FUJITSU COMPUTERS SIEMENS

Reliant UNIX ONLINE Documentation

Reliant UNIX 5.45

Reliant UNIX Installation

RM200, RM300, RM400, RM600

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1 Preface

UNIX® is a very efficient operating system, which is used in computers in different performance classes. Fujitsu Siemens has extended this operating system and adapted it specially to suit the hardware used in its own systems. The operating system therefore has a special name: Reliant UNIX.

This manual describes how Reliant UNIX 5.45 is installed. The description applies for the following computers:

RM200	models Cxx	5.45A and higher	120, 125, 220, 225
RM300	models Exx	5.45A and higher	e.□g. model E60
RM400	models Cxx	5.45A and higher	120, 220, 225, 420, 330, 340, 430, 440, 530, 540, 630, 730
RM400	models Exx	5.45A and higher	
RM600	models xxx	5.45A and higher	e.g. model 340
RM600	models Exx	5.45A and higher	e.g. model E80

Your computer is delivered with Reliant UNIX **preinstalled**. However, it may be necessary to install this operating system on the computer's system disk. The procedure for doing this is described in this manual.

The software you require for the installation is provided on a CD-ROM and must be read in from the CD-ROM (DVD) drive. If you do not want to perform the installation yourself, the Service department of Fujitsu Siemens will do it for you for a fee.

Reliant UNIX is a licensed product. Reliant UNIX may be used only on computers for which a license has been purchased.

You will find a README file on the system disk of your computer and on the supplied "Reliant UNIX 5.45" CD-ROM. This file contains important information on possible restrictions and changes that were not known when the manuals went to print. You should read the README file as soon as the computer is up and running.

1.1 Target group

The manual is intended primarily for system administrators and service engineers.

Those who already have experience in installation tasks will find a short description in Chapter "Installation for experts".

1.2 Changes since the last version of this manual

The documentation has been updated to conform with the software level of Reliant UNIX 5.45B.

1.3 Requirements

The following requirements must be met before you begin any of the tasks that are described in this manual:

- The computer hardware must be installed (see the Operating Manual).
- All hardware devices and controllers must be installed and configured in accordance with the manuals provided.
- You must know how to switch the computer on and off (see the operating instructions for your hardware).

1.4 Summary of contents

If your computer is to be incorporated into a network, you must configure the network services. The steps involved are described in the chapter entitled "Configuring network services and clusters"; there is one such chapter for the RM6000 and one for the RM200, RM300 and RM400. You should read the appropriate chapter after you have started your system for the first time, or following a new installation.

The chapter "Work schedules for installation" (one dealing with the RM600 and one for the RM200, RM300, RM400) is the central starting point for all installation activities. You should copy the work schedule that is relevant to the task you want to perform. Then read the sections referred to in the work schedule.

The chapter "Preparing the RM600" and "Preparing the RM200, RM300, RM400" describes how to boot the mini system in order to access the Mini System main menu. This menu is the starting point for beginning installation or for starting *DSSI*.

The installation of the Reliant UNIX operating system is described in two separate chapters. There are two chapters dealing with the RM600 and two with the RM200, RM300 and RM400. Please consult either the chapter on new installations or the chapter on updating an installation, depending on the type of installation you require.

With the *DSSI* program, you can back up and load the partitions of the system disk. You will find further details in the Chapter "DSSI".

The Chapter "Installation for experts" contains a brief description of the installation procedure. This is intended for those who already have experience in installing UNIX systems.

Typical input and output (dialogs) on the console are reproduced in this manual. The output on your screen may differ somewhat from the text that is presented below. The reason for this may be that your computer has been configured differently or that the installation procedure has changed slightly.

You can also install package- and PIF-packaged software products using *SAX-LSM* (PIF = Product Interchange File, SAX = Software Administration for Open Systems, LSM = Local Software Maintenance). This type of installation is described in the manual "DSM V1.3 - New Functions and Modifications".

1.5 Notational conventions

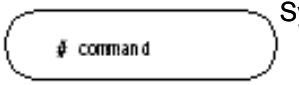
The following notational conventions are used in this manual:

Italics	Names of files, programs, commands, variables, and options, as well as screen references in the main body of text, such as input fields, text fields and menus.
Command (number)	The number following a command indicates the

chapter in which the command is described in one of the following manuals:

- "Commands. User's Reference Manual"
- "System Administrator's Reference Manual"
- "Networking – Reference Manual"

The brackets and number are not part of the command, i.e. they must not be entered.

Bold	Used for highlighting purposes in the main body of text.
Typewriter text	System output (error messages and other messages) and file entries.
Bold typewriter text	User input in examples, with the exception of variables (see above).
"Quotes"	References to other chapters or manuals.
	System output or user input in screen masks.
[D] [Ctrl] Ú	Keys on the keyboard.
[HELP] [ENTER]	Function keys in the mini operating system and in SYSADM
[Ctrl]+[C]	Key combination: A plus sign between a series of keys means that the keys must be pressed at the same time.
[#], [Q], Ú	Key sequence: A comma between a series of keys means that the keys must be pressed one after the other.
 +([B], [D], [M])	If a key sequence is part of a key combination, it is enclosed in parentheses. Example: Press and hold the  key, and then press [B] followed by [D] followed by [M].
▶	Actions performed by the user.
	Additional information, notes, and tips.
	Warning that must be heeded.

2 Network services and domains (RM600)

New computers are supplied ready to operate. If a computer is to be connected into a LAN (LAN = Local Area Network) (Ethernet ®, TCP/IP (TCP = Transmission Control Protocol, IP= Internet Protocol)) or is to operate in an administration domain, the network service or administration domain must be configured beforehand. This is necessary:

- the first time you start the computer,
- following a new installation.

The existing network configuration is retained with an update installation.

The steps required to connect the computer to an existing network or administration domain (see Section "Configuring administration domains") depend to a large extent on the actual conditions. The description given in this chapter is thus restricted to a typical scenario.

The following section describes setting up the **network services** with the *SYSADM* user interface. Detailed information on *SYSADM* can be found in the manual "System Administration and Hardware Configuration Using the SYSADM User Interface".

If you are using a high-availability configuration with OBSERVE, the network addresses are administered by OBSERVE. In this case, you should contact the system support specialist or system administrator and identify the files in which changes are to be made.

2.1 Configuring network services

You should obtain the following information from the network management before connecting your computer to the network:

- the node name of your computer
- the alias name of your computer
- the Internet address of your computer
- the domain name
- the Internet address of the network management computer (NIS)

Check with the network management that the network management computer recognizes your computer. Your computer can be registered on the network management computer via the SYSADM menu item *Network services - LAN - Connect*.

Defining the node name

Every computer has a name which can be used to access it in the network. This is called the *node name*. Enter this name if you have not already done so. If you are starting up your computer for the first time, the default name is *SNI*. You should change this name before you connect the computer to the network using the *SYSADM* user interface.

- Give the computer a meaningful name that is unique in the network.

  The name can be up to 14 characters long. It is, however, recommended to limit its length to 8 characters. It must start with a letter (a...z, A...Z), followed by further letters, digits (0...9), dashes (–) or underscore characters (_).

  Problems may occur with some applications if the name is longer than 8 characters.

  If two computers within the network have the same name, they cannot be uniquely addressed. This can lead to loss of data transferred in the network.

- Choose the following menu items in succession using the SYSADM user interface:

  in the main menu: *system_setup*

in the *Initial System Setup* menu:	*nodename*
in the *Display and Set System Name and Node Name of the Machine* menu:	*set*

To select a menu item, move the cursor to the relevant item and press [ENTER].

Then a form appears in which you enter the node name.

```
Node name:□□□□□□□□□_______________
Warning: After (re)setting the node name
□□□□□□□□□□file /etc/hosts has to be updated.
Perform the following steps on your
local machine:
-□Set node name with 'system_setup - nodename -
□□set'.
-□Actualize the configuration of the interfaces
□□(if no configuration tool exists, actualize
□□/etc/hosts and /etc/default/inet with an editor
-Reboot the machine with 'machine - reboot'.
Perform on other machines:
-□Actualize node name in file /etc/hosts.
Or if you use NIS
(can be checked with 'network_services - lan - status'):
-□On master machine change node name with
□□'network_services   lan - administer - hosts - remove'
□□and then 'add'.
-□On local machine 'network_services - lan - connect'.
```

- Enter the node name and follow the instructions.
- Press the [SAVE] function key.

  A message is displayed informing you that the node name has been changed.
- Acknowledge this message by pressing [CANCEL].

RM600-xxx: Configuring the CSI board

Use the *SYSADM* user interface to configure the CSI (CSI = Central Services & Interfaces) board.

- Start *SYSADM*.

  The main menu appears. Figure "Overview of SYSADM configuration (RM600-xxx)" shows an overview of how the program works.

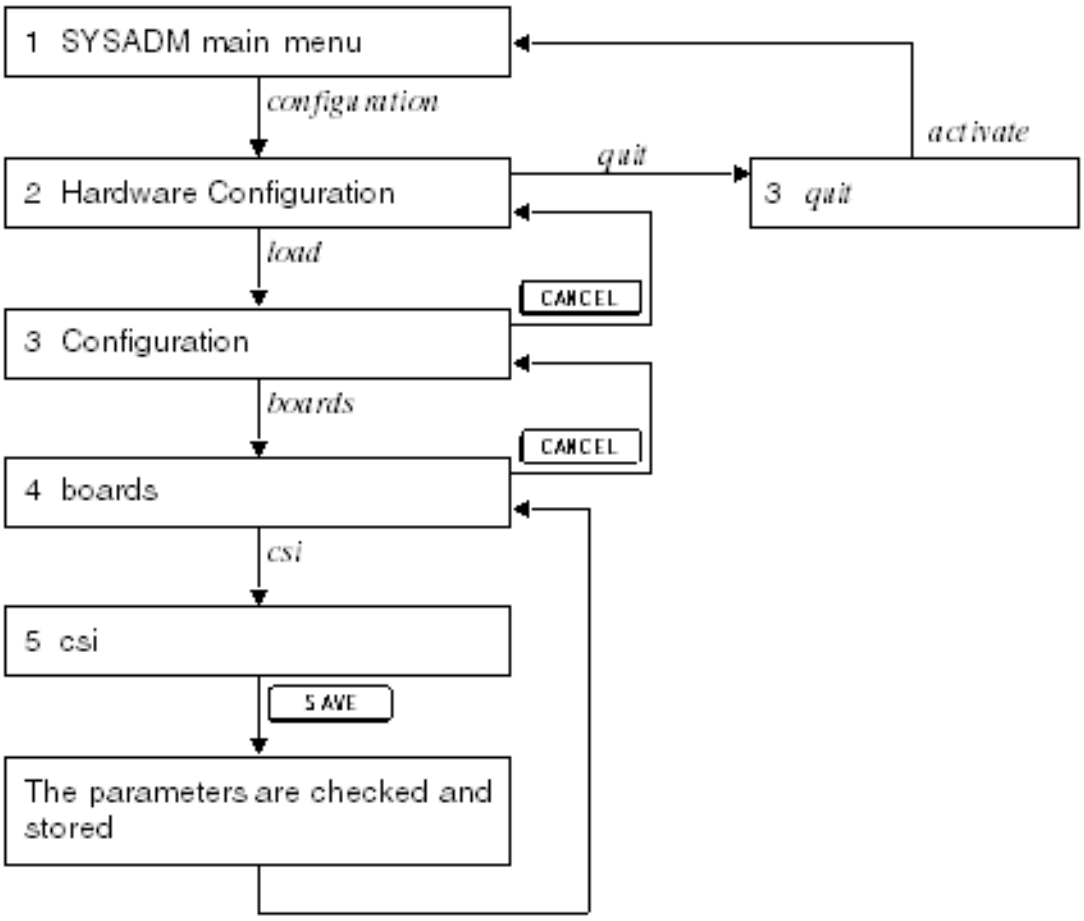
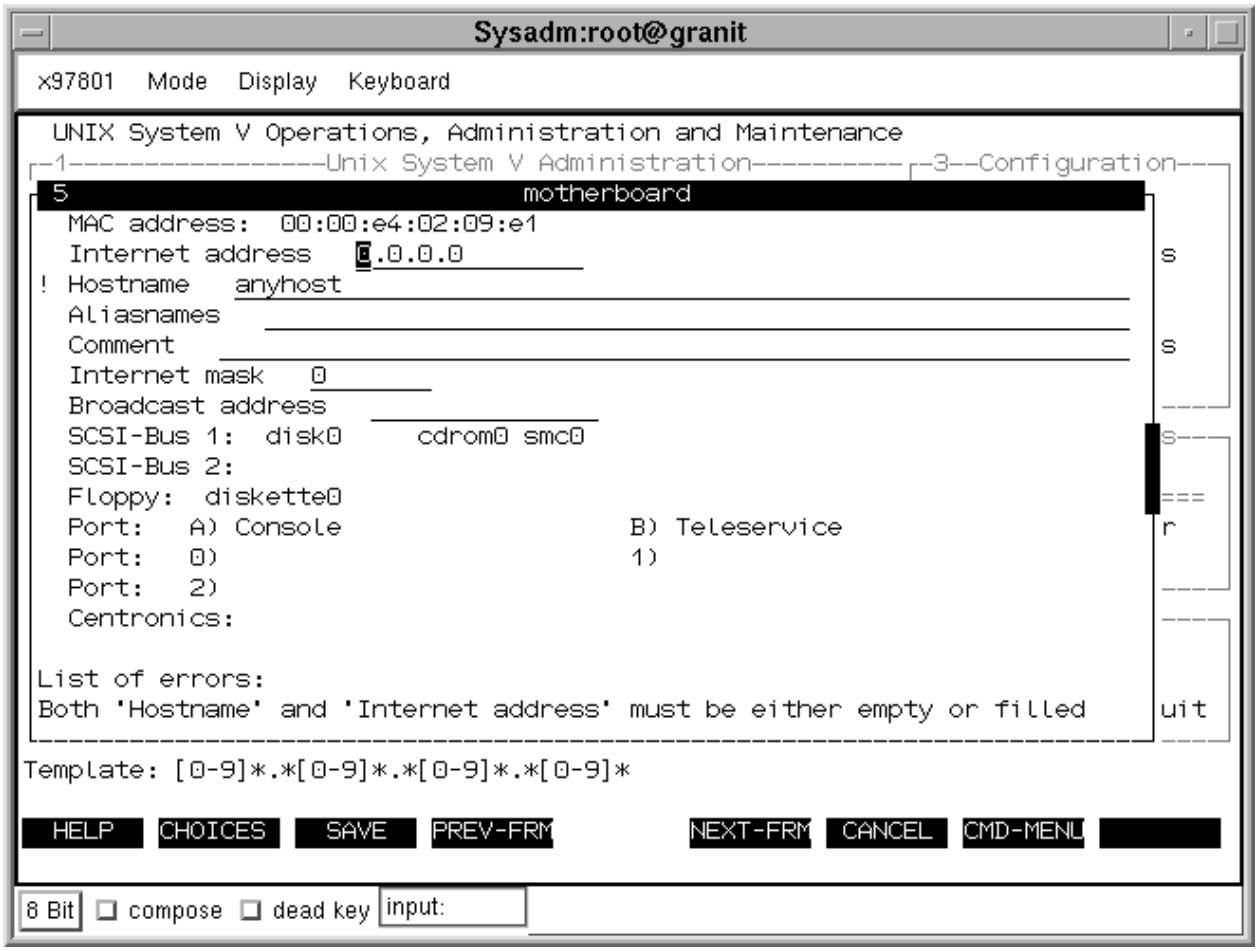


Figure 1: Overview of SYSADM – configuration (RM600-xxx)

- Choose the following menu items in succession:

1. In the main menu:	*configuration*
2. In the *Hardware Configuration* menu:	*load*
3. In the *Configuration* menu:	*boards*
4. In the *boards* menu:	*csi* (and possibly also other boards)

The following form appears:



For further reading, see the Section "Entering parameters and saving the configuration".

RM600 E: Configuring the (E)HIOS board

Use the *SYSADM* user interface to configure an (E)HIOS controller.

- Start *SYSADM*.

  The main menu appears. Figure "Overview of SYSADM configuration (RM600 E)" shows an overview of how the program works using the HIOS as an example.

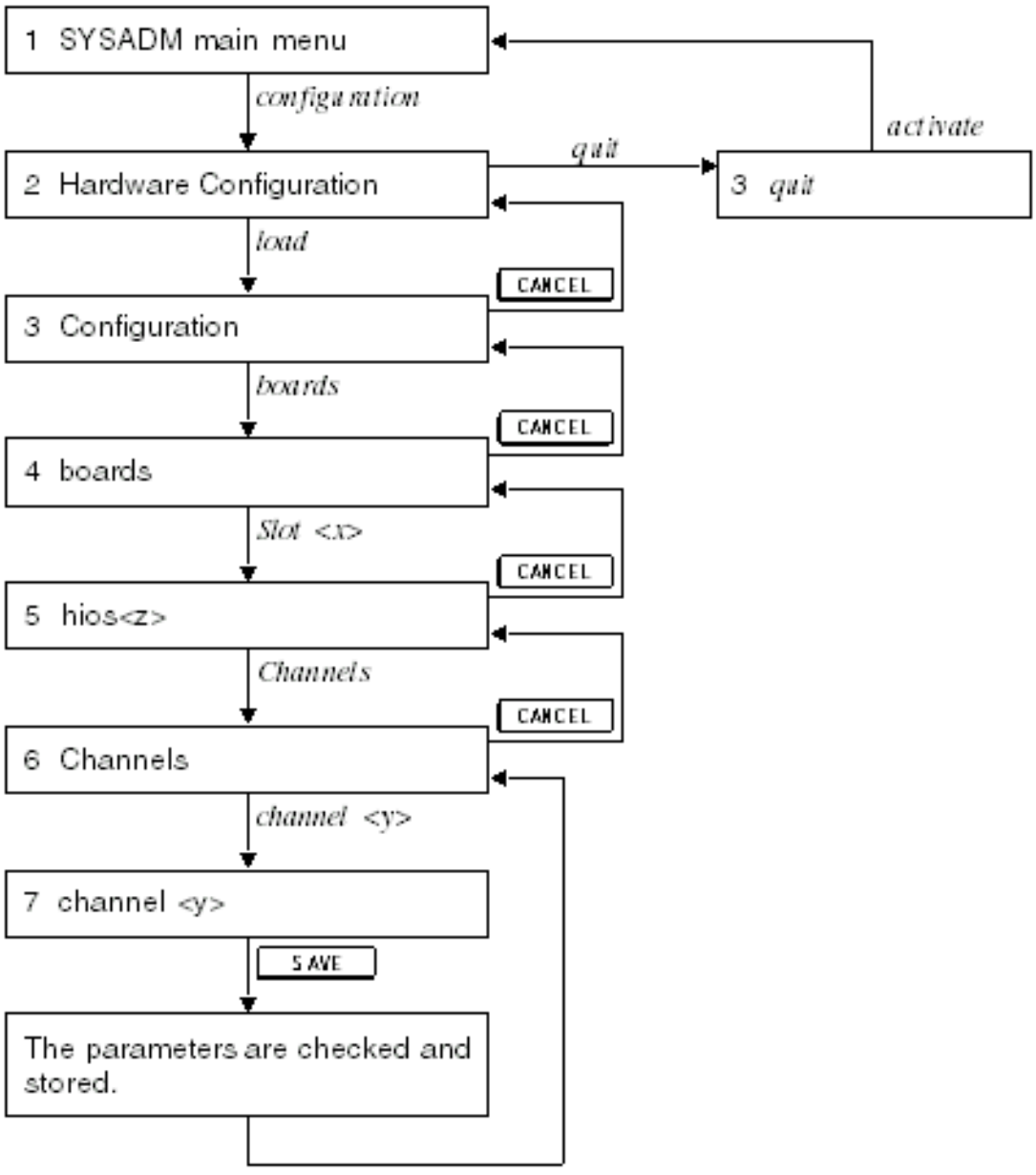


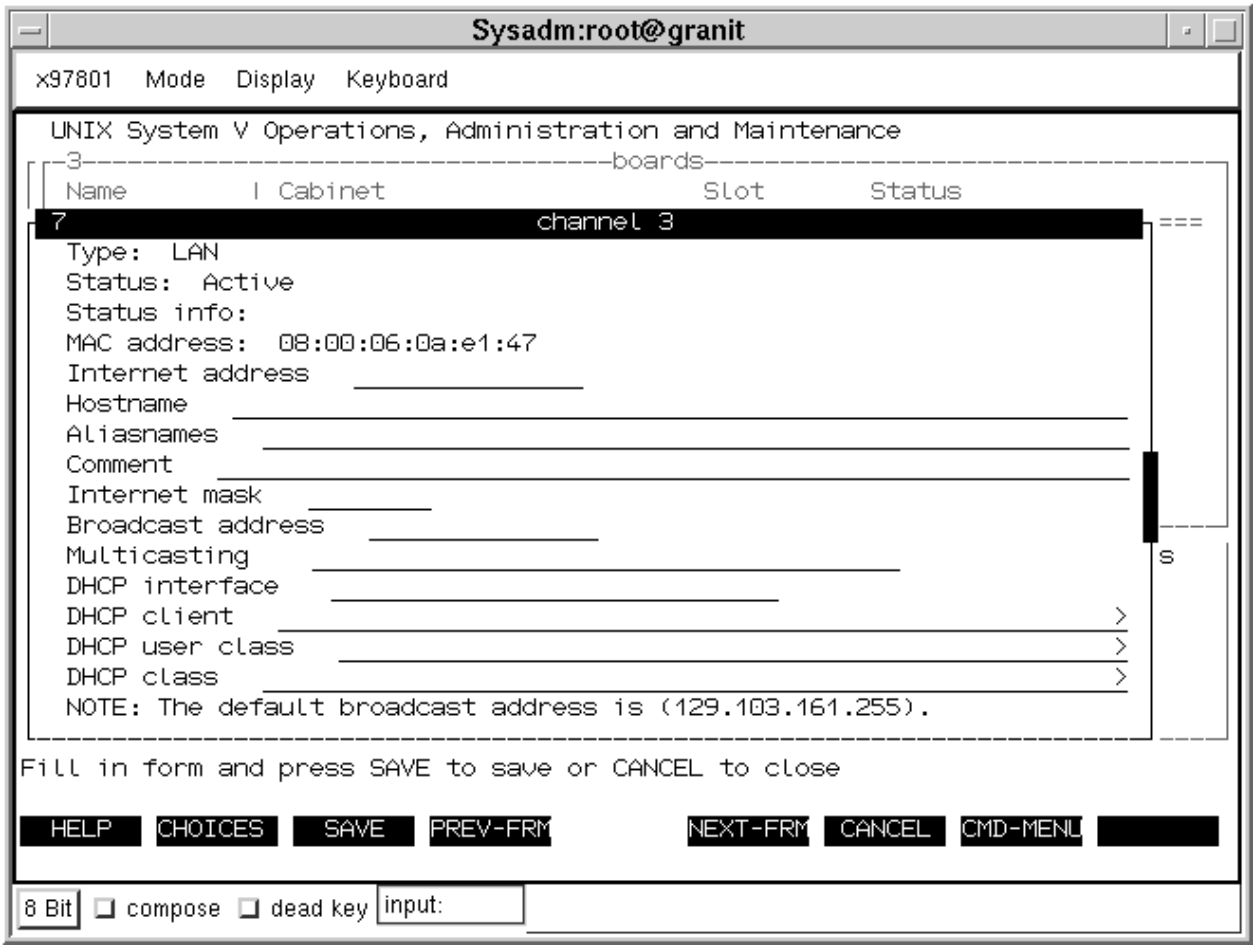
Figure 2: Overview of SYSADM – configuration (RM600 E)

- Choose the following menu items in succession:

1.	In the main menu:	*configuration*
2.	In the *Hardware Configuration* menu:	*load*
3.	In the *Configuration* menu:	*boards*
4.	In the *boards* menu:	*Slot <x>*
5.	In the *hios<z>* menu:	(and possibly other boards)
6.	In the *Channels* menu:	*Channels*
		channel <y>

Find out the HIOS controller (*Slot <x>*) (if only a LAN card is installed, it will always be slot 8) and submodule (*channel <y>*) (if only a LAN card is installed, it will always be channel 3)to which the Ethernet cable is connected. The controller type displayed should also help you here (LAN).

The following form appears:



Entering parameters and saving the configuration

- You must now enter the relevant parameters for your computer.

  Internet address
  example: 144.160.99.13
  The address must be unique throughout the network. Please ask your network administrator for the correct address. If the system is to be connected to the official Internet, the Internet address must be approved by the Network Information Centre (NIC). Further Information can be found in the Network Administration manual.

  Hostname
  example: orion
  Enter a valid name for the LAN controller. The name will be used by other systems in the network if this system is to be accessed via this controller. For the first network connection, you can use the same name as the system itself (see Section "Defining the node name").

  Internet mask
  example: fffffe00
  The Internet mask is only required for subnetworks. Please consult your network administrator.

  Broadcast address
  example: 144.160.99.255
  If this field is empty, a valid address is determined automatically when you quit the form using [SAVE].

  DHCP interface
  Here you specify whether you want to administer your LAN parameters with DHCP. (For detailed information, see the online help.)

- Press [SAVE].

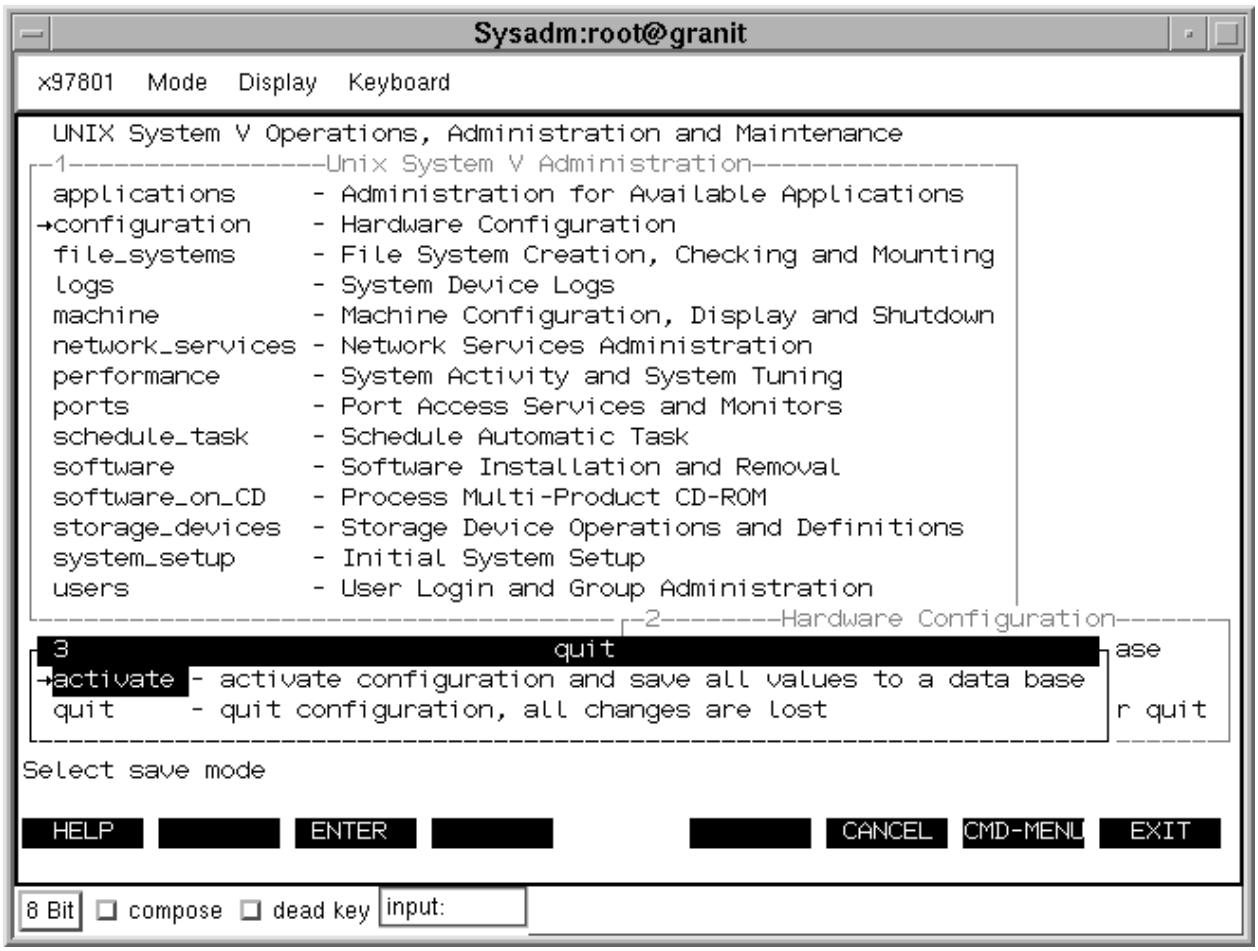
  If you want to configure other boards, repeat the procedure as described above.

- Change to the *Hardware Configuration* menu.

  To do this, press [CANCEL] several times.

- Choose the menu item *quit*.

  You must then decide whether the new values are to be activated or whether you want to cancel the configuration:



activate
The new values are entered in the database; messages are displayed to this effect.

quit The new values are not activated; the database remains unchanged.

However, please note that the relevant board is also unconfigured. You should therefore repeat the actions described in this section as soon as you know the correct network parameters.

- Confirm the selected save mode by pressing [ENTER].

  You then return to the *SYSADM* main menu.
- Exit *SYSADM*.

  To do this, press [EXIT].

Entering the Internet address of the network management computer

- Enter the Internet address of the network management computer on your computer by selecting the following menu items in SYSADM*:*

in the main menu:	*network_services*
in menu *Network Services Management*:	*name_to_address*
in menu *Name to Address Mapping*	*inet*
In menu *Internet Protocols*	*hosts*

- Enter the name and the Internet address of the network management computer and press the [SAVE] function key.

Connecting the computer to the network

- Select the following menu items in succession to connect the computer to the network:

in the main menu:	*network_services*
in menu *Network Services Management*:	lan
in menu *LAN Administration on Client*:	connect

- Enter the appropriate value and press the [SAVE] function key.

Modifying the /etc/default/login file

When you have started up the computer for the first time, you can only log on to the operating system as the user *root* on the console terminal. If you want to remove this restriction, proceed as follows:

- Edit */etc/default/login* file. You can use any standard text editor, e.g. *vi*(1). The file contains the following line:

  CONSOLE=/dev/console

- Insert the character # at the start of the line.

  # CONSOLE=/dev/console

  The statement is thus "commented out", which means that it now has no effect. You must then save the modified */etc/default/login* file and exit the editor.

Modifying the /etc/default/inet file

If you want to activate routing, you must modify the */etc/default/inet* file. To do this, use any of the usual text editors (vi, rand editor).

- Change the *DEFAULTGATEWAY* entry as follows:

  DEFAULTGATEWAY=<IP address of the gateway>

  The address of the default gateway must be specified here as the *IP address of the gateway*. If you have any queries, contact your network administrator.

- Save the modified */etc/default/inet* file and exit the editor.

   Further information on *Routing* can be found in the "Network Administration" manual.

Entering network computers in the /etc/inet/hosts file (In OBSERVE configurations, network processes are started in their own rc2 scripts. Please check your configuration documentation.)

If NIS (Network Information Service) is not active, you must enter the name of your computer, the computer with which you wish to establish a connection and the Internet addresses for both in the */etc/hosts* file.

To do this, select the menu items *network_services* - *name_to_address* - *inet* - *hosts* in *SYSADM* or use an editor. Then restart the computer. Example:

```
144.145.16.224 munich
```

You can also start the Domain Name Service (DNS) instead (see the "Network Administration" manual for more information).

The system is then connected to the network.

Restarting network processes

To make the changes you have made effective, you must then restart the network processes.

- Execute the following commands on the console (i.e. rather than using *rlogin*(1)):

```
# sh /etc/rc2.d/S69inet stop
# sh /etc/rc2.d/S69inet start
```

A precise description of how to connect a computer into a network is given in "Network Administration" manual.

2.2 Configuring administration domains

You can configure an administration domain using the add-on *DomainAdmin* product, which is an administration system for RM systems. This is performed within the *WebSysAdmin* (WSA for short) user interface component *VConfig*.

If you have not previously worked with *DomainAdmin*, you will find more detailed information in the manual "System Administration within a Domain" (Reliant UNIX)". The hardware and software requirements that must be fulfilled are also listed here.

2.2.1 Creating an administration domain

An administration domain is set up automatically with the internal name CADMIN following installation. This domain is still "empty", i.e. it does not contain any nodes as yet. The following section shows you the WSA window on the "post" system following installation and after you have selected the *VConfig* component and the *Nodes* entry on the menubar:

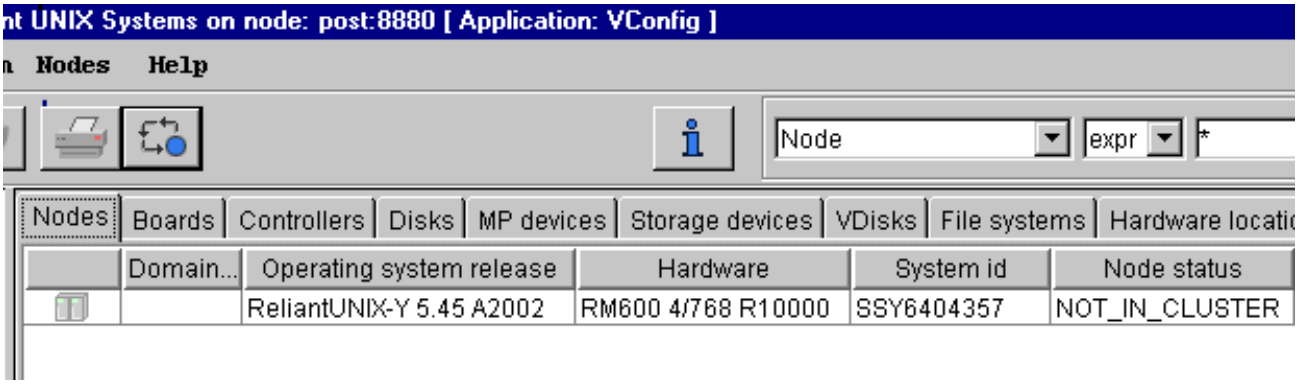


Figure 3: Example: Window showing an "empty" administration domain (excerpt, approx. fig.)

The *Domain net address or alias* and *Node status* columns in the object list indicate that the system has not yet been included in an administration domain. There is no entry in the *Domain* ... column and *NOT_IN_CLUSTER* is entered in the *Node status* column. This means that the "post" node on which you installed *SIclos* and started WSA is itself not a member of an administration domain (the word cluster is often used as a synonym for administration domain). In this case, the system administrator will possibly have the task of mounting this system as the first node in the administration domain and thus filling the domain.

There are two equivalent approaches to creating the first node in an administration domain. First of all, select the object in the object list by clicking it so that the entire line is highlighted in blue. Then, you can either

- click the *Nodes* entry on the menubar or
- right-click within the line of the object list.

The following sub-menu is then displayed:

Figure 4: Example: Creating an administration domain and the first node (excerpt, approx. fig.)

Now click the *Create domain* function in the sub-menu.

To create the first node, you first have to create an administration domain, since no domain yet exists from the user's perspective.

When you select the *Create domain* function, the following dialog box opens:

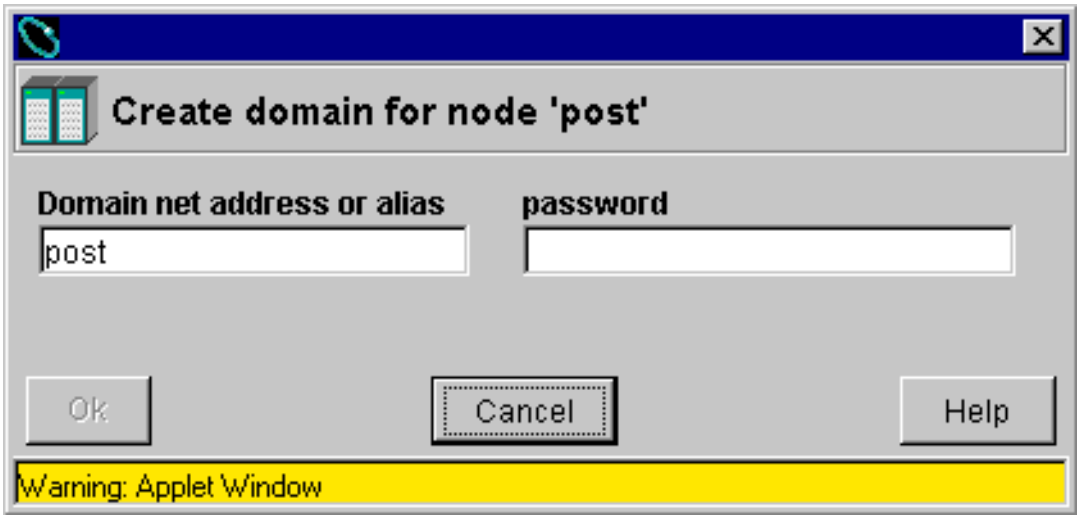


Figure 5: Example of a dialog box for creating an administration domain (approximates figure)

The dialog box for creating an administration domain contains two fields. In the *Domain net address or alias* field on the left, enter the alias name of the network interface (or the IP address) that is to be used for communication in the administration domain. The node name "post" is proposed automatically in this case for the system; it is taken from the current node name of the UNIX system (*uname –n*). You can accept this name. However, if you want to use a different network interface for domain communication, enter its IP address here in dot notation or alternatively its alias name.

The configured controllers or the permitted alias names can be established from the *LAN* sub-tab on the *Controllers* tab.

In the *password* field on the right, enter the root password for the node.

When you confirm both entries with *Ok*, an event box pops up, which tells you whether the action was executed successfully:

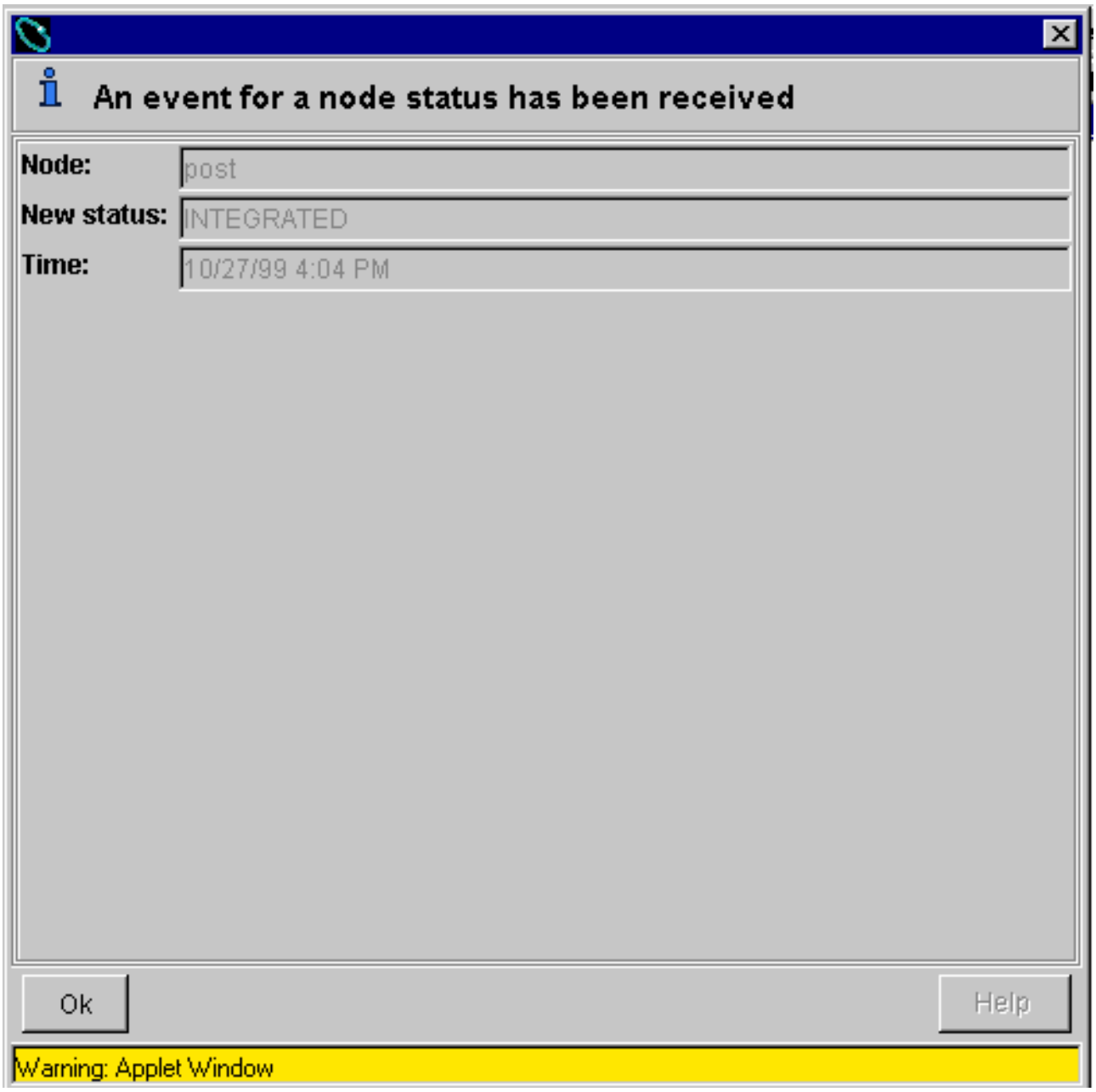


Figure 6: Example of an event box after creating the first node (approximates figure)

You are told that the "post" node now has the status *INTEGRATED*, i.□e. the node is integrated in the administration domain. When you confirm this event box with *Ok*, the new status is also displayed in the main window in the *Node status* column:

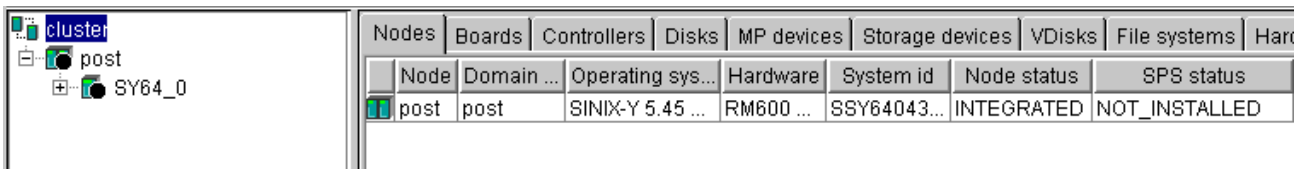


Figure 7: Example of the window after creating the administration domain and the first node)

A new *Nodes* column has now been added to the left in the object list with the entry "post", and the "post" node is also integrated in the administration domain with the same domain alias name (*Domain net address or alias*

column); as a result, the domain is no longer "empty".

You can also see from the hierarchy browser that an administration domain now exists, which contains the "post" node: The *cluster* icon has been entered at the top position.

2.2.2 Adding a node

If you have created the administration domain as well as the first node and then want to add further nodes to the administration domain, you can do so as follows. If you have not already done so, switch to the *VConfig* application. You now have two options:

- Click the  button (create object) on the toolbar or
- Choose the *Nodes* menu option on the menubar.

In the latter case, a sub-menu opens where you choose the *Create* menu option:

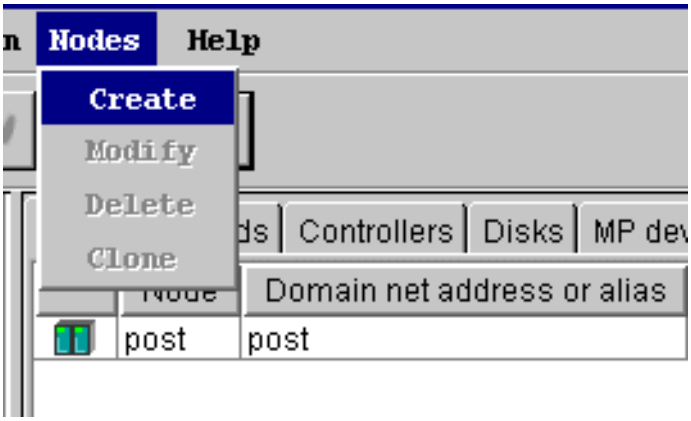


Figure 8: Example of a window for creating additional nodes (excerpt, approximates figure)

When you select *Create*, the *Create node* dialog box opens. The figure below gives you an example of how to fill this dialog box:

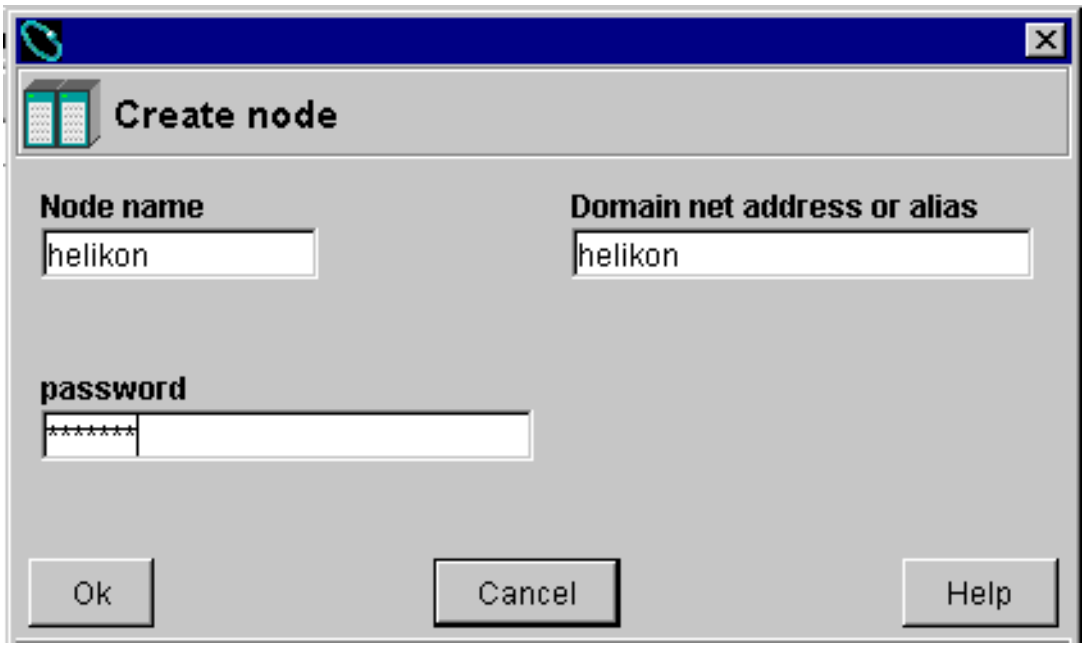


Figure 9: Example of the dialog box for creating an additional node (approximates figure)

The name of the UNIX system (*uname –n* command) must be chosen for the node name (in this case: *helikon*).

Once the node name has been entered, it is proposed as the domain net address or the alias. Finally, enter the root password and confirm with *Ok*. The newly added node is then also displayed in the main window.

A node can only be administered fully within the administration domain if it can access all other nodes and if the integrated nodes can also access it using the domain net address (it must be possible to successfully execute the *ping* command from all nodes).

New nodes can be added successively to the administration domain by following the procedure described. Once you have successfully created the nodes, you can use the object list in the main window to establish which nodes are integrated in the administration domain. In the figure below, the administration domain comprises three nodes, i.e. "post", "pfanne" and "helikon".

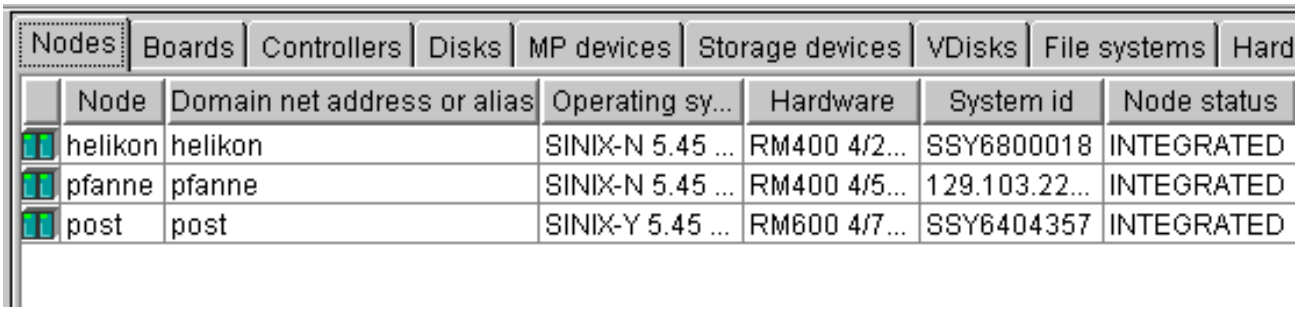


Figure 10: Example of an administration domain window with three nodes (excerpt, approximates figure)

The RM200 is not supported as a node in a domain.

The *CLODB* database in the administration domain is copied to new nodes as they are created.

All local information on the new nodes, which is stored in the database, is then lost (e. g. VDisk Lite configurations).

3 Work schedules for RM600

Each installation is an extremely complex procedure, which involves special preparatory steps that are influenced by various factors. For example, one factor is the hardware of the computer used (size of the main memory, graphics capability of the consoles). A second factor is the desired type of installation. A third factor is whether or not the installation is carried out by the local computer or via a server.

To ensure that you maintain an overview of the installation procedure, you should use a work schedule. This section contains work schedules for all the tasks described in this manual:

- preparing for installation
- new installation
- update installation
- DSSI

▶ Copy the work schedule relevant to the task that you want to carry out.

▶ Then read the sections that are mentioned in the work schedule.

3.1 Work schedule for a new installation

Part 1: Chapter "Preparing an RM600 for installation"

Preparing for installation	Comments
Booting the system	
Reading the new README file	
Backing up data on the system disk	*/home* file system can be retained
New installation: Partitioning	
Switching to the Board Debug Monitor	
Updating the EEPROM firmware	
Loading the Mini System main menu	
Choosing a language for the dialog	
Choosing the console type	
Testing the keyboard type	

Part 2: Chapter "New installation on an RM600"

Carrying out the installation	Comments
Part 1 of the installation: Dialog	
– Entering the date, time, and time zone	
– Entering the host name	
– Defining the system disk	
– Choosing the system disk configuration	
– Formatting and/or partitioning the system disk	
– Confirming the installation parameters	if required
Part 2 of the installation: Execution	
Post-installation tasks	
– Install software products	via *SYSADM*
– New installation on an RM600	

3.2 Work schedule for an update installation

Part 1: Chapter "Preparing an RM600 for installation"

Preparing for installation	**Comments**
Booting the system	
Reading the new README file	

Part 2: Preparing for an update installation, Chapter "Update installation for RM600"

Preparing for installation	Comments
Preparing for installation	
Installing the SInus package	
Reading the manual entry	
Mounting the installation medium	
Checking that the system can be updated	
Evaluating the log	

Part 3: Carrying out an update installation, Chapter "Update installation for RM600"

Carrying out the installation	Comments
Backing up data on the system disk	
Switching to the Board Debug Monitor	
Updating the EEPROM firmware	
Switching to single-user mode	
Carrying out the update installation	
Post-installation tasks, part 1	
Restarting the system	
Post-installation tasks, part 2	

3.3 Work schedule for DSSI

Part 1: Chapter "Preparing an RM600 for installation"

Preparing for installation	**Comments**
New installation: Partitioning	
Switching to the Board Debug Monitor	
Loading the Mini System main menu	
– Choosing a language for the dialog	
– Choosing the console type	
– Testing the keyboard type	

Part 2: Chapter "DSSI"

Carrying out the installation	Comments
Starting DSSI	
Backing up partitions	
– Selecting the hard disk	
– Selecting the tape device	
– Selecting the partitions to be backed up	
– Starting the backup procedure	
Restoring partitions	
– Backing up system files temporarily	
– Selecting the tape device	
– Selecting the partitions to be restored	
– Configuring file systems automatically	
– Starting the restore procedure	
Configuring hard disks	
– Selecting the tape device	
– Selecting a hard disk to be configured	
– Selecting file systems to be configured	
– Starting the configuration procedure	
Deleting a hard disk	
Terminating DSSI	

4 Preparing an RM600 for installation

This chapter describes all the preparatory steps that are required for the chapters listed below:

- New installation (see Chapter "New installation on an RM600")
- Update installation (see Chapter "Update installation for RM600")
- DSSI (see Chapter "DSSI")

Which various preparatory steps are necessary in each case is indicated in a special work schedule in Chapter "Work schedules for RM600". You should therefore copy the work schedule which is relevant to the task you want to perform. Then read the sections in this chapter that are mentioned in the work schedule.

Reliant UNIX 5.45 is not backwards compatible. For this reason, software created under Reliant UNIX 5.45 which is to run under an earlier version must be recompiled under the earlier version.

