

# Genesi Pegasos II Yellow Dog Linux 4

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This document describes the implementation of Yellow Dog Linux 4 (YDL4) on the Genesi Pegasos II computer system.

## 1 Introduction

YDL4 is available as an upgrade to the Genesi Pegasos II computer. Originally, YDL3 was installed, but it is now superseded by the YDL4 release. See Freescale application note AN2801, *Upgrade or Restore Firmware and Hard Drive on Genesi Pegasos II*.

This application note describes the Yellow Dog Linux 4 (YDL4) operating system and many of its commands. Linux has a variety of ways to accomplish most tasks. This paper presents primarily command line methods, although GUI methods are also given. However, when the network is set up with a GUI, how the files are actually affected is hidden, so using the command line allows feedback on exactly what is happening. This document is not intended to be a complete guide to YDL, but it is a collection of useful things to help both the experienced and novice user become quickly adept at YDL4.

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## 2 Terminology

The following terms are used in this document:

CUPS	Common Unix Printing System Architecture
Debian	One of the distributions of Linux
IDE	Type of hard drive, which allows up to 2 drives on each channel
Linux OS	Linux operating system
SCSI	Type of hard drive, which allows up to 8 drives on each channel
Shell	Software construct to allow separate users and jobs with in the same user to have a separate environment to avoid interfering with each other
ssh	Secure shell, an encoded secure method to log into a remote computer
USB	Universal serial bus
YDL	Yellow Dog Linux, one of the distributions of Linux

## 3 Starting Yellow Dog Linux

Use the boot option 5 for the Yellow Dog 2.6.8-1 kernel. Do not use option 4 for the 2.4 kernel.

### NOTE

The option numbers may be different. Booting with the 2.4 kernel may seriously disrupt the YDL4 installation.

During boot up there are lots of messages. After boot is complete, read some of these messages with the `dmesg` command and also in the `/var/log` directory. In fact, the `/var/log` directory contains many useful logs, including the XF86 logs.

See Freescale application note AN2801, *Upgrade or Restore Firmware and Hard Drive on Genesi Pegasos II* for information on the initial start up of YDL4. This paper assumes YDL4 has already been installed.

### 3.1 Types of Virtual Terminals

There are several virtual terminals available. They are accessed by the Alt+Ctrl+Fn combination. Using F7 displays the graphics window. F1, F2, F3, F4, F5, F6, and F8 are text windows. Switch between them by pressing the Alt+Ctrl+Fn combination. These virtual terminals only become available when the graphics display has been started.

### 3.2 Login Screen Options

After boot up, there is only one login screen. There are three options on the bottom of the screen, one for session, which at this time is KDE only, one for shutdown, and one for reboot. In the center of the screen is the login window. Enter the user name and then the password.

## 4 Logging in as a Normal User

During the initial startup, the user should have set up a regular user. For this example, assume it is 'guest' with password 'guestguest' and the root password is setup as 'Freescale.'

## 4.1 Users

The only users available on this system are root and guest. Log in now as 'guest,' with password 'guestguest'

## 4.2 Logging In from Another Linux or Unix Computer Using ssh

```
[apps1ab12.sps.mot.com:/maurie] bash
[apps1ab12.sps.mot.com:/maurie] ssh -l guest 10.82.125.179
guest@10.82.125.179's password:
[guest@freescallHost guest]$
```

## 4.3 Logging in from the Graphics Terminal

Figure 1 shows the graphics window for a user.

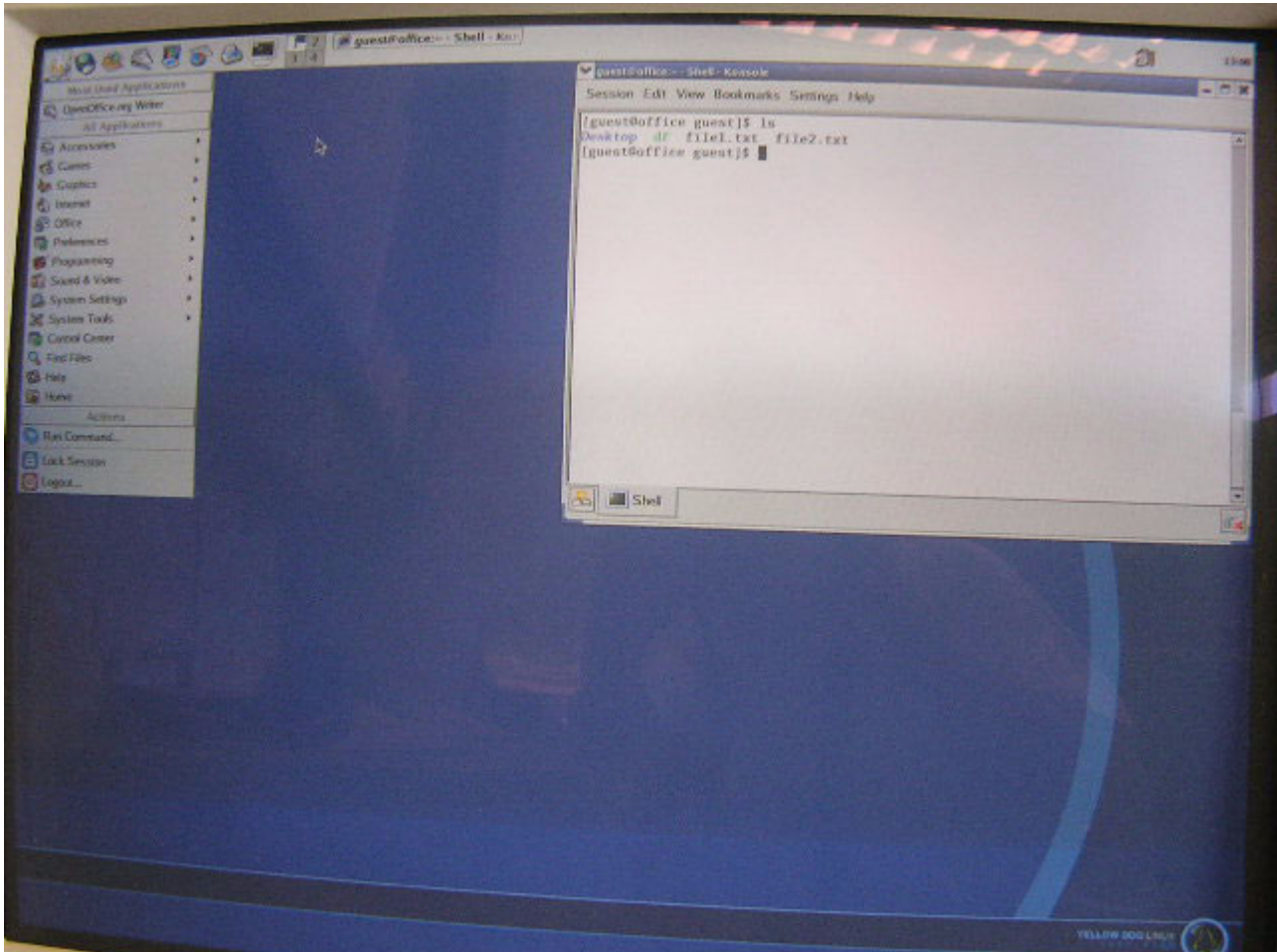


Figure 1. YDL4 Logged in as Guest

The menu is open and a command window is open. Along the top of the screen is a series of icons. The left most one is the main menu, single click on this icon and the menu of options displays as shown in Figure 1. The next icons are the Mozilla browser and the Ximian Evolution e-mail program, which is similar to Microsoft Outlook. The next

## Logging in as a Normal User

three icons open various office programs, a writer, a presentation, and a spreadsheet program. The following icon is the printer manager icon and the last one is the command window icon. The next block with the numbers 1,2,3, and 4 allow for four different window sessions to be open, the next rectangular windows indicate which windows are open, the far right side is the clipboard tool and finally the time display.

After logging in, notice a small CD icon bouncing by the cursor, this indicates that YDL4 is determining whether there is a CD in the CD-ROM drive, if not, it quits after about 30 seconds. Anytime an icon is clicked on, a small version of the icon bounces until the application begins.

Figure 2 shows these icons in larger scale. In addition to the icons at the top, five icons display along the left side of the window. The top one is the trash icon, drag files here to delete them. The next icons are the CD and Floppy icons, click on them to mount or unmount a CD or a Floppy. The Home icon opens a window explorer for files and directories. The Start Here icon opens a window to set preferences and make system settings.

