Openstack Essentials

RED PLANET

FOR INFRASTRUCTURE & OPERATIONS PROFESSIONALS

OpenStack's Global Traction Expands For Its Newton Release

OpenStack Summit And Newton Update, Q4 2016

December 19, 2016

By **Lauren E. Nelson, Fr**
Paul Miller, Sophia I. Va
Glenn O'Donnell, Laura K
Michael Caputo, Diane Ly

Why Read This Brief

OpenStack has grown into a de facto standard platform for the private cloud market and now serves as the foundation for public clouds, particularly in Europe and China. This report analyzes the state of OpenStack at the time of the summit recently hosted by the governing foundation in Barcelona to showcase Newton, its latest release. It also details the most important next steps for infrastructure and operations (I&O) leaders who are investing in the OpenStack platform.

Recommended Research

Predictions 2016: Digita
Services Transformed

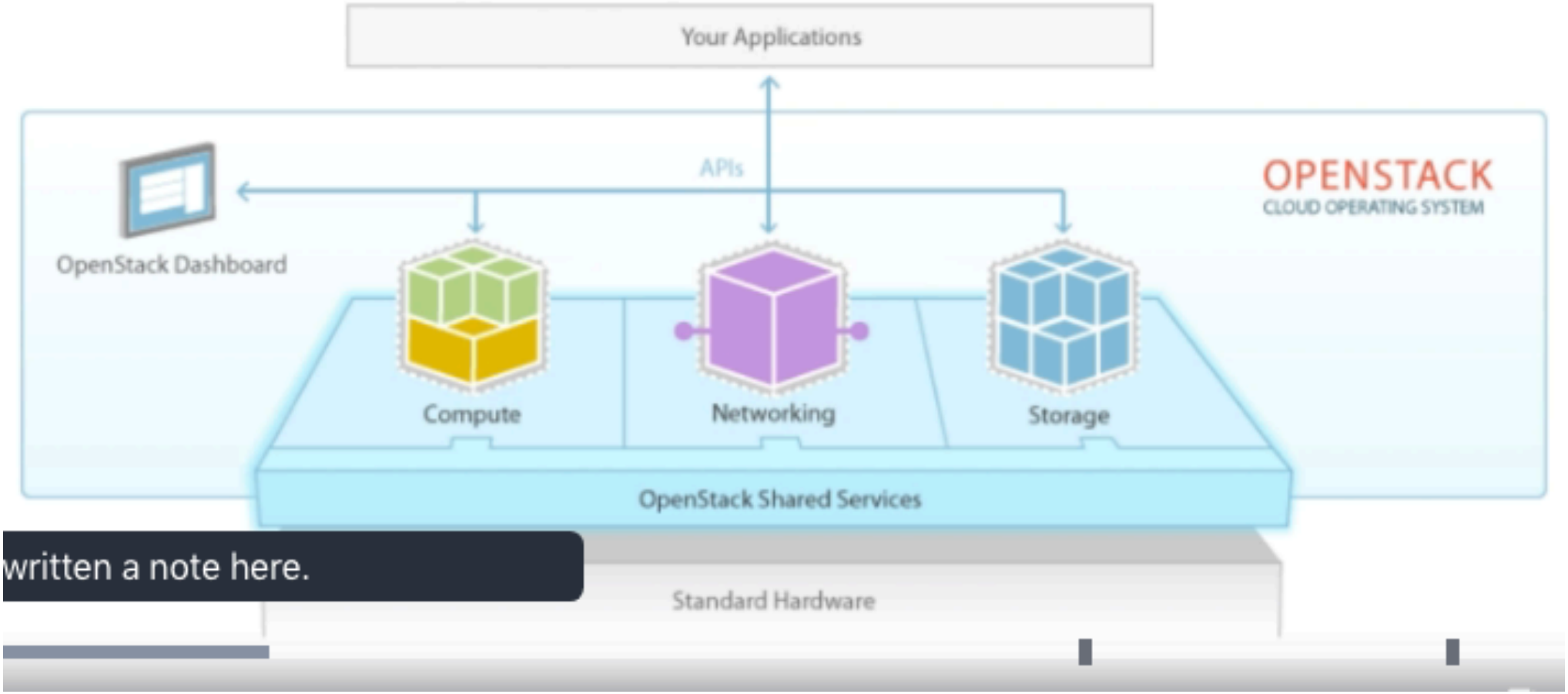
November 9, 2015 | John
McCarthy

- One of the most popular open source projects driven by the community so far
- De facto platform for the private cloud market
- Backed by more than 500 companies

