Linux® Installation for VnmrJ

Varian, Inc. NMR and MRI Systems
Pub. No. 01-999268-00, Rev. K 0508

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Applicability of manual:
64 bit version of Red Hat WS v5.1 installed on Dell OptiPlex 755N with VnmrJ 2.2 C or later.
64 bit version of Red Hat Enterprise WS v4.0 and v4.0.us update3, Dell models 370N, 380N, 390N, and VnmrJ 2.1A or later.

Revision history:
A0604 – Initial release with MERCURY VnmrJ LX
B0904 – Updated for INOVA VnmrJ LX
B1204 – Corrected ifconfig command on pg 17,sec 3.2, step 7 to include eth0
C0305 – Updated for Dell 370N and Red Hat Enterprise WS V3, update 2
C0405 – Updated for new Varian NMR Systems
D0905– Updated for Red Hat Enterprise WS v4.0, replacement of router with dual network interface cards, and Dell 380N.
D1005 – Added enhancements to installation instructions
E 0106 – Added instructions for showing VnmrJ icon
F 0406 – Updated instructions for eth1 configuration.
G1106 – Updated for Red Hat Enterprise WS v4.0.us update 3
H1206 – Updated for DVD installation and Dell models 370N, 380N, 390N
J0707 – Updated clarify steps, ECO 14438
K0508 – Updates for RedHat v5.1

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Chapter 1. Requirements

Varian, Inc. NMR spectrometers use VnmrJ as the data acquisition and processing software. This manual describes how to prepare a Linux workstation to run VnmrJ.

Getting Started

These instructions apply to the following Red Hat® Linux® version and Dell workstation:

- Red Hat® Linux® version 5.1 on a Dell OptiPlex 755n workstation.
- Older version of Red Hat and older Dell workstations.

  See Chapter 5 "Installing Older Versions of Red Hat® Linux® from CD or DVD," on page 21

The general installation steps are as follows:

Task	*More Information*
Collect network information	"Collecting Network Information" on page 7
Install Red Hat® Linux® version 5.1 from DVD	Chapter 2, "Installing Red Hat® Linux® from a DVD," page 9
Configuring the Network	Chapter 3, "Configuring Network Settings," page 11
Install Red Hat® Linux® version 4 and version 4 update 3 from CD	Chapter 5, "Installing Older Versions of Red Hat® Linux® from CD or DVD," page 21
Installing VnmrJ	*VnmrJ Installation and Administration* manual

Requirements

A host computer system (with two network interface ports) purchased from Varian, Inc. or in full compliance with current Varian Inc. specifications. Specification are available upon request. No other computer systems are supported.

Become familiar with the Linux operating system, computer hardware, and Ethernet networks before beginning any of the procedures in this manual.

Collecting Network Information

Use the "Network Information Worksheet" on page 8 to collect network information and use this information when installing Linux. The network administrator for the site must provide all required network information.

Network Information Worksheet

Network	*Comments*	*Your Configuration*
Host Name	The host name of the host computer. **DO NOT USE** names listed in Table 1.	
Network Device	The network interface (Ethernet board) installed in the computer. Linux systems show **`eth1`** for the primary (on board) interface and **`eth0`** as the secondary (card slot) interface.	
IP Address (**`eth1`**)	The network IP number for the Ethernet board connected to the NMR console. IP addresses, select one: 172.16.0.1 or 10.0.0.1.	
IP Address (**`eth0`**)	The network IP number for the Ethernet board connected to the network—supplied by the local network administrator.	
Netmask	The associated netmask or subnet mask number. Typically, this number is 255.255.255.0.	
Gateway	For or the secondary network card—supplied by the local network administrator.	
Name Service	Depends on the local network setup. NIS+, NIS, DNS, DCE, or similar.	
Domain Name	Network domain name; for example: `our.domain`—supplied by the local network administrator.	
Name Server	Network name server and IP address—supplied by the local network administrator.	
Proxy Server (Optional)	Proxy server name, e.g., `proxy.`*`domain`*`.com`—supplied by the local network administrator.	

.

Table 1. Reserved System Names

`inova, inovaauto, gemcon, or wormhole, master1, rf1, rf2, rf3, rf4, rf5, rf6, rf7, rf8, lock1, lock2, grad1, grad2, pfg1, pfg2, ddr1, ddr2, ddr3, ddr4, ddr5, ddr6, ddr7, ddr8`

Chapter 2. Installing Red Hat® Linux® from a DVD

Sections in this chapter:

WARNING: **This procedure completely erases the hard drive and all data on it. Backup all data that needs to be retained before continuing.**

2.1 Applicability of the DVD Installation of Red Hat® Linux®

This procedure is applicable to the installation of the 64-bit version of RedHat Linux 5.1 from a DVD on the following computer system:

- Dell OptiPlex 755n

2.2 Preparation

1. Turn on the workstation.
2. Insert the DVD into the DVD/CD-ROM drive.
3. Reboot.
4. Watch for the **F12** message to appear in the upper right corner.
5. Hit the **F12** key to make a one time change in the boot sequence so the workstation boots from the CD-ROM.
6. Change the boot sequence to use the CD-ROM:

   Use down arrow key to highlight **Onboard or USB CD-ROM Drive**.
7. Press **Enter** (the computer boots using the CD-ROM).
8. Continue with “Installing RedHat” on page 9.

