SUSE LINUX Enterprise Server

Architecture-Specific Information

2. Edition 2004

Notices and comments can be sent to `documentation@suse.de`.

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Contents

Preface

This manual describes the steps for installing SUSE LINUX Enterprise Server on IBM iSeries, pSeries, JS20 Blades, eServer i5 and eServer p5 systems. It contains all necessary information for the preparation of the installation of SUSE LINUX Enterprise Server. The installation of SUSE LINUX Enterprise Server is described in the *Installation and Administration*.

Whenever possible, this manual refers to relevant information sources and other documentation on the Internet and on your installed system. Detailed information about Linux device drivers and other technical details are covered in the IBM (online) documentation. Note the respective references.

Structure of this Manual

This manual provides information about the hardware and software requirements for successfully installing SUSE LINUX Enterprise Server on your system, necessary steps on OS/400, and the preparation of the iSeries, pSeries, JS20 Blades and eServer i5/p5 firmware.

Target Group

Readers of this manual should have some experience in the following areas:

- Use of OS/400 or the pSeries firmware.
- Knowledge of the hardware environment of the IBM iSeries or pSeries system, especially of the network environment.
- Basic Linux and Unix skills.

Acknowledgements

The history of Linux is a success story of countless developers around the world who continue what Linus Torvalds once started as a one-man show. We sincerely appreciate their tireless commitment.

We would particularly like to thank all who are involved in the iSeries and pSeries project at IBM and SUSE LINUX. Many thanks to the developers at SUSE LINUX and IBM, the testers at SUSE LINUX, and all beta testers and editors at IBM.

Nuremberg, July 1, 2004

Your SUSE LINUX Team

Preparation

This chapter describes the preparatory steps that must be taken before the actual installation.

The installation can be controlled via a VNC client (see the relevant chapter in *Installation and Administration*). The installation procedure depends on the system used. There is a section about the installation on IBM iSeries systems (Section 1.1), on IBM pSeries systems (Section 1.3 on page 30), and on IBM JS20 Blades (Section 1.4 on page 37).

Note

Creating a Network Installation Source

Create a network installation source if SUSE LINUX should be installed on a number of systems or partitions. This eliminates the need to change CDs during the installation. The same source can also be used for the concurrent installation on several partitions or systems of the same model line. The configuration of a network installation source is described in *Setting up a Central Installation Server* in the *Installation and Administration* manual. For iSeries and eServer i5, a network installation source is setup in a special partition. See Section 1.1.4 on page 23 for iSeries

Note

1.1 Preparing an Installation on an IBM iSeries System

An iSeries system must be prepared on the OS/400 side before installing SUSE LINUX. This section describes the installation with a built-in CD ROM drive.

Note

The steps in this section are especially written for the installation on iSeries systems running IBM OS/400 V5R1. They can also be performed on IBM OS/400 V5R2. Additional options only available to OS/400 V5R2 are described in *Linux in a guest partition* available at `http://publib.boulder.ibm.com/iseries/v5r2/ic2924/info/rzalm/rzalmlinuxkickoff.htm`

Note

The support portal often features articles about common problems. This portal can be accessed from the web site `http://portal.suse.de`.

This chapter was compiled in close cooperation with Christopher Abbey, James Srebbing, Jay S. Bryant, and Brent Baude.

1.1.1 Resources

Introductory Resources

- The iSeries site located at `http://www.ibm.com/servers/eserver/iseries/linux/`
- The IBM Linux on iSeries Redbook: `http://www.redbooks.ibm.com/pubs/pdfs/redbooks/sg246232.pdf`
- The iSeries on Linux system guide: `http://www.ibm.com/servers/eserver/iseries/linux/pdfs/guide.pdf`
- Linux in a guest partition: `http://publib.boulder.ibm.com/iseries/v5r2/ic2924/info/rzalm/rzalmlinuxkickoff.htm`
- Information about Linux on LPARs: `http://publib.boulder.ibm.com/pubs/html/as400/v5r1/ic2924/info/rzalm/rzalmlinuxkickoff.htm`
- Mailing lists:
  - `linuxppc-iseries` (to participate, send an e-mail with subscribe linuxppc-iseries in the message body to `Majordomo@lists.linuxppc.org`)

- linuxppc64-dev (to particpate, send an e-mail with subscribe linuxppc64-dev in the message body to Majordomo@lists.linuxppc.org)

The following links are interesting for the maintenance of an installation:

- The SUSE LINUX portal https://portal.suse.com/ The portal is an effective help tool for assisting customers in solving problems. A corresponding article is published whenever SUSE discover that a special case could lead to serious problems. Search the portal using keywords like PPC or POWER.
- Security alerts: http://www.suse.com/us/support/security/index.html SUSE also maintains two security-related mailing lists to which anyone may subscribe.
  - suse-security@suse.com — General discussion of security regarding Linux and SUSE. All security alerts for SUSE LINUX are sent to this list. To subscribe, send an e-mail message to mailto:suse-security-subscribe@suse.com.
  - suse-security-announce@suse.com — The SUSE mailing list exclusively for security alerts. To subscribe, send an e-mail message to mailto:suse-security-announce-subscribe@suse.com.

1.1.2 Necessary Steps Concerning OS/400

The following section assists in the configuration of an iSeries system when installing SUSE LINUX. Detailed reference information about how to create partitions for Linux is contained in the following documents:

- For OS/400 V5R1: http://publib.boulder.ibm.com/pubs/html/as400/v5r1/ic2924/info/rzalm/rzalmlinuxkickoff.htm
- For OS/400 V5R2: http://publib.boulder.ibm.com/iseries/v5r2/ic2924/info/rzalm/rzalmlinuxkickoff.htm

The redbook Linux on iSeries (SG24–6232–00) provides detailed information (http://www.redbooks.ibm.com/pubs/pdfs/redbooks/sg246232.pdf).

The configuration of a system on the OS/400 side requires an OS/400 system access with *SERVICE permissions and authority to access SST. A DST password for creation of a console user is also required. A 5250 terminal or a 5250 emulation package is required to be able to connect to OS/400 (like TN5250 on Linux or PCS or Client Access on Windows).

Partitioning the System

Create a new system partition for SUSE LINUX first. Use main option number 5, 'Work with System Partitions', suboption 5 'Create a new Partition' in STRSST. Use main option 3 -> 'Work with Partition Configuration', suboption 2 'Change Partition Processing Resources' if the partition already exist.

```
                        Create New Partition
                                                        System:   SUSE1
Complete blanks, press Enter.

 Partition identifier and name  ... . . . . . .  3__  GINGER__

 Number of available system processors  ... . :  1
 Number of partition processors ... . . . . . .  1__
 Minimum / maximum number of processors ... . .  0__ / 1__
 Use shared processor pool  ... . . . . . . . .  2  1=Yes, 2=No

 Size of available system main storage (MB) ..:  256      / 44
 Size of partition main storage (MB)  ... . . .  256_____
 Minimum / maximum size of main storage (MB) ..  0_______ / 752_____


F3=Exit   F9=Exclude limits   F10=Work with shared processor pool
F11=Display partition processing configuration   F12=Cancel
```

```
                Change Partition Processing Resources
                                                        System:   SUSE1
Type changes, press Enter.

 Partition identifier and name  .... . . . . :  3    GINGER

 Current / available number of processors ...:  1   / 0
 New number of processors .... . . . . . . . .  1__
 Use shared processor pool  .... . . . . . . .  2  1=Yes, 2=No

 Current / available size of main storage (MB)  :  256   / 44
 New size of main storage (MB)  .... . . . . .  256_____


F3=Exit   F9=Include limits   F10=Work with shared processor pool
F11=Display partition processing configuration   F12=Cancel
```

Try to plan your minimum and maximum values for processor ('Minimum / maximum number of processors') and main storage ('Minimum / maximum size of main storage') accurately because changing these values requires a primary partition IPL.

```
                Change Partition Processing Resources
                                                      System:   SUSE1
Type changes, press Enter.

 Partition identifier and name  .. . . . . . . :  3    GINGER

 Current / available number of processors .. . :  1   / 0
 New number of processors .. . . . . . . . . . .  1__
 Minimum / maximum number of processors .. . . .  0__ / 1__
 Use shared processor pool  .. . . . . . . . . .  2  1=Yes, 2=No

 Current / available size of main storage (MB) :  256      / 44
 New size of main storage (MB)  .. . . . . . . .  256_____
 Minimum / maximum size of main storage (MB)  ..  0_______ / 752_____


F3=Exit   F9=Exclude limits   F10=Work with shared processor pool
F11=Display partition processing configuration   F12=Cancel
```

Confirm the changes with Enter to start the process for creating a new partition.

