
Introduction to OpenStack

Shihabur R. Chowdhury
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University of Waterloo

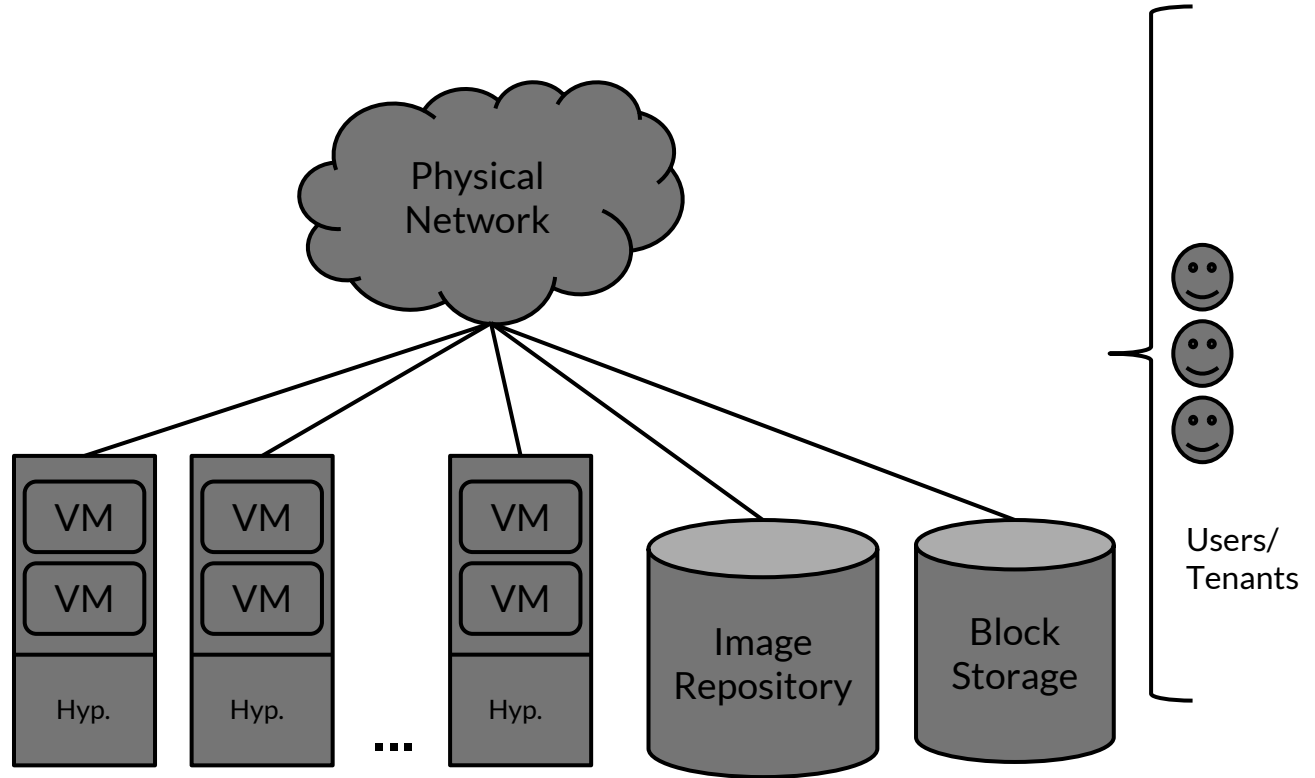
Outline

- History
 - What is OpenStack and Why?
 - OpenStack Components
 - OpenStack Concepts
 - Hands on
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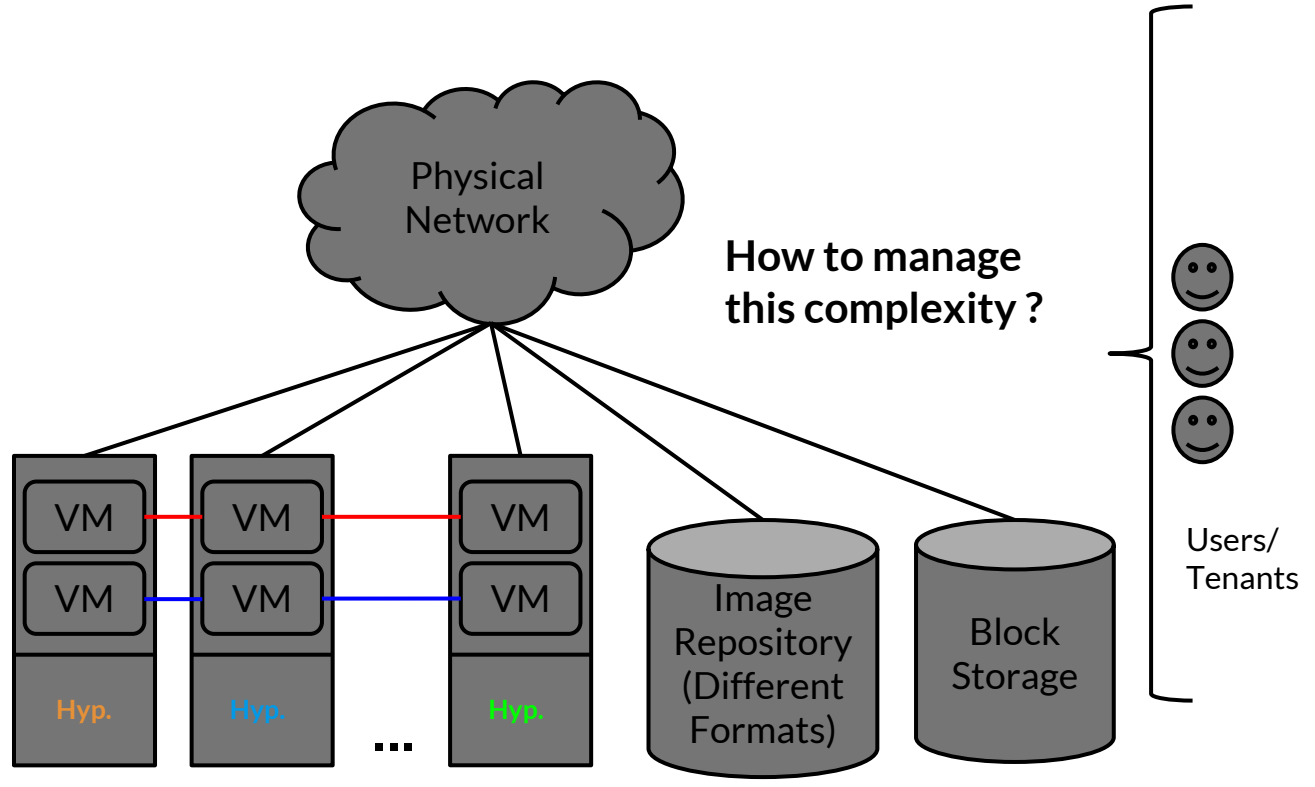
History

- 2010 - NASA and RackSpace launches OpenStack
 - 2011 - Canonical joins in
 - 2012 - Red Hat joins in
 - 2013 - NASA opts out, Oracle jumps in
 - 2014 - HP signs in
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What is OpenStack and Why?

