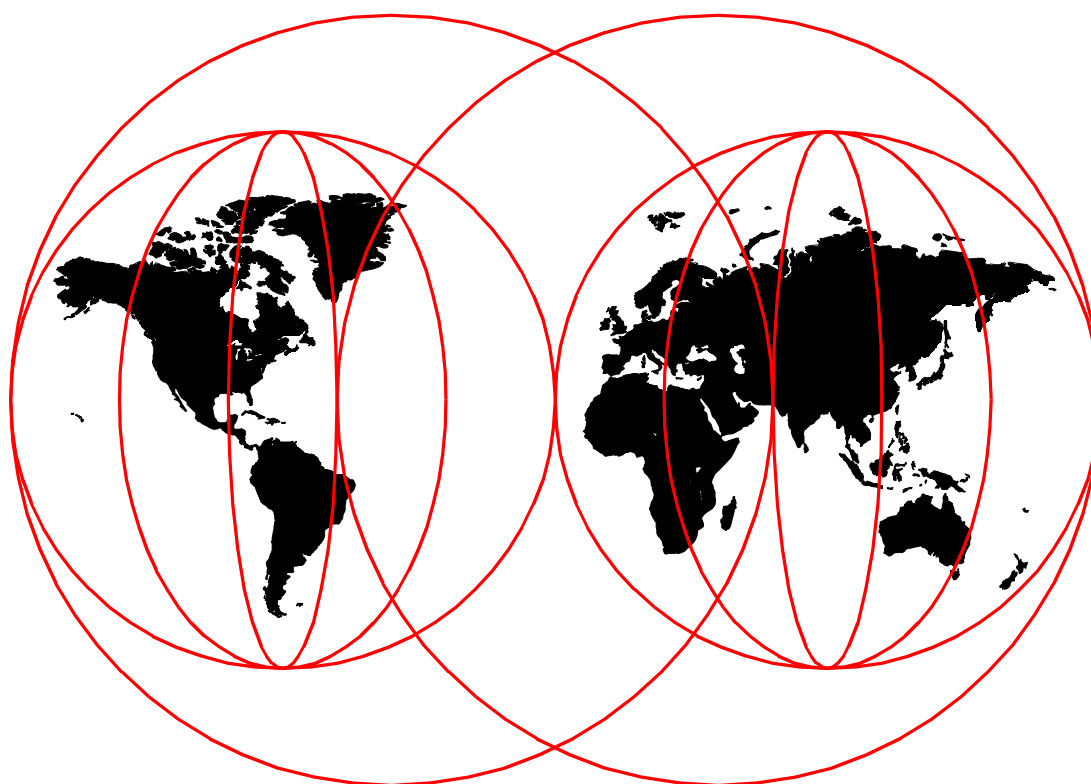




Installing Red Hat Linux 5.2 on Netfinity Servers

Jakob Carstensen, Margaret Ticknor



International Technical Support Organization

<http://www.redbooks.ibm.com>

Take Note!

Before using this information and the product it supports, be sure to read the general information in "Special Notices" on page 61.

March 1999

This redpaper applies to Netfinity 3000, 3500 and 5000 systems running Red Hat Linux 5.2.

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Preface

On February 18, 1999, Red Hat Software, Inc. announced that it had entered an alliance with IBM to deliver, via IBM Business Partners, high-performance IBM systems running Red Hat Linux. IBM and Red Hat are working together to optimize IBM personal system hardware for running Red Hat Linux, providing customers with powerful and reliable enterprise and e-business solutions on the Red Hat Linux platform.

This redpaper discusses the installation procedures of Red Hat Linux 5.2 on Netfinity Servers. It will cover which precautions to take during the installation, the problems we encountered, and will be useful to anyone involved with the installation of Red Hat Linux 5.2 on Netfinity Servers.

The redpaper is divided into five chapters. It begins with an introduction chapter that provides general information on the operating system and what to expect of it. The next three chapters cover the installation procedures of Red Hat Linux 5.2 on the Netfinity 3000, 3500 and 5000 systems respectively. Chapter 5 covers how to install with a token-ring card.

Note that the information contained in this document has not been submitted to any formal IBM test and is distributed AS IS. Furthermore, the use of this information or the implementation of any of these techniques is a customer responsibility and depends on the customer's ability to evaluate and integrate them into the customer's operational environment.

The Team That Wrote This Redpaper

This redpaper was produced by members of the International Technical Support Organization, Raleigh Center:

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Chapter 1. Introduction

On February 18, 1999, Red Hat Software, Inc. announced that it had entered an alliance with IBM to deliver, via IBM Business Partners, high-performance IBM systems running Red Hat Linux. IBM and Red Hat are working together to optimize IBM personal system hardware for running Red Hat Linux, providing customers with powerful and reliable enterprise and e-business solutions on the Red Hat Linux platform. Developers from both companies will work to maximize performance, reliability, and security for Red Hat Linux on IBM Netfinity servers. In addition to contributing developer expertise, Red Hat will also perform hardware certification testing.

Today more than 10 million users all over the world run the Linux operating system. According to IDC Research, Linux was the fastest growing server operating environment in 1998, capturing more than 17% of all server operating system shipments.

In 1998 Infoworld chose Red Hat Linux as their Product of the Year in the operating system category. Red Hat Linux was chosen for its ease of use, stability and utility as a multipurpose server platform for entry and mainstream servers.

In 1991, Linus Torvalds, a student at the University of Helsinki in Finland, developed an operating system he called Linux and he intended to have it as a hobby. Torvalds's hobby is what we today know as Linux and is an operating system which is developed with assistance from programmers around the world.

1.1 The Operating System

Today Linux is a complete multiuser UNIX operating system capable of multitasking and other features common to other operating systems such as Windows NT.

Compared to operating systems used today, Linux is very modest when it comes to hardware requirements. You will be able to run Linux on an 80386-based system with 4 MB of RAM. However, the system will not be able to run X Windows nor will it be able to run multiple programs simultaneously or applications such as a Web or mail server. Performance will increase significantly if you install Linux on a system equipped with a fast CPU and large amounts of RAM such as IBM Netfinity systems. Linux installed on Netfinity systems will be able to run business applications such as IBM DB2 Universal Database, IBM WebSphere Application Server, IBM eNetwork On-Demand, IBM eNetwork Host On-Demand, Oracle 8 and IBM's AFS Enterprise File System.

1.1.1 AFS Enterprise File System Version 3.5

IBM's AFS Enterprise File System makes collaborative work possible by allowing authorized users to share files. AFS is available on multiple platforms including AIX, Solaris, SGI IRIX, HP-UX, Digital UNIX, Windows NT, 95 and 98, Macintosh, NetWare and now also Linux operating environments - offering platform choice without loss of functionality.

The AFS Enterprise File System is developed and marketed by IBM and Transarc. With AFS Enterprise File Systems offerings, users are able to take

collections of dissimilar server and client machines and join them into a global, shared information system. For more information see <http://www.transarc.com>.

1.2 Red Hat Linux 5.2

Red Hat is the largest commercial distributor of the Linux operating system. Version 5.2 of Red Hat Linux uses the Linux kernel Version 2.0. This document will cover installation procedures of Red Hat 5.2, on the Netfinity 3000, 3500 and 5000 systems.

1.3 Limitations

So far, there are a few limitations when installing/running Red Hat Linux. This document will try to cover these limitations.

- SMP

Since the Netfinity 3500 and Netfinity 5000 support 2-way SMP (symmetric multi-processing) it is important to realize that Red Hat 5.2 does not support Intel SMP. SMP support in the kernel is still considered experimental by the developers; therefore, Red Hat has not shipped SMP kernels yet. It is, however, possible to install a fix to the kernel so it might work but it is not supported by Red Hat.

- RAM

Red Hat Linux 5.2 will not support more than 1 GB of RAM:

- Token-Ring

None of the IBM PCI Token-Ring adapters are currently supported. However, the IBM Turbo 16/4 ISA Adapter will work. The IBM Turbo 16/4 ISA Adapter has to be configured to auto 16/4 compatibility mode. This is done by using the LANAIDC diskette and issuing the following command.

```
LANAIDC /fast=auto16
```

- Display

1. The installation program will not be able to find the display adapter on Netfinity 3000s (SVGA S3 Trio3D). In order to run X Windows you must choose the Generic VGA compatible adapter. You will only be able to run X Windows in VGA mode.

At the time of publication, the driver for the S3 Trio3D was not available. As a result, we chose the generic driver and ran X Windows in VGA mode only. For higher resolutions, you will need a supported display adapter. See <http://www.redhat.com/support/docs/rhl/intel/rh52-hardware-intel-8.html> for the latest information on supported display adapters.

- Network

The installation program will not be able to find the network card on Netfinity 5000s (AMD Am79C972). Resolution: Choose the AMD PCnet package. It lets your AMD Am79C972 function as an AMD Am79c971 which is also capable of running 100 Mbps.

See the Ethernet Controllers Product Matrix for information about the AMD network cards at <http://www.amd.com/products/npd/overview/21135.pdf>.

1.4 The Netfinity Servers

The Netfinity systems used in this document are the Netfinity 3000, 3500 and 5000.

When you do a server class installation, the installation removes **all** existing partitions on your system. The installation program will create the following partitions on your system:

- A 64 MB swap partition
- A larger partition where all other files are stored (mounted as /). The size is dependent on the disk space available.
- A 256 MB partition (mounted as /)
- A partition of at least 512 MB (mounted as /usr)
- A partition of at least 512 MB (mounted as /home)
- A 256 MB partition (mounted as /var)

If you don't want the installation program to remove all partitions you must choose a custom class installation. This may apply if you already have Windows NT installed and you don't want to lose it; see Red Hat documentation under Linux+NT-loader HOWTO.

Before the installation of Red Hat Linux 5.2, there are things you need to know about your computer hardware:

- Hard drives - which interface (SCSI or IDE) and size
- CD-ROM - which interface (SCSI or IDE) and the make
- SCSI adapter - make and model number
- Display Adapter - make and model number
- Mouse - which mouse type and how it is connected
- Network card - make and model number
- RAM - the amount of RAM installed in your system

1.4.1 Netfinity 3000

These are the components in the Netfinity 3000:

Table 1. Netfinity 3000 Components

Components in the Netfinity 3000	
CPU	Single Intel Pentium II system running 400/100 MHz or 450/100 MHz
RAM	Comes standard with 64 MB ECC SDRAM/100 MHz (384 MB max)
SCSI disk controller	Adaptec AHA2940uWB SCSI Adapter
IDE disk controller	Enhanced IDE controller (Ultra DMA and ATA-33 support)
Ethernet controller	Ethernet card - Intel EtherExpress PRO/100 on planar (10BaseT, 100BaseTX/full duplex/PCI bus/wake on LAN/Alert on LAN)
CD-ROM drive	Max 32X CD-ROM/CAV (APAPI)/IDE/bootable
Display adapter	Display Adapter - SVGA S3 Trio3D 4 MB 100 MHz SGRAM on planar (DPMS and DDC2B compliant) up to 1600x1200 at 64 K colors at 84 Hz or 1024x768 at 16.7 M colors at 85 Hz
Mouse	PS/2 Mouse

1.4.2 Netfinity 3500

These are the components in the Netfinity 3500:

Table 2. Netfinity 3500 Components

Components in the Netfinity 3500	
CPU	Single Intel Pentium II system running 233/66 MHz, 266/66 MHz or 333/66 MHz. SMP support via a second identical processor (MPS 1.4)
RAM	Comes standard with 32 MB or 64 MB ECC SDRAM/66 MHz (512 MB max)
SCSI disk controller	Adaptec AHA7895 / dual channel Wide UltraSCSI controller on planar
IDE disk controller	Enhanced IDE controller (Ultra DMA and ATA-33 support)
Ethernet controller	Ethernet card - Intel EtherExpress PRO/100 on planar (10BaseT, 100BaseTX/full duplex/PCI bus/wake on LAN)
CD-ROM drive	Max 24X CD-ROM/CAV (APAPI)/IDE/bootable
Display adapter	Display Adapter - SVGA Number Nine Reality 334 / S3d Virge GX2 4 MB 100 MHz SGRAM (CPMS and DDC2B compliant) 60 Hz to 150 Hz vertical refresh rate; 35.5 KHz to 90 KHz horizontal scan rate
Mouse	PS/2 mouse

1.4.3 Netfinity 5000

These are the components in the Netfinity 5000:

Table 3. Netfinity 5000 Components

Components in the Netfinity 5000	
CPU	Single Intel Pentium II system running at 350/100 MHz, 400/100 MHz or 450/100 MHz. SMP support via a second identical processor (MPS 1.4)
RAM	Comes standard with 64 MB ECC SDRAM/100 MHz (1 GB max)
SCSI disk controller	Adaptec AHA7895 / dual channel Wide UltraSCSI controller on planar
IDE disk controller	Single primary IDE on planar used for CD-ROM drive
Ethernet controller	Ethernet card - AMD Am79C972 on planar (10BaseT, 100BaseTX/full duplex/PCI bus/wake on LAN)
CD-ROM drive	Max 32X bootable IDE CD-ROM
Display adapter	Display Adapter - SVGA S3 Trio64V2 1MB SGRAM, up to 1024x768 at 256 colors at 85 Hz
Mouse	PS/2 mouse

Chapter 2. Installing Red Hat Linux 5.2 on Netfinity 3000

In this chapter we will discuss the following items:

1. Prepare the CD-ROM drive to be bootable.
2. Perform a server-class installation of Red Hat Linux 5.2 on the Netfinity 3000 including the selection of devices and drivers.

2.1 Making the CD-ROM Bootable

Prior to the installation make sure that the system is able to boot from the CD-ROM drive. That is done by following these steps:

1. Power on the server. When you see the IBM logo press F1 to enter the Setup Utility.
2. From the Setup Utility select Start Options.
3. From the Start Options select Startup Sequence.
4. Make sure that your CD-ROM drive is one of the startup devices.
5. Press Esc until you come to the Setup Utility main screen and press Save Settings.
6. Press Enter to confirm saving the current settings.
7. Exit the Setup Utility.

Making the CD bootable can also be done by loading the default settings from the Setup Utility, but be aware that all other settings will be set to default as well.

2.2 Red Hat Linux 5.2 Installation Procedures

1. Power on the server and insert the bootable Red Hat 5.2 Linux CD in the CD-ROM drive.
2. The Red Hat installation program will boot from the CD-ROM. From the welcome screen press Enter to install or to upgrade. If you don't take any action within 1 minute, the installation program will automatically start.
3. Press **Ok** on the register screen. Figure 1 on page 12 now appears.

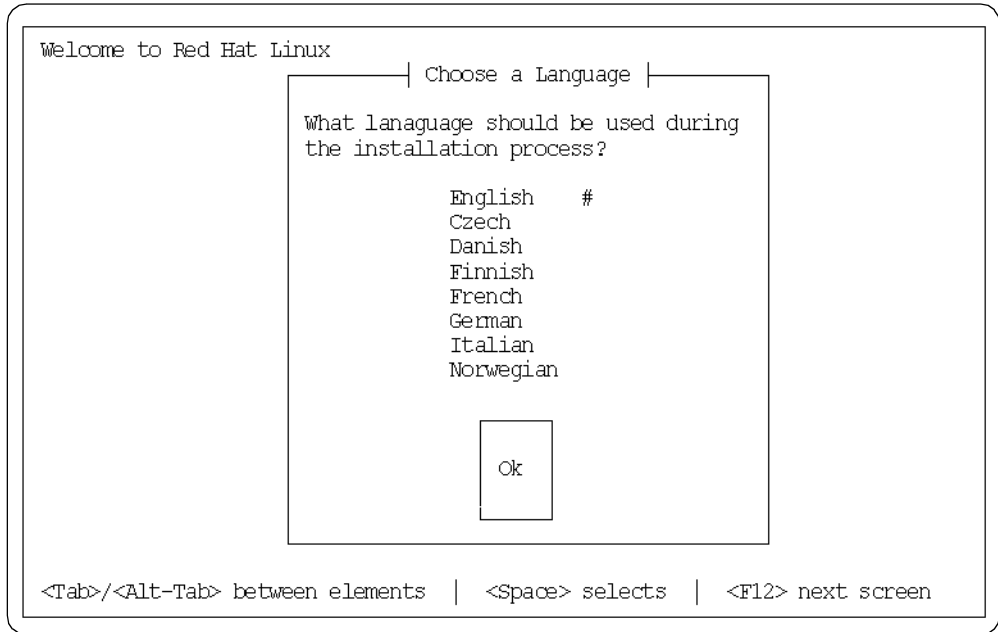


Figure 1. Choose a Language

4. Select your language. This is done by using the Tab key to scroll down and using the Space key to select your language.

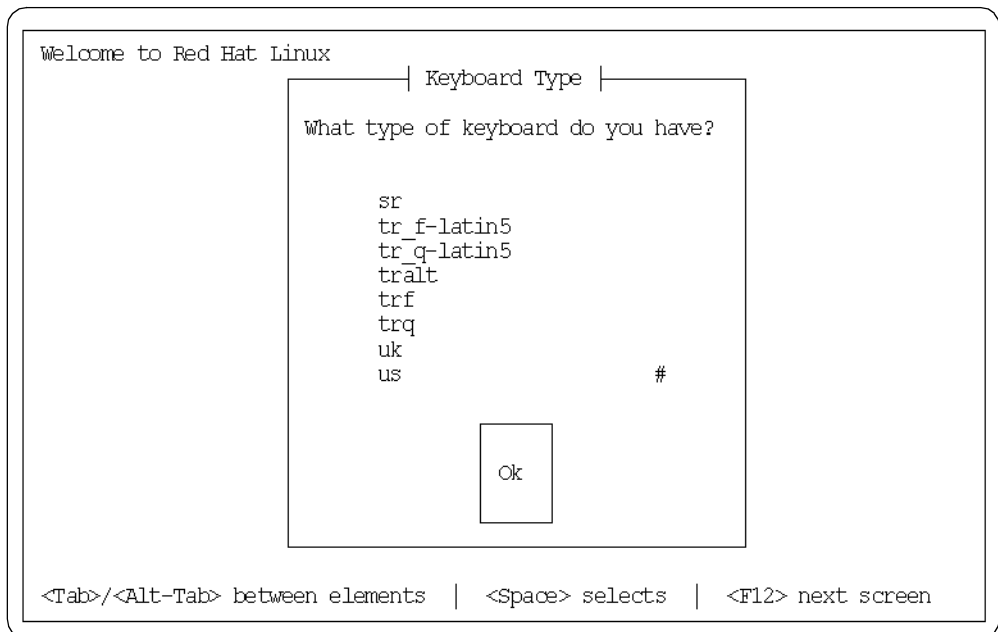


Figure 2. Keyboard Type

5. Select your keyboard type.

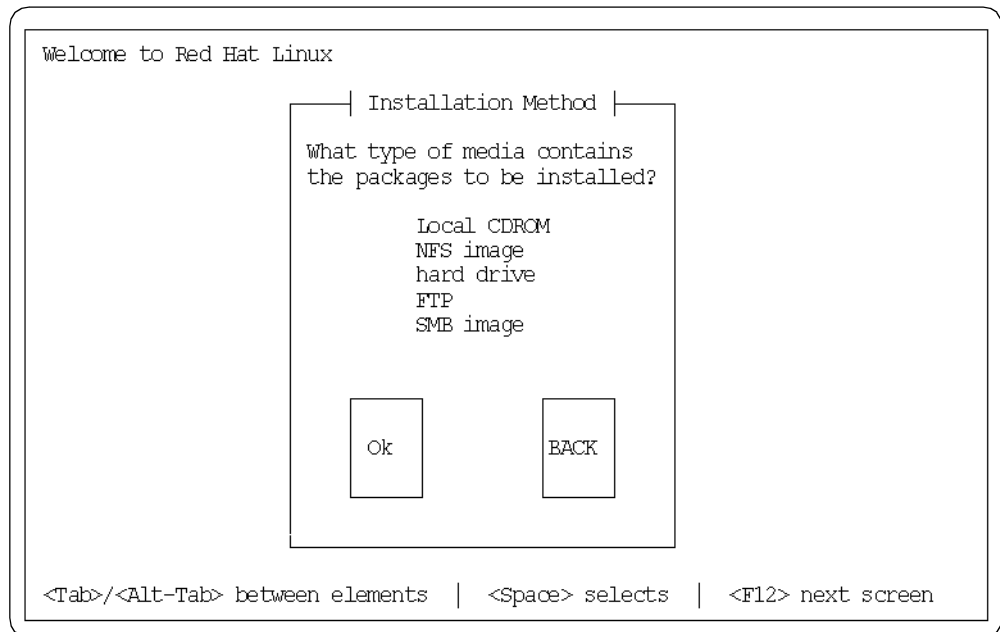


Figure 3. Installation Method

6. Choose your installation method. In this guide we will install from Local CD-ROM.
7. On the next screen you will be asked to insert the CD in the CD-ROM drive. Since the CD already is in the CD-ROM drive press **Ok** to continue. Figure 4 now appears.