An IPL is required after creating a new partition.

Configuration of the Virtual Ethernet (System Tools)

Use the `System Service Tools` (STRSST) to configure the `Virtual Ethernet`. Select (F5) ('Work with system partitions'), (F3) ('Work with partition configuration'), then (F10) to change the virtual LAN configuration. Pressing (F9) shows all partitions (even the ones not yet linked).

```
                Work with Virtual LAN Configuration
                                                      System:   SUSE1
Type options, press Enter.
  2=Change

    Par          --------------Virtual LAN Identifiers---------------
Opt ID  Name     0  1  2  3  4  5  6  7  8  9  10  11  12  13  14  15
 _    0 PRIMARY  1  .  .  .  .  .  .  .  .  .   .   .   .   .   .   .
 _    1 PEPPER   1  .  .  .  .  .  .  .  .  .   .   .   .   .   .   .
 _    2 CURRY    1  .  .  .  .  .  .  .  .  .   .   .   .   .   .   .
 _    3 GINGER   1  .  .  .  .  .  .  .  .  .   .   .   .   .   .   .




'1' Indicates LAN in use.  '.' Indicates LAN not in use.
F3=Exit                              F9=Show only partitions using Virtu
F11=Display communication options    F12=Cancel

                  Change Virtual LAN Configuration
                                                      System:   SUSE1
  Partition identifier . . . . . . . . . . . . . . . :  3
  Partition name . . . . . . . . . . . . . . . . . . :  GINGER

Type changes, press Enter.
  1=Yes  2=No

  -------------------Virtual LAN Identifiers-------------------
  0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
  1   2   2   2   2   2   2   2   2   2   2   2   2   2   2   2



F3=Exit   F12=Cancel
```

Partitioning Tips — Processors, Memory, NWSDs, and LPARs

- Run STRSST (Start System Service Tools) and select (5) ('Work with system partitions'), then (3) ('Work with partition configuration') and assign the host partition for the guest by entering 13 in the field next to the partition name.

- Declare a memory range for configuration in the LPAR (Logical Partition). This is the minimum and maximum amount of memory assigned to this LPAR without a primary IPL (Initial Program Load). The settings for the maximum amount should also reserve space for the `Hardware Page Table (HPT)`.

  To calculate the memory available to an LPAR, use this formula:

  ("Configured Memory" minus "Maximum Memory of the LPAR configuration") divided by 64

  The result is rounded up to a multiple of 2.

  Example: The maximum size shall be 248 MB. Assuming 1/64 of this value to be taken up by the HPT, the result of 3.875 MB is rounded up to the value of 4 MB.

- Minimum memory requirement for the installation: For a text-based installation, assign the LPAR at least 256 MB. An installation with VNC requires at least 448 MB.

Assignment of Network Storage Space

Next, assign SUSE LINUX some storage space. Do this with the utility CRTNWSSTG.

```
                    Create NWS Storage Space (CRTNWSSTG)

Type choices, press Enter.

Network server storage space.. > GINGER0___    Name
Size.. . . . . . . . . . . . .   9000_______   *CALC, 1-64000 megabytes
From storage space.. . . . . .   *NONE_____    Name, *NONE
Format.. . . . . . . . . . . .   *open_____    *NTFS, *FAT,*FAT32,*OPEN
Auxiliary storage pool ID  . . .   1_____        1-99
Text 'description' . . . . . .   ginger_root_disk_____________________



                                                                   Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this dis
F24=More keys
Creating NWS storage space GINGER0: 32 of 9000 megabytes complete.
```

Creation of the Network Server Description

The *Network Server Description* combines the individual configuration settings to one object.

```
                    Create Network Server Desc (CRTNWSD)

Type choices, press Enter.

Network server description . . .   ginger__       Name
Resource name  . . . . . . . . .   *NONE_____     Name, *NONE
Network server type  . . . . . .   *guest____     *WINDOWSNT, *GUEST



                                                                    Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this dis
F24=More keys
Parameter NWSD required.                                             +
```

Change the following settings:

- NWSD name
- Network server type = *GUEST
- Partition = ⟨*enter the partition name here*⟩
- Code page = 437
- IPL source = *STMF
- IPL stream file = '/QOPT/SU910.001/ISERIES64' The statements made in Section 1.1.4 on page 23 are valid for net-based installations.
- IPL parameters = 'vnc=1 vncpassword=suseinst'
- Text description = SUSE LINUX Enterprise Server
- Online at IPL = *NO

```
                    Create Network Server Desc (CRTNWSD)

Type choices, press Enter.

Network server description ... > GINGER__      Name
Resource name  ... . . . . . .   *NONE_____     Name, *NONE
Network server type  ... . . . > *GUEST____    *WINDOWSNT, *GUEST
Online at IPL  ... . . . . . .   *NO           *YES, *NO
Vary on wait ... . . . . . . .   *NOWAIT       *NOWAIT, 1-15 minutes
Partition  ... . . . . . . . . > GINGER____    Name
Code page  ... . . . . . . . .   437____       *LNGVER,437,850,852,857
Server message queue ... . . .   *JOBLOG___    Name, *JOBLOG, *NONE
  Library  ... . . . . . . . .     __________  Name, *LIBL, *CURLIB
TCP/IP port configuration:       _
  Port ... . . . . . . . . . .   *NONE_____    *NONE, *INTERNAL, 1, 2,3
  Internet address ... . . . .   _________________
  Subnet mask  ... . . . . . .   _________________
  Maximum transmission unit ..   __________   Number
            + for more values _
TCP/IP local host name ... . .   *NWSD_____________________________
TCP/IP local domain name ... .   *SYS______________________________
TCP/IP name server system  ...   *SYS______________
            + for more values   _________________
Restricted device resources ..   *NONE_____    Name, *NONE, *ALL...
            + for more values   __________
Synchronize date and time  ...   *TYPE         *TYPE, *YES, *NO
IPL source ... . . . . . . . > *STMF__        *NWSSTG, *PANEL, *STMF,A
IPL stream file  ... . . . . > '/QOPT/SU910.001/ISERIES64'___________
IPL parameters ... . . . . . .   'vnc=1 vncpassword=suseinst'____
Authority  ... . . . . . . . .   *LIBCRTAUT    Name, *LIBCRTAUT,*CHANGE
Text 'description' ... . . . > 'SUSE LINUX Enterprise Server'_______________

                                                                  Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this dis
F24=More keys
```

It is possible to pass additional IPL parameters for the VNC. Refer to the *Installation and Administration* manual.

The `IPL stream file` can be queried from the OS/400 command line with the command `DSPLNK('QOPT')`.

