

Red Hat Linux 7.1

**The Official Red Hat Linux zSeries Installation
Guide**

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1 Introduction

Welcome to the *Official Red Hat Linux zSeries Installation Guide*.

The *Official Red Hat Linux zSeries 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 zSeries installation. Once you have completed the installation as outlined in this manual, you will have a fully functioning Red Hat Linux desktop system.

1.1 Documentation 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 (like 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.

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.

Combinations of keystrokes

A combination of keystrokes is represented like this: [key]-[key]. For example:

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

Sequences of commands in Graphical User Interface (GUI) menus

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

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

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-class 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.

1.2 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.

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/FAQ.html

2 Steps to Get You Started

2.1 Getting Started

The installation process assumes basic familiarity with the IBM zSeries platform and makes reference to the *IBM Linux for S/390 Redbook (SG24-4987-00)* guide. In general, this section assumes that you have reviewed the *Redbook* and are familiar with setting up LPAR's and VM guests on a S/390 zSeries system.

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

1. Allocate DASD partitions (2 recommended of at least 2 GB each) and an additional DASD partition (64 MB minimum recommended) to designate as a swap partition.
2. Acquire a minimum of 64 MB RAM (128 MB is strongly recommended) to designate for the Linux virtual machine.
3. Decide what environment under which the Red Hat Linux virtual machine will run (from a LPAR or as a VM guest).
4. Finally, it is important to review sections 3.3 through 3.8 and Chapters 5 and 6 of the *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 VM Linux virtual machine.

2.2 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.

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

2.3 Additional zSeries Hardware Preparation for Installation Notes

The network configuration must be determined beforehand. Red Hat Linux for the zSeries supports CTC, IUCV, LCS, and Gigabit 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.

2.4 Basic Overview of the Boot Method

For installation you have to start a kernel (with the Linux kernel), an `initrd64.bin` (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` 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.

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

- Set up an FTP, HTTP, or NFS server on a different machine. This server is referred to as RPM-SERVER throughout the rest of this document.
- Set up this server to export the directory which contains the RedHat directory and verify that this is working. (*Important NOTE:* the directory specified in the following examples refers to */the/directory/containing/RedHat*. This means it is the directory up to, but *NOT* including, the RedHat distribution directory. For example, if you have a Red Hat Linux 7.1 cd mounted at `/mnt/cdrom` on you host machine, */the/directory/containing/RedHat* directory would be `/mnt/cdrom`. This goes for NFS, FTP, and HTTP installs.)
 - Install via NFS

Note

At the time of printing, NFS installations using the IBM 64 bit zSeries kernel are highly unstable. HTTP or FTP installations are recommended.

⇒ Configure `/etc/exports` by adding the following line:

```
/the/directory/containing/RedHat  
Your.S390.IP.Address(rw,no_root_squash)
```

Note

This has been broken into two lines for easier reading.

It is important to specify the IP Address of the S/390 virtual machine that will be connecting to this NFS server.

⇒ Alternatively you may specify (on some NFS systems):

```
/the/directory/containing/RedHat *(rw,no_root_squash)
```

This will allow anyone to mount the RedHat install system.

⇒ 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:

```
⇒ mkdir /mnt/mytemp
```

```
⇒ mount -o rw,rsiz=8192 -t nfs /whatever/s390-root  
/mnt/mytemp
```

```
⇒ cd /mnt/mytemp
```

```
⇒ ls — allows you to view the contents of /mnt/mytemp. If you do not see the RedHat  
directory, then wrong path was mounted and/or exported.
```

```
⇒ umount /mnt/mytemp
```

– Install via FTP

⇒ If there will be no access to the internet from the S/390, you may setup an anonymous FTP server on a machine in your local network. Be sure not to conflict with any firewall restrictions.

– Install via HTTP

⇒ Alternatively you may setup an internal HTTP server.

Note

When booting the installation program, several warning messages may appear regarding module mismatches and may be ignored. These warnings are caused by the Red Hat Linux kernel loading of the closed source, binary only network drivers supplied by IBM. Further, if using the binary only drivers, an error message may also appear that originates from the channel device layer. It states, `chandev_exec_start_script failed`, and may be ignored.

2.6 Installing in VM

Log onto 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 s390 management console. If you are working from a Windows based machine, Jolly Giant (<http://www.jollygiant.com>) has a decent 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, log in, and execute the following commands:

Note

If you are using the OCO driver modules, be sure to copy the `initrd64.bin` modified by the `prepinitrd` script from the `Red-Hat/Drivers/` directory instead of the one in `images/` to the host machine.

