实验 4 网络及其服务管理

一、实验目的

- 1. 熟悉 Linux 网络配置方法。
- 2. 在 Linux 系统中熟练配置 WWW 服务器、FTP 服务器等。

二、预备知识

1. 熟悉网络配置,使用 ip 命令查看并为主机分配 IP 地址。

Linux 的 ip 命令和 ifconfig 类似,但前者功能更强大,使用 ip 命令,只需一个命令就能很轻松地执行一些网络管理任务。而 ifconfig 是已被废弃使用的一个命令,已经没有维护了。(在实验室上机的同学注意,如果所使用的机器已经设置好 ip 地址,那么请不要修改,只需查看,避免冲突)

2. 远程登录命令 telnet、rlogin、ssh 的使用。 首先确认所使用的机器是否已经安装有这些服务,如果没有,可以自行安装。为了安全, 目前系统的远程登录都使用 ssh, telnet 和 rlogin 都已不用。

3. 搭建 WWW 服务器。 首先确认所使用的机器是否已经安装 Apache httpd,如果没有,可以通过 apt-get 来安装,之后建立 Web 主页,启动 Apache 服务器,输入 localhost 能看到所配置的主页。

4. 搭建 FTP 服务器。

用户通过客户机程序向服务器程序发出命令,服务器程序执行用户所发出的命令,并将执行的结果返回到客户机。用户可通过客户机程序向远程主机上传文件,或者从远程主机下载文件。

三、实验内容

注:以下实验内容除了标注在普通用户下操作的 ssh localhost 命令外,其他命令均在 root 用户下进行操作。

假设某班级分配了一台服务器, IP 地址为 192.168.2.2, 并且安装了 Linux 系统, 作为一个班级网络管理员, 现在要求作如下网络及服务配置:

- 1. 配置主机 IP 地址,以及主机名为 Class1Server。
 - (1) 配置主机 ip 地址:

查看网卡名称(如本图中为 ens33),操作如图 E4-1 所示。

```
File Edit View Search Terminal Help
root@donghua:~# ip addr
1: lo: <LOOPBACK,UP,LOWER UP> mtu 65536 qdisc noqueue state UNKNOWN group defaul
t glen 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 g
roup default glen 1000
    link/ether 00:0c:29:c2:71:ad brd ff:ff:ff:ff:ff
    inet 192.168.74.128/24 brd 192.168.74.255 scope global dynamic ens33
      valid_lft 1515sec preferred_lft 1515sec
    inet6 fe80::9808:5660:3388:99f3/64 scope link
       valid_lft forever preferred_lft forever
root@donghua:~#
```

图 E4-1 查看网卡名称

```
File Edit View Search Terminal Help

root@Class1Server:~# ip addr add 192.168.2.2/24 dev ens33

root@Class1Server:~#
```

图 E4-2 添加 ip 地址

注意: IP 地址要有一个后缀,比如/24。这种用法用于在无类域内路由选择(CIDR)中来显示所用的子网掩码。在这个例子中,子网掩码是 255.255.255.0。

需要删除时将本行语句 add 改成 del。

再次查看本机 ip 地址,操作如图 E4-3 所示。

```
File Edit View Search Terminal Help
root@donghua:~# ip addr
1: lo: <LOOPBACK, UP, LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defaul
t 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 g
roup default qlen 1000
    link/ether 00:0c:29:c2:71:ad brd ff:ff:ff:ff:ff
    inet 192.168.74.128/24 brd 192.168.74.255 scope global dynamic ens33
      valid_lft 1086sec preferred_lft 1086sec
    inet 192.168.2.2/24 scope global ens33
      valid_lft forever preferred_lft forever
    inet6 fe80::9808:5660:3388:99f3/64 scope link
       valid_lft forever preferred_lft forever
root@donghua:~#
```

图 E4-3 再次查看 ip 地址

(2) 修改主机名

临时修改主机名,操作如 E4-4 所示。

```
File Edit View Search Terminal Help
root@Class1Server:~# hostname Class1Server
root@Class1Server:~# hostname
Class1Server
root@Class1Server:~#
```

