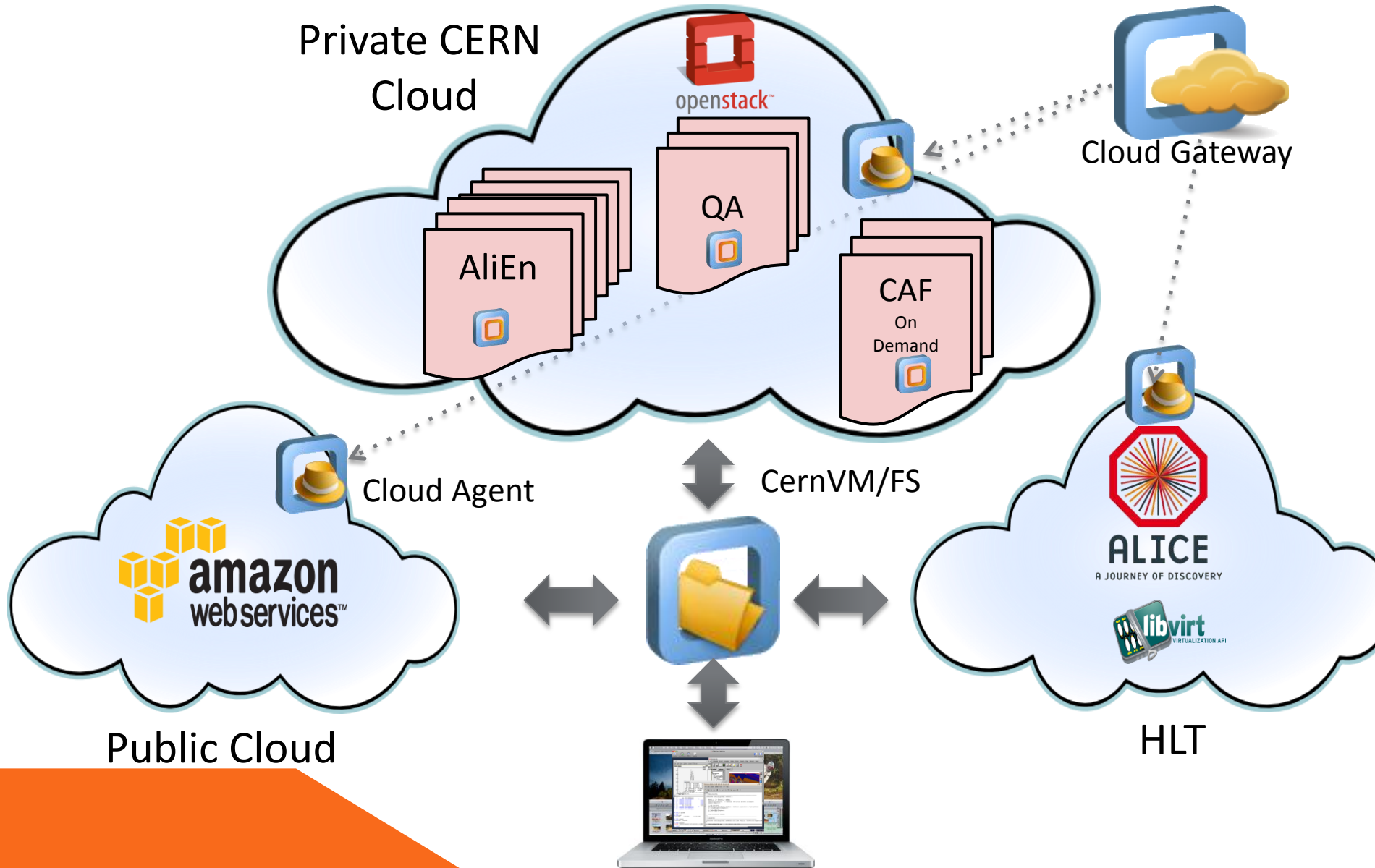
pre-GDB Meeting

15/01/2013

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



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

The image displays two overlapping browser windows from the CernVM Online web interface. The top window is at the URL `https://cernvm-online.cern.ch/cluster/create` and shows the 'Create Cluster' page. The bottom window is at `https://cernvm-online.cern.ch/cluster/clone/6` and shows a 'Service details' modal dialog.

Top Window: Create Cluster

- URL: `https://cernvm-online.cern.ch/cluster/create`
- Logged in as: `icharala`
- Navigation: About, Dashboard, Documentation, Downloads, Publications
- Left sidebar: Commands (Dashboard, Pair an instance, Create Context, Create Cluster), Recent Definitions (Testing-new-features, Graphical, Batch, Head, HLT-Batch), Cluster Definitions (Test, HLT)
- Main content: 'Create Cluster' form with fields for 'Cluster name:', 'Description:', and 'Secret key:'. A 'Create cluster' button is at the bottom.

