《数据库系统原理》课程实验指导

基于 openEuler 的 openGauss 数据库安装及配置

2022 年 9 月

目录

前　言

实验环境说明

之前，已经用 VirtualBox 安装并配置了 openEuler 系统，本实验在 openEuler 系统上安装 openGauss 数据库并进行相关配置。

1 PuTTY 工具

1.1 软件介绍

PuTTY 是一个 Telnet、SSH、rlogin、纯 TCP 以及串行接口连接软件。用于远程登陆管理 Linux 系统。

1.2 实验介绍

关于本实验

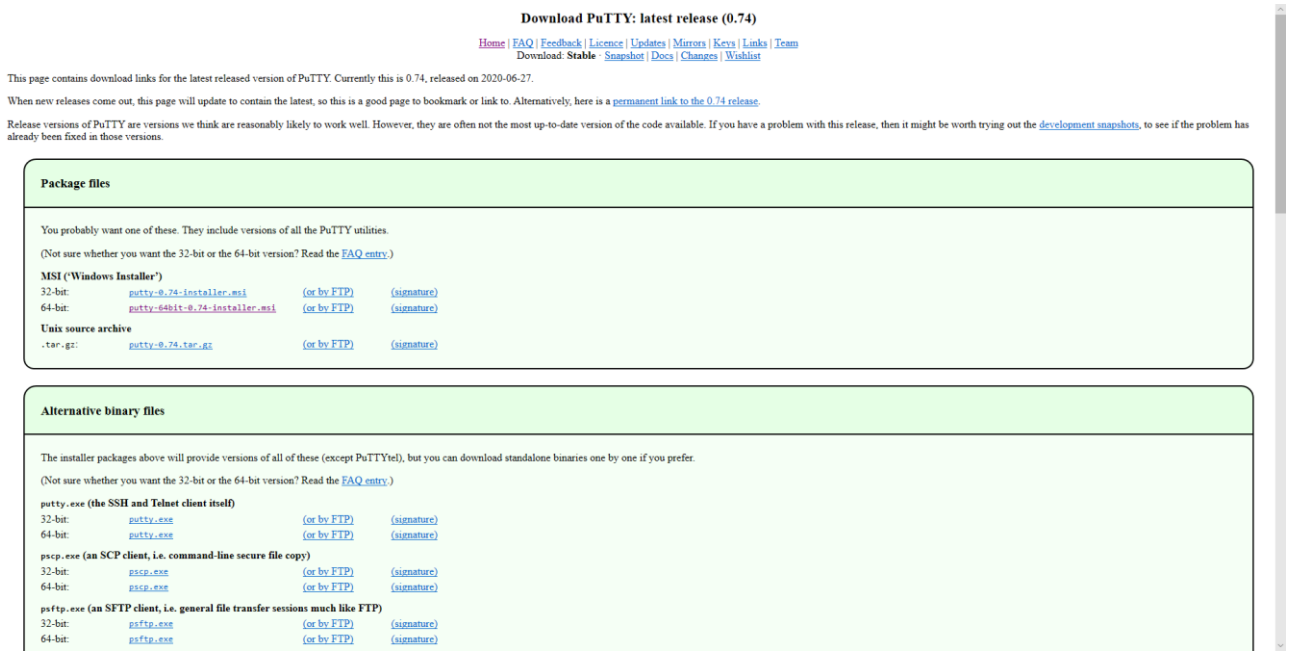
主要描述 PuTTY 的安装和使用过程，以便用于后续数据库实验。

实验目的

掌握 PuTTY 的基本使用方法

1.3 PuTTY 安装过程

访问 https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html



Download PuTTY: latest release (0.74)

Home | FAQ | Feedback | Licence | Updates | Mirrors | Keys | Links | Team
Download: **Stable** · Snapshot | Docs | Changes | Wishlist

This page contains download links for the latest released version of PuTTY. Currently this is 0.74, released on 2020-06-27.

When new releases come out, this page will update to contain the latest, so this is a good page to bookmark or link to. Alternatively, here is a permanent link to the 0.74 release.

Release versions of PuTTY are versions we think are reasonably likely to work well. However, they are often not the most up-to-date version of the code available. If you have a problem with this release, then it might be worth trying out the development snapshots, to see if the problem has already been fixed in those versions.

Package files

You probably want one of these. They include versions of all the PuTTY utilities.

(Not sure whether you want the 32-bit or the 64-bit version? Read the FAQ entry.)

MSI ('Windows Installer')

32-bit:	putty-0.74-installer.msi	(or by FTP)	(signature)
64-bit:	putty-64bit-0.74-installer.msi	(or by FTP)	(signature)

Unix source archive

.tar.gz:	putty-0.74.tar.gz	(or by FTP)	(signature)

Alternative binary files

The installer packages above will provide versions of all of these (except PuTTYtel), but you can download standalone binaries one by one if you prefer.