图 E4-4 临时修改主机名

关闭终端窗口后,(ctrl+alt+T)再次打开终端窗口,已经改变。但是重启后主机名不会改变,如图 E4-5 所示。

```
File Edit View Search Terminal Help
jsj2018@Class1Server:~$
```

图 E4-5 主机名展示

永久修改主机名,操作如图 E4-6 所示。

输入命令: vim /etc/hostname

该文件中只有一行,即主机名,需要重启后生效。

```
File Edit View Search Terminal Help
Class1Server
~
```

图 E4-6 永久修改主机名

- 2. 安装并配置 OpenSSH, 使得用户可以远程登录。
 - (1) 检查是否已安装 ssh 服务,若已安装,则可以直接登录,操作如图 E4-7 所示。

```
File Edit View Search Terminal Help

root@Class1Server:~# ps -e | grep sshd

root@Class1Server:~# ssh localhost

ssh: connect to host localhost port 22: Connection refused

root@Class1Server:~#
```

图 E4-7 查看 ssh 安装情况

(2) 安装 openssh 客户端,操作如图 E4-8 所示。

```
File Edit View Search Terminal Help
root@Class1Server:~# apt-get install openssh-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  rssh molly-guard monkeysphere
The following NEW packages will be installed:
  openssh-server
O upgraded, 1 newly installed, O to remove and 74 not upgraded.
Need to get 0 B/335 kB of archives.
After this operation, 904 kB of additional disk space will be used.
Preconfiguring packages ...
Selecting previously unselected package openssh-server.
(Reading database ... 244058 files and directories currently installed.)
Preparing to unpack .../openssh-server_1%3a7.2p2-4ubuntu2.6_amd64.deb ...
Unpacking openssh-server (1:7.2p2-4ubuntu2.6) ...
Processing triggers for ureadahead (0.100.0-19) ...
Processing triggers for systemd (229-4ubuntu21.10) ...
Processing triggers for ufw (0.35-0ubuntu2) ...
Processing triggers for man-db (2.7.5-1) ...
Setting up openssh-server (1:7.2p2-4ubuntu2.6) ...
Creating SSH2 RSA key; this may take some time ...
2048 SHA256:uovocpN1WeCD/uoC6g+SpchsMaMJFCxzi+DuuojbVt8 root@Class1Server (RSA)
Creating SSH2 DSA key; this may take some time ...
```

图 E4-8 安装 ssh 客户端

提示:用 apt-get 安装时出现 Error,若在实验 3 中安装了 SELinux:做实验 3 的最后一步安装 SELinux,会导致 apt-get install xx 命令无法运行、出现 error,请按如下步骤禁用 SELinux。

在 root 下输入指令 vi /etc/selinux/config 更改为 SELINUX=disabled 或 SELINUX=0 即可永久关闭、彻底禁用 SELinux。 启动 ssh 服务,操作如图 E4-9 所示。

```
File Edit View Search Terminal Help
root@Class1Server:~# service ssh start
root@Class1Server:~#
```

图 E4-9 启动 ssh 服务

查询服务启动状态,操作如图 E4-10 所示。

```
File Edit View Search Terminal Help
root@Class1Server:~# service ssh status
ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: enab
Active: active (running) since Sat 2018-12-01 21:24:16 PST; 11min ago Main PID: 3055 (sshd)
   CGroup: /system.slice/ssh.service

└─3055 /usr/sbin/sshd -D
Dec 01 21:24:16 Class1Server systemd[1]: Started OpenBSD Secure Shell server.
Dec 01 21:26:13 Class1Server systemd[1]: Started OpenBSD Secure Shell server.
Dec 01 21:28:43 Class1Server sshd[3166]: pam_unix(sshd:auth): authentication fai
Dec 01 21:28:45 Class1Server sshd[3166]: Failed password for root from 127.0.0.1
Dec 01 21:28:55 Class1Server sshd[3166]: Failed password for root from 127.0.0.1
Dec 01 21:29:01 Class1Server sshd[3166]: Failed password for root from 127.0.0.1
Dec 01 21:35:10 Class1Server sshd[3190]: pam_unix(sshd:auth): authentication fai
Dec 01 21:35:12 Class1Server sshd[3190]: Failed password for root from 127.0.0.1
Dec 01 21:35:28 Class1Server sshd[3190]: Failed password for root from 127.0.0.1
Dec 01 21:35:33 Class1Server sshd[3190]: Failed password for root from 127.0.0.1
lines 1-17/17 (END)
```