Introduction to Openstack

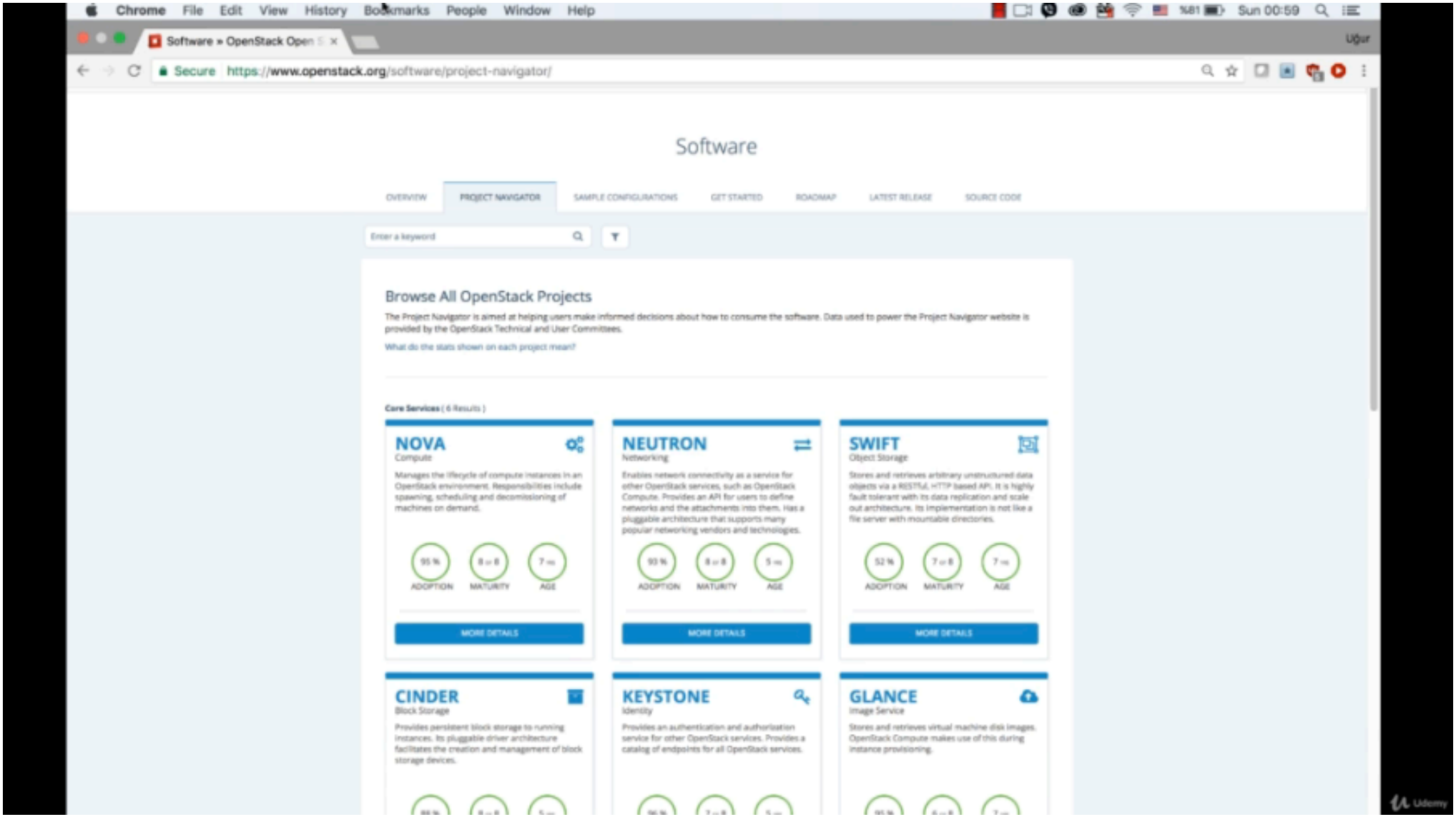
written a note here.

OpenStack Essentials



written a note here.


