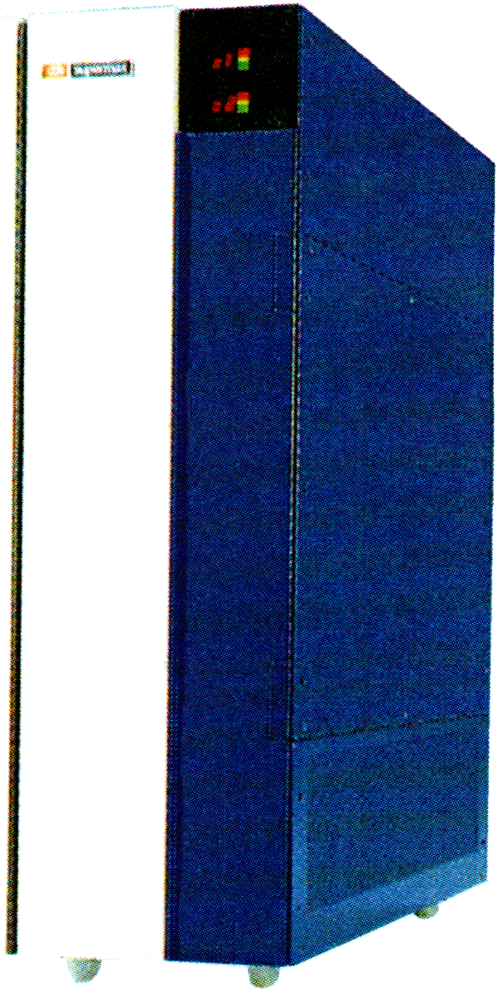
SUPERMAX

BUSINESS SERVER

ABC



SUPERMAX

Business Server

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0. Introduction

0.1 How to Use this Book

"Supermax Business Server ABC" is a start-up guide which will help you to put your new Supermax Business server into service, and it also describes maintenance and recovery. The information contained in this manual is not described in the standard UNIX manuals, in the application manuals, or in the DDE add-on products manuals.

"Supermax Business Server ABC" is aimed at the system administrator who is responsible for the day-to-day running of the Business Server.

Using this manual implies a knowledge of system administration under standard UNIX. It does not provide in-depth knowledge of UNIX nor does it intend to replace the UNIX manuals.

It is recommended to supplement the "Supermax Business Server ABC" with the manual "System Administrator's Quick Reference". It contains brief descriptions of how to perform certain system administration tasks and

refe- rences to the appropriate UNIX manuals which may save you time and work.

DDE has made a large effort to avoid technical inaccuracies and typographical errors in this manual, but it may include some, although.

DDE takes no responsibility for possible negative consequences due to the use of this manual. DDE may make improvements and changes in the products and programs described in this manual at any time.

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0.2 References

References to other manuals are gathered in this section to keep the layout of the book clear. In the chapters 1 - 12 the references only figure as italicized digits in parentheses such as *(1)*.

(1) Please refer to the UNIX manual "System Files and Device Reference" under '**fd(4)**' and '**fd(7)**'.

(2) Please refer to the UNIX manual "Command Reference (m-z)" under '**shutdown**'.

(3) Please refer to the UNIX manual "Command Reference (m-z)" under '**sysadm**'.

(4) Please refer to the UNIX manual "Command Reference (m-z)" under '**pkgadd**'.

(5) Please refer to the UNIX manual "Command Reference (a-l)" under '**disksetup (1M)**'.

(6) Before you change the file systems it is recommendable to be familiar with the UNIX manual "System Administration", Vol. 2, the chapter "Managing File System Types".

(7) Please refer to the UNIX manual "System Administration", Vol. 1, the chapter "Setting Up the Work Environment".

(8) Please refer to the UNIX manual "Network Administration", Vol. 1, the

chapter "Using Domain Name Service with TCP/IP".

(9) Please refer to the UNIX manual "Network Administration", Vol. 1, the chapter "Expanding Your TCP/IP Network".

(10) Please refer to the UNIX manual "Command Reference (a-l)" under '**edvtoc (1M)**'.

(11) Please refer to the UNIX manual "Command Reference (a-l)" under '**prtvtoc (1M)**'.

(12) Please refer to the UNIX manual "Command Reference (m-z)" under '**mkfs (1M)**'.

(13) Please refer to the UNIX manual "Command Reference (a-l)" under '**devattr (1M)**'.

