

浙江大学 实验报告

课程名称： 嵌入式系统

指导老师： 翁凯

姓名： 张腾

实验名称： 花生壳客户端

实验类型： 嵌入式开发

学号： 3120101111

一、实验目的和要求

在 Acadia 或 RPi 或 WRTnode 上实现一个花生壳（oray.com）的客户端，可以实现 3322.org 等免费域名的指向

二、实验内容和原理

1. 了解花生壳客户端的概念及其基本实现方法；
2. 掌握 Acadia 或 RPi 或 WRTnode 上建立花生壳客户端的方式；

三、主要仪器设备

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；

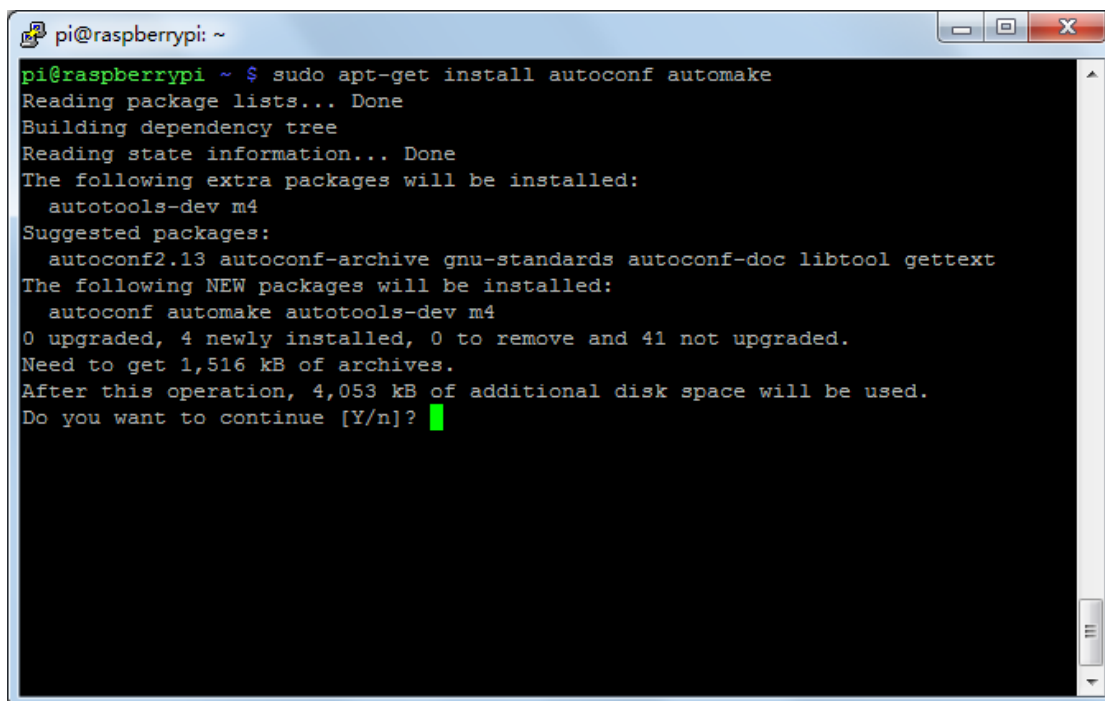
PC 上的串口终端软件，如 minicom、picocom、putty 等；

PC 上的 SSH 软件，如 putty 等。

实验名称: 花生壳客户端 姓名: 张腾 学号: 3120101111

四、操作方法和实验步骤

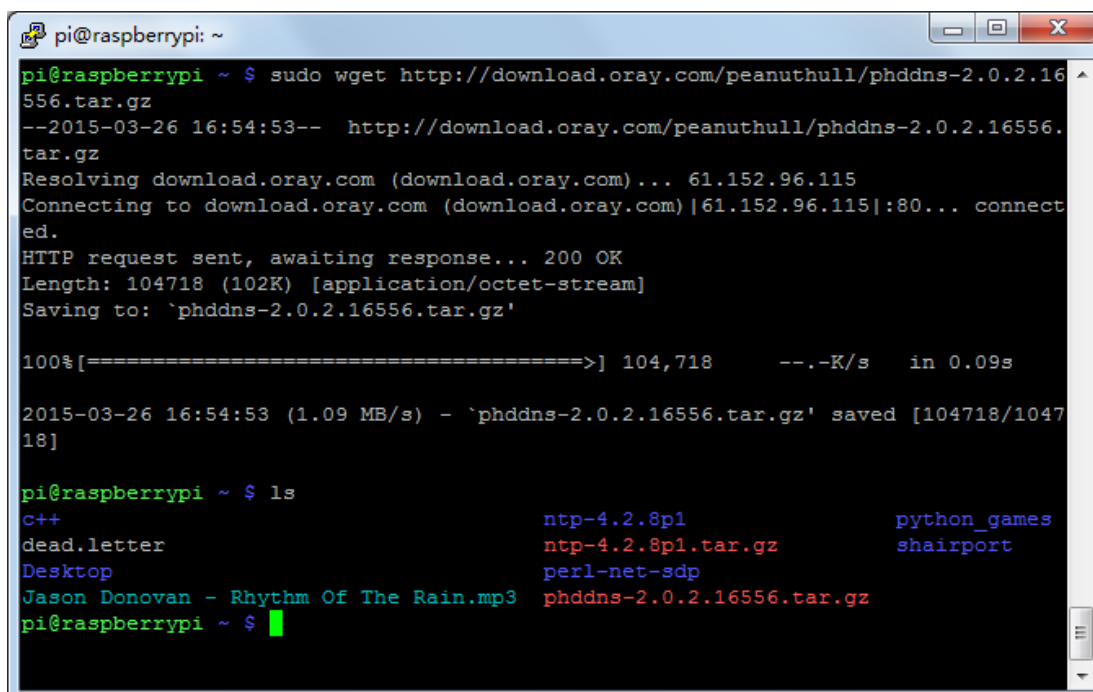
1. 安装依赖包;



```
pi@raspberrypi: ~
pi@raspberrypi ~ $ sudo apt-get install autoconf automake
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  autotools-dev m4
Suggested packages:
  autoconf2.13 autoconf-archive gnu-standards autoconf-doc libtool gettext
The following NEW packages will be installed:
  autoconf automake autotools-dev m4
0 upgraded, 4 newly installed, 0 to remove and 41 not upgraded.
Need to get 1,516 kB of archives.
After this operation, 4,053 kB of additional disk space will be used.