- `cd /where/the/boot/images/are`
- `locsite fix 80`
- `bin`
- `get vmkrnl64.bin (repl`
- `get initrd64.bin (repl`
- `ascii`
- `mget *.parm redhat.* (repl`
- `quit`

You may now customize the parameter file (`inst64.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.

Note

The limit on the parameters in the parm file is a max of 9 (nine). All others supplied parameters will not be set by the boot kernel, thus forcing a prompt during boot of the installation program.

This count includes the basic `root=/dev/ram0 ro ip=off` which count as 3 (three) separate parameters leaving only 6 (six) more parameters that could be added.

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

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

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

Table 2–1

Virtual Machine Network Device	Acceptable Values for HOST=<...>
Ethernet (eth0)	HOST=fqdn:device:ipaddr[:mtu] where, fqdn is the fully qualified domain name of the virtual machine; device is eth0; ipaddr is the fixed IP address for this virtual machine; mtu is number of maximum transfer units (optional, should be 1492 or 1500). For example: HOST=s390x.redhat.com:eth0:1.2.3.4:1500
CTC (ctc0)	HOST=fqdn:device:ipaddr:gateway[:mtu] where, fqdn is the fully qualified domain name of the virtual machine; device is ctc0; ipaddr is the fixed IP address for this virtual machine; gateway is the IP address of the gateway; mtu is number of maximum transfer units (optional, should be 1492 or 1500). For example: HOST=s390x.redhat.com:ctc0:1.2.3.4:1.2.3.3:1500
IUCV (iucv0)	HOST=fqdn:device:ipaddr:host:gateway[:mtu] where, fqdn is the fully qualified domain name of the virtual machine; device is iucv0; ipaddr is the fixed IP address for this virtual machine; host is the VM host name of the IUCV partner; gateway is the IP address of the IUCV partner; mtu is number of maximum transfer units (optional, should be 1492 or 1500). For example: HOST=s390x.redhat.com:iucv0:1.2.3.4:1.2.3.3:1.2.3.2:1500

```
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.

- *<dev_num>* is the device number that is appended to 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.
- *<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.
- *<check-sum_received_ip_pkts>* performs error checking on the packets.
- *<use_hw_stats>* makes the driver keep statistics on the hardware being used.

If one or more of the fields are not specified, the default values are used. For example:

LCS=lcs0,0x9a4,0x9a5,0,0 for OSA-2 with LCS, where read=0x9a4 and write=0x9a5.

QETH=*qethINCLUDE>,<read>,<write>,<data>,<memory_usage>,<port_no/protocol_no>,<checksum_received_ip_pkts>,<use_hw_stats>*

Note

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

- `<dev_num>` is the device number that is appended to `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.
- `<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.
- `<check-sum_received_ip_pkts>` performs error checking on the packets.
- `<use_hw_stats>` makes the driver keep statistics on the hardware being used.

For example:

```
QETH=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.s390x.rpm.dir
```

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

```
RPMSEVER=http://your.http.server/your.s390x.rpm.path
```

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

```
RPMSEVER=IP:/your.s390x.rpm.dir
```

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

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

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

```
CTC=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 CTC parameter is not set, the driver will default to detected settings, which, depending on the system setup, the ctc read and write channels may be reversed. Example: CTC=ctc0,05b5,05b6 — As an alternative to setting this parameter, the read and write channel connections can be physically swapped.

If any of the network parameters required to make the network operate correctly are omitted from the parm file, a prompt will be 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 `inst64` script.

```
inst64
```

Answer any questions the script asks you (if you've set up the `inst64.parm` file, you shouldn't be asked anything). When the bootup process is complete, `telnet` to your S390 machine, if prompted, log in as root (any password will work), and run `rhsetup`. Refer to Chapter 3, *Installing Red Hat Linux* for instructions on using the installation program.

When the installation is finished, set up your linux virtual machine to boot from the DASD (virtual harddisk) rather than entering CMS or CP. This is done by setting the IPL address to the address of the DASD, usually 200.

Once installation is complete and the installed system is running (after IPLing from 200 for example), disconnect from 3270 using

```
#cp disc
```

rather than logging out — *logging out will stop the virtual Linux machine.*

To continue with the installation, refer to Chapter 3, *Installing Red Hat Linux* for further instructions.