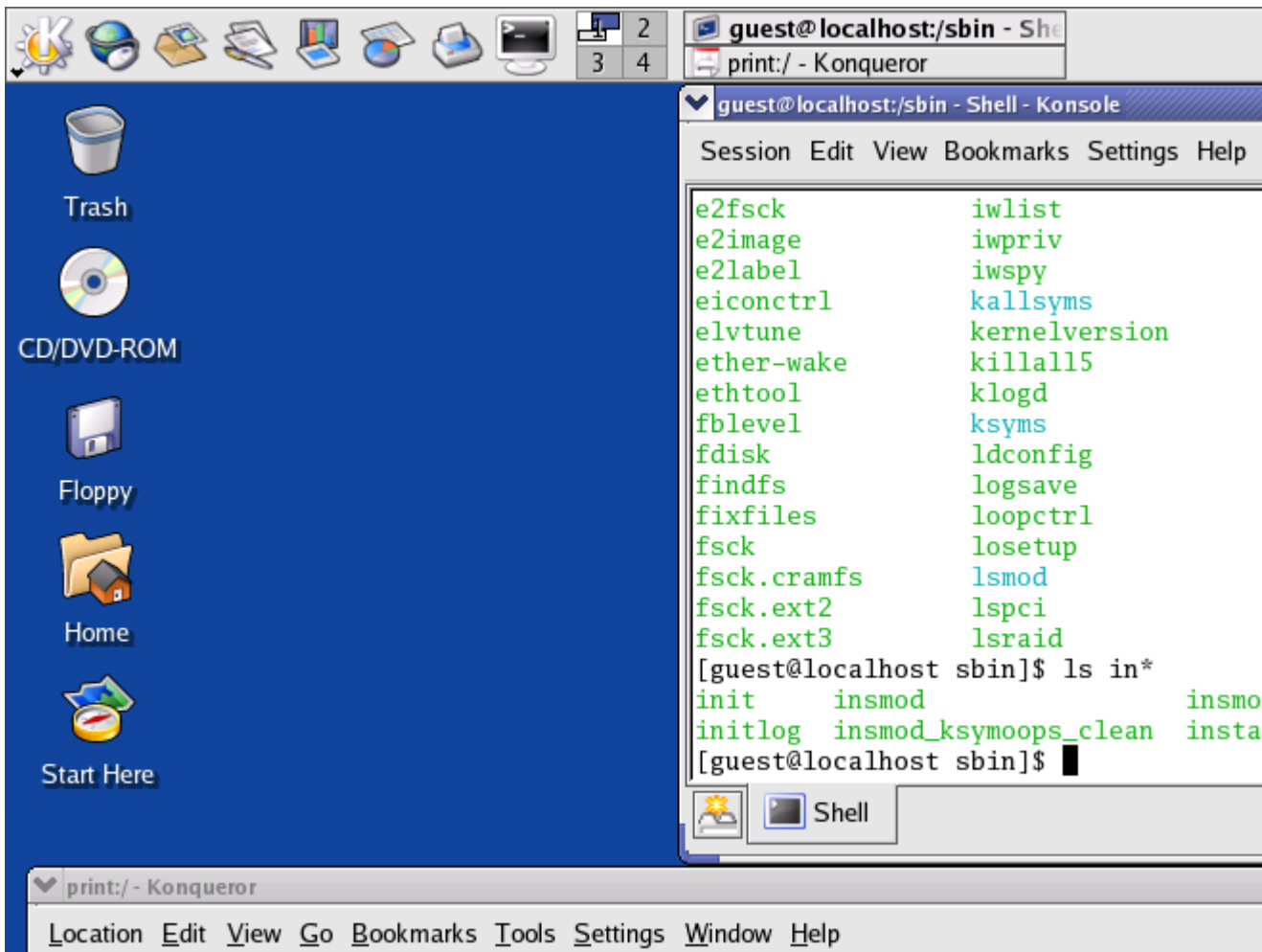


Figure 2. The Window Icons

See Figure 8 for another picture of the main window.

## 4.4 Changing Password

A user may change a password with the `passwd` command as shown below:

```
[guest@freescaleHost guest]$ passwd
Changing password for user guest.
Changing password for guest
(current) UNIX password:
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
[guest@freescaleHost guest]$
```

## 4.5 Changing Users

The `su` (switch user) command allows one to change users. Both of these forms create a new shell for the new user. The previous shell is preserved. There are two forms.

- `su <username>`
  - This form does not have the ‘-’ character. This command changes to the new user name. However, it keeps the environment of the current user. That means, that all permissions are associated with this new user, but the home directory and the environment remain with the old user. Typing `su` and no user name changes to the root user.
  - The system asks for the password for this user before making the change to the new user.
    - The root user can change, `su`, to any other user without giving the password.
- `su - <username>`
  - This form has the ‘-’ character. This changes to the new user name, and it changes the environment to the new user, that is, it invokes the `.login`, `.bashrc`, and other login files. So all actions are now performed by the new user with the new users environment. Typing `su -` and no user name changes to the root user.
  - the system asks for the password for this user before making the change to the new user.
    - The root user can change, `su`, to any other user without giving the password.
- The `exit` command returns the screen to the previous user, restoring the previous shell. The current shell is destroyed.

An example is shown below.

User `guest` wishes to switch to user `fae`, see [Section 7.2, “Create New Users,”](#) to create a user called `fae`.

`su fae`, followed by the `fae` password, switches to the new user, `fae`. However, the environment continues to stay in old user, `guest` in the home directory. Specifically, `cd` changes to `/home/guest`, not `/home/fae`. Creating new files gives ownership of those files to `fae`, but writes them to `/home/guest`, if `fae` has permission to write into `/home/guest`. The user can do a `cd /home/fae` to get to the `fae`’s home directory.

`su - fae`, followed by `fae` password, switches to the new user, `fae`, and changes the environment to the new user `fae`, therefore, the `cd` command moves to `/home/fae`.

## Logging in as a Normal User

If user is guest, switch to user root and gain root environment with the following command.

`su -`, followed by the root password changes to the root user. Note that no user name is given, root is the default user name for the `su` command.

`exit` returns to user guest.

## 4.6 Checking Disk Space

The command `df` checks disk space.

`df -k` displays all the mounted volumes. As shown in this example:

```
[guest@freescaleHost guest]# df -k
Filesystem          1K-blocks      Used Available Use% Mounted on
/dev/hda6            12643096    2301988   9698808  20% /
none                 127720         0    127720   0% /dev/shm
/dev/hda1            103101       12923     84855  14% /mnt/hd
[guest@freescaleHost guest]#
```

`df -k .` (note the space and then a dot character after the `-k`) displays just the mounted volumes associated with this user. As shown in this example:

```
[guest@freescaleHost guest]# df -k .
Filesystem          1K-blocks      Used Available Use% Mounted on
/dev/hda6            12643096    2301988   9698808  20% /
[guest@freescaleHost guest]$
```

## 4.7 Remote Access to Other Computers

`telnet <remote>` gives the user a window to a remote computer. `<remote>` can be the IP address, or the name of the machine.

Normally, Linux does not allow access through telnet, unless the `telnet-services` daemon has been installed and enabled. The same is true of the `ftp` daemon. The telnet daemon at `/usr/sbin/in.telnetd` has a configuration file at `/etc/xinetd.d` called `telnet`. See [Section 7.12, “Managing Packages, RPM, Red Hat Package Manager.”](#)

Use secure shell to log in, as shown in the following example:

```
ssh <remote> is a secure shell, similar to telnet.
[appslab12.sps.mot.com:/maurie] ssh -l guest 10.82.125.179
guest@10.82.125.179's password:
[guest@freescaleHost guest]$
```

`ftp <remote>` gives the user the capability of transferring files between the local computer and the remote computer.

On this version of YDL4, `ftp` may not be installed, See [Section 7.12, “Managing Packages, RPM, Red Hat Package Manager,”](#) to install the `ftp` daemon.

`/sbin/ifconfig` displays the IP address of the local machine.

```
[guest@freescaleHost guest]$ /sbin/ifconfig

eth0      Link encap:Ethernet  HWaddr 00:0B:2F:4E:1B:2B
          inet addr:10.82.125.179  Bcast:10.82.127.255  Mask:255.255.252.0
          inet6 addr: fe80::20b:2fff:fe4e:1b2b/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:24404 errors:0 dropped:0 overruns:0 frame:0
          TX packets:939 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2615491 (2.4 Mb)  TX bytes:498619 (486.9 Kb)
          Interrupt:9 Base address:0x800

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:16436  Metric:1
          RX packets:133356 errors:0 dropped:0 overruns:0 frame:0
          TX packets:133356 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:10266338 (9.7 Mb)  TX bytes:10266338 (9.7 Mb)

[guest@freescaleHost guest]$
```

## 4.8 Other Useful Commands

Commands must be issued from a command line window. Start a terminal window by clicking on the icon in the top menu bar. Here are a few simple, very useful commands.

`ls /bin`, displays all the user commands in the system.

`ls /usr/bin` and `ls /usr/local/bin` display the applications installed on this machine.

`ls` lists all the files in the current directory.

`ls -l` lists all the files in the current directory and gives the file size along with other statistics.

`pwd` shows the current directory.

`cd` returns the system to the home directory.

`cd <directory name>` takes the system to the directory named.

`whoami` tells who is the current user.

`grep <something> filename` finds all the occurrences of 'something' in the filename.

## Logging in as a Normal User

Using the meta character '\*', searches all files in the current directory.

`grep 'something' *` searches all files for the occurrence of the string 'something.' The string 'something' only requires either single or double quotes in the command line when it contains a special character, such as a blank space. The following example shows the use of the command `grep` to find all occurrences of '5 network' in the files. Only one file is found.

```
[guest@freescaleHost guest]$ grep '5 network' *
flatfile.ls:-r--r--r--  1 root      root           34 Aug 15 04:15 network
[guest@freescaleHost guest]$
```

`find . | xargs grep <something>` finds all the occurrences of 'something' in all files in all subdirectories as well.

`find . -name <name>` finds all files in all subdirectories of <name>.

`man <command name>` gives a short tutorial on the <command name> and displays it to the screen.

`man <command name> | col -b > j` sends the display to the file, j, which can then be printed or edited. Use this command to get a tutorial for all the commands listed here and in the /bin directory.

`info <command name>` gives a short tutorial on the <command name> and displays it to the screen. It is another type of man page with somewhat different descriptions. Sometimes, it helps to read both the man and the info description of a command to learn how to use it.

`cat <file name>` displays the contents of the file on the screen.

`cat -n <file name>` displays the contents of the file on the screen and numbers each line.

`mkdir <dir name>` creates a directory of name <dir name> in the current directory.

`rmdir <dir name>` removes a directory.

`rm <file name>` deletes a file.

`uname -a` gives the name of the running Linux system. As in the example below:

```
[guest@freescaleHost guest]$ uname -a
Linux freescaleHost 2.6.8ydl-freescale #8 Sun Sep 26 16:02:37 PDT 2004 ppc ppc ppc
GNU/Linux
[guest@freescaleHost guest]$
```

`ps -ef` displays all active processes and their IDs.

`ps -ef | grep <something>` displays all active processes that have <something> in their title.

