Volume

1

PBX IN A FLASH 1.7.5.5

PBX in a Flash 1.7.5.5 User Guide

PBX in a Flash User Guide

support@piafdevcorp.com

Table of Contents

Installing PBX in a Flash

"Even in the darkest corners of despair there are glimmers of light we call truth.
But what if it is a light to which the rest of the world is blind?"
TVOC1963

Welcome! This document will describe the configuration and installation of PBX in a Flash. We have tested this in Lab, Production, and Virtualization environments with great success. Does this mean it is absolutely safe? No warranties express or implied! We use PBX in a Flash <PIAF> day to day in mission critical applications so, yes, we eat our own dog food. Note this manual is a work in progress. If you find errors, let us know.

Overview

PBX in a Flash is based on Centos 5.5, Asterisk 1.4/1.6, FreePBX 2.6, LAMP, etc, all rolled into a very stable ISO. When the ISO is burned to a CDrom and then booted on your machine of choice it will install a rock-solid, world-class version of Asterisk. The ISO does not need frequent updating as we have chosen to compile the software on the fly as needed. There are scripts available to manage your updates manually.

One thing you won't find is bloat! We have heard that bloat is simply extra space used by programs but we beg to differ. Many installations like to install the kitchen sink which does tend to slow the machine down significantly and use up extra hard drive space. For example, if you wish to install a CRM product (and we have written a script for it), you simply download the script and run it. No muss no fuss! We feel our minimalist approach with the ability to add as much or as little as you want is the way to go. But, if you want the kitchen sink, there's the Incredible PBX one-click installer which gets you Asterisk.everything.

This PBX in a Flash build was developed on Intel and AMD-based computers with a minimum of 2 gigabytes of RAM and SATA hard drives. Both real and virtualized machines were used in the development and testing of PIAF.

Preparing for Installation

Although the installation of PBX in a Flash may appear technically challenging, this manual will take you through the entire installation and some of the configuration process in an easily followed step-by-step manner. Techno-speak and jargon have been kept to a minimum but it is assumed that the user knows the basics of computer operation. Please contact us on our support forums if you are having problems. Appendix A has full instructions on how to contact us.

Please read this guide in its entirety before starting the installation. Otherwise you may encounter difficulties. In several places during the installation, you may be asked for information that you may need to contact your Network Administrator about. These places are clearly marked in this guide.

System Requirements

The minimum recommended system requirements to install and run PBX in a Flash are given in the table below. Please ensure that the computer system on which PBX in a Flash is being installed meets or exceeds these requirements. PBX in a Flash will run in a lot less hardware! You may notice performance issues and other "odd" problems with lesser hardware. Also, if you wish to use the 64-bit ISO, you must have a processor that supports 64 bits!

DESCRIPTION	PBX in a Flash 1.x
Operating System	Centos 5.x This is installed with our ISO
Processor	Pentium 4 minimum or equivalent AMD system **
Memory	Minimum 1.0 gb – 2.0 gb recommended *
Hard Drive Space	Minimum 80gb 7200 rpm – 10,000 rpm recommend
Motherboard	Server class for production For example Supermicro
CD-ROM Drive	Any speed
FXO/FXS Card	Digium or equivalent if interfacing POTS lines

- ** There may be driver support issues with some very old and very new systems. This is a CentOS problem, not PIAF. Also PIAF will run on other processors but you may take a performance hit.

- * This is a recommended minimum. PIAF will run with a lot less ram and processor power but be prepared for performance issues. The general rule of thumb is the more extensions you have the more ram and processor power you need.

Other Requirements

There are a number of other minimum requirements to get up and running with a usable system. This is a general list for most installs.

- Working high speed internet connection
- Soft or Hard phone
- Working local area network (LAN)
- Working DNS server supporting your LAN <CRITICAL>

Installation

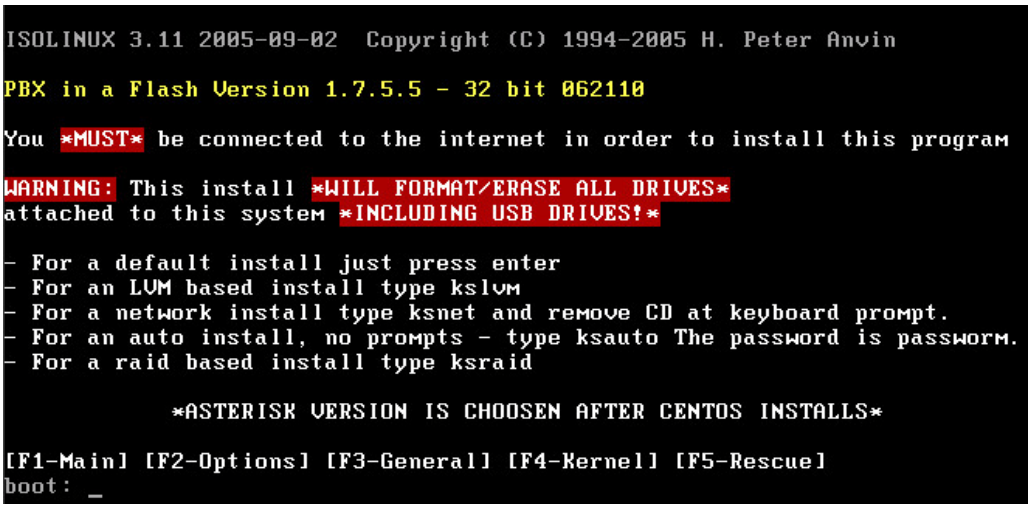
Initially you will have to decide if you want to install PBX in a Flash to a real computer or a virtual one. Either way will work but this document will concentrate on installing PBX in a Flash onto a real as opposed to virtual computer. Once you have downloaded the ISO image from www.pbxinaflash.net, burn it to a CD. Put the CD into the computer you want to install PBX in a Flash to and reboot the system.

WARNING THE PROCESS OF INSTALLING PBX IN A FLASH WILL DELETE ALL PARTITIONS ON ALL DRIVES ON THE TARGET COMPUTER. BE WARNED: THIS ALSO INCLUDES ANY ATTACHED USB DRIVES OR USB KEYS! PAY ATTENTION TO THIS WARNING!

1. First you need to download the latest ISO file of PBX in a Flash from www.pbxinaflash.net. Once the download has completed please burn the image to a CD-rom. If you don't know how to do this, here is a good starting place: http://docs.pcbsd.org/guide/chap2.2.html

2. Once you have your CD burned, place it into the cd/dvd drive and reboot the computer. Some external USB CDROM drives will not boot from a Centos 5.5 disk. This is a CENTOS problem, and NOT PBX in a Flash. Please visit our forums for solutions. HINT: HP and Sony devices generally work.

