Auto Install

for

Mandrake Linux

9.0.1

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Introduction

Summary

The Mandrake Linux Distribution provides a facility, DrakX, which allows for the automated installation on to computers that you use or manage.

The DrakX graphic installer has the capability of being used in the both interactive and automated modes. This document deals specifically with it's automated capability.

Automated Installation is intended for situations where the same 'Install' set is to be placed on multiple computers. This can be a substantial time saver for anyone. More importantly, the automation means that you do not have to sit in front of each computer filling in the blanks, picking this and that and hoping that you remember the selections you chose the previous time.

As a side benefit, it can be used as an emergency backup to re-install the same packages and basic configuration data on a computer that failed, lost everything and your normal back-ups can not be used to restore the computer.

I am sure that there are more reasons to use the automated features, but that's your experiment. Me, I was just tired of having to remember what I installed the last time. Also, this document provides me with the opportunity to give back to the Linux community something in kind.

The following sections will provide an overview of the process, details regarding the Install disks and the configuration files which drive the installation process.

Copyrights, Trademarks, Credits

New Versions

This document has been revised to conform with the capabilities of the 9.0 release.

You can find this document on the Mandrake Linux web site at:

http://www.linux-mandrake.com/drakx (then look for the 'kickstart' link)

or:

For current HTML and PDF versions as I generate them or, for older versions and my small collection of related stuff you can visit:

http://members.shaw.ca/mandrake/

If you find an error or some feature I missed you can contact me by email at **david@eastcott.net**

New / Changes in this version

| 9.0.1 | 2002-09-08 | Adjust examples to reflect 9.0 changes. Modified: bootloader - revert rename of 'entires', it still renames the new ones as old_..., keyboard - added GRP_TOGGLE, services - added dm to System list. |
| 9.0.0 | 2002-08-18 | Initial adjustments for 9.0; syslinux.cfg uses parameter aliases by default; authentication: winbind added for PDC support, bootloader: quiet option is default and the 'linux' section name is used to engage bootsplash graphic startup and the rename of 'entries' has changed, excludedocs: added note, keyboard: structure has changed with new keywords, manualFstab: smbfs declarations with user and password behaviour changed, miscellaneous: CLEAN_TMP deleted, netc: WINDOMAIN added, nomouseprobe: removed reference to kudzu, partitions: support for RAID and LVM added, postInstall/PostInstallNonRooted: corrected syntax, services: now output to the auto_inst.cfg file, users: icon names have changed, ; and of course the usual corrections and cleanups in other areas of the document. |

Installation Methods

Overview

Installation of the Mandrake Linux distribution on a computer(s) depends on a number of things:

* Environment; is the computer connected to a network, are you trying to use the computer for more than one Operating System (Multi-Boot),

* Equipment; does the computer contain conventional hardware, or are there special considerations such as USB or PCMCIA devices

* Preferences; what works best for you or your situation,

MandrakeSoft has gone to great lengths to simplify the installation process of their distribution on a large variety of computers, yet provide you a choice of approaches.

The Mandrake Linux distribution provides support for three primary installation methods (sources):

    via CD-ROM
    via Hard Disk with Linux, Windows or ReiserFS filesystems
    via Network based Services such as NFS, FTP or HTTP

In addition, there are a few variations that provide support for specific equipment:

    via PCMCIA devices
    via USB network and CD-ROM/RW devices
    via Other (Non-standard hardware)

And finally, if none of the above work with your hardware, there are a series of Alternatives which utilize different kernel versions for each of the above.

If you have time, read the file on the first Installation CD called `INSTALL.txt` and the one in the `images` directory called `README` for a bit more detail.

CD-ROM based installation is portable. With a floppy diskette and the CD-ROM set, you can install the distribution, anywhere, on any computer that has a CD-ROM drive and a floppy disk drive.

Hard Disk based installation is more for those of you which have multiple disk drives installed in the target computer, one to hold the distribution file set and a second which will contain the installed system. This would most likely be used in situations where the computer dual boots Linux and other OS's. It is not very portable, but it does afford one the ability to install Linux without disturbing the existing OS.

Network based installation is where the flexibility of the Automated Installation process really shines. One computer holds the distribution file set, all the other computers only require network based access to the file set. Now I can just carry a single disk about, insert it in the desired computer, push reset and go for coffee.

With the three options, NFS, FTP and HTTP, you can actually install files from one computer to another, anywhere in the world. However, there are performance and reliability issues which you will have to be prepared to deal with when accessing servers outside your own local world.

There are three installation modes which may be employed for each of the methods:

Manual - this mode is where you select every thing interactively. Most people use this method when they are installing the distribution on their personal workstation computer.

Fully - this mode is where all selections are predetermined, the installation process is controlled,
Automated without manual intervention, by the contents of a simple configuration file and, progress is indicated by simple text messages. It is ideally suited for installations on identical computers. Although creative individuals using the 'postInstall' features can overcome most obstacles.

Replay - this mode is very similar to the fully automated mode, except that progress is indicated via a graphical presentation and, the configuration file provides you with the ability to manually intervene during certain steps. You will love this one for situations where the computers are virtually identical, but you would normally have created a custom install disk to deal with certain hardware peculiarities or, you have a need to perform customization with each installation.

As I indicated earlier, you are going to have to make some choices that fit your situation and environment. The beauty of all these Choices is that you are not stuck doing it one way....

Getting Started

The simplest approach is to perform a Manual Install, then generate the desired Auto Install diskette. However, before you get started, please check the Errata page on the Mandrake web site (www.linux-mandrake.com) since there may be information there that applies to your equipment. The following are a brief set of steps to get you started.

1. decide if you are going to perform a CD-ROM, Hard Disk or Network based install. If you are going to do a CD-ROM install, then skip the next step.

2. copy the contents of all three CD-ROMs, or obtain the file set via ftp and:
   a) For a Hard Disk, make sure that the Mandrake Linux file set is present on one of the computers hard disks (partitions). Remember to retain the CD's directory hierarchy.
   b) For network services, make sure the Mandrake Linux file set is accessible on the server you want to use. (see section *Setting up a Simple NFS Server*). Remember to retain the CD's directory hierarchy.

3. Create a boot floppy disk using the appropriate image file:

   `images/cdrom.img` for CD-ROM based install (only if your computer can not boot from CD-ROM).
   `images/hd.img` for Hard Disk based install
   `images/network.img` for Network Services based install

   See the `images/README` document for instructions on how to create the diskette. Also you will find additional / alternate images to use which may resolve situations for your particular equipment setup.

4. Boot the computer and perform the installation manually.

5. JUST before re-booting, select **'Advanced'**, then select **'Generate an auto install floppy'**, then pick either **'Replay'** or **'Automated'**. This will create the needed diskette containing all the basic files you will need for the next installation.

6. Review the contents of the diskette and adjust as necessary before using. See the remainder of this document.

7. Install any where, any time and as often as you like, or until the coffee runs out.

There are a number of different and innovative approaches that you could use rather than the simplistic one above, but then that your job, eh? However, for those of you who are a bit braver or, just want to do it your self then you

should see the section *Scratch Built Auto Install Diskette* for a basic approach.

For those of you who were so excited about installing and test driving the new Mandrake Linux release that you forgot to **'Generate an auto install floppy'**, no problem. Mandrake Linux has a tool available, as part of the `drakconf` program (Mandrake Control Center), that will allow you to generate an Auto Install disk at any time after the initial installation, see the section *Replay Install* for details.

Contents of the Install Diskette

After completing the **'Generate an auto install floppy'** step, you should have a diskette containing the following files:

advanced.msg

> This file contains some text that describes a number of advanced options. You could customize this.

auto_inst.cfg

> This file contains your selections. See the section *Anatomy of the 'auto_inst.cfg' File* for details. In case you were wondering, you will also find this file in the `/root/drakx` directory with the name `auto_inst.cfg.pl`.

boot.msg

> This file contains a graphic image that appears as soon as you boot from the diskette. You could customize this.

help.msg

> This file contains some text regarding the start up options and keys, which you can customize too. It is optional and may not be present on your generated diskette (space limitations).

ldlinux.sys

> This is what booted (boot loader). Don't mess with it.

cdrom.rdz or hd.rdz or network.rdz

> The file name is dependent on the Method you used to perform the manual install. It contains stage 1 of DrakX and other things which are needed for the automated install.

syslinux.cfg

> This file contains information that controls the operation of the 'ldlinux' boot loader. You may have to modify this. See the section *Anatomy of the 'syslinux.cfg' File* for details.

vmlinuz

> This is the compressed Linux kernel image file. Don't mess with this one either.

The contents of the two files, `syslinux.cfg` and `auto_inst.cfg`, are what the bulk of this document is about, so with out further a due....

Anatomy of the 'syslinux.cfg' File

SYSLINUX is a light weight boot loader used to start Stage 1 of the Mandrake Linux installation. The file, `'syslinux.cfg'`, is used to specify what the boot loader is suppose to do and what options, if any, are available to an installer (you) at boot time. In addition, SYSLINUX passes parameters to the linux kernel when it loads and starts the kernel; a few of the parameters are used by the kernel and some are passed on to the Stage 1 program. Some of these parameters are specific to an installation method (as is the initial ram disk contained on the floppy).

Consequently, the Auto Install diskette that you created (at the end of your initial installation or from the Mandrake Control Center on a running system) is set up to match the installation method that was originally used.   If you are planning to install multiple computers the same way, then you are all set.

However, if you intend to change the installation method, you will have to create your own Auto Install diskette (see the section ***Scratch Built Auto Install Diskette***). The reason for this is due to the flexibility needed to support a variety of installation methods and options. You just can not get it all on one diskette. This is not as bad as you may think, since the most important file, ['auto_inst.cfg'](), is independent of the installation method.

The following are going review the contents of the `'syslinux.cfg'` file as used by MandrakeSoft. For an in depth description of the capabilities of SYSLINUX see the web site: http://syslinux.zytor.com.

General

The contents of the `'syslinux.cfg'` file are a set of directives which control the actions of the boot loader. These directives can be divided into two groups; global directives and section specific directives. The global ones control the operation of the boot loader, whereas the section directives are only effective when the installer (you) selects them (selection is accomplished by typing the name of the sections' label in response to the boot prompt).

The following is a fragment extracted from a `'syslinux.cfg'` file used with a Network Services:NFS install.

```
default linux
prompt 1
timeout 50
display boot.msg
F1 help.msg
F2 advanced.msg
F3 boot.msg
label linux
  kernel vmlinuz
  append kickstart=floppy automatic=method:nfs,
    server:fileserver,directory:/mnt/mass/Mandrake/mandrake/9.0,
    network:static,ip:192.168.5.202,netmask:255.255.255.0,
    gateway:192.168.5.253,dns:192.168.5.253,
    ramdisk_size=32000 initrd=network.rdz root=/dev/ram3 vga=788
```

NOTE: All the text starting with 'append' through '788' are on **ONE** line.

The global directives usually occur at the beginning of the file and specify things like which section is selected by default, how long to wait for the installer to enter a section label, etc.

The section specific directives are identified by a line containing `label <name>` and followed by two lines which specify the `kernel` image to load and, what parameters (`append`) to pass to the kernel (and the Stage 1 program). The `<name>` parameter is the value that an installer would type in at the boot prompt to select a specific section other than the `default` one.

Directives

The following details the purpose of the directives that you can use in the `'syslinux.cfg'` file. You should check out the Syslinux web page for more information regarding its capabilities and the options that are available to you. MandrakeSoft only uses a subset because they are generating "general purpose" files. You, on the other hand, are not as limited. Besides, if you want flashy color or graphics then you will find the pertinent information there.

Global Directives

The Global Directives are not method or mode specific, rather they affect all methods/modes the same.

`default linux` - if the user presses ENTER or the optional `timeout` expires, this tells the loader to locate the section `label linux` and begin booting the kernel as defined by the lines after the label.

`prompt 1` - this tells the loader to prompt the user to enter an alternate label rather than just using the `default` one. You can have several different boot scenarios in this file, which is the reason that the generated file has so much in it. This parameter is optional, removing it means the installer will not have the ability to select an alternate boot section.

`timeout 50` - this tells the loader to give the user 5 seconds to begin entering another label before using the `default` one and continuing on with the boot/install process. This parameter is optional and is not necessary if `prompt` is not used.

`display boot.msg` - this tells the loader to display the contents of the specified file before presenting a prompt. This is optional, but it may be a good idea to remind the installer what is being installed.

`F1 help.msg` - if the user presses the F1 key, then display the specified file's contents. This parameter and associated file are optional.

`F2 advanced.msg` - if the user presses the F2 key, then display the specified file's contents. This parameter and associated file are optional.

`F3 boot.msg` - if the user presses the F3 key, then display the specified file's contents. This parameter and associated file are optional.

`label linux` - this names a section that defines specific information that the loader uses for booting Stage 1 of the installation process. The value associated with any section label can be typed by the user at the prompt to instruct the loader to find the specific section, rather than use the one named by the `default` directive.

Section Directives

Section directives are preceded with the `label` directive. In this case, a section contains a `kernel` and an `append` directive (see the section ***Advanced Features*** for special options).

`kernel vmlinuz` - this is the name of the file containing the compressed kernel image to load and start.

`append=...` - this is a list of space separated parameters passed to the kernel when the loader starts it.

If you look in the file that was generated, you will find a number of sections (choices) that an installer could select. Each has a different effect or purpose which the following table briefly describes:

vgalo, vgahi, vga16	Are just different resolutions for graphic installs
text	Is a text based install
expert	Has the advantage of disabling Automatic Hardware Detection
rescue	Allows you to repair an already installed system using the CD-ROM.
patch	Allows you to install a patch from a floppy diskette.

'append' Parameters

NOTE: You are going to get caught with this one so I will tell you now; the kernel will only pass a **maximum** of 256 characters from the 'append' line through to the Stage 1 installer, so be careful.

DrakX supports a substantial number of parameters that can be used to control its operation. This document will describe just the ones that affect the Automated Install.

General Parameters

The following are common and not related to a specific method or mode:

kickstart=floppy - required, do not change. This actually causes the installer to look on the floppy diskette for the 'auto_inst.cfg' file.

An interesting tidbit; if you omit this option and set the automatic= option, you can do GUI based installs without having to enter the method information each time. Of course the auto_inst.cfg file, if present, is ignored.

ramdisk_size=32000 - required, do not change.

root=/dev/ram3 - required, do not change.

vga=788 - required, can be changed. Generally, this parameter affects the GUI installation, but it does have interesting effects when used in the Automated install. If you want details, then check out the kernel documents: Documentation/svga.txt and Documentation/i386/boot.txt

text	80x25 text
vga16	80x25 text, 640 x 480 GUI
785	80x30 text, 640 x 480 GUI (frame buffer)
788	100x37 text, 800 x 600 GUI (frame buffer)
791	130x48 text, 1024 x 768 GUI (frame buffer)
794	158x64 text, 1280 x 1024 GUI (frame buffer)

Others you can play with:

```
0x0f01      80x50 text
0x0f02      80x43 text
0x0f03      80x28 text
0x0f05      80x30 text
0x0f06      80x34 text
0x0f07      80x60 text
0x0122      100x30 text
Ask         prompt for desired video characteristics to use.
            You can use this to determine the selections
            actually available for your video card.
```

`initrd=network.rdz` - required, changes based on the type of method being used:

```
cdrom.rdz       for CD-ROM
hd.rdz          for Hard Disk
network.rdz     for Network Services
usb.rdz         for Network Services or CD-ROM/RW accessed via a
                USB device
pcmcia.rdz      for PCMCIA devices
```

Method Parameters

The `'automatic'` parameter is used to select the install method type (cdrom, disk, nfs, ftp or http) and to specify additional parameters as necessary. Any additional parameters are appended after the method type, with each being separated by a COMMA (,) rather than a SPACE. It uses the following general form:

```
automatic=method:<type>,<parameter>:<value>,
```

The following are a summary of the method parameters grouped by method type along with any special notes. The additional parameters are simply concatenated together to form a single comma separated string.

CD-ROM

```
automatic=method:cdrom,
```

NOTE: for those of you that are using CD-ROMs as the source media, the option interactive (see the section *Anatomy of the 'auto_inst.cfg' File*) is especially pertinent to package installation from more than the first CD.

`domain:eastcott.net,` - allows you to preset the domain name for the computer.

`hostname:linux1,` - allows you to set the host name for the computer.

Disk

```
automatic=method:disk,
```

> `directory:Mandrake/mandrake/9.0,` - root directory where the files are found or, it may also specify the location and name of an ISO image (this image must be the 'first' CD's ISO image).
>
> > **NOTE:** If you specify an ISO file name, then you will be limited to installing ONLY those packages which are available in that ISO image. You will not be able to install packages from the other ISO images which form the complete set.
>
> `disk:hda,` - disk drive containing the directory or ISO image.
>
> `domain:eastcott.net,` - allows you to preset the domain name for the computer.
>
> `hostname:linux1,` - allows you to set the host name for the computer.
>
> `partition:hda6,` - partition name of specified disk drive containing the directory or ISO image.

NFS Network Services

```
automatic=method:nfs,
```

> `interface:eth1,` - specifies the ethernet interface to use (eg. `eth0`, `eth5`, etc.). It is only required when there is more than 1 ethernet interface. This feature can only be used if DrakX can auto detect ALL the ethernet cards.
>
> > The trick when installing with multiple network card is convincing the computer that the ethX you specify is the same one it thinks is ethX. If you do not use the `interface` parameter, DrakX will ask you which one you want and then it will prompt you for the relevant information based on your specified method.
>
> `server:fileserver,` - machine where the installable files are located, can be an IP or a host.domain (or host).
>
> `directory:/mnt/mass/Mandrake/mandrake/9.0,` - root directory where the files are found.
>
> `network:static,` - means you are going to specify the necessary IP information;
>
> > `ip:192.168.5.202,` - what is it for this machine.
> >
> > `netmask:255.255.255.0,` - what is it's netmask. This is optional and is only required if you are using a non-standard netmask.
> >
> > `gateway:192.168.5.253,` - what is the gateway's IP. This is optional and should only be included if the specified `fileserver` is not located on the same subnet.
> >
> > `dns:192.168.5.253,` - what is the IP for the DNS server. Up to three DNS servers can be specified, each IP is separated by a comma. This is optional and should not be included if you do not have or use a DNS server. If it is not included, then the `server:` option must contain an IP address instead of a name.
>
> or
>
> `network:dhcp,` - means the IP, netmask, gateway and dns parameters are provided by the dhcp server. Depending on how the dhcp and DNS servers are configured, the host name and domain name may also be supplied.

or

network:adsl, - means the IP, netmask, gateway and dns parameters are provided by the ADSL service provider when you connect.

adsluser:my_adsl_name, - user name, as required, to login to your ADSL service provider.

adslpass:my_password, - password, as required, to login to your ADSL service provider.

NOTE: If you have selected network:adsl, be aware that ONLY the PPPoE protocol is currently supported.

domain:eastcott.net, - optionally allows you to preset the domain name for the computer. This parameter is only required if the stage 1 installer can not obtain the domain name from your DNS Server for the IP address that you specified.

hostname:linux1, - optionally allows you to set the host name for the computer. This parameter is only required if the stage 1 installer can not obtain the host name from your DNS Server for the IP address that you specified.

FTP Network Services

automatic=method:ftp,

interface:eth1, - specifies the ethernet interface to use (eg. eth0, eth5, etc.). It is only required when there is more than 1 ethernet interface. This feature can only be used if DrakX can auto detect ALL the ethernet cards.

The trick when installing with multiple network card is convincing the computer that the ethx you specify is the same one it thinks is ethx. If you do not use the interface parameter, DrakX will ask you which one you want and then it will prompt you for the relevant information based on your specified method.

server:fileserver, - machine where the installable files are located, can be an IP or a host.domain (or host).

directory:/mnt/mass/Mandrake/mandrake/9.0, - root directory where the files are found.

network:static, - means you are going to specify the necessary IP information;

ip:192.168.5.202, - what is it for this machine.

netmask:255.255.255.0, - what is it's netmask. This is optional and is only required if you are using a non-standard netmask.

gateway:192.168.5.253, - what is the gateway's IP. This is optional and should only be included if the specified fileserver is not located on the same subnet.

dns:192.168.5.253, - what is the IP for the DNS server. Up to three DNS servers can be specified, each IP is separated by a comma. This is optional and should not be included if you do not have or use a DNS server. If it is not included, then the server: option must contain an IP address instead of a name.

or

network:dhcp, - means the IP, netmask, gateway and dns parameters are provided by the dhcp server. Depending on how the dhcp and DNS servers are configured, the host name and domain name may also be supplied.

or

network:adsl, - means the IP, netmask, gateway and dns parameters are provided by the ADSL service provider when you connect.

adsluser:my_adsl_name, - user name, as required, to login to your ADSL service provider.

adslpass:my_password, - password, as required, to login to your ADSL service provider.

NOTE: If you have selected network:adsl, be aware that ONLY the PPPoE protocol is currently supported.

user:anonymous, - user name, as required, for ftp login.

pass:david@eastcott.net, - pass word, as required, for ftp login.

domain:eastcott.net, - optionally allows you to preset the domain name for the computer. This parameter is only required if the stage 1 installer can not obtain the domain name from your DNS Server for the IP address that you specified.

hostname:linux1, - optionally allows you to set the host name for the computer. This parameter is only required if the stage 1 installer can not obtain the host name from your DNS Server for the IP address that you specified.

HTTP Network Services

automatic=method:http,

interface:eth1, - specifies the ethernet interface to use (eg. eth0, eth5, etc.). It is only required when there is more than 1 ethernet interface. This feature can only be used if DrakX can auto detect ALL the ethernet cards.

