

# 《云计算与云服务》

## 实验报告

### 实验一 OpenStack 的安装与使用

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一.实验目的

- (1) 掌握 Linux 虚拟机的安装方法；
- (2) 掌握 OpenStack 的单机安装方法；
- (3) 熟悉 OpenStack 的核心组件。

二.实验环境

- (1) 操作系统：Linux。Ubuntu
- (2) 虚拟机软件：Vmware
- (3) devstack
- (4) OpenStack

三.实验内容与完成情况

1、安装必要工具

(1) Ubuntu 虚拟机安装

由于之前未进行相关虚拟机的操作，本次实验我需要针对虚拟机进行一个额外的安装，听取同学建议，我选择了 VMWare 作为我的虚拟机的主要选择。通过在网上对核验码的购买，加上对 unbuntu 的镜像的下载，我成功的得到了下面的一个初始的条件

|                                    |                     |   |
|------------------------------------|---------------------|---|
| 📄 排序 ▾ 📄 查看 ▾ 🔍 搜索选项 ▾ ... 📄 详细信息  |                     |   |
| 📄 ubuntu-20.04.6-desktop-amd64.iso | D:\VMware           | 修改日期: 2024-03-24 9:31<br>大小: 4.05 GB                |
| 📄 VirtualPrinter-Linux.iso         | D:\VMware           | 修改日期: 2022-07-10 23:11<br>大小: 1.47 MB               |
| 📄 VirtualPrinter-Windows.iso       | D:\VMware           | 修改日期: 2022-07-10 23:11<br>大小: 28.6 MB               |
| 📄 isoimages_manifest.txt           | D:\VMware           | 大小: 5.50 KB<br>修改日期: 2022-07-10 23:05               |
| 📄 isolinux.bin                     | D:\VMware\Resources | 类型: BIN 文件<br>修改日期: 2022-07-10 23:05<br>大小: 14.0 KB |
| 📄 linux.iso                        | D:\VMware           | 修改日期: 2022-07-10 22:52<br>大小: 55.9 MB               |
| 📄 netware.iso                      | D:\VMware           | 修改日期: 2022-07-10 22:52<br>大小: 528 KB                |
| 📄 solaris.iso                      | D:\VMware           | 修改日期: 2022-07-10 22:52<br>大小: 15.4 MB               |