3. Upon booting you will be presented with the following screen



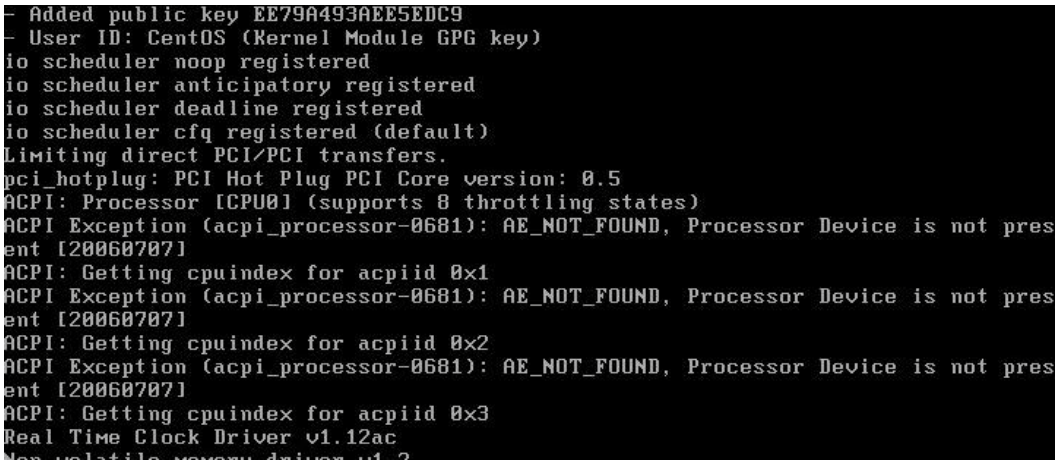
For most installs simply tap the ENTER key to continue. If you don't see this screen when the system boots you may have to change the boot device in your bios. This is custom to your computer so you will have to refer to the owner's manual for further instructions.

Note: Unlike prior PIAF editions, the version of Asterisk is no longer chosen on this screen. Choose the type of OS install first. Then you choose the Asterisk version AFTER the OS is installed. The available install options and meanings are in the table below. The rest of the manual is based on the default install.

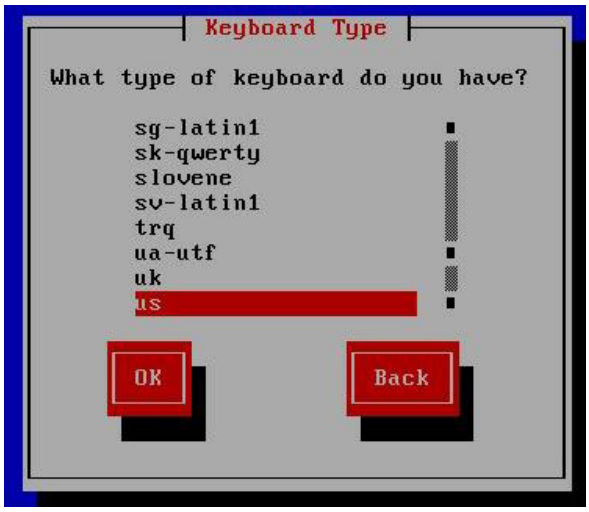
Table 1. Installation type explanation

Install Type	Explanation
Ksnet	This is the default install method and tapping Enter will cause this to load or it will load via timeout function. This installs CentOS 5.5 using an ext3 – non-lvm filesystem. This is the *recommended* setup
Kslvm	This will install CentOS running under LVM (Logical Volume Management) filesystem. This is not recommended as it complicates bare metal backup and restore operations. *not recommended*
Ksnet	This will install CentOS 5.5 from the Internet using ext3 filesystem. This is useful if you have a heavily customized version of CentOS
Ksauto	This will install CentOS 5.5 using an ext3 filesystem. There will be no user prompts and it will set the default root password to passworm.
ksraid	This sets CentOS up under a software-based RAID filesystem
ksmin	This choice allows you to just install Centos 5.5

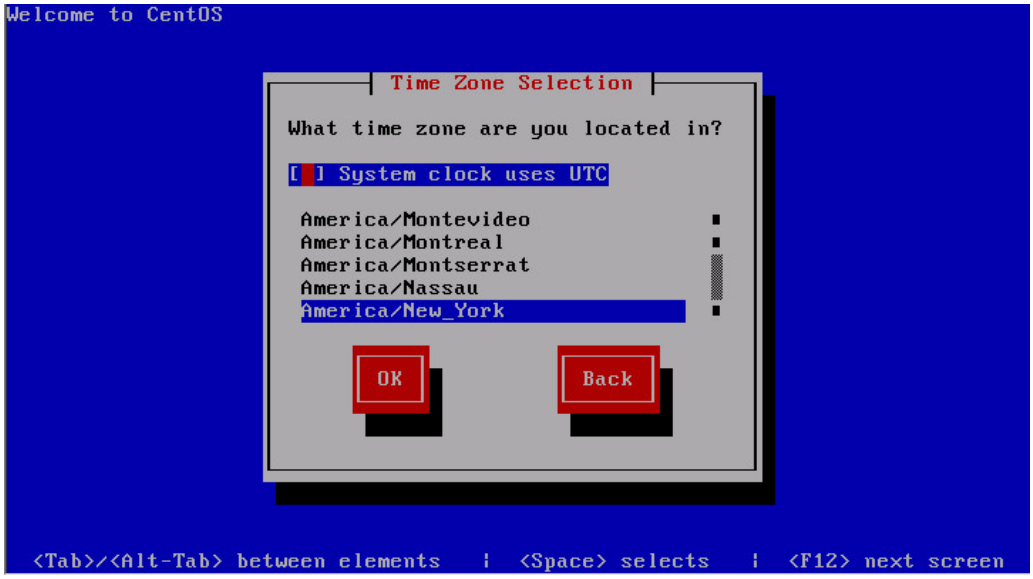
4. Now you will see Selinux process loading the bootstrap to continue with the install process similar to the screen below



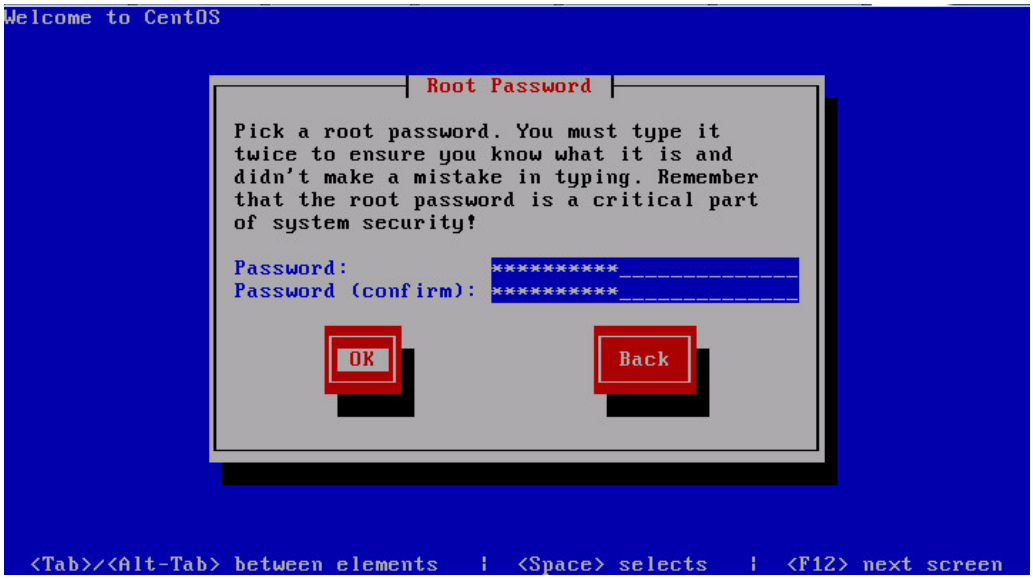
5. You will now be presented with a screen to choose your keyboard. To navigate, use Tab or the up and down arrows until the red cursor is over the keyboard type you want. Then Tab to OK and press ENTER to continue.