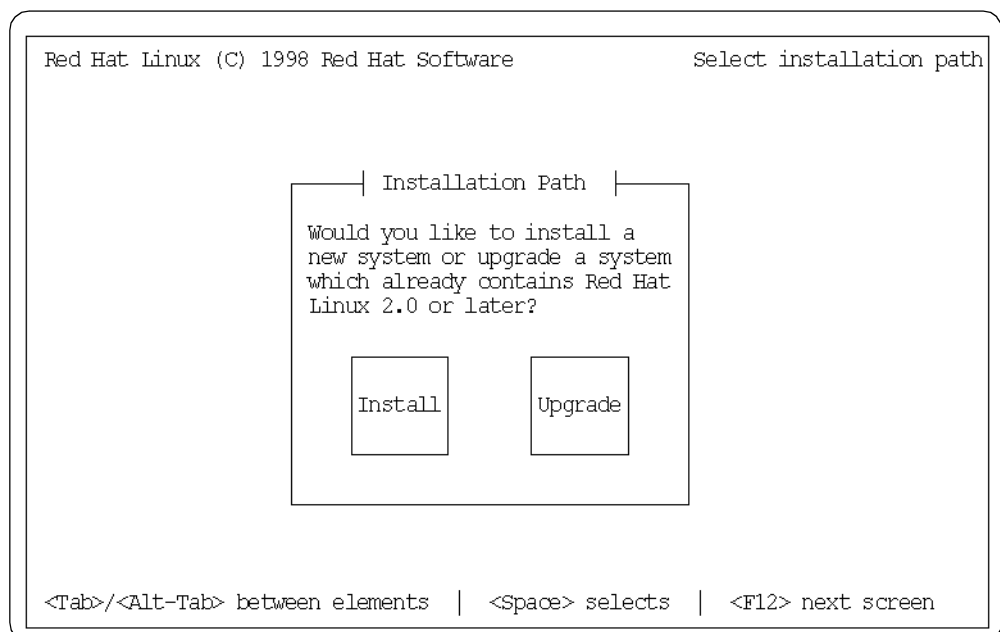


Figure 4. Installation Path

8. Press **Install** from the Installation Path screen.

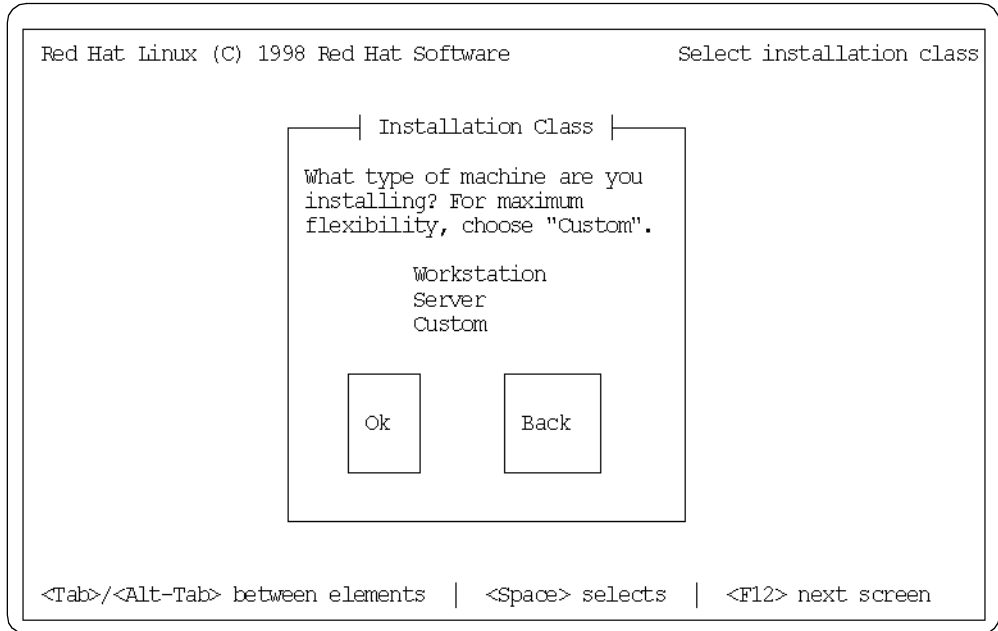


Figure 5. Installation Class

9. Select Server from the Installation Class screen.

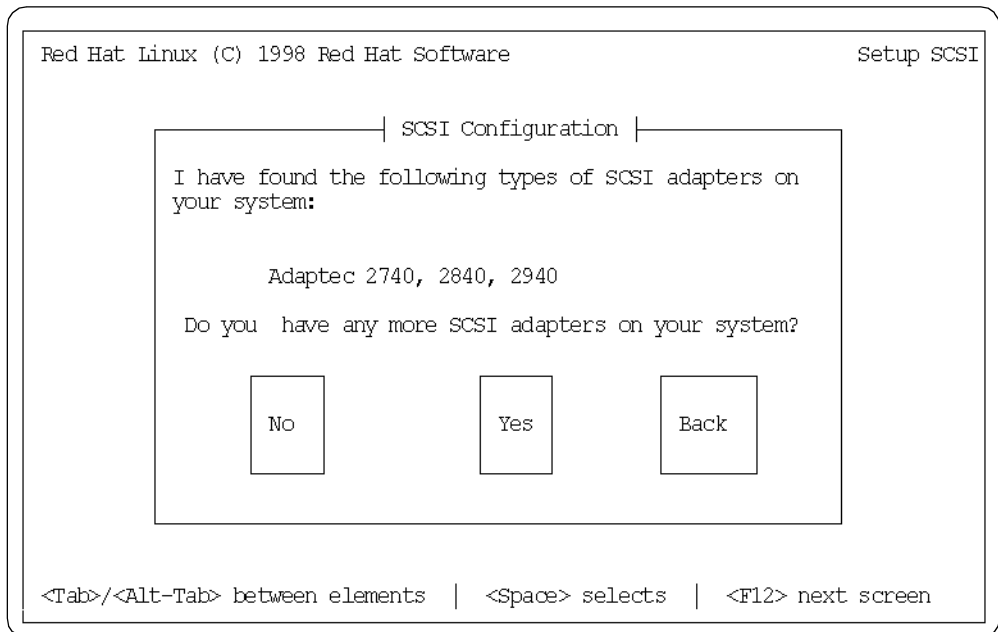


Figure 6. SCSI Configuration

10. The installation program will now scan for SCSI adapters. It will find the Adaptec 2740, 2840 and 2940. If you haven't added any additional SCSI adapters to the server press **No** to the question on the screen.

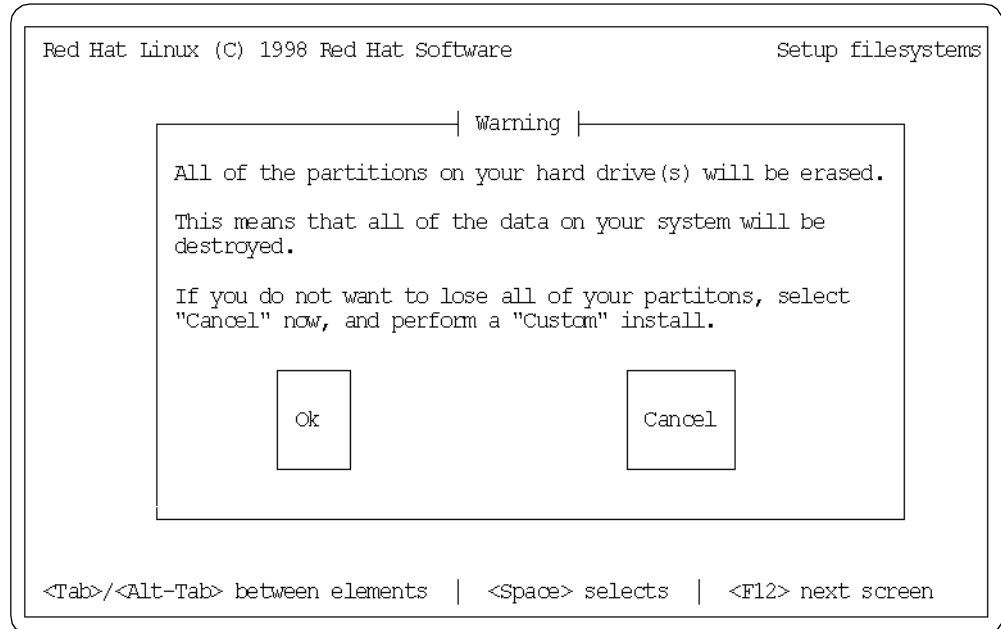


Figure 7. Warning - Partitions Will Be Erased

11. The installation program will now warn you that all your partitions will be erased if you press **Ok**. If you don't want to erase your partitions press **Cancel** at this time.
12. On the next screen you will be warned again - press **Yes** to continue or **No** to cancel.
13. The Installation program will now set up the partitions and the file system and begin the installation of the packages. During the installation you will be informed of how many packages there are in total to be installed, how many completed and how many remain.

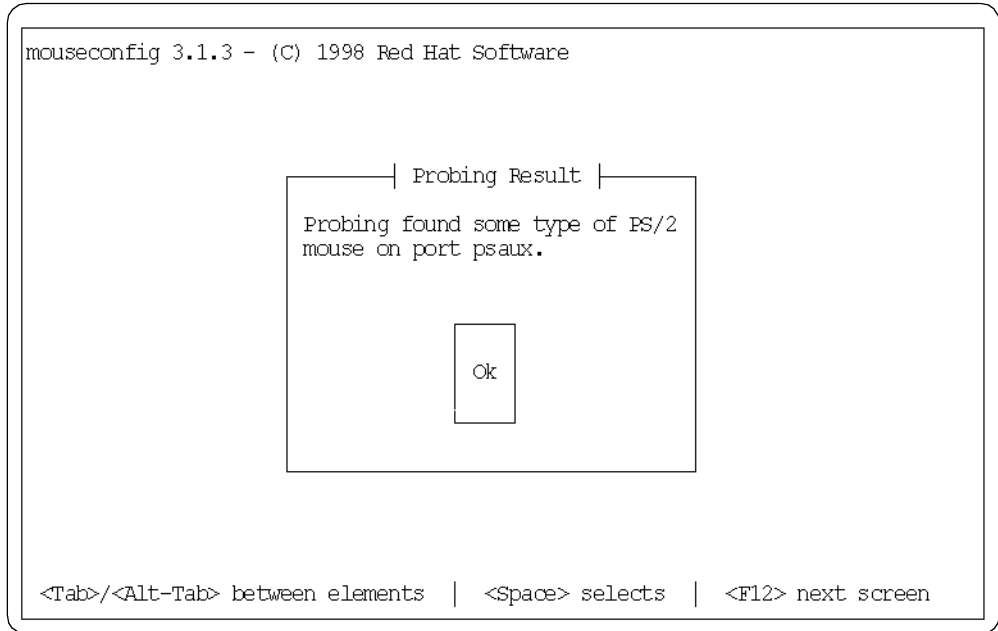


Figure 8. Probing Result - Mouse

14. After installation of the packages the installation program will search for devices attached to the server. The first device found is the PS/2 mouse on port psaux. Press **Ok** to continue.

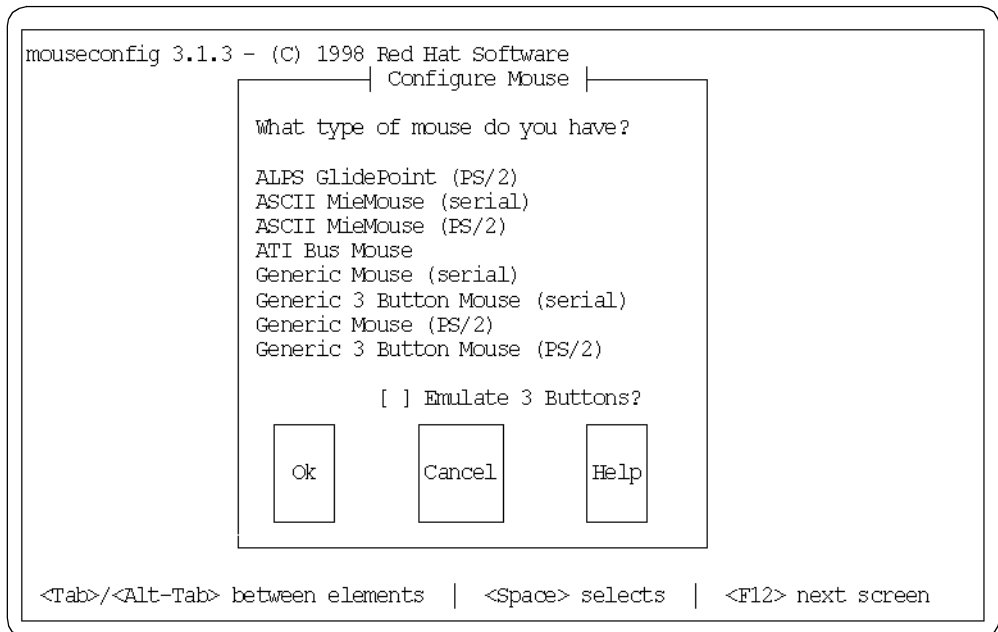


Figure 9. Configure Mouse

15. Select Generic Mouse (PS/2) if you have a standard 2 button mouse attached to the server and press **Ok** to continue.

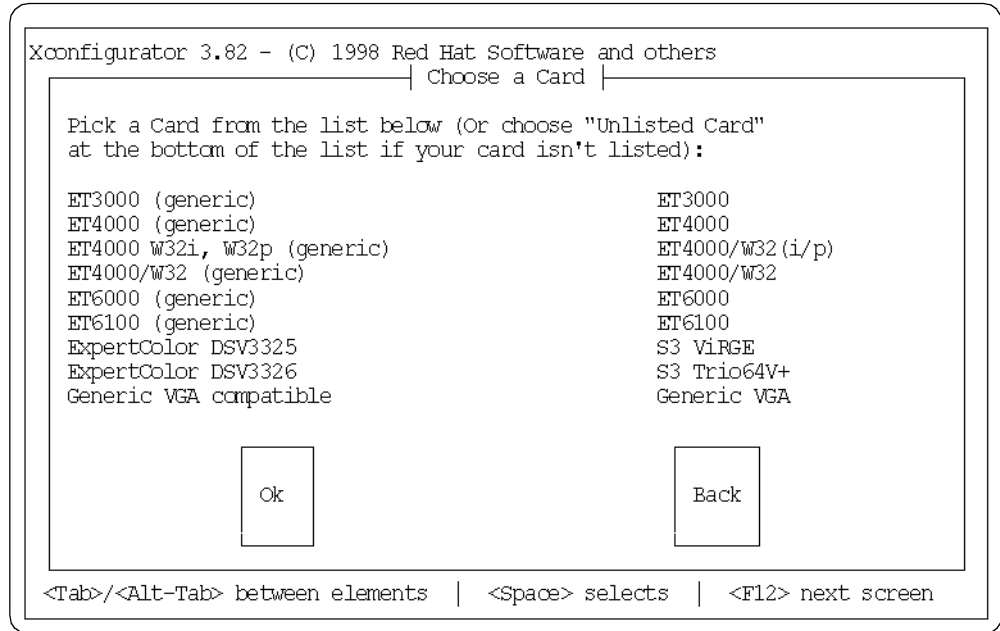


Figure 10. Display Adapters

16. The Installation program will not be able find the display adapter which, for this server, is an S3 Trio3D. In order to run X Windows you must choose the Generic VGA compatible adapter as shown in Figure 10. You will only be able to run X Windows in VGA mode.

At the time of publication, the driver for the S3 Trio3D was not available. As a result, we chose the generic driver and ran X Windows in VGA mode only. For higher resolutions, you will need a supported display adapter. See <http://www.redhat.com/support/docs/rhl/intel/rh52-hardware-intel-8.html> for the latest information on supported display adapters.

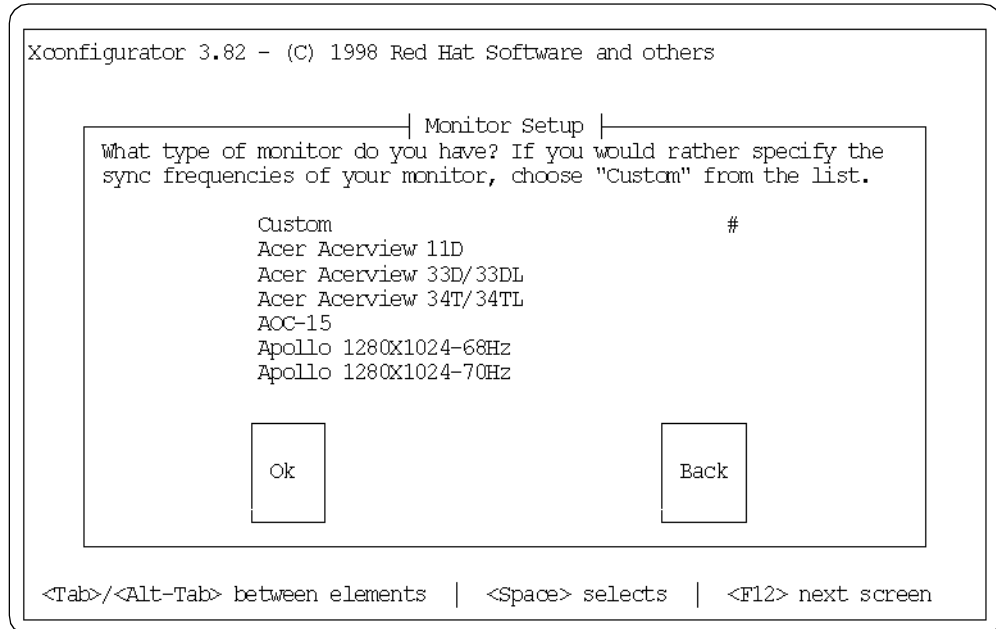


Figure 11. Monitor Setup

17. You will now be asked to choose which monitor you have. If your monitor is not present on the list select Custom. None of the newer IBM monitors are present in the list. During this installation we chose Custom. Press **Ok** to continue.

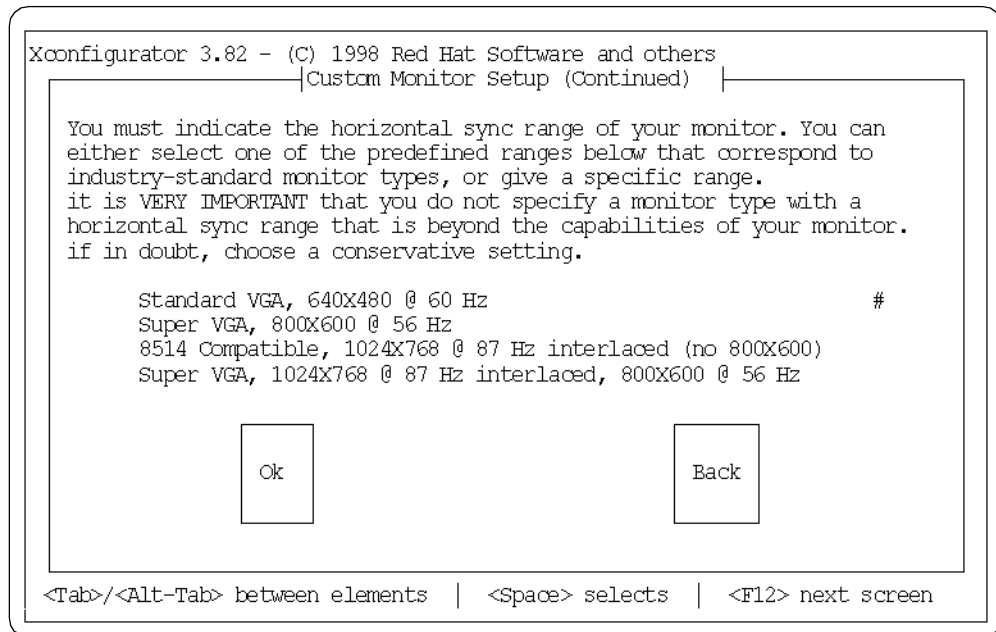


Figure 12. Custom Monitor Setup - Horizontal Sync Range

18. You must now indicate the horizontal sync range (addressability) of your monitor. Since we chose a VGA driver we will here select Standard VGA, 640x480 at 60 Hz.

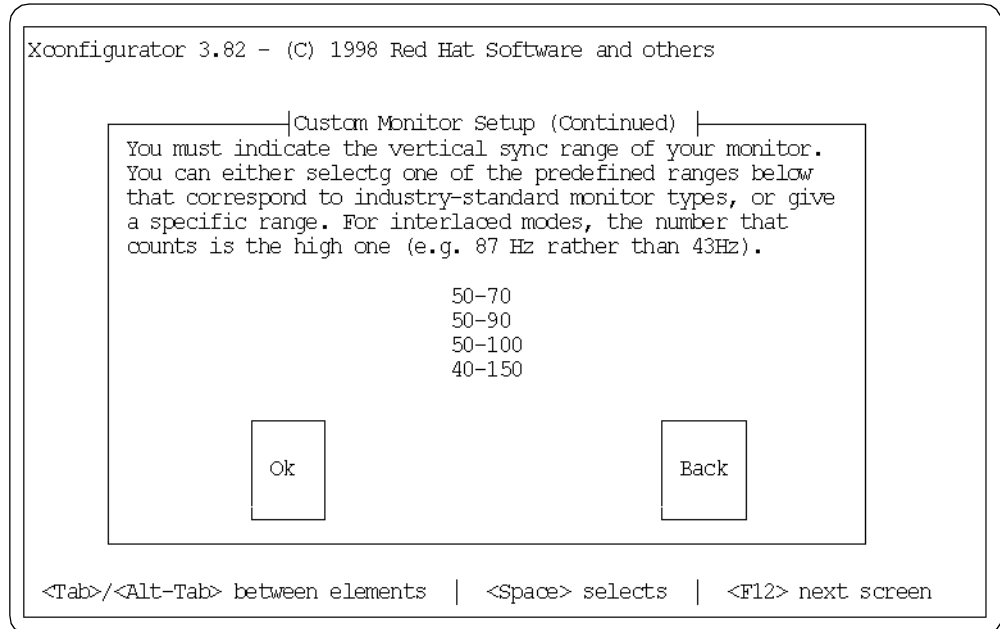


Figure 13. Custom Monitor Setup - Vertical Sync Range

19. You are now asked to choose the vertical sync range. If you don't know what vertical sync range your monitor is capable of, choose 50-70 Hz. Since almost all monitors today are capable of running interlaced (vs. non-interlaced) it is likely that your monitor is capable of 40-150 Hz and that is the setting we chose.

