



IBM iSCSI BladeBoot

Red Hat Enterprise Linux Setup Guide

Version 1.2





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Note

Before using this information and the product it supports, read the information in “Notices,” on page 21.

March 2007

This edition applies to Version 1.2 of IBM iSCSI BladeBoot and to all subsequent releases and modifications until otherwise indicated in new editions.

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Preface

The IBM® iSCSI BladeBoot Red Hat Enterprise Linux® (RHEL) Setup Guide supports Version 1.2 of the IBM iSCSI BladeBoot application. This application provides the capability to boot a blade server from an iSCSI target using the basic network interface cards (NICs) included on the blade. No additional hardware or adapters are required. When employing iSCSI Boot from SAN, you do not have to install an internal disk in the blade.

About this guide

The purpose of this guide is to provide users of the iSCSI BladeBoot application information on installing the application on RHEL 5.

Who should read this guide

This guide is for system programmers and users working in an IBM BladeCenter® environment and using iSCSI BladeBoot on supported blades in an IBM BladeCenter chassis.

Chapter 1. Restrictions and infrastructure preparation

Before you begin, ensure that you have all of the necessary hardware and software to complete the process.

RHEL 5 is provided with limited support in BladeBoot environments. Broader support is planned in RHEL 5.1.

IBM BladeBoot support has the following restrictions:

- Support for IBM BladeBoot is restricted to IBM N-Series iSCSI Targets.
- You cannot install to or boot from multipath devices.
- Reconfiguring iSCSI after a successful initial boot is not supported.
- Support for BladeBoot on RHEL 5 will stop 45 days after RHEL 5.1 is generally available. After this date BladeBoot support on RHEL will be on versions 5.1 and later.

You will need

- An IBM BladeCenter chassis for Blades
- An IBM Blade with BladeBoot support and:
 - The latest BIOS firmware update
 - The latest BMC firmware update
- The IBM iSCSI Configuration Manager software utility
- An iSCSI Target, for example and IBM N3700
- A DHCP server
- A TFTP server
- An NFS server

You can download the iSCSI Configuration Manager and find links to the BIOS and BMC firmware updates at: <http://www.ibm.com/servers/eserver/bladecenter/storage/iscsi.html>.

You must also configure your iSCSI Target to provide a LUN. The LUN should be cleared when created (all zeros in the first sector at a minimum)

Chapter 2. Before installing RHEL

This section provides information on tasks that must be completed prior to installing Red Hat Enterprise Linux Server 5.

Prerequisites

To complete the installation, you must have the following:

- A server compatible with RHEL. If you will be using this server as your DHCP, NFS, or TFTP server, you will need those applications as well.
- The server must be configured for TFTP connection.
- Create a folder containing the RHEL 5 DVD ISO image.

When you have completed these prerequisites, continue to the next step, “Mount the ISO image and copy files”

Mount the ISO image and copy files

Mount the ISO image to obtain the installer files.

For example:

```
mount -o loop /rhel5iso/RHEL5.iso /rhel5files
```

Copy `initrd.img` and `vmlinuz` from `/rhel5files/images/pxeboot/` to your TFTP root folder.

Obtain `pxelinux.0` and copy to the `tftproot` folder of the TFTP server. You can obtain a copy of `pxelinux.0` from <http://www.kernel.org/pub/linux/utils/boot/syslinux/>.

Configure NFS

Edit the NFS configuration file to include the RHEL ISO image.

To add the ISO image you mounted previously to the NFS configuration, edit the file `/etc/exports` and add the line:

```
/rhel5iso *(ro,no_root_squash)
```

Then start or restart NFS using the following commands:

```
/sbin/service nfs start  
/sbin/service nfs reload
```

Create a DHCP reservation

Create a DHCP reservation for the diskless blade.

Add the following options to the reservation:

host-name (option 12)

This value is arbitrary.

root-path (option 17)

Configure the root path as described in IETF RFC 4173, which can be found here: <http://www.ietf.org/rfc/rfc4173.txt>.

next-server (option 66)

The IP address of the TFTP server.

filename (option 67)

pxelinux.0

Create pxelinux.cfg

You must create a configuration file for use by pxelinux.

