本地虚机部署单节点 OpenStack 环境

版本	时间	修改人	主要修订内容
V1.0	2021-7-20	刘苏	初稿V1.0

1 准备虚机

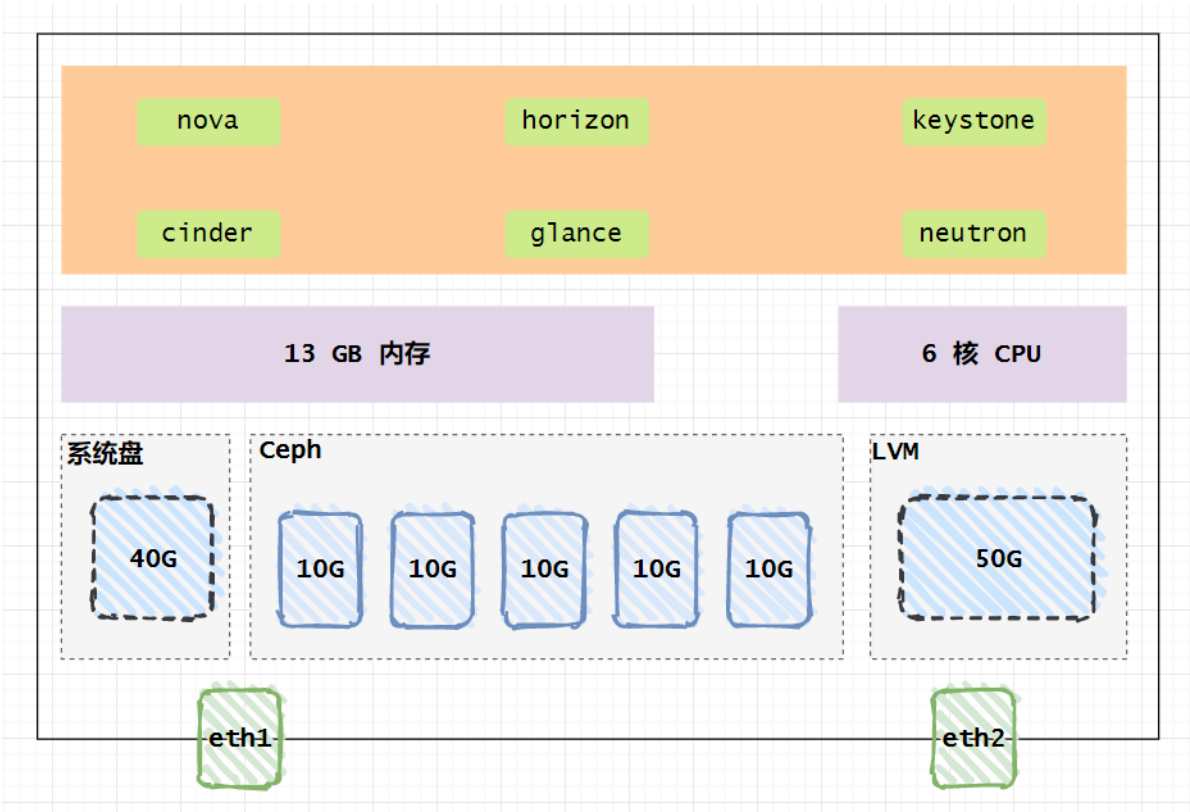
1.1 安装 VMware Workstation 16 Player

下载地址：https://www.vmware.com/products/workstation-player/workstation-player-evaluation.html