4.1 Booting the system

If UNIX is not yet running, you must first do the following:

- Switch on the console monitor and the other external devices.
- Switch on the computer.
- Log onto the console as user *root* as soon as you are prompted to do so.

The commands described in the following sections must be entered via the console.

- Insert the "Reliant UNIX 5.45" CD-ROM in the CD-ROM (DVD) drive.

Make sure that you only use the CD-ROM that was supplied for your computer.

Title:	Reliant UNIX 5.45
Subtitle:	*Computer models* (e.g. RM600)

The CD-ROM may only be removed from the drive, when the installation is **complete**, or when you are finished working with *DSSI*.

4.2 Reading the new README file

The "Reliant UNIX 5.45" CD-ROM contains a new README file. This file contains important information and changes that were not available when the manual went to print.

You will find the README file under the name *readme*

- on the system disk in the directory */opt/readme/sinix.D*.
- on the "Reliant UNIX 5.45" CD-ROM in the directory */cdrom/sinix_y/5_45x/en* (in 5.45*x*, *x* indicates the revision version).

Read the README file **before** you start the installation.

Also read the README file as soon as you receive a new update for Reliant UNIX and want to start the update installation.

You can read the README file

- using the commands *pg*(1), *more*(1), *less*(1),
- using an editor (e.g. *vi*(1),
- using the *SYSADM* user interface.

Reading the README file from the system disk (UNIX is running)

You can use the *SYSADM* system interface to install the README file on the system. A detailed description of this can be found in the manual ,,Reliant UNIX Operation". You can read the README file as follows:

#□pg□/opt/readme/sinix.GB/readme

Reading the README file from the CD-ROM (UNIX is running)

Use the *SYSADM* user interface. A detailed description of this can be found in the manual "System Administration and Hardware Configuration Using the SYSADM User Interface".

You can read the README file at shell level as follows:

RM600-xxx:

 # mount -F hs /dev/ios0/sdisk006s0 /cdrom

 # pg /cdrom/sinix_y/5_45b00/en*

RM600□E:

 # mount -F hs /dev/ios0/sdisk000s0 /cdrom

 # pg /cdrom/sinix_y/5_45b00/en*

Reading the README file from the CD-ROM (mini system is running)

Select the item *Read readme file* from the mini system main menu (see also Section "The Mini System main menu appears"). The *pg*(1) command is called automatically with the README file. If you type *q* after the colon, you return to the main menu of the mini system.

4.3 Backing up data on the system disk

You should back up all your data on a regular basis. You should certainly back up the data on the system disk in the following cases:

- before you carry out a new installation
- before you carry out an update installation
- before you format/partition the system disk

If you want to carry out a new installation, you can retain the data in the */home* partition in its current state. However, in this case you must refer to the guidelines for partitioning the system disk in the Section "New installation: Partitioning".

We also recommend that you back up all your data if the future system disk ran with a mirror disk up to now.

There are a number of UNIX commands that you can use for backing up data, e.g. *cpio*(1). However, you can also use the *DSSI* program (see Chapter "DSSI") or the add-on product *NetWorker* (see the manual "NetWorker V4.2 - User's Guide").

If you want to change the system disk partitioning, and back up data beforehand using the *DSSI* program, the CD-ROM which is used to start the mini system must correspond to Reliant UNIX Version 5.43 C or later. You must then use the logical backup mode (rather than the physical backup mode).

If the CD-ROM corresponds to an older version of SINIX or Reliant UNIX, you can back up the system disk in the following way:

- Load the mini system
- Switch to a shell
- Back up the data using *cpio*(1)

Always back up the data that you will need for your work later on: e.g. system name, domain name, Internet address, group names, login names, system disk partitioning.

- Copy Table "".
- Make a note in the table of the data that still has to be backed up.
- Now back up this data.

Examples of user and system files			
/home/liz		*/home/eric*	
/etc/device.tab	(□□□□)	*/etc/resolv.conf*	(□□□□)
/etc/dktab	(□□□□)	*/etc/shadow*	(□□□□)
/etc/gettydefs	(□□□□)	*/etc/vfstab*	(□□□□)
/etc/group	(□□□□)	*/etc/default/inet*	(□□□□)
/etc/inittab	(□□□□)	*/etc/dfs/**	(□□□□)
/etc/netconfig	(□□□□)	*/etc/inet/hosts*	(□□□□)
/etc/passwd	(□□□□)	*/etc/inet/networks*	(□□□□)
/etc/profile	(□□□□)	*/etc/inet/strcf*	(□□□□)
/etc/controller	(□□□□)		
Terminal configuration		*/dev* and the output of the command */usr/bin/termshow*	
Own Internet address, network mask, Internet address of the gateway		from the file */etc/default/inet*	
Additional scripts			(□□□□)
crontab tables			(□□□□)
List of all packages installed (*pkginfo*□list)			(□□□□)
Configuration data			(□□□□)

Table 1: Data that must be backed up before a new installation (examples)

4.4 New installation: Partitioning

For the RM600E: As a future system disk, you should choose a disk connected in the first SCSI channel (i.e. not *sdisk02x*).

It is possible that the partitioning of the hard disk, which you intend to use as the system disk, is not suitable for this purpose. Problems may arise in two cases:

- If you want to use a hard disk, which was previously used for a different purpose or which is newly installed, as the system disk.
- If you want to use a hard disk, which was partitioned using an earlier version of SINIX or Reliant UNIX, as the system disk.

In both cases, the hard disk in question may have to be repartitioned during installation to ensure that it can be used as the future system disk. You **must** therefore do the following:

- Check whether the partitioning of the future system disk is suitable for an installation:

- The partitions should have a **standard size**
- The partitions must have a **minimum size**

Partition number	Minimum size (in Mbytes)[1]	Standard disk size (in Mbytes)			
		>1200 <2200	< 5000	< 10 000	> 10 000
0	70	128	256	256	256
1	2 x main memory	256	512	1024	2560
2	200	300	512	512	1024
3	200	256	512	512	512
4	100	200	512	512	512

Table 2: Minimum and standard size of the system disk partitions

Make sure that the partition sizes are greater than the minimum values specified above. Additional space is needed in the partitions for add-on products (especially in */opt*).

If the previous partitions on the system disk are smaller than the minimum values listed above, the data on the */home* partition must be backed up prior to installation, because the menu item *Preserve Data on /home Partition* **cannot** be selected in this case.

The system disk partitioning which is best suited to your purposes depends on which add-on products you want to install later. Further information on this is given in the manuals for the add-on products in question. If you want to change the partitioning, you can do so during the new installation. To do this, you must choose either the menu item *Standard partitions* or *Old partitions* from the *Configure System Disk* menu. If the partitioning of the selected hard disk is not suitable for the future system disk, an error message is displayed.

Preparatory steps for changing the partitioning

You can display the partitioning using the command *dkpart*(8).

If the future system disk has to be repartitioned during installation, you must carry out additional preparations:

- Copy the following form and enter the new values.

Partition number	File system name	Type	Partition size in Mbytes
0	*/*	ufs	
1	*swap*	–	
2	*/opt*	vxfs	
3	*/usr*	vxfs	
4	*/var*	vxfs	
5	*/home*	vxfs	
10	*SASH*	–	4
15	*Status information*	–	0.4
Total size of the partitions:			
Capacity of the future system disk:			

Table 3: Form for changing the system disk partitioning

All data that was previously stored on the system disk is lost when you change the partitioning!

- Back up the data in the */home* file system.
- You can use the *DSSI* program in the mini system to do this.

Changing the partitioning

- Select the menu item *Standard partitions* or *Old partitions* during installation (see ...).

  You should select this menu item only if you either no longer need the data in the */home* partition or if you have backed it up before starting the installation procedure.

- Change the system disk partitioning.
- Copy the backed up data back into the */home* file system.

4.5 Update installation: Partitioning

The minimum amount of storage space specified in Table "" must be available in the partitions for checking mode for an update installation.

File system	Partition[1]	Required free storage space (in Mbytes)[2]
/	*/dev/ios0/sdisk000s0*	5
/swap	*/dev/ios0/sdisk000s1*	³ main memory[3]
/opt	*/dev/ios0/sdisk000s2*	5
/usr	*/dev/ios0/sdisk000s3*	5
/var	*/dev/ios0/sdisk000s4*	5
/home	*/dev/ios0/sdisk000s5*	5
SASH	*/dev/ios0/sdisk000s10*	_[4]
Status area	*/dev/ios0/sdisk000s15*	_[4]

Table 4: Free storage space required for an update installation

Note that storage space is required during checking for the SInus package temporary files. During checking, the system determines whether there is enough storage space for the actual update installation. This amount can vary greatly, depending on the update extent.

4.6 Working with DSSI: Switching on external devices

If external devices are connected to your computer (e.g. a drive for 8 mm magnetic tape cassettes), these devices must be switched on **before** you start *DSSI*. Otherwise, these devices will not be recognized by *DSSI* after it has started, and it will not therefore be possible to access them.

4.7 Switching to the Board Debug Monitor

- Switch off autoboot.

  # bootflags -p -f 209

- Check whether there are other users logged on using the *who*(1) command.

  who(1) does not show if users have access from other computers via *nfs* or *pcnfs*.

- Restart the system.

```
# cd /
# shutdown -i6 -g900
```

The *shutdown* command automatically informs all users who are logged on of the impending change in the run level. You can use the *wall*(1M) command if you want to provide the users with more information.

The *-g900* option causes a time delay of 900 s or 15 min. You should choose this option if there are other users still logged on. Otherwise, you can specify the *-g0* option instead. This option causes an immediate restart.

The boot process automatically ends in the Board Debug Monitor.

4.8 Preparing for remote installation

In the case of a remote installation, all the data required to install a system is retrieved from a designated computer in the network (installation server) via the network (i.e. an Ethernet). The server in the network is the system that provides all the necessary data, while the client is the system to be installed using the data made available on the server.

During remote installation, there is no need for the user to enter data on the client again himself if this data is either available on the server or can be determined automatically on the client.

A remote installation is performed, for example, if the systems to be installed do not have a local installation medium (e.g. CD-ROM (DVD) drive).

Also, if there are a large number of systems in a network, it is usually easier to manage the installation from a designated computer in the network (installation server) instead of having to run from system to system with a CD-ROM containing the operating system. This is especially true if other software is distributed from this server via SAX, for example. In this case, remote installation means that the installation procedure for the operating system adapts itself to an existing software distribution environment.

Another advantage may be that all the systems can be administered from a central site by a network administrator who determines which operating system is loaded and how the system disk is configured. An unattended, automatic remote installation procedure means that installation can be performed on the clients overnight without anyone having to insert or change the installation medium or answer questions regarding installation.

This also means that the systems can be installed at a time when they are not being used productively, which means that no-one is hindered in their work. There is no need for anyone to be present to start or monitor installation. In an ideal situation, a new operating system can be installed on a productive system, configured, and additional software loaded overnight, and the system is subsequently ready again for productive use.

Prerequisites for a remote installation

Any system in a network which satisfies the following requirements can be used as the server for a remote installation:

1. Server and client are connected via Ethernet. Both systems can be located in different subnetworks if the gateway between the subnetworks is configured in such a way that bootp requests can be transferred from one network to the other.
2. The server supports the bootp protocol so that the boot parameters can be sent to the client via the network.
3. The server supports the *tftp* protocol so that the boot files (boot2, miniroot and *unix*) can be loaded via the network.
4. The server supports the *nfs* protocol so that the installation data and the operating system packages can be made available on the client for installation (it must be possible for programs to executed from the *nfs* file system).
5. The server has a CD-ROM (DVD) drive so that the installation data can be read from the CD-ROM containing the operating system.
6. If the installation data are to be made available via CD-ROM, the server is able to mount a CD-ROM in RockRidge format.
7. The server has enough disk capacity to make the installation data available on the hard disk.

This section describes how to configure an RM600 or an RM200, RM300 or RM400 as the boot and installation server for RM systems. Please refer to the "LAN Console" manual for information on configuring a LAN console with Solaris as the boot and installation server for RM systems.

Possible configuration for a remote installation

The server can make **one** operating system version available for installation on the clients, or it can make **different** operating system versions available for installation in parallel on different clients.

The installation data for the clients can either be made directly available on the server via the CD-ROM (DVD) drive (or - if available - via several CD-ROM (DVD) drives) and the mounted Reliant UNIX operating system CD-ROM. Or the data can be copied from the mounted Reliant UNIX operating system CD-ROM to a disk and then be made available from there.

Which physical medium on the server makes the nfs file system available is of no significance to the installation procedure on the client.

Security problems relating to remote installation

In Reliant UNIX, the *tftp* daemon *in.tftpd* is normally started in security mode (option *-s* "*tftp home-directory*", where */tftpboot* is the *tftp* home directory). This means that *tftp* can only be used to read (load) files which are physically located in its home directory, i.e. it is not possible to work in other directories using symbolic or hard links.

This restriction is a security mechanism since *tftp* is otherwise able to read and overwrite any file in any directory on the system which can be read or written by any user without any further security checks being performed. Furthermore, *tftp* does not check whether a user is authorized to read or write the data during login. This security risk can be reduced by the restriction to the *tftp* home directory. With regard to remote installation and making data (especially the boot files) available on the server, this means the following:

1. If the *tftp* service is started in security mode with */tftpboot* as the *tftp* home directory, the boot files (*boot2*, *miniroot* and *unix*) required for the client must be copied on the server from the directory */var/sadm/remote* to */tftpboot*. Therefore there must be enough space under */tftpboot* (e.g. large root file system or */tftpboot* is a separate file system mounted under */tftpboot*).
2. If you start the *tftp* service without security mode, the restriction relating to the *tftp* home directory is lifted, which results in a hole in security on the server. However, there is then no need to copy the boot files. If necessary, a link can be set up to */tftpboot* or the boot files can be loaded directly from the base directory */var/sadm/remote*.

3. If no other requirements made of the system speak against it, *tftp* should be started in security mode with the home directory */var/sadm/remote*. This provides a certain level of security, and the data for the remote installation is made available for the client without having to copy it.

4.8.1 Preparations on the server

The central or "base" directory for the remote installation on the server is */var/sadm/remote*. All the data needed for the installation is located under this directory. This is where you will find the client-specific configuration files for unattended installation, and where the operating system CD-ROM is mounted or the corresponding data is made available on the disk.

If the directory */var/sadm/remote* does not exist on your server, you should created it:

 # mkdir -p /var/sadm/remote

The *bootp* service and the *tftp* service must be available on the server. Both services are supplied by the Internet daemon *inetd*.

The following entries must exist in the file */etc/services* in order to make the *bootp* service and the *tftp* service available on the server:

```
bootp 67/udp

tftp 69/udp
```

If these entries do not exist on your system, enter them in the file */etc/services*. The entries for *bootp* and *tftp* must also be activated or entered in the file */etc/inet/inetd.conf*. Most systems already include the entries for *bootp* and *tftp*, but they have been marked as comments (# at the beginning of the line). In this case, remove the comment sign. If no entries for *bootp* and *tftp* exist, make the following entries in */etc/inet/inetd.conf*:

```
bootp dgram udp wait root /usr/sbin/in.bootp in.bootp
tftp dgram udp wait root /usr/sbin/in.tftpd in.tftp -s
(tftp home directory)
```

These entries must then be activated.

Use the

 # ps -ef | grep inetd

command to determine the process number (PID) of the Internet daemon *inetd*. Use the command

 # kill -1 *process-number*

to cause the *inetd* to re-read its configuration file */etc/inet/inetd.conf*. This makes the new entries known to the system, and the service is available.

You will find more information on *bootp* or *tftp* in the "Network Administration" manual and the "Network Reference Manual".

Making only one operation system version available

The following is a description of what you have to do if you have one or more RM600 systems, or one or more RM200, RM300, RM400 systems, and want to install the same operating system version on all the systems.

- The installation data is made available on the server in the directory */var/sadm/remote/cdrom*. If this directory does not yet exist, create it with the command:

  # mkdir -p /var/sadm/remote/cdrom

- Make the data available on the server. There are several ways of doing this:
  - Mount the operating system CD-ROM. If you perform installation on several clients at the same time, installation will take a bit longer since the read head must constantly be repositioned and is therefore slower:

    # mount -F hs /dev/ios0/sdisk000s0 /var/sadm/remote/cdrom

  - Copy the data from the operating system CD-ROM to the directory */var/sadm/remote/cdrom*. The data needs approximately 480 MB to 650 MB of disk space.

    This procedure reads the data directly from the disk on which the directory is located. Because disk accesses are usually faster than accessing a CD-ROM, installation from the directory is faster than installation directly from the operating system CD-ROM. Also, there are no bottlenecks if you are performing installation on several clients at the same time.

    Mount the operating system CD-ROM:

    # mount -F hs /dev/ios0/sdisk000s0 /mnt

    Copy the contents of the operating system CD-ROM to the directory:

    # cd /mnt

    # find . -print | cpio -pdvum /var/sadm/remote/cdrom

  - You copy the operating system CD-ROM to a disk partition on one RM system, e.g. in the partition */dev/ios0/sdisk013s11*:

    # dd if=/dev/ios0/sdisk000s0 of=/dev/ios0/sdisk013s11

    Mount the partition under the directory */var/sadm/remote/cdrom*:

    # mount -F hs /dev/ios0/sdisk013s11 /var/sadm/remote/cdrom

    The data can then be read directly from the hard disk. Because disk accesses are usually faster than accessing a CD-ROM, this way of making the installation data available is faster. Also, there are no bottlenecks if you are performing installation on several clients at the same time.

- To start the remote installation, you need three "boot files". If you are operating the *tftp* service in security mode and the *tftp* home directory is */var/sadm/remote*, the boot files are located in the directory */var/sadm/remote/cdrom/BOOT*.

  If you are operating the *tftp* service in security mode and the *tftp* home directory is */tftpboot*, copy the boot files to the *tftp* home directory:

  # cp /var/sadm/remote/cdrom/BOOT/sash_b20 /tftpboot

  # cp /var/sadm/remote/cdrom/BOOT/mini_b20 /tftpboot

  # cp /var/sadm/remote/cdrom/BOOT/unix_b20 /tftpboot

- If you want to create an automatic installation with the help of the configuration file *install.cfg*, you need a directory for each client on the server in which you store the configuration file. Create this directory if necessary:

  # mkdir -p /var/sadm/remote/*client*

  For *client*, enter the name of the client on which you want to install Reliant UNIX.

Now store the file *install.cfg* in the directory */var/sadm/remote/client*. Make sure that the file contains the correct values for the client. This avoids the wrong disk being used as the system disk and data being lost.

- In order to make your computer available in the network as the NFS server for NFS clients, you must make local resources available for mounting on remote systems. The *share* command provides clients with access to server resources. If the server and client are entered in the DNS, enter the complete domain name of the client for *client* an, e.g. *angela.pdb.siemens.de*:

  # share -F nfs -o ro=*client*,root=*client* /var/sadm/remote

  # share -F nfs -o ro=*client*,root=*client* /var/sadm/remote/cdrom

  If the file systems are to be available each time the server is started, enter the two *share* commands in the file */etc/dfs/dfstab*.

  If you want to add a new client for remote installation, simply add the name of the client to the *share* options *ro* and *root*, separated by a colon. For example:

  # share -F nfs -o ro=liz:joe,root=liz:joe /var/sadm/remote

  # share -F nfs -o ro=liz:joe,root=liz:joe /var/sadm/remote/cdrom

  The *shareall* command allows you to activate the new entries without having to restart the server.

- If no DNS is active on your server, enter the IP address and the name of the client in the file */etc/inet/hosts*, for example:

  # 144.145.16.224 liz

- Enter the boot and network parameters for the client in the database for the *bootp* service, i.e. in the file */etc/inet/bootptab*. You will need the following data:
  - name of the client
  - IP address of the client
  - Ethernet address of the client
  - IP address of the gateway
  - network mask
  - relative path and name of the boot file under the *tftp* home directory (entry in the field *bf*), *for example: cdrom/BOOT/sash_b20*

  You will find a complete description of the file format and all the possible parameters for *bootptab* in the "Network Reference Manual" for Reliant UNIX.

Example of entries in */etc/inet/bootptab*:

```
.subnet16:\

□:hn:\□□□□□□□□□□□□□□□□□□□□□□#□<--□Send the name of the client

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□to the client

□:ht=.ether:\□□□□□□□□□□□□□□□#□<--□Hardware type of the network

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□(only Ethernet)

□:sm=255.255.255.0:□□□□□□□□#□<--□Network mask for

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□the installation

□:gw=144.145.16.1:□□□□□□□□#□<--□IP address of the gateway

liz:\

□:tc=.subnet16:\

□:ha=00.00.04.01.01.74:\□□#□<--□Hardware address of the client

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□(MAC address, Ethernet address)

□:ip=144.145.16.224:\□□□□□#□<--□IP address of the client

□hd=/cdrom/BOOT:\□□□□□□□□□□#□<--□Path name for the home

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□directory of the boot file,

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□under the tftp

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□home directory

□:bf=sash_b20:□□□□□□□□□□□□□#□<--□Boot file (for RM600)
```

- Update the Internet-to-MAC-address conversion table with the *arp* command:

  # arp -s liz 00:00:04:01:01:74

Making several operating system versions available in parallel

The following assumes that you have one or more RM600 systems or RM200, RM300, or RM400 systems on which you want to use different operating system versions. This description also applies to a heterogeneous system landscape, i.e. one or more RM600 systems and one or more RM300, RM300 or RM400 systems, which you want to supply with different operating system versions from the same server.

- On the server, create a subdirectory *version* for each operating system version under the directory */var/sadm/remote*. *version* stands for the name of the operating system version.

  When assigning a name for *version*, observe the following conventions exactly so that the installation procedure on the client can determine the correct names from the UNIX system booted during installation and find them on the server. The name comprises the following:

  1. A letter indicating the type of system (Y for RM600, N for RM200, RM300, RM400)
  2. The last digit of the revision version (e.g. 3 for Reliant UNIX 5.43, □ 5 for Reliant UNIX 5.45)
  3. A letter indicated the revision status
  4. A digit indicating the source correction status
  5. A digit indicating the object correction status
  6. A number indicating the production status

In the following diagram, the parts of the name for *version* are printed in bold type. The starting point is the name of the Reliant UNIX operating system version in the format output, for example, by the *uname -srv* command:

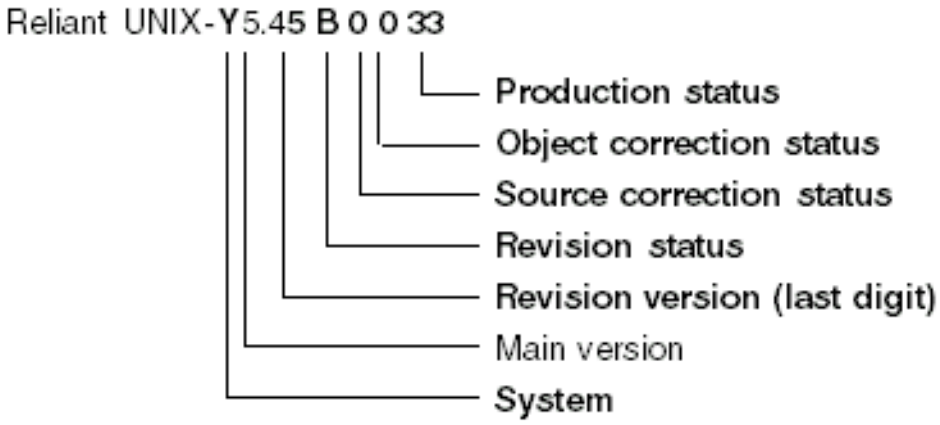


Figure 11: Structure of the operating system names for Reliant UNIX

Examples of names for *version*:

- N3C1001 for Reliant UNIX-N 5.43 C1001
- Y4B0030 for Reliant UNIX-Y 5.44 B0030
- N4A0040 for Reliant UNIX-N 5.44 A0040
- Y5B0010 für Reliant UNIX-Y 5.45 B0010

If the subdirectories *version* and *version/cdrom* of the directory */var/sadm/remote* do not exist on the server, create them:

 # mkdir -p /var/sadm/remote/*version*/cdrom

- Make the operating system data available on the server. There are different ways you can do this:

1. Mount the operating system CD-ROM in the appropriate version-specific directory */var/sadm/remote/version/cdrom*:

   # mount -F hs /dev/ios0/sdisk000s0 /var/sadm/remote/*version*/cdrom

   The data is now read directly from the CD-ROM, which means that installation may take a bit longer if you are performing installation on several clients at the same time since the constant repositioning of the read head makes accessing the CD-ROM (DVD) drive slower.

2. Copy the data from the operating system CD-ROM to the directory */var/sadm/remote/version/cdrom*. Since disk accesses are normally faster than accessing the CD-ROM, this way of making the installation data available is faster, provided that you have enough disk space (between 480 MB and 650 MB for each operating system version):

   Mount the operating system CD-ROM:

   # mount -F hs /dev/ios0/sdisk000s0 /mnt

   Copy the contents of the operating system CD-ROM to the directory */var/sadm/remote/version/cdrom*:

   # cd /mnt
   # find . -print | cpio -pdvum /var/sadm/remote/*version*/cdrom

3. On an RM system, you can also copy the operating system CD-ROM to a disk partition, e.g. in the partition */dev/ios0/sdisk013s11*:

   # dd if=/dev/ios0/sdisk000s0 of=/dev/ios0/sdisk013s11

Mount the partition under */var/sadm/remote/version/cdrom*:

 # mount -F hs /dev/ios0/sdisk013s11 /var/sadm/remote/*version*/cdrom

- To start the remote installation, you need three "boot files". If you are operating the *tftp* service in security mode and the *tftp* home directory is */var/sadm/remote*, the boot files are located in the directory */var/sadm/remote/version/cdrom/BOOT*.

  If you are operating the *tftp* service in security mode and the *tftp* home directory is */tftpboot*, copy the boot files to the *tftp* home directory:

 # cp /var/sadm/remote/*version*/cdrom/BOOT/sash_b20 /tftpboot/*version*

 # cp /var/sadm/remote/*version*/cdrom/BOOT/mini_b20 /tftpboot/*version*

 # cp /var/sadm/remote/*version*/cdrom/BOOT/unix_b20 /tftpboot/*version*

- If you want to create an automatic installation with the help of the configuration file *install.cfg*, you need a directory for each client on the server in which you store the configuration file. Create this directory if necessary:

  # mkdir -p /var/sadm/remote/*version/client*

  For *client*, enter the name of the client on which you want to install Reliant UNIX.

  Now store the file *install.cfg* in the directory */var/sadm/remote/version/client*. Make sure that the file contains the correct values for the client. This avoids the wrong disk being used as the system disk and data being lost.
- In order to make your computer available in the network as the NFS server for NFS clients, you must make local resources available for mounting on remote systems. The *share* command provides clients with access to server resources. If the server and client are entered in the DNS, enter the complete domain name of the client for *client* an, e.g. *angela.pdb.siemens.de*:

  # share -F nfs -o ro=*client*,root=*client* /var/sadm/remote/*version*

  # share -F nfs -o ro=*client*,root=*client* /var/sadm/remote/*version*/cdrom

  If the file systems are to be available each time the server is started, enter the two *share* commands in the file */etc/dfs/dfstab*.

  If you want to add a new client for remote installation, simply add the name of the client to the *share* options *ro* and *root*, separated by a colon. For example:

  # share -F nfs -o ro=liz:joe,root=liz:joe /var/sadm/remote/*version*

  # share -F nfs -o ro=liz:joe,root=liz:joe var/sadm/remote/*version*/cdrom

  The *shareall* command allows you to activate the new entries without having to restart the server.
- If no DNS is active on your server, enter the IP address and the name of the client in the file */etc/inet/hosts*, for example:

  # 144.145.16.224 liz

- Enter the boot and network parameters for the client in the database for the *bootp* service, i.e. in the file */etc/inet/bootptab*. You will need the following data:
  - name of the client
  - IP address of the client
  - Ethernet address of the client
  - IP address of the gateway
  - network mask
  - relative path and name of the boot file under the *tftp* home directory (entry in the field *bf*), for example: *cdrom/BOOT/sash_b20*

  
  You will find a complete description of the file format and all the possible parameters for *bootptab* in the "Network Reference Manual" for Reliant UNIX.

  Example of entries in */etc/inet/bootptab*:

  .subnet16:\

  □:hn:\□□□□□□□□□□□□□□□□□□□□□□□□#□<--□Send the name of the client

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□to the client

□:ht=.ether:\□□□□□□□□□□□□□□□#□<--□Hardware type of the network

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□(only Ethernet)

□:sm=255.255.255.0:□□□□□□□#□<--□Network mask for

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□the installation

□:gw=144.145.16.1:□□□□□□□□#□<--□IP address of the gateway

liz:\

□:tc=.subnet16:\

□:ha=00.00.04.01.01.74:\□□#□<--□Hardware address of the client

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□(MAC address, Ethernet address)

□:ip=144.145.16.224:\□□□□□#□<--□IP address of the client

□hd=/cdrom/BOOT:\□□□□□□□□□□#□<--□Path name for the home

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□directory of the boot file,

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□under the tftp

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□□□□□home directory

□:bf=sash_b20:□□□□□□□□□□□□□#□<--□Boot file (for RM600)

- Update the Internet-to-MAC-address conversion table with the arp command:

  # arp -s liz 00:00:04:01:01:74

4.8.2 Preparations on the client for an interactive installation

First of all, switch to the Board Debug Monitor (BDM). How you do this depends on the operating status of the computer.

After switching the computer on

If autoboot is deactivated, the system stops in the BDM.

- If the bootflags are set to autoboot, interrupt autoboot in Boot2 with the key combination [CTRL] [C]
- Switch to the BDM
  - For RM600-xxx with [CTRL] [A]
  - For RM600-Exx with [CTRL] [@] [B] [D] [M]
- Deactivate the autoboot mode with

  BDM(SPB □□□10 t)>**wf 209**

- Restart the system:

  BDM(SPB□□□10 t)>**creset**

From UNIX

If the system on which you want to perform installation is already running under Reliant UNIX or SINIX,

- Deactivate the autoboot mode with

  # bootflags -p -f 209

- Restart the system:

  # shutdown -i6 -g0

Starting the installation

- Load the SASH (Boot2) via the network:

  BDM(SPB□□□10 t)>**b 9 et(32,0,0)**

  On E4x/E8x:

  BDM(SPB□□□10 t)>**b 9 et(64,0,0)**

- Start the installation:

  boot2: **rinstall**

4.8.3 Preparations on the client for an automatic installation

First of all, activate the autoboot mode. How you do this depends on the operating status of the computer.

After switching the computer on

If autoboot is deactivated, the system stops in the BDM.

If the bootflags are set to autoboot,

- Interrupt autoboot in Boot2 with the key combination
  [CTRL] [C]
- Switch to the BDM
  - For RM600-xxx with [CTRL] [A]
  - For RM600-Exx with [CTRL] [@] [B] [D] [M]
- Activate the autoboot mode with

  BDM(SPB □□□10 t)>**wf 209**

- Set the boot string to the network:

  BDM(SPB□□□10 t)>**wn 0 et(32,0,0)**

  On E4x/E8x:

  BDM(SPB□□□10 t)>**wn 0 et(64,0,0)**

- Restart the system:

  BDM(SPB□□□10 t)>**creset**

From UNIX

If the system on which you want to perform installation is already running under Reliant UNIX or SINIX,

- Activate the autoboot mode with:

  # bootflags -p -f 200

- Set the boot string to the network:

  # bootflags -p -b "et(32,0,0)"

  On E4x/E8x:

  # bootflags -p -b "et(64,0,0)"

- Restart the system:

  # shutdown i6 -g0

4.9 Updating the EEPROM firmware

The "Reliant UNIX 5.45" CD-ROM contains an update utility. You can use this to update the EEPROM firmware.

If you start the firmware update even though the EEPROMs have already been programmed with the new firmware version, you will be informed of this.

4.9.1 Starting the firmware update

- Start the update utility:

  RM600-xxx:

  BDM(MBII□□0□t)>**b□9□cd(0,48,0)flsh**

  RM600 E:

  BDM(SPB□10□t)>**b□9□cd(0,0,0)flsh**

  A configuration menu appears on your screen. You can enter other commands in the command line of this menu. For example, you can call a help function using *help* or *?*. This causes all available commands to be listed. Press any key to return to the configuration menu.

- Now start the update process:

  Enter command: **fep -a** □□□□(Type ?<CR> to get help information

  During the update process, the power supply to the computer must not be interrupted. Otherwise, the relevant controller will have an undefined software status, which you cannot rectify yourself.

  If this occurs, please contact our Service department.

Modules with an older firmware version are now programmed in sequence with the new firmware. During this process, the message *flashing* appears in column 4 in place of the version number of the loaded firmware release. If the process is terminated correctly, an asterisk is inserted before and after the new version number.

- Once all modules have been programmed, perform a cold start:

  □Enter□command:□**reset**□□□□(Type□?<CR>□to□get□help□information)

The cold start ends in the Board Debug Monitor.

4.10 Loading the Mini System main menu

In some of the operations described in this manual the operating system cannot access the system disk. All the required commands must then be available in the main memory. For this purpose, the "Reliant UNIX 5.45" CD-ROM contains a mini system which is smaller than the Reliant UNIX operating system.

Update installation:

As of operating system/revision version B00 of Reliant UNIX 5.43, an update installation is no longer started from the mini system. The menu item of the same name in the Mini System main menu only displays information about the new procedure. If you want to perform this type of installation, please read the Chapter "Update installation for RM600".

Change to the BDM and first of all load the boot2 from the CD-ROM:

RM600-xxx:

BDM(MBII□□0□t)>**b□1□cd(0,48,10)sash**

RM600 E:

BDM(SPB□□10□t)>**b□1□cd(0,0,10)sash**

For the **RM600 E30/70**, you can also load the boot2 from a server via the network:

BDM(SPB□10□t)>**b 9 et(32,0,0)**

Also on **RM600 E4x/E8x**:

BDM(SPB□10□t)>**b 9 et(64,0,0)**

If you want to execute the load procedure using a different CD-ROM (DVD) drive or a different storage medium, you must change the boot string as appropriate.

You then load the Mini System main menu:

boot2: **install**

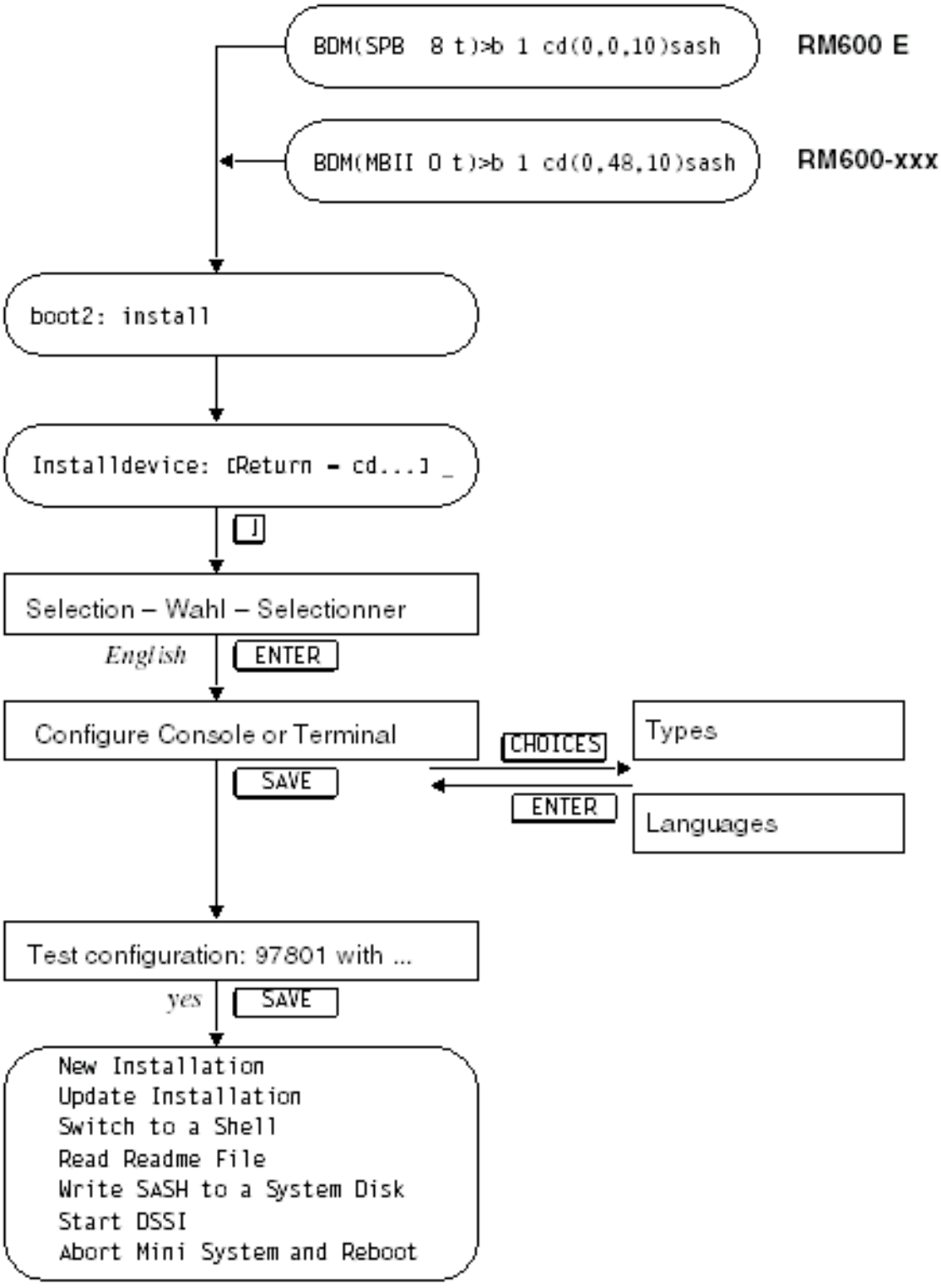


Figure 12: Overview of how the mini system main menu is loaded

4.10.1 How the load process works

A series of messages are displayed during the load process. If they are not of any interest to you, you can move straight on to Section "Choosing a language for the dialog".


Please note that the messages shown below may vary slightly due to the actual system configuration.

Further actions are then carried out:

- The CD-ROM (DVD) drive is mounted:

  mount: warning: <RELIANTUNIX_Y_V5_45B0000> mounted as </cdrom>

- The system checks whether a configuration file exists.

  The configuration file can be made available as a *cpio* file on a floppy disk or

  - for the **RM600-xxx** on the disk *sdisk000s0*
  - for the **RM600 E** on the disk marked as active in the root partition list

    If the configuration file is not found on the disk being searched, one of the following messages is displayed:

  +++ INFO: looking for config file
  +++ INFO: No config file found, switching to dialog mode

- The mini system dialog program is then started. It is based on the *FMLI* utility (Form and Menu Language Interpreter). This program runs both on character-based screens and on graphics screens.

  +++ INFO: start FMLI menus
  □□□□□□□□□□start fmli

4.10.2 Using the dialog program

The mini system dialog program is used in exactly the same way as the *SYSADM* user interface.

Basically, the dialog program runs in the following way:

- You are prompted to specify the desired dialog language.
- You are prompted to enter the parameters for screen and keyboard.
- The selected settings can be tested and corrected if necessary.
- The Mini System main menu appears.

It is possible that the first two menus on your screen will not be displayed correctly, or that the function keys do not work. The reason for this is that the dialog program initially sets a default value for the *$TERM* environment variable. This value is corrected automatically as soon as the second form is completed and saved (see Section "Choosing the console type").

If the function keys do not work, the corresponding functions can be carried out using special key sequences:

- Press and hold down the [CTRL] key.
- Press [F].
- Release both keys.
- Press the number of the function key whose function you want to execute (e.g. [1] for {HELP} or {F1}).

You can also press Ú instead of the [ENTER] function key.

4.10.3 Choosing a language for the dialog

You must define certain parameters before the Mini System main menu appears. You must first select the language in which the subsequent dialog is to be held:

English□□□Welcome to the CD-ROM Mini System.

□□□□□□□□□□For more Information press the HELP (F1) function key.

□□□□□□□□□□If the F1 function key doesn't work, use <Ctrl>f 1.

□□□□□□□□□□Please select the dialog language now.

Deutsch□□□Willkommen im CD-ROM Minisystem.

□□□□□□□□□□Mehr Informationen:□Druecken Sie die Funktionstaste

□□□□□□□□□□HELP (F1).

□□□□□□□□□□Alternative:□Druecken Sie <Ctrl>f 1.

□□□□□□□□□□Bitte waehlen Sie jetzt die Dialogsprache.

Francais□□Bienvenue dans le CD-ROM Minisystem

□□□□□□□□□□Plus d' information: appuyez sur la touche HELP (F1).

□□□□□□□□□□Si F1 ne marche pas: appuyez sur <Ctrl>f 1.

□□□□□□□□□□Selectionnez la langue s'il vous plait.

□□□□□□□□□□English - Continue□□□□□□□ENTER (F3)

□□□□□□□□□□Deutsch - Weiter mit□□□□□ENTER (F3)

□□□□□□□□□□Francais - Continuer avec ENTER (F3)

Use the [HELP] function key to display detailed help text. The help text is displayed in English if the cursor is on the second menu item.

- Move the cursor to the desired dialog language using the arrow keys or the TAB key.
- Press the [ENTER] function key or the Ú key.

The selected language only remains valid for the duration of the dialog. It has **no** effect on the language setting for the system once the installation has been completed.

4.10.4 Choosing the console type

You are then prompted to specify the type of terminal you are using as a console

Please specify the console or terminal type and, if necessary,

the keyboard language.

You can use the Tab key (TAB) or the arrow keys to move back and forth

between the fields in the menu.

Use the Enter key to confirm your choice.

vt02

97801

X11-Emulation-xterm

X11-Emulation-xpct

Select the terminal type

Press the [CHOICES] function key to display a selection menu:

vt02	TC20 or 97801 terminal
97801	TC20 or 97801 terminal
X11-Emulation-xterm	xterm emulation
X11-Emulation-xpct	xpct emulation

Enter keyboard language

Press the [CHOICES] function key to display a selection menu:

German	The [Q] [W] [E] [R] [T] [Z] keys lie side by side. Some keys are assigned umlauts Ä, Ö, Ü or the letter ß.
French	The [A] [Z] [E] [R] [T] [Y] keys lie side by side.
International	The [Q] [W] [E] [R] [T] [Y] keys keys lie side by side

Information about the TC20-V100 Data Display Terminal

If you are using a TC20-V100 Data Display Terminal as the console, but do not know which emulation is used, you can find this information in the terminal's operating manual. A distinguishing feature is the number of function keys:

- The keyboard for the VT320 emulation has 20 function keys (F1 through F20).
- The keyboard for the 97801 emulation has 22 function keys (F1 through F22).
- The PC keyboard MFII has 12 function keys (F1 through F12).

▶ Fill in the form.

▶ Press the [SAVE] function key.

4.10.5 Setting the terminal parameters

Parameters for the 97801-vt02 terminal

The TERM variable must be set to TERM=vt02, and the following entries should exist in the terminal's setup mode:

"general setup" menu	

Terminal ID:	*VT220*
Terminal mode:	*7 bit control*
User defined keys:	*locked*
Cursor key mode:	*ANSI control*
New-line mode:	*off*
User-preferred set:	*DEC*
Communication:	*online*

"host interface" menu	
Baud rate:	*19200*
Parity:	*off*
Character length	*8 bit*
Stopbit length:	*1 bit*
XOFF	*at 64*
Local echo mode	*off*
Transmit rate:	*limited*

You should also set the function *x key* to backspace in the "*keyboard setup*" menu and "*autowrap*" to "*on*" in the "*display setup*" menu.

Save these settings in the *basic function* menu of the setup mode.

4.10.6 Testing the keyboard type

In the next window you can check whether the selected console or keyboard type is applicable to your keyboard.

Check the selected terminal and keyboard configuration:

- A color display should be used, if possible.

- The windows should be framed by simple graphics, such as □□lines.

- The characters that were entered must be displayed correctly.

If the test window does not work correctly,

enter 'no' in the last line and press SAVE (F3).

If the function keys do not work, you can emulate them:

- Press <CTRL>f<i>, where {1, ..., 8} must be entered for i

- or press <CTRL>j, and type exit at the '-->' prompt.

If the test window works correctly, enter 'yes' in the last line

and press SAVE (F3).

□□□□□□□□□□□□□□□□□□□Entering text

□□□□□□□□□□□□□□□□□□□Testing the CHOICES (F2) function key

□□□□□□□□□□□□□□□□□□□Do the screen and keyboard work ok?

 In the case of a German keyboard, no umlauts can be used for testing.

Entering Text
: Press a few keys that are used for special characters.

Testing the CHOICES (F2) function key
: Press the [CHOICES} function key.

Do the screen and keyboard work ok?
: Enter **yes** or **no** here, depending on whether the displayed characters correspond to the keys you have just pressed. You can also use the [CHOICES} function key to do this.

- Type in text.
- Check the text on your screen.
- Enter *yes* or *no* in the last line.
- Press the [SAVE] function key.

4.10.7 The Mini System main menu appears

You start the installation process from the Mini System main menu. You should, however read the *README* file before choosing *Reinstall Reliant UNIX*.

You can carry out one of the following actions:

1. Reinstall Reliant UNIX

2. Find out how an update installation is carried out

3. Execute commands in a shell of the mini operating system

4. Read the README file

5. Write the stand-alone shell (SASH) to a system disk

6. Execute tasks with DSSI

7. Abort the mini operating system and restart the old system kernel

Reinstall Reliant UNIX
: Start a new installation. Please refer to Section "Part 1 of the installation: Dialog".

Find out how an update installation is carried out
: Display information about how an update information is performed.

  As of operating system/revision version B00 of Reliant UNIX 5.43, an update installation is no longer started from the mini system. If you want to perform this type of installation, you must do the following:

  - Exit the mini system by selecting the menu item Abort the mini operating system and restart the old system kernel.

    Please refer to Chapter "Update installation for RM600".

Execute commands in a shell of the mini system
: Exit the dialog program temporarily.

  You return to a shell of the mini system. From here, you can execute some UNIX commands (e.g. *autoconf*(8), *dksetup*(8)). You can use the *exit* command or press [CTRL] [D] to return to the dialog program (but only if the stty parameter *eof* has not been redefined).

  The settings for language, keyboard, and terminal type which you selected in the previous menus are still valid in the mini system.

Read the README file
: Read the new README file. Please refer to Section "Reading the new README file".

Write the stand-alone shell (SASH) to a system disk
: The SASH is needed to boot the operating system. It is located on partition 10 of the disk. If you have overwritten this partition by mistake, you will no longer be able to boot the system. You can use the menu item *Write the stand-alone shell (SASH) to a system disk* to write the SASH to partition 10 again.

  Confirm the suggested disk with the function key [SAVE].

Execute tasks with DSSI
: Start the *DSSI* program. Please refer to Chapter "DSSI".

Abort the mini operating system and restart the old system kernel
: Boot the computer from the system disk (cold start). The boot process ends in the PROM monitor or firmware monitor.

- Select a menu item.
- Press [ENTER] .

5 New installation on an RM600

This chapter describes how to perform a new installation of the Reliant UNIX 5.45 operating system on an RM600.

For this task, you may have to carry out various **preparatory steps**. The required steps are listed in a special work schedule on Section "Work schedule for a new installation". You should therefore make a copy of this work schedule. Then read the sections in the Chapter "Preparing an RM600 for installation"" that are mentioned in the work schedule.

Please note that the computer is supplied with the operating system **preinstalled**. When you power up the computer for the first time, you need only carry out the actions described in the operating manual.

If an older version of Reliant UNIX is already installed on your computer, you can also install the new Reliant UNIX version by carrying out an **update installation**. You should therefore check carefully to see which installation type is best suited to your needs. Information on the update installation can be found in the Chapter "Update installation for RM600".

As a prerequisite for installing Reliant UNIX 5.45 on the RM600, you need a main memory configuration of at least 128 Mbytes.

The Reliant UNIX 5.45 operating system is supplied on a CD-ROM and is therefore installed from the CD-ROM (DVD) drive. Provided you have carried out all the preparatory steps for installation, the new installation of the operating system takes approx. 1.5□-□2□hours.

5.1 General guidelines

Please observe the following rules during installation:

- All actions that are performed during the installation are logged. The log comprises two parts:

Part 1:	file */prot.install.mini*	in the mini system
	file */var/sadm/pkg/.prot.install.mini*	in UNIX
	file */var/sadm/pkg/.prot_inst.0*	in UNIX
Part 2:	file */var/sadm/pkg/.prot_inst.2*	in UNIX

- The standard partitioning of the system disk offered in the installation menu may not be suitable for your purposes. You can therefore change the partitioning during the installation dialog. If you want to change the partitioning, but have not yet checked the existing partitioning, you must do so **before** starting the new installation.

  When you change the system disk partitioning, all the data that was stored on the disk is lost!

- If you want to abort the installation, there are two options available to you:
  1. The [USER_INT] function key is displayed in certain windows. When you press this function key, a selection menu appears in which you can choose between a number of different actions (see ...).
  2. The menu item *Abort Installation and Reboot* is displayed in certain windows. When you select this menu item, the previous Reliant UNIX system is restarted. The boot process ends in the Board Debug Monitor or firmware monitor.

  If you abort the installation **after** you have started the installation procedure (by selecting the menu item *Start Installation*, see ...), you must then repeat the new installation.
- If you abort the installation procedure yourself before it is completed, you should try to install Reliant UNIX

again. If this attempt also fails, please contact the Fujitsu Siemens Service department.

- You should also consult the Fujitsu Siemens Service department if errors occur while you are installing an add-on package.

5.2 Overview of how a new installation works

A new installation is performed in two parts. In the first part, the installation parameters must be entered. The installation is then carried out automatically in the second part. The following table shows what you must do before, during, and after installation.

The data on your computer is completely safe while you are working within the dialog part. The hard disk is **only** updated when you select the menu item *Start Installation* at the end of the dialog (see ...). The only exception is that the date and time entered are changed immediately.

No.	Actions performed by the computer	Actions performed by the user
1.		**Preparatory steps**
	Mini system is booted	Work schedules for RM600
	You are prompted to specify:	
	the language (menu)	Choose *English*
	the console type (menu)	Select the console type
	whether the tested characters are ok	enter *yes*
	Mini System main menu appears	Choose *Perform New Installation*
2.	**Dialog**	
	You are prompted to specify:	
	date, time, time zone	Enter parameters
	name of the computer	Enter the name
	system disk	Select system disk
	system disk configuration	Confirm the system disk
	whether the installation values are ok	Press [SAVE] to confirm
		Press [ENTER] to start install.
3.	**Execution**	
	System disk is formatted/partitioned,if requestedFile systems are createdBasic system is installed	
	Miniroot file system is unmountedMini system is powered downBasic system is bootedAdd-on packages are installedRevision packages are installedNew system kernel is generatedBasic system is powered downNew system kernel is booted	

	Computer is ready	
4.		Post-installation tasks: Log on as user *root* Set password for user *root* Check *.protinst** in the */var/sadm/pkg* directory to ensure that the installation was completed successfully Back up the operating system Increase swap area if neccessary Set passwords for the users *oasys* and *sysadm* Network services and domains (RM600)

5.3 Part 1 of the installation: Dialog

As soon as the Mini System main menu appears (see Section "Loading the Mini System main menu"), select the menu item *Perform New Installation*.

5.3.1 Confirming the opening window

The welcome screen contains the following information:

```
Welcome to Reliant UNIX Installation!
In the following sections you must answer a few questions
about the installation.!
If you have never installed the Reliant UNIX system before,
you should first press the HELP (F1) function key. Further information
about the installation procedure is then displayed. If you encounter
problems during installation, do not hesitate to call up the help function
by pressing HELP (F1).
```

You have the following options in this window:

```
Continue
Back□□□□□□□□to Previous Menu
Abort□□□□□□□Installation and Reboot
```

Continue
: Choose this menu item if you want to carry out a new installation.

Abort Installation and Reboot
: Choose this menu item if you want to terminate the mini system and boot the old SINIX or Reliant UNIX system.

Back to Previous Menu
: Choose this menu item to return to the previous menu.

You can call up detailed help text by pressing the [HELP] function key. You can continue to view this help text in the course of the dialog, i.e. in the subsequent windows. To do this, you must press the [HELP] function key twice in succession.

- Select the desired menu item.
- Press the [ENTER] function key.