2.7 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 "SYSPROG" 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 2.9, *Installing in an LPAR (Common Steps)* to continue.

2.8 Installing in an LPAR without the Red Hat Linux zSeries LPAR CD

Important

64-bit Linux is not supported on MP3000.

Transfer the `redhat.tdf`, `tpkernl64.bin`, `lpar.prm` and `initrd64.bin` 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`, edit the `redhat.tdf` file and change the location accordingly. (A usable editor on OS/2 is `epm`.)

Note

If you are using the OCO driver modules, be sure to copy the `initrd64.bin` modified by the `prepinitrd` script from the `Red-Hat/Drivers/` directory instead of the one in `images/` to the host machine.

If you desire, customize the parameter file (`lpar.prm`). It takes the following parameters:

```
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`

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

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

```
NETWORK=hostname:device:IP:netmask:broadcast:gateway
```

where, *hostname* is your hostname; *device* is your network device (this will usually be `eth0`); *IP* is your S/390 virtual machine IP; *netmask* is the netmask (usually `255.255.255.0`); *broadcast* is the broadcast address; *gateway* is the default gateway on your network.

```
RPMSEVER=ftp://your.ftp.server/your.s390x.rpm.dir
```

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

```
RPMSEVER=http://your.http.server/your.s390x.rpm.path
```

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

```
RPMSEVER=IP:/your.s390x.rpm.dir
```

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

```
DNS=list,of,dns,servers:list,of,search,domains
```

Example: `DNS=10.0.0.1,10.0.0.2:redhat.com,redhat.de` In this example, the DNS servers `10.0.0.1` and `10.0.0.2`, use `redhat.com` and `redhat.de` as default search domains.

