

OpenStack Sahara

Big Data Processing Framework Provisioning

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Tentang Saya

- Koordinator Bidang Acara Asosiasi Cloud Computing Indonesia (ACCI)
- Direktur PT. Boer Technology (Btech)
- Anggota Komunitas openSUSE Indonesia
- Suami dari 1 istri dan ayah dari 3 anak

Tentang ACCI

- Asosiasi Cloud Computing Indonesia (ACCI) adalah sebuah organisasi non-profit yang diharapkan akan mampu menselaraskan perkembangan teknologi Cloud Computing serta meningkatkan kualitas sumber daya manusia untuk memenuhi kebutuhan industri dan atau meningkatkan kewirausahaan di bidang teknologi informasi.
- Info lebih lanjut: <https://www.acci.or.id>

Poin-poin Bahasan

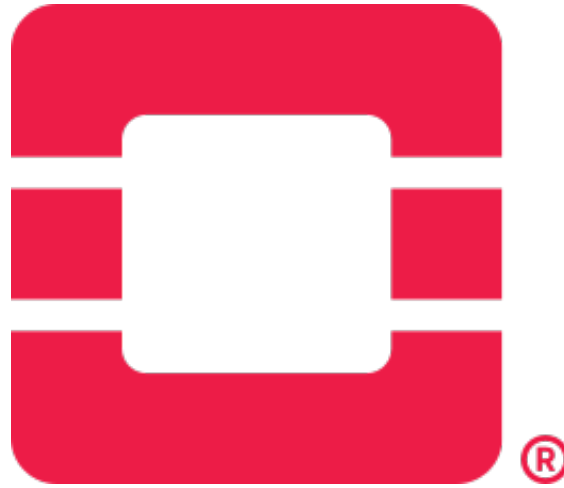
- OpenStack
- Demo OpenStack
- OpenStack Sahara
- Demo OpenStack Sahara

Referensi

- Web OpenStack: <https://www.openstack.org>
- Dokumentasi OpenStack: <https://docs.openstack.org>

OpenStack

OpenStack



- Perangkat lunak sumber terbuka untuk membangun *Infrastructure as a Service (IaaS) cloud*.
- Dikembangkan di bawah Yayasan OpenStack dengan dukungan perusahaan-perusahaan TIK populer di seluruh dunia (<https://www.openstack.org/foundation/companies/>).

OpenStack Identity Services



KEYSTONE
Identity service



BARBICAN
Key Management



CONGRESS
Governance



MISTRAL
Workflow service



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OpenStack Compute Services



NOVA
Compute Service



GLANCE
Image Service



IRONIC
Bare Metal Provisioning Service



MAGNUM
Container Orchestration Engine
Provisioning



STORLETS
Computable Object Store



ZUN
Container Management Service



OpenStack Storage Services



SWIFT
Object Store



CINDER
Block Storage



MANILA
Shared Filesystems



KARBOR
Application Data Protection as a
Service



FREEZER
Backup, Restore, and Disaster Recovery



OpenStack Networking Services



NEUTRON
Networking



DESIGNATE
DNS Service



DRAGONFLOW
Neutron Plugin



KURYR
Container plugin



OCTAVIA
Load Balancer



TACKER
NFV Orchestration



TRICIRCLE
Networking Automation for Multi-
Region Deployments



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OpenStack Data Services



TROVE

Database as a Service



SAHARA

Big Data Processing Framework
Provisioning



SEARCHLIGHT

Indexing and Search



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OpenStack Management Services



HORIZON

Dashboard

OPENSTACK CLIENT (CLI)

Command-line client



RALLY

Benchmark service



SENLIN

Clustering service



VITRAGE

RCA (Root Cause Analysis service)



WATCHER

Optimization Service



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OpenStack Application Services



HEAT
Orchestration



ZAQAR
Messaging Service



MURANO
Application Catalog



SOLUM
Software Development Lifecycle
Automation



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OpenStack Monitoring & Metering



CEILOMETER

Metering & Data Collection Service



CLOUDKITTY

Billing and chargebacks



MONASCA

Monitoring



AODH

Alarming Service



PANKO

Event, Metadata Indexing Service



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OpenStack Deployment Tools



CHEF OPENSTACK

Chef cookbooks for OpenStack



KOLLA

Container deployment



OPENSTACK CHARMS

Juju Charms for OpenStack



OPENSTACKANSIBLE

Ansible Playbooks for OpenStack



PUPPET OPENSTACK

Puppet Modules for OpenStack



TRIPLEO

Deployment service



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OpenStack Use Cases

- Web Applications
- Big Data
- Ecommerce
- Containers
- Video Processing and Content Delivery
- Telecom and NFV
- Enterprise
- Scientific Research
- HPC/HTC