Do you want to continue [Y/n]? Y
```

Figure 1

2. 下载安装 phddns 并进行配置;



```
pi@raspberrypi: ~
pi@raspberrypi ~ $ sudo wget http://download.oray.com/peanuthull/phddns-2.0.2.16556.tar.gz
--2015-03-26 16:54:53-- http://download.oray.com/peanuthull/phddns-2.0.2.16556.tar.gz
Resolving download.oray.com (download.oray.com)... 61.152.96.115
Connecting to download.oray.com (download.oray.com)|61.152.96.115|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 104718 (102K) [application/octet-stream]
Saving to: `phddns-2.0.2.16556.tar.gz'

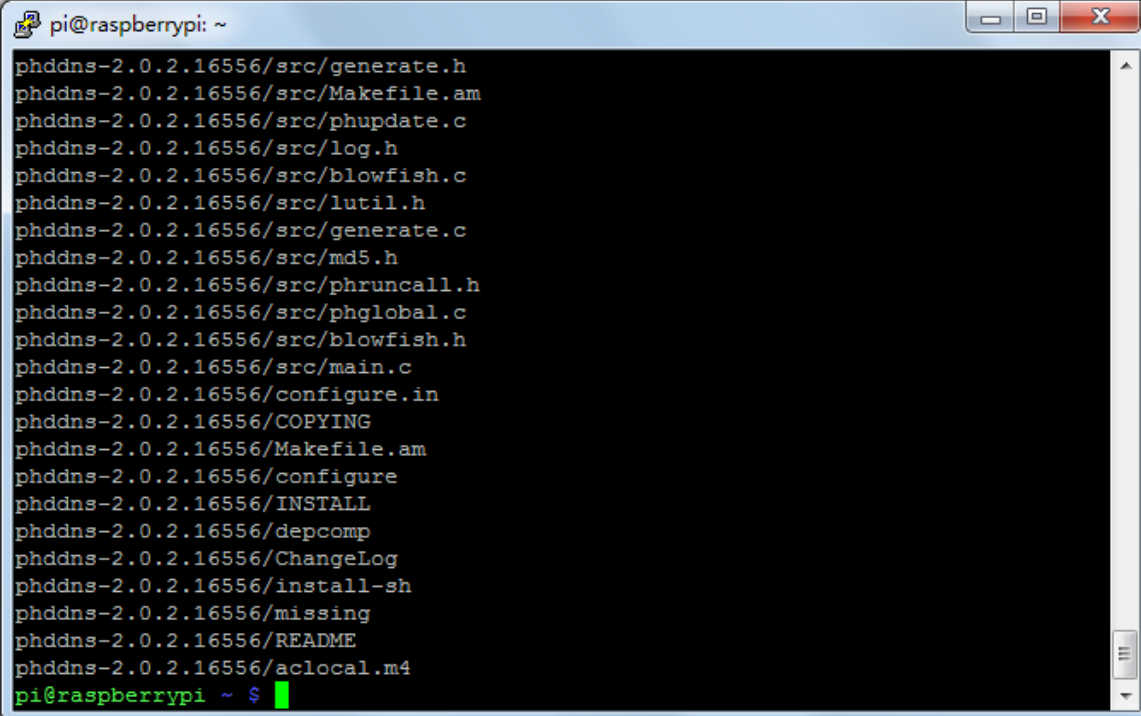
100%[=====>] 104,718 --.-K/s in 0.09s

2015-03-26 16:54:53 (1.09 MB/s) - `phddns-2.0.2.16556.tar.gz' saved [104718/104718]

pi@raspberrypi ~ $ ls
c++                                ntp-4.2.8pi                python_games
dead.letter                       ntp-4.2.8pi.tar.gz         shairport
Desktop                           perl-net-sdp
Jason Donovan - Rhythm Of The Rain.mp3  phddns-2.0.2.16556.tar.gz
pi@raspberrypi ~ $
```

