

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：

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

2.2 主机名与 IP 映射

编辑/etc/hosts 文件：

```
1 127.0.0.1 localhost localhost.localdomain node-a
2 192.168.3.146 node-a node-a.localdomain
```

测试网络连通性：

```
1 ping $HOSTNAME # 应返回正常响应
```

2.3 镜像挂载

创建并挂载 CD-ROM：

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

3 系统配置

3.1 更换阿里源

使用 curl 更换 yum 源：

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

更新 yum 源并安装工具：

```
1 yum update -y
2 yum install -y vim
```

3.2 禁用非必要服务

禁用防火墙和 NetworkManager：

```
1 systemctl stop firewalld
2 systemctl disable firewalld
3 systemctl stop NetworkManager
4 systemctl disable NetworkManager
5 systemctl enable network
```

3.3 时钟同步配置

安装并配置 chronyd:

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

查看时钟源状态:

```
1 chronyc sources
2 chronyc tracking
```

4 OpenStack 安装

4.1 更换华为源

配置 OpenStack Queens 仓库:

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

4.2 安装 OpenStack

安装 OpenStack 相关包:

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

4.3 单节点部署

使用 packstack 进行部署:

```
1 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:

```
1 cat /root/keystonerc_admin
```

5.2 加载管理员环境

```
1 source /root/keystonerc_admin
```

5.3 查看资源

列出可用镜像：

```
1 openstack image list
```

列出实例规格：

```
1 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：

```
1 openstack network list
```

列出密钥对：

```
1 openstack keypair list
```

5.4 创建实例

创建测试实例：

```
1 openstack server create \  
2   --image cirros \  
3   --flavor m1.tiny \  
4   --key-name mykey \  
5   --network private \  
6   --security-group default \  
7   my-test-instance
```

5.5 查看实例状态

```
1 openstack server list  
2 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

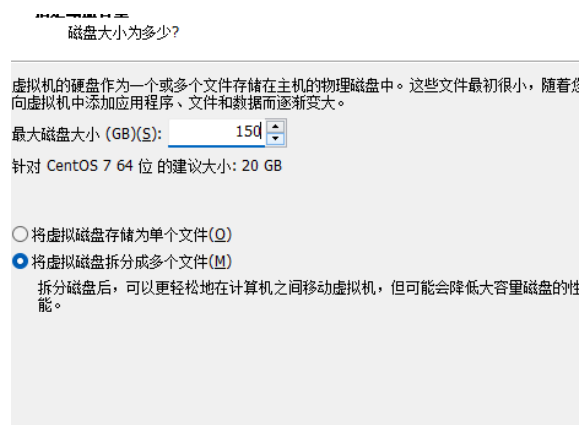


Figure 3: 选择比较大的磁盘大小



Figure 4: 选择 8Gb 内存同时启用桥接模式

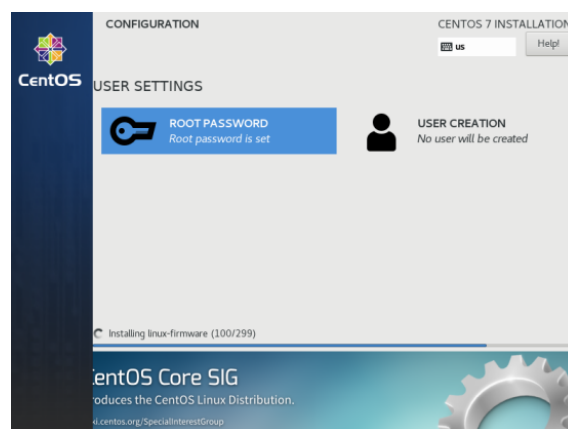


Figure 5:

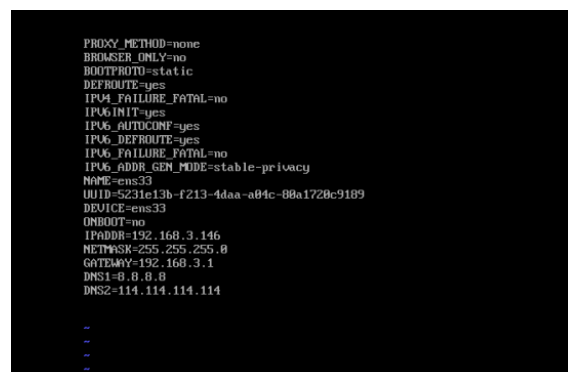


Figure 6: 进行配置桥接网络


```

root@node-a /]# yum clean all
Loaded plugins: fastestmirror
Cleaning repos: base extras updates
Cleaning up list of fastest mirrors
root@node-a /]# yum makecache
Loaded plugins: fastestmirror
Determining fastest mirrors
* base: mirrors.aliyun.com
* extras: mirrors.aliyun.com
* updates: mirrors.aliyun.com

```

Figure 15: 安装 vim

```

[root@node-a /]# yum -y install vim
Loaded plugins: fastestmirror

```

Figure 16: Enter Caption