OpenStack Version

Series	Status	Release Date	EOL
Queens	Under Development		
Pike	Stable	2017-08-30	
Ocata	Maintained	2017-02-22	2018-02-26
Newton	Maintained	2016-10-06	2017-10-11

OpenStack Distributions



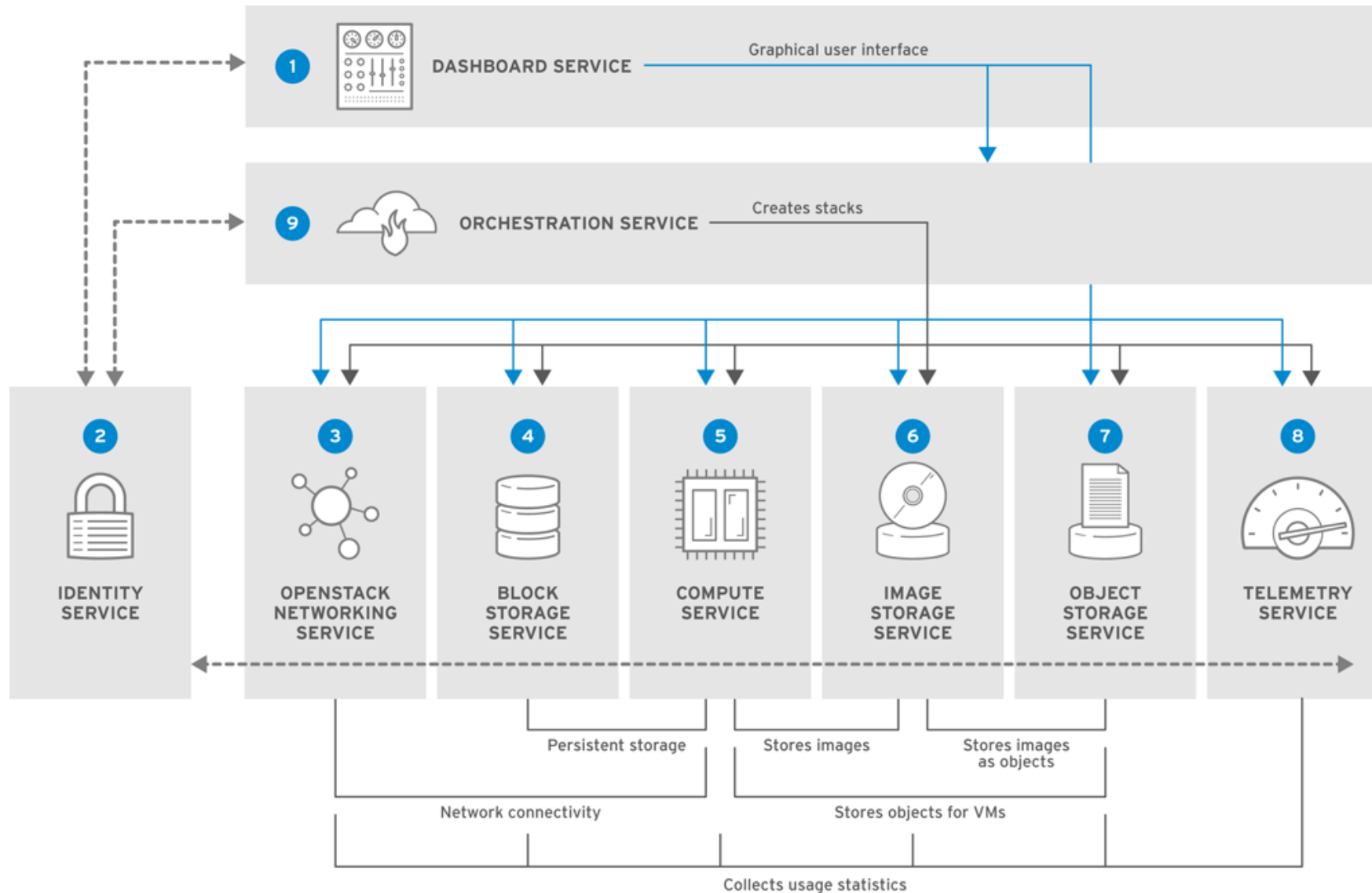
Distribution Deployment Tools

- RHEL/CentOS: Packstack & Triple O:
<https://www.rdoproject.org>
- Ubuntu: Conjure-up & Autopilot:
<https://www.ubuntu.com/cloud/openstack>
- SUSE/openSUSE: Crowbar: <http://crowbar.github.io>
- Mirantis: Fuel: <https://www.fuel-infra.org>
- Huawei: Compass: <http://www.syscompass.org>

