

# ***Red Hat Linux 7.2***

## **The Official Red Hat Linux for S/390 Installation Guide**

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# Introduction

Welcome to the *Official Red Hat Linux for S/390 Installation Guide*.

The *Official Red Hat Linux for S/390 Installation Guide* contains useful information to assist you during the installation of Red Hat Linux. From fundamental concepts such as installation preparation (gathering information about your current system) to the step-by-step installation procedure, this book will be a valuable resource as you install Red Hat Linux.

This manual will walk you through a typical S/390<sup>1</sup> installation. Once you have completed the installation as outlined in this manual, you will have a fully functioning Red Hat Linux system.

## Document Conventions

When you read this manual, you will see that certain words are represented in different fonts, typefaces, sizes and weights. This highlighting is systematic; different words are represented in the same style to indicate their inclusion in a specific category. The types of words that are represented this way include the following:

### **command**

Linux commands (and other operating system commands, when used) are represented this way. This style should indicate to you that you can type in the word or phrase on the command line and press [Enter] to invoke a command. Sometimes a command contains words that would be displayed in a different style on their own (e.g., filenames). In these cases, they are considered to be part of the command, so the entire phrase will be displayed as a command. For example:

Use the `cat testfile` command to view the contents of a file, named `testfile`, in the current working directory.

### **filename**

Filenames, directory names, paths and RPM package names are represented this way. This style should indicate that a particular file or directory exists by that name on your Red Hat Linux system. Examples:

The `.bashrc` file in your home directory contains bash shell definitions and aliases for your own use.

The `/etc/fstab` file contains information about different system devices and filesystems.

The `/usr/share/doc` directory contains documentation for various programs.

Install the `webalizer` RPM if you want to use a Web server log file analysis program.

<sup>1</sup> S/390 and zSeries hardware systems are commonly referred to as the mainframe.

---

## application

This style should indicate to you that the program named is an end-user application (as opposed to system software). For example:

Use **Netscape Navigator** to browse the Web.

## [key]

A key on the keyboard is shown in this style. For example:

To use **[Tab]** completion, type in a character and then press the **[Tab]** key. Your terminal will display the list of files in the directory that start with that letter.

## [key]-[combination]

A combination of keystrokes is represented in this way. For example:

The **[Ctrl]-[Alt]-[Backspace]** key combination will restart the X Window System.

## text found on a GUI interface

A title, word or phrase found on a GUI interface screen or window will be shown in this style. When you see text shown in this style, it is being used to identify a particular GUI screen or an element on a GUI screen (e.g., text associated with a checkbox or field). Examples:

On the GNOME **Control Center** screen, you can customize your GNOME window manager.

Select the **Require Password** checkbox if you would like your screensaver to require a password before stopping.

## top level of a menu on a GUI screen or window

When you see a word in this style, it indicates that the word is the top level of a pulldown menu. If you click on the word on the GUI screen, the rest of the menu should appear. For example:

Under **Settings** on a GNOME terminal, you will see the following menu items: **Preferences**, **Reset Terminal**, **Reset and Clear**, and **Color selector**.

If you need to type in a sequence of commands from a GUI menu, they will be shown like the following example:

Click on **Programs=>Applications=>Emacs** to start the Emacs text editor.

## button on a GUI screen or window

This style indicates that the text will be found on a clickable button on a GUI screen. For example:

Click on the **Back** button to return to the Web page you last viewed.

## computer output

---

When you see text in this style, it indicates text displayed by the computer on the command line. You will see responses to commands you typed in, error messages and interactive prompts for your input during scripts or programs shown this way. For example:

Use the `ls` to display the contents of a directory:

```
$ ls
Desktop          axhome          logs           paulwesterberg.gif
Mail             backupfiles    mail           reports
```

The output returned in response to the command (in this case, the contents of the directory) is shown in this style.

### prompt

A prompt, which is a computer's way of signifying that it is ready for you to input something, will be shown in this style. Examples:

```
$
#
[stephen@maturin stephen]$
leopard login:
```

### user input

Text that the user has to type, either on the command line, or into a text box on a GUI screen, is displayed in this style. In the following example, **text** is displayed in this style:

To boot your system into the text based installation program, you will need to type in the **text** command at the `boot:` prompt.

Another example, with the word **root** displayed as something the user needs to type in:

If you need to log in as root when you first log into your system, and you are using the graphical login screen, at the Login prompt, type **root**. At the Password prompt, type in the root password.

Additionally, we use several different strategies to draw your attention to certain pieces of information. In order of how critical the information is to your system, these items will be marked as a note, a caution, or a warning. For example:


---

---

**Note**

Remember that Linux is case sensitive. In other words, a rose is not a ROSE is not a rOsE.

---

**CAUTION**

Do not do routine tasks as root — use a regular user account unless you need to use the root account to administer your system.

---

**WARNING**

**If you choose not to partition manually, a server installation will remove all existing partitions on all installed hard drives. Do not choose this installation class unless you are sure you have no data you need to save.**

---

## How to Use This Manual

This manual focuses on VM and LPAR-based installations. It will help you prepare your system, walk you through the installation, and assist you in the configuration of Red Hat Linux.

If you are an experienced user and you do not need a review of the basics, you can skip ahead to Chapter 2, *Installing Red Hat Linux* to begin the installation process.

---

**Tip**

Refer to the **Red Hat Frequently Asked Questions** for answers to questions and problems that may occur before, during, or after the installation. You will find the FAQ online at:

[http://www.redhat.com/support/docs/faqs/rhl\\_general\\_faq/](http://www.redhat.com/support/docs/faqs/rhl_general_faq/)

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## We Need Feedback!

If you spot a typo in the *Official Red Hat Linux for S/390 Installation Guide*, or if you have thought of a way to make this manual better, we would love to hear from you! Please submit a report in Bugzilla ( <http://www.redhat.com/bugzilla/>) against the component *rhl-ig-s390*.

Be sure to mention the manual's identifier:

```
rhl-ig-s390(EN)-7.2-Print-RHI (2001-08-27T12:27-0400)
```

That way we will know exactly which version of the guide you have.

If you have a suggestion for improving the documentation, try to be as specific as possible when describing it. If you have found an error, please include the section number and some of the surrounding text so we can find it easily.

If you have a support question (for example, if you need help configuring X, or if you are not sure how to partition your hard drive[s]), please register your product at <http://www.redhat.com/apps/activate/> and use the online support system for those type of requests.

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# 1 Steps to Get You Started

The installation process assumes basic familiarity with the IBM S/390 platform and makes reference to the *IBM Linux for S/390 Redbook* (SG24-4987-00 and SG24-6264-00) guide (see <http://www.redbooks.ibm.com> for more information). In general, this section assumes that you have reviewed the *Redbook* and are familiar with setting up logical partitions (LPARs) and virtual machines (VMs) on an S/390 system.

---

## Note

For the most current IBM resources, please visit <http://www.ibm.com/eserver/zseries>.

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Before you install Red Hat Linux, you will need to perform the following steps:

1. Allocate **DASD**<sup>1</sup> partitions (2 recommended of at least 2 GB each).
2. Acquire a minimum of 64 MB RAM (128 MB is strongly recommended) to designate for the Linux virtual machine.
3. Determine if you need swap space and if so how much. While it is possible (and recommended) to assign enough memory to the VM and let the VM do the necessary swapping, there may be cases where the amount of required RAM is not predictable. In cases such as this, the amount of swap dedicated should be equal to two times the amount of RAM.
4. Decide what environment under which the Red Hat Linux operating system will run (on an LPAR or as a guest operating system on one or more virtual machines).
5. Finally, it is important to review sections 3.3 through 3.8 and Chapters 5 and 6 of the *IBM Linux for S/390 Redbook*, as it explains the different configurations and install scenarios available on the S/390 platform as well as how to setup an initial LPAR or Linux virtual machine (VM).

## 1.1 Do You Have the Right Red Hat Linux Components?

If you have purchased the Official Red Hat Linux boxed set, you are ready to go. However, mistakes occasionally happen, so now is a good time to double-check the contents of your boxed set.

<sup>1</sup> Direct Access Storage Devices (or DASDs) are hard disks that allow a maximum of three (3) partitions per DASD. For example, `dasda` has `dasda[123]`.

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A black, red, and white Registration Information card is included in your boxed set. A list of the contents of your boxed set version is on the back of the card. Please read over the list and check to make sure that you have all the CDs and manuals that are included with the version of Red Hat Linux that you purchased.

If you have purchased the Official Red Hat Linux boxed set from Red Hat, Inc. (or one of its distributors), and you are missing one or more of the items listed, please let us know. Contact information is also available on the box as well as on the Registration Information card.

*How to identify our official boxed set:* The bottom of our box has an ISBN number next to one of the bar codes. That ISBN number should be in this form:

1-58569-x-y

(The *x* and *y* will be unique numbers.)

Red Hat partners with companies (international and domestic) so that we can make Red Hat Linux available to you in the most convenient form. Because of these partnerships, you might find that your Red Hat Linux boxed set may not have been actually produced by Red Hat.

Red Hat provides support for only official Red Hat Linux products. If your box has a different ISBN number (or none at all), you will need to contact the company that produced your boxed set. Normally, third-party producers will include their logo and/or contact information on the outside of their box; an official Red Hat Linux boxed set lists only our name and contact information.

### 1.1.1 Where to Find Other Red Hat Linux Manuals

If your particular boxed set did not include all of the printed Red Hat Linux manuals, you can find them online or on the Red Hat Linux Documentation CD included with your official Red Hat Linux boxed set.

To find the manuals in both HTML and PDF formats online, go to <http://www.redhat.com/docs>.

### 1.1.2 Registering Your Red Hat Linux Boxed Set

If you have purchased an Official Red Hat Linux 7.2 boxed set, you should register your product. Registration offers many useful services, such as installation support, access to Red Hat Network, and more.

To register your product, go to <http://www.redhat.com/apps/activate/>. You will find your *Product ID* on the Registration Information card in your Official Red Hat Linux boxed set. Once registered, you will have access to all the extras that Red Hat provides to its registered users.

For more information on registering and the scope of Red Hat's technical support offerings, see Appendix C, *Getting Technical Support*.

---

## 1.2 Additional S/390 Hardware Preparation for Installation Notes

The network configuration must be determined beforehand. Red Hat Linux for S/390 supports CTC/Escon and IUCV network device configurations. For the purposes of this installation, it is recommended that two 2 GB DASD partitions be allocated for the installation process. All DASD disk allocations should be completed prior to the install process. After the installation, more DASD disk partitions may be added or deleted as necessary.

## 1.3 Basic Overview of the Boot Method

For installation you must start a kernel (with the Linux kernel), an `initrd.img` for VM installations or a `tapeinrd.img` for LPAR installation (with some basic network applications and kernel drivers), and a `parameter` file with some information about your network configuration. Once this is started on the S/390, the networking will be configured. You can then use `telnet` or `ssh` on another computer to log into your S/390 Linux install image and start an installation script to install S/390 Linux onto your file system.

## 1.4 Common Steps Needed for Installing Red Hat Linux to a VM or LPAR

The Red Hat Linux for S/390 media must be available for either a network installation (via NFS, FTP or HTTP) or installation via local hard disk (DASD). The following steps, common to both VM and LPAR installations, prepare for the chosen method of installation.

### Network Installation

The NFS, FTP or HTTP server to be used for installation over the network must be a separate machine which can provide the complete RedHat tree — this machine is referred to as **RPM-SERVER**. Both the `RedHat/base/` and `RedHat/RPMS/` directories must be available and populated with all files from the two installation CD-ROMs.

---

### Note

The directory specified in the following refers to */location/of/disk/space*. This means it is the directory up to, but NOT including, the RedHat distribution directory. For example, if you have a Red Hat Linux 7.2 CD-ROM mounted on `/mnt/cdrom`, */location/of/disk/space* would be `/mnt/cdrom`.

---

To copy the RedHat tree from each CD-ROM on a Linux machine, and make this tree available:

- Insert CD-ROM 1 and execute the following commands:
  - `mount /mnt/cdrom`
  - `cp -var /mnt/cdrom/RedHat /location/of/disk/space`  
Where `/location/of/disk/space` is a directory you create such as `/export/7.2/`.
  - `umount /mnt/cdrom`
- Insert CD-ROM 2 and execute the following commands:
  - `mount /mnt/cdrom`
  - `cp -var /mnt/cdrom/RedHat /location/of/disk/space`  
Where `/location/of/disk/space` is a directory you create such as `/export/7.2/`.
  - `umount /mnt/cdrom`
- Next, make `/location/of/disk/space` accessible to the installation program via NFS, FTP, or HTTP and verify access from a client.
- For NFS, export the directory by adding an entry to `/etc/exports`. To export to only one S/390 VM or LPAR add an entry like:

```
/location/of/disk/space your.s390.ip.address(ro,no_root_squash)
```

To export to all machines (not appropriate for all NFS systems), add:

```
/location/of/disk/space *(ro,no_root_squash)
```

Restart the NFS daemon (on a Red Hat Linux machine, use `/sbin/service nfs restart`) to force NFS to reload the `/etc/exports` file.

Attempt to mount the directory exported to a temporary directory and view its contents following this example (assuming a Red Hat Linux machine):

```
mkdir /mnt/mytemp
mount -o rw,rsize=8192 -t nfs /whatever/s390-root /mnt/mytemp
cd /mnt/mytemp
ls
umount /mnt/mytemp
rmdir /mnt/mytemp
```

If, with `ls`, you did not see the RedHat directory, then the wrong path may have been mounted and/or exported.

- FTP and HTTP installations also support a second tree structure. To make it easier to access the contents of the two CD-ROMs, you can mount your CD-ROMs or ISO images with the following mount points:

```
/location/of/disk/space/disc1/  
/location/of/disk/space/disc2/
```

For example:

```
mount -o loop CD1.iso /location/of/disk/space/disc1/
```

### Hard Disk Installation

Hard Disk installations require a working Linux system on your S/390, and the use of ISO (or CD-ROM) images rather than the entire installation tree. Depending upon how Red Hat Linux for S/390 was acquired, you may have either a set of CD-ROMs, or ISO images.