图 1 ubuntu 镜像安装

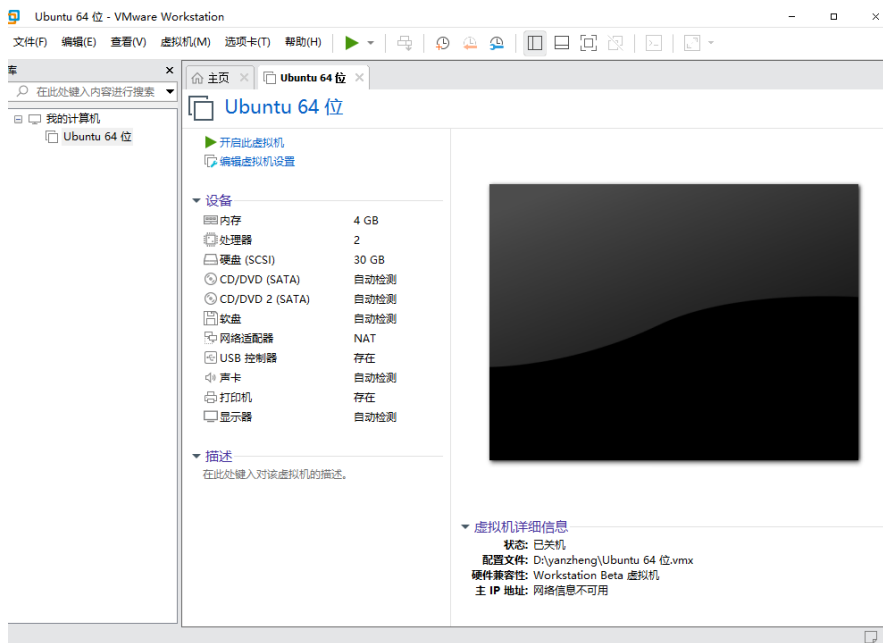


图 2 VMware 使用展示

## 2. 针对系统进行配置:

参考我电脑的相关配置，我对虚拟机的内存，处理器核数，硬盘的大小分配等设定为了下图所示，然后打开虚拟机，进行 openstack 相关的设定



图 3 虚拟机配置设定

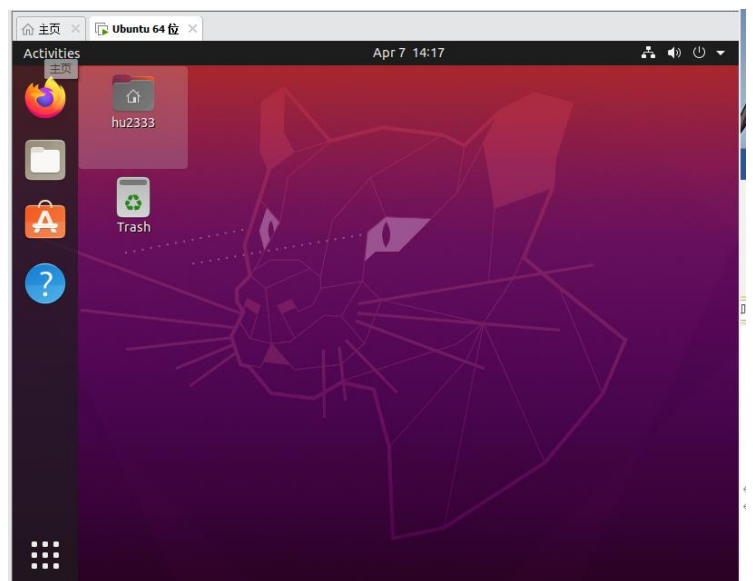


图 4 主页显示

### 3. Openstack 相关的配置

下面我们将进行 Openstack 相关的配置，首先进入我们的虚拟机终端，对我们的操作进行下方步骤设定：

#### (1) 安装 vim 编辑器

`sudo apt-get install vim`

```
hu2333@ubuntu:~/Desktop$ sudo apt-get install vim
[sudo] password for hu2333:
Sorry, try again.
[sudo] password for hu2333:
Reading package lists... Done
Building dependency tree
Reading state information... Done
vim is already the newest version (2:8.1.2269-1ubuntu5.22).
The following packages were automatically installed and are no longer required:
  acl apg colord-data gnome-control-center-faces gnome-online-accounts
  hplip-data libcolord-gtk1 libcolorhug2 libgsound0 libgssdp-1.2-0
  libgupnp-1.2-0 libgupnp-av-1.0-2 libgupnp-dlna-2.0-3 libieee1284-3
  libimagequant0 libmediaart-2.0-0 librygel-core-2.6-2 librygel-db-2.6-2
  librygel-renderer-2.6-2 librygel-server-2.6-2 libsane-common libsnmp-base
  libsodium23 libwebpmux3 mobile-broadband-provider-info
  network-manager-gnome printer-driver-postscript-hp python3-macaronbakery
  python3-nacl python3-olefile python3-pexpect python3-pil python3-protobuf
  python3-ptyprocess python3-pymacaroons python3-renderpm python3-reportlab
  python3-reportlab-accel python3-rfc3339 python3-tz rygel
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

#### (2) 安装 git

`sudo apt-get install git`

```
hu2333@ubuntu:~/Desktop$ sudo apt-get install git
Reading package lists... Done
Building dependency tree
Reading state information... Done
git is already the newest version (1:2.25.1-1ubuntu3.11).
The following packages were automatically installed and are no longer required:
  acl apg colord-data gnome-control-center-faces gnome-online-accounts
  hplip-data libcolord-gtk1 libcolorhug2 libgsound0 libgssdp-1.2-0
  libgupnp-1.2-0 libgupnp-av-1.0-2 libgupnp-dlna-2.0-3 libieee1284-3
  libimagequant0 libmediaart-2.0-0 librygel-core-2.6-2 librygel-db-2.6-2
  librygel-renderer-2.6-2 librygel-server-2.6-2 libsane-common libsnmp-base
  libsodium23 libwebpmux3 mobile-broadband-provider-info
  network-manager-gnome printer-driver-postscript-hp python3-macaronbakery
  python3-nacl python3-olefile python3-pexpect python3-pil python3-protobuf
  python3-ptyprocess python3-pymacaroons python3-renderpm python3-reportlab
  python3-reportlab-accel python3-rfc3339 python3-tz rygel
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