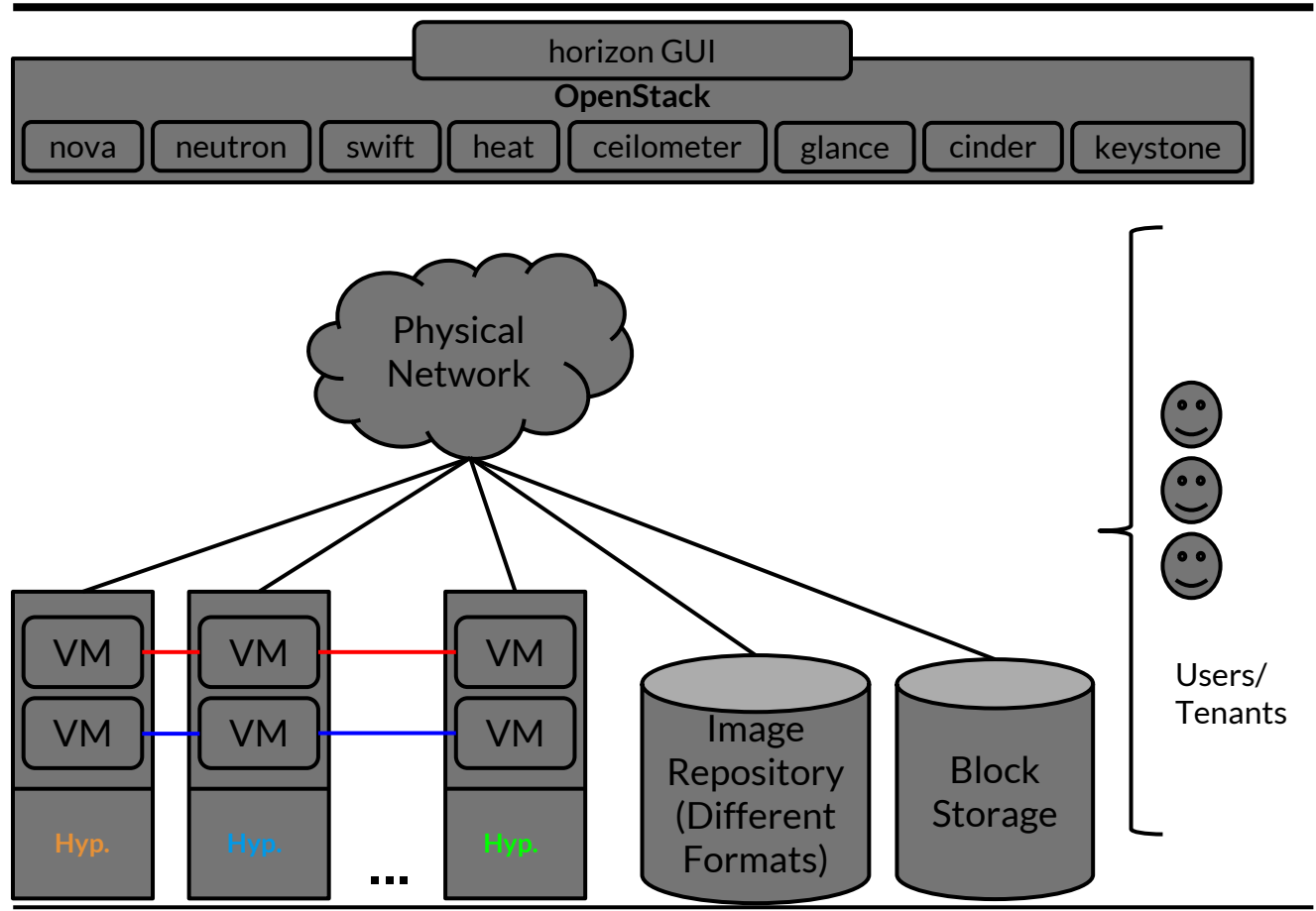