图 E4-10 查询 ssh 服务启动状态

(3) 使用 ssh 本地登录(注意切换普通用户,因为系统默认禁止 root 用户登录 ssh), 操作如图 E4-11 所示。

```
File Edit View Search Terminal Help

jsj2018@Class1Server:~$ ssh localhost
jsj2018@localhost's password:
Welcome to Ubuntu 16.04.5 LTS (GNU/Linux 4.15.0-29-generic i686)

* Documentation: https://help.ubuntu.com

* Management: https://landscape.canonical.com

* Support: https://ubuntu.com/advantage

177 packages can be updated.
106 updates are security updates.

New release '18.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Sat Dec 1 14:44:25 2018 from 127.0.0.1
jsj2018@Class1Server:~$
```

图 E4-11 ssh 登录

如果本机用户是首次登录 ssh,使用 ssh localhost 指令时可能出现以下内容,此时输入 yes 并输入 root 密码即可。

```
File Edit View Search Terminal Help
isi2018@Class1Server:~S ssh localhost
The authenticity of host 'localhost (127.0.0.1)' can't be established.

FCDSA key fingerprint is SHA256:Blo2Pouy6x0IcZ3gDoupEOR062WBWcz3LhSoRtI4lbs.
Are you sure you want to continue connecting (yes/no)? yes
<u>Marning: Permanently added 'L</u>ocalhost' (ECDSA) to the list of known hosts.
isj2018@localhost's password:
Welcome to Ubuntu 16.04.5 LTS (GNU/Linux 4.15.0-29-generic x86 64)
 * Documentation: https://help.ubuntu.com
 * Management:
                    https://landscape.canonical.com
                    https://ubuntu.com/advantage
 * Support:
182 packages can be updated.
109 updates are security updates.
New release '18.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
jsj2018@Class1Server:~$
```

图 E4-12 ssh 首次登录

提示:如果出现 Permission denied (publickey,gssapi-keyex,gssapi-with-mic) 警告时,请按如下步骤操作:

a) 首先:在 root 用户下配置 ssh 服务器配置文件。

输入命令: vi /etc/ssh/sshd config

权限设为 no:

#PermitRootLogin yes

#UsePAM yes

#PasswordAuthentication yes

如果前面有#号,将#号去掉,之后将 yes 修改为 no。

修改之后为:

PermitRootLogin no

UsePAM no

PasswordAuthentication no

权限设为 yes:

RSAAuthentication yes

PubkeyAuthentication yes

b) 重启 sshd 服务,输入以下命令

service ssh restart

service ssh status #查看 ssh 服务的状态

之后再输入 ssh localhost 命令进行操作。正常情况下应该如图 E4-11 所示。

提示: 如果您想用 root 账号登录 ssh 却出现 Permision denied, please try again.的状况,如图 E4-13 所示。

```
File Edit View Search Terminal Help
root@Class1Server:~# ssh localhost
root@localhost's password:
Permission denied, please try again.
```

图 E4-13 Permision denied, please try again.

