

Research on an universal Openstack upgrade solution

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IHEP Cloud : The IHEP private cloud was deployed at Nov 2014. Users and virtual machines grow fast. The Cloud system was scaled at the end of 2015. The resources increased from 8 compute nodes to 24 compute nodes. There are 496 cores and max 350 virtual machines at IHEP Cloud. More than 100 users of unified certification use this system. The IHEP cloud only provides virtual machine service, not provides volumes and not allows user create their own network and storage. The cloud provides UI nodes of IHEP local computing system for local computing system users and Linux testing machines for all users. The infrastructure is like Figure 1.

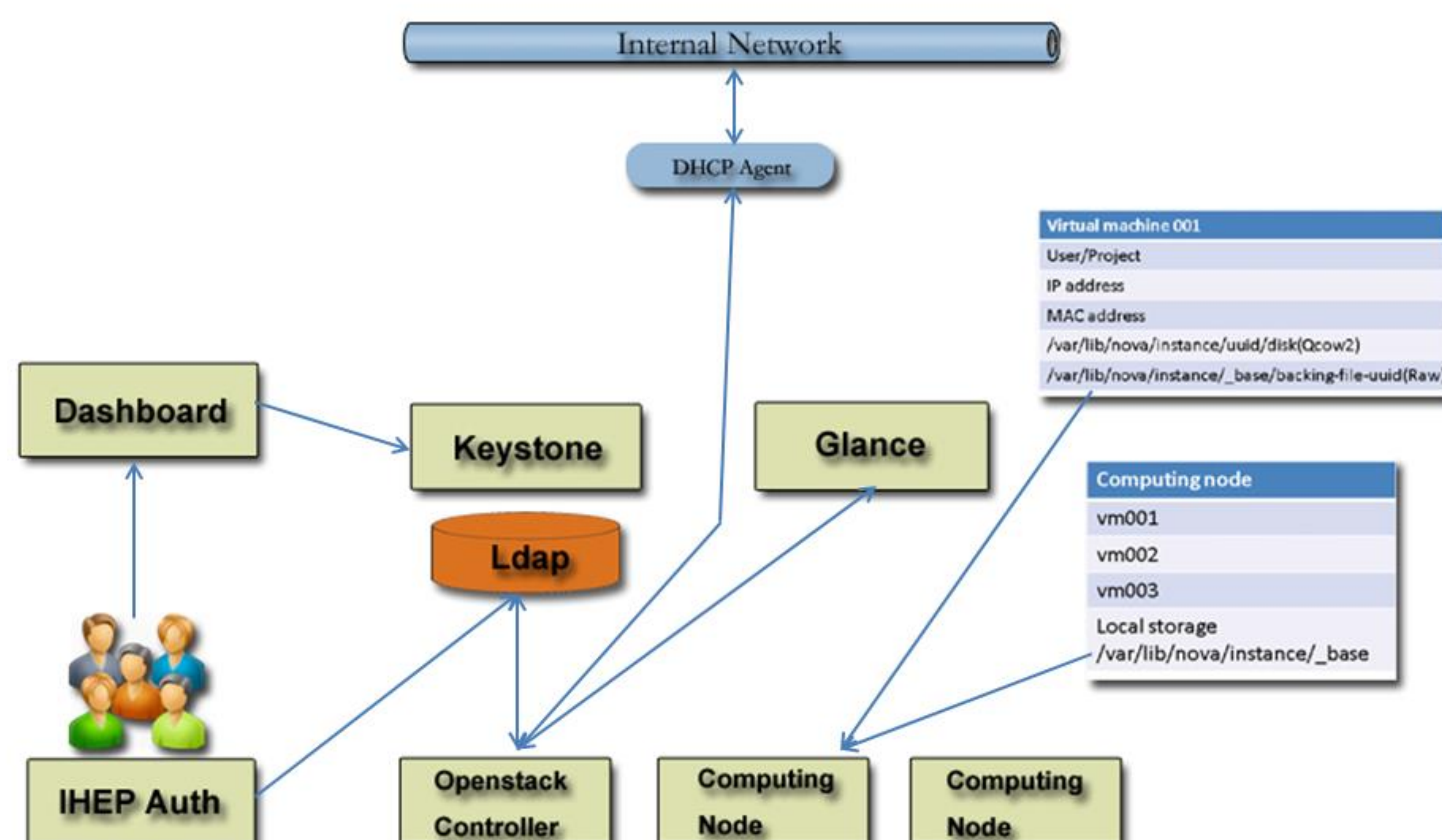


Figure 1: Old IHEP Private Cloud Architecture

Openstack universal Upgrade Solution: we adopted a new approach to achieve major version upgrade in Openstack . That approach is to deploy a new version Openstack Cloud and migrate network, virtual machine, users/project, secgroup rules and so on. IHEP Cloud use the solution to upgrade from Icehouse to Kilo and about 135 virtual machines and more than 100 users had been migrated. The process costs 45 hours.

