



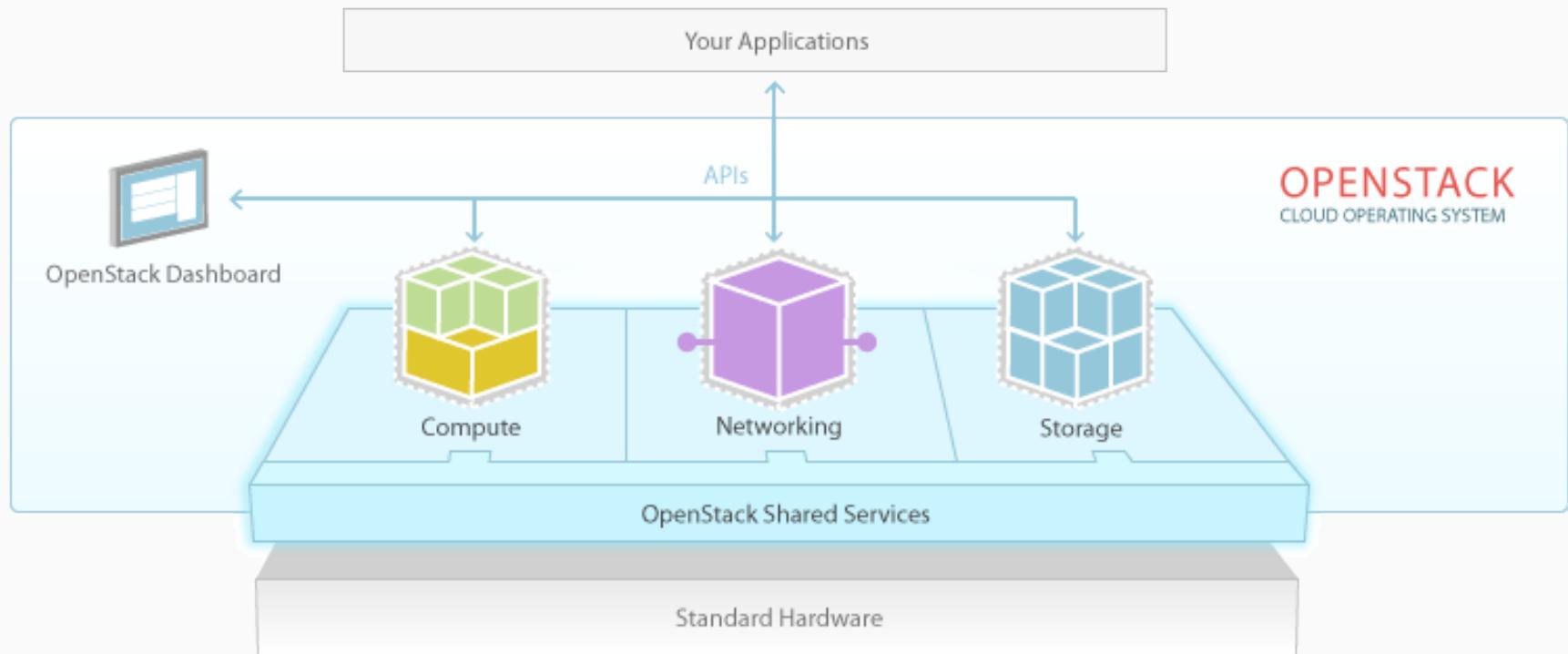
DESIGN YOUR PRIVATE CLOUD WITH RED HAT OPENSTACK PLATFORM



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Emerging Technologies team

WHAT IS OPENSTACK?



Cloud operating system

WHAT IS RED HAT OPENSTACK PLATFORM?



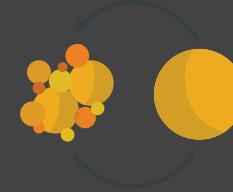
INFRASTRUCTURE AS A SERVICE



ALWAYS UP TO DATE

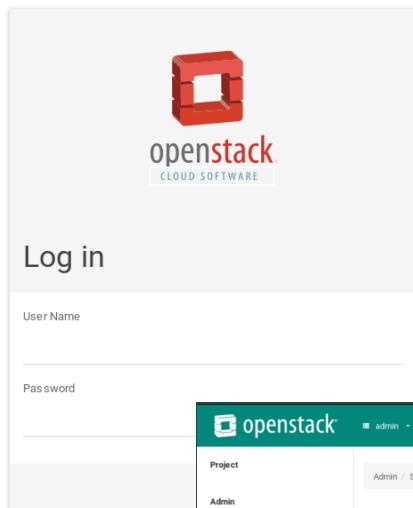


TRUSTED



STABLE

DEVSTACK



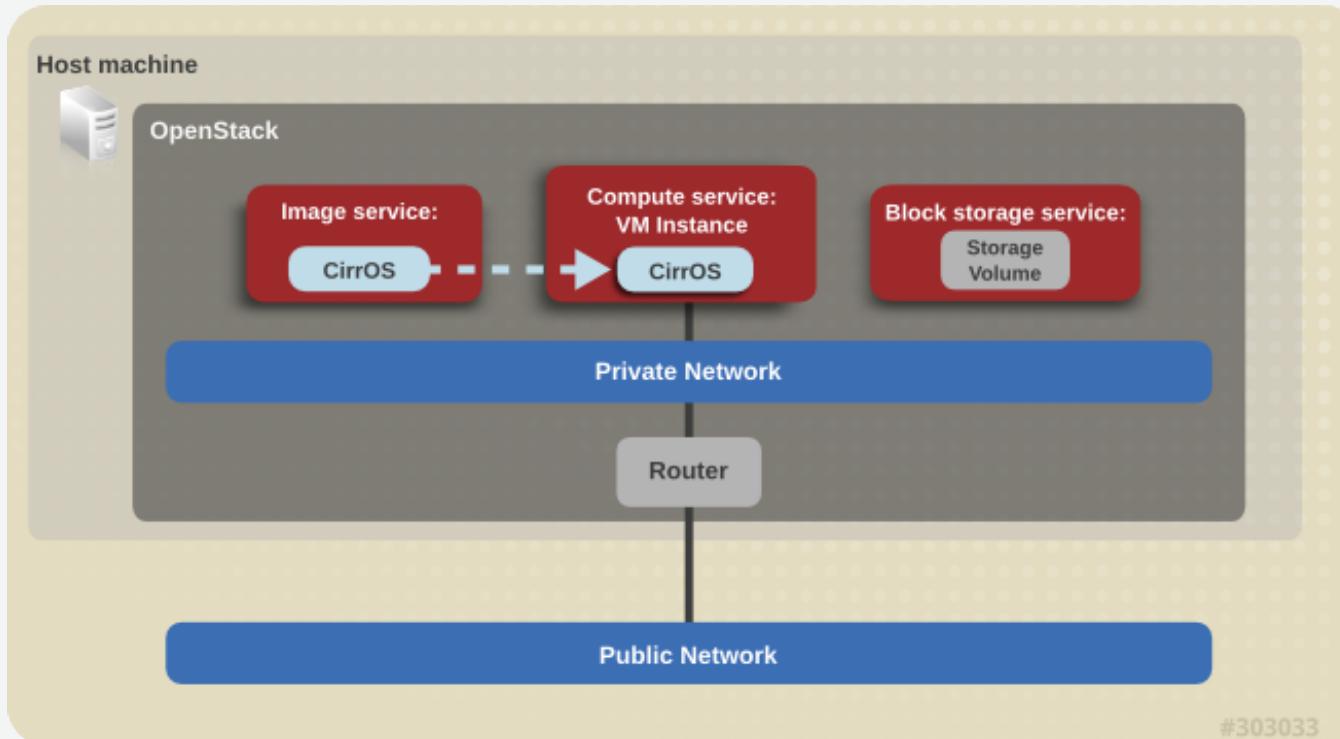
Flavors

Flavor Name	VCPUs	RAM	Root Disk	Ephemeral Disk	Swap Disk	RX/TX factor	ID	Public	Metadata	Actions
cirros256	1	256MB	0GB	0GB	0MB	1.0	c1	Yes	No	<button>Edit Flavor</button>
ds10	1	1GB	10GB	0GB	0MB	1.0	d2	Yes	No	<button>Edit Flavor</button>
ds20	2	2GB	10GB	0GB	0MB	1.0	d3	Yes	No	<button>Edit Flavor</button>
ds40	4	4GB	20GB	0GB	0MB	1.0	d4	Yes	No	<button>Edit Flavor</button>
ds512M	1	512MB	5GB	0GB	0MB	1.0	d1	Yes	No	<button>Edit Flavor</button>
m1.large	4	8GB	80GB	0GB	0MB	1.0	4	Yes	No	<button>Edit Flavor</button>
m1.medium	2	4GB	40GB	0GB	0MB	1.0	3	Yes	No	<button>Edit Flavor</button>
m1.micro	1	128MB	0GB	0GB	0MB	1.0	84	Yes	No	<button>Edit Flavor</button>
m1.nano	1	64MB	0GB	0GB	0MB	1.0	42	Yes	No	<button>Edit Flavor</button>
m1.small	1	2GB	20GB	0GB	0MB	1.0	2	Yes	No	<button>Edit Flavor</button>
m1.tiny	1	512MB	1GB	0GB	0MB	1.0	1	Yes	No	<button>Edit Flavor</button>
m1.xlarge	8	16GB	160GB	0GB	0MB	1.0	5	Yes	No	<button>Edit Flavor</button>