(Not sure whether you want the 32-bit or the 64-bit version? Read the FAQ entry.)

putty.exe (the SSH and Telnet client itself)

32-bit:	putty.exe	(or by FTP)	(signature)
64-bit:	putty.exe	(or by FTP)	(signature)

pscp.exe (an SCP client, i.e. command-line secure file copy)

32-bit:	pscp.exe	(or by FTP)	(signature)
64-bit:	pscp.exe	(or by FTP)	(signature)

psftp.exe (an SFTP client, i.e. general file transfer sessions much like FTP)

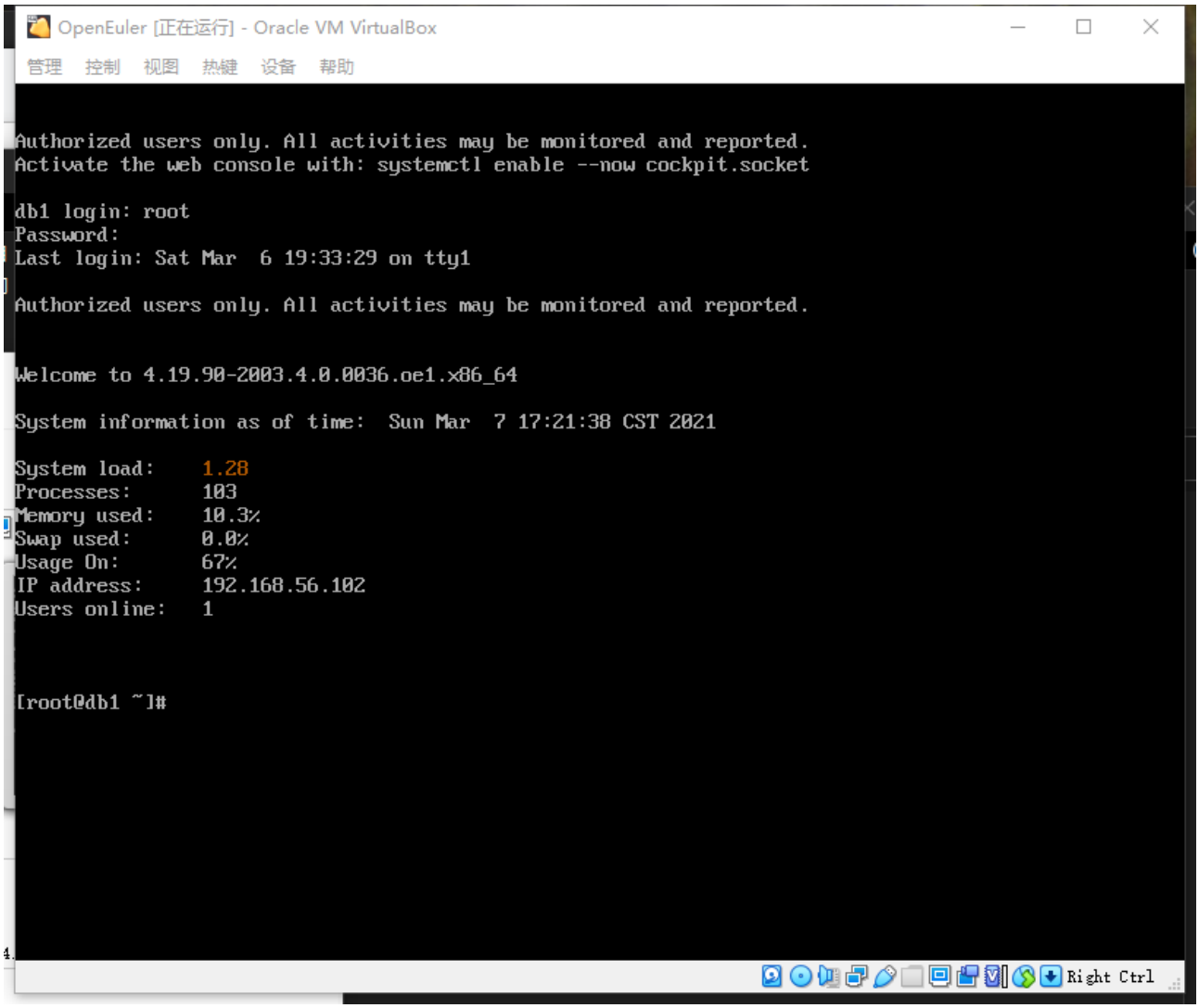
32-bit:	psftp.exe	(or by FTP)	(signature)
64-bit:	psftp.exe	(or by FTP)	(signature)