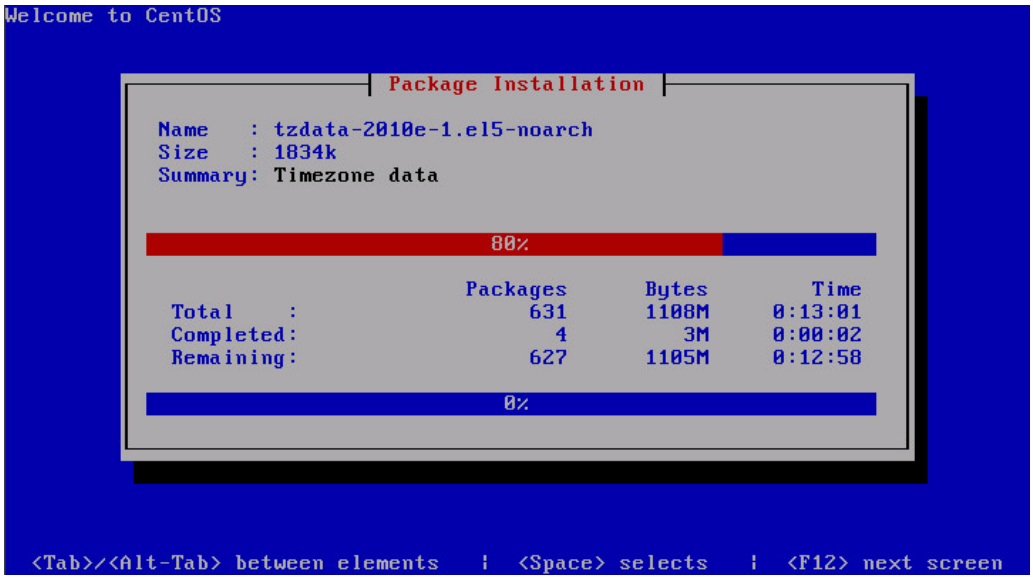
6. Next you will be asked to select your time zone. It is very important you select the correct time zone or later software installation could fail



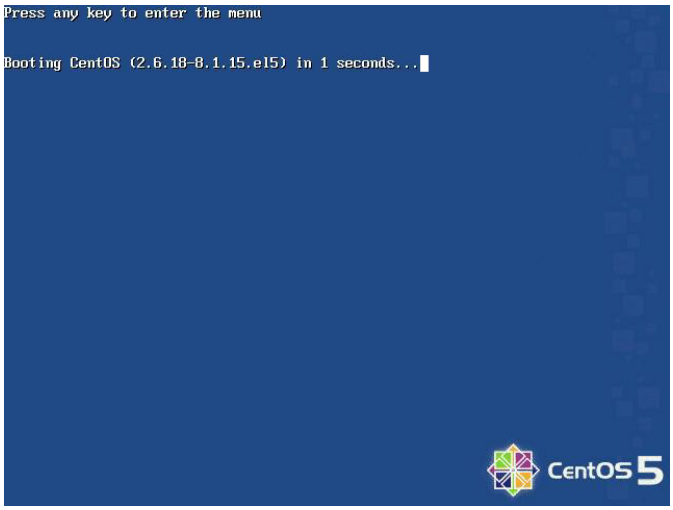
7. This screen is where you will enter the password for the root user. You must enter it twice before you can continue. Instructions on choosing a good password are included in *APPENDIX TWO*.



8. Now the install will proceed through a few steps. You should see something similar to the screens below.



9. Pay close attention to this stage. When the install process finishes the CDrom drive will eject the disk and you need to remove it. Once you have done this single left click the reboot button on the bottom right hand of the screen. **After the system reboots you should see the following screen.**



10. The boot sequence will progress until you see the following screen

With this screen you can choose which version of Asterisk you wish to install.

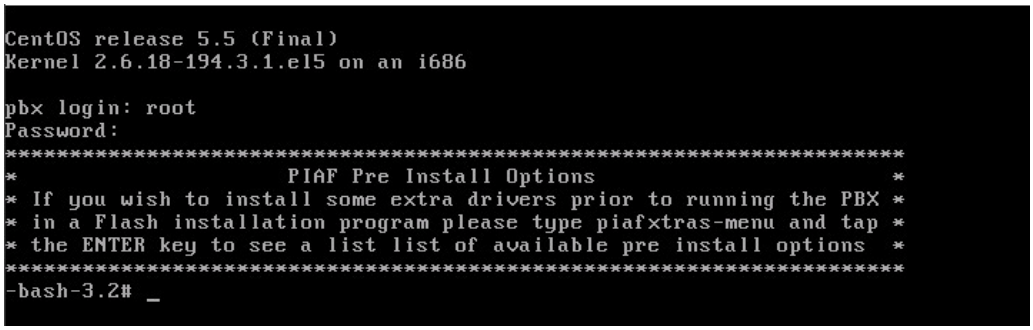
- PIAF-Gold installs Asterisk 1.4.12.1 and Zaptel 1.4.12.1. This is the last version of Asterisk that supports Zaptel which has been replaced by Dahdi. We chose this as our best solution for those looking for a rock solid PBX which has been around for a long time. While it does not have the entire set of up-to-the-minute features, it provides stable features.

- PIAF-Silver installs the current version of Asterisk 1.4 and the current version of Dahdi. Dahdi has come a long way and is now quite stable and supports almost all types of add in pots to digital cards.

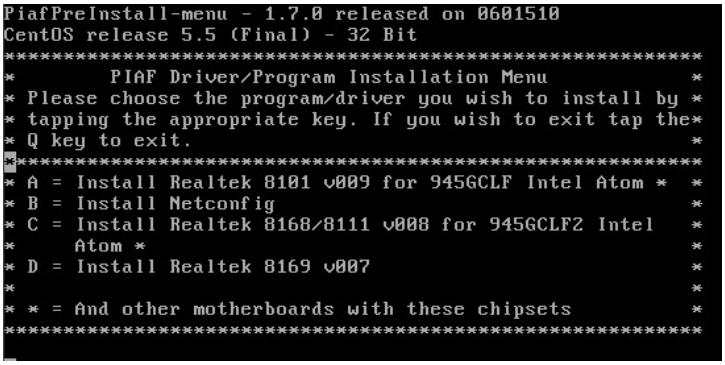
- PIAF-Bronze installs the current version of Asterisk 1.6 and the current version of Dahdi. This product is the newest and is under constant development which may lead to instability in the product. That being said most 1.6 based systems are quite stable. This version also has a number of "bleeding edge" features for those who must have it "right now!"

- Quitting to the console allows the advanced Linux user to install any required drivers that may be missing from the default Centos 5.5 distribution.