#### (3) 安装 pip

`sudo apt-get install python3-pip`

```

hu2333@ubuntu:~/Desktop$ sudo apt-get install python3-pip
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-pip is already the newest version (20.0.2-5ubuntu1.10).
The following packages were automatically installed and are no longer required:
  acl apg colord-data gnome-control-center-faces gnome-online-accounts
  hplip-data libcolor-gtk1 libcolorhug2 libgsound0 libgssdp-1.2-0
  libgupnp-1.2-0 libgupnp-av-1.0-2 libgupnp-dlna-2.0-3 libieee1284-3
  libimagequant0 libmediaart-2.0-0 librygel-core-2.6-2 librygel-db-2.6-2
  librygel-renderer-2.6-2 librygel-server-2.6-2 libsane-common libsnmp-base
  libsodium23 libwebpmux3 mobile-broadband-provider-info
  network-manager-gnome printer-driver-postscript-hp python3-macaronbakery
  python3-nacl python3-olefile python3-pexpect python3-pil python3-protobuf
  python3-ptyprocess python3-pymacaroons python3-renderpm python3-reportlab
  python3-reportlab-accel python3-rfc3339 python3-tz rygel
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.

```

通过 pip—version 和 git—version 我们发现，pip 和 git 安装成功

```

hu2333@ubuntu:~/Desktop$ pip --version
pip 24.0 from /usr/local/lib/python3.8/dist-packages/pip (python 3.8)
hu2333@ubuntu:~/Desktop$ git --version
git version 2.25.1

```

## 2、更换 apt 源为阿里源

```

sudo mv /etc/apt/sources.list /etc/apt/sources.list.bak
sudo vim /etc/apt/sources.list

```

```

Found a swap file by the name "/etc/apt/.sources.list.swp"
  owned by: root   dated: Sun Mar 24 09:56:01 2024
  file name: /etc/apt/sources.list
  modified: YES
  user name: root   host name: ubuntu
  process ID: 13355
While opening file "/etc/apt/sources.list"
  CANNOT BE FOUND
(1) Another program may be editing the same file.  If this is the case,
    be careful not to end up with two different instances of the same
    file when making changes.  Quit, or continue with caution.
(2) An edit session for this file crashed.
    If this is the case, use ":recover" or "vim -r /etc/apt/sources.list"
    to recover the changes (see ":help recovery").
    If you did this already, delete the swap file "/etc/apt/.sources.list.swp"
    to avoid this message.

Swap file "/etc/apt/.sources.list.swp" already exists!
[O]pen Read-Only, (E)dit anyway, (R)ecover, (D)elete it, (Q)uit, (A)bort:

```

这里我们之前对阿里源进行了一定的操作，这里我们选择 R 进行 ecover 覆盖操作，将下面的内容放入到我们的 list.swp 中

```
deb http://mirrors.aliyun.com/ubuntu/ focal main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal main restricted universe multiverse
deb http://mirrors.aliyun.com/ubuntu/ focal-security main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-security main restricted universe multiverse
deb http://mirrors.aliyun.com/ubuntu/ focal-updates main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-updates main restricted universe multiverse
deb http://mirrors.aliyun.com/ubuntu/ focal-proposed main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-proposed main restricted universe multiverse
deb http://mirrors.aliyun.com/ubuntu/ focal-backports main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-backports main restricted universe multiverse
```