选择相应版本进行下载安装即可。

PuTTY 使用

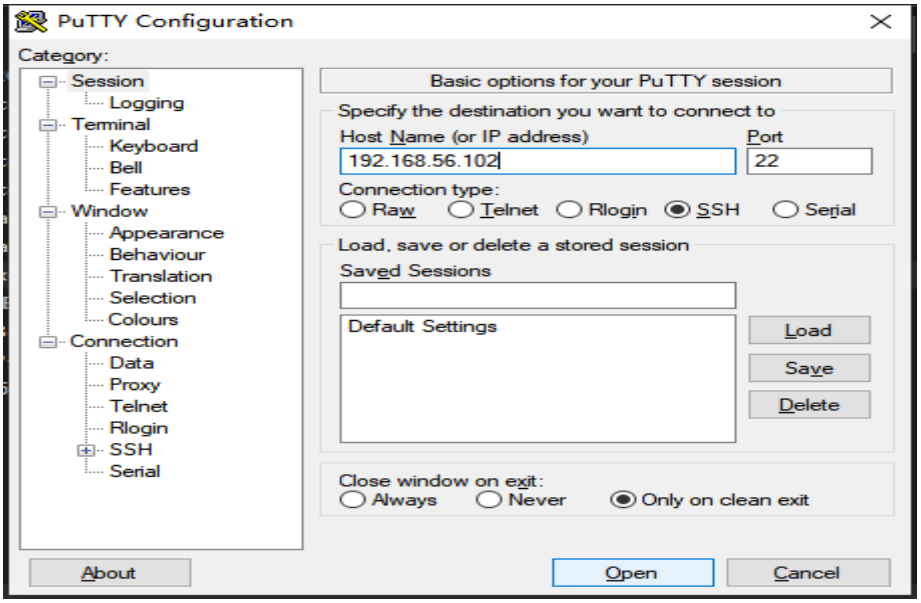
为了操作方便，可以使用 SSH 工具（比如：PuTTY 等）从本地电脑通过配置 enp0s3 网卡的 IP 地址（如：192.168.56.102）来连接虚拟机，并使用 ROOT 用户来登录。

步骤 1：在 VirtualBox 上用 ROOT 用户登入 openEuler 系统



步骤 2：打开 PuTTY

输入 enp0s3 网卡的 IP 地址（如：192.168.56.102），点击“open”



步骤 3：在 PuTTY 窗口中使用 ROOT 用户登录

这样便可以在该 PuTTY 窗口下操作 openEuler 系统了。在 PuTTY 窗口操作相比在原 VirtualBox 窗口下操作要更方便，比如可以粘贴复制的文本，可以输入中文等。

2 OpenGauss1.1.0 数据库安装

2.1 系统介绍

openGauss 是一款开源关系型数据库管理系统，openGauss 内核源自 PostgreSQL，是华为的 GaussDB 的开源版本。本实验安装的是其 1.1.0 版，也可以关注 openGauss 开发者社区，下载安装 openGauss 最新版本。

2.2 实验介绍

关于本实验

本实验主要描述在 openEuler 操作系统上安装 openGauss-1.1.0 版，以及相应 XML 配置文件的设置。

实验目的

1. 掌握 XML 配置文件的创建和书写方法
2. 学会下载解压 openGauss 数据库
3. 经行初始化等简单的配置

2.3 安装 openGauss

步骤 1：创建 XML 配置文件，用于数据库安装

```
[root@db1 ~]# cd /opt/software/openGauss
[root@db1 openGauss]# vi clusterconfig.xml
```