2.3 Installing RedHat

WARNING: **This procedure completely erases the hard drive and all data on it. Backup all data that needs to be retained before continuing. The installation script does not prompt for permission once the script is started.**

1. Enter the following at the prompt (command is case sensitive):

   `linux ks=cdrom:/Varian755_RH51.cfg`

   The installation takes approximately 35 minutes. The DVD ejects and re-inserts itself once during this process. Do not remove the DVD or the post installation part of the script will be skipped.

2. Wait for the message: **`installation complete`**.

3. Restart the workstation.

4. Log in as **`root`**.

5. Enter **`varian1`** (the default root password).

   Refer to the Linux documentation for instructions on changing the password for the `root` login and change the password.

6. Remove the DVD from the drive.

7. Double click on the **Computer** icon.

8. Double click on the **Filesystem** folder.

9. Double click on the **dell_drivers** folder.

10. Verify that the folder contains several files with the extension **`.rpm`**.

    This verifies successful installation of both the Red Hat 5.1 and the post installation successful.

    Repeat the installation process if the **dell_drivers** folder is missing or if the **dell_drivers** folder does not contain files with the extension **`.rpm`**.

11. Continue with Chapter 3, “Configuring Network Settings,” page 11.

Chapter 3. Configuring Network Settings

Sections in this chapter:

Configure the network in the *Network Configuration* screen. Each workstation ethernet port must be configured. Systems not connected to a network require only one ethernet port (on board port) and systems connected to a network require two ethernet ports (one on board and one card).

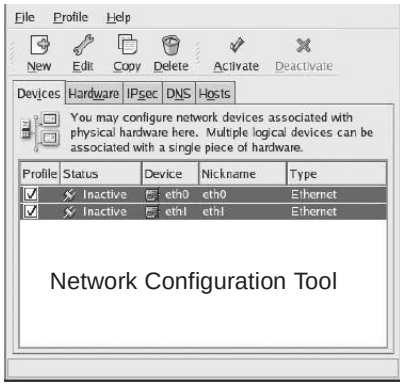
3.1 Connecting the Workstation to the Console and Network

1. Connect the on board network interface card, **eth1**, to the NMR console.
2. Connect the card slot network interface card, **eth0**, to the local network.
3. Turn on the computer.
4. Turn on the console.
5. Log in as **root** (password required).

3.2 Configuring the Workstation to NMR Console Ethernet Port

Start the Systems Setting Window

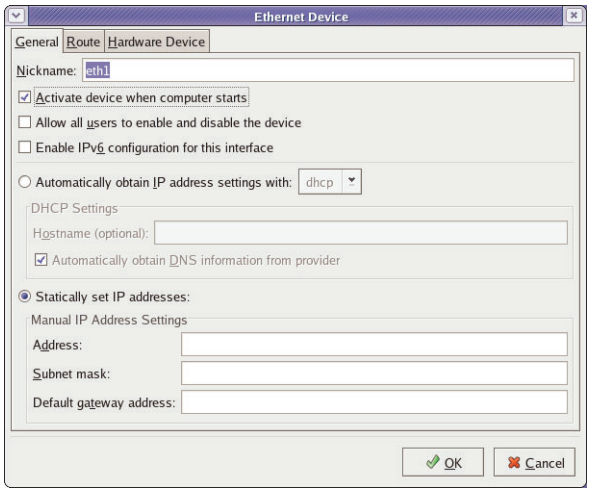
1. Click on **System** on the **Main Menu**.
2. Select **Administration**.
3. Select **Network** to start the **Network Configuration Tool**.
4. Click the **Devices** tab.



Configure eth1 (NMR Console Port)

The network port, eth1, is the port connected to the NMR console.

1. Double click on **eth1**.
2. Place a check in the box for the following options or enter the following to configure eth1 (port connected to the NMR console):



   a. Select **Activate device when computer starts** in the *Ethernet Device* screen (must be selected or port will not be active after reboot).

   b. Check **Statically set IP addresses –** required for Varian NMR Systems.

   c. Enter **IP Address** – see Table 2.

      Select a system IP address for the system that does not conflict with the network at the site and corresponds to the NMR console to which the host computer is connected, see Table 2.