对以上内容进行保存，对源进行更新，执行以下命令：

```
sudo apt-get update           //更新源
sudo apt-get upgrade          //更新已安装的包
```

```
hu2333@ubuntu:~/Desktop$ sudo apt-get update
Reading package lists... Done
hu2333@ubuntu:~/Desktop$ sudo apt-get upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following packages were automatically installed and are no longer required:
acl apg colord-data gnome-control-center-faces gnome-online-accounts
hplip-data libcolord-gtk1 libcolorhug2 libgsound0 libgssdp-1.2-0
libgupnp-1.2-0 libgupnp-av-1.0-2 libgupnp-dlna-2.0-3 libieee1284-3
libimagequant0 libmediaart-2.0-0 librygel-core-2.6-2 librygel-db-2.6-2
librygel-renderer-2.6-2 librygel-server-2.6-2 libsane-common libsnmp-base
libsodium23 libwebpmux3 mobile-broadband-provider-info
network-manager-gnome printer-driver-postscript-hp python3-macaroonbakery
python3-nacl python3-olefile python3-pexpect python3-pil python3-protobuf
python3-ptyprocess python3-pymacaroons python3-renderpm python3-reportlab
python3-reportlab-accel python3-rfc3339 python3-tz rygel
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

### 3、设定时间同步

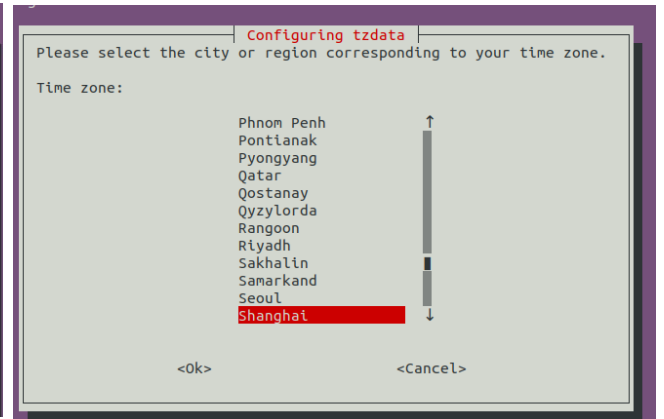
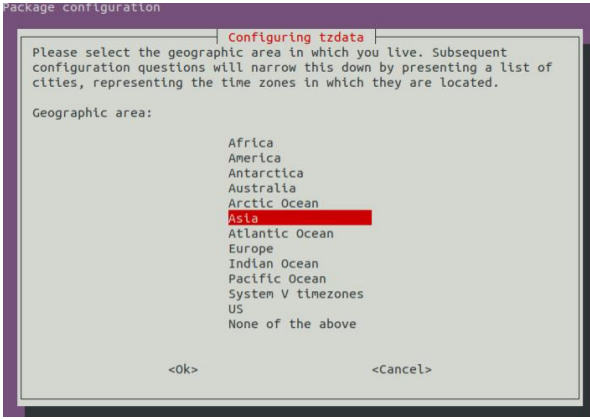
#### (1) 安装时间同步工具

```
sudo apt-get install ntpdate
```

```
hu2333@ubuntu:~/Desktop$ sudo apt-get install ntpdate
Reading package lists... Done
Building dependency tree
Reading state information... Done
```

(2) 设定时区, 选择 Asia、shanghai

```
sudo dpkg-reconfigure tzdata
```



(3) 与网络服务器同步时间并查看

```
sudo ntpdate cn.pool.ntp.org
```

date

```
hu2333@ubuntu:~/Desktop$  
hu2333@ubuntu:~/Desktop$ date  
Sun 07 Apr 2024 02:36:07 PM CST
```

时间显示正常

#### 4、更换 pip 为清华源

```
mkdir .pip
```

```
sudo vim .pip/pip.conf
```

[illegible]

## 5、创建 stack 用户



```
sudo useradd -s /bin/bash -d /opt/stack -m stack
```

```
hu2333@ubuntu:~/Desktop$ sudo useradd -s /bin/bash -d /opt/stack -m stack
useradd: user 'stack' already exists
```

由于此前已经创建过 stack 用户，所以显示 stack 已经 exists

6、授予 stack 用户 sudo 权限