Linking the Network Storage Space with the Network Server Description (WRKNWSSTG)

The newly created storage space needs to be linked with the `Server Description`. First select the `storage space` from the list.

```
                Work with Network Server Storage Spaces
                                                        System:   SUSE1
Type options, press Enter.
  1=Create   3=Copy   4=Delete   5=Display   6=Print   10=Add link
  11=Remove link

                 Percent
Opt  Name        Used     Size   Server  Drive  Format    Access    ASP
__   __________
__   CURRY0         0     2000  CURRY       1   *OPEN     *UPDATE     1
__   CURRY1         0     2000  CURRY       2   *OPEN     *UPDATE     1
10   GINGER0        0     9000                  *OPEN                 1
__   TEST           0     1500                  *OPEN                 1



                                                                  Bottom
Parameters or command
===> ____________________________________________________________________
F3=Exit   F4=Prompt   F5=Refresh   F6=Print list   F9=Retrieve
F11=Display text      F12=Cancel   F17=Position to
```

The link to the `Network Server Description` is then established.

```
                  Add Network Server Storage Link (ADDNWSSTGL)

Type choices, press Enter.

Network server storage space . . > GINGER0       Name
Network server description . . . > GINGER        Name
Drive letter . . . . . . . . . .   *FIRSTAVAIL   K-Z
Dynamic storage link . . . . . .   *yes          *NO, *YES
Network server type  . . . . . .   *NWSD         Character value
Drive sequence number  . . . . .   *CALC         3-18, *CALC

                          Additional Parameters

Access . . . . . . . . . . . . .   *UPDATE       *UPDATE, *READ



                                                                  Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this dis
F24=More keys
```

Additional Steps

The instructions in Section 1.1.3 on the next page explain how to configure a virtual console for operating the installation software.

1.1.3 Client for the Operation of the Installation Software

This section describes the configuration of the telnet access to the virtual console.

Supported Terminals

Table 1.1: *Supported Terminal Emulators*

Operating System	Terminal	Support
Linux	Linux console	fully supported
Linux	Standard Xterm	fully supported
Linux	GNOME terminal	fully supported
Linux	KDE terminal	fully supported
Linux	screen	fully supported
Windows	PuTTY	fully supported
Windows	Telnet client in Windows 98	not supported
Windows	Telnet client in Windows 2000	not supported
Windows	Telnet client in Windows XP	not supported
AIX	aix xterm	not supported

Note

Using a fully supported terminal emulator makes all features of the installation software accessible, including key combinations and colors.

Note

When installing from a Windows machine, the freely available telnet client PuTTY should be used in all cases. The rest of this section describes the configuration and operation of PuTTY in detail. The telnet client shipped with Windows 98 is not supported. The telnet clients shipped with Windows 2000 and Windows XP can be used while offering only a restricted usage of the installation software.

aixterm generally does not cooperate too well with Linux. A workaround solution is to start an xterm on AIX and set the terminal manually with

`TERM=vt100`. Because this is not possible during installation, a different platform should be used.

When operating the Linux terminal multiplexer screen, it is recommended to adjust the setting for `background-color-erase` because the background would otherwise be displayed black instead of reflecting the color indicated by the installation software. To achieve this, insert the following entry in the file `~/.screenrc`:

```
defbce on
```

To change this setting for just one single window, use (Ctrl)-(A) (:) bce (Enter).

Configuration of PuTTY

PuTTY is a freely available telnet and ssh client for Windows. putty.exe is located in the directory `dosutils` on CD 1. It is also available at `http://www.chiark.greenend.org.uk/~sgtatham/putty/latest/putty.exe`

CD 1 can be read by any Windows system. The application consists of just one executable file. No installation steps are necessary except for copying the file `dosutils/putty/putty.exe` to the hard disk of your system. Find comprehensive documentation read at `http://www.chiark.greenend.org.uk/~sgtatham/putty/`.

To simplify use of PuTTY, create a session profile for accessing the virtual console with PuTTY:

Start PuTTY. A dialog appears as shown in Figure 1.1.

1. Select 'Window' and change the window size to, for example, 40x100 by entering the values into the fields for 'rows' and 'columns' as shown in Figure 1.2.
2. Select 'Appearance' then select 'Change' (shown in Figure 1.3).
3. Select a font type as shown in Figure 1.4. Courier new, size 10 (points) is recommended. If this font type is not available, select Fixedsys, size 12.
4. Select 'OK' to save the font type settings. It is possible for a font other than the selected one to be displayed. This appears to be an error in PuTTY (compare with Figure 1.5).

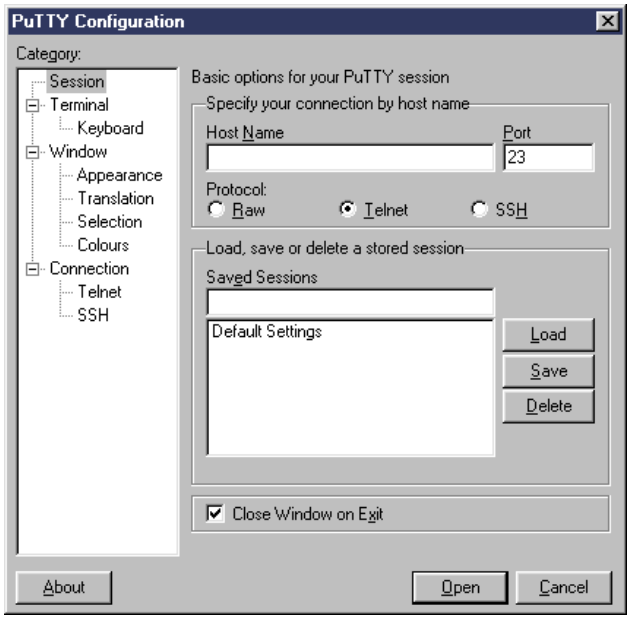

Figure 1.1: *Starting PuTTY for the First Time*

5. Select 'Session'. The dialog reappears in its original form.
6. Enter the host name as shown in Figure 1.6) to connect PuTTY with the host `iSeries`.
7. Enter `2301` in the field for 'Port'.
8. Enter a name for the session in the field 'Saved Sessions', for example, `iSeries virtual console`.
9. Select 'Save' as shown in Figure 1.7.

Once the session has been configured, activate the connection to the virtual console by selecting the session from the list and confirming with 'Open'.