SAHARA
Data Processing
ZAQAR
Messaging Service
GLANCE
Image
TROVE
Database
DESIGNATE
DNS Service
NOVA
Compute
NEUTRON
Networking
HEAT
Orchestration
BARBICAN
Key Management
CONGRESS
Governance Service
MISTRAL
Workflow Service
CINDER
Block Storage
SWIFT
Object Storage
MANILA
Shared Filesystems
KEYSTONE
Identity
HORIZON
Dashboard
MURANO
Application Catalog
CEILOMETER
Telemetry
MAGNUM
Container Service
IRONIC
Bare-Metal Provisioning
AND MANY MORE...


Chrome File Edit View History Bookmarks People Window Help
Sun 00:59
Software » OpenStack Open
Secure https://www.openstack.org/software/project-navigator/
Software
OVERVIEW
PROJECT NAVIGATOR
SAMPLE CONFIGURATIONS
GET STARTED
ROADMAP
LATEST RELEASE
SOURCE CODE
Enter a keyword
Browse All OpenStack Projects
The Project Navigator is aimed at helping users make informed decisions about how to consume the software. Data used to power the Project Navigator website is provided by the OpenStack Technical and User Committees.
What do the stats shown on each project mean?
Core Services (6 Results)
NOVA
Compute
Manages the lifecycle of compute instances in an OpenStack environment. Responsibilities include spawning, scheduling and decomissioning of machines on demand.
95 %
ADOPTION
8 or 8
MATURITY
7
AGE
MORE DETAILS
NEUTRON
Networking
Enables network connectivity as a service for other OpenStack services, such as OpenStack Compute. Provides an API for users to define networks and the attachments into them. Has a pluggable architecture that supports many popular networking vendors and technologies.
93 %
ADOPTION
8 or 8
MATURITY
5
AGE
MORE DETAILS
SWIFT
Object Storage
Stores and retrieves arbitrary unstructured data objects via a RESTful, HTTP based API. It is highly fault tolerant with its data replication and scale out architecture. Its implementation is not like a file server with mountable directories.
52 %
ADOPTION
7 or 8
MATURITY
7
AGE
MORE DETAILS
CINDER
Block Storage
Provides persistent block storage to running instances. Its pluggable driver architecture facilitates the creation and management of block storage devices.
KEYSTONE
Identity
Provides an authentication and authorization service for other OpenStack services. Provides a catalog of endpoints for all OpenStack services.
GLANCE
Image Service
Stores and retrieves virtual machine disk images. OpenStack Compute makes use of this during instance provisioning.
Udemy

Hear from Google, Harvard, eBay and more at the OpenStack Summit Boston, May 8-11. Hurry, prices increase March 14! REGISTER NOW

openstack. Q SEARCH SOFTWARE USERS COMMUNITY MARKETPLACE EVENTS LEARN DOCS MY ACCOUNT

Software

OVERVIEW PROJECT NAVIGATOR SAMPLE CONFIGURATIONS GET STARTED ROADMAP LATEST RELEASE SOURCE CODE

Web Applications Big Data eCommerce Video Processing and Content Delivery High Throughput Computing Container Optimi

WHAT ARE SAMPLE CONFIGURATIONS?

Think of these as curated playlists of OpenStack configurations. These sample configurations are based on OpenStack case studies and real-world reference architectures across industries and workloads. Each configuration will give you a good idea of which core and optional projects can be used for different environments.

WEB APPLICATIONS

Web Applications

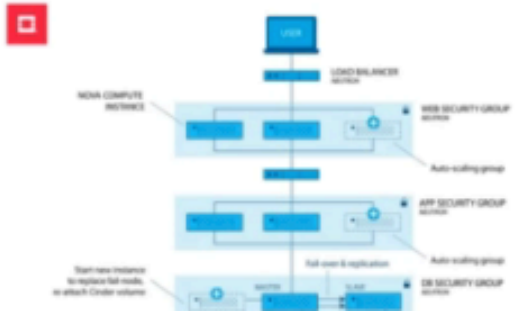
Interactive web applications are the most prevalent applications in business today. Consumers and enterprises alike interact with their employees, customers and partners online, using applications such as online banking, human resources and even tax filing and pet adoption. Many organizations, such as Workday, Betfair, Ancestry.com, JFE Steel, HMRC (Her Majesty's Revenue and Customs) and LivePerson are using OpenStack to deliver interactive web applications at scale.