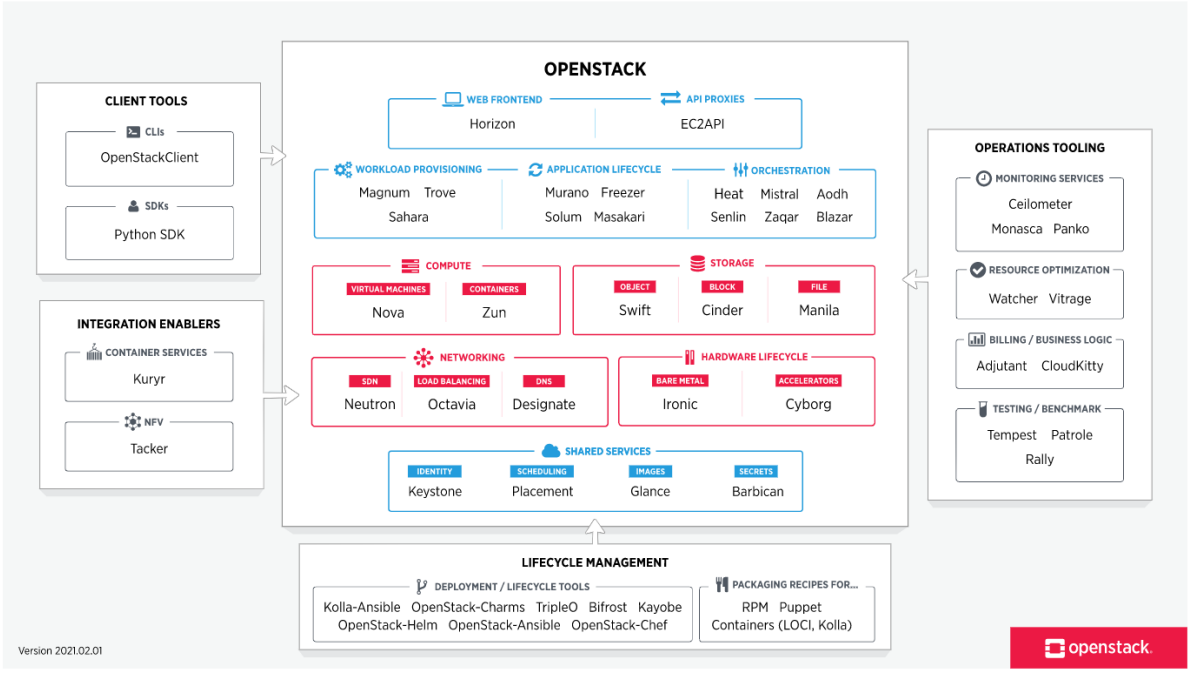
1.2 创建 CentOS 7 虚机

下载带桌面版的，iso 文件下载地址：https://mirrors.huaweicloud.com/centos/7.9.2009/isos/x86_64/

如下图所示，我的虚拟机给的配置为 13 G 内存，6 核处理器，一块 40 G 系统盘，一块 50 G 数据盘用作 lvm 卷组，5 块 10 G 的盘用来部署 Ceph，另外给了两块网卡，网络连接为 NAT 模式。



2 安装OpenStack



2.1 准备工作

2.1.1 设置时区

```
[root@controller ~]# cp /usr/share/zoneinfo/Asia/Shanghai /etc/localtime
cp: overwrite ‘/etc/localtime’? y
[root@controller ~]# date
Tue Jul 20 16:13:44 CST 2021
```

2.1.2 禁用 SELinux

```
[root@controller ~]# cat /etc/selinux/config

# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#     enforcing - SELinux security policy is enforced.
#     permissive - SELinux prints warnings instead of enforcing.
#     disabled - No SELinux policy is loaded.
SELINUX=disabled
# SELINUXTYPE= can take one of three values:
#     targeted - Targeted processes are protected,
#     minimum - Modification of targeted policy. Only selected processes are
protected.
#     mls - Multi Level Security protection.
SELINUXTYPE=targeted
```

2.1.3 关闭 Network Manager

```
[root@controller ~]# systemctl stop NetworkManager
[root@controller ~]# systemctl disable NetworkManager
```

2.1.4 关闭防火墙

```
[root@controller ~]# systemctl stop firewalld
[root@controller ~]# systemctl disable firewalld
```

2.1.5 配置主机名

```
[root@controller ~]# hostnamectl set-hostname controller
[root@controller ~]# hostname
controller
[root@controller ~]#
[root@controller ~]# cat /etc/hosts
127.0.0.1   localhost localhost.localdomain localhost4 localhost4.localdomain4
::1         localhost localhost.localdomain localhost6 localhost6.localdomain6

192.168.220.138 controller
[root@controller ~]#
[root@controller ~]#
[root@controller ~]# ping controller -c 3
PING controller (192.168.220.138) 56(84) bytes of data.
64 bytes from controller (192.168.220.138): icmp_seq=1 ttl=64 time=0.023 ms
64 bytes from controller (192.168.220.138): icmp_seq=2 ttl=64 time=0.028 ms
64 bytes from controller (192.168.220.138): icmp_seq=3 ttl=64 time=0.044 ms

--- controller ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2000ms
rtt min/avg/max/mdev = 0.023/0.031/0.044/0.011 ms
```

2.2 安装基本组件

2.2.1 安全

默认采用如下密码：

Password name	Description
Database password (no variable used)	Root password for the database
`ADMIN_PASS`	Password of user `admin`
`CINDER_DBPASS`	Database password for the Block Storage service
`CINDER_PASS`	Password of Block Storage service user `cinder`
`DASH_DBPASS`	Database password for the Dashboard
`DEMO_PASS`	Password of user `demo`
`GLANCE_DBPASS`	Database password for Image service
`GLANCE_PASS`	Password of Image service user `glance`
`KEYSTONE_DBPASS`	Database password of Identity service
`METADATA_SECRET`	Secret for the metadata proxy
`NEUTRON_DBPASS`	Database password for the Networking service
`NEUTRON_PASS`	Password of Networking service user `neutron`
`NOVA_DBPASS`	Database password for Compute service
`NOVA_PASS`	Password of Compute service user `nova`
`PLACEMENT_PASS`	Password of the Placement service user `placement`
`RABBIT_PASS`	Password of RabbitMQ user `openstack`