For example, `ps -ef | grep guest` displays all the active processes for the user guest, as shown in this example:

```
[guest@freescaleHost guest]$ ps -ef | grep guest
root      5826  1751  0 17:16 ?          00:00:00 sshd: guest [priv]
guest     5828  5826  0 17:16 ?          00:00:00 sshd: guest@pts/1
guest     5829  5828  0 17:16 pts/1    00:00:01 -bash
guest     5886  2126  0 17:25 ?          00:00:00 /bin/sh /usr/bin/startkde
guest     5938  5886  0 17:25 ?          00:00:00 /usr/bin/ssh-agent /etc/X11/xinit/Xclients
```

```

guest    5982      1  0 17:25 ?          00:00:00 kdeinit: Running...
guest    5985      1  0 17:25 ?          00:00:00 kdeinit: dcopserver --nosid
guest    5987    5982  0 17:25 ?          00:00:00 kdeinit: klauncher
guest    5990      1  0 17:25 ?          00:00:01 kdeinit: kded
guest    5991    1762  0 17:25 ?          00:00:00 fam
guest    6125    5982  0 17:25 ?          00:00:00 /usr/bin/artsd -F 10 -S 4096 -s 60 -m
artsmessage -c drkonqi -l 3 -f
guest    6127      1  0 17:25 ?          00:00:00 kdeinit: knotify
guest    6128    5886  0 17:25 ?          00:00:00 kwrapper ksmsserver

```

example shortened in the interest of space.

```

guest    6351    5829  0 18:08 pts/1      00:00:00 ps -ef
guest    6352    5829  0 18:08 pts/1      00:00:00 grep guest

[guest@freescaleHost guest]$

```

The commands `less` and `more` are useful as final pipe commands. Used either as stand alone or in pipe commands, they allow only one page of data to scroll by at a time. There are several examples of the `less` command later in this paper.

`ls -l | less` lists the files only one screenful at a time.

## 4.9 Using a USB Memory Stick

### 4.9.1 Manual Method

Plug the USB stick into the USB port on the front bottom of the machine. Then create a directory in `/` to mount it. There is already a directory called `/mnt/usb` that can be used.

#### NOTE

Only root user can mount and unmount the USB stick.

```
mount /dev/sda1 /mnt/usb
```

Now the data on the USB stick is available. Be sure and unmount it before removal.

```
umount /mnt/usb
```

### 4.9.2 Automatic Method

The manual method can still be used once this automated method is set up, but is unnecessary. However, only one of these two methods can be used at any one time. With this automatic method, any user can then mount and unmount the USB memory stick, but root user must first set it up.

- Edit `/etc/fstab` and add this line `/dev/sda1 /mnt/usb vfat noauto,ro,users 0 0`
- Create an icon for the desktop.
  - Right click on the desktop

## Logging in as a Normal User

- Choose add device
- Choose harddisk ...,
- Select /dev/sda1 under the device tab

Then after inserting a USB stick, it is only necessary to double click on the USB icon.

## 4.10 CD-ROM

### 4.10.1 Previously Written CD-ROM Device

Just put the CD in the CD-ROM reader. It should automount.

If it does not automount, then use either of these methods:

1. Type `mount /dev/cdrom /mnt/cdrom` in a command window
2. Double left click on the CD-ROM icon on the desktop

Remove the CD-ROM in any of these ways.

1. Type `umount /mnt/cdrom`
2. Type `eject /mnt/cdrom`. The advantage of this way is that it will eject the CD-ROM.
3. Right click the CD-ROM icon on the desktop and choose unmount.
4. Right click the CD-ROM icon on the desktop and choose actions | eject. The advantage of this way is that it ejects the CD-ROM.

### 4.10.2 Writing to a CD-R

Just put the blank CD-R in the CD-ROM writer. It automatically opens the CD-WRITER window on the desktop or alternately, choose menu item sound and video | K3B. Using the menu | browse filesystem menu, navigate to the files to copy to the CD-R and drag and drop them into the CD-WRITER window. Change the name of the CD label with this window. Files are copied exactly as they are, directory structure preserved to the CD. The menu item, write CD writes the CD.

This does not work for \*.iso type files. The method above copies the \*.iso file as a file to the CD, it does not create a CD image from the \*.iso file.

To create a CD from a CD image \*.iso file, ignore the CD-WRITER window and issue this command:

```
cdrecord -v -speed=0 -dev=/dev/hdc -d <name>.iso
```

In the example, where <name>.iso is the name of the ISO file, such as ydl4-pegasos.iso.

### 4.10.3 Creating an ISO File from a Directory

An ISO file is a CD-ROM image that can be burned into a CD or DVD. It is more compact than the original data. The command, `mkisofs -U -R -o <filename>.iso <iso_source_files>` creates an ISO file.

```
[guest@freescaleHost guest]$ mkisofs -U -R -o pics.iso pictures/
Warning: creating filesystem that does not conform to ISO-9660.
INFO:   UTF-8 character encoding detected by locale settings.
        Assuming UTF-8 encoded filenames on source filesystem,
        use -input-charset to override.

Total translation table size: 0
Total rockridge attributes bytes: 691
Total directory bytes: 0
Path table size(bytes): 10
Max brk space used 0
650 extents written (1 MB)
[guest@freescaleHost guest]$ ls
Desktop  evolution  guest.txt  j  pics.iso  pictures  test.txt
[guest@freescaleHost guest]$ ls -l
total 1336
drwx----- 3 guest guest  4096 Oct 13 17:25 Desktop
drwx----- 8 guest guest  4096 Oct 14 16:08 evolution
-rw-rw-r-- 1 guest guest   14 Oct 14 17:01 guest.txt
-rw-rw-r-- 1 guest guest 10082 Oct 14 17:40 j
-rw-rw-r-- 1 guest guest 1331200 Oct 14 17:42 pics.iso
drwxrwxr-x 2 guest guest  4096 Oct 14 17:39 pictures
-rw-rw-r-- 1 guest guest   15 Oct 14 17:00 test.txt
[guest@freescaleHost guest]$
```

## 5 Window Managers

There is only one window manager available, YDL, which is a derivative of the KDE window manager. The X11 window manager is GDM, it uses the `/etc/X11/XF86Config` file.

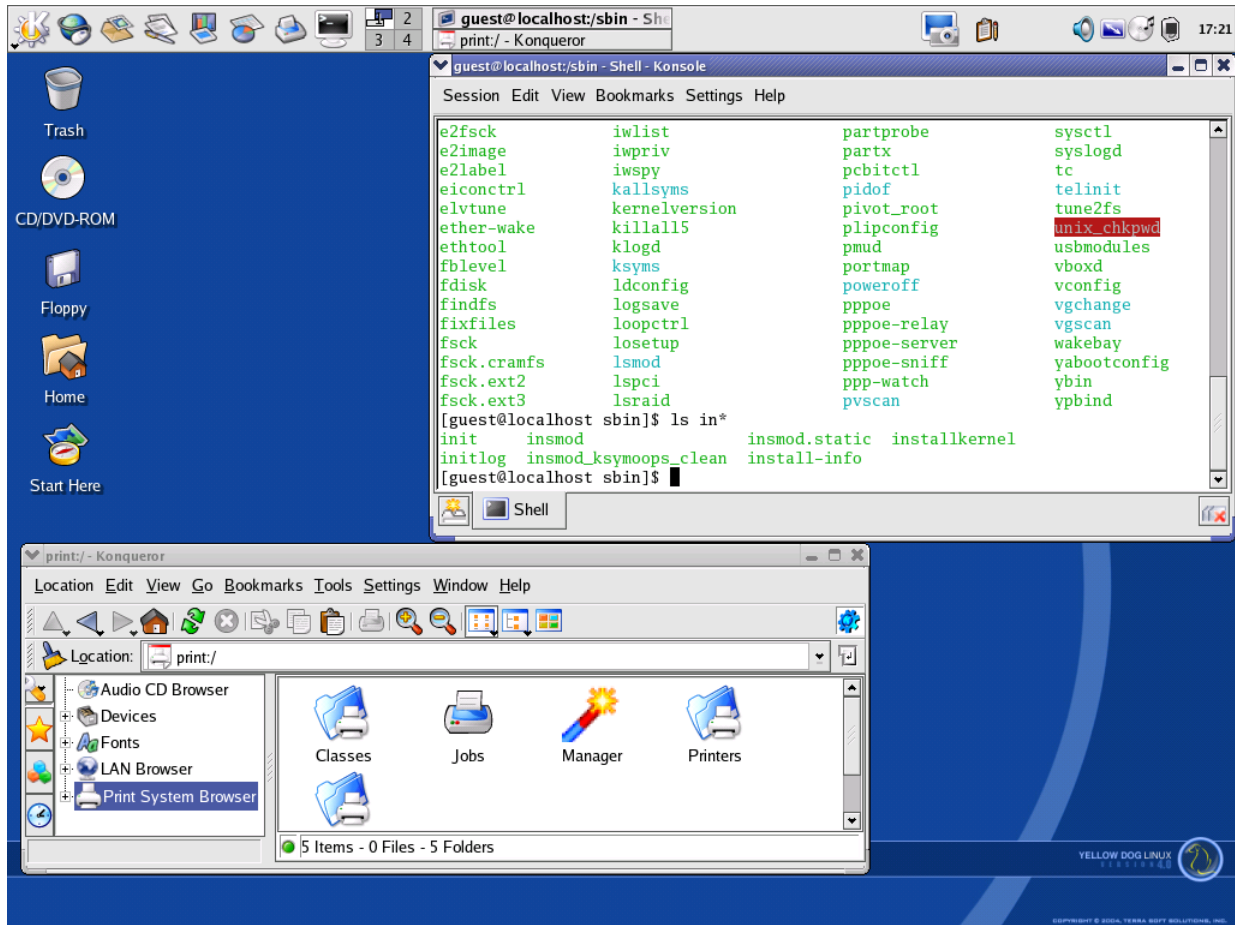
### 5.1 The YDL Window Manager

A snapshot program is available. To take snapshots, use the menu `| graphics | more graphics | Ksnapshot`. Screen shots cannot be taken of menus. This item, like any menu item can be added as an icon to the top panel by right click on the top panel, then select `add | add application | graphics | more graphics | Ksnapshot`.

The YDL Window Manager is a facility that runs on top of the X window system.

## Other User Applications

As shown in Figure 3, the menu is on the top left. The next icon opens Internet Explorer. Next over is the e-mail and open office icons, next over is an icon that opens a terminal window, which is shown. The four boxes allow the user to choose up to four windows with different applications, the next icon is the Ksnapshot, and the next is the clipboard, and the last icon is the time and date.



**Figure 3. The Main Yellow Dog Window**

The terminal window shown in Figure 3 is a session displaying some files. It was captured through the snapshot program.