IT resource needs for web applications often fluctuate with end user demand—predictably or unpredictably. Failure to respond to either can impact customer satisfaction and sales. The ability to dynamically add and remove resources is one of the primary benefits to using an OpenStack cloud.

Read this Web Applications reference architecture to learn how to use OpenStack services to build a three-tier web application on an existing OpenStack cloud. And, try it yourself with the Heat template provided in the Community Application Catalog!

The Heat template sets up new virtual machines, private networks for each tier and the proper connections, load balancers, routers and security groups. It deploys the popular LAMP software into the tiers, and WordPress as an example web application. Two templates are provided in the package—one for auto-scaling and one for manual scaling

The target OpenStack cloud must be configured with the six core projects and Heat (in order to use the deployment template). Ceilometer is required for auto-scaling deployment. Trove is referenced but not used in the sample configuration.



Udemy

Software

WHAT ARE SAMPLE CONFIGURATIONS?

Think of these as curated playlists of OpenStack configurations. These sample configurations are based on OpenStack case studies and real-world reference architectures across industries and workloads. Each configuration will give you a good idea of which core and optional projects can be used for different environments.

BIG DATA

Big Data

Providing scalable, elastic infrastructure for big data collection and analytics has been a primary use case for OpenStack in many industries. According to the April 2016 OpenStack User Survey, 27 percent of users have deployed or are testing Big Data analytics solutions. For example, a top 10 Automaker analyzes data from a variety sources including sensors in vehicles and social media feedback. BMW is another, as are credit reporting service FICO, Burton Snowboards and Naturalis.

Since Big Data analytics can include and analyze all types of data sources, the results are valuable for most departments in an enterprise. IT is often under pressure to fulfill a multitude of demands quickly. An OpenStack-based cloud environment offers automated Big Data cluster provisioning to service high volumes of analytics requests with rapid deployment time requirements.

Read this Big Data reference architecture to learn how to use OpenStack services to build and automatically scale an Apache Hadoop Big Data cluster on an existing OpenStack cloud. And, try it yourself with the Heat template provided in the Community Application Catalog!

The Heat template configures all of the Hadoop nodes using Apache Ambari in the cluster configuration shown in the diagram below. Ambari is an open source project that simplifies Hadoop management. The Heat template also installs these required services:

