CentOS 虚拟机部署与 OpenStack 安装指南

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Abstract

本文档详细描述了在 VMware Workstation Pro 环境中创建 CentOS 虚拟机、配置系统环境以及部署 OpenStack Queens 版本的完整流程。包含虚拟机创建、系统初始化、网络配置、时钟同步、OpenStack 安装和实例创建等关键步骤。

1 虚拟机创建

1.1 系统镜像选择

使用 CentOS 7 镜像，下载地址：
`https://mirrors.aliyun.com/centos/`

1.2 硬件配置要求

- CPU: 双核（需开启虚拟化支持）
- 内存: 8GB
- 硬盘: 200GB

1.3 磁盘配置

- 磁盘类型: SCSI 控制器
- 存储格式: 拆分为多个文件
- 磁盘大小: 150GB

参数	值
名称	CentOS 7 64 位
位置	D:\tmp\yunjisuan\centos
版本	Workstation 16.2.x
网络	桥接模式（自动）
外设	CD/DVD, USB 控制器, 打印机, 声卡

Table 1: 虚拟机详细配置

2 系统初始化

2.1 网络配置

配置桥接网络并设置主机名：

```
hostnamectl set-hostname node-a
cat /etc/hostname  # 验证主机名
```

2.2 主机名与 IP 映射

编辑/etc/hosts 文件：

```
127.0.0.1 localhost localhost.localdomain node-a
192.168.3.146 node-a node-a.localdomain
```

测试网络连通性：

```
ping $HOSTNAME  # 应返回正常响应
```

2.3 镜像挂载

创建并挂载 CD-ROM：

```
mkdir -p /media/cdrom
mount /dev/cdrom /media/cdrom
```

3 系统配置

3.1 更换阿里源

使用 curl 更换 yum 源：

```
curl -o /etc/yum.repos.d/CentOS-Base.repo \
https://mirrors.aliyun.com/repo/Centos-7.repo
```

更新 yum 源并安装工具：

```
yum update -y
yum install -y vim
```

3.2 禁用非必要服务

禁用防火墙和 NetworkManager：

```
systemctl stop firewalld
systemctl disable firewalld
systemctl stop NetworkManager
systemctl disable NetworkManager
systemctl enable network
```

3.3 时钟同步配置

安装并配置 chronyd：

```
systemctl start chronyd
systemctl enable chronyd
chronyc -a makestep  # 手动同步
```

查看时钟源状态：

```
chronyc sources
chronyc tracking
```

4 OpenStack 安装

4.1 更换华为源

配置 OpenStack Queens 仓库：

```
cat > /etc/yum.repos.d/centos-openstack-queens.repo << EOF
[centos-openstack-queens]
name=CentOS-7-OpenStack queens - Huawei
baseurl=https://repo.huaweicloud.com/centos/7/cloud/x86_64/openstack-queens/
gpgcheck=1
enabled=1
EOF
```

4.2 安装 OpenStack

安装 OpenStack 相关包：

```
yum install centos-release-openstack-queens -y
yum update -y  # 升级系统内核
yum install openstack-packstack -y
```

4.3 单节点部署

使用 packstack 进行部署：

```
packstack --allinone
```

5 OpenStack 验证

5.1 查看初始凭证

安装完成后查看管理员凭证：

```
cat /root/keystonerc_admin
```

5.2 加载管理员环境

```
source /root/keystonerc_admin
```

5.3 查看资源

列出可用镜像：

```
openstack image list
```

列出实例规格：

```
openstack flavor list
```

ID	Name	VCPUS	Disk
1	m1.tiny	1	1GB
2	m1.small	1	20GB
3	m1.medium	2	40GB
4	m1.large	4	80GB
5	m1.xlarge	8	160GB

Table 2: 实例规格列表

列出网络：

```
openstack network list
```

列出密钥对：

```
openstack keypair list
```

5.4 创建实例

创建测试实例：

```
openstack server create \
  --image cirros \
  --flavor m1.tiny \
  --key-name mykey \
  --network private \
  --security-group default \
  my-test-instance
```

