

VRE for regional Interdisciplinary communities in Southeast Europe and the Eastern Mediterranean

Cloud System



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Organization: Polytechnic University of Tirana

Outline

- ❑ Cloud computing
- ❑ OpenStack
- ❑ OpenStack web interface
- ❑ Cloud resource (UPT-Cloud)

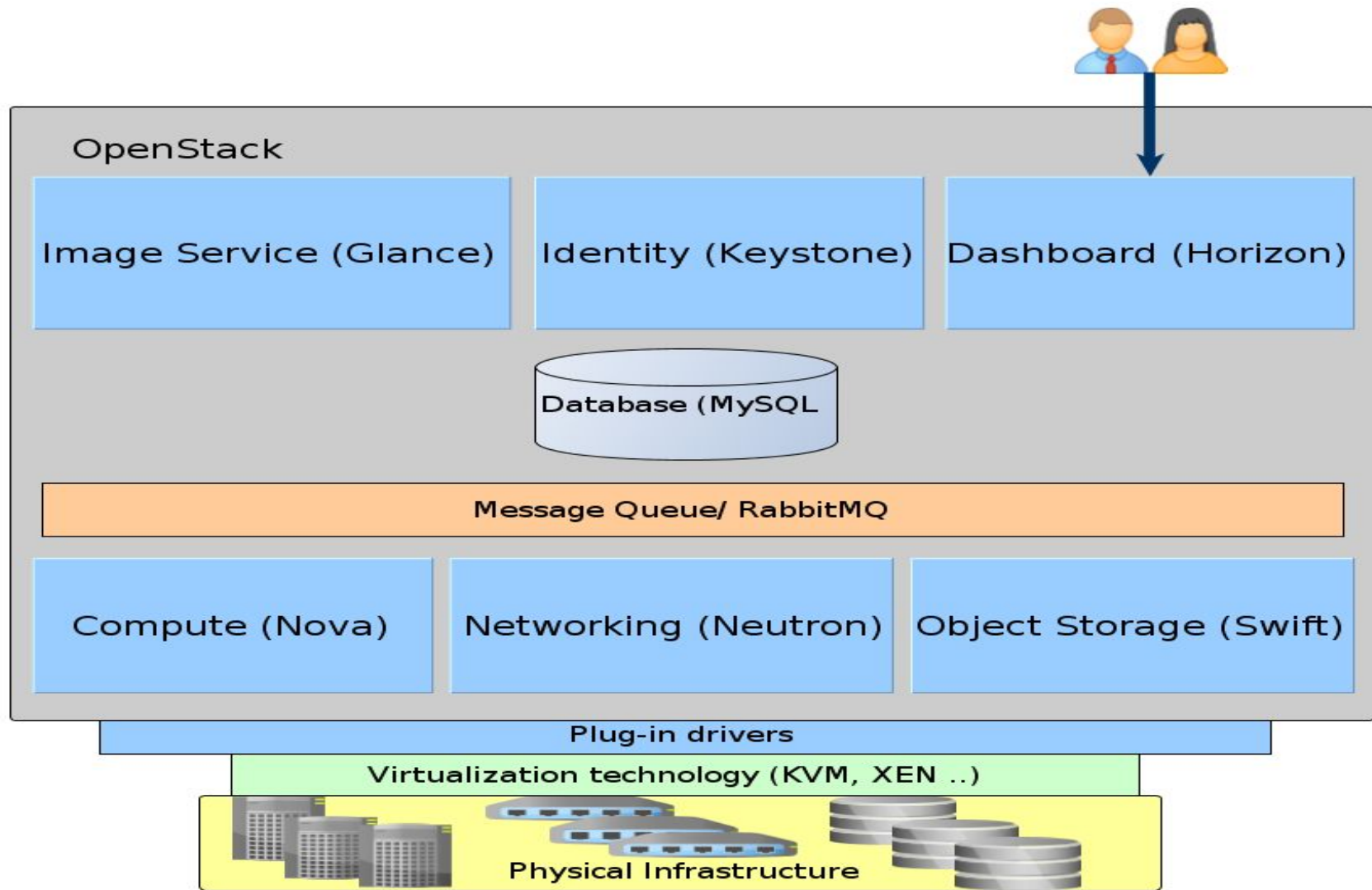
What is Cloud Computing ?

