

# NAS

把你的 Acadia 或 RPi 或 WRTnode 变成一台 NAS 服务器，能接一个 SATA 或 USB 硬盘，实现 Samba、DLNA 和 sftp 访问。

## 实现目的

1. 掌握 Acadia 或 RPi 或 WRTnode 和 PC 建立文件共享的方式；
2. 掌握 linux 下移动存储设备的挂载。

## 实验器材

### 硬件

- Acadia 或 RPi 或 WRTnode 板一块；
- 5V/1A 电源一个；
- microUSB 线一根；
- USB-TTL 串口线一根（FT232RL 芯片或 PL2303 芯片）。

以下为自备（可选）器材：

- PC（Windows/Mac OS/Linux）一台；
- 以太网线一根（可能还需要路由器等）。

### 软件

- PC 上的 USB-TTL 串口线配套的驱动程序；
- PC 上的串口终端软件，如 minicom、picocom、putty 等；
- PC 上的 SSH 软件，如 putty 等。

## 实验步骤

1. 把 USB 移动硬盘连接到 Acadia 或 RPi 或 WRTnode 上，并挂载；

通过给 linux 下的设备管理服务 udev 添加规则配置文件，可以实现命令行下 USB 存储设备自动挂载

输入命令

```
sudo nano /etc/udev/rules.d/10-usbstorage.rules
```

```
COM4 - PuTTY
pi.avi
pi.jpeg
zjuvpn-8.2.tar.gz
pi@raspberrypi: /media/Untitled-sda1$ sudo nano /etc/udev/rules.d/10-usbstorage.rules
GNU nano 2.2.6 File: /etc/udev/rules.d/10-usbstorage.rules

[
KERNEL!="sd*", GOTO="media_by_label_auto_mount_end"
SUBSYSTEM!="block", GOTO="media_by_label_auto_mount_end"
IMPORT{program}="/sbin/blkid -o udev -p %N"
ENV{ID_FS_TYPE}="", GOTO="media_by_label_auto_mount_end"
ENV{ID_FS_LABEL}!="", ENV{dir_name}="%E{ID_FS_LABEL}"
ENV{ID_FS_LABEL}="", ENV{dir_name}="Untitled-%k"
ACTION=="add", ENV{mount_options}="relatime, sync"
ACTION=="add", ENV{ID_FS_TYPE}=="vfat", ENV{mount_options}="iocharset=utf8,$
ACTION=="add", ENV{ID_FS_TYPE}=="ntfs", ENV{mount_options}="iocharset=utf8,$
ACTION=="add", RUN+="/bin/mkdir -p /media/%E{dir_name}", RUN+="/bin/mount -$

ACTION=="remove", ENV{dir_name}!="", RUN+="/bin/umount -l /media/%E{dir_nam$
LABEL="media_by_label_auto_mount_end"

[ Read 13 lines ]
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell
```

保存退出

再次插入 usb 存储设备 会自动挂载到/media 目录下面的目录 并且支持 utf8 格式的中文文件名

效果如下图所示:

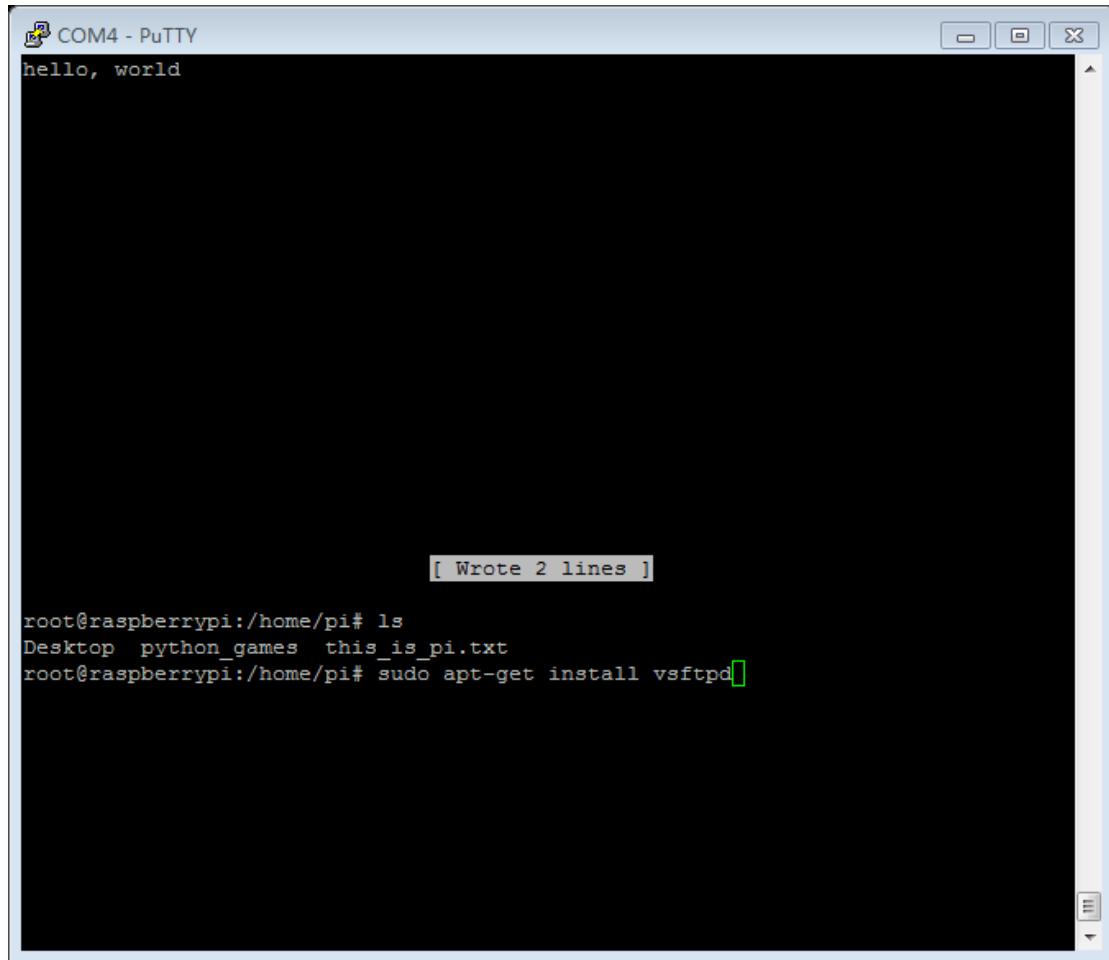
```
COM4 - PuTTY
# has an effect if the above global write enable is activated. Also, you will
[ Wrote 147 lines ]

root@raspberrypi:/home/pi# sudo service vsftpd restart
Stopping FTP server: vsftpd.
Starting FTP server: vsftpd.
root@raspberrypi:/home/pi# cd ..
root@raspberrypi:/home# cd ..
root@raspberrypi:/# ls
bin    dev    home  lost+found  mnt    proc    run    selinux  sys    usr
boot  etc    lib   media      opt    root    sbin   srv      tmp    var
root@raspberrypi:/# cd media
root@raspberrypi:/media# ls
Untitled-sda1
root@raspberrypi:/media# cd untitled-sda1
bash: cd: untitled-sda1: No such file or directory
root@raspberrypi:/media# cd Untitled-sda1
root@raspberrypi:/media/Untitled-sda1# ls
Battle.net                               usr
【 Big Hero 6】 【 DVD-RMVB.中字】 .rmvb  WarcraftIII 1.20E
Hearthstone                             xl2tpd_1.3.1+dfsg-1_armhf.deb
libpcap0.8 1.3.0-1_armhf.deb             zjuvpn-8.2.tar.gz
ppp 2.4.5-5.1_armhf.deb
root@raspberrypi:/media/Untitled-sda1#
```