```
LCS=lcs<dev_num>,<read>,<write>
```

If you are using an LCS network device, `<dev_num>` is the device number that is appended to `lcs` (values of `-1` indicates driver chooses the value and leaving this field blank will change `<read>`)

and <write> to a probe range), <read> is the read address, <write> is the write address. Example:
LCS=1cs0,0x9a4,0x9a5,0,0

If you omit any of these parameters, you will be prompted for them at installation time.

- 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**. At this point, 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-ROM, 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 2.9, *Installing in an LPAR (Common Steps)* to continue.

2.9 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**.

Answer any questions the script asks of you (if you've set up the `lpar.prm` file, you shouldn't be asked anything). When the bootup process is complete, `telnet` to your S390 machine as root and run `rhsetup`. Refer to Chapter 3, *Installing Red Hat Linux* for assistance with the Red Hat Linux installation program.

2.10 Which Installation Class is Best For You?

For the zSeries platforms, Red Hat Linux provides 3 different classes, or types, of installations:

Workstation

A workstation-class installation is most appropriate for a desktop system user. This option is not recommended for zSeries systems.

Server

A server-class installation is most appropriate for you 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 zSeries systems.

Custom

A custom-class installation allows you the greatest flexibility during your installation. You choose your partitioning scheme, which packages you want and more. Custom-class installations are most appropriate for those users more familiar with Red Hat Linux installations.

3 Installing Red Hat Linux

This chapter explains how to install Red Hat Linux after the system has been booted and the network has been configured as explained in Chapter 2, *Steps to Get You Started*. The following topics will be discussed:

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

3.1 The Installation Program User Interface

This release of Red Hat Linux features a text-based installation.

If you have never used the text mode installation program, or need a refresher on its user interface, read the next sections.

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. Please note, the screen shots provided in this document are from the x86 installation and are representative of the text-based installation for the zSeries.

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

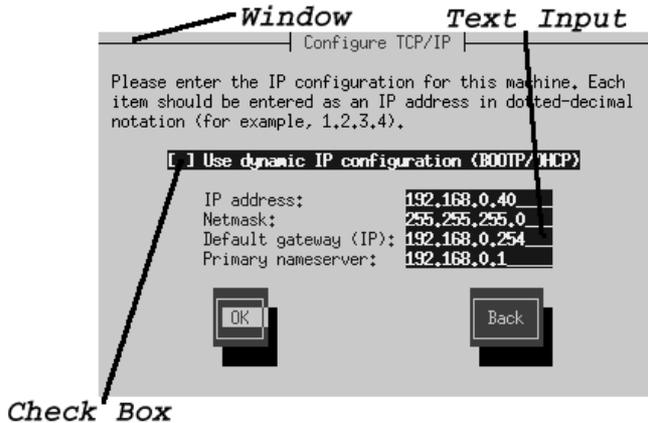
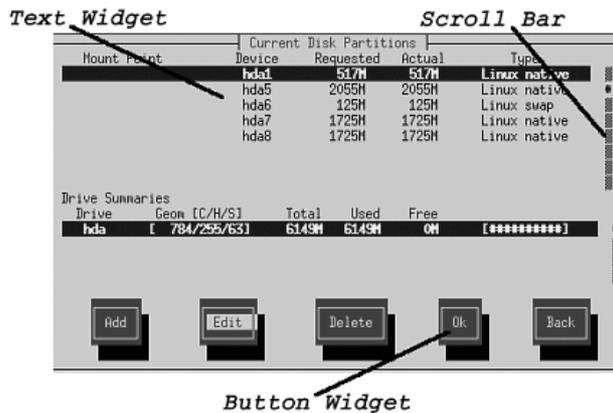


Figure 3–2 Installation Program Widgets as seen in Disk Druid



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.

3.1.1 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).

3.1.2 Starting the Installation Process

The following methods can be used to begin the installation process:

- VM guest installation
- LPAR installation

3.1.3 Displaying Online Help

Once the installation program is loaded into memory, you can obtain information about the installation process and options by pressing [F1] through [F6]. For example, press [F2] to see general information about the online help screens.

3.2 Running the Installation Program

After following the steps outlined in Chapter 2, *Steps to Get You Started* for booting an LPAR or VM system, `telnet` or `ssh` to the configured linux install system on the zSeries. Logging on via SSH is the preferred method.

When logged into the machine, running `rhsetup` will start the installation program. For problem resolution purposes, a script called `loaddasd.sh` is supplied that will load the DASD driver module.

3.3 Formatting DASD Partitions

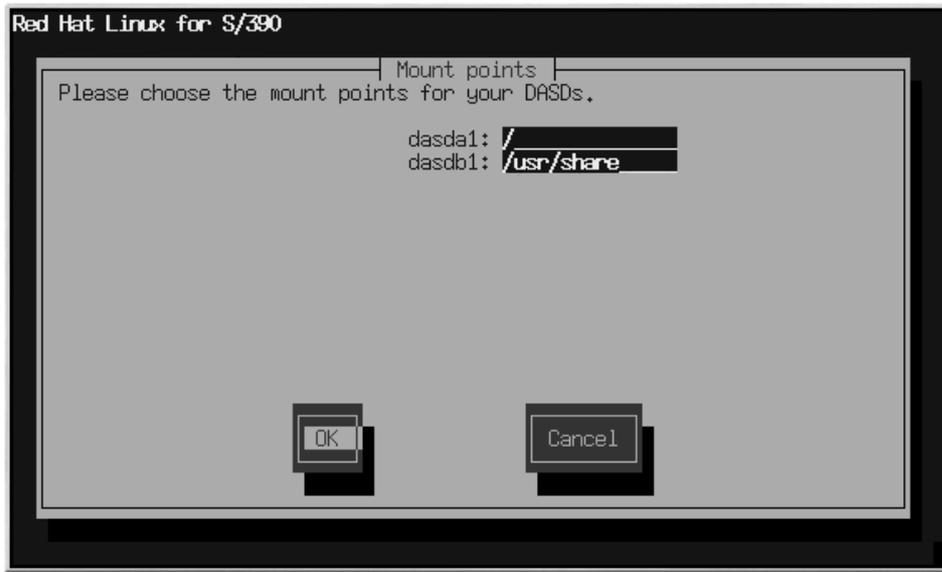
After the kernel loads the DASD driver and detects your DASD devices, you will be asked to format them. All newly created partitions should be formatted. In addition, any existing partitions that contain data you no longer need should be formatted. The DASD format program will format all selected DASD's simultaneously, therefore the formatting should only take as long as the largest DASD partition. Note: A 2 GB DASD partition could take upwards of 20 minutes to complete.