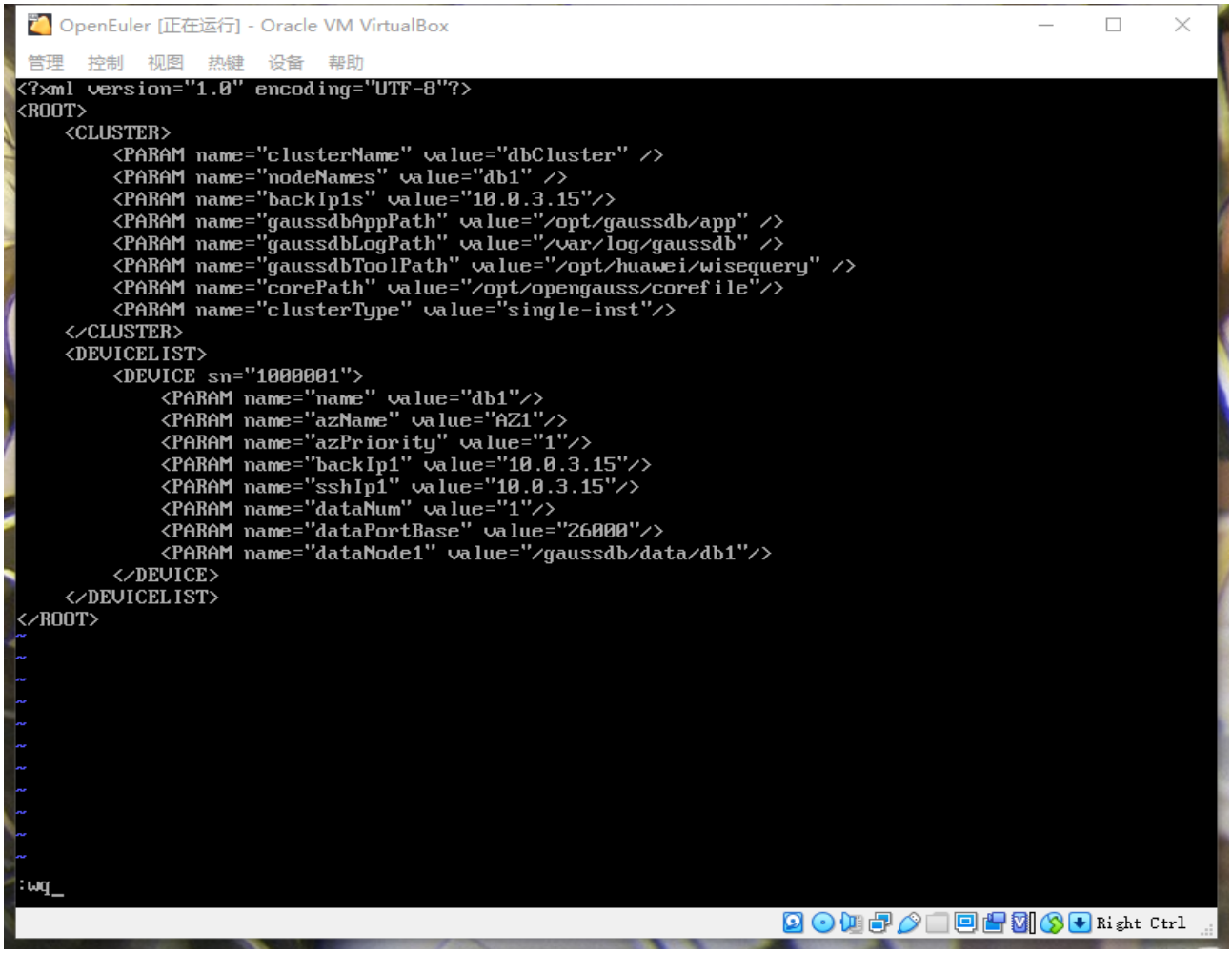
将以下内容添加进 clusterconfig.xml 文件中。添加完后按 esc，并输入:wq 保存并退出。

```
<?xml version="1.0" encoding="UTF-8"?>
<ROOT>
    <!-- openGauss 整体信息 -->
    <CLUSTER>
        <!-- 数据库名称 -->
        <PARAM name="clusterName" value="dbCluster" />
        <!-- 数据库节点名称(hostname) -->
        <PARAM name="nodeNames" value="db1" />
        <!-- 节点 IP，与数据库节点名称列表一一对应 -->
        <PARAM name="backIps" value="10.0.3.15"/> D
        <!-- 数据库安装目录-->
        <PARAM name="gaussdbAppPath" value="/opt/gaussdb/app" />
        <!-- 日志目录-->
        <PARAM name="gaussdbLogPath" value="/var/log/gaussdb" />
        <!-- 数据库工具目录-->
```

```
        <PARAM name="gaussdbToolPath" value="/opt/huawei/wisequery" />
        <!-- 数据库 core 文件目录-->
        <PARAM name="corePath" value="/opt/opengauss/corefile"/>
        <!-- 数据库类型-->
        <PARAM name="clusterType" value="single-inst"/>
    </CLUSTER>
    <!-- 每台服务器上的节点部署信息 -->
    <DEVICELIST>
        <!-- node1 上的节点部署信息 -->
        <DEVICE sn="1000001">
            <!-- 节点 1 的主机名称 -->
            <PARAM name="name" value="db1"/>
            <!-- 节点 1 所在的 AZ 及 AZ 优先级 -->
            <PARAM name="azName" value="AZ1"/>
            <PARAM name="azPriority" value="1"/>
            <!-- 节点 1 的 IP，如果服务器只有一个网卡可用，将 backIP1 和 sshIP1 配置成同一个 IP -->
            <PARAM name="backIp1" value="10.0.3.15"/>
            <PARAM name="sshIp1" value="10.0.3.15"/>

        <!--dbnode-->
        <!--当前主机上需要部署的数据库节点个数-->
        <PARAM name="dataNum" value="1"/>
        <!--数据库节点的基础端口号-->
        <PARAM name="dataPortBase" value="26000"/>
        <!--数据库主节点上的数据目录，及备机数据目录-->
        <PARAM name="dataNode1" value="/gaussdb/data/db1"/>
        </DEVICE>
    </DEVICELIST>
</ROOT>
```

说明：其中标红的内容，需要根据自己实际的 IP 和主机名进行修改，<!-- -->为注释，其内容可以不添加进去



步骤 2：使用 wget 下载数据库安装包到安装包目录

使用 wget 下载安装包：

```
[root@db1 openGauss]# wget
https://opengauss.obs.cn-south-1.myhuaweicloud.com/1.1.0/x86_openEuler/openGauss-1.1.0-openEuler-64bit-all.tar.gz
```

注：
https://opengauss.obs.cn-south-1.myhuaweicloud.com/1.1.0/x86_openEuler/openGauss-1.1.0-openEuler-64bit-all.tar.gz 是数据库安装包下载网址，输入时不需要进行换行。

下载成功显示如下：

```
……
2021-03-01 13:57:23 (9.33 MB/s) - ‘openGauss-1.1.0-openEuler-64bit-all.tar.gz’ saved [58468915/58468915]
```