The trick when installing with multiple network card is convincing the computer that the ethx you specify is the same one it thinks is ethx. If you do not use the interface parameter, DrakX will ask you which one you want and then it will prompt you for the relevant information based on your specified method.

server:fileserver, - machine where the installable files are located, can be an IP or a host.domain (or host). This is only required for nfs, ftp or http methods.

directory:/mnt/mass/Mandrake/mandrake/9.0, - root directory where the files are found. This is only required for nfs, ftp, http or disk methods. For the disk method, this may also specify the location and name of an ISO image.

network:static, - means you are going to specify the necessary IP information;

ip:192.168.5.202, - what is it for this machine.

netmask:255.255.255.0, - what is it's netmask. This is optional and is only required if you are using a non-standard netmask.

gateway:192.168.5.253, - what is the gateway's IP. This is optional and should only be included if the specified fileserver is not located on the same subnet.

dns:192.168.5.253, - what is the IP for the DNS server. Up to three DNS servers can be specified, each IP is separated by a comma. This is optional and should not be included if you do not have or use a DNS server. If it is not included, then the server: option must contain an IP address instead of a name.

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or

`network:dhcp,` - means the IP, netmask, gateway and dns parameters are provided by the dhcp server. Depending on how the dhcp and DNS servers are configured, the host name and domain name may also be supplied.

or

`network:adsl,` - means the IP, netmask, gateway and dns parameters are provided by the ADSL service provider when you connect.

> `adsluser:my_adsl_name,` - user name, as required, to login to your ADSL service provider.
>
> `adslpass:my_password,` - password, as required, to login to your ADSL service provider.
>
> **NOTE**: If you have selected `network:adsl`, be aware that ONLY the PPPoE protocol is currently supported.

`domain:eastcott.net,` - optionally allows you to preset the domain name for the computer. This parameter is only required if the stage 1 installer can not obtain the domain name from your DNS Server for the IP address that you specified.

`hostname:linux1,` - optionally allows you to set the host name for the computer. This parameter is only required if the stage 1 installer can not obtain the host name from your DNS Server for the IP address that you specified.

DHCP Notes

Documenting how you should use the `network:dhcp` option and the related `domain` and `hostname` options is difficult since they are highly dependent on the characteristics and interactions of your DHCP and DNS servers. In addition to the conventional servers, there are a number of devices capable of acting as DHCP servers for a LAN which are designed primarily for use in the Windows world and may require a bit of effort on your part to get it working.

Since there are may ways to set the DHCP / DNS servers up, I will present a few of the more common arrangements and what may be required for the Stage 1 installer. These are by no means the only ways.

DHCP servers can be configured to provide IP, host name and domain name information based solely on the ethernet address of the network card in a computer and the associated DNS server can be pre-configured with the IP and host name association, or the DHCP server can inform the DNS server of the IP/name association (Dynamic DNS). In this case all that is required is the `network:dhcp,` parameter.

Another configuration scenario is where the computer must supply a host name when requesting IP information, then the DHCP server will return the IP, host name, and domain name information. This is the usual case for most Cable Modem connections and is the behaviour exhibited by most Windows based computers. Again, the DNS server can be pre-configured with the association or the DHCP server can inform it with the necessary information (DDNS). In this case, both the `network:dhcp,` and `hostname:linux1,` parameters are required.

Finally, there is the case where the DHCP server does not return the host name or domain name to be used, and/or the DNS server does not contain the IP to name association or is not informed by the DHCP server. In this case you will need to supply all three parameters, `network:dhcp,hostname:linux1,domain:eastcott.net`.

The Stage 1 installer passes what ever information it is provided (from the parameters supplied, from the DHCP server or the DNS server) to the stage 2 installer to set up the final configuration for your computer. Your actual DHCP / DNS environment will have an impact on two possible aspects of an automated install. For NFS installs, if the IP that you are assigned does not have an associated host name that the NFS server can obtain from a DNS server, you will have to ensure that the NFS server is set for IP

authentication rather than name authentication (see the section ***Setting up a Simple NFS Server***, Step 5). Also, the DHCP server can be configured to supply the name and location of the auto_inst.cfg file (see the section ***DHCP Server***).

Regardless of how you think every things is supposed to work, you are advised to discuss things with your network administrator and experiment a bit to determine the best approach(s) for your actual environment.

Method Parameter Aliases

The problem of the 256 character line length can be mitigated somewhat by the use of aliases for some of the parameters as follows:

Full name	*Alias*
adslpass	adslp
adsluser	adslu
directory	dir
disk	dis
domain	dom
gateway	gat
hostname	hos
interface	int
method	met
netmask	netm
network	netw
pass	pas
partition	par
server	ser
user	use

By rewriting the example from the beginning of this section using the aliases, you get the following:

```
default linux
prompt 1
timeout 50
display boot.msg
F1 help.msg
F2 advanced.msg
F3 boot.msg
label linux
  kernel vmlinuz
  append kickstart=floppy automatic=met:nfs,
    ser:fileserver,dir:/mnt/mass/Mandrake/mandrake/9.0,
    netw:static,ip:192.168.5.202,netm:255.255.255.0,
    gat:192.168.5.253,dns:192.168.5.253,
    ramdisk_size=32000 initrd=network.rdz root=/dev/ram3 vga=788
```

NOTE: All the text starting with '`append`' through '`788`' are on **ONE** line.

For those of you who noticed, this example is now passed through to the Stage 1 installer intact (which, by the way, the original example is not).

Anatomy of the 'auto_inst.cfg' File

The automated installation feature of DrakX is controlled by the contents of a file named `'auto_inst.cfg'`. This file is generally located on the boot floppy diskette that you create manually, at the end of the initial installation process, or using the Mandrake Control Center (`drakconf`) from an installed system. However, it can also be located in a sub-directory of the method installation source media (see the section ***The 'auto_inst.cfg' File Location***).

The contents of the `auto_inst.cfg` file are comprised of a Perl Scalar Structure declaration (o). The declaration `$o = {...};` is used by the DrakX program to preset various options and selections. Within the opening/closing braces are a series of simple and/or compound declarations (representing your selections).

During a manual install, the various declarations are created and the appropriate fields filled in as you made choices from the various screens. Then when you created the Automated or Replay diskette, selected portions of this structure were simply dumped to a file that will control the actions of DrakX when an Automated or Replay install is done.

An Automated Install requires that all the choices be pre-selected using either the file generated by the install program or, manually by you. Me, I am a bit lazy so I generate an initial diskette at the end of the install or using `drakconf`, then modify it to suit my requirements.

The remainder of this section describes the options available for the o$ declaration.

As always, if you want the gory details regarding how and what, look on the CD-ROM (or installation source media) in the directory `Mandrake/mdkinst/usr/bin/perl-install` for the actual perl modules. MandrakeSoft has made the DrakX installer code available for public inspection via their CVS repository (see http://www.linux-mandrake.com/cgi-bin/cvsweb.cgi/). In addition to the source code, there are a variety of documents and text files that contain things you may be interested in.

Options Summary

There are a substantial number of options (choices) that are available to you and the following is a brief summary of the ones that you can preset (just to wet your appetite). You will find detailed descriptions for each, along with examples, on the subsequent pages.

M	authentication		mkbootdisk
	autoExitInstall	**C**	mouse
	autologin	**M**	netc
C	bootloader	**C**	nomouseprobe
	compssListLevel		partitioning
C	compssUsersChoice	**M**	partitions
	default_packages	**C**	postInstall
C	desktop	**C**	postInstallNonRooted
C	excludedocs	**C**	printer
	interactive		security
	interactiveSteps	**C**	services
	intf		superuser
	isUpgrade		timezone
M	keyboard		users
C	lang		useSupermount
C	manualFstab		wacom
M	miscellaneous		X

There have been some additions and a number changes to the various options since the previous release of Mandrake Linux. I have added an indicator: **N (new), C (important changes to content)** or **M (modified add or delete capability)** to the left of each affected option listed above.

authentication

This option is used to specify how user logins are authenticated.

```
'authentication' => {

    'shadow' => 1,
    'md5' => 1,
    'NIS' => undef,
    'LDAP' => undef,
    'winbind' => undef,
},
```

Descriptions:

`'shadow'` - Indicates if shadow passwords are used.

> 0 - disables
> 1 - enables

`'md5'` - Used to specify if md5 encryption is to be used for passwords.

> 0 - disables, (use default crypt)
> 1 - enables

`'NIS'` - Indicates if a NIS server is to be used for authentication

> `''` - if NIS is not being used. Also, if this line is not present, it means no NIS too.
> `'broadcast'` - if the NIS server is accessed via a broadcast message
> `'nisserver'` - name of the machine containing the NIS server.

`'LDAP'` - Indicates if a LDAP server is to be used for authentication.

> `''` - if LDAP is not being used. Also, if this line is not preset, it means no LDAP too.
> `'ldapserver'` - name of the machine containing the LDAP server.

`'windbind'` - Indicates if a Windows PDC (primary domain controller) is being used for authentication.

> `''` - if the PDC is not being used. Also, if this line is not preset, it means no PDC too.
> `'PDCserver'` - name of the machine acting as the PDC server.

> For this to work for a W2K PDC, you will probably need to have the administrator run:

> `C:\>net localgroup "Pre-Windows2000 Compatible Access" everyone /add`

> and reboot the server

By default, Mandrake Linux installations enable `md5` and `shadow`. Also, you will probably have noticed that the GUI based install no longer gives you the ability to select/de-select these two, rather the *Local files* selection is used to indicate them.

If you select NIS, LDAP or winbind, you will have to add NISDOMAIN, LDAPDOMAIN or WINDOMAIN to the option 'netc'.

Related Option Entries:

netc

autoExitInstall

This option is used to direct the installation process to automatically exit and re-boot the computer when the installation is complete.

```
'autoExitInstall' => 1,
```

Descriptions:

`'autoExitInstall'` - what you want to do

      `0` - when installation is complete, prompt the installer to re-boot and wait
      `1` - when installation is complete, re-boot the computer automatically.

NOTE: When you do a manual install, the `auto_inst.cfg.pl` file created in `/root/drakx` has this value set to 1. If you generated an Automated or Replay diskette, the `auto_inst.cfg` file also has this value set to 1.

CHANGE it to 0, otherwise the computer will re-boot and start the install all over again.

Related Option Entries:

none.

autologin

This is used to have the system automatically login a specific user, rather than having the usual login prompt. This feature can be used with a single user only and, the user should be defined (see the option **users**).

If the auto-login feature is not desired, then do not include this in your file.

```
'autologin' => 'david',
```

Descriptions:

`'autologin'` - specifies the name of the user that the system is to automatically log in as. Change it as you desire, but to a valid user only.

The installation process creates the file `/etc/sysconfig/autologin` and places `USER=<your user name>` along with a few other values in it.

Related Option Entries:

desktop, users

bootloader

This option allows you specify the boot loader to be installed and the associated parameters that it requires. The general structure and relevant parameters for each loader are presented and explained in their own section, rather than trying to show you the whole thing and adding comments indicating which parameter is valid for which boot loader. Also, check the notes at the end of each section for tidbits.

A couple things worth noting:

* The new graphic startup display (`bootsplash`) is activated when the `'default'` kernel image loaded has the `'linux'` label.
* The verbosity of both the kernel and the SysVinit scripts is controlled by the presence or absence of the keyword `'quiet'` in the `'append'` declaration.

The following is specifically for the x86 architecture.

LILO / GRUB

DrakX is capable of installing either the Lilo or Grub boot loaders for 'x86' type computers. The following causes DrakX to install the Lilo boot loader and create the file `/etc/lilo.conf`. You really want to look at '`man lilo.conf`' for the correct explanation for some of the following.

```
    'bootloader' => {

       'methods' => {
          'lilo' => 'lilo-text'
       },

       'boot' => '/dev/hda',
       'default' => 'my_linux',
       'install' => '/boot/boot.b',
       'lba32' => 1,
       'map' => '/boot/map',
       'message' => "My text boot up\n",
       'timeout' => '5',

       'entries' => [
          {
             'type' => 'image',
             'kernel_or_dev' => '/boot/vmlinuz',
             'label' => 'my_linux',
             'root' => '/dev/hda6',
             'initrd' => '/boot/initrd.img',
             'append' => 'mem=128M',
             'read-write' => 0,
          or
             'type' => 'other',
             'kernel_or_dev' => '/dev/zip',
             'label' => 'zip',
             'unsafe' => 1,
          }
       ]
    },
```

Descriptions:

'methods' - this entry defines the boot loader options; for x86 and IA64 computers this must be 'lilo' and
  optionally 'grub'.

   'lilo' - can be one of:

       'lilo-text' - if you want just a simple text based prompt.
       'lilo-menu' - if you want a text based menu or to use the Grub boot loader.
       'lilo-graphic' - if you want a graphical menu.

     DrakX creates all the necessary files that lilo is expecting.

   'grub' => 1 - if present, the Grub boot loader is installed rather than Lilo. In addition, DrakX creates all
       the necessary files and directories that grub is expecting. **NOTE:** 'lilo' => 'lilo-menu' must
       be used.

'append' - if present, it is placed in the lilo.conf and used as lilo's default for any per image entry that does
    not contain an 'append'. It is used to specify parameters to be passed to the kernel. eg. 'mem=128M
    console=ttyS0,9600n8'.

'boot' - this allows you to specify the disk drive that it to be used as the boot device. Do not include the
    partition number. eg. '/dev/hda' or '/dev/hde'.

'compact' => 1 - if present, says to try and merge read requests for adjacent sectors. This is seldom used.

'crushMbr' => 1 - if this is present, it means replace (crush) the existing Master Boot Record and install the
    lilo equivalent.

'default' - this is used to specify the default kernel image to boot. The value here is the 'label' value for
    one of the defined 'entries'. eg. 'my_linux'.

'install' - this is used to specify the file containing the new master boot record. eg. '/boot/boot.b'.

'lba32' => 1 - if present, says to generate 32 bit Logical Block Addresses instead of sector/head/cylinder.

'linear' => 1 - if present, says to generate linear sector addresses instead of sector/head/cylinder. This is
    seldom used. In fact, if 'lba32' is present then it is ignored.

'map' - this is the name and location of the map file created by lilo. eg. '/boot/map'.

'message' - this allows you to create a customized boot message. It is optional and if included, causes the file
    /boot/message to be created containing your string (don't forget to include '\n' where appropriate. Also
    use double quotes (")). If it is not included, then DrakX creates a default message for you.

'password' - if present, it specifies a pass word string (clear text) used to protect booting of all images. eg.
    'dickie'.

'perImageAppend' => '' - if this is present, then DrakX uses the values here as the append for each
    entry it automatically creates. Note, DrakX creates this if it detects that there are any IDE CDRW or CD
    Burrners installed, if the 'miscellaneous' => { 'HDPARM ' } is set, if it detects that you used mem=
    at the boot prompt or, if the syslinux.cfg file contains either mem= or console= in the append directive.

   NOTE: If console=ttyS0,9600n8 is present somewhere in the value, then DrakX will
   automatically add serial=0,9600n8 to the lilo.conf file. You can set the parameters for the
   console= to what ever you require, the previous was just an example. However, if you do use the
   console=, you might want to consider adding it to the 'append' as well.

'restricted' => 1 - if present, reduces the boot up password enforcement so that the user must enter a pass word only if the user enters additional parameters. 'password' **must** be present if 'restricted' is present.

'timeout' - the time, in seconds, to wait for the user to enter a desired image. eg. 'my_linux'. Also, this forces a prompt for the image name to boot. Note: DrakX changes the value from seconds to tenths of a second for placement in lilo.conf. If you do not want a prompt, then set the value to 0.

'vga' - if present, this is used to set the default video mode and can be:

'ask'	Ask at boot (kinda nice if you're just playing around)
'normal'	80 x 25 (default)
'0x0f01'	80 x 50
'0x0f02'	80 x 43
'0x0f03'	80 x 28
'0x0f05'	80 x 30
'0x0f06'	80 x 34
'0x0f07'	80 x 60
'0x0122'	100 x 30
'785'	640 x 480 in 16 bits (Frame Buffer only)
'788'	800 x 600 in 16 bits (Frame Buffer only)
'791'	1024 x 768 in 16 bits (Frame Buffer only)
'794'	1280 x 1024 in 16 bits (Frame Buffer only)

'entries' - this is an array of 'per image' entries describing selectable boot images. Normally you should not need to add any since DrakX installs a number of default entries which represent your computer's equipment. However if you do add a new one and it has the same label as an internally defined one (linux, linux-2.2, linux-hack, failsafe, failsafe-2.2, failsafe-hack, floppy, default, linux-up, linux-2.2up, linux-hackup, linux-nonfb, linux-2.2nonfb, linux-hacknonfb, NT, dos, windows) DrakX will rename your new one to old_... when it adds yours. So be careful.

Each entry has one of two forms:

'type' => 'image' - specifies that this image describes a Linux kernel image to boot.

'kernel_or_dev' - specifies the location and name of the kernel image to boot. eg. '/boot/vmlinuz'.

'label' - specifies the name associated with this image. eg. 'my_linux'.

'root' - specifies the partition to be mounted as 'root'. eg. '/dev/hda6'.

'initrd' - if present, specifies the location and name of the initial ram disk to be loaded. eg. '/boot/initrd.img'.

'append' - if present, specifies the kernel parameters for this image. eg. 'ramdisk=8192K'. **NOTE:** the 'perImageAppend' is NOT used for any entries you add. If you need special options, then use this to specify them.

'vga' - if present, specifies the video mode to be used with this image. (See 'vga' above.).

'read-write' => 1 - if present, indicates the root file system is to be mounted read-write. If it is NOT present, then the root file system is mounted read-only.

or,

'type' => 'other', - specifies that this image describes an arbitrary operating system to boot.

'kernel_or_dev' - specifies the device to boot. eg. '/dev/zip' or '/dev/hdb'.

`'label'` - specifies the name associated with this image. eg. `'my_linux'`.

`'unsafe' => 1` - see man lilo.conf.

`'table'` - see man lilo.conf.

`'map-drive'` - see man lilo.conf.

YABOOT

This loader is used on PowerPC computers. The following causes DrakX to create the file `/etc/yaboot.conf`. You really want to look at 'man yaboot.conf' for the correct explanation for some of the following.

```
    'bootloader' => {

        'methods' => {
            'yaboot' => 1
        },

        'useboot' => 'hda',
        'delay' => 30,
        'default' => 'my_linux',
        'defaultos => 'linux',
        'enablecdboot' => 1,
        'enableofboot' => 1,
        'initmsg' => "My init text\n",
        'message' => "My text boot up\n",
        'timeout' => 50,

        'entries' => [
            {
                'type' => 'image',
                'kernel_or_dev' => '/boot/vmlinuz',
                'label' => 'my_linux',
                'root' => '/dev/hda6',
                'initrd' => '/boot/initrd.img',
                'append' => undef,
                'read-write' => 0,
            }
        ]
    },
```

Descriptions:

'methods' - this entry defines the boot loader options the PowerPC and must be 'yaboot'.

'append' - if present, it is placed in the yaboot.conf and used as yaboot's default for any per image entry that does not contain an 'append'. It is used to specify parameters to be passed to the kernel. eg. 'mem=128M serial=0,9600n8'.

'useboot' - this allows you to specify the disk drive that it to be used as the boot device. Do not include the partition number. eg. 'hda' or 'hde'.

'delay' - the time, in ??? seconds, for the Open Firmware Delay.

'default' - this is used to specify the default kernel image to boot. The value here is the 'label' value of one of the defined 'entries'. eg. 'my_linux'.

'defaultos' - is one of 'linux', 'macos', 'macosx' or 'darwin'.

'enablecdboot' => 1 - enables booting from CD.

'enableofboot' => 1 - enables booting using Open Firmware.

'initmsg' - this allows you to create a customized boot message. It is optional and if included, will causes the file boot loader to display your string. Also use double quotes (").

'message' - this allows you to create a customized boot message. It is optional and if included, causes the file /boot/message to be created containing your string (don't forget to include '\n' where appropriate. Also use double quotes (")). If it is not included, then DrakX creates a default message for you.

'perImageAppend' => '' - if this is present, then DrakX uses the values here as the append for each entry it automatically creates. Note, DrakX creates this if it detects that there are any IDE CDRW or CD Burrners installed, if the 'miscellaneous' => { 'HDPARM ' } is set, if it detects that you used mem= at the boot prompt or, if the syslinux.cfg file contains either mem= or console= in the append directive.

'timeout' - the time, in ??? seconds, to wait for the user to enter a desired image. eg. '10'. Also, this forces a prompt for the 'label' name to boot.

'entries' - this is an array of 'per image' entries describing selectable boot images. DrakX installs a number of default entries and normally you should not need to add any. However if you do add a new one and it has the same label as an internally defined one (linux, linux-2.2, linux-hack, failsafe, failsafe-2.2, failsafe-hack, default, linux-up, linux-2.2up, linux-hackup, linux-nonfb, linux-2.2nonfb, linux-hacknonfb, NT, dos, windows) DrakX will rename your new one to old_... when it adds yours. So be careful.

Each entry has one of two forms:

'type' => 'image' - specifies that this image describes a Linux kernel image to boot.

    'kernel_or_dev' - specifies the location and name of the kernel image to boot. eg. '/boot/vmlinuz'.

    'label' - specifies the name associated with this image. eg. 'my_linux'.

    'root' - specifies the partition to be mounted as 'root'. eg. '/dev/hda6'.

    'initrd' - if present, specifies the location and name of the initial ram disk to be loaded. eg. '/boot/initrd.img'.

    'append' - if present, specifies the kernel parameters for this image. eg. 'ramdisk=8192K'.

    'read-write' => 1 - if present, indicates the root file system is to be mounted read-write. If it is NOT present, then the root file system is mounted read-only.

or

'type' => 'other' - specifies that this image describes a Linux kernel image to boot.

    'kernel_or_dev' - specifies the ???.

    'label' - specifies ???.

Examples (for x86):

This first one is the simplest and I use it on a server to obtain a simple text based boot prompt, rather than the default graphic one. This also lets DrakX fill in all the auto detected stuff for me.

```
'bootloader' => {

    'methods' => {
        'lilo' => 'lilo-text'
    },

    'crushMbr' => 1
},
```

NOTE: I use the `'crushMbr'` here to make sure that whatever is on the disk is replaced with lilo's boot loader. This may not be suitable for everyone (such as dual boot or if you want to keep the existing MBR). Your installation needs may be different, so use with caution.