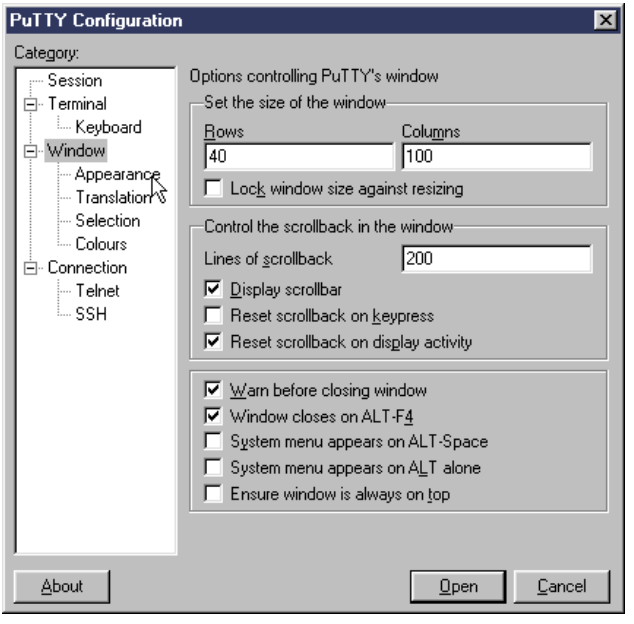

Figure 1.2: *Changing the Window Size in PuTTY*

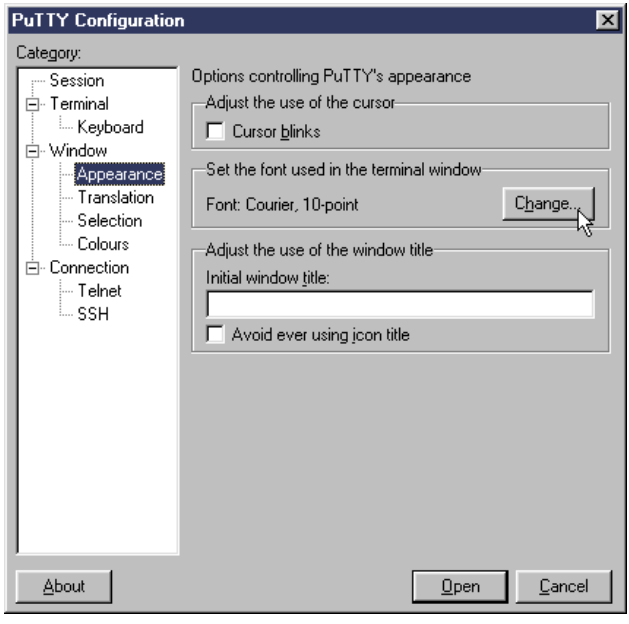

Figure 1.3: *The Font Selection Dialog in PuTTY*

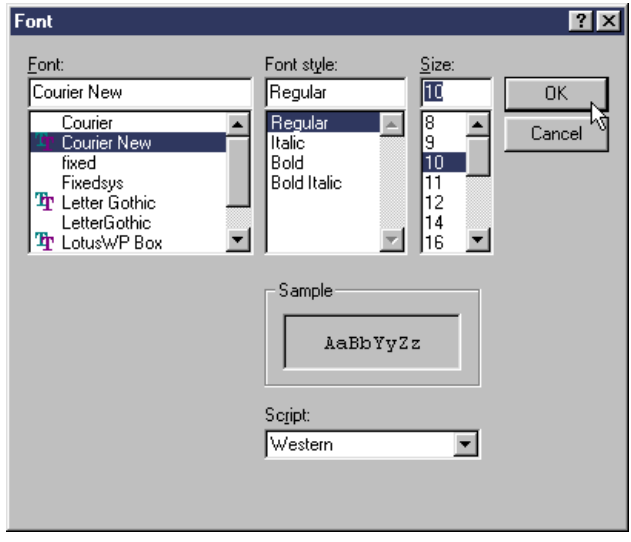

Figure 1.4: *Changing the Font Type*

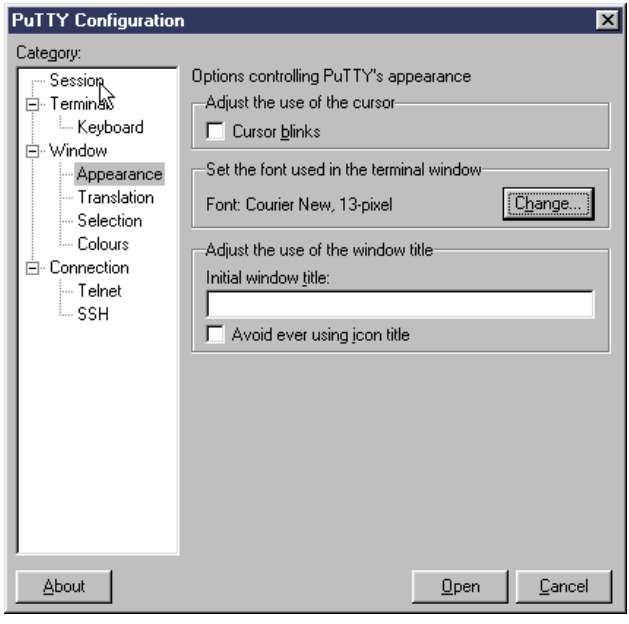

Figure 1.5: *A New Font for PuTTY*

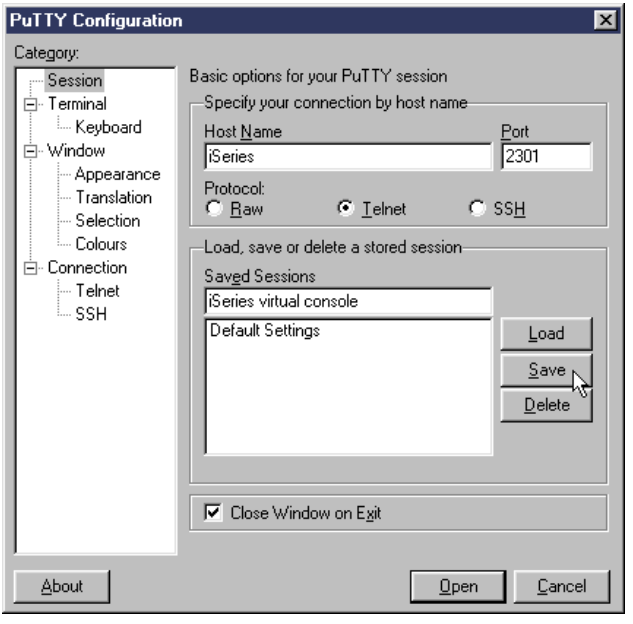

Figure 1.6: *Creating a PuTTY Session*

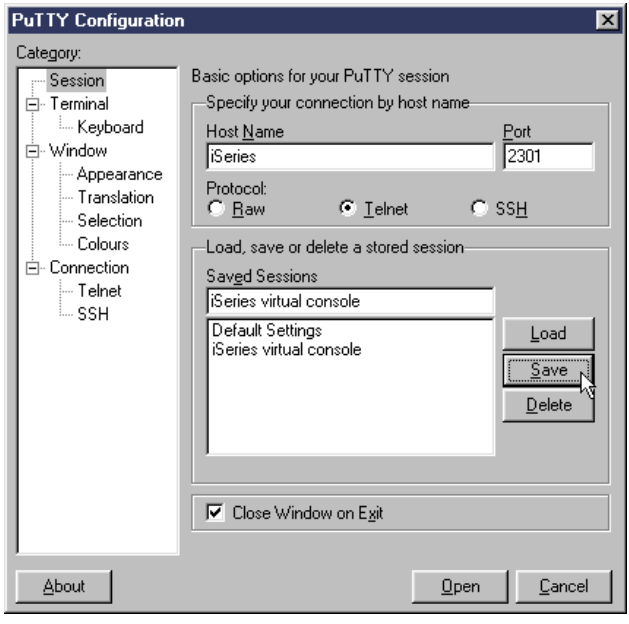

Figure 1.7: *Saving a PuTTY Session*

Recognizing the Virtual Console Terminal

When accessing the virtual iSeries console with telnet, Linux probes the telnet client to attain the best operability. The following settings are especially important:

- Is more than one connection active? (If yes, a warning is issued).
- What type of terminal is connecting?
- Is it a Windows-based terminal?
- What is the screen size?

This probe is performed during the start-up phase of the installation software as well as during logins to the installed system.

The OS/400 telnet server offers the possibility to maintain several concurrent connections to a Linux console.

Note

The probing will fail if more than one session is connected, resulting in erroneous assumptions regarding terminal settings. Multiple concurrent connections should therefore be avoided.

Note

Forcing a Terminal Initialization

The terminal detection and initialization can also be forced manually on an installed system with the command `initviocons`. If you change the terminal size during a session, do not forget to initialize the terminal again with the command `initviocons`.

Troubleshooting Terminal Problems

- Ctrl-L redraws the screen. This is useful if it looks odd or broken.
- linuxrc displays broken lineart. This is a known problem that is not related to the terminal application.
- A terminal connected when an installation aborted (e.g., by a sudden shutdown of the LPAR) may be badly configured upon reconnection. A fresh application window should be opened in this case.

- If the ← key in the KDE program konsole does not work, change the settings for the 'keyboard' in the 'Settings' menu to `xterm` or `linux console`.
- The backspace key might not work properly in VT100 fallback mode. This depends on the settings of the telnet client. This key can often be replaced with Ctrl-H.
- If backspace does not work, try using one of the following combinations:
  - Ctrl-H
  - Ctrl-?
  - Ctrl-Backspace
  - Delete-←
  - Ctrl-D-←

1.1.4 Creating a Network Installation Source

Create a network installation source if SUSE LINUX should be installed over a number of partitions. This eliminates the need to change CDs during installation. The same source can also be used for concurrent installation of various systems. The configuration of the network installation source is described in *Setting up a Central Installation Server* in the *Installation and Administration* manual.