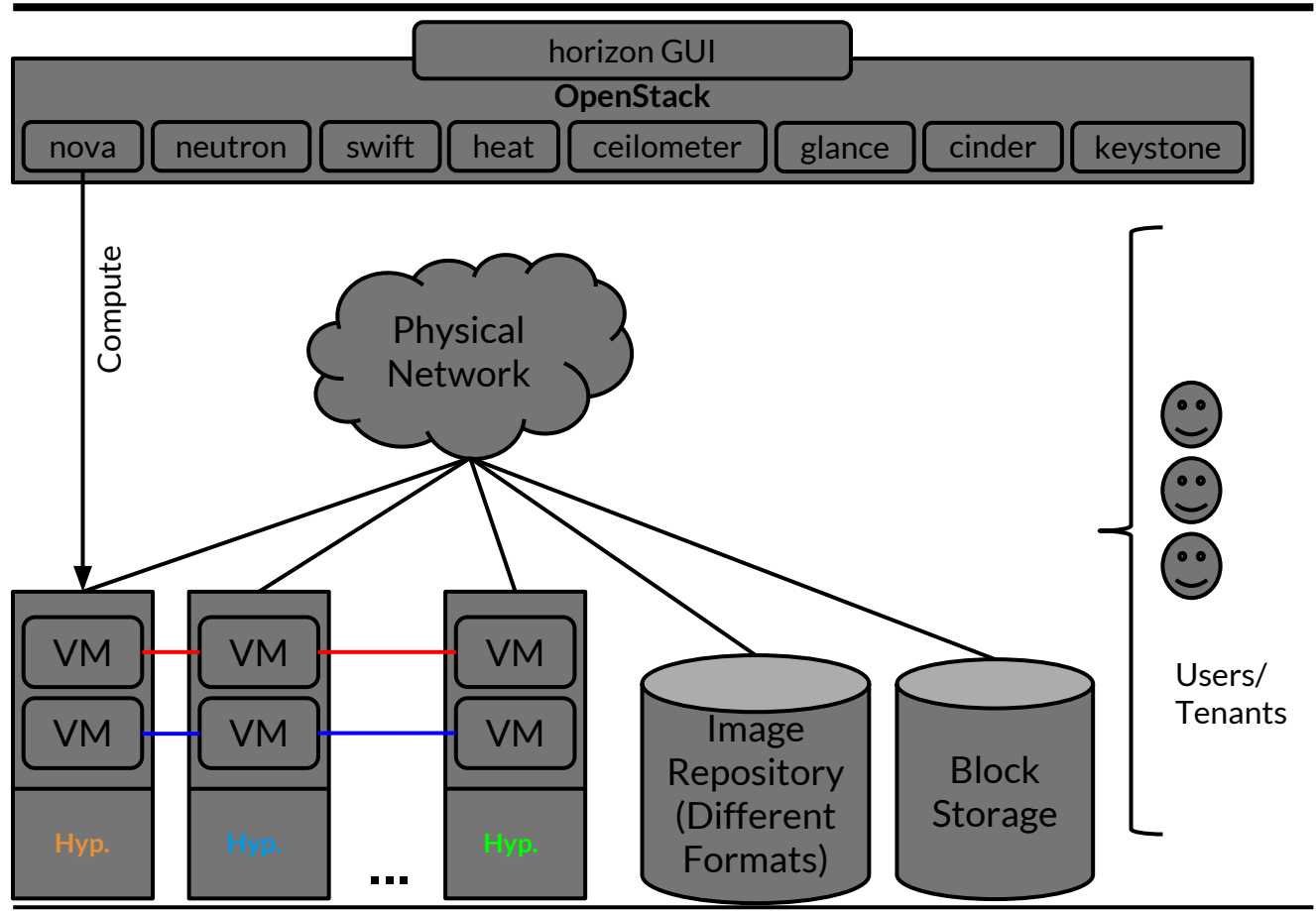
What is OpenStack and Why?