5.3.2 Entering the date, time, and time zone

The system supplies the following information for entering the time parameters:

```
Check the current date, time, and time zone.

You can use the Tab key (TAB), the Enter key or the arrow keys

to move back and forth between the fields in the form. Enter

the correct values. If you want to change the displayed time

zone, place the cursor on the relevant field, and press

the CHOICES (F2) function key. A submenu is then displayed.

Current date:□□□□□□□□□□□□□□□□10/06/97

Current time:□□□□□□□□□□□□□□□□20:20:53

Enter the current year:□□□□□1997

Enter the month:□□□□□□□□□□□□10

Enter the day:□□□□□□□□□□□□□□□07
```

Enter the hour:□□□□□□□□□□□□□□10

Enter the minute:□□□□□□□□□□□□21

Enter time zone:□□□□□□□□□□□□□□MET-1MDT,M3.5.0/02:>

The [USER_INT] function key is displayed in this window and in some of the following windows. You can use this function key to cancel the dialog. For further information, refer to Section "Aborting the installation dialog".

It is then not possible to return to the current window. If you inadvertently press the [USER_INT] function key, you must reload the Mini System main menu.

Any change made to the system date takes effect immediately.

- Check the parameters that are displayed. If a parameter is not correct, move the cursor to the relevant field and correct it. You can display a selection menu in the *Enter time zone* field by pressing the [CHOICES] function key.
- Press the [SAVE] function key.

5.3.3 Entering the host name

The following message is output to request you to enter the host name of your computer:

Enter a name for your computer. This name must start with a letter

followed by other letters, numbers, dashes, or underscore characters.

We recommend that the name does not exceed 8 characters. This recommendation

does not have to be observed, but entering a name longer

than 8 characters can create problems in certain applications.

If your computer is linked to a network, this name

is automatically used as the name of the network node, and must be unique

within the network.

- Enter a suitable host name.
  The computer can be accessed in the network using the host name. A "blank" host name is not accepted.

Remote installation:

If you have loaded the mini system remotely, the host name is read from the */etc/inet/bootptab* or */etc/hosts* file on the installation server. As a result, the default host name is only displayed here, just like the network parameters that are currently set. Check these parameters:

- Internet address of the computer
- Network mask of the computer
- Internet address of the gateway
- Internet address of the server

- If the network parameters are not correct, abort the installation. To do this, press the [USER_INT] function key.
- If the network parameters are correct, press [SAVE].

5.3.4 Defining the system disk

You must now specify the hard disk on which Reliant UNIX is to be installed. The installation procedure proposes the first disk found which would be suitable as the system disk:

RM600E: You should try and select a hard disk that is connected to the first SCSI string (i.e. not *sdisk02x*) as the system disk.

Please select the hard disk to be configured as the system disk

during this installation.

The window displays the first hard disk found (abbreviation and disk type).

Press the CHOICES (F2) function key if you want to select a

different hard disk. A submenu containing a list of

all the hard disks connected to your machine

and found by the installation procedure is then displayed.

Disks that are suitable for the installation are indicated by

an asterisk '(*)'.

If all the specifications are correct, save them by pressing SAVE (F3)

The following syntax applies to the hard disk names:

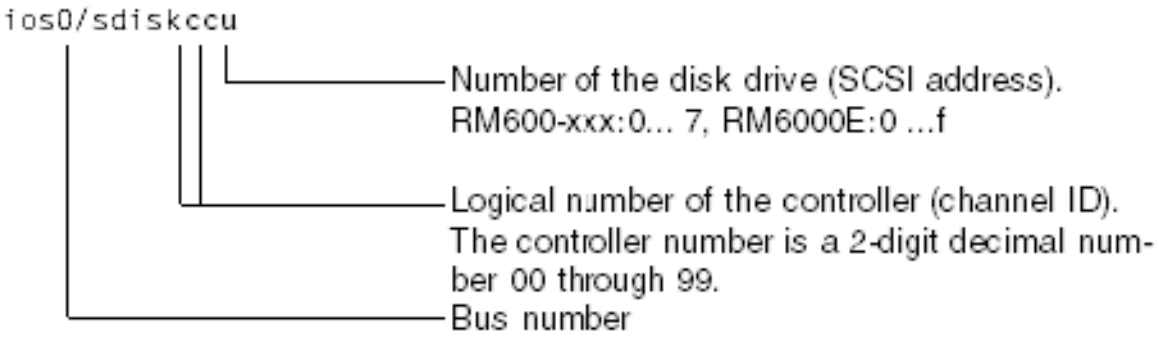


Figure 13: Syntax of the logical names used for hard disks

Further information on the naming conventions can be found in the manual entry for *sdisk*(7) and in the "System Administrator's Reference Manual".

- If you accept the recommended disk, press [SAVE].
- If you wish to select a different disk press [CHOICES].

  A selection list is displayed. The selection list shows all disks in the system cabinet, apart from WORM (Write Once Read Many) and ROD (Rewritable Optical Disk) drives. The drives which are suitable for installation are marked with an asterisk. These are the only drives available to you.

  Drives may be unsuitable because they do not have enough capacity, or the minimum partition size is not available (see Table "").

  An error message is output if a suitable hard disk is not found. In this case, please refer to Section "No system disk found" to find out what you can do.

- Select the desired hard disk.
- Press the [ENTER] function key. The window is closed and the previous window is reopened.
- Press the [SAVE] function key in this window.


It is recommended that you note the name of the selected system disk (e.g. */dev/ios0/sdisk020*).

All necessary boot string settings are made automatically during installation of Reliant UNIX.


If you select a system disk which is connected via a controller, neither the connection slot for the system disk nor the controller type may be changed after installation. Otherwise the system disk will no longer be recognized.

5.3.5 Choosing the system disk configuration

Decide how you want to configure the system disk:
1.□ 'Standard Partitions', 'Old Part.',
□□□You can accept or modify the selected
□□□ partition table.
□□□- Standard partitions:□/, <swap>, /opt, /usr, /var, /home
□□□- Old partitions:□□□□as before
□□□You can also have the disk □□□formatted.
□□□=====> ALL DATA WILL BE OVERWRITTEN.
2.□'Preserve Data on /home Partition'
□□□□=====> The old partitions and the /home file system are
□□□□□□□□□□□retained.

The menu items *Standard partitions* and *Old partitions* cause all the data on the system disk to be deleted. The data in the */home* file system is also lost.

Standard partitions

The system disk is to be formatted and/or partitioned before the installation is started. This involves writing the standard partition table to the system disk. The size of the partitions is calculated as a factor of the disk size.

Old partitions

The system disk is to be formatted and/or partitioned before the installation is started. This involves writing the previous ("old") partition table to the system disk. This partition table can contain either "standard" partitioning or one large partition.

If you want to retain the previous partition table in its present format, you do not need to format or partition the system disk. If this is the case, select the menu item *Old partitions* and note the information on the following pages.

Preserve Data on /home Partition

The partitioning of the system disk and the data in the */home* file system are to be retained.
Requirements:

- The hard disk was already used as the system disk before the installation was started.
- The hard disk is divided into 6 partitions ("standard" partitioning).
- The partitions are sufficiently large.
- The */home* file system is stored in partition 5.
- Partition 5 does not belong to a virtual disk.

All the data stored in partitions 0 through 4 (and in all parallel partitions) is deleted on the system disk!

Certain add-on products install additional data on the system disk. Problems may arise if the existing partitions are relatively small.

- Select the desired menu item.
- Press the [ENTER] function key.

If you have selected the menu item *Preserve Data on /home Partition*, you can move straight on to the Section "Confirming the installation parameters". If you have selected a different menu item, read the following section to find out how you can format and/or partition the system disk.

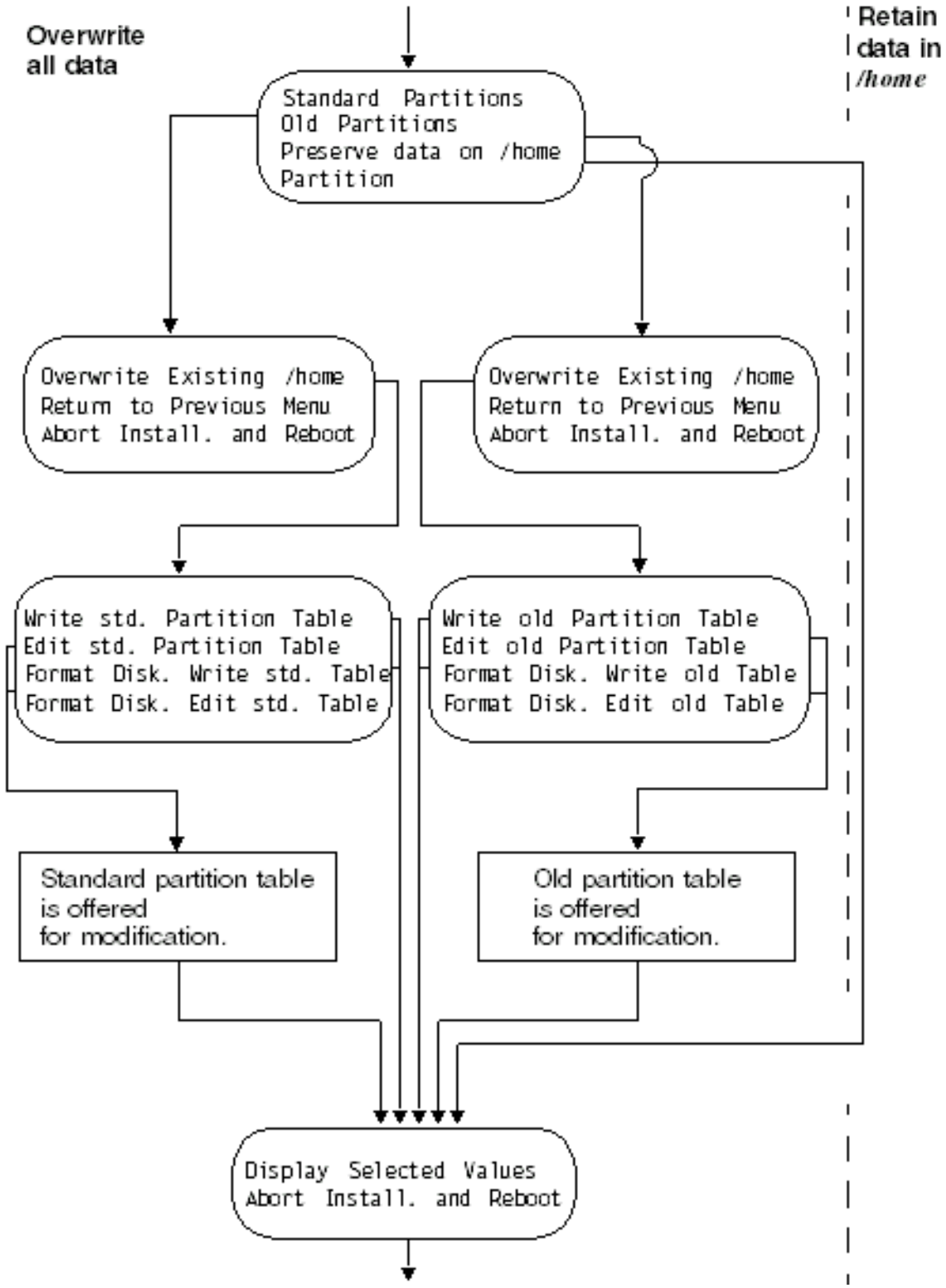


Figure 14: Formatting/partitioning dialog sequences

5.3.6 Formatting and/or partitioning the system disk

If you selected the menu item *Standard partitions* or Old partitions from the *Configure System Disk* menu, three additional windows are displayed in which you can define the formatting and partitioning of the system disk.

Partition 5 (/home) contains a file system.

Choose 'Overwrite Existing /home

□□□to continue with the installation.

□□□Overwriting old /home partition, all data

□□□will be lost.

Or

Choose 'Return to Previous Menu'

□□□to return to the menu. You can then choose

□□□'Preserve Data on /home Partition'.

Or

Choose 'Abort',

□□□to terminate the installation and restart the old

□□□system.

If a file system is detected in the */home* partition, you must first confirm that you want to overwrite the */home* partition.

You must then decide whether the system disk is to be formatted.

Depending on which menu item you select, either the menu for the standard partition table is opened (see below) or the menu for the old partition table.

□□□Write standard partition table
□□□Edit standard partition table
□□□Format the disk and write standard partition table
□□□Format the disk and edit standard partition table

If you want to save the */home* file system and have inadvertently arrived at this point in the program, you should press the [[PREVIOUS]] function key. You are then returned to the previous window.

The menu for the old partition table looks like this:

□□□Write old Partition Table
□□□Edit old Partition Table
□□□Format the Disk and Write the old Partition Table
□□□Format the Disk and Edit the old Partition Table

Write Standard Partition Table

The system disk is not formatted during the installation. The standard partitioning is written to disk at the beginning of the second part of the installation (no further menu appears and the installation proceeds with the menu shown in the Section "Confirming the installation parameters"").

Edit Standard Partition Table

The system disk is not formatted during the installation.The standard partitioning is written to disk with changes if the partitioning shown in the next menu *Edit Partition Table* is confirmed using the [SAVE] function key after the relevant entries have been changed.

If you confirm the partitioning shown using the [SAVE] function key, the standard partitioning is written **without changes** to disk.

Format the Disk and Write Standard Partition Table

The system disk is **formatted and partitioned** before installation begins. Only select this menu item if formatting the system disk is necessary.

Format the Disk and Edit Standard Partition Table

The system disk is **formatted and partitioned** before installation begins. If you make changes to the partitioning shown in the next mask *Edit Partition Table* by making new entries and confirm them using the [SAVE] function key, the modified partitioning is written to the disk.

The standard partitioning is written to the disk if you do not make any changes and confirm the partitioning shown with [SAVE].

Write old Partition Table

The system disk is **not formatted** during the installation. The old partition table remains unchanged on the disk. The partitioning of the disk is **not changed**.

Edit the old Partition Table

The system disk is **not formatted** during the installation. If you make changes to the entries in the next form *Edit Partition Table* and confirm these changes using the [SAVE] function key, the old partition table is written to the disk with the changes.

If you confirm the partitioning shown using the [SAVE] function key without making any changes, the standard partitioning is written to the disk.

Format the Disk and Write the old Partition Table

The system disk is formatted before the installation begins. The old partition table is then written unchanged again to disk. The partitioning of the disk is not changed.

Format the Disk and Edit the old Partition Table

The system disk is formatted before the installation begins. If you modify the entries in the next form *Edit Partition Table* and confirm these changes with [SAVE], the old partition table is written to the disk with the changes.

If you do not make any changes and confirm the partitioning shown using the [SAVE] function key, the standard partitioning is written to the disk.

Normally, it is not necessary to format the system disk when you are carrying out a new installation. You can therefore select the menu item *Write/Edit Partition Table*. However, if you want to format the system disk before you install Reliant UNIX, select the menu item *Format the Disk and Write the Partition Table*.

The system disk is only formatted once you have terminated the dialog and started the installation (see ...). The command */sbin/format* (with the option *f* and the serial number *0*) is used to format the system disk (see manual entry for *format*(8)).

- Select the desired menu item.

▶ Press the [ENTER] function key. You can then edit the partition table:

```
Edit partition table: ios0/sdisk011 - MP98

Edit Partition Table: ios0/sdisk011 - MP98

Name       Partition   File □□□□□□□□□□□□□□Size [MB]

□□□□□□□□□□□□□□□□□□□□□□□□□□□□system     Minimum     Selection

-----------------------------------------------------

<sash>     10        - □□□□□□□□□□2 □□□□□□□□□□2

/          0         ufs □□□□□□□□70□□□□□□□□□□100

<swap>     1         -         128       256

/opt□□□□□□□□2         vxfs □□□□□□□200 □□□□□□□□300

/usr       3         vxfs □□□□□□□200□□□□□□□□□200

/var       4         vxfs □□□□□□□100□□□□□□□□□200

/home      5         vxfs □□□□□□□8□□□□□□□□□□□4095

<remainder>                      3520

Add 3520 MB to ios0/sdisk000
```

You can change the size of the partitions */(root)*, *<swap>*, */opt*, */usr*, */var*, and */home* in the *selection* column. The *remainder* row shows the amount of disk space still available. The default setting depends on the size of the disk:

- Disk size<= 2 Gbytes:
  - The *selection column* contains the default values.
  - The */home* partition comprises the remainder of the disk.
  - No additional part of the disk is available, i.e. *remainder* = 0.
- Disk size > 2 Gbytes:
  - The *selection column* contains the default values.
  - The */home* partition contains the default value.
  - An additional part of the disk is available, i.e. *remainder* > 0.
- Disk size > 8 Gbytes
  - An additional partition 6 is available with a fixed size of 4 Gbytes as a dump device. This partition always comes before partition 15.
  - The */home* partition is comprises the remainder of the disk.

The *File system* column shows which type is assigned to the file systems:

- A *ufs* file system is configured in the */*(root) partition (ufs = UNIX File System).
- *vxfs* file systems are configured in the remaining partitions (default with Reliant UNIX 5.43 or later; vxfs = Veritas Extended File System).

Enlarge the swap area at this stage to avoid problems later (see the Section "Continuation of "normal" autoboot").

If the menu item Preserve Data on /home Partition was selected in the *Configure System Disk* menu, the existing type of the */home* file system is retained.

- If you are happy with the suggested partitioning, press the [SAVE] function key.

If you want to resize the partitions, please note the following:

- The partitioning should only be modified by an experienced system administrator.
- The partitions should be **as close as possible in size** to the default values (i.e. the same size as the default setting in the *selection* column).
- The partitions must be **at least as big** as the value set in the *Minimum* column (otherwise, [SAVE] cannot be used to exit the window).
- The total size of all partitions **cannot be greater** than the system disk (i.e. *remainder* must not be negative).
- For disks <= 2 Gbytes, the total size of all partitions should be **exactly the same** as the system disk (i.e. *remainder* should be equal to 0, wherever possible).

  When the partitions are configured (i.e. when the installation dialog is concluded), the sizes of these partitions may vary slightly from the values defined here because the partitions must always start and end at cylinder boundaries. As a result, the last partition (i.e. generally */home*) may be slightly smaller.

  If you define the values in such a way that *remainder* > 0, an additional partition is set up after the */home* partition during installation. However, you should only use this if both the */home* partition and this additional partition are not too small, i.e. not less than 5 Mbytes.

- Fill in the mask.
- Press the [SAVE] function key.

5.3.7 Confirming the installation parameters

The installation dialog is now concluded:

The installation specifications are now complete. All the parameters

are displayed again in the next window. Please check the values carefully.

Then proceed as follows:

- Mark incorrect values with 'new' using the CHOICES (F2) key.

- Confirm your check by pressing SAVE (F3).

□□The marked sections are then displayed again

□□so that you can correct the values. This

□□overview containing the current parameters is

□□then displayed again.

- Confirm each correct value with 'ok'

□□(this is the default).

- Confirm your check of all values by pressing SAVE (F3).

- Press the [ENTER] function key. An overview of the selected installation parameters is displayed.
- Check carefully to ensure that the displayed values are correct.

Check in particular that the displayed configuration of the */home* partition is correct:

** *run 'mkfs' on /home* The old data in the */home* file system is lost!

** *preserve old /home* The old data in the */home* file system is retained!

These values should be used for the installation

System name is oldenburg□□□□□□□□□□□□□□□□□□□□□□ok

Installation CD-ROM is ios0/sdisk005 type OS26

Date is Fri Feb 27 20:39:24 MDT 1998□□□□□□□□ok

Time zone is MET-1MDT,M3.5.0/02:00:00,M10.5.0/03:00:00□ok

System disk is ios0/sdisk011 -upgrade partition table□ok

Standard file systems and partitions:□□□□□□□□□□□□□□□□□□□□ok

Name	Partition	File sys	Size[MB]	Comment
<sash>	10	-	2	
/	0	ufs	100	
<swap>	1	-□□□□□□□□□□□□	300	
/opt	2	vxfs	450	
/usr	3	vxfs	450	

/var 4 vxfs 200

/home 5 vxfs 7171 □□□□□□** run 'mkfs' on

□□□** /home ok

<remainder> 0

Information about the file system type can be found in the Section "Formatting and/or partitioning the system disk".

- If all the installation parameters are correct, confirm these values by pressing the [SAVE] function key.

  If one or more installation parameters are incorrect, change the relevant entry to *new* using the [CHOICES] function key. Then confirm this by pressing the [SAVE] function key.

  In this case, the required windows are displayed once again. Correct the values here. You are then returned to the window shown on the previous page. Press the [ENTER] function key in this window. The above window is displayed again. Then, check all the values again.

5.3.8 Starting the installation

You can now start the installation.

```
You have now answered all the questions and checked your entries.
WARNING: This is the last opportunity you have to abort the Reliant
UNIX installation.
Now choose
-□'Start', if you want to install Reliant UNIX with these
□□parameters,
-□or 'Abort' to exit the installation and reload the system.
```

This is the last chance you have to abort the installation **without** changing relevant data.

Start Installation

Select this menu item if you are sure that you really want to perform an installation using the selected parameters. The installation procedure then continues automatically until the installation is complete (see ...).

Abort Installation and Reboot

Select this menu item if you do **not** want to carry out a new installation. The installation is then aborted and the system is rebooted.

- Choose the desired menu item.
- Press the [ENTER] function key.

5.4 Part 2 of the installation: Execution

The actual installation procedure starts now. It runs automatically and takes about one and a half hours. You can leave the console during this time, but you should check every now and then to see whether any error messages have been displayed.

In no event should you intervene in the installation, even during the boot process, unless you are specifically prompted to do so by a corresponding message.

You will know that the new installation has run its full course when the operating system switches to multiuser mode.

Please note that the messages shown below may vary slightly depending on the actual system configuration.

5.4.1 Formatting/partitioning the system disk

If you have specified that the system disk is to be formatted, the formatting process starts now. It may take a long time – up to an hour for large disks. During this time, no messages are displayed other than formatting/partitioning information.

The partition table is then written to the system disk.

5.4.2 Writing Boot2 to the system disk

The new Boot2 is written from the CD-ROM to the system disk.

```
Sash□is□written□to□the□volume□header.□□□Please□wait...
```

5.4.3 Creating file systems

The file systems are created.

When you create the file systems, all the data that was previously stored in the affected partitions is overwritten. Exception: If you have selected the menu item *Preserve Data on /home Partition* in the *Configure System Disk* menu (see ...), the data in this partition is retained. Depending on whether you have selected this menu item or not, you will see either the message

```
/home□partition□will□also□be□OVERWRITTEN
```

A new */home* file system is then also created.

or

```
/home partition will be PRESERVED.
```

The output of the commands used is then displayed.

The new system disk is entered in the root partition list with the status *active*.

5.4.4 Installing Reliant UNIX basic packages

The installation of the packages of the basic system now commences.

The device files are then created, and autoboot is activated.

Many packages also write a log file to the */var/sadm/install/logs* directory. You can use this log to check whether errors occurred, and if so which ones, once installation is concluded.

5.4.5 Performing post-installation tasks

The basic system is now completely installed and only a few post-installation tasks remain.Finally, the file systems are unmounted.

```
### config is /tmp/dialog.cfg
Performing some post configuration file setup... 
Unmounting all installation file systems... 
/sbin/umount /svr4/usr
/sbin/umount /svr4/var
/sbin/umount /svr4/opt
/sbin/umount /svr4/home
/sbin/umount /svr4
#------------------------------------------------------------#
#                                                               #
#          Installation of PART #1 is complete.                  #
#          System will reboot automatically,                      #
#          please wait, installation is continuing                  #
#                                                               #
#------------------------------------------------------------#
# The mini system is now powered down.                              #
```

5.4.6 Booting the basic system

The basic system is now booted automatically.

In no event should you intervene in the boot process.

```
Autoboot: Waiting to load sdisk011s0/unix sd(1,8,0)unix
root=ios0/sdisk011s0 swap=ios0/sdisk011s1 
(CTRL-C to abort, RETURN to expedite) loading
```

5.4.7 Installing add-on packages

The packages of part 2 of the installation are now installed automatically. This part contains the add-on packages. The installation of these packages is accompanied by corresponding messages. For example:

Some messages indicate that the system must be restarted in order to make the installation effective. You can ignore such messages during the installation procedure.

5.4.8 Installing revision packages

The packages of part 3 of the installation are now installed automatically. This part contains further add-on packages as well as those basic and/or add-on packages for which there is a new software version. Packages of the same name that are already installed are thus overwritten. The length of time required depends on the number of revision packages. The procedure is generally very fast. The installation of the revision packages is accompanied by corresponding messages. For example:

Furthermore, the README file is installed automatically. Please refer to Section "Reading the new README file" for information on how to read this file.

The database for the firmware check is now set up.

5.4.9 Booting the new system kernel

A new system kernel is then generated. Following this, the basic system is powered down and the new system kernel is booted.

In no event should you intervene in the boot process.

```
Autoboot: Waiting to load sdisk011s0/unix sd(1,8,0)unix
root=ios0/sdisk011s0 swap=ios0/sdisk011s1 
(CTRL-C to abort, RETURN to expedite) loading
```

5.4.10 Continuation of "normal" autoboot

The size of the available swap space is checked next. This space should be at least as large as the main memory, and preferably twice as big. If the swap space of your computer is large enough, the following message is displayed:

```
NOTICE:
Found□102508□KB□of□swap□space,□which□is□enough□for
□□□□□□65536□KB□of□main□memory
```

If the swap space on your computer is too small, you will see the following message instead:

```
WARNING:
************************************************************
Found□102508□KB□of□swap□space,□which□is□***NOT***□enough□for
□□□□□□261120□KB□of□main□memory
You□run□the□risk□of□a□system□panic□due□to□the□lack□of□swap□space!!!
Please□install□more□swap□space !
************************************************************
```

In this case, you should note the following:

If you have not already done so, increase the swap space immediately after installation is concluded. Otherwise errors can occur if the computer is overloaded and attempts are made to access the swap space. There are two ways of increasing the swap space:

- You can change the division of the partitions and reinstall Reliant UNIX.
- You can configure an additional swap space using the *swap -a* command (see the manual entry *swap*(1M)).

  We recommend that you configure additional swap space as this will give you greater flexibility if you need to make further changes to the swap area.

  You should modify the */etc/vfstab* file so that the additional swap space is made available in each new boot process. You can allocate partitions from another disk to the swap space.

5.5 The system is ready

The new installation of Reliant UNIX 5.45 is now complete. You are prompted to log on to the operating system.

```
The system is ready.
Console Login:
```

- Remove the CD-ROM from the CD-ROM (DVD) drive.
- Log on as user *root*.
- Enter the password for the *root* user and then repeat your entry.

```
Your password has expired. Choose a new one
New password:>      <
Re-enter new password:>      <
```

Viewing or changing the name of the system disk

When performing an installation via *dksetup -L* as of version 5.44, the name of the system disk, is identified on the hard disk by the operating system version, which means that this name can be viewed with *autoconf -l*. You can change the name again using *dksetup -L <string>*.

The *dkpart -d std* command (write standard partitioning to system disk) can be used to delete both the name of the system disk and the data on the disk.

5.6 Post-installation tasks

Reading electronic mail

If you encountered problems with the new installation, use the *mail*(1) command to read the electronic mail. On no account should you ignore this information.

Checking the log

All actions that were performed during the new installation were logged. Check this log.

This log is located in the */var/sadm/pkg* directory. The first part of the log is contained in the *.prot.install.mini* file, while the second part is in the *.prot_inst.2* file.

Many packages each write a separate log file to the */var/sadm/install/logs* directory. These contain additional information if problems occurred while installing individual packages.

Installing optional products

The "Reliant UNIX 5.45" CD-ROM contains a range of packages that can also be installed. You can use the *SYSADM* user interface for this purpose.

Backing up the operating system

We recommend that you now make a full backup of the system disk. The *DSSI* program can be used for this purpose. Further details are given in the Chapter "DSSI".

You can mirror the system disk to another hard disk. If the system disk fails, Reliant UNIX continues operating on the mirror disk without interruption. Please refer to the "Virtual Disks" manual for further information.

You can install Reliant UNIX on another hard disk. This disk is then entered as the active system disk in the root partition list, and all previously installed system disks are managed as inactive. If the system disk fails, you can start Reliant UNIX from the additional system disk.

Alternatively, you can use the add-on product *NetWorker*. The advantage of this over *DSSI* is that with *NetWorker* you not only back up and restore complete partitions, but also selected files and directories. You can create suitable backup plans with which to monitor and perform regular backups of all important data. If data is lost, the backed up data can be restored quickly and easily. Further information about *NetWorker* can

be obtained from your Fujitsu Siemens branch office. The "NetWorker V4.2 - User Guide" will also be of help.

Editing system and/or user data

Compare the new system and/or user data with the data which you backed up before installation (e.g. *passwd*, *shadow*). Copy over all important entries.

Under no circumstances should you simply overwrite the new data with the backed up data! If you do this, additional entries that are needed for the new system version will be lost.

Assigning passwords

When you perform a new installation, you should assign the necessary passwords for *oasys*, *sysadm*, etc. or lock these IDs.

Configuring the network

You must now configure the network services. The most important task here is to configure the LAN controllers. Use the *SYSADM* user interface for this purpose. Further details are given in the Chapter "Network services and domains (RM600)".

5.7 Aborting the installation dialog

If you want to abort the installation yourself while you are still in the dialog program, there are two options available to you:

- The menu item *Abort Installation and Reboot* is displayed in certain windows. When you select this menu item, the previous Reliant UNIX system is restarted. The boot process ends in the Board Debug Monitor or firmware monitor.
- The [USER_INT] function key is displayed in certain windows. When you press this function key, a selection menu appears.

  Switch to mini operating system shell
  Backup log to Diskette
  Abort the mini system, execute restart

Check whether you will need the installation log at a later stage!

All the actions that were performed in the mini system were logged in the */prot.install.mini* file.

The log file was previously only stored in the main memory. If you want to analyze the log at a later stage, you must back it up on a non-volatile storage medium. To do this, select the menu item *Backup log to Diskette*.

Switch to a mini operating system shell

This menu item brings you to a shell of the mini system. From here, you can execute certain UNIX commands (e.g. *autoconf*(8), *dksetup*(8)). Use the *exit* command or press [Ctrl] [D] to return to the Abort menu.

The settings for language, keyboard, and terminal type, which you selected in the previous menus, are still valid in the mini system.

Backup log to Diskette

The log file */prot.install.mini* is saved to a non-volatile storage medium (diskette).

Another window is displayed in which you are prompted to insert the storage medium. Make sure that it is not write-protected. If you are using a diskette, this must be formatted in UNIX format (using *flformat*(1M)).

The hardware configuration of your system is checked at installation runtime. Backup to magnetic tape is only offered if no floppy disk drive is present.

Abort the mini system, execute restart

The installation dialog is aborted; the previous Reliant UNIX system is restarted. The boot process ends in the Board Debug Monitor or firmware monitor.

It is **not possible** to return to the window in which you pressed the [USER_INT] function key. If you have inadvertently pressed this function key, you must reload the Mini System main menu. If this happens, choose the menu item Abort the mini system, execute restart.

If you abort the installation **after** you have started the installation procedure (i.e. by selecting the menu item *Start Installation* from the menu shown in Section "Starting the installation" and then pressing the [ENTER] function key), you must then repeat the new installation.

5.8 Error messages, warnings, information

If an error occurs in the dialog part of the installation, a corresponding message is displayed. Each message is also logged. You can review these messages in the *prot.install.mini* file while the mini system is running, and later in the files *.prot.install.mini* and *.prot_inst.2** in the */var/sadm/pkg* directory. Many packages write their own log in the directory */var/sadm/install/logs*. You can also use these logs when the installation is concluded to check that the procedure was performed correctly. An entry is also made for some errors in the */etc/motd* file. This provides you with the relevant information when you are logging on to the operating system. If you have corrected the error in question, you can delete these lines from the */etc/motd* file. Use a text editor for this purpose.

5.8.1 NVRAM is defective

The */etc/controller* file assigns logical numbers to the controllers of the MBII bus and the SP bus (SP bus = Synchronous Pipelined Bus, MBII bus = Multibus II). It is one of the most important configuration files. The data required for the */etc/controller* file is taken from the NVRAM (NVRAM = Non Volatile Random Access Memory). When the */etc/controller* file is created problems can occur in two cases:

1. If a new CSI controller, HIOS or EMOS master controller was installed in the computer before a new installation is started, in which case the NVRAM does not contain information about the current configuration.
2. If an error is detected in the NVRAM during installation.

In both cases, a corresponding error message is displayed. What you can or have to do next depends on whether the installation procedure can create a new */etc/controller* file.

Example 1: Installation cannot continue

The following message is displayed:

Your NVRAM data has been damaged!

The installation has been aborted because it

is impossible to restore your system configuration.

An error occurred during the installation.

Do the following:

- Back up the installation log to diskette, if necessary.

  To do this, choose the menu item *Backup log to Diskette* and press the [ENTER] function key.

  Another window is displayed in which you are prompted to insert the diskette. Make sure that the diskette is formatted in UNIX format (using *flformat*(1M)).
- Abort the installation.

  To do this, choose the menu item *Abort the mini system, execute restart* and press the [ENTER] function key.
- Try to start the old UNIX operating system.

Example 2: Installation can continue

The following message is displayed:

```
Your NVRAM data has been damaged!

This data is needed to create the /etc/controller file. If you continue

with the installation, a new /etc/controller file will be created.

WARNING: In this case, your logical system configuration will change!
```

When you see this message, the installation procedure **can** create a new */etc/controller* file.

RM600-xxx:
If you continue with the installation, the logical system configuration may change. The hard disks are then assigned new device names. For example, a hard disk that previously had the device name *sdisk020*, will now be called *sdisk010*. As a result, it could happen that

- you will choose an incorrect hard disk as the system disk,
- important data will be overwritten on this incorrect hard disk (e.g. a database),
- add-on products will no longer work correctly because these products expect to find data under a specific device name.

Do the following:

- If you are quite sure that you will not have any difficulties with a **new system configuration**, select the menu item *Continue*. Then press the [ENTER] function key.
- If you want to keep the **existing system configuration**, you can do so in four different ways. Please look at the following diagram and then decide which option is the most appropriate for your actual situation.

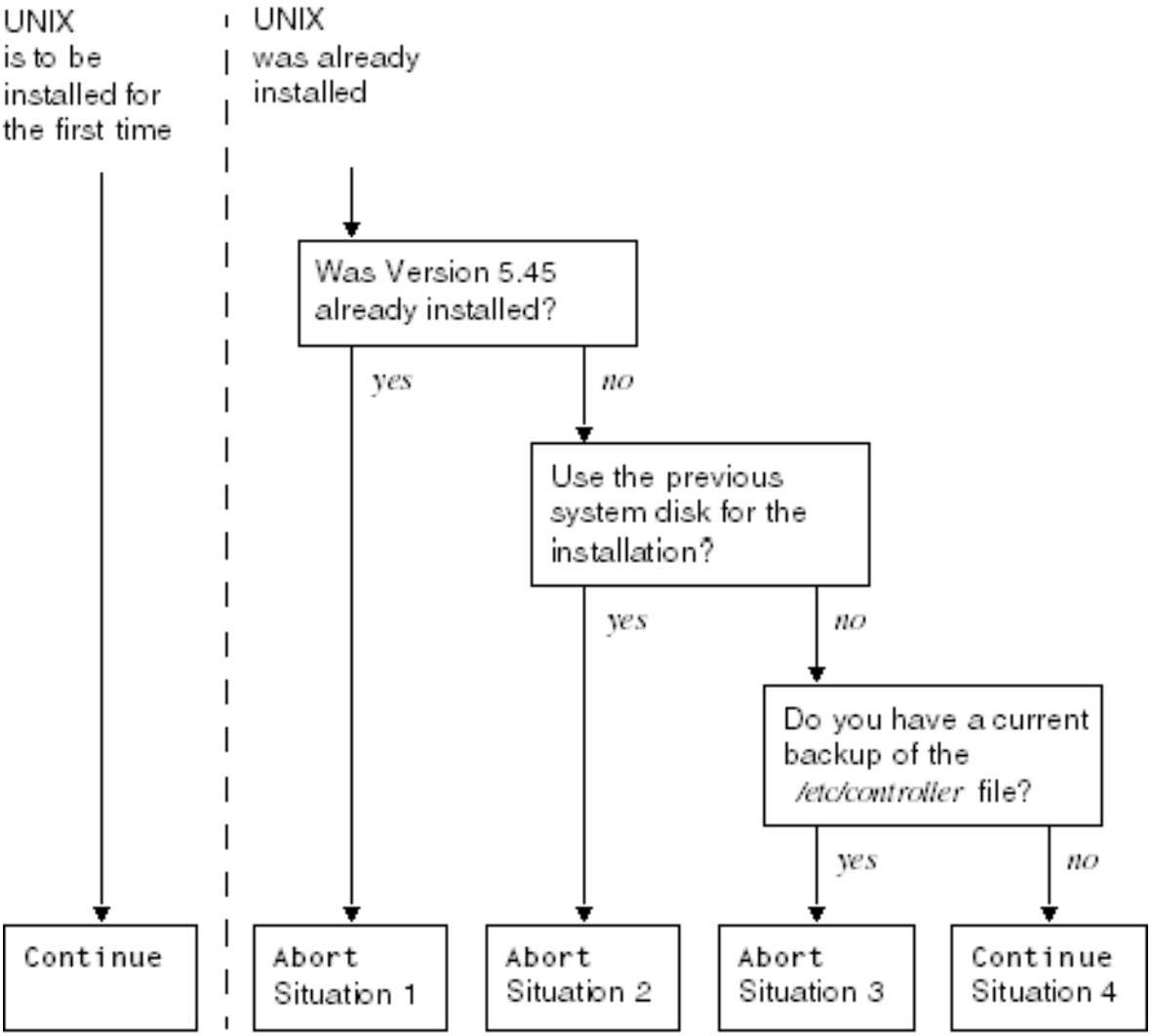


Figure 15: Procedure in the event of a defective NVRAM

Situation 1

Reliant UNIX 5.45 was already installed before the installation dialog was started. Therefore, there is a current backup of the CSI, HIOS or EMOS NVRAM on the disks in the system cabinet.

Proceed as follows:

- Select the menu item *Abort Installation and Reboot*.

  The boot process ends in the Board Debug Monitor.

- Load Boot2 from the CD-ROM.

  BDM(MBII□0□t)>**b□1□cd(0,0,10)sash**

- Enter the following Boot2 command:

  boot2:□**nv_list**

  The command compares the checksum of the CSI, HIOS or EMOS NVRAM with those of the NVRAM backups on the hard disks of the system cabinet.

All checksums **identical**:	Any NVRAM backup can be used to restore the CSI, HIOS or EMOS NVRAM.
Checksums **not identical**:	Select one of the hard disks that was located in the system cabinet the last time the system was shut down. The checksums of these disks are identical.

- Enter the following Boot2 command:

  boot2:□**nv_restore□sd(n,n,n)**

  For **n,n,n** enter the name of the desired hard disk as output by *nv_list* (e.g.□*nv_restore sd(1,0,0)*). □
  The CSI, HIOS or EMOS NVRAM is then restored.

- Switch back to the Board Debug Monitor.

RM600-xxx:	[Ctrl]+[A]
RM600□E:	[Ctrl]+[@], æ+([B],[D],[M])

- Execute a cold start:

  BDM(MBII□0□t)>**creset**

- Start the installation again from the beginning
  (see Section "Loading the Mini System main menu").

Situation 2

You can use the current */etc/controller* file on the system disk to write the required information to the NVRAM.

Proceed as follows:

- Choose the menu item *Abort Installation and Reboot*.
  The boot process ends in the Board Debug Monitor.
- Load Boot2 from the system disk.

  BDM(MBII□0□t)>**b□201□sdisk011s0/sash**

- Boot UNIX in single-user mode. If you know the boot string, enter it, e.g.:

  boot2:□**boot□-f□sd(0,0,0)unix□initarg=-s**

  If you do not know the boot string, issue the following command instead:

  boot2:□**boot□initarg=-s**

- When requested, enter the password for the user *root*.
- Issue the command */sbin/ldcontroller*.
  This command reads the */etc/controller* file, checks its contents for the correct syntax and for consistency, and writes the information to the NVRAM.
- Restart the system.

```
#□cd□/
#□shutdown□-i5□-g0
```

The boot process ends in the Board Debug Monitor.

- Start the installation again from the beginning
  (see Section "Loading the Mini System main menu").

Situation 3

You can copy the backed up */etc/controller* file to the mini system. You can then use this file to write the required information to the NVRAM.

Proceed as follows:

- Select the menu item *Abort Installation and Reboot*.

  The boot process ends in the Board Debug Monitor.
- Load the Mini System main menu again (see Section "Loading the Mini System main menu").
- Choose the menu item described in Switch to a mini operating system shell.
- Issue the command *autoconf -l*.

  Identify the device names of the cassette drive or of the disk drive. Example: *ios0/stape004* or *ios0/sfdisk005*.
- Select a suitable device and make it known to the mini system. Example:

  Cassette drive: **#□tpsetup□-U□ios0/stape002□**
  Disk drive: **#□fdsetup□-U□ios0/sfdisk001**

- Load a current backup of the */etc/controller* file.
- Issue the command */sbin/ldcontroller*.

  This command reads the */etc/controller* file, checks its contents for the correct syntax and for consistency, and writes the information to the NVRAM.
- Type *exit* to return to the Mini System main menu.
- Choose the menu item described in Abort the mini system, execute restart.

  The boot process ends in the Board Debug Monitor.
- Start the installation again from the beginning (see Section "Loading the Mini System main menu").

Situation 4

There is no current backup of */etc/controller*.

Please contact our Service department.

5.8.2 No system disk found

The installation program has checked whether and which hard disks in the system cabinet are suitable for an installation. No suitable hard disk was found. This may be for the following reasons:

- The capacity of the disks is too small and the minimum sizes of the partitions could not be guaranteed (see Table "").
- The disk type either could not be established or is not suitable for an installation. The latter point relates, for example, to WORM disks (WORM = Write Once Read Many).

A corresponding error message is displayed in both cases and can react by choosing one of the following options:

Switch to mini operating system shell
Backup log to Diskette
Abort the mini system, execute restart

Check whether you will need the installation log at a later stage!

All the actions that were performed in the mini system were logged in the */prot.install.mini* file. The log file was previously only stored in main memory. If you want to analyze the log at a later stage, you must back it up on a non-volatile storage medium. To do this, select the menu item *Backup log to Diskette*.

Switch to a mini operating system shell

This menu item brings you to a shell of the mini system. From here, you can execute certain UNIX commands (e.g. *autoconf*(8), *dksetup*(8)). Use the *exit* command or press [Ctrl] [D] to return to the Abort menu.

The settings for language, keyboard, and terminal type, which you selected in the previous menus, are still valid in the mini system.

Backup log to Diskette

The log file */prot.install.mini* is saved to a non-volatile storage medium (diskette).

Another window is displayed in which you are prompted to insert the diskette. Make sure that it is formatted in UNIX format (using *flformat*(1M)).

The hardware configuration of your system is checked at installation runtime. Backup to magnetic tape is only offered if no floppy disk drive is present.

Abort the mini system, execute restart

The installation dialog is aborted; the previous UNIX system is restarted. The boot process ends in the Board Debug Monitor or firmware monitor.

5.8.3 Unsuitable system disk partitioning

You selected the menu item *Preserve Data on /home Partition* from the *Configure System Disk* menu (see ...). The installation program then checked that the partitioning of the selected hard disk corresponds to the requirements that are laid down for a system disk. An error was detected here – possibly for the following reasons:

- One or more of the partitions required for the system disk are missing. The system disk needs a total of eight partitions:
  - partitions 0 through 5 for the Reliant UNIX file systems,
  - partition 10 for the Boot2,
  - partition 15 for the status information, if the system disk is mirrored.
- One or more of the existing partitions is less than the required minimum size (see Table "").

A corresponding error message is displayed in both cases and can react by choosing one of the following options:

Return to Previous Menu
Abort Installation and Reboot

Check whether you really need the data in the */home* partition!

What you should do now depends on your actual situation:

Situation 1:

You really need the data in the */home* partition.

- Select the menu item *Abort Installation and Reboot*.
- Load the mini system again (see Section "Loading the Mini System main menu").
- Back up the data in the */home* partition using *DSSI* (see Chapter "DSSI").

  Terminate *DSSI* by selecting the menu item *M* (see ...).
- Start the new installation again (see ...).
- When the new installation is complete, write the backed up data back to the */home* partition.

Situation 2:

You do **not** need the data in the */home* partition.

- Select the menu item *Return to Previous Menu*.
- Choose the menu item *Standard Partitions*, *Old Partitions* here.

5.9 Installation using the configuration file

In Reliant UNIX 5.45, installation can be carried out automatically, i.e. without dialog. In this case, the installation procedure reads all the details required during installation from a configuration file called *install.cfg*.

The configuration file includes parameters that are only valid for RM200, RM300, and RM400 systems. These parameters are marked with the comments "only for SINIX-N". If you install Reliant UNIX on an RM600, you can ignore these parameters.

You should only perform this type of installation if you have a lot of experience of installing Reliant UNIX systems!

5.9.1 Format of the configuration file

The configuration file has a defined format. It consists of a number of different sections, each of which defines the value of an installation parameter. Each section is introduced by a comment and contains a list of the valid values for the parameter:

Parameter	Valid values	Meaning
INST_TYPE		Type of installation procedure
	install	The installation procedure stored on the "Reliant UNIX 5.45" CD-ROM is to be used.
	custom	An installation procedure defined by the user is to be used.
TERM	*vt02, 97801, xterm, ansi-tc20-c*	Console or terminal type
KEYB		Keyboard language
	german	German keyboard (includes umlauts and the line of keys "qwertz")
	french	French keyboard (includes the line of keys "azerty")
	international	All keyboards except for German and French keyboards should be mapped to *international* for the installation
ROOT_DISK		Device name of the system disk on which installation is to take place. Corresponds to the output of the command *autoconf -l*
OLDHOME	Default value:	Preserve data in the */home* partition?
	YES	The data in the */home* partition is preserved during installation, only an fsck is performed on the file system
	NO	The data in the */home* partition is destroyed, an *mkfs* is performed on the file system during installation

DK_FLAG	Default value:	Determines whether system disk is formatted
	-U	Upgrade the system disk (*dksetup -l*)
	-F	Format the system disk
STD_PART	Default value:	Indicates whether the standard partitioning is to be written to the disk, or whether the old disk partitioning is to be retained
	true	The standard partitioning is to be written to the disk
	false	The old disk partition table is used
MOD_PART	Default value:	Edit partition table
	true	The partition table on the system disk is to be modified. The values of the variables whose names end with _SZ are used for this purpose.
	false	The partition table on the system disk is not to be modified, i.e. a standard partition or an old partition on the disk is retained.
Variables whose name ends with _SZ are only evaluated if *MOD_PART*=*true*. The variables determine the size of the partitions on the system disk. The size of the partitions are specified in Mbytes.		
ROOT_SZ	Size of the partition in mbytes:	Defines the size of the *Root* partition
SWAP_SZ	Size of the partition in mbytes:	Defines the size of the *Swap* partition
OPT_SZ	Size of the partition in mbytes:	Defines the size of the *opt* partition
USR_SZ	Size of the partition in mbytes:	Defines the size of the *usr* partition
VAR_SZ	Size of the partition in mbytes:	Defines the size of the *var* partition
HOME_SZ	Size of the partition in mbytes:	Defines the size of the *home* partition
REM_SZ	Default value:	Indicates whether the *home* partition encompasses all of the remainder of the system disk or whether another partition is located behind the *home* partition that is available to the user.
	0	*home* partition uses the remainder of the disk

	1	There is another partition (partition 6) behind the *home* partition. In this case, the value of *HOME_SZ* determines the size of the *home* partition; partition 6 occupies the remainder of the disk. No file system is set up on partition 6 during installation.
The following variables, whose names end with _FS, describe the file system type on the system disk:		
ROOT_FS	ufs	File system type of the *root* partition
OPT_FS	vxfs	File system type of the *opt* partition
USR_FS	vxfs	File system type of the *usr* partition
VAR_FS	vxfs	File system type of the *var* partition
HOME_FS	vxfs, ufs	File system type of the *home* partition. The value *ufs* is only permitted if *OLDHOME=YES* is set and the old file system for */home* was of the type *ufs*.
cd_inst	*yes*, *no*	Use CD-ROM as the installation medium?This parameter is always *yes* because the only installation medium supported at present is CD-ROM.
TAPE		Device name of the tape driveThis parameter is always blank because the only installation medium supported at present is CD-ROM.
MACH_NAME		Node name of the system
TZ	All valid time zones	Time zone
unselreqpsel	NRP	Do not change!

You will find the sample file *install.cfg* on the "Reliant UNIX 5.45" CD-ROM in the */MINI_EXT* directory.

As of Version 5.44 A00, the */var/sadm/pkg/.install.cfg* file will be created automatically at the end of the installation if the installation is being performed interactively (FMLI menus). All of the values selected interactively are contained in this file. If you have a number of absolutely identical systems to install, you can use this file as a configuration file for other installations.

5.9.2 Preparing the configuration file

You can prepare the configuration file in three different ways:

- on a server for remote installation
- on a diskette to be called up with *cpio*
- on partition 0 of the system disk

RM600-xxx: the hard disk *sdisk000*

RM600E: the hard disk marked as active in the root partition list

If you modify the configuration file, you should take extreme care not to enter any invalid values and to

ensure that the values of all the parameters are compatible.

Make sure that you prepare a current configuration file. Only this file contains all of the parameters required to install the current Reliant UNIX version. Before starting the installation, the system checks that the file is current. You will find an up-to-date file on the operating system CD for installation under *MINI_EXT/install.cfg*.

Preparing the configuration file on diskette in cpio format

- Mount the CD-ROM (DVD) drive, if it is not already mounted.

  # mount -F hs /dev/ios0/sdisk015s0 /mnt

- Copy the sample file to the hard disk.

  # cp /mnt/MINI_EXT/install.cfg /home/hugo

- Unmount the CD-ROM (DVD) drive again, if necessary.

  # umount /mnt

- Edit the sample file (e.g. with the *vi* editor) and enter the desired installation parameters.

  # vi /home/hugo/install.cfg

- Save the updated configuration file and exit the editor.
- Format the diskette.

  # flformat /dev/at/flp/rfx3ht

- Write the configuration file to the diskette in *cpio* format.

  # ls /home/hugo/install.cfg | cpio -ovc > /dev/at/flp/rf0t

Preparing the configuration file on a hard disk

- Change to the mount point of the hard disk.

  RM600-xxx:

  How you proceed depends on whether the disk *sdisk000* is the active system disk:

  - The disk *sdisk000* is the active system disk:

    # cd /

  - The active system disk is **not** the disk *sdisk000*. The disk *sdisk000* is, for example, mounted at the mount point *hugo*:

  # cd hugo

  RM600 E:

  # cd /

- Mount the CD-ROM (DVD) drive, if it is not already mounted

  # mount -F hs /dev/ios0/sdisk005s0 /mnt

- Copy the sample file to the hard disk

  # cp /mnt/MINI_EXT/install.cfg .

- Unmount the CD-ROM (DVD) drive again, if necessary

  # umount /mnt

- Edit the sample file and enter the desired installation parameters.

 # vi install.cfg

- Save the updated configuration file and exit the editor.

Preparing the configuration file on a server (remote installation)

In order to perform a remote installation, the installation server and the client must be configured appropriately (see Section "Preparing for remote installation").

- Create the client directory on the server. Replace *client* with the name of your client.

  # mkdir /var/sadm/remote/*client*

- Copy the sample file *install.cfg* to the client directory.

  # cp /var/sadm/remote/cdrom/MINI_EXT/install.cfg /var/sadm/remote/*client*

- Edit the file using an editor, e.g. *vi*:

  # vi /var/sadm/remote/*client*/install.cfg

  Make sure that the configuration file for your client contains the correct values so that the wrong disk is not used as the system disk and data lost, for example.

5.9.3 Starting the automatic installation

If you wish to install on the **local** system, do the following:

First of all, activate the autoboot mode. How you do this depends on the operating status of the computer.

After switching the computer on

If autoboot is deactivated, the system stops in the BDM.

If the bootflags are set to autoboot,

- interrupt autoboot in Boot2 with the key combination [CTRL] [C] .
- Switch to the BDM
  - For RM600-xxx with [CTRL] [A]
  - For RM600-Exx with [CTRL] [@] [B] [D] [M]
- Activate the autoboot mode with

  BDM(SPB □□□10 t)>**wf 200**

- Set the boot string to the boot device:

  BDM(SPB□□□10 t)>**wn 0 cd(0,0,10)**

- Restart the system:

  BDM(SPB□□□10 t)>**creset**

From UNIX

If the system on which you want to perform installation is already running under Reliant UNIX or SINIX,

- Activate the autoboot mode with:

  # bootflags -p -f 200

- Set the boot string to the boot device:

  # bootflags -p -b "cd(0,0,10)"

- Restart the system:

  # shutdown i6 -g0

If you wish to install on a **remote** system (remote installation) that **is already running**:

- Set the bootflags to "Autoboot".

  # /sbin/bootflags -p -f 200

- Set the bootstring to the network.