11. If you choose to exit to the console you will see the following screen.

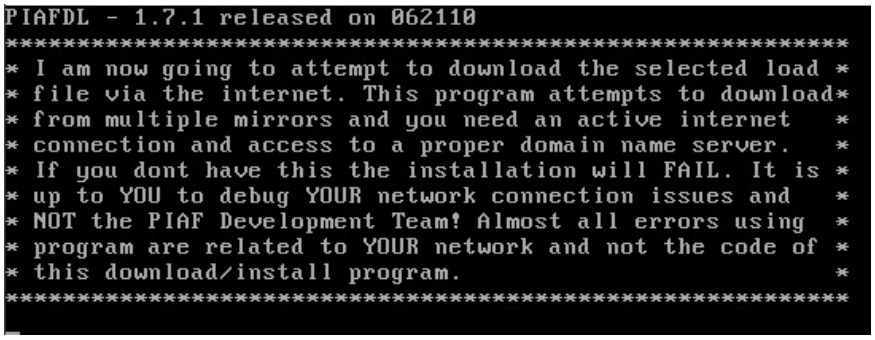


Please type *piafxtras-menu* and tap the Enter key to continue and you will see the following screen.

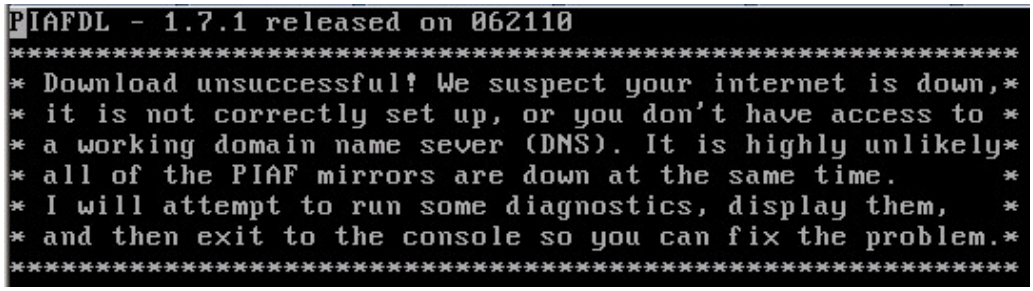


The list contains some network drivers that may not be in the basic Centos distribution. If you decide to install any of these drivers you will be prompted to reboot and then you can choose your Asterisk version.

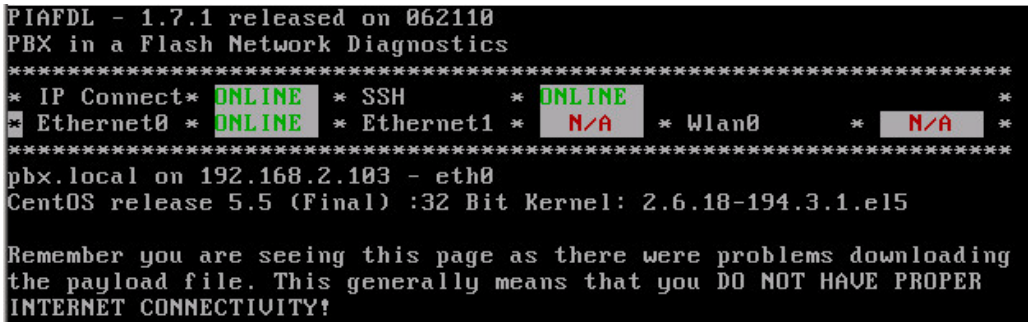
12. One new feature in this new version of PBX in a Flash is the install program now attempts to download from redundant mirrors and, if unsuccessful, displays a network diagnostic screen. Just before the program attempts to download the payload file this screen is displayed.



If an error occurs you will see the following screen next.

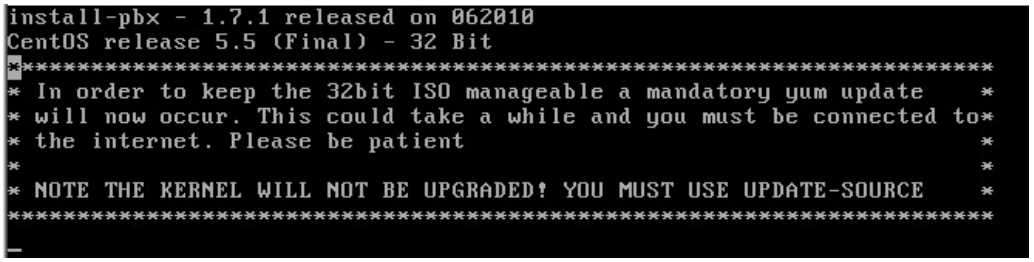


After this, the network diagnostic screen is displayed.



Please pay close attention to this screen. Once you have fixed your network errors please retry installing PBX in a Flash.

13. Continuing from point 10 the Asterisk version you chose will be installed. You will see a progression of screens similar to the ones below.



In order to keep the ISO as small as possible the installer program has to download and install some files from the CentOS repository. This may take a while so please be patient. As the install progresses you will see various screens appear that keep you informed as to the progress. Eventually the system will reboot and you will see the screen below. This was captured from a 32 bit install of PIAF-Gold:

14. Loading of PBX in a Flash will continue and you will eventually be prompted to login.

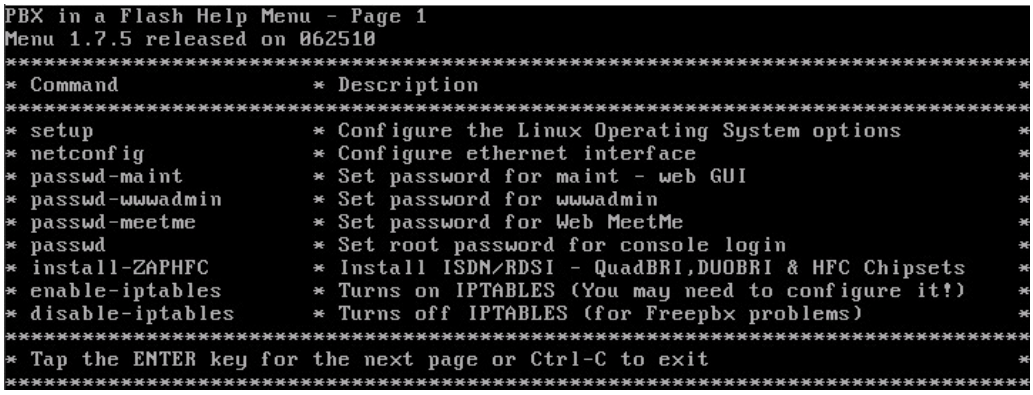
```
CentOS release 5.5 (Final)
Kernel 2.6.18-194.3.1.el5 on an i686

pbx login: _
```

You now need to log into your PBX in a Flash system. Type the username root and then enter the password you entered in Step 7.