OpenStack Images

- Cirros: <http://download.cirros-cloud.net>
- CentOS: <http://cloud.centos.org/centos/>
- OpenSUSE:
<http://download.opensuse.org/repositories/Cloud:/Images/>
- Ubuntu: <http://cloud-images.ubuntu.com>
- Debian: <http://cdimage.debian.org/cdimage/openstack/>
- Windows Server: <https://cloudbase.it/windows-cloud-images/>

OpenStack Services Diagram



RHELOSP_347192_1015



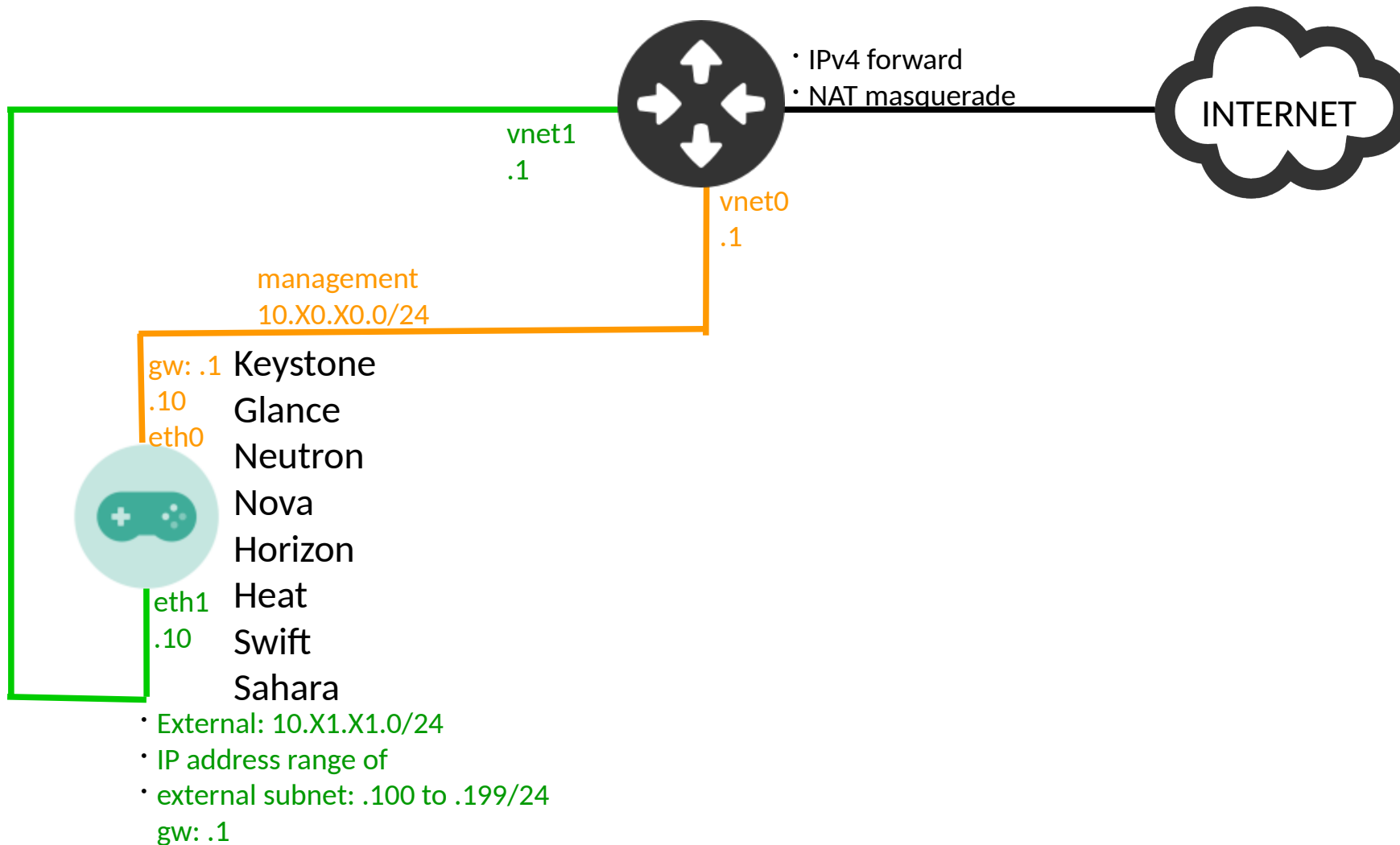
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Demo Praktik OpenStack