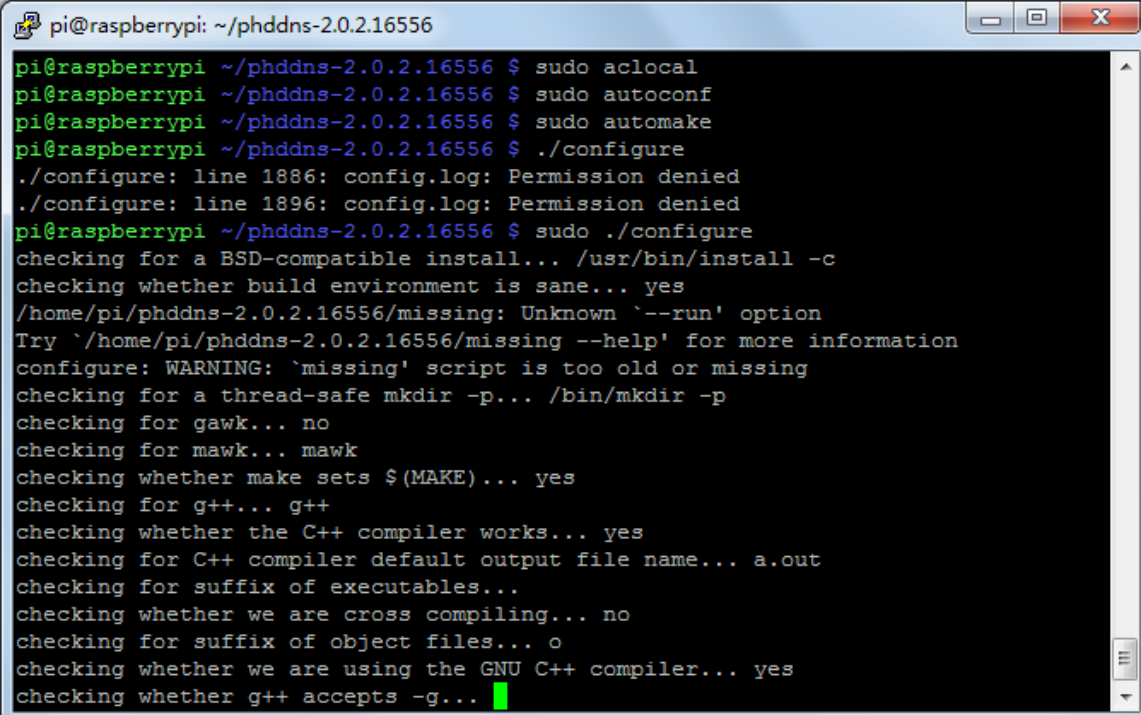
Figure 2

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```
pi@raspberrypi: ~  
phddns-2.0.2.16556/src/generate.h  
phddns-2.0.2.16556/src/Makefile.am  
phddns-2.0.2.16556/src/phupdate.c  
phddns-2.0.2.16556/src/log.h  
phddns-2.0.2.16556/src/blowfish.c  
phddns-2.0.2.16556/src/lutil.h  
phddns-2.0.2.16556/src/generate.c  
phddns-2.0.2.16556/src/md5.h  
phddns-2.0.2.16556/src/phruncall.h  
phddns-2.0.2.16556/src/phglobal.c  
phddns-2.0.2.16556/src/blowfish.h  
phddns-2.0.2.16556/src/main.c  
phddns-2.0.2.16556/configure.in  
phddns-2.0.2.16556/COPYING  
phddns-2.0.2.16556/Makefile.am  
phddns-2.0.2.16556/configure  
phddns-2.0.2.16556/INSTALL  
phddns-2.0.2.16556/depcomp  
phddns-2.0.2.16556/ChangeLog  
phddns-2.0.2.16556/install-sh  
phddns-2.0.2.16556/missing  
phddns-2.0.2.16556/README  
phddns-2.0.2.16556/aclocal.m4  
pi@raspberrypi ~ $
```

Figure 3



```
pi@raspberrypi: ~/phddns-2.0.2.16556  
pi@raspberrypi ~/phddns-2.0.2.16556 $ sudo aclocal  
pi@raspberrypi ~/phddns-2.0.2.16556 $ sudo autoconf  
pi@raspberrypi ~/phddns-2.0.2.16556 $ sudo automake  
pi@raspberrypi ~/phddns-2.0.2.16556 $ ./configure  
./configure: line 1886: config.log: Permission denied  
./configure: line 1896: config.log: Permission denied  
pi@raspberrypi ~/phddns-2.0.2.16556 $ sudo ./configure  
checking for a BSD-compatible install... /usr/bin/install -c  
checking whether build environment is sane... yes  
/home/pi/phddns-2.0.2.16556/missing: Unknown '--run' option  
Try `./missing --help' for more information  
configure: WARNING: 'missing' script is too old or missing  
checking for a thread-safe mkdir -p... /bin/mkdir -p  
checking for gawk... no  
checking for mawk... mawk  
checking whether make sets $(MAKE)... yes  
checking for g++... g++  
checking whether the C++ compiler works... yes  
checking for C++ compiler default output file name... a.out  
checking for suffix of executables...  
checking whether we are cross compiling... no  
checking for suffix of object files... o  
checking whether we are using the GNU C++ compiler... yes  
checking whether g++ accepts -g... 
```

Figure 4

实验名称：花生壳客户端 姓名：张腾 学号：3120101111