- ❑ A computing model where virtualized IT resources (infrastructure, software) are offered **as a service** to the user over the Internet
- ❑ Cloud computing characteristics:
 - ❑ On-demand, self-service access
 - ❑ Elasticity
 - ❑ Pay-per-use

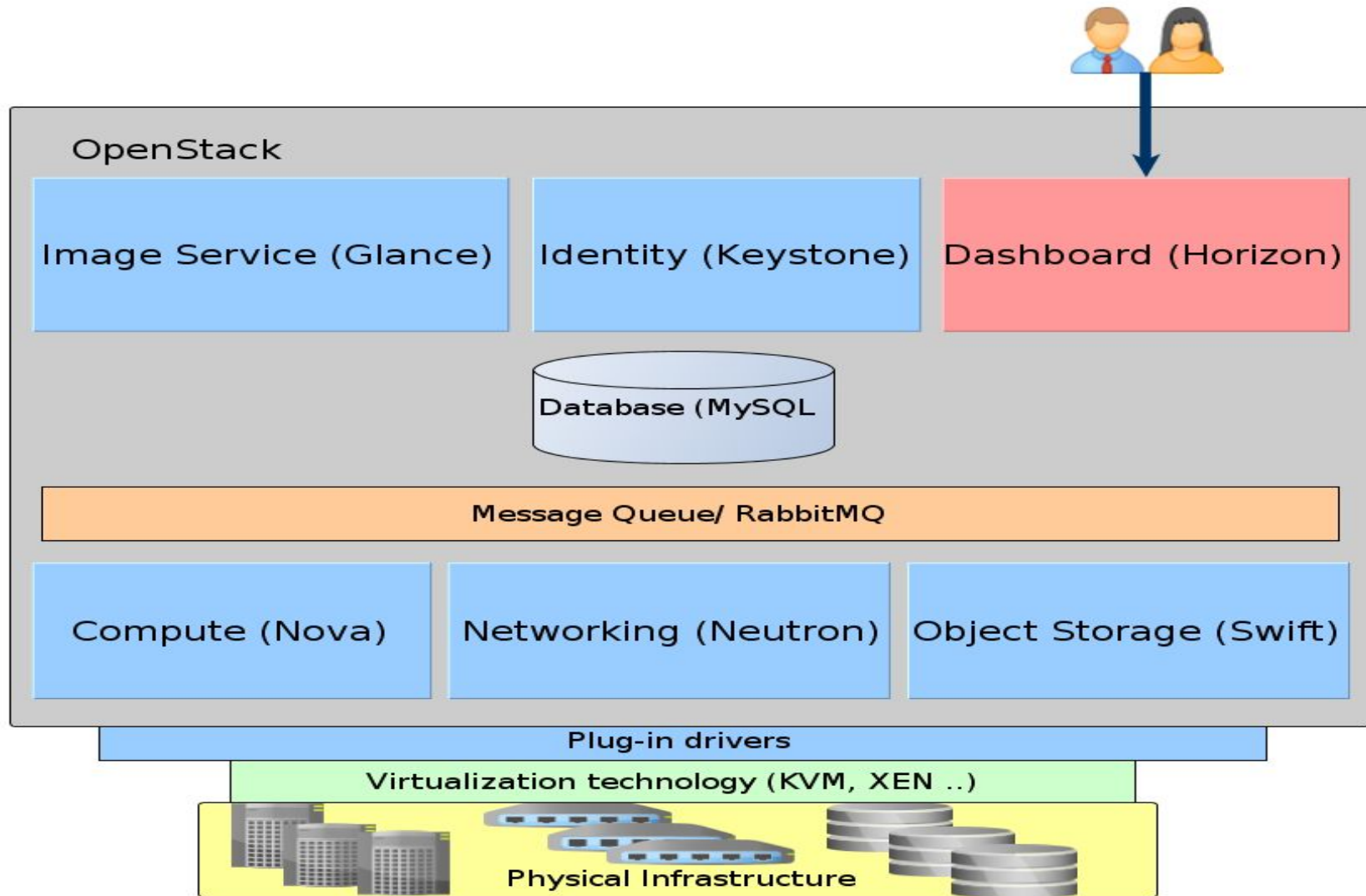
What is OpenStack ?