  # /sbin/bootflags -p -b "et(x,0,0)"

  'x' can have the following values:
  - **On E30/E70:** 32 ... 63
  - **On E4x/E8x:** 64 ... 95

- Reload the system.
  # init 6

If you wish to install on a **remote** system that is **not yet running**:

- Switch on the computer.
- If autoboot is deactivated, the system ends in the Board Debug Monitor.
  If autoboot is active, interrupt the autoboot in Boot2 with [CTRL] [C].
- Switch to the Board Debug Monitor
  - For RM600-xxx with [CTRL] [A]
  - For RM600-Exx with [CTRL] [@] [B] [D] [M]
- Set the boot flags to "autoboot":
  BDM(SPB□□□10 t)>**wf 200**
- Set the boot string to the network:
  BDM(SPB□□□10 t)>**wn 0 et(32,0,0)**
  On **E4x/E8x**:
  BDM(SPB□□□10 t)>**wn 0 et(64,0,0)**

   Values shown are examples.
- Reload the system:
  BDM(SPB□□□10 t)>**creset**

No further input is necessary. The procedure is identical with an interactive installation.

6 Update installation for RM600

This chapter describes how to perform an update installation of the Reliant UNIX 5.45 operating system on an RM600 if an earlier version of this operating system is already installed on the computer.

All the tasks required for an update installation are listed in a special work schedule which can be found in Section "Work schedule for an update installation". You should therefore copy this work schedule. Then read the sections in the manual that are mentioned in the work schedule.

Please note that the computer is supplied with the operating system **preinstalled**. When you power up the computer for the first time, you need only carry out the actions described in the operating manual.

If you merely want to reinstall the previous version of the operating system, please read Chapter "New installation on an RM600".

There are a number of special considerations to be taken into account if you are changing from a 32-bit operating system (version <5.44) to a 64-bit operating system (5.44A00 and higher). Please read the information on the next page.

As a prerequisite for installing Reliant UNIX 5.45 on the RM600, you need a main memory configuration of at least 128 Mbytes.

After performing an update installation, you have to check your OBSERVE configuration again. Please refer to the information provided in your update log.

If your system is part of an administration domain, you must ensure that all the systems in the domain are using the same Reliant UNIX version and the same versions of software components. This avoids incompatibilities between new versions of software components on one machine and older versions on other machines in the administration domain.

An update installation is more complex than a new installation. This is because the user-specific configurations of the systems may differ considerably. You should be very familiar with the configuration of your computer if you choose this type of installation. If you do not want to perform the installation yourself, you can have it done by the Fujitsu Siemens Service department.

The update installation is a largely automatic procedure. All the actions that are performed are logged. The log is stored in the file */var/sadm/pkg/.prot.update*.

The Reliant UNIX operating system is supplied on CD-ROM and is therefore installed using the CD-ROM (DVD) drive. The amount of time required to carry out an update installation varies considerably, and depends, for example, on which software packages were previously installed on the system disk, and which of these now have to be updated.

6.1 General guidelines

Please observe the following during installation:

- If you want to abort the update installation, you must enter the key combination [CTRL] [C].
- If the installation procedure aborts before running its full course, a corresponding error message is displayed. This will tell you what action you should take (see Section "Evaluating the log"). If you cannot resolve the problem, contact the Fujitsu Siemens Service department.

  When you carry out an update installation, the configuration that was previously set on your Reliant

UNIX operating system is retained. This relates, for example, to certain files like */etc/passwd*, the configuration of the terminals, and installed add-on products. For further information, refer to Section "Transferring configuration files". The specifications relating to which hard disk on your computer is used as the system disk, and how this disk is partitioned, cannot be changed.

Optional packages that are already installed are automatically updated in the course of an update installation.

- The update recognizes two operating modes: a **check mode** and an **armed mode**. The check mode allows the early detection of problems that may prevent an update installation. This mode does not modify the current system, and can be started as often as required.
- The update will allow you to move from a 32-bit operating system to a 64-bit operating system. Particular attention is paid here to third-party add-on products.
- The update can be stopped and started again. For example, if the update procedure aborts following an error (ERROR), it continues again automatically starting at the point at which it was aborted.
- The update can run with or without dialog (using the control file).
- The user can request that only the software packages already installed on the system disk are updated. This ensures that no new packages are installed.
- Various options can be set for the update installation.
- There is an interface for external procedures.

6.2 Overview of the update procedure

The update procedure differs depending on whether the operating system environment is to remain unchanged (e.g as formerly when moving from version 5.43B to 5.43C within a 32-bit environment) or is to change significantly (as when changing from 5.43 to 5.45 in a 64-bit environment).

These differences only come to light in armed mode, where there are two phases involved when moving to version 5.45. The details of the procedure are given on the next pages.

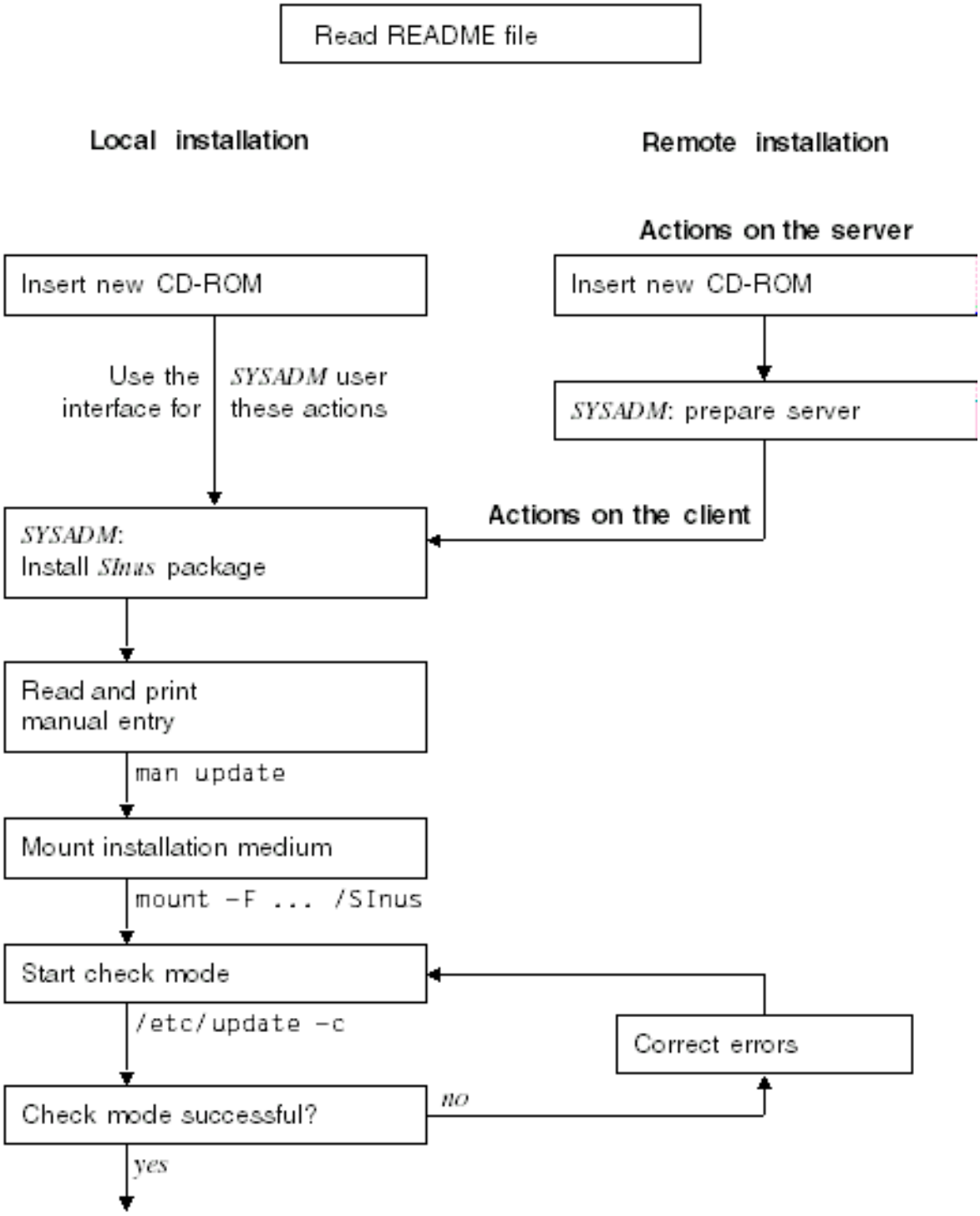


Figure 16: Overview of the preparatory steps for an update installation

Updating from 5.44 to 5.45

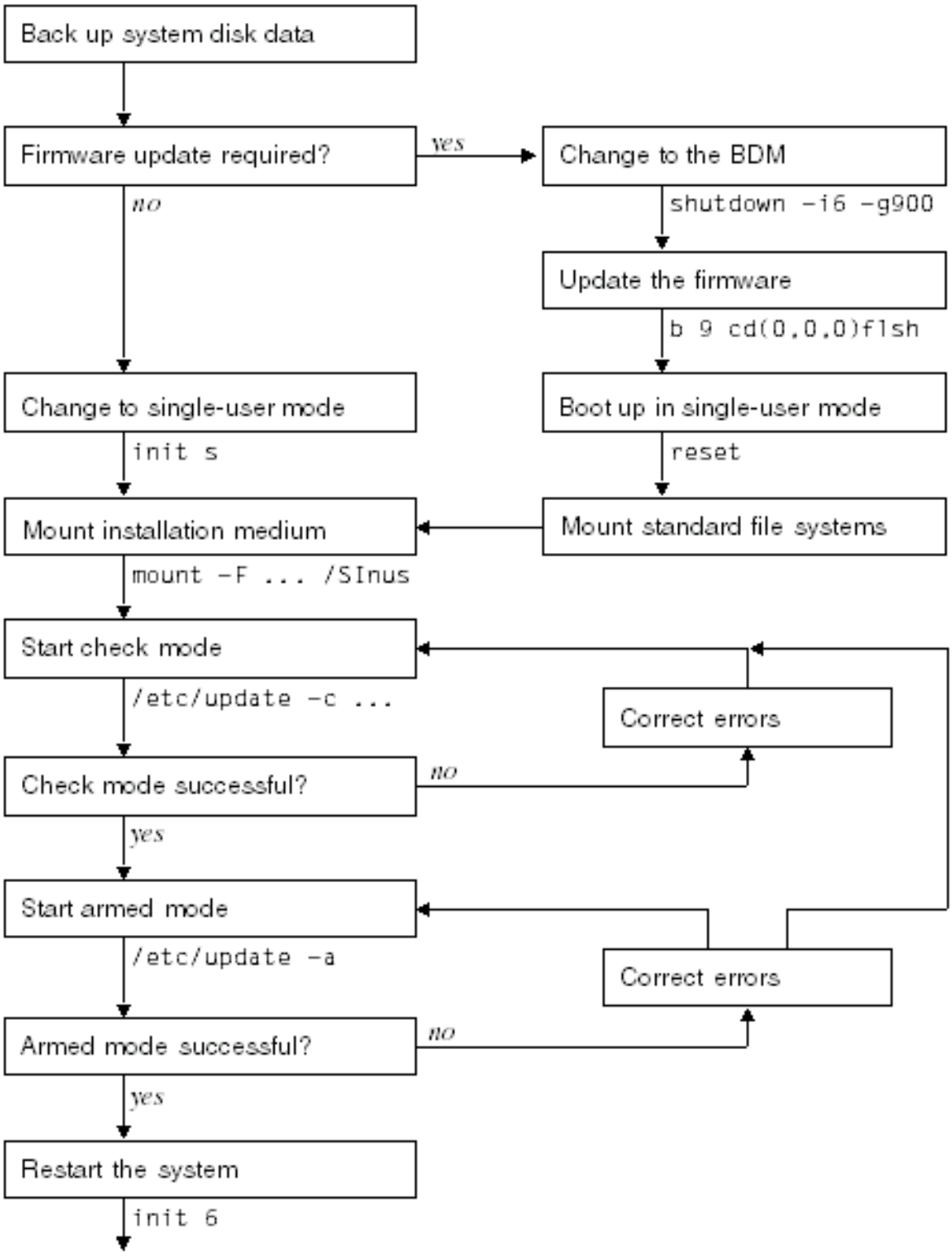


Figure 17: Performing an update installation in a 64-bit environment

Updating from 5.43 to 5.45

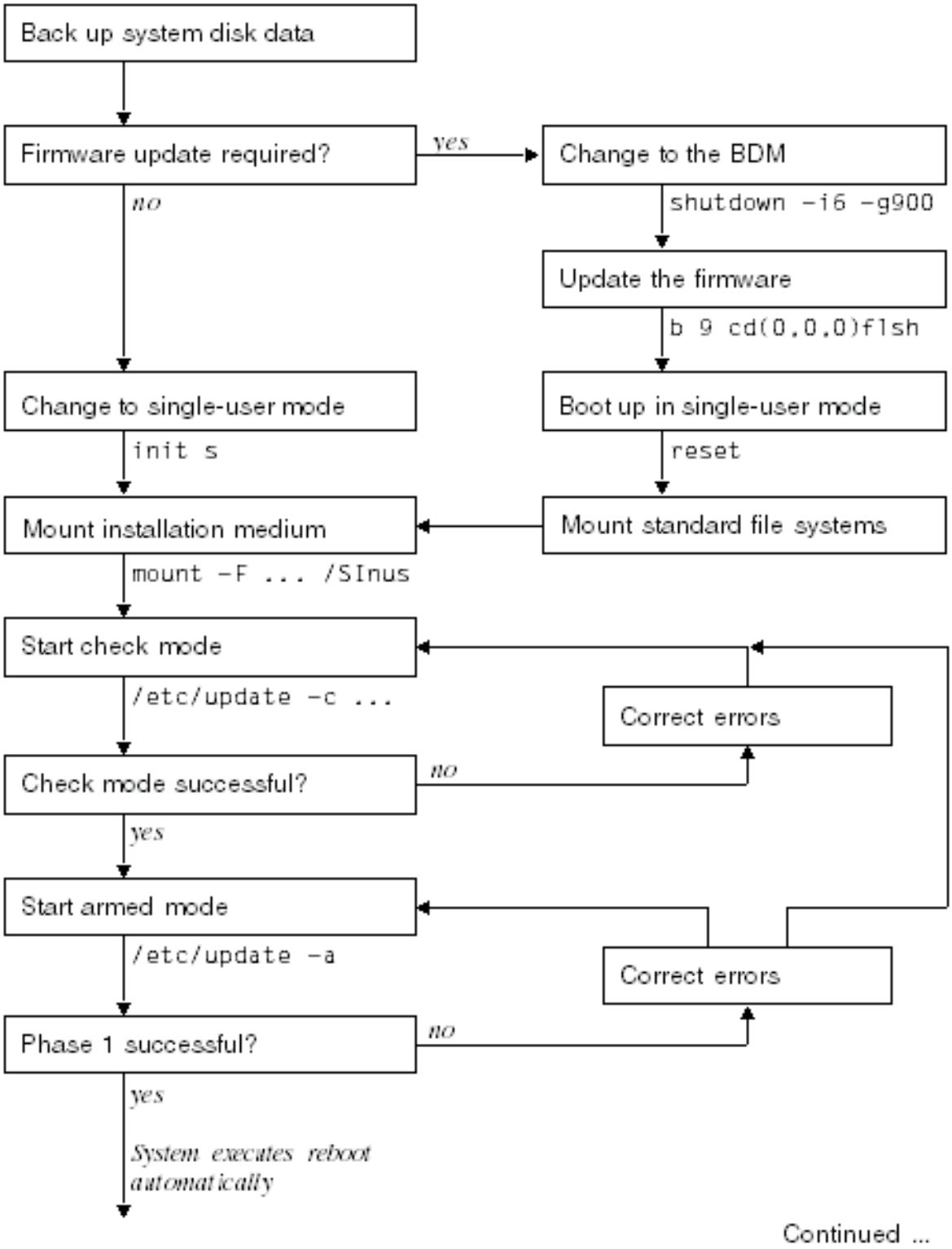
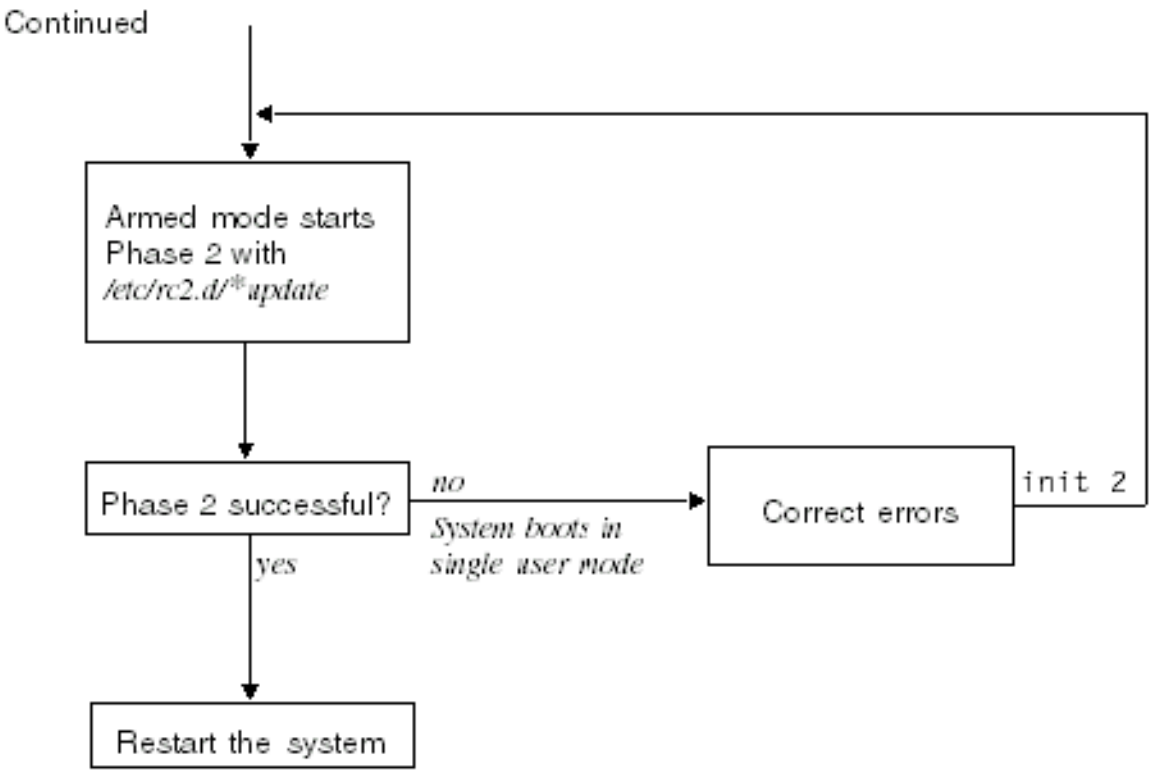


Figure 18: Performing an update installation moving from a 32-bit environment to a 64-bit environment



The differences are now described in detail:

- From 5.44/5.45A to 5.45B: This is a single phase procedure. You start the update from a shell in single-user mode and then return to this shell afterwards.
- From 5.43 to 5.45: The update is performed in two phases. Since it is generally only possible to install the 64-bit products using a 64-bit kernel, the system first performs some preparatory actions when it boots up from a shell in single-user mode (for example, it copies a 64-bit kernel to the system disk), so that it can quickly perform an automatic reboot with the new 64-bit kernel. The procedure is taken from */etc/rc2d/*update*. The update terminates with a final report and a shell prompt.

In both cases you have to reboot the system to activate the new operating system.

6.3 Preparing for installation

If you intend to carry out an update installation, you should start making preparations as soon as possible when you have received a new "Reliant UNIX" CD-ROM. You should allow several weeks before you actually carry out the update installation, so that you have enough time to deal with any problems that may occur.

Check the following on the CD-ROM you want to use:

- The CD-ROM must have names of the computers the subtitle.
- The CD-ROM must contain a more recent Reliant UNIX version than that already installed on your computer.

Selecting the installation procedure

The update installation can be carried out either locally or remotely. In the case of a local installation, the installation medium (the CD-ROM (DVD) drive in this case) is located on the machine whose operating system is to be updated. In the case of a remote installation, on the other hand, the installation medium is accessed through a network environment (*nfs*). Different preparatory steps are required, depending on which option you

choose. Now read the section which relates to the type of installation you want to perform.

Local installation

- Insert the "Reliant UNIX 5.45" CD-ROM in the CD-ROM (DVD) drive of the **local** computer.

Please read on in Section "Checking the operating system/revision version".

Remote installation

- Select a server which has a CD-ROM (DVD) drive.
- Insert the "Reliant UNIX 5.45" CD-ROM in the CD-ROM (DVD) drive of the **server**.
- Start *SYSADM*. The main menu appears.
- Select the menu item *software_prod*. The *Process_Products* menu appears.
- Choose the menu item *miscellaneous*. The *Miscellaneous Functions* menu appears.
- Select the menu item *prepare_server*. The *Prepare as CD-ROM Server* mask appears, in which you make the following entries:

```
CD-ROM device name:□□_____
Local mountpoint:□□□□_____
Clients:□□□□□□□□□□□□□□_____
```

CD-ROM device name	Device name of the CD-ROM (DVD) drive. This may be the name of the special file or the alias, as it is entered in the */etc/device.tab* file. Press the [CHOICES]function key to display a list of valid device names.
Local mountpoint	Name of the directory in which the CD-ROM (DVD) drive is mounted.
Clients	Names of all client computers. The name of a client computer corresponds to the output of *uname -n*. The names must be separated by a blank.

- Fill in the form.
- Press the [SAVE] function key.
- Press Ú.
- Exit *SYSADM*. To do this, press the [EXIT] function key.

You can now switch to the console of the first client system. The installation then proceeds in the same way as on a local system.

Checking the operating system/revision version

- Read the README file which is stored on the current "Reliant UNIX 5.45" CD-ROM (see Section "Reading the new README file").
- Check which operating system/revision version of Reliant UNIX is already installed on the computer:

  #□uname□-rsv

  The README file will tell you whether this operating system/revision version is suitable as a basis for an update installation. If it is not suitable, there are two things you can do:
  - carry out a new installation,
  - or contact the Fujitsu Siemens Service department.

6.3.1 Installing the SInus package

You must first install the *SInus* package (SINIX New Update Set). Use the *SYSADM* user interface for this purpose. The required actions are listed below. You will find a detailed description in the manual "System Administration and Hardware Configuration Using the SYSADM User Interface"

Installing the package does **not** affect the existing system.

The update deactivates itself once your system has been updated successfully, i.e. */etc/update* no longer changes your system. This means that you must install the SInus package **again** for a later update. It is nevertheless useful to leave SInus on your system in case Fujitsu Siemens needs information that can be obtained using SInus tools for debugging purposes.

- Start *SYSADM*. The main menu appears.
- Select the menu item *software_prod*. The *Process_Products* menu appears.
- Select the menu item *products_on_CD*. The *Process Multi-Product CD-ROM* mask appears.
- Press the [SAVE] function key.

  You may be asked whether the consistency of the product database has to be established or not. Answer with *yes*. A text window containing the copyright notice appears.

  Make sure you use the **new** system-CD-ROM to install the *SInus* package. You cannot use an earlier version of this package for the update installation.
- Press the [CONTINUE] function key. A selection list of all the add-on products that are on the CD-ROM appears.
- Mark the product *SInus* using the [MARK] function key.
- Press the [ENTER] function key. The function menu appears.
- Choose the menu item *install*. The installation form appears.

  Installation extent:□□□□□□□□□□□□□□Complete Product□□
  Installation mode:□□□□□□□□□□□□□□□□automatic□□□□□□□□□□
  Installation defaults filename:□□default□□□□□□□□□□□□
  Path to response file:□□□□□□□□□□□□on CD-ROM□□□□□□□□□□

  Accept the default settings without making any changes.
- Press the [SAVE] function key.

  Before the package is installed, the system may check which packages have already been installed, modified or removed on the system disk. After this the package *SInus* is installed.
- Press the Ú key when installation is complete. The installation form appears again.
- Exit *SYSADM*. To do this, press the function keys [CANCEL], [CANCEL] and [EXIT] in succession.

The *SInus* package contains:

- the manual entry *update*(1M),
- the utilities required for an update installation.

6.3.2 Reading the manual entry

You must now read the manual entry which describes the update installation. This manual entry was installed together with the *SInus* package

#□man□update

The manual entry describes the requirements for an update installation, the installation procedure, possible error sources and what to do if errors occur. The manual also contains a recipe-like list of actions to be taken.

It is important that you take the time to read the entire manual entry.

The README file, which can also be found on the "Reliant UNIX 5.45" CD-ROM, does **not** contain any information about the various operations involved in an update installation. However, it does contain

details of the special features of the current Reliant UNIX 5.45 version with regard to the update installation.

6.3.3 Mounting the installation medium

You can perform the update installation locally or remotely. In both cases, the installation software is loaded from the "Reliant UNIX 5.45" CD-ROM.

In special cases, it may be a good idea to copy the complete CD-ROM to the hard disk and load the installation software from there. However, this type of update installation can only be carried out by the Siemens AG Service department.

- Choose the installation procedure which best suits your needs.

Depending on the choice you make, different actions are required in order to mount the CD-ROM (DVD) drive. The following syntax must be used for the commands listed below:

x
: Device number of the hard disk or the CD-ROM (DVD) drive.

server
: Name of the remote system (which provides the software) for the remote installation.

client
: Name of the local system for the remote installation (whose operating system is to be updated).

fs_typ
: File system type

  As of Reliant UNIX 5.43, a *ufs* file system is generally configured in the */* partition, while *vxfs* file systems are configured in the other partitions (ufs = UNIX File System, vxfs = Veritas Extended File System).

/SInus
: New mount point for the installation medium.

  This was created when the *SInus* package was installed. The advantage of a new directory is that the existing directories (e.g. */cdrom*, */mnt*) remain free and can still be used.

Local installation

If you want to load the installation software using the CD-ROM (DVD) drive of the local system, you must do the following:

- Insert the new "Reliant UNIX 5.45" CD-ROM in the CD-ROM (DVD) drive of the **local** system.
- Mount the installation medium in the */SInus* directory.

```
#□mount□-F□hs□<devicename>□/SInus
```

Remote installation

If you want to load the installation software using the CD-ROM (DVD) drive of a server that can be accessed using *nfs*, you must do the following:

- Insert the new "Reliant UNIX 5.45" CD-ROM in the CD-ROM (DVD) drive of the **server**.
- Enter the following commands on the server:

```
#□mount□-F□hs□<devicename>□/cdrom
#□share□-oro,root=client□/cdrom
```

- Switch to the client.
- Mount the installation medium in the */SInus* directory.

```
#□mount□-F□nfs□server:/cdrom□/SInus
```

Since the execution part of the update installation (armed mode) is performed in single-user mode, you must first set up the network connection to the server before this mode is executed. Examples of how to do this are contained in the manual entry *update*. If, on the other hand, you simply want to run a check procedure (check mode), you do not need to switch to single-user mode.

6.3.4 Syntax of the update(1M) command

The *update*(1M) command can be called with the following options:

-a

armed mode

carries out an update installation

-c

check mode

checks that an update installation was successful

-e

error

error messages (ERROR) are ignored

 Be careful when using this option. You will not be warned of any possible instabilities.

-h

help

displays the syntax of the *update*(1M) command

-o

only the installed packages

tests / installs only the software packages that are found in the current system. This means that no **new** packages are installed except those required for the current version.

-r file

read

reads all the installation parameters from the file *file*. A sample file can be found under */etc/update.cfg*. If you are interested in this type of installation, please read the manual entry *update*(1M).

All the options are described in detail in the manual entry *update*(1M). You should therefore read this manual entry before you start the update installation. We will only explain two options in detail at this point:

- The update can be executed in two different modes: in **check mode** (*-c*□option) or in **armed mode** (*-a* option). Check mode allows the early detection of problems that may prevent an update installation. The update can be started as often as required in this mode.
- The update "records" the processing status in an internal **history file**. The history file is only modified in armed mode. The check mode can only read this file. This has the following advantage: If you start the update again because it was aborted the last time (following an error or after you pressed [Ctrl] [C]), the program resumes at the exact point at which it was aborted. This "resume" function can save a considerable amount of time. The history file is only modified in armed mode. The check mode can only read the history file.

 Please note that only one *update* command can run at any **one** time.

6.4 Checking that the system can be updated

Before you start the actual update installation, you should check whether problems are to be expected, and if so, which specific problems.

Start check mode as soon as possible after you have received the CD-ROM containing the new Reliant UNIX version. You then have enough time to correct any problems that may occur. Check mode does not modify the current Reliant UNIX system.

- Issue the *update*(1M) command in **check mode**. For example:

  #□/etc/update□-c

When check mode is started, the following message is first displayed:

```
+++□INFO:□□□□Congratulations!□You□are□about□to□update□to
□□□□□□□□□□□□□□Reliant UNIX-Y5.45B00.
+++□□□□□□□□□□□UPDATE□is□running□in□check□mode.
```

This is followed by other messages which report the success or failure of each individual check. The messages are the same as those that would be displayed in armed mode. The final message reveals the end result of the check:

```
+++□INFO:□□□Report□for□'update□-c'□:
+++□INFO:□□□We□detected□the□following□during□the□UPDATE□runtime:
+++□□□□□□□□□□Number□of□WARNINGs□:□□□□□□□0□
+++□□□□□□□□□□Number□of□ERRORs□□□:□□□□□□□0
```

If check mode did not find any problems (WARNINGS = 0, ERRORS = 0), you can then start the update installation in armed mode (see next section).

As little time as possible should elapse between checking whether an update is possible and performing the installation.

6.5 Evaluating the log

The update logs all the processing steps, both in check mode and in armed mode, in the */var/sadm/pkg/.prot.update* file. You can use this log to check on the various steps once the procedure is completed. The log begins with the message:

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++ This log reports actions concerning the
++ UPDATE. The first attempt started on Fri Jan 29 14:41:23
□□□MDT 1999
++ Please bear in mind that the most current run
++ is located at the end of this report file
++ (A comfortable and usual way of reading this
++ file is to go to the end of this file and
++ to search backwards for the
++ pattern "+++ run of UPDATE started".
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

There then follow all the calls of one and the same update procedure. Since this may make the log relatively long, the individual calls are separated optically from each other. Each call begins with

```
+++ run of UPDATE started at ...
```

and ends with

```
+++ run of UPDATE ended at ... with RETURN= ...
```

Please note that the last run of the update procedure is located at the end of the file. The individual actions within the procedure calls are identified more precisely by keywords:

INFO

This section informs you of the "normal" execution of the procedure. This information keeps you up-to-date with the current processing status. No actions are necessary.

WARNING

This section informs you of the "unusual" execution of the procedure. The significance of this information depends on the update mode:

Check mode: There is a problem which requires your attention. If the problem is not corrected, it may result in an error (ERROR) in armed mode, i.e. normally the update will be aborted.

Correct the problem before you start the update in armed mode.

Armed mode: There is a problem which requires your attention. This problem did not abort the update, but you should still correct it as soon as possible.

ERROR

This section indicates a problem which prevents the update installation from being carried out. Normally (i.e. if the -e option is not set, see ...), the update aborts because there does not seem to be any point in continuing. For example, the problem may be that the installation medium is invalid. If this is the case, many of the checks cannot be carried out.

Correct the problem and start the update again.

The update can be started as often as required in check mode.

6.6 Handling add-on products

The update checks your system for incompatible add-on or third-party products. This procedure can highlight many but not all incompatibilities. It is therefore in your best interest to check whether all add-on products installed on your system are compatible with the new version of the operating system. You should note the following, in particular:

- Changing versions within 5.45

  No inconsistencies should arise normally. The update knows the incompatibilities that may arise between the Fujitsu Siemens add-on product and the operating system and will indicate these. However, you should clarify the procedure to follow when changing operating system versions with the supplier of your third-party software.

- Changing from 5.43 to 5.45

  Incompatibilities between the operating system and the add-on products are more likely because the operating system has changed from a 32-bit to a 64-bit environment. The update will report to you centrally on the products or software packages that are incompatible with the new operating system version (these incompatibilities may be caused by 32-bit kernel components that cannot be linked with the 64-bit kernel).

Please read the log carefully. A check run without warnings and errors does **not** mean that no incompatible add-on products exist. Not every incompatibility invariably leads to the failure of the update.

The update concept for handling incompatible add-on products is divided into several phases:

1. Incompatible products or packages are reported in check mode (see next example). Contact the supplier of your software to get a new and compatible version.
2. Incompatible products or packages are again reported. In armed mode, however, the products or packages identified by '*' (see next example) are deleted because this type of software negatively impacts the operability of the operating system.

   Contact the supplier of your software to get a new and compatible version.

```
+++ INFO: Searching for packages with incompatible drivers...
+++
+ + WARNING: After update of the base system to 5.44 you need
+++         appropriate newer versions at least of the
□□□□□□□□□□□□□following software:
+++             Package (Product)
SIcommD (SIDLM) *
SIdlm   (SIDLM) *
SImc2   (SIDLM) *
SImsw   (SIDLM) *
audit   (AUDIT)
+++
+++         The currently installed versions are NOT
+++□□□□□□□□□□ COMPATIBLE with ReliantUNIX 5.45.
+++         Please get the appropriate CDROM's to have
+++□□□□□□□□□□□them already
+++         when you do the update of the base system.
+++         Update of these products has to be
+++□□□□□□□□□□□done right after
+++         the successful update of the base system.
+++         Some of the packages which were
+++□□□□□□□□□□□marked with an asterisk will
+++         be automatically removed in armed mode.
+++□□□□□□□□□□□(see protocol below)
+++
+++         .. successfully ended.
```

3. Incompatible products or packages, which do not however impair the basic operating system, are deactivated in armed mode (i.e not linked in the kernel) but not removed. Contact the supplier of your software to get a new and compatible version.

```
+++ INFO:    Now starting external script
+++□□□□□□□□□□ U99disable_32bit_driver ..
+++ INFO:    Searching for old 32-bit driver...
+++             disabled: audit
+++ WARNING: At least one incompatible driver has been disabled
```

+++ by update (see above).

+++ So please install appropriate new software.

+++ .. successfully ended.

Make sure to contact your local Fujitsu Siemens branch in good time or the supplier of the relevant product to get a new and compatible version of this software. You can install the new version when the operating system has been updated.

6.7 Carrying out the update installation

If no warnings or errors are reported when you check to ensure that the system is suitable for updating, you can now carry out the update installation.

The result of the check mode is only meaningful if

- the system was not modified since the last check and
- the same installation medium is used for armed mode.

- Make a **complete backup** of the system.

You will need a complete backup should the following situation arise:

- armed mode aborts, issuing an error (ERROR)

  In this case, you must first restore the old system. Otherwise, you may encounter problems in the interaction between the "old" and the already updated software.

6.7.1 Switching to single-user mode

The next step depends on whether the EEPROM firmware needs to be updated **before** the update installation can be performed. Information on this can be found in the README file. The */var/sadm/pkg/.prot.update* log file contains a corresponding prompt.

Refer to the section that applies for you.

Updating the EEPROM firmware

- Switch to the Board Debug Monitor.
- Update the EEPROM firmware.

  The subsequent cold start ends in the Board Debug Monitor.
- Boot the Boot2 from the active system disk, e.g. *sdisk011* (logical boot mode):

  BDM(MBII□□□0 t)>**b 201 sdisk011s0/sash**

- Boot UNIX in single-user mode (Abbreviated form):

  boot2: **boot initarg=-s**

- Mount the installation medium in the */SInus* directory.

  # mount -F hs /dev/ios0/sdisk00xs0 /SInus

- Mount the standard file systems (*/opt*, */usr*, */var*, */home*).

Not updating the EEPROM firmware

- Switch to single-user mode.

  #□cd□/
  #□shutdown□-is□-g900

  The *-g900* option introduces a time delay of 900□seconds or 15□minutes. You should select this time delay if other users are logged on. Otherwise, you can specify the *-g0* option instead.

6.7.2 Starting check mode again

Single-user mode was selected in order to ensure that no interaction could occur between the update and other active processes.

- Start the **check mode** of the *update*(1M) command again. For example:

  #□/etc/update□-c

- Check the */var/sadm/pkg/.prot.update* log file again.

6.7.3 Starting armed mode

- Start the **armed mode** of the *update*(1M) command. For example:

  #□/etc/update□-a

You can now leave the console. You are informed on a regular basis about how the installation is progressing. Example of installing software packages:

still□*n*□of□*m*□packages□to□install

You should note that the system may reboot automatically depending on the type of update (single phase or two phases). You should not intervene manually. **Each** update terminates with a final report which tells you what you have to do next. You will always get a shell where you can carry out any necessary revisions.

The update installation can be performed in command line mode and also invoked via the interface to the configuration file. In the second scenario, the *update*(8) command uses a configuration file (*-r* option), which allows the installation to be started as an *at*(1) job, e.□g. at a time when the system is not heavily loaded.

The update installation can be carried out both interactively and automatically. In the case of the latter, the *update*(1M) command uses a configuration file (*-r*□option). As a result, the installation can be started as an *at*(1) job, e.g. at a time when the system is not overloaded.

If the armed mode aborts and issues an error (ERROR), please note:

- The update aborts with an error that you cannot rectify yourself.

  Continue the update installation **as soon as possible**! The system should not remain in a "semi-updated" state for any length of time. The update has recorded the processing status and will restart at the exact location where the error occurred. Do not change the external conditions between the update runs (for example do not change the *mount* option you used to mount the installation medium).
- **Under no circumstances should you restart the system before the update installation has been completed successfully!**
- Otherwise, problems can occur in the interaction between the "old" and the already updated software.
- However, if you have to restart the system, you must first restore the old system. To do this, use the complete backup which you made **before** you started the armed mode.
- Cancel the EEPROM update by reading in the firmware from the CD-ROM containing the old firmware version.
- It may take some time to update the software. Do not interrupt this process unless you have to, in order to avoid problems between "old" and "new" software. A manual reboot, in particular, can cause unexpected problems which could force you to reload your data backup.

6.8 Post-installation tasks, part 1

When the update installation of Reliant UNIX 5.45 has been completed, you are informed of how it proceeded.

1st possibility: No messages of the WARNING or ERROR type

+++□INFO:□Report□for□'update□-a'□:

+++□INFO:□We□detected□the□following□during□the□UPDATE□runtime:

+++□□□□□□□□Number□of□WARNINGs□:□□□□□□□□0

+++□□□□□□□□Number□of□ERRORs□□□:□□□□□□□□0

+++□INFO:□Excellent!□The□current□UPDATE□installation□run□ended

□□□□□□□□□□□successfully.

+++□□□□□□□□Since this UPDATE run is a reentry,

+++□□□□□□□□you must bear in mind the WARNINGS you saw in the

+++□□□□□□□□previous UPDATE run.

+++□□□□□□□□Please look in the log file.

+++□□□□□□□□Please□reboot□your□system□as□soon□as□possible.

+++□□□□□□□□Make□sure□that□you□have□read□the□entire□log□file

+++□□□□□□□□and□that□you□are□quite□familiar□with□the□results

□□□□□□□□□□□reported□by

+++□□□□□□□□the□UPDATE□installation.

Please note that the figures given in lines 3 and 4 only refer to the last run of the update procedure. If you have started the update procedure more than once, you should check the log */var/sadm/pkg/.prot.update* even if no messages of the WARNING or ERROR type were output in the last run (see next section).

2nd possibility: Messages of the WARNING type

+++□INFO:□□Report□for□'update□-a'□:

+++□INFO:□□We□detected□the□following□during□the□UPDATE□runtime:

+++□□□□□□□□□Number□of□WARNINGs□:□□□□□□□□5

+++□□□□□□□□□Number□of□ERRORs□□□:□□□□□□□□0

+++□INFO:□□Excellent! The current UPDATE installation run ended □□□□□□□□□□□□successfully.

+++□□□□□□□□□(Please□look□in□the□log□file□named

+++□□□□□□□□□/var/sadm/install/../pkg/.prot.update)

+++□□□□□□□□□

+++□□□□□□□□□Please reboot your system as soon as possible.

+++□□□□□□□□□Make sure you have read the entire log file

+++□□□□□□□□□and that you are quite familiar with the results □□□□□□□□□□□□reported by

+++□□□□□□□□□the UPDATE installation.

Before restarting the system, you should first check what problems have occurred and rectify them.

- Use the log to check which problems have occurred.
- Rectify these problems as soon as possible.

  While doing so, also update those configuration files for which automatic updating was not successful. This is necessary because some configuration files are only analyzed in the boot phase of the system. For more detailed information, refer to the manual entry *update*(8) (see ...).

You can now read on in Section "Restarting the system".

3rd possibility: Messages of the ERROR type

Problems have arisen which have caused the UPDATE to abort. Depending on the version of Reliant Unix from which the update was started (Reliant UNIX 5.43 or Reliant UNIX 5.44), you will get an error message and a shell in which you should resolve the problem.

+++□INFO:□□□Report□for□'update□-a'□:

+++□INFO:□□□We□detected□the□following□during□the□UPDATE□runtime:

+++□□□□□□□□□□Number□of□WARNINGs□:□□□□□□□□3

+++□□□□□□□□□□Number□of□ERRORs□□□:□□□□□□□□1

+++□INFO:□□□Sorry! This update attempt was not successful.

+++□□□□□□□□□□Please□look□at□in□the□log□file□named

+++□□□□□□□□□□/var/sadm/install/../pkg/.prot.update

+++□□□□□□□□□□and pay particular attention to the 'ERRORS' an 'WARNING's.

+++□□□□□□□□□□You can restart the UPDATE once the problems

+++□□□□□□□□□□are resolved.

- Use the log to check which problems have occurred.
- Rectify these problems as soon as possible.
- Restart the update procedure using the command suggested by the UPDATE procedure.

Do not leave the system in a "semi-updated" state for too long. Also do not perform a restart before the update procedure has been completed. Otherwise, unforeseeable problems may be caused by the interaction between "old" and already updated software.

6.9 Restarting the system

After the update installation has been completed, you should restart the system as soon as possible.

- Remove the CD-ROM from the CD-ROM (DVD) drive.
- Restart the system using the command suggested by the UPDATE procedure.
- Log on again as user *root*.

6.10 Post-installation tasks, part 2

Noting the daily message

If problems occurred during the update installation, a daily message containing corresponding information is displayed after you log on

```
+++ INFO FROM UPDATE: Please don't forget to read
+++ the UPDATE installation log concerning WARNINGs.
```

Adapting configuration files

If there are configuration files that still need to be updated, you should do this as soon as possible. For more detailed information, refer to the manual entry *update*(8) (see Section "Reading the manual entry").

Backing up the operating system

We recommend that you now make a full backup of the system disk. The *DSSI* program can be used for this purpose. Further details are given in the Chapter "DSSI".

Alternatively, you can use the add-on product *NetWorker*. The advantage of this over *DSSI* is that with *NetWorker* you not only back up and restore complete partitions, but also selected files and directories. For this you can create suitable backup plans, with which to monitor and perform regular backups of all important data. If data is lost, the backed up data can be restored quickly and easily. Further details on *NetWorker* can be obtained from your Fujitsu Siemens branch office. The "NetWorker V4.2 - User's Guide" will also be of help.

6.11 Transferring configuration files

The individual configuration of the operating system is defined by more than 100 files. As already mentioned, the configuration files of the system are retained in the update installation. This means that these files need not be explicitly backed up before you start the update installation. You can list the relevant files by typing:

```
# cat /var/sadm/install/contents |grep CONFIG.prsv |awk '{print $1}'
```

Examples of configuration files are:

/etc/conf/cf.d/mtune	*/etc/mail/mailsurr*
/etc/conf/cf.d/stune	*/etc/profile*
/etc/cron.d/queuedefs	*/etc/shells*
/etc/default/login	*/usr/share/lib/termcap*
/etc/inet/services	*/var/spool/cron/crontabs/root*

Some configuration files may have changed from one Reliant UNIX version to the next. These changes are incorporated automatically in your configuration files during the update installation. Each file that is to be changed is first backed up by creating a copy of the file. In this process, the names of the copied files are formed in such a way that an extension is appended to the existing file names. This extension comprises the name of the future operating system version:

```
'/.profile' will be saved as '/.profile.pre_SINIX-Y5.45b0000'
```

The files with the *.pre_** extension are also retained after the update installation, but can be deleted manually

at a later stage, if required.

The update now attempts to incorporate the necessary modifications into the existing configuration files. If this is successful, the modified configuration files will be used in the future. As a result, these configuration files are not overwritten when the Reliant UNIX packages are subsequently loaded.

```
Trying to update your '/.profile' automatically.
/.profile was modified
```

If the attempt to incorporate the necessary changes into the existing configuration files fails for some reason (e.g. because the differences are too great), *standard configuration files* are copied to the system disk – as with a new installation. In this case, a corresponding warning is displayed:

```
+++ WARNING:  Unable to modify the '/.profile' configuration
                file automatically.
+++             '/.profile' is deleted to ensure that you get the
                new '/.profile'.
+++   The file currently active is backed up as
      '/.profile.pre_SINIX-Y5.45b0000'.
+++           We will use the newly installed file temporarily.
+++           Please combine the newly installed
+++           /.profile                    and your
+++           /.profile.pre_SINIX-Y5.45b0000 into a
+++           /.profile                    later.
```

This warning is recorded in the log. In addition, a message of the day are generated. The update installation is resumed. If it is completed successfully (i.e. without ERROR messages), you will receive the message shown in Section "2nd possibility: Messages of the WARNING type".

- Use the log to check whether there are configuration files for which automatic updating was not successful.

If this is the case, you should transfer the modifications of the "old" configuration files (with the extension *.pre_**) to the new standard configuration files. Please refer to the manual entry *update*(8) (see Section "Reading the manual entry") for how to proceed.

Under no circumstances should you reactivate the "old" configuration files either by loading them from the backup tape or by renaming the *.pre_** files to their "old" file names. The "new" operating system version requires the files in the "new" format.

7 Network services and domains (RM200, RM300, RM400)

New computers are supplied ready to operate. If a computer is to be connected into a LAN (LAN = Local Area Network) (Ethernet ®, TCP/IP (TCP = Transmission Control Protocol, IP= Internet Protocol)) or is to operate in an administration domain, the network service or administration domain must be configured beforehand. This is necessary:

- the first time you start the computer,
- following a new installation.

The existing network configuration is retained with an update installation.

The steps required to connect the computer to an existing network or administration domain (see Section "Configuring administration domains") depend to a large extent on the actual conditions. The description given in this chapter is thus restricted to a typical scenario.

The following section describes setting up the **network services** with the *SYSADM* user interface. Detailed information on *SYSADM* can be found in the manual "System Administration and Hardware Configuration Using the SYSADM User Interface".

If you are using a high-availability configuration with OBSERVE, the network addresses are managed by OBSERVE. In this case, you should contact the system support specialist or system administrator and identify the files in which changes are to be made.

7.1 Configuring network services

You should obtain the following information from the network management before connecting your computer to the network:

- the node name of your computer
- the alias name of your computer
- the Internet address of your computer
- the domain name
- the Internet address of the network management computer (NIS)

Check with the network management that the network management computer recognizes your computer. Your computer can be registered on the network management computer via the SYSADM menu item *Network services - LAN - Connect*.

Defining the node name

Every computer has a name which can be used to access it in the network. This is called the *node name*. Enter this name if you have not already done so. If you are starting up your computer for the first time, the default name is *SNI*. You should change this name before you connect the computer to the network using the *SYSADM* user interface.

- Give the computer a meaningful name that is unique in the network.

  The name can be up to 14 characters long. It is, however, recommended to limit its length to 8 characters. It must start with a letter (a...z, A...Z), followed by further letters, digits (0...9), dashes (–) or underscore characters (_).

  Problems may occur with some applications if the name is longer than 8 characters.

  If two computers within the network have the same name, they cannot be uniquely addressed. This can lead to loss of data transferred in the network.

- Choose the following menu items in succession using the *SYSADM* user interface:

  in the main menu: *system_setup*

in the *Initial System Setup* menu:	*nodename*
in the *Display and Set System Name and Node Name of the Machine* menu:	*set*

To select a menu item, move the cursor to the relevant item and press [ENTER].

Then a form appears in which you enter the node name.

Node name:□□□□□□□□□_____

Warning: After (re)setting the node name

□□□□□□□□□file /etc/hosts has to be updated.

Perform the following steps on your:

local machine:

-□Set node name with 'system_setup - nodename -

□□set'.

-□Actualize the configuration of the interfaces

□□(if no configuration tool exists actualize

□□/etc/hosts and /etc/default/inet with an editor

-Reboot the machine with 'machine - reboot'.

Perform on other machines:

-□Actualize node name in file /etc/hosts.

Or if you use NIS

(can be checked with 'network_services - lan - status'):

-□On master machine change node name with

□□'network_services lan - administer - hosts - remove'

□□and then 'add'.

-□On local machine 'network_services - lan - connect'.

- Enter the node name and follow the instructions.
- Press the [SAVE] function key.
  A message is displayed informing you that the node name has been changed.
- Acknowledge this message by pressing [CANCEL].

Configuring the motherboard

You configure the motherboard and any other boards using the *SYSADM* user interface.

- Choose the following menu items in succession:

in the main menu:	*configuration*
in the *Hardware Configuration* menu:	*load*
in the *Configuration* menu:	*boards*
in the *Boards* menu:	*motherboard* (or a different board, as appropriate)

The *motherboard* form is displayed

System:□□RM200-C20 SY66 PCI-Desktop 0000

Information: brdtype=9

Memory: BANK 64 MB BANK 1: 0 MB BANK 2: 0 MB BANK 3: 0 MB

MAC address:□□00:00:e4:02:09:e1

Internet address□□127.0.0.1_____

Hostname□□paris_____

Aliasname□□_____

Comment□□_____

Internet mask□□ff000000

Broadcast address□□127.255.255.255

Multicasting:□□□□disabled

DHCP:□□□□□□□□□□□□□□□□no

DHCP client:□□□□□□□□□_____

DHCP user class:□_____

DHCP class:□□□□□□□□□_____

SCSI devices:□disk 0000 disk 0002 exa 0 disk 0004 cdrom 0

- Now enter the data relevant to your computer:

Internet address	e.g. 12.0.01	
Hostname	e.g. paris	
Internet mask	e.g. ff000000	The internet mask is only required for subnetworks. Please consult your network administrator.
Broadcast address	e.g. 127.255.255.255	If this field is empty, a valid address is determined automatically when the system is booted.

If you do not know the addresses or the mask, ask your network administrator. You will find a description of the other parameters in the "Network Administration" manual.

Press the function key [SAVE]. If you want to configure other boards, use the procedure described above.

- Change to the *Hardware Configuration* menu. Press the function key□[CANCEL] twice.
- Select the menu item *quit*.

You must then select the "save mode", i.e. you must decide whether the new values are to be activated or whether you want to cancel the configuration:

activate - activate configuration and save all values

to a database ...

quit - quit configuration, all changes

are lost...

- Confirm the selected save mode with [ENTER].

  If you select *activate*, the new values are entered in the database; messages are displayed to this effect. You then return to the *SYSADM* main menu.

  If you do not want to save the new values, select *quit*. The database remains unchanged. However, please note that the motherboard remains unconfigured. You should therefore repeat the actions described in this section as soon as you know the correct network parameters.

Entering the Internet address of the network management computer

- Enter the Internet address of the network management computer on your computer by selecting the following menu items in *SYSADM*:

in the main menu:	*network_services*
in menu *Network Services Management*:	*name_to_address*
in menu *Name to address mapping*	*inet*
In menu *Internet Protocols*	*hosts*

- Enter the name and Internet address of your host and press the [SAVE] function key.

Connecting the host into the network

- Select the following menu items in succession to connect the host into the network:

in the main menu:	*network_services*
in menu *Network Services Management*:	*lan*
in menu *LAN Administration on Client*:	*connect*

- Enter the appropriate value and press the [SAVE] function key.

Modifying the /etc/default/inet file

If you want to activate routing, you must modify the */etc/default/inet* file. To do this, use any of the usual text editors (vi, rand editor).

- Change the *DEFAULTGATEWAY* entry as follows:

  DEFAULTGATEWAY=<IP address of the gateway>

  The address of the default gateway must be specified here as the *IP address of the gateway*. If you have any queries, contact your network administrator.

- Save the modified */etc/default/inet* file and exit the editor.

 Further information on *Routing* can be found in the manual "Network Administration".

Entering network computers in the /etc/inet/hosts file (In OBSERVE configurations, network processes are started in their own rc2 scripts. Please check your configuration documentation.)

If NIS (Network Information Service) is not active, you must enter the name of your computer, the computer with which you wish to establish a connection and the Internet addresses for both in the */etc/hosts* file.

To do this, select the menu items *network_services - Name/Address - inet - host_node_network_services - name_to_address - inet - hosts in SYSADM* or use an editor. Then restart the computer. For example:

144.145.16.224□munich

You can also activate the Domain Name Service (DNS) instead (see the "Network Administration" manual).