Kebutuhan Praktikum

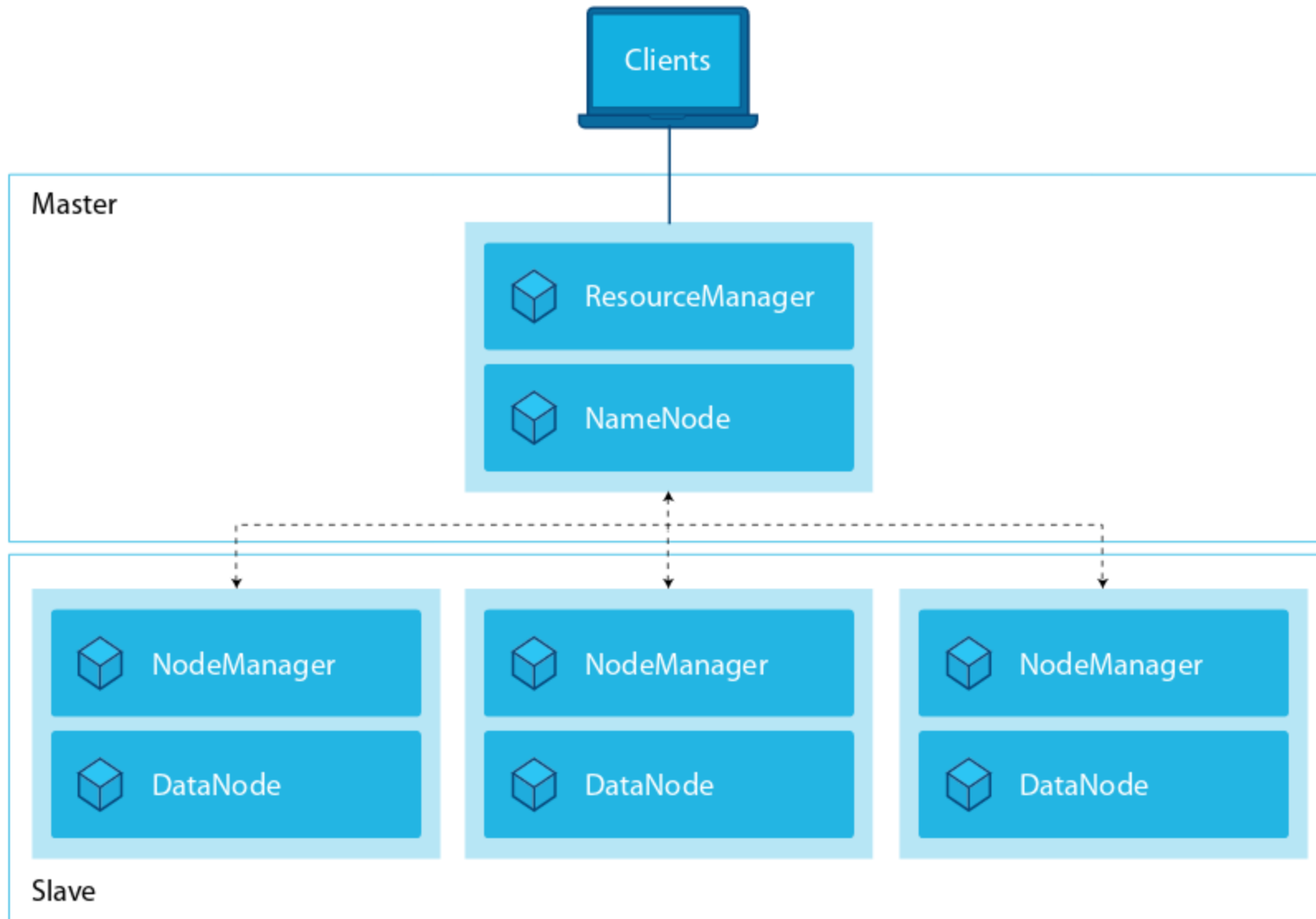
- Kemampuan administrasi Linux, administrasi jaringan dan administrasi storage
- 1 VM: CPU 8 cores, RAM 16 GB, HDD 128GB, NIC 2
- Sistem operasi: CentOS 7
- Skema partisi disk: partisi1 root (/) 100GB xfs, partisi2 swap 8GB, partisi3&4 10GB xfs
- Internet