```
echo "stack ALL=(ALL) NOPASSWD: ALL" | sudo tee /etc/sudoers.d/stack
```

```
hu2333@ubuntu:~/Desktop$ echo 'stack ALL=(ALL) NOPASSWD: ALL' | sudo tee /etc/sudoers.d/stack
stack ALL=(ALL) NOPASSWD: ALL
```

7、切换至 stack 用户

```
sudo su - stack
```

8、修改 hosts，添加成功后重启虚拟机

```
sudo vim /etc/hosts
```

```
Found a swap file by the name "/etc/.hosts.swp"
  owned by: root   dated: Sun Mar 24 10:26:58 2024
  file name: /etc/hosts
  modified: YES
  user name: root   host name: ubuntu
  process ID: 2195
While opening file "/etc/hosts"
  dated: Sun Mar 24 09:39:44 2024

(1) Another program may be editing the same file.  If this is the case,
    be careful not to end up with two different instances of the same
    file when making changes.  Quit, or continue with caution.
(2) An edit session for this file crashed.
    If this is the case, use ":recover" or "vim -r /etc/hosts"
    to recover the changes (see ":help recovery").
    If you did this already, delete the swap file "/etc/.hosts.swp"
    to avoid this message.

Swap file "/etc/.hosts.swp" already exists!
[O]pen Read-Only, (E)dit anyway, (R)ecover, (D)elete it, (Q)uit, (A)bort:
```

由于此前已经更改过 host 的值，此处我只展现更改的内容

```
#github
140.82.113.4 github.com
199.232.5.194 github.global.ssl.fastly.net
```

9、下载 devstack 至 devstack 文件夹

```
stack@ubuntu:~$ sudo git clone https://github.com/openstack-dev/devstack.git /opt/devstack
fatal: destination path '/opt/devstack' already exists and is not an empty directory.
```

10、设置权限

```
stack@ubuntu:~$ sudo chown -R stack:stack /opt/devstack
stack@ubuntu:~$ sudo chmod -R 777 /opt/devstack
```



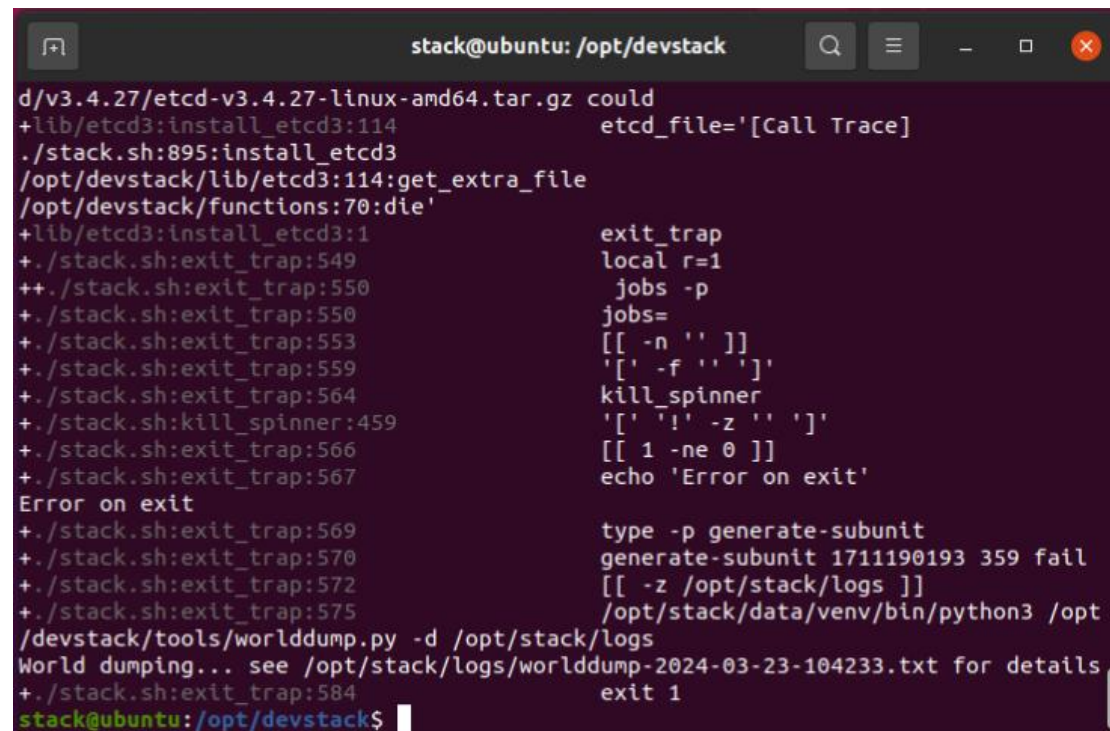
11、创建 local.conf 配置文件