This one adds an additional boot image that I use on my test machine to increase the size of the default ram disk.

```
'bootloader' => {

   'methods' => {
      'lilo' => 'lilo-text'
   },

   'entries' => [
      {
         'type' => 'image',
         'kernel_or_dev' => '/boot/vmlinuz',
         'label' => 'bigdisk',
         'root' => '/dev/hda6',
         'initrd' => '/boot/initrd.img',
         'append' => 'ramdisk=8192k'
      }
   ]
},
```

If I had wanted to make this new image the one which is automatically booted, then I would have added `'default' => 'bigdisk',` just before the `'entries'`.

Related Option Entries:

miscellaneous

compssListLevel

This option is only to be used in conjunction with `'compssUsersChoice'`. It allows you to install packages based on their relative importance and has the following is its general form:

```
'compssListLevel' => 5,
```

Descriptions:

`'compssListLevel'` - the desired rating value can be one of:

```
5  - Must Have
4  - Important
3  - Very nice
2  - Nice
1  - Maybe
```

Mandrake has taken most of the installable packages (*.rpms found in Mandrake/RPMS ...) and categorized them, hierarchically, into Groups (eg. Office, KDE) and then refined it a bit further into sub-groups (packages which should only be installed if the corresponding tag has been selected) and then finally applied a numerical rating (1 through 5) to each package. If you look in the file `Mandrake/base/rpmsrate`, you can see the group/sub-group tags, followed by the rating levels and each package assigned to that level.

When you use `'compssListLevel'`, DrakX will install every package which has a rating greater than or equal (`'>='`) to the value you specify with this option, regardless of the group or sub-group they have been listed in.

NOTE: Since the Mandrake Linux distribution comes on a varying number of CD's, you may find packages listed which are not found on the ones that you downloaded or bought - not to worry, DrakX knows this and will only attempt to install packages that you actually have.

Examples:

See the section *'compssUsersChoice'* for examples. Using this option without `'compssUsersChoice'` will not produce the result that older versions (earlier than 8.1) did.

Related Option Entries:

compssUsersChoice, default_packages

compssUsersChoice

This option is an alternate package selection method and, if used `'compssListLevel'` must be defined as well. These two options used together closely mimic the GUI based install where you selected which package groups to install. It has the following general form:

```
'compssUsersChoice' => {

    '<group_tag>' => 1,
    '<group_tag>' => 1
},
```

Descriptions:

`'<group_tag>'` - is one of the following:

ACCESSIBILITY	GNOME	NETWORKING_OTHER_SERVER
ARCHIVING	GRAPHICAL_DESKTOP	NETWORKING_REMOTE_ACCESS
GNOME	GRAPHICS	NETWORKING_REMOTE_ACCESS_SERVER
AUDIO	GNOME	NETWORKING_WWW
BOOKS	INSTALL	NETWORKING_WWW_SERVER
BURNER	NOCOPY	NIS
DEVELOPMENT	KDE	NIS_SERVER
COMMUNICATIONS	MONITORING	PHOTO
CONFIG	GNOME	GNOME
DATABASES	NETWORKING_CHAT	KDE
DATABASES_SERVER	NETWORKING_CHAT_SERVER	PHOTO
DEVELOPMENT	NETWORKING_DNS	PUBLISHING
DEVELOPMENT	NETWORKING_DNS_SERVER	SCANNER
BOOKS	NETWORKING_FILE	SCIENCES
GNOME	NETWORKING_FILE_SERVER	SHELLS
KDE	NETWORKING_FILE_TRANSFER	SOUND
DEVELOPMENT_OTHER	NETWORKING_FILE_TRANSFER_SERVER	SYSTEM
DOCS	NETWORKING_FIREWALLING_SERVER	BOOKS
EDITORS	NETWORKING_GROUPWARE_SERVER	TERMINALS
GNOME	NETWORKING_IRC	TEXT_TOOLS
EMULATORS	GNOME	BOOKS
FILE_TOOLS	NETWORKING_IRC	TV
GAMES	NETWORKING_LDAP_SERVER	VIDEO
GNOME	NETWORKING_MAIL	WEMIN
DEVELOPMENT	NETWORKING_MAIL_SERVER	X
KDE	NETWORKING_NEWS	GNOME
DEVELOPMENT	NETWORKING_NEWS_SERVER	
3D	NETWORKING_OTHER	

> **NOTE:** The indented tags indicate that there are packages in the corresponding Group which will only be installed if the indented tag is specified as well. If you look in the file `Mandrake/base/rpmsrate`, you can see the group/sub-group tags, followed by the rating levels and packages that are assigned to that level.

Before you get too carried away, remember that DrakX is going to install what it considers an essential minimum set of packages, then it looks at your selections and adds any extras that you selected and, any additional packages that are needed for your choices to operate properly.

Examples:

How do you select things? Well, have you ever tried the game 'Rubics Cube'; its kinda like that but with a bigger block.

First pick the features you want, then select the desktop you want to use. Then create a list of tags. Or you can look at the file `Mandrake/base/compssUsers` to see how Mandrake grouped things for the GUI Group Package selection screen and go from there. Finally, you have to set the package rating level you want as the minimum using `'compssListLevel'`.

The following are some simple examples:

This is what would be selected if you were using the GUI install and selected the icons for Game station, Multimedia Station, Console Tools and KDE:

```
'compssUsersChoice' => {

    'GAMES' => 1, 'AUDIO' => 1, 'VIDEO' => 1, 'GRAPHICS' => 1, 'EDITORS' => 1,
    'TERMINALS' => 1, 'TEXT_TOOLS' => 1,
    'SHELLS' => 1, 'FILE_TOOLS' => 1, 'KDE' => 1
},

'compssListLevel' => 5,
```

This example is basically the same, except the rating level includes almost everything possible for these groups. The `'default_packages'` option lets me add package(s) which would have been excluded.

```
'compssUsersChoice' => {

    'GAMES' => 1, 'AUDIO' => 1, 'VIDEO' => 1, 'GRAPHICS' => 1, 'EDITORS' => 1,
    'TERMINALS' => 1, 'TEXT_TOOLS' => 1,
    'SHELLS' => 1, 'FILE_TOOLS' => 1, 'KDE' => 1
},

'compssListLevel' => 2,
'default_packages' => [ 'joe' ],
```

Kinda like the individual package selection of the GUI install. Except that the rating level gives you a bit more control on the basic package set installed.

This example is a short way to install almost everything.

```
'compssUsersChoice' => {

    'ALL' => 1
},

'compssListLevel' => 0,
```

Related Option Entries:

compssListLevel, default_packages, excludedocs

default_packages

This option is used to explicitly specify which packages are to be installed. It is simply a list of package names. For an example, see the file `auto_inst.cfg.pl` that was placed in your `/root/drakx` after a graphic install. The general form is as follows:

```
'default_packages' => [

    '<package-name>',
    '<package-name>'
],
```

Descriptions:

`'<package-name>',` - name of the package to be installed, not including the version, release, architecture and filename extension. eg. if the package file name is `acon-1.0.4-5mdk.i586.rpm` then use `'acon',`.

If you are not sure of the name for the package you want installed, then use the following:

```
rpm -qp --queryformat %{NAME} <filename of package>
```

This will give you the name that the install is expecting.

After viewing the contents of the `auto_inst.cfg` or `auto_inst.cfg.pl` files, you may have noticed that the list does not contain all the packages that are installed in a system (`rpm -qa | sort`). This because a new approach is being used in an attempt to reduce the size of the files on the diskette. Basically, this means that packages 'required' by the listed ones are not included in the list.

NOTE: All packages must be in either the RPMS, RPMS2 or, RPMS3 directories. If you have added one, then see the section ***Creating an Updated Installation CD Set.***

Examples:

The following is a simple example to illustrate the use of this option.

```
'default_packages' => [

    'fonts-ttf-west_european',
    'strace',
    'gurpmi',
    'reiserfsprogs',
    'kudzu',
    'linux_logo',
    'bc',
    'fonts-ttf-decoratives',
    'at',
    'MAKEDEV',
    'iputils',
    'imwheel',
    'rpmdrake',
    'locales-en',
    'sndconfig',
    'rxvt',
    'numlock',
    'nfs-utils-clients',
```

```
            'man-pages',
            'open',
            'ldetect',
            'XFree86-server',
            'hexedit',
            'ftp',
            'anacron',
            'DrakConf',
            'XFree86-75dpi-fonts',
            'icewm-light'
        ],
```

Related Option Entries:

compssUsersChoice, compssListLevel, excludedocs

desktop

This option is used to preset the default Desktop (Window Manager) for users.

```
'desktop' => 'KDE',
```

Descriptions:

'desktop'- if this option is present, then it may be any one of the following, provided of course it was installed:

KDE
Gnome
WindowMaker
Enlightenment
Blackbox
XFce
ICEWM
default
failsafe

The DrakX installer places the specified value into the file /etc/sysconfig/desktop.

Default means that if you are at Run Level 3 and you type startx, then the window manager defined in the file is used. If you have a graphic Login Screen and you select default, rather than one of the indicated Window Managers, then the window manager defined in this file is used.

Related Option Entries:

autologin

excludedocs

This option instructs DrakX to inhibit the installation of any documents associated with packages being installed. Associated documents usually appear in `/usr/share/docs` in a sub-directory with the same base name as the package installed.

```
    'excludedocs' => 1,
```

Descriptions:

`'excludedocs'` - what you want to do

    `0` - include the package documentation.
    `1` - exclude the package documentation.

DrakX normally installs all documentation that is available with each package.

NOTE: If the `'excludedocs'` option is used, DrakX automatically adjusts the file `/etc/rpm/macros` so that any subsequent package installed also includes or excludes documentation based on your selection.

Related Option Entries:

compssUsersChoice, default_packages

interactive

This option is used when you are doing auto installs from CD-ROM and some of the packages to be installed are on the 2nd or 3rd CD. Or if you would simply like a graphic display showing the installation progress, rather than the simplistic text which is the default for an automated install.

```
    'interactive' => 'newt',
```

Descriptions:

The default operation of DrakX for automated installs does not allow for any interaction with the installer: Insert boot floppy, press reset and go for coffee. This approach works very well when installing via a network, but is inconvenient when using CDs and, some of the needed packages are on the second or third CD (they are skipped and you have to manually install them).

The interactive option allows you to perform a CD based auto install and have DrakX prompt you when it needs a different CD.

`'interactive'` - Selects the method of graphic presentation:

> `'newt'` - simple graphical interface (for the memory limited) or, for those that want a simpler presentation style.

> `'gtk'` - full graphical presentation similar to the GUI based install.

Related Option Entries:

none.

interactiveSteps

This option is used when you are creating a Replay Install configuration.

```
'interactiveSteps' => [
                      'doPartitionDisks',
                      'formatPartitions'
                    ],
```

Descriptions:

DrakX has the capability, Replay Auto Install, which can be used to assist installation on multiple computers with slightly different hardware configurations. This replay ability allows you to select one or more specific steps where you want to manually re-enter configuration selections.

Generation of a Replay Auto Install Disk and can be accomplished:

*   at the end of a Manual install where you select Advanced, Generate an auto install floppy, then Reply or,
*   on an installed system by running the `drakconf` program or,
*   manually creating the disk and files on it.

To change a standard Auto Install into a Replay Auto Install, just add this option. For a more detailed description and a summary of the available steps, please review the section ***Replay Install***.

Related Option Entries:

none.

intf

This option is used to define the various network (ethernet or wireless) capable devices in your system.

The following is the general form for the structure:

```
'intf' => {

    'ethx' => {},
and / or
    'wireless_eth' => {},
},
```

`'ethx'` - used to indicate an ethernet card interface definition. The `'x'` is a sequence number, beginning with 0, for each ethernet card installed. Up to 10 cards can be defined with this version of the installer.

`'wireless_eth'` - used to indicate that there is a wireless ethernet interface installed. Currently only a single interface is supported.

For an ethernet card, the following are valid:

```
'eth0' => {

    'DEVICE' => 'eth0',
    'BOOTPROTO' => 'static',
    'ONBOOT' => 'yes',
    'IPADDR' => '192.168.5.202',
    'NETMASK' => '255.255.255.0',
    'NETWORK' => '192.168.5.0',
    'BROADCAST' => '255.255.255.0',
    'HWADDR' => '00:01:02:03:04:05'
},
```

For a wireless interface, the following are valid:

```
'wireless_eth' => {

    'DEVICE' => 'wireless_eth',
    'BOOTPROTO' => 'static',
    'ONBOOT' => 'yes',
    'IPADDR' => '192.168.5.202',
    'NETMASK' => '255.255.255.0',
    'NETWORK' => '192.168.5.0',
    'BROADCAST' => '255.255.255.0',
    'WIRELESS_MODE' => 'Auto',
    'WIRELESS_ESSID' => 'any',
    'WIRELESS_NWID' => '',
    'WIRELESS_FREQ' => '',
    'WIRELESS_SENS' => '',
    'WIRELESS_RATE' => '',
    'WIRELESS_ENC_KEY' => '',
    'WIRELESS_RTS' => '',
    'WIRELESS_FRAG' => ','
    'WIRELESS_IWCONFIG' => '',
    'WIRELESS_IWSPY' => '',
    'WIRELESS_IWPRIV' => '',
},
```

Descriptions:

`'DEVICE'` - must be the same as the `'ethx'` (or `'wireless_eth'`) you used to start this definition with.

`'BOOTPROTO'` - may be one of `'static'`, `'dhcp'` or `'bootp'`.

`'ONBOOT'` - normally set to `'yes'`, but can be set to `'no'` if you do not want the interface automatically started at boot up.

`'IPADDR'` - IP address ('x.x.x.x') for this interface, not required if `BOOTPROTO` is `dhcp` or `bootp`.

`'NETMASK'` - Network Mask ('x.x.x.x') to be used with this interface, not required if `BOOTPROTO` is `dhcp` or `bootp`.

`'NETWORK'` - base IP address ('x.x.x.x') for this interface, not required if `BOOTPROTO` is `dhcp` or `bootp`.

`'BROADCAST'` - broadcast IP address ('x.x.x.x') for this interface, not required if `BOOTPROTO` is `dhcp` or `bootp`.

`'HWADDR'` - the ethernet hardware address for the associated ether net interface card. Only required if the system is tracking the networking id (see ['miscellaneous'](#)).

`'WIRELESS_MODE'` - may be one of `Ad-hoc`, `Managed`, `Master`, `Repeater`, `Secondary` or `Auto`.

`'WIRELESS_ESSID'` - Extended Service System ID, and is a string representing the desired ID or `'any'`

`'WIRELESS_NWID'` - Network ID or Channel Sequence number

`'WIRELESS_FREQ'` - Operating frequency of the wireless radio component. (eg. 2.46G)

`'WIRELESS_SENS'` - Receive sensitivity

`'WIRELESS_RATE'` - Data transfer rate (eg. 11M)

`'WIRELESS_ENC_KEY'` - Encryption or scrambling key

`'WIRELESS_RTS'` - ???

`'WIRELESS_FRAG'` - ???

`'WIRELESS_IWCONFIG'` - list of parameters to be given to the program `iwconfig`.

`'WIRELESS_IWSPY'` - list of parameters to be given to the program `iwspy`.

`'WIRELESS_IWPRIV'` - list of parameters to be given to the program `iwpriv`.

The entries for each interface appear in a configuration file located in `/etc/sysconfig/network-scripts/`. The configuration file name for each interface is formed by adding the `DEVICE` string to the end of `'ifcfg-'`. In the example below, you would expect to find the file: `/etc/sysconfig/network-scripts/ifcfg-eth0`.

```
    'intf' =>   {

      'eth0'  => {

          'DEVICE'  => 'eth0',
          ...
      }
   },
```

Examples:

See the section ***Network and Connection Examples*** for various examples.

For a computer which does not have an ethernet or wireless interface, then use the following:

```
'intf' => {},
```

If the target computer has multiple interfaces, then use the following:

```
'intf' =>    {
   'eth0' => {

       ...

   },

   'eth1' => {

       ...

   }
}
```

If the computer has more than one interface defined, make sure the '**netc**' option identifies which one is the GATEWAYDEV.

If the computer has an interface with BOOTPROTO set to 'dhcp', then see **'netc'** for selecting a 'dhcp_client' to be installed. If it is set to 'bootp', then the pump package is be automatically installed.

For those of you using a Wireless interface, the following are recommended reading for additional information:

The Wireless-HOWTO at www.linuxdoc.org and,

Linux Wireless Howto Collection at www.hpl.hp.com/personal/Jean_Tourrilhes/Linux/

NOTE: If you are trying to install ISA network cards , DrakX does not auto detect them and as a result will not update the /etc/modules.conf file with the appropriate alias. However, the /etc/sysconfig/network-scripts/ifcfg-eth[0-9] file is created with your specified values. To complete the installation, you will have to manually add the alias and any suitable options or, use the 'postInstall' option to make the necessary adjustments.

Related Option Entries:

netc, miscellaneous., postInstall

isUpgrade

This option is used to tell DrakX to perform an upgrade instead of a full install.

```
    'isUpgrade' => 0,
```

Descriptions:

`'isUpgrade'` - what you want to do

    `0` - perform a full install
    `1` - perform an upgrade

An upgrade will examine the currently installed packages on the computer and upgrade only those packages necessary. It will add additional new packages that are 'required' by the new packages which are replacing older ones.

Related Option Entries:

none.

keyboard

This option allows you to specify the type of keyboard you are using by specifying one of the country codes.

See file `Mandrake/mdkinst/usr/bin/perl-install/keyboard.pm` declaration for %keyboards which may contain a more up to date list.

```
'keyboard' => {
    'GRP_TOGGLE' => '',
    'KBCHARSET' => 'C',
    'KEYBOARD' => 'us'
},
```

Descriptions:

`'GRP_TOGGLE'` - specifies the key sequence used to switch keyboard layouts if you installed more than one. The value can be set to one of the following:

`'toggle'`	Right Alt key
`'shift_toggle'`	Both Shift keys simultaneously
`'ctrl_shift_toggle'`	Control and Shift keys simultaneously
`'caps_toggle'`	Capslock key
`'ctrl_alt_toggle'`	Control and Alt keys simultaneously
`'alt_shift_toggle'`	Alt and Shift keys simultaneously
`'menu_toggle'`	"Menu" key
`'lwin_toggle'`	Left "Windows" key
`rwin_toggle'`	Right "Windows" key
`''`	No toggle

`'KBCHARSET'` - specifies the keyboard character set to be used. The value here is obtained from the third (3rd) column of the table listed in the lang section for the language that you choose.

`'KEYBOARD'` - specifies the keyboard type used, possible values are:

`'al'`	Albanian
`'am_old'`	Armenian (old)
`'am'`	Armenian (typewriter)
`'am_phonetic'`	Armenian (phonetic)
`'az'`	Azerbaidjani (latin)
`'be'`	Belgian
`'bg'`	Bulgarian
`'bg_phonetic'`	Bulgarian (phonetic)
`'br'`	Brazilian (ABNT-2)
`'by'`	Belarusian
`'ch_de'`	Swiss (German layout)
`'ch_fr'`	Swiss (French layout)
`'cz'`	Czech (QWERTZ)
`'cz_qwerty'`	Czech (QWERTY)
`'de'`	German
`'de_nodeadkeys'`	German (no dead keys)
`'dk'`	Danish
`'dvorak'`	Dvorak
`'dvorak_no'`	Dvorak (Norwegian)

```
'dvorak_se'            Dvorak (Swedish)
'ee'                   Estonian
'es'                   Spanish
'fi'                   Finnish
'fr'                   French
'ge_ru'                Georgian (Russian layout)
'ge_la'                Georgian (Latin layout)
'gr'                   Greek
'hu'                   Hungarian
'hr'                   Croatian
'il'                   Israeli
'il_phonetic'          Israeli (Phonetic)
'ir'                   Iranian
'is'                   Icelandic
'it'                   Italian
'jp'                   Japanese 106 keys
'kr'                   Korean
'la'                   Latin American
'lt'                   Lithuanian AZERTY (old)
'lt_new'               Lithuanian AZERTY (new)
'lt_b'                 Lithuanian number row QWERTY
'lt_p'                 Lithuanian phonetic QWERTY
'lv'                   Latvian
'mk'                   Macedonian
'nl'                   Dutch
'no'                   Norwegian
'pl'                   Polish (qwerty layout)
'pl2'                  Polish (qwertz layout)
'pt'                   Portuguese
'qc'                   Canadian (Quebec)
'ro2'                  Romanian (QWERTZ)
'ro'                   Romanian (QWERTY)
'ru'                   Russian
'ru_yawerty'           Russian (Yawerty)
'se'                   Swedish
'si'                   Slovenian
'sk'                   Slovakian (QWERTZ)
'sk_qwerty'            Slovakian (QWERTY)
'sr'                   Serbian
'th'                   Thai keyboard
'tj'                   Tajik keyboard
'tml'                  Tamil
'tr_f'                 Turkish (traditional F model)
'tr_q'                 Turkish (modern Q model)
'ua'                   Ukrainian
'uk'                   UK keyboard
'us'                   US keyboard
'us_intl'              US keyboard (international)
'vn'                   Vietnamese numeric row QWERTY
'yu'                   Yugoslavian (latin)
```

Related Option Entries:

lang

lang

This option allows you to select the language used for text presentations. The default is English US ('en_US').