The system is then connected to the network.

Restarting network processes

To make the changes you have made effective, you must then restart the network processes.

- Execute the following commands on the console (i.e. rather than using *rlogin*(1)):

```
#□sh□/etc/rc2.d/S69inet□stop
#□sh□/etc/rc2.d/S69inet□start
```

A precise description of how to connect a computer into a network is given in manual "Network Administration".

7.2 Configuring administration domains

You can configure an administration domain using the add-on *DomainAdmin* product, which is an administration system for RM systems. This is performed within the *WebSysAdmin* (WSA for short) user interface component *VConfig*.

If you have not previously worked with *DomainAdmin*, you will find more detailed information in the manual "System Administration within a Domain" (Reliant UNIX)". The hardware and software requirements that must be fulfilled are also listed here.

7.2.1 Creating an administration domain

An administration domain is set up automatically with the internal name CADMIN following installation. This domain is still "empty", i.e. it does not contain any nodes as yet. The following section shows you the WSA window on the "post" system following installation and after you have selected the *VConfig* component and the *Nodes* entry on the menubar:

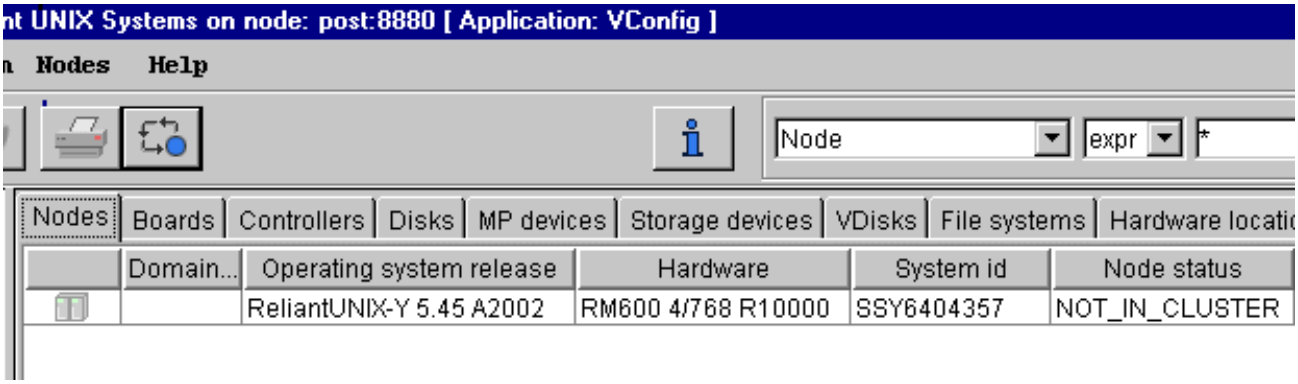


Figure 19: Example: Window showing an "empty" administration domain (excerpt, approx. fig.)

The *Domain net address or alias* and *Node status* columns in the object list indicate that the system has not yet been included in an administration domain. There is no entry in the *Domain* ... column and *NOT_IN_CLUSTER* is entered in the *Node status* column. This means that the "post" node on which you installed *SIclos* and started WSA is itself not a member of an administration domain (the word cluster is often used as a synonym for administration domain). In this case, the system administrator will possibly have the task of mounting this system as the first node in the administration domain and thus filling the domain.

There are two equivalent approaches to creating the first node in an administration domain. First of all, select the object in the object list by clicking it so that the entire line is highlighted in blue. Then, you can either

- click the *Nodes* entry on the menubar or
- right-click within the line of the object list.

The following sub-menu is then displayed:

Figure 20: Example: Creating an administration domain and the first node (excerpt, approx. fig.)

Now click the *Create domain* function in the sub-menu.

To create the first node, you first have to create an administration domain, since no domain yet exists from the user's perspective.

When you select the *Create domain* function, the following dialog box opens:

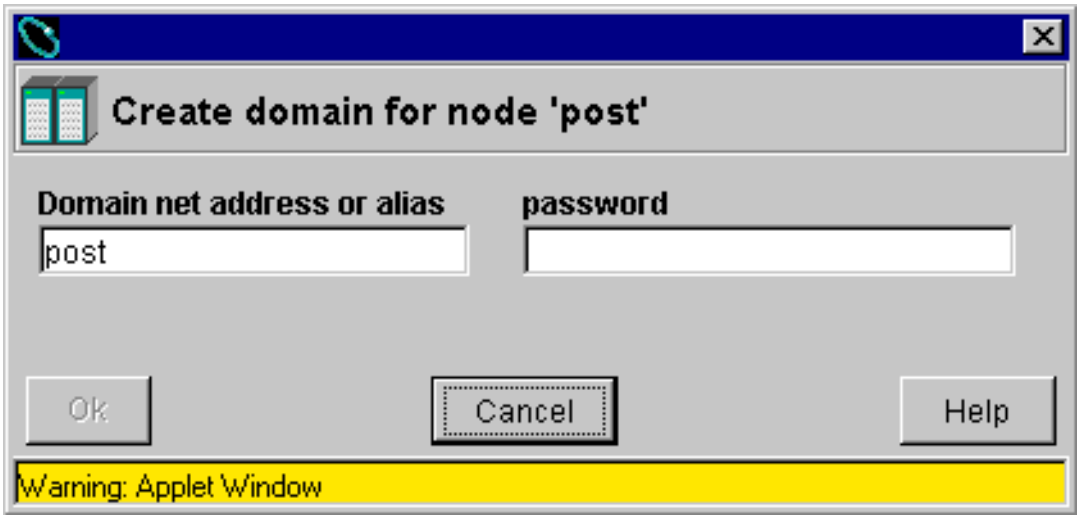


Figure 21: Example of a dialog box for creating an administration domain (approximates figure)

The dialog box for creating an administration domain contains two fields. In the *Domain net address or alias* field on the left, enter the alias name of the network interface (or the IP address) that is to be used for communication in the administration domain. The node name "post" is proposed automatically in this case for the system; it is taken from the current node name of the UNIX system (*uname –n*). You can accept this name. However, if you want to use a different network interface for domain communication, enter its IP address here in dot notation or alternatively its alias name.

The configured controllers or the permitted alias names can be established from the *LAN* sub-tab on the *Controllers* tab.

In the *password* field on the right, enter the root password for the node.

When you confirm both entries with *Ok*, an event box pops up, which tells you whether the action was executed successfully:

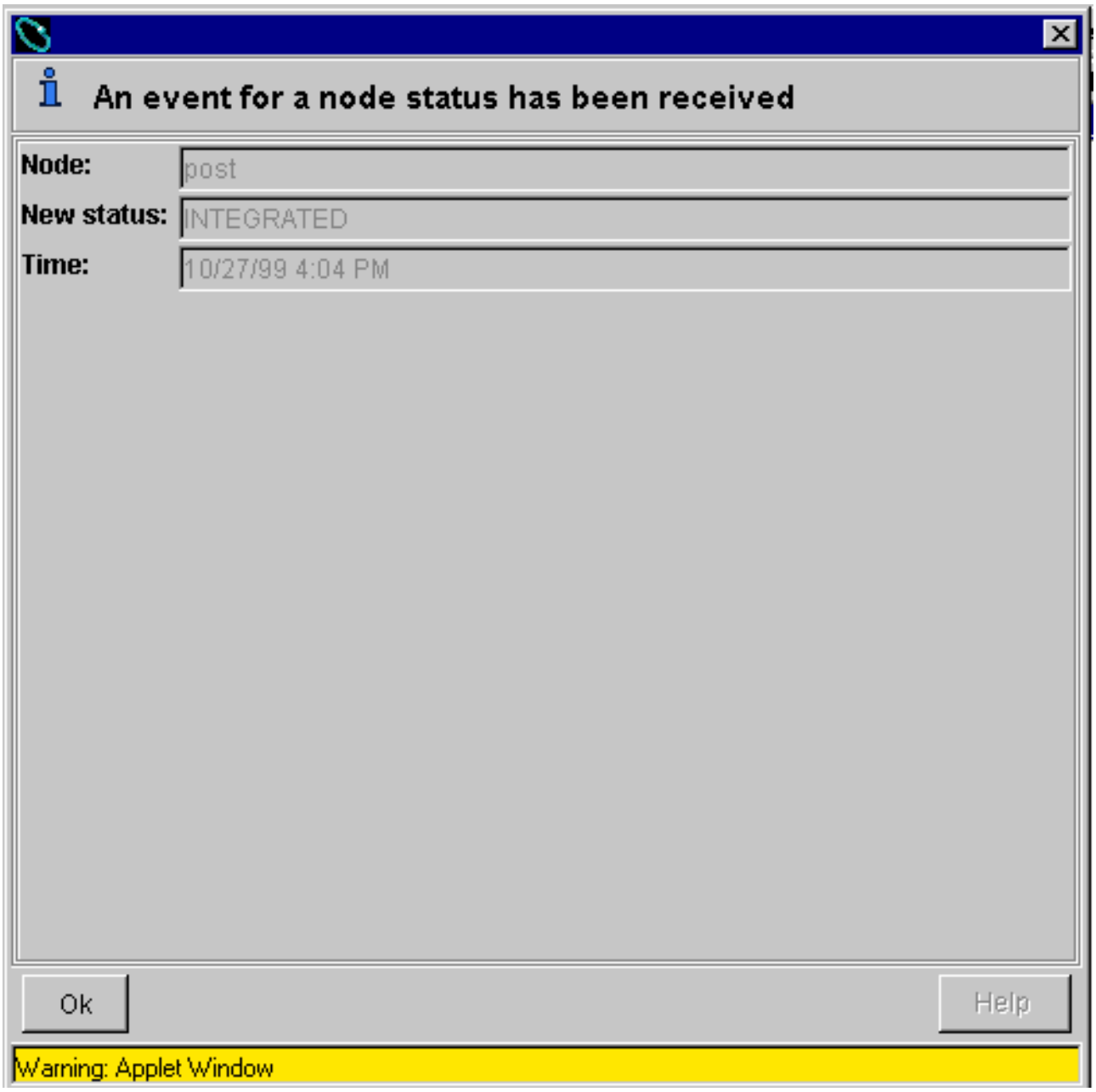


Figure 22: Example of an event box after creating the first node

You are told that the "post" node now has the status *INTEGRATED*, i.□e. the node is integrated in the administration domain. When you confirm this event box with *Ok*, the new status is also displayed in the main window in the *Node status* column:

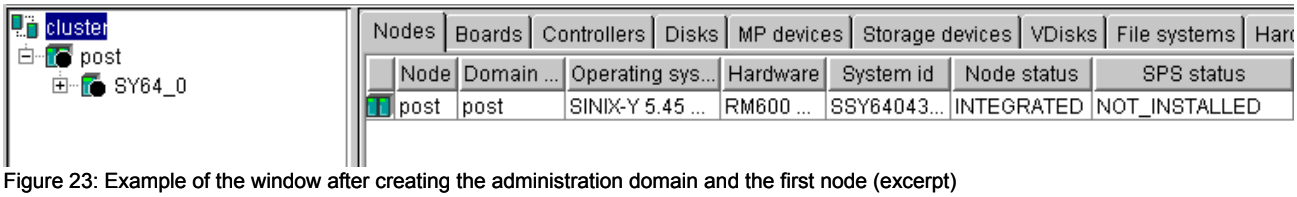


Figure 23: Example of the window after creating the administration domain and the first node (excerpt)

A new *Nodes* column has now been added to the left in the object list with the entry "post", and the "post" node is also integrated in the administration domain with the same domain alias name (*Domain net address or alias*

column); as a result, the domain is no longer "empty".

You can also see from the hierarchy browser that an administration domain now exists, which contains the "post" node: The *cluster* icon has been entered at the top position.

7.2.2 Adding a node

If you have created the administration domain as well as the first node and then want to add further nodes to the administration domain, you can do so as follows. If you have not already done so, switch to the *VConfig* application. You now have two options:

- Click the  button (create object) on the toolbar or
- Choose the *Nodes* menu option on the menubar.

In the latter case, a sub-menu opens where you choose the *Create* menu option:

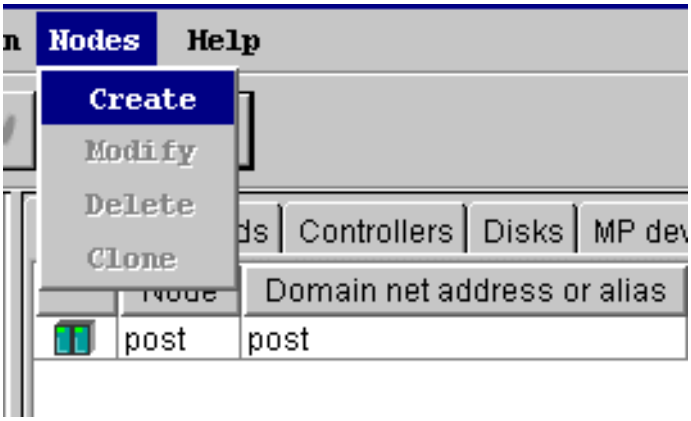


Figure 24: Example of a window for creating additional nodes (excerpt, approximates figure)

When you select *Create*, the *Create node* dialog box opens. The figure below gives you an example of how to fill this dialog box:

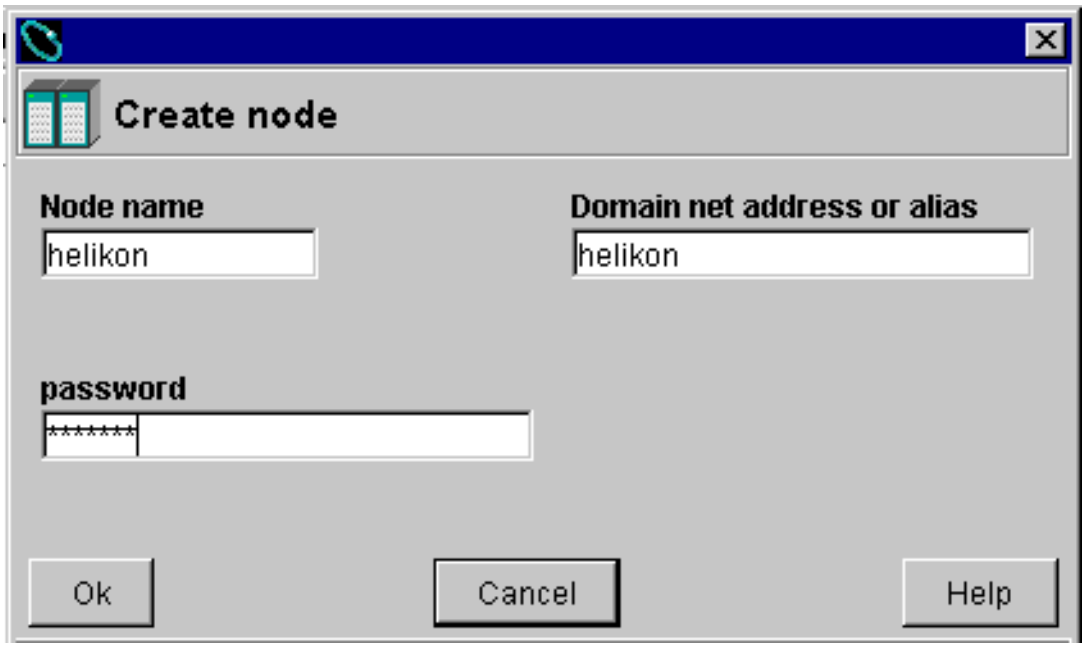


Figure 25: Example of the dialog box for creating an additional node (approximates figure)

The name of the UNIX system (*uname –n* command) must be chosen for the node name (in this case: *helikon*).

Once the node name has been entered, it is proposed as the domain net address or the alias. Finally, enter the root password and confirm with *Ok*. The newly added node is then also displayed in the main window.

A node can only be administered fully within the administration domain if it can access all other nodes and if the integrated nodes can also access it using the domain net address (it must be possible to successfully execute the *ping* command from all nodes).

New nodes can be added successively to the administration domain by following the procedure described. Once you have successfully created the nodes, you can use the object list in the main window to establish which nodes are integrated in the administration domain. In the figure below, the administration domain comprises three nodes, i.e. "post", "pfanne" and "helikon".

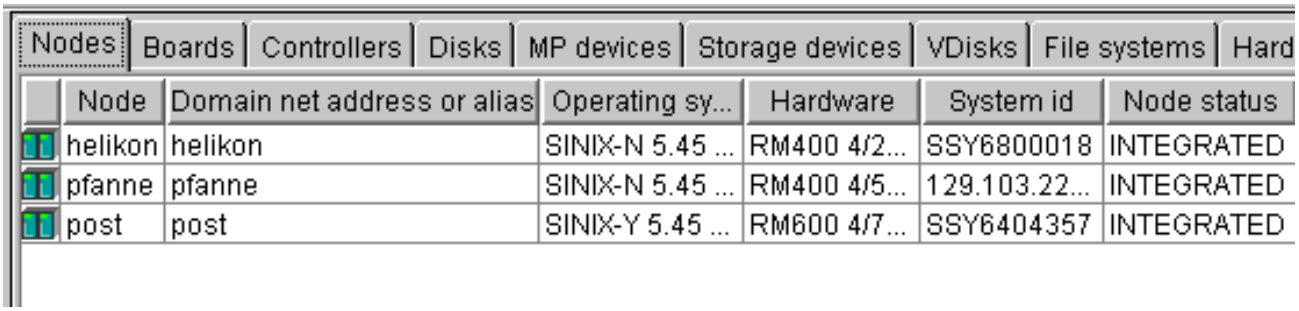


Figure 26: Example of an administration domain window with three nodes (excerpt, approximates figure)

The RM200 is not supported as a node in a domain.

The *CLODB* database in the administration domain is copied to new nodes as they are created.

All local information on the new nodes, which is stored in the database, is then lost (e. g. VDisk Lite configurations).

8 Work schedules for RM200, RM300, RM400

Each installation is an extremely complex procedure, which involves special preparatory steps that are determined by various factors. For example, one factor is the hardware of the computer used (size of the main memory, graphics capability of the consoles). A second factor is the desired type of installation. A third factor is whether or not the installation is carried out by the local computer or via a server.

To ensure that you maintain an overview of the installation procedure, you should use a work schedule. This section contains work schedules for all the tasks described in this manual:

- preparing for installation
- new installation
- update installation
- DSSI

▶ Copy the schedule for your work that you intend to follow.

▶ Then read the sections listed in the schedule.

8.1 New installation

Part 1:See Chapter "Preparing an RM600 for installation"

Preparing for installation	Comments
Booting the system	
Reading the new README file	
Backing up data on the system disk	*/home* file system can be retained
New installation: Partitioning	
Switching to the PROM monitor after switching on the computer	
Updating the EEPROM firmware	
Loading the Mini System main menu	
Choosing a language for the dialog	
Choosing the console type	
Testing the keyboard type	

Part 2:See Chapter "New installation on an RM600"

Carrying out the installation	Comments
Part 1 of the installation: Dialog	
– Entering the date, time, and time zone	
– Entering the host name	
– Defining the system disk	
– Choosing the system disk configuration	
– Formatting and/or partitioning the system disk	
– Confirming the installation parameters	if required
Part 2 of the installation: Execution	
Post-installation tasks	
– Installing software products	via *SYSADM*
– Chapter "Network services and domains (RM600)"	

8.2 Update installation

Part 1: Preparing for an update installation

Chapter "Preparing an RM600 for installation"

Preparing for installation	Comments
Booting the system	
Reading the new README file	

Part 2: Preparing for an update installation

In Chapter "Update installation for RM600"

Preparing for installation	Comments
Preparing for installation	
Installing the SInus package	
Reading the manual entry	
Mounting the installation medium	
Checking that the system can be updated	
Evaluating the log	

Part 3: Carrying out an update installation

In Chapter "Update installation for RM600"

Carrying out the installation	Comments
Backing up data on the system disk	
Switching to the PROM monitor after switching on the computer	
Updating the EEPROM firmware	
Switching to single-user mode	
Carrying out the update installation	
Post-installation tasks, part 1	
Restarting the system	
Post-installation tasks, part 2	

8.3 Work schedule for DSSI

Part 1: Chapter "Preparing an RM600 for installation"

Preparing for installation	Comments
New installation: Partitioning	
Switching to the PROM monitor after switching on the computer	
Loading the Mini System main menu	
– Choosing a language for the dialog	
– Choosing the console type	
– Testing the keyboard type	

Part 2: Chapter "DSSI"

Carrying out the installation	Comments
Starting DSSI	
Backing up partitions	
– Selecting the hard disk	
– Selecting the tape device	
– Selecting the partitions to be backed up	
– Starting the backup procedure	
Restoring partitions	
– Backing up system files temporarily	
– Selecting the tape device	
– Selecting the partitions to be restored	
– Configuring file systems automatically	
– Starting the restore procedure	
Configuring hard disks	
– Selecting a tape device	
– Selecting a hard disk to be configured	
– Selecting file systems to be configured	
– Starting the configuration procedure	
Deleting a hard disk	
Terminating DSSI	

9 Preparing RM200, RM300, RM400

This chapter describes all the preparatory steps that are required for the chapters listed below:

- New installation (see Chapter "New installation on an RM600")
- Update installation (see Chapter "Update installation for RM600")
- DSSI (see Chapter "DSSI")

Which various preparatory steps are necessary in each case is indicated in a special work schedule in Chapter "Work schedules for RM200, RM300, RM400". You should therefore copy the work schedule which is relevant to the task you want to perform. Then read the sections in this chapter that are mentioned in the work schedule.

Reliant UNIX 5.45 is not backwards compatible. For this reason, software created under Reliant UNIX 5.45 which is to run under an earlier version must be recompiled under the earlier version.

9.1 Booting the system

If UNIX is not yet running, you must first do the following:

- Switch on the console monitor and the other external devices.
- Switch on the computer.
- Log onto the console as user *root* as soon as you are prompted to do so.

  The commands described in the following sections must be entered via the console.
- Insert the "Reliant UNIX 5.45" CD-ROM in the CD-ROM (DVD) drive.

  Make sure that you only use the CD-ROM that was supplied for your computer.

Title:	Reliant UNIX 5.45
Subtitle:	*Computer models* (e.g. RM200/RM300/RM400)

The CD-ROM may only be removed from the drive, when the installation is **complete**, or when you are finished working with *DSSI*.

9.2 Reading the new README file

The "Reliant UNIX 5.45" CD-ROM contains a new README file. This file contains important information and changes that were not available when the manual went to print.

You will find the README file under the name *readme*

- on the system disk in the directory */opt/readme/sinix.D*.
- on the "Reliant UNIX 5.45" CD-ROM in the directory */cdrom/sinix_y/5_45x/en* (in 5.45*x*, *x* indicates the update status).

Read the README file **before** you start the installation.

Also read the README file as soon as you receive a new update for Reliant UNIX and want to start the update installation.

You can read the README file

- using the commands *pg*(1), *more*(1), *less*(1),
- using an editor (e.g. *vi*(1),
- using the *SYSADM* user interface.

Reading the README file from the system disk (UNIX is running)

You can use the *SYSADM* system interface to install the README file on the system. A detailed description of this can be found in the manual ,,Reliant UNIX Operation". You can read the README file as follows:

#□pg□/opt/readme/sinix.GB/readme

Reading the README file from the CD-ROM (UNIX is running)

Use the *SYSADM* user interface. A detailed description of this can be found in the manual "System Administration and Hardware Configuration Using the SYSADM User Interface".

You can read the README file at shell level as follows:

```
# mount -F hs /dev/ios0/sdisk015s0 /cdrom

# pg /cdrom/sinix_y/5_45b00/en*
```

Reading the README file from the CD-ROM (mini system is running)

Select the item *Read readme file* from the mini system main menu (see also Section "The Mini System main menu appears"). The *pg*(1) command is called automatically with the README file. If you type *q* after the colon, you return to the main menu of the mini system.

9.3 Backing up data on the system disk

You should back up all your data on a regular basis. You should certainly back up the data on the system disk in the following cases:

- before you carry out a new installation
- before you carry out an update installation
- before you format/partition the system disk

If you want to carry out a new installation, you can retain the data in the */home* partition in its current state. However, in this case you must refer to the guidelines for partitioning the system disk in the Section "New installation: Partitioning".

There are a number of UNIX commands that you can use for backing up data, e.g. *cpio*(1). However, you can also use the *DSSI* program (see Chapter "DSSI") or the add-on product *NetWorker* (see the "NetWorker V4.2 - User's Guide").

If you want to change the system disk partitioning, and back up data beforehand using the *DSSI* program, the CD-ROM which is used to start the mini system must correspond to Reliant UNIX Version 5.43 C or later. You must then use the logical backup mode (rather than the physical backup mode).

If the CD-ROM corresponds to an older version of SINIX or Reliant UNIX, you can back up the system disk in the following way:

- Load the mini system.
- Switch to a shell.
- Back up the data using *cpio*(1).

Always back up the data that you will need for your work later on: e.g. system name, domain name, Internet address, group names, login names, system disk partitioning.

- Copy Table "".
- Make a note in the table of the data that still has to be backed up.
- Now back up this data.

Examples of user and system files			
/home/liz		*/home/eric*	
/etc/device.tab	(□□□□)	*/etc/resolv.conf*	(□□□□)
/etc/dktab	(□□□□)	*/etc/shadow*	(□□□□)
/etc/gettydefs	(□□□□)	*/etc/vfstab*	(□□□□)
/etc/group	(□□□□)	*/etc/default/inet*	(□□□□)
/etc/inittab	(□□□□)	*/etc/dfs/**	(□□□□)
/etc/netconfig	(□□□□)	*/etc/inet/hosts*	(□□□□)
/etc/passwd	(□□□□)	*/etc/inet/networks*	(□□□□)
/etc/profile	(□□□□)	*/etc/inet/strcf*	(□□□□)
Terminal configuration		*/dev* and the output of the command */usr/bin/termshow*	
Own Internet address, network mask, Internet address of the gateway		from the file */etc/default/inet*	
Additional scripts			(□□□□)
crontab tables			(□□□□)
List of all packages installed (*pkginfo* list)			(□□□□)
Configuration data			(□□□□)

Table 5: Data to be backed up prior to a new installation (examples)

9.4 New installation: Partitioning

It is possible that the partitioning of the hard disk, which you intend to use as the system disk, is not suitable for this purpose. Problems may arise in two cases:

- If you want to use a hard disk, which was previously used for a different purpose or which is newly installed, as the system disk.
- If you want to use a hard disk, which was partitioned using an earlier version of SINIX or Reliant UNIX, as the system disk.

In both cases, the hard disk in question may have to be repartitioned during installation to ensure that it can be used as the future system disk. You **must** therefore do the following:

- Check whether the partitioning of the future system disk is suitable for an installation:
  - The partitions should have a **standard size**.
  - The partitions must have a **minimum size** (see Table "")

Partitions	**Minimum size Mbytes**[1]			
	Core system	**Application client system**		**Full system**
		without DS[2]	**with DS**[2]	
"Normal" partitioning				
/	45	45	45	70
swap	---------- □□□2 * Main memory[3]□□□ ----------			
/opt	80	180	200	240
/usr	105	105	145	200
/var	60	80	80	100
/home	35	35	35	50
SASH	2.3	2.3	2.3	2.3
Status area	0.4	0.4	0.4	0.4
Total (without *swap*)	367.7		505	730
One large partition				
/	45	45	45	70
swap	---------- □□□2 * Main memory[3]□□□ ----------			
/SAM	280	400	460	660
SASH	4	4	4	4
Status area	0.4	0.4	0.4	0.4
Total (without *swap*)	367.7		505	730

Table 6: Minimum partition size for a new installation

Make sure that the partition sizes are greater than the minimum values specified above. Additional space is needed in the partitions for add-on products (especially in */opt*).

If the previous partitions on the system disk are smaller than the minimum values listed above, the data on the */home* partition must be backed up prior to installation, because the menu item *Preserve Data on /home Partition* **cannot** be selected in this case.

The system disk partitioning which is best suited to your purposes depends on which add-on products you want to install later. Further information on this is given in the manuals for the add-on products in question. If you want to change the partitioning, you can do so during the new installation. To do this, you must choose one of the menu items *Standard partitions*, *Old partitions* or *One large partition* from the *Configure System Disk* menu. If the partitioning of the selected hard disk is not suitable for the future system disk, an error message is displayed.

Preparatory steps for changing the partitioning

You can display the partitioning using the command *dkpart*(8).

If the future system disk has to be repartitioned during installation, you must carry out additional preparations:

- Copy the following form and enter the new values.

Partitionnumber	File systemname	Type	Partition sizein Mbytes
0	*/*	ufs	
1	*swap*	–	
2	*/opt*	vxfs	
3	*/usr*	vxfs	
4	*/var*	vxfs	
5	*/home*	vxfs	
10	*SASH*	–	4
15	*Status information*	–	0.4
Total size of the partitions:			
Capacity of the future system disk:			

Table 7: Form for changing the system disk partitioning

All data that was previously stored on the system disk is lost when you change the partitioning!

- Back up the data in the */home* file system.
- You can use the *DSSI* program in the mini system to do this.

Changing the partitioning

- Select the menu item *Standard partitions*, *Old partitions* or *One large partition* during installation (see ...).

  You should select this menu item only if you either no longer need the data in the */home* partition or if you have backed it up before starting the installation procedure.

- Change the system disk partitioning.
- Copy the backed up data back into the */home* file system.

9.5 Update installation: Partitioning

The minimum amount of storage space specified in Table "" must be available in the partitions for checking mode for an update installation.

File system	Partition[1]	Required free storage space (in Mbytes)[2]
/	*/dev/ios0/sdisk000s0*	5
/swap	*/dev/ios0/sdisk000s1*	main memory[3]
/opt	*/dev/ios0/sdisk000s2*	5
/usr	*/dev/ios0/sdisk000s3*	5
/var	*/dev/ios0/sdisk000s4*	5
/home	*/dev/ios0/sdisk000s5*	5
SASH	*/dev/ios0/sdisk000s10*	–[4]
Status area	*/dev/ios0/sdisk000s15*	–[4]

Table 8: Free storage space required for an update installation

Note that storage space is required during checking for the SInus package temporary files. During checking, the system determines whether there is enough storage space for the actual update installation. This amount can vary greatly, depending on the update extent.

9.6 DSSI: external devices

If external devices are connected to your computer (e.g. a drive for 8 mm magnetic tape cassettes), these devices must be switched on **before** you start *DSSI*. Otherwise, these devices will not be recognized by *DSSI* after it has started, and it will not therefore be possible to access them.

9.7 Preparing remote tasks

Some of the tasks described in this manual can not only be executed directly on the local computer, but also indirectly using another computer:

- updating the firmware
- performing a new installation
- performing an update installation

Tasks that are carried out using another (remote) computer are identified by entering the word **remote**. When remote operations are performed, the local computer is called the **client** and the remote computer is called the **server**. The software which is required for the respective task on the client is loaded via the server. In the examples given below, the server is called *dagmar* and the client *liz*.

You should only perform this type of installation if you have a great deal of experience managing computer networks. You will find an introduction to network administration under Reliant Unix in the "Network Administration" manual.

Requirements for a remote installation

- The server and client must be linked via an onboard Ethernet connection.
- If the remote installation is to run via a gateway, a *bootpgw* daemon which can convert the incoming requests to another subnetwork must be running on the gateway.
- Note that only one installation server may exist in the local network for the corresponding client.
- You will require extensive knowledge of UNIX, and in particular experience of working with LAN.

If you want to perform one of the tasks mentioned above from a remote computer, you must enter the network parameters during installation.

- Copy the following table and enter the parameters.

IP address of the local computer	(nnn.nnn.nnn.nnn)
Name of the server	(max. 8 characters)
IP address of the server	(nnn.nnn.nnn.nnn)

You must also carry out a number of preparatory steps both on the server and on the client.

9.7.1 Preparations to be carried out on the server

Carry out the following preparatory steps on the server:

- Create the following directories on the server:
  - */var/sadm/remote*
  - */var/sadm/remote/cdrom*

  Use the *mkdir*(1) command for this.
- Create a link to */tftpboot*

```
#ln -s /var/sadm/remote/cdrom/BOOT /tftpboot
```

- Mount the operating system CD

  #□mount -F hs <device_name> /var/sadm/remote/cdrom

- Provide the client with the necessary file systems for nfs access. In the following example, computers *ralph* and *liz* are also granted root authorization on the server

  # share□-F ufs -o□ro=ralph,root=ralph:liz /var/sadm/remote
  # share□-F ufs -o□ro=ralph,root=ralph:liz /var/sadm/remote/cdrom

  If the server and client are connected together via DNS (Domain Name Service), the full client name should be specified, e.g. *liz.pdb.sni.de*.

  If the file systems are to be available each time the computer is booted, enter the *share* calls in the */etc/dfs/dfstab* file. You can activate the entries using the *shareall* command without having to execute a restart

  # cat /etc/dfs/dfstab
  ...
  share□-o□ro,root=rolf:liz /var/sadm/remote
  share□-o□ro,root=rolf:liz /var/sadm/remote/cdrom
  ...
  # shareall

- If DNS is not active, enter the client in the */etc/hosts* file. Example:

  144.145.16.224□liz

- Enter the client in the */etc/inet/bootptab* file, for example:

  .subnet16:\
  :hn
  □:sm=255.255.252.00:□□□□□#□<--□Network mask for installation
  liz:\
  □:tc=.subnet16:\
  □:ht=ether:\□□□□□□□□□□□□□□□#□<--Hardware type of the network
  □:ha=00.00.04.01.01.74:\□#□<--Hardware address of the client
  □□□□□□□□□□□□□□□□□□□□□□□□□□□□□#□(MAC address, Ethernet address)
  □:ip=144.145.16.224:\□□□□#□<--IP address of the client
  □:gw=144.145.16.1:□□□□□□□#□<--Gateway IP address

  You will find a description of the entries under "bootptab" in the "Network Reference Manual". The client entry assign the Ethernet address to the Internet address. You determine the Ethernet address in the client's PROM monitor with

  printenv ethernetaddr

  The command supplies the Ethernet address of the motherboard.

- Activate the entry with the *arp* command, e.g.

  # arp -s liz 00:00:e4:01:01:74

- Add the following entries to the */etc/inet/inetd.conf* file

  bootp dgram udp wait root /usr/sbin/in.bootp in.bootp
  tftp dgram udp wait root /usr/sbin/in.tftpd in.tftpd

  The switch *in.tftpd -s* is specified as default Reliant UNIX 5.45. This switch must be deactivated for the duration of the installation.

  
  Note that this deactivates the security mode for *in.tftpd*, i.e. public access is extended to all users reachable via the network. This means that access is extended to **all** the files in **all** the directories in the system including, for example, configuration files in */etc* if they can be read or written by any user.

- Add the following entries to the */etc/services* file

  bootp 67/udp
  tftp 69/udp

- Determine the process number (PID) of the daemon for the Internet service *inetd*

  # ps -ef|grep inetd

- Activate the entries

  # kill -1 *<process_number>*

  Enter the process number of */usr/sbin/inetd* for *<process_number>*.

  
  If the entries have not been activated, it is recommended that you reboot the system.

9.7.2 Preparations to be carried out on the client

First, switch to the PROM monitor or firmware monitor. The procedure for doing this is dictated by two factors: the current run level of the computer, and the boot mode that has been set.

Switching to the PROM monitor after switching on the computer

When you switch on the computer, the firmware executes a series of actions that correspond to the boot mode that was set. If autoboot is switched off (boot mode *d* or *m*), you automatically change to the PROM monitor or firmware monitor. If autoboot is switched on (boot mode *c* or *w*), the following message appears:

Autoboot: Waiting to load dkncr(0,0,10)sash (CTRL-C to abort, RETURN to expedite

Abort the boot process immediately by pressing [CTRL] [C]. You are then in the PROM monitor.


Either *dkpcs* or *dkdpt* will be output in place of *dkncr*, depending on the selected system disk.

Switching to the PROM monitor from UNIX

If the computer is already switched on and UNIX is running, you can get to the PROM monitor or firmware monitor by switching to run level *5*. The boot mode setting is irrelevant here.


If the system is currently in multiuser mode, you should execute the *who*(1) command prior to shutting down the system in order to check whether there are other users logged on.


who(1) does not show if users are accessing the system from other computers via *nfs* or *pcnfs*.

 # cd /
 # shutdown -i5 -g900

If no other users are active, you can specify the *-g0* option instead of the *-g900* option.

Switching to the firmware monitor

As soon as the messages from the firmware have been output, you are prompted to

Hit□any□key□to□continue□..

Press any key. The main menu for the firmware monitor is displayed.

Preparatory steps

Carry out the following preparatory steps:

- Enter the IP address, i.e. the Internet address of the client.

  Example (RM400):

  In the PROM monitor

  ```
  >> setenv netaddr 144.145.16.224
  ```

  In the firmware monitor

  ```
  Environment□modification
  □□□□□□□□□Keyboard□nationality (keyboard)
  □□□□□□□□□Internet□address(netaddr)
  □□□□□□□□□Local□serial□console□baudrate□(lbaud)
  □□□□□□□□□Remote□serial□console□baudrate□(rbaud)
  □□□□□□□□□Stand-alone□shell□name□(bootfile)
  □□□□□□□□□Firmware□startup□mode□(bootmode)
  □□□□□□□□□tty(0)□modem□signals□(tty(0)_if)
  □□□□□□□□□tty552(0)□modem□signals□(tty552(0)_if)
  □□□□□□□□□tty552(1)□modem□signals□(tty552(1)_if)
  □□□□□□□□□Teleservice□baudrate□(TS_baud)
  □□□□□□□□□Teleservice□bits□per□char□(TS_bit/char)
  □□□□□□□□□Teleservice□parity□(TS_parity)
  □□□□□□□□□Teleservice□stop□bits□(TS_stopbits)
  □□□□□□□□□Teleservice□modem□signals□(TS_if)
  □□□□□□□□□Teleservice□flags□(TS_flags)
  □□□□□□□□□Return□to□main□menu
  New□Internet□address□or□ESC□to□exit□:□144.145.16.224_
  ```

- Restart the client to make the change effective.

9.8 Updating the EEPROM firmware

The EEPROM firmware is automatically updated for the RM200, RM300 and RM 400 as soon as you perform a new or update installation. The description below tells you how to update the EEPROM firmware without performing having to perform an update installation or new installation at the same time.

The "Reliant UNIX 5.45" CD-ROM contains an update utility. You can use this to update the EEPROM firmware.

If you start the firmware update even though the EEPROMs have already been programmed with the new firmware version, you will be informed of this.

Start the update utility in the following way:

- **In the PROM monitor from the local compute**r

  ```
  >>□update
  ```

- **In the PROM monitor from a server**

  You need an additional parameter here: the name of the server:

  ```
  >>□rupdate□dagmar
  ```

- **In the firmware monitor from the local computer**

  ```
  Firmware□update□(update)
  ...
  ```

  You are prompted to enter the name of the update file in the command line:

  ```
  Enter□update□file□path□or□ESC□to□exit
  (default is dkncr(,5,10)upde_pci): Ú
  ```

- **In the firmware monitor from a server**

  ...
  Remote□firmware□update□(rupdate)
  ...

  You must enter two parameters in succession in the command line:

  1. Name of the server (for example: *dagmar*):

     □□□□□□Enter□server□name□or□ESC□to□exit□:□**dagmar**

  2. Name of the remote path:

     □□□□□□Enter□remote□path□or□ESC□to□exit
     □□□□□□(default□is□/tftpboot)□:□Ú

The update utility now programs the existing EEPROMs one after the other. This takes approximately 3 minutes for each EEPROM. The following messages or similar messages are displayed:

```
; device is a worm drive (read-only)
173904+286992+388064 entry: 0xa0020000
SNI RM400 FLASH-EEPROM Reprogramming Utility.
Present SINIX Firmware release is: 5.0207, update release is 5.0208.
Erasing ...
Writing Flash Eeprom, please wait ...
Flash Eeprom 1 programmed successfully ...
```

There is only one EEPROM in the RM200 and RM400 -C; this is called *Eeprom 0*.

When the update is complete, the computer is rebooted automatically. If you subsequently want to carry out an installation, you must switch once again to the PROM monitor or firmware monitor.

During the update process, it is important that the power supply to the computer is not interrupted! Otherwise, the relevant controller will have an undefined software status, which you cannot rectify yourself. If this occurs, please contact the Fujitsu Siemens Service department.

9.9 Loading the Mini System main menu

In some of the operations described in this manual the operating system cannot access the system disk. All the required commands must then be available in the main memory. For this purpose, the "Reliant UNIX 5.45" CD-ROM contains a mini system which is smaller than the Reliant UNIX operating system.

Update installation:

As of operating system/revision version B00 of Reliant UNIX 5.43, an update installation is no longer started from the mini system. The menu item of the same name in the Mini System main menu only displays information about the new procedure. If you want to perform this type of installation, please read the Chapter "Update installation for RM600".

If you are not yet in the PROM monitor or firmware monitor, switch to it now (see Section "Switching to the PROM monitor from UNIX"). Then complete the following actions:

- **In the PROM monitor from the local computer**

  >>□install

- **In the PROM monitor from a server**

  You need an additional parameter here: the name of the server:

  >>□rinstall□dagmar

- **In the firmware monitor from the local computer**

  Standard□installation□(install)

- **In the firmware monitor from a server**

  Remote□installation□(rinstall)

  You must then enter two parameters in succession in the command line:

  1. Name of the server (for example: *dagmar*):

     Enter□server□name□or□ESC□to□exit□:□**dagmar**

  2. Name of the remote path:

     Enter□remote□path□or□ESC□to□exit□(default□is□/tftpboot)□:□Ú

9.9.1 How the load process works

A series of messages are displayed during the load process. If they are not of any interest to you, you can move straight on to Section "Choosing a language for the dialog".

Please note that the messages shown below may vary slightly due to the actual system configuration.

Please do not let messages like the following worry you

Timeout during waiting for keyboard response

Keyboard selftest failed

These messages are normal if you are working on a system without a graphics console.

Further actions are then carried out:

- The CD-ROM (DVD) drive is mounted:

  mount: warning: <SINIX_N_V5_45B0000> mounted as </cdrom>

- The system checks whether a configuration file exists.

  The configuration file can be made available as a *cpio* file on a floppy disk or as a file on partition 0 of the system disk.

  If the configuration file is not found on the disk being searched, one of the following messages is displayed:

  ```
  +++ INFO: looking for config file
  +++ INFO: No config file found, switching to dialog mode
  ```

- The mini system dialog program is then started. It is based on the *FMLI* utility (Form and Menu Language Interpreter). This program runs both on character-based screens and on graphics screens.

  ```
  +++ INFO: start FMLI menus
  □□□□□□□□□□start fmli
  ```

9.9.2 Using the dialog program

The mini system dialog program is used in exactly the same way as the *SYSADM* user interface.

Basically, the dialog program runs in the following way:

- You are prompted to specify the desired dialog language.
- You are prompted to enter the parameters for screen and keyboard.
- The selected settings can be tested and corrected if necessary.
- The Mini System main menu appears.

It is possible that the first two menus on your screen will not be displayed correctly, or that the function keys do not work. The reason for this is that the dialog program initially sets a default value for the *$TERM* environment variable. This value is corrected automatically as soon as the second form is completed and saved (see ...).

If the function keys do not work, the corresponding functions can be carried out using special key sequences:

- Press and hold down the [CTRL] key.
- Press [F].
- Release both keys.
- Press the number of the function key whose function you want to execute (e.g. [1] for [HELP] or [F1]).

You can also press Ú instead of the [ENTER] function key.

9.9.3 Choosing a language for the dialog

You must define certain parameters before the mini operating system main menu appears. You must first select the language in which the subsequent dialog is to be held:

English□□□Welcome to the CD-ROM Mini System.
□□□□□□□□□□For more Information press the HELP (F1) function key.
□□□□□□□□□□If the F1 function key doesn't work, use <Ctrl>f 1.
□□□□□□□□□□Please select the dialog language now.
Deutsch□□□Willkommen im CD-ROM Minisystem.
□□□□□□□□□□Mehr Informationen:□Druecken Sie die Funktionstaste
□□□□□□□□□□HELP (F1).
□□□□□□□□□□Alternative:□Druecken Sie <Ctrl>f 1.
□□□□□□□□□□Bitte waehlen Sie jetzt die Dialogsprache.
Francais□□Bienvenue dans le CD-ROM Minisystem
□□□□□□□□□□Plus d' information: appuyez sur la touche HELP (F1).
□□□□□□□□□□Si F1 ne marche pas: appuyez sur <Ctrl>f 1.
□□□□□□□□□□Selectionnez la langue s'il vous plait.
□□□□□□□□□□English - Continue□□□□□□□ENTER (F3)
□□□□□□□□□□Deutsch - Weiter mit□□□□□ENTER (F3)
□□□□□□□□□□Francais - Continuer avec ENTER (F3)

Use the [HELP] function key to display detailed help text. The help text is displayed in English if the cursor is on the first menu item.

- Move the cursor to the desired dialog language using the arrow keys or the TAB key.
- Press the [ENTER] function key or the Ú key.

The selected language only remains valid for the duration of the dialog. It has **no** effect on the language setting for the system once the installation has been completed.

9.9.4 Choosing the console type

You are then prompted to specify the type of terminal you are using as a console.

```
Please specify the console or terminal type and, if necessary, the keyboard
language.
You can use the Tab key (TAB) or the arrow keys to move back and forth between
the fields in the menu.
Use the Enter key to confirm your choice.
vt02
97801
ba80/9766
VGA-Graphic
VGA-Ansi
X11-Emulation-xterm
X11-Emulation-xpct
```

Select the terminal type

Press the [CHOICES] function key to display a selection menu:

vt02	TC20 or 97801 Terminal
97801	TC20 or 97801 Terminal
ba80/9766	ba80 or 9766 Data Display Terminal
VGA-Graphic	Graphics screen, color (+ installation of SINIX/windows)
VGA-Ansi	Graphics screen in ANSI mode (no installation of SINIX/windows)
X11-Emulation-xterm	xterm emulation
X11-Emulation-xpct	xpct emulation

Enter keyboard language

Press the [CHOICES] function key to display a selection menu:

german	The keys [Q] [W] [E] [R] [T] [Z] lie side-by-side. Certain keys are assigned for the umlauts Ä, Ö, Ü and for ß.
french	The keys [A] [Z] [E] [R] [T] [Y] lie side-by-side.
international	The keys [Q] [W] [E] [R] [T] [Y] lie side-by-side.

The keyboard language *international* corresponds to the country-specific variant USA.

Information about the TC20-V100 Data Display Terminal

If you are using a TC20-V100 Data Display Terminal as the console, but do not know which emulation is used, you can find this information in the terminal's operating manual. A distinguishing feature is the number of function keys:

- The keyboard for the VT320 emulation has 20 function keys (F1 through F20).
- The keyboard for the 97801 emulation has 22 function keys (F1 through F22).
- The PC keyboard MFII has 12 function keys (F1 through F12).

- Fill in the form.
- Press the [SAVE] function key.

9.9.5 Setting the terminal parameters

Parameters for the 97801-vt02 terminal

The TERM variable must be set to TERM=vt02, and the following entries should exist in the terminal's setup mode:

"general setup" menu	
Terminal ID:	*VT220*
Terminal mode:	*7 bit control*
User defined keys:	*locked*
Cursor key mode:	*ANSI-control*
New-line mode:	*off*
User-preferred set:	*DEC*
Communication:	*online*

"host interface" menu	
Baud rate:	*19200*
Parity:	*off*
Character length	*8 bit*
Stopbit length:	*1 bit*
XOFF	*at 64*
Local echo mode	*off*
Transmit rate:	*limited*

You should also set the function *x key* to backspace in the "*keyboard setup*" menu and "*autowrap*" to "*on*" in the "*display setup*" menu.

Save these settings in the *basic function* menu of the setup mode.

9.9.6 Testing the keyboard type

In the next window you can check whether the selected keyboard type is applicable to your keyboard.

```
Check the selected terminal and keyboard configuration:
-□A color display should be used, if possible
-□The windows should be framed by simple graphics, such as
□□lines.
-□The characters that were entered must be displayed correctly.
If the test window does not work correctly, enter 'no' in the last line and press SAVE (F3).
If the function keys do not work, you can emulate them:
-□Press <CTRL>f<i>, where {1, ..., 8} must be entered for i,
-□or press <CTRL>j, and type exit at the '-->' prompt.
If the test window works correctly, enter 'yes' in the last line and press SAVE (F3).
Test configuration: vt02 with International keyboard
□□□□□□□□□□□□□□□□□□Entering text
□□□□□□□□□□□□□□□□□□Testing the CHOICES (F2) function key
□□□□□□□□□□□□□□□□□□Do the screen and keyboard work ok?
```

In the case of a German keyboard, no umlauts can be used for testing.

Entering Text

Press a few keys that are used for special characters.

Testing the CHOICES (F2) function key

Press the [CHOICES] function key.

Do the screen and keyboard work ok?

Enter *yes* or *no* here, depending on whether the displayed characters correspond to the keys you have just pressed. You can also use the [CHOICES] function key to do this.

- Type in text.
- Check the text on your screen.
- Enter *yes* or *no* in the last line.
- Press the [SAVE] function key.

9.9.7 The Mini System main menu appears

You start the installation process from the mini system main menu. You should, however read the *README* file before choosing *Reinstall Reliant UNIX*.

```
You can carry out one of the following actions:
1. Reinstall Reliant UNIX
2. Find out how an update installation is carried out
3. Execute commands in a shell of the mini operating system
4. Read the README file
5. Write the stand-alone shell (SASH) to a system disk
6. Execute tasks with DSSI
7. Abort the mini operating system and restart the old system
□□□kernel
```

Reinstall Reliant UNIX

Start a new installation. Please refer to Section "Part 1 of the installation: Dialog".

Find out how an update installation is carried out

Display information about how an update information is performed.

As of operating system/revision version B00 of Reliant UNIX 5.43, an update installation is no longer started from the mini system. If you want to perform this type of installation, you must do the following:

- Exit the mini system by selecting the menu item *Abort the mini operating system* and restart the old system kernel.

  Please refer to Chapter "Update installation for RM600".

Execute commands in a shell of the mini system

Exit the dialog program temporarily.

You return to a shell of the mini system. From here, you can execute some UNIX commands (e.g. *autoconf*(8), *dksetup*(8)). You can use the *exit* command or press [CTRL] [D] to return to the dialog program (but only if the stty parameter *eof* has not been redefined).

The settings for language, keyboard, and terminal type which you selected in the previous menus are still valid in the mini system.

Read the README file

Read the new README file. Please refer to Section "Reading the new README file".

Write the stand-alone shell (SASH) to a system disk

The SASH is needed to boot the operating system. It is located on partition 10 of the disk. If you have overwritten this partition by mistake, you will no longer be able to boot the system. You can use the menu item *Write the stand-alone shell (SASH) to a system disk* to write the SASH to partition 10 again.

Confirm the suggested disk with the function key [SAVE].

Execute tasks with DSSI

Start the *DSSI* program. Please refer to Chapter "DSSI".

Abort the mini operating system and restart the old system kernel

Boot the computer from the system disk (cold start). The boot process ends in the PROM monitor or firmware monitor.

If a RAID controller is recognized in the system, an additional menu item *Start RAIDmaster Storage Manager* is displayed. Please refer to the manual "RAIDmaster" for more information on the RAIDmaster.

10 New installation (RM200, RM300, RM400)

This chapter describes how to perform a new installation of the Reliant UNIX 5.45 operating system on an RM200, RM300 or RM400.

For this task, you may have to carry out various **preparatory steps**. The required steps are listed in a special work schedule in Section "New installation". You should therefore make a copy of this work schedule. Then read the sections in the Preparing an RM600 for installation that are mentioned in the work schedule.

Please note that the computer is supplied with the operating system **preinstalled**. When you power up the computer for the first time, you need only carry out the actions described in the operating manual.

If an older version of SINIX or Reliant UNIX is already installed on your computer, you can also install the new Reliant UNIX version by carrying out an **update installation**. You should therefore check carefully to see which installation type is best suited to your needs. Information on the update installation can be found in the chapter of the same name in Chapter "Update installation for RM600".

As a **prerequisite** for installing Reliant UNIX 5.45 on the RM200, RM300 and RM400 systems, you need a main memory configuration of at least 64 Mbytes.

The Reliant UNIX 5.45 operating system is supplied on CD-ROM and is therefore installed from the CD-ROM (DVD) drive. Provided you have carried out all the preparatory steps for installation, the new installation of the operating system takes approx. 1.5□-□2□hours.

10.1 General guidelines

Please observe the following rules during installation:

- All actions that are performed during the installation are logged. The log comprises two parts:

Part 1:	file */prot.install.mini*	in the mini system
	file */var/sadm/pkg/.prot.install.mini*	in UNIX
	file */var/sadm/pkg/.prot_inst.0*	in UNIX
Part 2:	file */var/sadm/pkg/.prot_inst.2*	in UNIX

- The standard partitioning of the system disk offered in the installation menu may not be suitable for your purposes. You can therefore change the partitioning during the installation dialog. If you want to change the partitioning, but have not yet checked the existing partitioning, you must do so **before** starting the new installation.