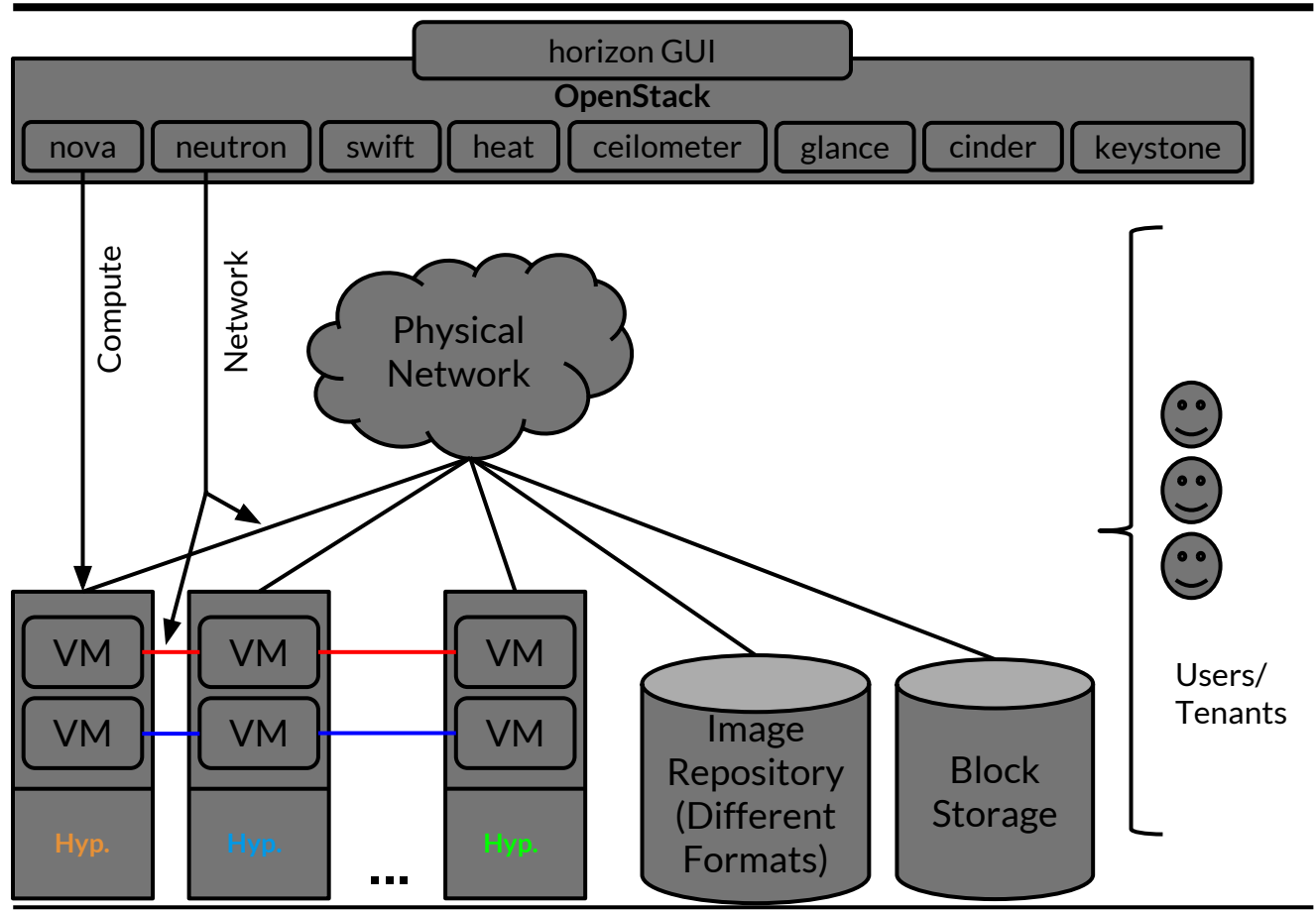