2.2.2 配置网络

```
[root@controller ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group
default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: ens33: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
group default qlen 1000
    link/ether 00:0c:29:6f:e6:af brd ff:ff:ff:ff:ff:ff
    inet 192.168.220.138/24 brd 192.168.220.255 scope global ens33
       valid_lft forever preferred_lft forever
    inet6 fe80::20c:29ff:fe6f:e6af/64 scope link
       valid_lft forever preferred_lft forever
```

```
3: ens37: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default
qlen 1000
    link/ether 00:0c:29:6f:e6:b9 brd ff:ff:ff:ff:ff:ff
4: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN
group default qlen 1000
    link/ether 52:54:00:5b:c3:c0 brd ff:ff:ff:ff:ff:ff
    inet 192.168.122.1/24 brd 192.168.122.255 scope global virbr0
       valid_lft forever preferred_lft forever
5: virbr0-nic: <BROADCAST,MULTICAST> mtu 1500 qdisc pfifo_fast master virbr0
state DOWN group default qlen 1000
    link/ether 52:54:00:5b:c3:c0 brd ff:ff:ff:ff:ff:ff
[root@controller ~]#
[root@controller ~]#
[root@controller ~]# cat /etc/sysconfig/network-scripts/ifcfg-ens33
TYPE="Ethernet"
PROXY_METHOD="none"
BROWSER_ONLY="no"
BOOTPROTO="static"
DEFROUTE="yes"
IPV4_FAILURE_FATAL="no"
IPV6INIT="yes"
IPV6_AUTOCONF="yes"
IPV6_DEFROUTE="yes"
IPV6_FAILURE_FATAL="no"
IPV6_ADDR_GEN_MODE="stable-privacy"
NAME="ens33"
UUID="a27d2bd8-d207-4b73-bfd9-d8fab4064bb3"
DEVICE="ens33"
ONBOOT="yes"
IPADDR=192.168.220.138
GATEWAY=192.168.220.2
NETMASK=255.255.255.0
DNS1=114.114.114.114
```

2.2.3 时间同步服务

安装包并配置：

```
[root@controller ~]# yum install chrony -y
[root@controller ~]# systemctl restart chronyd
[root@controller ~]# systemctl enable chronyd
[root@controller ~]# systemctl status chronyd
● chronyd.service - NTP client/server
   Loaded: loaded (/usr/lib/systemd/system/chronyd.service; enabled; vendor
preset: enabled)
   Active: active (running) since Tue 2021-07-20 20:16:17 CST; 6s ago
     Docs: man:chronyd(8)
           man:chrony.conf(5)
  Process: 3881 ExecStartPost=/usr/libexec/chrony-helper update-daemon
(code=exited, status=0/SUCCESS)
  Process: 3877 ExecStart=/usr/sbin/chronyd $OPTIONS (code=exited,
status=0/SUCCESS)
 Main PID: 3879 (chronyd)
    Tasks: 1
   CGroup: /system.slice/chronyd.service
           └─3879 /usr/sbin/chronyd
```

```
Jul 20 20:16:17 controller systemd[1]: Starting NTP client/server...
Jul 20 20:16:17 controller chronyd[3879]: chronyd version 3.4 starting (+CMDMON
+NTP +REFCLOCK +RTC +PRIVDROP +SCFILTER +SIGND +ASYNCDNS +SECHASH +IPV6 +DEBUG)
Jul 20 20:16:17 controller chronyd[3879]: Frequency 2.997 +/- 3.581 ppm read
from /var/lib/chrony/drift
Jul 20 20:16:17 controller systemd[1]: Started NTP client/server.
[root@controller ~]# chronyc sources
210 Number of sources = 1
MS Name/IP address         Stratum Poll Reach LastRx Last sample
===============================================================================
^? ntp5.flashdance.cx            2   6     1     3  -3409us[-3409us] +/-  163ms
```

2.2.4 添加 OpenStack 源

添加 Queens 版本源：

```
[root@controller ~]# yum install centos-release-openstack-queens -y
[root@controller ~]# yum upgrade -y
```

安装 OpenStack client：

```
[root@controller ~]# yum install python-openstackclient -y
```

2.2.5 安装 SQL 数据库

安装包：

```
[root@controller ~]# yum install mariadb mariadb-server python2-PyMySQL -y
```

