InfoMagic Workgroup Server
version 2.1
Supplemental Guide

Stelias Computing, Inc.
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Contents

Chapter 1

Introduction

Welcome to the InfoMagic Workgroup Server version 2.1. In this short supplemental guide you will find sections describing installation, upgrading, the new packages (MetroX, Post.Office, Macintosh tools, Fax Server and Firewall Tool), and the support arrangements.

There are major differences between this version and version 1.1. The InfoMagic Workgroup Server is now based on Red Hat Linux version 4.1, which adds support for numerous new devices and uses a modularized kernel. Numerous new packages will make your InfoMagic Workgroup Server even more useful.

1.1 Where do I find the answer to my question?

There is a lot of documentation, partially in print in this guide and in your manual, and on the CD in HTML format. With your web browser you can find the HTML documentation by pointing it at the

`doc/HTML/index.html`

file on the CD. There you will find:

- The Official Red Hat Users Guide for version 4.1
- The Installation and Getting Started guide
- The Linux HOWTO's (click on the right arrows to get to the index)
- A variety of other documents

Guide to the documentation

1. **Installation**
   - This guide is your primary reference.
   - The RedHat 4.1 Users guide on the CD has a lot of useful information that you may wish to print out before starting. Point your web browser at the **doc/HTML** directory and follow the link to the Users Guide.
   - The installation and getting started guide has a wealth of installation. Use your web browser.
2. **Upgrading an existing InfoMagic Workgroup Server or Red Hat Linux system.**
   - **Definitely read this guide.**
   - The RedHat 4.1 Users guide will have helpful supplemental information.
3. **New packages**
   - **MetroX, Post.Office, Fax Server, Macintosh services and the Firewall tool are described in this guide.**
4. **Operating the server**
   - The InfoMagic Workgroup Server manual is your primary reference.
   - The RedHat Users Guide will have helpful supplemental information.
   - The /usr/doc directory on your InfoMagic Workgroup Server is full of documentation.

It is possible to upgrade InfoMagic Workgroup Server version 1.1, Red Hat Linux version 2.0 or later or Caldera desktop to InfoMagic Workgroup Server version 2.1, and this process is described in detail.

1.2 New packages

We have added many new packages. The new packages significantly extend the usefulness of the server in terms of integration with Macintosh and PC networks, networking capabilities, window systems and so on. Among the new things are:

1. **Metro X:** a commercial X Server, which can drive some graphics cards not supported by XFree.
2. **Post.Office** is included with a trial license for 10 clients. Post.Office is the celebrated mail server also in use in the Netscape Server Suite.
3. **Macintosh hfs filesystem:** support has been added for reading and sharing Macintosh CD-ROMs.

4. **HFS utilities** graphical utilities to manipulate Macintosh files and disks are available.
5. **Fax server:** We have included fax server, allowing you to send faxes from Macs and PC's using Windows and Macintosh word processors. You will need a single fax modem attached to your InfoMagic Workgroup Server.
6. **Firewall and internet gateway:** A simple graphical firewalling tool is included, which helps you to tighten the security of your network and allows any number of Windows and Macintosh computers to reach the internet using a single internet connection for the the InfoMagic Workgroup Server.

1.3 Acknowledgements

Partially based on:
Linux Installation HOWTO by Matt Welsh, mdw@sunsite.unc.edu
RedHat-HOWTO by Donnie Barnes, djb@redhat.com
Official Red Hat Linux User Guide by RedHat Software, Inc.

Acknowledgements 1.3

Chapter 2

Installing the InfoMagic Workgroup Server

his chapter outlines the process of successfully installing the InfoMagic Workgroup Server, and is adapted from Henry M. Pierce's, QuickStart Guide 3.1, InfoMagic 1997.

2.1 Selecting hardware for a new system

A basic Intel based PC should consist of a combination of the following: An i386, i486, i586 or higher processor installed on an ISA, VESA or PCI based mother board with 8 megabytes of RAM or more; a 3.5-1.44MB floppy drive; An AT-standard hard disk (most MFM, RLL or IDE based hard drive and controllers) or SCSI hard drive with supported SCSI controller; and a supported proprietary 2X CD-ROM drive such as a SoundBlaster, Panasonic, Sony cdu31a/33a, Mitsumi 2X drive or any standard IDE/ATAPI or SCSI (with supported SCSI controller card) CD-ROM drive. Almost any standard CGA, EGA, VGA or SVGA video card will support Linux's text based mode. For X-Window compatibility, please check the XFree86-HOWTO. For a detailed list of supported hardware, please check the Hardware-HOWTO on the CD, or comp.os.linux.hardware.

TIP: IDE/ATAPI CD-ROMS are an industry standard. If you have a SoundBlaster, Mitsumi, or other recently made 4X speed or higher CDROM drive, you most likely have a IDE/ATAPI based CD-ROM. Many of these drives are configured as slave and don't get detected by Linux. These drives must be set as Master if they are the only drive on an IDE interface.

2.2 Collecting Hardware Requirements

Before you start you installation or upgrade make sure you have the details of your hardware handy.

Collecting hardware details

1. **BIOS:** Determine the type of your BIOS. Turn on LBA if you have large disks. Turn off plug and play for devices you want to use with Linux.
2. **Ethernet & SCSI cards:** Write down the precise make, model number of the card. Use Windows 95 System Control Panel or vendor supplied utilities to know the IRQ and I/O Base address of the card.
3. **CD drive and disk drives:** Find out the geometry of the drive (look in the BIOS), which controller it is attached to and wether it is a primary or slave drive on that controller.
4. **CD drive:** Make sure that any IDE/ATAPI CD-ROM's are attached as master to the second IDE interface, if they are the only drive attached to that interface.
5. **Video system:** Find out the manufacturer and model of your video card and monitor. Write down the horizontal and vertical frequency ranges your monitor can accept.
6. If you have **SCSI devices** make sure you know the target number of each device attached to your SCSI chain.

2.3 Supported Hardware

The following tables list the hardware supported by the version of the Linux kernel included in the InfoMagic Workgroup Server. During the install or upgrade process, you will be asked as needed whether you need to load drivers for your Ethernet card, SCSI card, or CD-ROM drive. If so, you will be presented with a list of driver options. You can refer to the tables below to help choose which option is appropriate.