Table 2. IP Addresses

Main network address	*Set IP to*
Does not start with 172.16	172.16.0.1
Starts with 172.16	10.0.0.1

      Refer to the "Network Information Worksheet" on page 8 for DNS IP numbers and any network information specific to the network at the site. The local network administrator must provide all the required information.

   d. **Netmask**: enter **255.255.255.0**

   e. **Default Gateway Address** – leave empty.

3. Click **OK**.
4. Do one of the following:

- Local network connection required and available:

  Continue with “Configuring the Workstation to Local Network Ethernet Port” on page 13.

- No local network connection required or available.

  Continue with “Configuring the Second Ethernet Port with No Local Network Connection” on page 14.

3.3 Configuring the Workstation to Local Network Ethernet Port

Required Information Specific to the Local Network

Refer to the “Network Information Worksheet” on page 8 for DNS IP numbers and any network information specific to the network at the site. The local network administrator must set up the connection between the workstation and the local network and provide all the required information.

Configure eth0 (Local Network Port)

The network port, eth0, is port connected to the local network.

1. Start the **Network Configuration Tool** if it is not open.
2. Click the **Devices** tab.
3. Double click on **eth0**.

   The the **Ethernet Device** screen opens with the **General** tab selected.
4. Select **Activate device when computer starts** (must be selected or port will not be active after reboot).
5. Set up the IP address (information supplied by the local network administrator) by clicking on the radio button for either of the following:

   Automatically obtain IP address settings with

   a. Select **dhcp**.
   b. Fill in the **Hostname (optional):** field if needed.
   c. Place a check in the box for **Automatically obtain DNS information from provider** to have the system obtain the required information from the local network.

   Statically set IP addresses:

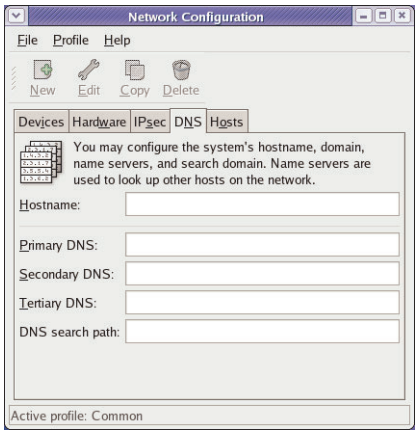
   Fill in the following fields (information provided by the local network administrator):

   a. **Address:**
   b. **Subnet mask:**
   c. **Default gateway address:**
6. Click **OK**.

7. Click on the **DNS** tab.
8. Delete any entries already present.
9. Enter the following:
   - **Hostsname**

     The default name is Varian-NMR.
   - **DNS addresses**

     Enter all DNS addresses supplied by the site network administrator
   - **DNS search path**.
10. Click **File.**
11. Click **Save** and Save the changes.



12. Click **Quit** to exit the Network Configuration Tool.
13. Click on **System** on the main tool bar.
14. Click **Log out**.
15. Click **Restart**.
16. Click **Restart**.

    The workstation is now attached to the customer network.
17. Continue with installing VnmrJ, refer to the *VnmrJ Installation and Administration* manual for instructions.

3.4 Configuring the Second Ethernet Port with No Local Network Connection

Use this procedure if network information is not available or no local network connections is required:

Start the Systems Setting Window

1. Click on **System** on the **Main Menu**.
2. Select **Administration**.
3. Select **Network** to start the **Network Configuration Tool**.
4. Click the **Devices** tab.

Configure eth0

1. Double-click **eth0**.
2. Select **Activate device when computer starts** in the *Ethernet Device* screen (must be selected or port will not be active after reboot).
3. Check **Statically set IP addresses** (Do NOT select DHCP).

a. Set **IP=123.123.123.123** (or any phony IP) except 172.xx.xx.xx)

b. Subnet mask=255.255.255.0

c. Leave gateway IP blank.

d. Click **OK**.

4. Highlight **eth0**

5. Click **activate**.

6. Click on the **DNS** tab.

   The default hostname, `localhost.localdomain`, should show in the DNS tab. Do not call the host computer wormhole or use any of the names listed in Table 1, "Reserved System Names," on page 8.

Note: If the computer boot-up hangs up (for 5 minutes) at *enabling swap space*, do one of the following:

a. Activate and configure `eth0`.

b. Disable sendmail service if not connected to a LAN `(applications=>system settings=>server settings=>services)`.

7. Continue with installing VnmrJ.

   Refer to the *VnmrJ Installation and Administration* manual for instructions.

3.5 Configuring eth0/hostname After Loading VnmrJ

1. Login as root.

2. Open a terminal window.

3. Enter: **`/vnmr/bin/sudoins`**

   This sets vnmr1's privileges with user accounts.

   A message **`sudoins done`** should appear.