The bottom window is a view of applications which is opened by the Start Here icon.

Click on the menu icon and a set of menus are presented. Menus are placed in categories and by choosing a category, more menus are presented.

## 6 Other User Applications

### 6.1 OpenOffice

OpenOffice is a full featured facility similar to the Microsoft applications Word, Excel, and PowerPoint. All the Microsoft files work identically in OpenOffice and OpenOffice files can be saved in Microsoft format.

Any of the OpenOffice applications, Writer (compare to Word), Calc (compare to Excel), Impress (compare to PowerPoint) can be started either directly from the icon in the top panel, from menu | office, or from a command window. The command window invocation is the name preceded by an 'oo' for OpenOffice. For example: oowriter, oocalc, and ooinpress.

Figure 4 shows choosing OpenOffice from the menu.

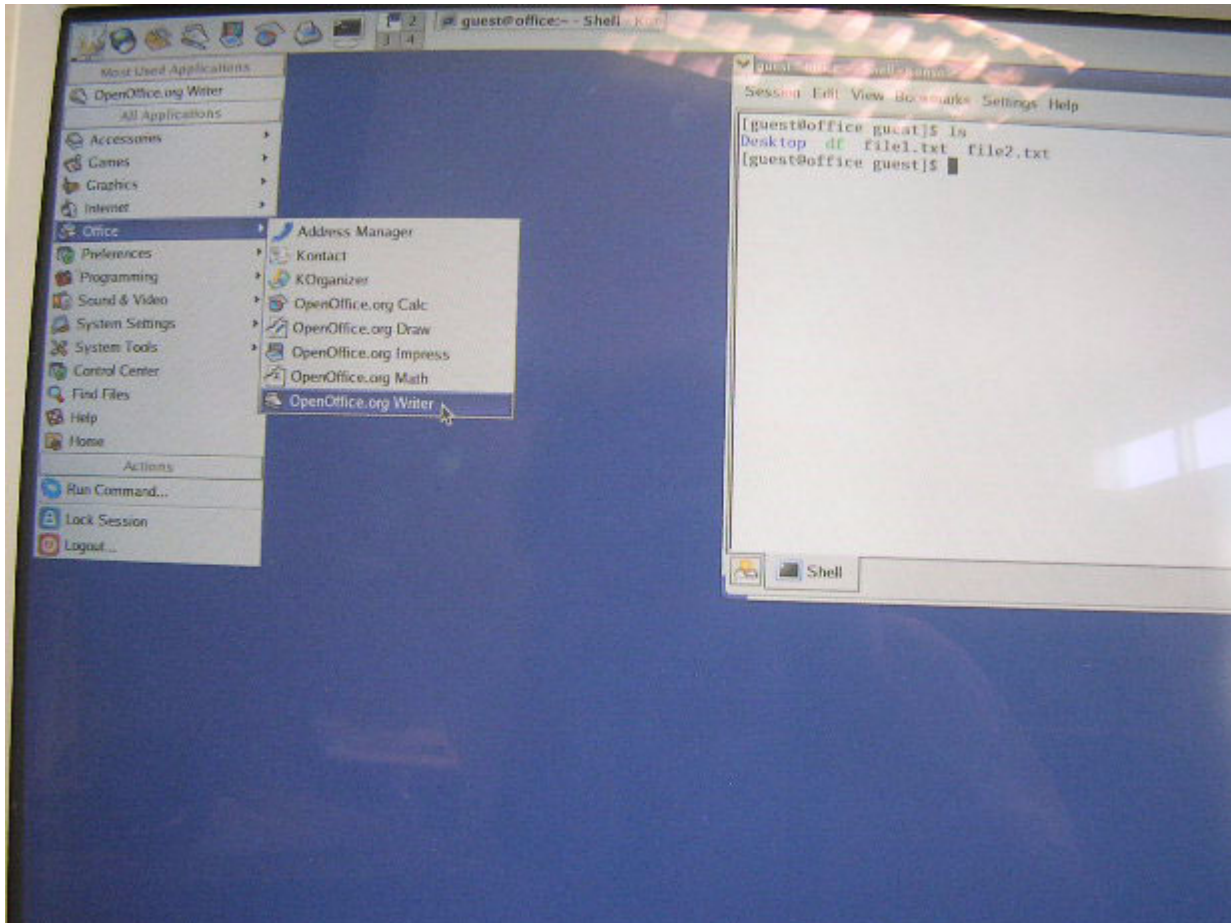


Figure 4. Opening OpenOffice from the Main Menu

## Other User Applications

Figure 5 shows the window opening.

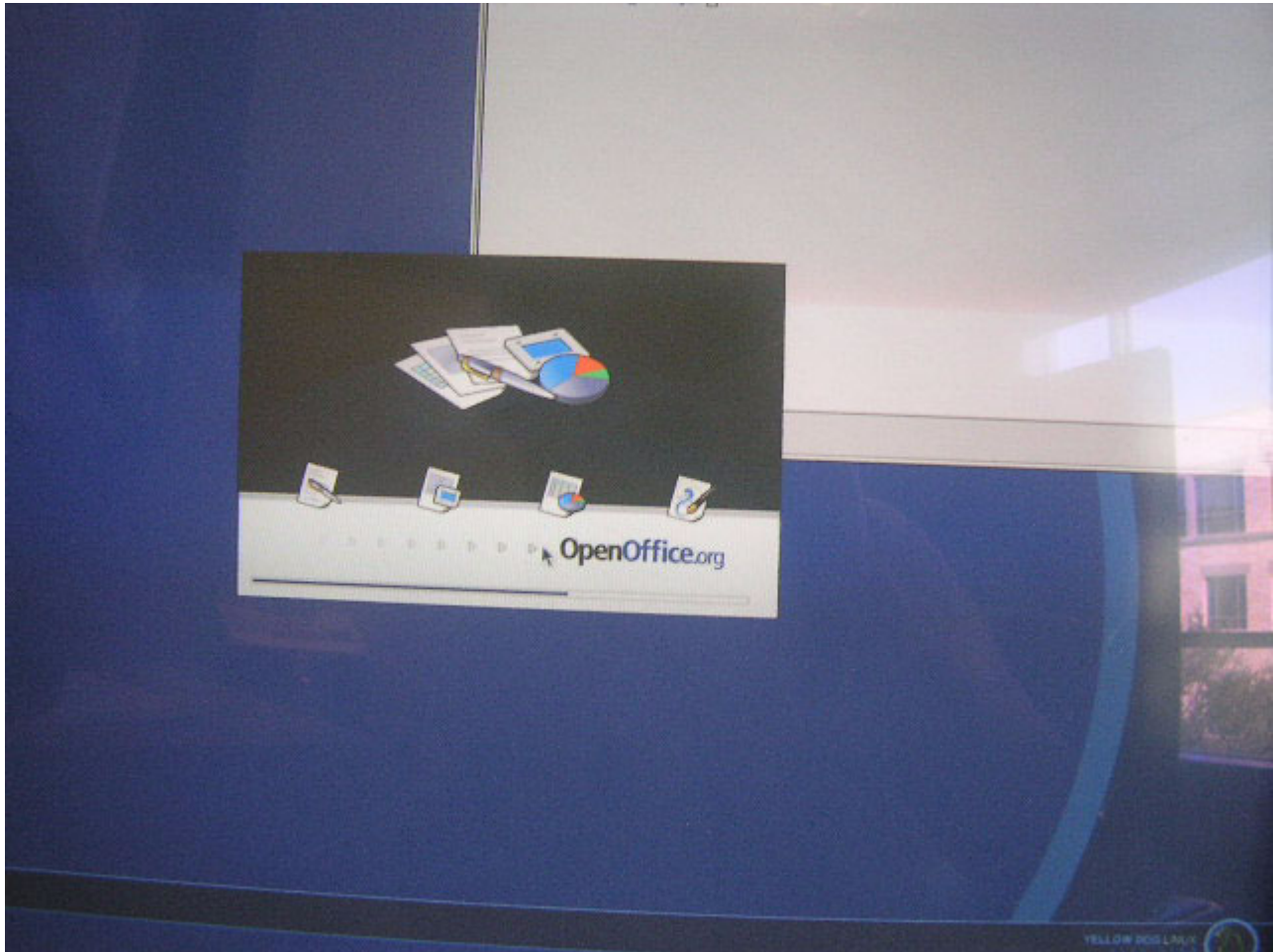
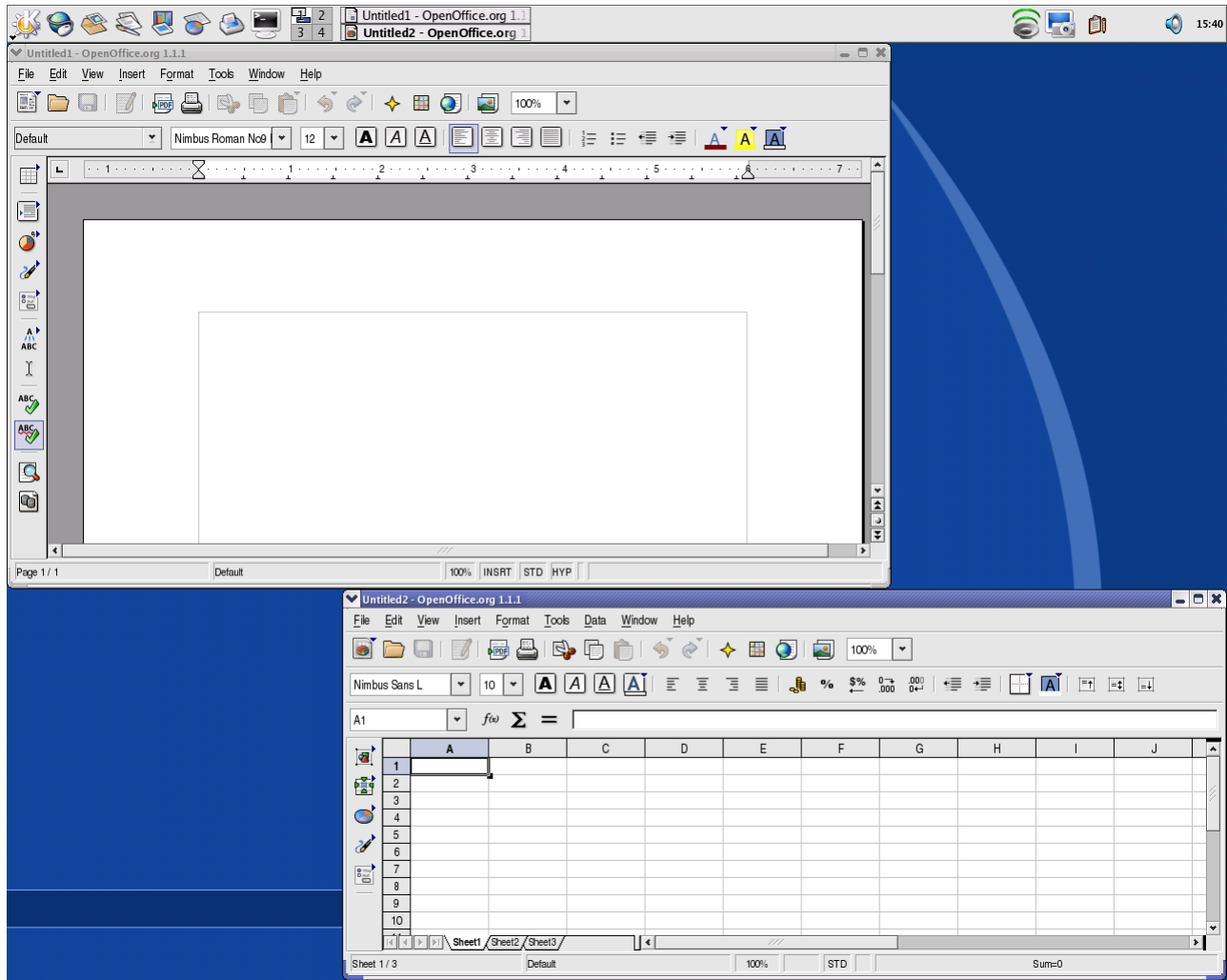