2. 安装配置 Samba、DLNA 和 sftp，在 PC 上分别用这三种访问移动硬盘。

安装 samba, minidlna, sftp

```
COM4 - PuTTY
64 bytes from 115.239.210.27: icmp_req=5 ttl=54 time=5.42 ms
64 bytes from 115.239.210.27: icmp_req=6 ttl=54 time=4.24 ms
64 bytes from 115.239.210.27: icmp_req=7 ttl=54 time=8.59 ms
^Z
[2]+  Stopped                  ping www.baidu.com
pi@raspberrypi:~$ sudo bash
root@raspberrypi:/home/pi# apt-get install samba
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  libwbclient0 samba-common smbclient tdb-tools
Suggested packages:
  openbsd-inetd inet-superserver smbldap-tools ldb-tools ctdb
Recommended packages:
  samba-common-bin
The following NEW packages will be installed:
  samba tdb-tools
The following packages will be upgraded:
  libwbclient0 samba-common smbclient
3 upgraded, 2 newly installed, 0 to remove and 26 not upgraded.
Need to get 8,179 kB of archives.
After this operation, 20.2 MB of additional disk space will be used.
Do you want to continue [Y/n]? ☐
```



```
COM4 - PuTTY
hello, world

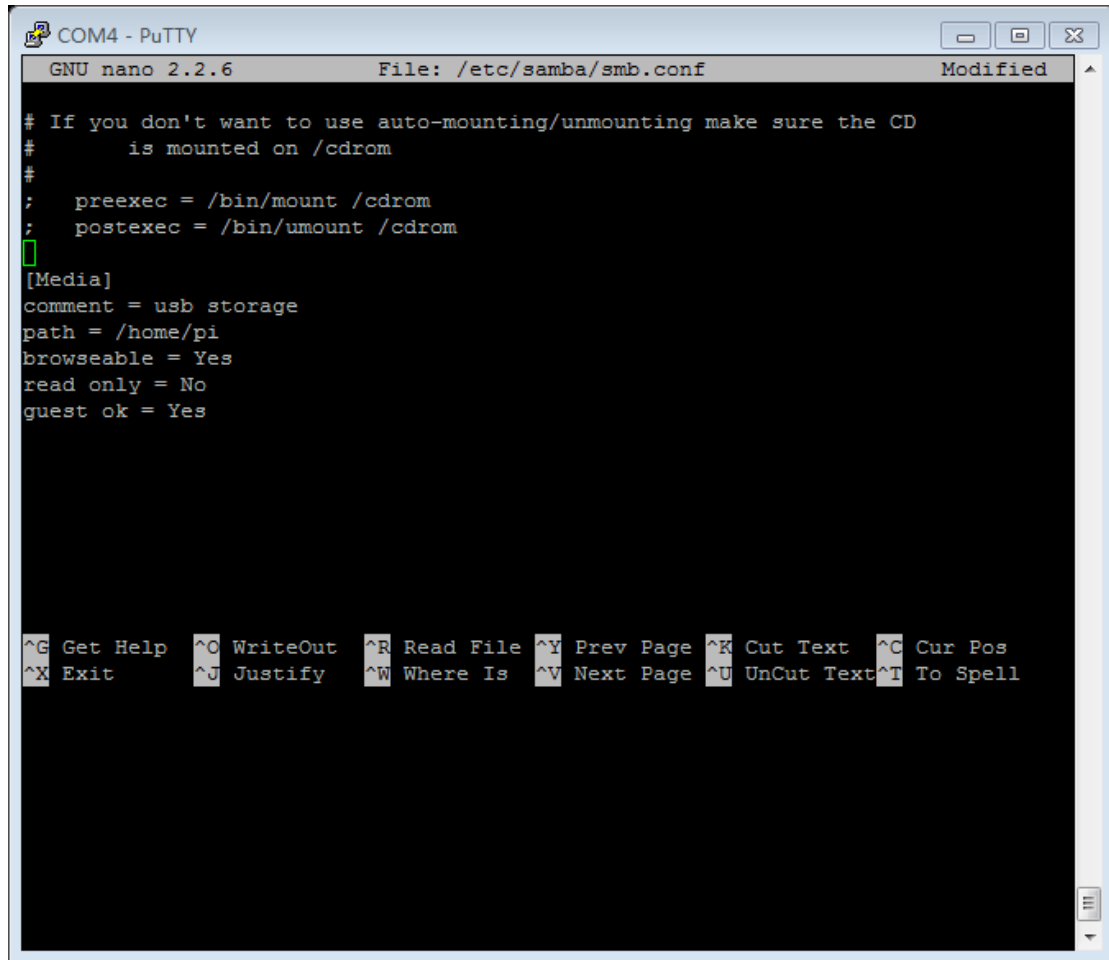
[ Wrote 2 lines ]

root@raspberrypi:/home/pi# ls
Desktop  python_games  this_is_pi.txt
root@raspberrypi:/home/pi# sudo apt-get install vsftpd
```

```
COM4 - PuTTY
5
ppp_2.4.5-5.1_armhf.deb          A    353808  Tue Mar 24 07:03:08 2015
x12tpd_1.3.1+dfsg-1_armhf.deb    A    70814   Tue Mar 24 07:03:54 2015
libpcap0.8_1.3.0-1_armhf.deb     A   135146   Tue Mar 24 07:03:48 2015
zjuvpn-8.2.tar.gz                A    2271   Tue Mar 24 07:03:40 2015
usr                              D      0    Sun Nov 25 18:51:42 2012

          59605 blocks of size 131072. 35543 blocks available
smb: \Untitled-sda1\> exi
pi@raspberrypi:/media$
pi@raspberrypi:/media$ dlina
-bash: dlina: command not found
pi@raspberrypi:/media$ sudo apt-get install minidlna
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  libavformat53
The following NEW packages will be installed:
  libavformat53 minidlna
0 upgraded, 2 newly installed, 0 to remove and 26 not upgraded.
Need to get 555 kB of archives.
After this operation, 1,332 kB of additional disk space will be used.
Do you want to continue [Y/n]? ☐
```