Copy the file `ISERIES64` from the installation source to the OS/400 IFS using FTP:

```
ftp iseries
(login)
ftp> cd /kernels
ftp> bin
ftp> put ISERIES64
ftp> bye
```

The installation can then be started as described before. Do not forget to change the `IPL Source` before doing this:

```
IPL source . . . . . *STMF__ *SAME, *NWSSTG, *PANEL...
IPL stream file . . . . . '/kernels/ISERIES64'_____________
IPL parameters . . . . . 'vnc=1 vncpassword=suseinst'______
```

It is additionally possible to pass parameters for VNC. Refer to the *Installation and Administration* manual for information.

Additional Steps

Start (IPL) the kernel as described in the following section 1.1.5.

1.1.5 IPL: Starting the NWSD (WRKCFGSTS *NWS)

Establish a connection to the virtual console with PuTTY or to telnetd port 2301 with one of the supported terminals. Start the installation kernel (IPL) by activating Option 1 in the target NWSD. Watch the kernel messages on the virtual console carefully.

```
                    Work with Configuration Status         SUSE1
                                                  12/03/01  17:45:21
Position to  . . . . .   __________   Starting characters

Type options, press Enter.
  1=Vary on   2=Vary off   5=Work with job   8=Work with description
  9=Display mode status    13=Work with APPN status...

Opt  Description       Status                ----------Job-------------
__   CINST            VARIED OFF
__   CURRY            ACTIVE
1_   GINGER           VARIED OFF
__   PEPPER           VARIED OFF
__   PEPPERI          ACTIVE
__   TEST             VARIED OFF



                                                                  Bottom
Parameters or command
===> ____________________________________________________________________
F3=Exit   F4=Prompt   F12=Cancel   F23=More options   F24=More keys
```

Watch the virtual console. linuxrc appears in the case of a network or VNC installation and requests the user to make a few choices.

The IPL of the file `ISERIES64` starts linuxrc in the case of a network installation. The following steps are then necessary:

1. Select the desired language in linuxrc.
2. Select the 'Kernel Modules (Hardware Drivers)' to load.
3. Select 'Load ppc_iseries modules' and load the appropriate network module.
4. Select 'Back' then 'Start Installation or System'.

5. Select the installation source. Three options are available:

   CD-ROM This offers to install from an internal CD-ROM drive. Before the system accesses the CD-ROM, enter the network parameters for the installation over VNC.

   Network Allows the installation from an NFS share. The necessary network parameters are requested along with the host name or IP address of the NFS server. Also enter the path to the NFS share.

   Hard Disk Use this when the installation files are available on another hard disk. Enter the device name including the partition name and the path to the installation files (for example, `/dev/sdb1` and `/suse`). Before the system accesses the hard disk, the network parameters for the installation over VNC are requested for input.

You are then directed to start the VNC client. See Example 1.1.

Example 1.1: *The Installation over VNC Can Begin*

```
starting VNC server...
a log can be found in /tmp/vncserver.log ...
*** *** You can connect to 192.168.0.154, display :1 now ***
(When YaST2 is finished, close your VNC viewer and return to this
window.)
```

Start the VNC client with the displayed parameters (192.168.0.154:1 in this example) and enter the VNC password (`suseinst` in this example). The graphical interface of VNC appears and YaST starts a few seconds later.

Additional Steps

Proceed to *Installation and Administration* to start the installation of the software.

1.2 Preparing for the Installation on an IBM pSeries System

This section covers the preparatory steps for installing SUSE LINUX on pSeries systems. It explains the installation from a built-in CD-ROM drive and over the network.

1.2.1 Special Features of IBM pSeries p670 and p690

IBM p670 and p690 systems offer the possibility to partition the system like on IBM iSeries systems. This enables the concurrent operation of up to sixteen operating systems on one machine. These operating systems are installed in *LPAR*s (logical partitions). One or several of these partitions can contain a SUSE LINUX environment.

To prepare a LPAR for SUSE LINUX, first configure the system over the *HMC*. Refer to the redbook *IBM @server pSeries 690 System Handbook* (SG24-7040-00) for details.

Important notes regarding the configuration:

- The recommended maximum number of processors for a SUSE LINUX LPAR is eight, because the kernel can only manage eight processors effectively.
- For the installation, select 'SMS' as the boot mode for the respective partition.
- The *HMC* terminal used for the input during the installation is a VT320 emulation. This emulation can lead to strange effects with some applications. If possible, use an XTerm for communicating with the LPAR.

1.2.2 Hard Disk Space

Make sure you have sufficient hard disk space for installing SUSE LINUX. The use of a separate hard disk is recommended.

1.2.3 Setting up the Installation Source

If you plan to install from CD-ROM, insert CD1 in the drive. In LPAR mode, the partition to install must have the CD-ROM in its partition profile. Create a network installation source if SUSE LINUX should be installed over a number of partitions. This eliminates the need to change CDs during installation. The same source can also be used for concurrent installation of various systems. The configuration of the network installation source is described in *Setting up a Central Installation Server* in the Administrationshandbuch manual.

1.2.4 Starting the Installation

To start the installation, reboot the system. Then enter the system firmware by pressing F1 or 1 when using the serial console during the system check when the system is rebooted.

```
          1 = SMS Menu                          5 = Default Boot List
          8 = Open Firmware Prompt              6 = Stored Boot List

     memory      keyboard     network      scsi      speaker
```

Press F1 or 1 while the SCSI devices are checked. Select '6 MultiBoot' to enter the 'Multiboot' dialog:

```
Version M2P01113
(c) Copyright IBM Corp. 2000  All rights reserved.
------------------------------------------------------------------------
Multiboot

1  Select Software
2  Software Default
3  Select Install Device
4  Select Boot Devices
5  OK Prompt
6  Multiboot Startup <ON>




                                                          .-------.
                                                          |X=Exit|
                                                          '-------'

===>3
```

Select 3 to set the *Install Device*. A list of available devices is displayed:

```
Install Operating System

Device Device
Number Name
1        Diskette
2        SCSI Tape id=0 ( slot=50322f5a )
3        SCSI CD-ROM id=1 ( slot=50322f5a )
4        Ethernet  ( Integrated )
5        SysKonnect PCI FDDI Adapter  ( slot=4 )
6        Ethernet  ( slot=2 )
7                 None








                                                                  .------.
                                                                  |X=Exit|
                                                                  `------'

===>3
```

1.2.5 Booting from the CD-ROM Drive

Select the respective CD-ROM drive (3 in this example). The system reads from the CD-ROM drive and displays the *identstring*.

```
->1   SUSE Linux SLES-9 (PPC)<-
```

After you select ①, the yaboot utility will be started.

```
Welcome to SUSE Linux (SLES9)!

  Use  "install"     to boot the pSeries 64bit kernel
  Use  "install32"   to boot the 32bit RS/6000 kernel

  You can pass the option "noinitrd"  to skip the installer.
  Example: install noinitrd root=/dev/sda4

Welcome to yaboot version 1.3.11.SuSE
Enter "help" to get some basic usage information
boot:
```

Select 'install' from the menu and press Enter. To install on a 32-bit system, enter `install32` and press Enter.

To install from a network source (see Section 1.3.3 on the following page), append `manual` to the kernel to install (install or install32).

For an installation over VNC, append the parameters `vnc=1` and `vncpassword=` to the kernel (install or install32). Read more about VNC in Administrationshandbuch.

If yaboot cannot be started, launch the loading process manually:

- To get to the OK prompt, hit 0 from SMS. The firmware prompt appears.
- Check the alias list of the available devices:

  ```
  0> devalias
  ```

- Enter the `boot string` with the required alias (in this example: `cdrom`).