Hard drive installations only work from ext2 or ext3 filesystems. If you have a filesystem other than ext2 or ext3 you will not be able to perform a hard drive installation.

- Set of CD-ROMs — you need to create CD-ROM ISO image files from the two installation CD-ROMs. These can be created on a Linux machine by inserting the first CD-ROM into the CD-ROM drive and running:

```
dd if=/dev/cdrom of=/tmp/CD1.iso
```

Repeat for the second CD-ROM, with:

```
dd if=/dev/cdrom of=/tmp/CD2.iso
```

This command may raise an error message when the end of data on the CD-ROM is reached - this can be ignored. The ISO images created can now be used for installation, once copied to the correct DASD.

- ISO images — simply transfer these images to the correct DASD.

Verifying that ISO images are intact before you attempt an installation, will help to avoid problems. To verify the ISO images are intact prior to performing an installation, use an `md5sum` program (many `md5sum` programs are available for various operating systems). An `md5sum` program should be available on the same Linux machine as the ISO images.

Make the correct DASDs accessible to the new VM or LPAR, and then proceed with installation.

## 1.5 Installing under VM

Log onto the VM as the user maintaining Linux installations. You can use `x3270` or `c3270` (from the `x3270-text` package in Red Hat Linux) to log in to VM from other Linux systems. Alternatively, use the

OS/2 3270 terminal emulator on the S/390 management console. If you are working from a Windows based machine, Jolly Giant (<http://www.jollygiant.com>) offers an SSL enabled 3270 emulator.

If you aren't already in CMS mode, enter it now.

```
i cms
```

FTP to the machine containing the Red Hat Linux boot images (`kernel.img` and `initrd.img`), log in, and execute the following commands:

- `cd /where/the/boot/images/are`
- `locsite fix 80`
- `bin`
- `get kernel.img (repl`
- `get initrd.img (repl`
- `ascii`
- `mget *.parm *.exec (repl`
- `quit`

You may now customize the parameter file (`redhat.parm`). See Appendix B, *Sample Parameter Files for LPAR and VM Configurations* for several examples of `parm` files. Below is an explanation of the `parm` file contents.

```
root=/dev/ram0 ro ip=off
```

These values are given directly to the linux kernel and should be left as provided.

```
HOST=<...>
```

**Table 1–1**

Virtual Machine Network Device	Acceptable Values for HOST=<...>
Ethernet (eth0)	<b>HOST=<i>fqdn:device:ipaddr[:mtu]</i></b> where, <b>fqdn</b> is the fully qualified domain name of the virtual machine; <b>device</b> is eth0; <b>ipaddr</b> is the fixed IP address for this virtual machine; <b>mtu</b> is number of maximum transfer units (optional, should be 1492 or 1500). For example: <b>HOST=s390.redhat.com:eth0:1.2.3.4:1500</b>



Virtual Machine Network Device	Acceptable Values for HOST=<...>
CTC (ctc0)	<b>HOST=fqdn:device:ipaddr:gateway[:mtu]</b> where, <b>fqdn</b> is the fully qualified domain name of the virtual machine; <b>device</b> is ctc0; <b>ipaddr</b> is the fixed IP address for this virtual machine; <b>gateway</b> is the IP address of the gateway; <b>mtu</b> is number of maximum transfer units (optional, should be 1492 or 1500). For example: <b>HOST=s390.redhat.com:ctc0:1.2.3.4:1.2.3.3:1500</b>
IUCV (iucv0)	<b>HOST=fqdn:device:ipaddr:host:gateway[:mtu]</b> where, <b>fqdn</b> is the fully qualified domain name of the virtual machine; <b>device</b> is iucv0; <b>ipaddr</b> is the fixed IP address for this virtual machine; <b>host</b> is the VM host name of the IUCV partner; <b>gateway</b> is the IP address of the IUCV partner; <b>mtu</b> is number of maximum transfer units (optional, should be 1492 or 1500). For example: <b>HOST=s390.redhat.com:iucv0:1.2.3.4:1.2.3.3:1.2.3.2:1500</b>

`DASD=x-y[,a-c...]`

Range of addresses of your DASD devices. 200-20f should be sufficient in most cases. Example: `DASD=200-20f,B01-B03,F01`

`DTZ=timezone`

Default time zone as returned by the linux tzselect-utility, Examples: `DTZ=Europe/Berlin` or `DTZ=America/Chicago`

```
LCS=lcs/qeth<dev_num>,<read>,<write>,<data (qeth only,
ignored otherwise)>,<memory_usage>,
<port_no/protocol_no>,<checksum_received_ip_pkts>,<use_hw_stats>
```

---

### Note

The above LCS line values have been broken into segments for easier reading. Ideally, everything listed after `LCS=` should be included as one line

---

Type defines an OSA-2 with LCS (lcs) or an OSA-Express with QDIO/QETH (qeth) device, where `<dev_num>` is the device number that is appended to lcs or qeth (values of -1 indicates driver chooses the value and leaving this field blank will change `<read>` and `<write>` to a probe range for non-qeth devices), `<read>` is the read address, `<write>` is the write address, `<data>` is the data address valid only if qeth is specified, `<memory_usage>` is the amount of memory in kilobytes to allow the driver to use,

---

<port\_no/protocol\_no> allows a port number or protocol to be specified for use by the driver, <checksum\_received\_ip\_pkts> performs error checking on the packets, and <use\_hw\_stats> will make the driver keep statistics on the hardware being used. If one or more of the fields are not specified, the default values are used. Example 1: `LCS=lcs0,0x9a4,0x9a5,0,0` for OSA-2 with LCS, where `read=0x9a4` and `write=0x9a5`. Example 2: `LCS=qeth1,0x0fc00,0xfc01,0x7c02` for an OSA-Express with QDIO/QETH, where `read=0x7c00`, `write=0x7c01`, and `data=0x7c02`.

```
NETWORK=IP:netmask:broadcast[:gw]
```

where, *IP* is your S/390 virtual machine IP; *netmask* the netmask; *broadcast* the broadcast address; *gw* the gateway-IP for your eth device (for eth-device only).

```
DNS=list:of:dns:servers
```

The list of DNS servers, separated by colons. Examples: `DNS=10.0.0.1:10.0.0.2` will use the DNS servers 10.0.0.1 and 10.0.0.2

```
SEARCHDNS=list:of:search:domains
```

The list of the search domains, separated by colons. Example: `SEARCHDNS=redhat.com:redhat.de`

```
RPMSEVER=ftp://your.ftp.server/your.s390.rpm.dir
```

To access the S/390 binary RPM packages via FTP.

```
RPMSEVER=http://your.http.server/your.s390.rpm.path
```

To access the S/390 binary RPM packages via HTTP.

```
RPMSEVER=IP:/your.s390.rpm.dir
```

Give the IP address of the NFS server containing the S/390 binary RPM packages (e.g. via an NFS mount of the Red Hat Linux for S/390 CD-ROM).

```
RPMSEVER=ftp://user:password@your.ftp.server//your.s390.rpm.dir
```

To access the S/390 binary RPM packages via FTP with authentication.

```
MOUNTS=dev:mountpoint,dev2:mountpoint2
```

This defines a comma-delimited list of the DASD device-partitions and where they should be mounted by default. For example:

```
MOUNTS=/dev/dasda1:/,/dev/dasdb1:/usr/share,/dev/dasdc1:/tmp
```

```
SWAP=list:of:swap:devices
```

The list of initial swap devices, delimited by colons. For example:

```
SWAP=/dev/dasds1:/dev/dasdw1:/dev/dasdp1
```

```
DEBUG=<value>
```

If you encounter problems during an install, set `DEBUG` to any value to get a shell at certain steps during an installation.

```
chandev=ctc0,<read_channel_address>,<write_channel_address>  
CHANDEV=ctc0,<read_channel_address>,<write_channel_address>
```

This setup parameter will allow the `ctc` driver to properly connect to the `ctc` read and write channels if connections are reversed. If the `chandev` parameter is not set, the driver will default to detected settings, which, depending on the system setup, may have `ctc` read and write channels reversed. Example: `CHANDEV=ctc0,0x600,0x601` — As an alternative to setting this parameter, the read and write channel connections can be physically swapped.

---

### Note

When setting the parameters, you must either set both or neither of the parameters (`chandev` and `CHANDEV`). These values are necessary for proper boot loader configuration, therefore exactly the same values have to be given as `CHANDEV`.

---

If any of the network parameters required to make the network operate correctly are omitted from the `parm` file, a prompt will appear during the installation boot process.

Next, if the guest ID under which you wish to install is under a different guest, then log out of the 3270 VM session.

```
#cp log
```

If you logged off, reconnect and log in using the VM guest ID you configured earlier for the install. If you are not in CMS mode, enter it now.

```
i cms
```

Run the `redhat` script.

```
redhat
```

The initial installation start-up script will ask you questions about your networking and DASDs unless you have specified all necessary information in the `redhat.prm` file.

Once all questions have been answered, you will be ready to begin the core installation program, `loader`. To continue with the installation, refer to Chapter 2, *Installing Red Hat Linux* for further instructions. Alternatively, refer to Chapter 3, *Installing Red Hat Linux via Text Mode* if you will perform a text mode installation.

---

---

**Note**

If you install over a network with FTP or HTTP you must perform a text mode installation.

---

## 1.6 Installing in an LPAR using the Red Hat Linux LPAR CD

The following steps are to be taken when installing Red Hat Linux onto an LPAR.

- Log in on the Support Element Workplace (some older versions of the SEW are called Hardware Management Console) as a user with sufficient privileges to install a new OS to an LPAR. The "SYSPPROG" user is recommended.
- Select **Images**, then select the LPAR to which you wish to install. Use the arrows in the frame on the right side to navigate to the **CPC Recovery** menu.
- Double-click on **Load from CD-ROM or Server**.
- In the dialog box that follows, select **Local CD-ROM** then click **Continue**.
- In the dialog that follows, keep the default selection of `redhat . ins` then click **Continue**.
- Skip to Section 1.8, *Installing in an LPAR (Common Steps)* to continue.

## 1.7 Installing in an LPAR without the Red Hat Linux for S/390 CD-ROMs

### 1.7.1 Installing in an LPAR without the Red Hat Linux LPAR CD using a recent SEW

- Log in on the Support Element Workplace as a user with sufficient privileges to install a new OS to an LPAR. The "SYSPPROG" user is recommended.
- Select **Images**, then select the LPAR you wish to install to.
- Use the arrows in the frame on the right side to navigate to the **CPC Recovery** menu.
- Double-click on **Load from CD-ROM or Server**.
- In the dialog box that follows, select **FTP Source**, and enter the following information:

**Host Computer:**

hostname or IP address of the FTP server you wish to install from (e.g. `ftp . redhat . com`)

---

**User ID:**

Your user name on the FTP server (or "anonymous")

**Password:**

Your password (use your email address if you are logging in as anonymous)

**Account:**

Leave this field empty

**File location (can be left blank):**

Directory on the FTP server holding Red Hat Linux for S/390 (e.g. /pub/red-hat/linux/rawhide/s390)

- Click **Continue**.
- In the dialog that follows, keep the default selection of `redhat.ins` and click **Continue**.
- Refer to Section 1.8, *Installing in an LPAR (Common Steps)* to continue.

## 1.7.2 Installing in an LPAR without the Red Hat Linux LPAR CD using an old SEW/HMC

- Transfer the `redhat.tdf`, `tapekrnl.img`, `lpar.prm` and `tapeinrd.img` files to the OS/2 machine, in the directory used for virtual tapes. This is usually `F:\AWSOMA`.

If the directory is not `F:\AWSOMA`, you will have to edit the `redhat.tdf` file. A usable editor on OS/2 is `epm`.

- You may now customize the parameter file (`lpar.prm`). See Appendix B, *Sample Parameter Files for LPAR and VM Configurations* for several examples of parm files. Also refer to the previous section, in particular, the *explanation of the parm file contents*.
- If you do not specify any necessary information with these parameters, you will be required to enter the information when the installation program begins.
- Create a virtual tape containing the Red Hat Linux images:

```
awsmount 080 F:\AWSOMA\REDHAT.TDF
awsmount 080 /D /R /REW
```

- Log in on the Support Element Workplace (some older versions of the SEW are called Hardware Management Console) as a user with sufficient privileges to install a new OS to an LPAR. The "SYSprog" user is recommended.
  - Select **Images**, then select the LPAR you wish to install to.
-

- Use the arrows in the frame on the right side to navigate to the **CPC Recovery** menu.
- Double-click on **Load**.
- In the dialog box that follows, select **Clear** and enter the address of the virtual tape you just generated. Usually, this will be **fc80**.
- Click **OK**. Red Hat Linux will be booted.
- If you get any odd messages saying `Load error` or something similar on a Multiprise 3000 or another machine with CD-ROM support, try installing something (anything) from a CD, interrupting, stopping the LPAR, and retrying the **Load** step. This appears to be a bug in some versions of the Support Element Workplace.
- Refer to Section 1.8, *Installing in an LPAR (Common Steps)* to continue.

## 1.8 Installing in an LPAR (Common Steps)

Once the Red Hat Linux installation program has started (if the red field behind the LPAR icon is disappearing, the installation program has begun), select the LPAR and double-click on **Operating System Messages**.

The initial installation start-up script will ask you questions about your networking and DASDs unless you have specified all necessary information in the `lpar.parm` file.

Once all questions have been answered, you will be ready to begin the core installation program, `loader`. To continue with the installation, refer to Chapter 2, *Installing Red Hat Linux* for further instructions. Alternatively, refer to Chapter 3, *Installing Red Hat Linux via Text Mode* if you will perform a text mode installation.

---

### Note

If you install over a network with FTP or HTTP you must perform a text mode installation.

---

## 1.9 Do You Have Enough Disk Space?

Nearly every modern-day operating system (OS) uses **disk partitions**, and Red Hat Linux is no exception. When you install Red Hat Linux, you may have to work with disk partitions.

The disk space used by Red Hat Linux must be separate from the disk space used by other OSes you may have installed on your system.