(14) Please refer to the UNIX manual "Command Reference (a-l)" under '**diskadd (1M)**'.

1. Supermax Business Server

Supermax Business Server consists of a cabinet, which contains the Business Server itself, and a console.

1.1 The Front of the Business Server

On the front of the cabinet an activity indicator and, behind a door, an operator panel and peripheral units are located.

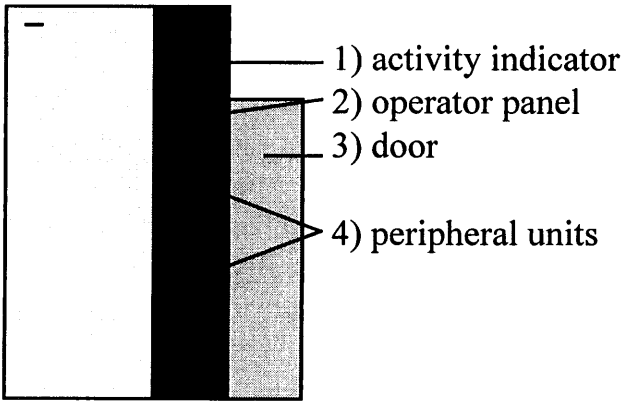

Fig. 1.1: The Business Server Front.

1.1.1 The Activity Indicator

The activity indicator consists of seven segment LEDs and red and green LEDs. It indicates CPU

activity, disk traffic and Ethernet traffic. Besides, it indicates that the SHUTDOWN button is activated. Please refer to the chapter "Operating the Business Server" details on the activity indicator.

1.1.2 The Operator Panel

The operator panel is located behind the front door of the Business Server. The panel consists of:

- A push-button labelled: START
- A push-button labelled: SHUTDOWN
- A key switch
- An LCD display which continuously shows messages about voltage levels, temperature, and other data about the Business Server.

For a detailed description of the operator panel please refer to the chapter "Operating the Business Server".

1.1.3 Peripheral Units

The Business Server is always equipped with the peripheral units mentioned below:

- 3.5" floppy disk drive (floptical)
- 1/4" tape streamer 525 MB

Besides, the Business Server can have several other types of peripheral units. For example:

- 1/4" tape streamer 2.4 GB
- 8 mm video streamer 2.3 GB
- 8 mm video streamer 5.0 GB
- 4 mm DAT streamer 3.8 GB
- CD ROM unit 600 MB

The above list may be subject to change without notice.

1.2 The Rear of the Business Server

Located behind a door on the rear of the Business Server you will find the I/O submodule connectors. The Business Server always has two RS232 connectors: one for the

console and one for the service port. Besides, the mains switch is located here.

1.2.1 The Rear Door

The rear door is opened in this way:

1. Insert your fingers into the two black slide latches on the rear door.
2. Press the upper latch downwards and the lower latch upwards simultaneously while opening the door.
3. Release the latches.

The rear door is closed again in this way:

1. Press the upper latch downwards and the lower latch upwards simultaneously while closing the door.
2. Release the latches.

1.2.2 The Subsystems

The term "**subsystem**" is a collective name for the Business Server's CPU boards and I/O controller boards.

Types of I/O controller boards:

Type	Function
DIOC3	two SCSI channels and a floppy drive
SIOC2	64 RS-323 lines and a parallel printer
MIOC	room for two submodules named number 1 and 2
Ethernet submodule	one 10 Mbit Ethernet (AUI cable)
HDLC submodule	two V.24/V and two V.36/V.1128
TERM8	eight RS-232 lines
TERM32	32 RS-232-lines

1.2.3 The Subsystem Unit Numbers

All boards except for memory modules have a unique number (0 - 14). It is configured by means of a switch on the board itself. The

numbering must comply with the following rules:

- The MCU board always has the number 6
- Board number 0 must contain an RS-232 connecttion for the console. Therefore, number 0 either must be a MIOC or a SIOC2 board
- The first DIOC3 has number 14 and has a connection for a floppy, a boot tape drive and a disk.
- If the Business Server has more than one DIOC3 they are numbered continuously: 13, 12, 11
- If the Business Server has more MIOCs or SIOC2s they are numbered consecutively: 1, 2, 3, 4, 5

If the above described numbering rules is violated the Business Server is not able to boot. If possible an error message will appear on the console, a message will also appear on the service port, and the floppy device will flash: three short, three long, and three short flashes (...___...).