2.2.6 安装消息队列

安装包：

```
[root@controller ~]# yum install rabbitmq-server -y
```

2.2.7 安装 Memcached

安装包：

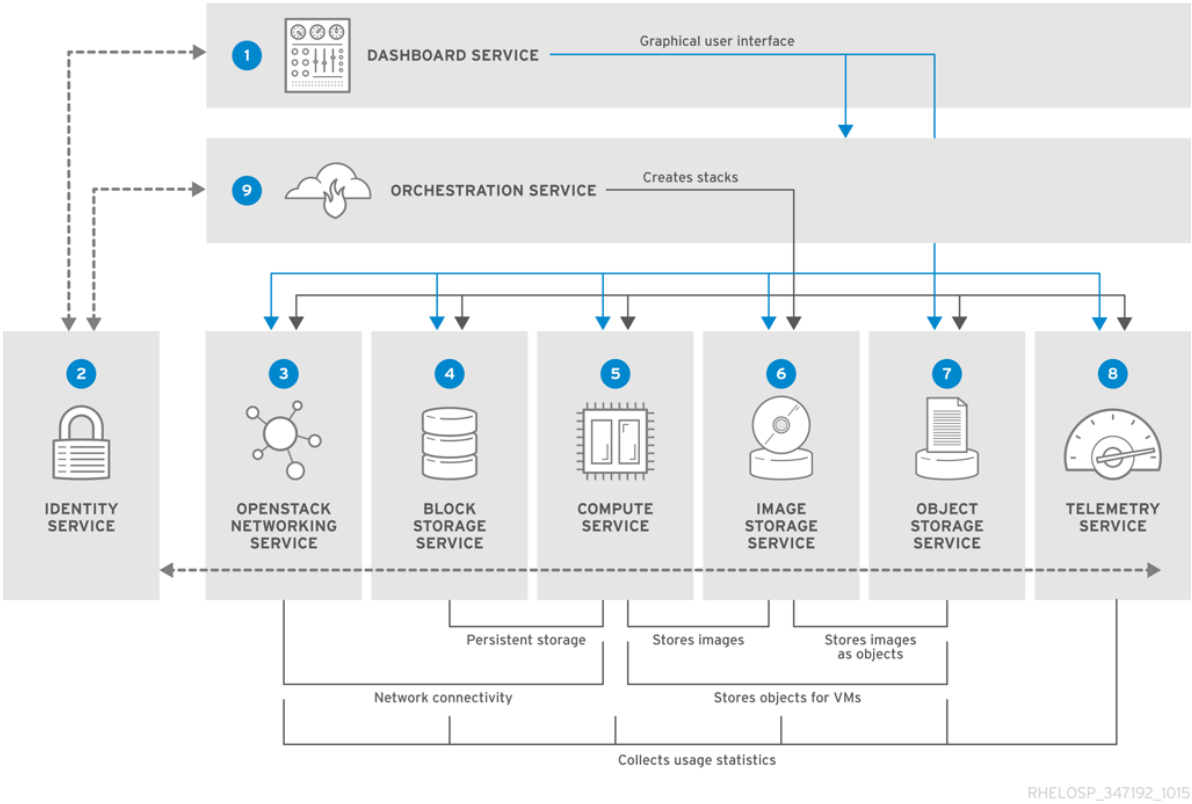
```
[root@controller ~]# yum install memcached python-memcached -y
```

2.2.8 安装 Etcd

安装包：

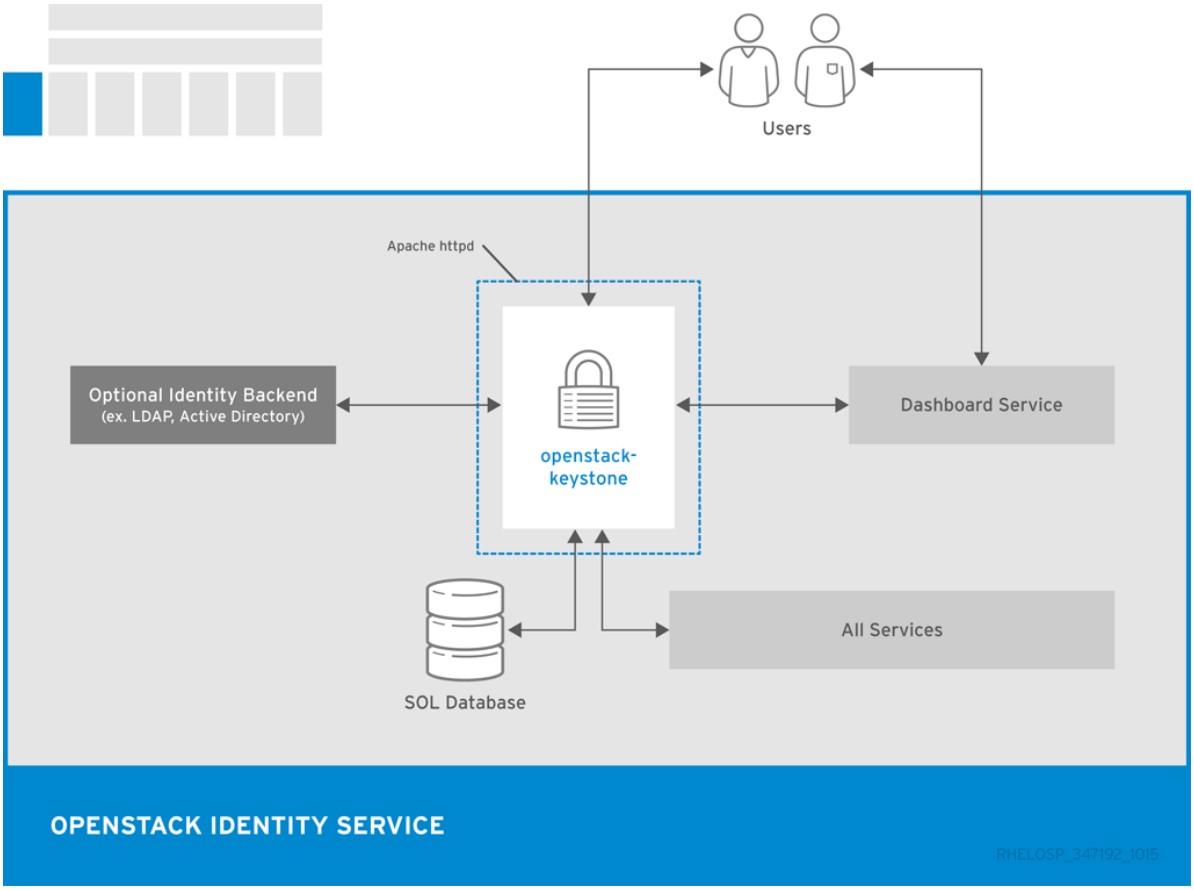
```
[root@controller ~]# yum install etcd -y
```