The column in the tables labelled "Module" gives the name of the loadable device driver which supports the given hardware. You do not need to know this name to choose from the lists provided by the install/upgrade program, since these lists use descriptive names. However, if you add or change hardware later, you can use the Kernel Daemon Configuration tool, described in the Red Hat Users Guide, to load new modules into your kernel.

There are a few drivers which have "(in-kernel)" listed in the Module column. These are automatically included in the kernel (because, for technical reasons, they do not work as loadable modules). The drivers in question are the ones for LANCE Ethernet, AMD AM53C974-based SCSI interfaces, and SCSI and IDE CD-ROMs. If you have hardware covered by these drivers, you do not need to choose any extra drivers to load; the kernel should detect your hardware when the install/upgrade disk boots.

This distribution supports the following Ethernet cards.

Supported Ethernet Cards

Vendor	Card	Module
3com	3c59x/3c90x "Vortex/Boomerang"	`3c59x`
	3c509	`3c509`
	3c503	`3c503`
	3c501	`3c501`
Apricot	Xen on-board	`apricot`
Cabletron	E2100	`e2100`
Digital/DEC	DE425/434/435/450/500	`de4x5`
	Etherworks (DEPCA, DE100/1, DE200/1/2, DE210, DE422)	`depca`
	Etherworks 3 (DE203, DE204, DE205)	`ewrk3`
DEC 21040 ("Tulip") cards	many cards/vendors; e.g.: Accton EN1203, EN1207, EtherDuo-PCI; Cogent eMASTER+, EM100-PCI, EM400, EM960, EM964; Danpex EN9400; D-Link DE-530; Mylex LNP101; Proteon P1670-EA; Thomas Conrad TC-5048; SMC EtherPower PCI (8432); Znyx ZX342	`tulip` (alternately, `de4x5`)
HP	PCLAN+ (27247B and 27252A)	`hp-plus`
	PCLAN (27245 and other 27xxx)	`hp`
	HP10/100VG anyLAN	`hp100`
LANCE, LANCE32	many vendors/cards; e.g.: NE1500/2100-compatibles; Allied Telesyn/Telesis AT1500, AT2450; Bosa BEN; D-Link DE-520; HP J2405A, Vectra on-board; Racal-Interlan NI6510EB EtherBlaster	(in-kernel)
NE2000-compatible	many vendors/cards; e.g.: Accton MPX; RealTek 8029-based cards; D-Link DE-100, DE-200, DE-220-T; DFI DFINET-300 and -400; Proteon P1380-EA	`ne`
SMC/Western Digital	WD80x3, SMC Elite(/16)	`wd`
	SMC Elite Ultra, EtherEZ (Ultra mode)	`smc-ultra`
	SMC 9000 series	`smc9194`

(Continued on next page)

Supported Ethernet Cards (cont'd.)

Vendor	Card	Module

The following Ethernet card is supported but cannot run AppleTalk:

Vendor	Card	Module
Intel	EtherExpress	`eexpress`

The following SCSI interfaces are supported:

Supported SCSI Interfaces

Vendor	Card	Module
Adaptec	AHA152x/2825	`aha152x`
	AHA1542	`aha1542`
	AHA1740	`aha1740`
	AHA274x/284x/294x (AIC7xxx chipset)	`aic7xxx`
AdvanSys	ABP510/5150, 5140, 5142, 920, 930, 930U, 960, 960U, 542, 742, 842, 940, 940U, 970, 970U, 752, 852, 950. (Also, some SIIG models, some SCSI cards included with Iomega, HP products.)	`advansys`
Always	IN2000	`in2000`
AMD-based boards	AM53C974	(in-kernel)
BusLogic	MultiMaster series (948, 958, 958D, 946C, 956C, 956CD, 445C, 747C, 757C, 757CD, 545C, 540CF, 445S, 747S, 747D, 757S, 757D, 545S, 542D, 742A, 542B, 742A, 542B)	`BusLogic`
DPT	Smartcache (Plus), SmartCache III, IV, SmartRAID and other "EATA DMA" controllers from NEC, AT&T, SNI, AST, Olivetti, Alphatronix	`eata_dma`
	old DPT PM2001, PM2012A	`eata_pio`
DTC	3180/3280	`dtc`
Future	TMC-885, TMC-950	`seagate`
Domain	TMC-16x0	`fdomain`

(Continued on next page)

Supported SCSI Interfaces (cont'd.)

Vendor	Card	Module
NCR-chip-based boards	NCR 5380	`g_NCR5380`
	NCR 53c406a	`NCR53c406a`
	NCR 53C810/53C820 PCI (aka Symbios)	`53c7,8xx`
	NCR 53C810/53C820 (alternate)	`ncr53c8xx`
	Pro Audio Spectrum/Studio 16	`pas16`
	Seagate ST01, ST02; Trantor T128/128F/228	`seagate`
Qlogic	ISP1020 boards, IQ-PCI, IQ-PCI-10, IQ-PCI-D	`qlogicisp`
	FASxxx boards, FastSCSI!	`qlogicfas`
UltraStor	14F, 24F, 34F	`ultrastor`
	14F, 34F (alternate module)	`u14-34f`
Western Digital	7000FASST	`wd7000`

Supported CD-ROM drives:

Supported CD-ROM Interfaces

Drive	Module
Standard IDE CD-ROMs	(in-kernel)
Standard SCSI CD-ROMs	(in-kernel)
Aztech/Orchid/Okano/Wearnes/TXC/CyDROM	`aztcd`
Backpack	`bpcd`
Goldstar R420	`gscd`
Matsushita/Panasonic/Creative SoundBlaster	`sbpcd`
Mitsumi (standard—no XA/Multisession)	`mcd`
Mitsumi (alternate–including XA/Multisession)	`mcdx`
Optics Storage 8000	`optcd`
Phillips CM206/CM260	`cm206, cdrom`
Sanyo CDR-H94A	`sjcd`
ISP16/MAD16/Mozart CD-ROM interface	`isp16`
Sony CDU31A/CDU33A	`cdu31a`
Sony CDU535	`sonycd535`

2.4 Laying out your partitions and space requirements

Depending on your needs, goals, the distribution and your hardware, the InfoMagic Workgroup Server can be installed in as little as 150MB of drive space, but generally you will want generous room for growth and future upgrades. A standard installation includes the Workgroup Server tools including the networking software you need, and the X-Window system. A full installation of about 250MB would include the X-Window system, additional applications, a web server, and additional software development support (C++, PERL, Pascal, FORTRAN, etc.). You should also factor in a 16MB swap partition (the minimum recommended) and an additional space for files you wish to serve and email.