Before you start the installation process, one of the following conditions must be met:

---

- Your computer must have enough *unpartitioned* disk space for the installation of Red Hat Linux.
- You must have one or more partitions that may be deleted, thereby freeing up enough disk space to install Red Hat Linux.

## 1.9.1 Installation Disk Space Requirements

---

### Note

These recommendations are based on an installation that only installs one language (such as English). If you plan to install multiple languages to use on your system, you should increase the disk space requirements.

---

#### Workstation

A workstation installation, choosing to install GNOME or KDE, requires at least 1.1 GB of free space. Choosing both GNOME and KDE requires at least 1.3 GB of free disk space, while a complete install of every package requires at least 1.6 GB.

#### Server

A server installation requires 800 MB for a minimal installation without X (the graphical environment), at least 900 MB of free space if all components (package groups) other than X are installed, and at least 1.5 GB to install all packages including GNOME and KDE.

#### Custom

A custom installation requires 350 MB for a minimal installation and up to 3 GB of free space if every package is selected.

## 1.10 Which Installation Class is Best For You?

Usually, Red Hat Linux is installed on its own disk partition or set of partitions, or over another installation of Linux.

---

### WARNING

**Installing Red Hat Linux over another installation of Linux (including Red Hat Linux) does *not* preserve any information (files or data) from a prior installation. Make sure you save any important files! To preserve the current data on your existing system, you should back up your data.**

---

Red Hat Linux provides three different classes, or types, of installations:

### Workstation

A workstation installation is most appropriate if you are new to the world of Linux. It will create a system for your home or desktop use. A graphical, Windows-like environment will be installed.

---

### Important

Workstation installations are not recommended for S/390 systems.

---

### Server

A server installation is most appropriate if you would like your system to function as a Linux-based server, and you do not want to heavily customize your system configuration. The server-class installation is the preferred type of installation for S/390 systems.

### Custom

A custom installation allows you the greatest flexibility during your installation. You choose your boot loader, which packages you want, and more. Custom installations are most appropriate for those users more familiar with Red Hat Linux installations and for those afraid of losing complete flexibility.

These classes give you the option of simplifying the installation process (with some potential for loss of configuration flexibility), or retaining flexibility with a slightly more complex installation process. Next, take a detailed look at each class, so you can see which one is right for you.

## 1.10.1 Workstation Installations

Most suitable for new users, the *workstation installation* will install your choice of the GNOME or KDE desktop environments, or both, and the X Window System (the graphical environment).

Below are the minimum recommended disk space requirements for a workstation installation where only one language (such as English) will be installed.

- Workstation choosing GNOME or KDE: 1.1 GB
- Workstation choosing both GNOME and KDE: 1.3 GB

If you plan to choose all group packages (for example, GNOME is a group of packages), as well as select additional individual packages, you may want to allow yourself 1.6 GB or more of disk space. If you provide this extra space, you will have room for additional data, if needed.

---



---

### Note

Unlike workstation installations previous to Red Hat Linux 7.0, performing a Red Hat Linux 7.2 workstation installation will not install the network daemon `xinetd` (inet services). When `xinetd` is not installed, you will have a more secure installation. However, in-bound network-related services such as `finger`, `telnet`, `talk`, and `FTP` will not work.<sup>2</sup> If you require these types of services, please go back and choose a server or a custom installation.

---

## 1.10.2 Server Installations

A *server installation* is most appropriate if you would like your system to function as a Linux-based server, and you do not want to heavily customize your system configuration.

Below are the minimum recommended disk space requirements for a server installation where only one language (such as English) will be installed.

- Server minimum with no graphical interface: 800 GB
- Server choosing everything, no graphical interface: 900 GB
- Server choosing everything, GNOME and KDE: 1.5 GB

If you plan to choose all group packages, as well as select additional individual packages, you may want to allow yourself 1.5 GB or more of disk space. This will provide space where additional data may be written.

During the server installation, *the X Window System is not configured and no GUI will be loaded* when the system boots, unless you choose to install the appropriate packages during package selection.

## 1.10.3 Custom Installations

The *custom installation* allows you the most flexibility during your installation. During a custom installation, you have complete control over the packages that will be installed on your system.

The recommended disk space requirements for a custom installation are as follows:

- Custom minimum: 350 MB
- Custom choosing the default package set: 850 MB
- Custom choosing everything: 3 GB

<sup>2</sup> For example, you can `telnet` out to other systems, but other systems cannot `telnet` in to your system.

---



## 2 Installing Red Hat Linux

This chapter explains how to install Red Hat Linux for S/390 using the graphical, mouse-based installation program. The following topics are discussed:

- Getting familiar with the installation program's user interface
- Starting the installation program
- Selecting an installation method
- Configuration steps during the installation (language, keyboard, mouse, etc.)
- Finishing the installation

### 2.1 The Installation Program User Interface

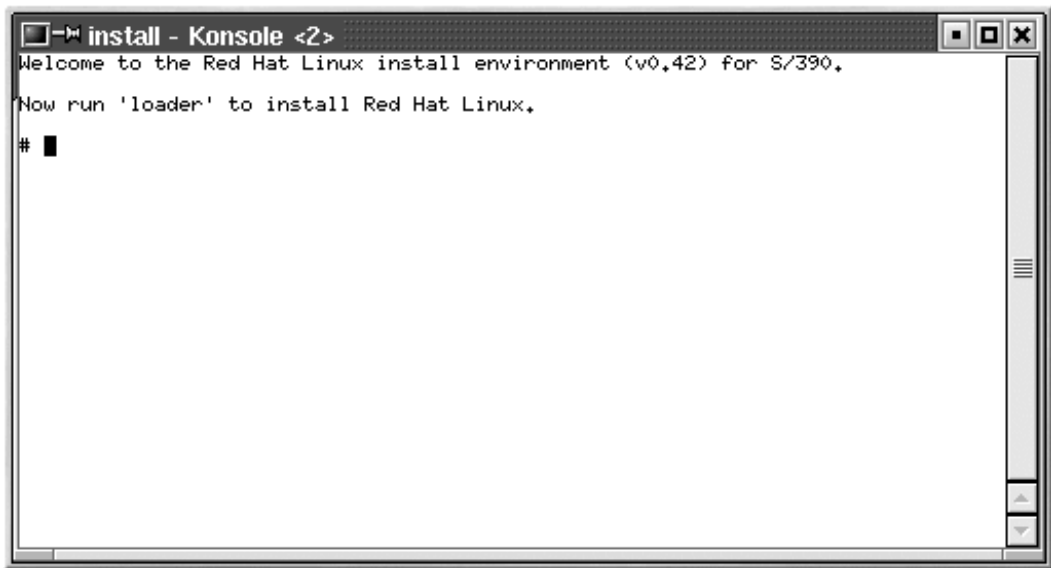
If you have used a **graphical user interface (GUI)** before, you will be familiar with this process; simply use your mouse to navigate the screens, "click" buttons, or enter text fields. You can also navigate through the installation using the [Tab] and [Enter] keys.

### 2.2 Running the Installation Program

After following the steps outlined in Chapter 1, *Steps to Get You Started* for booting an LPAR or VM system, `telnet` or `ssh` to the configured Linux install system on the S/390. Logging on via `ssh` is the preferred method.

When logged into the machine, running `loader` will start the installation program.

---



When `loader` starts, there will be several text mode screens for selecting the installation method. Refer to Section 3.5, *Installing from Hard Drive (DASD)* and Section 3.6, *Installing over a Network* for information on these screens.

---

---

### Note

While the text mode installation program is run by default for most installations, NFS installations will run the graphical installation program by default if you have logged into the VM from an X11 terminal.

If your DNS or hostnames are not set correctly, or the VM is not allowed to open applications on your display, the installation program will fail. You can prevent this by setting a correct `DISPLAY` variable (execute the command `export DISPLAY=workstationname:0.0` at the VM prompt) and allowing the VM to connect (using the command `xhost +vmname` on your local workstation).

If you have a slow connection or prefer a text installation, unset the `DISPLAY` variable by executing the command `unset DISPLAY` at the VM prompt.

If the graphical installation via NFS does not automatically begin for you, be sure to check what the `DISPLAY=variable` is set to. To begin the graphical installation program once you have logged into the VM, you must issue the command `export DISPLAY=workstationname:0.0`, where *workstationname* is the name of your workstation. You must also make sure the workstation you are working on will allow the display of remote windows by setting `xhost +VMname`.

Additionally, if you set a `DISPLAY` variable on your local workstation before connecting to the VM (which is always the case when you connect using an `xterm` inside of an X Window System session), you do not need to do a `xhost +VMname`. The `ssh` application will do all the work for you.

---

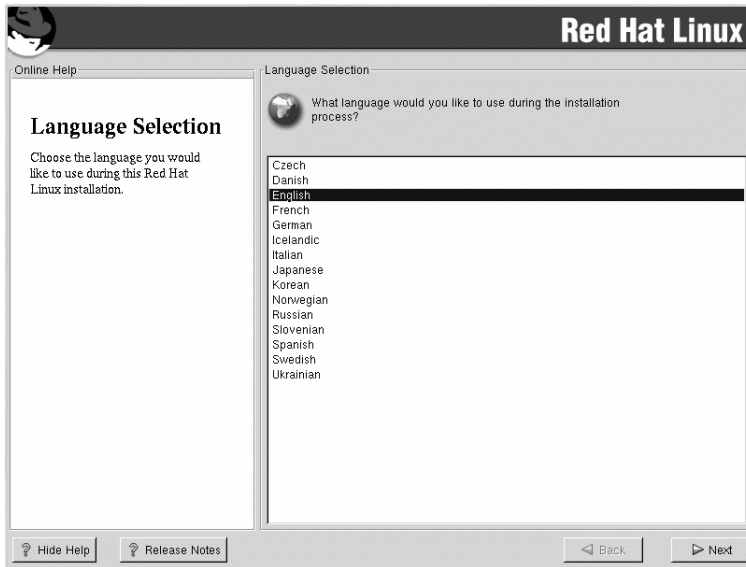
## 2.3 Language Selection

Using your mouse, select the language you would prefer to use for the installation and as the system default (see Figure 2–1, *Language Selection*).

Selecting the appropriate language will also help target your time zone configuration later in the installation. The installation program will try to define the appropriate time zone based on what you specify on this screen.

Once you select the appropriate language, click **Next** to continue.

---

**Figure 2–1 Language Selection**

## 2.4 Welcome to Red Hat Linux

The **Welcome** screen does not prompt you for any input. Please read over the help text in the left panel for additional instructions and information on where to register your Official Red Hat Linux product.

Please notice the **Hide Help** button at the bottom left corner of the screen. The help screen is open by default. If you do not want to view the help information, click on **Hide Help** to minimize the help portion of the screen.

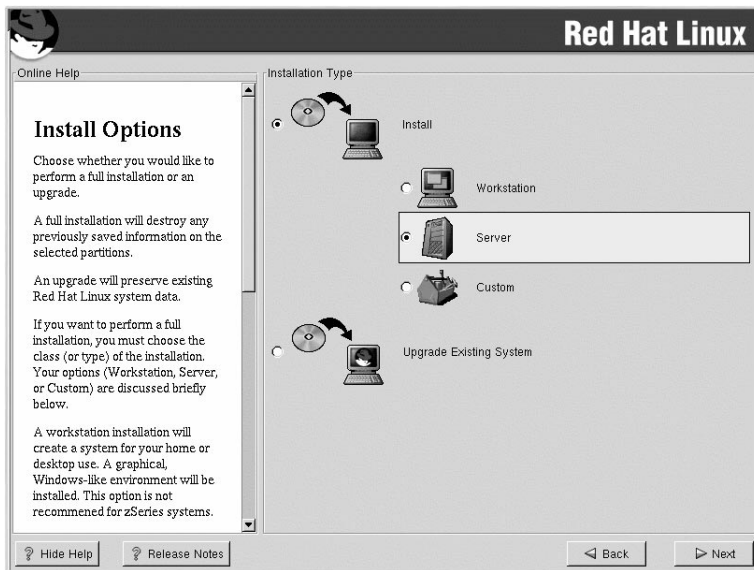
Click on the **Next** button to continue.

## 2.5 Install Options

Choose whether you would like to perform a full installation or an upgrade (see Figure 2–2, *Choosing Your Installation Type*).

Red Hat Linux allows you to choose the installation type that best fits your needs. Your options are **Workstation**, **Server**, and **Custom**.

Figure 2–2 Choosing Your Installation Type



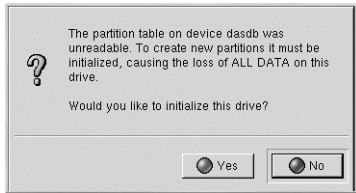
For more information about the different installation classes, please refer to Section 1.10, *Which Installation Class is Best For You?*.

## 2.6 Partitioning with fdasd

If you have assigned previously unused DASDs to the Linux VM, the installation program is sometimes unable to determine the size and geometry of this DASD. In such cases you may see a message similar to: `Unable to determine geometry of file/device`. You should not use `Parted` unless you **REALLY** know what you're doing! This message is presented just for your information. Press **Ignore** to continue with the installation process. The DASD will then be initialized using the `dasdfmt` program.

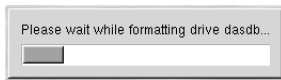
Before you partition your DASD device(s), you may need to initialize the DASD device(s) first. You will only see these screens if the installation program does not find a valid partition table on your DASD device(s), or the DASD device has not been already initialized w/ the **Compatible Disk Layout (CDL)**.