```

pi@raspberrypi: ~/phddns-2.0.2.16556
H=1 -DHAVE_SYS_SOCKET_H=1 -DSELECT_TYPE_ARG1=int -DSELECT_TYPE_ARG234=(fd_set\
\*) -DSELECT_TYPE_ARG5=(struct\ timeval\ \*) -DRETSIGTYPE=void -DHAVE_STRFTIM
E=1 -DHAVE_VPRINTF=1 -DHAVE_GETHOSTBYNAME=1 -DHAVE_INET_NTOA=1 -DHAVE_ISASCII=1
-DHAVE_MEMSET=1 -DHAVE_SELECT=1 -DHAVE_SOCKET=1 -DHAVE_STRCHR=1 -DHAVE_STRSTR=1
-I. -I. -g -O2 -MT blowfish.o -MD -MP -MF .deps/blowfish.Tpo -c -o blowfish.o
blowfish.c
mv -f .deps/blowfish.Tpo .deps/blowfish.Po
gcc -DPACKAGE_NAME=\"FULL-PACKAGE-NAME\" -DPACKAGE_TARNAME=\"full-package-name\"
-DPACKAGE_VERSION=\"VERSION\" -DPACKAGE_STRING=\"FULL-PACKAGE-NAME\ VERSION\" -
DPACKAGE_BUGREPORT=\"BUG-REPORT-ADDRESS\" -DPACKAGE_URL=\"\" -DPACKAGE=\"phddns\"
-DVERSION=\"2.0.2.16556\" -DSTDC_HEADERS=1 -DHAVE_SYS_TYPES_H=1 -DHAVE_SYS_STA
T_H=1 -DHAVE_STDLIB_H=1 -DHAVE_STRING_H=1 -DHAVE_MEMORY_H=1 -DHAVE_STRINGS_H=1 -
DHAVE_INTTYPES_H=1 -DHAVE_STDINT_H=1 -DHAVE_UNISTD_H=1 -DHAVE_ARPA_INET_H=1 -DHA
VE_FCNTL_H=1 -DHAVE_MEMORY_H=1 -DHAVE_NETDB_H=1 -DHAVE_NETINET_IN_H=1 -DHAVE_STD
DEF_H=1 -DHAVE_STDLIB_H=1 -DHAVE_STRING_H=1 -DHAVE_SYS_IOCTL_H=1 -DHAVE_SYS SOCK