See file Mandrake/mdkinst/usr/bin/perl-install/lang.pm declaration for %languages which may contain a more up to date list.

```
    'lang' => 'en_US',
```

Descriptions:

'lang' - used to specify the desired language, possible values are:

'en_US'	English (US)	C
'en_US.UTF-8'	English (US, UTF-8)	iso-8859-15
'en_GB'	English (UK)	iso-8859-15
'en_IE'	English (Ireland)	iso-8859-15
'af'	Afrikaans	iso-8859-1
'ar_EG.UTF-8'	Arabic	iso-8859-6
'az_AZ.UTF-8'	Azeri (latin)	iso-8859-9e
'be'	Belarussian	cp1251
'be_BY.UTF-8'	Belarussian (UTF-8)	cp1251
'bg'	Bulgarian	cp1251
'bg_BG.UTF-8'	Bulgarian (UTF-8)	cp1251
'br'	Brezhoneg	iso-8859-15
'bs'	Bosnian	iso-8859-2
'ca_ES'	Catalan	iso-8859-15
'cs'	Czech	iso-8859-2
'cy_GB.UTF-8'	Cymraeg (Welsh)	iso-8859-14
'da'	Danish	iso-8859-15
'de_AT'	German (Austria)	iso-8859-15
'de_BE'	German (Belgian)	iso-8859-15
'de_CH'	German (Swiss)	iso-8859-15
'de_DE'	German (Germany)	iso-8859-15
'el'	Greek	iso-8859-7
'el_GR.UTF-8'	Greek (UTF-8)	iso-8859-7
'eo'	Esperanto	iso-8859-3
'es_AR'	Spanish (Argentina)	iso-8859-1
'es_ES'	Spanish (Spain, modern sorting)	iso-8859-15
'es_ES.UTF-8'	Spanish (Spain, modern sorting, UTF-8)	iso-8859-15
'es@tradicional'	Spanish (Spain, traditional sorting)	iso-8859-15
'es_MX'	Spanish (Mexico)	iso-8859-1
'et'	Estonian	iso-8859-15
'eu_ES'	Euskara (Basque)	iso-8859-15
'fa_IR.UTF-8'	Farsi (Iranian, UTF-8)	unicode
'fi_FI'	Finnish (Suomi)	iso-8859-15
'fr_BE'	French (Belgian)	iso-8859-15
'fr_CA'	French (Canada)	iso-8859-15
'fr_CH'	French (Swiss)	Iso-8859-15
'fr_FR'	French (France)	iso-8859-15
'fr_FR.UTF-8'	French (France, UTF-8)	iso-8859-15
'ga_IE'	Gaeilge (Irish)	iso-8859-15
'gl_ES'	Galego (Galician)	iso-8859-15
'he_IL.UTF-8'	Hebrew	iso-8859-8
'hr'	Croatian	iso-8859-2
'hu'	Hungarian	iso-8859-2
'hy_AM.UTF-8'	Armenian	armscii-8
'id'	Indonesian	iso-8859-1

'is'	Icelandic	iso-8859-1
'it_CH'	Italian (Swiss)	iso-8859-15
'it_IT'	Italian (Italy)	iso-8859-15
'ja'	Japanese	jisx0208
'ja_JP.UTF-8'	Japanese (UTF-8)	jisx0208
'ka_GE.UTF-8'	Georgian	georgian-ps
'ko'	Korean	ksc5601
'ko_KR.UTF-8'	Korean (UTF-8)	ksc5601
'lt'	Lithuanian	iso-8859-13
'lv'	Latvian	iso-8859-13
'mi'	Maori	iso-8859-13
'mk_MK.UTF-8'	Macedonian (Cryllic)	cp1251
'ms'	Malay	iso-8859-1
'mt_MT.UTF-8'	Maltese	iso-8859-3
'nl_BE'	Dutch (Belgian)	iso-8859-15
'nl_NL'	Dutch (Netherlands)	iso-8859-15
'no'	Norwegian (Bokmaal)	iso-8859-1
'nn'	Norwegian (Nynorsk)	iso-8859-1
'pl'	Polish	iso-8859-2
'pt_BR'	Portuguese (Brazil)	iso-8859-1
'pt_PT'	Portuguese (Portugal)	iso-8859-15
'ro'	Romanian	iso-8859-2
'ru_RU.CP1251'	Russian	cp1251
'ru_RU.KOI8-R'	Russian (KOI8)	koi8-r
'ru_RU.UTF-8'	Russian (UTF-8)	cp1251
'sk'	Slovak	iso-8859-2
'sl'	Slovenian	iso-8859-2
'sp'	Serbian (Cyrillic)	iso-8859-5
'sr'	Serbian (Latin)	iso-8859-2
'sr_YU.UTF-8'	Serbian (Latin, UTF-8)	iso-8859-2
'sv'	Swedish	iso-8859-1
'ta_IN.UTF-8'	Tamil	Iso-8859-1
'tg_TJ.UTF-8'	Tajik	koi8-c
'th'	Thai	tis620
'th_TH.UTF-8'	Thai (UTF-8)	tis620
'tr'	Turkish	iso-8859-9
'uk_UA'	Ukrainian (KOI8)	koi8-u
'uk_UA.CP1251'	Ukrainian	cp1251
'uk_UA.UTF-8'	Ukrainian (UTF-8)	cp1251
'uz'	Uzbek	iso-8859-1
'vi_VN.UTF-8'	Vietnamese	viscii
'wa'	Walon	iso-8859-1
'zh_TW.Big5'	Chinese (Traditional)	Big5
'zh_TW.UTF-8'	Chinese (Traditional, UTF-8)	Big5
'zh_CN.GB2312'	Chinese (Simplified)	gb2312
'zh_CN.UTF-8'	Chinese (Simplified, UTF-8)	gb2312

NOTE: Not all languages are supported by all applications. The third column, above, is the character set for the language.

Related Option Entries:

keyboard

manualFstab

This option allows you to add additional entries to the `/etc/fstab` file on the target computer. The most notable include adding NFS mounts and Windows shares (smbfs). Possibilities include other devices which are not detected by the install program, partitions or devices which already exist on the target computer and have not been specified in the 'partitioning' option.

```
'manualFstab' => [
   {
       'device' => 'linux1:/nfscd/cdrom82',
       'mntpoint' => '/mnt/linux1',
       'type' => 'nfs',
       'options' => 'noauto,ro,nosuid,rsize=8192,wsize=8192'
   }
],
```

The fields for this option are identical to those you would see in the `/etc/fstab` file.

Descriptions:

`'device'` - a physical device (partition) such as `'hdd1'` or, a nfs network device such as `'linux1:/nfscd/cdrom82'` or, `'//cherry/cherry-c'` for smb file systems.

`'mntpoint'` - the file system mount point for the device. It is a good idea NOT to use a mount point that is created for the use of rpmdrake (eg. /mnt/nfs).

`'type'` - type of file system on the device (eg. `ext2`, `reiserfs`, `nfs`, `smbfs`). See `man mount` for a list of supported file types.

`'options'` - mount options for the device/file system being mounted.

`'passno'` - if present, the value specified is placed in the fifth (5) field (default value of 0 is used if this is omitted). See the man page for fstab (man fstab).

`'freq'` - if present, the value specified is placed in the sixth (6) field (default value of 0 is used if this is omitted). See the man page for fstab (man fstab).

`'toFormat' => 1,` - if present, causes the associated `'device'` to be formatted. This selection is applicable to local devices only and is ONLY used when an EXISTING partition must be formatted prior to the actual installation (see the Note for the option `'partitioning'`).

Examples:

The following is a simple example to illustrate specifying a Windows Share:.

```
'manualFstab' => [
   {
       'device' => '//cherry/cherry-c',
       'mntpoint' => '/mnt/cherry',
       'type' => 'smbfs',
       'options' => 'noauto,ro,username=david,password=hawker,workgroup=eastcott'
       'passno' => 0,
       'freq' => 0,
   }
],
```

NOTE: Because `username` and `password` are present, `drakx` will automatically create a file

`/etc/samba/auth.cherry.david` (`/etc/samba/auth.<server>.<username>`) which will contain the actual `username` and `password` values, and adjust the `/etc/fstab` file entry so that it contains a reference (`credentials`) to this file. See `man smbmount` for more details.

Related Option Entries:

[partitions](), [partitioning]()

miscellaneous

This is where stuff goes that does not fit anywhere else.

```
'miscellaneous' => {

    'numlock' => 1,
    'HDPARM' => 1,
    'http_proxy' => undef,
    'ftp_proxy' => undef,
    'track_network_id' => undef
},
```

Descriptions:

`'numlock'` - if present, causes the numlock package to be installed. Whether it is set to 1 or 0 does not matter, the numlock service will be started with the result that keyboards' NumLock will be turned on after boot up. If you want it off after boot up, then you will have to create a services list which specifically excludes numlock (see the <u>'services'</u> option).

`'HDPARM'` - if present, then forces the `'perImageAppend'`, used by the bootloader, to have ALL IDE controllers set for auto tune (eg. ide0=autotune ide1=autotune).

`'http_proxy'` - if used, then it is set to the URL and port for the http proxy server.

`'ftp_proxy'` - if used, then it is set to the URL and port for the ftp proxy server.

`'track_network_id'` - if used, then it allows you to enable (1) or disable (0) the ethernet interface hardware address (ethernet hardware address) tracking. It is useful for Laptops where the interface card can be removed/replaced under varying circumstances.

If you have specified entries for the `'http_proxy'` or `'ftp_proxy'` options, DrakX places them in two files: `/etc/profile.d/proxy.sh` and `/etc/profile.d/proxy.csh`.

NOTE: The option `'CLEAN_TMP'` has been removed, but you can still have the startup scripts clean the /tmp directory by adding `CLEAN_TMP=1` to the `/etc/sysconfig/system` file.

Related Option Entries:

<u>default_packages</u>, <u>bootloader</u>, <u>intf</u>, <u>services</u>.

mkbootdisk

This option allows you to create a boot disk during the install process. Probably not something you want to do while doing an auto installation.

```
'mkbootdisk' => '',
```

Descriptions:

`'mkbootdisk'` - used to specify the floppy device that is to be used:

`'0'` or `''` - no boot disk

`'1'` - if there is only 1 floppy drive in the system, then this will create the boot disk on it.

`'fd0'` - if you have more than one floppy device, then you can specify the one to be used. It is the device name without the `'/dev/'` part. For IDE floppies it is typically `'fd0'` or `'fd1'`, LS120 devices are `'pf0'` and for scsi floppies, it is dependent on its LUN (eg. `'sdb'`).

Related Option Entries:

none.

mouse

This option is used to define the Mouse that is attached to the target computer. Use this option ONLY if you know the required information. By using this option, DrakX is inhibited from performing a 'Mouse Probe' in an attempt to automatically identify the type of mouse available. See `'nomouseprobe'` for additional information.

```
'mouse' => {

    'type' => 'serial',
    'device' => 'ttyS1',
    'name' => 'Generic 2 Button Mouse',
    'nbuttons' => 2,
    'XEMU3' => 'yes',
    'MOUSETYPE' => 'Microsoft',
    'XMOUSETYPE' => 'Microsoft',
    'FULLNAME' => 'serial|Generic 2 Button Mouse',
    'WHEEL' => 'no'
},
```

Descriptions:

`'type'` - one of `'PS/2'`, `'USB'`, `'serial'`, `'busmouse'`, or `'none'`. See table for mice for each type.

`'device'` - device file to use:

- for PS/2, use `'psaux'`,
- for serial use `'ttySx'` where x is a serial port number (0, 1, 2 or 3),
- for busmouse use one of `'atibm'`, `'inportbm'` or `'logibm'` (depends on card installed), for a PPC use `'adbmouse'`
- for USB, use `'usbmouse'`
- for none, use `'none'`

`'name'` - see table.

`'nbuttons'` - 2 or 3 for mice without a wheel, 5 for mice with a wheel (see table).

`'XEMU3'` - `'yes'` if 2 button mouse and you want 3 button emulation, else should be set to `'no'`.

`'MOUSETYPE'` - see table.

`'XMOUSETYPE'` - see table.

`'FULLNAME'` - is `'<type> | <name>'`. eg. `'PS/2|Standard'`

`'WHEEL'` - `'yes'` if mouse has a wheel, `'no'` if the mouse does not.

'nbuttons'	'MOUSETYPE'	'XMOUSETYPE'	'name'
'PS/2'			
2	ps/2	PS/2	Standard
5	ps/2	MouseManPlusPS/2	Logitech MouseMan+
5	imps2	IMPS/2	Generic PS2 Wheel Mouse
5	ps/2	GlidePointPS/2	GlidePoint
5	ps/2	ThinkingMousePS/2	Kensington Thinking Mouse
5	netmouse	NetMousePS/2	Genius NetMouse
5	netmouse	NetScrollPS/2	Genius NetScroll
'USB'			
2	ps/2	PS/2	Generic 2 Button Mouse
3	ps/2	PS/2	Generic
5	ps/2	IMPS2	Wheel
1	ps/2	PS/2	1 button (PPC only)
'serial'			
2	Microsoft	Microsoft	Generic 2 Button Mouse
3	Microsoft	Microsoft	Generic 3 Button Mouse
5	ms3	IntelliMouse	Microsoft IntelliMouse
3	MouseMan	MouseMan	Logitech MouseMan
2	MouseSystems	MouseSystems	Mouse Systems
3	logim	MouseMan	Logitech CC Series
5	pnp	IntelliMouse	Logitech MouseMan+/FirstMouse+
5	ms3	IntelliMouse	Genius NetMouse
2	MMSeries	MMSeries	MM Series
2	MMHitTab	MMHittab	MM HitTablet
3	Logitech	Logitech	Logitech Mouse (serial, old C7 type)
3	Microsoft	ThinkingMouse	Kensington Thinking Mouse
'busmouse'			
1	Busmouse	BusMouse	1 button (PPC only)
2	Busmouse	BusMouse	2 buttons
3	Busmouse	BusMouse	3 buttons
'none'			
0	None	Microsoft	No mouse

Examples:

NOTE: If you are using an old Microsoft Bus Mouse, you MUST use this option.

```
        'mouse' =>  {

        'type' => 'busmouse',
        'device' => 'inportbm',
        'name' => '2 buttons',
        'nbuttons' => 2,
```

```
'XEMU3' => 'yes',
'MOUSETYPE' => 'Busmouse',
'XMOUSETYPE' => 'BusMouse',
'FULLNAME' => 'busmouse|2 buttons',
'WHEEL' => 'no'
},
```

The following is an example for a PS/2 non wheel mouse:

```
'mouse' =>  {

'type' => 'PS/2',
'device' => 'psaux',
'name' => 'Standard',
'nbuttons' => 2,
'XEMU3' => 'yes',
'MOUSETYPE' => 'ps/2',
'XMOUSETYPE' => 'PS/2',
'FULLNAME' => 'PS/2|Standard',
'WHEEL' => 'no'
},
```

The following is an example for a serial mouse:

```
'mouse' => {

'type' => 'serial',
'device' => 'ttyS1',
'name' => 'Generic 2 Button Mouse',
'nbuttons' => 2,
'XEMU3' => 'yes',
'MOUSETYPE' => 'Microsoft',
'XMOUSETYPE' => 'Microsoft',
'FULLNAME' => 'serial|Generic 2 Button Mouse',
'WHEEL' => 'no'
},
```

The following is an example for a Generic PS/2 Wheel mouse:

```
'mouse' => {

'type' => 'PS/2',
'device' => 'psaux',
'name' => 'Generic PS2 Wheel Mouse',
'nbuttons' => 5,
'XEMU3' => 'no',
'MOUSETYPE' => 'imps/2,
'XMOUSETYPE' => 'IMPS/2',
'FULLNAME' => 'PS/2|Generic PS2 Wheel Mouse',
'WHEEL' => 'yes',
},
```

NOTE: Information from here is used to update the files /etc/sysconfig/mouse and
/etc/X11/XF86Config(-4) Mouse section.

Related Option Entries:

nomouseprobe, wacom, X

netc

This option contains values used to configure the network parameters for the target computer. The general form is as follows:

```
'netc' =>   {

    'NETWORKING' => 'yes',
    'minus_one' => 1,
    'nb_cards' => 2,
    'FORWARD_IPV4' => 'false',
    'HOSTNAME' => 'linux-dev.eastcott.net',
    'DOMAINNAME' => 'eastcott.net',
    'GATEWAY' => '192.168.5.254',
    'GATEWAYDEV' => 'eth0',
    'dnsServer' => '24.64.8.1',
    'dnsServer2' => '24.64.8.2',
    'dnsServer3' => undef,
    'NISDOMAIN' => undef,
    'LDAPDOMAIN' => undef,
    'DHCP_HOSTNAME' => 'CS167266-B',
    'dhcp_client' => 'dhcpcd,
},
```

Descriptions:

'NETWORKING' - set to 'yes' if this machine is network connected, otherwise it is set to 'no' and remove any other entries .

'minus_one' - set to 1 if any interface uses DHCP to obtain its IP information, otherwise it is set to 0.

'nb_cards' - number of ethernet capable interface cards in the computer. This is a count of the number of definitions that you specified in the 'intf' option, including the wireless_eth.

'FORWARD_IPV4' - set to 'true' if IP forwarding between interfaces is required, otherwise it should be set to 'false'.

'HOSTNAME' - fully qualified host name for the target computer. This is not required if supplied via a DHCP server.

'DOMAINNAME' - domain name for the target computer. This is not required if supplied via a DHCP server.

'GATEWAY' - IP address for the machine that processes all non-local IP messages. This is not required if supplied via a DHCP server.

'GATEWAYDEV' - device name for the interface that is to be used to access the gateway machine. This is not required if supplied via a DHCP server.

'dnsServer' - IP addresses for DNS server, up to three may be specified. This is not required if supplied via a DHCP server.

'dnsServer2' - if available, then the second DNS server's IP address. This is not required if supplied via a DHCP server.

'dnsServer3' - if available, then the second DNS server's IP address. This is not required if supplied via a DHCP server.

'NISDOMAIN' - if NIS authentication is used, then this contains the NIS domain name, otherwise it is not required.

'LDAPDOMAIN' - if LDAP authentication is being used, then this contains the Base Distinguished Name, otherwise it is not required. (eg. `'LDAPDOMAIN' => 'dc=eastcott,dc=net'`)

'WINDOMAIN' - if Windows PDC authentication is being used, then this contains the Windows Domain, otherwise it is not required. (eg. `'WINDOMAIN' => 'EASTCOTT'`)

'DHCP_HOSTNAME' - if needed by the DHCP server, the name to be presented when requesting an IP address and other related values.

> **NOTE:** this value can be different from HOSTNAME (when supplying a specific name to an ISP) and is usually just the host name (no domain name part). You should look at the file `/etc/sysconfig/network-scripts/ifup` to see the effects that HOSTNAME, DOMAINNAME and DHCP_HOSTNAME have on the parameters sent to the DHCP server via your specified `dhcp_client`.

'dhcp_client' - if one or more interfaces specifies `dhcp` for BOOTPROTO then this parameter this specifies the DHCP client package to be installed; it may be one of `'dhcpcd'`, `'dhcpxd'` or `'pump'`. If this parameter is not specified, then the `dhcpcd` package is installed by default. If more than one dhcp client package is installed, you should add DHCP_CLIENT=<your client> to the associated ifcfg-ethx file.

You will find most of these options placed in the files `/etc/resolv.conf` and `/etc/sysconfig/network`.

Examples:

See the section ***Network and Connection Examples*** for various examples.

When you examine the `/sbin/ifup` script, you will see a couple other things that can be done to control the actual operation of the dhcp client (dhcpcd) that you may find useful. If you add PEERDNS=no to the `/etc/sysconfig/network` file, then the dhcpcd client will NOT replace your `/etc/resolv.conf` file (for those of you using a local DNS server). And, if you delete the HOSTNAME and DOMAINNAME entries from `/etc/sysconfig/network` file, the dhcpcd client can be made to update these with information it gets from the DHCP server. These fine adjustments need to be done either manually or by using the 'postinstall' option. eg.

```
        'postInstall' => "
# fix so that dhcp client updates host and domain names from server
cat /etc/sysconfig/network | sed '/^HOSTNAME/d' | \
      sed '/^DOMAINNAME/d' > /etc/sysconfig/network1
# but make sure it does not replace resolv.conf
echo \"PEERDNS=no\" >> /etc/sysconfig/network1
mv -f /etc/sysconfig/network1 /etc/sysconfig/network
"
```


Related Option Entries:

intf, authentication, postInstall

nomouseprobe

This option is used to prevent the install program from doing a 'Mouse Probe' on serial ports, PS/2 mouse port, etc. You would ONLY use this when the target computer has no mouse attached and you have equipment connected to the computer (typically serial ports) that would be adversely affected by the mouse probe.

If you use the `'mouse'` option to define your mouse, then the mouse probe is automatically disabled and this option is not necessary.

```
'nomouseprobe' => 1,
```

Descriptions:

`'nomouseprobe'` - what to do

0	- enable probing for a mouse.
1	- disable probing for a mouse.

Normally if you want probing, then this statement is not included in the `auto_inst.cfg` file

Related Option Entries:

mouse, postInstall, services

partitioning

This option is used to control the partitioning of the target systems' hard disk drives.

```
'partitioning' =>    {

   'clearall' => 1,
   'clear' => undef,
   'eraseBadPartitions' => 0,
   'auto_allocate' => 1
},
```

Descriptions:

'clearall' - set to 1 if all the existing partitions on all disks are to be cleared and replaced by new ones (internal defaults or the ones defined by 'partitions' are to be used). Set to 0 if the disks are to be left untouched or, you are going to use 'clear' instead.

'clear' - if present, this is a list of the disks that are to have their partitions cleared. If your system has more than one disk drive, any drive(s) you do not list are left untouched.

   eg. 'clear' => ['hda', 'hdc'], clears the partitions on hda and hdc, but leaves hdb untouched. The partitions for hdb will have to be defined using the 'manualFstab' option.

'eraseBadPartitions' - this is no longer used and, if present it has no affect.

'auto_allocate' - set to 1 if disk partitions are to be defined by the option 'partitions', set to 0 if the installer is to leave the existing partitioning untouched. If you have cleared all or, one or more drive partitions, then you need to set this option to the value one (1) and, you have to define the new partition layout for the cleared drives using the 'partitions' option.