5.5 查看实例状态

```
openstack server list
openstack server show my-test-instance
```

6 结论

本文完整展示了从虚拟机创建到 OpenStack 云平台部署的全流程。通过详细的步骤说明和命令行操作，读者可以快速搭建起一个功能完整的 OpenStack 环境，并成功创建虚拟机实例进行验证。

7 截图

Figure 1: 虚拟机配置

Figure 2: 虚拟机配置

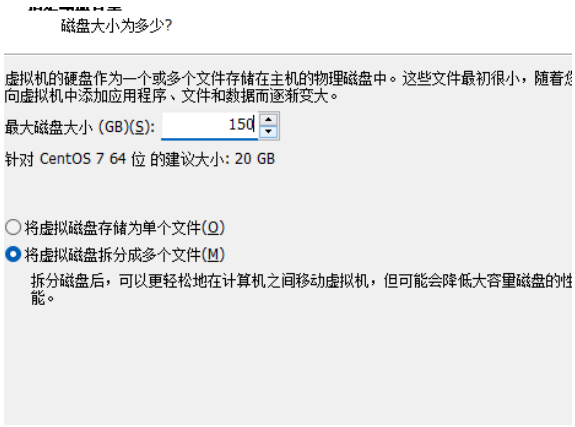

Figure 3: 选择比较大的磁盘大小

Figure 4: 选择 8Gb 内存同时启用桥接模式

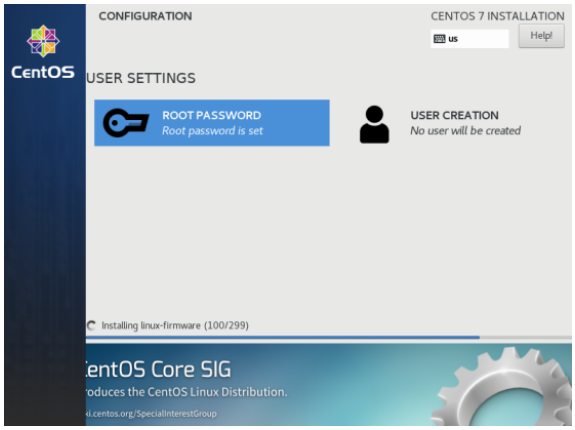

Figure 5:

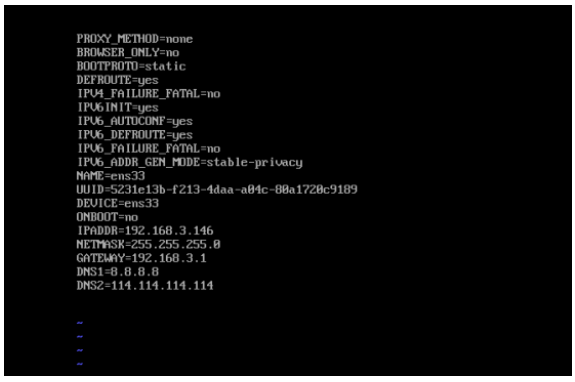

Figure 6: 进行配置桥接网络

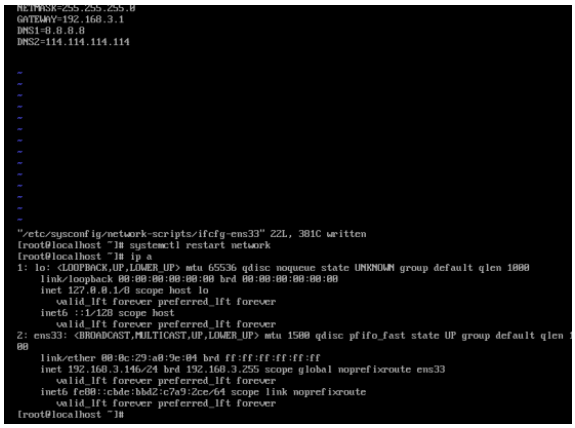

Figure 7: 配置完成

```
[root@localhost ~]# hostnamectl set-hostname node-a
[root@localhost ~]# cat /etc/hostname
node-a
```