2.3 安装 OpenStack 服务组件



	Service	Code	Description
•	Dashboard	horizon	Web browser-based dashboard that you use to manage OpenStack services.
•	Identity	keystone	Centralized service for authentication and authorization of OpenStack services and for managing users, projects, and roles.
•	OpenStack Networking	neutron	Provides connectivity between the interfaces of OpenStack services.
•	Block Storage	cinder	Manages persistent block storage volumes for virtual machines.
•	Compute	nova	Manages and provisions virtual machines running on hypervisor nodes.
•	Image	glance	Registry service that you use to store resources such as virtual machine images and volume snapshots.
•	Object Storage	swift	Allows users to store and retrieve files and arbitrary data.
•	Telemetry	ceilometer	Provides measurements of cloud resources.
•	Orchestration	heat	Template-based orchestration engine that supports automatic creation of resource stacks.

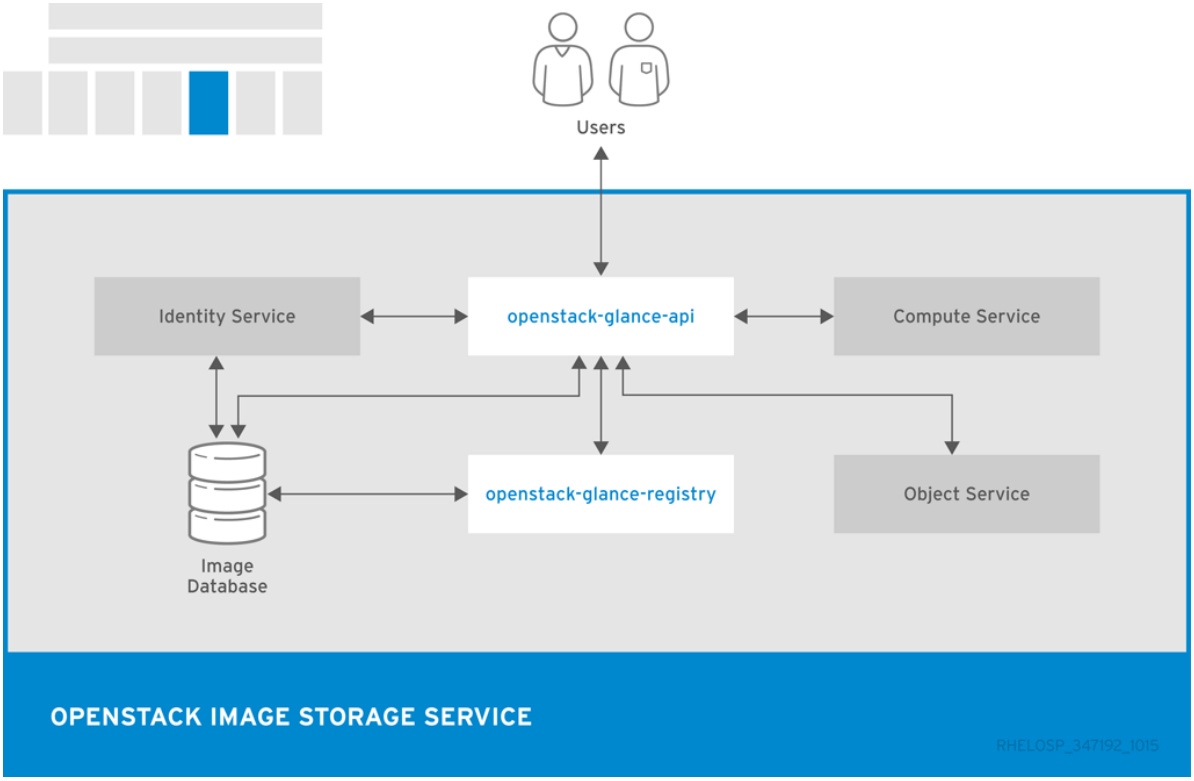
2.3.1 安装 Keystone 认证服务



安装包：

```
[root@controller ~]# yum install openstack-keystone httpd mod_wsgi -y
```