请按下述步骤操作:

首先 Ctrl+c 退出密码输入界面。

然后输入: su – 注意 su 后面的 "–"

再输入命令 vi /etc/ssh/sshd_config

找到如图 E4-14 所示部分

```
File Edit View Search Terminal Help

LogLevel INFO

# Authentication:
LoginGraceTime 120
PermitRootLogin prohibit-password
StrictModes yes

RSAAuthentication yes
PubkeyAuthentication yes
#AuthorizedKeysFile %h/.ssh/authorized_keys
```

图 E4-14 更改部分示意图

替换为如下所示部分:

Authentication:

LoginGraceTime 120

#PermitRootLogin without-password

PermitRootLogin yes

StrictModes yes

```
File Edit View Search Terminal Help

LogLevel INFO

# Authentication:
LoginGraceTime 120
#PermitRootLogin prohibit-password
PermitROotLogin yes
StrictModes yes

RSAAuthentication yes
PubkeyAuthentication yes
#AuthorizedKeysFile %h/.ssh/authorized_keys
```

图 E4-15 更改部分示意图

保存并退出后,输入命令 service ssh restart 重启 ssh 服务,再输入 ssh localhost 即可登录。

```
File Edit View Search Terminal Help
root@Class1Server:~# service ssh restart
root@Class1Server:~# ssh localhost
root@localhost's password:
Welcome to Ubuntu 16.04.5 LTS (GNU/Linux 4.15.0-29-generic x86 64)
 * Documentation: https://help.ubuntu.com
 * Management:
                   https://landscape.canonical.com
 * Support:
                   https://ubuntu.com/advantage
182 packages can be updated.
109 updates are security updates.
New release '18.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
root@Class1Server:~#
```

图 4-16 成功在 root 下登录

- 3. 安装并配置 Apache 服务器,每个同学都可以编辑自己的主页,然后发布到服务器中,而且访问方式为 http://Class1Server/stu_i,其中 i 是序号。
 - (1) 安装 apache2, 操作如图 E4-17、E4-18、E4-19 所示。

```
File Edit View Search Terminal Help

root@Class1Server:~# apt-get update

Hit:1 http://ppa.launchpad.net/gnome3-team/gnome3/ubuntu xenial InRelease

Get:2 http://security.ubuntu.com/ubuntu xenial-security InRelease [107 kB]

Hit:3 http://us.archive.ubuntu.com/ubuntu xenial InRelease

Get:4 http://us.archive.ubuntu.com/ubuntu xenial-updates InRelease [109 kB]

Get:5 http://us.archive.ubuntu.com/ubuntu xenial-backports InRelease [107 kB]

Fetched 323 kB in 2s (110 kB/s)

Reading package lists... Done

root@Class1Server:~#
```

图 E4-17 安装 Apache 服务器

```
File Edit View Search Terminal Help
root@Class1Server:~# apt-get install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
 apache2-bin apache2-data apache2-utils libapr1 libaprutil1
 libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.1-0
Suggested packages:
 apache2-doc apache2-suexec-pristine | apache2-suexec-custom
The following NEW packages will be installed:
 apache2 apache2-bin apache2-data apache2-utils libapr1 libaprutil1
 libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.1-0
0 upgraded, 9 newly installed, 0 to remove and 174 not upgraded.
Need to get 1,540 kB of archives.
After this operation, 6,373 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

图 E4-18 安装 Apache 服务器

```
File Edit View Search Terminal Help
root@Class1Server:~# apt-get install apache2-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  autotools-dev debhelper dh-strip-nondeterminism libapr1-dev libaprutil1-dev
  libexpat1-dev libfile-stripnondeterminism-perl libldap-2.4-2 libldap2-dev
  libmail-sendmail-perl libsctp-dev libsctp1 libsys-hostname-long-perl
  po-debconf uuid-dev
Suggested packages:
  dh-make lksctp-tools libmail-box-perl
The following NEW packages will be installed:
  apache2-dev autotools-dev debhelper dh-strip-nondeterminism libapr1-dev
  libaprutil1-dev libexpat1-dev libfile-stripnondeterminism-perl libldap2-dev
  libmail-sendmail-perl libsctp-dev libsctp1 libsys-hostname-long-perl
  po-debconf uuid-dev
The following packages will be upgraded:
  libldap-2.4-2
1 upgraded, 15 newly installed, 0 to remove and 173 not upgraded.
Need to get 2,884 kB of archives.
After this operation, 18.8 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

图 E4-19 安装 Apache 服务器

若需要完全卸载 apache2, 命令如下:

\$ sudo apt-get --purge remove apache2

\$ sudo apt-get --purge remove apache2.2-common

\$ sudo apt-get autoremove //找到没有删干净的配置文件,删除

\$ sudo find /etc -name "*apache*" -exec rm -rf {};

\$ sudo rm -rf /var/www

查看安装是否成功,输入命令 systemctl status apache2,在浏览器输入 localhost 或者 127.0.0.1 或者本机 ip (192.168.2.2)。操作如图 E4-20、图 E4-21 所示

```
File Edit View Search Terminal Help
root@Class1Server:~# systemctl status apache2
 apache2.service - LSB: Apache2 web server
   Loaded: loaded (/etc/init.d/apache2; bad; vendor preset: enabled)
  Drop-In: /lib/systemd/system/apache2.service.d
            -apache2-systemd.conf
   Active: active (running) since Sat 2018-12-01 21:47:21 PST; 5h 50min ago
     Docs: man:systemd-sysv-generator(8)
   CGroup: /system.slice/apache2.service
            -3712 /usr/sbin/apache2 -k start
            —3715 /usr/sbin/apache2 -k start
             -3716 /usr/sbin/apache2 -k start
Dec 01 21:47:20 Class1Server systemd[1]: Starting LSB: Apache2 web server...
Dec 01 21:47:20 Class1Server apache2[3690]: * Starting Apache httpd web server
Dec 01 21:47:20 Class1Server apache2[3690]: AH00558: apache2: Could not reliably
Dec 01 21:47:21 Class1Server apache2[3690]:
Dec 01 21:47:21 Class1Server systemd[1]: Started LSB: Apache2 web server.
Dec 02 02:16:13 Class1Server systemd[1]: Started LSB: Apache2 web server.
Dec 02 02:48:32 Class1Server systemd[1]: Started LSB: Apache2 web server.
Dec 02 03:03:59 Class1Server systemd[1]: Started LSB: Apache2 web server.
lines 1-19/19 (END)
```

图 E4-20 查看是否安装成功

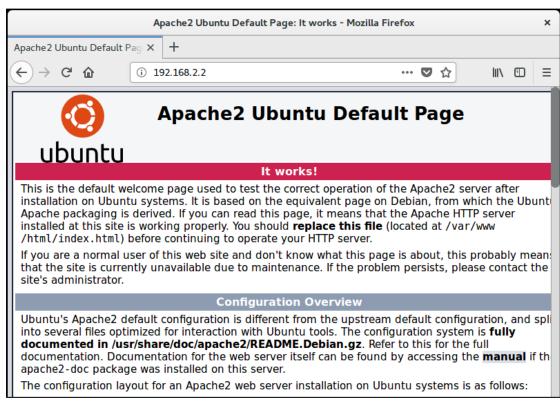


图 E4-21 浏览器查看

apache 其他一些操作:

- a) 查看安装位置 whereis apache2
- b) 查看 apache 版本 apache2ctl -v
- c) 正常启动关闭 apache, 查看对应的 systemctl status 发现状态有所不同。
- \$ sudo /etc/init.d/apache2 stop//停止后 localhost unable to connect
- \$ sudo /etc/init.d/apache2 restart//重启
- \$ sudo /etc/init.d/apache2 start//启动
- (2) 新建/var/www/html/stu_i 文件夹和/var/www/html/stu_i/index.html 文件并编辑, 操作如图 E4-22、E4-23、E4-24 所示。

```
File Edit View Search Terminal Help

root@Class1Server:~# mkdir /var/www/html/stu_1
root@Class1Server:~#
```

图 E4-22 新建/var/www/html/stu i 文件夹

再输入命令: [root@主机名]# vim /var/www/html/stu_i/index.html

```
File Edit View Search Terminal Help
root@Class1Server:~# vim /var/www/html/stu_1/index.html
root@Class1Server:~#
```