To create this file, use the following procedure:

1. Create a folder in the TFTP root folder named pxelinux.cfg.
2. Create a file in pxelinux.cfg with a name that is the hex representation of the IP address assigned to the diskless Blade. For example, 192.168.70.2 would be C0A84602.
3. Add the following to the file:

```
label RHEL5GA
kernel vmlinuz
append initrd=initrd.img ramdisk_size=10000 method=nfs:server_IP:/home/rhel5iso
```

Note: The append line must be on a single line in the file.

Chapter 3. Install RHEL

This example describes how to perform an install of RHEL 5 from the network on a diskless Blade in an iSCSI Boot environment. The type of network install described requires an NFS server supplying the contents of the RHEL 5 DVD ISO image.

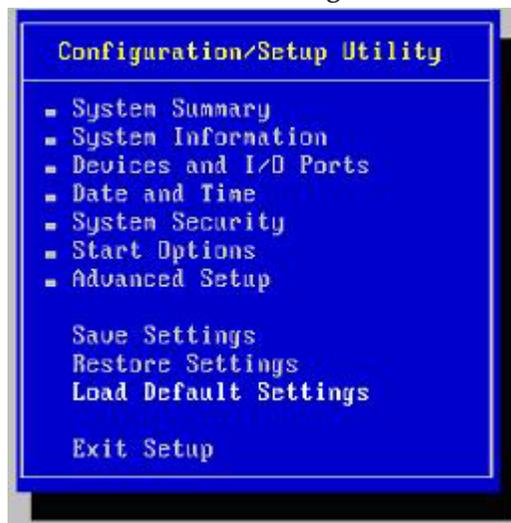
Note: In this example there is a LAN and a SAN. Switch 1 in the BladeCenter is connected to the LAN, switch 2 is connected to the SAN. The iSCSI Target, TFTP, DHCP, and NFS servers are all connected to the SAN.

Blade configuration

This section describes the configuration options for the blade.

To configure your diskless blade for RHEL installation, use the following procedure:

1. Power on the blade and press F1 when prompted to enter the Configuration/Setup utility.
2. Select **Load Default Settings** then **Select Start Options**.



3. Select the Ethernet connection being used for the SAN. In this example Planar Ethernet 2 is being used. Set **Run PXE only on selected Planar NIC** to Enabled.
4. Press **Esc** to exit the settings menu, then save the settings and exit Setup.

PXE Boot

If you have configured your pxelinux file for a prompt, you will be prompted now.

At the prompt, enter the name of your PXE entry. For this example, it is RHEL5GA.