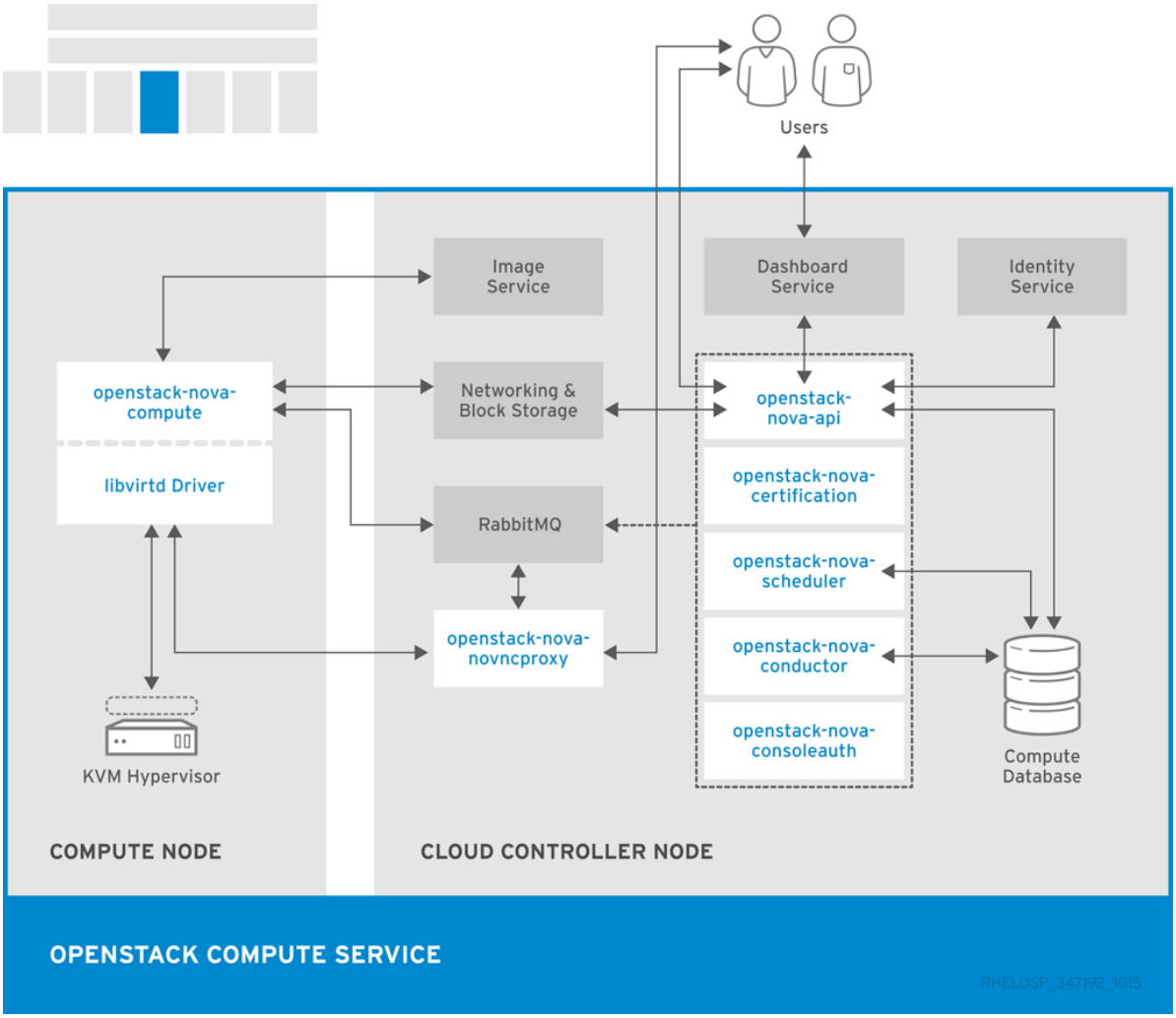
2.3.2 安装 Glance 镜像服务



安装包：

```
[root@controller ~]# yum install openstack-glance -y
```

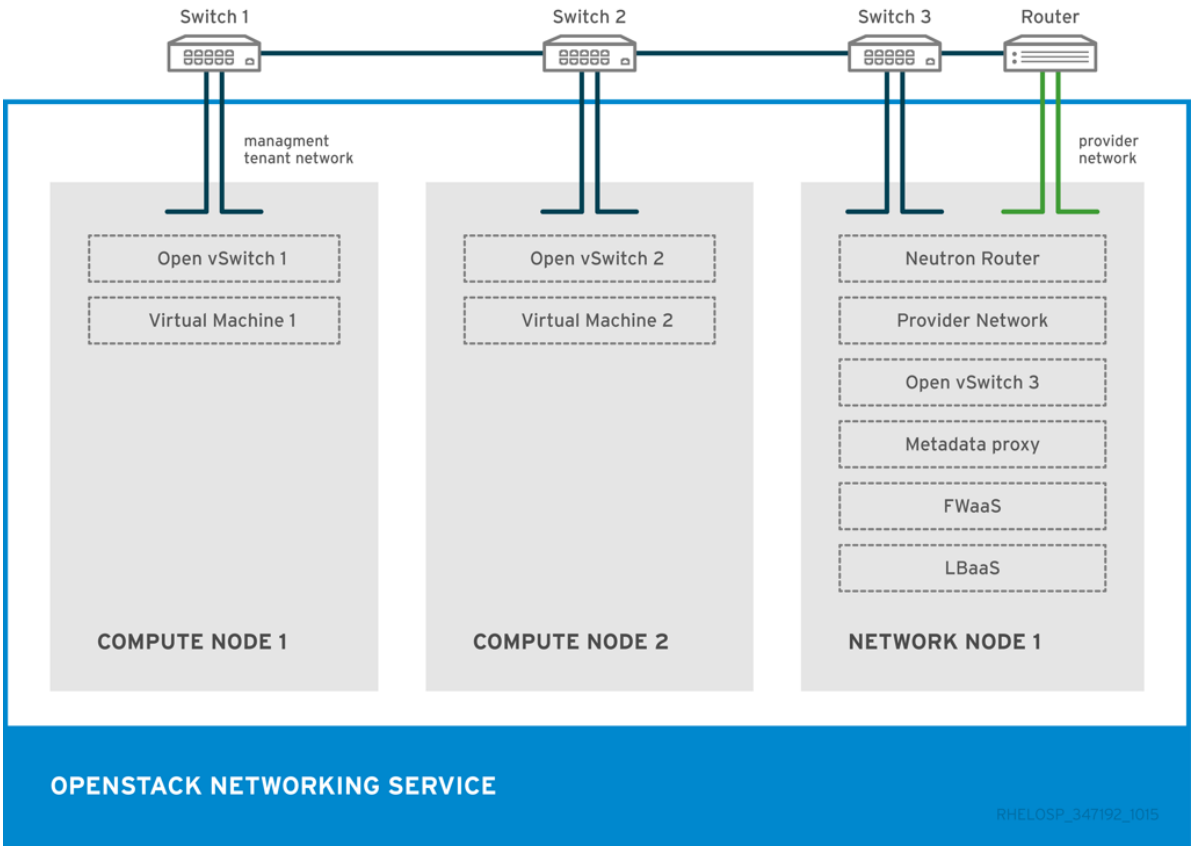
2.3.3 安装 Nova 计算服务



安装包：

```
[root@controller ~]# yum install openstack-nova-api openstack-nova-conductor
openstack-nova-console openstack-nova-novncproxy   openstack-nova-scheduler
openstack-nova-placement-api -y
[root@controller ~]# yum install openstack-nova-compute -y
```