设置 samba



The image shows a PuTTY terminal window titled "COM4 - PuTTY". Inside, the GNU nano 2.2.6 text editor is open, editing the file /etc/samba/smb.conf. The editor's status bar at the top indicates "File: /etc/samba/smb.conf" and "Modified". The text content of the file is as follows:

```
# If you don't want to use auto-mounting/unmounting make sure the CD
#   is mounted on /cdrom
#
; preexec = /bin/mount /cdrom
; postexec = /bin/umount /cdrom
[Media]
comment = usb storage
path = /home/pi
browseable = Yes
read only = No
guest ok = Yes
```

The cursor is positioned at the end of the line following the [Media] section. At the bottom of the window, a help menu is displayed with the following options:

^G Get Help	^O WriteOut	^R Read File	^Y Prev Page	^K Cut Text	^C Cur Pos
^X Exit	^J Justify	^W Where Is	^V Next Page	^U UnCut Text	^T To Spell

```
COM4 - PuTTY
#      is mounted on /cdrom
#
;   preexec = /bin/mount /cdrom
;   postexec = /bin/umount /cdrom

[Media]
comment = usb storage
path = /home/pi
browseable = Yes
read only = No
guest ok = Yes

[ Wrote 340 lines ]

root@raspberrypi:/home/pi# service samba restart
Stopping Samba daemons: nmbd smbd.
Starting Samba daemons: nmbd smbd.
root@raspberrypi:/home/pi#
```



```
COM4 - PuTTY
GNU nano 2.2.6      File: /etc/samba/smb.conf      Modified
#
#       /dev/scd0    /cdrom  iso9660 defaults,noauto,ro,user  0 0
#
# The CD-ROM gets unmounted automatically after the connection to the
#
# If you don't want to use auto-mounting/unmounting make sure the CD
#       is mounted on /cdrom
#
; preexec = /bin/mount /cdrom
; postexec = /bin/umount /cdrom

[Media]
comment = usb storage
path = /media
browseable = Yes
read only = No
guest ok = Yes

File Name to Write: /etc/samba/smb.conf
^G Get Help      M-D DOS Format      M-A Append      M-B Backup File
^C Cancel        M-M Mac Format      M-P Prepend
```