**Figure 2–3 Selecting Your DASD Device to be Initialized**



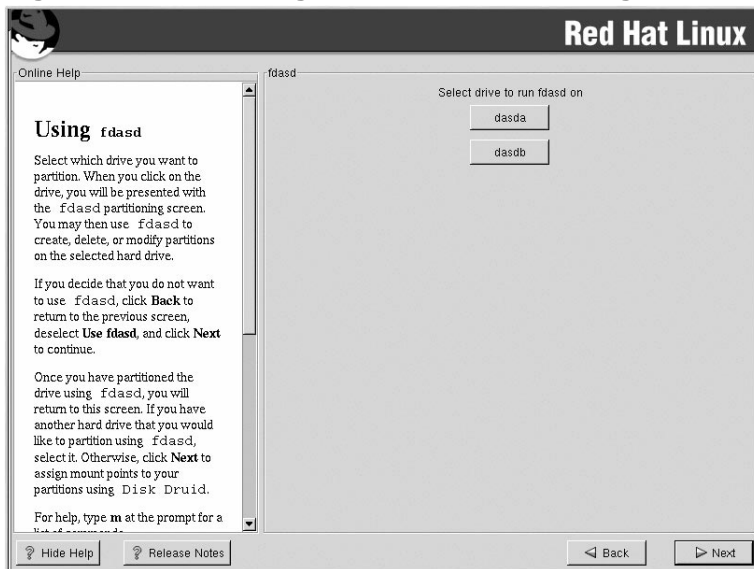
Once you choose to initialize the DASD device, you will see a progress bar while the initialization process takes place.

**Figure 2–4 Intializing Your DASD Device**



To use `fdasd`, you must first select a drive to partition using `fdasd`. Once you have chosen which drive to partition, you will be presented with the `fdasd` command screen. If you do not know what command to use, type `[m]` at the prompt for help.

**Figure 2–5 Selecting a Drive for Partitioning**





The following table provides the most common `fdasd` commands.

**Table 2–1 fdasd commands**

Command	What it Does
m	displays help
p	displays the current partition table
n	creates a new partition
d	deletes a partition
v	changes the volume serial
t	sets the type of partition
r	recreates the VTOC
s	shows the mapping between partition numbers in the device node and the z/OS data set name
q	quits <code>fdasd</code>
w	writes the partition table to disk

You will need to be aware of a few issues regarding partitioning with `fdasd`. First, Linux `fdasd` creates partitions of type **linux** by default. The partition type for any given partition may be specified by using the `t` command in `fdasd`. The three (3) partition types available are:

**Table 2–2 Available Partition Types**

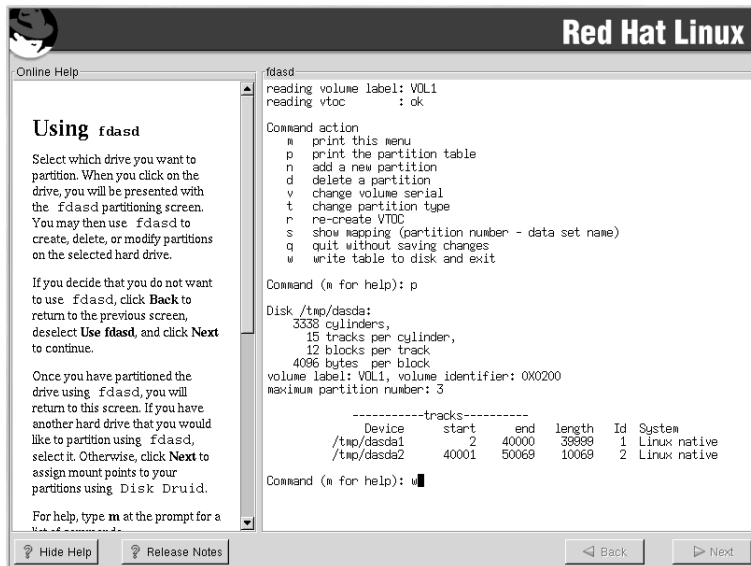
Type ID	Type Name (Description)
1	Linux Native
2	Linux Swap
3	Linux RAID

RAID partitions and swap partitions need to be marked as such using `fdasd` at this stage of installation.

Red Hat Linux for S/390 supports the Compatible Disk Layout (CDL) for DASDs. CDL supports up to three (3) partitions (and is z/OS compatible). We suggest taking a note of which partitions (e.g. `/dev/dasda2`) are intended for which mount points (e.g. `/usr`) as you create partitions in `fdasd`.

When you are finished making partitions, type [w] to save your changes and quit. You will be taken back to the original `fdasd` screen where you can choose to partition another drive or continue with your installation.

**Figure 2–6 Partitioning with `fdasd`**



### Note

None of the changes you make take effect until you save them and exit `fdasd` using the `w` command. You can quit `fdasd` at any time without saving changes using the `q` command.

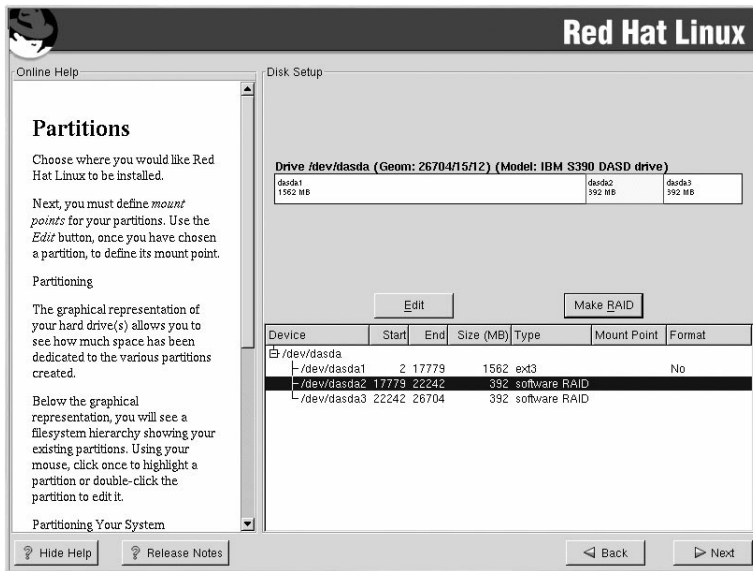
After you have partitioned your drive(s), click **Next**. You will need to use Disk Druid to assign mount points to the partitions you just created with `fdasd`.

You will not be able to add new partitions using Disk Druid, but you will be able to assign mount points for the partitions you have already created. For each partition created with `fdasd`, click on the **Edit** button, choose the appropriate mount point for that partition from the pulldown menu, and click on **OK**.

## 2.7 Partitioning Your System

At this point, you must tell the installation program where to install Red Hat Linux. This is done by defining mount points for one or more disk partitions in which Red Hat Linux will be installed.

**Figure 2–7 DASD Partitions**



### 2.7.1 Graphical Display of Hard Drive(s)

Disk Druid offers a graphical representation of your hard drive(s).

Using your mouse, click once to highlight a particular field in the graphical display. Double-click to edit an existing partition and assign a mount point.

Above the display, you will see the **drive** name (such as /dev/dasda), the **geom** (which shows the hard disk's geometry and consists of three numbers representing the number of cylinders, heads, and sectors as reported by the hard disk), and the **model** of the hard drive as detected by the installation program.

---

### Note

For S/390 systems, Disk Druid will only assign (or edit) mount points for the partitions you created using `fdasd`. You will not be able to add or delete partitions using Disk Druid.

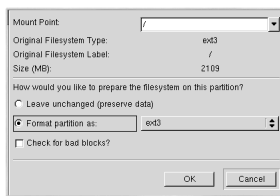
---

## 2.7.2 Disk Druid's Buttons

These buttons control Disk Druid's actions. They are used to change the attributes of a partition (for example the filesystem type and mount point) and also to create RAID devices. Buttons on this screen are also used to accept the changes you have made, or to exit Disk Druid. For further explanation, take a look at each button in order.

- **Edit:** Used to modify attributes of the partition currently selected in the **Partitions** section. Selecting **Edit** opens a dialog box. Some or all of the fields can be edited, depending on whether the partition information has already been written to disk.

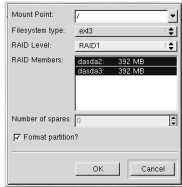
**Figure 2–8 Editing Your DASD Partitions**



- **Make RAID:** **Make RAID** can be used if you want to provide redundancy to any or all disk partitions. *It should only be used if you have experience using RAID.* To read more about RAID, please refer to *RAID (Redundant Array of Independent Disks)* in the *Official Red Hat Linux Customization Guide*.

To make a RAID device, you must first create software RAID partitions. Once you have created two or more software RAID partitions, select **Make RAID** to join the software RAID partitions into a RAID device.

---

**Figure 2–9 Setting Up Your RAID Device**

## 2.7.3 Partition Fields

Above the partition hierarchy are labels which present information about the partitions you are creating. The labels are defined as follows:

- **Device:** This field displays the partition's device name.
- **Start:** This field shows the sector on your hard drive where the partition begins.
- **End:** This field shows the sector on your hard drive where the partition ends.
- **Size:** This field shows the partition's size (in MB).
- **Type:** This field shows the partition's type (for example, ext2 or ext3).
- **Mount Point:** A mount point is the location within the directory hierarchy at which a volume exists; the volume is "mounted" at this location. This field indicates where the partition will be mounted. If a partition exists, but is not set, then you need to define its mount point. Double-click on the partition or click the **Edit** button.

## 2.7.4 Editing Partitions

To edit a partition, select the **Edit** button or double-click on the existing partition.

---

### Note

If the partition already exists on your hard disk, you will only be able to change the partition's mount point. If you want to make any other changes, you will need to delete the partition and recreate it.

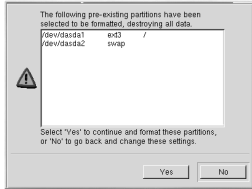
---

## 2.7.5 Formatting Your DASD Partitions

When you click **Next** to create your DASD partitions, a warning screen will appear. This screen allows you to perform a final check regarding formatting the pre-existing partitions displayed in this warning.

---

**Figure 2–10 DASD Partition Format Warning**



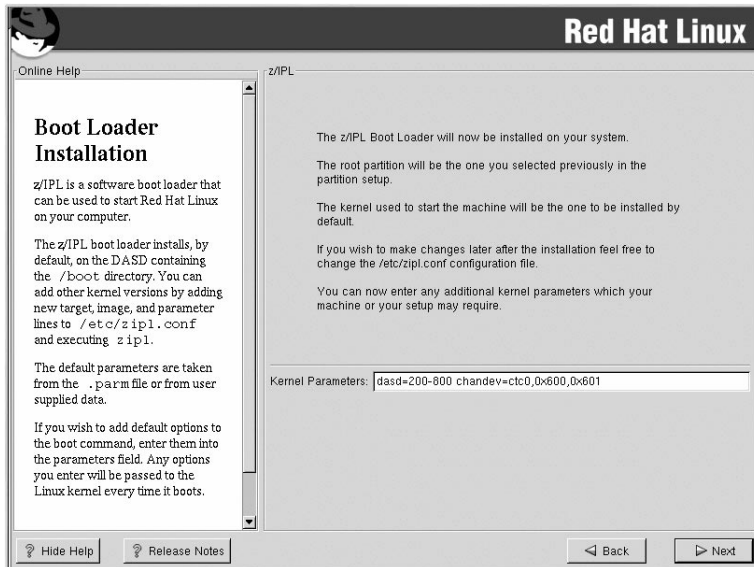
If you do not wish for these partitions to be formatted, select **No**. By selecting **No**, you will be able to go back and make any necessary modifications to your partitions. To continue with the installation, select **Yes**.

## 2.8 Boot Loader Installation

In order to boot your Red Hat Linux system without a boot disk, you usually need to install a boot loader.

z/IPL is the software boot loader that is used to IPL your installation of Red Hat Linux.

**Figure 2–11 Boot Loader Installation**



If you wish to add default options to z/IPL's boot command, enter them into the **Kernel parameters** field. Any options you enter will be passed to the Linux kernel every time it boots.

## 2.9 Network Configuration

If you do not have a network device, you will not see this screen. Skip ahead to Section 2.10, *Firewall Configuration*.

If you have a network device and you have not already configured your networking, you now have the opportunity (as shown in Figure 2–12, *Network Configuration*).

If you have multiple devices, you will see a tab for each device. You may switch between devices (for example, between eth0 and eth1) and the information you provide on each tab will be specific to each device.

Indicate if you would like to configure your IP address using DHCP (Dynamic Host Configuration Protocol). If you select **Activate on boot**, your network interface will be started when you boot. If you do not have DHCP client access or you are unsure what to provide here, please contact your network administrator.

Next enter, where applicable, the **IP Address**, **Netmask**, **Network**, **Broadcast**, and **Point to Point** addresses. If you are unsure about any of these, please contact your network administrator.

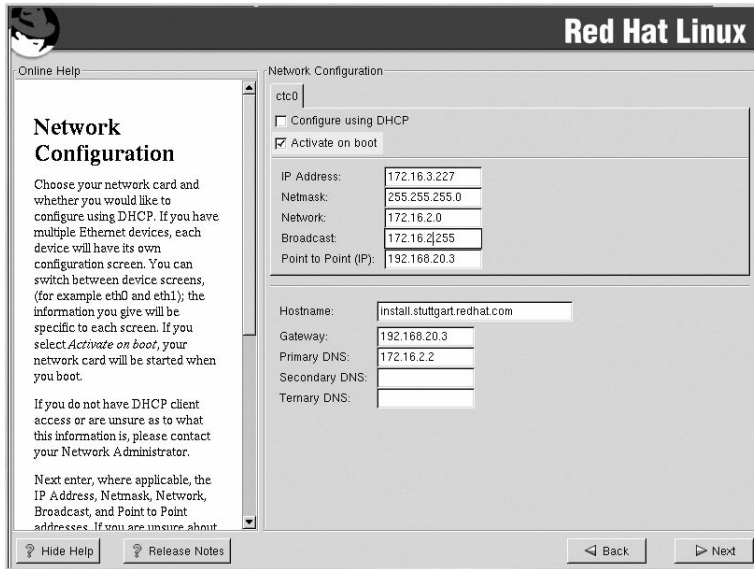
---

### Note

Point to Point addresses are used to configure point-to-point connections for CTC and ESCON devices.

---

Figure 2–12 Network Configuration




---

### Note

Do not use the numbers as seen in this sample configuration. These values will not work for your own network configuration. If you are not sure what values to enter, contact your network administrator for assistance.

---

If you have a fully qualified domain name for the network device, enter it in the **Hostname** field.