Figure 8: 设置主机

```
[root@node-a ~]# cat /etc/hosts
127.0.0.1   localhost localhost.localdomain localhost4 localhost4.localdomain4 node-a
::1         localhost localhost.localdomain localhost6 localhost6.localdomain6 node-a
192.168.3.146 node-a node-a.localdomain
```

Figure 9: 将主机名（域名）与 IP 的映射关系写入 hosts

```
root@node-a ~]# ping $HOSTNAME
ING localhost (127.0.0.1) 56(84) bytes of data.
4 bytes from localhost (127.0.0.1): icmp_seq=1 ttl=64 time=0.038 ms
4 bytes from localhost (127.0.0.1): icmp_seq=2 ttl=64 time=0.038 ms
4 bytes from localhost (127.0.0.1): icmp_seq=3 ttl=64 time=0.043 ms
C
-- localhost ping statistics ---
packets transmitted, 3 received, 0% packet loss, time 2000ms
tt min/avg/max/mdev = 0.038/0.039/0.043/0.007 ms
```

Figure 10: ping HOSTNAME 看是否生效

```
[root@node-a ~]# cd /
[root@node-a /]# mkdir -p /media/cdrom
[root@node-a /]# mount /dev/
Display all 160 possibilities? (y or n)
[root@node-a /]# mount /dev/cdrom /media/cdrom/
mount: /dev/sr0 is write-protected, mounting read-only
[root@node-a /]#
```

Figure 11: 设置永久镜像挂载点

```
#
# /etc/fstab
# Created by anaconda on Sun Jun  8 17:57:35 2025
#
# Accessible filesystems, by reference, are maintained under '/dev/disk'
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info
#
/dev/mapper/centos-root /                       xfs     defaults        0 0
UUID=ff09a3f5-0729-4395-9607-c070752be972 /boot                   xfs     defaults        0 0
/dev/mapper/centos-home /home                   xfs     defaults        0 0
/dev/mapper/centos-swap swap                    swap    defaults        0 0
/dev/cdrom /media/cdrom iso9660 0 0
~
~
```

Figure 12: 更换阿里源

```
root@node-a /]# curl -o /etc/yum.repos.d/CentOS-Base.repo https://mirrors.aliyun.com/repo/Centos-7.repo
 % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
00  2523  100  2523    0     0  13390      0 --:--:-- --:--:-- --:--:-- 13420
```

Figure 13:

```
[root@node-a /]# cp /etc/yum.repos.d/CentOS-Base.repo /etc/yum.repos.d/CentOS-Base.repo.backup
[root@node-a /]# wget -O /etc/yum.repos.d/CentOS-Base.repo https://mirrors.aliyun.com/repo/Centos-7.repo
-bash: wget: command not found
```