图 E4-23 打开 index.html 文件

图 E4-24 编辑网页文件

在浏览器中输入 localhost/stu_1 查看刚刚新建的网页,操作如图 E4-25 所示。

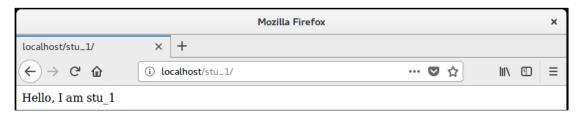


图 E4-25 查看网页

(3) 设置 ip 和主机名映射 vim /etc/hosts, 操作如图 E4-26、E4-27 所示。

```
File Edit View Search Terminal Help
root@Class1Server:~# vim /etc/hosts
root@Class1Server:~# ■
```

图 E4-26 输入命令 vim /etc/hosts

```
File Edit View Search Terminal Help

127.0.0.1 localhost
127.0.1.1 ubuntu
192.168.2.2 Class1Server

# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
```

图 E4-27 修改 hosts 文件

(4) 启动 apache, 命令: /etc/init.d/apache2 start。在 firefox 输入 url: http://Class1Server/stu_1, 操作如图 E4-28、E4-29 所示。

```
File Edit View Search Terminal Help

root@Class1Server:~# /etc/init.d/apache2 start

[ ok ] Starting apache2 (via systemctl): apache2.service.

root@Class1Server:~# |
```

图 E4-28 启动 apache



图 E4-29 浏览主页

- 4. 安装并配置 vsFTP 服务器,用户(stu_i)可以在 FTP 目录中上传和下载自己的主页文件或目录。
 - (1) 安装 vsFTP, 操作如图 E4-30 所示。

```
Edit View Search Terminal Help
root@Class1Server:~# apt-get install vsftpd
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  vsftpd
O upgraded, 1 newly installed, O to remove and 173 not upgraded.
Need to get 115 kB of archives.
After this operation, 336 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu xenial/main amd64 vsftpd amd64 3.0.3-3
ubuntu2 [115 kB]
Fetched 115 kB in 1s (81.7 kB/s)
Preconfiguring packages ...
Selecting previously unselected package vsftpd.
(Reading database ... 211149 files and directories currently installed.)
Preparing to unpack .../vsftpd_3.0.3-3ubuntu2_amd64.deb ...
Unpacking vsftpd (3.0.3-3ubuntu2) ...
Processing triggers for systemd (229-4ubuntu21.4) ...
Processing triggers for ureadahead (0.100.0-19) ...
Processing triggers for man-db (2.7.5-1) ...
Setting up vsftpd (3.0.3-3ubuntu2) ..
Processing triggers for systemd (229-4ubuntu21.4) ...
Processing triggers for ureadahead (0.100.0-19) ...
root@Class1Server:~#
```

E4-30 安装 FTP 服务器

(2) 添加用户 stu 1, 操作如图 E4-31 所示。

```
File Edit View Search Terminal Help

root@Class1Server:~# useradd -m -d /home/stu_1 -s /bin/bash stu_1
root@Class1Server:~# passwd stu_1
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
```

图 E4-31 添加用户 stu 1

备注: -m,自动创建用户目录,要指明 bash,或者到 /etc/passwd 修改。

(3) 修改 vsftpd 配置文件,命令 vi /etc/vsftpd.conf,操作如图 E4-32 所示。

```
File Edit View Search Terminal Help
root@Class1Server:~# vi /etc/vsftpd.conf
root@Class1Server:~#
```

图 E4-32 修改 vsftpd 配置文件

修改如下内容(如果需要添加的,请添加至文件末尾;如果语句前有#号,请把#号去掉):

```
anonymous_enable=NO #设定不允许匿名访问 local_enable=YES #设定本地用户可以访问 chroot_local_user=YES chroot_list_enable=YES #使用户不能离开主目录 chroot_list_file=/etc/vsftpd.chroot_list write_enable=YES 可写 anon_upload_enable=YES
```

anon_mkdir_write_enable=YES

添加: anon_umask=022 掩码

实现上传功能:添加一行 local umark=022(因为原文件默认是 077)。

(4) 修改 vsftpd.chroot list,添加可访问用户名单每行一个,操作如图 E4-33、图

E4-34 所示。

```
File Edit View Search Terminal Help
root@Class1Server:~# vim /etc/vsftpd.chroot_list
root@Class1Server:~# _
```