Topologi Praktikum



OpenStack Sahara

Hadoop High Level Architecture



OpenStack Services to support Hadoop

Authentication & authorization



Interfaces for managing OpenStack



Orchestration



Networking resources



Persistent storage resources



Instance management



Compute resources



Telemetry & data collection



Legend



Core service

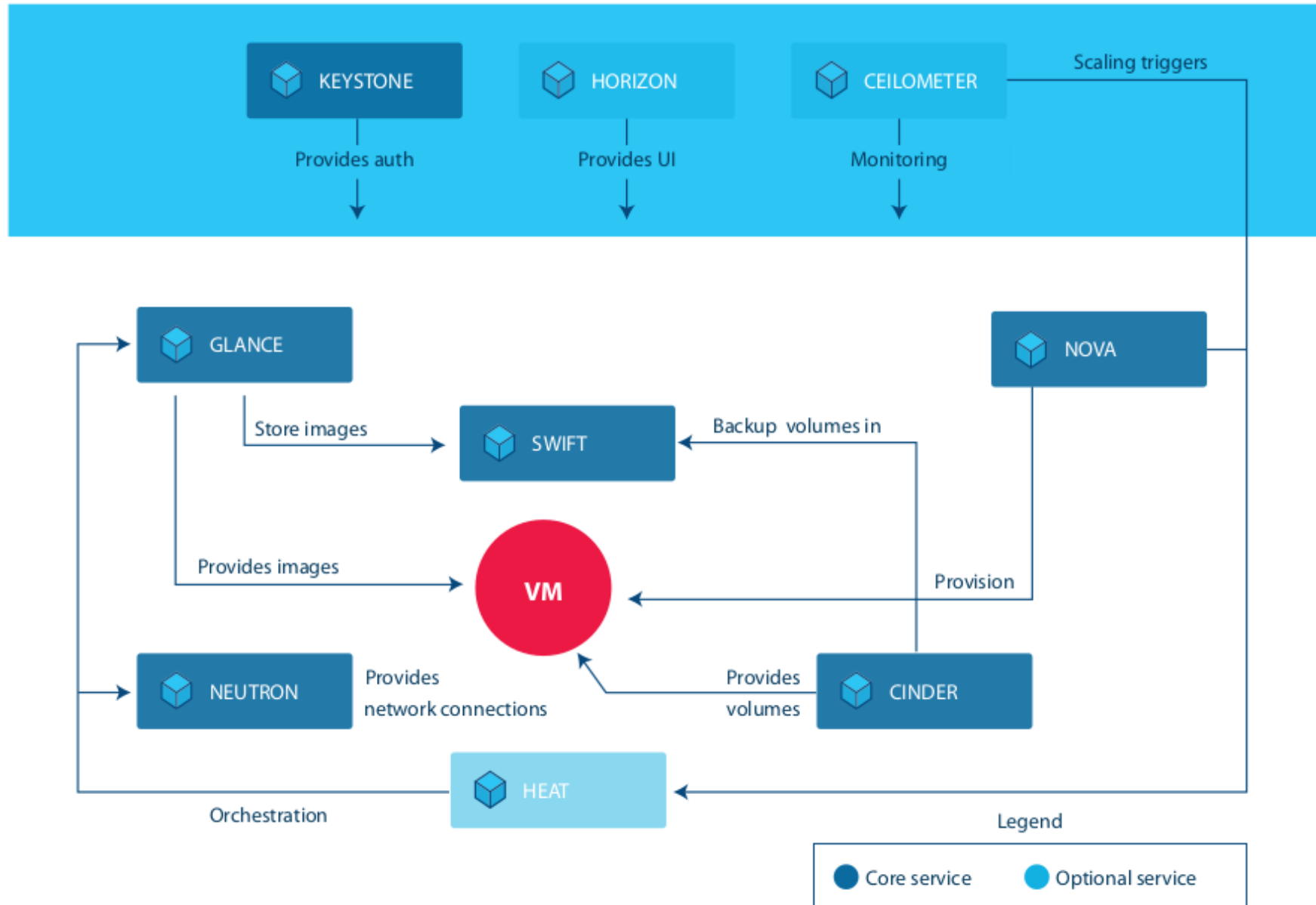