To see the hardware configuration use the **/usr/bin/prtconf** program.

1.3 The Console

The Business Server console must be a terminal approved for the purpose by DDE. It must have a DDE default set-up. To communicate correctly with the system the communications parameters of the console must be set like this:

- Baud rate = **9600**
- Bits per character = **8**
- Parity = **none**
- Number of stop bits = **1**
- Transmission handshake = **XON/OFF**

It is possible to connect a terminal to the service port for trouble shooting. The communications parameters must be se like this:

- Baud rate = **9600**
- Bits per character = **7**
- Parity = **even**
- Number of stop bits = **1**
- Transmission handshake = **HARDWARE**

Please refer to the manual for the terminal in question to see how to check and modify the parameters.

1.3.1 Console without Function Keys

If the console is of another type than recommended by DDE as console for a Business server, and the VTI program is not installed, the function keys may not be available. To solve this problem it is possible to combine other keys to perform the function key functions:

1. Press the **CTRL**-key and an "**f**" simultaneously followed by the function key number.

Eg. you get **f3** by pressing "**CTRL f**" followed by **3**.

2. Operating the Business Server

When the Business Server is installed and connected to correct mains voltage (must be done by qualified personnel only) and turned on, it is operated via the console keyboard and the operator panel which is located behind the blue door on the front of the cabinet. Data input and output is managed via the units placed beneath the operator panel.

2.1 The Mains Switch

The key switch on the operator panel powers the Business Server on and off. The power supplies, however, are not affected. Therefore, the Business Server also has a mains switch, which completely disconnects the mains to the Business Server, including the power supplies.

The mains switch is a rotary switch located on the rear side of the Business Server. To reach it you must open the rear door of the Business Server. (Please refer to the section "The Rear Door" in the chapter "Supermax Business Server").

2.1.1 Operating the Mains Switch

To turn on the mains switch of the Business Server:

1. Turn the rotary switch to the right until the line on the switch points to the text 'I' on the cabinet.

To turn off the mains switch:

1. Turn the rotary switch to the left until the line on the main switch points to the text 'O' on the cabinet.

2.2 The Operator panel

The operator panel consists of two system buttons, (**1**) START and (**2**) SHUTDOWN, a semigraphical LCD display (**3**), and a key switch (**4**).

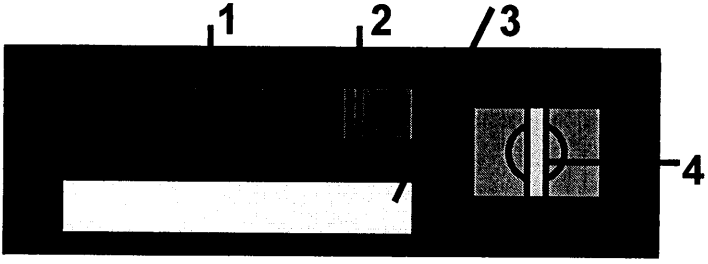

Fig. 2.1: The operator panel.

2.2.1 The System Buttons

On the front of the Business Server there are two system buttons: a push-button labeled **'START'** and another labeled **'SHUTDOWN'**.

The START Button

The '**START**' button immediately resets the Business Server without any warnings and without closing open files etc. Therefore, the users risk loosing data, if a running Business Server is reset.

The button is only operational when the key switch is in **'SYSTEM'** position (see below).

The SHUTDOWN Button

The '**SHUTDOWN**' button shuts down the Business Server in the same way as the UNIX command '**shutdown**', including user warnings and file closing, before shutting down the UNIX system and powering off the Business Server. Therefore, you should use this button before booting, if you are not able to run the '**shutdown**' command.

When you press the button the horizontal bar in the middle of the right seven segment LED of

the activity indicator lights up. It indicates that the shutdown procedure has started.

The '**SHUTDOWN**' button is only operational when the key switch is in '**SYSTEM**' position. (See below).

2.2.2 The Status Display

Next to the activity indicator there is a display which shows information about the running of the Business Server.

2.2.3 The Key Switch

To power on and off the Business Server you will use the key switch.

The key switch has three key mode positions:

OFF Switches off the power to the Business Server. The UNIX system is not shut down correctly. Therefore, you should use the normal UNIX shutdown procedure first to prevent data loss etc.

SYSTEM Switches on the power to the Business Server. If you leave the

key in this position after booting the system buttons are operational.