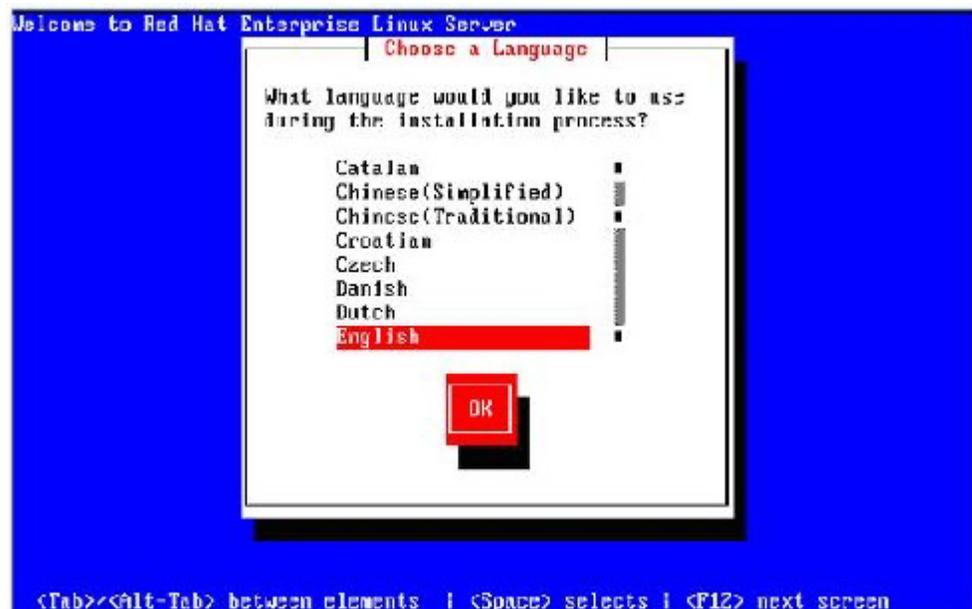
```
Broadcom UEFI PXE 2.1 v3.0.12
Copyright (C) 2000-2000 Broadcom Corporation
Copyright (C) 1997-2000 Intel Corporation
All rights reserved.

CLIENT MAC ADDR: 00 14 58 3D 1F 57  CUID: 58FC11BE 355F 302A 9BF8 3B5510F5FFE4
CLIENT IP: 192.168.70.2  MASK: 255.255.255.0  DHCP IP: 192.168.70.47

PXELINUX 0.11 2005-09-02 Copyright (C) 1994-2005 H. Peter Anvin
UNDI data segment at: 000942A0
UNDI data segment size: 40FA
UNDI code segment at: 00099000
UNDI code segment size: 4ECC
PXE entry point found (we hope) at 9900:0006
My IP address seems to be 000E4602 192.168.70.2
ip=192.168.70.2:192.168.70.47:0.0.0.0:255.255.255.0
TFTP prefix:
Trying to load: pxelinux.cfg/01-00-14-5a-3d-1f-57
Trying to load: pxelinux.cfg/000E4602
Trying to load: pxelinux.cfg/000E460
Trying to load: pxelinux.cfg/000E46
boot: RHEL5GA
```

Select a language

Select your language, tab to OK and press Enter.



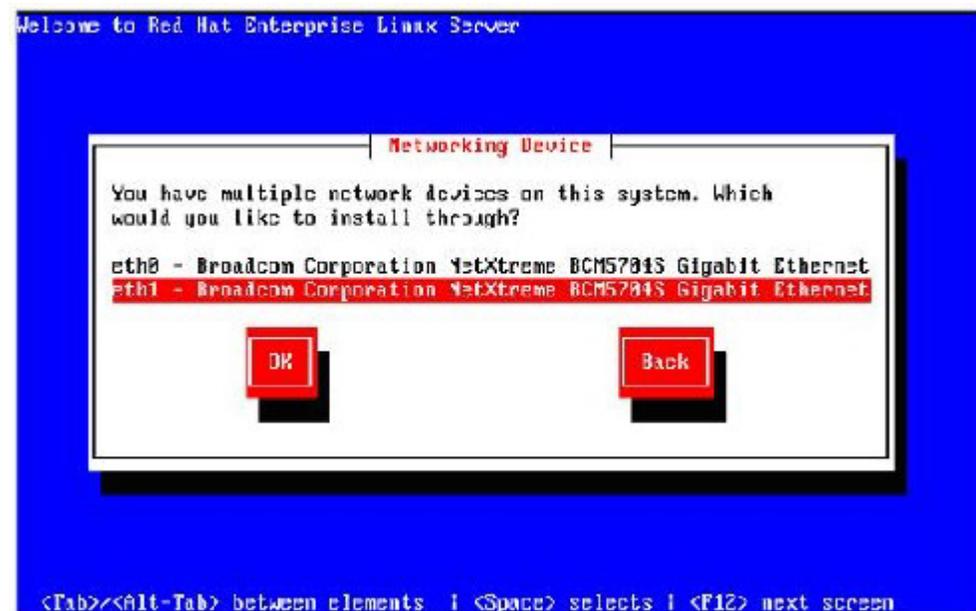
Keyboard type

Select your keyboard type, tab to **OK**, and press **Enter**.



Networking Device

Select your networking device, tab to **OK**, and press **Enter**. In this example the SAN is connected via eth1.



RHEL installation wizard

This section describes the panels and options for the RHEL installation wizard.