步骤 3：在安装包所在的目录下，解压安装包

解压缩安装包：

先解压 openGauss-1.1.0-openEuler-64bit-all.tar.gz 包。

```
[root@db1 openGauss]# tar -zxvf  openiGauss-1.1.0-openEuler-64bit-all.tar.gz
```

再先解压 openGauss-1.1.0-openEuler-64bit-om.tar.gz 包。

```
[root@db1 openGauss]# tar -zxvf  openGauss-1.1.0-openEuler-64bit-om.tar.gz
```

解压后如下，用 ls 命令查看如下：

```
[root@db1 openGauss]# ls
```

```
[root@db1 openGauss]# ls
clusterconfig.xml                       openGauss-1.1.0-openEuler-64bit.tar.bz2
lib                                     script
openGauss-1.1.0-openEuler-64bit-all.tar.gz  simpleInstall
openGauss-1.1.0-openEuler-64bit-om.sha256   upgrade_sql.sha256
openGauss-1.1.0-openEuler-64bit-om.tar.gz   upgrade_sql.tar.gz
openGauss-1.1.0-openEuler-64bit.sha256      version.cfg
```

安装包解压后，会在/opt/software/openGauss 路径下自动生成 script 子目录，并且在 script 目录下生成 gs_preinstall 等各种 OM 工具脚本。

步骤 4：更改权限

```
[root@db1 openGauss]# chmod 755 -R /opt/software
```

步骤 5：执行初始化脚本

```
[root@db1 openGauss]# cd /opt/software/openGauss/script
[root@db1 script]# python gs_preinstall -U omm -G dbgrp -X /opt/software/openGauss/clusterconfig.xml
Parsing the configuration file.
Successfully parsed the configuration file.
Installing the tools on the local node.
Are you sure you want to create trust for root (yes/no)? yes
Please enter password for root.
Password:
Creating SSH trust for the root permission user.
Checking network information.
...........................................
Are you sure you want to create the user[omm] and create trust for it (yes/no)? yes
Please enter password for cluster user.
Password:
Please enter password for cluster user again.
Password:
Successfully created [omm] user on all nodes.
Preparing SSH service.
Successfully prepared SSH service.
...........................................
Successfully set finish flag.
Preinstallation succeeded.
```

期间需要输入操作系统 root 用户的密码（如密码：openGauss123）和创建操作系统 omm 用户及设置密码（如密码：openGauss1234）。

当返回 Preinstallation succeeded 内容时，表明初始化完成。

步骤 6：初始化数据库

先用 init 6 重启下虚拟机（主要是为了释放一些内存资源）。

```
[root@db1 script]# init 6
```

过段时间虚拟机重启好后，再次使用 SSH 工具（比如：PuTTY 等）从本地电脑通过配置 enp0s3 网卡的 IP 地址（如：192.168.56.102）来连接虚拟机，并使用 ROOT 用户来登录，然后接着以下操作。

然后更新下权限。

```
[root@db1 ~]# cd /opt/software/openGauss/script
[root@db1 script]# chmod 755 -R /opt/software
```

最后使用 omm 用户进行数据库初始化。

注意：根据用户实际内存大小设置对应的共享内存的大小，如果对该参数进行了设置，会在数据库启动时候报错，本实验虚拟机总内存大小是 2G。

gs_install -X /opt/software/openGauss/clusterconfig.xml --gsinit-parameter="--encoding=UTF8" --dn-guc="max_process_memory=2GB" --dn-guc="shared_buffers=128MB" --dn-guc="bulk_write_ring_size=128MB" --dn-guc="cstore_buffers=16MB"

具体如下：

```
[root@db1 openGauss]# su - omm
[omm@db1 ~]$ cd /opt/software/openGauss/script
[omm@db1 script]$ gs_install -X /opt/software/openGauss/clusterconfig.xml --gsinit-parameter="--encoding=UTF8" --dn-guc="max_process_memory=2GB" --dn-guc="shared_buffers=128MB" --dn-guc="bulk_write_ring_size=128MB" --dn-guc="cstore_buffers=16MB"
Parsing the configuration file.
Check preinstall on every node.
Successfully checked preinstall on every node.
Creating the backup directory.
Successfully created the backup directory.
begin deploy..
Installing the cluster.
begin prepare Install Cluster..
Checking the installation environment on all nodes.
begin install Cluster..
Installing applications on all nodes.
Successfully installed APP.
begin init Instance..
encrypt cipher and rand files for database.
Please enter password for database:
Please repeat for database:
begin to create CA cert files
```

```
The sslcert will be generated in /opt/gaussdb/app/share/sslcert/om
Cluster installation is completed.
Configuring.
.........................
Successfully started cluster.
Successfully installed application.
end deploy..
```

注意：输入 omm 用户密码时，不要输入错误（如密码：openGauss1234）。

```
[root@db1 script]# cd /opt/software/openGauss
[root@db1 openGauss]# su - omm_
```

```
[omm@db1 ~]$ cd /opt/software/openGauss/script
[omm@db1 script]$ gs_install -X /opt/software/openGauss/clusterconfig.xml --gsinit-parameter="--enc
ding=UTF8" --dn-guc="max_process_memory=2GB" --dn-guc="shared_buffers=128MB" --dn-guc="bulk_write_r
ng_size=128MB" --dn-guc="cstore_buffers=16MB"_
```