  
  When you change the system disk partitioning, all the data that was stored on the disk is lost!

- If you want to abort the installation, there are two options available to you:

  1. The [USER_INT]function key is displayed in certain windows. When you press this function key, a selection menu appears in which you can choose between a number of different actions (see ...).
  2. The menu item Abort Installation and Reboot is displayed in certain windows. When you select this menu item, the previous Reliant UNIX system is restarted. The boot process ends in the PROM monitor or firmware monitor.

  If you abort the installation **after** you have started the installation procedure (by selecting the menu item *Start Installation*, see ...), you must then repeat the new installation.

- If you abort the installation procedure yourself before it is completed, you should try to install Reliant UNIX again. If this attempt also fails, please contact the Fujitsu Siemens Service department.
- You should also consult the Fujitsu Siemens Service department if errors occur while you are installing an add-on package.

10.2 Overview

A new installation is performed in two parts. In the first part, the installation parameters must be entered. The installation is then carried out automatically in the second part. The following table shows what you must do before, during, and after installation.


The data on your computer is completely safe while you are working within the dialog part. The hard disk is **only** updated when you select the menu item *Start of Installation* at the end of the dialog (see ...). The only exception is that the date and time entered are changed immediately.

No.	Actions performed by the computer	Actions performed by the user
1.		**Preparatory steps**
	Mini system is booted	Work schedules for RM200, RM300, RM400
	You are prompted to specify:	
	the language (menu)	Choose *English*
	the console type (menu)	Select the console type

	whether the tested characters are ok	enter *yes*
	Mini System main menu appears	Choose *Reinstall Reliant UNIX*
2.	**Dialog**	
	You are prompted to specify:	
	date, time, time zone	Enter parameters
	name of the computer	Enter the name
	user profile	Select menu item
	whether the user profile should be enhanced	Select menu item
	system disk	Select system disk
	system disk configuration	Select menu item
	whether the installation values are ok	Press [SAVE] to confirm
		Press [ENTER] to start install.
3.	**Execution**	
	System disk is formatted/partitioned,if requestedFile systems are createdBasic system is installed	
	Miniroot file system is unmountedMini system is powered downBasic system is bootedAdd-on packages are installedRevision packages are installedNew system kernel is generatedBasic system is powered downNew system kernel is booted	
	Ethernet configuration	See Section "Configuring network services"
	Computer with the graphics card: Configuration requested for keyboard, mouse, screen	See ... Enter all relevant parameters save with[SAVE] or [F3]
	Computer is ready	
4.		Post-installation tasks: Log on as user *root* Set password for user *root* Check *.protinst** in the */var/sadm/pkg* directory to ensure that the installation was completed successfully Back up the operating system Increase the swap space, if necessary

		Set passwords for the users *oasys* and *sysadm* Network services and domains (RM600)

10.3 Part 1 of the installation: Dialog

As soon as the Mini System main menu appears (see ...), select the menu item *Reinstall Reliant UNIX*.

10.3.1 Confirming the opening window

The welcome screen contains the following information:

```
Welcome to Reliant UNIX Installation!
In the following sections you must answer a few questions about the installation
If you have never installed the Reliant UNIX system before, you should first
press the HELP (F1) function key. Further information about the installation
procedure is then displayed. If you encounter problems during installation, do
not hesitate to call up the help function by pressing HELP (F1).
```

You have the following options in this window:

```
Continue
Back□□□□□□□□to Previous Menu
Abort□□□□□□□Installation and Reboot
```

Continue

Choose this menu item if you want to carry out a new installation.

Back to Previous Menu

Choose this menu item to return to the previous menu.

Abort Installation and Reboot

Choose this menu item if you want to terminate the mini system and boot the old SINIX or Reliant UNIX system.

You can call up detailed help text by pressing the [HELP] function key. You can continue to view this help text in the course of the dialog, i.e. in the subsequent windows. To do this, you must press the [HELP] function key twice in succession.

- Select the desired menu item.
- Press the [ENTER] function key.

10.3.2 Entering the date, time, and time zone

The system supplies the following information for entering the time parameters:

```
Check the current date, time, and time zone.
You can use the Tab key (TAB), the Enter key or the arrow keys to move back and
forth between the fields in the form. Enter the correct values. If you want to
change the displayed time zone, place the cursor on the relevant field, and
press the CHOICES (F2) function key. A submenu is then displayed
Set Date, Time, and Time Zone
Current date:□□□□□□□□□□□□□□□□10/06/00
Current time:□□□□□□□□□□□□□□□□20:20:53
Enter the current year:□□□□□2000
Enter the month:□□□□□□□□□□□□□10
Enter the day:□□□□□□□□□□□□□□□07
Enter the hour: □□□□□□□□□□□□□10
Enter the minute:□□□□□□□□□□□□21
Enter time zone:□□□□□□□□□□□□□MET-1MDT,M3.5.0/02:>
```

The [USER_INT] function key is displayed in this window and in some of the following windows. You can use this function key to cancel the dialog. For further information, refer to Section "Aborting the installation dialog".

It is then not possible to return to the current window. If you inadvertently press the [USER_INT] function key, you must reload the Mini System main menu.

Any change made to the system date takes effect immediately.

- Check the parameters that are displayed. If a parameter is not correct, move the cursor to the relevant field and correct it. You can display a selection menu in the *Enter time zone* field by pressing the [CHOICES] function key.
- Press the [SAVE] function key.

10.3.3 Entering the host name

The following message is output to request you to enter the host name of your computer:

```
Enter a name for your computer. This name must start with a letter, followed by
other letters, numbers, dashes, or underscore characters.
We recommend that the name does not exceed 8 characters.  This recommendation
does not have to be observed, but entering a name longer than 8 characters can
create problems in certain applications.
If your computer is linked to a network, this name is automatically used as the
name of the network node, and must be unique within the network.
```

- Enter a suitable host name.

  The computer can be accessed in the network using the host name. A "blank" host name is not accepted.

Remote installation:

If you have loaded the mini system remotely, the host name is read from the */etc/inet/bootptab* or */etc/hosts* file on the installation server. As a result, the default host name is only displayed here, just like the network parameters that are currently set. Check these parameters:

- Internet address of the computer,
- Network mask of the computer,
- Internet address of the gateway
- Internet address of the server,

- If the network parameters are not correct, abort the installation. To do this, press the [USER_INT] function key.
- If the network parameters are correct, press [SAVE].

10.3.4 Choosing a user profile

The user profile describes the scope of the software to be installed. The following information appears in the selection window:

```
Now You have to select the Software to be installed on your computer. To do that
you can choose one of the following user profiles:
1.□a application client system - with the option to add
□□□developer support
2.□a core system - the minimum of software a system needs
3.□a full system - the full installed system
You can select to install a user profile as it is defined or you can select to
install it with additional language supplement support. Do not hesitate to use
the HELP (F1) facility to get more information.
```

Core System, Application Client System

Choose one of these menu items if you only want to install part of the Reliant UNIX software.

The different software packages that belong to each user profile can be displayed using the [HELP] function key.

Full System

Choose this menu item if you want to install the complete Reliant UNIX software.

- Select the desired menu item.
- Press [ENTER].

A certain user profile is specified during a new installation. If, during normal operation, you realize that you need additional software from the basic Reliant UNIX system or that you have installed too much software, you can install/remove the appropriate groups or packages using the SYSADM user interface.

10.3.5 Enhancing the user profile

You can vary the user profiles *Core System* and *Application Client System* slightly in the following way. Certain menu items are displayed, depending on the selected user profile.

install□-□as defined
and add□-□language supplement
and add□-□developer support
and add□-□developer support and language supplement

install as defined
Choose this menu item if you do not want to change the selected user profile.

and add language supplement
Choose this menu item if you also want to install the language supplement.

and add developer support
Choose this menu item if you also want to install the developer support.

- Select the desired menu item.
- Press [ENTER].

10.3.6 Defining the system disk

You must now specify the hard disk on which Reliant UNIX is to be installed. The installation procedure proposes the first disk found which would be suitable as the system disk:

Please select the hard disk to be configured as the system disk during this installation.
The window displays the first hard disk found (abbreviation and disk type).
Press the CHOICES (F2) function key if you want to select a different hard disk.
A submenu containing a list of all the hard disks connected to your machine and found by the installation procedure is then displayed.
Disks that are suitable for the installation are indicated by an asterisk '(*)'.
If all the specifications are correct, save them by pressing SAVE (F3).

The following syntax applies to the hard disk names:

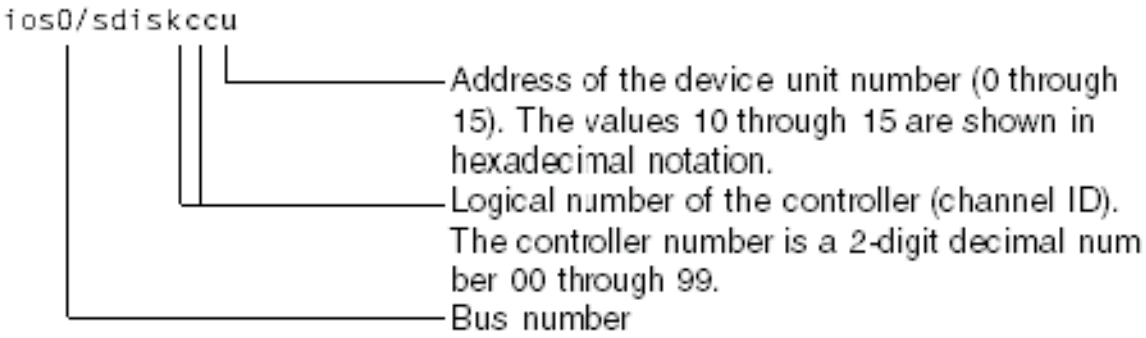


Figure 27: Syntax of the logical names used for hard disks

Further information on the naming conventions can be found in the manual entry for *sdisk*(7) and in the "System Administrator's Reference Manual".

- If you accept the recommended disk, press [SAVE].
- If you wish to select a different disk press [CHOICES].

  A selection list is displayed. The selection list shows all disks in the system cabinet, apart from WORM (Write Once Read Many) and ROD (Rewritable Optical Disk) drives. The drives which are suitable for installation are marked with an asterisk. These are the only drives available to you.

  Drives may be unsuitable, because they do not have enough capacity, or the minimum partition size is not available (see Table "").

  An error message is output if a suitable hard disk is not found. In this case, please refer to Section "No system disk found" to find out what you can do.

- Select the desired hard disk.
- Press the [ENTER] function key. The window is closed and the previous window is reopened.
- Press the [SAVE] function key in this window.

  It is recommended that you note the name of the selected system disk (e.g. */dev/ios0/sdisk020*).

All necessary boot string settings are made automatically during installation of Reliant UNIX.

If you select a system disk which is connected via a controller, neither of their connection slots may be changed after installation, otherwise the system disk will no longer be recognized.

10.3.7 Choosing the system disk configuration

Decide how you want to configure the system disk:
1.□'Standard Partitions', 'Old Part.', 'One Large Part.'
□□□You can accept or modify the selected partition table
□□□(provided the mini operating system is contained on the
□□□RAM disk).
□□□- Standard partitions:□/, <swap>, /opt, /usr, /var, /home
□□□- Old partitions:□□□□□□as before

□□□- One large partition:□An additional partition to / and
□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□<swap> You can also format the disk.
□□□====> ALL DATA WILL BE OVERWRITTEN.
2.□'Preserve Data on /home Partition'
□□□====> The old partitions and the /home file system are
□□□□□□□□□□retained.

Standard partitions

The system disk is to be formatted and/or partitioned before the installation is started. This involves writing the standard partition table to the system disk. The size of the partitions is calculated as a factor of the disk size.

Old partitions

The system disk is to be formatted and/or partitioned before the installation is started. This involves writing the previous ("old") partition table to the system disk. This partition table can contain either "standard" partitioning or one large partition.

One large partition

The system disk is to be formatted and/or partitioned before the installation is started. This involves writing a partition table developed for small hard disks (i.e. hard disks with a less than 1 Gbyte) to the system disk. In contrast to the "standard" layout, only two partitions are created here: */* and */SAM*.

The three menu items described above cause **all** data on the system disk to be deleted! Even data in the */home* file system is lost!

Preserve Data on /home Partition

The partitioning of the system disk and the data in the */home* file system are to be retained. Requirements:

- The hard disk was already used as the system disk before the installation was started.
- The hard disk is divided into 6 partitions ("standard" partitioning).
- The partitions are sufficiently large (see Table "").
- The */home* file system is stored in partition 5.
- Partition 5 does not belong to a virtual disk.

All the data stored in partitions 0 through 4 (and in all parallel partitions) is deleted on the system disk!

Certain add-on products install additional data on the system disk. Problems may arise if the existing partitions are relatively small.

- Select the desired menu item.
- Press the [ENTER] function key.

If you have selected the menu item "Preserve Data on /home Partition", you can move straight on to the Section "Confirming the installation parameters". If you have selected a different menu item, read the following section to find out how you can format and/or partition the system disk.

10.3.8 Formatting and/or partitioning the system disk

If you selected the menu item *Standard partitions* or Old partitions from the *Configure System Disk* menu, three additional windows are displayed in which you can define the formatting and partitioning of the system disk.

Partition 5 (/home) contains a file system.
Choose 'Overwrite Existing /home
□□□to continue with the installation.
□□□Overwriting old /home partition, all data will be lost.
Choose 'Return to Previous Menu'
□□□to return to the menu. You can then choose
□□□'Preserve Data on /home Partition'.
Choose 'Abort'
□□□to terminate the installation and restart the system.

If a file system is found in the */home* partition, you must first confirm that you actually want to overwrite the */home* partition.

You must then decide whether the system disk is to be formatted.

Depending on which menu item you select, either the menu for the standard partition table is opened (see below) or the menu for the old partition table.

□□□Write old Partition Table
□□□Edit the old Partition Table
□□□Format the Disk and Write the old Partition Table
□□□Format the Disk and Edit the old Partition Table

If you want to save the */home* file system and have inadvertently arrived at this point in the program, you should press the [PREVIOUS] function key. You are then returned to the previous window.

The menu for the old partition table looks like this:

□□□Write old Partition Table
□□□Edit the old Partition Table
□□□Format the Disk and Write the old Partition Table
□□□Format the Disk and Edit the old Partition Table

Write Standard Partition Table

The system disk is not formatted during the installation. The standard partitioning is written to disk at the beginning of the second part of the installation (no further menu appears and the installation proceeds with the menu shown in the section Confirming the installation parameters).

Edit Standard Partition Table

The system disk is not formatted during the installation.The standard partitioning is written to disk with changes if the partitioning shown in the next menu *Edit Partition Table* is confirmed using the [SAVE] function key after the relevant entries have been changed.

If you confirm the partitioning shown using the [SAVE] function key, the standard partitioning is written **without changes** to disk.

Format the Disk and Write Standard Partition Table

The system disk is **formatted and partitioned** before installation begins. Only select this menu item if formatting the system disk is necessary.

Format the Disk and Edit Standard Partition Table

The system disk is **formatted and partitioned** before installation begins. If you make changes to the partitioning shown in the next form *Edit Partition Table* by making new entries and confirm them using the[SAVE] function key, the modified partitioning is written to the disk.

The standard partitioning is written to the disk if you do not make any changes and confirm the partitioning shown with [SAVE].

Write old Partition Table

The system disk is **not formatted** during the installation. The old partition table remains unchanged on the disk. The partitioning of the disk is **not changed**.

Edit the old Partition Table

The system disk is **not formatted** during the installation. If you make changes to the entries in the next form *Edit Partition Table* and confirm these changes using the [SAVE] function key, the old partition table is written to the disk with the changes.

If you confirm the partitioning shown using the[SAVE] function key without making any changes, the standard partitioning is written to the disk.

Format the Disk and Write the old Partition Table

The system disk is formatted before the installation begins. The old partition table is then written unchanged again to disk. The partitioning of the disk is not changed.

Format the Disk and Edit the old Partition Table

The system disk is formatted before the installation begins. If you make changes to the entries in the next form *Edit Partition Table* and confirm these changes with[SAVE], the old partition table is written to the disk with the changes.

If you do not make any changes and confirm the partitioning shown using the [SAVE] function key, the standard partitioning is written to the disk.

Normally, it is not necessary to format the system disk when you are carrying out a new installation. You can therefore select the menu item *Write/Edit Partition Table*. However, if you want to format the system disk before you install Reliant UNIX, select the menu item *Format the Disk and Write the Partition Table*.

The system disk is only formatted once you have terminated the dialog and started the installation (see ...). The command */sbin/format (*with the option *f* and the serial number *0* is used to format the system disk (see manual entry for *format*(8)).

- Select the desired menu item.
- Press the [ENTER] function key. You can then edit the partition table:

Edit partition table: ios0/sdisk000 - MP98

Name	Partition	File system	Size[MB] Minimum	Selection
<sash>	10	-	1	2
/	0	ufs	45	100
<swap>	1	-	128	256
/opt	2	vxfs	150	300
/usr	3	vxfs	105	200
/var	4	vxfs	80	200
/home	5	vxfs	35	4095
<remainder>				3520

Add 3520 MB to ios0/sdisk000

You can change the size of the partitions */*, *<swap>*, */opt*, */usr*, */var*, and */home* in the *selection* column. The *remainder* row shows the amount of disk space still available. The default setting is as follows:

- Disk size<= 2 Gbytes:
  - The *selection column* contains the default values.
  - The */home* or */SAM* partition comprises the remainder of the disk.
  - No additional part of the disk is available, i.e. *remainder* = 0.

- Disk size> 2 Gbytes
  - The *selection column* contains the default values.
  - The */home* or */SAM* partition contains the default value.
  - An additional part of the disk is available, i.e. *remainder* > 0.
- Disk size > 8 Gbytes
  - An additional partition 6 is available with a fixed size of 4 Gbytes as a dump device. This partition always comes before partition 15.
  - The */home* partition is comprises the remainder of the disk.

The *File system* column shows which type is assigned to the file systems:

- A *ufs* file system is configured in the */* partition (ufs = UNIX File System).
- *vxfs* file systems are configured in the remaining partitions (default with Reliant UNIX 5.43 or later; vxfs = Veritas Extended File System).

Enlarge the swap area at this stage to avoid problems later (see the Section "Continuation of "normal" autoboot").

If the menu item *Preserve Data on /home Partition* was selected in the *Configure System Disk* menu, the existing type of the */home* file system is retained.

- If you are happy with the suggested partitioning, press the [SAVE] function key.

If you want to resize the partitions, please note the following:

- The partitioning should only be modified by an experienced system administrator.
- The partitions should be **as close as possible in size** to the default values (i.e. the same size as the default setting in the *selection* column).
- The partitions must be **at least as big** as the value set in the *Minimum* column (otherwise, [SAVE] cannot be used to exit the window).
- The total size of all partitions **cannot be greater** than the system disk (i.e. *remainder* must not be negative).
- For disks <= 2 Gbytes, the total size of all partitions should be **exactly the same** as the system disk (i.e. *remainder* should be equal to 0, wherever possible).

When the partitions are configured (i.e. when the installation dialog is concluded), the sizes of these partitions may vary slightly from the values defined here because the partitions must always start and end at cylinder boundaries. As a result, the last partition (i.e. generally */home*) may be slightly smaller.

If you define the values in such a way that *remainder* > 0, an additional partition is set up after the */home* partition during installation. However, you should only use this if both the */home* partition and this additional partition are not too small, i.e. not less than 5 Mbytes.

- Fill in the mask.
- Press the [SAVE] function key.

10.3.9 Confirming the installation parameters

The installation dialog is now concluded:

```
The installation specifications are now complete. All the parameters are
displayed again in the next window. Please check the values carefully.
Then proceed as follows:
- Mark incorrect values with 'new' using the CHOICES (F2) key.
- Confirm your check by pressing SAVE (F3).
```

□□The marked sections are then displayed again so that you
□□can correct the values. This overview containing the
□□current parameters is then displayed again.
-□Confirm each correct value with 'ok'
□□(this is the default).
-□Confirm your check of all values by pressing SAVE (F3).

- Press the [ENTER] function key. An overview of the selected installation parameters is displayed.
- Check carefully to ensure that the displayed values are correct.

Check in particular that the displayed configuration of the */home* partition is correct:

** *run 'mkfs' on /home*	The old data in the */home* file system is lost!
** *preserve old /home*	The old data in the */home* file system is retained!

```
These values should be used for the installation
System name is oldenburg□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ok
Installation CD-ROM is ios0/sdisk005 type OS26
Date is Fri Feb 27 20:39:24 MDT 2000□□□□□□□□ok
Time zone is
MET-1MDT,M3.5.0/02:00:00,M10.5.0/03:00:00□□□□□□□□□ok
User profile is Application Client System□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ok
System disk is ios0/sdisk000 - upgrade partition table□□□□□□ok
Standard file systems and partitions:□□□□□□□□□□□□□□□□□□□□□□□□□ok
Name□□□□□□□Partition□□□Filesystem□□□Size[Mb]□□Comment
<sash>□□□□□10□□□□□□□□□□-□□□□□□□□□□□□2
/□□□□□□□□□□0□□□□□□□□□□□ufs□□□□□□□□□□100
<swap>□□□□□1□□□□□□□□□□□-□□□□□□□□□□□□300
/opt□□□□□□□2□□□□□□□□□□□vxfs□□□□□□□□□450
/usr□□□□□□□3□□□□□□□□□□□vxfs□□□□□□□□□450
/var□□□□□□□4□□□□□□□□□□□vxfs□□□□□□□□□200
/home□□□□□□5□□□□□□□□□□□vxfs□□□□□□□□□7171□□□□□** run 'mkfs' on
□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□**□/home ok
<remainder>□□□□□□□□□□□□□□□□□□□□□□□□□0
```

Information about the file system type can be found in the Section "Formatting and/or partitioning the system disk".

- If all the installation parameters are correct, confirm these values by pressing the [SAVE] function key.

If one or more installation parameters are incorrect, change the relevant entry to *new* using the [CHOICES] function key. Then confirm this by pressing the [SAVE] function key.

In this case, the required windows are displayed once again. Correct the values here. You are then returned to the window shown on the previous page. Press the [ENTER] function key in this window. The above window is displayed again. Then, check all the values again.

10.3.10 Starting the installation

You can now start the installation.

```
You have now answered all the questions and checked your entries.
WARNING: This is the last opportunity you have to abort the Reliant UNIX
installation.
Now choose
-□'Start', if you want to install Reliant UNIX with these
□□parameters,
-□or 'Abort' to exit the installation and reload the system.
```

This is the last chance you have to abort the installation **without** changing relevant data.

Start Installation

Select this menu item if you are sure that you really want to perform an installation using the selected parameters. The installation procedure then continues automatically until the installation is complete (see ...).

Abort Installation and Reboot

Select this menu item if you do **not** want to carry out a new installation. The installation is then aborted and the system is rebooted.

- Choose the desired menu item.
- Press the [ENTER] function key.

10.4 Part 2: Execution

The actual installation procedure starts now. It runs automatically and takes about one and a half hours. You can leave the console during this time, but you should check every now and then to see whether any error messages have been displayed.

In no event should you intervene in the installation, even during the boot process, unless you are specifically prompted to do so by a corresponding message.

You will know that the new installation has run its full course when you have to configure the graphics (on a computer with graphics, see Section "Configuring graphics"), or when the operating system switches to multiuser mode (on a computer without graphics, see ...).

Please note that the messages shown below may vary slightly depending on the actual system configuration.

10.4.1 Formatting/partitioning the system disk

If you have specified that the system disk is to be formatted, the formatting process starts now. It may take a long time – up to an hour for large disks. During this time, no messages are displayed other than formatting/partitioning information.

The partition table is then written to the system disk.

10.4.2 Writing the SASH to the system disk

The new SASH is written from the CD-ROM to the system disk.

```
Sash□is□written□to□the□volume□header.□□□Please□wait...
```

10.4.3 Creating file systems

The file systems are created.

When you create the file systems, all the data that was previously stored in the affected partitions is overwritten. Exception: If you have selected the menu item "Preserve Data on /home Partition" in the *Configure System Disk* menu (see ...), the data in this partition is retained. Depending on whether you have selected this menu item or not, you will see either the message

/home□partition□will□also□be□OVERWRITTEN

A new */home* file system is then also created.

or

/home partition will be PRESERVED.

The output of the commands used is then displayed.

10.4.4 Installing Reliant UNIX basic packages

The installation of the packages of the basic system now commences.

The device files are then created, and autoboot is activated.

Many packages also write a log file to the */var/sadm/install/logs* directory. You can use this log to check whether errors occurred, and if so which ones, once installation is concluded.

10.4.5 Performing post-installation tasks

The basic system is now completely installed and only a few post-installation tasks remain.Finally, the file systems are unmounted.

```
### config is /tmp/dialog.cfg
Performing some post configuration file setup... 
Unmounting all installation file systems... 
/sbin/umount /svr4/usr
/sbin/umount /svr4/var
/sbin/umount /svr4/opt
/sbin/umount /svr4/home
/sbin/umount /svr4
#-------------------------------------------------------------#
#                                                                                          #
#          Installation of PART #1 is complete.                  #
#          System will reboot automatically,                        #
#          please wait, installation is continuing                #
#                                                                                          #
#-------------------------------------------------------------#
# The mini system is now powered down.                           #
```

10.4.6 Booting the basic system

The basic system is now booted automatically.

In no event should you intervene in the boot process.

```
Autoboot: Waiting to load dkncr(0,0,10)sash (CTRL-C to abort,
RETURN to expedite) loading
```

10.4.7 Installing add-on packages

The packages of part 2 of the installation are now installed automatically. This part contains the add-on packages. The installation of these packages is accompanied by corresponding messages. For example:

Some messages indicate that the system must be restarted in order to make the installation effective. You can ignore such messages during the installation procedure.

10.4.8 Installing revision packages

The packages of part 3 of the installation are now installed automatically. This part contains further add-on packages as well as those basic and/or add-on packages for which there is a new software version. Packages of the same name that are already installed are thus overwritten. The length of time required depends on the number of revision packages. The procedure is generally very fast. The installation of the revision packages is accompanied by corresponding messages.

Furthermore, the README file is installed automatically. Please refer to Section "Reading the new README file" for information on how to read this file.

If you selected *VGA-Graphic* as the console type, the graphics software is now installed. For further information, please read the next section. Otherwise, move on to Section "Booting the new system kernel".

If you selected *VGA-Ansi* as the console type, only the *SIadmcon, SIgraphics* and *SIackey* packages are installed.

10.4.9 Installing graphics software (on a graphics console)

If you selected *VGA-Graphic* as the console type, the packages of part 6 (Part #6) are also installed automatically. This part contains the graphics software belonging to the *SINIX/windows User Environment* application program.

```
Starting Installation of Part #6
Installation in progress.  Do not remove the installation media.
```

 Use the *SYSADM* user interface to install system software packages later.

10.4.10 Booting the new system kernel

A new system kernel is then generated. Following this, the basic system is powered down and the new system kernel is booted.


In no event should you intervene in the boot process.

```
Autoboot:□Waiting□to□load□dkncr(0,0,10)sash□(CTRL-C to abort,RETURN to expedite)
loading
```

If you selected *VGA-Graphic* or *VGA-Ansi* as the console type, you must now configure the graphics. For further information, read the next section. Otherwise you can move on to Section "Continuation of "normal" autoboot".

10.4.11 Setting up a default Ethernet configuration

As soon as you have completed installation from the CD (not an update or remote installation), a selection menu appears for you to choose how you want to configure the Ethernet. The following menu items are offered:

```
Default Ethernet Configuration
Exit for later Ethernet Configuration
Installation without Ethernet Configuration
```

If you choose *Exit for later Ethernet Configuration*, you will exit the configuration menu. This is the correct choice if you want to perform the configuration during a later boot.

If you choose *Installation without Ethernet Configuration*, you should be sure that you want to perform the configuration without the menus offered here, i.e. with SYSADM or by editing the necessary system files.

If you choose *Default Ethernet Configuration*, you can set up the default Ethernet configuration with the help of additional menus. By pressing [CANCEL] ([F6] key on ASCII terminals) and [EXIT] ([F8] key on ASCII terminals), you can exit the configuration masks without modifying the configuration.

In the menu which opens when you select *Default Ethernet Configuration*, the IP address stored in the *nvram* is offered as the default. You can substitute a different value for this address if necessary. Confirm the address and save it with [SAVE]. The address is used to calculate the broadcast address and the address of the default gateway automatically.

The next mask shows these values again, so that you can check them. It also requests you to enter the netmask and the interface to be used for accessing the Ethernet. The values for these are defaulted, but can be changed. Only controllers that are actually installed can be entered as the interface. The *etherstat* command lists the installed controllers. To change the values, overwrite the fields or enter *no* or use the [CANCEL] key. If the values are those that you require, confirm the entered values with *yes* and save them with [SAVE].

The *nvram* and the */etc/hosts* and */etc/default/inet* files are now initialized with the selected values.

10.4.12 Configuring graphics

If you selected *VGA-Graphic* or *VGA-Ansi* as the console type, the "normal" autoboot is interrupted so that you can define the graphics parameters. These parameters are needed for three hardware components:

- keyboard
- mouse (only for *VGA-Graphic*)
- screen (only for *VGA-Graphic*)

To do this, you must establish the following details:

Keyboard country variant:

Graphics card connection:	onboard or via additional graphics card
Type of screen:	15", 17" or 21", □ color or monochrome monitor

Mouse type

This information can be obtained either from the inscriptions on the devices or from the Operating Manual.

A special window containing a form is displayed for each component. These windows are part of the *SYSADM* user interface. The procedure for filling in the forms is therefore the same as in *SYSADM*.

Configuring the keyboard

Enter the following parameters to configure the keyboard:

```
Country specific keyboard: _____________
Additional options:□□□□□□□□_____________
```

Information on the parameters:

Country specific keyboard	The keyboards are assigned country-specific characters. You can use the [CHOICES] function key to display an overview of all country variants that are supported. If you do not know the variant that applies to you, you can display a help text by pressing the [HELP] function key. This contains an assignment of the variants available for the type designation of the keyboard. This information can be found on the type label on the underside of the keyboard.
Additional options	Possible values: *no*, *yes* You can enter *yes* here, if required (by pressing the [CHOICES]) function key). An additional menu is then displayed, in which you can change certain default settings (see figure shown below).

Proceed as follows:

- Fill in the form.
- Save the values by pressing the [SAVE] function key.

If you entered *no* for *Additional Options*, please move on to Concluding the keyboard configuration.

Specifying additional options

If you entered *yes* for *Additional Options*, another form is displayed containing the following parameters:

Display mode Possible values: *all*, *alpha*, *graphic*

The keyboard should only be set for one specific display mode. Use the [CHOICES] function key if you want to change the default setting *all*.

Deadkey Possible values: *disabled*, *enabled*

Diacritical characters (e.g. accents) should appear as independent characters (*disabled*) or only in combination with a suitable basic character (*enabled*). Press the [CHOICES] function key if you want to change the default setting *disabled*.

Code set for ANSI Possible values: *88591*, *850*

Here, you can specify which PC code table is to be used for the ANSI terminal emulation(s). The code table can be based on either the ISO 8859 Standard or the PC Industry Standard.

The 97801 terminal emulation (x97801) basically only supports ISO 8859. Press the [CHOICES] function key, if you want to change the default setting.

Proceed as follows:

- Fill in the form.
- Save the values by pressing the [SAVE] function key.

Concluding the keyboard configuration

A message is displayed informing you that the keyboard has been configured successfully.

- Press [CANCEL] to close this message window.
- Press [EXIT] to conclude the keyboard configuration.

The selected settings become effective as soon as autoboot is completed. It is not necessary to restart the system. When autoboot is complete, the only thing you have to do is to assign the correct value to the *$LANG* environment variable.

Configuring the mouse

The following parameters are queried to configure the mouse:

```
Mouse type:□□□□□□_________
Mouse device:□□_________
```

Notes on the parameters:

Mouse□type	Press the [CHOICES] function key to display an overview of all the mouse types that are supported. If you do not know which type applies to you, you can display help text by pressing the [HELP] function key. Default: A Microsoft-compatible mouse with three buttons. If you configure a mouse with two buttons, the third button is emulated in SINIX/windows. You can use this button by pressing the two mouse buttons simultaneously.
Mouse□device	The mouse is generally connected *internally*, i.e. to the mouse port of the computer. Confirm the default setting in this case

- Fill in the form.
- Save the values by pressing the [SAVE] function key.

Configuring the monitor

A menu containing three items is displayed: *Hardware*, *Startup* and *Extended*. Each of these menu items displays a submenu. You **must** configure the hardware, but you can accept the default settings for the other two parameters.

Submenu *Hardware*

Graphics Hardware:□_____
Monitor Type:□□□□□□_____
Graphics Mode:□□□□□_____

Notes on the parameters:

Graphics□Hardwar e Press the [CHOICES] function key and select a module

Monitor□Type Press the [CHOICES] function key

A selection list is then displayed, from which you can select a monitor type. The preferred models appear at the top of the list. If your monitor does not feature in this list, please refer to the manual for your monitor in order to find out the range of horizontal frequencies that your monitor can synchronize. Then choose one of the "*multifrequency*" entries that suits best. □
b/w stands for "black-white" or "monochrome"

Graphics□Mode Press the [CHOICES] function key and select a mode.

A mode is a compilation of several parameters:
- resolution (height and width of the visible image in pixels),
- depth (number of bits per pixel),
- vertical refresh rate in Hertz.

We recommend the following resolution, depending on the size of the monitor:15" and 17" monitor:
1024x76821" monitor: 1280x1024

- Fill in the form.Save the values by pressing the [SAVE] function key.

  You then return to the *X Server Administration* window. You can now proceed as follows, depending on whether you want to configure the *Startup* and *Extended* parameters:

- To terminate the configuration of the X Server:
  Press the [EXIT] function key. Then move on to the Section "Checking the test screen" or
- choose the menu item *Startup*:

  Start via xdm:□_____

Notes on the parameter:

Start□via□xdm If you choose yes here, *xdm* restarts the X server each time the system is powered on and whenever a session is terminated. Your work is then completely graphic.

If you enter *no* instead, the X Server will not start until you invoke the *startx &* or *startrx &* command from the shell. This means that you must first log on to the Alpha screen.

- Save the values by pressing the [SAVE] function key.
  You then return to the *X Server Administration* window.
- Choose the menu item *Extended*:

  Number of screens:□___

Notes on the parameter:

Number□of□screens If a number of screens are connected to your computer, you can enter this number here (maximum of 4). Each screen needs its own graphics card. All the screens are operated using one keyboard and one mouse. The *DISPLAY* variable is defined as follows::0.0□□□ for the first screen,:0.1□□□ for the second screen (and so on).

- Fill in the form.
- Save the values by pressing the [SAVE] function key. You then return to the *X Server Administration* window.
- Press the [EXIT] function key.

Checking the test screen

Finally, a test screen is displayed. Check that the displayed colors and gray tones are acceptable. Move the mouse pointer across the screen. Press all the mouse buttons in succession. Check that the mouse pointer changes accordingly.

```
Server Test Utility
Screen #0: 1024x768, 256 r/w colors (PseudoColor)
Please try to move the mouse and press some buttons.
Press any key to exit.
```

Then, press any key. You must now decide whether the graphics parameters are correct:

```
Mouse and X11 Server ok? [y/n] > _
```

If the test screen is OK and the mouse works correctly, enter *yes* in response to the question shown above.

You are now prompted to enter the *root* password. This is required for the proper startup of the XServer.

You can then move on to the Section "Continuation of "normal" autoboot".

Incorrect graphics parameters

If the test screen shows that the graphics parameters are incorrect, you must enter *no* here. The windows for configuring the mouse (see Section "Configuring the mouse") and screen (see Section "Configuring the monitor") are displayed again. Correct the incorrect parameters until you are happy with the test screen.

If necessary, you can also correct the configuration of the graphics parameters after you have completed the installation.

10.4.13 Continuation of "normal" autoboot

The size of the available swap space is checked next. This space should be at least as large as the main memory, and preferably twice as big. If the swap space of your computer is large enough, the following message is displayed:

```
NOTICE:
Found□102508□KB□of□swap□space,□which□is□enough□for
□□□□□□65536□KB□of□main□memory
```

If the swap space on your computer is too small, you will see the following message instead:

```
WARNING:
**************************************************************
Found□102508□KB□of□swap□space,□which□is□***NOT***□enough□for
□□□□□□261120□KB□of□main□memory
You□run□the□risk□of□a□system□panic□due□to□the□lack□of□swap□space!!!
Please□install□more□swap□space !
**************************************************************
```

In this case, you should note the following:

If you have not already done so, increase the swap space immediately after installation is concluded. Otherwise errors can occur if the computer is overloaded and attempts are made to access the swap space. There are two ways of increasing the swap space:

- You can change the division of the partitions and reinstall Reliant UNIX.
- You can configure an additional swap space using the *swap -a* command (see the manual entry *swap*(1M)).

  We recommend that you configure additional swap space as this will give you greater flexibility if you need to make further changes to the swap area.

  You should modify the */etc/vfstab* file so that the additional swap space is made available in each new boot process. You can allocate partitions from another disk to the swap space.

10.5 Assigning a password

The new installation of Reliant UNIX 5.45 is now complete. You are prompted to log on to the operating system.

```
The system is ready.
Console Login: _
```

- Remove the CD-ROM from the CD-ROM (DVD) drive.

  SINIX V5.41 used a baud rate of 9600 for the console screen. In contrast, SINIX V5.42, Reliant UNIX 5.43 and Reliant UNIX 5.45 use a baud rate of 19200. If unreadable characters appear on your screen instead of the login prompt, you must change the baud rate of your console screen to 19200. For further information, please refer to the Operating Manual for your screen.

- Log on as user *root*.
- Enter the password for the *root* user and then repeat your entry.

```
Your password has expired. Choose a new one
New password: >      <
Re-enter new password: >      <
```

10.6 Post-installation tasks

Reading electronic mail

If you encountered problems with the new installation, use the *mail*(1) command to read the electronic mail. On no account should you ignore this information.

Checking the log

All actions that were performed during the new installation were logged. Check this log.

This log can be found in the */var/sadm/pkg* directory. The first part of the log is contained in the *.prot.install.mini* file, while the second part is in the *.prot_inst.2* file.

Many packages each write a separate log file to the */var/sadm/install/logs* directory. These contain additional information if problems occurred while installing individual packages.

Installing optional products

The "Reliant UNIX 5.45" CD-ROM contains a range of packages that can also be installed. You can use the *SYSADM* user interface for this purpose.

Backing up the operating system

We recommend that you now make a full backup of the system disk. The *DSSI* program can be used for this purpose. Further details are given in the Chapter "DSSI".

You can mirror the system disk to another hard disk. If the system disk fails, Reliant UNIX continues operating on the mirror disk without interruption. Please refer to the manual "Virtual Disks" for further information.

You can install Reliant UNIX on another hard disk. This disk is then entered as the active system disk in the root partition list, and all previously installed system disks are managed as inactive. If the system disk fails, you can start Reliant UNIX from the additional system disk.

Alternatively, you can use the add-on product *NetWorker*. The advantage of this over *DSSI* is that with *NetWorker* you not only back up and restore complete partitions, but also selected files and directories. You can create suitable backup plans with which to monitor and perform regular backups of all important data. If data is lost, the backed up data can be restored quickly and easily. Further information about *NetWorker* can be obtained from your Fujitsu Siemens branch office. The "NetWorker V4.2 - User Guide" will also be of help.

Editing system and/or user data

Compare the new system and/or user data with the data which you backed up before installation (e.g. *passwd*,

shadow). Copy over all important entries.

Under no circumstances should you simply overwrite the new data with the backed up data! If you do this, additional entries that are needed for the new system version will be lost.

Assigning passwords

When you perform a new installation, you should assign the necessary passwords for *oasys*, *sysadm*, etc. or lock these IDs.

Configuring the network

You must now configure the network services. The most important task here is to configure the LAN controllers. Use the *SYSADM* user interface for this purpose. Further details are given in the Chapter "Network services and domains (RM600)".

10.7 Aborting the installation dialog

If you want to abort the installation yourself while you are still in the dialog program, there are two options available to you:

- The menu item *Abort Installation and Reboot* is displayed in certain windows. When you select this menu item, the previous Reliant UNIX system is restarted. The boot process ends in the PROM monitor or firmware monitor.
- The [USER_INT] function key is displayed in certain windows. When you press this function key, a selection menu appears.

  Switch to mini operating system shell
  Backup log to Diskette
  Abort the mini system, execute restart

Check whether you will need the installation log at a later stage!

The actions that were performed in the mini system were logged in the */prot.install.mini* file.

The log file was previously only stored in the main memory. If you want to analyze the log at a later stage, you must back it up on a non-volatile storage medium. To do this, select the menu item *Backup log to Diskette*.

Switch to a mini operating system shell

This menu item brings you to a shell of the mini system. From here, you can execute certain UNIX commands (e.g. *autoconf*(8), *dksetup*(8)). Use the *exit* command or press [Ctrl] [D] to return to the Abort menu.

The settings for language, keyboard, and terminal type, which you selected in the previous menus, are still valid in the mini system.

Backup log to Diskette

The log file */prot.install.mini* is saved to a non-volatile storage medium (diskette).

Another window is displayed in which you are prompted to insert the storage medium. Make sure that it is not write-protected. If you are using a diskette, this must be formatted in UNIX format (using *flformat*(1M)).

The hardware configuration of your system is checked at installation runtime. Backup to magnetic tape is only offered if no floppy disk drive is present.

Abort the mini system, execute restart

The installation dialog is aborted; the previous Reliant UNIX system is restarted. The boot process ends in the PROM monitor or firmware monitor.

It is **not possible** to return to the window in which you pressed the [USER_INT] function key. If you have inadvertently pressed this function key, you must reload the Mini System main menu. If this happens, choose the menu item Abort the mini system, execute restart"

If you abort the installation **after** you have started the installation procedure (i.e. by selecting the menu item Start Installation from the menu shown in the Section "Starting the installation" and then pressing the [ENTER] function key), you must then repeat the new installation.

10.8 Error messages

If an error occurs in the dialog part of the installation, a corresponding message is displayed. Each message is also logged. You can review these messages in the *prot.install.mini* file while the mini system is running, and later in the files *.prot.install.mini* and *.prot_inst.2** in the */var/sadm/pkg* directory. Many packages write their own log in the directory /var/sadm/install/logs. You can also use these logs when the installation is concluded to check that the procedure was performed correctly. An entry is also made for some errors in the */etc/motd* file. This provides you with the relevant information when you are logging on to the operating system. If you have corrected the error in question, you can delete these lines from the */etc/motd* file. Use a text editor for this purpose.

10.8.1 No system disk found

The installation program has checked whether and which hard disks in the system cabinet are suitable for an installation. No suitable hard disk was found. This may be for the following reasons:

- The capacity of the disks is too small and the minimum sizes of the partitions could not be guaranteed (see Table "").
- The disk type either could not be established or is not suitable for an installation. The latter point relates, for example, to WORM disks (WORM = Write Once Read Many).

A corresponding error message is displayed in both cases and can react by choosing one of the following options:

Switch to mini operating system shell
Backup log to Diskette
Abort the mini system, execute restart

Check whether you will need the installation log at a later stage!

All the actions that were performed in the mini system were logged in the */prot.install.mini* file. The log file was previously only stored in main memory. If you want to analyze the log at a later stage, you must back it up on a non-volatile storage medium. To do this, select the menu item *Backup log to Diskette*.

Switch to a mini operating system shell

This menu item brings you to a shell of the mini system. From here, you can execute certain UNIX commands (e.g. *autoconf*(8), *dksetup*(8)). Use the *exit* command or press [Ctrl] [D] to return to the Abort menu.

The settings for language, keyboard, and terminal type, which you selected in the previous menus, are still valid in the mini system.

Backup log to Diskette

The log file */prot.install.mini* is saved to a non-volatile storage medium (diskette).

Another window is displayed in which you are prompted to insert the diskette. Make sure that it is formatted in UNIX format (using *flformat*(1M)).

The hardware configuration of your system is checked at installation runtime. Backup to magnetic tape is only offered if no floppy disk drive is present.

Abort the mini system, execute restart

The installation dialog is aborted; the previous UNIX system is restarted. The boot process ends in the PROM monitor or firmware monitor.

10.8.2 Unsuitable system disk partitioning

You selected the menu item *Preserve Data on /home Partition* from the *Configure System Disk* menu (see ...). The installation program then checked that the partitioning of the selected hard disk corresponds to the requirements that are laid down for a system disk. An error was detected here – possibly for the following reasons:

- One or more of the partitions required for the system disk are missing. The system disk needs a total of eight partitions:
  - partitions 0 through 5 for the Reliant UNIX file systems,
  - partition 10 for the SASH,
  - partition 15 for the status information, if the system disk is mirrored.
- One or more of the existing partitions is less than the required minimum size (see Table "").

A corresponding error message is displayed in both cases and can react by choosing one of the following options:

Return to Previous Menu
Abort Installation and Reboot

 Check whether you really need the data in the */home* partition!

What you should do now depends on your actual situation:

Situation 1:

You really need the data in the */home* partition.

- Select the menu item *Abort Installation and Reboot*.
- Load the mini system again (see ...).
- Back up the data in the */home* partition using *DSSI* (see Chapter "DSSI").

  Terminate *DSSI* by selecting the menu item *M* (see ...).
- Start the new installation again (see Section "Part 1 of the installation: Dialog").
- Select the menu item *Standard partitions*, *Old partitions* or *One large partition* from the *Configure System Disk* menu (see ...).
- When the new installation is complete, write the backed up data back to the */home* partition.

Situation 2:

You do **not** need the data in the */home* partition.

- Select the menu item *Return to Previous Menu*.
- Choose the menu item *Standard partitions*, *Old partitions* or *One large partition* here.

10.8.3 Correcting incorrect graphics parameters

If the test screen shows that the graphics parameters are incorrect, you can correct the configuration of the graphics parameters after you have completed the installation. The following steps must then be carried out:

- Log on as the user *root*.
- Start the *SYSADM* user interface.

  If the keyboard has the wrong character set assignment, please note that the letters *y* and *z* may be reversed. However, the assignment of the cursor keys (arrow keys) is unchanged.

  If you have not configured the keyboard at all, it is assigned the character set of the *US/international* country variant.
- From the main menu, select the item *console_config*. The window *Keyboard, Mouse, Xserver Configuration for Console* then appears. The forms explained earlier (see ...) can then be displayed by selecting the menu items *keyboard* (menu item *set*), *mouse* and *xserver*.
- Correct the values and save the correct settings using the [SAVE] function key.
- Exit *SYSADM*.
- Then restart UNIX.

```
# cd /
# shutdown -i6 -g0
```

10.9 Configuration file

In Reliant UNIX 5.45, installation can be carried out automatically, i.e. without a dialog. In this case, the installation procedure reads all the details required during installation from a configuration file called *install.cfg*.

You should **only** perform this type of installation if you have a lot of experience in installing Reliant UNIX systems!

10.9.1 Format of the configuration file

The configuration file has a defined format. It consists of a number of different sections, each of which defines the value of an installation parameter. Each section is introduced by a comment and contains a list of the valid values for the parameter:

Parameter	Valid values	Meaning
INST_TYPE		Type of installation procedure
	install	The installation procedure stored on the "Reliant UNIX 5.44" CD-ROM is to be used.
	custom	An installation procedure defined by the user is to be used.
TERM	*vt02, 97801, xterm,ansi-tc20 -c, ba80-vt220*	Console or terminal type
	AT386	VGA graphics
	AT386-M	VGA ANSI
KEYB		Keyboard language
	german	German keyboard (includes umlauts and the line of keys "qwertz")
	french	French keyboard (includes the line of keys "azerty")
	international	All keyboards except for German and French keyboards should be mapped to *international* for the installation
ROOT_DISK		Device name of the system disk on which installation is to take place. Corresponds to the output of the command *autoconf -l*
OLDHOME	Default value:	Preserve data in the */home* partition?
	YES	The data in the */home* partition is preserved during installation, only an fsck is performed on the file system
	NO	The data in the */home* partition is destroyed, an *mkfs* is performed on the file system during installation
DK_FLAG	Default value:□	Determines whether system disk is formatted

	-U	Upgrade the system disk (*dksetup -l*)
	-F	Format the system disk
STD_PART	Default value:	Indicates whether the standard partitioning is to be written to the disk, or whether the old disk partitioning is to be retained
	true	The standard partitioning is to be written to the disk
	false	The old disk partition table is used
SAM_PART	Default value:	Indicates the number of partitions on the system disk
	true	The system disk is split into three partitions: the *Root* partition, the *Swap* partition and the remainder of the disk as one large partition. Partitions 10 and 15 are of course reserved for a system disk. The *SAM* partition is at most 4 Gbytes in size. If the disk is larger, a further partition (Partition 3) will be set up behind the *SAM* partition. This is then freely available since it is not needed by the operating system.
	false	The system disk is to be divided into six partitions - *root*, *swap*, *opt*, *usr*, *var*, and *home*
MOD_PART	Default value:	Edit partition table
	true	The partition table on the system disk is to be modified. The values of the variables whose names end with _SZ are used for this purpose.
	false	The partition table on the system disk is not to be modified, i.e. a standard partition or an old partition on the disk is retained.
Variables whose name ends with _SZ are only evaluated if *MOD_PART*=*true*. The variables determine the size of the partitions on the system disk. The size of the partitions are specified in Mbytes.		
ROOT_SZ	Size of the partition in mbytes:	Defines the size of the *Root* partition
SWAP_SZ	Size of the partition in mbytes:	Defines the size of the *Swap* partition
OPT_SZ	Size of the partition in mbytes:	Defines the size of the *opt* partition
USR_SZ	Size of the partition in mbytes:	Defines the size of the *usr* partition
VAR_SZ	Size of the partition in	Defines the size of the *var* partition

	mbytes:	
HOME_SZ	Size of the partition in mbytes:	Defines the size of the *home* partition
REM_SZ	Default value:	Indicates whether the *home* partition encompasses all of the remainder of the system disk or whether another partition is located behind the *home* partition that is available to the user
	0	*home* partition uses the remainder of the disk
	1	There is another partition (partition 6) behind the *home* partition. In this case, the value of *HOME_SZ* determines the size of the *home* partition; partition 6 occupies the remainder of the disk. No file system is set up on partition 6 during installation.
The following variables, whose names end with _FS, describe the file system type on the system disk:		
ROOT_FS	ufs	File system type of the *root* partition
OPT_FS	vxfs	File system type of the *opt* partition
USR_FS	vxfs	File system type of the *usr* partition
VAR_FS	vxfs	File system type of the *var* partition
HOME_FS	vxfs, ufs	File system type of the *home* partition. The value *ufs* is only permitted if *OLDHOME=YES* is set and the old file system for */home* was of the type *ufs*.
SAM_FS	vxfs	File system type of the *SAM* partition
cd_inst	*yes*, *no*	Use CD-ROM as the installation medium?This parameter is always *yes* because the only installation medium supported at present is CD-ROM.
TAPE		Device name of the tape deviceThis parameter is always blank because the only installation medium supported at present is CD-ROM.
MACH_NAME		Node name of the system
TZ	All valid time zones	Time zone
TOPIC		User profile defining the scope of installation (number of packages) and thus the function range of the system. *SYSADM* can be used after installation to change the user profile.
	Core	Core system
	acs	Application client system

	dcs	Application client system + developer support
	full	Full system
TOPIC_OPT		User profile option
	def	As defined
	msg	German language support
sel	*Y*	Variables for user profile and *SIupm*
unsel *reqpsel*	NRP	Do not change!

You will find the sample file *install.cfg* on the "Reliant UNIX 5.45" CD-ROM in the */MINI_EXT* directory.

As of Version 5.44 A00, the */var/sadm/pkg/.install.cfg* file will be created automatically at the end of the installation if the installation is being performed interactively (FMLI menus). All of the values selected interactively are contained in this file. If you have a number of absolutely identical systems to install, you can use this file as a configuration file for other installations.

10.9.2 Preparing the configuration file

You can prepare the configuration file in three different ways:

- on a server for remote installation
- on a diskette to be called up with *cpio*
- on partition 0 of the system disk

If you modify the configuration file, you should take extreme care not to enter any invalid values and to ensure that the values of all the parameters are compatible.

Make sure that you prepare a current configuration file. Only this file contains all of the parameters required to install the current version. Before starting the installation, the system checks that the file is current. You will find an up-to-date file on the operating system CD-ROM supplied for installation under *MINI_EXT/install.cfg*.

Preparing the configuration file on diskette in cpio format

- Mount the CD-ROM (DVD) drive, if it is not already mounted.