Further, if data DASD partitions such as `/home` or `/usr/local` have been added from another system, be sure not to format them if they contain data you wish to keep.

Figure 3–3 Choosing Partitions to Format

3.4 Setting the System Mount Points (Partitioning)

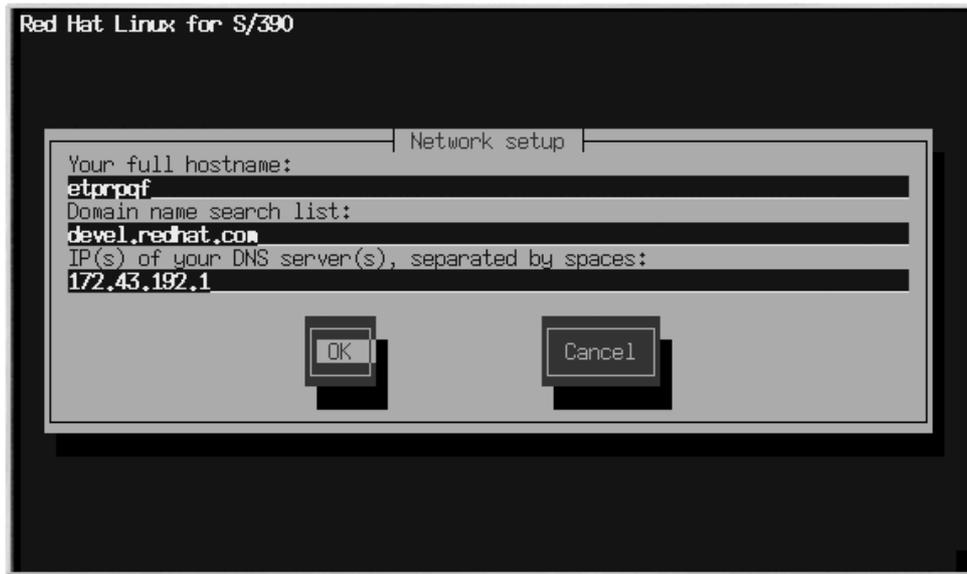
At this point, you must tell the installation program where to install Red Hat Linux. This is done by defining mount points for one or more disk partitions in which Red Hat Linux will be installed. One of the DASD's must be specified as the root partition (i.e. a mount point of `/`). Because the DASD partitions are usually small (e.g. ~ 2 GB's) it is recommended mount points of `/` and `/usr/share` be used (refer to Figure 3–4, *Setting Mount Points*). It is also recommended data partitions be specified (i.e data partition mount points `/home` and `/usr/local`).

Figure 3–4 Setting Mount Points

3.5 Network Configuration

The IP address of your network connection is already set up at this point from the boot stage of the installation process. This step requires additional network information, such as, the hostname, domain name search, and the IP address of the domain name servers. If more than one item is provided in the domain name search or DNS fields, please separate them by spaces.

Figure 3–5 Network Configuration



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`.

3.6 Installation Package Source Location

The Red Hat Linux installation program for the S/390 zSeries allows for 3 types of installations: FTP, HTTP, and NFS. Figure 3–6, *Setting the Package Source Location* illustrates the package source dialog. When typing in the location, do *NOT* include the `RedHat` directory in the path.

Following the package location selection, the install system will attempt to connect to the source location and kickoff stage two of the install process, package selection. This may take a while depending on the network speed.

Figure 3–6 Setting the Package Source Location

3.7 Welcome to Red Hat Linux

The **Welcome** screen does not prompt you for any input. At this point, the text mode installation program will begin.

In text mode, help can be seen by pressing [F1].

Figure 3–7 The Welcome Screen



Press the **OK** button to continue.

3.8 Install Options

Choose whether you would like to perform a full installation or an upgrade (see Figure 3–8, *Choosing Your Installation Type*).

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

Figure 3–8 Choosing Your Installation Type

3.9 Firewall Configuration

Red Hat Linux also offers you 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 3–9 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**. You can 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. It is recommended that this only be selected if you are running on a trusted network (not the Internet), or if you plan to do more detailed firewall configuration later.

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

Figure 3–10 Firewall Custom Configuration



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-class 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.

3.10 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 3–11 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.

3.11 Time Zone Configuration

Next, enter your system's time zone (see Figure 3–12, *Configuring the Time Zone*).

Figure 3–12 Configuring the Time Zone



If you wish to set the hardware (CMOS) clock to GMT (Greenwich Mean Time, also known as UTC, or Universal Coordinated Time), select **Hardware clock set to GMT**. Setting it to GMT means your system will properly handle daylight-saving time, if your time zone uses it.

Select your time zone from the list and press [Enter].

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.

3.12 Account Configuration