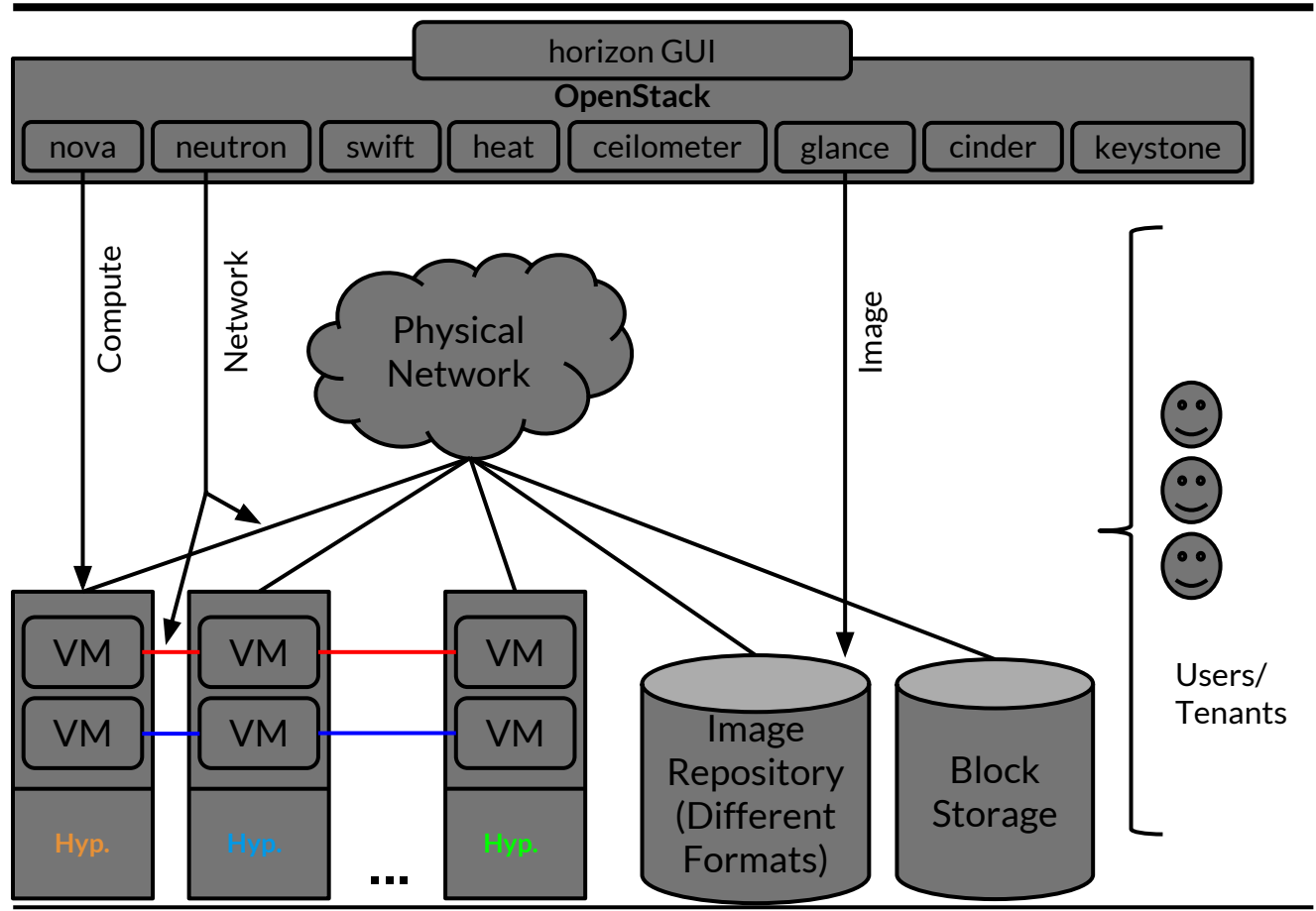
Why OpenStack ?