Optional service

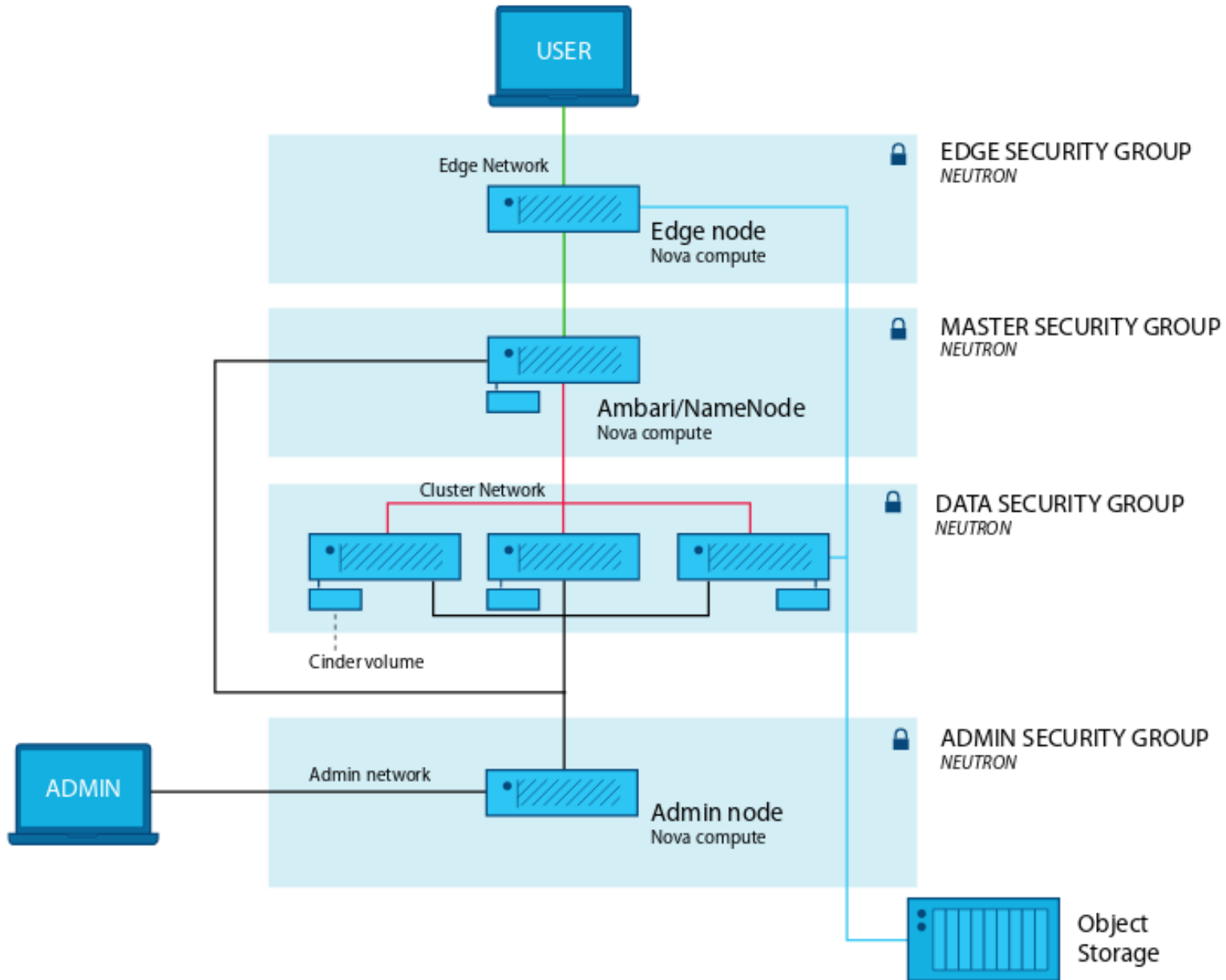


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OpenStack Services Interaction



Hadoop Cluster on OpenStack



Sahara Introduction

Provide users with a simple means to provision data processing frameworks (Hadoop, Spark, Storm) clusters by specifying several parameters such as the version, cluster topology, hardware node details and more.