The account configuration screens allow you to set your root password and set up user accounts for you to log in to once the installation is complete (see Figure 3–13, *Root Account Creation* and Figure 3–14, *User Account Creation*).

3.12.1 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.

Figure 3–13 Root Account Creation



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 password¹ 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.

¹ 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.

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.

3.12.2 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.

Figure 3–14 User Account Creation



Enter an account name. Then enter and confirm a password for that user account. Enter the full name of the account user and press **OK**. 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.

After you add a user account for yourself, the **User Account Setup** dialog (which is not presented in this text) appears, giving you the opportunity to create additional accounts. Select **Add** to do so or **OK** to continue.

You can also choose **Add** 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.

3.13 Authentication Configuration

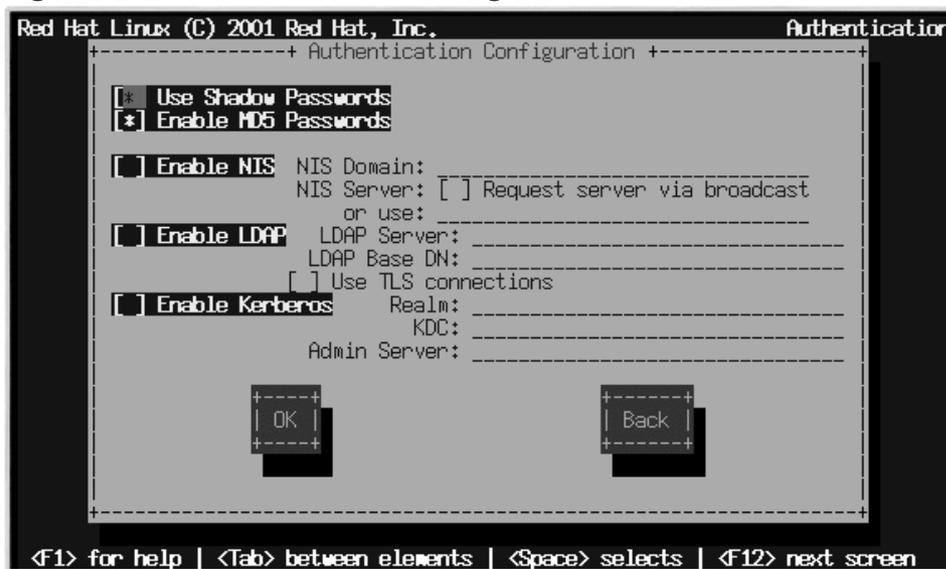
If you are performing a workstation- or server installation, please skip ahead to Section 3.14, *Package Group Selection*.

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 3–15, *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 3–15 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.

3.14 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-class 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.

GNOME and KDE are both graphical desktop environments² 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.

² 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.

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, press [Enter] or [Space] to activate the checkbox beside it (see Figure 3–16, *Package Group Selection*).

Figure 3–16 Package Group Selection



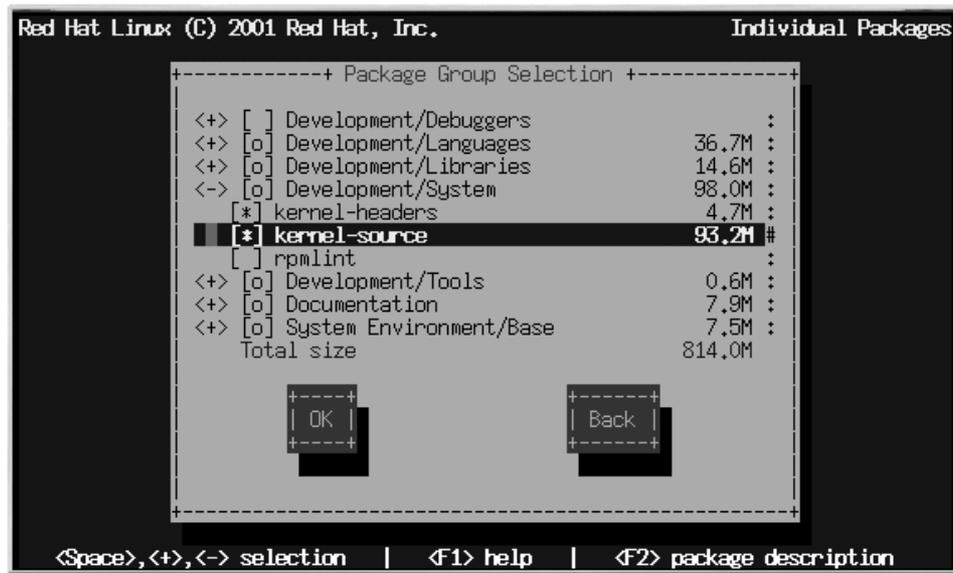
Select each component you wish to install. Selecting **Everything** (at the end of the component list) during a custom-class installation installs all packages included with Red Hat Linux. If you select every package, you will need approximately 1.7 GB of free disk space.

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

3.14.1 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 [Space] (see Figure 3–17, *Selecting Individual Packages*).

Figure 3–17 Selecting Individual Packages



On the left side of the screen you will see a directory listing of various package groups. When you expand a directory (press [Enter] or [Space]), the list of packages available for installation will appear in the panel on the right.

To see the list of packages in the **Applications/Editors** category, for example, use the arrow keys to select this group and press [Enter] or [Space]. When you do, the + sign (closed) changes to a - sign (open) and a list of packages in this category appears. An * appears beside currently selected packages. Press the [Enter] or [Space] keys to select or deselect packages.

To see a description of a particular package, make sure that package is highlighted and press [F1].

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.

3.14.2 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 3–18, *Unresolved Dependencies*).

The **Unresolved Dependencies** screen will only appear 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 3–18 Unresolved Dependencies



3.15 Preparing to Install

You will 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 DASD partitions are rewritten.

To cancel this installation process, press your computer's Reset button or use the [Control]-[Z] to exit out of the installation program or shutdown the LPAR or VM boot environment.

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

3.16 Installing Packages

At this point there is nothing left for you to do until all the packages have been installed (see Figure 3-19, *Installing Packages*). How quickly this happens depends on the number of packages you have selected and your computer's speed.

Figure 3–19 Installing Packages