  # mount -F hs /dev/ios0/sdisk015s0 /mnt

- Copy the sample file to the hard disk.

  # cp /mnt/MINI_EXT/install.cfg /home/hugo

- Unmount the CD-ROM (DVD) drive again, if necessary.

  # umount /mnt

- Edit the sample file (e.g. with the *vi* editor) and enter the desired installation parameters.

  # vi /home/hugo/install.cfg

- Save the updated configuration file and exit the editor.
- Format the diskette.

  # flformat /dev/at/flp/rfx3ht

- Write the configuration file to the diskette in *cpio* format.

 # ls /home/hugo/install.cfg | cpio -ovc > /dev/at/flp/rf0t

Preparing the configuration file on a hard disk

- Change to the root directory.

  # cd /

- Mount the CD-ROM (DVD) drive, if it is not already mounted.

  # mount -F hs /dev/ios0/sdisk005s0 /mnt

- Copy the sample file to the hard disk.

  # cp /mnt/MINI_EXT/install.cfg .

- Unmount the CD-ROM (DVD) drive again, if necessary.

  # umount /mnt

- Edit the sample file and enter the desired installation parameters.

  # vi install.cfg

- Save the updated configuration file and exit the editor.

Preparing the configuration file on a server (remote installation)

In order to perform a remote installation, the installation server and the client must be configured appropriately (see Section "Preparing for remote installation").

- Create the client directory on the server.

  # mkdir /var/sadm/remote/*CLIENT_NAME*

- Copy the sample file *install.cfg*.

  # cp /var/sadm/remote/cdrom/MINI_EXT/install.cfg /var/sadm/remote/*CLIENT_NAME*

- Edit the file using an editor, e.g. *vi*:

  # vi /var/sadm/remote/*CLIENT_NAME*/install.cfg

10.9.3 Starting the automatic installation

The remaining process can be controlled from within Reliant UNIX:

- If you wish to install on the **local** computer, enter the following

  # nvram -S i
  # init 6

- If you wish to install on a **remote** computer, enter the following

  # nvram -S r
  # init 6

  
  The installation server and the client must be appropriately configured to enable a remote installation to be carried out (see Section "Preparing for remote installation").

  No further input is necessary. The procedure is identical with an interactive installation.

11 Update installation for RM200, RM300, RM400

This chapter describes how to perform an update installation of the Reliant UNIX 5.45 operating system on an RM200, RM300 or RM400 if an earlier version of this operating system is already installed on the computer.

All the tasks required for an update installation are listed in a special work schedule which can be found in Section "Update installation". You should therefore copy this work schedule. Then read the sections in the manual that are mentioned in the work schedule.

Please note that the computer is supplied with the operating system **preinstalled**. When you power up the computer for the first time, you need only carry out the actions described in the operating manual.

If you merely want to reinstall the previous version of the operating system, please read Chapter "New installation on an RM600".

There are a number of special considerations to be taken into account if you are changing from a 32-bit operating system (version <5.44) to a 64-bit operating system (5.44A00 and higher). Please read the information on the next page.

As a **prerequisite** for installing Reliant UNIX 5.45 on the RM200, RM300 and RM400 systems, you need a main memory configuration of at least 64 Mbytes.

After performing an update installation, you have to check your OBSERVE configuration again. Please refer to the information provided in your update log.

If your system is part of a cluster, you must ensure that all the systems in the cluster are using the same Reliant Unix version and the same versions of software components. This avoids incompatibilities between new versions of software components on one machine and older versions on other machines in the cluster.

An update installation is more complex than a new installation. This is because the user-specific configurations of the systems may differ considerably. You should be very familiar with the configuration of your computer if you choose this type of installation. If you do not want to perform the installation yourself, you have it done by the Fujitsu Siemens Service department.

The update installation is a largely automatic procedure. All the actions that are performed are logged. The log is stored in the file */var/sadm/pkg/.prot.update*.

The Reliant UNIX operating system is supplied on CD-ROM and is therefore installed using the CD-ROM (DVD) drive. The amount of time required to carry out an update installation varies considerably, and depends, for example, on which software packages were previously installed on the system disk, and which of these now have to be updated.

11.1 General guidelines

Please observe the following rules during installation:

- If you want to abort the update installation, you must enter the key combination [Ctrl] [C].
- If the installation procedure aborts before running its full course, a corresponding error message is displayed. This will tell you what action you should take (see Section "Evaluating the log"). If you cannot resolve the problem, contact the Fujitsu Siemens Service department.

When you carry out an update installation, the configuration that was previously set on your Reliant

UNIX operating system is retained. This relates, for example, to certain files like */etc/passwd*, the configuration of the terminals, and installed add-on products. For further information, refer to Section "Transferring configuration files". The specifications relating to which hard disk on your computer is used as the system disk, and how this disk is partitioned, cannot be changed.

Optional packages that are already installed are automatically updated in the course of an update installation.

- The update recognizes two operating modes: a **check mode** and an **armed mode**. The check mode allows the early detection of problems that may prevent an update installation. This mode does not modify the current system, and can be started as often as required.
- The update will allow you to move from a 32-bit operating system to a 64-bit operating system. Particular attention is paid here to third-party add-on products.
- The update can be stopped and started again. For example, if the update procedure aborts following an error (ERROR), it continues again automatically starting at the point at which it was aborted.
- The update can run with or without dialog (using the control file).
- The user can request that only the software packages already installed on the system disk are updated. This ensures that no new packages are installed.
- Various options can be set for the update installation.
- There is an interface for external procedures.

11.2 Preparing for installation

If you intend to perform an update installation, you should start making preparations as soon as possible when you have received a new "Reliant UNIX 5.45 B00" CD-ROM. You should allow several weeks before you actually carry out the update installation, so that you have enough time to deal with any problems that may occur.

Check the following on the CD-ROM you want to use:

- The CD-ROM must bear the subtitle "Šnzung;".
- The CD-ROM must contain a more recent Reliant UNIX version or SINIX version than that already installed on your computer.

Selecting the installation procedure

The update installation can be carried out either locally or remotely. In the case of a local installation, the installation medium (the CD-ROM (DVD) drive in this case) is located on the machine whose operating system is to be updated. In the case of a remote installation, on the other hand, the installation medium is accessed through a network environment (*nfs*). Different preparatory steps are required, depending on which option you choose. Now read the section which relates to the type of installation you want to perform.

Local installation

- Insert the "Reliant UNIX 5.45" CD-ROM in the CD-ROM (DVD) drive of the **local** computer.

Please skip to the Section "Checking the operating system/revision version".

Remote installation

- Select a server which has a CD-ROM (DVD) drive.
- Insert the "Reliant UNIX 5.45" CD-ROM in the CD-ROM (DVD) drive of the **server**.
- Start *SYSADM*. The main menu appears.
- Select the menu item *software_prod*. The *Process_Products* menu appears.
- Choose the menu item *miscellaneous*. The *Miscellaneous Functions* menu appears.
- Select the menu item *prepare_server*. The *Prepare as CD-ROM Server* form appears:

```
CD-ROM device name:□□_____

Local mountpoint:□□□□_____

Clients:□□□□□□□□□□□□□□_____
```

Enter the following details in the form:

CD-ROM device name	Device name of the CD-ROM (DVD) drive. This may be the name of the device file or the alias, as is entered in the */etc/device.tab* file. Press the [CHOICES] function key to display a list of valid device names.
Local mountpoint	Name of the directory in which the CD-ROM (DVD) drive is mounted.
Clients	Names of all client systems The name of a client system corresponds to the output from *uname -n*. The names must be separated by a blank.

- Fill in the form.
- Press the [SAVE] function key.
- Press Ú.
- Exit *SYSADM*. To do this, press the [EXIT] function key.

You can now switch to the console of the first client system. The installation then proceeds in the same way as on a local system.

Checking the operating system/revision version

- Read the README file which is stored on the current "Reliant UNIX 5.45" CD-ROM (see ...).
- Check which revision version of Reliant UNIX is already installed on the computer:

```
#□uname□-rsv
```

The README file will tell you whether this revision version is suitable as a basis for an update installation. If it is not suitable, there are two things you can do:

- Perform a new installation.
- Contact the Fujitsu Siemens Service department.

11.2.1 Installing the SInus package

You must first install the *SInus* package (SINIX New Update Set). Use the *SYSADM* user interface for this purpose. The required actions are listed below. A detailed description can be found in the "System Administration and Hardware Configuration Using the SYSADM User Interface" manual.

 Installing the package is a completely safe procedure. It does not affect the existing system.

- Start *SYSADM*. The main menu appears.
- Choose the menu item *software_prod*. The *Process_Products* menu appears.
- Choose the menu item *products_on_CD*. The *Process Multi-Product CD-ROM* form is displayed.
- Press the [SAVE] function key.

  You may be asked whether or not the consistency of the product database is to be established. Answer *yes*. A text window containing the copyright notice appears.
- Press the [CONTINUE] function key. A selection list of all the add-on products that are on the CD-ROM appears.
- Mark the product *SInus* using the [MARK] function key.
- Press the [ENTER] function key. The function menu appears.
- Choose the menu item *install*. The installation form appears.

  Installation extent:□□□□□□□□□□□□□□Complete Product□□
  Installation mode:□□□□□□□□□□□□□□□□automatic□□□□□□□□□
  Installation defaults filename:□□default□□□□□□□□□□□
  Path to response file:□□□□□□□□□□□□on CD-ROM□□□□□□□□□

  Accept the default settings without making any changes.
- Press the [SAVE] function key.

  Before the package is installed, the system may check which packages have already been installed, modified or removed on the system disk. After this, the package *SInus* will be installed.
- Press the Ú key when installation is complete. The installation form appears again.
- Exit *SYSADM*. To do this, press the function keys [CANCEL], [CANCEL] and [EXIT] in succession.

The *SInus* package contains

- the manual entry *update*(1M),
- the utilities required for an update installation.

11.2.2 Reading the manual entry

You must now read the manual entry which describes the update installation. This manual entry was installed together with the *SInus* package.

#□man□update

The manual entry describes the requirements for an update installation, the installation procedure, possible error sources, and what to do if errors occur.

It is important that you take the time to read the entire manual entry.

The README file, which can also be found on the "Reliant UNIX 5.45" CD-ROM, does **not** contain any information about the various operations involved in an update installation. However, it does contain details of the special features of the current Reliant UNIX 5.45 version with regard to the update installation.

11.2.3 Mounting the installation medium

You can perform the update installation locally or remotely. In both cases, the installation software is loaded from the "Reliant UNIX 5.45" CD-ROM.

In special cases, it may be a good idea to copy the complete CD-ROM to the hard disk and load the installation software from there. However, this type of update installation can only be carried out by the Siemens AG Service department.

- Choose the installation procedure which best suits your needs.

Depending on the choice you make, different actions are required in order to mount the CD-ROM (DVD) drive. The following syntax must be used for the commands listed below:

x
: Device number of the hard disk or the CD-ROM (DVD) drive

server
: Name of the remote system (which provides the software)□
for the remote installation

client

Name of the local system for the remote installation □
(whose operating system is to be updated)

fs_typ

File system type

As of Reliant UNIX 5.43, a *ufs* file system is generally configured in the */* partition for a new installation, while *vxfs* file systems are configured in the other partitions (ufs = UNIX File System, vxfs = Veritas Extended File System).

/SInus

New mount point for the installation medium

This was created when the *SInus* package was installed. The advantage of a new directory is that the existing directories (e.g. */cdrom*, */mnt*) remain free and can still be used.

Local installation

If you want to load the installation software using the CD-ROM (DVD) drive of the local system, you have to:

- Insert the new "Reliant UNIX 5.45" CD-ROM in the CD-ROM (DVD) drive of the **local** system.
- Mount the installation medium in the */SInus* directory.

```
#□mount□-F□hs□<devicename>□/SInus
```

Remote installation

If you want to load the installation software using the CD-ROM (DVD) drive of a server that can be accessed using *nfs*, you must do the following:

- Insert the new "Reliant UNIX 5.45" CD-ROM in the CD-ROM (DVD) drive of the **server**.
- Enter the following commands on the server:

```
#□mount□-F□hs□<devicename>□/cdrom
#□share□-oro,root=client□/cdrom
```

- Switch to the client.

- Mount the installation medium in the */SInus* directory.

  #□mount□-F□nfs□server:/cdrom□/SInus

Since the update installation is performed (armed mode) in single-user mode, you must first set up the network connection to the server before this mode is executed. Examples of how to do this are contained in the manual entry *update*. If, on the other hand, you simply want to run a check procedure (check mode), you do not need to switch to single-user mode.

11.2.4 Syntax of the update(1M) command

The *update*(1M) command can be called with the following options:

-a armed mode

carries out an update installation

-c check mode

checks that an update installation was successful

-e error

error messages (ERROR) are ignored

Be careful when using this option. You will not be warned of any possible instabilities.

-h help

displays the syntax of the *update*(1M) command

-o only the installed packages

tests / installs only the software packages that are found in the current system. This means that no **new** packages are installed except those required for the current version.

-r file read

reads all of the installation parameters from the *file*. A sample file can be found under */etc/update.cfg*. If you are interested in this type of installation, please read the manual entry *update*(1M).

All of the options are described in detail in the manual entry *update*(1M). You should therefore read this manual entry before you start the update installation. We will only explain two options in detail at this point:

- The update procedure can be executed in two different modes: in **check mode** (*-c* option) or in **armed mode** (*-a* option). Check mode allows the early detection of problems that may prevent an update installation. The update procedure can be started as often as required in this mode.
- The update "records" the processing status in an internal **history file**. The advantage of this is as follows: If you start the update again because it was aborted the last time (following an error or after you pressed [Ctrl] [C]), the program resumes at the exact point at which it was aborted. This "resume" function can save a considerable amount of time. The history file is only modified in armed mode. The check mode can only read the history file.


Please note that only one *update* command can run at any **one** time.

11.3 Update check

Before you start the actual update installation, you should check whether problems are to be expected, and if so, which specific problems.


Start check mode as soon as possible after you have received the CD-ROM containing the new Reliant UNIX version. You then have enough time to correct any problems that may occur. Check mode does not modify the current Reliant UNIX system.

- Issue the *update*(1M) command in **check mode**. For example:

```
#□/etc/update□-c
```

When check mode is started, the following message is first displayed:

```
+++□INFO:□□□□Congratulations!□You□are□about□to□update□to
□□□□□□□□□□□□□□Reliant UNIX-N5.45B00.
+++□□□□□□□□□□□UPDATE□is□running□in□check□mode.
```

This is followed by other messages which report the success or failure of each individual check. The messages are the same as those that would be displayed in armed mode. The final message reveals the end result of the check:

```
+++□INFO:□□□Report□for□'update□-c'□:
+++□INFO:□□□We□detected□the□following□during□the□UPDATE□runtime:
+++□□□□□□□□□□Number□of□WARNINGs□:□□□□□□□0□
+++□□□□□□□□□□Number□of□ERRORs□□□:□□□□□□□0
```

If check mode did not find any problems (WARNINGS = 0, ERRORS = 0), you can then start the update installation in armed mode (see next section).


As little time as possible should elapse between checking whether an update is possible and performing the installation.

11.4 Evaluating the log

The update logs all the processing steps, both in check mode and in armed mode, in the */var/sadm/pkg/.prot.update* file. You can use this log to check on the various steps once the procedure is completed. The log begins with the message:

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
++ This log reports actions concerning the
++ UPDATE. The first attempt started on Fri Jan 29 14:41:23
□□□MDT 2000
++ Please bear in mind that the most current run
++ is located at the end of this report file
++ (A comfortable and usual way of reading this
++ file is to go to the end of this file and
++ to search backwards for the
++ pattern "+++ run of UPDATE started".
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

There then follow all the calls of one and the same update procedure. Since this may make the log relatively long, the individual calls are separated optically from each other. Each call begins with

```
+++ run of UPDATE started at ...
```

and ends with

```
+++ run of UPDATE ended at ... with RETURN= ...
```

Please note that the last run of the update procedure is located at the end of the file. The individual actions within the procedure calls are identified more precisely by keywords:

INFO

This section informs you of the "normal" execution of the procedure. This information keeps you up-to-date with the current processing status. No actions are necessary.

WARNING

This section informs you of the "unusual" execution of the procedure. The significance of this information depends on the update mode:

Check mode: There is a problem which requires your attention. If the problem is not corrected, it may result in an error (ERROR) in armed mode, i.e. normally the update will be aborted.

Correct the problem before you start the update in armed mode.

Armed mode: There is a problem which requires your attention. This problem did not abort the update, but you should still correct it as soon as possible.

ERROR

This section indicates a problem which prevents the update installation from being carried out. Normally (i.e. if the *-e* option is not set, see ...), the update aborts because there does not seem to be any point in continuing. For example, the problem may be that the installation medium is invalid. If this is the case, many of the checks cannot be carried out.

Correct the problem and start the update again.

The update can be started as often as required in check mode.

11.5 Carrying out the update

If no warnings or errors are reported when you check to ensure that the system is suitable for updating, you can now carry out the update installation.

The result of the check mode is only meaningful if

- the system was not modified since the last check and
- the same installation medium is used for armed mode.

- Make a **complete backup** of the system.

You will need a complete backup should the following situation arise:

- armed mode aborts, issuing an error (ERROR)

  In this case, you must first restore the old system. Otherwise, you may encounter problems in the interaction between the "old" and the already updated software.

11.5.1 Switching to single-user mode

- Switch to single-user mode.

```
#□cd□/
#□shutdown□-is□-g900
```

The *-g900* option introduces a time delay of 900□seconds or 15□minutes. You should select this time delay if other users are logged on. Otherwise, you can specify the *-g0* option instead.

11.5.2 Starting check mode again

Single-user mode was selected in order to ensure that no interaction could occur between the update and other active processes.

- Start the **check mode** of the *update*(1M) command again. For example:

```
#□/etc/update□-c
```

- Check the */var/sadm/pkg/.prot.update* log file again.

11.5.3 Starting armed mode

- Start the **armed mode** of the *update*(1M) command. For example:

```
#□/etc/update□-a
```

You can now leave the console. You are informed on a regular basis about how the installation is progressing. Example of installing software packages:

```
still□n□of□m□packages□to□install
```

You should note that the system may reboot automatically depending on the type of update (single phase or two phases). You should not intervene manually. **Each** update terminates with a final report which tells you what you have to do next. You will always get a shell where you can carry out any necessary revisions.

The update installation can be performed in command line mode and also invoked via the interface to the configuration file. In the second scenario, the *update*(8) command uses a configuration file (*-r* option), which allows the installation to be started as an *at*(1) job, e.□g. at a time when the system is not heavily loaded.

The update installation can be carried out both interactively and automatically. In the case of the latter, the *update*(1M) command uses a configuration file (*-r* option). As a result, the installation can be started as an *at*(1) job, e.g. at a time when the system is not overloaded.

If the armed mode aborts and issues an error (ERROR), please note:

- The update aborts with an error that you cannot rectify yourself.

  Continue the update installation **as soon as possible**! The system should not remain in a "semi-updated" state for any length of time. The update has recorded the processing status and will restart at the exact location where the error occurred. Do not change the external conditions between the update runs (for example do not change the *mount* option you used to mount the installation medium).
- **Under no circumstances should you restart the system before the update installation has been completed successfully!**
- Otherwise, problems can occur in the interaction between the "old" and the already updated software.
- However, if you have to restart the system, you must first restore the old system. To do this, use the complete backup which you made **before** you started the armed mode.
- Cancel the EEPROM update by reading in the firmware from the CD-ROM containing the old firmware version.
- It may take some time to update the software. Do not interrupt this process unless you have to, in order to avoid problems between "old" and "new" software. A manual reboot, in particular, can cause unexpected problems which could force you to reload your data backup.

11.6 Post-installation tasks, part 1

When the update installation of Reliant UNIX 5.45 has been completed, you are informed of how it proceeded.

1st possibility: No messages of the WARNING or ERROR type

```
+++ INFO: Report for 'update -a':
+++ INFO: We detected the following during the UPDATE runtime:
+++        Number of WARNINGs:       0
+++        Number of ERRORs   :       0
+++ INFO: Excellent! The current UPDATE installation run ended
          successfully.
+++        Since this UPDATE run is a reentry,
+++        you must bear in mind the WARNINGS you saw in the
+++        previous UPDATE run.
+++        Please look in the log file.
+++        Please reboot your system as soon as possible.
+++        Make sure that you have read the entire log file
+++        and that you are quite familiar with the results
          reported by
+++        the UPDATE installation.
```

Please note that the figures given in lines 3 and 4 only refer to the last run of the update procedure. If you have started the update procedure more than once, you should check the log */var/sadm/pkg/.prot.update* even if no messages of the WARNING or ERROR type were output in the last run (see next section).

2nd possibility: Messages of the WARNING type

```
+++ INFO: Report for 'update -a':
+++ INFO: We detected the following during the UPDATE runtime:
+++        Number of WARNINGs:       5
+++        Number of ERRORs   :       0
+++ INFO: Excellent! The current UPDATE installation run ended successfully.
+++        (Please look in the log file named
+++        /var/sadm/install/../pkg/.prot.update)
+++
+++        Please reboot your system as soon as possible.
+++        Make sure you have read the entire log file
+++        and that you are quite familiar with the results reported by
+++        the UPDATE installation.
```

Before restarting the system, you should first check what problems have occurred and rectify them.

- Use the log to check which problems have occurred.
- Rectify these problems as soon as possible.

  While doing so, also update those configuration files for which automatic updating was not successful. This is necessary because some configuration files are only analyzed in the boot phase of the system. For more detailed information, refer to the manual entry *update*(8) (see ...).

You can now read on in Section "Restarting the system".

3rd possibility: Messages of the ERROR type

Problems have arisen which have caused the UPDATE to abort. Depending on the version of Reliant Unix from which the update was started (Reliant UNIX 5.43 or Reliant UNIX 5.44), you will get an error message and a shell in which you should resolve the problem.

```
+++ INFO: Report for 'update -a':
+++ INFO: We detected the following during the UPDATE runtime:
+++        Number of WARNINGs:       3
+++        Number of ERRORs   :       1
+++ INFO: Sorry! This update attempt was not successful.
+++        Please look at in the log file named
+++        /var/sadm/install/../pkg/.prot.update
+++        and pay particular attention to the 'ERRORS' and 'WARNINGS'.
```

```
+++□□□□□□□□□□You can restart the UPDATE once the problems
+++□□□□□□□□□□are resolved.
```

- Use the log to check which problems have occurred.
- Rectify these problems as soon as possible.
- Restart the update procedure using the command suggested by the UPDATE procedure.

Do not leave the system in a "semi-updated" state for too long. Also do not perform a restart before the update procedure has been completed. Otherwise, unforeseeable problems may occur in the interaction between "old" and already updated software.

11.7 Restarting the system

After the update installation has been completed, you should restart the system as soon as possible.

- Remove the CD-ROM from the CD-ROM (DVD) drive.
- Restart the system (e.□g. with *init 6*).
- Log on again as user *root*.

11.8 Post-installation tasks, part 2

Parameters for graphics consoles

The parameters must be set with SYSADM after installing an update on systems with graphical consoles. You should therefore always note the settings for keyboard and X server.

Noting the daily message

If problems occurred during the update installation, a daily message containing corresponding information is displayed after you log on

```
+++□INFO□FROM□UPDATE:□Please□don't□forget□to□read
+++□the□UPDATE□installation□log□concerning WARNINGs.
```

Adapting configuration files

If there are configuration files that still need to be updated, you should do this as soon as possible. For more detailed information, refer to the manual entry *update*(8) (see Section "Reading the manual entry").

Backing up the operating system

We recommend that you now make a full backup of the system disk. The *DSSI* program can be used for this purpose. Further details are given in the Chapter "DSSI".

Alternatively, you can use the add-on product *NetWorker*. The advantage of this over *DSSI* is that with *NetWorker* you not only back up and restore complete partitions, but also selected files and directories. For this you can create suitable backup plans, with which to monitor and perform regular backups of all important data. If data is lost, the backed up data can be restored quickly and easily. Further details on *NetWorker* can be obtained from your Fujitsu Siemens branch office. The "NetWorker V4.2 - User's Guide" will also be of help.

11.9 Transferring configuration files

The individual configuration of the operating system is defined by more than 100 files. As already mentioned, the configuration files of the system are retained in the update installation. This means that these files need not be explicitly backed up before you start the update installation. You can list the relevant files by typing:

```
#□cat□/var/sadm/install/contents□|grep□CONFIG.prsv□|awk□'{print□$1}'
```

Examples of configuration files are:

/etc/conf/cf.d/mtune */etc/mail/mailsurr*

/etc/conf/cf.d/stune */etc/profile*

/etc/cron.d/queuedefs	*/etc/shells*
/etc/default/login	*/usr/share/lib/termcap*
/etc/inet/services	*/var/spool/cron/crontabs/root*

Some configuration files may have changed from one Reliant UNIX version to the next. These changes are incorporated automatically in your configuration files during the update installation. Each file that is to be changed is first backed up by creating a copy of the file. In this process, the names of the copied files are formed in such a way that an extension is appended to the existing file names. This extension comprises the name of the future operating system version, e.g. for an RM200, RM300 or RM400:

'/.profile' will be saved as '/.profile.pre_SINIX-N5.45b0000'

The files with the *.pre_** extension are also retained after the update installation, but can be deleted manually at a later stage, if required.

The update now attempts to incorporate the necessary modifications into the existing configuration files. If this is successful, the modified configuration files will be used in the future. As a result, these configuration files are not overwritten when the Reliant UNIX packages are subsequently loaded.

Trying to update your '/.profile' automatically.
/.profile was modified

If the attempt to incorporate the necessary changes into the existing configuration files fails for some reason (e.g. because the differences are too great), *standard configuration files* are copied to the system disk – as with a new installation. In this case, a corresponding warning is displayed:

+++□WARNING:□□Unable□to□modify□the□'/.profile'□configuration□
□□□□□□□□□□□□□□□file□automatically.
+++□□□□□□□□□□□□'/.profile'□is□deleted□to□ensure□that□you□get□the
□□□□□□□□□□□□□□□new□'/.profile'.
+++□□The□file□currently□active□is□backed□up□as□
□□□□□'/.profile.pre_SINIX-N5.45b0000'.
+++□□□□□□□□□□□□We□will□use□the□newly□installed□file□temporarily.
+++□□□□□□□□□□□□Please□combine□the□newly□installed
+++□□□□□□□□□□□□/.profile□□□□□□□□□□□□□□□□□□and□your
+++□□□□□□□□□□□□/.profile.pre_SINIX-N5.45b0000□into□a
+++□□□□□□□□□□□□/.profile□□□□□□□□□□□□□□□□□later.

This warning is recorded in the log. In addition, a message of the day are generated. The update installation is resumed. If it is completed successfully (i.e. without ERROR messages), you will receive the message shown in Section "2nd possibility: Messages of the WARNING type".

- Use the log to check whether there are configuration files for which automatic updating was not successful.

If this is the case, you should transfer the modifications of the "old" configuration files (with the extension *.pre_**) to the new standard configuration files. Please refer to the manual entry *update*(8) (see Section "Reading the manual entry") for how to proceed.

You should reactivate the "old" configuration files under no circumstances either by loading them from the backup tape or by renaming the *.pre_** files to their "old" file names. The "new" operating system version requires the files in the "new" format.

12 DSSI

The mini system contains a program called *DSSI*, which is used for data backup and system installation. The following tasks can be performed using *DSSI*:

- You can back up and restore the partitions of those hard disks also displayed by the *autoconf*(8) command. Because *DSSI* is started from the mini system, the root file system of the system disk can also be backed up and loaded without difficulty.

  Both logical and physical backups can be performed. It is also possible to physically back up and load database partitions. In addition, the partition tables of all existing hard disks are saved with each backup if requested.

  The partition tables for **all** connected hard disks are no longer backed up automatically. Instead, a query appears. In any event, the partition table of the disk to be backed up will also be backed up.
- If an intact hard disk is to be removed from your computer, all data stored on the disk can be deleted beforehand.

For these tasks, you may have to carry out various **preparatory steps**. The required steps are listed in a special work schedule given in the Section "Work schedule for DSSI" or in Chapter "Work schedules for RM200, RM300, RM400". You should therefore copy this work schedule. Then read the sections in the chapter "Preparing an RM600 for installation" or the chapter "Preparing an RM600 for installation" that are mentioned in the work schedule.

12.1 General guidelines

All drives for ¼-inch and 8-mm magnetic tape cassettes that can be addressed via the SCSI bus can be used as backup devices.

Please observe the following rules when working with *DSSI*:

- Terminate all input by pressing the Ú key.
- Do not remove the magnetic tape cassettes or diskettes until you are requested to do so.
- The following naming conventions are used in the menus for selecting a hard disk or a tape device: First, the name of the respective device is displayed (e.g. MP48 for a hard disk). This is followed by the number of the SCSI controller (specification *CTL=*) and the SCSI address (specification *ID=*; ID = identifier) of the device in parentheses. The name of the associated special file appears in square brackets.
- If you want to restore partitions or file systems, please check beforehand whether system configuration files need to be temporarily backed up. Further details can be found in Section "Backing up system files temporarily".

You can only use *DSSI* if one of the following requirements is met:

- a local CD-ROM (DVD) drive is installed or
- Ethernet access to the server is available.

If external SCSI devices are connected to your computer (e.g. a drive for 8-mm magnetic tape cassettes), these devices must be turned on **before** you start DSSI. Otherwise they will not be recognized when you start DSSI and therefore cannot be accessed.

Each storage medium can only back up the data from one hard disk.

If the *SIdlm* package is installed and the partitions */usr*, */opt* or */var* are mirrored, these partitions cannot be backed up logically as virtual disks. In this case, you must back up the relevant partitions physically using their "normal" nodes.

OLR mirror disks can only be backed up with *DSSI* if they are not defined as a group in the file */etc/dktab* (see the "Virtual Disks" manual).

12.2 Information on changing the partitioning

To change the partitioning of a hard disk, you must do the following:

- Back up the data logically using *DSSI*.
- Change the partitioning of the hard disk.
- Configure file systems manually, if necessary.

  This is only necessary if the new file systems do **not** have to be configured with the default values.
- Load the backed up data using *DSSI*.

  Choose one of the following menu items from the menu shown in Section "Configuring file systems automatically":

(D) if the new file system is to be configured **automatically** using the default parameters,

(N) if you have already configured the new file system **manually**.

You can use the same procedure to write data which you have backed up logically with *DSSI* to a hard disk

whose partitioning was changed since the backup.

12.3 Starting DSSI

If you want to work with *DSSI*, you must carry out a number of preparatory steps. The required steps are listed in a special work schedule given in the Section "Work schedule for DSSI". You should therefore copy this work schedule. Then read the sections of the Chapter "Preparing an RM600 for installation" or Chapter "Preparing an RM600 for installation" (Chapter "Preparing an RM600 for installation" or Chapter "Preparing an RM600 for installation") mentioned in the work schedule. As soon as the Mini System main menu appears (see Section "The Mini System main menu appears" or Section "The Mini System main menu appears"), proceed as follows:

- Choose the menu item *Start DSSI*.

  DSSI first displays the copyright notice:

  □□□□□□The unauthorized copying and distribution of all or

  □□□□□□part of the disk without the permission of

  □□□□□□Fujitsu Siemens is prohibited.

  □□□□□□Violators will be prosecuted by law.

  DSSI then determines which hard disks and tape devices are connected.

  ==========

  □□□□□□□□□□□□□□□□□□□starting DSSI.

  ==========

  DSSI is now searching for connected SCSI devices.

  This may take a moment, please be patient...

  Disk:□□□ios0/sdisk000□□□MP46□--□MP46□(CTL=00,□ID=0)

  Disk:□□□ios0/sdisk001□□□MP46□--□MP46□(CTL=00,□ID=1)

  Disk:□□□ios0/sdisk002□□□MP46□--□MP46□(CTL=00,□ID=2)

  Disk:□□□ios0/sdisk003□□□MP46□--□MP46□(CTL=00,□ID=3)

  Tape:□□□ios0/stape004□□□MS05□(CTL=00,□ID=4)

  Tape:□□□ios0/stape005□□□MC10□(5□GB)□(CTL=00,□ID=5)

  Once this automatic device detection is completed, the following operating instructions are displayed:

  ==========

  □□□□□□□□□□□□□□□□□□□DSSI□Version□5.45

  ==========

  □□□□□IMPORTANT INFORMATION ON OPERATING DSSI:

  □□□□□*Please only remove the diskette from the drive

  □□□□□□□when you are requested to do so!

□□□□□*□Please do not, under any circumstances, remove the

□□□□□□□□media from the drive during a backup or load process

Press the CR key to continue

□□or 'A' to abort DSSI (the computer will be rebooted):

□□or 'M' to abort DSSI and return to miniroot:

- Press Ú.

12.4 DSSI main menu

The *DSSI* main menu is now displayed.

```
================================================================

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□DSSI□MAIN MENU

================================================================


□□□□□□□□(1)□□□□Backing up partitions

□□□□□□□□(2)□□□□Restoring partitions


□□□□□□□□(3)□□□□Configuring a hard disk

□□□□□□□□(4)□□□□Deleting a hard disk


□□□□□□□□(0)□□□□End DSSI and restart the system

□□□□□□□□(A)□□□□End DSSI and switch off the system

□□□□□□□□(M)□□□□End DSSI and return to the minisystem main menu


□□□□□□□□Selection:□_
```

Menu items *(1)* through *(4)* are described in more detail in the following sections. If you want to exit *DSSI* (menu items *(0)*, *(A)*, and *(M)*), refer to the last section of this chapter for further information (see ...).

12.5 Backing up partitions

- Choose the menu item *Backing up partitions* from the DSSI main menu.

  DSSI now requires information on which hard disks are in your computer and which file systems exist on these hard disks. The number and type of hard disks are determined by *DSSI* automatically. It refers to the */etc/vfstab* file for the list of file systems. Before this file can be read, the file system */* must be mounted. To do this you must inform DSSI where this file system is located.

  If a new installation was carried out and *DSSI* was started from the Mini System main menu, the */etc/vfstab* file is not yet up-to-date. This file must be updated **before you start** *DSSI* so that *DSSI* can determine all the file systems.

12.5.1 Defining the root file system

DSSI first requires you to enter the name of the device file for the root file system to allow it to identify the existing file systems. The default setting for the root file system is */dev/ios0/sdisk000s0*. If the root file system is located on a different hard disk or on a different partition, you must change this default setting.

```
Change default setting for root file system (y/n)?
```

- Enter *n* for no.

  ```
  Backup partition data for all connected hard disks

  (y/n):
  ```

  Depending on your configuration, you will see output such as the following if you respond with *n*:

  ```
  Reading the file system information from /dev/ios0/sdisk000s0
  sdisk000s0□□□□□/□□□□□□□□□□ufs
  sdisk000s2□□□□□/opt□□□□□□vxfs
  sdisk000s3□□□□□/usr□□□□□□vxfs
  sdisk000s4□□□□□/var□□□□□□vxfs
  sdisk000s5□□□□□/home□□□□□vxfs
  ```

  If you respond to the query regarding the backup of partition data with *y*, the file systems are determined (see Section "Determining the file systems").

- Enter *y* for yes

  If you want to change the default setting for the root file system, the following dialog is started:

  ```
  In the following menu, select the hard disk containing the root file system.

  You will then be asked for the partition number.

  Press CR to continue: _
  ```

```
============================================================

Backup partitions: Select root hard disk.

============================================================

Current root hard disk: MP19 -- MP19 (CTRL=00, ID=0) [/dev/ios0/sdisk000]

□□□□□□(0)□□Return to previous menu

□□□□□□(1)□□MP19 -- MP19: 5.45 B0000 (CTRL=00, ID=0)[/dev/ios0/sdisk000]

□□□□□□□□

□□□Selection: 1

Now enter the number of the partition in which the root

file system is located: 0

Backup partition data for all connected hard disks

(y/n):
```

In general, it is not necessary to back up all partition data. However, all partition tables should be backed up in the case of mirror root configurations.

- Now answer the question in accordance with the respective situation.

12.5.2 Determining the file systems

As required, *DSSI* reads the partition tables of all hard disks known on the system, and generates a list of file systems.

```
DSSI now determines the partition data and the file systems

of the connected hard disks.

This may take a while, please wait..

Reading the file system information from□/dev/ios0/sdisk000s0

sdisk000s3□□□□□□/usr□□□□vxfs

sdisk000s4□□□□□□/var□□□□vxfs

sdisk000s2□□□□□□/opt□□□□vxfs

sdisk000s5□□□□□□/home□□□ufs

sdisk001s6□□□□□□/home3□□ufs

sdisk001s13□□□□□/home2□□ufs

sdisk001s14□□□□□/opt2□□□vxfs

sdisk002s6□□□□□□/sources□□□□□□□□ufs
```

sdisk002s13□□□□□□/home5□□ufs

sdisk002s14□□□□□□/backup2□□□□□□□□□ufs

sdisk003s0□□□□□□□/tmp□□□□ufs

sdisk003s3□□□□□□□/local□□ufs

sdisk003s4□□□□□□□/var/crash□□□□□□□vxfs

sdisk003s5□□□□□□□/home4□□ufs

12.5.3 Selecting the hard disk

A further menu is displayed containing a list of all the hard disks found by *DSSI* in the automatic device recognition process.

```
============================================================

□□Backing up partitions: Select hard disk

============================================================


□□□□□(0)□□□□Return to previous menu

□□□□□(1)□□□□MP46□--□MP46□(CTL=00,□ID=0)□□□□□[/dev/ios0/sdisk000]

□□□□□(2)□□□□MP46□--□MP46□(CTL=00,□ID=1)□□□□□[/dev/ios0/sdisk001]

□□□□□(3)□□□□MP46□--□MP46□(CTL=00,□ID=2)□□□□□[/dev/ios0/sdisk002]

□□□□□(4)□□□□MP46□--□MP46□(CTL=00,□ID=3)□□□□□[/dev/ios0/sdisk003]


□□□□□Selection:□_
```

- Select the hard disk whose file systems are to be backed up. The following menu is then displayed:

```
============================================================

□□□□□□□□□□□□□□□□□□□□Backing up partitions

============================================================


Hard disk:□MP46□--□MP46□(CTL=00,□ID=2)□[/dev/ios0/sdisk002]

Tape device:□No tape device selected


□□□□□□□□(0)□Return to previous menu


□□□□□□□□(1)□Select the tape device

□□□□□□□□(2)□Select the partitions to be backed up

□□□□□□□□(3)□Start the backup procedure


□□□□□□□□Selection:□_
```

The first line shows the selected hard disk. In the second line, you are informed that no tape device has yet been selected. You must now select menu items *(1)*, *(2)* and *(3)* in succession.

12.5.4 Selecting the tape device

- Choose the menu item *Select the tape device* from the menu shown above.

  A list is displayed of all tape devices found during the *DSSI* restore procedure.

```
============================================================
□□Backing up partitions: Select tape device
============================================================
□□□□□□□□(0)□Return to previous menu
□□□□□□□□(1)□MS05□(CTL=00,□ID=4)□□□□□□[/dev/ios0/rstape004]
□□□□□□□□(2)□MC10□(5□GB)□(CTL=00,□ID=5)□[/dev/ios0/rstape005]
□□□□□□□□Selection:□_
```

- Select the tape device to be used to perform the backup.

  The *Backing up partitions* menu appears again (see ...). The selected drive is now indicated in the second line.

If compression or high density is supported, the following additional queries are displayed for certain types of drive:

```
Do you want to use device node with compression (y/n) _

Do you want to use device node with high density (y/n) _
```

Partitions must be loaded and hard disks configured using the same node as the backup.

12.5.5 Selecting the partitions to be backed up

- You must now choose the menu item *Select the partitions to be backed up* (see ...).
  A list of all partitions is displayed. This list indicates which partition contains a file system.

```
============================================================

□□□□□□□□□□□□□□□□Selection of partitions

============================================================

□□□□□□No.□□Device□□□□□□□□□□FSType□MntPnt□□Backup□type□□Backup

□□□□□□□----------------------------------------------------

□□□□□□0□□□□sdisk000s0□□□□□□ufs□□□□/□□□□□□□□□□□□□□□L□□□□□□□□□□□□□N

□□□□□□2□□□□sdisk000s2□□□□□□vxfs□□□□/opt□□□□□□□□□□□□L□□□□□□□□□□□□□N

□□□□□□3□□□□sdisk000s3□□□□□□vxfs□□□□/usr□□□□□□□□□□□L□□□□□□□□□□□□□N

□□□□□□4□□□□sdisk000s4□□□□□□vxfs□□□□/var□□□□□□□□□□□L□□□□□□□□□□□□□N

□□□□□□5□□□□sdisk000s5□□□□□□vxfs□□□□/home□□□□□□□□□□L□□□□□□□□□□□□□N

□□□□□□6□□□□sdisk000s6□□□□□□-□□□□□□-□□□□□□□□□□□□□□□□P□□□□□□□□□□□□N

□□□□□□7□□□□sdisk000s7□□□□□□-□□□□□□-□□□□□□□□□□□□□□□□P□□□□□□□□□□□□N

□□□□□□8□□□□sdisk000s8□□□□□□-□□□□□□-□□□□□□□□□□□□□□□□P□□□□□□□□□□□□N

□□□□□□9□□□□sdisk000s9□□□□□□-□□□□□□-□□□□□□□□□□□□□□□□P□□□□□□□□□□□□N

□□□□□□10□□□sdisk000s10□□□□-□□□□□□-□□□□□□□□□□□□□□□□P□□□□□□□□□□□□N

□□□□□□11□□□sdisk000s11□□□□-□□□□□□-□□□□□□□□□□□□□□□□P□□□□□□□□□□□□N

□□□□□□12□□□sdisk000s12□□□□-□□□□□□-□□□□□□□□□□□□□□□□P□□□□□□□□□□□□N

□□□□□□13□□□sdisk000s13□□□□-□□□□□□-□□□□□□□□□□□□□□□□P□□□□□□□□□□□□N

□□□□□□14□□□sdisk000s14□□□□-□□□□□□-□□□□□□□□□□□□□□□□P□□□□□□□□□□□□N

□□□□□□15□□□sdisk000s15□□□□-□□□□□□-□□□□□□□□□□□□□□□□P□□□□□□□□□□□□N

□□□□□□(1)□□□Include□partition□in□the□backup□list

□□□□□□(2)□□□Delete□the□partition□from□the□backup□list

□□□□□□(3)□□□Change□backup□type

□□□□□□Selection [(0): Return□to□previous□menu]:□_
```

The columns in this list are explained below:

No.		Partition number
Device		Name of the associated hard disk special file (without directory path)
FSType	_	File system typethere is no file system in the partition
MntPnt	□	Name of the directory under which the file system is mountedthere is no file system in the partition
Backup type	L□ P	Backup type to be used to back up the partition logical backup(preset for partitions containing a file system) physical backup (preset for all other partitions)
Backup	NJ	Partition markingdo not back up (default)back up

- Mark the partitions that are to be backed up. To do this, enter one of the following digits:

  0 Exit the list and return to the *Backing up partitions* menu

  1 Mark a partition

  This is used to mark a partition for backup. You must then enter the number of the partition to be backed up, or you can use the following letters:

  A□ mark all partitions

  D mark all partitions containing a file system

  The marked partitions are indicated by *Y* in the *Backup* column.

  2 Delete a partition marking

  This is used to delete the marking of a partition. The partition is specified as described under *(1)*. The corresponding entry in the *Backup* column is set to *N*.

  3 Change the backup type

  If a partition contains a file system, you can use this to change the backup type that was set. The partition is specified as described under *(1)*. You can then enter one of the following letters:

  L back up the partition logically

  P back up the partition physically

  Partitions that do not contain a file system can only be backed up physically.

  Make sure that you back up partition 10 of the system disk. This partition is particularly important because it contains the SASH (boot2), which is required for booting the computer. If the system disk is damaged and must be exchanged, you cannot reboot the system and load the data until you partition the new hard disk with the backed up data.

- Select the partitions to be backed up.
- Enter *0* to exit the selection list. The *Backing up partitions* menu appears again (see ...).

12.5.6 Starting the backup procedure

- Choose the menu item *Start the backup procedure*.
  If you have not selected any partitions for the backup, the following message is displayed:

  □Note□

  You□have□started□a□backup□procedure□without□selecting□

  partitions for the□backup.□In□this□case,□only□the□configuration□data□of□

  the□connected hard□disk□is□backed□up.□Is□this□correct□(y/n)?□

- If you also want to back up partitions, enter *n*.
  The *Backing up partitions* menu is displayed again.
- If you only want to back up the partition tables of the hard disks, enter *y*.
  You are prompted to insert a storage medium.

```
============================================================

□□□□□□□□□□□□□□□□Backing up partitions

============================================================

Please insert the storage medium into the following device

□□MS05□(CTL=00,□ID=4)□□[/dev/ios0/rstape004]

Wait□until□the□device□is□ready.

Then□press

□□the□CR-key□□to□continue□with□the□Backing□up□partitions□or

□□□□(0)□□□□□to□cancel□the□Backing□up□partitions

□□Input:□_
```

- If you want to abort the backup process, enter *0*. The *Backing up partitions* menu appears again (see ...).
- If you do not want to abort the backup process, press Ú.

  You are prompted to specify a title for the backup. The title is used to identify the storage medium and is displayed for any subsequent restore process.

```
Please□specify□a□title□for□the□backup

(e.g. system name and date).□This title is used

to□identify□the storage□medium and□will□be□displayed

during□restoring□at a later date.

□□□TITLE:□_
```

- Enter a title. It can be up to 255 characters long. You must then confirm the title again

```
The□following□title□was□specified□for□the□backup:

□□□□□□□□"<title>"

Is□this□correct□(y/n)?□_
```

- Enter *y*.

  DSSI automatically determines the capacity of the storage medium.

  If the capacity of the storage medium cannot be determined for some technical reason, the following message is displayed

```
Media□size□cannot□be□determined□automatically!

Please□enter□media□size□in□megabyte:□_
```

- Enter an integer here.

  The backup process is now started.

   During the backup, **all** data previously contained on the backup tape is overwritten.

  Firstly, the backup tape is tagged with an identifier. It is assigned a serial number, so that the sequence of backup tapes can be checked during a subsequent restore procedure.

  Whenever a partition is backed up logically, a dot is displayed on the screen for each file backed up. During the backup, data is written to 95□% of the data medium (maximum). If the partitions to be backed up require more space, you are requested to insert a continuation tape

```
End□of□medium□on□output,□rewind□tape□...

Please□insert□tape□number□<xx>: _

To□continue, type "yes" when ready:
```

 Make sure that a new data medium has actually been inserted. Otherwise, **all** data previously contained on the backup tape will be overwritten!

- Then enter *yes*.

  The following message is displayed as soon as the backup is finished:

```
All□selected□partitions□were□backed□up□successfully.
You□can□remove□the□storage□medium□from□the□tape□drive.
Press□the□CR□key□to□continue:□_
```

- Confirm this message by pressing Ú. The *Backing up partitions* menu is then displayed again (see ...).

You can now either back up further partitions on another storage medium, or you can select the menu item *(0)* to return to the *Select hard disk* menu (see ...). If your computer has several hard disks, you can now back up another hard disk. If you do not want to do this, you can return to the *DSSI* main menu by selecting the item *(0)*. From there, you can restart the computer by selecting the menu item *(0)*.

12.6 Restoring partitions

If a hard disk has been damaged, you can restore the partitions using *DSSI*, provided you have an up-to-date backup of these partitions.

However, before you can begin to restore the backed up partitions, you should do the following: Check whether you must first temporarily back up certain system files. If this is not the case, you can skip the next section and continue with the Section "Selecting the tape device".

12.6.1 Backing up system files temporarily

Before loading the partitions, you can temporarily back up certain system files and then restore them again. These files then effectively remain unaffected by the restore procedure.

The names of all system files that are to be temporarily backed up before the restore procedure must be entered in a file called *sich.list*. This file is then loaded from a diskette in cpio format before the restore procedure is started.

The *sich.list* file must have a line-based structure, i.e. each line must contain the path name of a file. The path names must be specified absolutely, i.e. they must begin with */*. Alternatively, the path name can be preceded by the *$DSSI_ROOT* variable, in order to back up the files relative to the *DSSI* directory. Before the temporary backup, the */etc/dssi_root* file is then read from the root file system, and its contents are used as the value for the *$DSSI_ROOT* variable.

The *sich.list* file could have the following contents, for example (incomplete):

/etc/passwd

/etc/group

/etc/shadow

/etc/inet/hosts

When you have created the *sich.list* file, you must write it to a formatted diskette. To do this, switch to the directory containing the *sich.list* file. Then enter the following command:

#□ls□sich.list□|□cpio□-ovcB□-O□<device□file□for□diskette□drive>

The system files are backed up in the */tmp/save* directory of the miniroot file system. Please note that there is a limited amount of storage space available, which means that only small files can be backed up (approximately 1□Mbyte in total).

12.6.2 Selecting the tape device

- Select the menu item *Restoring partitions* from the *DSSI* main menu.

  You must first decide which tape device you want to use:

```
============================================================
□□Restoring□partitions:□Select□tape□device
============================================================
□□□□□□□□(0)□Return□to□previous□menu
□□□□□□□□(1)□MS05□(CTL=00,□ID=4)□□□□□□[/dev/ios0/rstape004]
□□□□□□□□(2)□MC10□(5□GB)□(CTL=00,□ID=5)□[/dev/ios0/rstape005]
□□□□□□□□Selection:□_
```

- Select a tape device.

You are then prompted to insert a storage medium in the drive.

```
============================================================

□□□□□□□□□□□□□□□□Restoring□partitions

============================================================


□□Please□insert□the□storage□medium□into□the□following□device:


□□□□MS05□(CTL=00,□ID=4)□□[/dev/ios0/rstape004]


□□Wait□until□the□device□is□ready.


□□Then□press


□□□□□the□CR□key□□to□continue□with□the□Restoring□partitions□or

□□□□□□□(0)□□□□□to□cancel□the□Restoring□partitions


□□□□□Input:□_
```

If you want to abort the restore procedure, you can enter *0*. The previous *Select tape device* menu is then displayed again.

- Insert a data medium in the specified drive.

- Press Ú.

DSSI reads the contents of the data medium.The following menu then appears:

```
============================================================

□□□□□□□□□□□□□□□□□Restoring□partitions

============================================================


Title□□□□□:□Backup□from□26.□July□2000

Hard disk:□MP46□--□MP46□(CTL=00,□ID=2)□[/dev/ios0/sdisk002]

tape device:□MS05□(CTL=00,□ID=4)□□□□□□[/dev/ios0/rstape004]


□□□□□□□□(0)□Return□to□previous□menu


□□□□□□□□(1)□Select□the□partitions□to□be□restored

□□□□□□□□(2)□Start□the□restore□procedure


□□□□□□□□Selection:□_
```

The following information is contained here: The title assigned to the backup, the device name of the backed up hard disk, and the selected tape device.

12.6.3 Selecting the partitions to be restored

- First select the menu item *Select the partitions to be restored* from the menu shown above. A selection list of all the partitions that have been backed up on the data medium is displayed.

```
============================================================

□□□□□□□□□□□□□□□□Selection□of□partitions

============================================================


No.□Device□□□□FSType□MntPnt□Backup type□□Restore□□Configure□FS

------------------------------------------------------------

0□□□□sdisk000s0□□□ufs□□□/□□□□□□□L□□□□□□□□N□□□□□N

2□□□□sdisk000s2□□□vxfs□□/opt□□□□L□□□□□□□□N□□□□□N

3□□□□sdisk000s3□□□vxfs□□/usr□□□□L□□□□□□□□N□□□□□N

4□□□□sdisk000s4□□□vxfs□□/var□□□□L□□□□□□□□N□□□□□N

5□□□□sdisk000s5□□□ufs□□□/home□□□L□□□□□□□□N□□□□□N

10□□□sdisk000s10□□-□□□□□-□□□□□□□P□□□□□□□□N□□□□□-

15□□□sdisk000s15□□-□□□□□-□□□□□□□P□□□□□□□□N□□□□□-


□□□□□□(1)□□□□Include□partition□in□the□restore□list

□□□□□□(2)□□□□Delete□the□partition□from□the□restore□list

□□□□□□Selection□[(0):□Return□to□previous□menu]:□_
```

The columns in this list are explained below:

No.		Partition number
Device		Name of the related hard disk special file (without directory path)
FSType	_	File system typeThere is no file system in the partition.
MntPnt		Directory under which the file system is mounted
	_	There is no file system in the partition.
Backup type		Backup type used to back up the partition
	L	logical backup
	P	physical backup
Restore		Partition marking
	N	do not restore (default)
	Y	restore
Configure FS		Marking as to whether the file system is to be configured
	_	There is no file system
	N	do not configure file system automatically
	Y	configure file system automatically using parameters from the backup tape
	D	configure file system automatically using default parameters

- Mark the partitions that are to be restored. To do this, enter one of the following digits:

0 Exit selection list and return to the previous menu

1 Mark partition

This is used to mark a partition for the restore procedure. You must then specify the number of the partition to be restored, or you can use the following letters:

A mark all partitions

F mark all partitions that contain a file system.