Figure 5. Open Office Opening

An open page of the Writer and the Calc program are displayed in [Figure 6](#).



**Figure 6. OpenOffice Writer and Calc application**

## 6.2 E-mail Facility

The e-mail facility, Ximian evolution, can also be opened from the main menu, or from the icon in the top panel. It is similar to the Microsoft Outlook application.

Figure 7 shows the OpenOffice Ximian program.

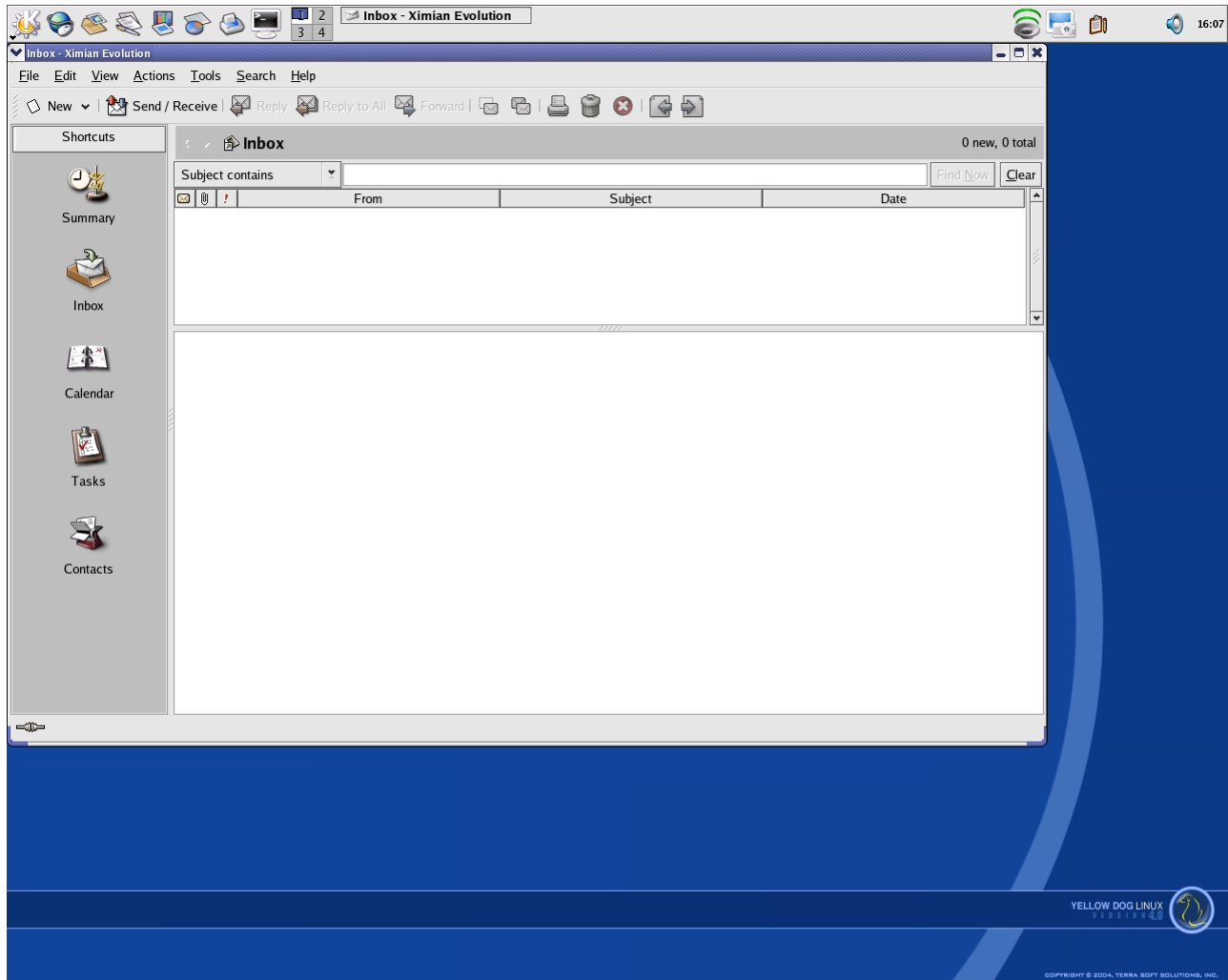


Figure 7. Ximian E-mail Program

## 6.3 Internet Browser

Open the Mozilla application using the main menu, go to Internet, then Mozilla or just click the Internet browser button on the top panel.

By default, Mozilla uses a direct connection to the Internet. In locations where proxies are needed, set up the proxy by using the Mozilla menu Edit | Preferences | Advanced | Proxies as shown in Figure 8.

The icons across the left top panel have been discussed previously; however, there are four more icons on the right side now. The first is the sound icon, which opens the sound controls, which are shown in the bottom of the window, allowing one to set headset and master volume. The following icons are the Ksnapshot icon, the clipboard, and the single volume control. In the right top of the main window, a command window displays files and directories, which are also graphically represented by the Konqueror window in the left bottom of the main window. It is similar to the Microsoft Windows Explorer, which is started from the Home icon on the left of the main window. On the right bottom is the Mozilla window, and on the left top is the Proxies window.

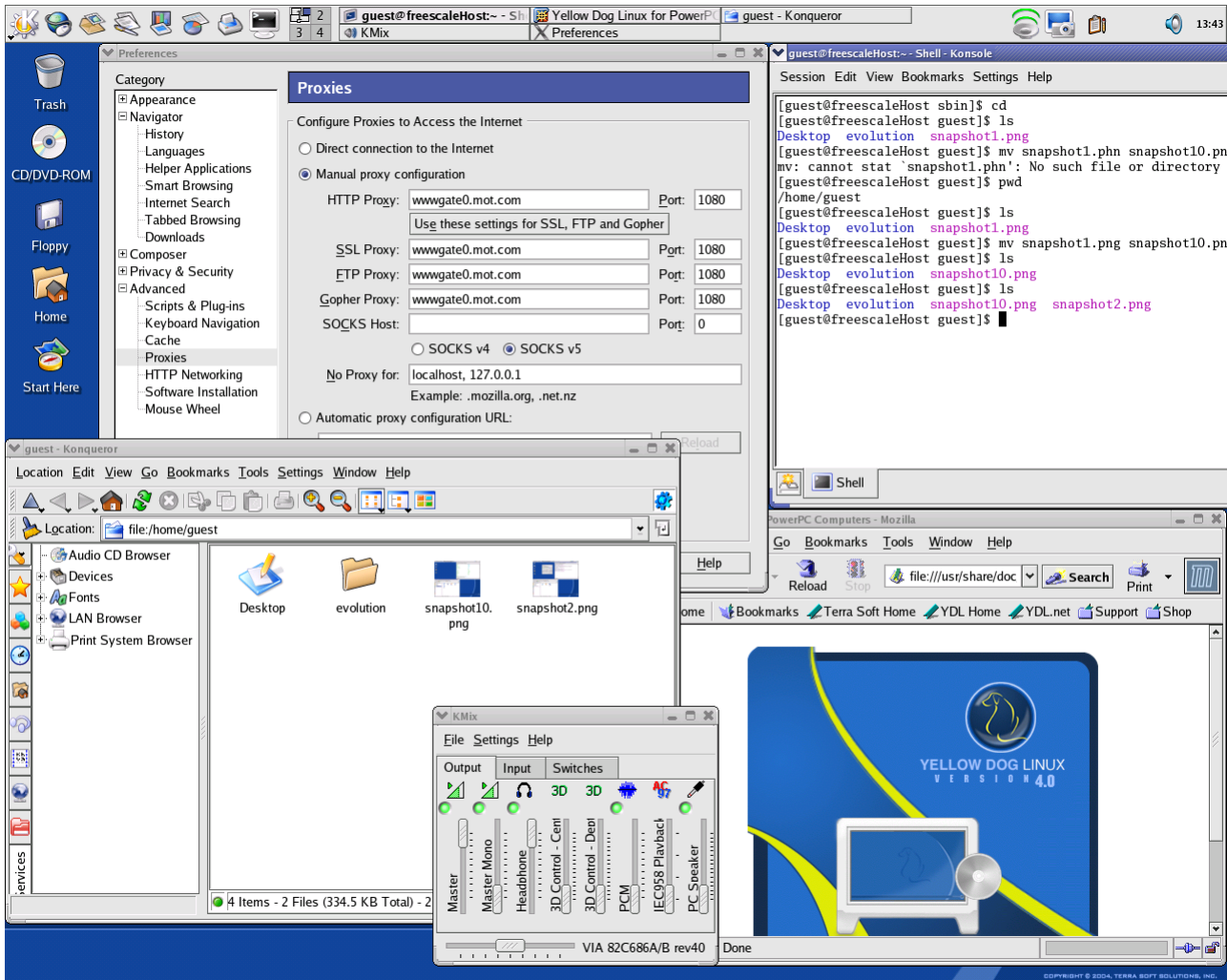


Figure 8. Mozilla Proxies Window

## 7 Root User

Change to root user. Do not log in as root user, root privilege grants unlimited access and unlimited opportunity to mess up the root file system beyond repair. Log in as a normal user and change to root user with the command:

```
su -
```

The password is whatever is set up during initial installation. Freescale was the initial root password during the setup instructions.