- ❑ OpenStack is a cloud software for managing a pool of virtualized resources and providing them over the Internet to the user
- ❑ It enables the creation of an **laaS** cloud
- ❑ OpenStack characteristics:
 - ❑ Open source (Python)
 - ❑ Modular and extendable
 - ❑ Scalable

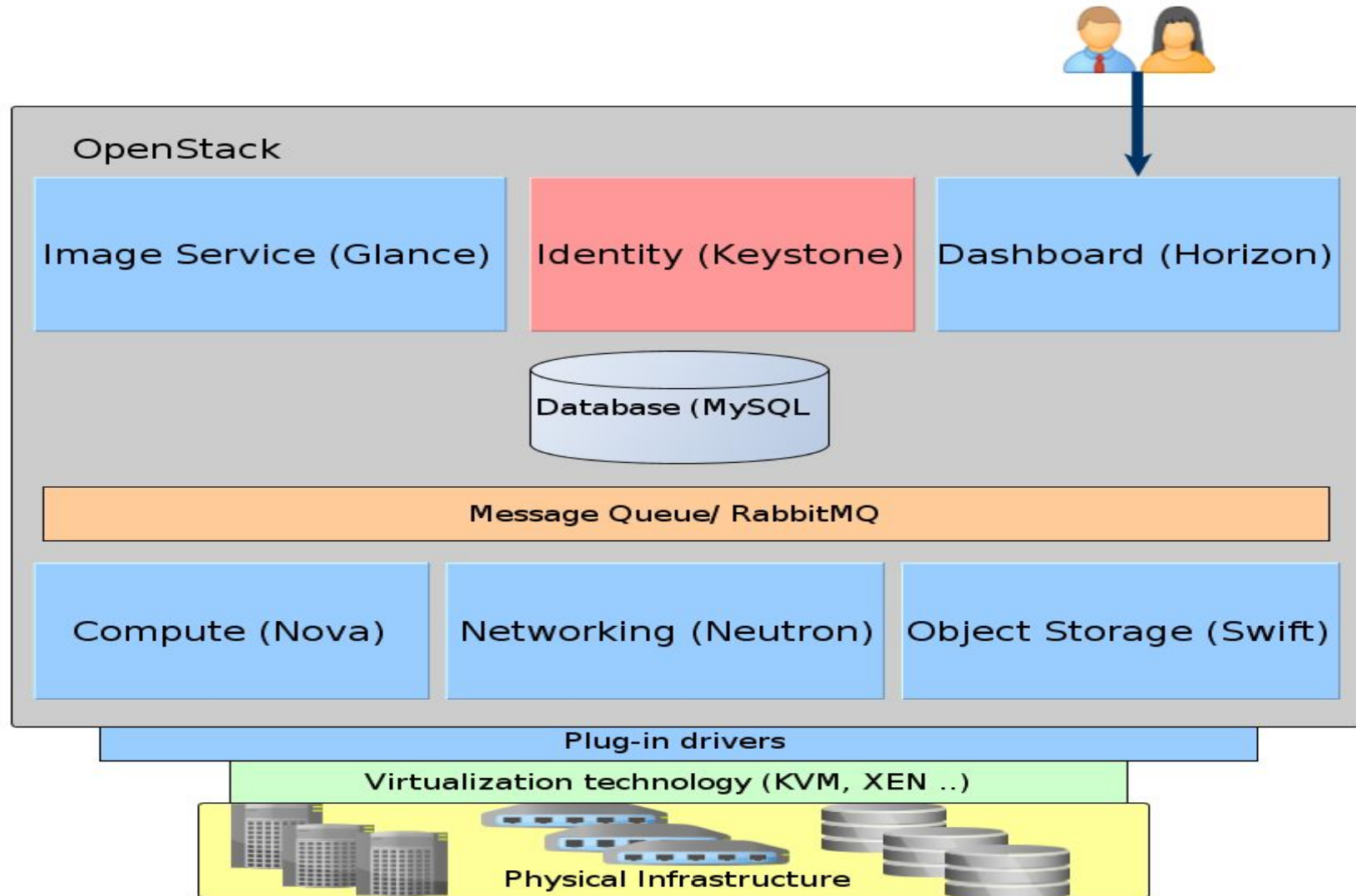
OpenStack Architecture



OpenStack Architecture



OpenStack Architecture



Identity (Keystone)

https://cloud-controller.upt.al/auth/login/

CSE 5306 Distrib... Distributed Syste... Understanding C... Best newly availa... CS 739 - Distribut... Dynamo... Cloud Computing... 6.824 Schedule: S... Distributed S...