Bottom Window: Service details

- URL: `https://cernvm-online.cern.ch/cluster/clone/6`
- Logged in as: `icharala`
- Navigation: About, Dashboard, Documentation, Downloads, Publications
- Left sidebar: Same as the top window.
- Main content: 'Service details' modal dialog with the following fields:
 - Service key: Head
 - Context: Head
 - Template: CernVM 2.6.0 Batch Node
 - Min. instances: 1 (Fixed service)
 - Service offering: 512 MB RAM - 1 CPU
 - Disk offering: No disk
 - Network offering: No preference
- Bottom right: A table of services with columns for CPU, Operations, and Scalable services (Workers).

CPU	Operations	Scalable services (Workers)
512 MB RAM - 1 CPU	Del Edit	512 MB RAM - 1 CPU
512 MB RAM - 1 CPU	Del Edit	
- Buttons: Save, Cancel

Cluster definition

CernVM Cloud Gateway

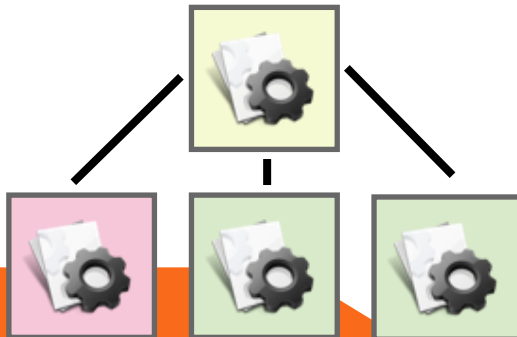


CernVM Online

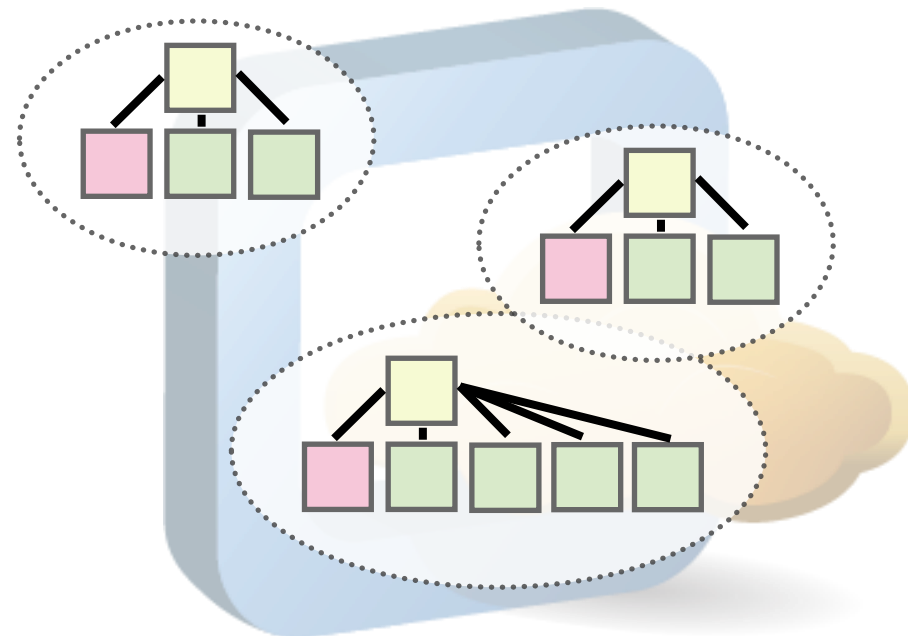


CernVM Gateway

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

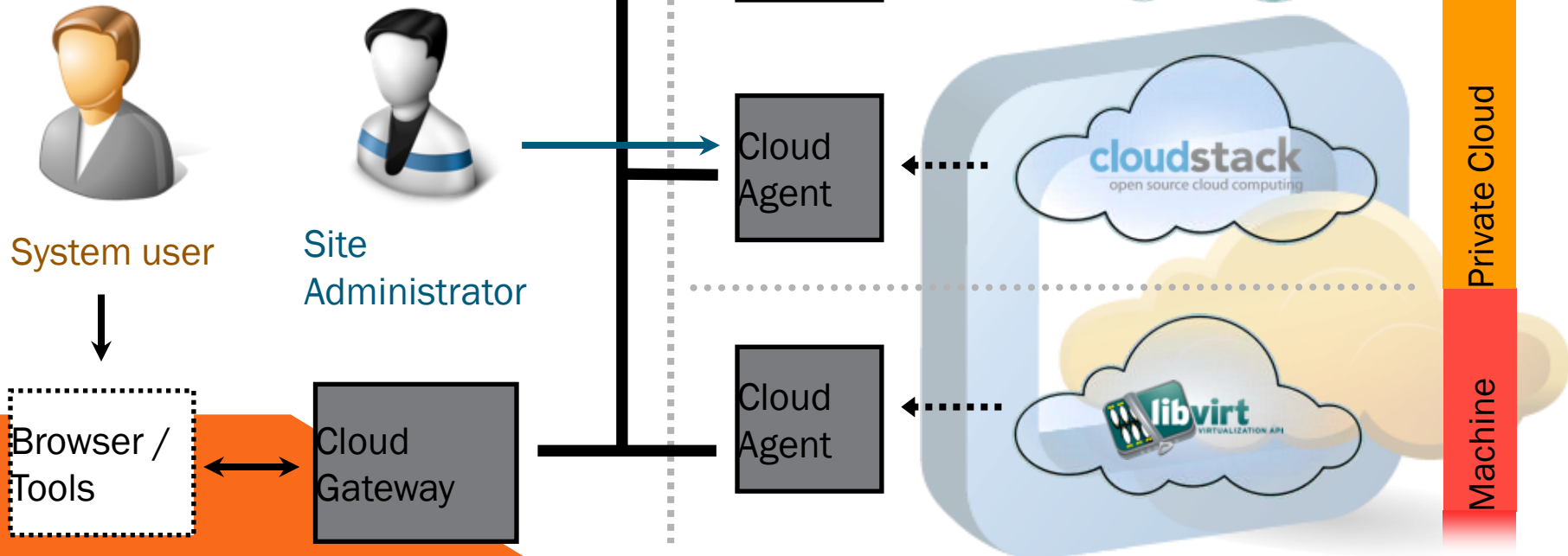


- Instantiate a cluster based on it's **definition**
- Scale individual services (REST API)



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.

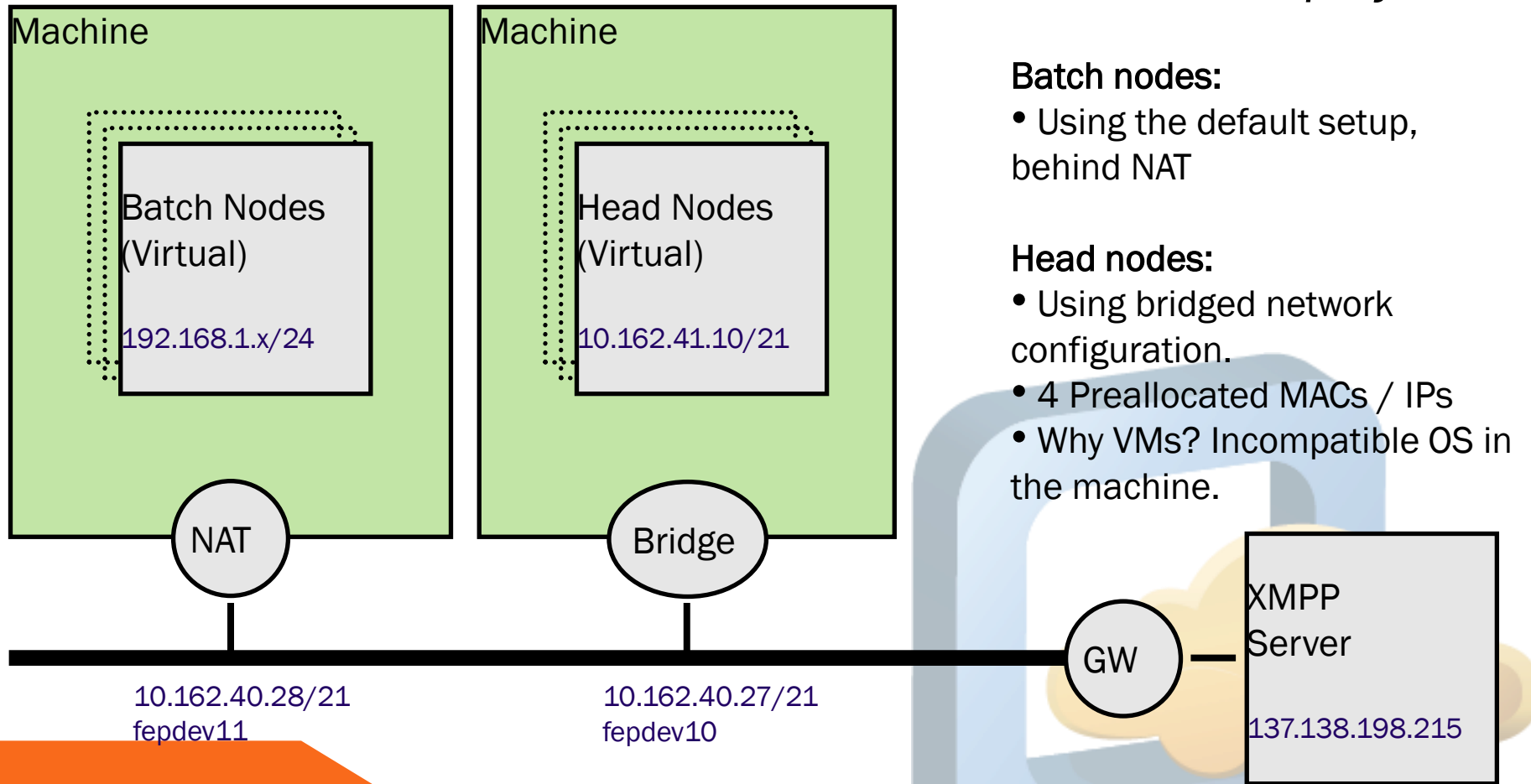


CernVM Cloud Agent

- 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