Figure 14: 更新 yum 源

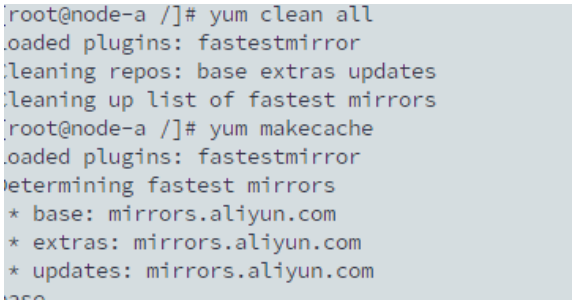

Figure 15: 安装 vim

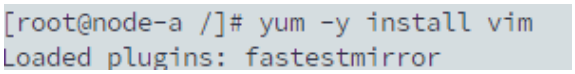

Figure 16: Enter Caption

Figure 17: 禁用 firewalld、NetworkManager

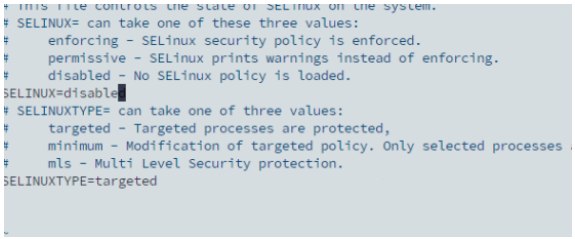

Figure 18: SELinux

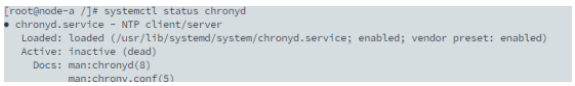

Figure 19: 时钟同步

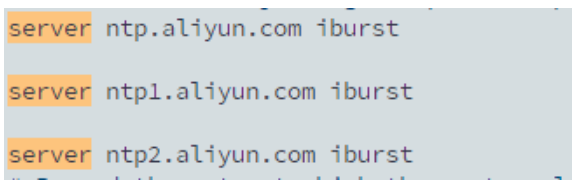

Figure 20:

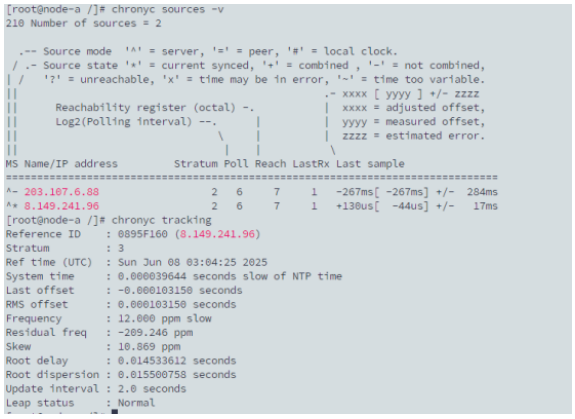

Figure 21: 查看时钟源

Figure 22: 安装 Openstack Queens 版本库

Figure 23: 安装 Openstack Queens 版本库

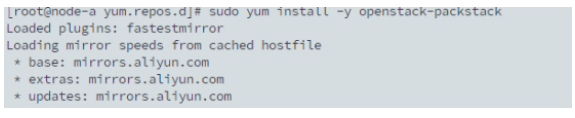

Figure 24: 安装 Packstack 库

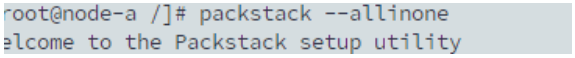

Figure 25: 单节点部署

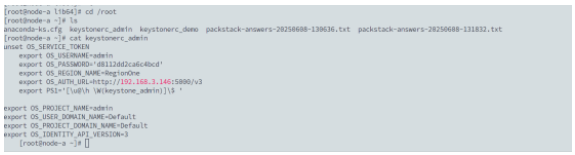

Figure 26: 查看初始用户和密码

Figure 27: 体验

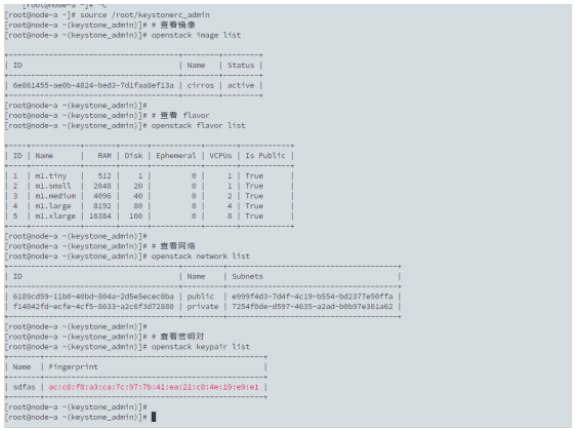

Figure 28: 查看可用资源

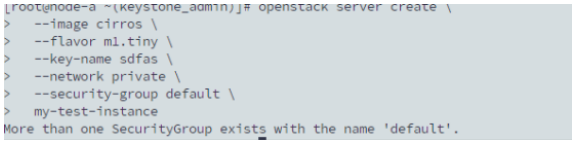

Figure 29: 创建实例

Figure 30: 查看详情