Note:

If you want to re-use the existing partitions, then set clearall and auto_allocate to their zero (0) value. AND add all the mounting information to the 'manualFstab'.

If you want the install program to auto-allocate the partitions, then set clearall and auto_allocate to their one (1) value, and remove the 'partitions' option.

Related Option Entries:

partitions, manualFstab

partitions

This option is used to define the partitions that are to be created on your hard disks. It is used in conjunction with the 'partitioning' options entry for 'auto_allocate'. If 'auto_allocate' => 0, then this options' contents are ignored.

```
'partitions' => [
    {
        'mntpoint' => '/boot',
        'type' => 131,
        'size' => 64449,
        'hd' => 'hda'
    },
    {
        'mntpoint' => 'swap',
        'type' => 130,
        'size' => 524097,
        'hd' => 'hda'
    },
    {
        'mntpoint' => '/',
        'type' => 387,
        'size' => 573344,
        'ratio' => 100,
        'maxsize' => 5750000
        'hd' => 'hda'
    }
],
```

Descriptions:

'mntpoint' - normally, this is the directory where the partition will be mounted. However, it is also used to provide a unique name for a RAID volume or LVM physical volume (PV) that will be combined in a subsequent declaration using the 'parts' option.

'type' - file system type for the partition.

131 (0x83) is ext2, 130 (0x82) is swap, 387 (0x183) is reiserfs. See Mandrake/mdkinst/usr/bin/perl-install/partition_table.pm for a complete listing.

NOTE: use 142 (0x8e) for LVM PVs or 253 (0xfd) for RAID partitions

'size' - the number of sectors that the partition is to be created with. The partitioning of the disk is done to the nearest cylinder boundary less than or equal to the number you have specified. The number of sectors in a cylinder are found by (number of sectors per track) * (number of heads). Usually each sector is 512 bytes in size, so you can do the math...

A quick short way is: 'size' => 32 << 11 should give you something just short of 32 megabytes.

'ratio' - is the percentage (1 -> 100) of the disk that the partition can grow to.

'maxsize' - is the maximum number of sectors that the partition can be. A limit on the 'ratio'

'hd' - device label (without the /dev/ part) for the disk drive that this set of definitions applies to. eg. hda or sdb. This entry is not required if you only have one hard disk, but it may be a good habit to get into in case the next system has more than one drive and you forget.

'level' - this specifies the Software RAID level that is desired. Supported levels are:

```
        'linear','0','1','4' or '5'
```

'parts' - this is a space separated list of 'mntpoint' which are to be combined into either a RAID array or a LVM Volume Group (VG).

'VG_name' - is the name used to reference a Volume Group in a subsequent declaration.

NOTE: To make your life a bit simpler and be able to allocate all of the disk, change the last partitions 'size' to some small value and set the 'ratio' to 100. This has the effect of allocating all of the remainder of the disk to that partition.

Examples:

LVM:

```
partitions => [
  ...
  { 'mntpoint' => 'vg_a', 'size' => 400 << 11, 'type' => 0x8e, 'hd' => 'sda' },
  { 'mntpoint' => 'vg_b', 'size' => 400 << 11, 'type' => 0x8e, 'hd' => 'sdb', 'ratio' => 1 },
  { 'VG_name' => 'pixVG', 'parts' => 'vg_a vg_b' },
  { 'mntpoint' => '/home', 'size' => 500 << 11, 'type' => 0x183, 'hd' => 'pixVG' },
],
```

NOTE: If the 'parts' field is omitted, then any PV available will be used.

Software RAID:

```
partitions => [
  ...
  { 'mntpoint' => 'raid_a', 'size' => 400 << 11, 'type' => 0xfd, 'hd' => 'sda', 'ratio' => 1 },
  { 'mntpoint' => 'raid_b', 'size' => 400 << 11, 'type' => 0xfd, 'hd' => 'sdb', 'ratio' => 1 },
  { 'mntpoint' => 'raid_c', 'size' => 400 << 11, 'type' => 0xfd, 'hd' => 'sdc', 'ratio' => 1 },
  { 'mntpoint' => 'raid_d', 'size' => 400 << 11, 'type' => 0xfd, 'hd' => 'sdd', 'ratio' => 1 },
  { 'mntpoint' => '/home', 'type' => 0x483, 'hd' => 'md0', 'level' => 1, 'parts' => 'raid_a raid_b' },
],
```

LVM on software raid:

```
partitions => [
  ...
  { 'mntpoint' => 'raid_a', 'size' => 400 << 11, 'type' => 0xfd, 'hd' => 'sda', 'ratio' => 1 },
  { 'mntpoint' => 'raid_b', 'size' => 400 << 11, 'type' => 0xfd, 'hd' => 'sdb', 'ratio' => 1 },
  { 'mntpoint' => 'raid_c', 'size' => 400 << 11, 'type' => 0xfd, 'hd' => 'sdc', 'ratio' => 1 },
  { 'mntpoint' => 'raid_d', 'size' => 400 << 11, 'type' => 0xfd, 'hd' => 'sdd', 'ratio' => 1 },
  { 'mntpoint' => 'vg_a', 'type' => 0x8e, 'hd' => 'md0', 'level' => 1, 'parts' => 'raid_a raid_b' },
  { 'mntpoint' => 'vg_b', 'type' => 0x8e, 'hd' => 'md1', 'level' => 1, 'parts' => 'raid_c raid_d' },
  { 'VG_name' => 'pixVG', 'parts' => 'vg_a vg_b' },
  { 'mntpoint' => '/home', 'size' => 500 << 11, 'type' => 0x183, 'hd' => 'pixVG' },
],
```

NOTE: If the 'parts' field is omitted, then any PV available will be used.

Related Option Entries:

manualFstab, partitioning

postInstall and postInstallNonRooted

This option provides the installer two simple methods for performing post installation activities on the installed system. You can use one or the other or both methods. If you want to use both, then the installer will execute the `'postInstallNonRooted'` first, then the `'postInstall'` last.

postInstall:

```
          'postInstall' => "
echo \"This is a test string\" > /root/test.log
"
```

For this option, the install script is executed as root on the target computer with the environment set to that of the target computer. In other words, any references to the file system are relative to the target computers / (root). In addition, DrakX executes the script that you define using the form: `chroot /mnt bash -c <yourscript here>` (/mnt is the directory, in the DrakX environment, under which the entire file system for the target computer is located).

postInstallNonRooted:

```
          'postInstallNonRooted' => '
echo "This is a test string" > /mnt/root/test.log
'
```

For this option, the install script is executed within the current environment of the DrakX install program. In other words, any references to the file system are relative to DrakX's / (root). In addition, DrakX executes the script that you define using the form: `bash -c <yourscript here>`.

The above two examples produce the exact same result; the string, `This is a test string` is placed in a file called `test.log` located in the `/root` directory on the target computer. For the observant, there are a some other subtle differences. The use of a perl single-quote string literal (which allows only the `\'` and `\\` escape-sequences) and the perl double-quote string literal (which allows backslash and variable interpolation). Either form can be used with either option, although the single-quote form is the easiest to follow and likely the most often used. In the double-quote form, the double-quote (`"`) before and after the string `This is a test string` had to be 'escaped', otherwise the script would have terminated prematurely and as a consequence **not** be executed.

Examples:

The following are a simple set of examples which demonstrate the use of these options.

Change the default auto install run level from 5 to 3 (uses "" so that the sed parameter does not have to be 'escaped'):

```
          'postInstall' => "
# change run level from 5 to 3
cat /etc/inittab | sed 's/^id:5:init/id:3:init/' > /etc/inittab1
mv -f /etc/inittab1 /etc/inittab
"
```

Or using a simple perl one-liner:

```
         'postInstall' => '
# change run level from 5 to 3
perl -p -i -e "s/^id:5:init/id:3:init/" /etc/inittab
'
```

Copy the auto install configuration file defined with the `syslinux.cfg` append parameter `auto_install=` to the target computers `/root/drakx` directory (this only works for NFS and CD-ROM source medias):

```
         'postInstallNonRooted' => "
# copy the file from the source media
cp /tmp/image/$::auto_install /mnt/root/drakx/
"
```

A little more complicated variation:

```
         'postInstall' => '
# only if the NTP package is installed
if [ -f /etc/ntp.conf ]; then
    cat <<EOF1 > /etc/ntp/step-tickers
time-server.eastcott.net
EOF1
fi

# clean up bug for Netscape
cat <<EOF2 >> /etc/skel/.bash_profile

# clean up old cache files, since Netscape doesn't
[ -d ~/.netscape ] && rm -rf ~/.netscape/cache/*

EOF2
'
```

NOTE: the `EOF` (or what you used for `<<EOF`) MUST begin in column 1 and be on a line by itself.

One final note, if you selected `'autoExitInstall' => 0`, then these two options do **NOT** get executed until AFTER you press the ENTER key at the end of the installation process.

Related Option Entries:

Depends on what all you installed.

printer

This option provides you with the ability to install and configure none, one, or more printers. DrakX provides installation support for four basic printing systems: CUPS, LPRng, LPD and PDQ. The following is an attempt to distill the auto install stuff down to a simple presentation.

If all else fails, use the following form to indicate that there is no printer to be installed and then after the install is done, use the `printerdrake` program to add your printing system and printers.

To have No Printing System installed, simply ensure that the `'printer'` option is not in the file, or:

```
'printer' => undef,
```

However, for the more adventurous:

```
    'printer' => {

       'DEFAULT' => 'HP990C',
       'SPOOLER' => 'cups',
       'BROWSEPOLLADDR' => undef,
       'BROWSEPOLLPORT' => undef,
       'MANUALCUPSCONFIG' => undef,

       'configured' => {

          'HP990C' => {
             'queuedata' => {
                'spooler' => 'cups',
                'foomatic' => 1,
                'printer' => '530418',
                'ppd' => undef,
                'queue' => 'HP990C',
                'driver' => 'hpijs',
                'connect' => 'smb://david:cherry@eastcott/cherry/HP-990C'
                'desc' => 'Color InkJet',
                'loc' => 'Cherry\'s Computer',
                'make' => 'HP',
                'model' => DeskJet 990C',
                'options' => [
                   '-o',
                   'PageSize=Letter',
                   '-o',
                   'InputSlot=Default'
                   '-o',
                   'Duplex=None',

                   ...
                ],
             },
          }
       }
    },
```

NOTE: `BROWSEPOLLADDR`, `BROWSEPOLLPORT` and `MANUALCUPSCONFIG` are **not** currently used. So you could remove them or, just not include them in your `'auto_inst.cfg'` file.

Descriptions:

`'DEFAULT'` - this is set to the `'queue'` name for the printer that you want as the default (generally referenced as lp). eg. `'DEFAULT' => 'HP990C',`

`'SPOOLER'` - this is the printing systems that you want installed. It may be one of `'cups'`, `'lpd'`, `'lprng'` or, `'pdq'`. eg. `'SPOOLER' => 'cups',` **NOTE:** it seems that `'lpd'` and `'lprng'` are going to be removed in future versions.

`'BROWSEPOLLADDR'` - not currently supported. This is an IP address that CUPS will poll for supported printers (see the file `/etc/cups/cupsd.conf`). eg. `'BROWSEPOLLADDR' => '192.168.5.253',`

`'BROWSEPOLLPORT'` - not currently supported. This is the interface Port number to contact when polling for supported printers (see the file `/etc/cups/cupsd.conf`). eg. `'BROWSEPOLLPORT' => '631',`

`'MANUALCUPSCONFIG'` - not currently supported. Set to 1 if you are manually configuring the printing subsystem. Set to 0, if CUPS is to automatically set up the configuration files each time the CUPS service is started. eg. `'MANUALCUPSCONFIG' => 1,`. The file `/etc/sysconfig/printing` will contain a line:

> `CUPS_CONFIG=manual` - when this option is set to 1 or,
>
> `CUPS_CONFIG=automatic` - when this option is set to 0

Each `'configured'` printer definition begins with the name of the printer `'queue'`, and is followed by all the printer specific parameters as follows:

`'spooler'` - this is set to the same value used for `'SPOOLER'`. eg. `'spooler' => 'cups',`

`'foomatic'` - set to 1 if you want to select the printer using the foomatic printer ID. If you want to use a CUPS+PPD file instead, then set it to `undef` and enter the `'ppd'` information. eg. `'foomatic' => '1',`

`'printer'` - required if you set `'foomatic' => 1,`. This is set to the printer ID contained in the foomatic database You can determine the value to use with the command `'/usr/bin/foomatic-configure -O -q | less'` to locate your printer, then extract the string which is bounded by the xml tag `<id>...</id>`. eg. `'printer' => '530418',`

`'ppd'` - required if you set `'foomatic' => undef,`. This is set to the file name for the CUPS+PPD file associated with the printer. You can determine the filename by using the command `'/usr/bin/poll_ppd_base -a | less'` to locate the PPD definition for your printer. Each line contains a number of fields separated by a vertical bar (`|`). The first field contains the filename required for this entry. An alternate approach is to look in the directory `/usr/share/cups/model`, locate your model and desired ppd file. The value for `'ppd'` would be the sub-directory and filename you want. Set it to 1 if the printer is to be installed without an initial PPD script. Set it to `undef` if you are not using a PPD file. eg. `'ppd' => 'xerox/xr_45171.ppd.gz',`

`'queue'` - this is set to a string which represents the name of the printer that all printing utilities recognize as meaning 'this' printer. It MUST be set to the same value that is used for this printers definition. **NOTE:** the CUPS tools only allow the use of letter, number and the underscore characters. Strange, because the KUPS administration tool lets you add printer names with a hyphen too. eg. `'queue' => 'HP990C',`

`'driver'` - this is the name of the driver to be used for this printer. You can determine the driver name by using the command `'/usr/bin/foomatic-configure -O -q | less'` to locate your printer, then locate the driver selections which are bounded by the xml tag `<drivers> ...</drivers>`, then extract the string bounded by the xml tag `<driver>...</driver>` for the driver you want to use. eg. `'driver' => 'hpijs',`

`'connect'` - this defines how the printer is to be accessed (pick one of the following):

file - the printer is accessed via a local parallel or usb port. General form is:

```
file:<port device file name>
```

eg. `'file:/dev/lp0'`, or `'file:/dev/usb/lp0'`,

ipp - the printer is accessed via the internet printing protocol. General form is:

```
ipp://<IP or FQDN>/printers/<printer name>
```

eg. `'ipp://linux1.eastcott.net/printers/HP_820C'`,

lpd - the printer is accessed via a remote lpd. If the spooling system selected is `'lpd'`, then the package `rlpr` must be installed. General form is:

```
lpd://<IP or FQDN>/<queue name>
```

eg. `'lpd://xerox.eastcott.net/PORT1'`,

serial - the printer is accessed via a local serial port. General form is:

```
serial:<serial port device file name>[?option[+option...]]
baud=rate - Sets the baud rate for the device.
bits=7 or 8 - Sets the number of data bits.
parity=even - Sets even parity checking.
parity=odd - Sets odd parity checking.
parity=none - Turns parity checking off.
flow=dtrdsr - Turns DTR/DSR (hardware) flow control on.
flow=hard - Turns RTS/CTS (hardware) flow control on.
flow=none - Turns flow control off.
flow=rtscts - Turns RTS/CTS (hardware) flow control on.
flow=soft - Turns XON/XOFF (software) flow control on.
```

eg. `'serial:/dev/ttyS0?baud=9600+bits=8+parity=none'`,

smb - the printer is accessed via the Microsoft SMB protocol. If this option is specified, then the package `samba-clients` must be installed. General form is one of the following:

```
smb://workgroup/server/sharename
smb://server/sharename
smb://user:pass@workgroup/server/sharename
smb://user:pass@server/sharename
```

eg. `'smb://MY-COMPUTER/HP_990C'`,

socket - the printer is accessed via the AppSocket protocol (a.k.a. JetDirect). If the printing system selected is `'lpd'` or `'lprng'`, then the package `nc` must be installed. General form is:

```
socket://<IP or FQDN>[:<port number>]
```

eg. `'socket://hp.eastcott.net:9600'`,

If a port number is not specified, it defaults to 9100

ncp - the printer is accessed via a Netware Host. If this option is used, then the package `ncpfs` must be installed. General form is:

```
ncp:lpd://user:password@<server name>/<queue name>
ncp:lpd://<server name>/<queue name>
```

eg. 'ncp://MY_PRINT_SERVER/PRINTER1',

postpipe - the file being printed is 'piped' through a user command, rather then being sent to a printer directly. General form is:

postpipe:<command>

eg. 'postpipe:cat > $HOME/rawfile',

NOTE: If you have a machine running with CUPS, then you can look at the CUPS documentation at http://localhost:631/sam.html which has a ton of information.

'desc' - this is descriptive text about the associated printer. eg. 'desc' => 'Color InkJet',

'loc' - this is usually text which describes where the printer is physically located. eg. 'loc' => 'Cherry\'s Office',

'make' - this is the manufacture's name for the printer. It is optional.

'model' - this is the manufacture's model designation for the printer. It is optional.

'options' - this is a series of parameters, which are concatenated together (space separated) and passed to the printer administration tool (foomatic-configure or lpadmin) when the printer queue is created. These options typically preset the default printer options. And are very dependent on the 'driver' selected.

To figure out what to put here, there are two steps (note: foomatic-configure outputs a perl data structure because of the -P option in the steps below):

First use:

```
foomatic-configure -P -q -p 530428 -d gimp-print -s cups | grep  "'name" | less
```

to get a list of option names for the printer (530418) and driver (gimp-print) and spooler (cups) combination.

Then use:

```
foomatic-configure -P -q -p 530428 -d gimp-print -s cups | less
```

and search for 'name' => '<option name you are looking to find values for>', just after it will be a structure beginning with 'vals_byname' which contains series of option values by name along with some information specific to each value. All you are interested in is the exact option value name(s).

Finally you create the 'option' entries as follows:

```
'-o',
'<option name>=<option value>',
```

and repeat for all options.

NOTES:

There are a couple issues with the CUPS system that you may want to be aware of:

1. The default auto install leaves the CUPS system acquiring and reporting printer information automatically on your network. You might really want to modify the /etc/cups/cupsd.conf file and set the BrowseInterval to 0 so that your computer does not broadcast its printer definitions to the world. This

propensity to tell everyone everything results in the various GUI tools presenting multiple instances of the printer definitions that can lead to confusion. Especially if the printer in question is a network based printer and you want to configure each computer to access the printer directly.

2. There is a lurking problem related to the CUPS ability to modify its configuration file to suit the network environment every time the daemon is restarted. If this is causing you concerns, you were wondering why your changes were being ignored, or you simply do not want this behavior, then make sure that the file `/etc/sysconfig/printing` exists, and contains the line `CUPS_CONFIG=manual`.

3. One final note. You normally do not have to set definitions for printers which are already defined on other computers running CUPS, as CUPS checks all other machines to see what printers they are exporting and will make them available to you. However, if they are exporting a printer which is actually on another computer or network and you print to it, then your print job actually goes to that computer first, then it goes to the printer. The downside is that if that computer is off, then you will not be able to use the printers it has defined. So use your discretion when defining printers

Examples:

NO Printers:

```
'printer' => undef
```

If you use this option, then you will probably have to install all the appropriate packages when you do set up your printers.

Multiple Printers:

```
'printer' => {
    'configured' => {
        'CK_HP990C' => {
            'queuedata' => {
                'printer' => '530418',
                'make' => 'HP',
                'foomatic' => 1,
                'options' => [
                    '-o',
                    'PageSize=Letter',
                    '-o',
                    'InputSlot=Default',
                    '-o',
                    'Duplex=None',
                    '-o',
                    'Resolution=300ColorCMYK',
                    '-o',
                    'Model=HP-DeskJet_990C'
                ],
                'ppd' => undef,
                'spooler' => 'cups',
                'model' => 'DeskJet 990C',
                'desc' => 'Color InkJet',
                'loc' => 'Cherry\'s Office',
                'queue' => 'CK_HP990C',
                'connect' => 'smb://david:cherry@eastcott/cherry/HP-990C',
                'driver' => 'hpijs'
            }
        },
        'CK_HP2200D' => {
            'queuedata' => {
                'printer' => 'HP-LaserJet_2200',
                'make' => 'HP',
                'foomatic' => 1,
                'options' => [
                    '-o',
                    'PageSize=Letter',
                    '-o',
                    'InputSlot=Default',
                    '-o',
                    'Manualfeed=Off',
```

```
                                    '-o',
                                    'Duplex=On',
                                    '-o',
                                    'Binding=LongEdge',
                                    '-o',
                                    'Resolution=300',
                                    '-o',
                                    'REt=Medium',
                                    '-o',
                                    'HPLJDensity=3',
                                    '-o',
                                    'Copies=1',
                                    '-o',
                                    'Economode=Economy',
                                    '-o',
                                    'FastRes=Off',
                                    '-o',
                                    'MemBoost=Auto',
                                    '-o',
                                    'PreFilter=No'
                                ],
                                'ppd' => undef,
                                'spooler' => 'cups',
                                'model' => 'LaserJet 2200',
                                'desc' => 'LazerJet',
                                'loc' => 'Dave\'s Office',
                                'queue' => 'CK_HP2200D',
                                'connect' => 'lpd://scb65358/L1',
                                'driver' => 'Postscript'
                            }
                        }
                    },
                    'BROWSEPOLLADDR' => undef,
                    'MANUALCUPSCONFIG' => undef,
                    'BROWSEPOLLPORT' => undef,
                    'DEFAULT' => 'CK_HP2200D',
                    'SPOOLER' => 'cups'
                },
```

Related Option Entries:

default_packages

security

This option is used to set the Mandrake Security Level.

```
'security' => 2,
```

Descriptions:

`'security'` - security level desired, from 0 through 5

> See the documentation on **msec** for more information regarding the meaning and effects of the various security level settings.