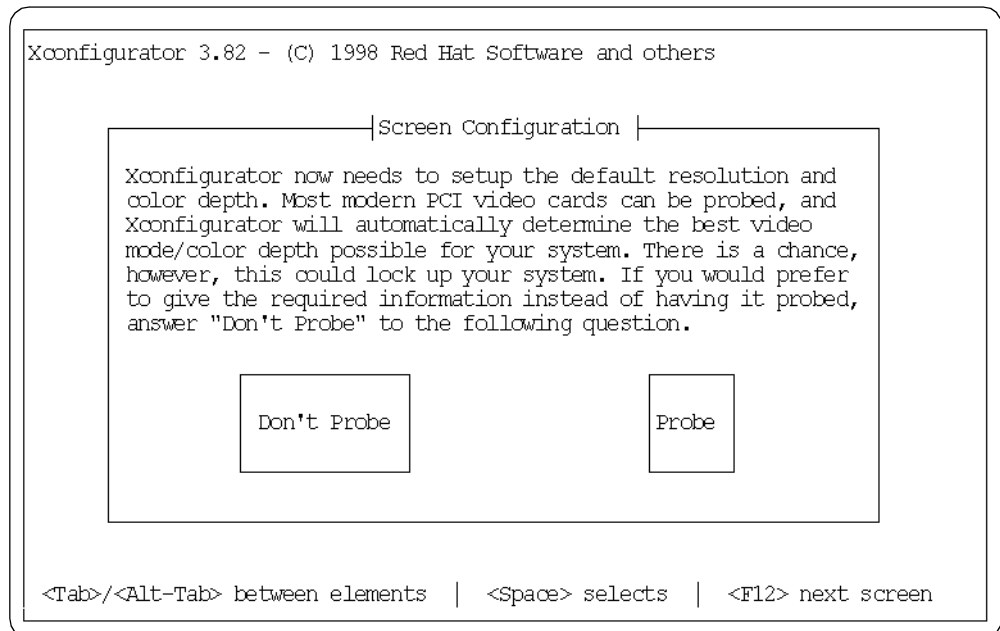


Figure 14. Screen Configuration

20. The Installation program asks you if you want to probe your settings. Select either. We selected **Probe**. Press **Ok** for probing to begin.

21. You have now reached the point of the installation where the network will be configured and you will be presented with a screen from where you can choose to configure the network. From that screen press **Yes** to configure the network. If you don't want to configure your network press **No**. If you are installing with a token-ring card see Chapter 5, "Installing Your Server with Token-Ring" on page 53.

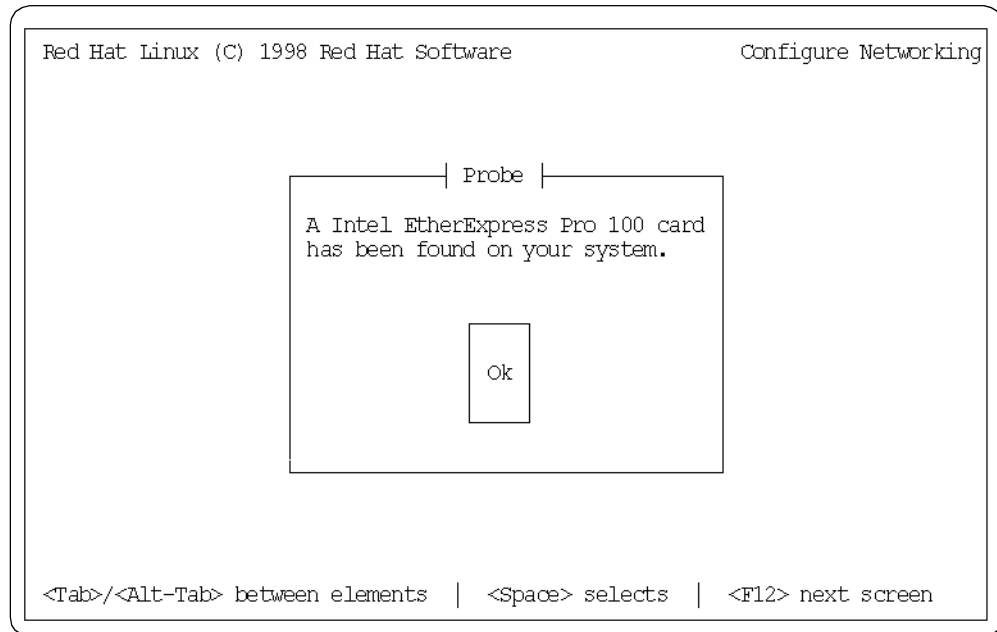


Figure 15. Network Probe

22. The installation program will find the Intel EtherExpress Pro 100 network card on the planar of your server. Press **Ok** to continue. If for some reason the network card is not found it might be because it has been disabled in the Setup Utility.

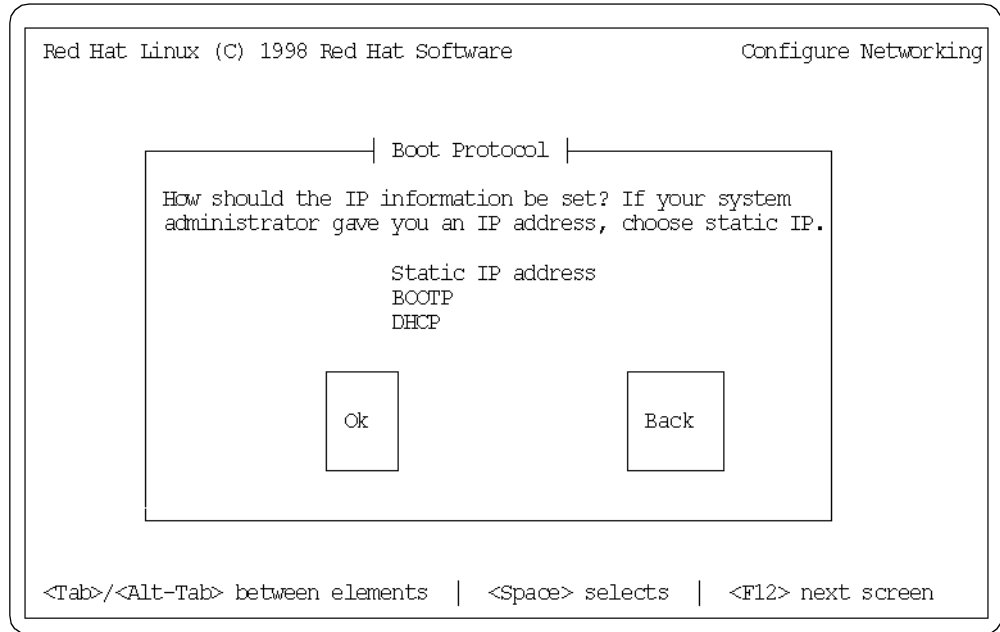


Figure 16. Boot Protocol

23. You must now select how to approach the network. Select one of the three options. See Figure 16. We chose Static IP address which is probably the most realistic choice when installing a server.

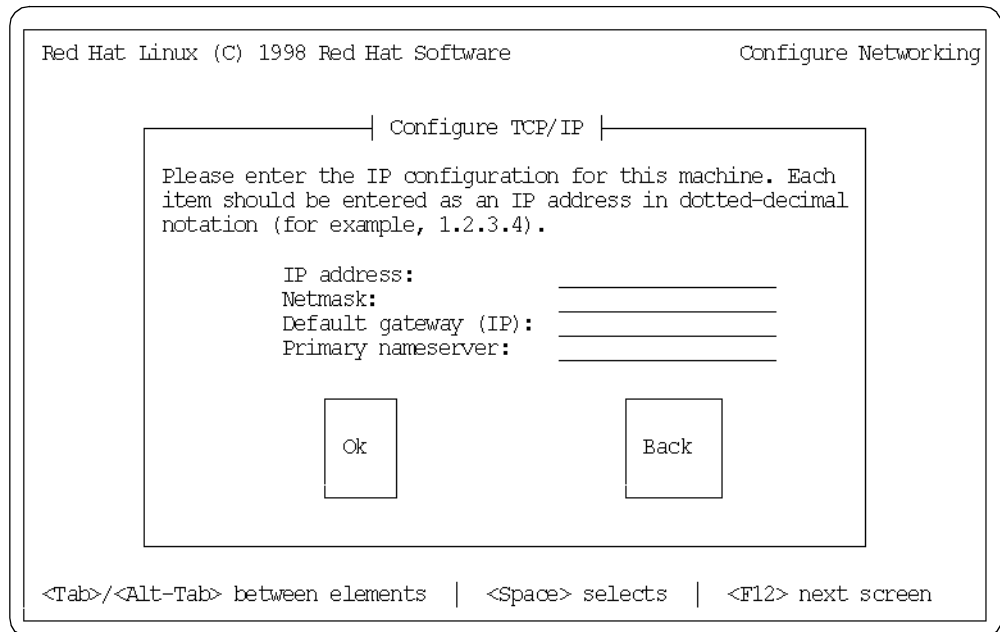


Figure 17. Configure TCP/IP

24. The installation program now requires an IP address. After you have typed in the IP address the installation program attempts to guess your Netmask, Default gateway and Primary nameserver. If the guesses are incorrect, correct them and press **Ok** to continue.

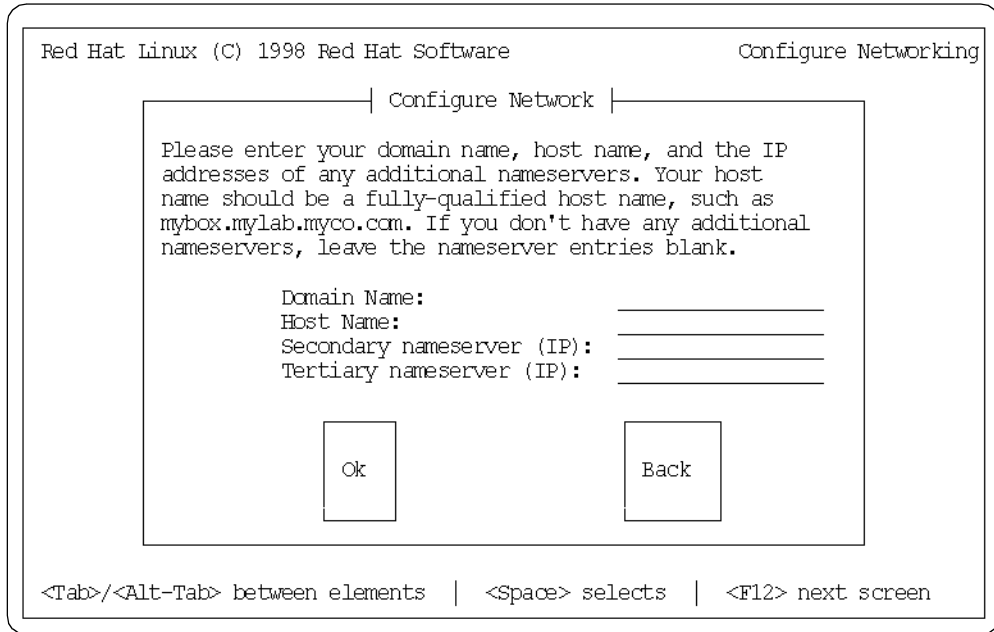


Figure 18. Configure Network

25. Enter your Domain Name and Host Name. Add Secondary and Tertiary nameservers if appropriate.

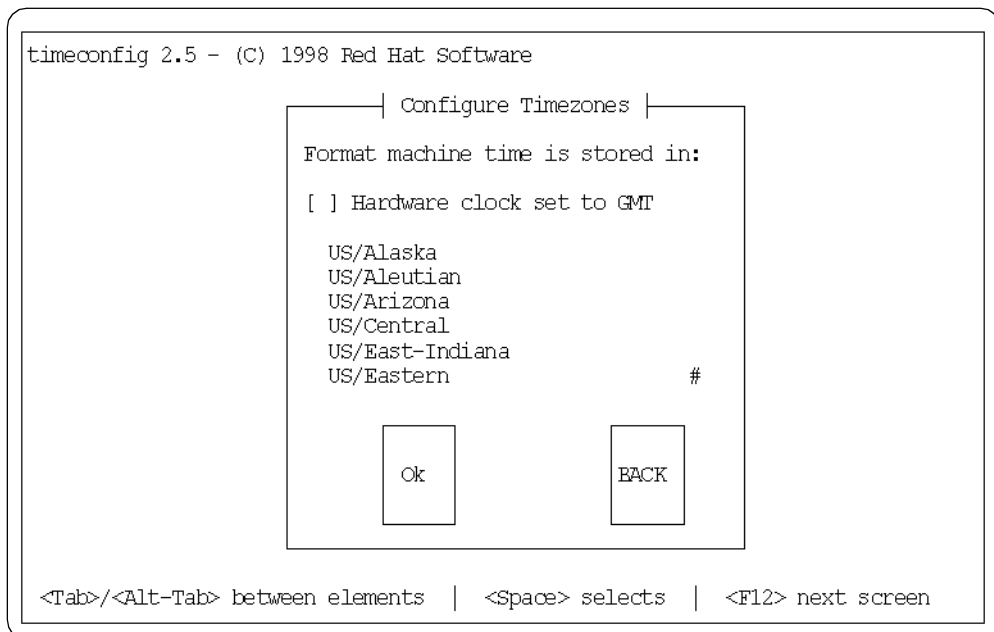


Figure 19. Configure Timezone

26. Select the timezone in which your server is situated.

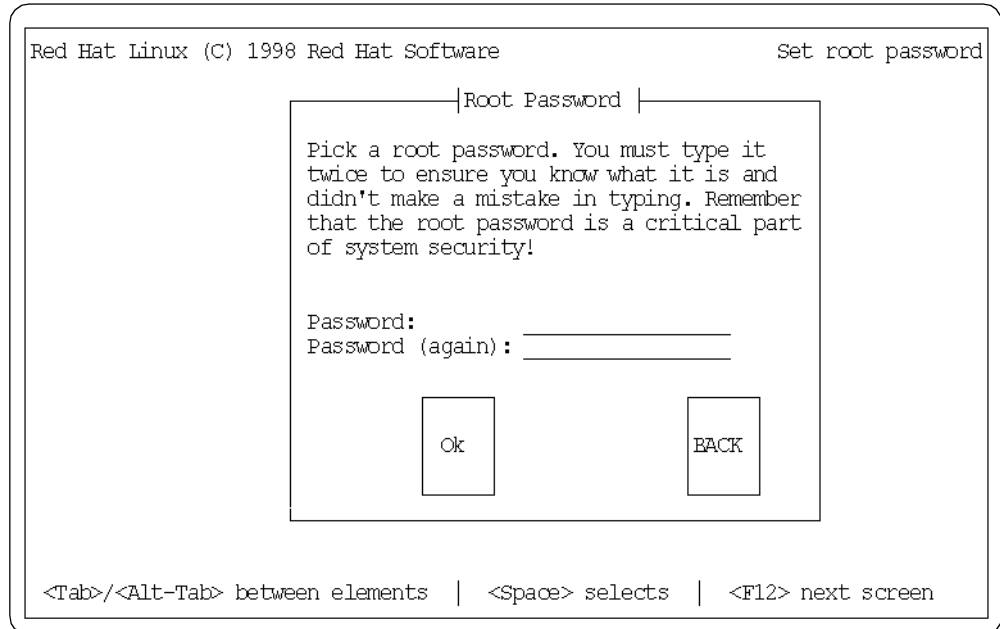


Figure 20. Root Password

27. Enter a root password. You will use the root user to logon to your system for the first time. The root user is a user ID with administrators rights, which means that the ID has access to the whole system without limits. You will only use this user ID to perform administration and maintenance tasks.
28. You are now asked to make a bootdisk. You should always say **Yes** to this question. The bootdisk can help you recover from a server crash. Insert a diskette (it doesn't have to be blank) in the diskette drive and press **Ok**.

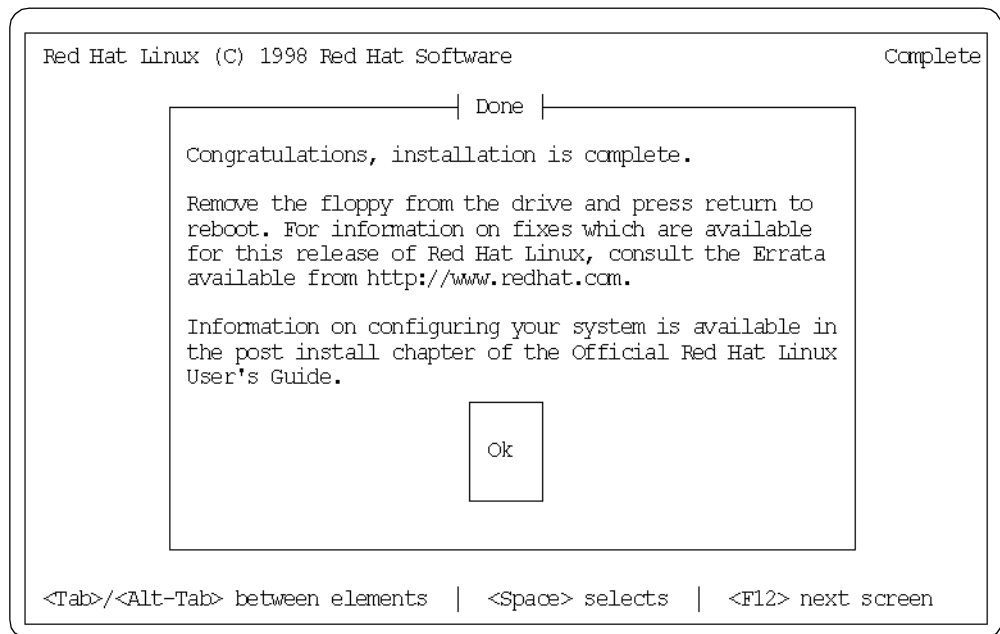


Figure 21. Installation Complete

29. You have now completed the installation of Red Hat Linux 5.2 and you are asked to remove the diskette from the diskette drive and press **Ok** to reboot.

Note

You will not be able to remove the CD from the CD-ROM drive at this time because the CD-ROM drive is still mounted. Press **Ok** to reboot and remove the CD from the CD-ROM drive during boot. If you fail to do so your server will boot from the CD-ROM drive and install from the beginning.

30. Your server will reboot into a command mode. Logon as root and type in your password from the installation. When you are successfully logged on issue the `startx` command to enter the X Window system.

Chapter 3. Installing Red Hat Linux 5.2 on Netfinity 3500

In this chapter we will discuss the following items:

3. Prepare the CD-ROM drive to be bootable.
4. Perform a server-class installation of Red Hat Linux 5.2 on the Netfinity 3500 including the selection of devices and drivers.

3.1 Making the CD-ROM Bootable

Prior to the installation make sure that the system is able to boot from the CD-ROM drive. That is done by following these steps:

1. Power on the server. When you see the IBM logo press F1 to enter the Setup Utility.
2. From the Setup Utility select Start Options.
3. From the Start Options select Startup Sequence.
4. Make sure that your CD-ROM drive is one of the startup devices.
5. Press Esc until you come to the Setup Utility main screen and press Save Settings.
6. Press Enter to confirm saving the current settings.
7. Exit the Setup Utility.

Making the CD-ROM bootable can also be done by loading the default settings from the Setup Utility, but be aware that all other settings will be set to default as well.

3.2 Red Hat Linux 5.2 Installation Procedures

1. Power on the server and insert the bootable Red Hat Linux 5.2 CD in the CD-ROM drive.
2. The Red Hat installation program will boot from the CD-ROM. From the welcome screen press Enter to install or to upgrade. If you don't take any action within 1 minute, the installation program will automatically start.
3. Press **Ok** on the register screen.

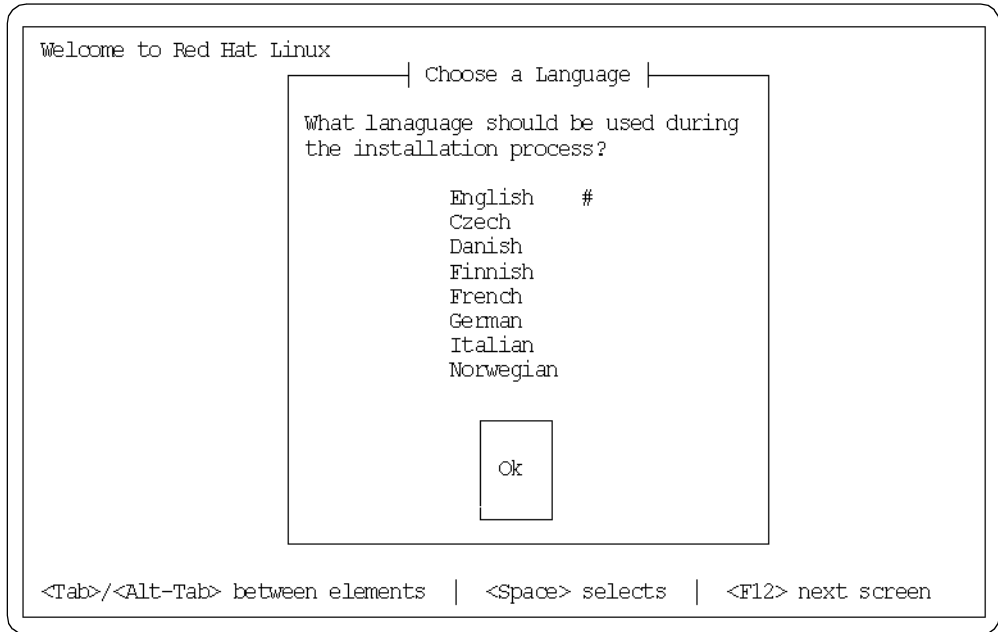


Figure 22. Choose a Language

4. Select your language. This is done by using the Tab key to scroll down and using the Space key to select your language.