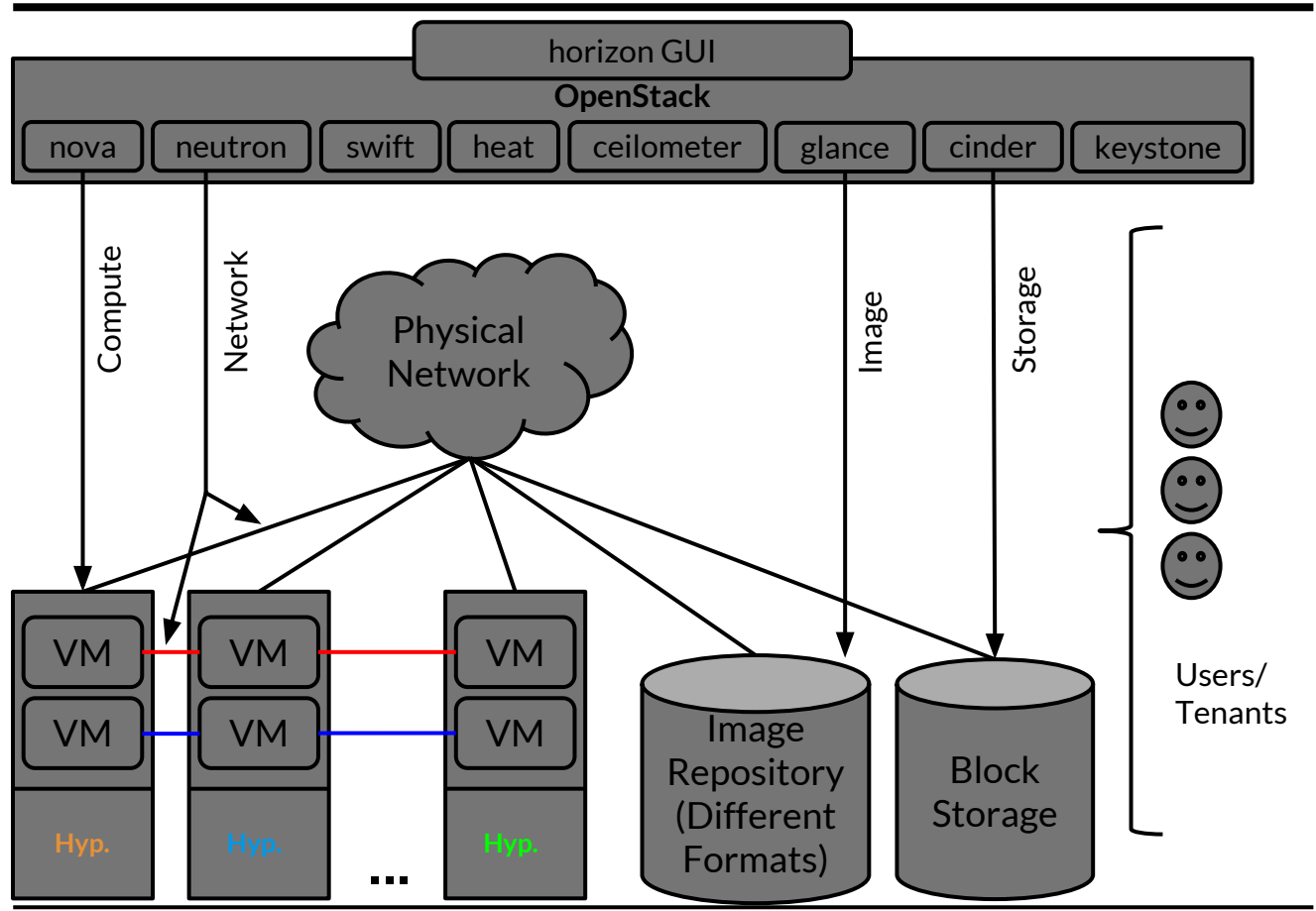
- Manages heterogenous pool of resources
 - Compute, Network, Storage
 - Works with heterogenous technologies
 - KVM, ESXi, Hyper-V etc.
 - Linux bridge, Open vSwitch etc.
 - Management via GUI and APIs