  To boot a ppc64 kernel:

  ```
  0> boot cdrom;,install
  ```

  To boot a ppc32 kernel:

  ```
  0> boot cdrom;,install32
  ```

1.2.6 Booting from the Network Source

Select an ethernet device that has access to the installation source (`6` in this example).

1.2.7 Additional Steps

Proceed as described in the chapters *Special Installation Procedures* and *Installation with YaST* of the manual Administrationshandbuch to begin installing the software with linuxrc and YaST.

1.3 Preparing for the Installation on IBM eServer i5/p5 Systems

This section covers the preparatory steps for installing SUSE LINUX on IBM eServer i5/p5 System. It explains the installation from a built-in CD-ROM drive and over the network.

This section assumes you have setup your HMC and connected it to your system. You can find more information on using the wizard to configure your HMC in "Configuring the HMC using the Guided Setup Wizard": `http://publib.boulder.ibm.com/infocenter/eserver/v1r2s/en_US/index.htm?info/iphai/confighmcgs.htm`

1.3.1 Modern Features of IBM eServer i5/p5 Systems

IBM eServer i5/p5 Systems offer the possibility to partition the system like on IBM iSeries systems. This enables the concurrent operation of up to 254 operating systems on one machine. These operating systems are installed in *LPAR*s (logical partitions). One or several of these partitions can contain a SUSE LINUX environment.

To prepare a LPAR for SUSE LINUX, first configure the system over the *HMC*. Refer to the IBM documentation for details: `http://publib.boulder.ibm.com/infocenter/eserver/v1r2s/en_US/info/iphbi/iphbikickoff.htm`

1.3.2 Hard Disk Space

Make sure you have sufficient hard disk space for installing SUSE LINUX. The standard system requires at least 1.5 gigabytes of free hard disk space.

1.3.3 Setting up the Installation Source

If you plan to install from CD-ROM, insert CD1 in the drive. In LPAR mode, the partition to install must have the CD-ROM in its partition profile. To assign the CD-ROM to a partition open the HMC application and go to 'Server and Partition' → 'Server Management'. Then from the available servers open the server and partition you want to install to. Right click on the profile you want to use for installation and select 'Properties' — see

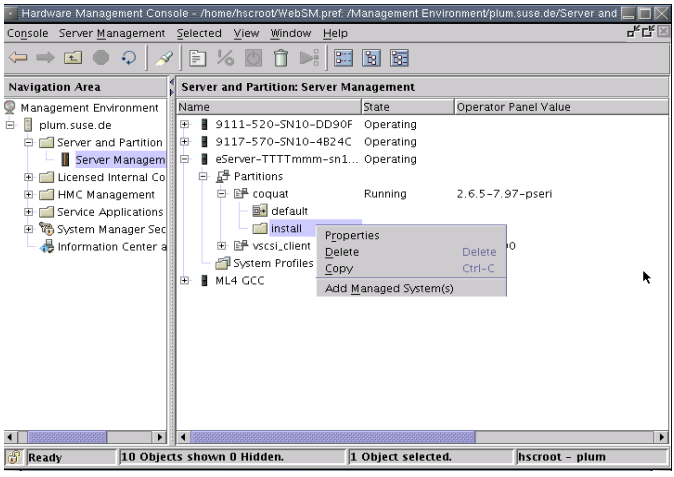

Figure 1.8: *HMC: Server Management — Properties*

Figure 1.8 on the next page. In the “Logical Partiton Profile Properties” dialog, select the ‘Physical I/O’ tab. Then, from the “Managed system I/O devices” select the ‘Other Mass Storage Controller’ from the bus where it is installed. To assign this DVD drive to the partition, click ‘Add as required’. The result should look like Figure 1.9 on the following page.

In LPAR mode, if you plan to install from the network, the partition to install must have the network adapter in its partition profile. To assign the network adapter to a partition open the HMC application and go to ‘Server and Partition’ → ‘Server Management’. Then from the available servers open the server and partition you want to install to. Right click on the profile you want to use for installation and select ‘Properties’ — see Figure 1.8. In the “Logical Partiton Profile Properties” dialog, select the ‘Physical I/O’ tab. Then, from the “Managed system I/O devices” select the ‘PCI 10/100/1000Mbps Ethernet UTP 2-port’ from the bus where it is installed. Then click ‘Add as required’.

If you plan to install using a virtual ethernet adapter, refer to the IBM documentation.

Create a network installation source if SUSE LINUX should be installed on a number of partitions. This eliminates the need to change CDs during installation. The same source can also be used for concurrent installation of various systems. The configuration of the network installation source

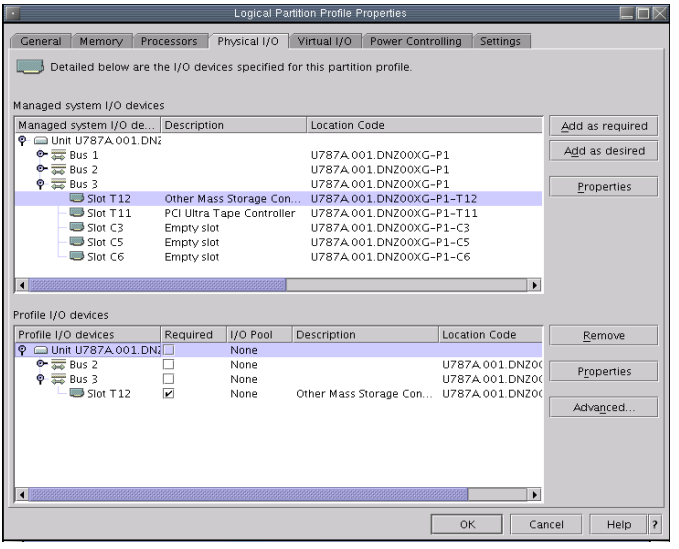

Figure 1.9: *HMC: Managed system I/O devices*

is described in *Setting up a Central Installation Server* in the Administrationshandbuch manual.

1.3.4 Starting the Installation

To start the installation, reboot the system. Right click on the profile name, select 'Activate' and press 'OK' in the following dialog.

Use the screen console or connect to a serial console as described in the IBM documentation. One simple way to start a serial console is to open a VTerm while activating the partition. To do this check the option 'Open a terminal window or console session' in the 'Activate Logical Partition' dialog.

Enter the system firmware by pressing (F1) or (1) when using a serial console or a virtual console during the system check when the system is rebooted; see Figure 1.10 on the facing page.

Press (F1) or (1) while the SCSI devices are checked. Select '5. Select Boot Options' to enter the boot options dialog; see Figure 1.11 on page 34.

```
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM

       1 = SMS Menu                            5 = Default Boot List
       8 = Open Firmware Prompt                6 = Stored Boot List


     memory      keyboard     network     scsi     speaker
```

Figure 1.10: *System Firmware*

Select '1. Select Install/Boot Device' to set the *Install Device*. Go to '7. List all Devices' and you will see the list of available devices; see Figure 1.12 on page 35.

1.3.5 Booting from the CD-ROM Drive

Select the CD-ROM drive (4 in this example; see Figure 1.13 on page 36).

Choose '2. Normal Mode Boot' to install from this device. On the next screen, confirm with '1. Yes' to exit 'System Management Services' and boot from the device.

The system reads from the CD-ROM drive and the yaboot utility will be started; see Figure 1.14 on page 36.

Select 'install' from the menu and press Enter. On IBM eServer i5/p5 System, you only boot the 64-bit kernel.

If you want to read the installation data from a network install source rather than continuing the installation from the CD-ROM (see Section 1.3.3 on page 30), append the option `manual` to the name of the kernel ("install").