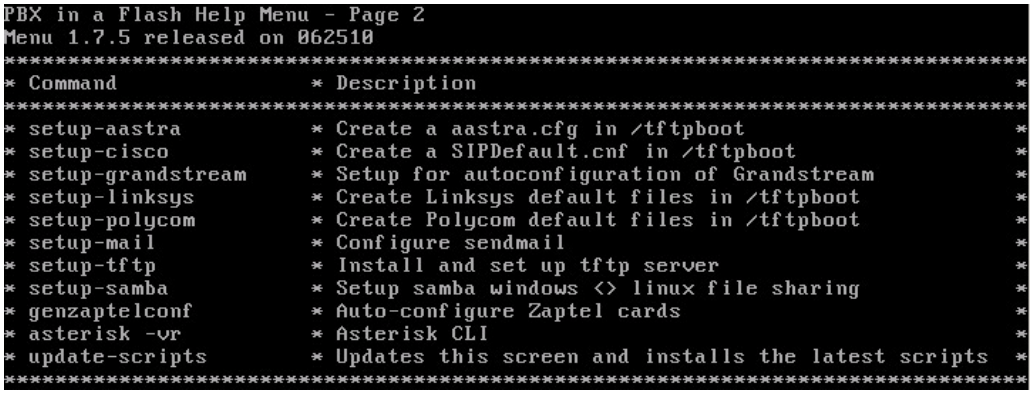
15. You should now see the following screen. Welcome to PBX in a Flash!

```
Last login: Fri Jun 25 04:57:19 on tty1

-------------------------------------------------

For access to the PBX web GUI use this URL
http://192.168.2.102

For help on PBX commands you can use from this
command shell type help-pbx.

root@pbx:~ $ _
```

16. Type *help-pbx* and then tap the ENTER key. Here you will see some scripts that will aid you in getting your PBX in a Flash setup.



```
PBX in a Flash Help Menu - Page 1
Menu 1.7.5 released on 062510
*************************************************************************************
* Command                * Description                                              *
*************************************************************************************
* setup                  * Configure the Linux Operating System options             *
* netconfig              * Configure ethernet interface                             *
* passwd-maint           * Set password for maint - web GUI                         *
* passwd-wwwadmin        * Set password for wwwadmin                                *
* passwd-meetme          * Set password for Web MeetMe                              *
* passwd                 * Set root password for console login                      *
* install-ZAPHFC         * Install ISDN/RDSI - QuadBRI,DUOBRI & HFC Chipsets        *
* enable-iptables        * Turns on IPTABLES (You may need to configure it!)        *
* disable-iptables       * Turns off IPTABLES (for Freepbx problems)                *
*************************************************************************************
* Tap the ENTER key for the next page or Ctrl-C to exit                             *
*************************************************************************************
```



```
PBX in a Flash Help Menu - Page 2
Menu 1.7.5 released on 062510
*************************************************************************************
* Command                * Description                                              *
*************************************************************************************
* setup-aastra           * Create a aastra.cfg in /tftpboot                         *
* setup-cisco            * Create a SIPDefault.cnf in /tftpboot                     *
* setup-grandstream      * Setup for autoconfiguration of Grandstream               *
* setup-linksys          * Create Linksys default files in /tftpboot                *
* setup-polycom          * Create Polycom default files in /tftpboot                *
* setup-mail             * Configure sendmail                                       *
* setup-tftp             * Install and set up tftp server                           *
* setup-samba            * Setup samba windows <> linux file sharing                *
* genzaptelconf          * Auto-configure Zaptel cards                              *
* asterisk -vr           * Asterisk CLI                                             *
* update-scripts         * Updates this screen and installs the latest scripts      *
*************************************************************************************
```

In the next section of this document we will begin to configure PBX in a Flash. There are almost a limitless number of ways to configure PBX in a Flash but we shall try to outline the basics to get you up and running.

Initial Configuration of PBX in a Flash

"Always listen to experts. They'll tell you what can't be done, and why. Then do it." RAH

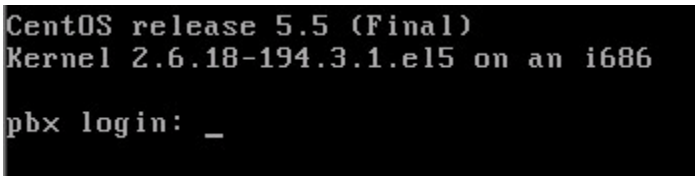
Overview

The next few pages will walk you through the steps required to get your PBX in a Flash system up and running in a minimalist configuration. This is by no means a complete configuration guide, but there are numerous resources on the web.

Updating PBX in a Flash

There may be some late breaking updates that did not make it into the current release of PBX in a Flash so you should check for upgrades. Please perform the following steps:

1. Log into the CLI (Command Line Interface) as user root using the password you typed in during the install.



2. This is the initial login screen and tells you about your system including how to get help. Notice the green root@pbx:~ $. This is a customized version of the bash environment and is a visual queue that the install of PBX in a Flash seems to have completed successfully.

```
Last login: Fri Jun 25 04:57:19 on tty1

------------------------------------------------

For access to the PBX web GUI use this URL
http://192.168.2.102

For help on PBX commands you can use from this
command shell type help-pbx.

root@pbx:~ $ _
```

3. Let's update all of the scripts on our PBX in a Flash machine. At the CLI type *update-scripts* and tap the Enter key. You should see a screen similar to the one below.

```
*******************************************************************************
* In order to download and install this compiled script you must              *
* agree to the following:                                                     *
*                                                                             *
* 1. I agree to honor the terms of use set out below                          *
* 2. I agree not to reverse engineer any of the binaries                      *
* 3. I agree not to request the source code for this script                   *
* 4. I agree to only run this script on a PBX in a Flash system,              *
* 5. I agree that this script is an 'independent and separate work'           *
* 6. By typing Y, I agree that this act constitutes my legal                  *
*    signature and agreement to all of these terms and conditions             *
*    of use.                                                                  *
* 7. I agree that no warranty is expressed or implied for this                *
*    program including any warranty of fitness for any purpose.              *
*                                                                             *
* IF YOU DO NOT AGREE WITH THESE TERMS OF USE DO NOT USE THIS PROGRAM*
*                                                                             *
* Tap the Y key to agree to these terms or ENTER to exit                      *
*******************************************************************************
```

As the install program progresses you will see the following screen

```
That is it! type help-pbx to see what is new
You really need to run update-fixes NOW!
root@pbx:~ $ _
```

4. Once update-scripts has completed please type help-pbx and you will see a screen similar to the ones below.

```
PBX in a Flash Help Menu - Page 1
Menu 1.7.5 released on 062510
*********************************************************************************
* Command               * Description                                           *
*********************************************************************************
* setup                 * Configure the Linux Operating System options          *
* status                * Provides information about your PIAF System           *
* netconfig             * Configure ethernet interface                          *
* install-netconfig     * Reinstalls netconfig which is deleted by Centos 5.1   *
* passwd-master         * Fixes fpbx/webmin and sets passwds maint/amp/meetme    *
* passwd-maint          * Set password for maint - web GUI                      *
* passwd-wwwadmin       * Set password for wwwadmin                             *
* passwd-meetme         * Set password for Web MeetMe                           *
* passwd-webmin         * Set password for Webmin                               *
* passwd                * Set root password for console login                   *
* enable-iptables       * Turns on IPTABLES (You may need to configure it!)     *
* disable-iptables      * Turns off IPTABLES (for Freepbx problems)             *
* enable-fail2ban       * Turns on Fail2ban IP security monitor                 *
* disable-fail2ban      * Turns off Fail2ban IP security monitor                *
*********************************************************************************
* Tap the ENTER key for the next page or Ctrl-C to exit                         *
*********************************************************************************
```

```
PBX in a Flash Help Menu - Page 2
Menu 1.7.5 released on 062510
*********************************************************************************
* Command               * Description                                           *
*********************************************************************************
* setup-aastra          * Create a aastra.cfg in /tftpboot                      *
* setup-cisco           * Create a SIPDefault.cnf in /tftpboot                  *
* setup-grandstream     * Setup for autoconfiguration of Grandstream            *
* setup-linksys         * Create Linksys default files in /tftpboot             *
* setup-polycom         * Create Polycom default files in /tftpboot             *
* setup-samba           * Setup samba windows <> linux file sharing             *
* genzaptelconf         * Auto-configure Zaptel cards (NOT PRESENT FOR DAHDI)   *
* asterisk -vr          * Asterisk CLI                                          *
* update-source         * Updates all of the digium source                      *
* update-scripts        * Updates this screen and installs the latest scripts   *
* update-fixes          * This fixes minor problems with PIAF until next ver    *
* install-key           * This lets you generate a new secure server key        *
* install-munin         * This will install munin reports                       *
*********************************************************************************
* Tap the ENTER key for the next page or Ctrl-C to exit                         *
*********************************************************************************
```

```
PBX in a Flash Help Menu - Page 3
Menu 1.7.5 released on 062510
*********************************************************************************
* Command               * Description                                           *
*********************************************************************************
* install-ZAPHFC        * Install ISDN/RDSI - QuadBRI,DUOBRI & HFC Chipsets     *
* setup-mail            * Configure sendmail                                    *
* setup-tftp            * Install and set up tftp server                        *
* passwd-ari            * This sets the ARI admin password                      *
*********************************************************************************
root@pbx:~ $ _
```