- The following messages or events may occur if the eth0/hostname is configured after loading VnmrJ:

  `Cannot make a new user.`

  `Cannot set up printers.`

  `Console is inactive/cannot communicate.`

- Hostname changes to wormhole (i.e., the terminal prompt shows *vnmr1@wormhole)*.

  a. The hostnames in the DNS GUI field, `/etc/sysconfig/network`, and typing `hostname` in a terminal should have the same hostname (localhost or some other name, but not wormhole).

  b. Ensure that both `ifcfg-eth0` and `ifcfg-eth1` (under `/etc/csysconfig/network-scripts`) do not have a line similar to `hostname=wormhole`. If they do, simply delete the line.

- Controllers take a long time to boot (more than 3 minutes instead of the normal 10-15 seconds).

  Reset as follows:

a. Reset the master1 controller. Wait for all the controllers to boot (may take 4-5 minutes).

b. Open a a terminal window and change user to root

c. Type: **`/vnmr/bin/setacq`**

   It will fail.

d. Reboot the master1 again.

   All controllers should boot in 10-15 seconds.

e. Re-run **`setacq`**.

f. Start **VnmrJ**.

g. Enter **`load=y su`** on the VnmrJ command line (*setup complete* message should appear).

Chapter 4. Linux Administration Notes

Sections in this chapter:

This chapter provides some additional information about Linux administration as it relates to VnmrJ.

4.1 Understanding User Accounts

One method of creating user accounts for VnmrJ is to let the VnmrJ installation software use the “VnmrJ master user” (vnmr1), and to then use vnmrj adm (the VnmrJ Administrative interface) to create any additional users (vnmrj adm calls makeuser internally; calling makeuser in a UNIX shell should also be OK).

The one drawback with this method is that makeuser automatically selects a user-ID (UID) for new users, and if you define multiple users, their user-ID will depend on the sequence in which they are defined. On a single / stand-alone Linux / VnmrJ installation this is perfectly OK – the user actually never needs to know what his/her user-ID is. However, in networked installations with multiple Linux / VnmrJ installations you may experience problems if the user-ID for a given user name is not the same across all workstations, in that (for example) on NFS-mounted partitions you may not be able to read what you think are your files on the remote system, because these files may have an unexpected UID.

The proper solution for networked systems (apart from using NIS or similar means of sharing user definitions, password information etc.) would be to define all users before starting the VnmrJ installation. This way you (or the system administrator) can decide what the user-ID for a given user name should be on all systems, and the user definitions can be made consistent across the network.

Note that makeuser allocates UIDs starting and incrementing from the value 500. Many UNIX system administration handbooks actually recommend the following:

- Not using UIDs below 100 at all (these should be reserved for internal use).
- Using UIDs between 100 and 1000 for administrative accounts only.
- Allocating UIDs from 1001 (or 1000) up for ordinary users.

Note that under Solaris, makeuser allocates UIDs starting at value 72 – we strongly recommend not propagating this to the Linux systems.

The real pitfall with a manual user account definition under Linux is in the choice of user shell: by default, under RedHat Linux, user accounts are set up with “bash” as the default user shell. You will not be able to start VnmrJ with this setting. You must make sure you specify **tcsh** (`/bin/tcsh`) as the user's default shell on Linux platforms.

4.2 Transferring Data from a Sun to a Linux PC

This section (adapted from *Varian NMR News 2005-02-13*) describes transferring data from a Sun workstation to a Linux workstation. You may want to transfer files if you are considering upgrading a NMR spectrometer host from a Sun workstation to a PC running RedHat Linux and VnmrJ 2.1A or newer.

- section “Single-User Data Transfer” on page 18
- section “Multiple-User Data Transfer” on page 19

Single-User Data Transfer

The most generic solution certainly is to use NFS mounting for temporary access to the Sun disk from the PC. This involves the following steps:

1. Make sure both systems are on the same network branch and can access each other.

   It is convenient if the systems know each other through entries in `etc/hosts` (then you can use host names), but that's not a requirement; the minimal condition is that the two systems can reach each other by IP address - you can test this by using `ping` *`ip_address`* e.g.:

   ```
   # ping 123.45.67.89
   ```

   which should report:

   ```
   host 123.45.67.89 is alive
   ```

   Make sure you try this from both sides.

2. On the Sun, edit the file `/etc/dfs/dfstab` as root, adding a line such as

   ```
   share -F nfs /export/home
   ```

   then (still as root) enter:

   ```
   /etc/init.d/nfs.server start
   ```

   which initiates the sharing and starts the necessary NFS daemon copies. The command `share` without argument should now report the shared file system.