步骤 7：清理软件安装包

```
[omm@db1 openGauss]$ exit
logout
[root@db1 /]# cd /root
[root@db1 script]# cd /opt/software/openGauss/
[root@db1 openGauss]# ll
total 288M
-rw-------.  1 omm  dbgrp 1.4K Jan  7 10:32 clusterconfig.xml
drwx------. 15 root root  4.0K Jan  7 10:31 lib
-r--------.  1 root root   95M Dec 31 20:59 openGauss-1.1.0-openEuler-64bit-all.tar.gz
-r--------.  1 root root    65 Dec 31 20:40 openGauss-1.1.0-openEuler-64bit-om.sha256
-r--------.  1 root root   13M Dec 31 20:40 openGauss-1.1.0-openEuler-64bit-om.tar.gz
-r--------.  1 root root    65 Dec 31 20:39 openGauss-1.1.0-openEuler-64bit.sha256
-r--------.  1 root root   84M Dec 31 20:39 openGauss-1.1.0-openEuler-64bit.tar.bz2
-r--------.  1 root root   96M Jan  7 10:32 openGauss-Package-bak_392c0438.tar.gz
drwx------.  6 root root  4.0K Dec 31 20:40 script
drwxr-xr-x.  2 root root  4.0K Dec 31 20:40 simpleInstall
-r--------.  1 root root    65 Dec 31 20:39 upgrade_sql.sha256
-r--------.  1 root root  132K Dec 31 20:39 upgrade_sql.tar.gz
-r--------.  1 root root    32 Dec 31 20:38 version.cfg
-rwxr-xr-x.  1 root root    32 Oct 14 02:12 version.cfg
[root@db1 openGauss]# rm -rf openGauss-1.1.0-openEuler-64bit-all.tar.gz
[root@db1 openGauss]# rm -rf openGauss-1.1.0-openEuler-64bit-om.tar.gz
```

```
[root@db1 openGauss]# ll
total 288M
-rwxr-xr-x.  1 omm  dbgrp 1.1K Mar  6 18:56 clusterconfig.xml
drwxr-xr-x. 15 root root  4.0K Mar  6 18:55 lib
-rwxr-xr-x.  1 root root   95M Dec 31 20:59 openGauss-1.1.0-openEuler-64bit-all.tar.gz
-rwxr-xr-x.  1 root root    65 Dec 31 20:40 openGauss-1.1.0-openEuler-64bit-om.sha256
-rwxr-xr-x.  1 root root   13M Dec 31 20:40 openGauss-1.1.0-openEuler-64bit-om.tar.gz
-rwxr-xr-x.  1 root root    65 Dec 31 20:39 openGauss-1.1.0-openEuler-64bit.sha256
-rwxr-xr-x.  1 root root   84M Dec 31 20:39 openGauss-1.1.0-openEuler-64bit.tar.bz2
-rwxr-xr-x.  1 root root   96M Mar  6 18:56 openGauss-Package-bak_392c0438.tar.gz
drwxr-xr-x.  6 root root  4.0K Dec 31 20:40 script
drwxr-xr-x.  2 root root  4.0K Dec 31 20:40 simpleInstall
-rwxr-xr-x.  1 root root    65 Dec 31 20:39 upgrade_sql.sha256
-rwxr-xr-x.  1 root root  132K Dec 31 20:39 upgrade_sql.tar.gz
-rwxr-xr-x.  1 root root    32 Dec 31 20:38 version.cfg
[root@db1 openGauss]# rm -rf openGauss-1.1.0-openEuler-64bit-all.tar.gz
[root@db1 openGauss]# rm -rf openGauss-1.1.0-openEuler-64bit-om.tar.gz_
```

至此，数据库安装结束。

3 OpenGauss 2.0.0 数据库安装脚本

3.1 说明

为了提高大家部署 openGauss 数据库的效率，将安装步骤写入 shell 脚本，在 openEuler 操作系统可以连接外网的情况下，实现一键式配置、下载、安装。