Exit from root user as soon as the tasks that required root privileges are done.

### 7.1 Changing the Root Password

Since YDL4 asked for the root password to be set up during the initial startup, there is no need to change the root password again. However, good practice is to change the root password periodically. The command is `passwd`. As

## Root User

shown below, a prompt asks for the new password twice. Once accepted, this new password is needed to gain access to root privileges again.

Change to root, and change the password to some real english word. A 'BAD PASSWORD' message displays, but the password changes anyway. If the password is a nonword that is greater than 6 characters, no warning displays and the password changes.

```
[guest@freescaleHost guest]$ su -
Password:
[root@freescaleHost root]# passwd
Changing password for user root.
New UNIX password:
BAD PASSWORD: it is based on a dictionary word
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
[root@freescaleHost root]# passwd
Changing password for user root.
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

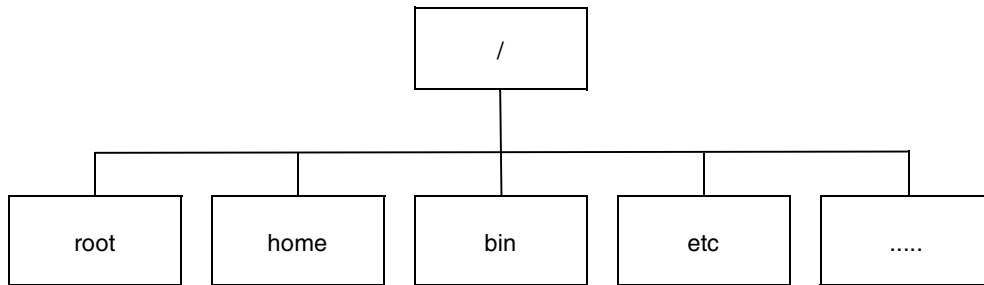
Root can also change user passwords with the `passwd <username>` command

```
[root@freescaleHost root]# passwd guest
Changing password for user guest.
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
[root@freescaleHost root]#
```

## 7.2 Create New Users

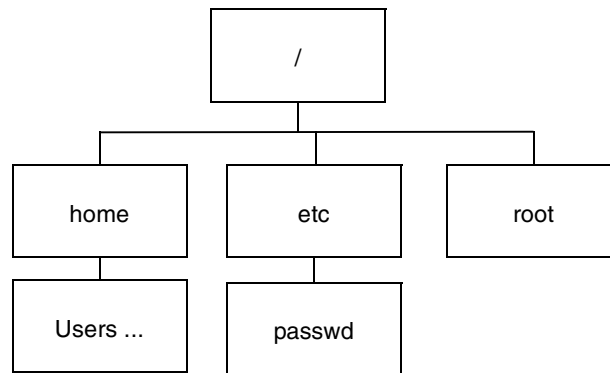
Users exist in a running Linux, a running Linux has a root file system, in the case of Yellow Dog on Pegasos II, it is `/dev/hda6`. Freescale application note AN2738, *Genesi Pegasos II Firmware*, discusses the firmware boot command, which passes the argument, `root=/dev/hda6`. Thus the root file system for YDL Linux is partition 5 (since partitions start at 0, but Linux designates them starting at 1), which is `/dev/hda6`.

The root file system, diagramed in [Figure 9](#), includes all the directories necessary for Linux.



**Figure 9. Root File System**

A user is a member of the club, that is, they can log in and use the Linux resources. The `/etc/passwd` file denotes all users, encrypted passwords, and the initial shell, which is owned by the user, root, but available to read from by any user. One way to see who is able to log onto the system is to read this file, however, a shadow password file can be created to blunt this possibility. Only root can create new users, but each user owns their own home directory in `/home`, however, root has the home directory of `/root`. This structure is shown in [Figure 10](#).



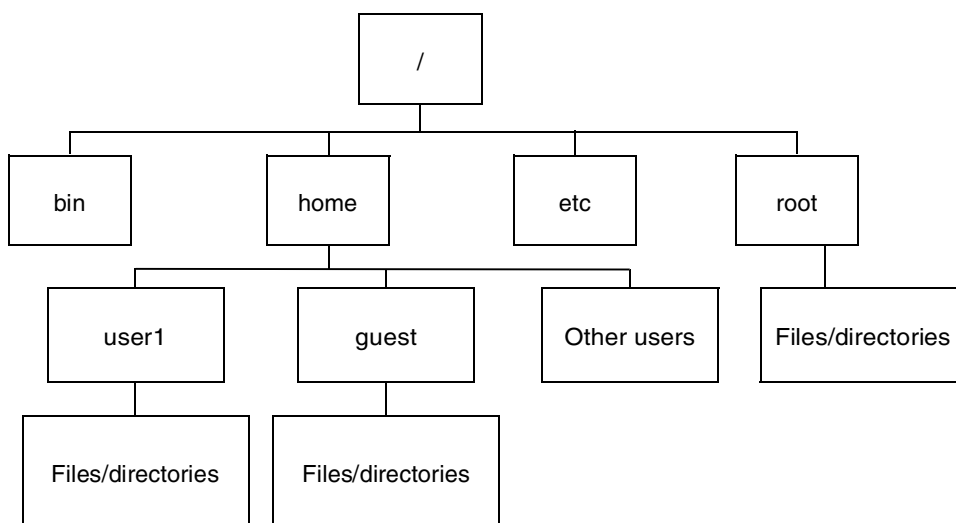
**Figure 10. home, root, and etc Directories.**

As an example for the following users, with these `passwd` file entries:

```

user1:x:501:501::/home/user1:/bin/bash
guest:x:502:502::/home/guest:/bin/bash
user2:x:503:503::/home/user2:/bin/bash
user3:x:514:514::/home/user3:/bin/bash
  
```

Figure 11 shows the arrangement of home directories.



**Figure 11. Home Directories**

Thus when a new user is created, an entry is added to the `/etc/passwd` file. A new directory is created in the `/home` file and an environment is set up, usually consisting of several hidden files, `.bashrc` and other files that begin with the `'.'` character.

Every user has a user name, a password, an environment, a user ID, and a group ID. Looking at the example `passwd` file previously given, `user1` is ID 501 and group 501, `guest` is ID 502 and group 502. Normally, user IDs and group IDs are assigned sequentially. These IDs are used to indicate the permission of files. Permission values are denoted by 3 octal digits, `uuu,ggg,aaa`, where `uuu` is the user set, `ggg` is the group set, and `aaa` is the all other set. Each group of 3 octal digits, represents the permissions, write, read, execute. Thus a permission set of 640 indicates that the user (owner of the file) has a permission set of 5, which is octal 110, indicating read and write, groups set is 4, octal 100 indicating read only, and all other users have 0, indicating no access. Thus users can be grouped together to share certain files.

```

[guest@freescaleHost guest]$ groups
guest
[guest@freescaleHost guest]$
  
```

As a normal user, these hidden files that begin with a `'.'` can be seen with the `ls -a` command.

Now these commands can be used to create new users.

`useradd <user name>`, creates a `/home` directory, sets up the environment, and prompts for an initial password. `YDL4 adduser` is an alias for `useradd`, in other words, `useradd` and `adduser` are identical.

`userdel <user name>` removes all the information for this user.

Here is an example:

```

[root@freescaleHost root]# useradd fae
[root@freescaleHost root]# passwd fae
Changing password for user fae.
  
```

```
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

```
[root@freescaleHost root]# userdel fae
```

Look at the home directory for fae, all the environment files are created.

```
[root@freescaleHost root]# ls -a /home/fae
.  ..  .bash_logout  .bash_profile  .bashrc  .emacs  .gtkrc  .kde
```

## 7.3 Using Sound

The rear speaker is enabled by default, the front earphone connection is not enabled. To enable it, choose menu | sound and video | Kmix. This starts a sound mixer board graphic. Turn the headphone volume switch up to enable it and adjust the other slide switches if necessary. When finished, quit this application and the settings remain. See [Figure 8](#) for a sample of the Kmix application.

To test sound or turn on/off alerts and bells chose menu | control center | sound and multimedia. After the application starts, choose the options of alerts, bells, and other sound features.

## 7.4 Naming Conventions of Devices, /dev/sda1, /dev/hda1, etc.

Most devices on YDL4 Linux are accessed via a special facility know as the /dev facility. It is a directory in root, which is the '/' directory. There are many devices defined here. Use the `ls /dev` command to see these devices:

```
[root@localhost dev]# ls /dev | less
MAKEDEV
X0R
adb
adbmouse
agpgart
amigamouse
amigamouse1
apm_bios
    and many more.
```

The special MAKEDEV is a script that recreates the /dev directory if it becomes corrupted.

All devices are a set of keywords and a number. For example, hard drives on the IDE channel are designated, hdx, where x is a letter designating the channel. Thus hda is the hard drive on IDE channel zero master position, hdb is IDE channel zero slave position, hdc is IDE channel one master position, and so forth. Each partition is then indicated by a number. Thus hda1 is the first partition on this hard drive.