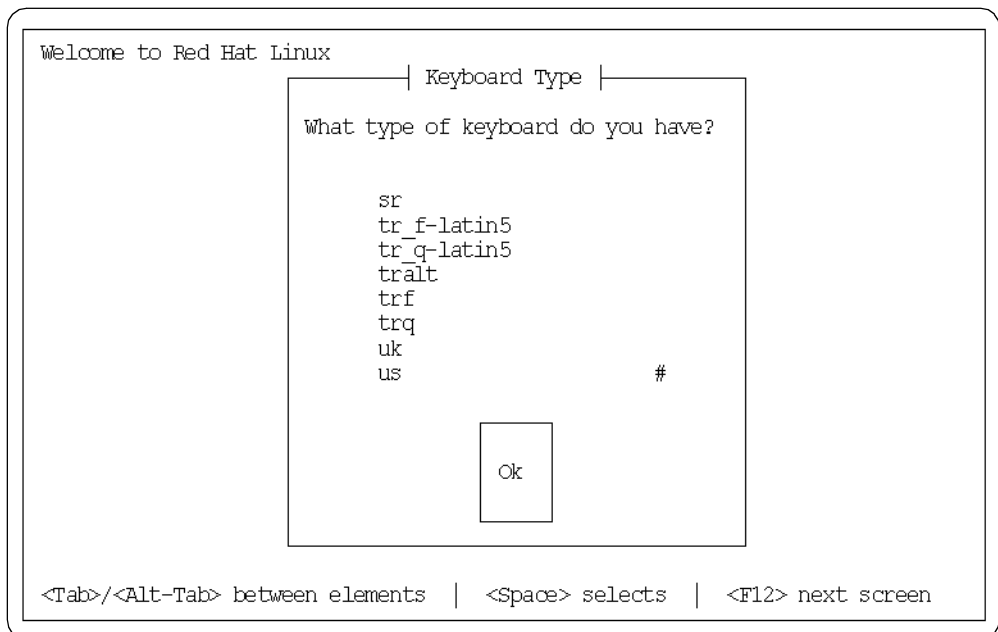


Figure 23. Keyboard Type

5. Select your keyboard type.

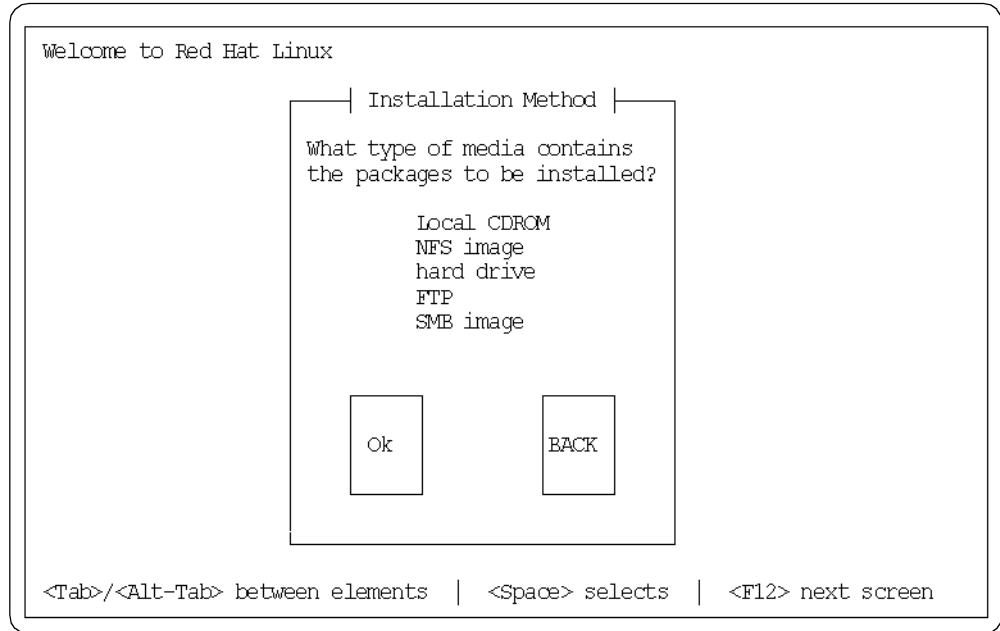


Figure 24. Installation Method

6. Choose your installation method. In this guide we will install from Local CD-ROM.
7. On the next screen you will be asked to insert the CD in the CD-ROM drive. Since the CD already is in the CD-ROM drive press **Ok** to continue.

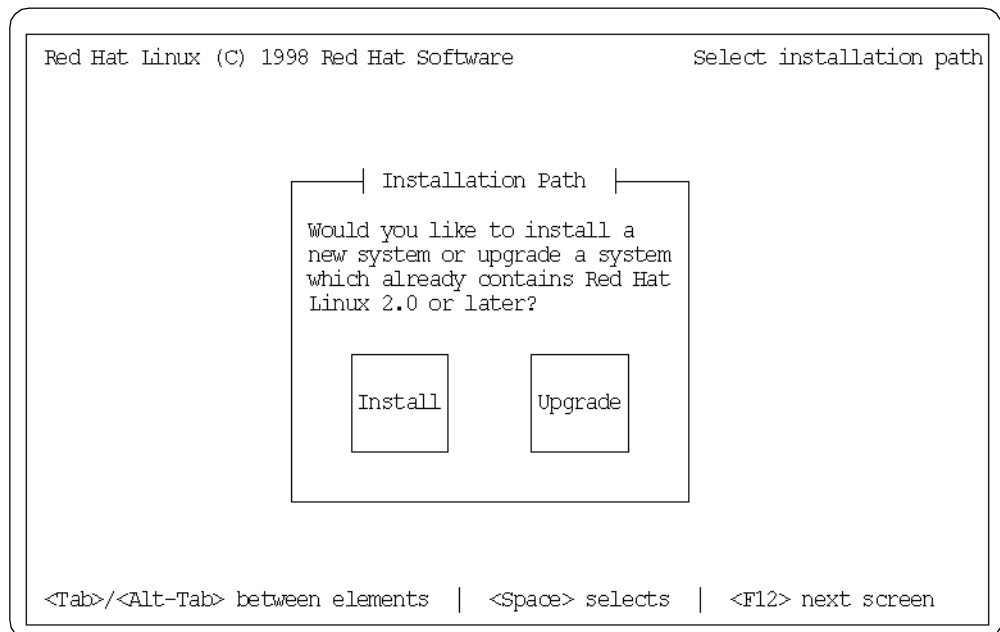


Figure 25. Installation Path

8. Press **Install** from the Installation Path screen.

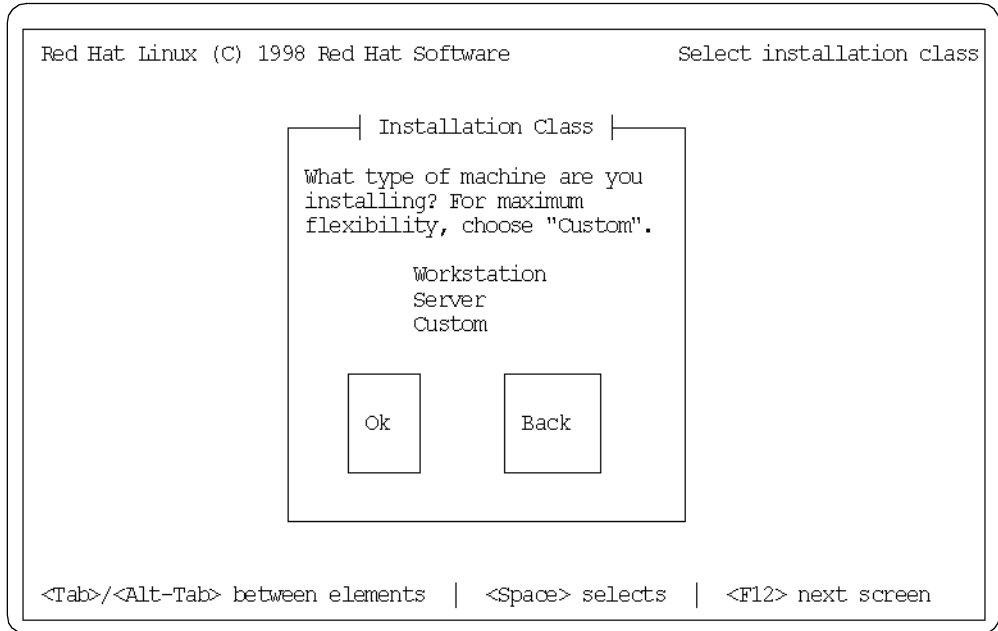


Figure 26. Installation Class

9. Select Server from the Installation Class screen.

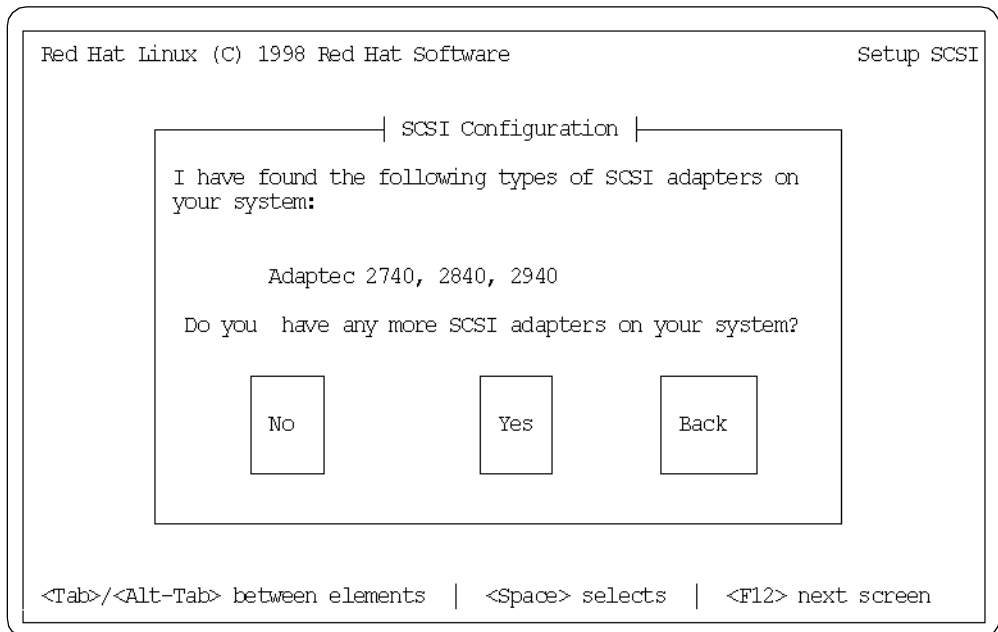


Figure 27. SCSI Configuration

10. The installation program will now scan for SCSI adapters. It will find the Adaptec 2740, 2840 and 2940. Even though the Netfinity 3500 has an Adaptec 7895 you will accept this. If you haven't added any additional SCSI adapters to the server press **No** to the question on the screen.

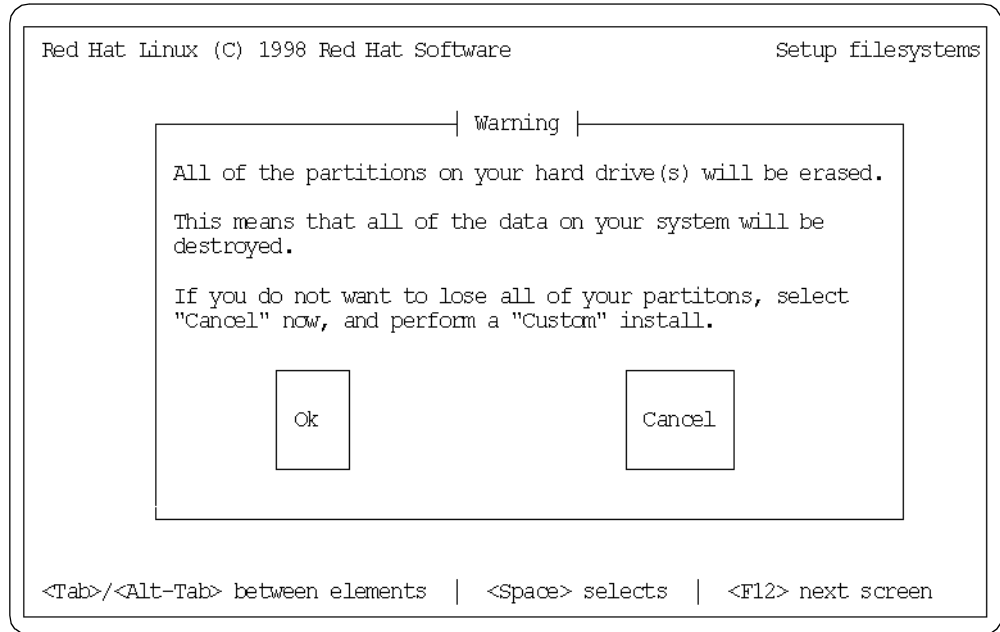


Figure 28. Warning - Partitions Will Be Erased

11. The installation program will now warn you that all your partitions will be erased if you press **Ok**. If you don't want to erase your partitions press **Cancel** at this time.
12. You will be warned again - press **Yes** to continue or **No** to cancel.
13. The Installation program will now set up the partitions and the file system and begin the installation of the packages. During the installation you will be informed on how many packages there are in total to be installed, how many completed and how many remain.

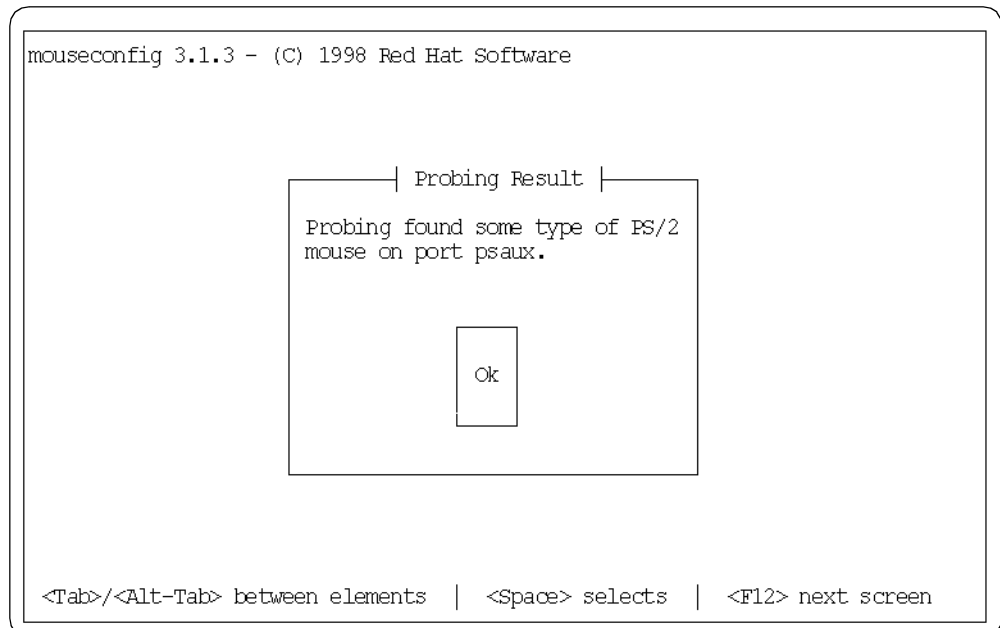


Figure 29. Probing Result - Mouse

14. After installation of the packages the installation program will search for devices attached to the server. The first device found is the PS/2 mouse on port psaux. Press **Ok** to continue.

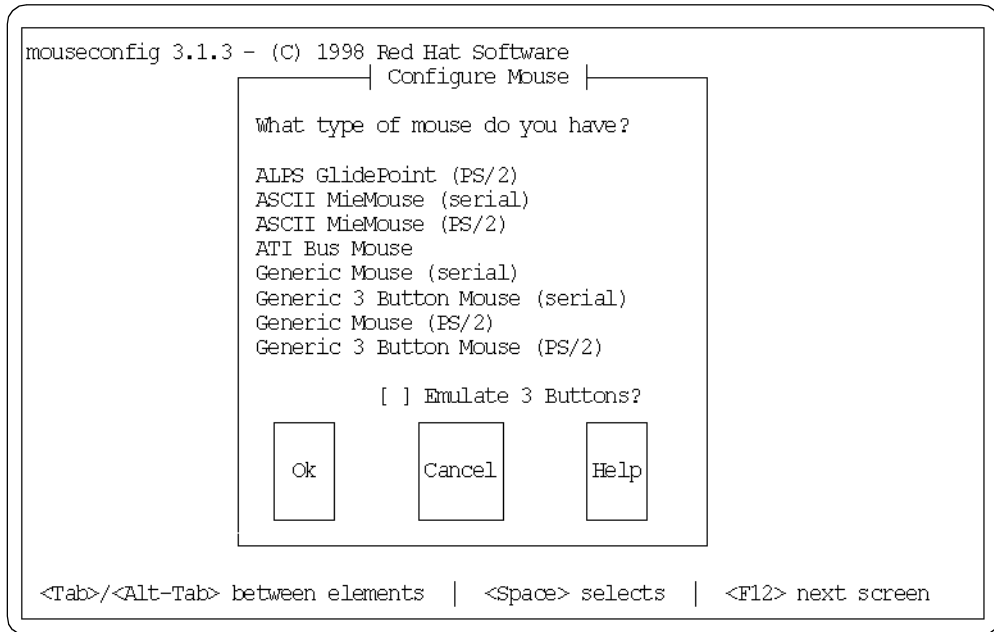


Figure 30. Configure Mouse

15. Select Generic Mouse (PS/2) if you have a standard 2 button mouse attached to the server and press **Ok** to continue.
16. Next the Installation program will find the display adapter which, for this server, is a S3d Virge/GX and it will install the SVGA package for X Server. Press **Ok** to the PCI Probe screen.

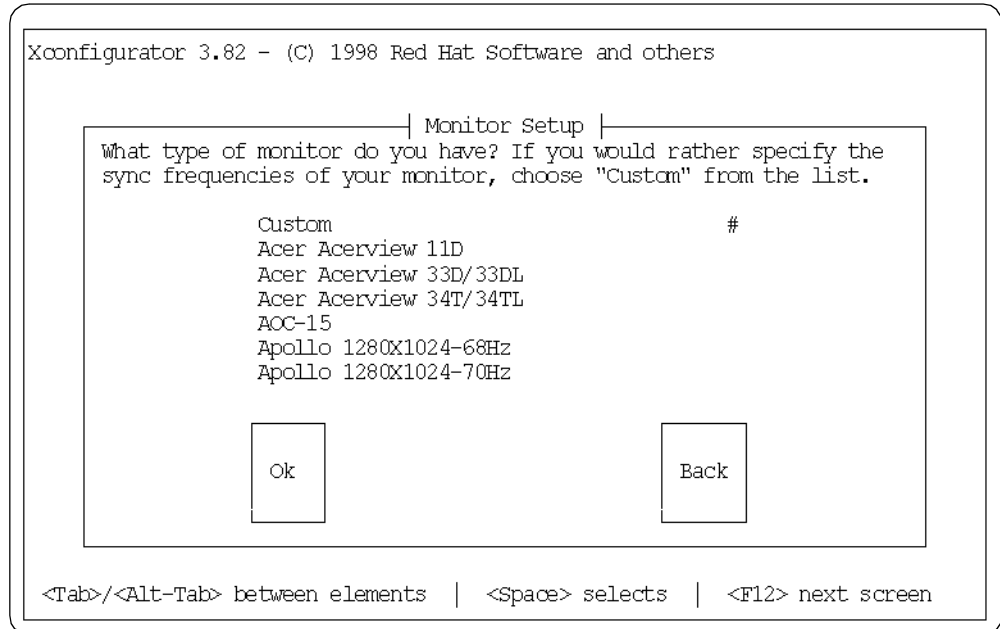


Figure 31. Monitor Setup

17. You will now be asked to choose which monitor you have. If your monitor is not present on the list select Custom. None of the newer IBM monitors are present in the list. During this installation we chose Custom. Press **Ok** to continue.

18. Press **Ok** to the Custom Monitor Setup screen.

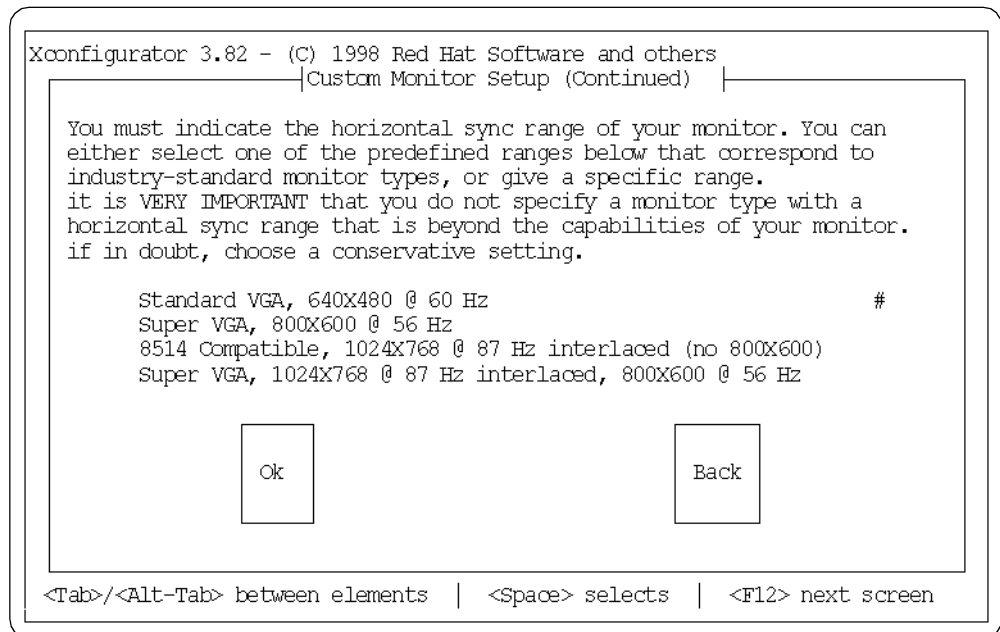


Figure 32. Custom Monitor Setup - Horizontal Sync Range

19. You must now indicate the horizontal sync range (addressability) of your monitor. If you don't know the horizontal sync range of you monitor, select a standard VGA or Super VGA setting. Most IBM monitors will be able to run the

Super VGA 1024x768 at 87 Hz interlaced, 800x600 at 56 Hz and that was the setting we chose during the installation.