ubuntu® OpenStack Dashboard

Log in

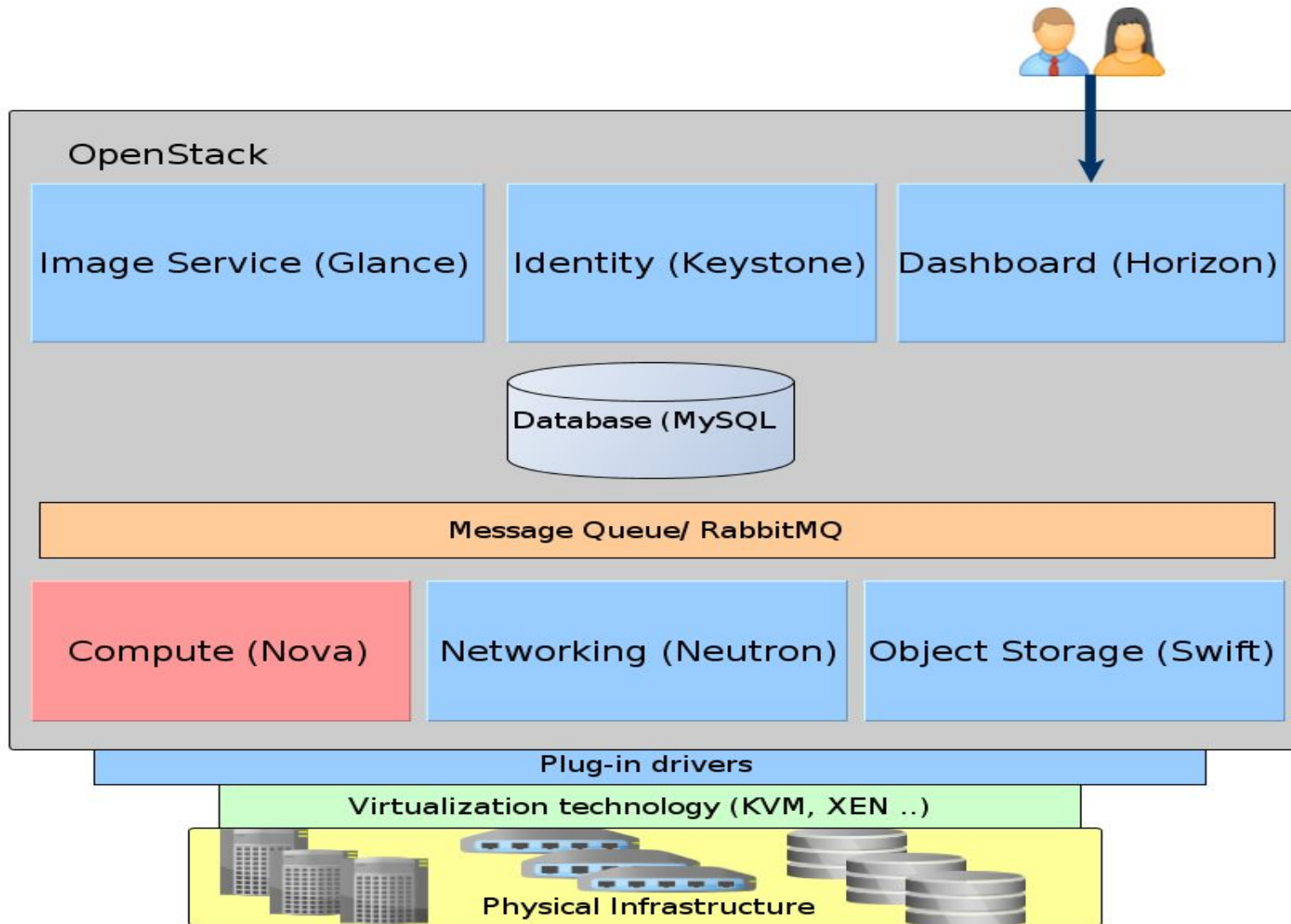
Domain

User Name

Password

Connect

OpenStack Architecture



Compute (Nova)