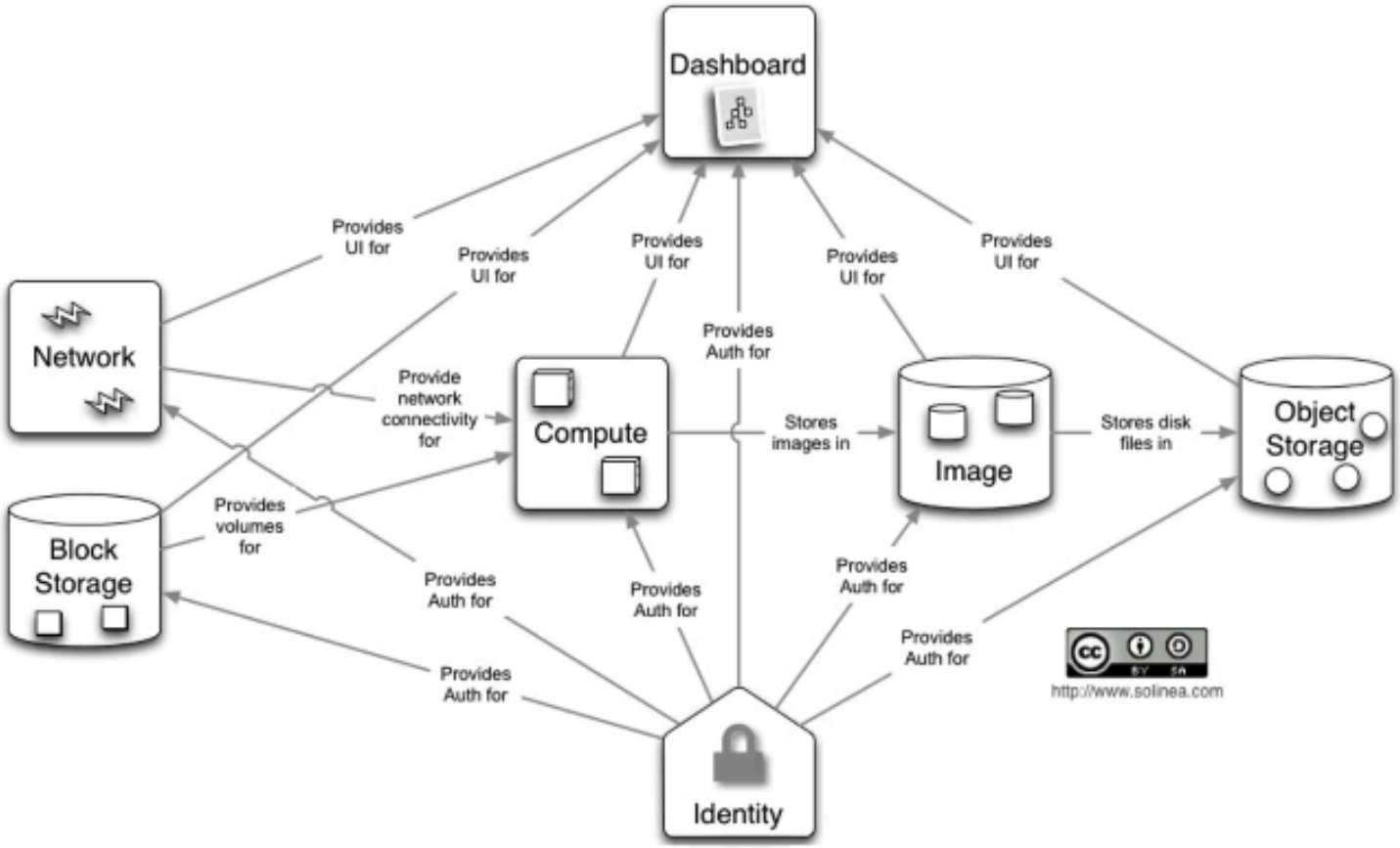
- Name server.
- Network Time Protocol (NTP) server.
- Database.
- Ambari-required operating system configuration customization.
- Floating IP can be allocated to the Master Node.
- Ambari agent service on each node of the cluster.
- Multiple networks (edge, cluster, management, data).
- Neutron security group attached to each instance of the cluster node.
- Cinder volumes and attached one Cinder volume to each node.

The target OpenStack cloud must be configured with the five core projects outlined below and Heat (in order to use the deployment template). Trove and Sahara are referenced but not used in the sample configuration at this time.