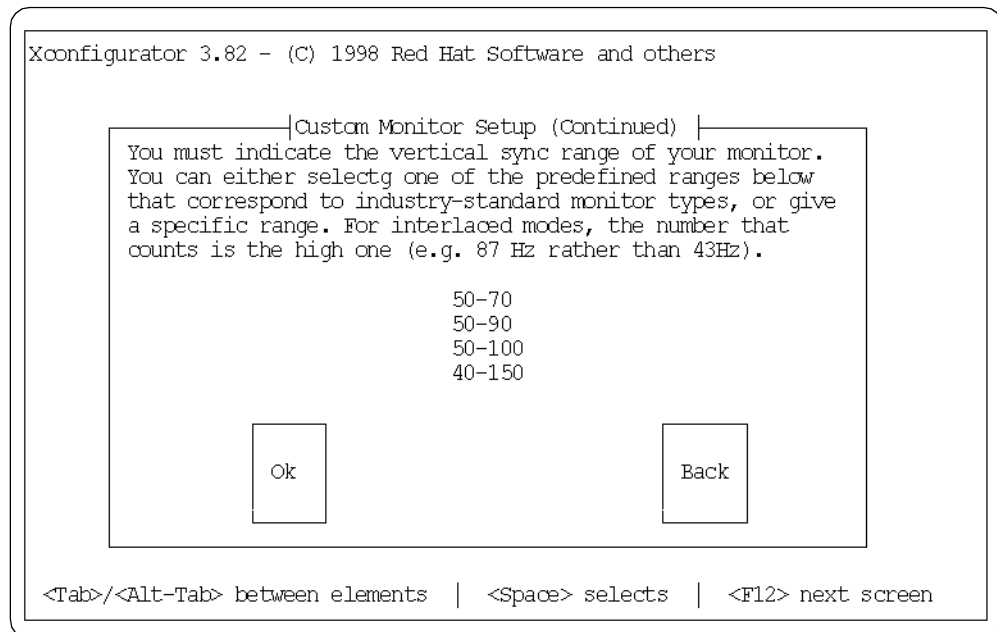


Figure 33. Custom Monitor Setup - Vertical Sync Range

20. You are now asked to choose the vertical sync range. If you don't know what vertical sync range your monitor is capable of, choose 50-70 Hz. Since almost all monitors today are capable of running interlaced (vs. non-interlaced) it is likely that your monitor is capable of 40-150 Hz and that is the setting we chose.

21. The Installation program will now probe your settings. Press **Ok** to continue.

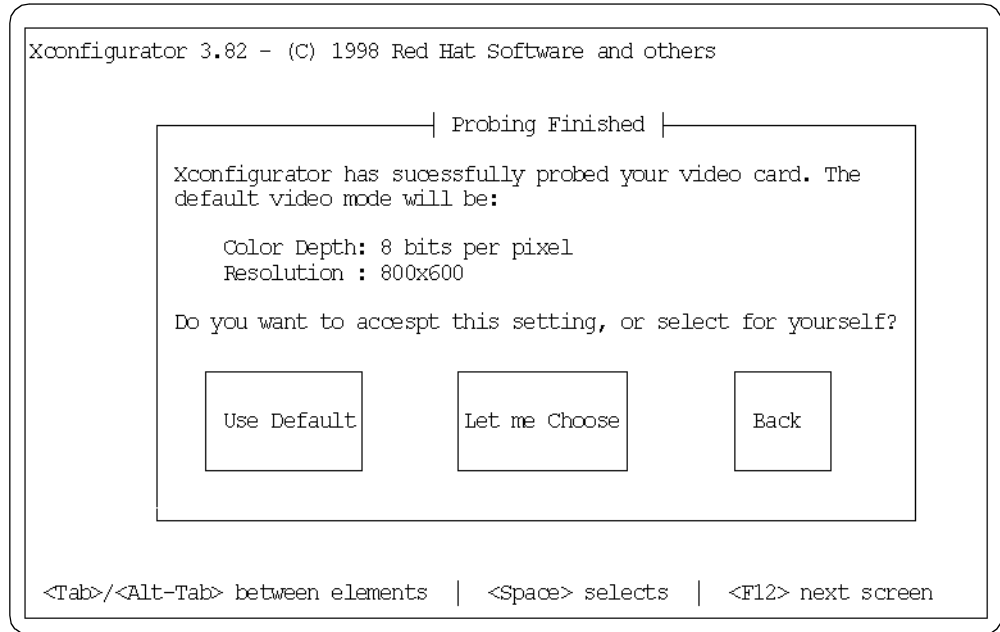


Figure 34. Probing Finished

22. When the test is over, you are asked if you will accept the default settings. If you don't know how many colors your display adapter can support, we recommend that you accept the default. You can, when the installation is over, use the Xconfigurator utility to change the settings. We chose not to accept the default settings and pressed the **Let me Choose** button and chose instead 24-bit 800x600 which means more colors supported.

Note

Colors

- 4 bits per pixel = 16 colors
- 8 bits per pixel = 256 colors
- 16 bits per pixel = 65636 colors
- 24 bits per pixel = 16.7 million colors (true color)

23. You have now reached the point of the installation where the network will be configured. From that screen press **Yes** to configure the network. If you don't want to configure your network press **No**. If you are installing with a token-ring card see Chapter 5, "Installing Your Server with Token-Ring" on page 53.

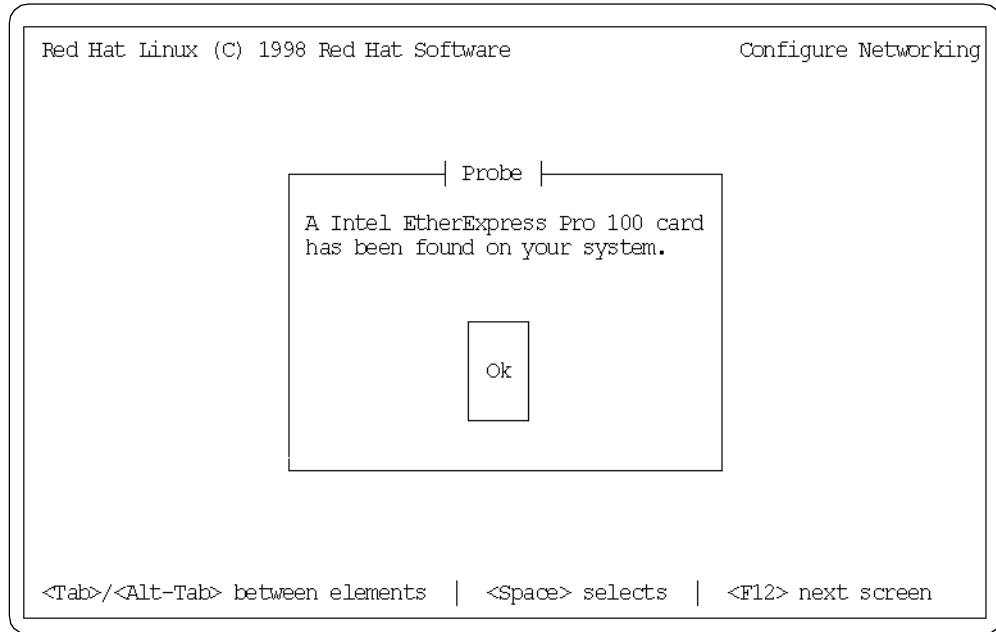


Figure 35. Network Probe

24. The installation program will find the Intel EtherExpress Pro 100 network card on the planar of your server. Press **Ok** to continue. If for some reason the network card is not found it might be because it has been disabled by the Setup Utility.

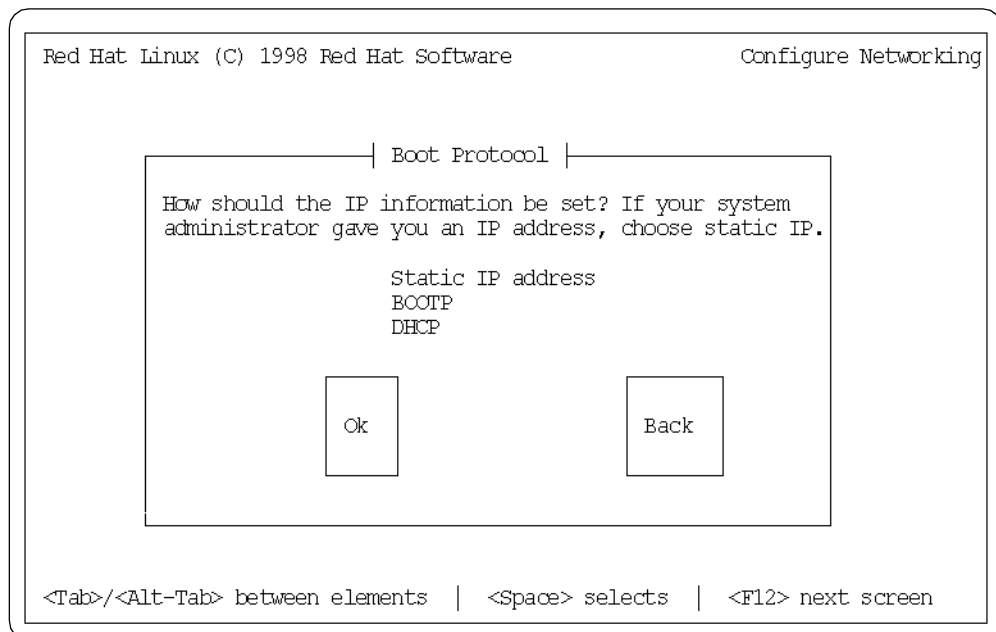


Figure 36. Boot Protocol

25. You must now select how to approach the network. Select from any of the three options. We chose Static IP address which is probably the most realistic choice when installing a server.

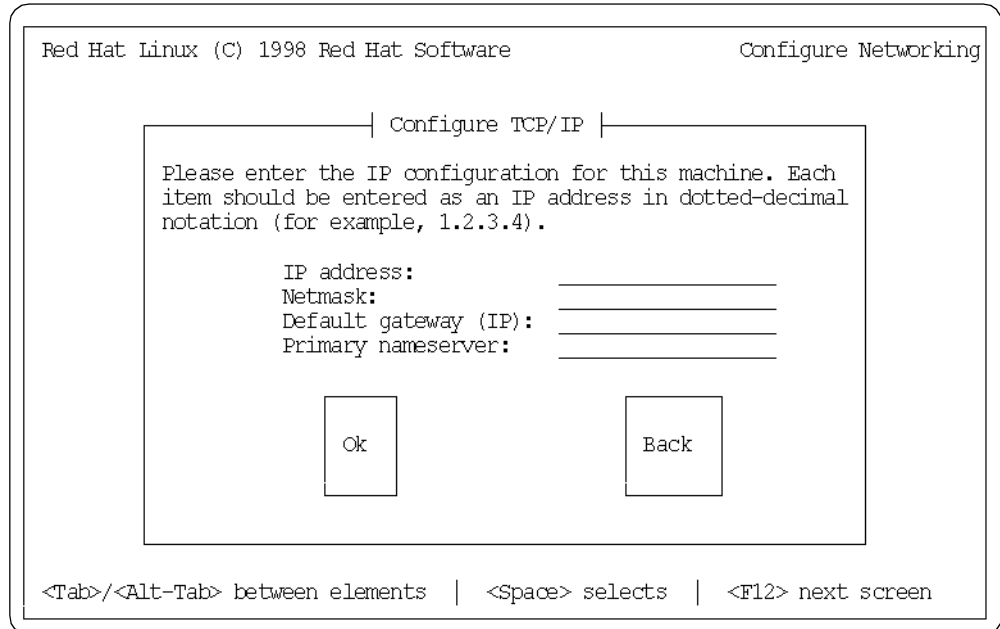


Figure 37. Configure TCP/IP

26. The installation program now requires an IP address. After you have typed in the IP address the installation program attempts to guess your Netmask, Default gateway and Primary nameserver. If the guesses are incorrect, correct them and press **Ok** to continue.

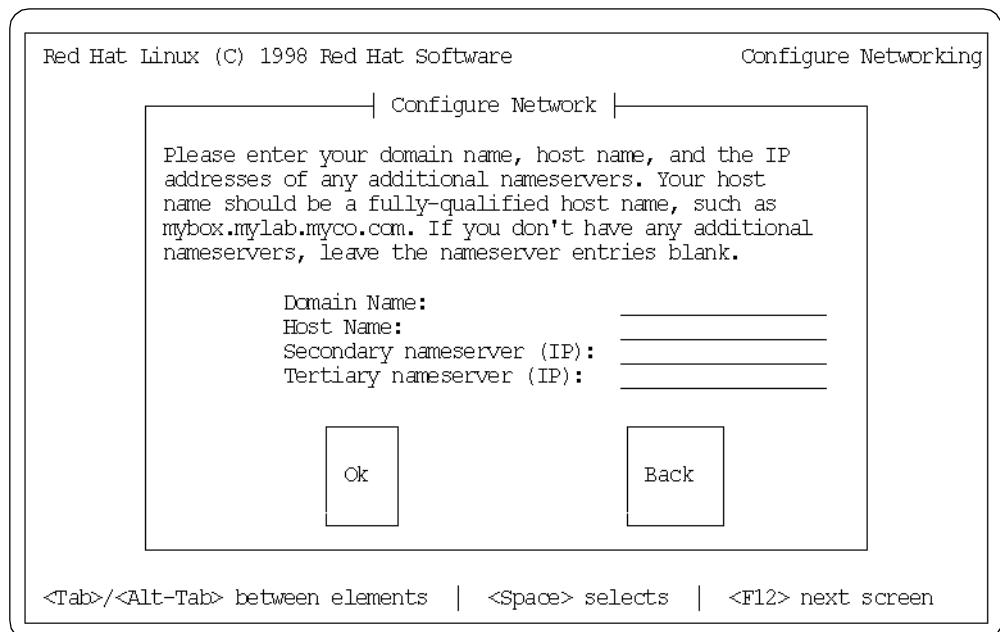


Figure 38. Configure Network

27. Enter your Domain Name and Host Name. Add Secondary and Tertiary nameservers if appropriate.

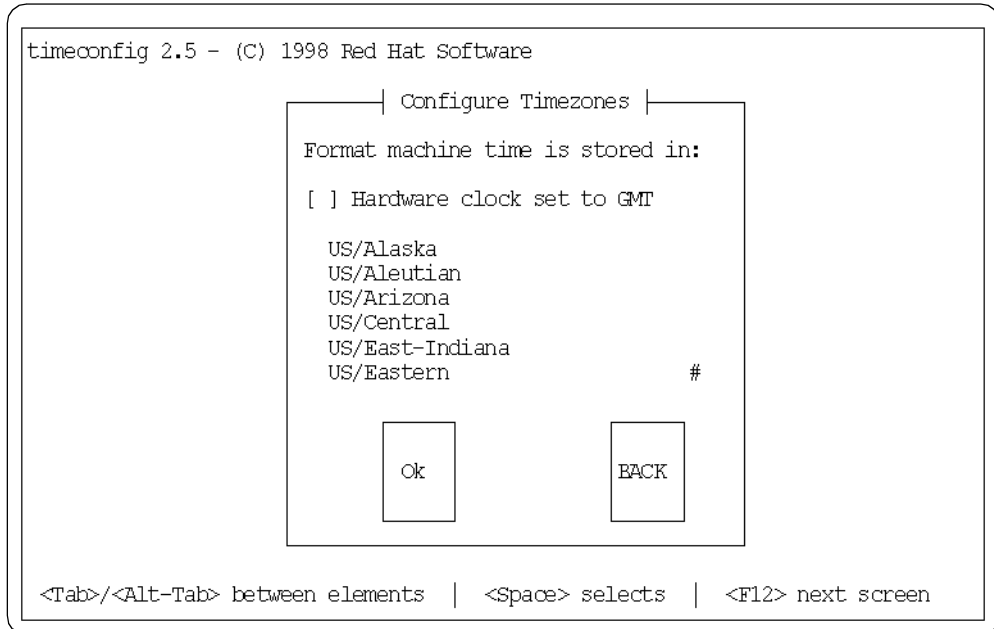


Figure 39. Configure Timezone

28. Select the timezone in which your server is situated.

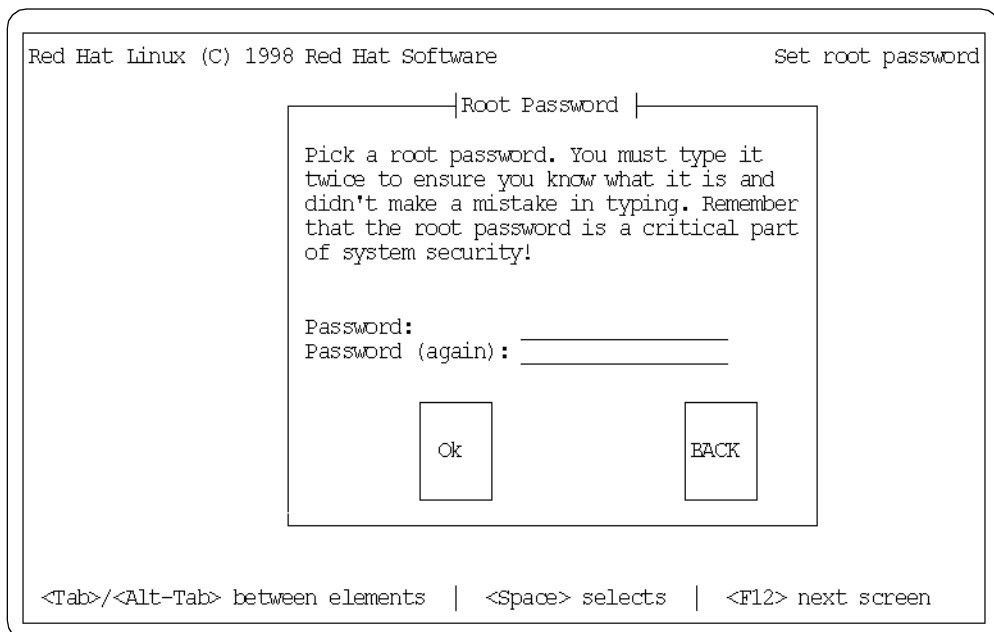


Figure 40. Root Password

29. Enter a root password. You will use the root user to logon to your system for the first time. The root user is a user ID with administrators rights, which means that the ID has access to the whole system without limits. You will only use this user ID to perform administration and maintenance tasks.

30. You are now asked to make a bootdisk. You should always say **Yes** to this question. The bootdisk can help you recover from a server crash. Insert a diskette (it doesn't have to be blank) in the diskette drive and press **Ok**.

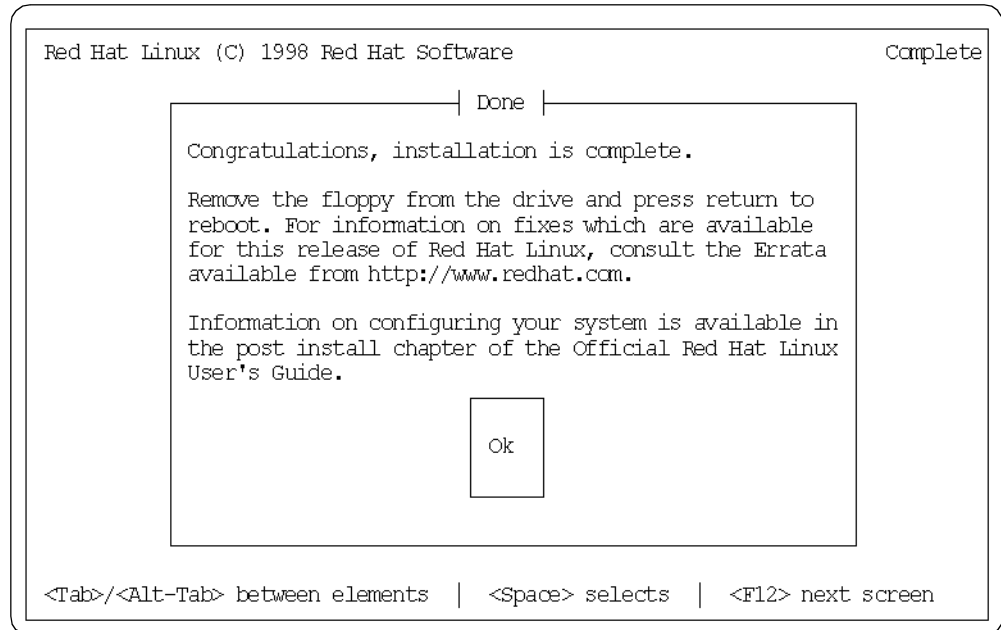


Figure 41. Installation Complete

31. You have now completed the installation of Red Hat Linux 5.2 and you are asked to remove the diskette from the diskette drive and press **Ok** to reboot.

Note

You will not be able to remove the CD from the CD-ROM drive at this time because the CD-ROM drive is still mounted. Press **Ok** to reboot and remove the CD from the CD-ROM drive during boot. If you fail to do so your server will boot from the CD-ROM drive and install from the beginning.

32. Your server will reboot into a command mode. Logon as root and type in your password from the installation. When you are successfully logged on issue the `startx` command to enter the X Window system.