There are a few important points with repect to booting Linux. It is important that the root partition lies within the first 1024 cylinders of the harddrive. If you have an LBA capable bios, this corresponds to the first 1024MB of the hard drive. If you have an older BIOS that does not support LBA, this means the the partition must be within the first 512MB of the harddrive.

Suitable parition layouts for server use are discussed in section 2.3 of the InfoMagic Workgroup Server manual.

Partition Layout and Space Requirements

1. **Root and var partition sizes** should be **minimally 16MB each** as of release 2.1 of the InfoMagic Workgroup Server. If you have **no separate /var** partition, allocate at least 32MB to /.
2. **Location of** /: the root partition must lie in a disk which the BIOS code can access for booting. This means that it must lie entirely in the first 1024MB of your first or second disk. For older BIOS's (without LBA) it must lie in the first 512MB of the first or second disk.
3. **Space** Due to new packages the minimum space requirement for a normal Workgroup Server installation is 150MB.

2.5 Upgrading to InfoMagic Workgroup Server version 2.1 from other systems

Upgrading to the InfoMagic Workgroup Server version 2.1 is possible if you are running RedHat version 2.0 or later, InfoMagic Workgroup Server version 1.1, or Caldera Desktop version 1. If you have enough space on your / and /var/ partitions, and you are running one of these systems, you can upgrade to the new release of the Workgroup Server.

Upgrading starts with backing up all important data and then following the install instructions below and selecting the upgrade option. After the installation you need to run an upgrade script on the CD.

Upgrading to InfoMagic Workgroup Server version 2.1

1. Make sure you are running Red Hat Linux version 2.0 or later, Caldera Desktop version 1.0 or InfoMagic Workgroup Server version 1.1.

2. Make sure you have at least 32MB of space in /var and / combined or 32MB in root if you don't have a separate /var parition.
3. Back up all important data on your disk.
4. Proceed to the "Installation Instructions", section 2.6.2:
   - Select the upgrade option from the menu
   - Do **NOT** format disks, or shrink partitions
5. After going through the upgrade process with the installation floppies of the InfoMagic Workgroup Server, version 2.1, complete the upgrade by following the post-install upgrade instructions in 2.7.

2.6 Installing InfoMagic Workgroup Server

Linux does not rely on any operating system such as MS-DOS, Windows 95 or OS/2 being installed on the target computer, and normally resides on it's own native partition. While Linux is a stand-alone operating system, it may co-exist with another operating system such as MS-DOS or Windows 95 on the same hard drive. It may also be installed on a second hard drive or be installed as the only operating system on the computer.

The process of installing Linux involves the following: preparing the hard drive for Linux; creating a set of floppy disks for the distribution to be installed; using the distribution's installation software; and finally, booting and using the newly installed Linux system.

2.6.1 Shrinking DOS/Windows space on the hard drive with fips.exe

Most people installing Linux will have one hard drive with a single MS-DOS or Windows 95 partition that uses the entire drive. Not to worry though, the InfoMagic Workgroup Server comes with a handy utility called fips which will allow you to shrink your MS-DOS or Windows 95 partition and free up hard drive space for a Linux native and swap partition. You can only use FIPS with a DOS or Windows 95 FAT partition.

NOTE: If you are using a recent copy of Windows 95, you may be using Microsofts new FAT32. FIPS will currently not shrink a FAT32 partition. To see if you are using FAT32, go to: Start | Settings | Control Panel | System Look at the general tab and if the Windows 95 System version is "4.00.950 B", then you are using FAT32 and cannot use FIPS to resize the partitions.

Before going any further, BACKUP the existing system before running fips or installing Linux. You should also read FIPS.DOC which will provide more detailed information about FIPS. While it is extremely rare to completely lose an existing partition, it might happen and a backup will ease the recovery of such an event. Fips is located in the \dosutils directory on the WGS CD-ROM. To use fips, use the following steps:

Using fips.exe to shrink FAT partitions

1. Copy fips.exe to your C: drive into a directory such as C:\WINDOWS or C:\DOS.
2. Create a bootable DOS or Windows 95 floppy disk and place RESTORRB.EXE from the dosutils directory on the CD onto the bootable disk.
3. Run scandisk and defrag (included with DOS 6.X and higher). This places all free space at the end of the drive so fips can create a second partition.
4. Make sure you are in DOS mode (i.e. Not running Windows 3.X or Windows 95). Windows 95 users: remember you can choose re-boot into DOS mode from the shutdown menu.
5. Type fips. An introductory message will be shown and with a choice for which drive to shrink. Most people will choose partition 1 to be split.
6. After confirming that you wish to continue, you will be asked to make a backup copy of your existing boot and rootsectors on the bootable disk made above. This will allow you to restore the hard drive if needed.
7. FIPS will ask if all the available free space should be used and present an initial partition table dividing the hard drive into two partitions. If you say no, you can use your UP and DOWN arrow keys to adjust the amount of space freed. Hit ENTER to continue. If the sizes with the new partition table are acceptable, choose 'c' to continue. If not, choose 'r' to re-edit the table.
8. One last chance will be given to quit FIPS or write out the new partition table. If you are happy, write it out!
9. Once FIPS is done, re-boot your machine.
10. Next, use DOS's fdisk.exe to delete the second partition. Linux's fdisk will be used later to create the Linux native and swap partitions in the freed hard drive space.