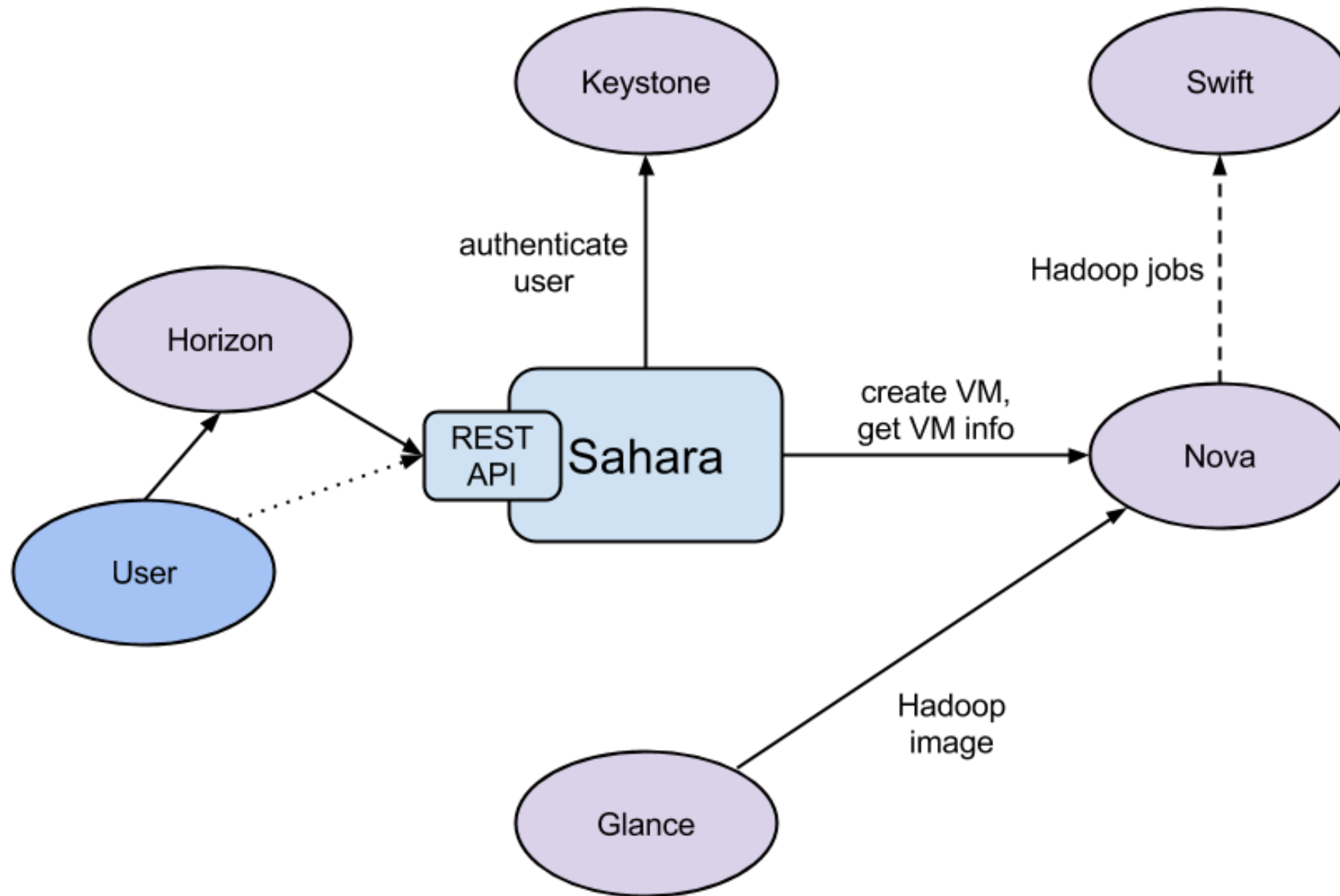
Use cases:

- Fast provisioning of data processing clusters on OpenStack for development and quality assurance(QA).
- Utilization of unused compute power from a general purpose OpenStack IaaS cloud.
- “Analytics as a Service” for ad-hoc or bursty analytic workloads (similar to AWS EMR).