Chapter 4. Installing Red Hat Linux 5.2 on Netfinity 5000

In this chapter we will discuss the following items:

5. Prepare the CD-ROM drive to be bootable.
6. Perform a server-class installation of Red Hat Linux 5.2 on the Netfinity 5000 including the selection of devices and drivers.

4.1 Making the CD-ROM Bootable

Prior to the installation make sure that the system is able to boot from the CD-ROM drive. That is done by following these steps:

1. Power on the server. When you see the IBM logo press F1 to enter the Setup Utility.
2. From the Setup Utility select Start Options.
3. Make sure that your CD-ROM drive is one of the startup devices.
4. Press Esc and press Save Settings.
5. Press Enter to confirm saving the current settings.
6. Exit the Setup Utility.

Making the CD-ROM bootable can also be done by loading the default settings from the Setup Utility but, be aware of that all other settings will be set to default as well.

4.2 Red Hat Linux 5.2 Installation Procedures

1. Power on the server and insert the bootable Red Hat Linux 5.2 CD in the CD-ROM drive.
2. The Red Hat installation program will boot from the CD-ROM. From the welcome screen press Enter to install or to upgrade. If you don't take any action within 1 minute, the installation program will automatically start.
3. Press **Ok** on the register screen.

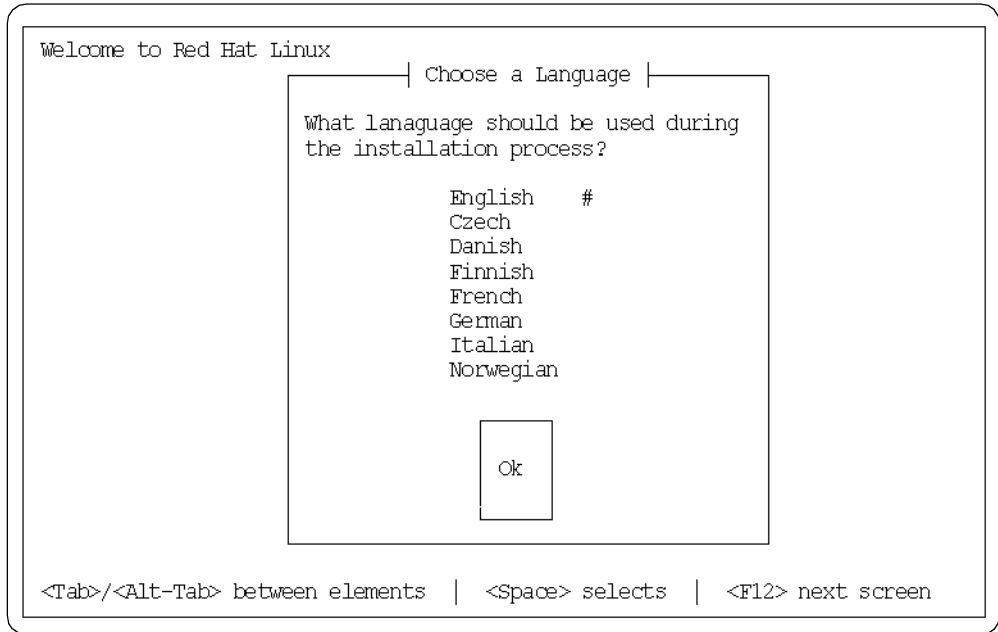


Figure 42. Choose a Language

4. Select your language. This is done by using the Tab key to scroll down and using the Space key to select your language.

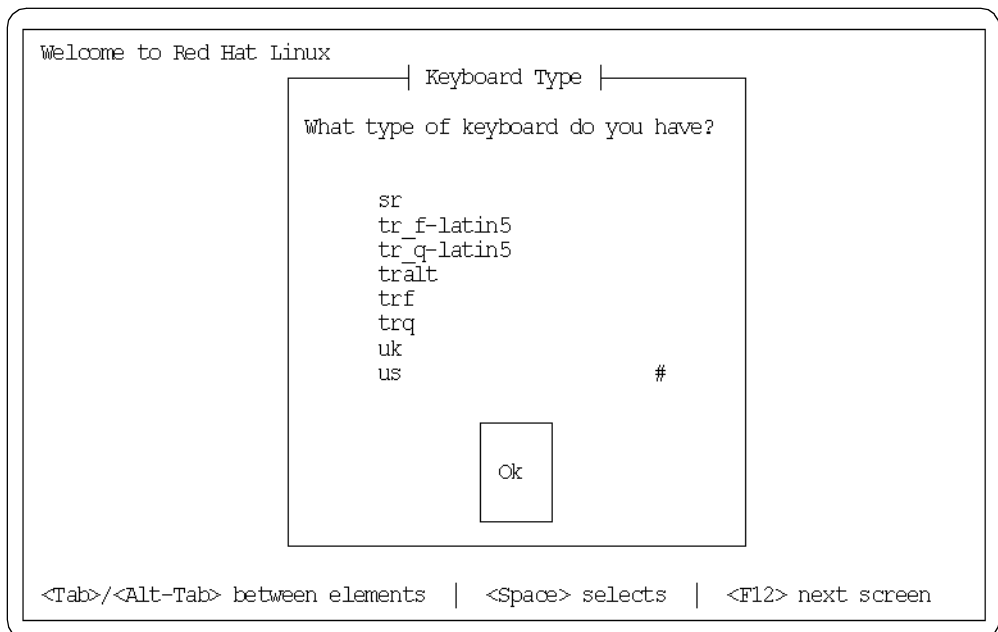


Figure 43. Keyboard Type

5. Select your keyboard type.

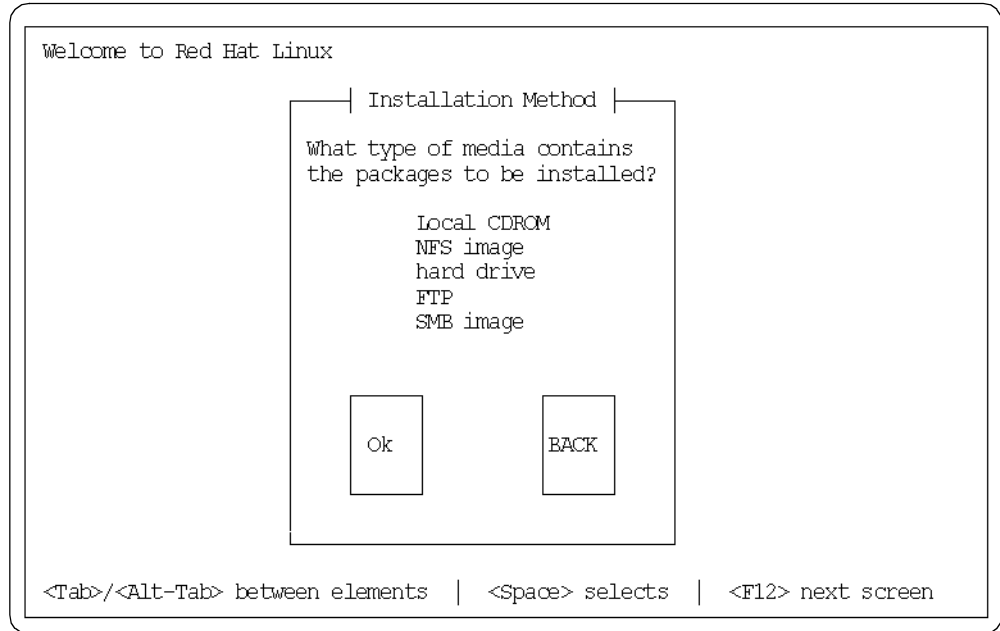


Figure 44. Installation Method

6. Choose your installation method. In this guide we will install from Local CD-ROM.
7. On the next screen you will be asked to insert the CD in the CD-ROM drive. Since the CD already is in the CD-ROM drive press **Ok** to continue.

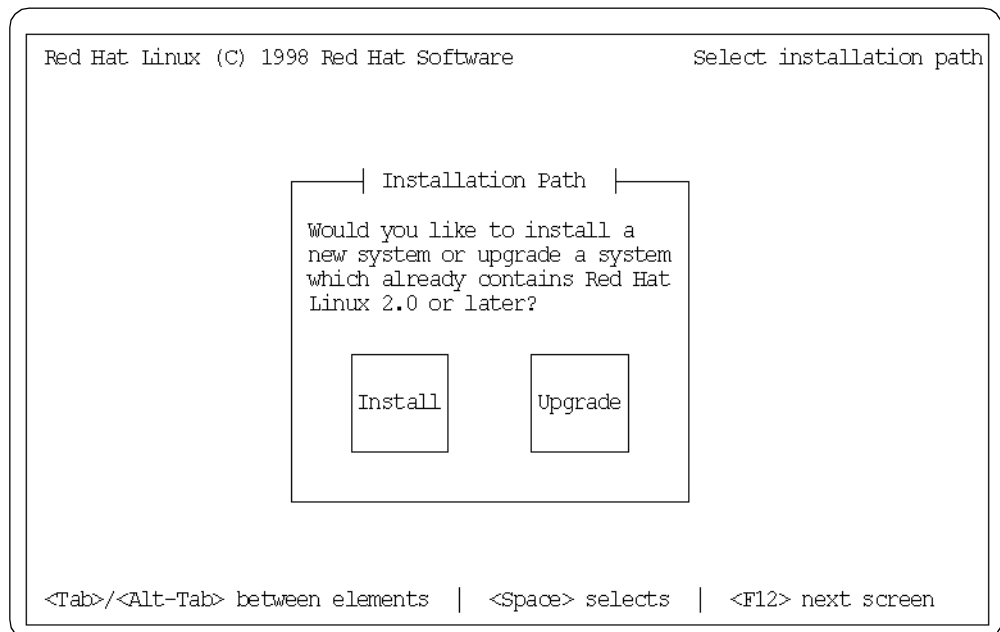


Figure 45. Installation Path

8. Press **Install** from the Installation Path screen.

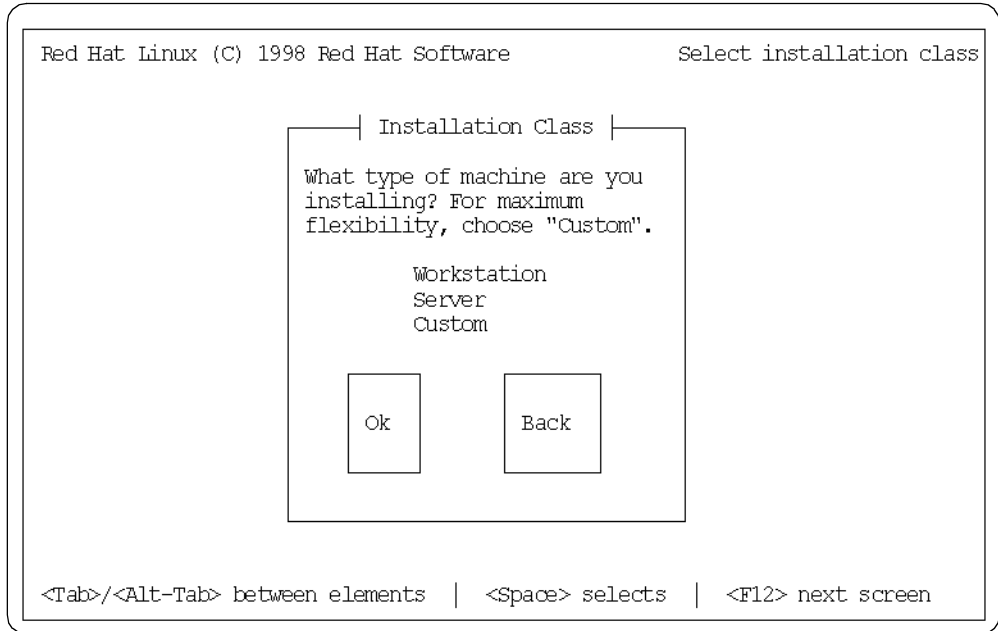


Figure 46. Installation Class

9. Select Server from the Installation Class screen.

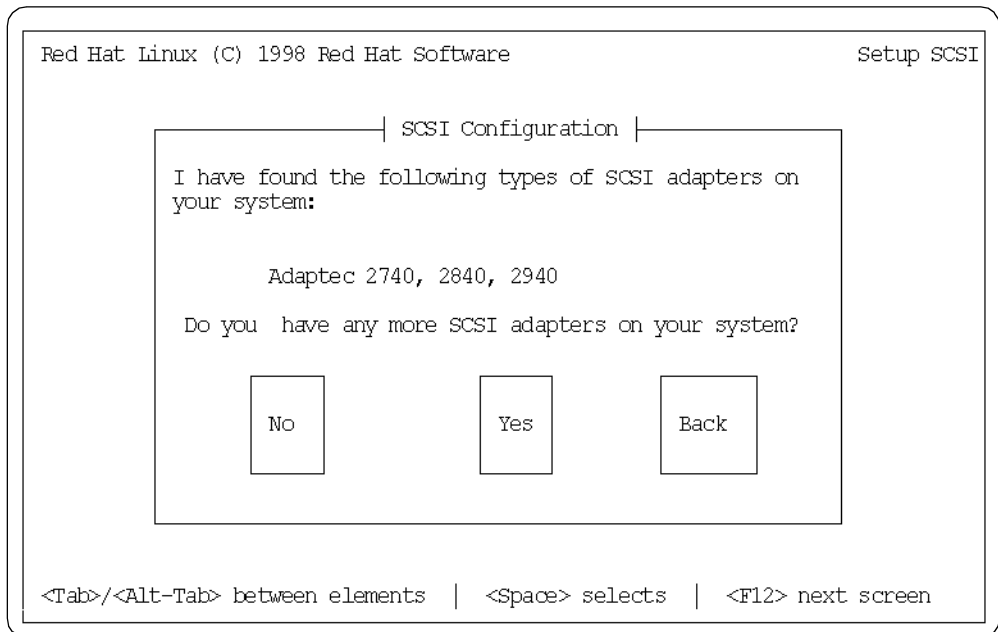


Figure 47. SCSI Configuration

10. The installation program will now scan for SCSI adapters. It will find the Adaptec 2740, 2840 and 2940. Even though the Netfinity 5000 has an Adaptec 7895 you will accept this. If you haven't added any additional SCSI adapters to the server press **No** to the question on the screen

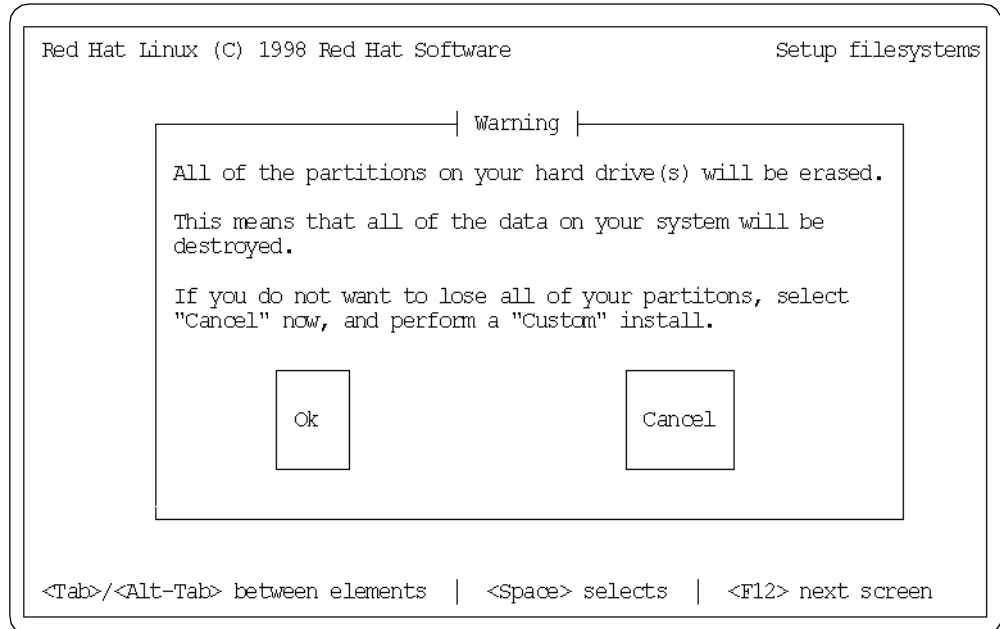


Figure 48. Warning - Partitions Will Be Erased

11. The installation program will now warn you that all your partitions will be erased if you press **Ok**. If you don't want to erase your partitions press **Cancel** at this time.
12. You will be warned again - press **Yes** to continue or **No** to cancel.
13. The Installation program will now set up the partitions and the file system and begin the installation of the packages. During the installation you will be informed on how many packages there are in total to be installed, how many completed and how many remain.

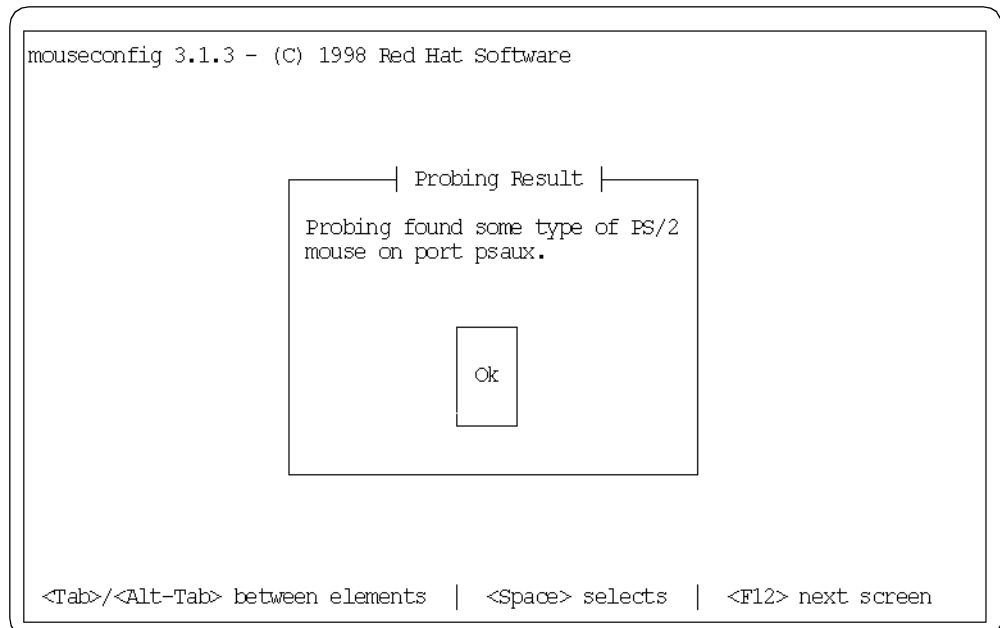


Figure 49. Probing Result - Mouse

14. After installation of the packages the installation program will search for devices attached to the server. The first device found is the PS/2 mouse on port psaux. Press **Ok** to continue.

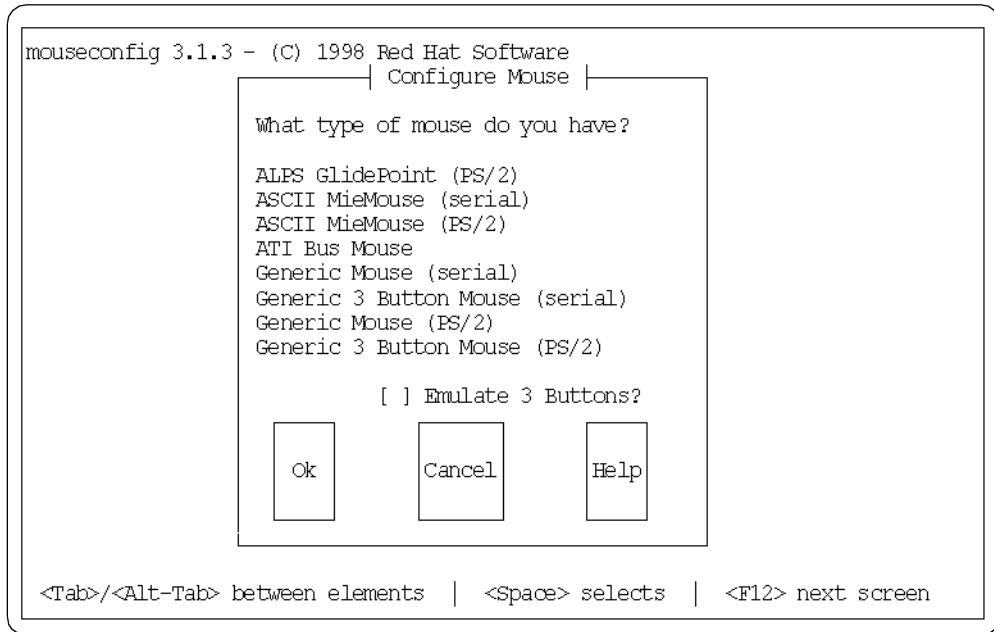


Figure 50. Configure Mouse

15. Select Generic Mouse (PS/2) if you have a standard 2 button mouse attached to the server and press **Ok** to continue.
16. Next the Installation program will find the display adapter which, for this server, is an S3 Trio64V2 and it will install the S3 package for X Server. Press **Ok** on the PCI Probe screen.