During the GUI installation, DrakX allows you to select one of four security levels, the following shows the security level associated with each:

Standard	2
High	3
Higher	4
Paranoid	5

Related Option Entries:

none.

services

This option is used to specify exactly which services are to be started at boot up. This is a tough one to describe since the services that are started at boot up are dependent on what you installed. However, the general form is as follows:

```
'services' => [

    '<name of service>',
    '<name of service>'
],
```

Descriptions:

'<name of service>' - This is a list of service names (the ones in /etc/rc.d/init.d) which you want automatically started.

DrakX determines what services are present in the /etc/rc.d/init.d directory and it runs 'chkconfig -- add ...' for the ones you list, and 'chkconfig --del ...' for those that are installed but you did not list. The following is a brief summary of the services that are possible (see the file Mandrake/mdkinst/use/bin/perl-install/services.pm for details):

Printing	cups cupslpd lpr lpd oki4daemon hpoj cups-lpd
Internet	httpd boa tux roxen ftp pftp tftp proftpd wu-ftpd pure-ftpdipsec proftpd-xinetd ipchains iptables ipvsadm isdn4linux ibod jabber jabber-icq adsl squid portsentry prelude nessusd junkbuster radvd cddbp ippl iptoip jail.init
File sharing	nfs nfslock smb nettalk netfs mcserv autofs amd venus.init auth2.init codasrv.init update.init swat
System	usb usbd pcmcia irda xinetd inetd kudzu harddrake apmd sound network xfs alsa functions halt kheader killall mandrake_everytime mandrake_firstime random rawdevices single keytable syslog crond medusa-init portmap acon anacron atd gpm psacct wine acpid numlock jserver sensors mosix bpowerd bpowerfail fcron powertweak.init ups syslog-ng cvs apcupsd dm
Remote Administration	sshd telnetd telnet rsh rlogin rexec webmin cfd heartbeat ldirectord iplog mon vncserver netsaint olympusd drakxtools_http
Database Server	mysql postgresql

NOTE: do NOT include mandrake_firstime or mandrake_everytime in your list, they are automatically handled by the scripts rc.local and rc.sysinit, respectively.

Examples:

A simple example:

```
'services' => [

        'syslog',
        'xfs',
        'network',
        'portmap'
],
```

Related Option Entries:

compssListLevel, compssUsersChoice, default_packages, nomouseprobe

superuser

This option is to set the Super User log in (usually referred to as root). These values are placed in the file `/etc/passwd` and the group id is placed in the file `/etc/group`.

```
'superuser' => {

    'uid' => '0',
    'gid' => '0',
    'realname' => 'root',
    'pw' => '$1$XHDtOdGw$kBibHl2otqOVEnBIumdgR/',
    'password' => 'psbcr!',
    'shell' => '/bin/bash',
    'home' => '/root',
    'icon' => 'root'
},
```

Descriptions:

`'uid'` - user id number (SHOULD ALWAYS be 0)

`'gid'` - group ID (SHOULD ALWAYS be 0)

`'realname'` - usually root, but can be anything you want.

> **NOTE:** use either `'pw'` or `'password'` - but NOT both.

`'pw'` - this is the encrypted form of the password. Its contents are dependent on the authentication used. If using MD5 and Shadow, then copy it from `/etc/shadow'`.

`'password'` - this is the clear text form of the password. Just what ever you want.

`'shell'` - the path name and shell program to use when root logs in.

`'home'` - where root's home directory is.

`'icon'` - if present, is the filename (but no extension) containing the desired icon. These icons are located in: `/usr/share/mdk/faces`.

NOTE: Setting `'pw' => undef` will result in an installed system where you can log in as root without a password. Probably not something you really want to do.

Related Option Entries:

users

timezone

This option is used to set the Time zone for the computer and to indicate if the computers hardware clock is set to UTC (GMT) or not.

```
'timezone' => {

    'UTC' => 1,
    'ntp' => 'time-server.eastcott.net',
    'timezone' => 'Canada/Mountain'
},
```

Descriptions:

`'UTC'` - how is the hardware clock set:

0 means it is set for the local timezone.
1 means it is set to GMT.

`'ntp'` - set to the fully qualified domain name for the time server that you want to access. See
http://www.ntp.org for a list of known time servers in your area and, more IMPORTANTLY, the rules
governing their access. See also the file /etc/ntp.conf and the directory contents in /etc/ntp.

`'timezone'` - set to one of the time zone strings for the local time zone

The time zone string can be determined from the directories located in /usr/share/zoneinfo and combining
the directory names and filenames.

Examples:

The directory Canada contains a file Mountain, so the time zone string would be `'Canada/Mountain'`.

NOTE: The file /etc/sysconfig/clock is updated with information from this option.

Related Option Entries:

none.

users

This option is used to add users to the system.

```
'users' => [
  {
      'name' => 'tom',
      'uid' => '5000',
      'gid' => '5000',
      'realname' => 'Tomas Wild',
      'pw' => '$1$XHDtOdGw$kBibHl2otqOVEnBIumdgR/',
    or
      'password' => 'psbcr!',
      'shell' => '/bin/bash',
      'home' => '/home/tom',
      'icon' => 'ic-bird',
      'groups' => []
  }
],
```

Descriptions:

'name' - the log in user name (REQUIRED). DrakX adds an entry to the /etc/passwd file using the value specified here, along with uid, gid, realname, home and shell. See man passwd.

'uid' - user id number (optional, if omitted then default begins at 501 and increments for each successive user)

'gid' - group ID number (optional, if omitted then default begins at 501 and increments for each successive user). DrakX updates the /etc/group file with an entry containing a group name, the same as 'name' above, and the 'gid' specified here or automatically generated.

'realname' - usually the user's full name, but can be anything you want. (optional, can be omitted)

   NOTE: use either 'pw' or 'password' - but NOT both.

'pw' - this is the encrypted form of the password. Its contents are dependent on the authentication used. If using MD5 and Shadow, then copy it from /etc/shadow.

'password' - this is the clear text form of the password. Just what ever you want.

'shell' - the path name and shell program to use when a user logs in. (Optional, defaults to /bin/bash)

'home' - where the users home directory is. (Optional, defaults to /home/<name>).

'icon' - if present, is the filename (no extension) containing the desired icon. These icons are located in: /usr/share/mdk/faces.

'groups' - if present, is a list of supplemental groups that this user is to be added to. You may specify either numeric gid's or text group names. DrakX will automatically add the user to the groups listed and remove the user from any groups not listed. **NOTE**: the group name or gid listed must already exist in the /etc/group file.

DrakX's default for the text group name is to use the 'name' value. This option works OK if you do not want specific text names for the GID. However, if you do want specific text names, then add the users that you want and modify the /etc/group file manually after the system is started. Alternately, you could use the 'postInstall' option to automate the fix up.

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Examples:

`'users' => [],` means do not create any user accounts.

An example to illustrate the `'groups'` feature:

```
    'users' => [
      {
          'name' => 'tom',
          'uid' => '5000',
          'gid' => '5000',
          'realname' => 'Tomas Wild',
          'pw' => '$1$XHDtOdGw$kBibHl2otqOVEnBIumdgR/',
          'shell' => '/bin/bash',
          'home' => '/home/tom',
          'icon' => 'ic-fish',
          'groups' => [ 'disk', '80' ]
      }
    ],
```

A simple example to add new groups (no user) and then add a user to the new groups, change and existing group name to a different name:

```
          'postInstall' => "
# add some groups
groupadd -g 4001 g_special
groupadd -g 4002 g_new_special
usermod -G special,new_special,disk,80 tom
groupmod -n g_ david david
"
```

Related Option Entries:

superuser, postInstall

useSupermount

This option is used to enable or disable the use of Supermount.

```
    'useSupermount' => 0,
```

Descriptions:

`'useSupermount'` - to use it or not

    `0` - to disable.
    `1` - to enable its use or, `''`

If the floppy device is not always using a FAT/VFAT file system, then you have to disable the use of Supermount. MDK 8.2 defaults to using Supermount for all removable media (cdrom , floppy, zip) that the installer detects in your system.

You can always modify the `/etc/fstab` file after installation as required.

NOTE: During a normal GUI based install, the ability to select/deselect Supermount can be adjusted by clicking the MORE button on the disk partitioning display and then select/deselect the button 'Removable media automounting'.

Related Option Entries:

manualFstab

wacom

This option is used to define none, one, or more graphical Tablet devices (WACOM)

```
'wacom' => [

    '<device>'
],
```

Descriptions:

`'<device>'` - the device that the tablet is attached to, without the `'/dev/'` part. eg. `ttyS0`.

There may be up to 4 tablets defined.

An interesting feature, when XFree86-4 is used, is the ability to use both a regular mouse device and a Wacom graphics tablet. See the following references for more details:

> http://www.linuxdoc.org/HOWTO/Wacom-Tablet-HOWTO.html
> http://www.linuxdoc.org/HOWTO/mini/Wacom-USB-mini-HOWTO.html
> http://www.lepied.com/xfree86

Examples:

No tablets installed use:

```
'wacom' => [],
```

A tablet attached to a serial port:

```
'wacom' => [

  'ttyS1'
],
```

A tablet attached via USB:

```
'wacom' => [

  'input/event0'
],
```

Related Option Entries:

mouse, X

X

The following are a collection of observations, rather than a definitive reference guide, to installing and customizing the X environment for your equipment.

No X

For those of you who are not installing or do not want X, make sure that the `'X' => {...}`, is not present in the `auto_inst.cfg` file. Also, make sure that you do not install any packages which have XFree86* as a dependancy. Or you can use `'X' => { 'disabled' => 1 }`, and not worry about which packages are installed.

Please note, that even though you may have installed the XFree86* packages, window manager packages, and / or X based applications, X will not be configured correctly. So don't forget and type startx at the command prompt!

Perhaps a better solution is to install X, then use the 'postInstall' option to change the default run level from 5 to 3 as follows:

```
         'postInstall' => "
# change run level from 5 to 3
cat /etc/inittab | sed 's/^id:5:init/id:3:init/' > /etc/inittab1
mv -f /etc/inittab1 /etc/inittab
"
```

Default X

If you are installing on a relatively new computer using a newer and supported graphics card, then the install program will probably be able to identify what it needs with only a couple hints as follows:

```
    'X' => {

        'resolution_wanted' => '1024x768',
        'default_depth' => '32'
    },
```

`'resolution_wanted'` - this may be one of: 640x480, 800x600, 1024x768, 1152x864, 1280x1024, 1400x1050, 1600x1200, 1920x1440, or 2048x1536; its very dependent on the type video card that you have installed and the monitor that is used.

`'default_depth'` - this may be one of: 8, 15, 16, 24 or 32; its very dependent on the type video card that you have installed.

Manual X

Manual configuration of your Card and Monitor values will require that you reference the files: `Mandrake/mdkinst/usr/share/ldetect-1st/Cards+.gz` and `MonitorsDB.gz` for some information. And possibly the manufactures documentation too.

If the `'ddcxinfos'` command does not work with your video card, or it returns incorrect values, then you can preset or over-ride the basic values as a first step, as follows:

```
'X' => {

        'resolution_wanted' => '1024x768',
        'default_depth' => '32',

        'card' => {
          'type' => 'ATI Mach64'
        },
        'monitor' => {
          'EISA_ID' => 'aocd556'
        }
},
```

The value for `'type'` is extracted from the Cards+ file from the NAME field in the section appropriate to your card. The `'EISA_ID'` value is obtained from the MonitorsDB file, <EISA ID> field and all letters must be LOWERCASE .

Anything beyond this and you should really use the *__Replay Install__* and add the selection 'ConfigureX'.

Multi-Head X

For this one you really want to use the *__Replay Install__* and add the selection 'ConfigureX'.

Related Option Entries:

mouse, wacom

Replay Install

DrakX has an exciting capability, Replay Auto Install, which can be used to assist installation on multiple computers with slightly different hardware configurations. This replay ability allows you to select one or more specific steps where you want to manually re-enter configuration selections.

Generation of a Replay Auto Install Disk and can be accomplished:

* at the end of a Manual install where you select Advanced, Generate an auto install floppy, then Reply or,
* on an installed system by running the `drakconf` program or,
* manually creating the disk and files on it.

Currently, the first two approaches generate an `auto_inst.cfg` file which contains only the options that were selected at the time the initial install was done. If you are using the `drakconf` program, you will have to manually update the `auto_inst.cfg` file to reflect the latest changes on the computer and make adjustments to the default options.

The only difference that you will notice in the `auto_inst.cfg` file between an Automated Install and a Replay Install is the absence or presence of the following `$o` option:

```
    'interactiveSteps' => [
                            'doPartitionDisks',
                            'formatPartitions'
                          ],
```

The following are a list of the steps available to you and a short description of what each does:

Step	*drakconf Label*	*Description*
selectLanguage	Choose your language	Select language(s) support to be installed.
selectInstallClass	Select installation class	Select type of install to be performed; recommended or expert
setupSCSI	Hard drive detection	Check for any SCSI devices
selectMouse	Configure mouse	Select the desired mouse
selectKeyboard	Choose your keyboard	Select the desired keyboard
miscellaneous	Security	Select the security level desired
doPartitionDisks	(not selectable, always added)	Set up disk drives, their partitions, mount points and options. MUST be used if you are installing software RAID or LVM.
formatPartitions	(not selectable, always added)	Select which partitions are to be formatted.
choosePackages	Choose packages to install	The package selection (both groups and individual packages)
installPackages	Install system	Install selected packages.
setRootPassword	Set root password	Select root's password and select the type of authentication to be used.

Step	*drakconf Label*	*Description*
addUser	Add a user	Add users
configureNetwork	Configure networking	Set up networking options
summary	Summary	Select the time zone, GMT/Local hardware clock and if you want NTP installed
configureServices	Configure services	Allows you select which services are to be automatically started at boot time
setupBootloader	Install bootloader	Select boot loader type and options to be installed
createBootdisk	Create a bootdisk	Create a boot disk.
configureX	Configure X	Select and setup your X configuration. Absolutely need when performing Multi-Head X configuration.
installUpdates	Install system updates	Obtain and install updated system packages.
exitInstall	Exit install	Prompt for exit, and offer's the option of creating an automated install disk.

Does any of this look familiar, it should. These are the main steps that you went through while doing a Manual install. drakconf uses the notation Replay (to use the contents of the auto_inst.cfg file) or Manual (to cause DrakX to prompt you for input).

Which steps, if any, should you use? MandrakeSoft recommends that as a minimum, the doPartitionDisks and formatPartitions steps should be included. This may only necessary if you are trying to preserve existing data on some partitions or on other drives.

You really need to evaluate this on a machine by machine basis. What is different about this new machine that could cause you trouble?

By the way, you just might want to check out the ***Advanced Features*** discussion regarding the use of the 'display=' parameter.

What affect does each of the Steps, selected for Manual (included in the list), have on the various selections and setting that were preset with the $o = {...} declaration? For the most part, your presets become the defaults when DrakX prompts you for input.   **DO NOT** expect the doPartitionDisks and formatPartitions steps to use your settings as defaults.

Which $o options are associated with which step? The following table provides a bit of information:

Step	*Option*	*Notes*
selectLanguage	lang	If the option is present, its value is used as the default when the GUI display is presented.
selectInstallClass	–	There is no option for this step.
setupSCSI	–	There is no option for this step.
selectMouse	mouse, wacom	If either or both options are present, then they are used as the default when the GUI display is presented.

Step	Option	Notes
selectKeyboard	keyboard	If the option is present, its value is used as the default when the GUI display is presented.
miscellaneous	security	If the option is present, its value is used as the default when the GUI display is presented.
doPartitionDisks	manualFstab, useSupermount, partitioning, partitions	The option manualFstab, if present, will have its contents added to the /etc/fstab file. The option useSupermount, if present, sets the default state of the 'More' button's radio-button selection for 'Removable media automounting'. The options partitioning and partitions are ignored.
formatPartitions		This step should ALWAYS be used in conjunction with doPartitionDisks.
choosePackages	compssListLevel compssUsersChoice default_packages	If these options are present, the STEP is IGNORED.
installPackages	default_packages	If this option is present, the STEP is IGNORED.
setRootPassword	superuser, authentication	The option superuser is ignored. The option authentication, if present, is used as the default when the GUI display is presented.
adduser	user, autologin	If the option user is present, its contents are added and you will be prompted for addition one. NOTE, you can not edit any predefined users. If the autologin options is present, it is used directly and you are NOT prompted to change its settings.
configureNetwork	intf, misc, netc	The contents of these options, if present, are used as the defaults when the GUI displays are presented.
summary	keyboard, mouse, printer, timezone	The contents of these options, if present, are used as the defaults when the GUI displays are presented.
configureServices	services	If the option is present, its value is ignored.
setupBootloader	bootloader, misc	The contents of these options, if present, are used as the defaults when the GUI displays are presented.
createBootdisk	mkbootdisk	If the option is present, its value is used as the default when the GUI display is presented.
configureX	X	If the option is present, its value is used as the default when the GUI display is presented.
installUpdates	-	There is no option for this step.

Step	*Option*	*Notes*
`exitInstall`	`autoExitInstall`	If the option is present, its value is used as the default when the GUI display is presented.

The safest policy when mixing Replay Steps and predefined options is to delete the predefined options from the `$o` structure. This ensures that there are no hidden or adverse interactions that will produce undesired results. On the other hand, a bit of experimenting to confirm expectations will result in a very flexible and powerful tool.

Special Notes:

Just so you know, DrakX creates the file `replay_install.img` in `/root/drakx`, along with the `auto_inst.cfg.pl` file. The `replay_install.img` file is actually a modified version of the boot image file that corresponds to your method of installation (basic image file is found in the `images` directory on the CD).

What's different? The `syslinux.cfg` file is modified: to add the `'kickstart='` parameter, the `'automatic='` parameter is adjusted to reflect the method and network parameters used for the computer when it was first installed. The `auto_inst.cfg`, which was added at install time, is the same as the `auto_inst.cfg.pl` file except for the `'auto_allocate'` and `'autoExitInstall'` options.

When you use `drakconf` to create an auto install disk, it copies the image to the floppy diskette, then adjusts the `auto_inst.cfg` file, on the floppy diskette, with your manual selections.

Use: `mount replay_install.img /mnt/disk -t vfat -o loop` to check it out.

Advanced Features

If you were curious and pressed the F1 and/or the F2 keys during a Manual install, you would have noticed a few features that you may find useful; the text on the screens indicate that you can type the indicated keywords in response to the boot prompt. You can also add them, in the 'syslinux.cfg' file, to the Section append line(s) as additional SPACE separated parameters.

WARNING: Please be careful when adding additional parameters to the append line(s) that you **DO NOT** exceed the 256 character limit. Use the *__Method Parameter Aliases__* to reduce the line length. If this is still not enough, determine what you can live with or, find an alternative approach.

The following are a selection of interesting / exotic / useful features that I felt needed to be highlighted.

Kernel 'append' Parameters

Just a couple for now. **NOTE:** you can only provide parameters to the kernel for 'compiled' in capabilities. You can not pass parameters to 'modules' using the append line in the 'syslinux.cfg' file.

  quiet - has the dubious benefit of making the kernel less verbose while it is going though its boot up process. Mostly it is for those who complain about all the 'noise' on the screen at start up, which they can not read, do not understand or care about. This option has become the default used in the 'lilo.conf' file.

  mem=nopentium - this is needed for Athlon based computers until a kernel upgrade is released which resolves AMD's 'not a bug' issue. This one is critical.

The 'auto_inst.cfg' File Location

Until this point, I have always indicated that the configuration file is always called 'auto_inst.cfg' and that it is always located on the floppy diskette. Most people find this to be the easiest and most portable method and, it is better to use a consistent presentation in a document (less confusion).

However DrakX is not that limited. In fact it supports a number of different methods for specifying where the file is located and what its name is. The following provide an illustration of most approaches.

Floppy Disk

This is the primary location for the 'auto_inst.cfg' file and it is generally specified using 'kickstart=floppy'. You may also use 'auto_install=floppy'. In either case, when the floppy keyword is used, DrakX expects the file to be called 'auto_inst.cfg'or, 'auto_inst.cfg.pl'.

Source Media

As an alternative to the floppy diskette, DrakX provides a capability that allows you to specify the name and location of the configuration file on the source media (where the install file set is). You can use this feature with any of the Network Services methods as well as the CD-ROM method.

Basically, you use either the kickstart= or auto_install= parameter to specify a file relative to the

location of the install file set using the following general form:

```
auto_install=<path>/<name>
```

> <path>/ - is the directory path, optional, to the file (<name>) relative to the directory that you
> specified with the 'directory:' parameter and,

> <name> - is the name of a unique file which contains the installation selections (see the section
> ***Anatomy of the 'auto_inst.cfg' File***).

Here is a simple example:

```
append auto_install=cfgs/test.cfg automatic=met:nfs,
   ser:fileserver,dir:/mnt/mass/Mandrake/mandrake/9.0,
   netw:static,ip:192.168.5.202,netm:255.255.255.0,
   gat:192.168.5.253,dns:192.168.5.253,
   ramdisk_size=32000 initrd=network.rdz root=/dev/ram3 vga=788
```

Can you imagine the possibilities? Especially (the people building clusters) if you combine this with the postInstall and postInstallNonRooted options? **NOTE:** DrakX mounts the NFS exported directory on the server as Read Only, and if you are using ftp or http it is a bit more troublesome, so ...

The CD-ROM method can be used too, but it requires that you create new CD-ROMs containing the configuration file(s) (see the section ***Creating an Updated Installation Set***).

All the fore going require that you use a boot floppy, for those of you who are really into customization and the ultimate in CD-ROM automated installs, try modifying the images/cdrom.img file on the new CD-ROMs that you need to create. It works great if you only want one kind of install configuration. **Warning**: this will affect the replay_install.img that the Mandrake Control Center tool uses to generate Replay Installation disks so make sure that you correct that image using the postInstall options.