For an installation over VNC, append the parameters `vnc=1` and `vncpassword=` to the name of the kernel ("install"). Read more about VNC in Administrationshandbuch.

```
Version SF220_004
SMS 1.5 (c) Copyright IBM Corp. 2000,2003 All rights reserved.
------------------------------------------------------------------------
Main Menu
 1.  Select Language
 2.  Setup Remote IPL (Initial Program Load)
 3.  Change SCSI Settings
 4.  Select Console
 5.  Select Boot Options


------------------------------------------------------------------------
Navigation Keys:

                                 X = eXit System Management Services
------------------------------------------------------------------------
Type the number of the menu item and press Enter or select Navigation
                                                                Key:5
```

Figure 1.11: *SMS: Main Menu*

1.3.6 Booting from the Network Source

Select an ethernet device that has access to the installation source (2 in this example).

1.3.7 Additional Steps

Proceed as described in the chapters *Special Installation Procedures* and *Installation with YaST* of the manual Administrationshandbuch to begin installing the software with linuxrc and YaST.

```
Version SF220_011
SMS 1.5 (c) Copyright IBM Corp. 2000,2003 All rights reserved.
------------------------------------------------------------------------------
Select Device
Device  Current  Device
Number  Position  Name
 1.        -      Virtual Ethernet
                  ( loc=U9111.520.10D3CCC-V1-C3-T1 )
 2.        -      Ethernet
                  ( loc=U787A.001.DNZ00XG-P1-T5 )
 3.        -      Ethernet
                  ( loc=U787A.001.DNZ00XG-P1-T6 )
 4.        -      IDE CD-ROM
                  ( loc=U787A.001.DNZ00XG-P4-D3 )
 5.        1      SCSI 73407 MB Harddisk
                  ( loc=U787A.001.DNZ00XG-P1-T10-L8-L0 )

------------------------------------------------------------------------------
Navigation keys:
M = return to Main Menu
ESC key = return to previous screen    X = eXit System Management Services
------------------------------------------------------------------------------
Type the number of the menu item and press Enter or select Navigation Key:
```

Figure 1.12: *SMS: Select Device*

```
SMS 1.5 (c) Copyright IBM Corp. 2000,2003 All rights reserved.
------------------------------------------------------------------------------
Select Task

IDE CD-ROM
    ( loc=U787A.001.DNZ00XG-P4-D3 )

 1.  Information
 2.  Normal Mode Boot
 3.  Service Mode Boot




------------------------------------------------------------------------------
Navigation keys:
M = return to Main Menu
ESC key = return to previous screen    X = eXit System Management Services
------------------------------------------------------------------------------
Type the number of the menu item and press Enter or select Navigation Key:
```

Figure 1.13: *SMS: Select Task*

```
Elapsed time since release of system processors: 9808 mins 37 secs

Config file read, 148 bytes


  Welcome to SuSE Linux (SLES9)!

  Use  "install"     to boot the pSeries 64bit kernel
  Use  "install32"   to boot the 32bit RS/6000 kernel

  You can pass the option "noinitrd"  to skip the installer.
  Example: install noinitrd root=/dev/sda4

Welcome to yaboot version 1.3.11.SuSE
Enter "help" to get some basic usage information
boot:
```

Figure 1.14: *yaboot: Boot Prompt*

1.4 Preparing an Installation on IBM JS20 Blades

This section describes the preparatory steps for the installation of SUSE LINUX on JS 20 blades. It covers the installation using the CD-ROM drive of the BladeCenter and over the network.

1.4.1 Creating a Network Installation Source

Create a network installation source if SUSE LINUX should be installed over a number of partitions. This provides the advantage that no CDs need to be changed during installation. The same source can also be used for the concurrent installation of various systems. The configuration of the network installation source is described in *Setting up a Central Installation Server* of the *Installation and Administration* manual.

1.4.2 Hard Disk Storage Space

Ensure that enough hard disk storage space is available for the installation of SUSE LINUX. It is recommended to use a dedicated hard disk.

1.4.3 Preparing the System for Boot

Preparing to Boot from the CD-ROM Drive

Perform the steps described in this section if an installation from CD-ROM is desired.

Assign the CDROM drive to the JS 20 Blade chosen for installation by connecting with a web browser to a BladeCenter Management Module then logging in. After login, select the function 'Remote Control' in the menu 'Blade Tasks' then activate 'Start Remote Control'. Assign the CD-ROM drive to the desired blade in the menu 'Change Media Tray Owner' of the new window.

Then set up the CD-ROM drive as a boot device. Do this by selecting 'Blade Tasks' then 'Configuration' while in the BladeCenter Management Module. Then select the JS 20 Blade '' in the section 'Boot Sequence'. Set the entry for '1st Device' on the page for 'Blade Boot Sequence' to 'CDROM'.

Put CD 1 in the CDROM drive and restart the blade.

Preparing to Boot from the Network

Perform the steps as described in this section if an installation over the network is desired.

Connect to the BladeCenter Management Module using a web browser and log in. Set the boot device to the network by accessing the 'Configuration' menu from the page 'Blade Tasks'. Then select the JS 20 Blade in the section 'Boot Sequence' and set the item '1st Boot Device' to 'Network — BOOTP' on the page 'Blade Boot Sequence'.

Rebooting and Connecting to the Console of the JS 20 Blade

Reboot the JS 20 Blade from the item 'Power/Restart' of the 'Blade Tasks' menu in the BladeCenter Management Module. A table appears, showing the power status of the blades in the 'Pwr' column. Mark the check box of the desired blade and restart it with 'Power On Blade'.

Connect to the BladeCenter with the command `telnet <bladecenter>` and log in.

```
username: <user>
password: ********
system>
```

The command `env -T system:blade[<bay number>]` determines for which JS 20 Blade the subsequent commands are intended. The blades installed in the BladeCenter are listed by calling `list -l 3`.

```
system> list -l 3
system
        mm[1]    primary
        power[1]
        power[2]
        power[3]
        power[4]
        blower[1]
        blower[2]
        switch[1]
        switch[3]
        blade[1]
                sp
                cpu[1]
                cpu[2]
        blade[3]
                sp
        blade[4]
                sp
```

```
        blade[6]
                sp
        blade[8]
                sp
                cpu[1]
                cpu[2]
        blade[9]
                sp
                cpu[1]
                cpu[2]
        blade[10]
                sp
        blade[11]
                sp
        blade[13]
                sp
        mt
system>
```

The *command target* is then determined. To work, for example, with blade number `9`, enter `env -T system:blade[9]`. Connect with the console of the JS 20 Blade over *Serial over LAN (SOL)* with the command `console`.

```
system> env -T system:blade[9]
OK
system:blade[9]> console
```

Starting the Installation

The SUSE LINUX boot loader starts after the system check has completed.

```
Config file read, 149 bytes


  Welcome to SuSE Linux (SLES-9)!

  Use  "install"     to boot the pSeries 64bit kernel
  Use  "install32"   to boot the 32bit RS/6000 kernel

  You can pass the option "noinitrd"  to skip the installer.
  Example: install noinitrd root=/dev/sda4

Welcome to yaboot version 1.3.11.SuSE
Enter "help" to get some basic usage information
boot:
```

Select 'install' from the menu and press Enter.

In the case of an installation over VNC, append the parameters `vnc=1` and `vncpassword=<password>` to the command line for the kernel (install).

Additional Steps

Proceed with the chapters *Special Installation Procedures* and *Installation with YaST* of the *Installation and Administration* manual to start the installation with linuxrc and YaST.

Booting Linux

This chapter describes the procedure for booting an installed SUSE LINUX on iSeries and pSeries.

2.1 Booting Linux on an iSeries System

The recommended method for halting an iSeries Linux partition is to stop the NWSD (`vary off`). Simply restart the NWSD to reboot the system (`vary on`).