---

### Tip

Even if your computer is not part of a network, you can enter a hostname for your system. If you do not take this opportunity to enter in a name, your system will be known as `localhost`.

---

Finally, enter the **Gateway** and **Primary DNS** (and if applicable the **Secondary DNS** and **Tertiary DNS**) addresses.

---

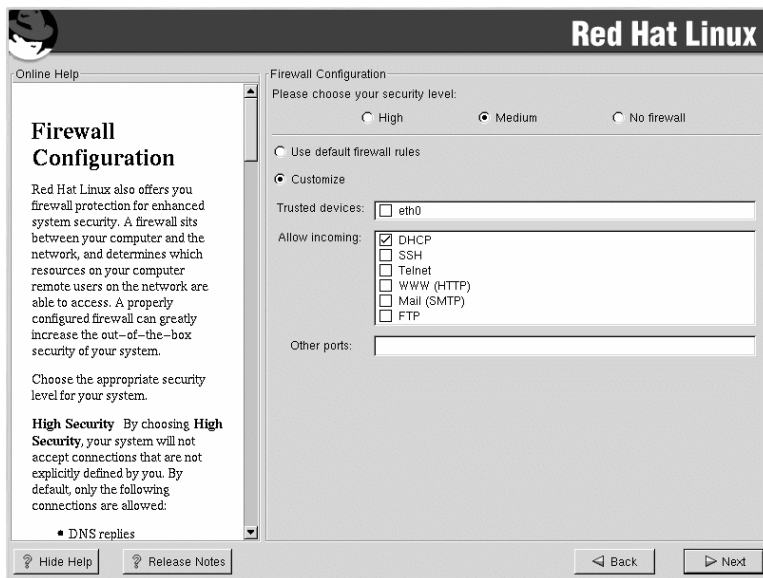


## 2.10 Firewall Configuration

Red Hat Linux offers firewall protection for enhanced system security. A firewall exists between your computer and the network, and determines which resources on your computer remote users on the network can access. A properly configured firewall can greatly increase the security of your system.

Choose the appropriate security level for your system.

Figure 2–13 Firewall Configuration



### High

If you choose **High**, your system will not accept connections (other than the default settings) that are not explicitly defined by you. By default, only the following connections are allowed:

- DNS replies
- DHCP — so any network interfaces that use DHCP can be properly configured

If you choose **High**, your firewall will not allow the following:

- Active mode FTP (passive mode FTP, used by default in most clients, should still work)
- IRC DCC file transfers

- RealAudio™
- Remote X Window System clients

If you are connecting your system to the Internet, but do not plan to run a server, this is the safest choice. If additional services are needed, you can choose **Customize** to allow specific services through the firewall.

### Medium

If you choose **Medium**, your firewall will not allow remote machines to have access to certain resources on your system. By default, access to the following resources are not allowed:

- Ports lower than 1023 — the standard reserved ports, used by most system services, such as FTP, SSH, telnet, and HTTP
- The NFS server port (2049)
- The local X Window System display for remote X clients
- The X Font server port (by default, `xfs` does not listen on the network, it is disabled in the font server)

If you want to allow resources such as RealAudio™, while still blocking access to normal system services, choose **Medium**. Select **Customize** to allow specific services through the firewall.

### No Firewall

No firewall provides complete access to your system and does no security checking. Security checking is the disabling of access to certain services. This should only be selected if you are running on a trusted network (not the Internet) or plan to do more firewall configuration later.

Choose **Customize** to add trusted devices or to allow additional incoming services.

### Trusted Devices

Selecting any of the **Trusted Devices** allows access to your system for all traffic from that device; it is excluded from the firewall rules. For example, if you are running a local network, but are connected to the Internet via a PPP dialup, you can check `eth0` and any traffic coming from your local network will be allowed. Selecting `eth0` as trusted means all traffic over the Ethernet is allowed, but the `ppp0` interface is still firewalled. If you want to restrict traffic on an interface, leave it unchecked.

It is not recommended that you make any device that is connected to public networks, such as the Internet, a **Trusted Device**.

### Allow Incoming

---

Enabling these options allow the specified services to pass through the firewall. Note, during a workstation installation, the majority of these services are *not* installed on the system.

#### DHCP

If you allow incoming DHCP queries and replies, you allow any network interface that uses DHCP to determine its IP address. DHCP is normally enabled. If DHCP is not enabled, your computer can no longer get an IP address.

#### SSH

Secure *SHell* (SSH) is a suite of tools for logging into and executing commands on a remote machine. If you plan to use SSH tools to access your machine through a firewall, enable this option. You need to have the `openssh-server` package installed in order to access your machine remotely, using SSH tools.

#### Telnet

Telnet is a protocol for logging into remote machines. Telnet communications are unencrypted, and provide no security from network snooping. Allowing incoming Telnet access is not recommended. If you do want to allow inbound Telnet access, you will need to install the `telnet-server` package.

#### WWW (HTTP)

The HTTP protocol is used by Apache (and by other Web servers) to serve Web pages. If you plan on making your Web server publicly available, enable this option. This option is not required for viewing pages locally or for developing Web pages. You will need to install the `apache` package if you want to serve Web pages.

#### Mail (SMTP)

If you want to allow incoming mail delivery through your firewall, so that remote hosts can connect directly to your machine to deliver mail, enable this option. You do not need to enable this if you collect your mail from your ISP's server using POP3 or IMAP, or if you use a tool such as `fetchmail`. Note that an improperly configured SMTP server can allow remote machines to use your server to send spam.

#### FTP

The FTP protocol is used to transfer files between machines on a network. If you plan on making your FTP server publicly available, enable this option. You need to install the `wu-ftpd` (and possibly the `anonftp`) package for this option to be useful.

#### Other ports

You can allow access to ports which are not listed here, by listing them in **Other ports** field. Use the following format: `port:protocol`. For example, if you want to allow

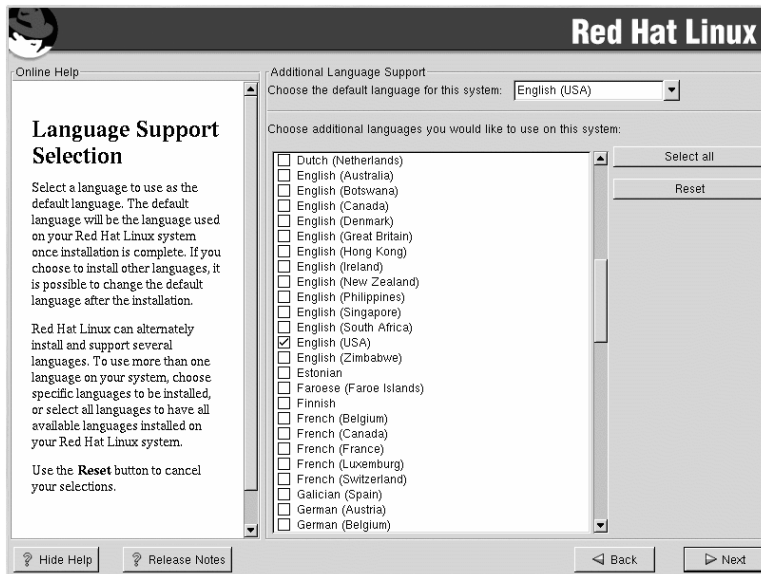
IMAP access through your firewall, you can specify `imap:tcp`. You can also explicitly specify numeric ports; to allow UDP packets on port 1234 through the firewall, enter `1234:udp`. To specify multiple ports, separate them with commas.

## 2.11 Language Support Selection

Red Hat Linux can install and support multiple languages for use on your system.

You must select a language to use as the default language. The default language will be used on your Red Hat Linux system once installation is complete. If you choose to install other languages, you can change your default language after the installation.

**Figure 2–14** Language Support Selection



If you are only going to use one language on your system, selecting only that language will save significant disk space. The default language is the language you selected to use during the installation. However, if you select only one language, you will only be able to use that specified language after the Red Hat Linux installation is complete.

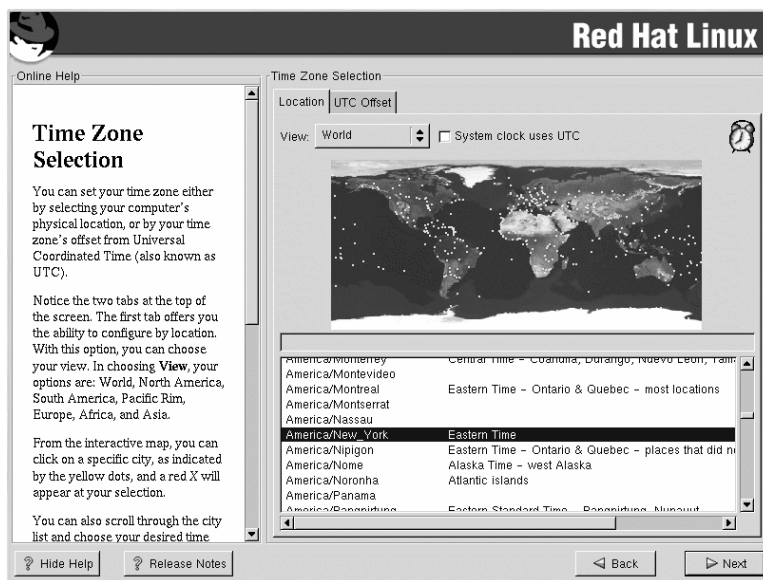
To use more than one language on your system, choose specific languages to be installed or select all languages to have all available languages installed on your Red Hat Linux system.

Use the **Reset** button to cancel your selections. Resetting will revert to the default; only the language you selected for use during the installation will be installed.

## 2.12 Time Zone Configuration

You can set your time zone by selecting your computer's physical location or by specifying your time zone's offset from Coordinated Universal Time (UTC).

**Figure 2–15** Configuring the Time Zone



Notice the two tabs at the top of the screen (see Figure 2–15, *Configuring the Time Zone*). The first tab allows you to configure your time zone by your location. You can specify different areas to view: **World, North America, South America, Pacific Rim, Europe, Africa, and Asia**.

On the interactive map, you can also click on a specific city, which is marked by a yellow dot; a red **X** will appear indicating your selection. You can also scroll through a list and choose a time zone.

The second tab allows you to specify a UTC offset. The tab displays a list of offsets to choose from, as well as an option to set daylight saving time.

On both tabs, you can select **System Clock uses UTC**. Please select this if you know that your system is set to UTC.

---

### Tip

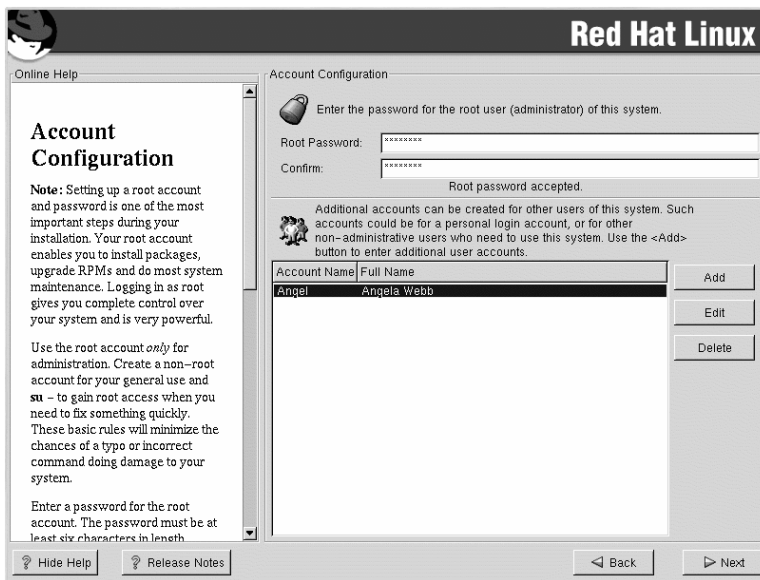
If you wish to change your time zone configuration after you have booted your Red Hat Linux system, become root and use the `/usr/sbin/time-config` command.

---

## 2.13 Account Configuration

The **Account Configuration** screen allows you to set your root password. Additionally, you can set up user accounts for you to log in to once the installation is complete (see Figure 2–16, *Account Creation*).

**Figure 2–16 Account Creation**



### 2.13.1 Setting the Root Password

Setting up a root account and password is one of the most important steps during your installation. Your root account is similar to the administrator account used on Windows NT machines. The root account is used to install packages, upgrade RPMs, and perform most system maintenance. Logging in as root gives you complete control over your system.

---

Use the root account only for system administration. Create a non-root account for your general use and `su -` to root when you need to fix something quickly. These basic rules will minimize the chances of a typo or an incorrect command doing damage to your system.

The installation program will prompt you to set a root password<sup>1</sup> for your system. You must enter a root password. The installation program will not let you proceed to the next section without entering a root password.

The root password must be at least six characters long; the password you type is not echoed to the screen. You must enter the password twice; if the two passwords do not match, the installation program will ask you to enter them again.

You should make the root password something you can remember, but not something that is easy for someone else to guess. Your name, your phone number, **qwerty**, **password**, **root**, **123456**, and **anteater** are all examples of bad passwords. Good passwords mix numerals with upper and lower case letters and do not contain dictionary words: **Aard387vark** or **420BMttNT**, for example. Remember that the password is case-sensitive. If you write down your password, keep it in a secure place. However, it is recommended that you do not write down this or any password you create.

---

### Note

Do not use one of the example passwords offered in this manual. Using one of these passwords could be considered a security risk.

---

---

### Note

The root user (also known as the superuser) has complete access to the entire system; for this reason, logging in as the root user is best done *only* to perform system maintenance or administration.

---

## 2.13.2 Setting Up User Accounts

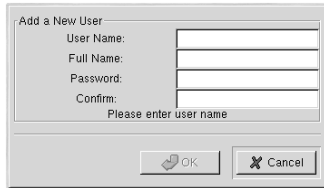
If you choose to create a user account now, you will have an account to log in to once the installation has completed. This allows you to safely and easily log into your computer without having to be root to create your user account.