A number of new programs have been installed onto your system which you can explore.

5. Now we need to update PBX in a Flash with any patches that did not make it into the current release of PIAF. Type *update-fixes* to begin. It is *ESSENTIAL* that you perform this step. Failure to do so may result in an unstable system. You should see a screen similar to the one below.

```
**************************************************************************
* In order to download and install this compiled script you must         *
* agree to the following:                                                *
*                                                                        *
* 1. I agree to honor the terms of use set out below                     *
* 2. I agree not to reverse engineer any of the binaries                 *
* 3. I agree not to request the source code for this script              *
* 4. I agree to only run this script on a PBX in a Flash system,         *
* 5. I agree that this script is an 'independent and separate work'      *
* 6. By typing Y, I agree that this act constitutes my legal             *
*    signature and agreement to all of these terms and conditions        *
*    of use.                                                             *
* 7. I agree that no warranty is expressed or implied for this           *
*    program including any warranty of fitness for any purpose.          *
*                                                                        *
* IF YOU DO NOT AGREE WITH THESE TERMS OF USE DO NOT USE THIS PROGRAM*
*                                                                        *
* Tap the Y key to agree to these terms or ENTER to exit                 *
**************************************************************************
```

Please tap the Y key to continue.

6. You will see various things going on and eventually you will arrive back at the prompt. Congratulations! You have finished updating your PIAF system with the latest patches and scripts. You should see a screen similar to the one below while the update is occurring although this will change from time to time depending on what was "fixed".

```
update-fixes - 1.7.5 released on 062510   PAGE 3
CentOS release 5.5 (Final) - 32 Bit
**************************************************************************
Detailed Log available at /var/log/update-fixes.log!
**************************************************************************
* #117 - Extra check for Pear DB due to system problem                   *
* #118 - Check for include zapata-channels                               *
* #119 - Fix errant device file permission if exists                     *
* #120 - Force use of .htaccess for admin folder                         *
* #121 - THIS HAS BEEN SUPERCEDED by patch #122                          *
* #122 - Install Fail2ban Your PBX will be without protection*
*        for about 20 seconds                                            *
* #123 - Added wanpipe (if exist) awareness                              *
* #124 - Force user to change ARI password from default                  *
*                                                                        *
* Ctrl-C to exit or just wait to continue                                *
**************************************************************************
```

```
update-fixes - 1.7.5 released on 062510
CentOS release 5.5 (Final) - 32 Bit
********************************************************************
* Update proceding. Please resist the urge to tap the ENTER key*
********************************************************************
Patch #107 patch for freepbx .htaccess problem
Patch #107 already applied no update required
Patch #108 checking for missing conf files
Patch #108 not required
Patch #109 fix for flashing fop panel
Patch #109 not required
Patch #110 patch for kennonsoft menu
Patch #110 applied

Patch #111 patch for wrong permission in session
Patch #111 already installed
Patch #112 installing latest genzaptelconf
Patch #112 successfully installed
```

```
********************************************************************
* You must now set the password for the ARI interface. I have just  *
* checked your system and the default password is still present! This*
* is a mandatory security upgrade.                                   *
*                                                                    *
* Tap the ENTER key to continue                                      *
********************************************************************
```

Setting passwords

PBX in a Flash must be secured! In order to do this you will need to set the passwords. You have already set the "root" password when you initially installed PIAF. We have written a script that sets most passwords and enhances the security of your PIAF install. If you use weak passwords your installation will be compromised. See Appendix one for tips on creating good quality passwords.

passwd-master is the script you will want to run in order to set most passwords in PIAF. This script will do the following.

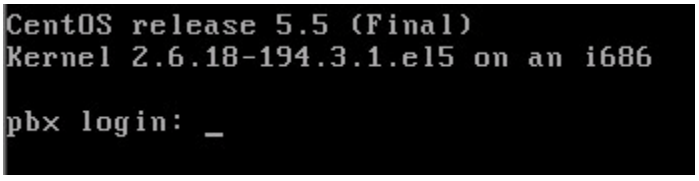
- Sets up WebMin to use the "root" password for access
- Changes FreePBX to use .htaccess instead of database access. This will allow you to use your "maint" password to gain access to FreePBX instead of admin/admin. Much handier not having to remember more passwords.
- Set the passwords for users "maint", "amp", and "meetme" to the same password. This is useful initially when you are setting up your PIAF system, however it is a bit of a security risk so once your

system is up and running it is recommended you change the individual passwords to something unique. Type *help-pbx* to change each password individually.

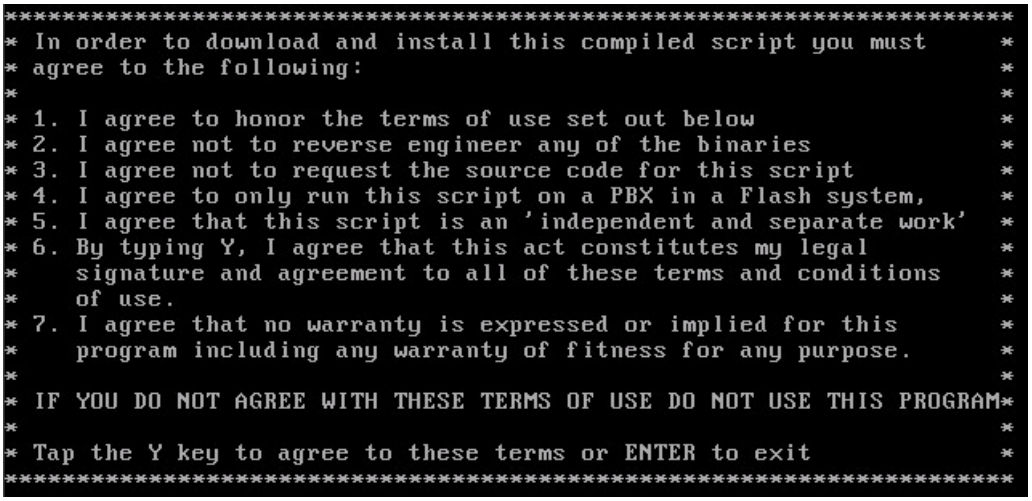
passwd-master will not change the password of MySQL or Asterisk Manager! **Resist** the urge to "fiddle" as your PIAF system will **die** unless you **REALLY** know what you are doing. Only someone with access to your server and your root password can gain access to MySQL using the default password.