```

Red Hat Linux (C) 2001 Red Hat, Inc.                                Install System
-----+ Package Installation +-----
Name   : glibc-2.2.3-6c
Size   : 16552k
Summary: The GNU libc libraries.

-----+-----+-----+-----+
Total   :          Packages      Bytes      Time
Completed:          15          206M      0:02:04
Remaining:          297          531M      0:05:20
-----+-----+-----+-----+

<F1> for help | <Tab> between elements | <Space> selects | <F12> next screen

```

3.17 Recovering From a Failed Installation

To help recover from a failed installation or a broken system, the installation program has a limited set of utilities you can use. After bringing up the installed system and logging on, do not use the `rhsetup` command. Instead, type `loadasd.sh` which brings up your DASD partitions. To mount the partitions, use, for example, `mount -t ext2 /dev/dasda1 /mnt/dest`. You can then make any changes required to that mounted partition. Here are a few other helpful hints about other utilities on the initial install ramdisk

1. The boot loader utility, `zipl` is the S/390 equivalent to the x86 utility, `LILO`. Modify `/etc/zipl.conf` when changes are made to the kernel or configuration prior to running `zipl`.

Note

To properly operate this utility you must first change root into the mounted previously installed system (e.g. `chroot /mnt/dest`).

2. The format utility with a text based interface, `dasdfmt`, can be used to reformat individual or multiple DASD partitions simultaneously. (`dasdfmt` will make all formatted filesystems use the ext2 filesystem). To change the filesystem type use `fdasd`, the S/390 equivalent to the x86 utility `fdisk`.
3. `dasdfmt` is the command line utility to individually format a DASD. Following a `dasdfmt`, run `fdasd`.
4. `mke2fs` or `mkswap` will create a swap partition. This partition type that is chosen must coincide with what is setup using `fdasd`.

3.18 Installation Complete

Your Red Hat Linux 7.1 installation is almost complete.

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`.

3.19 Common System Administration Tasks

- `chkconfig` can enable services including `xinetd`.
- `ntsysv` is also beneficial for selecting the services to be started when the linux virtual machine is booted.
- `setup` can be used to configure your machine. Check especially for `locale_config` and `timetool` after the installation.
- Configure XDMCP for remote X:
 - Set the desktop to `AnotherLevel`.
 - Edit `/etc/sysconfig/desktop` and change the line `DESKTOP=xxxx` to `DESKTOP=AnotherLevel`.
 - or
 - edit `/etc/X11/prefdm` and search for the line