2.6.2 Installation Instructions

The InfoMagic Workgroup Server provides several methods of installation. The CD-ROM based methods of installing are covered in this document. Overall, the installation process has been simplified with the use of a one-floppy its all (Only 3.5, 1.44M floppies are supported) installation. The install program supports installing a new InfoMagic Workgroup Server system and upgrading an existing InfoMagic Workgroup Server version 1.1, RedHat 2.0 or higher to InfoMagic Workgroup Server version 2.1. Technically, RedHat should run on an i386 based machine with 4MB of physical memory. However, the practical minimum is a i486DX/66 with 8MB of physical RAM and a 2X or higher supported CD-ROM drive and 250MB to 350MB of hard drive space.

2.6.3 Creating the Boot Diskette

One blank DOS formatted floppy will be needed to create the boot diskette used for either installing or upgrading InfoMagic Workgroup Server. A "one disk fits all" strategy is employed to install or upgrade from the CD-ROM. This diskette image contains the kernel and the module support for most combinations of hardware. The image, boot.img, is located in the **images** directory on the CD-ROM. The DOS utility, rawrite.exe, is used to create the floppy and rawrite.exe can be found in the **dosutils** directory on the CD-ROM. Please copy rawrite.exe to C:\DOS or C:\WINDOWS directory which will place the rawrite utility in your command path. From the CD-ROM (presuming it is the D: drive), type:

```
D:\DOSUTILS> copy rawrite.exe C:\WINDOWS
```

Once rawrite has been copied to the C:\DOS or C:\WINDOWS directory, do the following to create the boot disk:

```
C:\> D:
D:\> cd \images
D:\images> rawrite
Enter disk image source file name: boot.img
Enter target diskette drive: a:
Please insert a formatted disk into drive A: and press -Enter-:
```

Once rawrite is done creating the boot disk, remove the floppy from the floppy drive and label it Boot Diskette. Remember, InfoMagic Workgroup Server uses a one disk fits all strategy so you don't have to worry about matching a boot image to your hardware. Once the floppy is labeled, re-insert it into the diskette drive and re-boot your system.

You are now ready to install the InfoMagic Workgroup Server.

2.6.4 Creating the Boot Diskette using Linux

If you already have Linux on your computer, it may be more convenient to create the boot diskette using Linux rather than DOS. To do this:

Creating Boot Diskette using Linux

1. Mount the CD.
2. Change directory to the **images** subdirectory on the CD.
3. Insert a formatted disk in the floppy drive.
4. Use the **dd** command to copy the **boot.img** to **/dev/fd0**.

5. For example:

```
mount -t iso9660 -r /dev/cdrom /mnt/cdrom
cd /mnt/cdrom/images
dd if=boot.img of=/dev/fd0
```

2.6.5 Creating the RedHat Supplemental Diskette

The supplemental disk is only needed if you are installing to a laptop and need PCMCIA support. This diskette image is located in the **images** directory on the CD-ROM. While the following type of installation is not covered in this document, the supplemental disk is also required for hard drive installs. For CD-ROM installs, the supplemental disk is required for laptops which require PCMCIA support for the CD-ROM drive and/or floppy. Please follow the instructions for Creating the Boot Diskette except substitute **supp.img** for **boot.img**. Label the disk clearly.

2.6.6 Installing or upgrading

The installation program is easy to use and starts up automatically. The setup program is self-explanatory. TIP: If you do not have an Ethernet Card, DO NOT configure networking when asked by the setup program. The setup program will proceed as follows:

Installation steps

1. You will be asked if you have a color screen (if you do, press OK), you will then be greeted and asked if you need PCMCIA support (say No unless you are installing to a laptop and have the supplemental diskette already made).
2. Next, you will be prompted for the installation media, and you should select, Local CDROM. You will then be asked a series of questions about your CD-ROM hardware. The options are: IDE/ATAPI, SCSI or proprietary CD-ROM drive. Choose the appropriate option for your hardware. TIP: Most recent 4X speed or faster CD-ROM drives are IDE/ATAPI.
3. Next, you will be asked if you are installing to a New System or Upgrading InfoMagic Workgroup Server version 1.1, RedHat 2.0 or higher, or Caldera. If you are upgrading, you will not be offered the chance to partition your hard drive or configure anything with your system except LILO.
4. If you are installing for the first time, you will need to partition your hard disk. You will need to highlight the hard disk you wish to partition. Please see section 2.8 for the use of Linux's fdisk program. If you do not have any free space on your hard disk to create partitions, please review the fdisk section of this document.

5. Once you have created the necessary Linux Native and Linux Swap partitions, setup will ask you to configure your Swap partition. You should do so as it will speed up the installation. You will then be asked which partition(s) you intended to install Linux to: You must configure and choose one partition for the **root** partition. If you have more than one partition for the Linux installation, now is the time to designate them as well.
6. Next is the Software Package Selection. First, a list of software categories to install is presented, followed by a chance to customize which software packages from each category is to be installed. If you have not installed Linux before, you select the groups you think you will use, but should let the setup program install the defaults in each group. While the software is installing, you will see a progress indicator and should get a cup or two of coffee. Installation can take anywhere from 5min. to an hour or so depending on software choices and hardware configuration.
7. After the software installation is done, you will be asked to configure you mouse. Again, choose what is appropriate for your hardware.
8. Next is the X-Window configuration. You can choose to install an XFree86 X-server or the MetroX server for your video card.
9. If you do not have an Ethernet Card, DO NOT configure your network at this time. If you do have a network card and didn't configure it earlier, you should configure it now.
10. Next, you need to configure the system clock. UTC is a good choice if you are on a network and want daylight savings time handled properly. Local Time is good if this is a stand-alone machine.
11. If you do not have a US Keyboard, you will need to configure for the keyboard you have at this time.
12. You will now be prompted for the system password for the root account. Write it down and don't forget it as it is a non-trivial matter to recover the password.
13. Finally, you will be asked to configure LILO. Please see the LILO section for information.

Once the installation procedure is completed, you are ready to re-boot your system and use the InfoMagic Workgroup Server.

2.7 Finishing an upgrade install

If you are upgrading you are not quite done yet. The upgrade has replaced all packages with the new versions on the CD and made various other changes to your system. What we will do here is to install packages which are not yet on your system. For example, if you are upgrading from a RedHat or Caldera system you will not have the graphical utilities for administering file and printer sharing.