本节参照网上资料“一键部署 openGauss2.0.0”，作者：酷哥，菊厂，深耕数据库 10 年，致力于数据库技术学习、探索与传播。特此致谢。

3.2 安装脚本

```
vi  /root/auto_install.sh
------------------------------------------------------------------------------
----------------------------
#!/bin/bash

## Author:    贾军锋
## Date:      2021-04-15
## OS:        openEuler20.03LTS [最小硬件配置：2c/4G]
## Database: openGauss 2.0.0
## Description: 一键式实现操作系统环境配置、openGauss 软件下载、openGauss 软件安装等步骤，帮助大家提升安装 openGauss 数据库效率
## Tips:      请确保操作系统可以连接外网

## 0.关闭 virbr0 网卡 [本地虚拟机标准化安装 openEuler 系统会默认存在 virbr0 网卡，删除该网卡以避免干扰数据库的安装]
## virsh net-destroy default
## virsh net-list
## echo "Net device virbr0 is disabled."

## 1.定义主机信息[请根据实际情况修改]
export MY_HOSTNAME=node1           ## 主机名
export MY_HOSTIP=192.168.8.133     ## IP 地址
export MY_SOFTWARE_DIRECTORY=/soft/openGauss      ## 软件包所在目录
export MY_XML=/soft/openGauss/clusterconfig.xml   ## 集群配置文件 XML
export
openGauss_Download_url=https://opengauss.obs.cn-south-1.myhuaweicloud.com
```

```
/2.0.0/x86_openEuler/openGauss-2.0.0-openEuler-64bit-all.tar.gz  ## openGauss 软件包下载地址

## 1. 设置主机名并配置 hosts 文件
hostnamectl set-hostname $MY_HOSTNAME
sed -i '/$MY_HOSTIP/d' /etc/hosts
echo "$MY_HOSTIP  $MY_HOSTNAME   #Gauss OM IP Hosts Mapping" >> /etc/hosts
cat /etc/hosts
echo "1.Configure /etc/hosts completed."
echo -e "\n"

## 2. 关闭防火墙
systemctl disable firewalld.service
systemctl stop firewalld.service
echo "Firewalld " `systemctl status firewalld|grep Active`
echo "2.Disable firewalld service completed."
echo -e "\n"

## 3. 关闭 SELinux
sed -i '/^SELINUX=/d' /etc/selinux/config
echo "SELINUX=disabled" >> /etc/selinux/config
cat /etc/selinux/config|grep "SELINUX=disabled"
echo "3.Disable SELINUX completed."
echo -e "\n"


## 4. 设置操作系统字符集编码
echo "LANG=en_US.UTF-8" >> /etc/profile
source /etc/profile
echo $LANG
echo "4.Configure encoding completed."
echo -e "\n"

## 5. 设置操作系统时区
rm -fr /etc/localtime
ln -s /usr/share/zoneinfo/Asia/Shanghai  /etc/localtime
date -R
hwclock
echo "5.Configure Timezone completed."
echo -e "\n"

## 6. 关闭 SWAP 分区 [对于 2G 内存的设备，建议待安装完毕后再打开 SWAP 以间接 “扩容内存容量”]
sed -i '/swap/s/^/#/' /etc/fstab
swapoff -a
free -m
```

```
echo "6.Close swap partition completed."
echo -e "\n"

## 7. 配置 SSH 服务，关闭 Banner，允许 root 远程登录
sed -i '/Banner/s/^/#/'  /etc/ssh/sshd_config
sed -i '/PermitRootLogin/s/^/#/'  /etc/ssh/sshd_config
echo -e "\n" >> /etc/ssh/sshd_config
echo "Banner none " >> /etc/ssh/sshd_config
echo "PermitRootLogin yes" >> /etc/ssh/sshd_config
cat /etc/ssh/sshd_config |grep -v ^#|grep -E 'PermitRoot|Banner'
echo "7.Configure SSH Service completed."
echo -e "\n"

## 8. 配置 YUM 源、安装依赖包、修改默认 Python3 版本
mkdir /etc/yum.repos.d/bak
mv /etc/yum.repos.d/*.repo  /etc/yum.repos.d/bak/
wget -O /etc/yum.repos.d/openEulerOS.repo
https://repo.huaweicloud.com/repository/conf/openeuler_x86_64.repo
yum clean all
yum install -y bzip2 python3
yum install -y libaio-devel libnsl flex bison ncurses-devel glibc-devel patch
readline-devel net-tools tar
mv /usr/bin/python  /usr/bin/python2_bak
ln -s /usr/bin/python3 /usr/bin/python
python -V
echo "8.Configure Install Packages and change default Python version
completed."
echo -e "\n"

## 9. 配置 sysctl.conf 和 performance.sh
cat >> /etc/sysctl.conf << EOF
net.ipv4.tcp_retries1 = 5
net.ipv4.tcp_syn_retries = 5
net.sctp.path_max_retrans = 10
net.sctp.max_init_retransmits = 10
EOF
sysctl -p

sed -i '/vm.min_free_kbytes/s/^/#/' /etc/profile.d/performance.sh   ## Only
for openEuler
cat /etc/profile.d/performance.sh|grep vm.min_free_kbytes

echo "9.Configure sysctl.conf and performance.sh completed."
echo -e "\n"

## 10. 配置资源限制
echo "* soft stack 3072" >> /etc/security/limits.conf
```

```
echo "* hard stack 3072" >> /etc/security/limits.conf
echo "* soft nofile 1000000" >> /etc/security/limits.conf
echo "* hard nofile 1000000" >> /etc/security/limits.conf
echo "* soft nproc unlimited" >> /etc/security/limits.d/90-nproc.conf