3. On the Linux PC, as root, make sure you have a mount point that you can use, e.g.:

   ```
   mkdir /mnt/sundisk
   ```

   Mount the Sun file system with

   ```
   mount host_name:/export/home /mnt/sundisk
   ```

   or, if the Sun workstation is not listed in `/etc/hosts`:

   ```
   mount ip_address:/export/home /mnt/sundisk
   ```

4. As a VnmrJ user, you should be able to transfer your files, e.g., with

   ```
   cp -r /mnt/sundisk/vnmr1/vnmrsys/data/* ~/vnmrsys/data
   ```

   – OR –

   ```
   cp -r /mnt/sundisk/vnmr1/data/* ~/data
   ```

   (This command will not work if you are logged in as root)

   This works as expected, under two conditions:

   - There are no symbolic links involved (`cp -r` would replace such links by the files they are pointing to). If you want symbolic links to be copied as such, then rather use a command such as:

     ```
     cd /mnt/sundisk/vnmr1/data
     tar cf - . | (cd ~/data; tar xfBp -)
     ```

- All files to be copied are “world-readable”, i.e., have read permission for everybody (and directories must have “execute” permission for everybody). The problem with the last point is that in all likelihood (at least, if you simply used `makeuser` to define the VNMR / VnmrJ users on the two systems), users may have identical names on both systems, but they will have different UIDs (see also Varian NMR News 2005-02-05). If the copying fails, you can alter the permissions first: log into the Sun, then (as VNMR / VnmrJ user) use the following command:

  ```
  chmod -R +r ~
  ```

  and in the case of problems with directory access use

  ```
  find ~ -type d -exec chmod +x {} \;
  ```

It may be necessary for every VnmrJ user to perform these steps. While basic FTP is OK for simple, plain files, it is tedious to use for transferring nested directories - but alternatively, you may user GUI-based, easy-to-use FTP utilities such as gFTP under Linux to do the data transfer.

This should avoid permission issues, as on the remote system you act as a local user.

Note: Beware of transferred binary executables! Compiled programs ONLY work on the architecture for which they have been compiled. Files (other than shell scripts) in `~/bin` or `/vnmr/bin` are suspicious under that aspect.

Multiple-User Data Transfer

With many users a managed data transfer as root might be more efficient than the single-user procedure described above. To do this, you must export the Sun file system(s) *with root permission*. This is achieved by changing the file sharing command in `/etc/dfs/dfstab`, for example:

```
share -F nfs -o root=host1:host2 /export/home
```

where *host1* and *host2* would be potential NFS clients with root access. Now, after mounting, root retains root access even on the NFS-mounted file system, and a global data transfer can be done with the following commands, for example:

```
mkdir /home/import
cd /export/home
tar cf - vnmr1 vnmr2 user3 user4 ... | (cd /home/import; tar xvfBp -)
```

where `/home/import` is a directory on the Linux system that receives all Sun files. In this case, the transferred files will retain the UID and the GID that they had in the Sun and Solaris environment. Due to the potential discrepancy in the UID and GID assignment, you will need to correct the ownership of the transferred files. You can do this by file or directory name, for example:

```
cd /home/import
chown -Rh vnmr1:nmr vnmr1
chown -Rh vnmr2:nmr vnmr2
...
```

Alternatively, if you have directory trees with mixed ownership, you can change the ownership by UID, for example, if vnmr1 in Solaris had UID 72, you can catch all files with that UID by entering:

```
find /home/import -user 72 -exec chown -h vnmr1:nmr {} \;
```

In this case, the recursion is achieved with the `find` command. The `-h` option causes `chown` to change the ownership of a symbolic link rather than trying to change it on the file the link points at.

4.3 Logging in Remotely to a Linux Workstation

Security features in Linux require the use of **`ssh`** (Secure Shell) instead of `rlogin` to remotely login to a Linux workstation.

The typical syntax for the `ssh` command is:

`ssh [-l login_name] host_name`

Other login options are:

`ssh login -name@host_name`

`ssh host_name [-l login_name]`

Chapter 5. Installing Older Versions of Red Hat® Linux® from CD or DVD

Sections in this chapter:

5.1 Applicability of the CD Installation of Red Hat® Linux®

This procedure assures compatibility with VnmrJ and applies to the installation of 64-bit RedHat Linux version 4.0 from a CD–ROM on the following computer system:

- Dell Precision 380N

WARNING: **Do not use this procedure to install Linux on either of the following systems:**
Dell Precision 390N.
Use the procedure in 5.2 “Applicability of the DVD Installation of Red Hat® Linux®,” on page 26

Dell OptiPlex 755n.
Use the procedure in Chapter 2, “Installing Red Hat® Linux® from a DVD,” page 9.

Booting from the Installation CD

Use the arrow keys (up, down, left, or right) or the mouse to select options during the installation process. The instruction to **Restart** the computer requires powering down the computer and powering it back up. Rebooting the computer is either automatic or the user is prompted to select or accept a restart.