ubuntu®

default • Hadoop ▾

Project ^

Compute ^

Overview

Instances

Images

Access & Security

Network ▾

Object Store ▾

Identity ▾

Instances

Instance Name = Filter Launch Instance De

<input type="checkbox"/>	Instance Name	Image Name	IP Address	Size	Key Pair	Status	Availability Zone	Task	Power State	Time s
<input type="checkbox"/>	Slave4	Slave4_Copy	172.16.0.23 Floating IPs: 192.168.0.194	HadoopF	Hadoop	Shutoff	Compute2	None	Shut Down	3 mon
<input type="checkbox"/>	Slave2	HadoopImg	172.16.0.9 Floating IPs: 192.168.0.192	HadoopF	Hadoop	Shutoff	Compute4	None	Shut Down	3 mon
<input type="checkbox"/>	Slave1	HadoopImg	172.16.0.8 Floating IPs: 192.168.0.191	HadoopF	Hadoop	Shutoff	Compute3	None	Shut Down	3 mon

Displaying 3 items

Compute (Nova)

Instance Name = <input type="text"/> <input type="button" value="Filter"/> <input type="button" value="Launch Instance"/> <input type="button" value="Delete Instances"/> <input type="button" value="More Actions"/>										
me	IP Address	Size	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions	
py	172.16.0.23 Floating IPs: 192.168.0.194	HadoopF	Hadoop	Shutoff	Compute2	None	Shut Down	3 months, 1 week	Start Instance	
ig	172.16.0.9 Floating IPs: 192.168.0.192	HadoopF	Hadoop	Shutoff	Compute4	None	Shut Down	3 months, 2 weeks	Start Instance	
ig	172.16.0.8 Floating IPs: 192.168.0.191	HadoopF	Hadoop	Shutoff	Compute3	None	Shut Down	3 months,	<div>Create Snapshot Disassociate Floating IP Attach Interface Detach Interface Edit Instance Update Metadata Resize Instance Lock Instance Unlock Instance Soft Reboot Instance Hard Reboot Instance Rebuild Instance Delete Instance</div>	

Compute (Nova)

Launch Instance

Details *

Source *

Flavor *

Networks *

Network Ports

Security Groups

Key Pair

Configuration

Metadata

Flavors manage the sizing for the compute, memory and storage capacity of the instance.

Allocated

Name	VCPUS	RAM	Total Disk	Root Disk	Ephemeral Disk	Public
Select an item from Available items below						

▼ Available 8

Select one

Q Click here for filters.						
Name	VCPUS	RAM ▲	Total Disk	Root Disk	Ephemeral Disk	Public
> m1.nano	1	64 MB	1 GB	1 GB	0 GB	Yes
> m1.tiny	1	512 MB	1 GB	1 GB	0 GB	Yes
> HadoopF	1	512 MB	20 GB	20 GB	0 GB	No