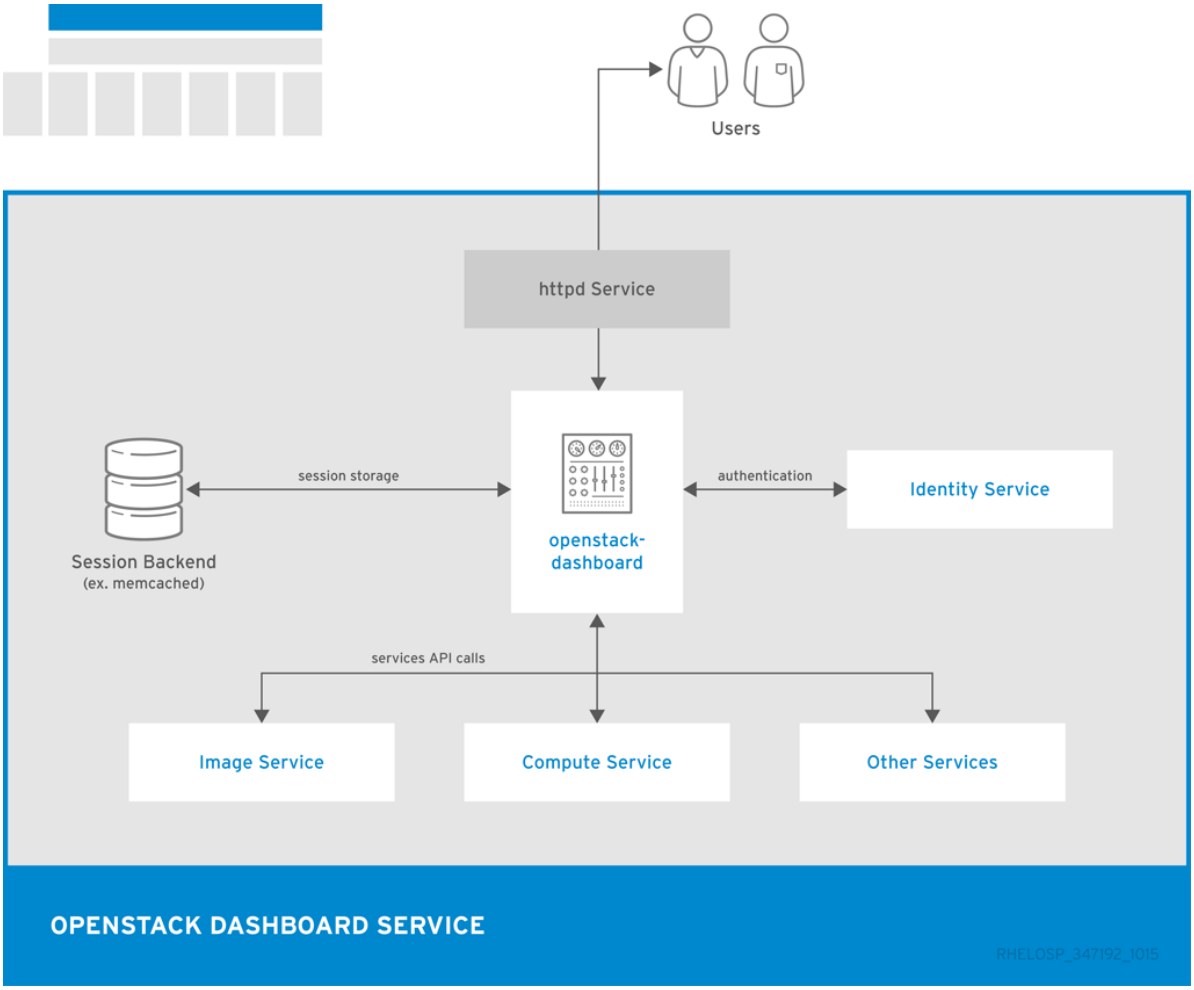
2.3.4 安装 Neutron 网络服务



安装包：

```
[root@controller ~]# yum install openstack-neutron openstack-neutron-ml2
openstack-neutron-linuxbridge ebtables -y
```

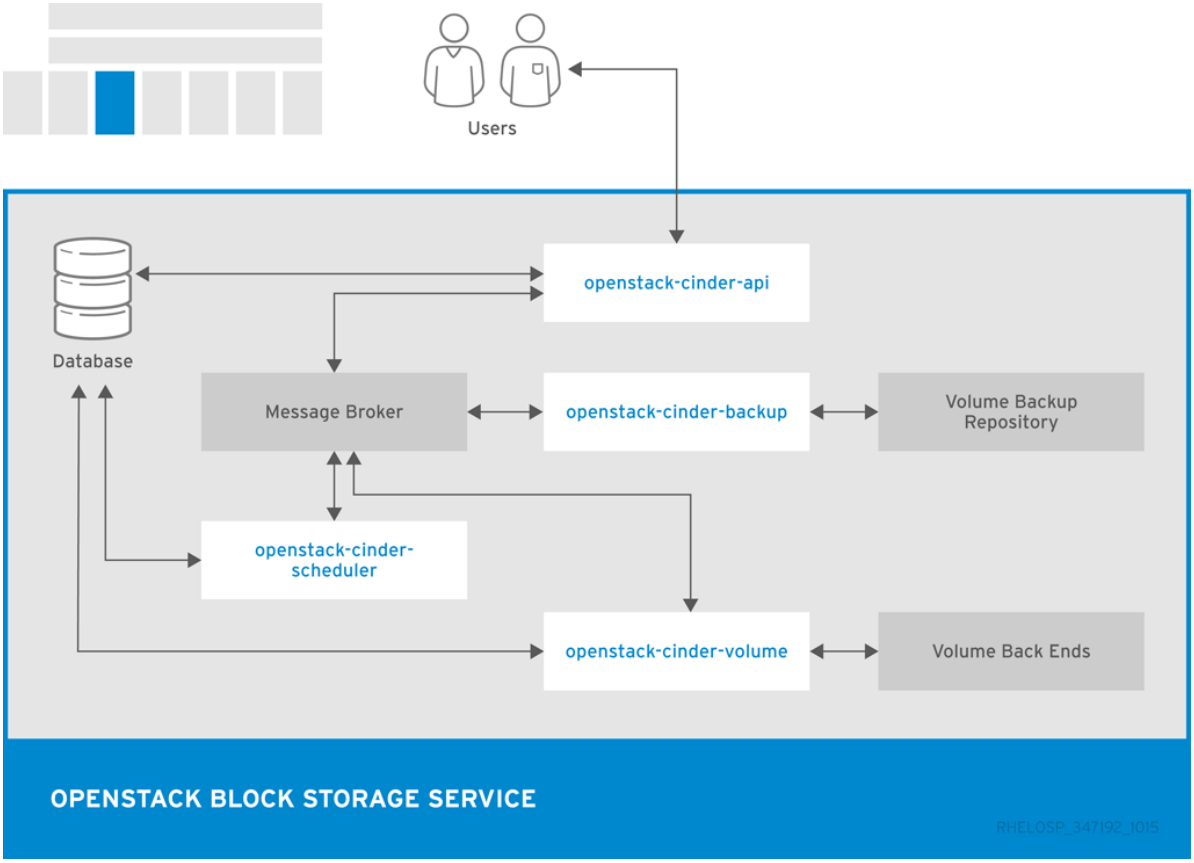
2.3.5 安装 Dashboard



安装包：

```
[root@controller ~]# yum install openstack-dashboard -y
```

2.3.6 安装 Cinder 块存储服务



安装包：

```
[root@controller ~]# yum install lvm2 device-mapper-persistent-data -y
[root@controller ~]# yum install openstack-cinder targetcli python-keystone -y
```

3 OpenStack 对接 Ceph

3.1 安装 Ceph

3.2 对接 Ceph