Finishing the upgrade goes as follows:

Finishing an upgrade install

1. Log in as root
2. Put the InfoMagic Workgroup Server CD-ROM in the drive
3. Mount the CD with the command

   ```
   mount /dev/cdrom /mnt/cdrom
   ```
4. Go to the

   ```
   cd /mnt/cdrom/postinst
   ```
5. To upgrade Workgroup Server packages type the following in at the console or in an xterm:

   ```
   ./upgrade-group /mnt/cdrom
   ```
6. To upgrade another group of packages, first list them with the help option, then upgrade as follows:

   ```
   ./upgrade-group /mnt/cdrom help
   ./upgrade-group /mnt/cdrom selected-group
   ```
7. To install or upgrade MetroLink's X server:

   ```
   ./upgrade-metrox /mnt/cdrom
   ```

Your InfoMagic Workgroup Server is now ready for use.

2.8 Using fdisk

To create Linux partitions on a hard drive with free space (see the section on FIPS), the version of fdisk supplied by Linux will be used. This version of fdisk is not used under DOS but from within Linux. This implies that you should only create or delete partitions with the version of fdisk that comes with the operating system you are manipulating partitions for. That is, only create and delete DOS partitions with DOS's fdisk and only create and delete Linux partitions with Linux's fdisk.

2.8.1 Partitions Under Linux

Before using Linux's fdisk, you should have an understanding of how Linux labels and uses drive partitions. To Linux, partitions are given a name based on the disk on which the partition resides. That is, the device (drive) is considered first followed by the partition contained on the device. For example, /dev/hda refers to the first physical IDE hard disk (/dev/sda refers to the first physical SCSI disk) and /dev/hda1 (or /dev/sda1) refers to the first partition on the first hard disk. Linux labels hard drives in the order they are configured on your system: So, /dev/hdb refers to the second physical IDE drive and /dev/sdb refers to the second physical SCSI hard drive. This is in contrast to DOS, where two partitions on the same disk are seen as logical drives such as C: and D:, or C: and D: could also refer to two physically distinct drives as well. This is a powerful feature of Linux because you can put different parts of the operating system on different partitions (and/or drives) but have all the partitions appear as one directory tree hierarchy. This can assist in meeting hardware limitations as well as managing the installed system. For example, /dev/hda2 could be defined as a "/" (root) partition and /dev/hda3 could be defined as a /usr partition. When the Linux system is booted, it does not matter that / and /usr are on different partitions in the sense of DOS as Linux treats the partitions as part of the same directory hierarchy instead of logical drives C: and D:.

Linux's fdisk is fairly easy to use. InfoMagic's Workgroup Server installation program will provide a list of available hard drives. Highlight the drive you wish to partition, and press OK.

```
fdisk /dev/hdb
```

Within the installation software, fdisk is automatically informed of which drive you wish to partition. When fdisk is first started, you will receive a command prompt. By entering "m" you will get a list of available commands for fdisk. However, the most useful one to start with is "p":

```
Command (m for help): p
Disk /dev/hda: 32 heads, 63 sectors, 1024 cylinders
Units = 3D cylinders of 1024 * 512 bytes
Device   Boot Begin Start End  Blocks Id System
/dev/hda *    1     1     49   100160 06 DOS 16-bit >=32
```

To add a swap partition, use the 'n' command:

```
Command (m for help): n
Command action
e extended
p primary
p
Partition number (1-4): 2
First cylinder (50-1024): 50
Last cylinder or +size or +sizeM or +sizeK (50-1024): +16M
```

This will create a Linux Native partition 16MB in size. This is required if you have less than 16MB of physical RAM. The general rule of thumb for installations with 16MB or more of physical RAM is 2X physical RAM. Next, the partition must have its ID type changed to Linux swap with the "t" command:

```
Command (m for help): t
Partition number (1-4): 2
Hex code (type L to list codes): 82
```

If you use the "L" command, you will get a list of partition types and the ID numbers they use. You will discover a Linux native partition is type 83 (the default type Linux fdisk makes) and type 82 for Linux swap partitions. Now that the swap space has been created, the primary Linux native partition needs to be created with the "n" command:

```
Command (m for help): n
Command action
e extended
p primary
p
Partition number (1-4): 3
First cylinder (54-1024): 54
Last cylinder or +size or +sizeM or +sizeK (54-1024): +250M
```

This will create a Linux Native partition of about 250MB which is the minimum needed if you intend to run X-Windows and have some development tools. At this point, we have not saved the changes to the partition table so if the "q" command is given, fdisk will quit without saving these changes to the partition table. However, since we have gotten this far, we will want to review the partition table (using the "p" command) and assuming the partition layout is satisfactory, use the "w" command to write the table out to the hard drive:

```
Command (m for help): p
Disk /dev/hda: 32 heads, 63 sectors, 1024 cylinders
Units =3D cylinders of 1024 * 512 bytes
Device    Boot Begin Start End  Blocks  Id  System
/dev/hda1 *    1     1     49   100160  06  DOS 16-bit >=3D32M
/dev/hda2      50    50    54    16016  82  Linux Swap
/dev/hda3      54    54   1024  260160  83  Linux Native
Command (m for help): w
```

A summary of the action fdisk takes will be printed out followed by a message to re-boot the computer. The computer should be re-booted at this time to ensure the partition table is properly written. When the option to partition the hard drives comes back up within the setup program, simply indicate that the drives do not need to be partitioned again.

2.9 Using Lilo

LILO (LInux LOader) is a boot loader used by the InfoMagic Workgroup Server which can be used to boot into either Linux, MS-DOS, Windows 95 or other operating systems. LILO can function either as a first stage boot loader (when stored in the MBR (Master Boot Record) of the drive) or second stage boot loader (when stored in the boot sector of a partition). It can also load Linux from a floppy. There are several considerations that need to be made when using LILO to manage a computer system including how the system is setup and if any other boot managers are present.

The first consideration is how the partitions are setup. Due to early design limitations in the PC, the BIOS of most PC's is only able to boot partitions on the first 2 physical drives that reside within the first 1024 cylinders of the drive in question. This means if you have three 1.2 gigabyte IDE hard drives, you are limited to booting partitions on the first two hard drives with partitions in the first 1024 cylinders of the drives.