1. Use the 64 bit version of Linux for this installation — read the labels on the CDs.
2. Start the computer.
3. Press **F2** during the start-up process and access the BIOS settings.
   Restart the computer and try again if the screen passes before F2 is pressed.
4. Insert the first of the Linux installation CDs into the CD/DVD drive.
5. Change **Boot Sequence** in the **BIOS settings**.

a. Go to the **Boot Sequence** section after entering the BIOS setup window and press **Enter**.

   Boot options:

   ```
   onboard or USB floppy drive
   onboard SATA hard drive
   onboard IDE hard drive
   onboard or USB CD-ROM
   ```

b. Change this sequence and place the CD-ROM first in boot order.

   The computer first looks at the CD-ROM drive for bootable media; if it does not find bootable media on the CD-ROM drive, it looks for the hard drive or diskette drive.

c. Follow the on screen instructions and press **Enter** to save the changes.

6. Set SATA Operation to **RAID Autodetect / AHCI** as follows:

   a. Select **Drives**.

   b. Press **Enter**.

   c. Select **SATA Operation**.

   d. Press **Enter**.

   e. Select **RAID Autodetect / AHCI**.

   f. Press **Enter**.

   g. Select **Save / Exit** in the next window.

      The system saves changes to the BIOS settings and automatically reboots the computer. Refer to the documentation that came with the host system or the *Red Hat Linux Installation* manual for more information.

   h. Press **ESC** to exit.

   i. Select **Save / Exit**.

   j. Press **Enter**.

7. Select the **CD-ROM** option from the boot loader screen, if asked, and click **OK**.

8. Select the **Graphical Mode** (software will automatically default to graphic mode if no action is taken) for the Red Hat installation.

9. Press **Enter**.

Installing the 64 bit Version of Linux

Install the operating system in the following order:

- "Responding to Options Presented During Installation" on this page
- "Setting Up the Linux Installation Process" on page 23
- "Installing Linux" on page 23
- "Setting up Linux" on page 26

Responding to Options Presented During Installation

The following table summarizes the suggested responses to various prompts presented during the installation process and is provided as a guide and reference. Follow installation procedure beginning with "Setting Up the Linux Installation Process" on page 23.

Screen	*Selection*
Test CD Media	**Skip**
Language Selection	**English**
Keyboard Configuration	**U.S. English**
Installation Type (full)	**Install** Red Hat Enterprise Linux workstation (do not upgrade)
Disk Partitioning Setup	**Automatically Partition** See step 2 in "Installing Linux" on page 23.
Boot Loader Configuration	GRUB (default)
Network Configuration	Network configuration instructions are in "Configuring Network Settings" on page 11.
Firewall Configuration	Select **No firewall**.
Additional Language Support	Select **English (USA)** as the default; select other languages to install such as Japanese.
Time Zone Configuration	Select the local time zone.
Set Root Password	Enter a root password.
Package Installation Defaults	Select **Customize the set of packages to be installed**.
Package Group Selection	Select **Everything**.

Setting Up the Linux Installation Process

1. Wait for the Red Hat Linux installation Welcome screen to display.
2. Click **Next** to begin setting up the installation.

   A series of screens appear that require making a selection and clicking the Next button.
3. Continue with "Installing Linux" on this page.

Installing Linux

Refer to "Responding to Options Presented During Installation" on page 23 and the *Red Hat* manuals as needed.

1. Click on the **Next** button to begin.

   The **Next** button must be clicked on at the completion of each screen to proceed to the next step. The **Back** button steps the process backward.
2. When the *Disk Partitioning Setup* screens do the following:
   a. Select **Automatically Partition**.
   b. Select **Remove all Partitions**.
   c. Verify that the option: **Review (and modify if needed) the partition created** is checked.
   d. Select **Yes …** in popup window.
3. Add the `/home` partition is as follows.

a. Select **Remove all Partitions on this System**.
b. Select **Next**.
c. Select **yes** in Warning dialog box.
d. Select **VolGroup00**.
e. Select **Delete**.
f. Select **/devldsa2**.
g. Select **Delete**.
h. Select **New**.
i. Select **swap** as File System Type with the following:

   Set the size (MB) to **2000**.

   Select **Fixed Size**.

   Select **OK**.
j. Select **New**.
k. Select **/** as the Mount Point and **ext3** as the File System Type with the following:

   Set the size (MB) to **20000**.

   Select **Fixed Size**.

   Select **OK**.
l. Select **New**.
m. Select **/home** as the Mount Point and **ext3** as the File System Type with the following:

   Set the size (MB) to the remaining disk space.

   Select **Fixed Size**.

   Select **OK**.

4. Click **Next** to accept the changes and continue.

   The boot loader in the *Boot Loader Configuration* screen is displayed.
5. Keep the GRUB boot loader as the default.
6. *Do not* configure the **any** network device.