OpenStack Architecture

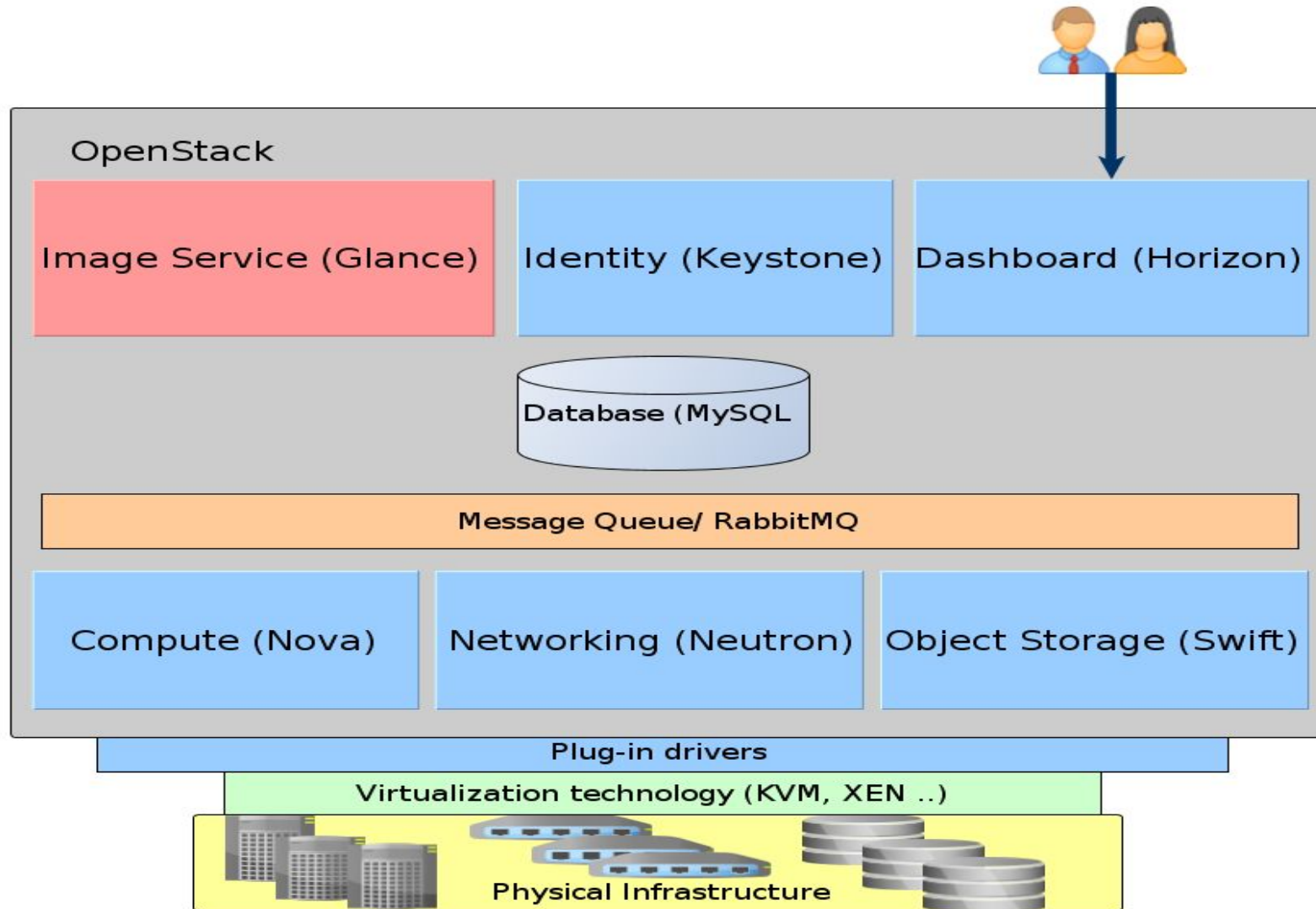


Image Service (Glance)

Project ^

Compute ^

Overview

Instances

Images

Access & Security

Network v

Object Store v

Identity v

Images

 Project (3)  Shared with Me (0)  Public (1) [+ Create Image](#) 

<input type="checkbox"/>	Image Name	Type	Status	Public	Protected	Format	Size
<input type="checkbox"/>	HadoopImg	Image	Active	No	No	QCOW2	248.9 MB
<input type="checkbox"/>	MasterCopy	Snapshot	Active	No	No	QCOW2	2.4 GB
<input type="checkbox"/>	Slave4_Copy	Snapshot	Active	No	No	QCOW2	2.3 GB

Displaying 3 items

Image Service (Glance)

Create An Image

Name *

Description

Image Source

Image Location ?

Format *

Architecture

Minimum Disk (GB) ?