Displaying 12 items

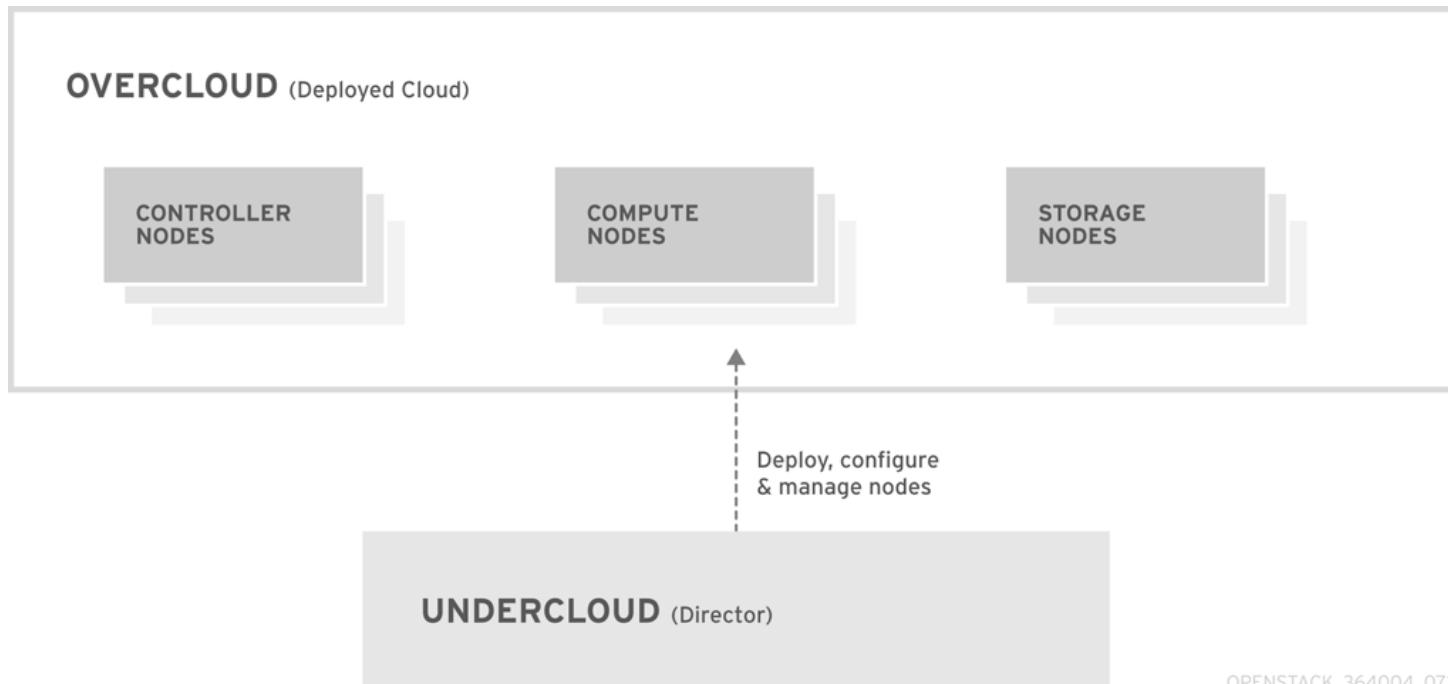
local.conf

PACKSTACK



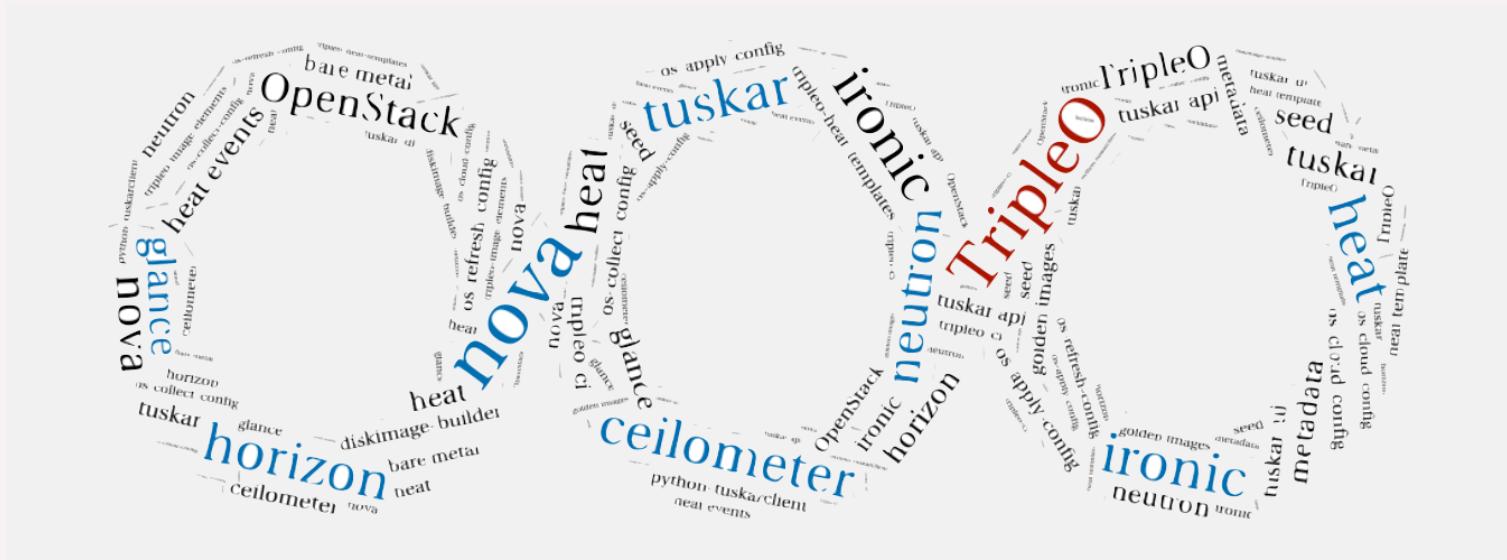
[OpenStack single-node deployment | Packstack networking overview](#)

DIRECTOR



OPENSTACK_364004_0715

TRIPLEO

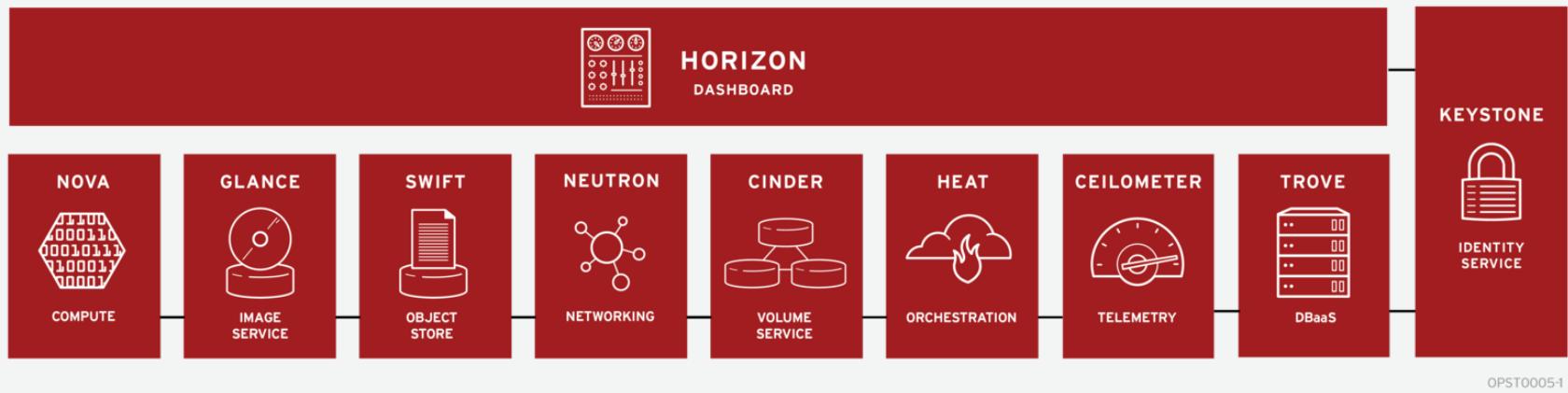


- * Friendly name for "OpenStack On OpenStack"
 - * Allows you to deploy production cloud on bare-metal hardware
 - * *Undercloud*: Subset of existing OpenStack components
 - * *Overcloud*: Production OpenStack cloud