ET_H=1 -DHAVE_SYS TIME_H=1 -DHAVE_SYS TIMEB_H=1 -DHAVE_TERMIOS_H=1 -DHAVE UNISTD
_H=1 -DHAVE_BOOL_H=1 -DHAVE_STDBOOL_H=1 -DWITH SYS TIME=1 -DHAVE SYS SELECT
_H=1 -DHAVE_SYS_SOCKET_H=1 -DSELECT_TYPE_ARG1=int -DSELECT_TYPE_ARG234=(fd_set\
\*) -DSELECT_TYPE_ARG5=(struct\ timeval\ \*) -DRETSIGTYPE=void -DHAVE_STRFTIM
E=1 -DHAVE_VPRINTF=1 -DHAVE_GETHOSTBYNAME=1 -DHAVE_INET_NTOA=1 -DHAVE_ISASCII=1
-DHAVE_MEMSET=1 -DHAVE_SELECT=1 -DHAVE_SOCKET=1 -DHAVE_STRCHR=1 -DHAVE_STRSTR=1
-I. -I. -g -O2 -MT generate.o -MD -MP -MF .deps/generate.Tpo -c -o generate.o
generate.c

```

Figure 5

在花生壳网站上注册，并申请免费域名：

英文域名 中文域名 姓名域名 **壳域名** 精品域名 ★我的收藏

搜索: jason-zhang 查询

免费壳域名: .wicp.net

一口价壳域名: .vicp.net, .oicp.net, .xicp.net, .vicp.cc, .eicp.net, .uicp.cn, .51vip.biz, .xicp.cn, .uicp.net, .vicp.hk, .5166.info, .coyo.eu, .imblog.in, .imzone.in, .imshop.in, .imbbs.in, .imwork.net

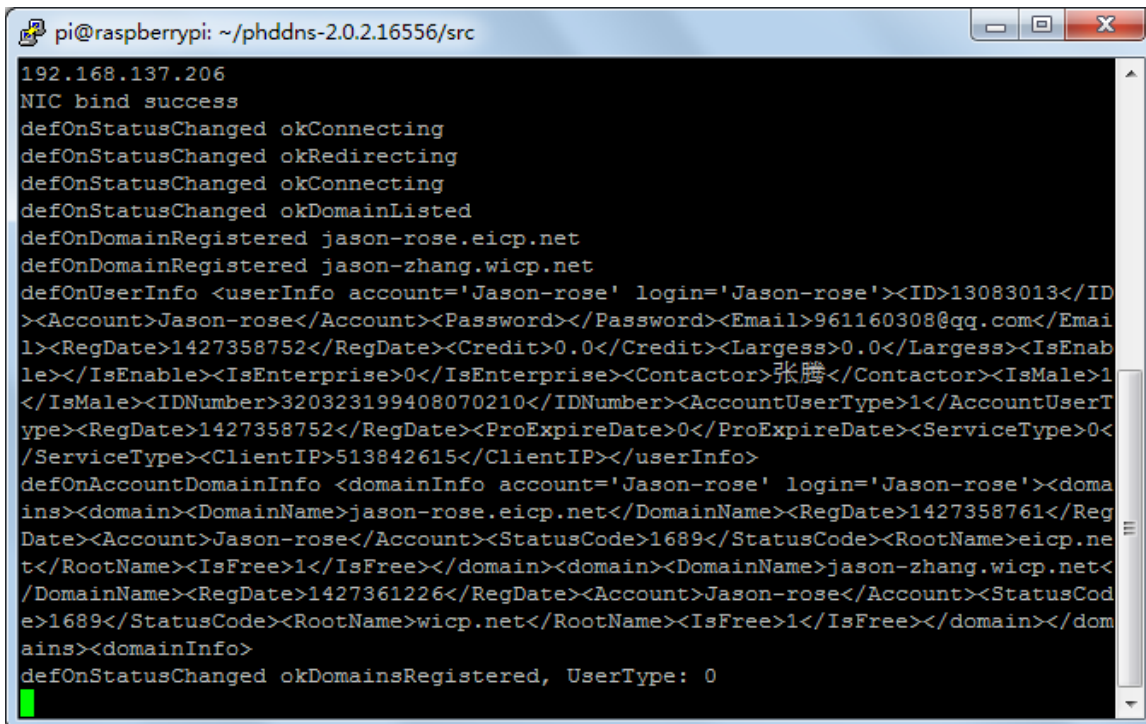
年付壳域名: .iego.cn, .vicp.co, .iego.net, .1366.co, .1866.co

清除选择

Figure 6

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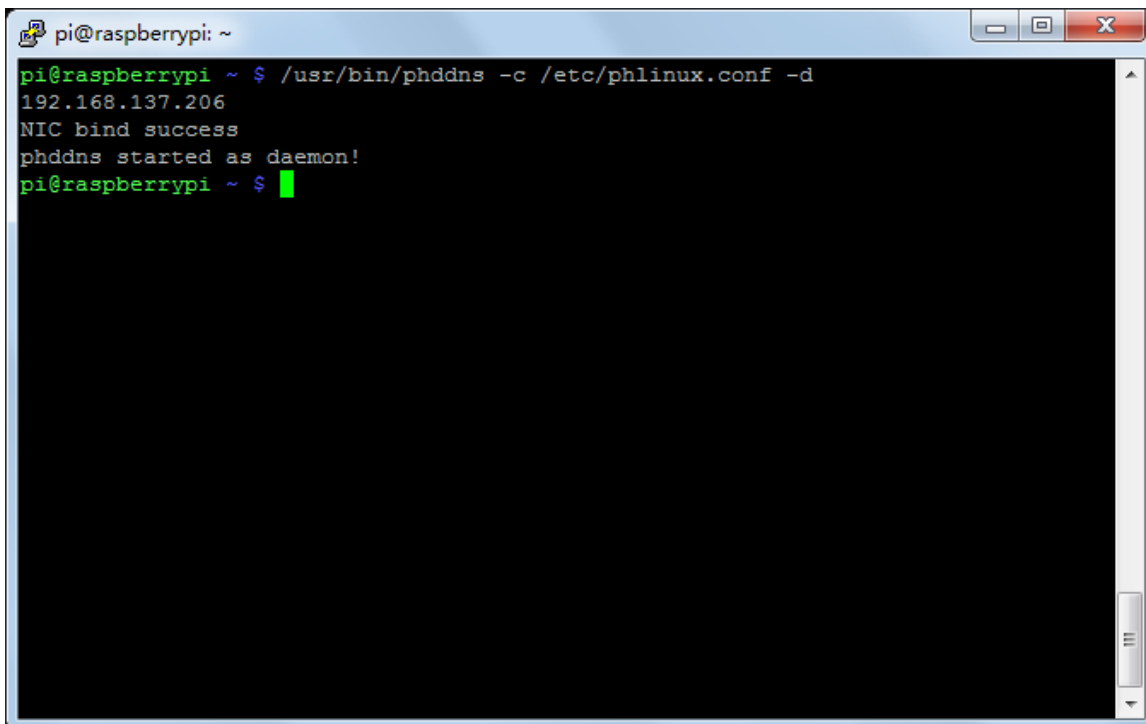
配置客户端, 输入注册的用户名以及密码