```

root@node-a /]# sudo systemctl disable firewalld
Removed symlink /etc/systemd/system/multi-user.target.wants/firewalld.service.
Removed symlink /etc/systemd/system/dbus-org.fedoraproject.FirewallD1.service.
root@node-a /]# sudo systemctl stop firewalld
root@node-a /]# sudo systemctl disable NetworkManager
Removed symlink /etc/systemd/system/multi-user.target.wants/NetworkManager.service.
Removed symlink /etc/systemd/system/dbus-org.freedesktop.nm-dispatcher.service.
Removed symlink /etc/systemd/system/network-online.target.wants/NetworkManager-wait-online.service.
root@node-a /]# sudo systemctl stop NetworkManager
root@node-a /]# sudo systemctl enable network
network.service is not a native service, redirecting to /sbin/chkconfig.
Executing /sbin/chkconfig network on

```

Figure 17: 禁用 firewalld、NetworkManager

```

# 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
#   mls - Multi Level Security protection.
SELINUXTYPE=targeted

```

Figure 18: SELinux

```

root@node-a /]# systemctl status chronyd
● chronyd.service - NTP client/server
   Loaded: loaded (/usr/lib/systemd/system/chronyd.service; enabled; vendor preset: enabled)
   Active: inactive (dead)
     Docs: man:chronyd(8)
           man:chronv.conf(5)

```

Figure 19: 时钟同步

```

server ntp.aliyun.com iburst
server ntp1.aliyun.com iburst
server ntp2.aliyun.com iburst

```

Figure 20:


```

[root@node-a ~]# cd /root
[root@node-a ~]# ls
openstack-ks.cfg  keystonerc_admin  keystoneadm_demo  packstack-answers-20210608-130636.txt  packstack-answers-20210608-131032.txt
[root@node-a ~]# cat keystone_admin
unset OS_SERVICE_TOKEN
export OS_REGION_NAME=admin
export OS_PASSWORD='081126d2a648c4'
export OS_REGION_NAME=RegionOne
export OS_AUTH_URL=http://10.1.1.1:35353/v3
export PS1='[\u@h \W]keystone_admin\]\$ '

export OS_PROJECT_NAME=admin
export OS_USER_DOMAIN_NAME=Default
export OS_PROJECT_DOMAIN_NAME=Default
export OS_IDENTITY_API_VERSION=3
[root@node-a ~]#

```

Figure 26: 查看初始用户和密码

ID	Name	Status	Image	Flavor	Network	Security Group
6e08455-a60b-4024-bed3-7d1fa5ef13a	cirros-test	active	cirros	m1.tiny	private	default
41212a1b1a1a1a1a1a1a1a1a1a1a1a1a	test-instance	active	centos	m1.xlarge	private	default

Figure 27: 体验

```

[root@node-a ~]# source /root/keystonerc_admin
[root@node-a ~(keystone_admin)]# # 查看镜像
[root@node-a ~(keystone_admin)]# openstack image list

+-----+-----+-----+
| ID | Name | Status |
+-----+-----+-----+
| 6e08455-a60b-4024-bed3-7d1fa5ef13a | cirros | active |
+-----+-----+-----+

[root@node-a ~(keystone_admin)]# # 查看 flavor
[root@node-a ~(keystone_admin)]# openstack flavor list

+-----+-----+-----+
| ID | Name | RAM | Disk | Ephemeral | VCPUs | Is Public |
+-----+-----+-----+
| 1 | m1.tiny | 512 | 1 | 0 | 1 | True |
| 2 | m1.small | 2048 | 20 | 0 | 1 | True |
| 3 | m1.medium | 4096 | 40 | 0 | 2 | True |
| 4 | m1.large | 8192 | 80 | 0 | 4 | True |
| 5 | m1.xlarge | 16384 | 160 | 0 | 8 | True |
+-----+-----+-----+

[root@node-a ~(keystone_admin)]# # 查看网络
[root@node-a ~(keystone_admin)]# openstack network list

+-----+-----+-----+
| ID | Name | Subnets |
+-----+-----+-----+
| 618bdc59-11b8-48bd-804a-2d5e4ecacba | public | e995f4d3-7d4f-4c19-b554-bd2377a50ffa |
| f14842fd-ecfe-4c15-b633-azcef3d72888 | private | 7254f80e-d597-4635-a2ad-b8897831a62 |
+-----+-----+-----+

[root@node-a ~(keystone_admin)]# # 查看密钥对
[root@node-a ~(keystone_admin)]# openstack keypair list

+-----+-----+-----+
| Name | Fingerprint |
+-----+-----+-----+
| sdfas | a1c081f01a3ca7c1977b41eac21c0d4e19e91e1 |
+-----+-----+-----+

[root@node-a ~(keystone_admin)]#

```

Figure 28: 查看可用资源

```

[root@node-a ~(keystone_admin)]# openstack server create \
> --image cirros \
> --flavor m1.tiny \
> --key-name sdfas \
> --network private \
> --security-group default \
> my-test-instance
More than one SecurityGroup exists with the name 'default'.

```

Figure 29: 创建实例

Field	Value
id	6e08455-a60b-4024-bed3-7d1fa5ef13a
name	my-test-instance
image_ref	6e08455-a60b-4024-bed3-7d1fa5ef13a
flavor_ref	m1.tiny
networks	[{"network_id": "private", "subnets": [{"id": "f14842fd-ecfe-4c15-b633-azcef3d72888"}]}]
security_groups	[{"id": "default"}]
key_name	sdfas
progress	100%
created_at	2021-06-08T13:10:32Z
updated_at	2021-06-08T13:10:32Z
status	ACTIVE
addresses	[{"network": "private", "addr": "10.1.1.100"}]
metadata	{}

Figure 30: 查看详情