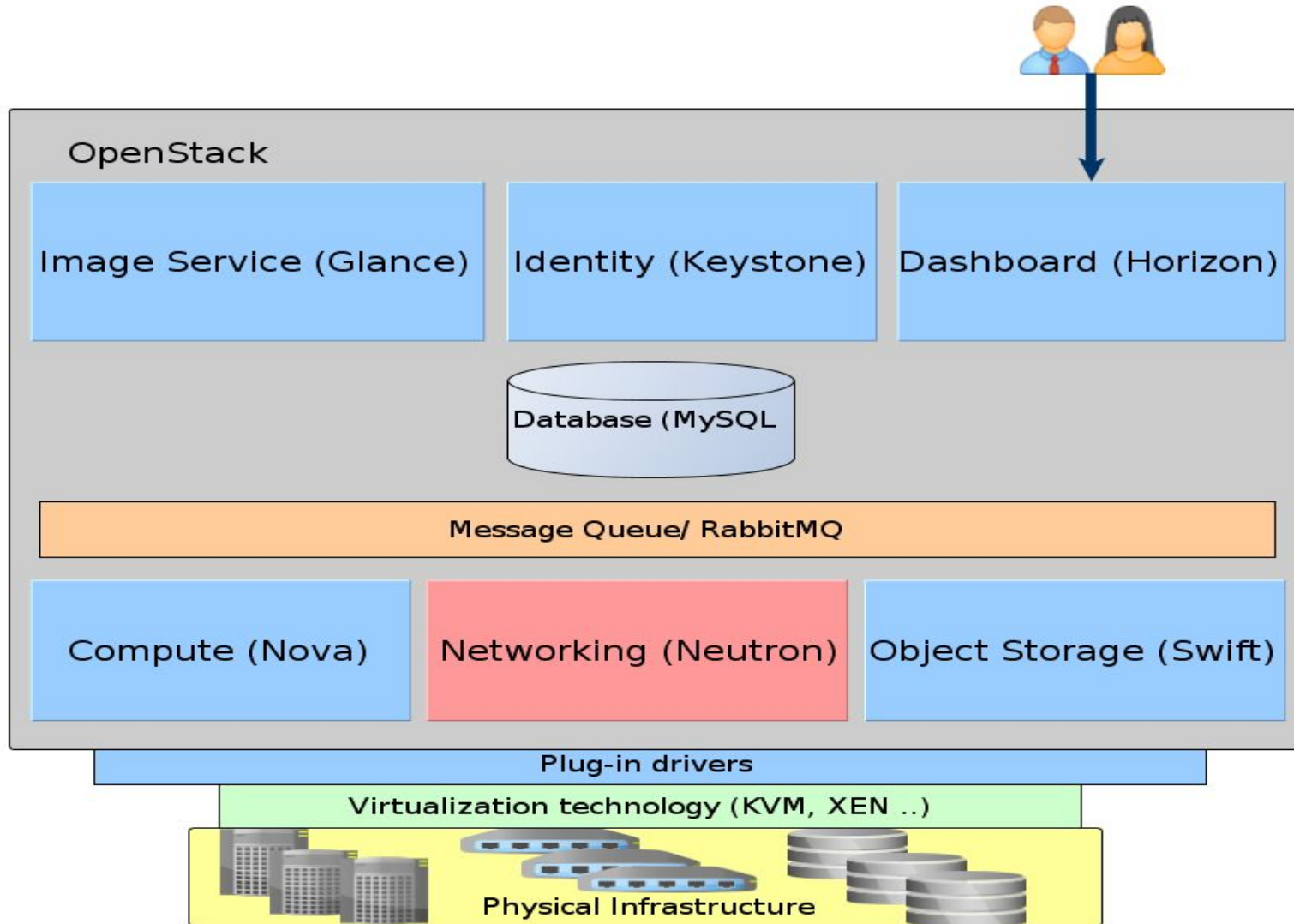
Minimum RAM (MB) ?

Description:

Currently only images available via an HTTP/HTTPS URL are supported. The image location must be accessible to the Image Service.

Please note: The Image Location field MUST be a valid and direct URL to the image binary. URLs that redirect or serve error pages will result in unusable images.

OpenStack Architecture



Networking (Neutron)