```
pi@raspberrypi: ~/phddns-2.0.2.16556/src
192.168.137.206
NIC bind success
defOnStatusChanged okConnecting
defOnStatusChanged okRedirecting
defOnStatusChanged okConnecting
defOnStatusChanged okDomainListed
defOnDomainRegistered jason-rose.eicp.net
defOnDomainRegistered jason-zhang.wicp.net
defOnUserInfo <userInfo account='Jason-rose' login='Jason-rose'><ID>13083013</ID>
<Account>Jason-rose</Account><Password></Password><Email>961160308@qq.com</Email>
<RegDate>1427358752</RegDate><Credit>0.0</Credit><Largess>0.0</Largess><IsEnable>
</IsEnable><IsEnterprise>0</IsEnterprise><Contactor>张腾</Contactor><IsMale>1
</IsMale><IDNumber>320323199408070210</IDNumber><AccountUserType>1</AccountUserT
ype><RegDate>1427358752</RegDate><ProExpireDate>0</ProExpireDate><ServiceType>0<
/ServiceType><ClientIP>513842615</ClientIP></userInfo>
defOnAccountDomainInfo <domainInfo account='Jason-rose' login='Jason-rose'><doma
ins><domain><DomainName>jason-rose.eicp.net</DomainName><RegDate>1427358761</Reg
Date><Account>Jason-rose</Account><StatusCode>1689</StatusCode><RootName>eicp.ne
t</RootName><IsFree>1</IsFree></domain><domain><DomainName>jason-zhang.wicp.net<
/DomainName><RegDate>1427361226</RegDate><Account>Jason-rose</Account><StatusCod
e>1689</StatusCode><RootName>wicp.net</RootName><IsFree>1</IsFree></domain></dom
ains><domainInfo>
defOnStatusChanged okDomainsRegistered, UserType: 0
```

Figure 7

启动花生壳客户端, 后台运行