DHCP Server

DHCP servers can, in addition to supplying an IP address and other network information, provide the name of a file to any or all client machine(s) that request an IP. When used with the Stage 1 install program, this file can be the name of a generic or a machine specific 'auto_inst.cfg' file.

This new feature of the Stage 1 install program is enabled when you specify network:dhcp. It is a bit exotic and definitely not for the faint of heart. However, it works well and has the benefit of not requiring you to waste characters on the 'append' line. It does require that you have access to the configuration files for the DHCP server and, optionally, that you know the Type and Hardware Address (link layer address) for each of the Network Interface Cards (NICs) that you plan to use this feature with. Working knowledge for configuring a DHCP server is mandatory.

There are four (4) method available; a simple one that can be used with any/all computers and three which allow you to customize for specific computers and requires specific parameter settings on the append line as well as changes to the DHCP server's configuration file. The following are a brief description of each.

Method 1

If you are going to use the same configuration file with all computers, then adding an entry similar to the following in the Global Section of the dhcp.conf file will be adequate:

```
filename    "my_cfgs/auto_inst.cfg";
```

The `'syslinux.cfg'` files' append line should be similar to the following:

```
append automatic=method:nfs,server:fileserver,
   directory:/mnt/mass/Mandrake/mandrake/9.0,network:dhcp
   ramdisk_size=32000 initrd=network.rdz root=/dev/ram3 vga=788
```

Method 2

If you want specific configuration filenames given to specific computers, then you need to create host declarations which identify each of the client hardware addresses and the filenames to be served; similar to the following:

```
host tommy {
       hardware ethernet 00:20:78:11:F9:A2;
       filename   "my_cfg/tommy.cfg";
}

host johnny {
       hardware ethernet 00:60:05:37:69:C8;
       filename   "my_cfg/johnny.cfg";
}
```

The `'syslinux.cfg'` files' append line should be similar to the following:

```
append automatic=method:nfs,server:fileserver,
   directory:/mnt/mass/Mandrake/mandrake/9.0,network:dhcp
   ramdisk_size=32000 initrd=network.rdz root=/dev/ram3 vga=788
```

Method 3

If you are using Dynamic DNS and want to specify the host name for the computer, then use something similar to the following:

```
host tommy {
       option dhcp-client-identifier  1:00:20:78:11:F9:A2;
       filename   "my_cfg/tommy.cfg";
}

host johnny {
       option dhcp-client-identifier  1:00:60:05:37:69:C8;
       filename   "my_cfg/johnny.cfg";
}
```

The `'syslinux.cfg'` files' append line should be similar to the following:

```
append automatic=method:nfs,server:fileserver,
   directory:/mnt/mass/Mandrake/mandrake/9.0,network:dhcp,
   hostname:tommy
   ramdisk_size=32000 initrd=network.rdz root=/dev/ram3 vga=788
```

Method 4

This is a simple variation of Method 3 where you want or need to specify the domain name as well, then use something similar to the following:

```
host tommy {
        option dhcp-client-identifier "\000tommy.eastcott.net";
        filename   "my_cfg/tommy.cfg";
}

host johnny {
        option dhcp-client-identifier  "\000johnny.eastcott.net";
        filename   "my_cfg/johnny.cfg";
}
```

The 'syslinux.cfg' files' append line should be similar to the following:

```
append automatic=method:nfs,server:fileserver,
    directory:/mnt/mass/Mandrake/mandrake/9.0,network:dhcp,
    hostname:tommy,domain:eastcott.net
    ramdisk_size=32000 initrd=network.rdz root=/dev/ram3 vga=788
```

Note: the fore going examples assume the use of an ISC DHCP server: dhcp-server-3.0-0rc12.1mdk or later (earlier versions should work too).

A bit of advice for those of you contemplating setting up a DHCP server in an environment where there is one already, **don't**. At least not with out coordinating with the people responsible for administering the network so that it is set up correctly and does not interfere with existing operations. If you do, do not be surprised if they invite you for a picnic by the river and there is a 25kg bag of cement in the basket (hehehe).

Install Console Choices

My favorite for Network Service installs. Have you ever been stuck trying to find a keyboard and display to install on a headless server? Well if you enter display=<display machine name or IP>:<display> (eg. display=linux1:0) at the boot prompt and you use the command xhost + on the target display machine, then lo and behold all the Stage 2 information that would have been displayed on the local console will show up on the target display machine that you specified. **NOTE:** currently this only works when you are using a full GUI install (gtk), the newt or text modes do not support this.

If you create a boot diskette using the MandrakeSoft supplied network.img image, modify the 'syslinux.cfg' files' append line similar to the following:

```
append display=linux1:0 automatic=method:nfs,
    server:fileserver,directory:/mnt/mass/Mandrake/mandrake/9.0,
    network:static,ip:192.168.5.202,netmask:255.255.255.0,
    gateway:192.168.5.253,dns:192.168.5.253,
    ramdisk_size=32000 initrd=network.rdz root=/dev/ram3 vga=788
```

You can now do a remote Manual install on a headless machine too. (GC claims this has been available forrreverrrrrrr, hmmm). Only the Stage 2 portion of the install is actually displayed on the remote machine, all Stage 1 information is still presented on the local display (so if you made a mistake, you will never see the Stage 2 graphics stuff on the remote machines' display).

For the auto install crowd, there are four things you will have to do:

   a) use the command xhost + on the target display computer. For the more security conscious, xhost + <IP or name> for the machine being installed. eg. xhost +192.168.5.202 or xhost +linux2.eastcott.net.

   b) add the option 'interactive' => 'gtk', to your auto_inst.cfg file.

   c) adjust your syslinux.cfg file to added the display= parameter.

d) Just to keep things from getting too confusing, you might want to start a second X session using the `startx -- :1` command, then adjusting the `'display='` parameter so that it references this new session for the display.

One final note (hehehe), if you use the `'display='` parameter, the specified machine must have an X server running on it.

Scratch Built Auto Install Diskette

This section is for those of you who are in a hurry and don't want to read all the preceding pages. This project started out small and turned into a bit more than just a couple pages, hehehe.

Unfortunately, to use the Auto Install Features of DrakX, you DO need to know a few things. There are short cuts, and you can mostly depend on DrakX auto detecting a lot of things for you, but you are going to get to a point or a situation where the rest of the document does come in handy.

The kinda Short Cuts.

1. If you already have Mandrake Linux 9.0 installed on a machine, then you can use the `drakconf` program to create a basic auto install disk.

2. Alternately, you can follow the first three steps from the section ***Getting Started***, then copy the file found in `/root/drakx` called `auto_inst.cfg.pl` to the newly created boot floppy diskette as `auto_inst.cfg`. Then you need to modify the file `syslinux.cfg` to add the `kickstart=floppy automatic=method:...` options to the first `append` line (see the section ***Anatomy of the 'syslinux.cfg' File***).

3. If you do not have Mandrake Linux 9.0 installed yet, you can go to the section ***Installation Methods*** and do the steps identified in the sub-section ***Getting Started***, but stop **after** you complete step 5. While you are doing the Manual Install, and you get the point where it is asking you what packages to install (you have a choice here) deselect all package groups, make sure that the Individual Package Selections is selected, then when prompted select (or not) With X and With documentation, then select any additional packages you want (or not) and finish the install. You will, as part of step 5, now have a diskette containing, for the most part, a basic auto install diskette. From this point on, you can let your repressed creative talents have at it.

Using any of the above approaches will produce a syntactically correct `auto_inst.cfg` file on the floppy diskette. However, you MUST review the contents of the file to ensure that what it is going to cause, is in fact what you want it to do (see the section ***Anatomy of the 'auto_inst.cfg' File***). Pay particular attention to the options: 'autoExitInstall', 'mkbootdisk', 'partitioning' and 'partitions' (if the diskette was created by the `drakconf` program, you can ignore the 'partitioning' and 'partitions' options since the **Replay Install** will force you to re-do these steps). Finally, if you are going to be auto installing from CD-ROM, then you might want to consider adding the 'interactive' option.

Things to know before starting

The general objective for creating an Auto Install diskette is to minimize the work that you will have to do when installing basically the same suite of programs on multiple computers. You have a choice at this point, create a 'Basic AutoInstall Diskette' which contains all stuff common to all computers and then use the Software Manager on each computer to customize for the user. Or, create a custom diskette for each computer, this is a lot of work and there are probably more optimal approaches that you could use.

Unless you are really a lucky individual and all the computers you are doing the installs for are identical, hardware wise, there is some customization that you will have to do for each. The following is a minimal list of things you need to know so that you can begin the 'customization'.

1. The amount of installed memory. (just in case the Auto Detection and your BIOS disagree).

2. The number of hard disk drives, their type (IDE and/or SCSI), their device ordering (hda, hdb, ... or sda, sdb, ...) and the size of each in terms of Cylinder/Heads/Sectors.

3. The number and type of CD or CD-RW or DVD drives and their device ordering (hda, hdb ... or sda, sdb ...).

4. The number of Floppy disk drives.

5. The number of types of other removable media devices (zip drives, Jazz drives, tape drives, ...) and their device ordering (hda, hdb ... or sda, sdb ...).

6. The type of pointer device, if any (typically a mouse) and how it is connected (serial, bus mouse, ps/2 ...).

7. The network card type, for non Plug and Pray types, you will also need to know its I/O address and the IRQ it uses.

8. The type of video card used (mostly the chip set that is used on it).

9. The type and capabilities of the monitor.

Next, you need to know how you plan to organize your devices (storage media) into a uniform file system hierarchy (/, /boot, ...). Which devices and partitions (also what file types ie. xfs, ext3) on each go where.

Finally, you need to determine what packages are going to be installed on the target computer.

So much for Quick, eh?

I almost forgot, you need to decide what Installation Method you plan on using (see the section ***Installation Methods***). This document is going to use the NFS Server method and it also assumes that you have set up the NFS server with the required file set (see the section ***Setting Up a Simple NFS Server*** as an example).

There is a vast volume of information regarding the general subject of setting up and organizing your computer available in book stores and on the web. Everyone has an opinion, good and bad, but you will find that experience is the best, so just use your own best judgment. A good place to start is at http://linuxdoc.org, look at the HOW-TOs, Mini HOW-TOs and Guides. Just in case, the Mandrake Distribution contains most of these documents (albeit somewhat dated) and they may already be installed in a computer that you can access.

Remember, if what you do the first time is not right, do it again. The beauty of the Auto Install process is that you can make changes to the `auto_inst.cfg` file and repeat the installation until you get it the way you want. Although, lots of coffee or other suitable stimulant may be required.

Creating the Basic Auto Install Diskette

The best way to start is to create a known 'good' boot diskette using the images that Mandrake has supplied on their CD-ROM, then remove what you do not want, modify what is left as desired, then add anything that is missing. Sounds simple, eh?

Build Base diskette:

Load and mount the Install CD-ROM, or cd to the directory containing the Mandrake Linux file set, place a blank diskette in the floppy drive.

```
dd if=images/network.img of=/dev/fd0
```

Remove un-necessary files (optional):

Mount the floppy diskette.

```
rm -f /mnt/floppy/help.msg
```

Customize the Loader's Configuration File:

Edit `/mnt/floppy/syslinux.cfg` and remove/change what you do not need (see the section *Anatomy of the 'syslinux.cfg' File*); the following is my file's contents:

```
default linux
display boot.msg
label linux
    kernel vmlinuz
    append kickstart=floppy automatic=met:nfs,
        ser:fileserver,dir:/mnt/mass/Mandrake/mandrake/9.0,
        netw:static,ip:192.168.5.202,netm:255.255.255.0,
        gat:192.168.5.253,dns:192.168.5.253,
        ramdisk_size=32000 initrd=network.rdz root=/dev/ram3 vga=788
```

NOTE: All the text starting with 'append' through '788' are on **ONE** line.

Customize the Boot Message:

This one is up to you, but here is what is in mine (create or replace the file `/mnt/floppy/boot.msg`):

```
<blank line>
Installing Mandrake Linux 9.0
<blank line>
This will install a basic system.
<blank line>
```

<blank line> is just in indicator meaning that an empty line is actually in the file. Be as creative or simplistic as you want. If you want flashy graphics, then check out the Syslinux home page at http://syslinux.zytor.com.

Adding your Customized Auto Install File:

Copy your customized `auto_inst.cfg` (or what ever name you used to distinguish it from other such files) file to the floppy diskette as `auto_inst.cfg`.

Un-mount the diskette and remove it. It is probably a good idea to put a label on the diskette with suitable markings so you can find it again and know what it contains. I have a bad habit of not putting labels on them and ending up with a table full of blank disks and not being able to find the one I want.

Test Drive:

This may be a good place to go get a good book, extra coffee etc.

Install your shiny new Auto Install disk in the target computer, turn it on an watch what happens. If everything went properly, the last message on the screen should be: `Please remove disk and re-boot...`

If not, then use `Ctrl-Alt-F3` to switch to the diagnostic screen and see what the error message was. Then fix what its complaining about, and re-boot and do it again. It might be a good idea to use `Ctrl-Alt-F3` shortly after the kernel boots so you can see all the steps that DrakX is going through.

Repeat as required until you get what you want.

A common problem with customized `auto_inst.cfg` files is you didn't get the syntax correct. Your first hint will be that the install stops with a cryptic error message indicating it could not load the `auto_install.cfg` file (maybe it even gives you the line number). If you are not in a rush, you could follow Mandrake's advice in the generated `auto_inst.cfg` file:

```
# You should always check the syntax with 'perl -cw auto_inst.cfg.pl' before testing
```

Another problem is that you did not get the settings and options correct in the `syslinux.cfg` file. In this case, you will probably be presented with the Manual Install GUI screens. Solving this type of problem is simply a matter of reviewing the file and ensuring that your options are correct.

A more difficult problem to resolve is if you forgot to add a field / line for one of the options you modified or added. There are two possible indications:

1. the install stops before completing, or
2. the hard one - you get the `success - please re-boot` message, but it doesn't boot or if it does boot, it does not seem to be working right.

Unfortunately, there is no easy answer here. Begin by reviewing the contents of the `auto_inst.cfg` file and comparing the entries to the descriptions in the section ***Anatomy of the 'auto_inst.cfg' File***. Pay particular attention to those parts which relate to your hardware, maybe what you thought, is not what the computer knows.

Another approach may be to modify the contents of the `auto_inst.cfg` file down to an absolute minimum, get that working and then begin adding back the stuff you deleted.

Examples

The following is an example `auto_inst.cfg` file for a recent computer used as a workstation. Your situation will obviously vary, but it will give you an idea of what you could do.

By the way, the file were generated using the **kinda Short Cut #3** described at the beginning of this section, with a few personal adjustments.

Example 1: Recent Computer

```perl
#!/usr/bin/perl -cw
#
# You should check the syntax of this file before using it in an auto-install.
# You can do this with 'perl -cw auto_inst.cfg.pl' or by executing this file
# (note the '#!/usr/bin/perl -cw' on the first line).
$o = {
    'isUpgrade' => 0,
    'autoExitInstall' => 0,
    'mkbootdisk' => 0,
    'security' => 2,
    'keyboard' => {
        'GRP_TOGGLE' => '',
        'KBCHARSET' => 'C',
        'KEYBOARD' => 'us'
    },
    'lang' => 'en_US',
    'miscellaneous' => {
        'numlock' => 1
    },
    'useSupermount' => 0,
    'partitioning' => {
        'auto_allocate' => 1,
        'clearall' => 1,
        'eraseBadPartitions' => 0
    },
    'partitions' => [
        {
            'mntpoint' => '/boot',
            'type' => 1155,
            'size' => 96390
        },
        {
            'mntpoint' => 'swap',
```

```
                          'type' => 130,
                          'size' => 562212
                     },
                     {
                          'mntpoint' => '/',
                          'type' => 1155,
                          'size' => 775190,
                          'ratio' => 100
                     }
                ],
                'manualFstab' => [
                     {
                          'device' => '//cherry/c',
                          'mntpoint' => '/mnt/cherry-c',
                          'type' => 'smbfs',
                          'options' => 'noauto,username=davey,password=crocket,workgroup=eastcott,ro'
                     }
                ],
                'authentication' => {
                     'NIS' => '',
                     'shadow' => 1,
                     'winbind' => '',
                     'LDAP' => '',
                     'md5' => 1
                },
                'superuser' => {
                     'password' => 'gotcha',
                     'uid' => '0',
                     'realname' => 'root',
                     'shell' => '/bin/bash',
                     'home' => '/root',
                     'gid' => '0'
                },
                'users' => [],
                'intf' => {
                     'eth0' => {
                          'isUp' => 1,
                          'BOOTPROTO' => 'static',
                          'DEVICE' => 'eth0',
                          'NETMASK' => '255.255.255.0',
                          'BROADCAST' => '192.168.5.255',
                          'IPADDR' => '192.168.5.222',
                          'isPtp' => 0,
                          'NETWORK' => '192.168.5.0',
                          'ONBOOT' => 'yes'
                     }
                },
                'netc' => {
                     'DOMAINNAME' => 'eastcott.net',
                     'NETWORKING' => 'yes',
                     'nb_cards' => 1,
                     'dnsServer' => '192.168.5.254',
                     'GATEWAY' => '192.168.5.252',
                     'minus_one' => 0,
                     'HOSTNAME' => 'cooker.eastcott.net',
                     'FORWARD_IPV4' => 'false'
                },
                'netcnx' => {
                     'NET_DEVICE' => undef,
                     'type' => 'lan',
                     'lan' => {},
                     'NET_INTERFACE' => undef
                },
                'timezone' => {
                     'ntp' => 'time-server.eastcott.net',
                     'timezone' => 'Canada/Mountain',
                     'UTC' => 1
                },
                'services' => [
                     'alsa',
                     'anacron',
                     'atd',
                     'crond',
                     'devfsd',
                     'dm',
                     'gpm',
                     'keytable',
                     'kheader',
                     'netfs',
                     'network',
                     'nfslock',
                     'ntpd',
                     'numlock',
                     'partmon',
```

```
                'portmap',
                'random',
                'rawdevices',
                'sound',
                'syslog',
                'usb',
                'xfs'
        ],
        'mouse' => {
                'XMOUSETYPE' => 'IMPS/2',
                'name' => 'Generic PS2 Wheel Mouse',
                'device' => 'psaux',
                'type' => 'PS/2',
                'nbuttons' => 5,
                'MOUSETYPE' => 'imps2'
        },
        'X' => {
                'resolution_wanted' => '1024x768',
                'default_depth' => 24
        },
        'default_packages' => [
                'locales-en',
                'msec',
                'XFree86',
                'eject',
                'urpmi',
                'XFree86-75dpi-fonts',
                'devfsd',
                'mandrake_desk',
                'urw-fonts',
                'tmpwatch',
                'sudo',
                'man',
                'procmail',
                'hotplug',
                'ntp',
                'sox',
                'gnupg',
                'icewm-light',
                'rxvt',
                'menudrake',
                'nfs-utils-clients',
                'XFree86-server',
                'bootsplash',
                'drakconf',
                'mdk-eazel-engine',
                'strace',
                'MAKEDEV',
                'anacron',
                'at',
                'aumix',
                'bc',
                'drakfirsttime',
                'draksync',
                'fonts-ttf-decoratives',
                'fonts-ttf-west_european',
                'ftp-client-krb5',
                'gpm',
                'grub',
                'gurpmi',
                'hexedit',
                'info',
                'joe',
                'ldetect',
                'man-pages',
                'mandrake-mime',
                'mdkonline',
                'numlock',
                'rpmdrake',
                'usbview',
                'userdrake'
        ],
};
```

Creating an Updated Installation CD Set

There are a couple of reasons for doing this

      1. You are tired of installing everything, then having to run rpmdrake to install all updates.

      2. You are tired of doing more than you really need to...

Creating updated CDs provides you with a some benefits, Nice new shiny up to date date CDs that you can use for installing, up date your NFS Server file set (for network installs), learn something new.

The following is a simple manual approach to creating a set of updated CDs. I expect that you will adapt it to suit your environment and personal preferences.

NOTE: The CD images that you create are for the newer 800MB disks. If you still want to use the 650MB size, then you will have modify the configuration file and add additional disk definitions.

Creating a Mastering File Set

The first step is to install the package `mkcd-3.0.4-1mdk` (or later) and all of its dependencies, then create a mirror image of the installation CDs in a working directory and make a few adjustments. As a regular user:

1. Create Working directories as follows:

```
mkdir -p master_cd/cd
cd master_cd
```

2. Obtain an initial image of the CD-ROM's directory hierarchy and files.

    Insert and Mount the first CD (Installation) then,

```
cp -a /mnt/cdrom/* cd
chmod -R u+w cd
```

    Un-mount the first CD, then repeat the above for each of the second and third CDs.