 - Command Line Interface
 - RESTful API with different language bindings
 - Python, Ruby, Java etc.
 - Open source
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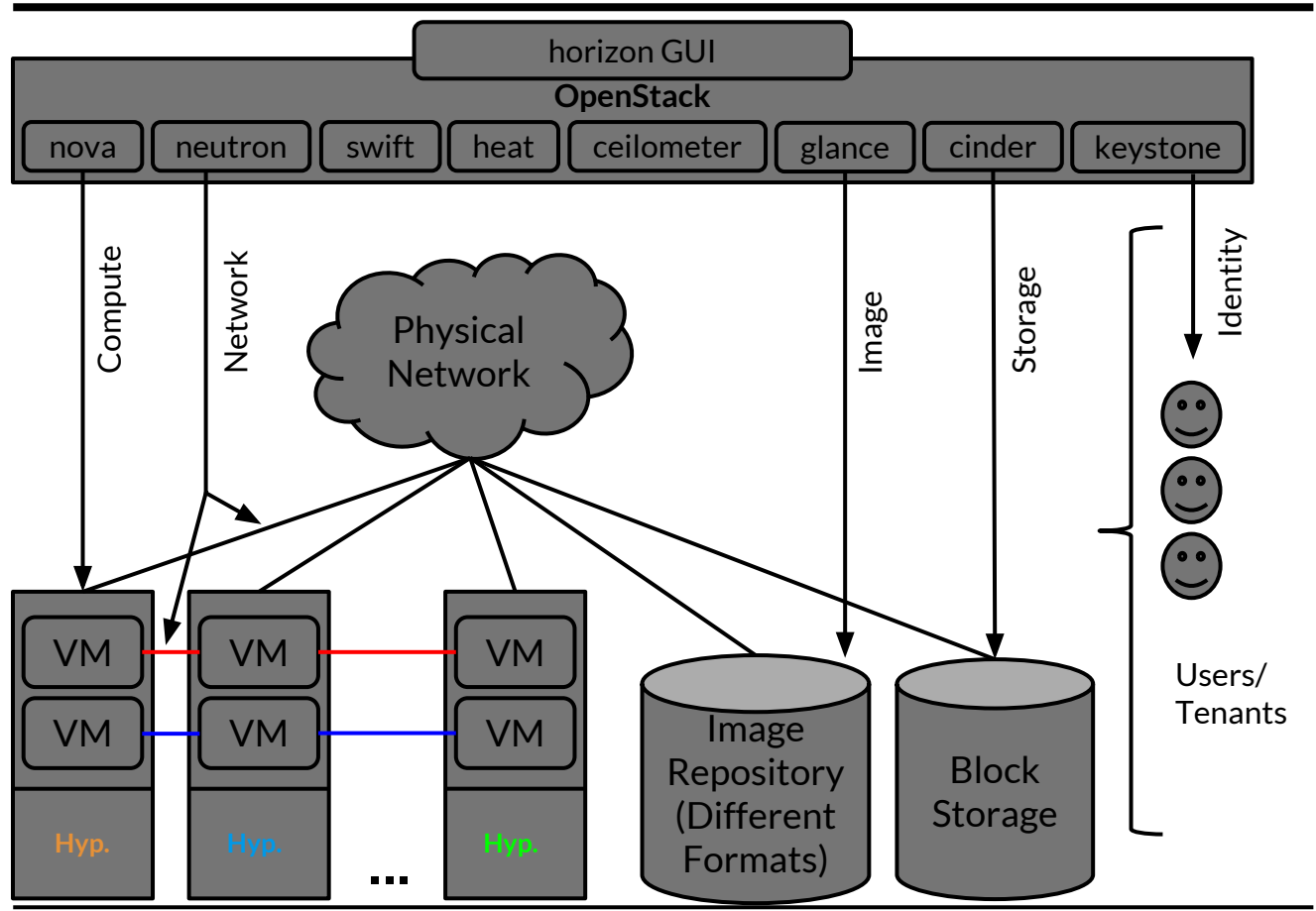