   Device configuration is part of "Configuring Network Settings" on page 11.
7. Click **OK**.
8. Configure the Firewall in the *Firewall Configuration* screen:

   Select **No firewall** and **Disable SELinux active**.
9. Click on **Proceed** in the *Warning No Firewall* popup window.
10. Install *Additional Language Support*:
    a. Select **English (USA)** as the default.
    b. Optional: select other languages.
11. Enter the *time zone* information.
12. Set the *root password* as appropriate.
13. Make the following *Package Installation Defaults* selection*:*

    Select **Customize the set of packages to be installed**.

14. Click **Next.**

    The *Package Group Selection* screen appears—scroll to the bottom and check the **Everything** box, which is at the end of the list.

15. Click **Next** to start the software installation.

16. Click on **Continue**.

    The information window displays a message that CDs 1 to 5 are will be required.

    The Installing Packages screen appears, displays a progress bar, and start6s the installation process. Switch CDs as instructed. An hour or more is required to install the software.

17. Click on **Reboot** when the last CD has loaded.

    Installation of the patch for 64 bit operation fixes any graphics issues after the computer reboots.

    a. **Restart** the computer.

    b. Press **Enter** when the Booting Red Hat Graphics Linux screen appears (screen disappears quickly). Restart the computer after the startup has completed if the Booting Red Hat Graphics Linux screen disappears before the enter key is pressed.

    c. **Highlight** the first entry:

    ```
    Red Hat Enterprise Linux WS (2.6.9-XX.ELsmp)
    ```

    d. **Do not** press Enter.

    e. Press the **a** key to modify the Kernel.

    f. Wait for the Linux kernel to load.

    g. Wait for the operating system to a prompt and text.

    h. **Append** a **-s** (a space proceeds the **-s**) to the end of the line that is displayed and press **Enter**.

    i. Wait for the system to boot and display the `sh-3.00#` prompt.

    j. Insert the *Supplement for DELL 380N CD*, suppled by Varian, into the CDROM drive.

    k. Wait for the system to mount the CD.

    Do the following only if **auto mount fails:**

    Enter the following at the `sh-3.00#` prompt:

    ```
    mount /dev/cdrom /media
    ```

    l. Enter the following at the `sh-3.00#` prompt:

    ```
    cd /media
    ls
    ./pkgsetup
    ```

    m. Wait for the patches to install.

    n. Enter the following at the `sh-3.00#` prompt:

    ```
    cd
    umount media
    eject
    reboot
    ```

Setting up Linux

Complete the setup information requested in the following screens. VnmrJ requires a generic (**`user01`**) user account.

1. Click **Next** in the *Welcome* screen.
2. Read the *License Agreement*— and click **Yes, I agree to the License Agreement**.
3. Click **Next**.
4. Set the appropriate *Date and Time*— and ***disable*** **Network Time Protocol**.
5. Select configure *Graphics and Monitor.*
   - **Select** the monitor supplied with the computer by clicking on the **triangle symbol** next to DELL In the *Monitor Configuration* screen.
6. Set the following in the Customize Graphics Configuration screen:
   - Color Depth: **Millions of Colors**
   - Screen Resolution: **1280x1024** and click **next.**
7. Click on the message **Tell me why … and provide Red Hat login**.
8. Click on **Next**.
9. Choose to not register now.
10. Click on Next.
11. Enter **`user01`** for the *User Account*.
    a. Click **Use Network Login** to configure the name server and authentication.
    b. Click the **User Information** tab and configure the name server as appropriate for the site.

       Refer to the Network Information Worksheet on page 8 and the network administrator.
    c. Click the **Authentication** tab and ***disable*** **Use MD5 Passwords**.
12. Install any of the *Additional CDs* listed.

    VnmrJ does not required the content of these CDs but they might be useful the user.
13. Click **Next** to *Finish Setup.*
14. Login as **root**.

    Linux is now installed as required for VnmrJ.
15. Continue with “Entering the Network Configuring Settings” on page 29.

    Do not install VnmrJ before the network setting are configured.

5.2 Applicability of the DVD Installation of Red Hat® Linux®

This procedure is applicable to the installation of the 64-bit version of RedHat Linux 4.0 update 3 from a DVD on the following computer systems:

- Dell Precision 370N
- Dell Precision 380N
- Dell Precision 390N.

WARNING: Do not use this procedure to install Linux on the following system: Dell OptiPlex 755n.
Use the procedure in Chapter 2, "Installing Red Hat® Linux® from a DVD," page 9.

WARNING: This procedure will completely erase the hard drive; all data will be lost. Backup all data that needs to be retained before continuing.