```
cd /opt/devstack  
vim local.conf
```

将 local.conf 的值设定为如下：

```
[[local|localrc]]  
  
ADMIN_PASSWORD=admin  
  
DATABASE_PASSWORD=admin  
  
RABBIT_PASSWORD=admin  
  
SERVICE_PASSWORD=admin  
  
#Use mirror  
  
GIT_BASE=http://git.trystack.cn  
  
NOVNC_REPO=http://git.trystack.cn/kanaka/noVNC.git  
  
SPICE_REPO=http://git.trystack.cn/git/spice/spice-html5.git
```

12、在 devstack 目录下运行脚本 ./stack.sh ./unstack.sh ./clean.sh



```
stack@ubuntu: /opt/devstack  
d/v3.4.27/etcd-v3.4.27-linux-amd64.tar.gz could  
+lib/etcd3:install_etcd3:114 etcd_file='[Call Trace]  
./stack.sh:895:install_etcd3  
/opt/devstack/lib/etcd3:114:get_extra_file  
/opt/devstack/functions:70:die'  
+lib/etcd3:install_etcd3:1 exit_trap  
+./stack.sh:exit_trap:549 local r=1  
++./stack.sh:exit_trap:550 jobs -p  
+./stack.sh:exit_trap:550 jobs=  
+./stack.sh:exit_trap:553 [[ -n '' ]]  
+./stack.sh:exit_trap:559 '[' -f '' ]'  
+./stack.sh:exit_trap:564 kill_spinner  
+./stack.sh:kill_spinner:459 '[' '!' -z '' ]'  
+./stack.sh:exit_trap:566 [[ 1 -ne 0 ]]  
+./stack.sh:exit_trap:567 echo 'Error on exit'  
Error on exit  
+./stack.sh:exit_trap:569 type -p generate-subunit  
+./stack.sh:exit_trap:570 generate-subunit 1711190193 359 fail  
+./stack.sh:exit_trap:572 [[ -z /opt/stack/logs ]]  
+./stack.sh:exit_trap:575 /opt/stack/data/venv/bin/python3 /opt  
/devstack/tools/worldddump.py -d /opt/stack/logs  
World dumping... see /opt/stack/logs/worldddump-2024-03-23-104233.txt for details  
+./stack.sh:exit_trap:584 exit 1  
stack@ubuntu: /opt/devstack$
```

### 运行过程图

经过三个小时的安装，访问 <http://192.168.33.189/dashboard>



# openstack®

登录

用户名

密码



登入

## 四.实验总结

本次实验是我首次使用虚拟机进行项目安装的相关实验，由于开始的时候没有进行虚拟机的安装和其他操作，我询问了周围好友相关虚拟机的知识，通过他们的推荐，我选择了 VMWare 作为虚拟机的搭载，并在官网上下载了 ubuntu 的多种镜像版本作为本次实验的镜像。

在实验过程中，尤其是最后一步的 ./sh 操作中，我出现了各种各样的问题，在网上查阅了大量的资料，我发现很多的原因来源于镜像和版本的相关要求，虽然觉得比较玄学，但是还是进行了很多镜像版本的安装，从 19 到 20 到 21. 最后在 21 的时候针对操作安装成功，完成了 openstack 的网站跳转。实验操作成功。

其次是一些自己的想法，原来很多的代码操作我都是在本地上进行的相关运行，网站上跳转很多也是通过各种各样的框架进行后端的搭建，本次头一次还是在虚拟机上进行 GitHub 项目的运用，虽然过程很痛苦，但整体结果还是比较不错的。