Running *passwd-master*

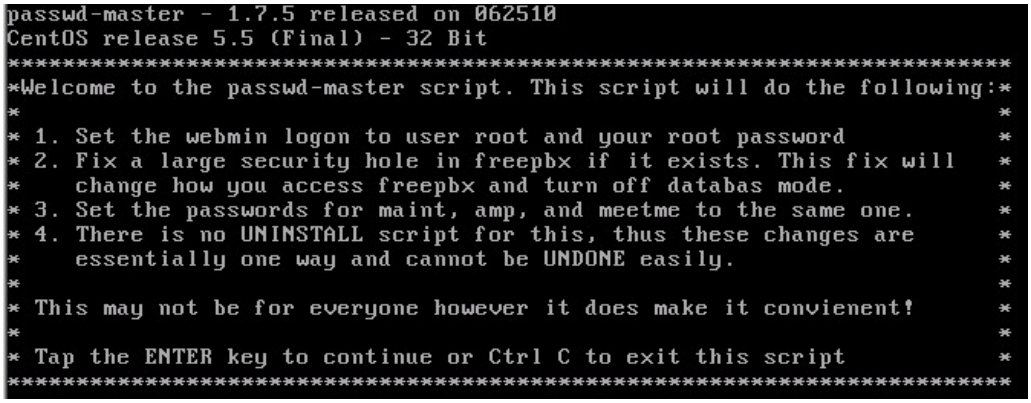
1. Log into the CLI (Command Line Interface) as user root using the password you typed in during the install.



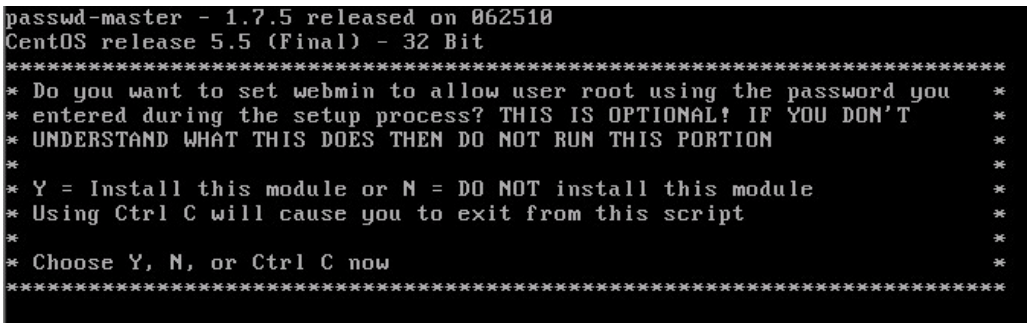
2. Type *passwd-master* and tap the Enter key. You should see a screen similar to the one below.



3. Now tap the Y key and you should see a screen similar to the one below.



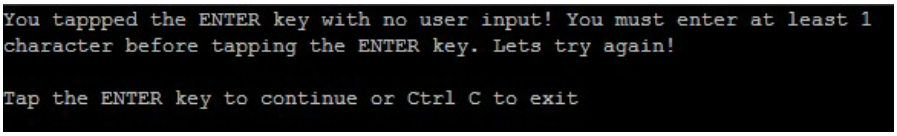
4. You have 2 choices. You can tap the Enter key to continue or hold down the Control key and tap the C key. If you tap the Enter key you will see the following screen

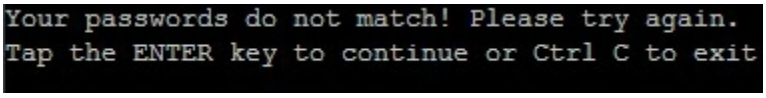


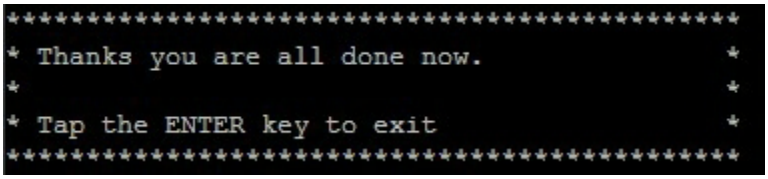
Choose Y <recommended> to continue.

5. The following screen will be displayed and allows you to set all of your passwords to the same password. During setup this is a good thing to have, however on a production version of PBX in a Flash this is a very BAD idea. All passwords should be different and complex for enhanced security.

6. Common errors with this script are attempting to just hit the Enter key and not typing the same password. Null passwords are not allowed so you have to enter something. For guidelines on choosing a password please look in Appendix 1. Below are the screens you may see if you encounter and error and if you successfully set the passwords.







Network Configuration

This should be one of the easiest parts of the install however some have reported a non-sticky IP address which could cause problems so we will outline a workaround for it. Also there is some controversy regarding the use of DHCP versus Static IP addresses for PIAF systems. The best plan for your PIAF system is to assign it a static IP address this will ensure that the phones can always find it on the network and solve a lot of common DNS errors. Using DHCP can work in some circumstances; however, my recommendation is to stick with static IP addresses only. A discussion of the pros and cons of each is beyond the scope of this document.

1. Gather the information you will need to create a static address. Have a look at the table below and fill it out prior to going on to step 2. If you are going to use a DHCP IP address skip this section entirely. A short explanation of each item is below the table.

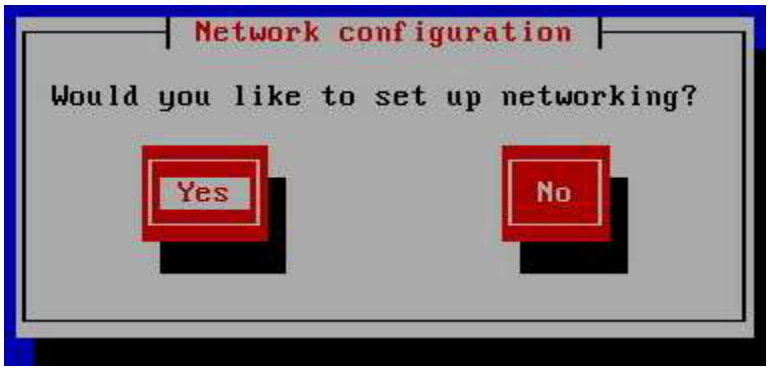
Table 1

Option	Information
Static IP Address	
Netmask	
Default Gateway	
Primary Nameserver	

- Static IP Address: This is generally one that your router does not assign by DHCP
- Netmask: This is generally 255.255.255.0 for Class C non sub netted networks
- Default Gateway: This is generally the IP address of your router
- Primary Nameserver: This should not be the same address as the Default Gateway (depending on your network). This is due to some routers used at the consumer level have problems with nameserver tasks. A better solution is to point to the nameserver of your ISP as opposed to your router. You will need to look at your router configuration pages to get this number. Thus if you simply point your Primary Nameserver to your router will you have problems? Probably not; but if you run into errors with DNS resolution then you should try to point to your ISP's nameserver.