ARCHITECTURE

OPENSTACK ARCHITECTURE

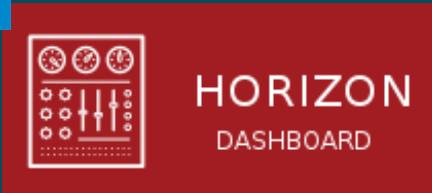
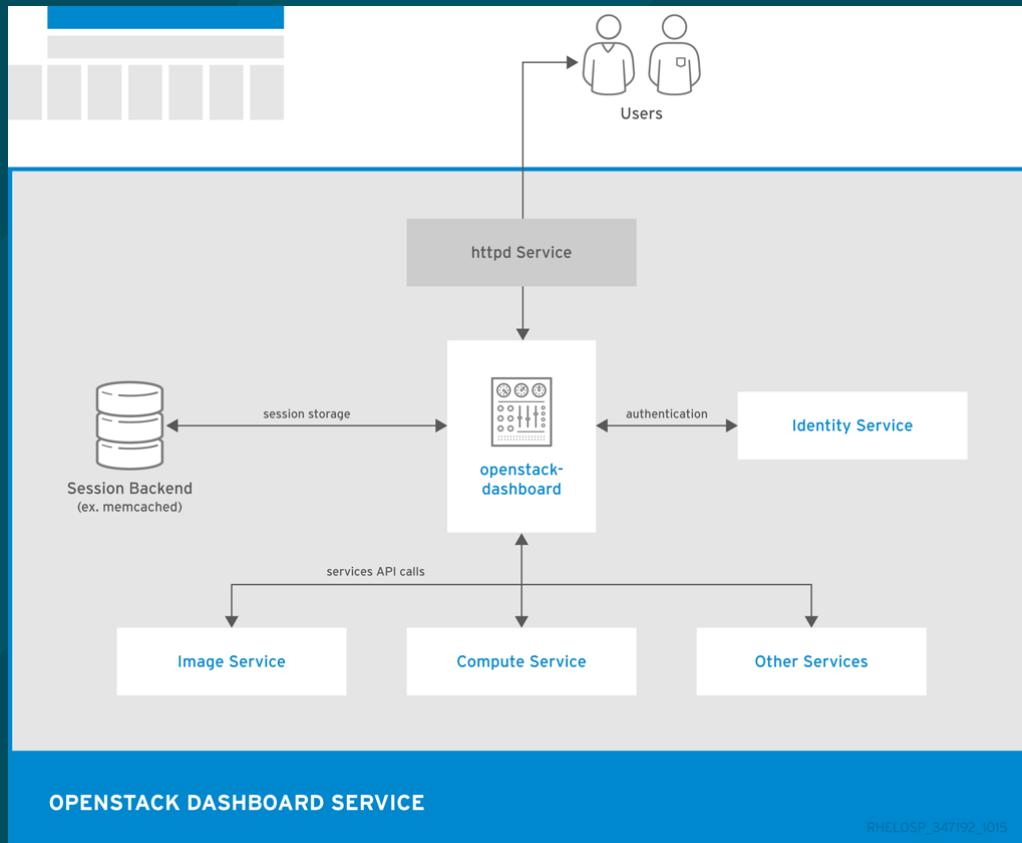
OpenStack is built out from a group of services that split up the work that has to happen to create a true cloud environment.



Each service implements a portion of the OpenStack API. In the above diagram, the top word (e.g. Nova) is the implementation name. The bottom word is the project/API name.