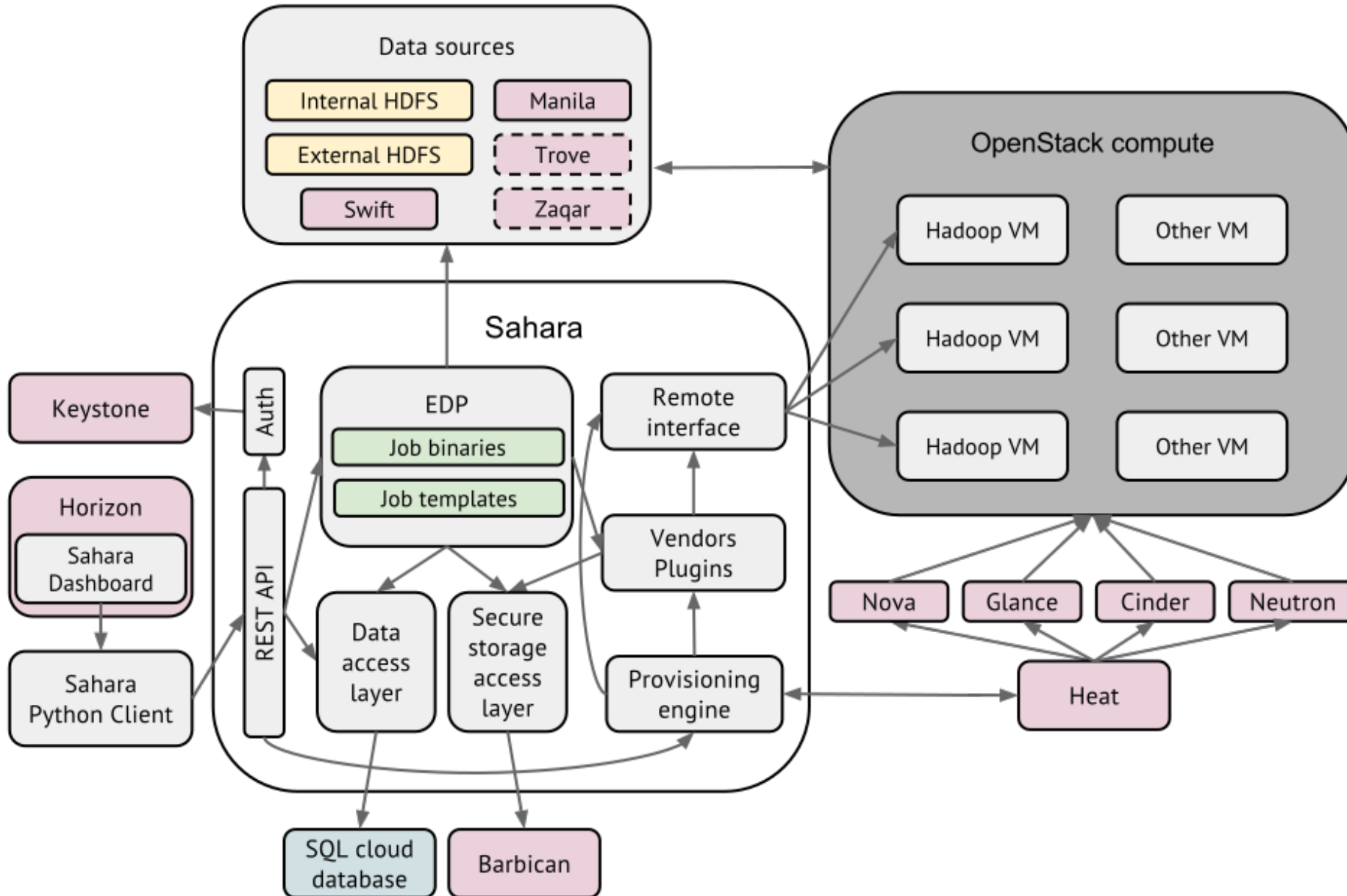
Sahara Key Features

- Designed as an OpenStack component.
- Managed through a REST API with a user interface(UI) available as part of OpenStack Dashboard.
- Support for a variety of data processing frameworks:
 - Multiple Hadoop vendor distributions.
 - Apache Spark and Storm.
 - Pluggable system of Hadoop installation engines.
 - Integration with vendor specific management tools, such as Apache Ambari and Cloudera Management Console.
- Predefined configuration templates with the ability to modify parameters.

Sahara and Other OpenStack Services



Sahara Architecture



Cluster Provisioning Workflow

- Select a Hadoop (or framework) version.
- Select a base image with or without pre-installed data processing framework. Download prepared up-to-date images from <http://sahara-files.mirantis.com/images/upstream/>
- Define cluster configuration, including cluster size, topology, and framework parameters (configurable templates are provided).
- Provision the cluster; sahara will provision VMs, install and configure the data processing framework.
- Perform operations on the cluster; add or remove nodes.
- Terminate the cluster when it is no longer needed.

Analitycs as a Service Workflow

- Select one of the predefined data processing framework versions.
- Configure a job.
- Set the limit for the cluster size.
- Execute the job.
- Get the results of computations (for example, from swift).

Demo Praktik Sahara

Terima Kasih

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