OpenStack Components

Nova	Provisions and manages Virtual Machines. It can work with hypervisors such as VMWare, Hyper-V, KVM etc.
Neutron	The virtual network manager.
Cinder	Responsible for managing block storage.
Glance	The VM image registry.
Horizon	The user facing GUI dashboard. Implemented using Django.
Swift	A highly available, fault tolerant, horizontally scalable object storage.
Heat	OpenStack application orchestrator.
Ceilometer	The cloud monitor. Can be integrated with heat to provide services like autoscaling.
Keystone	OpenStack identity manager. Uses MySQL database at the backend.

Other OpenStack Components

Manila	Shared file system service for VMs.
Ironic	Bare metal server manager. Integrates with IPMI or PXE to manage bare metal hardware, <i>i.e.</i> , physical servers
Magnum	OpenStack container (Docker/LXC) orchestrator.
Sahara	Data analytics cluster manager for Hadoop/Spark.

OpenStack Concepts - Identity

- Tenant
 - A group of “users” belonging to an isolated set of resources.
 - Analogous to Linux “groups”
 - Tenants are unaware of each other’s resources
 - User
 - A user or service using OpenStack
 - A user can be assigned to a tenant
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OpenStack Concepts - Compute

- Availability zones
 - A group of physical servers
 - Grouped based on some common property
 - Same data center
 - Same rack
 - Same power source, etc.
 - Semantics is used by administrators to ensure high availability
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OpenStack Concepts - Network

- Security groups
 - Group of firewall rules
 - A VM can be member of one or more security groups

OpenStack Concepts - Storage

- Ephemeral Storage
 - Lives only the lifetime of a VM
 - Data is lost as soon as a VM terminates
 - Cinder block storage
 - Provides block storage service for VMs
 - Suitable for creating disk for VMs, expandable file systems, RDBMS etc.
 - Swift object storage
 - Simple HTTP API for object storage and retrieval
 - Suitable for storing large objects, e.g., disk images
 - Not suitable for using as a disk for a virtual machine
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Questions ?