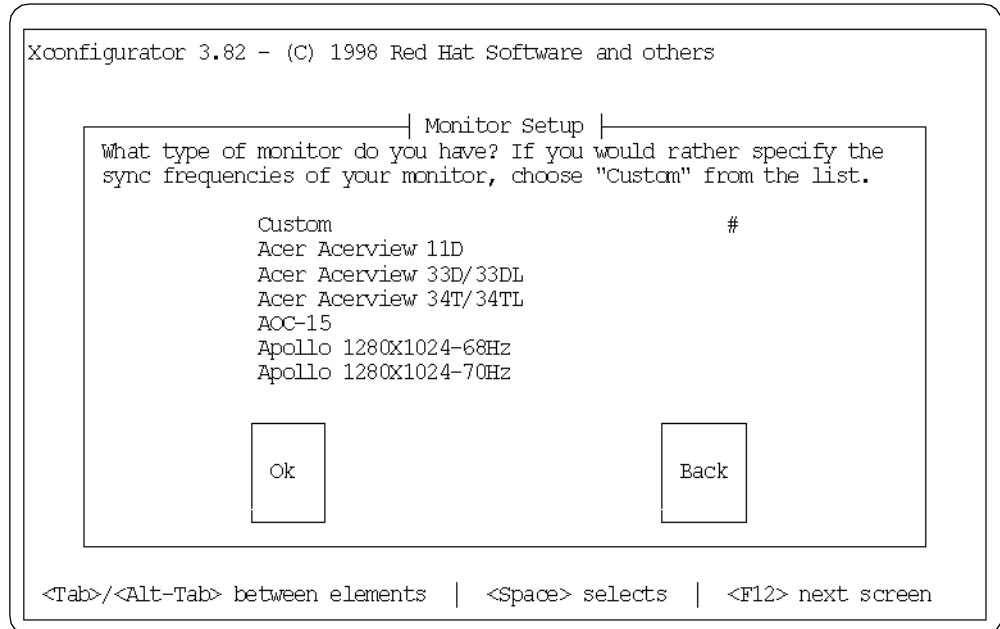


Figure 51. Monitor Setup

17. You will now be asked to choose which monitor you have. If your monitor is not present on the list select Custom. None of the newer IBM monitors are present in the list. During this installation we chose Custom. Press **Ok** to continue.

18. Press **Ok** to the Custom Monitor Setup screen.

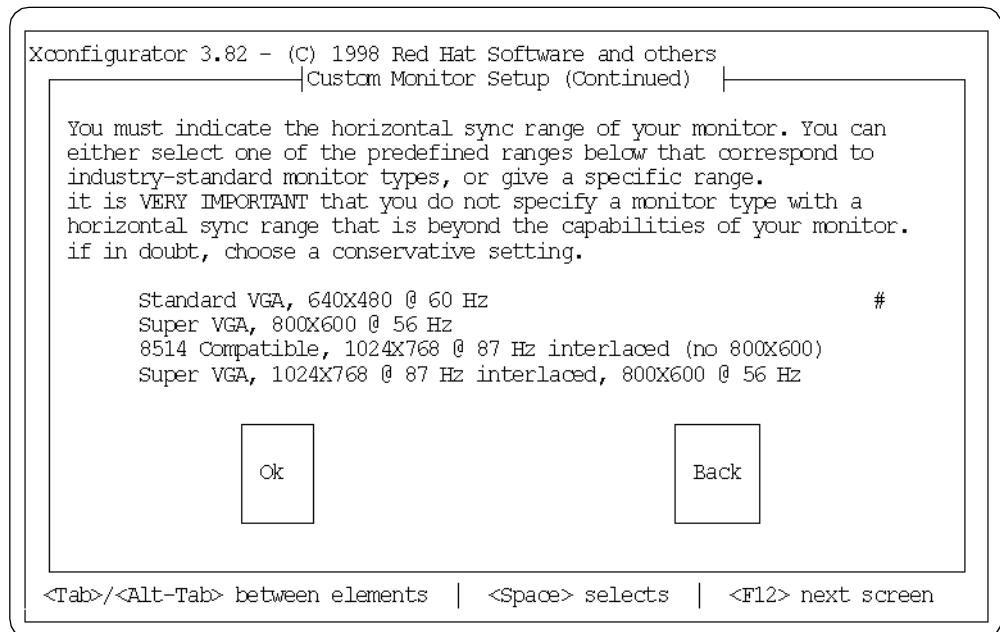


Figure 52. Custom Monitor Setup - Horizontal Sync Range

19. You must now indicate the horizontal sync range (addressability) of your monitor. If you don't know the horizontal sync range of you monitor, select a standard VGA or Super VGA setting. Most IBM monitors will be able to run the

Super VGA 1024x768 at 87 Hz interlaced, 800x600 at 56 Hz and that is the setting we chose during the installation.

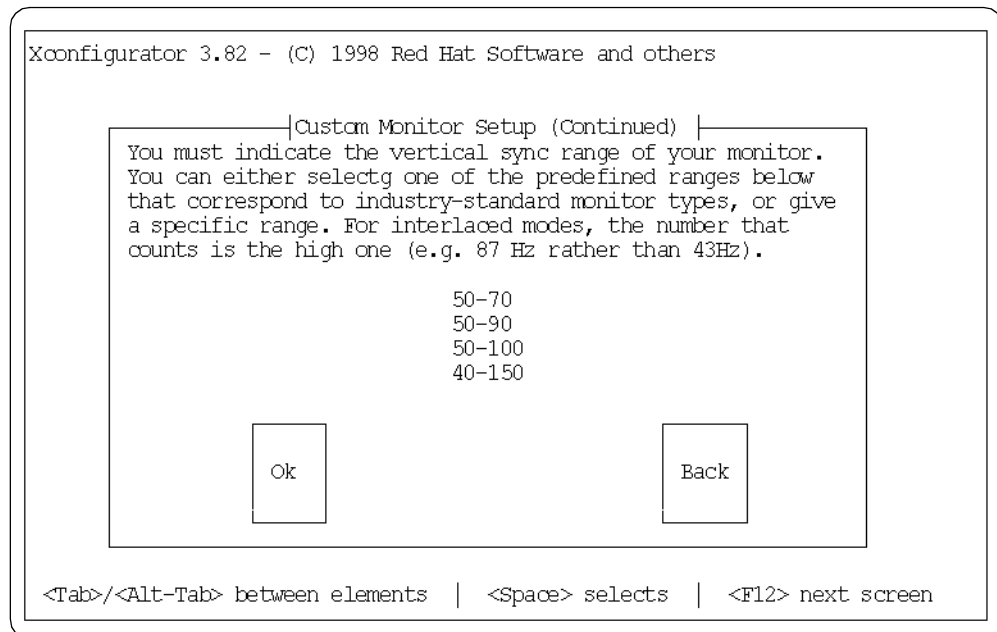


Figure 53. Custom Monitor Setup - Vertical Sync Range

20. You are now asked to choose the vertical sync range. If you don't know what vertical sync range your monitor is capable of, choose 50-70 Hz. Since almost all monitors today are capable of running interlaced (vs. non-interlaced) it is likely that your monitor is capable of 40-150 Hz and that is the setting we chose.

21. The Installation program will now probe your settings. Press **Ok** to continue.

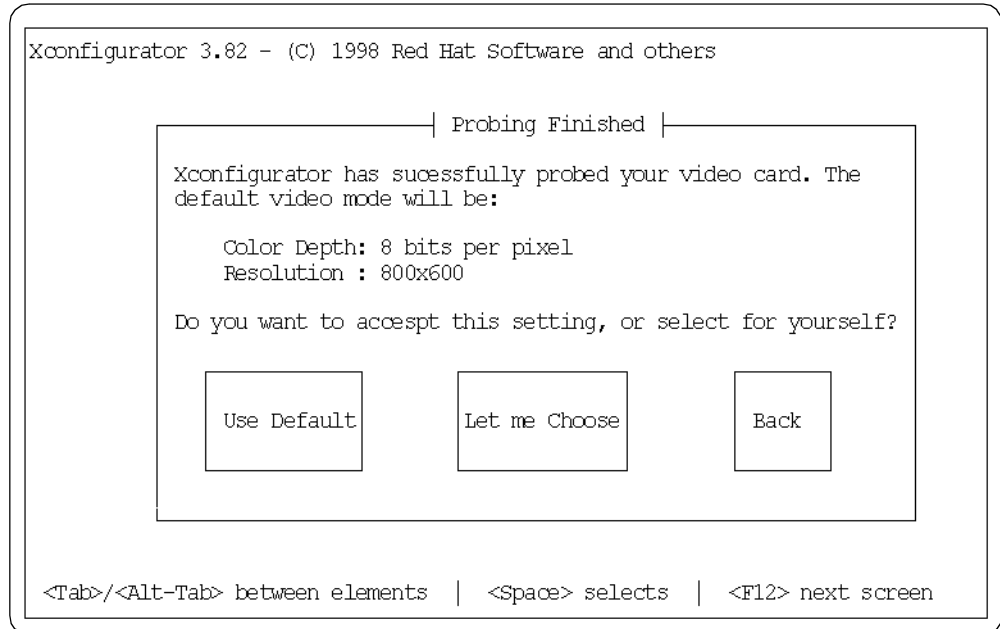


Figure 54. Probing Finished

22. When the test is over, you are asked if you will accept the default settings. If you don't know how many colors your display adapter can support, we recommend that you accept the default. You can, when the installation is over, use the Xconfigurator utility to change the settings. We chose not to accept the default settings and pressed the **Let me Choose** button and chose instead 16-bit 800x600 which means more colors supported.

Note

Colors

- 4 bits per pixel = 16 colors
- 8 bits per pixel = 256 colors
- 16 bits per pixel = 65636 colors
- 24 bits per pixel = 16.7 million colors (true color)

23. You have now reached the point of the installation where the network will be configured. From the Network Configuration screen press **Yes** to configure the network or press **No** to skip the network installation. If you are installing with a token-ring card see Chapter 5, "Installing Your Server with Token-Ring" on page 53.

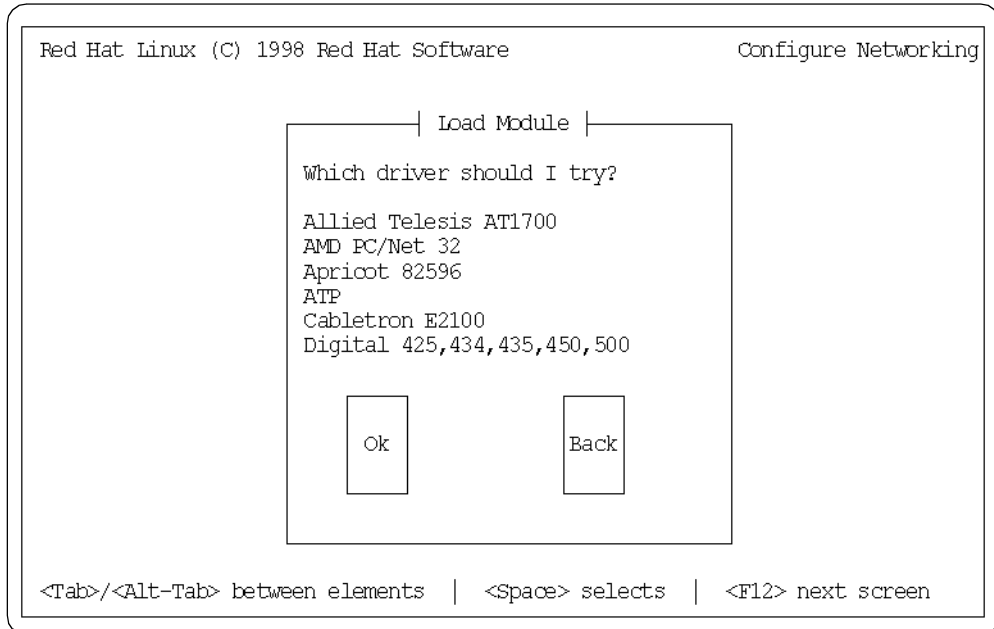


Figure 55. Network Probe

24. The installation program will not be able to find the AMD Am79C972 network card on the planar of your server. You will be asked which driver you want to use. Here you should choose the AMD PC/Net 32 driver which is the driver for the AMD Am79c971 Ethernet card. For information on this Ethernet card see <http://www.amd.com/products/npd/overview/21135.pdf>. Press **Ok** to continue.

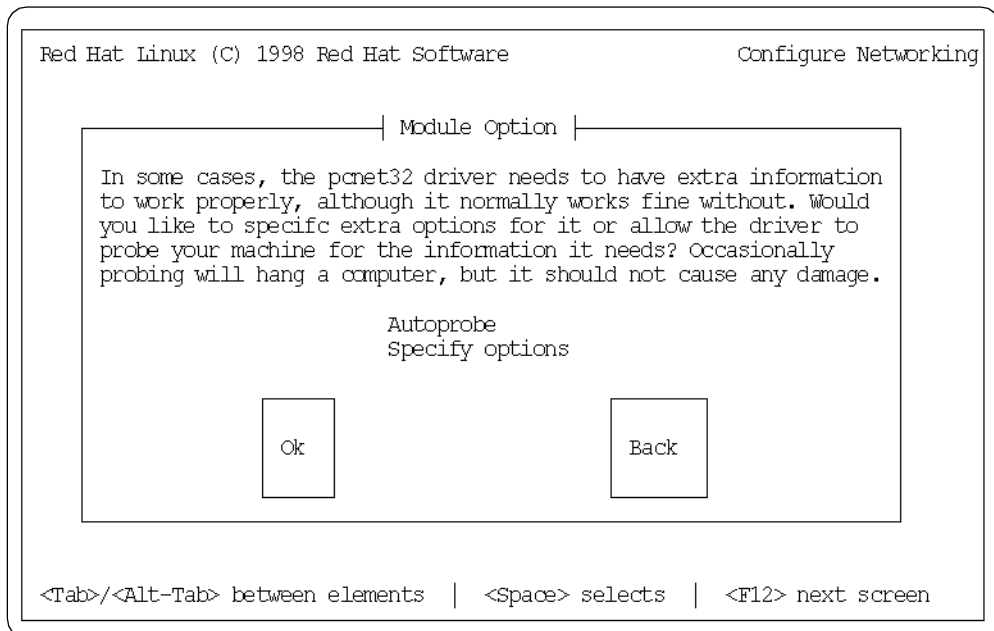


Figure 56. Module Option

25. Now select Autoprobe if you want the network driver to probe your server. Otherwise, you can select Specify options, but we recommend selecting Autoprobe.

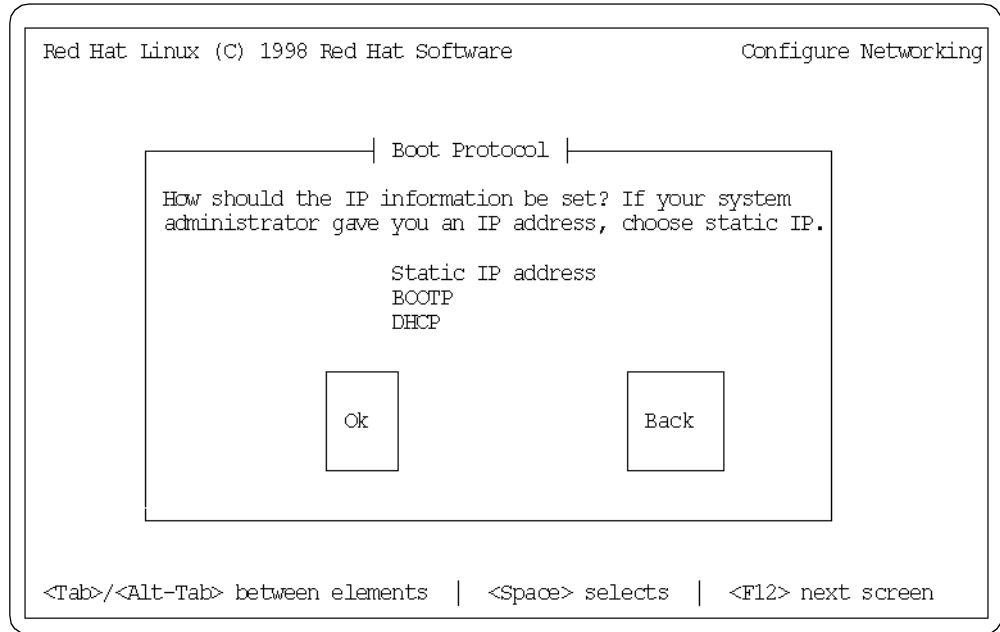


Figure 57. Boot Protocol

26. You must now select how to approach the network. Select any of the three options. We chose Static IP address which is probably the most realistic choice when installing a server.

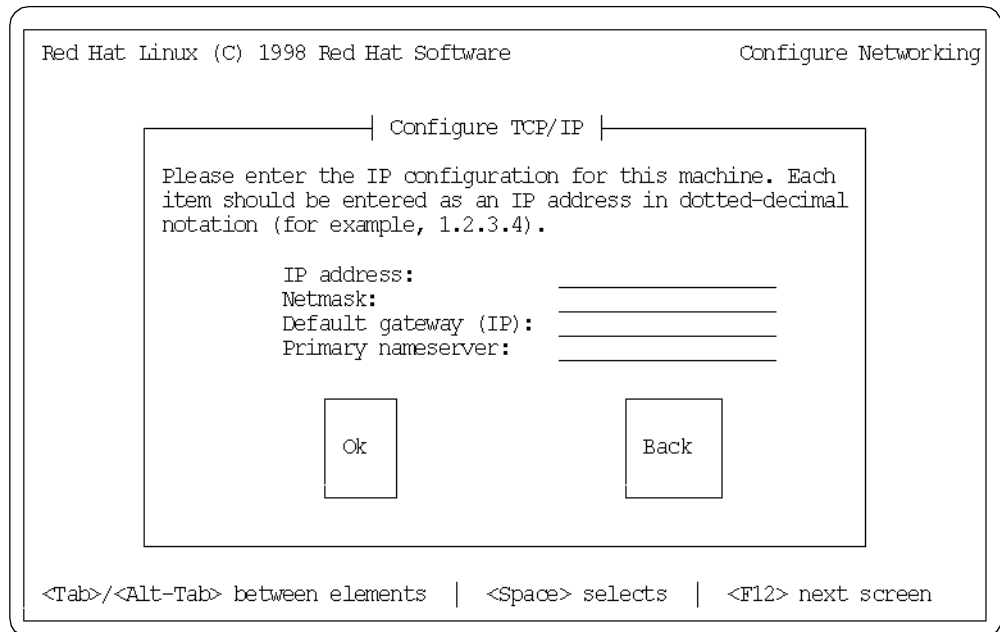


Figure 58. Configure TCP/IP

27. The installation program now requires an IP address. After you have typed in the IP address the installation program attempts to guess your Netmask, Default gateway and Primary nameserver. If the guesses are incorrect, correct them and press **Ok** to continue

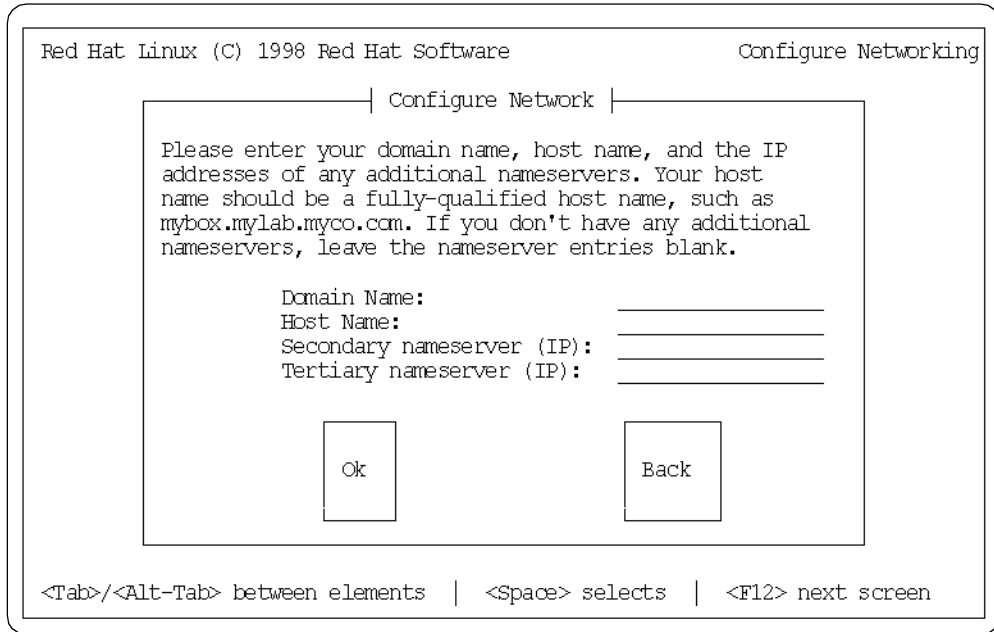


Figure 59. Configure Network

28. Enter your Domain Name and Host Name. Add Secondary and Tertiary nameservers if appropriate.

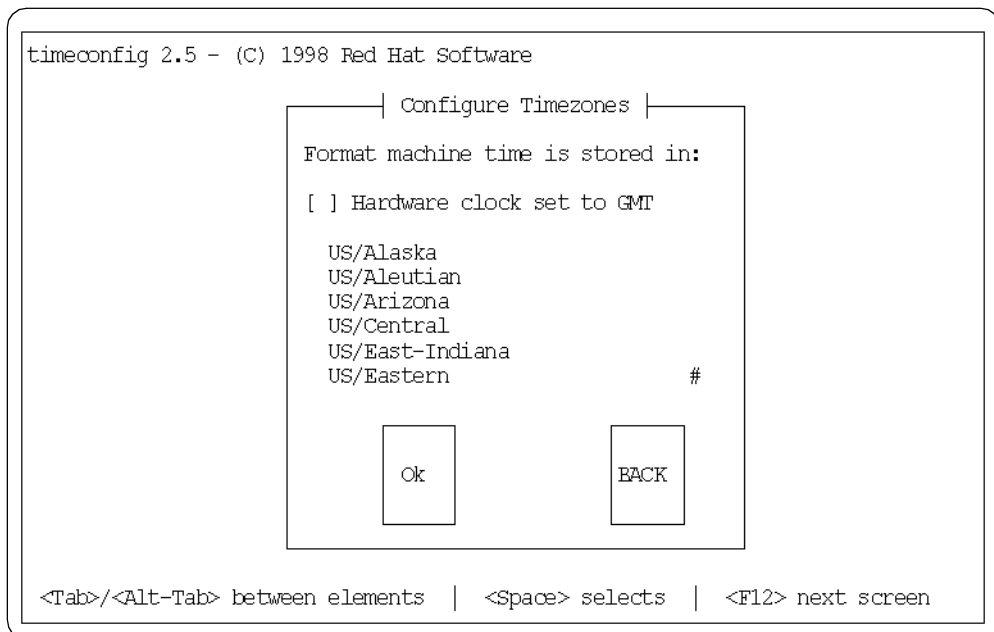


Figure 60. Configure Timezone

29. Select the timezone in which your server is situated and press **Ok** to continue.

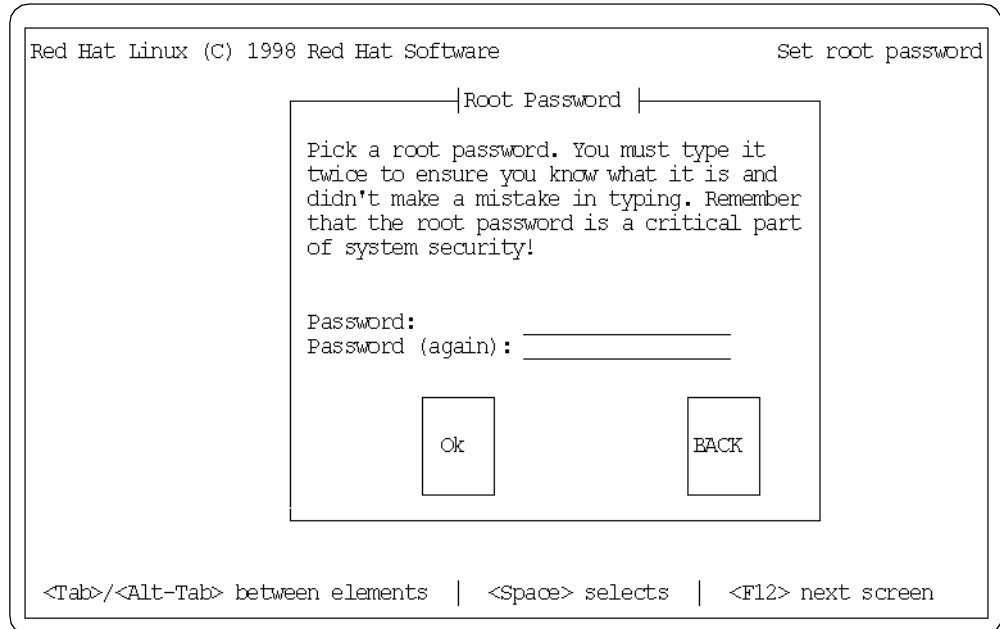


Figure 61. Root Password

30. Enter a root password. You will use the root user to logon to your system for the first time. The root user is a user ID with administrators rights, which means that the ID has access to the whole system without limits. You will only use this user ID to perform administration and maintenance tasks.
31. You are now asked to make a bootdisk. You should always say **Yes** to this question. The bootdisk can help you recover from a server crash. Insert a diskette (it doesn't have to be blank) in the diskette drive and press **Ok**.