图 E4-33 修改 vsftpd.chroot_list

```
File Edit View Search Terminal Help
stu_1
```

图 E4-34 添加 stu_1

(5) 启动 vsftp 服务: service vsftpd start 查看 vsftpd 服务启动状态: service vsftpd status 操作如图 E4-35 所示。

```
File Edit View Search Terminal Help

root@Class1Server:~# service vsftpd start
root@Class1Server:~# service vsftpd status

vsftpd.service - vsftpd FTP server

Loaded: loaded (/lib/systemd/system/vsftpd.service; enabled; vendor preset: e
Active: active (running) since Sun 2018-12-02 01:20:31 PST; 22min ago

Main PID: 10721 (vsftpd)

CGroup: /system.slice/vsftpd.service

10721 /usr/sbin/vsftpd /etc/vsftpd.conf

Dec 02 01:20:31 Class1Server systemd[1]: Starting vsftpd FTP server.

Dec 02 01:42:40 Class1Server systemd[1]: Started vsftpd FTP server.

Dec 02 01:43:07 Class1Server systemd[1]: Started vsftpd FTP server.

lines 1-11/11 (END)
```

图 E4-35 启动 vsftp 服务 查看 vsftpd 服务启动状态

(6) 登录界面,如图 E4-36 所示。

登录身份			×
P	服务器不允许匿名登录,	或者不接受该电子邮件地址。	
	FTP 服务器:	192.168.0.129	
	用户名(U):	~	
	密码(P):		
登录后,可以将这个服务器添加到你的收藏夹,以便轻易返回。			
<u> </u>	FTP 将数据发送到服务用 WebDAV。	务器之前不加密或编码密码或数据。要保护密码和数据的安全,请	使
	□匿名登录(A)	□保存密码(S) 登录(L) 取消	

图 E4-36 登陆 FTP 服务器

提示: 如果您不会查看 ftp 地址,请按下述步骤:

输入命令 ifconfig,图 E4-37 中的 inet addr 处即为 ftp 地址。

```
File Edit View Search Terminal Help
root@Class1Server:~# ifconfig
ens33
          Link encap: Ethernet
                                HWaddr 00:0c:29:fd:bf:79
          inet addr:192.168.174.129 Bcast:192.168.174.255 Mask:255.255.255.0
          inet6 addr: fe80::9057:95b5:edbb:7503/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:62 errors:0 dropped:0 overruns:0 frame:0
          TX packets:128 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:7883 (7.8 KB) TX bytes:12830 (12.8 KB)
lo
          Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING MTU:65536
                                            Metric:1
          RX packets:234 errors:0 dropped:0 overruns:0 frame:0
          TX packets:234 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:19509 (19.5 KB) TX bytes:19509 (19.5 KB)
root@Class1Server:~#
```

图 E-37 查看 ftp 的地址

提示: 如果显示电脑主机连不上虚拟机: 调整虚拟机网络中网卡配置为桥接模式。

(7) 界面,如图 E4-38 所示。

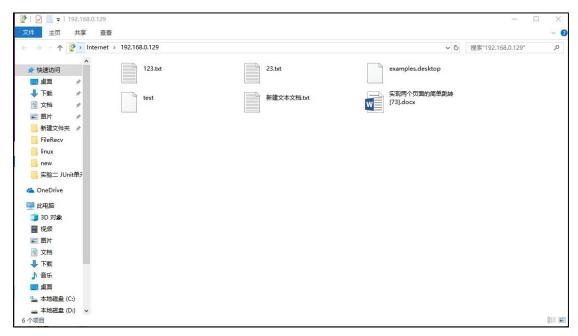


图 E4-38 文件上传与下载

一、拓展

- 1、 针对以上实验内容, 创建和配置 DNS 服务器。
- 2、 针对以上实验内容, 创建和配置 DHCP 服务器。

针对以上实验内容,搭建一个 Mail 服务器,为班级所有同学提供邮件服务,邮箱名为学号,创建和配置邮件服务器。