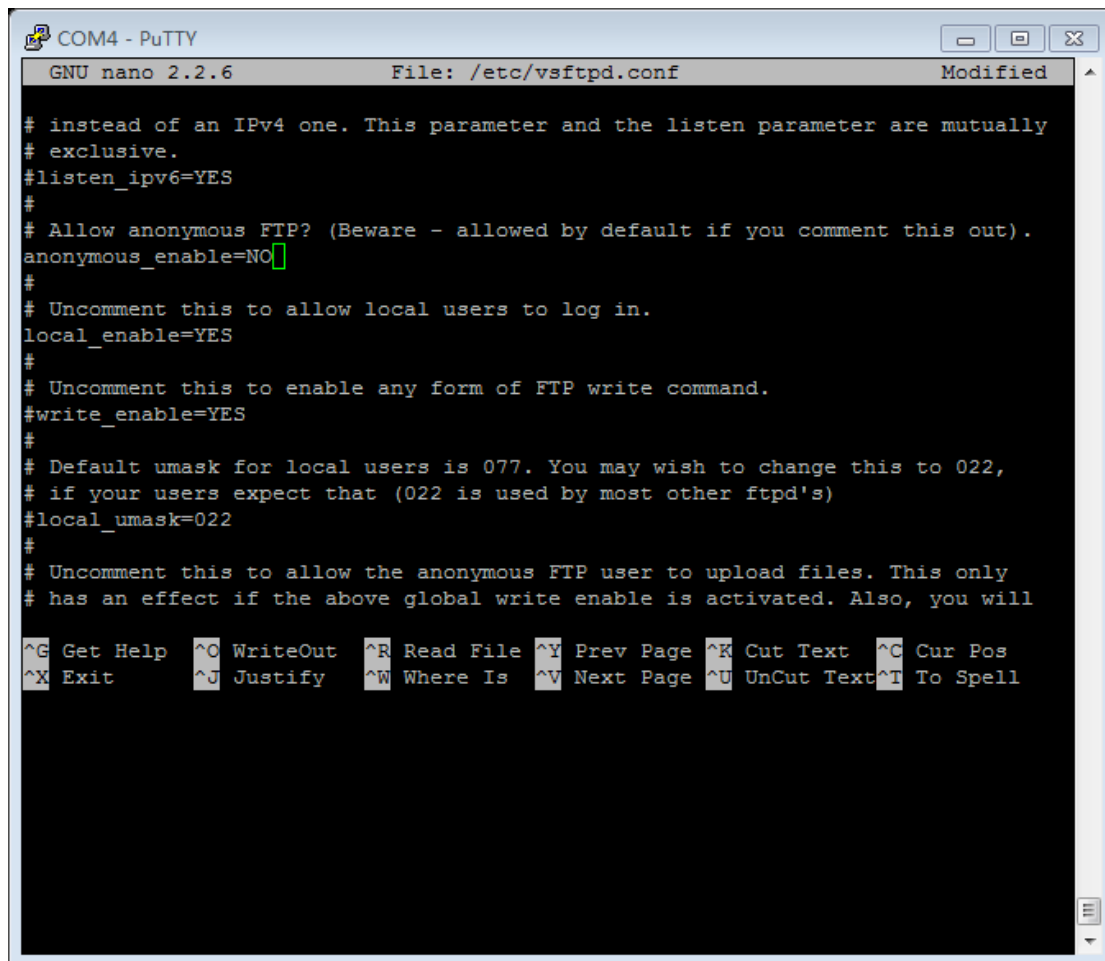
测试 samba

```
Domain=[WORKGROUP] OS=[Unix] Server=[Samba 3.6.6]
smb: \> ls
.                               D            0   Wed Mar 25 18:51:54 2015
..                              D            0   Mon Feb 16 22:10:55 2015
Untitled-sda1                  D            0   Thu Jan  1 08:00:00 1970

59605 blocks of size 131072. 35543 blocks available
smb: \> cd Untitled-sda1
smb: \Untitled-sda1> ls
.                               D            0   Thu Jan  1 08:00:00 1970
..                              D            0   Wed Mar 25 18:51:54 2015
WarcraftIII_1.20E              D            0   Fri Dec  5 05:26:48 2014
Hearthstone                    D            0   Thu Mar 12 06:29:04 2015
Battle.net                     D            0   Sat Feb 28 07:40:48 2015
【 Big Hero 6】【 DVD-RMVB.中字】.rmvb  A 619788212  Fri Jan 30 03:36:50 201
5
ppp_2.4.5-5.1_armhf.deb        A    353808  Tue Mar 24 07:03:08 2015
xl2tpd_1.3.1+dfsg-1_armhf.deb  A    70814  Tue Mar 24 07:03:54 2015
libpcap0.8_1.3.0-1_armhf.deb   A   135146  Tue Mar 24 07:03:48 2015
zjuvpn-8.2.tar.gz              A     2271  Tue Mar 24 07:03:40 2015
usr                             D            0   Sun Nov 25 18:51:42 2012

59605 blocks of size 131072. 35543 blocks available
smb: \Untitled-sda1>
```