<sup>1</sup> A root password is the administrative password for your Red Hat Linux system. You should only log in as root when needed for system maintenance. The root account does not operate within the restrictions placed on normal user accounts, so changes made as root can have implications for your entire system.

---

Enter an account name. Then enter and confirm a password for that user account. Enter the full name of the account user and press **Add**. Your account information will be added to the account list, and the user account fields will be cleared so that you can add another user.

**Figure 2–17 Creating a User Account**



You can also choose **New** to add a new user. Enter the user's information and use the **Add** button to add the user to the account list.

You can also **Edit** or **Delete** the user accounts you have created and no longer want.

## 2.14 Authentication Configuration

If you are performing a workstation or server installation, please skip ahead to Section 2.15, *Package Group Selection*.

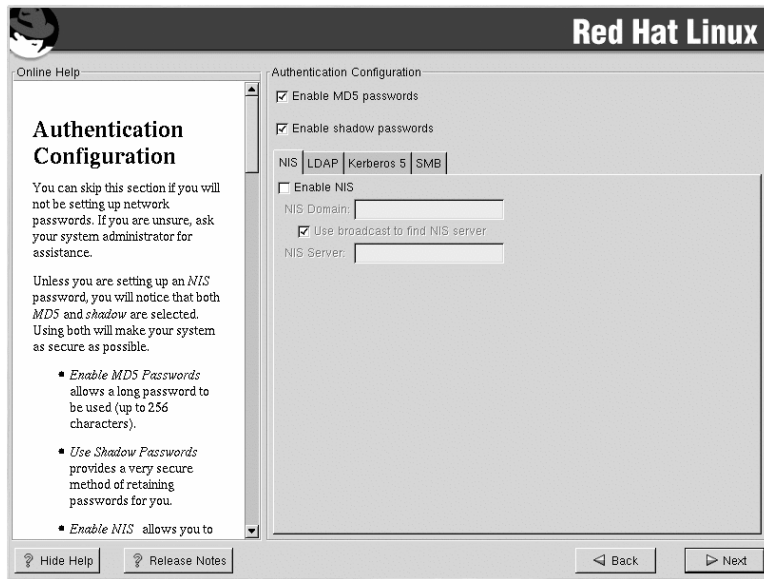
You may skip this section if you will not be setting up network passwords. If you do not know whether you should do this, please ask your system administrator for assistance.

Unless you are setting up **NIS** authentication, you will notice that only **MD5** and **shadow** passwords are selected (see Figure 2–18, *Authentication Configuration*). We recommend you use both to make your machine as secure as possible.

To configure the NIS option, you must be connected to an NIS network. If you are not sure whether you are connected to an NIS network, please ask your system administrator.



Figure 2–18 Authentication Configuration



- **Enable MD5 passwords** — allows a long password to be used (up to 256 characters), instead of the standard eight letters or less.
- **Enable shadow passwords** — provides a secure method for retaining passwords. The passwords are stored in `/etc/shadow`, which can only be read by root.
- **Enable NIS** — allows you to run a group of computers in the same Network Information Service domain with a common password and group file. You can choose from the following two options:
  - **NIS Domain** — allows you to specify the domain or group of computers your system belongs to.
  - **Use broadcast to find NIS server** — allows you to broadcast a message to your local area network to find an available NIS server.
  - **NIS Server** — causes your computer to use a specific NIS server, rather than broadcasting a message to the local area network asking for any available server to host your system.
- **Enable LDAP** — tells your computer to use LDAP for some or all authentication. LDAP consolidates certain types of information within your organization. For example, all of the different lists of users within your organization can be merged into one LDAP directory. For more information

about LDAP, refer to *Official Red Hat Linux Reference Guide, Lightweight Directory Access Protocol (LDAP)*. You can choose from the following options:

- **LDAP Server** — allows you to access a specified server (by providing an IP address) running the LDAP protocol.
- **LDAP Base DN** — allows you to look up user information by its Distinguished Name (DN).
- **Use TLS (*Transport Layer Security*) lookups** — this option allows LDAP to send encrypted user names and passwords to an LDAP server before authentication.
- **Enable Kerberos** — Kerberos is a secure system for providing network authentication services. For more information about Kerberos, see *Using Kerberos 5 on Red Hat Linux* in the *Official Red Hat Linux Reference Guide*. There are three options to choose from here:
  - **Realm** — this option allows you to access a network that uses Kerberos, composed of one or a few servers (also known as KDCs) and a potentially large number of clients.
  - **KDC** — this option allows you access to the Key Distribution Center (KDC), a machine that issues Kerberos tickets (sometimes called a Ticket Granting Server or TGS).
  - **Admin Server** — this option allows you to access a server running kadmind.
- **Enable SMB Authentication** — Sets up PAM to use an SMB server to authenticate users. You must supply two pieces of information here:
  - **SMB Server** — Indicates which SMB server your workstation will connect to for authentication.
  - **SMB Workgroup** — Indicates which workgroup the configured SMB servers are in.

## 2.15 Package Group Selection

After your partitions have been selected and configured for formatting, you are ready to select packages for installation.

---

### Note

Unless you choose a custom installation, the installation program will automatically choose most packages for you. However, you must select either GNOME or KDE (or both) to install a graphical environment.

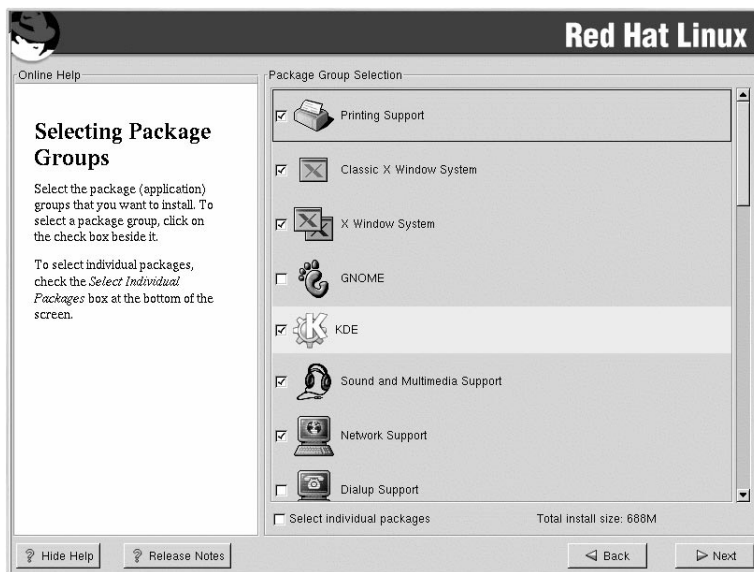
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GNOME and KDE are both graphical desktop environments<sup>2</sup> that handle the overall look and feel of your system. You must choose one of these to have a default graphical setup, but you can also install both to determine for yourself which you prefer.

You can select components, which group packages together according to function (for example, **C Development**, **Networked Workstation**, or **Web Server**), individual packages, or a combination of the two.

To select a component, click on the checkbox beside it (see Figure 2–19, *Package Group Selection*).

**Figure 2–19** Package Group Selection



Select each component you wish to install. Selecting **Everything** (at the end of the component list) during a custom installation installs all packages included with Red Hat Linux. If you select every package, you will need approximately 1.7 GB of free disk space.

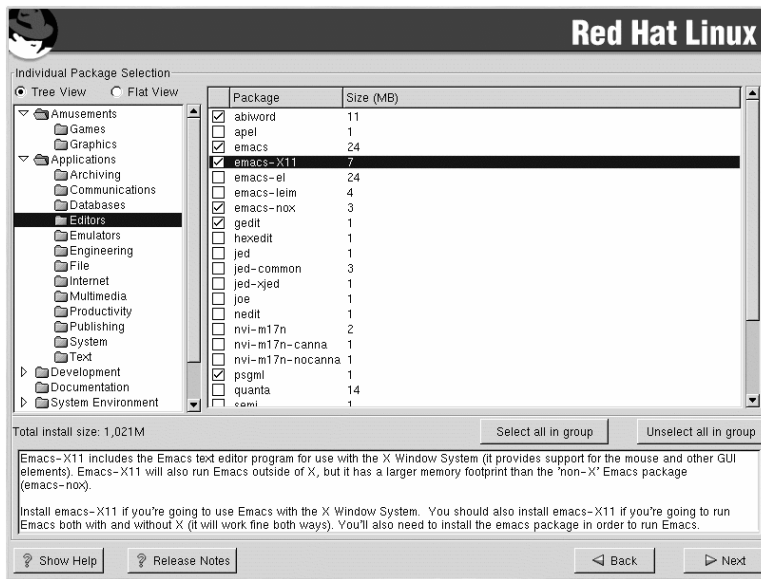
To select packages individually, check the **Select Individual Packages** box at the bottom of the screen.

<sup>2</sup> A desktop environment in Linux is similar to the environment you might see in other operating systems. However, environments differ in their look and feel and are easily customized for your individual needs.

## 2.15.1 Selecting Individual Packages

After selecting the components you wish to install, you can select or deselect individual packages. You can select or deselect packages using your mouse (see Figure 2–20, *Selecting Individual Packages*).

**Figure 2–20** Selecting Individual Packages



You can choose to view the individual packages in **tree view** or **flat view**.

**Tree view** allows you to see the packages grouped by application type.

**Flat view** allows you to see all of the packages in an alphabetical listing on the right of the screen.

Using **Tree view**, you see a listing of package groups. When you expand this list and pick one group, the list of packages in that group appears in the panel on the right.

To sort alphabetically, click on the **Package** tab. To sort packages by size, click on the **Size (MB)** tab.

To select an individual package, double-click the checkbox beside the package name. A check mark in the box means that a package has been selected.

For more information about a specific package, click on the individual package name. The package information will appear at the bottom of the screen.

You can also select or deselect all packages listed within a particular group, by clicking on the **Select all in group** or **Unselect all in group** buttons.

---

### Note

Some packages (such as the kernel and certain libraries) are required for every Red Hat Linux system and are not available to select or deselect. These base packages are selected by default.

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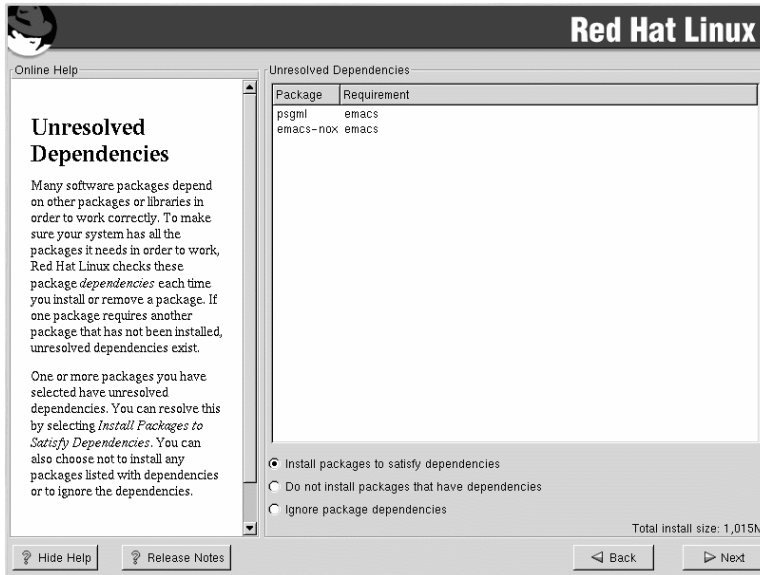
## 2.15.2 Unresolved Dependencies

Many software packages, in order to work correctly, depend on other software packages that must be installed on your system. For example, many of the graphical Red Hat system administration tools require the `python` and `pythonlib` packages. To make sure your system has all the packages it needs in order to be fully functional, Red Hat Linux checks these package **dependencies** each time you install or remove software packages.

If any package requires another package which you have not selected to install, the program presents a list of these unresolved dependencies and gives you the opportunity to resolve them (see Figure 2–21, *Unresolved Dependencies*).

The **Unresolved Dependencies** screen appears only if you are missing packages that are needed by the packages you have selected. At the bottom of the screen, under the list of missing packages, an **Install packages to satisfy dependencies** checkbox is selected by default. If you leave this checked, the installation program will resolve package dependencies automatically by adding all required packages to the list of selected packages.

Figure 2–21 Unresolved Dependencies



## 2.16 Preparing to Install

You should now see a screen preparing you for the installation of Red Hat Linux.

### WARNING

**If, for some reason, you would rather not continue with the installation process, this is your last opportunity to safely cancel the process and reboot your machine. Once you press the Next button, partitions will be written and packages will be installed. If you wish to abort the installation, you should reboot now before your hard drive(s) are rewritten.**

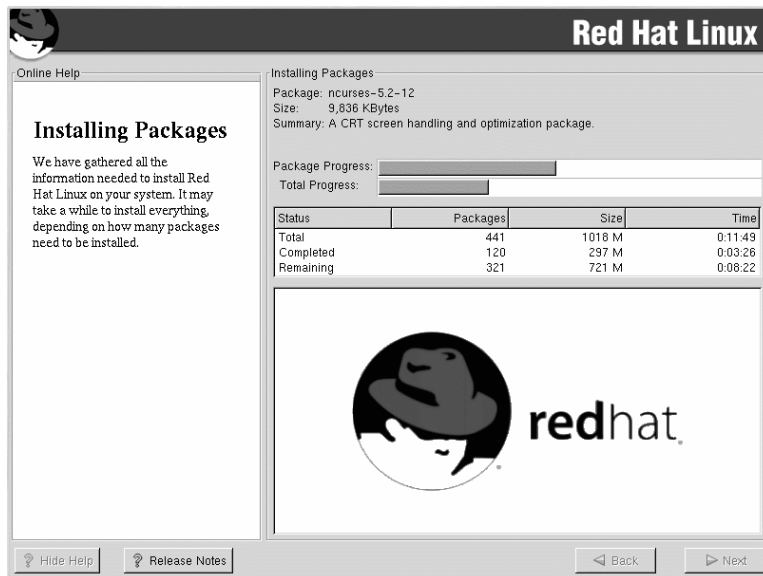
To cancel this installation process, you must stop the VM. To do this, and restart CMS, type `#cp i cms` in the 3270 console window.