The marked partitions are indicated by *Y* in the *Restore* column. You must then decide whether a file system is to be configured automatically during the restore procedure (see next section).

2 Delete a partition marking

This is used to delete the marking of a partition. The partition is specified as described under *(1)*. The corresponding entry in the *Restore* column is set to *N*.

- Enter *0* to exit the selection list. The *Restoring partitions* menu then appears again (see ...).

12.6.4 Configuring file systems automatically

If you mark a partition containing a file system for the restore procedure (by selecting the menu item *(1)*), you must also decide whether a file system should also be configured automatically during the restore procedure.

file□system(s)□to□be□configured□automatically?

□□(Y)□□□File□system□will□be□configured□(parameters□from□your□tape)

□□(D)□□□File□system□will□be□configured□(default□parameters

□□(N)□□□File□system□will□not□be□configured

□□□□□□□□Selection:□_

- Enter one of the following letters:

  Y The file system is configured **automatically**. The parameters from the backup tape are used. As a result, the new file system will have exactly the same features as the backed up file system.

  D The file system is configured **automatically**. The default parameters are used.

  N The file system is **not** configured **automatically**.

  In this case, you must configure the new file system yourself **before** the restore procedure begins (see ...).

As soon as you have made your selection, the *Selection of partitions* menu appears again (see ...).

12.6.5 Starting the restore procedure

Select the menu item *Start the restore procedure* (see Section "Selecting the tape device").

During the restore procedure, **all** data previously stored in the relevant partition of the hard disk is overwritten.

To ensure that you do not inadvertently overwrite data, you must explicitly confirm the restore procedure again before it is started.

```
============================================================
□□□□□□□□□□□□□□□□□□□□W□A□R□N□I□N□G
============================================================
As□a□result□of□Restoring□partitions,□existing□data□is
overwritten□and therefore□permanently□destroyed.
□□□□Enter□'yes'□to□continue□Restoring□partitions.
□□□□Any□other□input□leads□to□an□abort.
Input:□_
```

- Then enter *yes*.

  You will then be asked whether you first want to back up the system files temporarily.

```
============================================================

□□□□□□Backing□up□the□system□configuration□files

============================================================


You□have□the□option□of□preventing□certain□system□files□from

being□overwritten. These□files□are□temporarily□backed□up□prior to

restoring and then reloaded on□the□system.□For□this□purpose, a list of

these system files must be read□in□from□a□diskette (see manual).

□□□□Do□you□want□a□temporary□backup□of□the□system□files?


□□□□□(j)□□□□□□Yes

□□□□□(n)□□□□□□No


□□□□□(0)□□□□□□Cancel□the□restore□procedure


□□□□□Input:□_
```

  If you enter *y*, you are prompted to insert the diskette containing the list of system files.

```
Please□insert□the□diskette□with□the□list□of□the□configuration

files□in□the□drive and□press


□□□□the□CR□key□□to□continue□or

□□□□□□(0)□□□□□□□□□to□cancel□the□restore□procedure.


□□□□Input:□_
```

- Confirm this again by pressing Ú.

  DSSI then backs up the system files specified in the list. The normal restore procedure is then continued.

  While restoring a partition that has been backed up logically, a dot is displayed on the screen for every file restored. After the restore procedure, all file systems are checked automatically for consistency using the *fsck* command.

  When the selected partitions have been restored successfully, the temporarily backed up system files can be restored again, if this is requested.

  As soon as the restore procedure is finished, the data medium is rewound. The following message is then displayed:

```
============================================================
Start□of□restore:□□□□17:24:04
End□□of□restore:□□□□17:34:11
============================================================
All□selected□partitions□were□restored□successfully.
You□can□remove□the□storage□medium□from□the□tape□drive.
Press the CR key□to□continue:□_
```

- Confirm this message by pressing Ú.

  The *Select tape device* menu (see ...) is then displayed again. You can now either select another tape device in order to restore partitions from another data medium, or you can select the menu item *(0)* to return to the *DSSI* main menu. From there, you can restart the system by selecting the menu item *(0)*.

12.7 Configuring hard disks

The menu item *Configuring a hard disk* in the *DSSI* main menu can be used to perform the following tasks:

- Write the partition table to a selected hard disk. This is required if
  - only the partition table on a hard disk was destroyed,
  - the backed up data is to be written to a new hard disk.

  However, the disk to which the data is to be written must be in the same location in the system cabinet as the disk which was backed up. Thus, for instance, the backup partition table for the disk */dev/ios0/rdisk001* can only be restored to the disk */dev/ios0/rdisk001*.

  In the case of the RM600, you cannot reboot immediately after loading data on a system disk, rather you must first make some adaptations in Boot2. You will find further details in the manual "Reliant UNIX Operation".

- You can also configure file systems on the hard disk.

  This is required only for file systems that have been backed up using a physical backup procedure other than *DSSI* (e.g. *cpio*(1)). File systems that are loaded from a *DSSI* backup tape (using the menu item *Restoring partitions* in the *DSSI* main menu) are configured automatically and need not be considered here.

  If you want to write the partition table to a hard disk of a type other than that from which this table originates (e.g. MP12 to MP46), the capacity of the hard disk to be configured should be larger than that of the original disk. *DSSI* then converts the partition table to the new geometry. If the capacity is not sufficient, you may have to change the size of the partition manually.

- Select the menu item *Configuring a hard disk* from the *DSSI* main menu.

12.7.1 Selecting a tape device

You are now prompted to select a tape device.

```
============================================================
□□Configuring□a□hard□disk:□Select□tape□device
============================================================
□□□□□□□□(0)□Return□to□previous□menu
□□□□□□□□(1)□MS05□(CTL=00,□ID=4)□□□□□□[/dev/ios0/rstape004]
□□□□□□□□(2)□MC10□(5□GB)□(CTL=00,□ID=5)□□□□□[/dev/ios0/rstape005]
□□□□□□□□Selection:□_
```

If you select an 8-mm magnetic tape cassette drive (MTC), you must use the same node as that used to back up the partitions.

You are then requested to insert the data medium containing the backed up partition tables into the drive:

```
============================================================

□□□□□□□□□□□□□□□□□□□□Configuring□a□hard□disk

============================================================


□□□□Please□insert□the□storage□medium□into□the□following□device:


□□□□□□MS05□(CTL=00,□ID=4)□□[/dev/ios0/rstape004]


□□□□Wait□until□the□device□is□ready.


□□□□Then□press


□□□□□□□□the□CR□key□□to□continue□with□the□Restoring□partitions□or

□□□□□□□□□□(0)□□□□□to□cancel□the□Restoring□partitions


□□□□□□□□Input:□_
```

- Insert the backup tape onto which the hard disk to be configured has been backed up, into the specified drive.

  If you do not have this backup tape, you can use the backup tape of another hard disk instead, as *DSSI* also backs up the partition tables of all existing hard disks during each backup procedure.
- If you want to abort the configuration, enter *0*. You then return to the *DSSI* main menu.
- If you do not want to abort the configuration, press Ú.

  DSSI reads the backed up partition tables from the inserted backup tape. The following menu is then displayed.

```
============================================================

□□□□□□□□□□□□□□□□□Configuring□a□hard□disk

============================================================


Title□of□the□storage□medium:□Backup□from□26.□July□2000

Backed□up□hard□disk□□□□:□MP46□--□MP46□(CTL=00,□ID=2)□[/dev/ios0/sdisk002]
```

```
□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

Hard□disk□to□be□configured:□MP46□--□MP46□(CTL=00,□ID=2)□[/dev/ios0/sdisk002]

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

Tape device□□□□□□□□□□□□□□□□:□MS05□(CTL=00,□ID=4)□[/dev/ios0/rstape004]

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□□□□□□□□(0)□Return□to□previous□menu


□□□□□□□□(1)□Select□hard□disk□to□be□configured

□□□□□□□□(2)□Select□file□system□to□be□configured


□□□□□□□□(3)□Start□configuration□procedure


□□□□□□□□Selection:□_
```

The hard disk that was backed up on the backup tape is proposed as the hard disk to be configured. If you want to configure this hard disk, select the item *Select file system to be configured*. In this case, you should now read the Section "Selecting file systems to be configured". Otherwise, you must first determine which hard disk is to be configured.

- Specify which hard disk you want to configure.

12.7.2 Selecting a hard disk to be configured

If you want to configure a hard disk other than that backed up on the backup tape, select the item *Select hard disk to be configured* from the menu shown above. A further menu is then displayed listing all hard disks found by *DSSI* in the automatic device recognition process.

```
================================================================

□□Configuring□a□hard□disk:□Select□hard□disk

================================================================


Cur.□hard□disk:□MP65□-□MP65□(CTL=00,□ID=2)□[/dev/ios0/sdisk002]


□□□□□□(0)□□□□Return□to□previous□menu

□□□□□□(1)□□□□MP46□--□MP46□(CTL=00,□ID=0)□□□□[/dev/ios0/sdisk000]

□□□□□□(2)□□□□MP46□--□MP46□(CTL=00,□ID=1)□□□□[/dev/ios0/sdisk001]

□□□□□□(3)□□□□MP46□--□MP46□(CTL=00,□ID=2)□□□□[/dev/ios0/sdisk002]

□□□□□□(4)□□□□MP46□--□MP46□(CTL=00,□ID=3)□□□□[/dev/ios0/sdisk003]


□□□□□□Selection:□_
```

- Select the hard disk to be configured. The *Configuring a hard disk* menu (see ...) is displayed again.
  If the selected hard disk does not match that backed up on the data medium, a corresponding warning is issued.

```
□□***□WARNING:□The□hard□disk□you□want□to□configure□does□not

□□correspond□to□the original□hard□disk□backed□up□on.

□
```

If you want to write the partition table of a disk to a disk of a different type, (e.g. MP12 to MP46), the capacity of the disk to be configured should be greater than that of the disk to be configured. *DSSI* then converts the partition table to the new geometry. If the capacity is not sufficient, you may have to change the size of the partition manually.

```
The□capacity□of□the□new□disk□which□is□to□be□configured□is□!
insufficient.□Do□you□want□to□edit□the□partition□table□manually□(y|n)□?□_
```

If you enter *y* in response to this question, the *dkpart -e* command is called. You can then define the size of the partitions. When you have done this, you can exit *dkpart* by entering *s*. You must then decide whether the new partition table is to be written to the disk.

```
Should□the□partition□table□be□written□to□the□disk□(y|n)□?□_
```

- Answer *y* to this question.
  The *Configuring a hard disk* menu is then displayed again (see ...).

12.7.3 Selecting file systems to be configured

You must now decide **how** the selected hard disk is to be configured:

- If you immediately select the menu item *Start configuration procedure* (see Section "Configuring hard disks"), only the partition table is written to the selected hard disk. File systems are not created. This procedure is necessary if only the partition table on the hard disk was destroyed. Following configuration, you can again access the existing file systems. Now read the Section "Starting the configuration procedure".
- If you first select the menu item *Select file system to be configured*, you can also configure file systems on the hard disk in addition to writing the partition table to the hard disk. This is only required for file systems that are not contained on any backup tape. File systems that are loaded subsequently from a backup tape (using the menu item *Restoring partitions* in the *DSSI* main menu) are configured automatically in the process and need not be considered here.

If you select the menu item *Select file system to be configured* (see Section "Configuring hard disks"), *DSSI* displays a selection list of all the file systems that were contained on the hard disk to be configured.

```
================================================================

□□□□□□□□□□□□□□□□Selection□of□file□systems

================================================================


□□No.□□□Device□□□□□□□□FSType□□MntPnt□□□□□Backup□type□□□□Configure

□□----------------------------------------------------------------

□□0□□□□□□sdisk000s0□□□ufs□□□□/□□□□□□□□□L□□□□□□□□□□□□□□□□N

□□2□□□□□□sdisk000s2□□□vxfs□□□/opt□□□□□L□□□□□□□□□□□□□□□□N

□□3□□□□□□sdisk000s3□□□vxfs□□□/usr□□□□□L□□□□□□□□□□□□□□□□N

□□4□□□□□□sdisk000s4□□□vxfs□□□/var□□□□□L□□□□□□□□□□□□□□□□N
```

□□5□□□□□sdisk000s5□□□ufs□□□□/home□□□□L□□□□□□□□□□□□□□□N

□□□□□□(1)□□□□Include□partition□in□the□configuration□list

□□□□□□(2)□□□□Delete□the□partition□from□the□configuration□list

□□□□□□Selection□[(0):□Return□to□previous□menu]:□_

The columns in the selection list are explained below:

No.	File system number
Device	Name of the related hard disk special file (without directory path)
FSType	File system type
MntPnt	Name of the directory under which the file system is mounted
Backup type	Backup type with which the file system was backed up: *L* =logical backup
Configure	File system marking: *N* = do not configure (default) *Y* = configure

In this list, you can now mark the file systems to be configured by *DSSI*. As already mentioned, this is required only for those file systems that were backed up using a logical backup procedure other than *DSSI* (e.g. *cpio*(1)). File systems that were backed up onto the inserted backup tape need not be configured.

- If you want to mark a file system, enter one of the following digits:

  0 Exit the selection list and return to the previous menu

  1 Mark the file system

  This is used to mark a file system for configuration. You must then specify the number of the file system to be configured, or you can use the following letter:

  A□mark all file systems

  The marked file systems are indicated by *Y* in the *Configure* column.

  2 Delete a file system marking

  This is used to delete a file system marking. The file system is specified as described under *(1)*. The corresponding entry is set to *N* in the *Configure* column.

- Enter *0* to exit the selection list.

  The *Configuring a hard disk* menu is displayed again (see ...).

12.7.4 Starting the configuration procedure

- Select the menu item *Start configuration procedure* (see ...). You are first warned of the possible consequences of this action:

==========

□□□□□□□□□□□□□□□□□□□□□□□W□A□R□N□I□N□G

==========

□□□□As□a□result□of□Configuring□a□hard□disk,□existing□data□is

□□□□overwritten and□therefore□permanently□destroyed.

□□□□

□□□□□□□□Enter□'yes'□to□continue□Configuring□a□hard□disk.

□□□□□□□□Any□other□input□leads□to□an□abort.

□□□□□□□□

□□□□Input:□_

- If you want to configure the selected hard disk, enter *yes*.

  The hard disk is first partitioned, i.e. the partition table is written to the hard disk. Some messages originating from the system commands used appear on the screen during this process. The selected file systems are then configured.

  When configuration of the hard disk is complete, the following message is displayed:

  The□hard□disk□was□configured□successfully.
  Press□the□CR□key□to□continue:□_

- Confirm this message by pressing Ú.

  The *Configuring a hard disk* menu (see ...) then appears again. From here, you can select the menu item *(0)* to display the *DSSI* main menu. You can then either restore the backed up partitions of the hard disk by selecting the item *Restoring partitions*, or restart the system by selecting *(0)*.

12.8 Deleting a hard disk

If a hard disk is to be completely deleted for data protection reasons, all data on this hard disk must be overwritten. This task can be performed using *DSSI*.

A menu is first displayed from which you can select the hard disk which you want to delete.

==========

□□Deleting□a□hard□disk:□Select□hard□disk

==========

□□□□□(0)□□□Return□to□previous□menu

□□□□□(1)□□□MP46□--□MP46□(CTL=00,□ID=0)□□□□□□□[/dev/ios0/sdisk000]

□□□□□(2)□□□MP46□--□MP46□(CTL=00,□ID=1)□□□□□□□[/dev/ios0/sdisk001]

□□□□□(3)□□□MP46□--□MP46□(CTL=00,□ID=2)□□□□□□□[/dev/ios0/sdisk002]

□□□□□(4)□□□MP46□--□MP46□(CTL=00,□ID=3)□□□□□□□[/dev/ios0/sdisk003]

□□□□□Selection:□_

- Select a hard disk. You are then warned of the possible consequences of deleting this hard disk

```
************************************************************

□□□□□□□□□□□□□□□DELETING□A□HARD□DISK

************************************************************


□□□>>□----------□Note□----------□<<

□□□>>□Deleting□a□hard□disk□takes□time:□30-60□□□□□<<

□□□>>□minutes□depending□on□the□size□of□the□disk!□<<


Hard□disk□to□be□deleted:□MP65□--□MP65□(CTL=00,□ID=2)□[/dev/ios0/sdisk002]


□□□□Deleting□destroys□a□l□l□the□user□data□on□the□selected□

□□□□hard□disk.□If□you□are□sure□that□you□still□want□to□delete□the□hard□disk,

□□□□enter□"DELETE". Any□other□input□cancels□the□delete□procedure


□□□□Input:□_
```

- If you are sure you want to delete the hard disk, enter *DELETE*.

  The selected hard disk is then deleted. For monitoring purposes, the current cylinder number of the hard disk is displayed.

  The following message is displayed when the delete procedure is finished

```
The□hard□disk□was□deleted
Press□the□CR□key□to□continue:□_
```

Confirm this message by pressing Ú. You are then returned to the *DSSI* main menu. From there, you can restart the system by selecting the menu item *(0)*.

12.9 Terminating DSSI

You can terminate *DSSI* from the main menu. Three different menu items can be used for this purpose (see Section "DSSI main menu").

(0) *DSSI* is terminated and UNIX is then booted.

(A) *DSSI* is terminated and the power supply to the system is shut off.

(M) *DSSI* is terminated. The Mini System main menu automatically appears again (see ...).

- If you want to continue working with Reliant UNIX, enter *0*.

  Provided autoboot is activated, the operating system is booted automatically to the point where you are requested to log onto the system.
- Remove the CD-ROM from the CD-ROM (DVD) drive.

12.10 RM600 systems without a CD-ROM (DVD) drive

DSSI is integrated in the mini system. Normally, you can only use *DSSI* if your system has a CD-ROM (DVD) drive that can be used to load the mini system. If this is not the case, you can load *DSSI* using a ¼" magnetic tape cassette (MTC). To do this, you must first configure the magnetic tape accordingly.

Preparatory steps on a system with a CD-ROM (DVD) drive

- Load the Mini System main menu.
- Switch to a shell of the mini system.

  To do this, select the menu item *Execute commands in a shell of the mini system*. The values for language, keyboard type and terminal type, which you have already selected, are still effective in the shell.
- Enter the following command:

  #□copy_dssi

You will see the message:

Please□insert□a□tape□in□/dev/ios0/rstape004 and□type□the□CR□key,

when□the□device□is□ready.

(any□other□key□will□cancel□copy_dssi):□_

The precise wording of the message depends on the device name of the ¼" MTC drive.

- Insert a magnetic tape cassette in the specified drive and confirm this action by pressing Ú.

  The required software is copied to the magnetic tape. The mini system prompt appears again as soon as the copy operation is finished.
- Remove the magnetic tape cassette from the drive.
- Change back to the Mini System main menu.

  To do this, enter the command *exit* or press [Ctrl] [D].
- Boot Reliant UNIX from the system disk. To do this, select the menu item *Abort the mini operating system and restart the old system kernel*. The boot process ends in the PROM monitor or firmware monitor.

Preparatory steps on a system with no CD-ROM (DVD) drive

- Change to the Board Debug Monitor.

  To do this, either restart or switch on the system, as appropriate.
- Load the Boot2 (SASH) from tape:

  BDM(MBII 0 t)>**b 1 st(0,24,0)sash**

The example assumes that the MTC ¼" drive has the SCSI address 3. If this is not the case, you must modify the boot string accordingly.

- Load the mini system:

  boot2: **install**

The Boot2 searches for the first CD-ROM (DVD) drive and asks whether this drive should be used for the load procedure.

- Enter the boot string for the MTC ¼" drive again:

  Installdevice: [Return = cd(0,48,10)] **st(0,24,0)**

Again, you must modify the boot string if the MTC ¼" drive does not have the SCSI address 3.

The following actions are now performed automatically:

- The mini system is loaded.
- You are prompted to choose the dialog language.
- *DSSI* is started.

13 Installation for experts

This chapter contains brief instructions for a new installation of Reliant UNIX. Please note that the following description can only provide a cursory overview of the stages involved in installation. It does not take account of situations which deviate from a standard installation, neither does it provide background information on installation or cover an update installation.

Before starting installation, you should be familiar with the configuration of your computer. You should also be aware of the fact that existing data is lost with a new installation.

- You should therefore determine what data you still require and back up any such data.
- Prior to the installation, always make a note of important data such as the machine name, the domain name, the Internet address, group names, logins and the partitions on the system disk.

All the commands described below must be entered at the console.

Switch on all external devices before starting installation.

Installation of the Reliant UNIX operating system is done from the CD-ROM (DVD) drive. Insert the "Reliant UNIX" CD-ROM in the drive before proceeding as described below.

13.1 New installation for an RM600

You should proceed as follows:

- Carry out the necessary preparatory steps:
  - Boot the system and insert the CD-ROM
  - Read the Readme file
  - Special preparations:
    - Check the partitioning

      RM600 E: The hard disk you select for future use as the system disk should, if possible, be connected to the first SCSI channel (i.e. not *sdisk02x*).
    - Power up the external devices for working with DSSI
- Switch to the Board Debug Monitor:
  1. from multiuser mode:

     #□bootflags□-p□-f□209
     #□init□6

  2. or in the Board Debug Monitor:

     BDM(SPB□□10□t)>**wf□209**
     BDM(SPB□□10□t)>**creset**

- Update the EEPROM firmware:

  RM600-xxx:

  BDM(MBII□0□t)>**b□9□cd(0,48,0)flsh**

  RM600□E:

  BDM(SPB□□10□t)>**b□9□cd(0,0,0)flsh**

- Enter the following command in the command line of the offline flash utility:

  Enter□command:□**fep -a**

- Now reset the system and start it again:

  Enter□command:□**reset**

Situation: The firmware is updated

- Start the miniroot system. Load Boot2 from the CD-ROM:

  RM600-xxx:

  BDM(MBII□0□t)>**b□1□cd(0,48,10)sash**

  RM600□E:

  BDM(SPB□□10□t)>**b□1□cd(0,0,10)sash**

- Enter the following boot2 command:

  boot2:□**install**

- Confirm the installation device

Situation: Minisystem is booted

- Select the required language from the list displayed
- Select a suitable console type from the list displayed
- Test the selected console type in relation to character representation and function keys

Situation: Minisystem main menu appears

- Select *Perform New Installation*
- Enter the date, time and time zone
- Enter the host name

Situation: Select system disk

- Select a system disk from the list displayed
- Establish whether the data in the */home* partition is to be retained (this is not possible if the size of the partitions has been changed already)
- Confirm with [SAVE], if the installation values are correct

  At this point you have a final opportunity to cancel the installation, **without** changing any relevant data.

- Start the installation by pressing [ENTER] .

Situation: Perform follow-up activities

- Log on as *root*
- Assign a password for the user *root*
- Use the *.prot.inst** logs in the */var/sadm/pkg* directory to check whether the installation has run without errors
- Back up your new operating system (e.□g. with *DSSI*, and this time from the "Reliant UNIX 5.45" CD-ROM)
- Enlarge the swap area if necessary
- Assign passwords for the users *oasys* and *sysadm*
- Configure the network services:
  - The node name of the host may have to be defined
  - The CSI/HIOS board must be configured, and possibly other boards also
  - The */etc/default/login* and possibly */etc/default/inet* files must be edited

- The network processes must be restarted
- The */etc/inet/hosts* file must be edited

All of the necessary installation activities are now complete.

13.2 New installation for an RM200, RM300, RM400

Switch to run mode 5, i.e. to the PROM monitor (with graphics-capable computers, you always go to the firmware monitor if you switch to the PROM monitor):

```
# cd /

# shutdown -i5 -y
```

Start the PROM monitor or the firmware monitor in the mini system.

In the PROM monitor:

```
>> install
```

In the firmware monitor, select the following menu item:

Standard installation (install)

The dialog program for the mini system is then started. You use the dialog program in the same way as the SYSADM user interface.

The following parameters are queried in the dialog program:

- language for the dialog
- console type
- keyboard type

Once you have made your entries, the main menu of the mini system is output:

Choose the menu item

Reinstall Reliant Unix

The installation dialog

The installation starts with an interactive dialog.

 Press the function key [HELP] to call up a help text for each of the dialog boxes.

The following parameters are defined in the dialog section of the installation:

- date, time and time zone
- host name of the computer
- user profile

  The user profile describes the scope of the software to be installed. You can choose between *Full System*, *Core System* (a minimum amount of installed software) and *Application Client System* (no server software is installed).

  You can also customize the user profiles *Core System* and *Application Client System*.
- system disk
- configuration of the system disk

  When configuring the system disk, you define, among other things, whether the data in the */home* partition are to be retained.

At the close of the installation dialog, you are asked to confirm the parameters you have specified.

You can then start the actual installation by selecting the menu item *Start installation* or abort the installation by selecting *Abort Installation and Reboot*.

 This is the last chance you have to abort the installation without changing relevant data.

Installation execution

The actual installation procedure starts now. It runs automatically and takes about one and a half hours. You

can leave the console during this time, but you should check every now and then to see whether any error messages have been displayed.

In no event should you intervene in the installation, even during the boot process, unless you are specifically prompted to do so by a corresponding message.

If you selected *VGA graphic* as the console type, you must specify the graphics parameters. These parameters are required for three hardware components:

- keyboard
- mouse
- screen

Once the installation has been completed, the computer is in multiuser mode.

Glossary

address

An address refers to the position of data in the physical or virtual Master Test Handler (RM600 only) of the computer.

ASCII file

See "text file"

basic system

The basic system behaves like a subset of the Reliant UNIX operating sytem. It contains the most important UNIX commands, which are used to install the add-on packages and to generate the Reliant UNIX system kernel.

Board Debug Monitor (RM600 only)

The Board Debug Monitor (BDM) is part of the firmware of an RM600 controller:

- RM600-xxx: CSI controller□
  (CSI = Central Services & Interfaces)
- RM600 E: (E)HIOS master controller□
  (abbreviated to (E)HIOS in the manual;□
  (E) = Enhanced,□
  (E)HIOS = High Performance Input Output System)

The BDM corresponds to the PROM monitor of the other RM servers. When the operating system of the RM600 is booted, the BDM is started automatically once the Master Test Handler (RM600 only) has completed its tests correctly. Depending on the boot mode set, the BDM either starts the SASH automatically or waits for user input. The BDM issues the following prompt:

- RM600-xxx: BDM(MBII□0□t)>
- RM600 E: BDM(SPB□□10□t)>

boot

Starting the operating system s is referred to as booting. The system kernel must first be loaded from a data medium (e.g. the system disk) into the main memory. Booting involves a number of boot phases: PROM monitor and SASH. All logins and processes are killed when the operating system is booted.

Boot2 (RM600)

The Boot2 (Second Level Boot) is a Reliant UNIX system interface on RM600 systems. It waits for user input with the prompt boot2:. The Boot2 is identical to the SASH (Stand-Alone SHell).

boot mode

There are two modes in which a Reliant UNIX system can be booted. In autoboot, all boot phases are run through automatically until the login prompt of the Reliant UNIX operating system appears. With manual booting, the boot procedure is stopped in the boot phases PROM monitor and SASH. A prompt appears and the user can enter commands.

boot phases

Several boot phases are run through when Reliant UNIX is booted: PROM monitor and SASH. Depending on the boot mode set, the next boot phase is started automatically in the PROM monitor and in the SASH (autoboot), or a prompt is displayed (manual booting).

buffer

A buffer is an area for temporarily storing input/output data of any length. The data is divided into smaller units that are easier for system functions to handle. Buffers are used both by the file system and by the standard functions for input/output (*stdio*).

buffering

This is the term used to describe temporary data storage in node names.

built-in self-test (RM600)

The built-in self-tests (BIST) are part of the firmware stored permanently in the controllers. The BISTs are started automatically when the computer is switched on. They check all the controllers and store the results in a special controller:

- RM600-xxx: in the CSI controller
  (CSI = Central Services & Interfaces)
- RM600 E: in the (E)HIOS master controller
  (abbreviated to HIOS in the manual;
  (E) = Enhanced,
  (E)HIOS = High Performance Input Output System)

The results of the tests are subsequently queried by the Master Test Handler (RM600 only).

child process

See "fork"

client

If a system is integrated in a network, certain activities can be executed remotely on this system (i.e. via another remote computer). In this case, the local system is called the client and the remote system is called the server. For example, the software, which is required for each different activity on the client, can be read in via the server.

command

A command is

- an instruction to the shell, which normally starts a program as a child process (see fork).
- in a wider sense, any executable file.

command file

See "shell script"

configuration

The configuration of a system means

- the characteristics of the software running on that system. The characteristics of the operating system are influenced by certain parameters (e.g. *$SHELL*, *$TZ*, *$PS1*), certain files (*e.g.* /etc/profile, /etc/passwd), tuneable parameters (defined in the files */etc/conf/cf.d/mtune* and */etc/conf/cf.d/stune*).
- b) the hardware components belonging to the system. This includes the integrated controllers, hard disks, and directory trees, as well as the available peripherals.

console
The console is the terminal connected directly to the system. This terminal is used by the system administrator to communicate with the system.

controller
A controller is an intelligent control unit that controls more or less independently data input between the central processor and a peripheral device.

core dump
The core dump is a copy of all segments of a *process*. It is created if the process is not terminated "normally" (e.g. by means of a signal). This copy can be located in the main memory, the swap area, or in a core file named *core*. The *core* file is used for debugging. It is always created in the current virtual memory of the process. Special switches and commands can also be used to dump the contents of the main memory at a particular time to a file. The file is stored under */var/crash*.

cylinder
This refers to the set of all tracks on a hard disk that are equidistant from the rotating center of the disk, but can be on different interfaces. All tracks on the cylinder can be read without having to reposition the read / write unit.

daemon
A daemon is a process that runs in the background (usually permanently) and executes a public task throughout the system, e.g. *calendar*(1) and *cron*(8).

device
A device is a file that is neither a normal file nor a virtual memory, e.g. a tape device, the null special file, or a device unit, a physical input/output unit.

directory

A directory is a file that contains a catalog of file names. Based on the organizational principles of file systems, a directory consists of entries that identify files (and also other directories). This means that a directory forms a node in the directory tree.

directory entry

A directory entry is

- the assignment of a name to an inode number. Each entry in a virtual memory has this format.
- the name part of such an assignment.

directory hierarchy

See "directory tree"

directory tree

This term refers to the entire tree containing all *directories*. In this tree, each directory can be accessed from the root directory / via a series of subdirectories.

drive

Drives are hardware devices that can contain or accommodate data media (hard disks, CDs, magnetic tapes, or diskettes).

dump

See core dump, exec

environment

An environment is

- a set of character sequences that is made available to a process in addition to its arguments when it is executing a file. Normally, the environment is inherited with exec(2) operations.
- a particular environment that is administered by the shell.

error

An error is a hardware- or software-related situation that prevents a system or user process from being executed successfully. In such cases, the operating system outputs an error message on the console or on the user's terminal.

error message

See error

exec

exec is a system call that enables users to execute another program.

file

A file is

- in general, a possible source for input or a target for output
- in particular, an inode and/or associated file contents, i.e. a normal file, a special file, or a virtual memory
- a virtual memory, where different directory entries can refer to the same file

If the executive permissions have been set, the file is referred to as executable (see "permission"). If the file is used as a source for input or a target for output, it is referred to as open. A file can be open several times simultaneously.

file name

A file name is the name of a file

- in absolute form, it is a *path name*
- in relative form, it is the last component of a path name

file system

A file system is

- a collection of filess that can be mounted in a block-based special file. The inode for each file appears precisely once in the i-list of the file system. Each file can be accessed via a *path* from the root directory of the file system.
- the complete set of all files on the computer
- that part of the system kernel which deals with file systems.

firmware

Firmware comprises the programs stored permanently in the EEPROMs of the controllers. The programs are executed in sequence when the system is booted and the operating system is loaded to main memory.

fork

This system call is used to duplicate a *process*, so that a parent process and a child process then exist with separate (but initially identical) text segments, data segments, and batch segments.

formatting

This refers to a process whereby a hard disk is assigned an addressing schema. The disk is divided into tracks and sectors.

function key

The term function key is used to refer to certain keys on the keyboard that are numbered consecutively (e.□g. F1 through F12). Some application programs use these keys to control how the program operates (e.□g. SYSADM and the dialog program of the mini system). The various functions that are assigned to the function keys depend on the program context. The current function key assignments are displayed at the bottom of the screen.

group

A group is

- a set of permissions which, in addition to the user's permissions, control access to a file,
- a set of user IDs that can assume the priority rights of a group,

group ID

The group ID is an integer that is usually assigned to one or more login names. If files are created by a process, they are assigned the user ID of the process as the owner, and the group ID of the process as the group.

hard disk

Hard disks are data media that are usually installed directly in the computer. This distinguishes them from removable data media, such as diskettes, cassettes, and CDs. The system disk is particularly important, since it contains the operating system. Each hard disk is divided into several areas referred to as partitions. The existing partitioning is stored in a partition table**.**

i-list

The i-list contains all inodes belonging to a file system. This list is referenced by means of the inode number.

inode

An inode (i-node or information node) is an individual data structure in the i-list. Each file of a file system has precisely one inode. This inode contains information for managing the file. The link to the i-list is established by means of the inode number. An inode contains the following information: the file type, the permissions, information on subdirectories, the number of links, the owner, the user IDs, the group, the group ID, the size in bytes, the date on which the inode was last modified, the date on which the file was created, last modified, and last accessed, and references to the file contents.

inode number, i-number
Each inode is assigned a number. The inode number combined with the device number refer to the unique relevant entry in the i-list of a file system.

installation
This is the process of loading software packages from a data medium (installation medium) and copying them to a hard disk**.**

link
A link is

- an additional directory entry for an existing file. This type of link can be created using the *link*(1M) command and deleted using the *unlink*(1M) command.
- in a wider sense, a normal directory entry.
- in a general sense, any directory entry, apart from the entry taken to be the main entry for a predefined inode referenced using either a normal link or a *symbolic link*.

local
The system to which the user's terminal is connected is called the local system. Any other system that can be accessed over the network, on the other hand, is referred to as the remote system. If the local system is used exclusively for an activity, the activity is also referred to as local.

log files
Log files contain records of actions executed on the system by the software. During installation, all actions are logged under */var/sadm/pkg/.prot**.

login
A login is

- the program that executes the login on the operating system
- the procedure for logging onto the operating system

Master Test Handler (RM600 only)
The Master Test Handler (MTH) is part of the firmware stored permanently in the controllers. The MTH is started automatically once the built-in self-tests (RM600) have checked the controllers. It queries the results of these tests, checks other hardware modules, and outputs a log to the console. The log contains the test status of every module tested. If an error is detected in a module, the MTH aborts system startup.

memory
This term can have the following meanings

- a physical memory that reflects the available space in the main memory
- an extension of the main memory. Programs can use memory on the hard disk as an extension of the main memory by means of virtual memory management.

memory image
This is a synonym for core dump.

miniroot file system
The miniroot file system is a small root file system. It is located on the operating system CD-ROM and can be copied from the SASH to the RAM disk.

mini system
The mini system behaves like a subset of the Reliant UNIX operating system. It only supports commands that are needed for installing Reliant UNIX or for working with the *DSSI* program. It is located on the operating system CD-ROM and can be booted from the PROM monitor.

mount

Mounting a file system extends the directory hierarchy. This is achieved by assigning the root of the new file system to a virtual memory of a file system already mounted. The *mount*(1M) command is used for this purpose. The *umount*(1M) command has the opposite effect.

multiuser mode
The multiuser mode is a run level that allows several users to access the standard output.

networking
Networks are used to transfer data between various systems. Communication lines such as coaxial cables, telephone lines, etc., are used for this purpose. Networking services include file transfer, remote login, and remote execution of commands.

new installation
If you want to install Reliant UNIX on a hard disk on which this operating system was not previously installed, you must carry out a new installation. Normally, this is only required if a new system disk has been integrated in the system. All data that was previously stored on the hard disk, including the add-on products, is overwritten in this type of installation. Exception: the existing */home* file system can be retained.

node name
Each system has its own name, known as the *node name*. The system can be addressed by means of this name if it is integrated in a network. The name must be unique and can be displayed using *uname -n*.

operating system
The operating system is a program for managing the computer resources. For example, it handles input/output procedures and process planning. This relieves user programs of these tasks. Well-known operating systems include DOS, UNIX, and Reliant UNIX. During installation of Reliant UNIX, several interim levels of the operating system are installed. These include the mini system and the basic system.

owner
The owner of a file is the user ID of the *process* that created the file. Owners have special permissions for their files.

parent process
See "fork"

partition
Each hard disk is divided into a number of areas (partitions) which can overlap. The existing partitioning is stored in a partition table on the hard disk. The partitions of the system disk must have a minimum size. The SASH, which is required in order to boot the system, is stored in partition 10.

partition table
The partitioning of each hard disk is defined in a partition table. This table is stored on the hard disk. Partition tables are created and administered using the *dkpart*(8) command.

path, pathname
Both terms are synonyms, and are used to refer to a name string which identifies a file. A relative path name always starts at the current directory. For example, if the current directory contains the subdirectory *A*, which in turn contains the subdirectory *B*, which contains the file *xyz*, this file is referred to as *A/B/xyz*. A complete path name always begins at the rootfile system (*/*), e.g. */home/peter/A/B/xyz*.

permission
This controls certain types of access to a file, namely read access, write access, and executive permission (in the case of a directory, the last permission is the search permission). Permissions are assigned separately to owners, groups, and others.

pipe
A pipe is a direct data stream connection between *processes*. The output data of one process becomes the input data of the other process.

pipeline
A pipeline is a concatenation of several programs by means of pipes.

process
A process is a sequence of related statements. When a process is started, three dumps are usually opened: standard input (*stdin*), standard output (*stdout*), and standard error (*stderr*) from the *stdio* standard library. Initially, all three files refer to the terminal.The characteristics of a process are specified by its core dump. The core dump contains the command counter and information about the current directory, the set of opened files, the controller terminal, the user ID, and the group ID.

process ID, process number
The process ID is an integer for identifying a *process*.

profile
A profile is

- an optional shell script called *.profile*. Normally, this script is run by the shell when a user logs on, in order to set the environment and other working conditions that the user expects.
- a file for capturing the time profile of a *process*. This contains the regularly scanned states of the command counter.

program
A program is

- an executable file
- a process

PROM monitor
The PROM (PROM= Programmable Read Only Memory) monitor is stored in the PROM as firmware. It is started automatically as soon as the startup phase and the basic initializations have been concluded successfully.

The PROM monitor checks the hardware and outputs the results to the screen. Depending on the boot mode set, it either automatically initiates the SASH, or awaits user input with the prompt >>.

queue

A queue is a list of actions waiting to be processed.

Reliant UNIX

Reliant UNIX is the UNIX of Fujitsu Siemens. It is a standardized open operating system which satisfies high requirements with regard to reliability and availability – both in commercial and technical usage. Reliant UNIX is the new name for Version 5.43 B00 and later versions of the SINIX operating system. All the proven SINIX features are still available in Reliant UNIX.

reinstallation

If Reliant UNIX is to be installed on a *hard disk* on which this *operating system* was **not** previously installed, reinstallation is performed. This is normally only necessary if a new *system disk* has been installed in the computer. For this *type of installation*, any data previously stored on the hard disk is overwritten, including the add-on products.Only exception: the previous */home file system* can be retained.

remote

The system to which the user's terminal is connected is called the local system. Every other system that can be accessed over a network, on the other hand, is referred to as the remote system. If a remote system is used to perform an activity, this activity is also described as remote. In a remote operation, the local system is also called the client and the remote system is called the server. For example, the software required for any activity on the client is loaded via the server.

root

root is

- the login name of the user *root*. As system administrator or superuser, this user has special rights (*root* authorization).
- a special directory (*/*) that forms the root of the directory hierarchy in a file system. This is also the login directory of the user *root*.

run level

The run level is a software configuration of the operating system, which permits the existence of a particular group of *processes*. A distinction is made between single-user mode and multiuser mode.

SASH

The SASH (Stand-Alone SHell) is a system interface which operates independently of the standard output. It is stored in partition 10 on the symbolic link. It is loaded by the PROM monitor into the main memory, where it is executed as a loader process. Depending on the boot mode set, it either automatically loads the Reliant UNIX operating system, or awaits user input with the prompt *sash:*.

search path
The search path of the shell consists of a list of directory names. If a command is called, it is prefixed with the directory names in sequence until an executable file is found. The search path is stored in the *$PATH* shell variable.

sector
Each hard disk is logically divided into concentric circles called tracks. These tracks are in turn divided like a cake into parts called sectors.

server
If a system is integrated in a network, certain activities on this system can be carried out remotely (i.e. using another remote system). In this case, the local system is called the client, while the remote system is called the server. For example, the software required for any activity on the client can be loaded via the server.

shell
The shell is

- the *sh*(1) program which activates other programs when commands are entered. Normally, this is the program set by the user, which is started when the user logs onto the operating system (see also "login").
- the term commonly used for every program started after login.

shell procedure
See "shell script"

shell script
A shell script is an executable file whose contents are used by the shell as command input.

single-user mode
The single-user mode is a run level in which only one user has access to the operating system.

SINIX

SINIX is a UNIX *operating system* for systems developed by Fujitsu Siemens. It is a standardized open operating system with commercial applications. The new name *Reliant UNIX* is used for Version 5.43 B00 and later versions of the operating system. All the proven SINIX features are still available in Reliant UNIX.

special file

A special file is formed by an inode that refers to a device.

standard error

This term refers to one of the three filess that are normally already open when a *process* is started. The file name of standard error output is *stderr*. Initially, the file refers to the screen.

standard input

This term refers to one of the three files that are normally already open when a *process* is started. The file name of standard input is *stdin*. Initially, the file refers to the screen.

standard output

This term refers to one of the three files that are normally already open when a *process* is started. The file name of standard output is *stdout*. Initially, the file refers to the screen.

startup

See "boot"

superuser

The superuser or system administrator has the login name "root" and the user ID 0. Regardless of the permission set, he/she can access all files and activate certain system calls that require special rights (*root* authorization), e.g. to assign permissions.

swap area

The swap area is the part of the hard disk which stores the "anonymous" memory contents when swapping out. It is a separate area and is not part of the file system.

symbolic link
A symbolic link is a file containing the *path name* of another file. When a symbolic link is accessed, the file with the specified path name is accessed.

SYSADM
SYSADM is an interactive program package for system administration. It is started by the *sysadm*(1M) command and supports most system administration tasks via its own user interface.

system administrator
The system administrator or "superuser" is the user who is logged on with the user ID root. Only the system administrator is authorized to execute certain administration tasks. The rights required for this purpose are also called *root* authorization.

system call
System calls are:a set of operating system functions used to assign, start, monitor, handle, and terminate all operating system operations.calls issued by user processes for executing system-dependent functions. These include input/output and process creation.

system crash
Hardware or software errors can lead to conditions that the operating system cannot handle. If this occurs, the system is terminated automatically and "crashes". Such conditions arise, for example,

- if the operating system cannot assign any further resources,
- if it cannot manage any further *processes*,
- if it cannot support any further system calls,
- if the power supply is unstable.

system disk
Each system can contain several hard disks. Any hard disk containing the root file system (/) is known as the system disk. The partitions of the system disk must have a minimum size. Partition 10 of the system disk contains the SASH, which is required to boot the system. Partition 15 stores the status information if the system disk is mirrored.

system kernel
The system kernel is the actual operating system. It is located on the system disk as the */unix* or */stand/unix* file. This file is approximately 5 Mbytes in size. It is loaded into the main memory during the boot procedure and remains resident there. The command*/etc/conf/bin/idbuild* can be used to generate a new system kernel. This is then loaded automatically the next time the system is booted.

terminal
A terminal is an input/output device consisting of a keyboard and a monitor (and possibly a mouse). The terminal that is connected directly to the system is referred to as a console.

text file
A text file or ASCII file only contains ASCII characters.

tunable parameter
Tunable parameters are used to define sizes and limits for various control structures of the Reliant UNIX operating system. This enables the operating system to be adapted to a certain extent to the respective operating conditions. The tunable parameters are defined in the */etc/conf/cf.d/mtune* and */etc/conf/cf.d/stune* files. They can be changed using the *idtune*(1M) command.

types of installation
There are two different types of installation: new installation and update installation. When Reliant UNIX is installed, a number of intermediate stages of the operating system are installed. These include the mini system and the basic system.

update installation

An installation is referred to as an update installation if two conditions apply: a particular version of Reliant UNIX has already been installed on the system, and a new version is now to be installed. With this type of installation, all system data with which the system has been configured is retained, together with all user data and add-on products.

user ID

The user ID is a positive integer that is normally assigned to a login name. The user ID of a process is inherited by all processes created by that process (using fork). It is also entered as the multiuser mode of all files created by the process.

virtual memory

A memory management procedure used by most modern operating systems. See also "Master Test Handler (RM600 only)".

Related publications

Ordering manuals

Please apply to your local office for ordering the manuals.

A number of the most frequently used manuals are also available online. The online documentation is available on CD and also on the World Wide Web on the Fujitsu Siemens homepage.

Please refer also to the documentation overview in the README file. This file is located under the name *readme* in the */opt/readme/sinix.GB* directory on the system disk or in the */cdrom/sinix_y/5_45b00/en* or */cdrom/sinix_n/5_45b00/en directory on the "Reliant UNIX 5.45 B00" CD-ROM*.

[1] **Reliant UNIX**
Operating Manual (hardware-specific)

Target Group
Users and system administrators

Contents
This manual describes the hardware installation for the respective system type as well as the system startup.

[2] **Reliant UNIX**
Technisches Handbuch RM200 C-Modelle / RM200 C Models Hardware Guide

Target Group
Users and system administrators

Contents
The manual describes the internal structure of the system and the changing of SIDATA components.

[3] **Reliant UNIX**
Technisches Handbuch RM300 C-Modelle / RM300 C Models Hardware Guide

Target Group
Users and system administrators

Contents
The manual describes the internal structure of the system and the changing of SIDATA components.

[4] **Reliant UNIX 5.44**
User's Guide
User's Guide

Target Group
Users

Contents
The "Users Guide" provides an overview of the Reliant UNIX operating system as well as an introduction to the general basics for users.

[5] **Reliant UNIX 5.45**
Commands, User Reference Manual
Reference Manual

Target Group
Users

Contents
This manual describes the Reliant UNIX commands in alphabetical order.

[6] **Reliant UNIX 5.44**
System Administrator's Guide
System Administrator's Guide

Target Group
System administrators

Contents
The manual provides an overview of UNIX system administration.

[7] **Reliant UNIX 5.45**
System Administrator's Reference Manual
Reference Manual

Target Group
System administrators

Contents
This manual describes commands and application programs for system maintenance, file formats and special system administration files, and also provides diagnostic information.

[8] **Reliant UNIX 5.44**
System Administration and Hardware Configuration Using the SYSADM User Interface
System Administrator's Guide

Target Group
System administrators

Contents
This manual describes operation of SYSADM, system administration (managing file systems and network services, installing software, configuring the system, and user administration) and hardware configuration using the SYSADM user interface.

[9] **Reliant UNIX 5.45**
Reliant UNIX Operation
System Administrator's Guide

Target Group
System administrators

Contents
This manual describes essential information for using Reliant UNIX and for performing software administration with SYSADM.

[10] **Reliant UNIX 5.45**
Network Administration
System Administrator's Guide

Target Group
Network administrator, system administrators

Contents
This manual describes the network administration activities that have to be performed when using the TCP/IP software on Reliant UNIX 5.45 as well as the basic network function (BNU).

[11] **Reliant UNIX 5.45**
Network Reference Manual
System Administrator's Guide

Target Group
Network administrators, system administrators

Contents
This manual gives a description in alphabetical order of the commands, functions, utilities and files that are important for network operation.

[12] **Reliant UNIX 5.45**
System Administration within a Domain
System Administrator's Guide

Target Group
System administrators

Contents
This manual describes how domains are created and administered using *DomainAdmin*.

[13] **Reliant UNIX 5.45**
Veritas File System (VxFS) V2.1
System Administrator's Guide

Target Group
System administrators

Contents
This manual provides an introduction to system administration of the Veritas file system (VxFS) and also explains the error and diagnostic messages.

[14] **Reliant UNIX 5.44**
UFS UNIX File System

Target Group
System administrators

Contents
This manual describes the organization, administration, maintenance and consistency checking for the ufs file system.

[15] **Reliant UNIX 5.44**
Virtual Disks
User's Guide

Target Group
System administrators

Contents
This manual describes the various types of virtual disk and how they are configured.

[16] **Reliant UNIX 5.45**
Configuring Virtual Disks with VDisk Lite
System Administrator's Guide

Target Group
System administrators

Contents
This manual describes how you configure virtual disks with VDisk Lite.

[17] **Reliant UNIX, Solaris**
LAN Console
Product Manual

Target Group
System administrators, service engineers

Contents
This manual describes the installation, configuration and operation of LAN consoles and RCAs as well as the individual device configurations.

[18] **SINIX/windows User Environment V3.0**
Documentation Overview

Target Group
SINIX/windows users

Contents
Overview of the comprehensive documentation for SINIX/windows User Environment V3.0

[19] **SINIX/windows User Environment V3.0 (CDE)**
User's Guide
User's Guide

Target Group
Users with basic knowledge of SINIX.

Contents
This manual describes the underlying features of the SINIX/windows desktop and explains how to work with the desktop and the desktop applications.

[20] **SINIX/windows User Environment V3.0 (SINIX Desktop)**
Introduction to Handling and Configuration
User's Guide

Target Group
Users with basic knowledge of SINIX

Contents
This manual describes the components of the SINIX/windows desktop, how to use the user interface, as well as the interactive configuration of the desktop.

[21] **SINIX/windows User Environment V3.0 (CDE)**
Advanced User and System Administrator Guide
User's Guide

Target Group
System administrators

Contents
This manual explains the concepts underlying the product as well as how to configure and integrate applications.

[22] **SINIX/windows User Environment V3.1 (CDE)**
CDE Enhancements
User's Guide

Target Group
SINIX/windows users and system administrators

Contents
The book provides an overview of the additional functionality that Siemens Nixdorf Informationssysteme AG and Triteal Corporation have added to the Common Desktop Environment (CDE).

[23] **SINIX/windows User Environment V3.0 (SINIX Desktop)**
Guide for Experts and System Administrators
User's Guide

Target Group
SINIX/windows experts and system administrators

Contents
This manual discusses the concepts underlying SINIX/windows as well as the configuration of the user interface. It also describes the primary clients for display administration or window management as well as the service tools and files.

[24] **SINIX/windows User Environment (SINIX Desktop)**
Clients Reference Manual
Reference Manual

Target Group
SINIX/windows experts and system administrators

Contents
This manual provides the experienced user with comprehensive information about the clients, i.e. about the calls, options and resources that determine their appearance and behavior. It also describes the sequence and priority with which the resource definitions are evaluated.

[25] **SINIX/windows User Environment (SINIX Desktop)**
XDCL Desktop Configuration Language
Reference Manual

Target Group
SINIX/windows experts and system administrators

Contents
This manual provides an introduction to the XDCL language (Desktop Configuration Language) and also includes a representation of its syntax. The experienced user can use XDCL to configure the SINIX/windows desktop.

[26] **Reliant UNIX 5.44**
Tuning Guide
System Administrator's Guide

Target Group
System administrators

Contents
Description of how the system performance (Performance) can be analyzed and improved (Tuning), and when the hardware should be extended.

[27] **Reliant UNIX 5.45**
Diagnostics and Troubleshooting

Target Group
System administrators, programmers, service technicians

Contents
The manual describes potential system errors, how these errors are interpreted, as well as possible measures for dealing with errors.

[28] **NetWorker V4.2C**
Installation and Maintenance
System Administrator's Guide

Target Group
System administrators

Contents
Description of how the NetWorker software is installed on server and client systems. The manual also provides an overview of the administration of the NetWorker environment.

[29] **NetWorker V4.2C**
User's Guide
User's Guide

Target Group
Users who want to implement NetWorker

Contents
Description of how data is backed up and restored using NetWorker. The manual explains all NetWorker functions available to the user.

[30] **NetWorker V4.2C**
System Administrator's Guide
System Administrator's Guide

Target Group
System administrators and users

Contents
Description of how NetWorker can be configured and managed.

[31] **Reliant UNIX**
RAIDmaster

System Administrator's Guide

Target Group
System administrators

Contents
The manual describes how the RAIDmaster controller is implemented in Reliant UNIX systems.

[32] **Distributed Systems Management V1.3**
DSM V1.3 - New Functions and Modifications
System Administrator's Guide

Target Group
System administrators

Contents
The manual describes the new functions of DSM V1.0 (DSM = Distributed Systems Management), the packaging process of DSM V1.3 as well as the operating of SAX-LSM (SAX = Software Administration for Open Systems, LSM = Local Software Maintenance).