3. Create the new Master RPMS sets using the following:

```
mkdir myRPMS
mv cd/Mandrake/RPMS/* myRPMS
mv cd/Mandrake/RPMS2/* myRPMS
mv cd/Mandrake/RPMS3/* myRPMS
rm -rf cd/Mandrake/RPMS
rm -rf cd/Mandrake/RPMS2
rm -rf cd/Mandrake/RPMS3
mkdir myRPMS4
mv cd/Mandrake/RPMS4/* myRPMS4
rm -rf cd/Mandrake/RPMS4
```

4. Create a CD configuration file called `myCD.conf` (similar to the following) and place it in the `master_cd` directory. If you want to save yourself a lot of typing, look in `cd/misc/doc` and you will find a template called `9.0.conf`. Modify it so that appears similar to the following (you can experiment with the other stuff there some other time), but adjust the full path names to reflect your setup:

```
#

9.0

LIST 1 /home/david/master_cd/cd/misc/doc/main
/home/david/master_cd/myRPMS

LIST 2 /home/david/master_cd/cd/misc/doc/contrib
##/home/david/master_cd/myRPMS4

DISC 1 734000000 MY-DLE-90EN DISC 1 Download Edition Installation CD (x86)
dir rpms Mandrake/RPMS
generic --synthesis rpms 1
advertising /home/david/master_cd/cd/Mandrake/share/advertising/00-thanks.png
    /home/david/master_cd/cd/Mandrake/share/advertising/01-gnu.png
    /home/david/master_cd/cd/Mandrake/share/advertising/02-internet.png
    /home/david/master_cd/cd/Mandrake/share/advertising/03-graphic.png
    /home/david/master_cd/cd/Mandrake/share/advertising/04-develop.png
    /home/david/master_cd/cd/Mandrake/share/advertising/05-contcenter.png
    /home/david/master_cd/cd/Mandrake/share/advertising/06-user.png
    /home/david/master_cd/cd/Mandrake/share/advertising/07-server.png
    /home/david/master_cd/cd/Mandrake/share/advertising/08-games.png
    /home/david/master_cd/cd/Mandrake/share/advertising/09-MDKcampus.png
    /home/david/master_cd/cd/Mandrake/share/advertising/10-MDKexpert.png
    /home/david/master_cd/cd/Mandrake/share/advertising/11-consul.png
    /home/david/master_cd/cd/Mandrake/share/advertising/12-MDKstore.png
    /home/david/master_cd/cd/Mandrake/share/advertising/13-Nvert.png
installation -o 50,3,0.1 --synthesis -l fr,it,en,de,es -t i586
    -i /home/david/master_cd/cd/ -d 1/rpms 2/rpms 3/rpms 3/rpms2
boot --isolinux isolinux -b isolinux/isolinux.bin --first /home/david/master_cd/cd/isolinux
-f /home/david/master_cd/cd/images

DISC 2 734000000 MY-DLE-90EN02 DISC 2 Download Edition Second Installation CD (x86)
dir rpms Mandrake/RPMS2
generic --synthesis rpms 1

DISC 3 734000000 MY-DLE-90EN03 DISC 3 Download Edition Contributions CD (x86)
dir rpms Mandrake/RPMS3
##dir rpms2 Mandrake/RPMS4
generic --synthesis rpms 1
##generic -l 0.6 --synthesis rpms2 2
```

NOTE: the text beginning with `advertising` through `13-Nvert.png` are all on ONE line. The same with the text beginning with `installation` through `3/rpms2`. Also, the lines beginning with `##` need to be removed if the final 9.0 ships with CD 3 containing both the RPMS3 and RPMS4 directories or, you add packages of your own.

5. Remove files that are re-generated when creating the ISO images.

```
rm -f  myRPMS/*.cz
rm -f  myRPMS4/*.cz
rm -f  cd/isolinux/boot.cat
rm -f  cd/pkg*.idx
rm -f  cd/Mandrake/base/compss
rm -f  cd/Mandrake/base/depslist.ordered
rm -f  cd/Mandrake/base/hdlist*.cz
rm -f  cd/Mandrake/base/provides
rm -f  cd/Mandrake/base/synth*
rm -f  cd/.rr_moved
```

6. Update the `'rpmsrate'` file

This is optional, but if you added a new package and you want it to be installed using the alternate package selection methods then you have to update the file for your changes. Simply edit the file `Mandrake/base/rpmsrate`, locate the appropriate Group tag, sub-group tag and add your package to the desired rate. If the rate you want to use is missing, then add it along with your package name. If you have to, add the necessary sub-group tag. Be smart and do not create a new tag.

At this point your 'master_cd' directory should have the directories 'myRPMS', 'myRPMS4' and 'cd' and the file

```
    'myCD.conf'.
```

Updating the Master File Set

Now the fun part. Locate your favorite ftp mirror site and get the 'updates/9.0/RPMS' directory contents and place them in the master_cd directory in a directory called updates.

When you are done, the updates directory should only contain '*.rpm' files

Now the tricky part. You have to delete the older rpms from your myRPMS and myRPMS4 directories and replace them with the new ones from the updates directory into the appropriate myRPMS or myRPMS4 directory.

I have found that if you run Midnight Commander (mc) from the console or an xterm, you can point it at both your myRPMS/myRPMS4 and updates directories at the same time. This makes it a little easier to see what has to be removed and copied.

WARNING: Be careful and delete only the older files that correspond to the new update ones. See the Advanced section below.

Creating New ISO Images

1. Clean up from any previous ISO creation sessions

```
cd master_cd
rm -rf tmp
rm -rf build
rm -rf iso
rm -f myCD.script
```

2. Build the new ISO images

```
mkcd -s myCD.conf --verbose -p myCD.script -m 1,2,3
```

When the build is done, you should have three ISO images in the iso/9.0 directory called:
    1-9.0.iso, 2-9.0.iso and 3-9.0.iso.

You can now use your favorite CD writing program to create new CDs.

A few things you should watch out for:
   1. If you seem to be missing some RPMS on your new CD set, it is probably because there were missing dependencies and as a result they were dropped by mkcd. If you saw REJECTED appear on the display, then you definitely are missing some packages. You will have to look at the dependencies for the rejected packages and make suitable adjustments.
   2. If only CD 1 is too large, you can try reducing the 734000000 for it to try and force mkcd to move some packages from CD 1 to the remaining 2 CDs.

If you make any changes then repeat all the steps in ***Creating New ISO Images***.

Advanced and Less Error Prone Approaches

Alternate for Creating the Initial Image

ISO via Loopback device

If you obtained your Mandrake Linux installation CD by downloading the ISO files from a ftp site and have kept them around just in case, then a more reliable way of creating the Mastering File Set is to mount the ISO images via a loop back device and simply copy their contents. The following is a simple set of steps to make an ISO image accessible as though it was just another disk.

The following replaces Step 2, assuming that you are following the steps for Creating a Master Files Set and that you have completed Step 1. You need a temporary mount point and /mnt/disk is usually available so, as root:

```
mount <where your isos are>/MandrakeLinux-9.0-CD1.i586.iso /mnt/disk \
      -t iso9660 -o loop
cp -a /mnt/disk/* cd
umount /mnt/disk
chmod -R u+w cd

mount <where your isos are>/MandrakeLinux-9.0-CD2.i586.iso /mnt/disk \
      -t iso9660 -o loop
cp -a /mnt/disk/* cd
umount /mnt/disk
chmod -R u+w cd

mount <where your isos are>/MandrakeLinux-9.0-CD3.i586.iso /mnt/disk \
      -t iso9660 -o loop
cp -a /mnt/disk/* cd
umount /mnt/disk
chmod -R u+w cd
```

finally you have to change ownership from root to a regular user,

```
chown -R <user>.<group> cd
```

Now you can resume with Step 3 of *Creating a Master Files Set*.

A Script Based Updater

The single most frustrating part of maintaining an Updated Installation CD Set, is deleting the correct 'old' RPMS and replacing them with the new 'Updates' RPMS. It is also the one most likely to result in an error; deleting the wrong file or not copying over the new update.   So I created the following script to help me. It is not pretty and I am sure that an enterprising individual could come up with a better/safer one, but it works for me.

```
#!/bin/bash
#
# usage:  check2updates <Master RPMS directory> <Master RPMS4 directory> <updates directory>
#
#         Examines each update file to see if it is newer than one in the master set.
#         If it is, then the older one is removed and the update copied to the master
#         set.
#
#         If an update package is found that is not in the master set, its name is
#         placed in the file "new_rpms.list" for you to manually deal with.
#

# first some Constants
MASTER_FILES="masterfiles.list"
UPDATE_FILES="updatefiles.list"
```

```
                SELECT_FILES="selections.list"
                NEW_RPMS="new_rpms.list"

                # and variables
                masterfile=""
                mastername=""
                masterversion=""
                masterrelease=""

                updatefile=""
                updatename=""
                updateversion=""
                updaterelease=""

                master=""
                master4=""
                updates=""

                # then some functions

                decide_action ()
                {
                    missing=0

                    for masterfile in `cat $SELECT_FILES`
                    do
                        If [ "`basename $masterfile`" = "$updatefile" ]; then
                            return 2
                        fi

                        get_master_info "$masterfile"

                        if [ "$mastername" = "$updatename" ]; then
                            missing=1

                            # this is the right one
                            if [ `expr $masterversion \< $updateversion` = "1" ]; then
                                return 0

                            elif [ "$masterversion" = "$updateversion" ]; then
                                if [ `expr $masterrelease \< $updaterelease` = "1" ]; then
                                    return 0
                                fi
                            fi
                        fi
                    done

                    if [ $missing -eq 0 ]; then
                        # update has no match in master list
                        return 1
                    fi

                    # no need to update this one
                    return 2
                }

                get_update_info ()
                {
                    #    $1 is name of package to query

                    updatename=`rpm -qp --queryformat %{NAME} $1`
                    updateversion=`rpm -qp --queryformat %{VERSION} $1`
                    updaterelease=`rpm -qp --queryformat %{RELEASE} $1 | sed s/mdk//`
                }


                get_master_info ()
                {
                    #    $1 is name of package to query

                    mastername=`rpm -qp --queryformat %{NAME} $1`
                    masterversion=`rpm -qp --queryformat %{VERSION} $1`
                    masterrelease=`rpm -qp --queryformat %{RELEASE} $1 | sed s/mdk//`
                }

                #
                #
                # finally the main entry point
                #

                if [ $# -ne 3 ]; then
                    echo "usage: <Master RPMS> <Master RPMS4> <Update RPMS>"
                    exit 1
                fi
```

```
        if [ ! -d "$1" ]; then
            echo "Need directory name for Master RPMS."
            exit 1
        fi
        master="$1"

        if [ ! -d "$2" ]; then
            echo "Need directory name for Master RPMS4."
            exit 1
        fi
        master4="$2"

        if [ ! -d "$3" ]; then
            echo "Need directory name for Update RPMS."
            exit 1
        fi
        updates="$3"

        #clean up old files from previous runs
        rm -f $NEW_RPMS

        # create list of Update RPMS
        ls $updates/* | sed 's|'$updates'/||' > $UPDATE_FILES

        # and for the master RPMS
        ls $master/*      > $MASTER_FILES
        ls $master4/* >> $MASTER_FILES

        # lets do it
        for updatefile in `cat $UPDATE_FILES`
        do
            # get update package info
            echo "Check status of update package: $updatefile."
            get_update_info "$updates/$updatefile"

            grep "$updatename" $MASTER_FILES > $SELECT_FILES
            if [ $? -eq 0 ]; then

                decide_action
                result=$?

                case $result
                in
                    0)  # replace, new update
                        echo "  Replacing `basename $masterfile` with $updatefile"
                        rm -f $masterfile
                        cp $updates/$updatefile "`dirname $masterfile`/"
                        ;;

                    1)  # missing from master list
                        echo "  Update does not exist in the Master File Set: $updatefile"
                        echo "$updatefile" >> $NEW_RPMS
                        ;;

                    *)  # skip, update already in Master, but make sure it really is..
                        If [ ! "`basename $masterfile`" = "$updatefile" ]; then
                            echo "  ERROR Skipping Master file: $masterfile"
                        fi
                        ;;
                esac

            else

                # the update is a new package, report and add to new list
                echo "  Update does not exist in the Master File Set: $updatefile"
                echo "$updatefile" >> $NEW_RPMS
            fi
        done

        # clean up junk files
        rm -f $MASTER_FILES
        rm -f $UPDATE_FILES
        rm -f $SELECT_FILES

        exit 0
```

Alternate for Creating an Updated CD Set

1. Create a Mastering File set as described in steps 1 through 6 of the section ***Creating a Mastering File Set*** (Step 2 could be replaced by the procedure described in section ***Alternate for Creating the Initial Image***).

2. Run the script `check2updates`, (described in the section ***A Script Based Updater***).

3. Then use the following script to create the ISO images. The first time the script is run, or after you have run the `check2updates` script, then use the following:

```
#!/bin/bash
#
#        This is a simple script to complete the generation of a
#        set of CD's containing the current updates.
#
#        It assumes that the ./check2updates script has been run, and that
#        the master RPM files contain all the latest stuff.
#
#        usage:   ./makecd
#

MY_DIR=`pwd`

# couple quick integrity checks
if [ ! -e $MY_DIR/myRPMS ]; then
    echo "Could not find the \"myRPMS\" directory."
    exit 1
fi

if [ ! -e $MY_DIR/myRPMS4 ]; then
    echo "Could not find the \"myRPMS4\" directory."
    exit 1
fi

if [ ! -e $MY_DIR/myCD.conf ]; then
    echo "Could not find the CD Configuration file."
    exit 1
fi

if [ ! -e $MY_DIR/cd ]; then
    echo "Could not find the \"cd\" directory."
    exit 1
fi

# first, get rid of the old stuff
echo "Removing old stuff..."

rm -f  $MY_DIR/myRPMS/*.cz
rm -f  $MY_DIR/myRPMS4/*.cz
rm -f  $MY_DIR/cd/isolinux/boot.cat
rm -f  $MY_DIR/cd/pkg*.idx
rm -f  $MY_DIR/cd/Mandrake/base/compss
rm -f  $MY_DIR/cd/Mandrake/base/depslist.ordered
rm -f  $MY_DIR/cd/Mandrake/base/hdlist*.cz
rm -f  $MY_DIR/cd/Mandrake/base/provides
rm -f  $MY_DIR/cd/Mandrake/base/synth*
rm -f  $MY_DIR/cd/.rr_moved
rm -rf $MY_DIR/tmp
rm -rf $MY_DIR/build
rm -rf $MY_DIR/iso
rm -f  $MY_DIR/myCD.script
rm -f $MY_DIR/progress.log

echo "Now making ISO images."
mkcd -s $MY_DIR/myCD.conf --verbose -p myCD.script -m 1,2,3 &> $MY_DIR/progress.log

echo "Done, the ISOs are located at $MY_DIR/iso/9.0."
echo "and, the verbose diagnostic information is in the file $MY_DIR/progress.log"
exit 0
```

Setting up a Simple NFS Server

The following is a simple example, you should adjust it as required for your environment and security requirements. After setting up a NFS Server, you will be able to use the 'network' install for Manual Installations and for NFS Automated / Replay installs.

Step 1

On the designated server machine, make sure that NFS is installed and running. For this example, my server's name is `'fileserver.eastcott.net'`.

Step 2 As root on `'fileserver'`:

a) Create a directory using: `mkdir /nfscd`

b) change the permissions to 0755 using: `chmod 755 /nfscd`

c) change ownership of the directory to a regular user <user.group> using:

`chown user.group /nfscd`

Step 3 As the regular user who owns `/nfscd`:

(Assumes that the CD-ROM is mounted as `/mnt/cdrom`.)

a) Insert the MDK Install CD (1 of ...) into your CD-ROM, and mount it.

b) copy the CD-ROMs contents to the new directory using: `cp -a /mnt/cdrom /nfscd`

c) Umount the first disk, then insert and mount the second CD.

d) again, copy the files using: `cp -a /mnt/cdrom /nfscd`

e) Unmount and remove the CD.

f) Repeat if you have more disks.

Step 4

Rename the directory `/nfscd/cdrom` to `/nfscd/cdrom9.0` using:

`mv /nfscd/cdrom /nfscd/cdrom9.0`

Step 5 As root:

a) Modify your /etc/exports files to contain the the line:

`/nfscd/cdrom9.0   *.eastcott.net(ro,root_squash)`

NOTE: if you the NFS server can not do a reverse name look up because the DNS server does not have an IP to name entry for your computer, then you may have to change the above line to use the IP form:

`/nfscd/cdrom9.0   192.168.5.0/255.255.255.0(ro,root_squash)`

b) Then update the NFS exports using: `exportfs -r`

Step 6 On a different computer:

   a) Test that the NFS volume can be mounted (probably as root) using:

```
mount -t nfs fileserver:/nfscd/cdrom9.0 /mnt/nfs
```

   b) Un-mount it.

Step 7 Create a test auto install disk

   Adjust the `syslinux.cfg` file for your network, adjust the `auto_inst.cfg` file to your requirements. Then install the disk in a target computer, re-boot it and verify that you can do an install.

Problems that you may encounter include:

   a) The install fails with an error message indicating it can not find the install files. This may be caused because the `'syslinux.cfg'` file `directory` parameter is incorrect, you forgot to re-export the NFS volumes after changing the `/etc/exports` file.

   b) The install fails with an indication similar to Permission Denied. This is usually because the directory and file permissions are set incorrectly on NFS server. All directories in the export volume should have the permissions of a least 555, and all the distribution files should have permissions of at least 444.

   c) The install fails with an error similar to unable to execute `install2`. This is again a permissions problem.

   d) The install completes, but not all the packages were installed. This may be because you did not copy all the required CDs and retain the required directory heirarchy.

The last three problems are usually solved by deleting the `/nfscd` directory and its contents, then repeating steps 2 through 5 again.

Network and Connection Examples

This section is being provided because there were just too many variations for the ['intf'](#) and ['netc'](#) options as a result of their interactions. And providing isolated examples in each section made it difficult to see their relationship to one another.

NOTE: For examples using DHCP, if the DHCP server does not provide all the necessary information, then just add the missing parts (to netc) yourself.

Single Interface Connections to a LAN or Internet

Static IP: Generally, this form is use on LANs and the information is provided by your system administrator :

```
'intf' =>    {
    'eth0' => {
        'DEVICE' => 'eth0',
        'BOOTPROTO' => 'static',
        'ONBOOT' => 'yes',
        'IPADDR' => '192.168.5.210',
        'NETMASK' => '255.255.255.0',
        'NETWORK' => '192.168.5.0',
        'BROADCAST' => '192.168.5.255'
    }
},

'netc' =>    {
    'NETWORKING' => 'yes',
    'minus_one' => 0,
    'nb_cards' => 1,
    'FORWARD_IPV4' => 'false',
    'HOSTNAME' => 'linux-dev.eastcott.net',
    'DOMAINNAME' => 'eastcott.net',
    'GATEWAY' => '192.168.5.254',
    'GATEWAYDEV' => 'eth0',
    'dnsServer' => '192.168.5.254'
},
```

DHCP IP: This minimal form is used when the DHCP server provides all the information that you require. Generally, the server dispenses IP information based on your cards ethernet hardware address and name resolution is provided by static DNS server tables:

```
'intf' =>    {
    'eth0' => {
        'DEVICE' => 'eth0',
        'BOOTPROTO' => 'dhcp',
        'ONBOOT' => 'yes'
    }
},

'netc' =>    {
    'NETWORKING' => 'yes',
    'minus_one' => 1,
    'nb_cards' => 1,
    'FORWARD_IPV4' => 'false',
},
```

DHCP IP: This is the next level, where the DHCP server needs you to supply a host name, typically so it can dynamically update a DNS server:

```
'intf' =>    {
    'eth0' => {
        'DEVICE' => 'eth0',
        'BOOTPROTO' => 'dhcp',
        'ONBOOT' => 'yes'
    }
},

'netc' =>    {
    'NETWORKING' => 'yes',
    'minus_one' => 1,
    'nb_cards' => 1,
    'FORWARD_IPV4' => 'false',
    'DHCP_HOSTNAME' => 'mydog',
},
```

Multiple Interface Connections

Local LAN and Cable Access to Internet:

```
'intf' =>    {
    'eth0' => {
        'DEVICE' => 'eth0',
        'BOOTPROTO' => 'dhcp',
        'ONBOOT' => 'yes'
    },

    'eth1' => {
        'DEVICE' => 'eth1',
        'BOOTPROTO' => 'static',
        'ONBOOT' => 'yes',
        'IPADDR' => '192.168.5.202',
        'NETMASK' => '255.255.255.0',
        'NETWORK' => '192.168.5.0',
        'BROADCAST' => '192.168.5.255'
    }
},

'netc' =>    {
    'NETWORKING' => 'yes',
    'minus_one' => 1,
    'nb_cards' => 2,
    'FORWARD_IPV4' => 'false',
    'HOSTNAME' => 'linux2.eastcott.net',
    'DOMAINNAME' => 'eastcott.net',
    'DHCP_HOSTNAME' => 'CS167266-A',
    'GATEWAYDEV' => 'eth0',
    'dnsServer' => '192.168.5.253',
},
```

NOTE: If you have a DNS server on your LAN, you may want to add PEERDNS=no to the /etc/sysconfig/network file to prevent the /etc/resolv.conf file being replaced when the ISP server responds with its DNS server IPs. By specifying the HOSTNAME and DOMAINNAME parameters, you are also inhibiting the dhcp client from "re-naming" the computer to the hostname and domain name (respectively) that the ISP thinks you are.

Dual Lan: (multiple is just more `intf` definitions)

```
        'intf' =>    {
            'eth0' => {
                'DEVICE' => 'eth0',
                'BOOTPROTO' => 'static',
                'ONBOOT' => 'yes'
                'IPADDR' => '192.168.1.2',
                'NETMASK' => '255.255.255.0',
                'NETWORK' => '192.168.1.0',
                'BROADCAST' => '192.168.1.255'
            },

            'eth1' => {
                'DEVICE' => 'eth1',
                'BOOTPROTO' => 'static',
                'ONBOOT' => 'yes',
                'IPADDR' => '192.168.5.202',
                'NETMASK' => '255.255.255.0',
                'NETWORK' => '192.168.5.0',
                'BROADCAST' => '192.168.5.255'
            }
        },

        'netc' =>    {
            'NETWORKING' => 'yes',
            'minus_one' => 1,
            'nb_cards' => 2,
            'FORWARD_IPV4' => 'false',
            'HOSTNAME' => 'linux3.eastcott.net',
            'DOMAINNAME' => 'eastcott.net',
            'GATEWAY' => '192.168.5.253',
            'GATEWAYDEV' => 'eth1',
            'dnsServer' => '192.168.5.253',
        },
```

NOTE: If this computer is acting as a bridge between the two networks, then you need to change
FORWARD_IPV4 to `true`.

Problems and Issues

As with all things, the Automated Installation facility has its problems. This section will attempt to identify them and illustrate, if possible, work a rounds for them.

1. **Missing RAID and LVM definitions.**

   Unfortunately when the `auto_inst.cfg` file is generated, the RAID and LVM declarations are NOT. You will have to manually add them your self.

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0. PREAMBLE

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