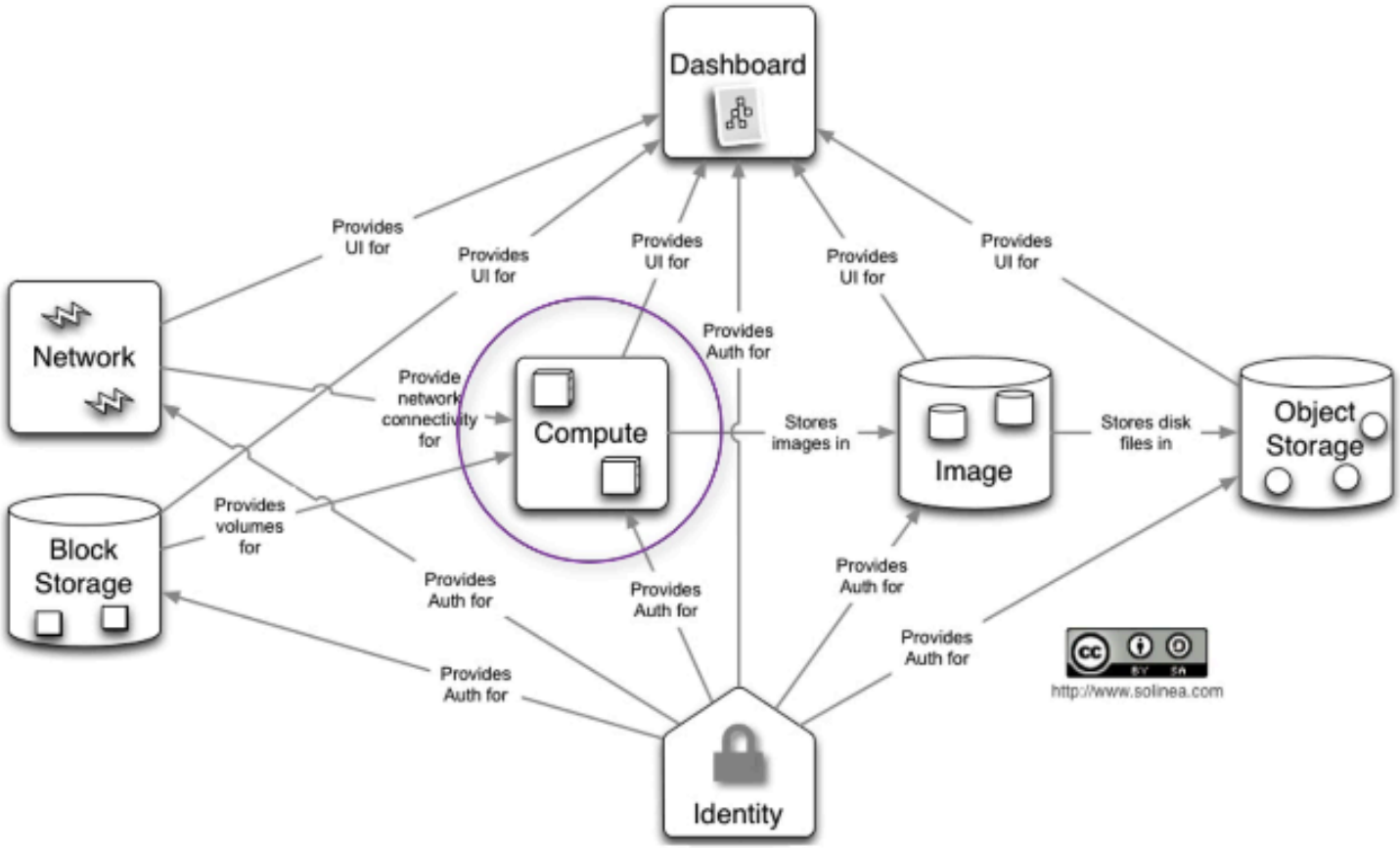
Sahara, an emerging option for big data analytics, provides a simple means to provision a data-intensive application cluster (such as Hadoop or Spark) on top of OpenStack. Like most OpenStack components, it's pluggable with support for a variety of data processing frameworks. It is often deployed with the Ironic bare metal service.

Overview of Component Services

Overview


Dashboard
Network
Compute
Image
Object Storage
Block Storage
Identity
Provides UI for
Provides Auth for
Provide network connectivity for
Stores images in
Stores disk files in
Provides volumes for
http://www.solinea.com