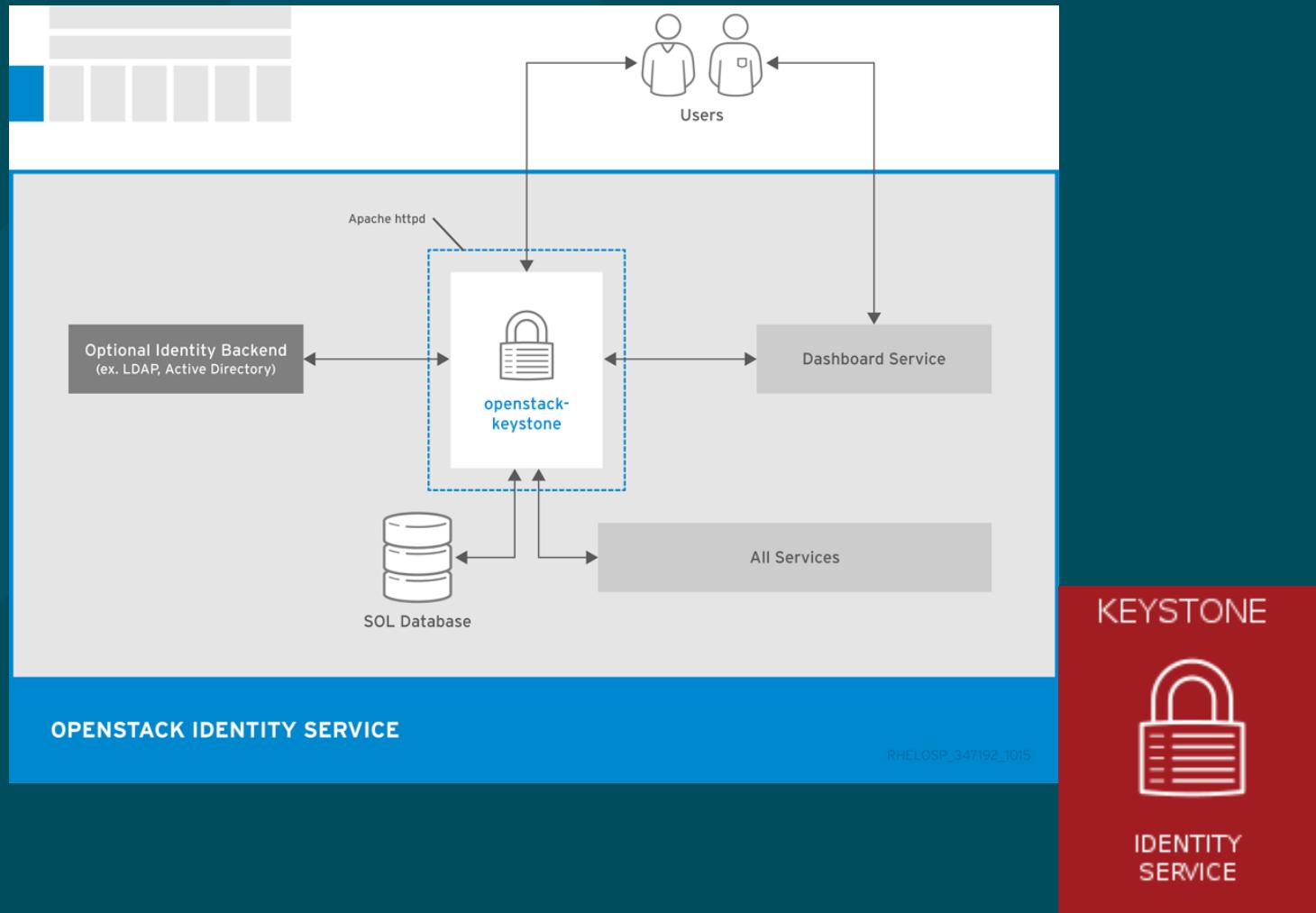
HORIZON

Dashboard - Service diagram



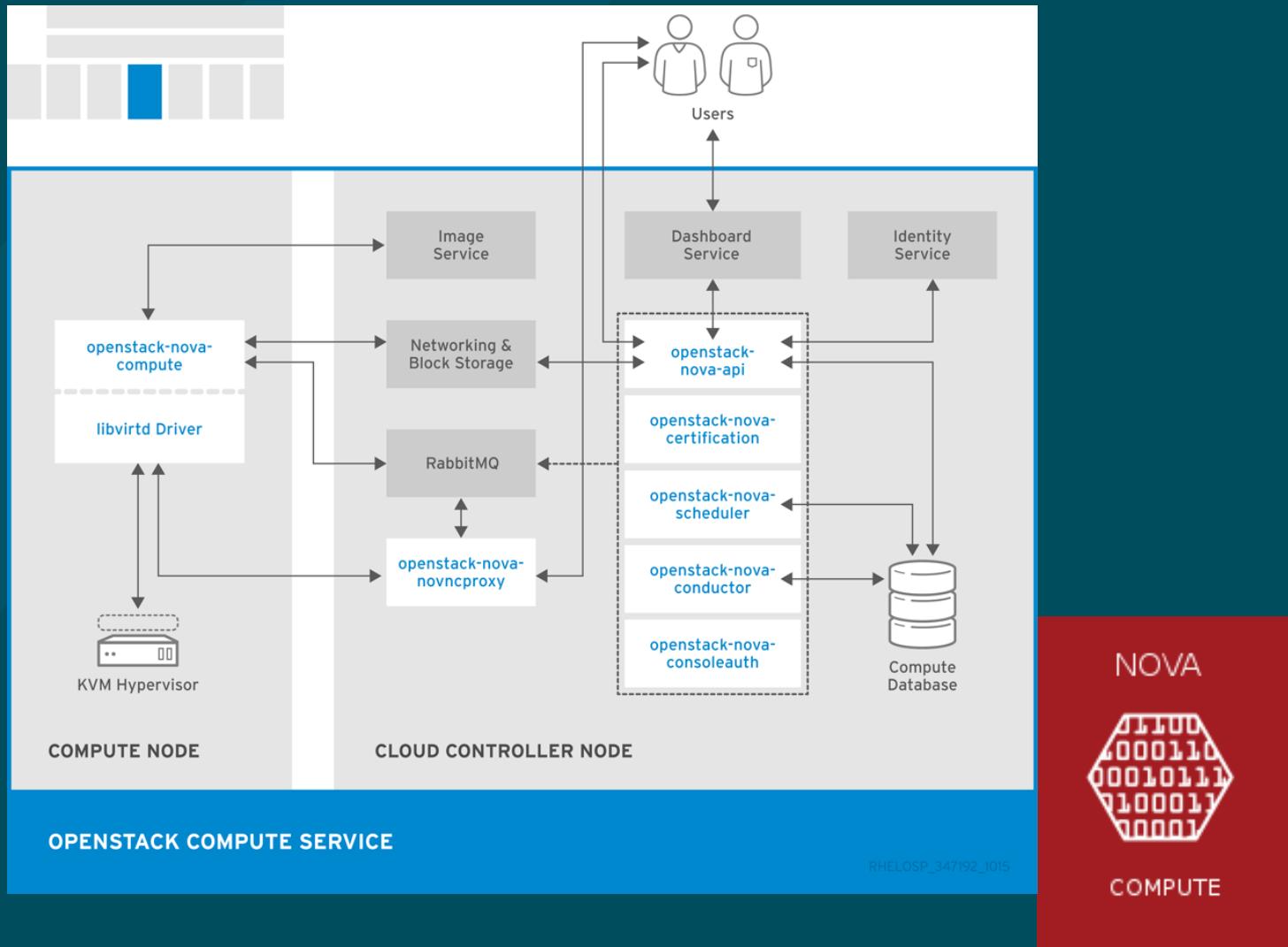
KEYSTONE

Identity management



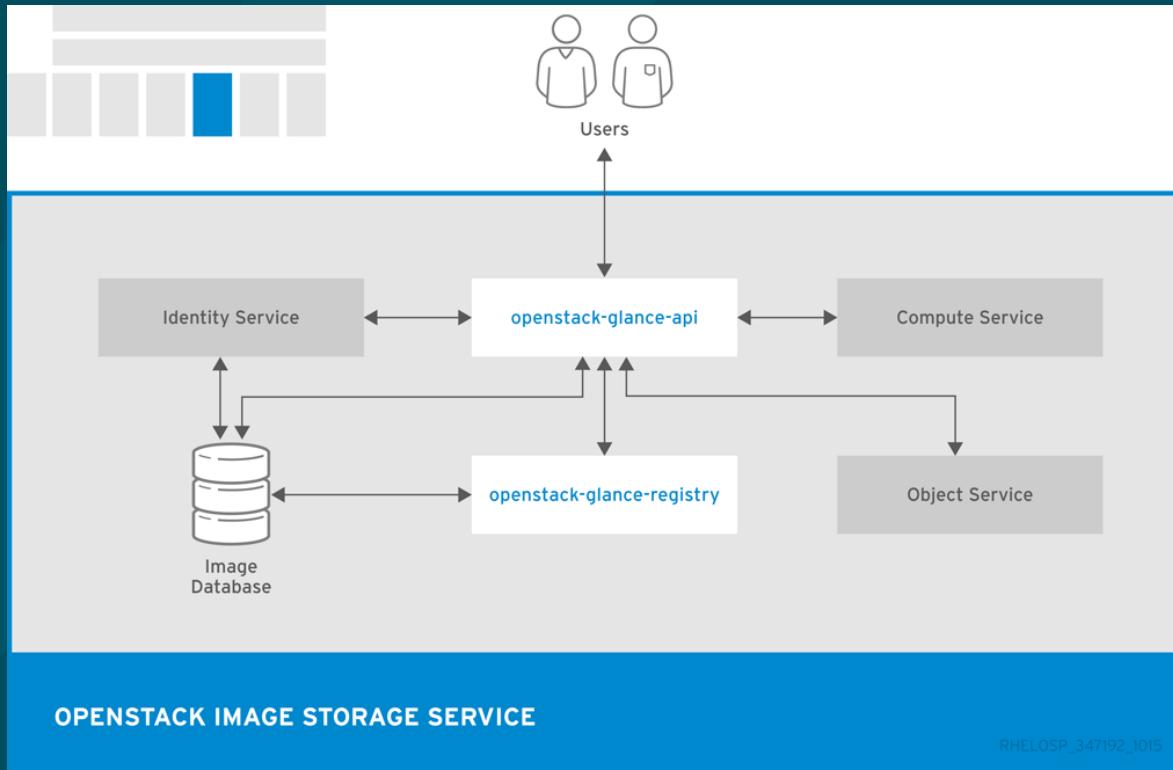
NOVA

The Brains of the Operation



GLANCE

Image store Service Diagram



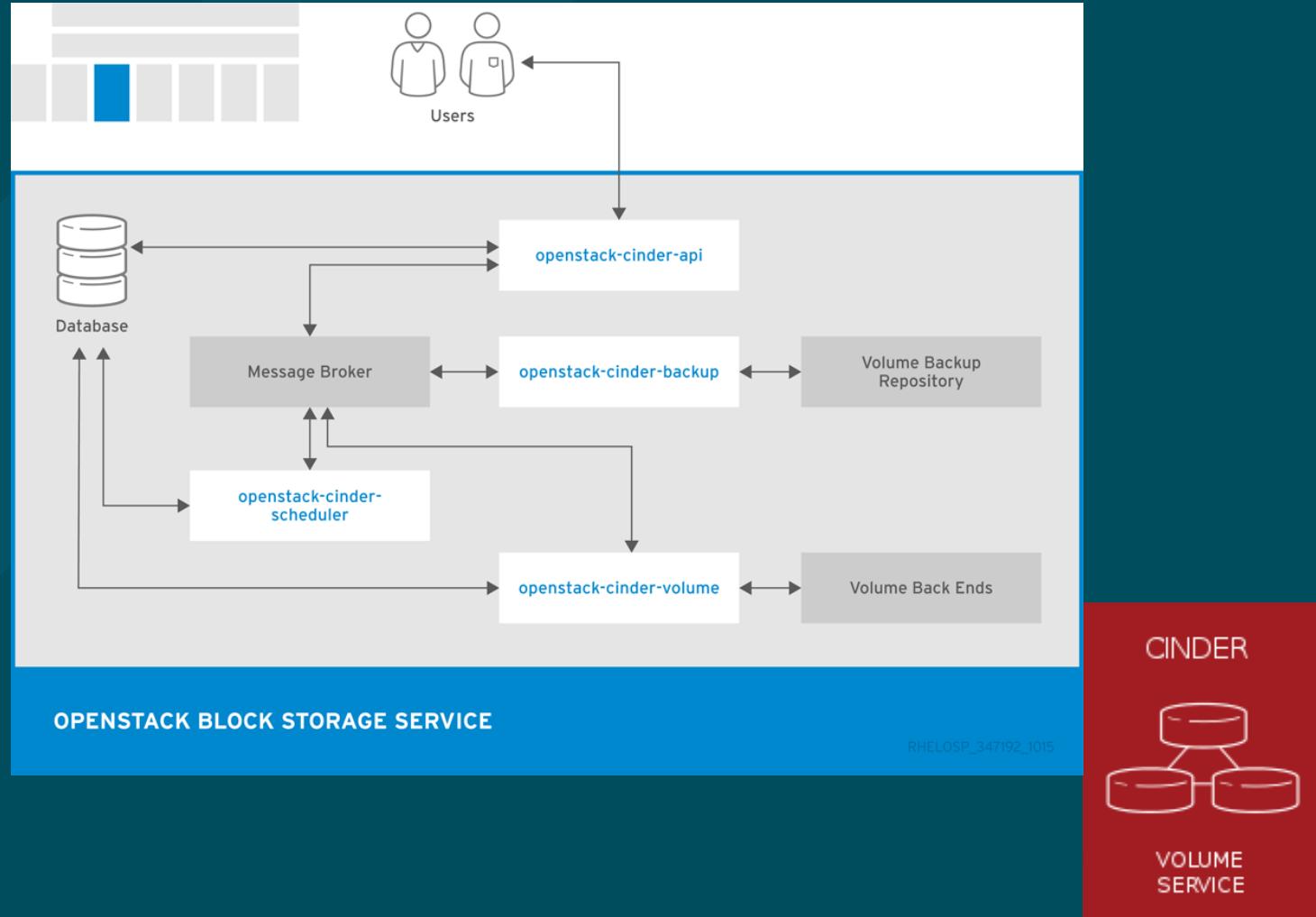
GLANCE



IMAGE
SERVICE

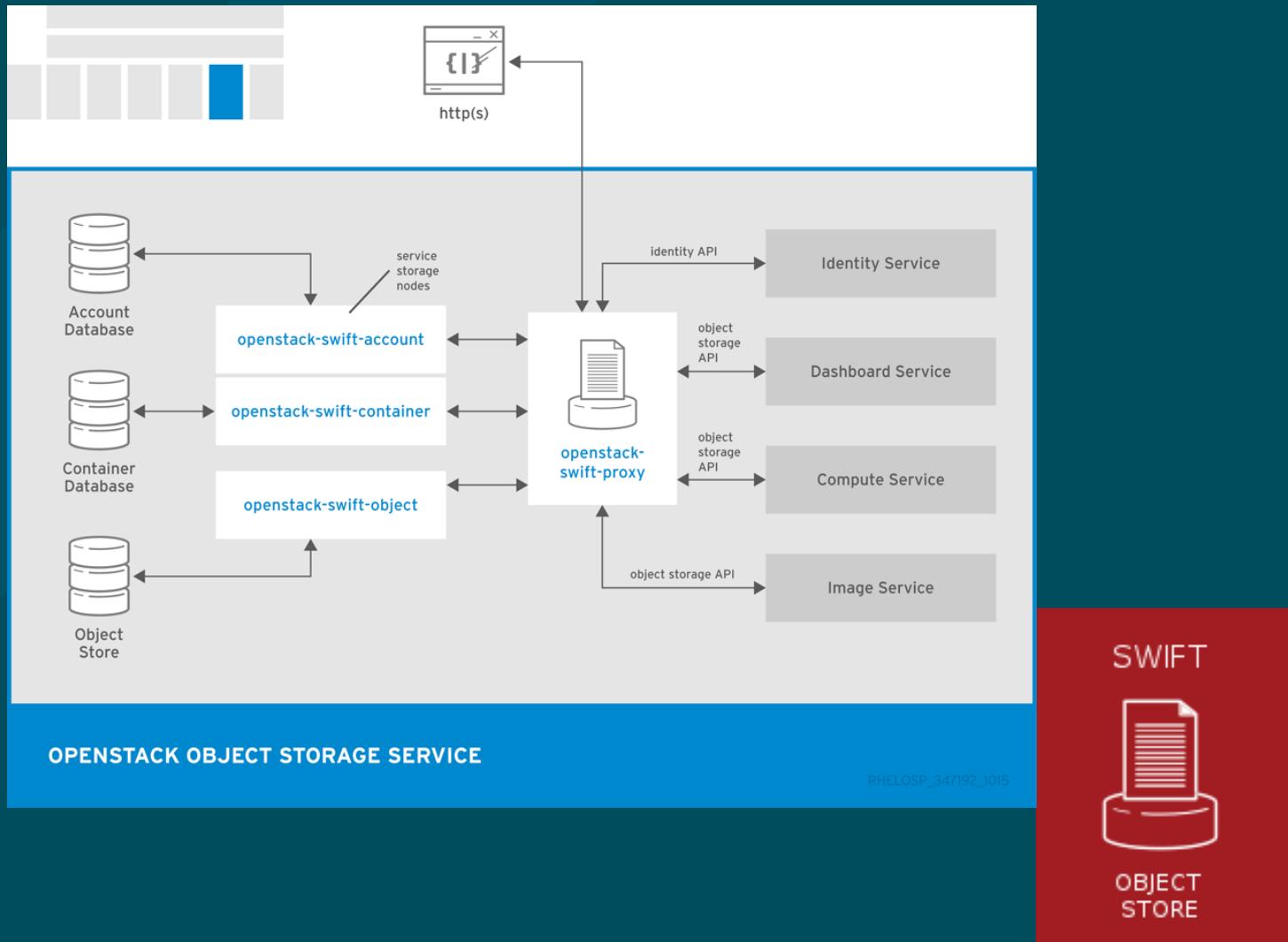
CINDER

Volume based storage Services



SWIFT

Object Storage Service Diagram



NEUTRON

Software-Defined Networking

The OpenStack Networking service handles the creation and management of a virtual networking infrastructure in the OpenStack cloud. Elements include networks, subnets, and routers; advanced services such as firewalls or virtual private networks (VPN) can also be used.