Project ^

Compute v

Network ^

Network Topology

Networks

Routers

Object Store v

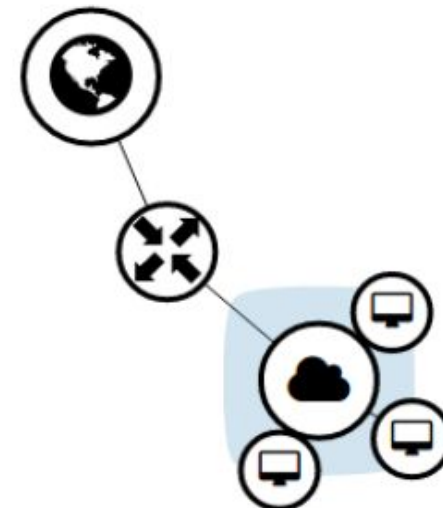
Identity v

Network Topology

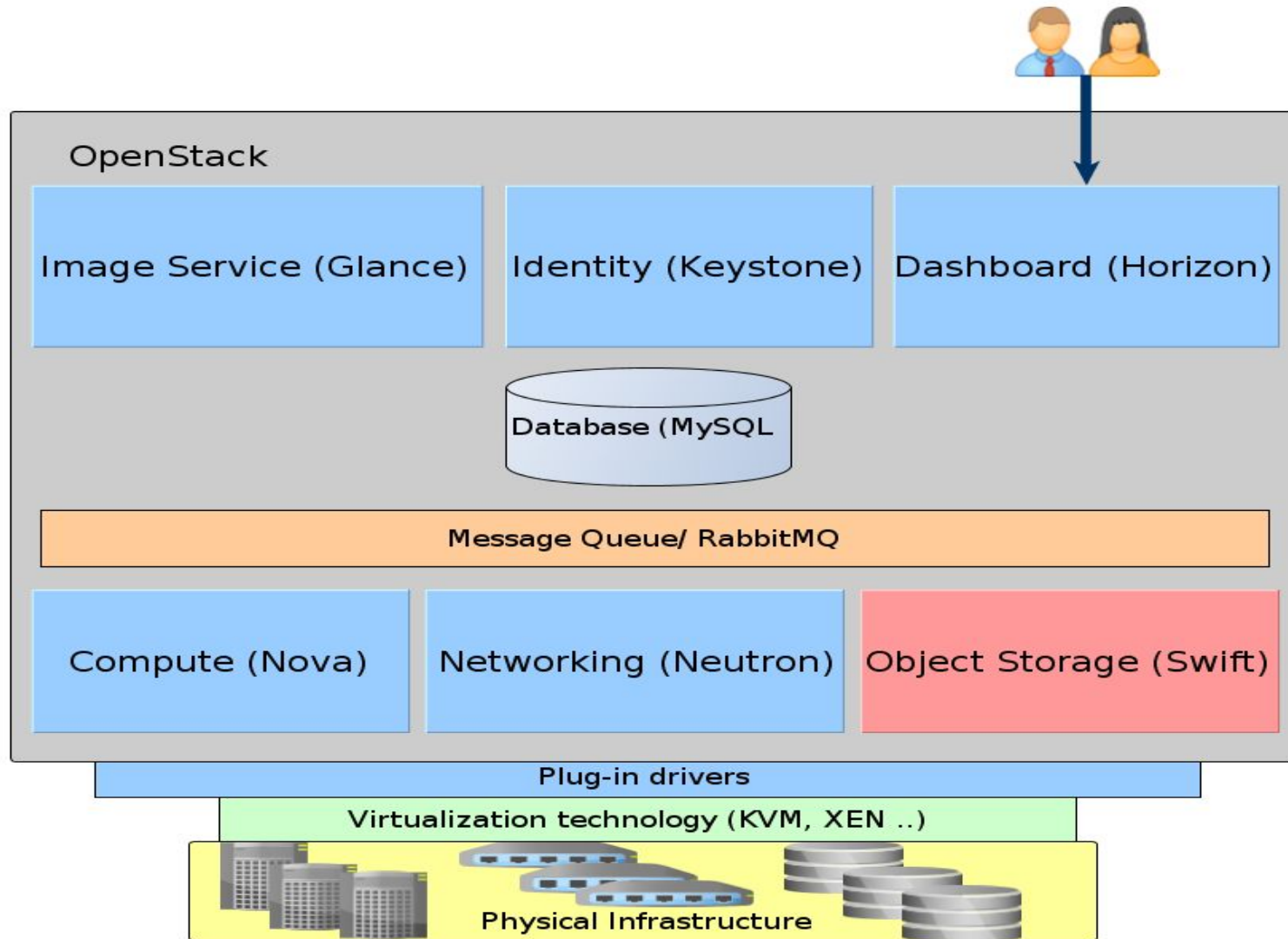
Resize the canvas by scrolling up/down with your mouse/trackpad on the topology. Pan around the canvas by click

 Toggle labels

 Toggle Network Collapse



OpenStack Architecture



Object Storage (Swift)

Project ^

Compute v

Network v

Object Store ^

Containers

Identity v

Containers

+ Container

Select a container to browse.

Cloud Resource (UPT-Cloud)

- ❑ 4 nodes (dual-core Intel Xeon, 1.86GHz, 2GB RAM + 80GB HDD)
- ❑ OpenStack (Mitaka)
 - ❑ 1 cloud controller node (identity,image,compute,dashboard,network)
 - ❑ 3 compute nodes (running VM instances on KVM hypervisor)
 - ❑ 1 VM has: 1 VCPU , 512MB - 1GB RAM, 30GB HDD
 - ❑ VMs running Ubuntu 14.04 Linux
 - ❑ Total: 6 VMs available for the project
 - ❑ For the moment VMs have only private ip addresses