Overview

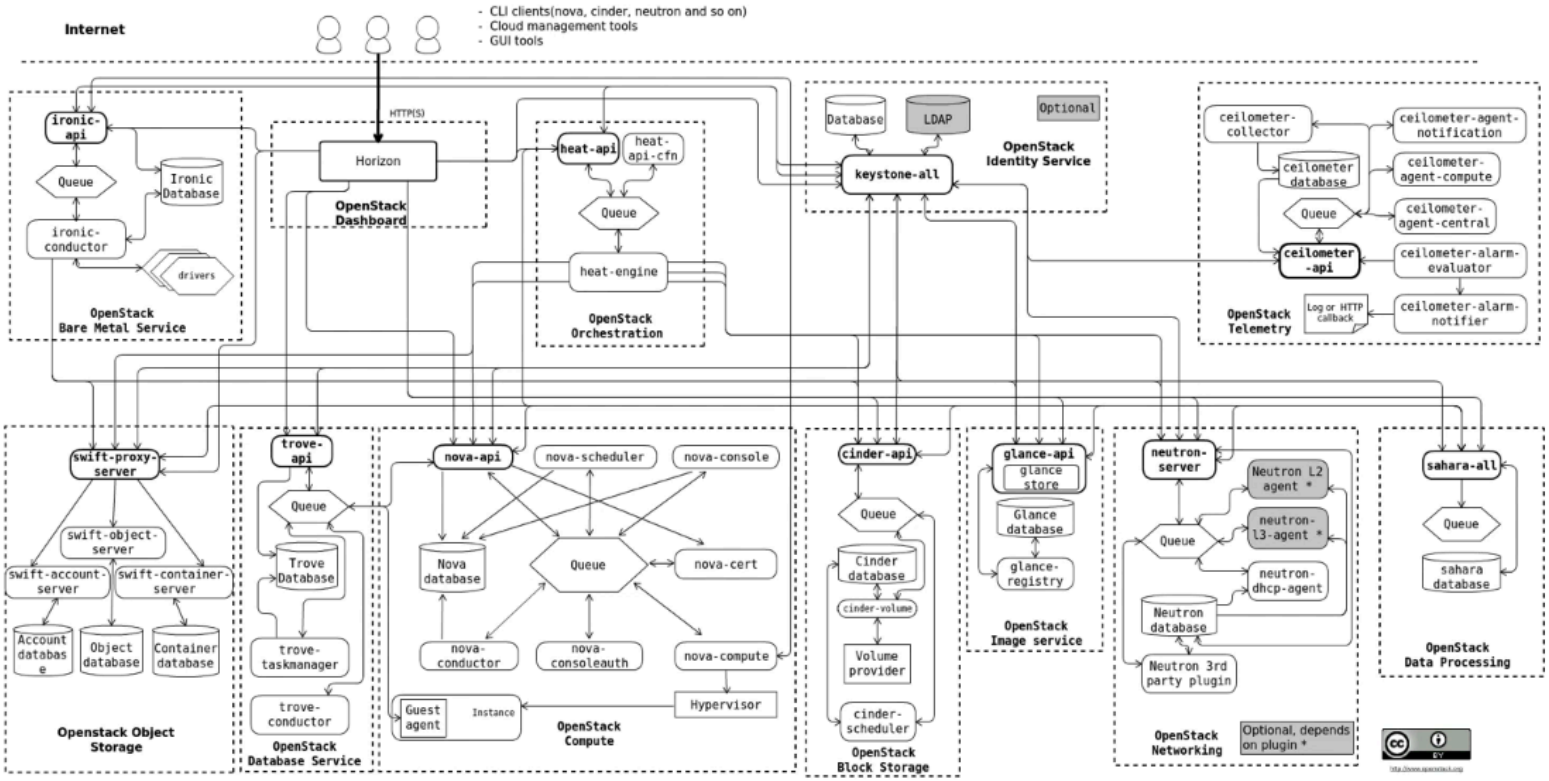

Dashboard
Network
Block Storage
Compute
Image
Object Storage
Identity
Provides UI for
Provides Auth for
Provide network connectivity for
Stores images in
Stores disk files in
Provides volumes for
http://www.solinea.com

Openstack Architecture

RED PLANET

openstack.

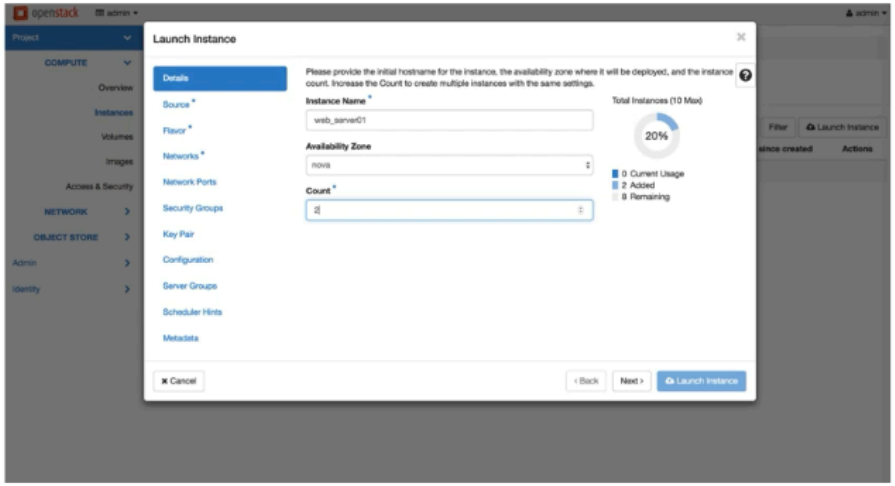
Logical architecture



Rewind 5s

3

1. The Horizon Dashboard



2. The Command Line Interface

```
openstack server create --image centos-7-x86_64-st --flavor 1 --nic net-id=4528135f59f84c31bZ68f3503e1a3766 appserver12
```

3. The API

```
$ curl -s -H "X-Auth-Token: $OS_TOKEN" \
  $OS_COMPUTE_API/flavors \
  | python -m json.tool
```

Rewind 5s