Because the OpenStack network is software-defined, it can easily and quickly react to changing network needs

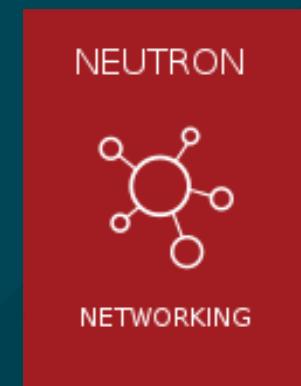
Network agent(controllers): Service that runs on each OpenStack node to perform local networking configuration for the node virtual machines and for networking services such as Open vSwitch.

neutron-dhcp-agent: Agent that provides DHCP services to tenant networks.

neutron-server: Python daemon that manages user requests and exposes the Networking API.

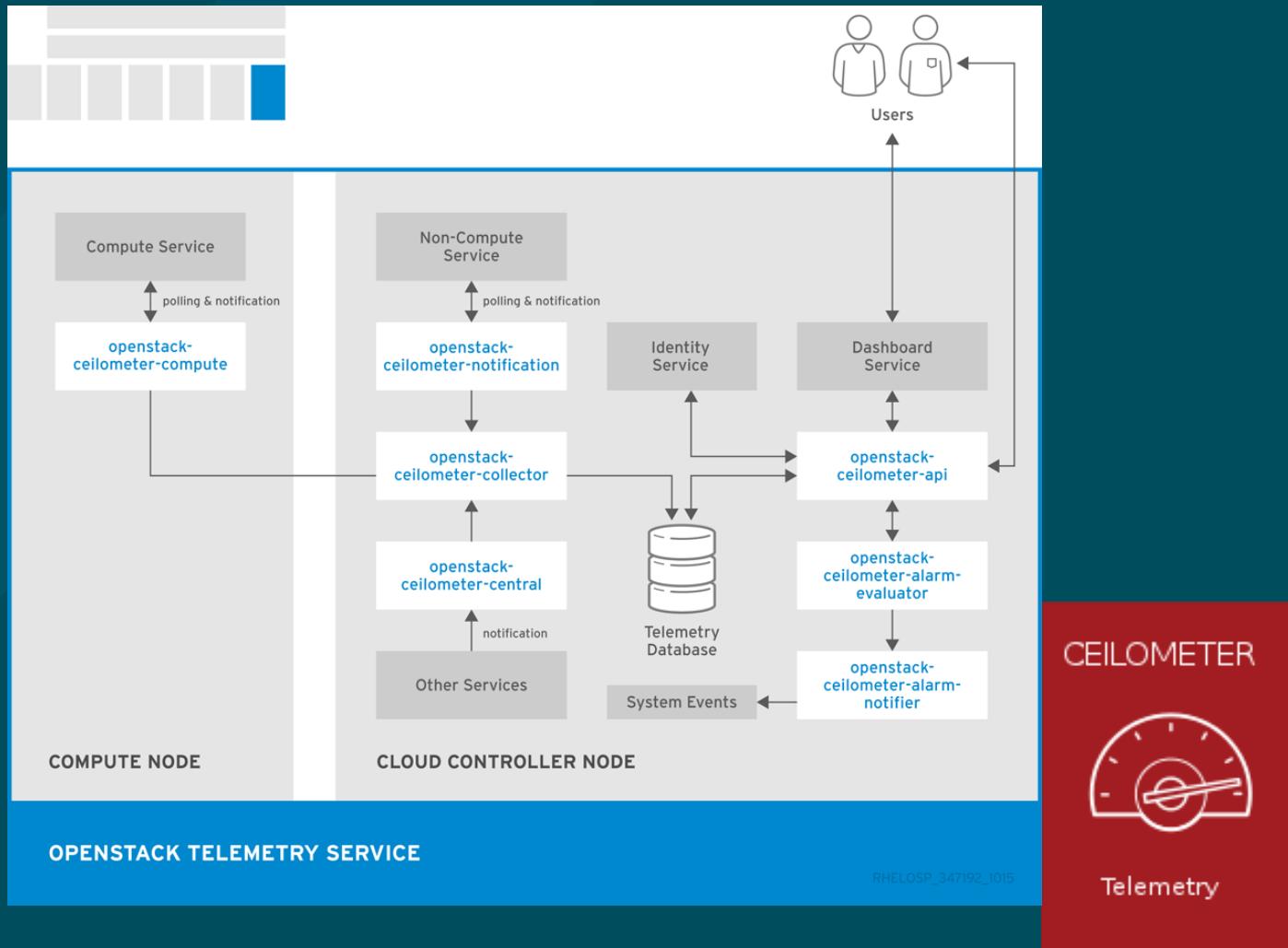
neutron-metadata-agent: Provides the web service proxy used by VMs to get VM metadata from the nova metadata service.

neutron-l3-agent: Provides L3 tenant routers. By using Linux network namespaces many independent routers can be deployed on a network node.