When you have completed the configuration steps, the RHEL installation wizard starts. To begin the wizard, follow these steps:

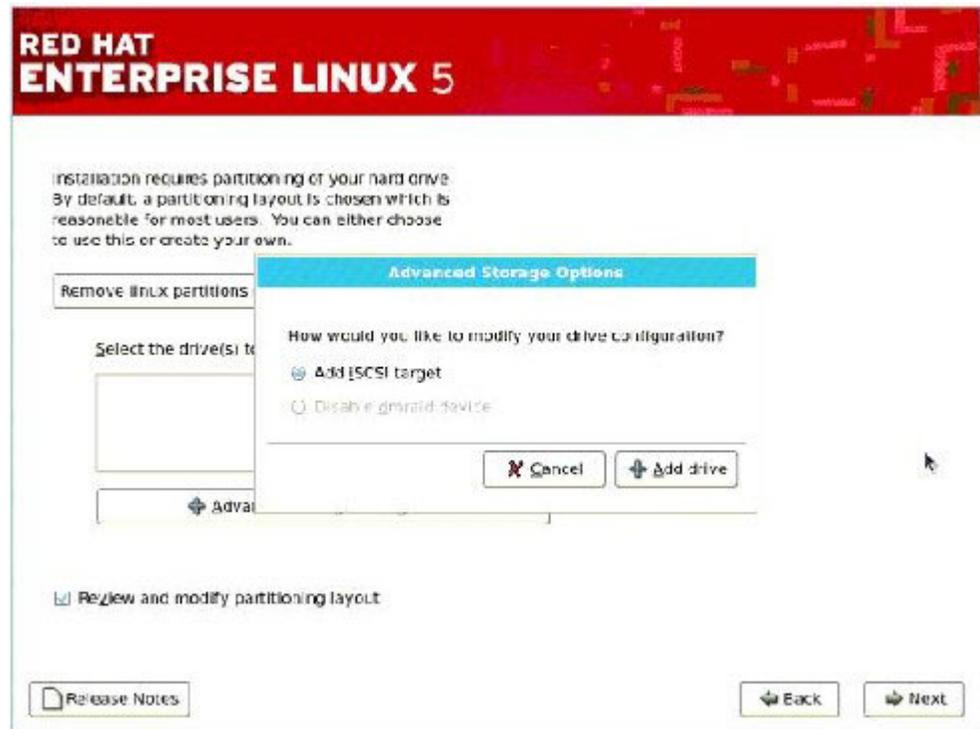
1. On the Start panel, click **Next** to continue to the Installation number panel.
2. If you have an Installation Number enter it on this panel. Otherwise select "Skip entering Installation Number".

Hard Drive

Next you must modify your drive configuration to include an iSCSI Target.

Modify your drive configuration using the following procedure:

1. Select **Review and modify partitioning layout**.
2. Click **Advanced storage configuration**.
3. Click **Add drive**.



4. Enter the Target IP Address.
5. Enter the IQN string you used when setting up the LUN on the iSCSI Target.
6. Click **Add target**. The LUN created on the iSCSI Target shows up as a drive.
7. Click **Next** to display the disk layout.
8. Verify the disk layout and click **Next** to configure and install the GRUB boot loader.
- 9.

Network configuration

Use the Network Devices screen to set the device that will be active on boot.

In this example the LAN is on eth0 and the SAN is on eth1. Enable the checkbox next to eth0 and click Next.



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Network Devices

Active on Boot	Device	IPv4/Netmask	IPv6/Prefix	Exit
<input checked="" type="checkbox"/>	eth0	DHCP	DHCP	
<input type="checkbox"/>	eth1	192.168.70.2/24		

Hostname
Set the hostname:

automatically via DHCP

manually (e.g., host.domain.com)

Miscellaneous Settings

Gateway:

Primary DNS:

Secondary DNS:

[Release Notes](#) [Back](#) [Next](#)

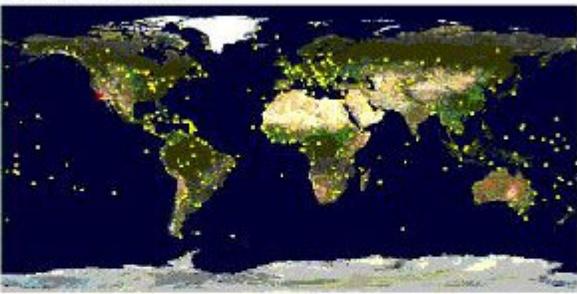
Time Zone

Set the time zone and click Next.