Disk Partitioning, Packages Installed, and Features

Disk Partitions

This procedure will install the corrected disk image of RedHat Linux 4 update 3 and format the hard disk as SATA with the partitions and sizes given in Table 3:

Table 3. Disk Partitions and Sizes - DVD Installation

Partition	*size*
/boot	100 MB
/	20 GB
swap	2 GB
/home	(rest of disk space)

Packages Installed

- ftp
- RARP daemon

Features

- Improved I/O response time — new format no longer uses the `VolumeGroup0`.
- Redhat 4.0u3 loads the correct network driver.
- Creates root password as varian1.
- Loads all video drivers — no need to install the Supplement CD.

Preparation and First Time Installation

This section is required the first time the operating system is installed. Skip to "Installing RedHat" on page 28 if the operating system is being reloaded.

Note: Make sure that the DVD drive is set to master and the CDRW to slave via jumpers on the back of each drive (this check may be needed on 390N with a DVD/RW below the CDRW). Dell ships the 390 with both drives set to cable select. If the DVD drive is set as cable select (default), automatic installation from DVD will NOT occur–instead you will get the graphical install and have to enter items manually. The jumpers from left to right are cable select (CS), slave (S), and master.

1. Insert the DVD into the DVD/CD-ROM drive and reboot.
2. Hit the **F2** key to get into the Bios (wait for the F2 message to display) as soon as the F2 message appears in the upper right corner.
3. Change the boot sequence in the BIOS to boot from the CD-ROM:

a. Under System use down arrow key to select **Boot sequence** and hit **Enter**.
b. Use arrow keys to highlight the **CD-ROM drive**.
c. Press **U** key to move the CDROM drive to the first boot position.
d. Press **Enter**.

4. Set the hard drive to Raid Autodetect:
   a. Scroll down to the line **Drives** and hit **Enter**.
   b. Scroll down to **SATA Operation** and hit **Enter**.
   c. Select **RAID Autodetect / AHCI** and hit **Enter** (click save if prompted).

WARNING: **Do not select *Combination*. Linux will not function with this selection**

5. Press **Esc**.
6. Select **Save /Exit**.
7. Press **Enter** (the computer reboots).
8. Continue with "Installing RedHat" on page 28.

Installing RedHat

1. Do one of the following:
   - First time installation — continue with step 2.
   - Re-installation of Linux — do the following:
   a. Insert the DVD into the DVD/CD-ROM drive.
   b. Reboot.
   c. Wait for the RedHat installation prompt.
   d. Continue with step 2.
2. Enter in the following based on the computer model at the **boot prompt**:

Computer type	*Enter the following*
Dell 370N	`linux ks=cdrom:/ks370.cfg`
Dell 380N	`linux ks=cdrom:/ks380.cfg`
Dell 39N	`linux ks=cdrom:/ks390.cfg`

   Installation of Linux OS requires about 35 minutes. The installation routine sets the root password to varian1, ejects the DVD, and reboots the system after the OS is installed. Remove the DVD at before it is automatically re-inserted and the system starts to load the software from the DVD (if this happens eject the DVS and reboot the system).
3. Press any key during the first reboot when *Welcome to Kudzu* screen appears.
4. Do the following:
   - **Dell 390N:**
   a. Click on the Hardware Added window.
   b. Use the arrow keys in the Hardware Added window and highlight **configure** for the **Broadcom network card**.

c. Press **enter**.

d. Click on the **Configure TCP/IP** window.

e. Select **Do NOT check "Use dynamic IP…"**

f. Set the IP address as follows:

Main network address	*Set IP to*
Does not start with 172.16	172.16.0.1
Starts with 172.16	10.0.0.1

g. Set netmask to **255.255.255.0**

h. Leave the field for gateway **blank**.

i. Use down arrow to click **OK**.

- **Dell 370N, Dell 380N, and Dell 390N:**

a. Click on the Hardware Added window.

b. Use the right arrow key in the Hardware Added window to highlight **Ignore** for the **nVidia video adapter**.

c. Press **enter**.

5. Wait for the computer to finish the reboot process.
6. **Do not load the "Supplement for Dell 390N" CDROM**.
7. Continue with "Entering the Network Configuring Settings" on page 29.

5.3 Entering the Network Configuring Settings

Configure the network in the *Network Configuration* screen. Each workstation ethernet port must be configured. Systems not connected to a network require only one ethernet port (on board port) and systems connected to a network require two ethernet ports (one on board and one card).

Follow the procedures in Chapter 3, "Configuring Network Settings," page 11 with the following exception for starting the Network Configuration Tool:

1. Log in as root.
2. Click on **Applications** on the **Main Menu**.
3. Select **System Settings**.
4. Select **Network** to start the **Network Configuration Tool**.
5. Click the **Devices** tab.
6. Continue with Chapter 3, "Configuring Network Settings," page 11.