CEILOMETER

Telemetry Service Diagram



AN API FOR EVERYTHING

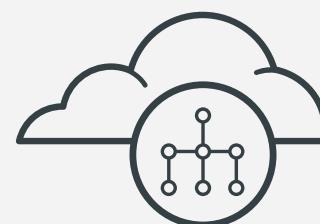
and for every service a RESTful API

Each core service within OpenStack provides RESTful APIs for external use. Internally, a combination of these RESTful APIs and AMQP messages is used for IPC.

A positive is that any service can be located just about anywhere as long as it can communicate via HTTPS to the other services it needs to make OpenStack functional.



A negative is that OpenStack can be deployed in a large number of permutations.



KILO? LIBERTY? MITAKA? ...

Major versions of upstream OpenStack are released by code name. Currently, the code names are voted on by the community, and follow alphabetical order.

OpenStack Code Name	RH OSP Release
Havana	4
Icehouse	5
Juno	6
Kilo	7
Liberty	8
Mitaka	9
Newton	10 (Not yet released)

HYPERVERISOR SUPPORT

Red Hat Enterprise Linux OpenStack Platform supports multiple hypervisors.

RED HAT[®]
ENTERPRISE
VIRTUALIZATION

- lightweight / small footprint
- low overhead
- small attack surface
- cost-effective
- massive scale-out



- co-exist with existing stuff
- seamless migration
- use Neutron with NSX
- ESXi not supported

COMPLEMENTARY PRODUCTS

RED HAT® CLOUDFORMS

CloudForms provides a management tools for multiple cloud platforms, including OpenStack.



OpenShift is a Platform-as-a-Service platform. It can be run on top of bare metal systems or IaaS platforms like OpenStack

OPENSTACK VS AMAZON

OpenStack is not feature complete with AWS. However, most of the core functionality is available in OpenStack equivalents.

Compatibility with some AWS service APIs is available.

OpenStack	AWS
Nova	EC2
Cinder	EBS
Swift/Ceph	S3
Heat	Cloudformation

* This table is incomplete.

A low-angle photograph of two modern skyscrapers against a backdrop of a blue sky with scattered white clouds. The building on the left has a glass facade with a grid pattern. The building on the right is dark blue with vertical slats and rectangular windows.