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Please click into the map to choose a region:



America/Los Angeles Pacific Time

System clock uses UTC

[Release Notes](#) [Back](#) [Next](#)

Root Password

Enter the Root password and click Next.



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The root account is used for administering the system. Enter a password for the root user.

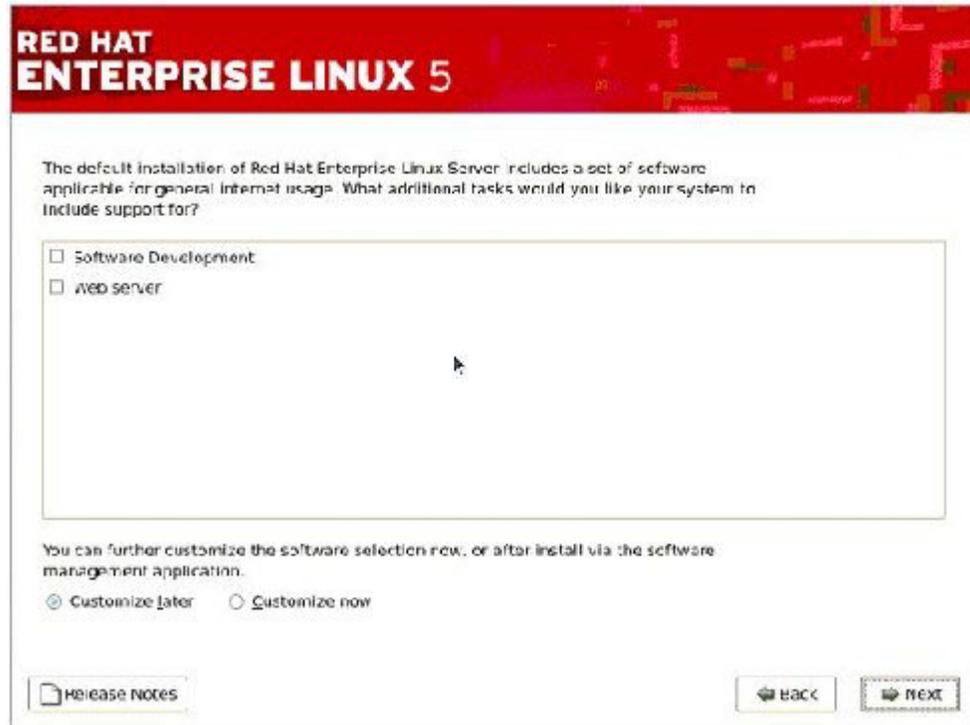
Root Password:

Confirm:

[Release Notes](#) [Back](#) [Next](#)

Installation Options

Select the options appropriate to your requirements and click Next.



RED HAT ENTERPRISE LINUX 5

The default installation of Red Hat Enterprise Linux Server includes a set of software applicable for general internet usage. What additional tasks would you like your system to include support for?