However, most machines with a BIOS manufacture date of about June 1994 or later support a mode called LBA (Logical Block Addressing) which trades off the number of physical cylinders with the number of physical heads in a disk drive for determining the disk geometry. There are also some EIDE cards that allow machines with older BIOSes to employ LBA mode as well. The solution works by having BIOS report a bogus geometry when queried for information about the drive by halving (or quartering) the actual number of cylinders and doubling (or quadrupling) the actual number of heads. By enabling LBA mode, a hard drive with 2048 physical cylinders and 16 physical heads, will be reported as having 1024 cylinders and 32 heads. This allows LILO to calculate the correct geometry for booting a partition on the hard drive, but works within the restrictions placed upon the PC due to the engineering limitations. The Linux kernel does not have this limitation as it ignores BIOS and gets the geometry directly from the hard drive. But, we are reliant on LILO to start the kernel so we are restricted a bit in how the system can be organized. For more information, please consult the LILO-HOWTO.

A second consideration is whether you are already using another boot loader such as that provided with OS/2 or Windows NT. In this case, you will need to install LILO to the boot sector of Linux's root partition and have the OS/2 or NT loader load the Linux partition. In either case, if your Linux partition (or other bootable partitions) does not reside in cylinders 0-1023, DO NOT INSTALL LILO.

The Lilo component of the installation prompts you for the following questions:

1. When asked for any additional boot parameters, most people can skip this unless you need to type something at the boot prompt to get all of your hardware recognized.
2. Next, you will be asked to designate each partition you wish to have LILO boot for you.

3. You will be asked to give each partition a unique identifying name for LILO. For example, you might want to use linux for you linux partition and DOS for your DOS partition.
4. You will then be given one last chance to decide if you want to install LILO. Presumably, you will want to install it.

If LILO does not start your computer properly for any reason (or you decide to remove Linux from your system), and you have an emergency DOS or Windows 95 boot disk, you can remove LILO by booting into DOS or Windows 95 and type:

```
C:\> fdisk /mbr
```

This will remove LILO from the MBR and replace it with DOS or Windows 95 boot loader and allow the system to boot as it did before the installation of Linux. As for Linux, should this happen, the boot installation disk should be used to boot Linux off the hard drive to help figure out what went wrong with the installation of LILO. Using the RedHat boot disk, you will want to type the following at the boot: prompt

```
boot: rescue ro root=/dev/???? load_ramdisk=0
```

Where `/dev/????` is the root partition you installed Linux to. While booting from a floppy in this manner is slow, it will allow you to startup the system and examine what went wrong.

To trouble shoot LILO problems, please consult the LILO-HOWTO.

Chapter 3

New packages in the InfoMagic Workgroup Server

In the sections below the configuration and use of new software on the InfoMagic Workgroup Server CD is discussed. We refer to parts of the InfoMagic Workgroup Server manual where appropiate.

3.1 Installing and Configuring the MetroLink Metro-X server or XFree86 servers.

InfoMagic is pleased to include the MetroLink Metro-X X-Window server on the InfoMagic Workgroup Server. This server has support for video cards not supported by the standard X-Window System supplied by the X-Consortium and may provide enhanced performance over the standard X-Consortium servers for supported cards. At the same time, the XFree86 Servers now have much better installation support too, so we discuss both.

3.1.1 Installing the MetroLink servers

To install the Metro-X servers, mount the CD-ROM and install using the following command:

Configuring MetroX

1. Install the server (if necessary) with:

   `mount -t iso9660 /dev/cdrom /mnt/cdrom`

```
rpm -Uvh /mnt/cdrom/RedHat/RPMS/metroess-3.1.2-1.i386.rpm
```

2. To configure the server type

   ```
   configX
   ```

3. **Mouse problems:** If you can't figure out what mouse you have, run `mouse-test`, followed by `mouseconfig` to set up the mouse.

Now refer to the subsection "Running X" below for instructions how to start.

3.1.2 Configuring XFree86

If you have chosen to install XFree86 servers, there are several programs at your disposal to configure the Window system.

Configuring XFree86

1. To install a server and the configuration programs type:

   ```
   mount -t iso9660 /dev/cdrom /mnt/cdrom
   rpm -Uvh /mnt/cdrom/RedHat/RPMS/XFree86-XF86Setup-3.2-4.i386.rpm
   rpm -Uvh /mnt/cdrom/RedHat/RPMS/Xconfigurator-2.6-5.i386.rpm
   rpm -Uvh /mnt/cdrom/RedHat/RPMS/XFree86-servername-3.2-?.i386.rpm
   ```

   The Xconfigurator program will present a list of video cards and corresponding servers in case you need to determine what server is needed for what card. You can also find this in the documentation on the CD.

2. Configure the mouse typing at the console:
   - `mouse-test`
   - `mouseconfig`

3. Run XF86Setup or Xconfigurator to configure X.

The XF86Setup program is easy to use but runs slowly.

3.1.3 Running X

After configuring the server the system should be ready to run the Window system by typing **startx**. Once everything works well you may want to log in as root and type issue the command **exec xdm**. This allows you to log in using a graphical login prompt. (To kill xdm, type `killall xdm` as root.)

Controlling screen resolutions can be done with the keys Ctrl-Alt-**—**. This is handy when you have many windows on the screen.

3.2 Firewall configuration

The InfoMagic Workgroup Server comes with a simple firewall configuration tool. You will find this tool useful if your server is equiped with **two** network interfaces, for example, a modem (for PPP) and an ethernet card to serve an internal net of PC's and Macintoshes. Alternatively you may have two ethernet cards, one attached to the ISP provided connection, one for the internal network of PC's and Mac's in your organization. Yet another combination of two network interfaces is an ISDN modem and an ethernet card.

In such situations the following issues arise:

- Can the hosts on the internal net exploit the InfoMagic Workgroup Server as a "route" to the internet?
- Can we limit the access to the InfoMagic Workgroup Server to protect information on it?
- Can I shield the internal net from outside intruders who want to contact hosts inside the internal net?
- Can we allow access to the internet from the internal net, but limit web browsing?
- Do we need to request a network number for our internal net?

A few clicks will help you get a set up with many benefits.