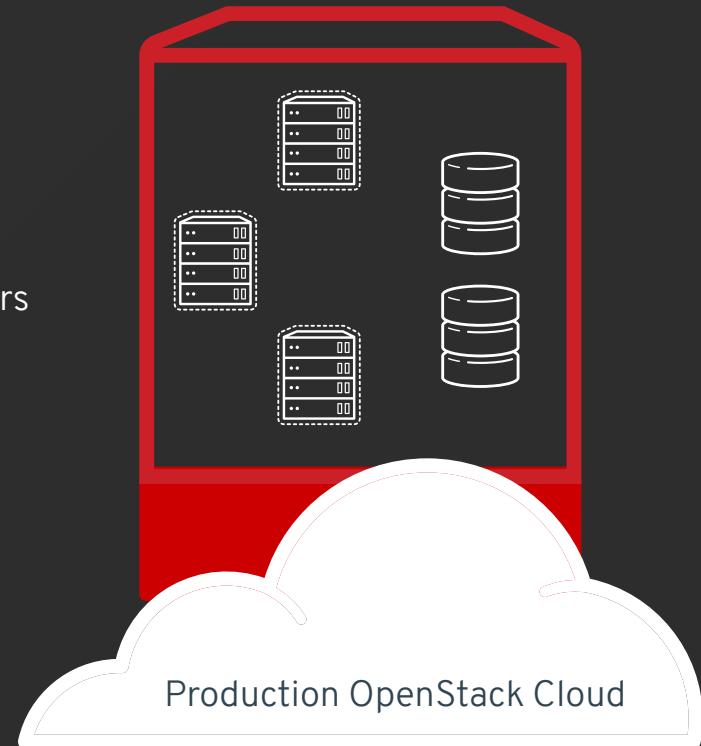
DEPLOY

TRIPLEO OVERVIEW

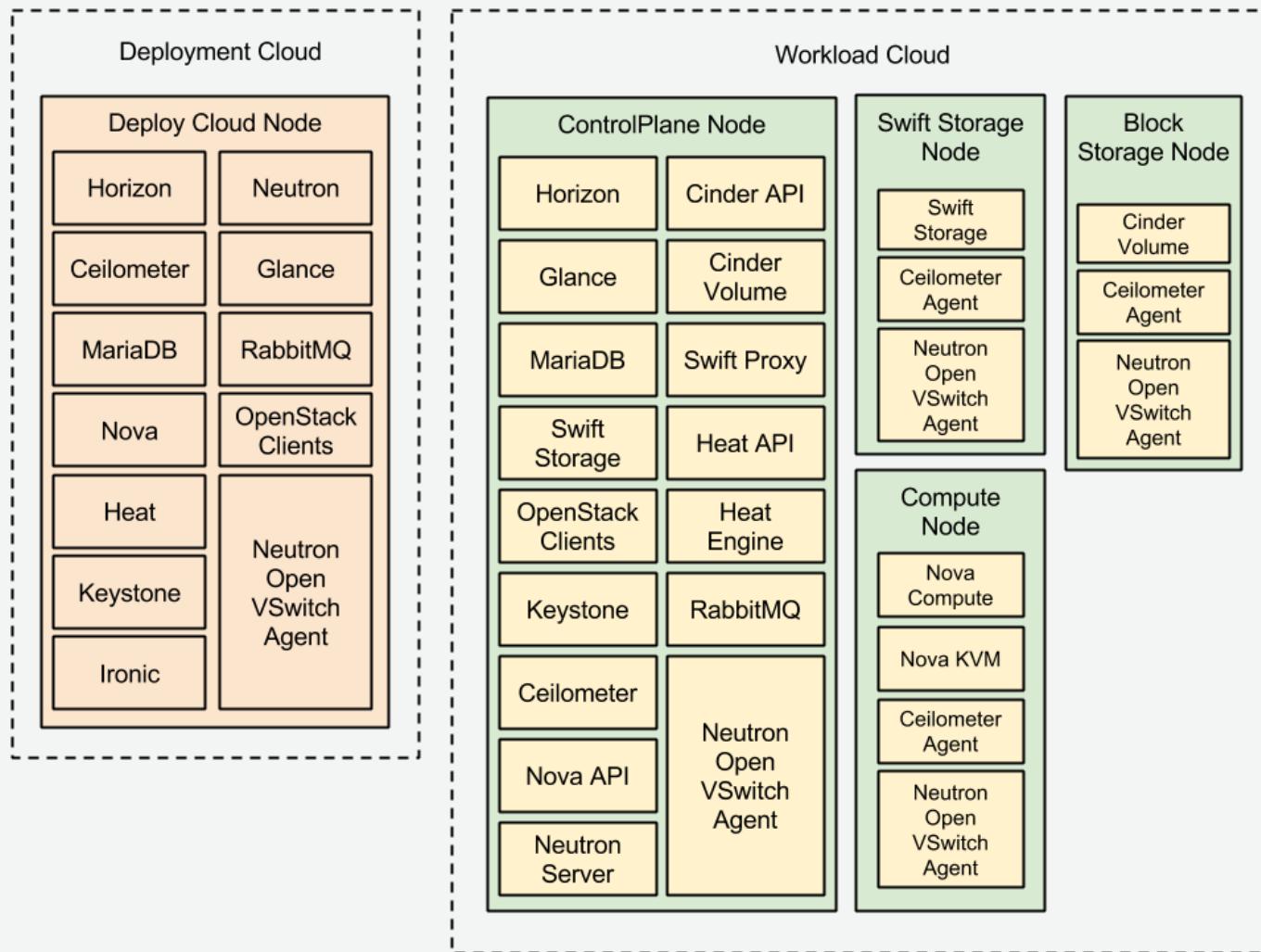


TripleO based
management application

Deploys, updates, monitors



TRIPLEO PHYSICAL VIEW

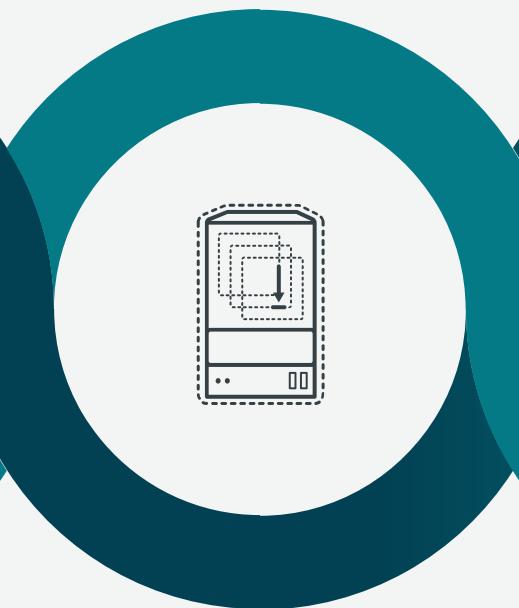


TRIPLEO

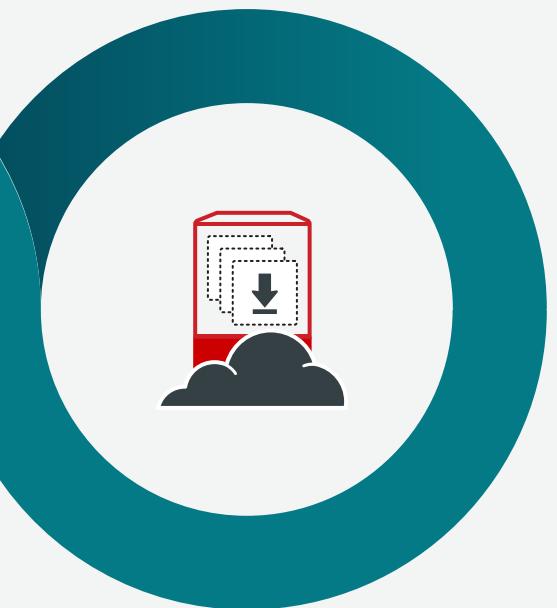
Deployment workflow overview



Prepare undercloud node



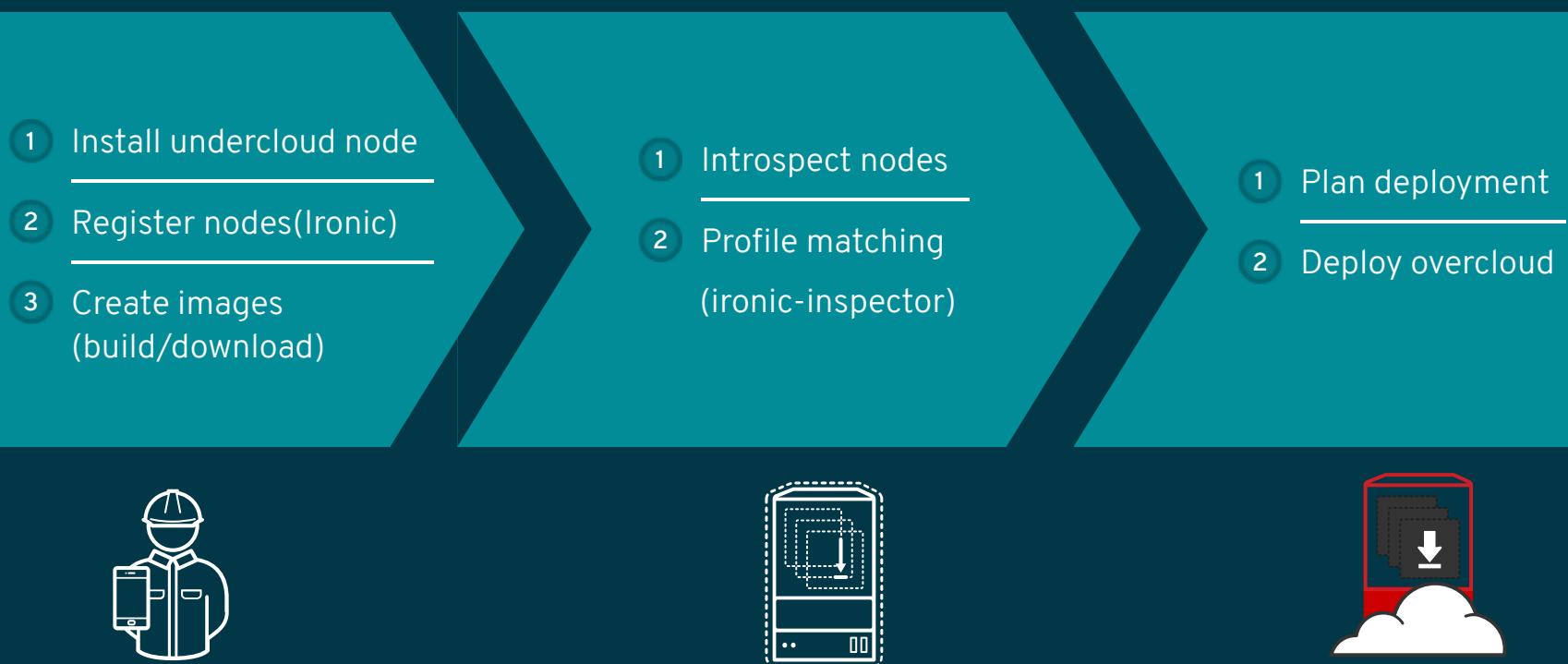
Introspect nodes



Plan deployment

TRIPLEO

Deployment workflow overview



OVERCLOUD

Requirements

COMPUTE

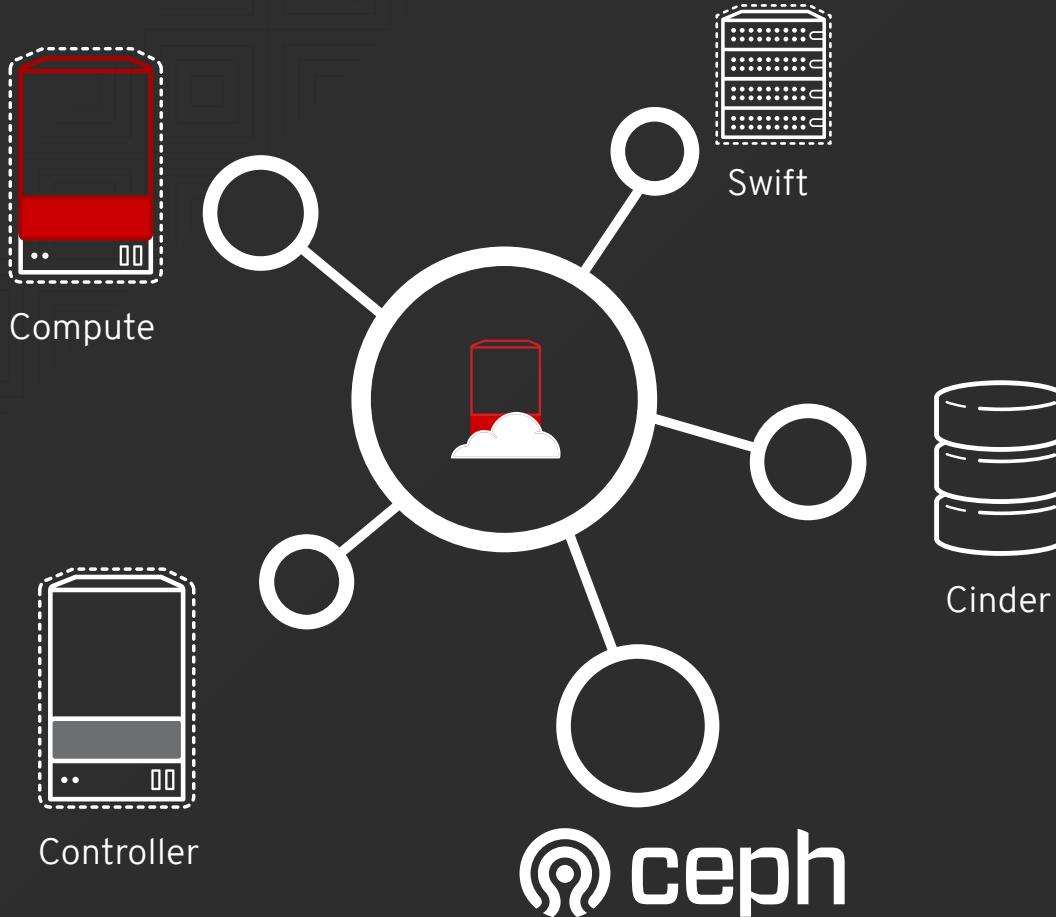
	value
Processor	64-bit x86 (Intel 64 or AMD64)
Memory	minimum 6 GB of RAM
Disk Space	40 GB available
NICs	min. 1 Gbps, at-least 2 in production
IPMI	IPMI functionality in motherboard