For your reference, a complete log of your installation can be found in `/tmp/install.log` once you reboot your system.

## 2.17 Installing Packages

At this point there is nothing left for you to do until all the packages have been installed (see Figure 2–22, *Installing Packages*). How quickly this happens depends on the number of packages you have selected and your computer's speed.

**Figure 2–22** Installing Packages



## 2.18 Installation Complete

Congratulations! Your Red Hat Linux 7.2 installation is now complete!

The installation program will prompt you to prepare your system for reboot.

Once the installation is complete, you must IPL (boot) from the DASD(s) where Red Hat Linux has been installed. For example, on the 3270 console you may issue the command `#cp i 200`.

---

**Note**

Assuming you are to disconnect from the 3270 console, use `#cp disc` instead of `#cp logout` or `#cp log`. This will allow Red Hat Linux for S/390 to continue running when not connected to the 3270 console.

---

Following IPLing the installed Red Hat Linux OS, you may log on to the system via `telnet` or `ssh`. It is important to note, the only place you can log in as root is from the 3270 or from other devices as listed in `/etc/securetty`. To log in as root from remote systems, use `ssh`.



## 3 Installing Red Hat Linux via Text Mode

This release of Red Hat Linux features a graphical, mouse-based installation program, but you can also install Red Hat Linux using a text mode, keyboard-based installation program. This chapter briefly explains how to use the text mode installation program. Here are some recommendations:

- If you are new to Linux installations, read Chapter 2, *Installing Red Hat Linux* first. The main focus of that chapter is the graphical installation process, but most of the concepts apply to the text mode installation as well. After reading that chapter, Section 3.1, *Things You Should Know* will give you more information regarding the aspects of installing Red Hat Linux that do not apply to the graphical installation process.
- If you have never used the text mode installation program, or need a refresher on its user interface, read the next sections.
- To begin installation without further delay, turn to Section 3.3, *Running the Installation Program*.

### 3.1 Things You Should Know

Before attempting to install Red Hat Linux, you should collect information about your system. This information will help prevent any surprises during the installation. You can find most of this information in the documentation that came with your system, or from the system's vendor or manufacturer.

#### 3.1.1 Network-related Information

If you are connected to a network, be sure you know the following:

- IP address — usually represented as a set of four numbers separated by dots, such as 10 . 0 . 2 . 15.
  - Netmask — another set of four numbers separated by dots; an example netmask would be 255 . 255 . 248 . 0.
  - Gateway IP address — another set of four dot-separated numbers; for example, 10 . 0 . 2 . 254.
  - One or more name server IP addresses — one or more sets of dot-separated numbers; for example, 10 . 0 . 2 . 1 might be the address of a name server.
  - Domain name — the name your organization uses; for example, Red Hat has a domain name of redhat . com.
  - Hostname — the name assigned to your individual system; for example, a computer might be named pooh.
-

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### Note

The information provided here is as an example only! Do *not* use it when you install Red Hat Linux! If you do not know the proper values for your network, ask your network administrator.

---

## 3.2 The Installation Program User Interface

The Red Hat Linux text mode installation program uses a screen-based interface that includes most of the on-screen "widgets" commonly found on graphical user interfaces. Figure 3-1, *Installation Program Widgets as seen in Configure TCP/IP* and Figure 3-2, *Installation Program Widgets as seen in Disk Druid* illustrate the screens you will see.

Figure 3-1 Installation Program Widgets as seen in Configure TCP/IP

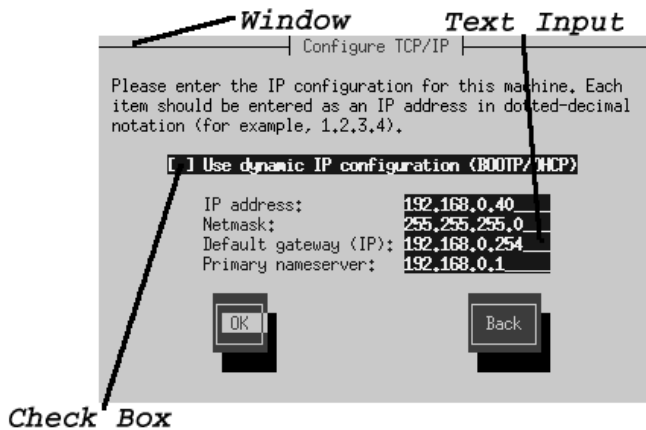
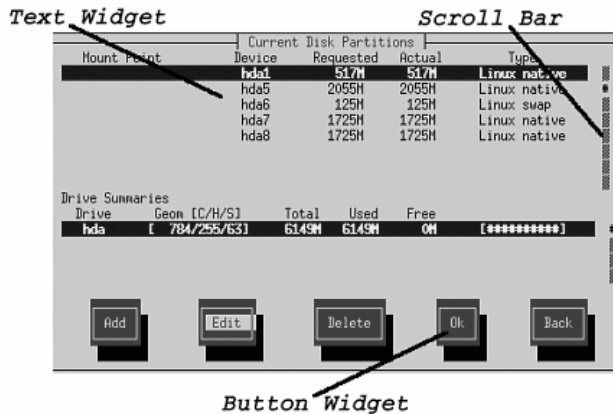


Figure 3–2 Installation Program Widgets as seen in Disk Druid



Here is a list of the most important widgets shown in Figure 3–1, *Installation Program Widgets as seen in Configure TCP/IP* and Figure 3–2, *Installation Program Widgets as seen in Disk Druid*:

- **Window** — windows (usually referred to as **dialogs** in this manual) will appear on your screen throughout the installation process. At times, one window may overlay another; in these cases, you can only interact with the window on top. When you are finished in that window, it will disappear, allowing you to continue working in the window underneath.
- **Text Input** — text input lines are regions where you can enter information required by the installation program. When the cursor rests on a text input line, you may enter and/or edit information on that line.
- **Checkbox** — checkboxes allow you to select or deselect a feature. The box displays either an asterisk (selected) or a space (unselected). When the cursor is within a checkbox, press [Space] to select an unselected feature or to deselect a selected feature.
- **Text widget** — text widgets are regions of the screen for the display of text. At times, text widgets may also contain other widgets, such as checkboxes. If a text widget contains more information than can be displayed in the space reserved for it, a scroll bar appears; if you position the cursor within the text widget, you can then use the [Up] and [Down] arrow keys to scroll through all the information available. Your current position is shown on the scroll bar by a # character, which moves up and down the scroll bar as you scroll.

- **Button widget** — button widgets are the primary method of interacting with the installation program. You progress through the windows of the installation program by navigating these buttons, using the [Tab] and [Enter] keys. Buttons can be selected when they are highlighted.
- **Cursor** — although not a widget, the cursor is used to select (and interact) with a particular widget. As the cursor is moved from widget to widget, it may cause the widget to change color, or you may only see the cursor itself positioned in or next to the widget. In Figure 3–1, *Installation Program Widgets as seen in **Configure TCP/IP***, the cursor is positioned on the **OK** button. Figure 3–2, *Installation Program Widgets as seen in **Disk Druid*** shows the cursor on the **Edit** button.

### 3.2.1 Using the Keyboard to Navigate

Navigation through the installation dialogs is performed through a simple set of keystrokes. To move the cursor, use [Left], [Right], [Up], and [Down] arrow keys. Use [Tab], and [Alt]-[Tab] to cycle forward or backward through each widget on the screen. Along the bottom, most screens display a summary of available cursor positioning keys.

To "press" a button, position the cursor over the button (using [Tab], for example) and press [Space] or [Enter]. To select an item from a list of items, move the cursor to the item you wish to select and press [Enter]. To select an item with a checkbox, move the cursor to the checkbox and press [Space] to select an item. To deselect, press [Space] a second time.

Pressing [F12] accepts the current values and proceeds to the next dialog; it is equivalent to pressing the **OK** button.



Unless a dialog box is waiting for your input, do not press any keys during the installation process (doing so may result in unpredictable behavior).

---

## 3.3 Running the Installation Program

After following the steps outlined in Chapter 1, *Steps to Get You Started* for booting an LPAR or VM system, `telnet` or `ssh` to the configured Linux install system on the S/390. Logging on via `ssh` is the preferred method.

When logged into the machine, running `loader` will start the installation program.

When `loader` starts, there will be several text mode screens for selecting the installation method. Refer to Section 3.5, *Installing from Hard Drive (DASD)* and Section 3.6, *Installing over a Network* for information on these screens.

---

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### Note

While the text mode installation program is run by default for most installations, NFS installations will run the graphical installation program by default if you have logged into the VM from an X11 terminal.

If your DNS or hostnames are not set correctly, or the VM is not allowed to open applications on your display, the installation program will fail. You can prevent this by setting a correct `DISPLAY` variable (execute the command `export DISPLAY=workstationname:0.0` at the VM prompt) and allowing the VM to connect (using the command `xhost +vmname` on your local workstation).

If you have a slow connection or prefer a text installation, unset the `DISPLAY` variable by executing the command `unset DISPLAY` at the VM prompt.

If the graphical installation via NFS does not automatically begin for you, be sure to check what the `DISPLAY=variable` is set to. To begin the graphical installation program once you have logged into the VM, you must issue the command `export DISPLAY=workstationname:0.0`, where *workstationname* is the name of your workstation. You must also make sure the workstation you are working on will allow the display of remote windows by setting `xhost +VMname`.

Additionally, if you set a `DISPLAY` variable on your local workstation before connecting to the VM (which is always the case when you connect using an `xterm` inside of an X Window System session), you do not need to do a `xhost +VMname`. The `ssh` application will do all the work for you.

---

## 3.4 Installation Cross-reference Table

Most text mode installation screens can be cross-referenced with their GUI screen counterparts. This table lists the installation screens in order and where you can go to get the necessary information for each part of the installation.

For those screens which do not have adequate GUI counterparts, installation-related instructions and screenshots will be provided in this chapter.

---

**Table 3–1 Installation Cross-reference Table**

<b>Text Mode Screen</b>	<b>Text Mode Reference Point</b>
Language Screen	Section 2.3, <i>Language Selection</i>
Installation Method	Section 2.2, <i>Running the Installation Program</i>
Installing from Hard Disk (DASD)	Section 3.5, <i>Installing from Hard Drive (DASD)</i>
Installing over a Network	Section 3.6, <i>Installing over a Network</i>
Welcome Screen	Section 2.4, <i>Welcome to Red Hat Linux</i>
Installation Type	Section 2.5, <i>Install Options</i>
DASD Initialization	Section 2.6, <i>Partitioning with fdasd</i>
Disk Partitioning Setup	Section 2.6, <i>Partitioning with fdasd</i> and Section 2.7, <i>Partitioning Your System</i>
Hostname Configuration	Section 2.9, <i>Network Configuration</i>
Firewall Configuration	Section 2.10, <i>Firewall Configuration</i>
Network Configuration	Section 2.9, <i>Network Configuration</i>
Language Support and Default Language	Section 2.11, <i>Language Support Selection</i>
Time Zone Selection	Section 2.12, <i>Time Zone Configuration</i>
Root Password	Section 2.13, <i>Account Configuration</i>
Add User/User Account Setup	Section 2.13, <i>Account Configuration</i>
Authentication Configuration	Section 2.14, <i>Authentication Configuration</i>
Package Installation (Group, Individual, Dependencies)	Section 2.15, <i>Package Group Selection</i>
Package Installation	Section 2.16, <i>Preparing to Install</i> and Section 2.17, <i>Installing Packages</i>
Installation Complete	Section 2.18, <i>Installation Complete</i>

## 3.5 Installing from Hard Drive (DASD)

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### Note

Hard drive installations only work from ext2 or ext3 filesystems. If you have a filesystem other than ext2 or ext3 you will not be able to perform a hard drive installation.

---

Refer to Section 1.4, *Common Steps Needed for Installing Red Hat Linux to a VM or LPAR* to prepare your DASD for Hard Disk installation.

The **Select Partition** screen (Figure 3–3, *Selecting Partition Dialog for Hard Drive Installation*) applies only if you are installing from a disk partition (that is, if you selected **Hard Drive** in the **Installation Method** dialog). This dialog allows you to name the disk partition and directory from which you are installing Red Hat Linux.

Enter the device name of the partition containing the Red Hat ISO images. There is also a field labeled **Directory holding images**. If the ISO images are not in the root directory of that partition, enter the path to the ISO images (for example, if the ISO images are in `/test/new/RedHat`, you would enter `/test/new`).

After you have identified the disk partition, you will next see the **Welcome** dialog. See Table 3–1, *Installation Cross-reference Table* for more information.

**Figure 3–3 Selecting Partition Dialog for Hard Drive Installation**



## 3.6 Installing over a Network

If you are performing a network installation, the **Configure TCP/IP** dialog appears; for an explanation of this dialog, go to Section 2.9, *Network Configuration* and then return here.

### 3.6.1 Setting Up the Server

Refer to Section 1.4, *Common Steps Needed for Installing Red Hat Linux to a VM or LPAR* to prepare your NFS, HTTP or FTP server.

If you are not sure how to do this, refer to the *Official Red Hat Linux Customization Guide* and the *Official Red Hat Linux Reference Guide* for more information.

### 3.6.2 NFS Setup

The NFS dialog (Figure 3–4, *NFS Setup Dialog*) applies only if you are installing from an NFS server (if you selected **NFS Image** in the **Installation Method** dialog).

**Figure 3–4** NFS Setup Dialog



Enter the fully-qualified domain name or IP address of your NFS server. For example, if you are installing from a host named `eastcoast` in the domain `redhat.com`, enter `eastcoast.redhat.com` in the **NFS Server** field.



Next, enter the name of the exported directory. If you followed the setup described in Section 3.6, *Installing over a Network*, you would enter the directory `/location/of/disk/space/` which contains the RedHat directory.

If the NFS server is exporting a mirror of the Red Hat Linux installation tree, enter the directory which contains the RedHat directory. (If you do not know this directory path, ask your system administrator.) For example, if your NFS server contains the directory

Next you will see the **Welcome** dialog. See Table 3-1, *Installation Cross-reference Table* for more information.