tail -n 4 /etc/security/limits.conf
tail -n 1 /etc/security/limits.d/90-nproc.conf
echo "10.Configure resource limits completed."
echo -e "\n"

## 11. 关闭透明大页[Only for CentOS]
cat >>/etc/rc.d/rc.local<<EOF
if test -f /sys/kernel/mm/transparent_hugepage/enabled; then
   echo never > /sys/kernel/mm/transparent_hugepage/enabled
fi
if test -f /sys/kernel/mm/transparent_hugepage/defrag; then
   echo never > /sys/kernel/mm/transparent_hugepage/defrag
fi
EOF
chmod +x /etc/rc.d/rc.local
/usr/bin/sh /etc/rc.d/rc.local
cat /sys/kernel/mm/transparent_hugepage/enabled
cat /sys/kernel/mm/transparent_hugepage/defrag
echo "11.Close transparent_hugepage completed."
echo -e "\n"

## 12. 禁用 RemoveIPC[Only for openEuler]
sed -i '/^RemoveIPC/d' /etc/systemd/logind.conf
sed -i '/^RemoveIPC/d' /usr/lib/systemd/system/systemd-logind.service
echo "RemoveIPC=no"  >> /etc/systemd/logind.conf
echo "RemoveIPC=no"  >> /usr/lib/systemd/system/systemd-logind.service
systemctl daemon-reload
systemctl restart systemd-logind
loginctl show-session | grep RemoveIPC
systemctl show systemd-logind | grep RemoveIPC
echo "12.Disable RemoveIPC completed."
echo -e "\n"

## 13. 下载 openGauss 软件包
mkdir -p $MY_SOFTWARE_DIRECTORY
cd $MY_SOFTWARE_DIRECTORY
wget $openGauss_Download_url
echo "13.openGauss software download completed."
echo -e "\n"

## 14. 配置 XML 文件
rm -fr $MY_XML
cat >> $MY_XML <<EOF
```

```
<?xml version="1.0" encoding="UTF-8"?>
<ROOT>
    <!-- openGauss 整体信息 -->
    <CLUSTER>
        <PARAM name="clusterName" value="dbCluster" />
        <PARAM name="nodeNames" value="$MY_HOSTNAME" />
        <PARAM name="backIp1s" value="$MY_HOSTIP"/>
        <PARAM name="gaussdbAppPath" value="/gaussdb/app" />
        <PARAM name="gaussdbLogPath" value="/gaussdb/log" />
        <PARAM name="gaussdbToolPath" value="/gaussdb/om" />
        <PARAM name="corePath" value="/gaussdb/corefile"/>
        <PARAM name="clusterType" value="single-inst"/>
    </CLUSTER>
    <!-- 每台服务器上的节点部署信息 -->
    <DEVICELIST>
        <!-- node1 上的节点部署信息 -->
        <DEVICE sn="1000001">
            <PARAM name="name" value="$MY_HOSTNAME"/>
            <PARAM name="azName" value="AZ1"/>
            <PARAM name="azPriority" value="1"/>
            <!-- 如果服务器只有一个网卡可用，将 backIP1 和 sshIP1 配置成同一个 IP
-->
            <PARAM name="backIp1" value="$MY_HOSTIP"/>
                    <PARAM name="sshIp1" value="$MY_HOSTIP"/>

            <!--dbnode-->
            <PARAM name="dataNum" value="1"/>
            <PARAM name="dataPortBase" value="26000"/>
            <PARAM name="dataNode1" value="/gaussdb/data/db1"/>
        </DEVICE>
    </DEVICELIST>
</ROOT>
EOF
cat $MY_XML
echo "14.Configure XML file completed."
echo -e "\n"


## 15. 解压安装包并修改目录权限
echo "Begin to Uncompress openGauss Package and Modify directory
permissions:"
cd $MY_SOFTWARE_DIRECTORY
tar -zxvf *all.tar.gz
tar -zxvf *om.tar.gz
ls -l
chmod -R 777 $MY_SOFTWARE_DIRECTORY/../
```

```
echo "15.Uncompress openGauss Package completed."
echo -e "\n"

## 16. 执行 gs_preinstall
echo "Begin to execute openGauss preinstall:"
python $MY_SOFTWARE_DIRECTORY/script/gs_preinstall -U omm -G dbgrp -X
$MY_XML
echo "16.openGauss preinstall completed."
echo -e "\n"


## 17. 检查预安装环境
echo "Begin to Check OS environment:"
$MY_SOFTWARE_DIRECTORY/script/gs_checkos -i A -h $MY_HOSTNAME --detail


## 18. 执行 gs_install
echo "Begin to execute openGauss install:"
touch /home/omm/install_db
cat >> /home/omm/install_db <<EOF
source ~/.bashrc
gs_install -X  $MY_XML --gsinit-parameter="--encoding=UTF8"
--dn-guc="max_process_memory=2GB" --dn-guc="shared_buffers=128MB"
--dn-guc="cstore_buffers=16MB"
EOF
chown -R omm:dbgrp /home/omm/install_db
su - omm -c "sh /home/omm/install_db"
echo "17.openGauss install completed."
echo -e "\n"

## 安装完毕!
echo "openGauss Install completed.congratulations"
echo "Congratulations!!!"
```