Software Development

Web server

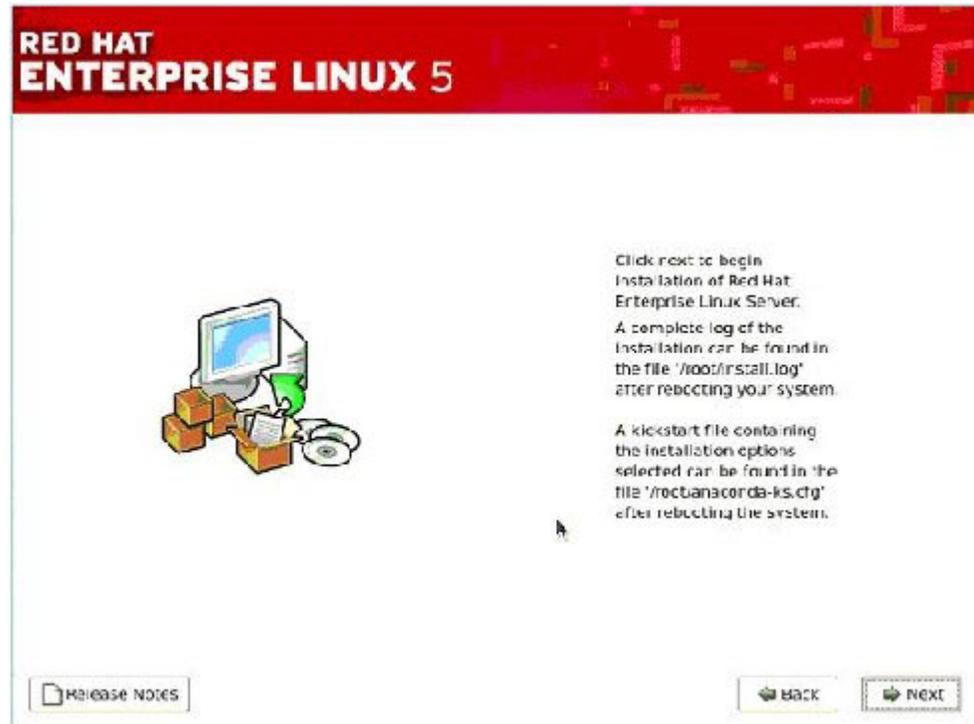
You can further customize the software selection now, or after install via the software management application.

Customize later Customize now

[Release Notes](#) [Back](#) [Next](#)

Begin installation

Click Next to begin the installation.



Reboot

When the installation is complete, click **Reboot**. You must press **F1** during the reboot to perform additional configuration on the blade.

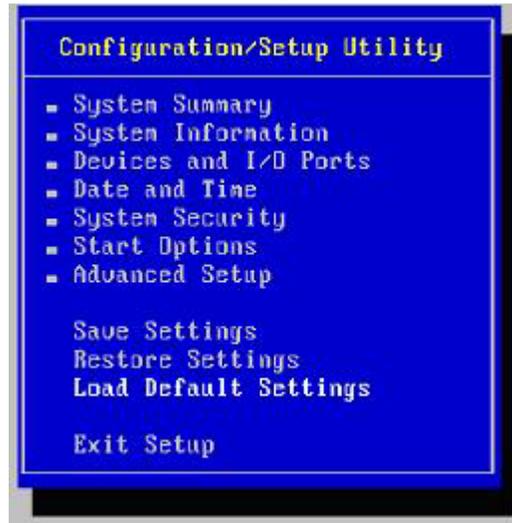


Blade reconfiguration

During the reboot, press **F1** to enter the Configuration/Setup utility and perform additional blade configuration.

After the installation is complete, you must perform the following additional configuration on the blade:

1. Select **Load Default Options** and then select **Start Options**.



2. On the **Start Options** panel, set "iSCSI Initiator" to **Enabled**.



3. Press **Esc** to exit, then save your settings and exit the setup.

iSCSI Firmware login

You should now see the iSCSI firmware successfully log in to the iSCSI target.