```
if [ -n "$preferred" ] && which $preferred >/dev/null 2>&1; then
```

Add the line

```
preferred=xdm
```

Before this line.
 - Edit `/etc/X11/xdm/xdm-config` and comment out the line

```
DisplayManager.requestPort: 0
```

by placing a [!] in front of it.

- Edit `/etc/X11/xdm/Xaccess` and remove the first # from the line

```
# *          #any host can get a login window
```

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 7.1, 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 from Red Hat, Inc.'s support team.
- Red Hat Network — Easily update your packages and receive security notices that are customized for your system. Go to <https://www.redhat.com/network> for details.
- Priority FTP access — No more late-night visits to congested mirror sites. Owners of Red Hat Linux 7.1 receive free access to priority.redhat.com, Red Hat's preferred customer FTP service, offering high bandwidth connections day and night.
- 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

Red Hat provides installation assistance for Official Red Hat Linux boxed set products and covers installation on a single computer. This assistance is intended to help customers successfully install Red Hat Linux. Assistance with installation is offered via telephone and the Web.

Red Hat Support will attempt to answer any questions you may have before the installation process is initiated. This includes the following:

- Hardware compatibility questions
- Basic hard drive partitioning strategies

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 local parallel port printer to print text
- Configuring a mouse

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 setting up a Web server, which are not covered.

For assistance with these tasks, there is a wealth of on-line 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: *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 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 Scope of Red Hat Support

Red Hat, Inc. can only provide installation assistance to customers who have purchased an Official Red Hat Linux boxed set. If you have obtained Linux from any other company, you must contact that company for support. Examples of such companies are as follows:

- Macmillan
 - Sams/Que
 - Linux Systems Labs (LSL)
 - Mandrake
 - CheapBytes
-

Additionally, Red Hat Linux obtained via any of the following methods does not qualify for support from Red Hat:

- Red Hat Linux PowerTools Archive
- Downloaded via FTP on the Internet
- Included in a package such as Motif or Applixware
- Copied or installed from another user's CD

C.4 How to Get Technical Support

In order to receive technical support for your Official Red Hat product, you must first sign up.

Every Official Red Hat product comes with a Product Identification code: a 16-character alphanumeric string. The Product ID for Red Hat Linux 7.1 is located on the Registration Information Card that can be found inside the box. Your Product ID is on a perforated card that you can punch out and keep in a safe place. You need this code, so do not lose the card!

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.

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. The Product ID may also enable priority FTP access, depending on the product that you purchased, for a limited amount of time.

C.4.1 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.
 2. Using your login name and password you created during the customer profile, please login at the Red Hat Support website at <http://www.redhat.com/support>.
 3. 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.

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

4. Add a product to your profile. Please enter the following information:
 - The Product ID for your boxed set product
 - A description of the hardware on which the Red Hat Linux product will be installed
 - The Support Certificate Number or Entitlement Number if the product is a contract
5. Set your customer preferences.
6. Answer the optional customer questionnaire.
7. 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). Please do not lose your Product ID, or you might not be able to receive support.

C.5 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:

- 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 NIC do you have?)

C.5.1 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>.

C.6 Support Frequently Asked Questions (FAQ)

C.6.1 Q: Email Messages to support@redhat.com Bounce

I send email to support@redhat.com but my messages bounce back to me. What is the problem?

C.6.2 A: support@redhat.com Is Not Used at This Time

To better serve our customers, Red Hat is re-engineering our email support process. At this time, the support@redhat.com address is not functional. In the meantime, please use support via the Web or by telephone.

C.6.3 Q: System Will Not Allow Login

I know that I have already signed up, but the system will not let me log in.

C.6.4 A: Old Logins and Passwords Will Not Work

You could be trying to use an old login and password, or simply mistyping your login or password. Refer to Section D.2.2, *Problems When You Try to Log In* for more information.

D Troubleshooting Your Installation of Red Hat Linux

This appendix discusses some common installation problems you could encounter and provides solutions to these problems.

D.1 Trouble During the Installation

D.1.1 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.2 Problems After Installation

D.2.1 Problems with Server Installations and X

If you performed a server installation and you are having trouble getting X to start, that is because the X Window System is not installed during a server-class installation.

If you want the X Window System, but you did a server-class installation, 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.2.2 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-class 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>.

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