The designation sda indicates an SCSI device. The USB devices are on the SCSI bus and are therefore designated as sda0; unused sda1, the bottom front connector; and sda2 and sda3, the rear connectors.

## 7.5 The Partition Table Editor

The utility, parted, is the partition table editor for the Genesi Pegasos II system and is similar to the earlier utility, fdisk, used on many MAC and X86 Linux systems.

The `q` command quits and `p` command prints the partition info.

```
[root@freescaleHost root]# parted /dev/hda
GNU Parted 1.6.14 with HFS shrink patch 12.5
Copyright (C) 1998 - 2004 Free Software Foundation, Inc.
This program is free software, covered by the GNU General Public License.

This program is distributed in the hope that it will be useful, but WITHOUT ANY
WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A
PARTICULAR PURPOSE. See the GNU General Public License for more details.

Using /dev/hda
(parted) p
Disk geometry for /dev/hda: 0.000-38166.679 megabytes
Disk label type: amiga
Minor      Start      End      Filesystem  Name          Flags
1           3.999     107.973  ext2        boot
2          107.974     611.850  asfs        mos            boot
3          611.851    3615.117  asfs        mos-data
4          3615.117   4618.872  linux-swap  swap          hidden
5          4618.872  25621.743  ext3        debian        hidden
6          25621.743  38166.679  ext3        ydl           hidden
(parted) q
Information: Don't forget to update /etc/fstab, if necessary.

[root@freescaleHost root]#
```

## 7.6 Mounting Partitions

To use any partitions on a hard drive, they must be mounted. The `df` command shows which hard drives are mounted. The `mount` command with no arguments shows all mounted devices.

The command, `mount -r -t <type> /dev/<designator> <directory>` mounts a partition or other device onto an existing directory in the root file system. The `-r` parameter indicates read only, the `-t <type>` indicates the type of file system, and `/dev/<designator>` is the device, and `<directory>` is the mount point.

The beginning of the file system is the root, which is designated as '/'. Thus to move to the root of the top level directory, use the command `cd /`. All directories must start at '/'. Remember that there is also a /root directory, which is the home directory for the root user, but the root of the directory is '/'. In order to mount any new partitions, they must start in some directory in the existing root directory. The default directory /mnt is available for mounting partitions, however, a partition can be mounted on any directory. Once a partition is mounted, then the previous contents of that directory address are no longer viewable; they still exist, but they have been covered up by the mounted partition, also called a mounted volume.

Thus to mount the second partition, which is partition 1 (counting from 0) is the /dev/hda2 on Linux.

`mount -r -t asfs /dev/hda2 /mnt/temp2` mounts the second partition onto the mount point /mnt/temp2 as a file system type asfs.

The sixth partition (counting from zero) is the /dev/hda5 on Linux, which is the Debian partition.

Use either of the following commands:

- `mount -r -t ext3 /dev/hda5 /mnt/temp5`
- `mount -r /dev/hda5 /mnt/temp5`

Designating the type is not necessary for either ext2 and ext3, which are the native Linux partition types.

In both cases, whatever files were on /mnt/temp5 previous to the mount are now covered and un-seeable. Once the `umount` command is performed, the previous /mnt/temp5 will be visible.

### NOTE

The mount point is unmounted, not the partition.

As an example, mount the Debian partition, /dev/hda5, look at the files with `ls`, and view the partition mounts with `df -k`, then dismount the partition from /mnt/temp1.

```
[root@freescaleHost root]# mount /dev/hda5 /mnt/hd
[root@freescaleHost root]# cd /mnt/hd
[root@freescaleHost hd]# ls
bin      etc      lost+found  proc  tftpboot  var
boot     floppy  media      root  tmp       vmlinuz
cdrom    home    mnt        sbin  usb       vmlinuz.old
cdrom0   initrd  opt        srv   usb4      ZDLPegasos2.png
dev      lib     pegasos    sys   usr

[root@freescaleHost hd]#
[root@freescaleHost hd]# df -k
Filesystem          1K-blocks      Used Available Use% Mounted on
/dev/hda6            12643096    2301832   9698964   20% /
none                 127720         0    127720    0% /dev/shm
/dev/hda5            21170868    5412320  15758548   26% /mnt/hd

[root@freescaleHost root]# umount /mnt/hd
[root@freescaleHost root]#
```

## 7.7 Accessing the Boot Partition 0

The boot partition 0 is the first partition on the hard drive, which as described in Freescale application note AN2736, *Genesi Pegasos II Boot Options*, is an affs, amega fast file system. After applying the Debian upgrade, see AN2801, *Upgrade or Restore Firmware and Hard Drive on Genesi Pegasos II*, this partition will be a standard ext3 Linux partition. By mounting it from Linux, all the files are accessible. Assuming that there is a /mnt/temp1 directory, or by creating one, mount the partition with one of the commands listed below.

### NOTE

The original release of the Genesi Pegasos II computer designated the first (zero) partition to be an affs, amega fast file system. Subsequent and upgraded releases now designate the first (zero) partition as an ext3, standard Linux partition.

For the original Genesi Pegasos II release use this command:

```
mount -r -t affs /dev/hda1 /mnt/temp1
```

where -r indicates mount in read only mode, so this partition cannot be accidentally written into, and -t indicates file system type, in this case, affs, amiga fast file system.

For subsequent and upgraded Genesi Pegasos II releases use this command:

```
mount -r /dev/hda1 /mnt/temp1
```

where -r indicates mount in read only mode, so this partition cannot be accidentally written into. In this case, since the partition type is ext3, the -t parameter is not needed.

Change to that directory with the following command: `cd /mnt/temp1`

Use the command `ls` to see the files on this partition

```
[root@freescaleHost root]# su -
Password:
[root@freescaleHost root]# mount -r -t affs /dev/hda1 /mnt/temp1
Subsequent upgraded systems use this mount command:
[root@freescaleHost root]# mount -r /dev/hda1 /mnt/temp1

[root@freescaleHost root]# cd /mnt/temp1
[root@freescaleHost temp1]# ls
boot.img          menu              vmlinuz-2.4.24-pegasos  vmlinuz-2.6.4-pegasos
bootpeg2.img     update-2004.04.05 vmlinuz-2.4.25-powerpc
[root@localhost temp1]#
```

Table 1 shows the use for these files:

**Table 1. Description of Files in the /boot partition 0 (/dev/hda1)**

Name	Type	Source	Use
boot.img	bootpegasos2ram.img	Amiga	ROM Image
bootpeg2.img	bootpegasos2ram.img	Amiga	ROM image
menu	Forth type file	Open Firmware	Boot choice program
update-2004.04.05	PowerPC™ executable	Unknown	Unknown
vmlinuz-2.4.24-pegasos	PowerPC executable	Linux	2.4.24 kernel for debian
vmlinuz-2.4.25-powerpc	PowerPC executable	Linux	2.4.25 kernel for yellow dog
vmlinuz-2.6.4-pegasos	PowerPC executable	Linux	2.6.4 kernel for debian

The `umount /mnt/temp1` command unmounts the partition.

## 7.8 Accessing the MorphOS Partitions

Create two directories on /mnt named temp2 and temp3 using these commands.

```
mkdir /mnt/temp2
```

```
mkdir /mnt/temp3
```

### NOTE

Unlike the Debian kernels, both affs and asfs file system types are available on YDL with this kernel.

Mount the two MorphOS partitions using these commands.

```
mount -r -t asfs /dev/hda2 /mnt/temp2, where asfs indicates amiga smart file system.
```

```
mount -r -t asfs /dev/hda3 /mnt/temp3
```

Use the `ls` command, to see the files on these partitions.

### NOTE

These files can be read and edited. Specifically, the pdf files referenced in Freescale application note AN2738, *Genesi Pegasos II Firmware* and *SmartFirmware User Manual* are available on the MorphOS partition.

To access the files now on these two partitions use these commands to see the /dev/hda2 partition files.

```
[root@freescaleHost root]# mkdir /mnt/temp2
[root@freescaleHost root]# mount -r -t asfs /dev/hda2 /mnt/temp2
[root@freescaleHost root]# mkdir /mnt/temp3
[root@freescaleHost root]# mount -r /dev/hda3 /mnt/temp3
```

## Root User

Some of the files are listed here:

```
[root@freescaleHost root]# ls /mnt/temp2 | less
Apps
Apps.info
Barfly
Barfly.info
C
Classes
Classes.info
Devs
Devs.info
Docs
Docs.info
Fonts
```

Only the first few files are shown above.

The pdf files in the Docs directory display with the command `ls Docs` as in the example below:

```
[root@freescaleHost root]# ls /mnt/temp2/Docs | less
Audio.pdf
Audio.pdf.info
FrontPanel.pdf
FrontPanel.pdf.info
ModeEdit.pdf
ModeEdit.pdf.info
MorphOS-dev.pdf
MorphOS-dev.pdf.info
PegasosFirmware.txt
PegasosFirmware.txt.info
PegasosSpecs.pdf
PegasosSpecs.pdf.info
SFUserManual.pdf
SFUserManual.pdf.info
SmartFirmware.pdf
SmartFirmware.pdf.info
```

Finally, list the files on /dev/hda3 with these commands:

```
[root@localhost root]# ls /mnt/temp3 | less
AmiNetRadio
AmiNetRadio.info
AmiNetRadio.readme
Demos
Demos.info
Developer
Developer.info
Docs.info
Dopus5
Dopus5.info
Games
Games.info
Icons
```

Only the first few files are shown above.

## 7.9 Printers

The print server and client are the Common Unix Printing System Architecture (CUPS) facility.

### 7.9.1 Installing a Printer.

Open the Mozilla browser. In the browser window type `http://localhost:631`, then enter. The printer daemon uses port 631.

#### NOTE

YDL4 does not appear to be as particular about access to port 631 as is Debian. However, if and only if there is a problem, then the user may want to complete the steps in the rest of this note.

If an error message appears because the localhost will not connect, the message may say something about the server being busy or down. In this case, there may be a problem with the /etc/local/hosts file. The localhost IP and/or name may be incorrect.

The host name is delineated in two special files:

- /etc/hosts
- /etc/sysconfig/network

## Root User

The `HOSTNAME` in `/etc/sysconfig/network` must correspond to the host name listed in `/etc/hosts`. Port 631 is on the local host.