2. Log into the CLI using the root user and type *netconfig* and then tap the ENTER key. NOTE!!! This is a legacy program that no longer is part of the default CentOS distribution. If the following steps are performed exactly it *does* work very well

3. You should see a screen similar to the one below



If you get a "command not found" warning then netconfig may have been deleted from your PIAF system. This is occurring because CentOS 5.5 removes it and installs system-configure-network which is an inferior program! You will need to restore the netconfig program using a script that has been included. Type *install-netconfig* at the prompt and once it completes retry netconfig. If you get the screen above using the left or right arrow select the Yes button and then tap the ENTER key

4. You should now see the screen below:

Tab down to the IP address field and fill out all of the information that is required. NOTE do not use the information contained in the image! Select the Ok button and tap the ENTER key.

5. You should be back at the Linux CLI now. We need to restart the networking services by typing service network restart.

```
root@pbx:~ $ service network restart
Shutting down interface eth0:                              [  OK  ]
Shutting down loopback interface:                          [  OK  ]
Bringing up loopback interface:                            [  OK  ]
Bringing up interface eth0:
Determining IP information for eth0... done.
                                                           [  OK  ]
```

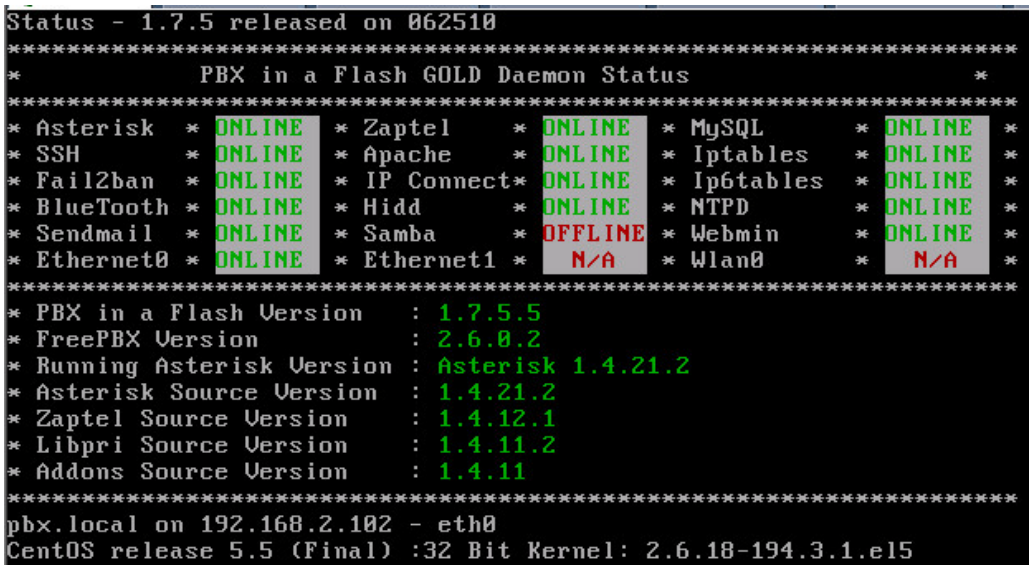
6. Once the networks have restarted please type netconfig once again and enter the same information as before. Save your changes and test to see if you can see the internet. Please type ping www.google.com and then tap the Enter key. You should see a screen similar to the one below. If not, then you have a problem with your network or connection to the Internet. Track down the errors and correct them. Press Ctrl-C to exit.

```
root@pbx:~ $ ping www.google.com
PING www.l.google.com (209.85.157.147) 56(84) bytes of data.
64 bytes from yu-in-f147.1e100.net (209.85.157.147): icmp_seq=1 ttl=47 time=29.6
 ms
64 bytes from yu-in-f147.1e100.net (209.85.157.147): icmp_seq=2 ttl=47 time=29.6
 ms
64 bytes from yu-in-f147.1e100.net (209.85.157.147): icmp_seq=3 ttl=47 time=30.2
 ms

--- www.l.google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2326ms
rtt min/avg/max/mdev = 29.693/29.871/30.222/0.248 ms
```

Appendix 1

What version of … am I running?

This can be answered easily by typing *status* in the console. You should see a lot of information about your system



Appendix 2

Choosing a Password

Passwords used by PBX in a Flash can be of any length and are both case and punctuation sensitive. We recommend using at least eight characters, some of which are punctuation marks or other special keyboard characters. Shorter and simpler passwords weaken your defenses. For example, the password JOHNJOHN is quite weak, particularly if your name is John. J_O%H#N@ is slightly better, but it still contains elements of your name.

A password such as F#LLL&*_ would be a better choice (***Note: Please do not use this example***). Lastly, try to use a password you will remember, but which others will not guess (easier said than done), and **NEVER** write your password down and place it in a place that anyone can easily find.

We stand by this recommendation One of our developers worked COMPSEC for a national police agency trying to penetrate their own security and this was his favorite method of "breaking into" secure systems.

One of the most common forms of social engineering (hacking) comes from people finding the passwords you wrote down and left laying around. If your memory is not too good and you write your passwords down please put them somewhere safe such as a lockbox or an encrypted USB key or a smartcard. All of these methods can be broken at the moment except for your memory (there is some question about that now with the advent of fPET/fMRI scans).

We suggest using an easily remembered scheme such as the following that is almost impossible to guess:

1. Choose a nursery rhyme or other saying that you can remember.
2. Use the first letter of each word, either upper or lower case, in sequence to make up the password.
3. For words such as "and", "at", "number" or "star" use the symbols on the top row of the keyboard ("&", "@", "#" or "*".
4. For numbers use the actual number key rather than the word.
5. Use punctuation where appropriate.

6. For example, “Hey Diddle Diddle, the Cat and the Fiddle!” would generate the following password: HDD,tC&tF!. (**Do not use this example as *your* password**)
7. Lastly there are multiple passwords that PIAF uses for various functions. You should NOT make all of the passwords the same on PRODUCTION MACHINES EVER! However when you are initially setting up the production server it is convenient to do so.

Appendix 3

Joes Own Editor Commands

CURSOR			
^B	Left	^F	Right
^P	Up	^N	Down
^Z	Previous Word	^X	Next Word
SEARCH			
^KF	Find Text	^L	Find Next
Go To			
^U	Previous Screen	^V	Next Screen
^A	Beginning of Line	^E	End of Line
^KU	Top of File	^KV	End of File
^KL	Go to Line Number		
BLOCK			
^KB	Begin Block	^KK	End Block
^KM	Move Block	^KC	Copy Block
^KW	File Block	^KY	Delete Block
^K/	Filter Block with....		
DELETE			
^D	Delete Character	^Y	Delete Line
^W	Delete Word to right of Cursor	^O	Delete Word to Left of Cursor
^J	Delete Line to Left of Cursor	^_	Undo Delete
^^	Redo Delete		

MISCELLANEOUS			
^KJ	Format Text	^T	Options
^R	Refresh Screen	^@	Insert
SPELL			
^[N	Spell Word	^[L	Spell Check File
EXIT			
^KX	Save File With Changes	^C	Exit File No Changes
^KZ	Open Shell Window		
FILE			
^KE	Edit Another File	^KR	Insert File
^KD	Save File		

Index

Coming RSN <real soon now>