CONTROLLER

	value
Processor	64-bit x86 (Intel 64 or AMD64)
Memory	min. 32 GB RAM, 64 GB recommended



PLANNING YOUR OVERCLOUD



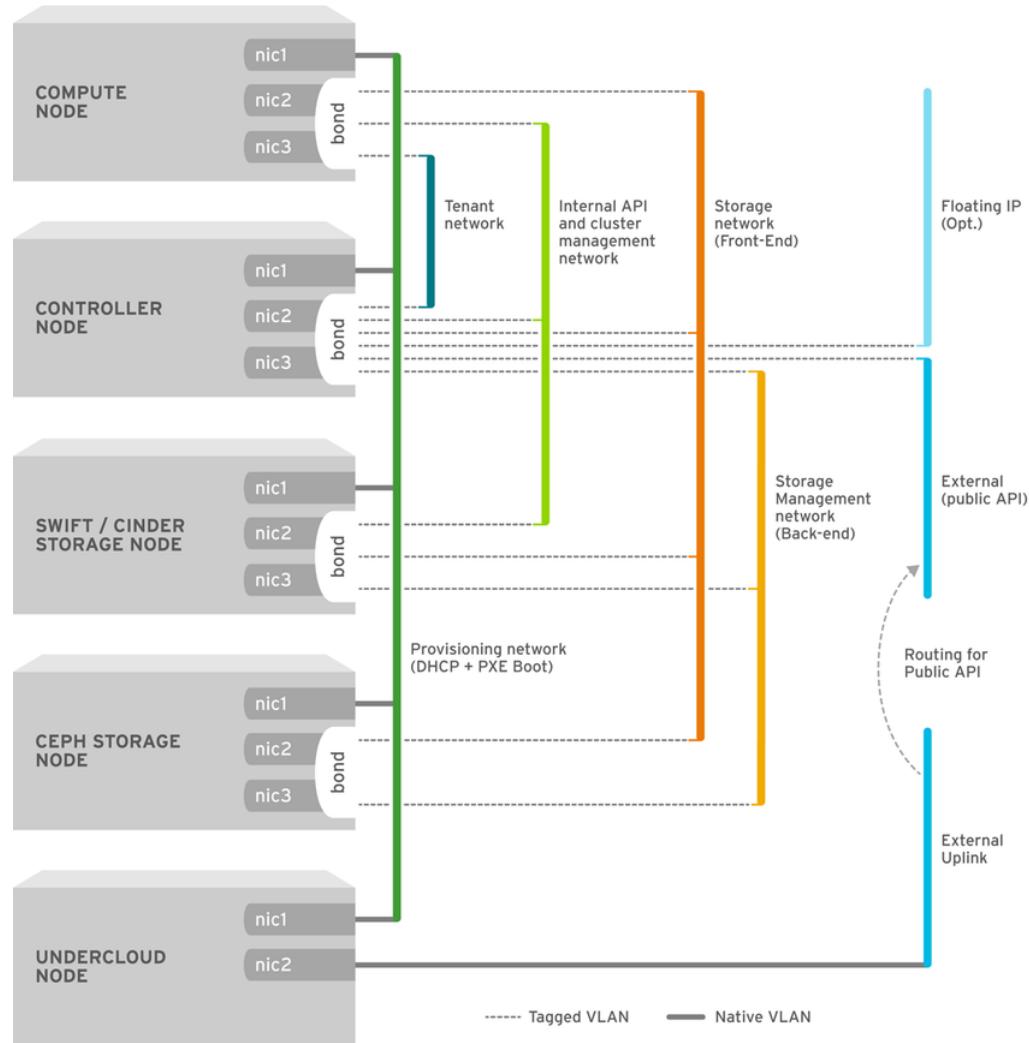


PLANNING YOUR OVERCLOUD

Overcloud	Controller	Compute	Ceph	Swift
Small	1	1	-	-
Medium	1	3	-	-
Medium with object storage	1	3	-	1
Medium(HA)	3	3	-	-
Medium(HA) with Ceph	3	3	3	-

[Planning your Overcloud](#)

PLANNING NETWORKS



HEAT TEMPLATE

[Understanding heat template](#)

```
heat_template_version: 2013-05-23

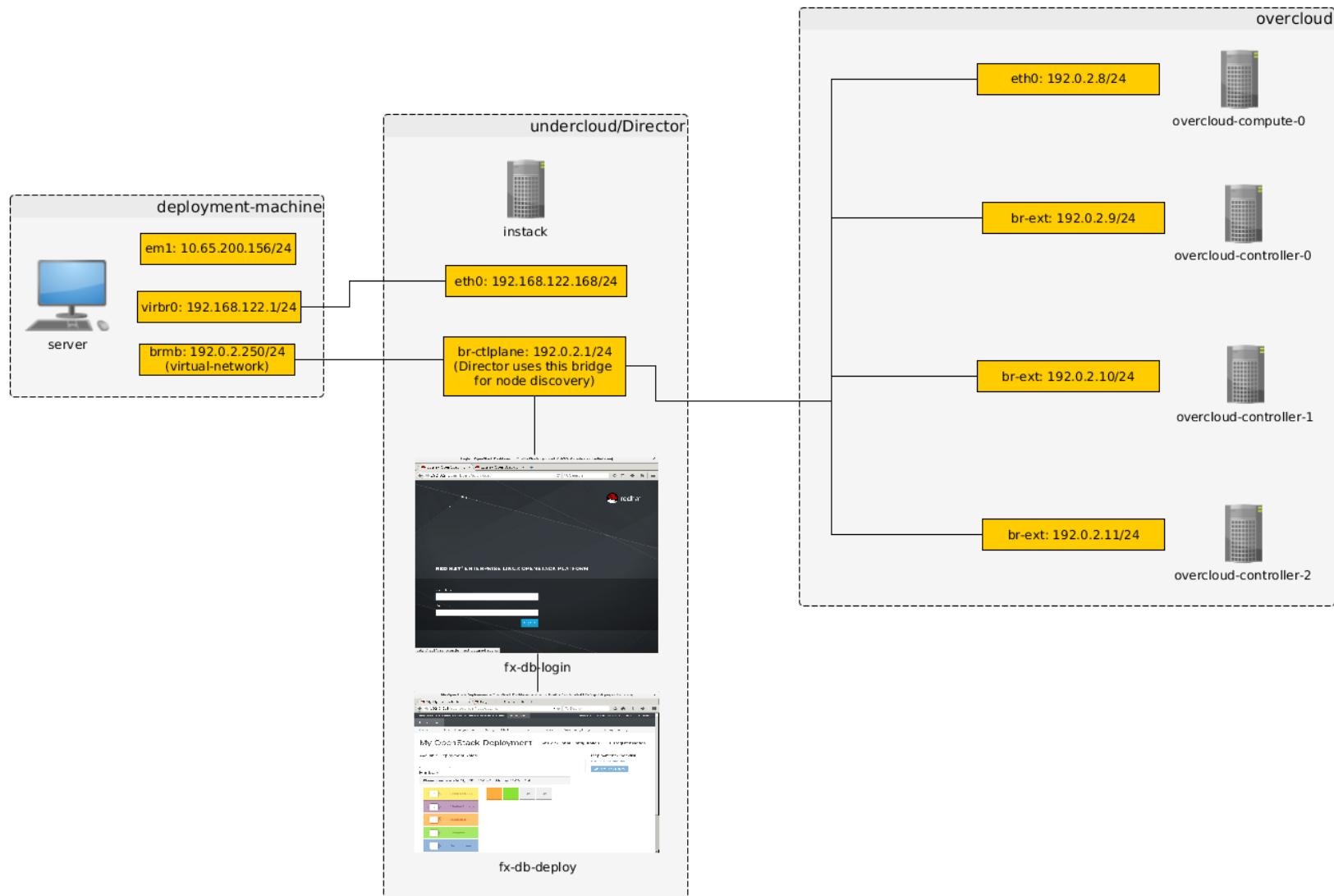
description: > A very basic Heat template.

parameters:
  key_name:
    type: string
    default: lars
    description: Name of an existing key pair to use for the instance
  flavor:
    type: string
    description: Instance type for the instance to be created
    default: m1.small
  image:
    type: string
    default: cirros
    description: ID or name of the image to use for the instance

resources:
  my_instance:
    type: OS::Nova::Server
    properties:
      name: My Cirros Instance
      image: { get_param: image }
      flavor: { get_param: flavor }
      key_name: { get_param: key_name }

outputs:
  instance_name:
    description: Get the instance's name
    value: { get_attr: [ my_instance, name ] }
```

TOPOLOGY



RED HAT® OPENSTACK PLATFORM

<https://access.redhat.com/documentation/en/red-hat-openstack-platform>



redhat.[®]