### 3.6.3 FTP Setup

The FTP dialog (Figure 3-5, *FTP Setup Dialog*) applies only if you are installing from an FTP server (if you selected **FTP** in the **Installation Method** dialog). This dialog allows you to identify the FTP server from which you are installing Red Hat Linux.

**Figure 3-5 FTP Setup Dialog**



Enter the name or IP address of the FTP site you are installing from, and the name of the directory containing the RedHat installation files for your architecture. For example, if the FTP site contains the directory

If everything has been specified properly, a message box appears indicating that `base/hdlist` is being retrieved.

Next you will see the **Welcome** dialog. See Table 3–1, *Installation Cross-reference Table* for more information.

### 3.6.4 HTTP Setup

The HTTP dialog (Figure 3–6, *HTTP Setup Dialog*) applies only if you are installing from an HTTP server (if you selected **HTTP** in the **Installation Method** dialog). This dialog prompts you for information about the HTTP server from which you are installing Red Hat Linux.

**Figure 3–6** HTTP Setup Dialog



Enter the name or IP address of the HTTP site you are installing from, and the name of the directory there containing the RedHat installation files for your architecture. For example, if the HTTP site contains the directory

If everything has been specified properly, a message box appears indicating that `base/hdlist` is being retrieved.

Next you will see the **Welcome** dialog. See Table 3–1, *Installation Cross-reference Table* for more information.

## A Removing Red Hat Linux

To remove Red Hat Linux from the S/390 you can either remove the DASD allocation from VM or you can start the installation program and re-format all of the DASD partitions. Instead of selecting **Ok** you will select **Cancel** to exit out of the installation.

---



## B Sample Parameter Files for LPAR and VM Configurations

Install in an LPAR:

```
root=/dev/ram0 ro ip=off
HOST=lpar.redhat.com:eth0:172.16.2.176
NETWORK=172.16.2.0:255.255.255.0:172.16.2.255:172.16.2.1
DNS=172.16.2.2:172.16.2.15 SEARCHDNS=redhat.com
RPMSEVER=172.16.2.140:/ftp/pub/redhat/linux/s390
MOUNTS=/dev/dasda1:/,/dev/dasdb1:/usr/share
INSTALL=default DTZ=CET LCS=lcs0,0xfc20,0xfc21,0,0
```

Install in a VM:

```
root=/dev/ram0 ro ip=off DASD=200-20f
HOST=s390.redhat.com:ctc0:172.16.3.225:192.168.20.1:1492
DNS=172.16.2.2:172.16.2.15 SEARCHDNS=redhat.com
RPMSEVER=ftp://172.16.2.140/pub/redhat/linux/s390
MOUNTS=/dev/dasda1:/,/dev/dasdb1:/usr/share
INSTALL=default DTZ=CET
```

---

# C Getting Technical Support

## C.1 Remember to Sign Up

If you have an official edition of Red Hat Linux 7.2 and/or an official Red Hat OEM partner kit, please remember to sign up for the benefits you are entitled to as a Red Hat customer.

You will be entitled to any or all of the following benefits, depending upon the Official Red Hat Linux product you purchased:

- Official Red Hat support — Get help with your installation questions as well as defect support from Red Hat, Inc.'s support and development teams.
- Red Hat Network — Easily update your packages and receive security notices that are customized for your system. Go to <http://rhn.redhat.com> for details.
- Under the Brim: The Official Red Hat E-Newsletter — Every month, get the latest news and product information directly from Red Hat.

To sign up, go to <http://www.redhat.com/apps/activate/>. You will find your **Product ID** on the Registration Information Card in your Official Red Hat Linux boxed set.

## C.2 An Overview of Red Hat Support

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### Note

Refer to the service level agreement at <http://www.redhat.com/support/sla/> for more information on how Red Hat's technical support staff can assist you.

---

Red Hat provides both remote and onsite installation assistance for Official Red Hat Linux for S/390 boxed set products. This assistance is intended to help customers successfully install Red Hat Linux on their S/390. Assistance with installation support is offered via telephone, the Web, and in person. Please check your boxed set to see what types of support are available to you.

Red Hat Support will attempt to answer any questions you may have before the installation process is initiated. Depending on the product purchased, it can include the following:

- Hardware compatibility questions
  - Basic hard drive partitioning strategies
  - Installation on certified hardware.
  - Preparation of mainframe for use with Red Hat Linux
-

Red Hat, Inc. Support can also provide assistance during the installation process:

- Getting supported hardware recognized by the Red Hat Linux operating system
- Assistance with drive partitioning

We can also help you with basic post-installation tasks, such as:

- Successfully configuring the X Window System using Xconfigurator
- Configuring a mouse
- Telnet server configuration
- FTP server configuration
- POP3/IMAP mail retrieval server configuration
- NFS installation and configuration
- Client network configuration
- Network printing
- Assistance in securing your system
- Assistance in performing system backups
- Installation and configuration of SSH
- Apache Web server configuration
- Sendmail installation and configuration
- Assistance in setting up DNS
- Samba configuration
- Installation and configuration of a caching proxy server using Squid
- Installation and configuration of a DHCP server

Our installation assistance service is designed to get Red Hat Linux running on your system as quickly and as easily as possible. However, there are many other things that you may want to do with your Red Hat Linux system, from compiling a custom kernel to integrating Linux systems into your IT environment which are *not* covered by our standard support offerings.

For assistance with these tasks, there is a wealth of online information available in the form of HOWTO documents, Linux-related websites, and commercial publications. The various Linux HOWTO documents are included with Red Hat Linux on the Documentation CD in the `/HOWTOS` directory. These HOWTOS are provided in text files that can easily be read from within Red Hat Linux and other operating systems.

---



A large number of Linux-related websites are available. The best starting point for finding information on Red Hat Linux is the Red Hat, Inc. website:

`http://www.redhat.com/`

Many Linux-related books are available. If you are new to Linux, a book that covers Linux basics will be invaluable. We can recommend several titles: *The Official Red Hat Linux Getting Started Guide*; *Using Linux*, by Bill Ball; *Linux Clearly Explained*, by Bryan Pfaffenberger; *Linux for Dummies*, by Jon "maddog" Hall; and *Learning Red Hat Linux*, by Bill McCarty.

Red Hat also offers various incident-based support plans and custom professional services to assist with configuration issues and tasks that are not covered by installation assistance. Please see the Red Hat Support website for more information. The Red Hat technical support website is located at the following URL:

`http://www.redhat.com/support/`

## C.3 How to Get Technical Support

In order to receive technical support for your Official Red Hat product, you must register your product on Red Hat's website.

Every Official Red Hat product comes with a Product Identification code: a 16-character alphanumeric string. The Product ID for Red Hat Linux 7.2 is located on the Registration Information Card that can be found inside the box. Your Product ID is included in your boxed set, and you should keep it in a safe place. You need this code, so do not lose the card!

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### Note

Do not throw away the card with your Product ID. You need the Product ID to get technical support. If you lose the certificate, you may not be able to receive support.

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The Product ID is the code that will enable your technical support and any other benefits or services that you purchased from Red Hat, depending upon which Red Hat product you purchased.

### C.3.1 Signing up for Technical Support

To sign up for technical support, you will need to:

1. Create a customer profile at `http://www.redhat.com/apps/activate/`. You may have already completed this step; if you have, continue to the next step. If you do not already have a customer profile on the Red Hat website, please create a new one.
-

- Using the login name and password you created during the customer profile, please log in at the Red Hat Support website at <http://www.redhat.com/support>.

If you created a new customer profile, once you activate your product you will see a webpage that shows your registered products. There is also a button, **Access Web Support**, on this page that will take you to the support website.

- Update your contact information if necessary.

---

### Note

If your email address is not correct, communications regarding your technical support requests CANNOT be delivered to you, and you will not be able to retrieve your login and password by email. Be sure that you give us your correct email address.

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If you are worried about your privacy, please see Red Hat's privacy statement at [http://www.redhat.com/legal/privacy\\_statement.html](http://www.redhat.com/legal/privacy_statement.html).

- Add a product to your profile. Please enter the following information:
  - The Product ID for your boxed set product
  - The Support Certificate Number or Entitlement Number if the product is a contract
- Set your customer preferences.
- Answer the optional customer questionnaire.
- Submit the form.

If the previous steps were completed successfully, you can now login at <http://www.redhat.com/support> and open a new technical service request. However, you must still use your Product ID in order to obtain technical support via telephone (if the product you purchased came with phone support). You will also be asked for your login name when contacting the technical support team via telephone.

## C.4 Questions for Technical Support

Technical support is both a science and a mystical art form. In most cases, support technicians must rely on customer observations and communications with the customer in order to diagnose and solve the problem. Therefore, it is extremely important that you are as detailed and clear as possible when you state your questions and report your problems. Examples of what you should include are:

---

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**Note**

Refer to the service level agreement at <http://www.redhat.com/support/sla/> for more information on how Red Hat's technical support staff can assist you.

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- Symptoms of the problem (for example: "Linux is not able to access my CD-ROM drive. When it tries, I get timeout errors.")
- When the problem began (for example: "My system was working fine until yesterday, when a lightning storm hit my area.")
- Any changes you made to your system (for example: "I added a new hard drive and used Partition Wizzo to add Linux partitions.")
- Other information that may be relevant to your situation, such as the installation method (CD-ROM, NFS, HTTP)
- Specific hardware devices that may be relevant to your problem (for example: If you cannot setup networking, what kind of network card do you have?)

### C.4.1 How to Send Support Questions

Please login at <http://www.redhat.com/support> and open a new service request, or call the phone number for support. If your product came with phone support, or you have purchased a phone support contract, the phone number you will need to call will be provided to you during the sign up process.

For more information on using Red Hat's online support system go to <http://www.redhat.com/support/services/access.html>.

In some cases, the purchase of your product will entitle you to a Technical Account Owner (TAO) — a readily accessible, single point of contact for your organization's open source deployments and timely problem resolution. When you create a custom profile and activate your product, information about your TAO will be delivered to you. Prior to contacting your TAO, please have ready any support ticket numbers or problem descriptions and/or symptoms.

Please read your specific service level agreement for a more detailed description of the TAO service, along with related escalation procedures.

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## D Troubleshooting Your Installation of Red Hat Linux

This appendix discusses some common installation problems and their solutions.

### D.1 You are Unable to Boot Red Hat Linux

#### D.1.1 Is Your System Displaying Signal 11 Errors?

If you receive a fatal signal 11 during your installation, it is probably due to a hardware error in memory on your system's bus. A hardware error in memory can be caused by problems in executables or with the system's hardware. Like other operating systems, Red Hat Linux places its own demands on your system's hardware. Some of this hardware may not be able to meet those demands, even if they work properly under another OS.

Check to see if you have the latest installation and supplemental boot diskettes from Red Hat. Review the online errata to see if newer versions are available. If the latest images still fail, it may be due to a problem with your hardware. Commonly, these errors are in your memory or CPU-cache. A possible solution for this error is turning off the CPU-cache in the BIOS. You could also try to swap your memory around in the motherboard slots to see if the problem is either slot or memory related.

For more information concerning signal 11 errors, refer to <http://www.bitwizard.nl/sig11/>.

### D.2 Trouble During the Installation

#### D.2.1 Partition Creation Problems

If you are having trouble creating a partition (for example, a root (/) partition), make sure you are setting its partition type to Linux Native.

#### D.2.2 Are You Seeing Python Errors?

During some upgrades or installations of Red Hat Linux, the installation program (also known as Anaconda) may fail with a Python or traceback error. This error may occur after the selection of individual packages or while trying to save the upgrade log in /tmp. The error may look similar to:

```
Traceback (innermost last):
  File "/var/tmp/anaconda-7.1/usr/lib/anaconda/iw/progress_gui.py",
line 20, in run
    rc = self.todo.doInstall ()
  File "/var/tmp/anaconda-7.1/usr/lib/anaconda/todo.py", line 1468, in
doInstall
```

```

    self.fstab.savePartitions ()
    File "fstab.py", line 221, in savePartitions
    sys.exit(0)
SystemExit: 0

Local variables in innermost frame:
self: <fstab.GuiFstab instance at 8446fe0>
sys: <module 'sys' (built-in)>

ToDo object:
(itodo
ToDo
p1
(dp2
S'method'
p3
(iimage
CdromInstallMethod
p4
(dp5
S'progressWindow'
p6

<failed>

```

This error occurs in some systems where links to `/tmp` are symbolic to other locations or have been changed since creation. These symbolic or changed links are invalid during the installation process, so the installation program cannot write information and fails.

If you experience such an error, first try to download any available errata for Anaconda. Errata can be found at <http://www.redhat.com/support/errata>.

You can also search for bug reports related to this problem. To search Red Hat's bug tracking system, go to <http://bugzilla.redhat.com/bugzilla>.

Finally, if you are still facing problems related to this error, register your product and contact our support team. To register your product, go to <http://www.redhat.com/apps/activate>.

## D.3 Problems After Installation

### D.3.1 Problems with Server Installations and X

If you performed a server installation and you are having trouble getting X to start, you may not have installed the X Window System during your installation.

If you want the X Window System, you can perform an upgrade to install X. During the upgrade, select the X Window System packages, and choose GNOME, KDE, or both.

Alternatively, you can install the XFree86 RPMs. For more information, refer to <http://www.redhat.com/support/docs/howto/XFree86-upgrade/XFree86-upgrade.html>.

### D.3.2 Problems When You Try to Log In

If you did not create a user account during the installation you will need to log in as root and use the password you assigned to root.

If you cannot remember your user account password, you must become root. To become root, type `su -` and enter your root password when prompted. Then, type `passwd <username>`. This allows you to enter a new password for the specified user account.

If you selected either the custom or workstation installation and do not see the graphical login screen, check your hardware for compatibility issues. The *Hardware Compatibility List* can be found at <http://hardware.redhat.com>.

### D.3.3 Your Printer Will Not Work Under X

If you are not sure how to set up your printer or are having trouble getting it to work properly, try using the graphical `printconf` program. Log in as root, open a terminal window, and type `printconf-gui`.

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