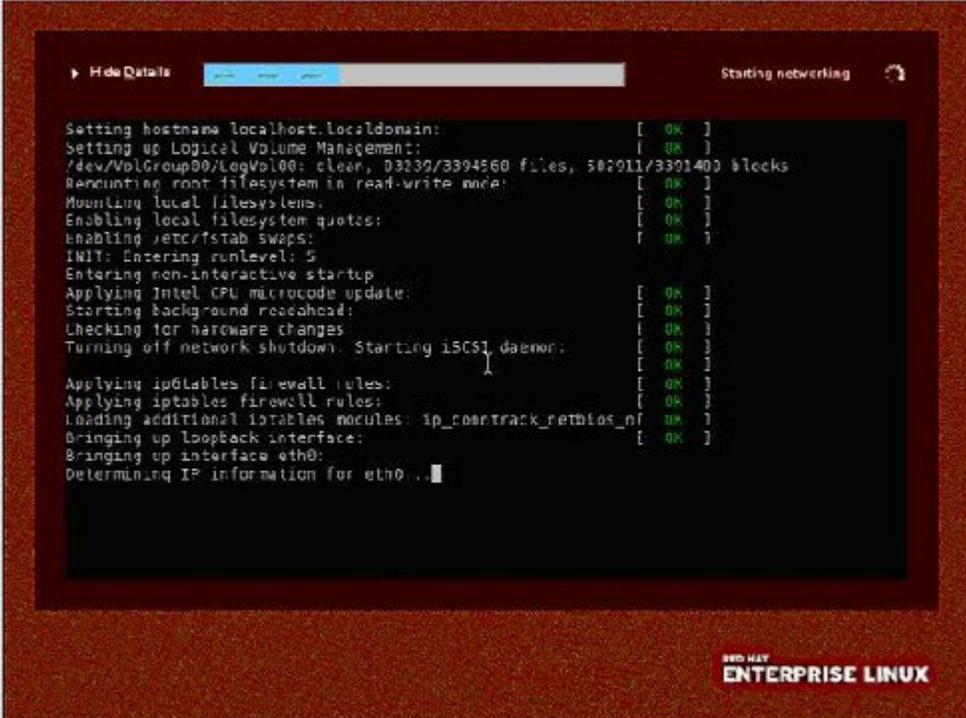
```
Attempting iSCSI connection

IBM iSCSI Firmware Initiator v1.0.31.0
(C) Copyright IBM Corp. 2003, 2006 All Rights Reserved
Initiator:
iqn : iqn.1986-03.com.ibm:KDKHG8X
IP : 192.168.70.2
Mask : 255.255.255.0
NIC : 00:14:5a:3d:1f:57

Target:
iqn : iqn.1986-03.com.ibm:sn.04251942
IP : 192.168.70.19
LUN : 0-0-0-0
Port : 3260
Login succeeded
```

RHEL Starts

After the iSCSI firmware has logged in to the target, RHEL starts.



```
Setting hostname localhost.localdomain: [ OK ]
Setting up Logical Volume Management: [ OK ]
/dev/VolGroup00/LogVol00: clean, 93239/3394560 files, 502911/3301400 blocks
Remounting root filesystem in read-write mode: [ OK ]
Mounting local filesystems: [ OK ]
Enabling local filesystem quotas: [ OK ]
Enabling /etc/fstab swaps: [ OK ]
INIT: Entering runlevel: 5
Entering non-interactive startup
Applying Intel CPU microcode update: [ OK ]
Starting background recheckd: [ OK ]
Checking for hardware changes: [ OK ]
Turning off network shutdown. Starting iSCSI daemon: [ OK ]
Applying iptables firewall rules: [ OK ]
Applying iptables firewall rules: [ OK ]
Loading additional iptables modules: ip_conntrack_netbios_nf [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface eth0:
Determining IP information for eth0 ..
```

Starting networking

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ENTERPRISE LINUX

RHEL Welcome screen

When the RHEL Welcome screen is displayed, click **Forward** to complete the installation.



RHEL License Agreement

The RHEL license agreement is displayed. Read the license agreement and, if you agree to it, select **Yes** and click **Next**.



Configure firewall

Configure the RHEL firewall as appropriate for your environment and click Forward.