Warning: The InfoMagic Workgroup Server firewall is simple and an acceptable solution for many situations. However, it is not as complete in the protection it offers your internal net as dedicated firewall computers can do. In particular it only runs a packet filter to control access and forwarding, and the InfoMagic Workgroup Server is not configured as a bastion host.

The InfoMagic Workgroup Server uses **masquerading** in the Linux operating system. This means that the Linux machine can accept network traffic from a client on the internal network on the internal interface which is destined for hosts on the outside network (probably the internet). When masquerading is enabled and a client on the inside net requests data from a host outside, the InfoMagic Workgroup Server will contact the host outside on behalf of the client on the internal net who wanted to make this connection. This means that the client is totally invisible and only the data requested from the host is returned to the client. From the perspective of the outside host the connection is made by the InfoMagic Workgroup Server, not by the internal client.

In particular with masquerading enabled you **can** use the reserved network numbers (such as 192.168.1.*) on your internal net. These numbers will never become visible to hosts outside receiving traffic from inside clients, since these hosts are contacted by the InfoMagic Workgroup Server and not directly.

To set up the WGS as a firewall proceed as follows:

Firewall Setup

1. Configure the internal network in such a way that the PC's and Macintosh machines can contact the InfoMagic Workgroup Serverin the way you want.
2. Ensure that the internal machines specify the internal IP address of the InfoMagic Workgroup Server as their gateway.
3. Configure the DNS on client machines to use the name servers provided by your ISP. (The name servers will be contacted only by the InfoMagic Workgroup Server using masquerading.)
4. Configure the networking to your internet service provider:
   - On the Control Panel, click TCP/IP Networking.
   - Click on interfaces
   - Click on add.
   - Select the type of interface and click OK.
   - Fill out the appropiate details, referring to the RedHat Linux Users guide on the CD.
5. Verify that the InfoMagic Workgroup Server can reach the internet through the second ethernet card, or a PPP connection using a modem.
6. Click Firewall Tool on the Control Panel.
7. Click the **On** button.
8. Enter the IP address of the InfoMagic Workgroup Server in the box; for example: 192.168.1.1. For a class C network enter 24 in the mask field, for a B network 16 etc.
9. Enter the name of the outside interface, for example eth1, ppp0.
10. Configure access from the machines on the internal net:
    - If desired allow access from machines on the internal net to the outside.
    - If desired allow access to the Workgroup Server. Such access will be needed to run the SMB file server software, and to reach the WWW server on the InfoMagic Workgroup Server.
    - You can block access to WWW sites from internal machines if there is a need to prevent employees, managers or pupils from accessing the web.
11. Finally configure the access to the Workgroup Server from outside machines.
    - Tick **Block access to less secure ports** to active the access control from outside machines to the InfoMagic Workgroup Server.

- Now allow those services that you wish to be available to outside hosts, for example enable **access to http server** to make your web server visible to the outside network.

12. To activate the configuration click **Apply** or **OK** if you are done. To load the previous configuration, click **Reset**, press **Cancel** to quit.

13. When the firewall is up, and access to outside hosts is enabled, clients on the internal net should be able to use a WWW browser as usual.

Regarding security the following:

- All access to the Workgroup Server from outside hosts carries security risks
- the ssh server provides relatively secure access to the InfoMagic Workgroup Server. You must purchase or download this software.
- The sendmail mailserver has a history of security problems that is particularly worrisome. The Post.Office mailserver may well have advantages here.

3.3 Setting up a Fax Server

Your InfoMagic Workgroup Server can function as a fax server. In outline, the fax server pretends to be a Unix printer, which cheats: it analyses the text it needs to "print" and finds out which phone number follows the string *faxnr:* (this string is customisable). It then converts the postscript to a fax format and uses the modem to dispatch the fax. The printer can be shared with Macintosh and Windows computers as described in the manual, and offer the fax services to PC's and Macintosh computers.

Setting up a fax server

1. Click **Printer Queues** on the Control Panel.

2. Click **Add** and select the **efax fax modem** option.

3. Give the printer a name, for example **fax**.

4. Fill in file limits and the modem device (Use the Modem Configuration to set up a modem).

5. In the station name entry enter the name of your company, and in the Station number box the fax number of your company.

6. Adjust the fax modem class (see your modem's manual).

7. Try the fax server with the **Test fax send...** button. In case of failure try the following:

- Try other values of the fax modem class.

- Click on **Advanced**
- Read your modem manual and the efax manual page (type man efax in an xterm), to find suitable modem initialization strings.

8. To customize the **fax number marker** enter another string (in case of problems, avoid spaces, hyphens and the like).
9. Make the Unix printer queue *fax* available to Macintosh computers using the **AppleTalk** Printer Sharing option. On the Macintosh this printer becomes visible as a **LaserWriter** in the Chooser (see the InfoMagic Workgroup Server manual)
10. Make the Unix printer queue *fax* available on Windows computers using the **SMB** File and Printer Sharing option. The printer becomes available on Windows machines and we recommend installing an AppleTalk Postscript Printer driver for the printer on the Windows client. (For more details see the InfoMagic Workgroup Server manual.)

Now you are ready to use the fax server, simply by printing documents prepared on PC's or Macintoshes to the fax printer. To identify the fax number to the server, you **must include the string and the number (for example: *faxnr:19075551212*) in your document**, and print to the fax printer. Avoid using the string to refer to other numbers. You may have spaces and hyphens in your phone number, but some word processors and PostScript printer drivers produce such PostScript that the fax server can no longer find the fax number in the text.

Using the fax server from a Windows or Macintosh computer

1. Prepare your document using a wordprocessor such as Microsoft Word.
2. Use a string of the form: **faxnr: 1-907 555 1212** just once in your document to indicate the fax number to which you want to send (you can put this string and number in small print in the footer if you like). In case of problems, try omitting hypens and spaces in the string.
3. On the Mac,
   - select the printer to be the shared fax printer on the InfoMagic Workgroup Server.
   - Print the document
4. On the PC
   - Print the document using the **Print** option in the File menu
   - Select the networked fax printer as the destination

3.4 Sharing Macintosh CD-ROMS and HFS utilities

The InfoMagic Workgroup Server comes with the HFS filesystem module for the kernel which allows reading of Macintosh filesystems. This can be useful to use CD-ROM drives attached to the InfoMagic Workgroup Server to share Macintosh CD's over the network with other computers.