The Goal of upgrade:

- ✓ To upgrade IHEP cloud from Openstack Icehouse to Kilo
- ✓ To achieve shared storage and instance copy on write;
- ✓ To achieve unified certification both IHEP unified auth users and local users and maintain privilege users such as admin and services or special users;
- ✓ To maintain all users virtual machines

The step of Upgrade

✓ new Cloud deployed

- 1.To install a new Cloud based on Openstack Kilo.
- 2.To install a GlusterFS to support shared storage.
- 3.To modify policies to limit user privilege
- 4.To modify dashboard to achieve IHEP-SSO and unified certification.

✓ Cloud configuration

- 1.Configure network as same as Old Cloud and stop old DHCP
- 2.Import images like old Cloud,
- 3.Configure flavors like old one
- 4.Create users with a local password, and import quota and secgroup rules.

✓ Migrate virtual machines

- 1.Create a new virtual machine with the same ip, mac, flavor, image, project, user
- 2.Stop the new virtual machine and the old one
- 3.Copy increasing image from old Cloud to new location and modify backing file path(the same backing image but not same file name)
- 4.Start the new virtual machine
- 5.Repeat the process until all virtual machines are migrated.

✓ Others

Install unified certification database and system, modify dashboard.

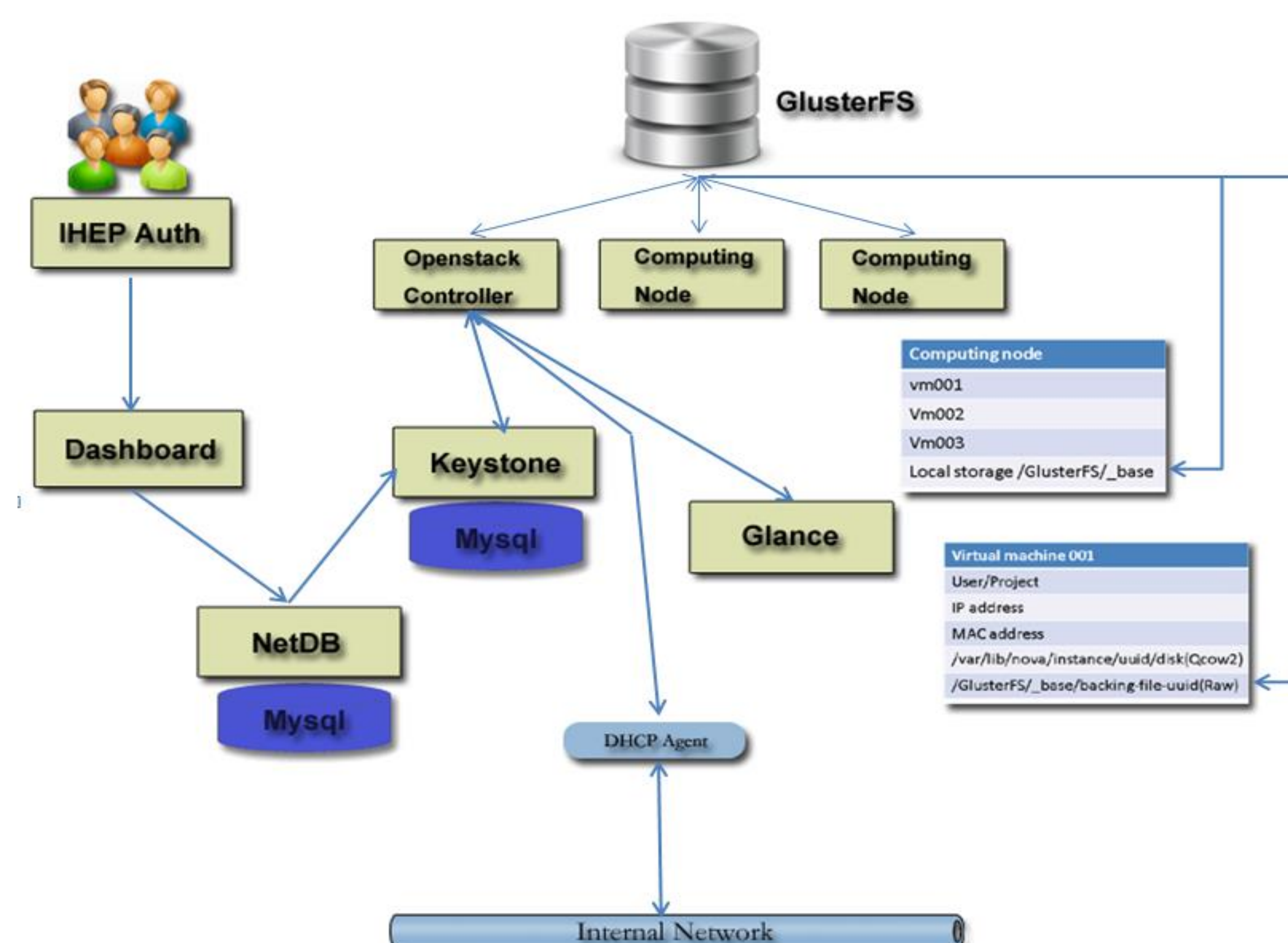


Figure 2: New IHEP Private Cloud Infrastructure