```
pi@raspberrypi: ~
pi@raspberrypi ~ $ /usr/bin/phddns -c /etc/phlinux.conf -d
192.168.137.206
NIC bind success
phddns started as daemon!
pi@raspberrypi ~ $
```

Figure 8

实验名称：花生壳客户端 姓名：张腾 学号：3120101111

设置开机自动运行（daemon）

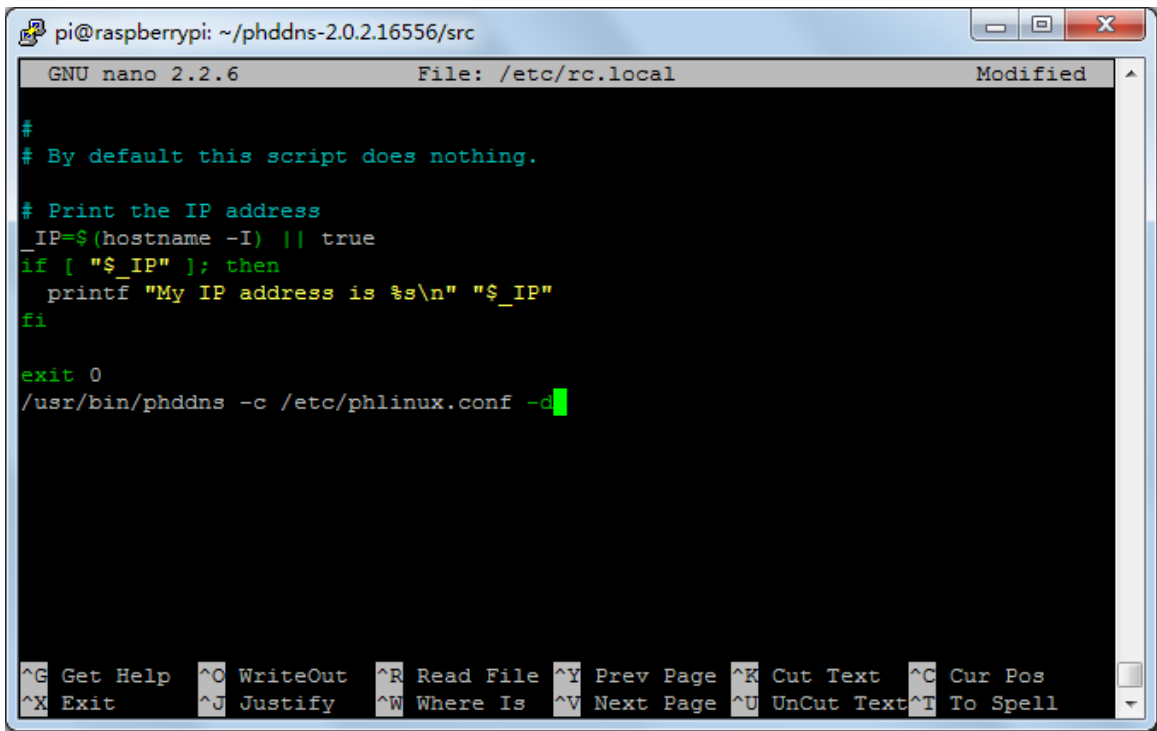


Figure 9

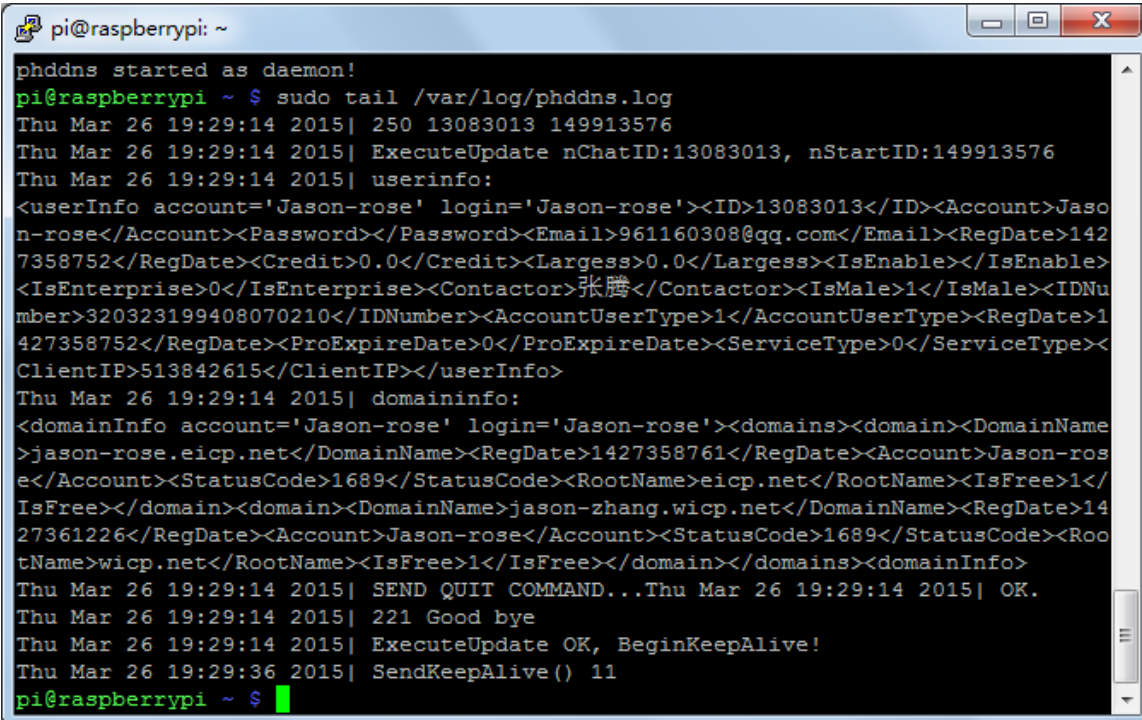
3. 检查运行状况。
在花生壳网页上进行管理



Figure 10

实验名称: 花生壳客户端 姓名: 张腾 学号: 3120101111

查看运行日志:



```
pi@raspberrypi: ~
phddns started as daemon!
pi@raspberrypi ~ $ sudo tail /var/log/phddns.log
Thu Mar 26 19:29:14 2015| 250 13083013 149913576
Thu Mar 26 19:29:14 2015| ExecuteUpdate nChatID:13083013, nStartID:149913576
Thu Mar 26 19:29:14 2015| userinfo:
<userInfo account='Jason-rose' login='Jason-rose'><ID>13083013</ID><Account>Jason-rose</Account><Password></Password><Email>961160308@qq.com</Email><RegDate>1427358752</RegDate><Credit>0.0</Credit><Largess>0.0</Largess><IsEnable></IsEnable><IsEnterprise>0</IsEnterprise><Contactor>张腾</Contactor><IsMale>1</IsMale><IDNumber>320323199408070210</IDNumber><AccountUserType>1</AccountUserType><RegDate>1427358752</RegDate><ProExpireDate>0</ProExpireDate><ServiceType>0</ServiceType><ClientIP>513842615</ClientIP></userInfo>
Thu Mar 26 19:29:14 2015| domaininfo:
<domainInfo account='Jason-rose' login='Jason-rose'><domains><domain><DomainName>jason-rose.eicp.net</DomainName><RegDate>1427358761</RegDate><Account>Jason-rose</Account><StatusCode>1689</StatusCode><RootName>eicp.net</RootName><IsFree>1</IsFree></domain><domain><DomainName>jason-zhang.wicp.net</DomainName><RegDate>1427361226</RegDate><Account>Jason-rose</Account><StatusCode>1689</StatusCode><RootName>wicp.net</RootName><IsFree>1</IsFree></domain></domains></domainInfo>
Thu Mar 26 19:29:14 2015| SEND QUIT COMMAND...Thu Mar 26 19:29:14 2015| OK.
Thu Mar 26 19:29:14 2015| 221 Good bye
Thu Mar 26 19:29:14 2015| ExecuteUpdate OK, BeginKeepAlive!
Thu Mar 26 19:29:36 2015| SendKeepAlive() 11
pi@raspberrypi ~ $
```

Figure 11

五、实验数据记录和处理

暂无实验数据

六、实验结果与分析

可以看到 IP 地址指向到 183.157.160.30 (这个 IP 是浙江大学的一个公共出口 IP), 因为使用的是学校的 VPN, 所以没有独立 IP, 因此无法通过这个域名连接到自己的板子。如果使用的是闪讯的话应该可以得到一个独立的公网 IP, 才能够通过域名解析访问到树莓派。

七、讨论、心得

本次试验完成了花生壳客户端的配置, 了解了域名动态解析的含义, 能够在树莓派上登陆花生壳客户端, 虽然由于 VPN 的原因没有连接到自己的板子, 但还是获得了很多的收获。