设置 sftp



```
COM4 - PuTTY
GNU nano 2.2.6      File: /etc/vsftpd.conf      Modified
# instead of an IPv4 one. This parameter and the listen parameter are mutually
# exclusive.
#listen_ipv6=YES
#
# Allow anonymous FTP? (Beware - allowed by default if you comment this out).
anonymous_enable=NO
#
# Uncomment this to allow local users to log in.
local_enable=YES
#
# Uncomment this to enable any form of FTP write command.
write_enable=YES
#
# Default umask for local users is 077. You may wish to change this to 022,
# if your users expect that (022 is used by most other ftpd's)
local_umask=022
#
# Uncomment this to allow the anonymous FTP user to upload files. This only
# has an effect if the above global write enable is activated. Also, you will
#
^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page ^U UnCut Text ^T To Spell
```

测试 sftp

```
C:\Windows\system32\cmd.exe - ftp
ftp> cd /media
250 Directory successfully changed.
ftp> ls
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
Untitled-sda1
226 Directory send OK.
ftp: 收到 15 字节, 用时 0.00秒 15.00千字节/秒。
ftp> cd Untitled-sda1
250 Directory successfully changed.
ftp> ls
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
Battle.net
Hearthstone
WarcraftIII_1.20E
libpcap0.8_1.3.0-1_armhf.deb
ppp_2.4.5-5.1_armhf.deb
usr
x12tpd_1.3.1+dfsg-1_armhf.deb
zjuvpn-8.2.tar.gz
鉅恨ig Hero 6鉅咸C恂UD-RMUB.涓嚟砧鉅?rmvb
226 Directory send OK.
ftp: 收到 198 字节, 用时 0.00秒 49.50千字节/秒。
ftp>
```

设置 minidlna

```
COM4 - PuTTY
GNU nano 2.2.6 File: /etc/minidlna.conf
#
# This option can be specified more than once if you want multiple directories
# scanned.
#
# If you want to restrict a media_dir to a specific content type, you can
# prepend the directory name with a letter representing the type (A, P or V),
# followed by a comma, as so:
# * "A" for audio (eg. media_dir=A,/var/lib/minidlna/music)
# * "P" for pictures (eg. media_dir=P,/var/lib/minidlna/pictures)
# * "V" for video (eg. media_dir=V,/var/lib/minidlna/videos)
#
# WARNING: After changing this option, you need to rebuild the database. Either
# run minidlna with the '-R' option, or delete the 'files.db' file
# from the db_dir directory (see below).
# On Debian, you can run, as root, 'service minidlna force-reload' ins$
media_dir=/media/Untitled-sda1

# Path to the directory that should hold the database and album art cache.
#db_dir=/var/lib/minidlna
[ Read 94 lines ]
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell
```

测试 minidlna