`/etc/sysconfig/network`

```
NETWORKING=yes
```

```
HOSTNAME=<hostname>
```

`/etc/hosts`

```
127.0.0.1 <hostname>.localdomain <hostname>
```

/ Optionally, other host names listed in this file are used for remote access.

An example of the `/etc/hosts` and `/etc/sysconfig/network` file for the pegasos machines running YDL4 is shown below.

```
[root@localhost root]# cat /etc/hosts
```

```
# Do not remove the following line, or various programs
```

```
# that require network functionality will fail.
```

```
127.0.0.1      localhost.localdomain localhost
```

```
[root@localhost root]# cat /etc/sysconfig/network
```

```
NETWORKING=yes
```

```
HOSTNAME=localhost.localdomain
```

- Choose manage printers.
- Look at available printers.
- Choose add a printer.
- Use root user and password.
- Enter the name, location, and description (for example, cannon400-bw in room b2455).
- Enter device (for example, AppSocket/HP jetDirect).
- Choose the network protocol (for example, LaserJet Series cups v1.1).
- Specify device URI (for example, socket://IP:9100, where IP is a valid IP address, or alternatively, socket://10.82.119.224:9100).
- Specify the driver (such as Cannon400, HP 4SI/4SI MX driver or Raw Print Queue).

## 7.9.2 Other Operations with a Printer

Once the manage a printer window displays, choose to print a test page, delete a printer, or other tasks associated with printers.

## 7.9.3 Using a Printer

The `lp <file>` command sends a file to a printer.

The `lpstat -t` command displays the status of the printer.

The `enscript` command formats a file for fancy printing, for example, more than one page per physical page, rotated, and other things.

To try the printer functions, create some file, use the any editor, and call the file test.prt.

The command `lp test.prt` sends it to the default printer.

The command `lp -d <printer name> test.prt` sends it to a specific printer instead of the default printer.

Use the following commands to create and print a post script file:

`man enscript | col -b > j` captures the man page for enscript and formats it for printing and stores the results in the file, j.

`enscript -c -2r -o out.ps j` formats the man page for a post script file, printing 2 pages per physical page, rotated.

`lp out.ps` prints it to a post script printer.

`lpstat -a` shows the status of the print job.

## 7.9.4 Using the Printer Icon

The printer icon will start a GUI printer configuration manager.

It asks the same questions as the Mozilla browser for `http://localhost:631`, but in a different order.

## 7.9.5 The CUPS Command

One can query, stop, and start the CUPS daemon as shown below.

```
[guest@freescaleHost guest]$ /etc/init.d/cups status
cupsd (pid 1558) is running...
[guest@freescaleHost guest]$ /etc/init.d/cups stat
Usage: cups {start|stop|restart|condrestart|reload|status}
[guest@freescaleHost guest]$
```

## 7.10 Specifying the Keyboard, Mouse, and Video Characteristics

The `/etc/X11/XF86Config` file controls the video display characteristics for the graphic display monitor. It does not affect the monitor display during boot up or while using the single text screen.

### NOTE

Debian Linux uses the `XF86Config-4` file for monitor and mouse control, YDL4 uses the `XF86Config` file for monitor and mouse control, do not confuse them.

Edit the `XF86Config` file to make changes. In this release, there is no need to change the `XF86Config` file.

## 7.11 Networking

### 7.11.1 Manual Method

Managing a network on YDL4 Linux consists of using a few commands and defining two configuration files, `/etc/sysconfig/network` and `/etc/sysconfig/network-scripts/ifcfg-eth0`.

## Root User

`ifcfg-eth<n>` indicates what ethernet connections and associated IP addresses are assigned to this local computer. Each ethernet connection has a name of `eth<n>`, where *n* is the ethernet number. `eth0` is assigned to the ethernet port physically located farthest from the mouse port and next to the video port. See Freescale application note AN2666, *Genesi Pegasos II Setup*.

`lo` is the loop back port. If no IP is assigned to any ethernet port, then `ifconfig` only shows the `lo` port.

Network information can be found from the `ifconfig` command. As a non-root user, use the absolute path for the command, `/sbin/ifconfig`.

```
[root@freescaleHost network-scripts]# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0B:2F:4E:1B:2B
          inet addr:10.82.125.179  Bcast:10.82.127.255  Mask:255.255.252.0
          inet6 addr: fe80::20b:2fff:fe4e:1b2b/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:166360 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2622 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:17026064 (16.2 Mb)  TX bytes:817924 (798.7 Kb)
          Interrupt:9 Base address:0x800

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:16436  Metric:1
          RX packets:134055 errors:0 dropped:0 overruns:0 frame:0
          TX packets:134055 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:10329172 (9.8 Mb)  TX bytes:10329172 (9.8 Mb)
```

The file `/etc/sysconfig/network` is the file that specifies networking: either on, yes; or off, no.

```
[root@freescaleHost sysconfig]# cat network
NETWORKING=yes
HOSTNAME=freescaleHost
[root@freescaleHost sysconfig]#
```

There are two types of ethernet methods for obtaining an IP address.

1. DHCP, dynamically attain an IP from a DHCP server
2. static, statically assign an IP address

The `/etc/sysconfig/network-scripts/ifcfg-eth0` file can specify which method to use. The file shown below uses the DHCP method.

```
[root@freescaleHost network-scripts]# cat ifcfg-eth0
DEVICE=eth0
BOOTPROTO=dhcp
ONBOOT=yes
TYPE=Ethernet
[root@freescaleHost network-scripts]#
```

The command, `ifup eth0`, starts the `eth0` network.

Correspondingly, `ifdown eth0`, shuts the `eth0` network down.

### 7.11.2 GUI Method

By navigating the main menu through menu | system settings | network, use a GUI to set up these files by answering just a few questions. Using the Devices, Hardware, DNS, and HOSTS tabs to set the networking values which will be placed in the appropriate files.

#### NOTE

Go to the DNS tab to set the host name.

### 7.11.3 Changing the Host Name

The `/etc/network` file is also used to define the host name, the current setting is `localhost`. This name is printed on each prompt line. Change this name by editing this file.

The networking control files begin in the `/etc/sysconfig` directory.

```
[root@localhost root]# cat /etc/network
NETWORKING=yes
HOSTNAME=localhost
```

Change this to something else, such as `freescaleHost` by using an editor such as `vi` or `emacs`, resulting in this file content.

```
[root@freescaleHost root]# cat /etc/network
NETWORKING=yes
HOSTNAME=freescaleHost
```

#### NOTE

The prompt host name portion has changed.

## 7.12 Managing Packages, RPM, Red Hat Package Manager

System programs managed by the kernel and invoked to perform services system wide are managed by the Red Hat Package manager.

## Root User

Packages can be obtained from the YDL web site, <http://www.yellowdoglinux.com>; YDL community web site, <http://www.yellowdoglinux.org/>; or from the Yellow Dog Linux distribution CD.

On some distributions, a subset of available packages are available on the hard drive at `/usr/src/rpm`. On this system, these are empty.

RPM is a powerful Package Manager, which can be used to build, install, query, verify, update, and erase individual software packages. A package consists of an archive of files and meta-data used to install and erase the archive files. The meta-data includes helper scripts, file attributes, and descriptive information about the package. Packages come in two varieties: binary packages, used to encapsulate software to be installed, and source packages, containing the source code and recipe necessary to produce binary packages.

More information is available through the man and info systems.

```
man rpm
```

```
info rpm
```

## 7.12.1 Installing the Telnet and FTP Daemons.

### 7.12.1.1 FTP and Telnet Daemon Packages

These packages can be downloaded from the YDL web site with proper access authorization. RPMs have the form, `name.packageNumber.rpm`.

Once obtained they can be queried with the command:

```
rpm -q -l name.packageNumber.rpm
```

 and installed with the command:

```
rpm -i name.packageNubmer.rpm.
```

### 7.12.1.2 FTP Daemon

The FTP daemon is called `vsftpd`.

1. Download the `vsftpd` RPM from ydl4 site (assuming you have access)
2. Install it with this command:  

```
rpm -i vsftpd-<packageNumber>.rpm
```
3. Start it with this command:  

```
service vsftpd start
```
4. Verify its status with this command:  

```
service vsftpd status
```
5. Look at all services with either of these methods:
  - Using this command:  

```
service --status-all
```
  - Using a GUI that is started through the menu | system settings | server | services

### 7.12.1.3 Telnet Daemon

Using telnet is not recommended, instead use ssh, secure shell. The telnet daemon is called telnet-services

1. Download the telnet-services from the ydl4 site.
2. Install it with this command:  

```
rpm -i telnet-services.<packageName>.rpm
```
3. Enable it by editing the /etc/xinetd.d/telnet text file
4. Change the 'Disable yes' line to 'Disable no'

## 8 References

The following Freescale documents describe the various applications of the Genesi Pegasos II system.

- AN2666, *Genesi Pegasos II Setup*
- AN2736, *Genesi Pegasos II Boot Options*
- AN2738, *Genesi Pegasos II Firmware*
- AN2739, *Genesi Pegasos II Debian Linux*
- AN2751, *Genesi Pegasos II Yellow Dog Linux 3*
- AN2743, *Software Analysis on Genesi Pegasos II Using PMON and AltiVec*
- AN2744, *PMON Module—An Example of Writing Kernel Module Code for Debian 2.6 on Genesi Pegasos II*
- AN2748, *Genesi Pegasos II Kernel and NFS facility*
- AN2801, *Upgrade or Restore Firmware and Hard Drive on Genesi Pegasos II*
- AN2749, *Genesi Pegasos II Using sim\_G4plus*
- AN2750, *Genesi Pegasos II Analysis and Optimization of Code with sim\_G4plus*

For assistance or answers to any question on the information that is presented in this document, send an e-mail to risc10@freescale.com.

## 9 Document Revision History

Table 2 provides a revision history for this application note.

**Table 2. Document Revision History**

Revision	Date	Substantive Change(s)
1	03/04/05	Added note to <a href="#">Section 7.9.1, "Installing a Printer</a> . Minor editing.
0	10/28/04	Initial release.

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AN2802  
Rev. 1  
03/2005