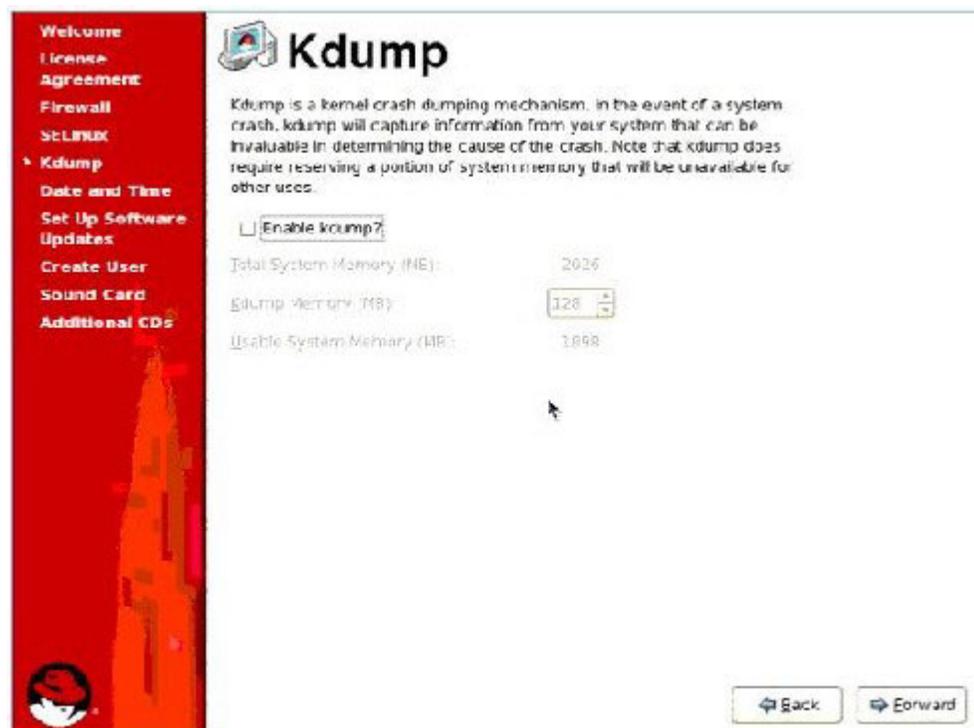
Configure security

Select the SELinux Setting as appropriate. Click **Forward** to continue.



Disable KDump

For this example, KDump must be disabled. Ensure that it is, and click **Forward**.



Configure date and time

Set the date and time and click **Forward** to continue.

Date and Time

Please set the date and time for the system.

Date & Time | Network Time Protocol

Date

March 1 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Time

Current Time: 13:26:00

Hour: 13

Minute: 20

Second: 23

Back Forward

Software Updates

For this example, skip setting up Software Updates by clicking **Forward**.

Set Up Software Updates

This assistant will guide you through connecting your system to Red Hat Network (RHN) for software updates, such as:

- Your Red Hat Network or Red Hat Network Satellite login
- A name for your system's Red Hat Network profile
- The address to your Red Hat Network Satellite (optional)

If you do not have a Red Hat login, this assistant will allow you to create one.

Why Should I Connect to RHN? ...

Would you like to register your system at this time? **(Strongly recommended.)**

Yes, I'd like to register now.

No, I prefer to register at a later time.

Back Forward

Create User

Enter the user information and click **Forward**.

Welcome
License Agreement
Firewall
SELinux
Kdump
Date and Time
Set Up Software Updates
Create User
Sound Card
Additional CDs

Create User

It is recommended that you create a 'username' for regular (non-administrative) use of your system. To create a system 'username,' please provide the information requested below.

Username:

Full Name:

Password:

Confirm Password:

If you need to use network authentication, such as Kerberos or NIS, please click the Use Network Login button.

Sound Card

The sound card is not necessary for this example. Click **Forward** to continue.

Welcome
License Agreement
Firewall
SELinux
Kdump
Date and Time
Set Up Software Updates
Create User
Sound Card
Additional CDs

Sound Card

An audio device has been detected in your computer.

Click the "Play" button to hear a sample sound. You should hear a series of three sounds. The first sound will be in the right channel, the second sound will be in the left channel, and the third sound will be in the center.

No soundcards were detected.

Additional CDs

You are prompted for additional CDs. There are no additional CDs for this installation. Click **Forward** to continue.



Installation complete

You have completed all of the required steps for installation.

To begin using the installation, login with the user credentials you supplied during the installation.

Appendix. Notices

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