Following the installation, the NWSD must be configured to be able to start the installed system. This can be done in three different ways:

2.1.1 Stream File from the IFS

Like in the boot process of the installation system, the IPL source can be a stream file — but this time only the kernel:

```
IPL source . . . . . .  *STMF__   *SAME, *NWSSTG, *PANEL...
IPL stream file  . . . .  '/KERNELS/ISERIES64'_______________
IPL parameters . . . . .  'root=/dev/hda3 noinitrd'__________
```

To boot an STMF kernel, first copy the kernel from the Linux system (`/boot/suse_linux_bootfile`) to OS/400. This can be done via FTP over the virtual network or over the normal network. If you decide to use the installation kernel `ISERIES64`, modify the IPL parameters (append `noinitrd`). Simply copy the `ISERIES64` file from CD-ROM to the IFS.

2.1.2 Stream File from a Virtual Disk

The kernel can also be loaded from the first PReP partition of the first NWSSTG (virtual disk):

```
IPL source . . . . . .  *NWSSTG   *SAME, *NWSSTG, *PANEL...
IPL stream file  . . . .  *NONE_____________________________
IPL parameters . . . . .  'root=/dev/hda3'__________________
```

2.1.3 Kernel Slots

Alternatively, the system can be booted from one of the two kernel slots (B in this example):

```
IPL source . . . . . .  B_____   *SAME, *NWSSTG, *PANEL...
IPL stream file  . . . .  *NONE_____________________________
IPL parameters . . . . .  *NONE_____________________________
```

If you boot from slot A or B, the command line of the kernel is read from the LPAR setting 'Work with Partition Configuration', option 14 of the SST. The command line is also accessible through the proc file system in Linux. The command line is located in `/proc/iSeries/mf/A|B/cmdline`. Use commands such as the following to change it:

```
echo 'root=/dev/hda3 single' > cmdline
```

The IPL parameters are ignored when booting from slot A or B.

Finally, put the kernel into place:

```
dd if=/boot/suse_boot_file of=/proc/iSeries/mf/B/vmlinux bs=32k
```

Selecting the Boot Method One advantage of starting the IPL from a file in the IFS is that several NWSDs can use the same kernel. Systems that only use native I/O can be booted without NWS and are therefore less dependent on OS/400. If you use a different kernel, be sure to install the needed modules. This subject is covered in detail in the IBM redbook Linux on iSeries (SG24–6232–00) (`http://www.redbooks.ibm.com/redpieces/pdfs/sg246232.pdf`).

- An NWSD with a linked NWSSTG (*Network Server Storage* or virtual disk) can be booted from a PReP partition, one of the kernel slots, or a stream file.
- An NWSD without any linked NWSSTG but with a connected *native disk* can be booted from one of the kernel slots or a stream file.

If you created a PReP partition, YaST will have activated this partition and installed a kernel on it. Even if you do not have a PReP partition for booting, YaST always installs the installation kernel in slot A and slot B. YaST places the `ISERIES64` kernel in slot A (see Section 2.1 on the facing page). The default kernel (`/boot/vmlinux64`) is installed in slot B together with slot B. This RAM disk contains the `ibmsis` driver. The installation kernel should be viewed as a last resort in case booting is not possible from slot B.

Recommendations:

1. If you have a PReP boot partition, use it.
2. Select slot B if you do not have any virtual disks.

3. If you want all partitions to use the same kernel, select booting from stream files (*STMF) and specify the path to `vmlinux`.

Kernel parameters: In the first and third case, the root partition must be passed to the kernel via the IPL parameters (here: `root=/dev/hda3`). In the second case, this is achieved by means of the command lines of the slots A and P (LPAR 'Work with Partition Configuration', option 14 in the SST). The command lines can also be accessed through the proc file system in Linux. These are located in `/proc/iSeries/mf/A|B/cmdline`. Use commands such as the following to change them:

```
echo 'root=/dev/hda3 single' > cmdline
```

When booting from slot A or B, the IPL parameters are ignored.

By default, the kernel parameters in slot A are set to boot in the *recovery* mode. Following the installation, the slot A command line resembles `start_shell manual=1 single`. If a system is started in the single-user mode, switch it to runlevel 3 with the command `init 3` (only `root` can log in to the system in single-user mode).

2.2 Boot Configuration of IBM pSeries

Here, decide where to install the boot kernel and specify additional kernel parameters. Initially, all options supported by your partition layout are selected. The following three boot options are probably possible:

- A stream file (under 'iSeries stream file for *STMF booting') is copied to the `/boot` directory of the installed system. This file can be copied to the IFS of the OS/400 system via FTP for booting with '*STMF'.
- Another kernel is copied to a 0x41 PReP boot partition (under 'Choose 41 PReP boot partition'). (Note: This option is only possible if at least one PReP partition is available, not if the system is installed on a native DASD).
- A "rescue system" kernel is installed in slot A and a normal kernel in slot B.

Chose any combination of these boot methods by selecting and deselecting the buttons.

Additional kernel parameters can be specified in 'Kernel boot parameters'.

If you do not want to configure the boot process, select 'Do not configure boot loader'. In this case, YaST skips the boot configuration.

For information about the use of the installed kernel, refer to Chapter 2 on page 41.

2.3 Booting Linux on a pSeries System

There are two ways of booting SUSE LINUX on a IBM pSeries system:

- zImage on the PReP partition
- yaboot

2.3.1 Using the zImage on the PReP Partition

To use the PReP partition to boot Linux on the pSeries system, copy the kernel image directly to the partition:

```
dd if=/boot/vmlinuz of=/dev/sda1 bs=4096
```

In this example, `/dev/sda1` is the PReP partition.

Then check the boot configuration of the system firmware. Activate booting from the PReP partition in the firmware. Refer to the hardware documentation for details.

2.3.2 Booting with yaboot

yaboot gives more flexibility in the boot process. With yaboot, you can

- Configure several kernels for booting
- Select one of the configured kernels during the boot process
- Pass additional parameters to the kernel

yaboot is controlled by the configuration file `/etc/yaboot.conf`. This file is generated by the file `/etc/lilo.conf`, which is identical to the file used on x86 systems. In the following example file, `root` is `/dev/sda3` and the boot loader is located in `/dev/sda1`:

Example 2.1: *Configuration File /etc/lilo.conf*

```
boot=/dev/sda1
default=linux
timeout=100
activate

image = /boot/vmlinuz
        root = /dev/sda3
        label = linux
        append = ""     # optional kernel parameters
image = /boot/vmlinuz.new
        root = /dev/sda3
        label = newlinux
        append = ""     # optional kernel parameters
```

Adapt the individual entries in `/etc/lilo.conf` to match your system configuration. Specify the correct partitions and partition numbers. The individual options have the following meanings:

- `boot=/dev/sda1`: Your boot partition
- `default=linux`: This configuration section is loaded if you press Enter or after the `timeout` elapses.
- `image =`: Path to the kernel image.
- `root =`: Path to the root partition.
- `append = ""`: Passes additional parameters to the kernel.
- `image =`: Appends additional kernels to the configuration, enabling you to make several kernels available for selection.

After adapting the file `/etc/lilo.conf`, launch the configuration with the command `lilo` to complete the boot configuration.

2.4 Updating the Kernel

Before installing a new kernel RPM, consider how this affects the boot process. In general, the update consists of two steps: first, the installation of the kernel RPM and, second, the installation of the kernel on the boot medium (PReP, slot B, or STMF). If you boot from a PReP partition or from slot B, read the instructions in the `README` file enclosed with the kernel update.

For STMF, install the kernel update RPM on the partition before booting the kernel. This ensures that the kernel modules are up-to-date. Always install the modules before booting the associated STMF kernel. Otherwise, many device drivers (e.g., network card drivers) existing in the form of modules will not work. Remember that the kernel update can impair the *recovery* mode in slot A. However, you can always boot the current `ISERIES64` kernel with the `recovery` command line in the IPL parameters.