Sharing a Macintosh CD

1. Put the Macintosh CD-ROM in the drive
2. Type `mount -t hfs /dev/cdrom /mnt/cdrom`
3. Use **AppleTalk** File Sharing on the Control Panel to make the /mnt/cdrom directory shared.
4. Access the share from the Mac using the Chooser.

Anoter useful utility allows you to read files on Macintosh floppies and CD's and copy them to Macintosh floppies on the InfoMagic Workgroup Server. The tool is quite flexible and its use can be illustrated with an example:

Using xhfs to copy a file from a Mac CD to a Macintosh floppy

1. In an xterm type `xhfs`
2. Insert the CD and the Mac floppy in the drives
3. Use the file menu and open option to open the devices `/dev/cdrom` and `/dev/fd0` on the left and the right.
4. Use the buttons to browse and copy files.
5. Use the balloon help to learn about the options.

3.5 Setting up Post.Office or sendmail as an SMTP and IMAP/POP3 email service

In this section we describe briefly how to set up an email service on your InfoMagic Workgroup Server. There are two options. A 10 user trial license of Post.Office is included with the InfoMagic Workgroup Server. The alternative is sendmail for which there are not licensing restrictions. To make you choice read through the installation sections. With each of them you can run POP, and with sendmail you can also run an IMAP service, which clients like Eudora, Netscape and Microsoft Outlook can access.

3.5.1 Post.Office Configuration

The InfoMagic Workgroup Server includes a 10 user trial license of the Post.Office mail server suite. This is an advanced tool to receive and send mail with administration through a WWW browser, which is also used in the Netscape server suite. Post.Office appears to have many advantages over the Unix sendmail mail server, but it does require the system administrator to set up a *mailbox* for each new user (and acquire a license when exceeding 10 mailboxes), which is something that is automatic with sendmail.

Post Office includes POP3 service.

To install and configure Post.Office proceed as follows:

Installing and configuring Post.Office

1. Install the Post.Office rpm by typing:

```
mount /dev/cdrom /mnt/cdrom
rpm -Uvh /mnt/cdrom/RedHat/RPMS/postoffice-2.0-2.i386.rpm
```

   This package also includes the local delivery agent called **deliver**

2. Now install and configure the package with the following commands:

```
cd /usr/src
tar zxvf postoffice.tgz
cd Post.Office
./installpo
```

3. Answer the questions on the screen, make sure to enter a

   - **Mail domain:** enter domain for your company e.g. `mycompany.com`
   - When the string **Reading configuration information.... done** appears, do not accept the default settings for the WWW server. We recommend using the port number 8080 (which can not be blocked by the firewall) or 440 (which can be blocked by the firewall). To avoid a conflict with the Apache WWW server which may well have been installed on your system, tell Post.Office to **not** use the default port 80 for the Web server. Post.Office uses this WWW server for administration of the mail server, so access from the outside to this server may not be necessary.

4. To administer the mail server and get help information point a Web browser at `http://your.machine:8080`, log in with the Postmaster account (root by default) and the Post.Office password you entered during installation and follow the on screen instructions.

3.5.2 Sendmail installation

The Unix program **sendmail** is another SMTP mailserver. It is installed by default, and will deliver and receive mail correctly in most situations. To customise the mail domain appearing in outgoing mail, use an editor to edit the file **/etc/sendmail.cf**, (for example, type `xedit` in an xterm). Find the line `Who do I masquerade as` (in xedit use Control-S to search) and below it change **DM** to **DMmycompany.com**.

Configuring sendmail

1. Edit the file /etc/sendmail.cf and change the DM string to DMmycompany.com to make mycompany.com the mail domain appearing in outgoing messages.
2. In PC and Macintosh client programs you may use the InfoMagic Workgroup Server hostname as the SMTP server.
3. A POP3 and IMAP service may be installed with:

   ```
   mount /dev/cdrom /mnt/cdrom
   rpm -Uvh /mnt/cdrom/RedHat/RPMS/imap-4.1.BETA-3.i386.rpm
   ```

   When this is installed you may use the InfoMagic Workgroup Server as a POP or IMAP server from PC or Macintosh email client programs such as Netscape and Eudora.

Chapter 4

Support

InfoMagic is pleased to provide technical support by email for installation issues to help you get the InfoMagic Workgroup Server installed and running on your system. Other issues will be addressed as well, however, installation support has priority. Each incoming email message will be automatically assigned a tracking number. World Wide Web users should check out http://www.infomagic.com/support/linux for information on common problems and solutions in regards to installation and configuration of Linux.

Phone support is available for $US 2.00 per minute in the continental USA at 1-900-786-5555.

We provide limited support for configuring X-Windows via email due to the overwhelming number of combinations of video cards and monitors. If you call for X-Windows configuration support, please have the horizontal and vertical sync frequencies of your monitor available as well as the brand and model of your video card. Without this information, we will be unable to assist with getting X-Windows up and running.

When contacting InfoMagic Technical Support by phone or email, please have the following information available to help us assist you faster:

- Version of InfoMagic Workgroup Server you are running or installing
- Manufacturer and model of your computer
- Number, type, capacity and geometry of your hard drive
- Manufacturer, model, I/O port and IRQ information on all installed cards (especially CD-ROM drives, SCSI and sound interface cards)
- Complete text of any error messages

It is also helpful if you can be near your system when you call as we will often ask you to check configuration details or manually adjust the system startup files.

Please address e-mail support questions to: wgs-supportinfomagic.com.

Please do not send tech support questions to infoinfomagic.com or call the 800 number, unless you wish to purchase a support contract. You will only be referred to the above email and technical support phone numbers! These support options supersede all previous options offered by InfoMagic, Inc.

Support Contracts: Since your Workgroup Server might become a computer that is critical to the mission of your organisation an annual priority support package is available. InfoMagic will answer calls from priority support customers before others and additionally the developers of the Workgroup Server guarantee offer up to 4 hours of consulting as part of this package to address any special questions you may wish to address regarding the InfoMagic Workgroup Server.

Thank You for Choosing InfoMagic!