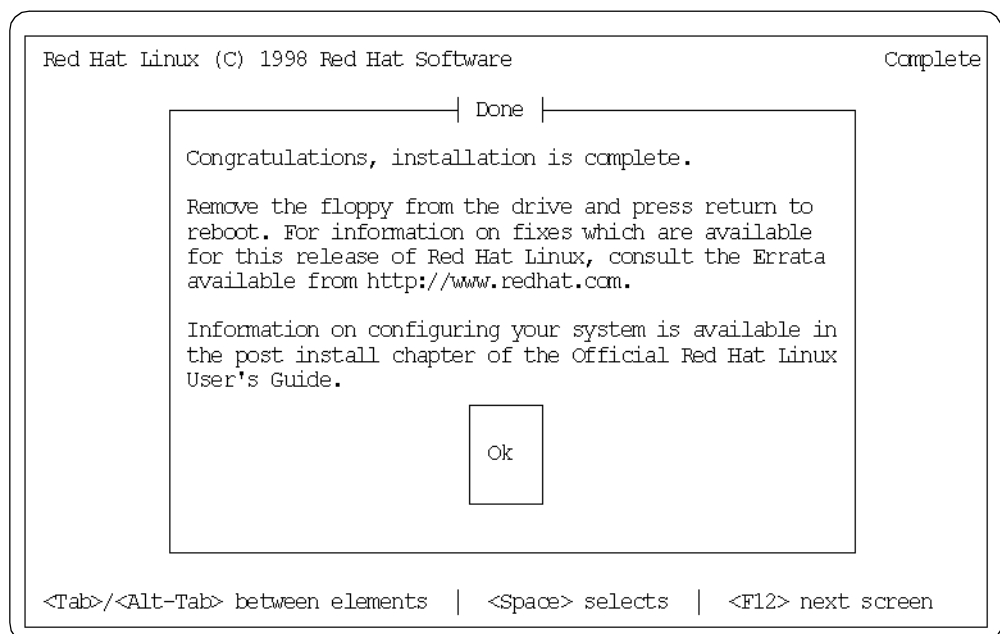


Figure 62. Installation Complete

32. You have now completed the installation of Red Hat 5.2 Linux and you are asked to remove the diskette from the diskette drive and press **Ok** to reboot.

Note

You will not be able to remove the CD from the CD-ROM drive at this time because the CD-ROM drive is still mounted. Press **Ok** to reboot and remove the CD from the CD-ROM drive during boot. If you fail to do so your server will boot from the CD-ROM drive and install from the beginning.

33. Your server will reboot into a command mode. Logon as root and type in your password from the installation. When you are successfully logged on issue the `startx` command to enter the X Window system.

Chapter 5. Installing Your Server with Token-Ring

None of the IBM PCI Token-Ring cards are currently supported. The only supported IBM Token-Ring card is the IBM Turbo 16/4 ISA Adapter. The IBM Turbo 16/4 ISA Adapter has to be configured to auto 16/4 compatibility mode. This is done by using the LANAIID diskette and running this command:

```
LANAIDC /fast=auto16
```

`LANAIDC /VIEW` will show you the current settings.

If you don't want to use both the Ethernet card on the planar and the installed token-ring card you must disable the Ethernet card in the Setup Utility. This is done by following the steps described in 5.1.

5.1 Disable the Ethernet Card on the Planar

Netfinity 3000 and 3500

1. When you see the IBM logo press F1 to enter the Setup Utility.
2. From the Setup Utility select Devices and I/O Ports.
3. From Devices and I/O Ports select Ethernet Setup.
4. Use the left or right arrow to Enable/Disable the Ethernet card.
5. Press Esc until you reach the Setup Utility menu.
6. Save your settings and exit.

This can also be done by loading the default settings but be aware that all settings will then be set to default.

Netfinity 5000

1. When you see the IBM logo press F1 to enter the Setup Utility.
2. From the Setup Utility select Advanced Setup.
3. From Advanced Setup select PCI Bus Control.
4. From PCI Bus Control select PCI Device Enable/Disable.
5. Use the left or right arrow to Enable/Disable the Ethernet card.
6. Press Esc until you reach the Setup Utility menu.
7. Save your settings and exit.

This can also be done by loading the default settings but be aware that all settings will then be set to default.

5.2 Configuration of Token-Ring Card

We will now discuss two ways of configuring your token-ring card.

1. When Red Hat Linux is installed and you want to configure a token-ring card from the X Window system
2. When you install Red Hat Linux from the beginning and you wish to configure your server with a token-ring card

5.2.1 Configure a Token-Ring Card from X Windows

The only supported IBM Token-Ring card is the IBM Turbo 16/4 ISA Adapter. Before you begin the configuration make sure that the token-ring card is in auto 16/4 compatibility mode as explained earlier; see the beginning of Chapter 5, "Installing Your Server with Token-Ring" on page 53. We will now configure a token-ring card from X Windows.

1. Before you begin you should have the token-ring card installed and connected to the network.
2. Logon to the server as root and start X Windows by issuing the `startx` command.

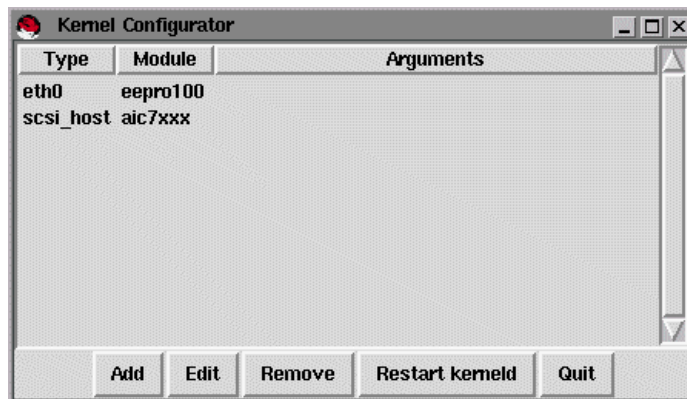


Figure 63. Kernel Configuration

3. Press Start, Programs, Administration, Kernel Configuration. You will now see the Kernel Configurator screen. Select **Add**.

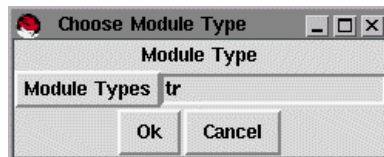


Figure 64. Choose Module Type

4. From the Choose Module Type screen select `tr` and press **Ok** to continue.

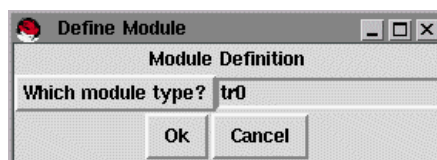


Figure 65. Define Module

5. From the Define Module screen select `tr0` and press **Ok** to continue.

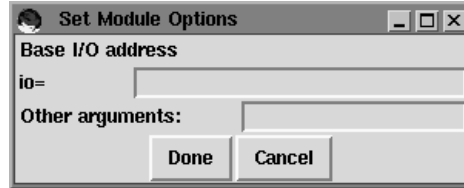


Figure 66. Set Module Options

6. From the Set Module Options screen press **Done** to continue.
7. At the Kernel configuration panel press **Restart Kernel** to restart the kernel then press **Quit** to exit.
8. From the Control Panel press the Network Configuration button.

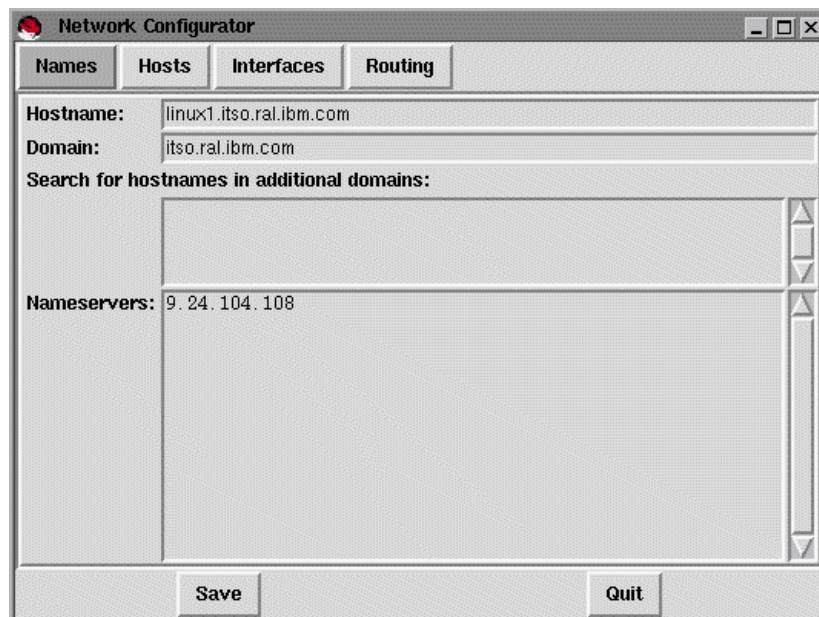


Figure 67. Network Configurator

9. In the Network Configurator select **Interfaces**.

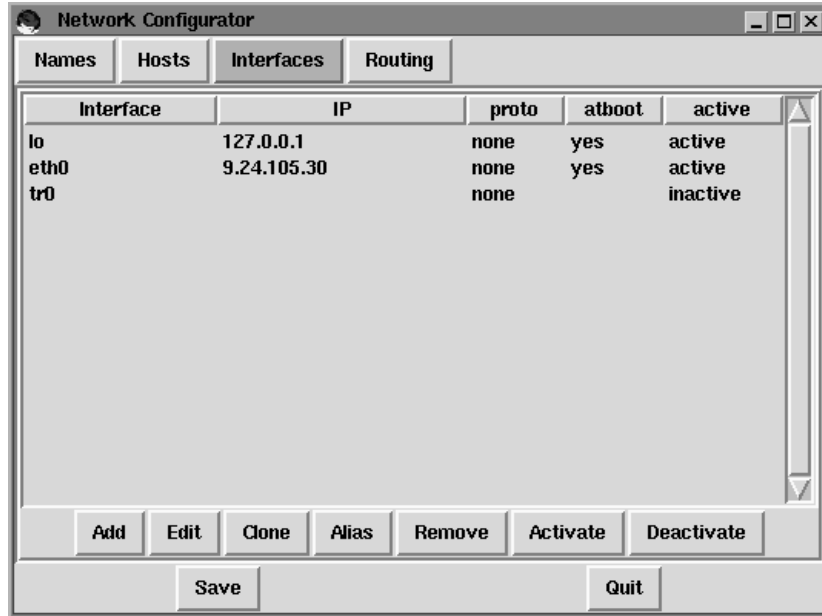


Figure 68. Network Configurator - Interfaces

10. Select Tr0 from the list and press **Edit** to continue.

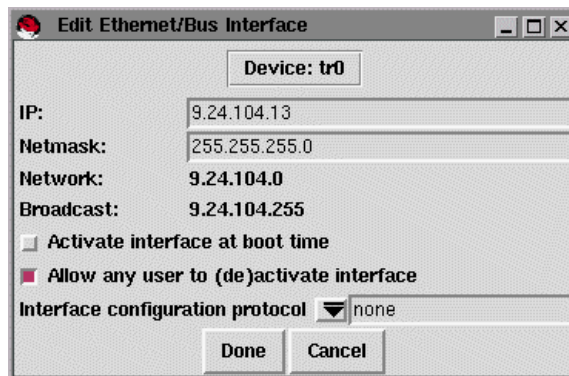


Figure 69. IP Address and Netmask

11. You now need to enter the IP address and network mask. You can also select the adapter to be activated at boot time and the protocol to use. Press **Done** to continue.

12. You will now be asked to **Save** or **Cancel** current configuration. Press **Save** to continue.

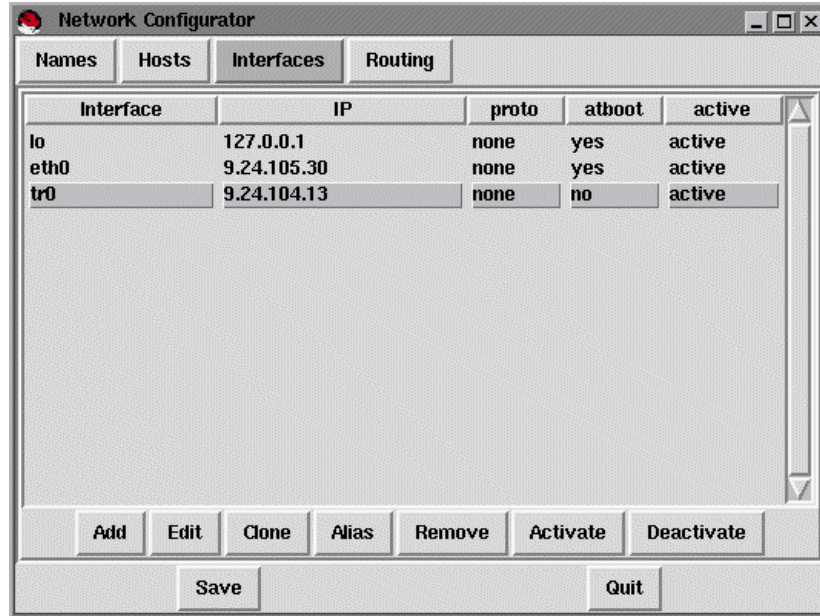


Figure 70. Network Configurator - Activate

13. To activate the adapter, select tr0 then press **Activate**. Press **Save** then **Quit** to exit.

You have now configured and activated your token-ring card.

5.2.2 Configure a Token-Ring Card from the Setup Program

You can choose to install and configure your token-ring card from the beginning of the installation. The only supported IBM Token-Ring card is the IBM Turbo 16/4 ISA Adapter. Before you begin the configuration make sure that the token-ring card is in auto 16/4 compatibility mode as explained earlier; see the beginning of Chapter 5, "Installing Your Server with Token-Ring" on page 53. We will now go through the installation steps.

1. First you will need to disable the Ethernet card on the planar; see 5.1 on page 53.

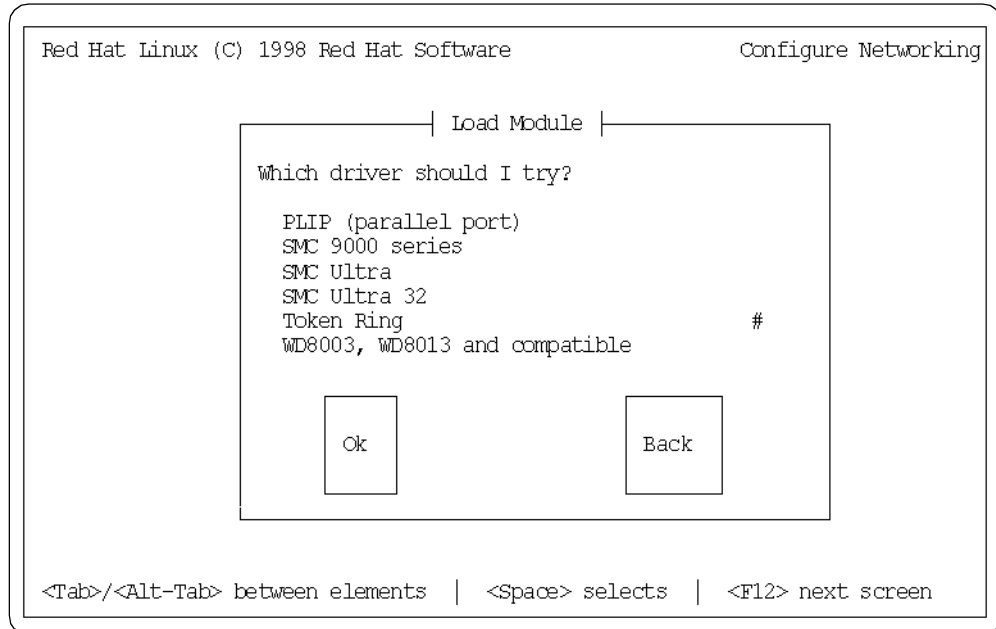


Figure 71. Load Module

2. See the appropriate Installation sections in this document for your server on how to install the token-ring card. When you get to the Configure Networking section you will be asked what driver should be loaded. Select Token Ring and press **Ok** to continue.

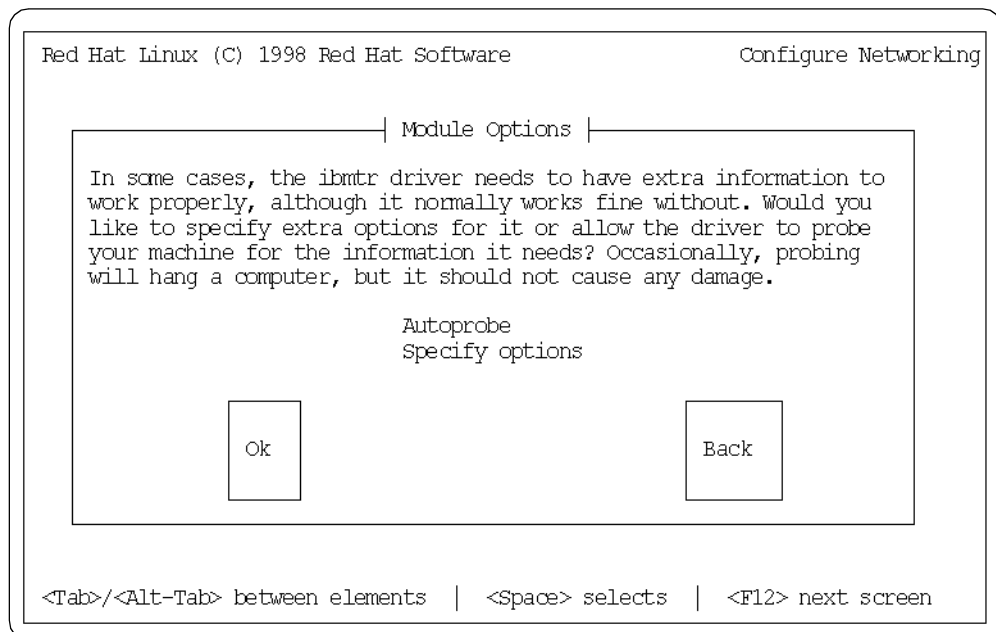


Figure 72. Module Option

3. You will then be asked if you want to specify extra options or allow autoprobe to get the information. For this install we used Autoprobe. Select **Autoprobe** and press **Ok** to continue.

The token-ring card is now configured and you should go back to the installation section for your server in order to complete the installation.

Appendix A. Special Notices

This publication is intended to help everyone install RedHat Linux. The information in this publication is not intended as the specification of any programming interfaces that are provided by Linux.

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