RUN Is the key mode position during normal operation. If you leave the key in this position after booting the system buttons are not operational. In this way you prevent unintended shut-down or reset.

When the key switch is in the RUN position, the key should be removed from the Business Server. Otherwise false operating may cause unintended system shutdown resulting in data loss etc.

When the key switch is in SYSTEM position, it is only possible to single user mode.

At different points within system administrative procedures, for example when updating the UNIX system, you will be required to place the key switch in any one of these three positions.

2.2.4 The Activity Indicator

In the operator panel you will also find an activity indicator. Here two seven segment LEDs show the computer's activity.

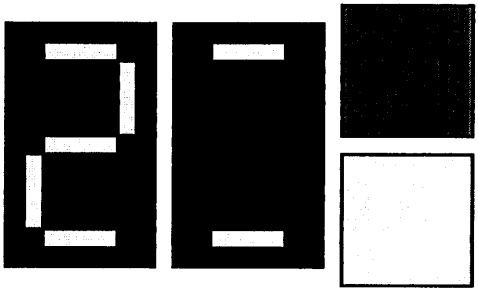

Fig. 2.2: The Activity Indicator.

The segment to the left shows a digit from 0 - 9 which indicates CPU activity. 0 means no activity, 9 means maximum activity. The digit is updated every other second.

In the segment to the right the upper horizontal bar shows SCSI disk traffic, the lower Ethernet traffic.

The activity indicator only shows physical disk traffic. I.e. reading from the cache will not make the upper bar flash to indicate traffic. In the same way the lower bar only flashes when Ethernet packages for the Business Server in concern are received.

The horizontal bar in the middle of the right LED seven segment is turned on when the SHUTDOWN button is activated, and the shutdown procedure is initiated. (Please refer to the section "The System Buttons" above).

2.3 The Peripheral Units

The Business Server is always equipped with a floppy disk drive and a tape streamer unit. Besides, it is possible to install other types of peripheral units. These units are located below the operator panel.

2.3.1 Floppy Disk Drive

The 3.5" disk drive can read high density diskettes formatted for 1.44 MB.

2.3.2 Tape Streamers

The Business Server can be equipped with different types of streaming tape units for 1/4" tapes .

Do not use tapes of other types than the ones recommended by the Business Server supplier.

2.3.3 Video Streamers

The Business Server can be equipped with different types of video streamers for 8 mm tapes

Do not use tapes of other types than the ones recommended by the Business Server supplier.

Please notice when removing tape from the unit that it might take a while for the tape unit to release the tape because the unit has to rewind the tape first.

2.3.4 DAT Streamers

The Business Server can be equipped with a DAT streamer for 4 mm DAT-tape.

Do not use tapes of other types than the ones recommended by the Business Server supplier.

Please notice, when removing tape from the unit that it might take a while for the unit to release the tape, because it has to rewind the tape first.

2.3.5 CD ROM Unit

The Business Server can be equipped with a CD ROM unit.

The CD ROM for this unit must be a standard CD data disk. It must be placed in the caddy, which DDE delivers with the CD ROM unit. Finally, the caddy can be inserted in the Business Server CD ROM unit.

3. Boot and Shutdown

An Business Server in normal operation must be shut down and booted again under certain circumstances. For example in the case of system modifications and certain types of errors.

A normal boot means that the Business Server performs internal hardware tests and reads in the contents of the boot disk including the UNIX operating system.

If an error occurs during relinking of the UNIX kernel so that the Business Server is unable to boot normally, the old boot module must be reinstalled. This situation is described below in the section "Boot After UNIX Relinking Error".

3.1 How to Boot

If the Business Server is running you should shut it down correctly before booting. I.e. warning the users to give them a chance to terminate programs and log out, and allowing the Business Server to close open files and perform other shutdown procedures.

If you are booting due to an error the console may be inaccessible. In this case you can try to shut down the system using the system button **'SHUTDOWN'**. (Please refer to the section "Shutdown Without Console" below).

Whenthe Business Server is shut down do as follows to boot:

1. Turn the key switch to the position **'SYSTEM'**.
2. Press the system button **'START'**.
3. Turn back the key switch to the position **'RUN'**.

Now the Business Server boots automatically from the harddisk. (Normally from the boot file '**unix**' under '**/stand**').

If the preceding shutdown of the system was uncontrolled (for example due to a power failure) the boot will take longer than usual, because the Business Server checks the file system, closes open files etc. automatically.

When the console shows the following message:

```
The system is coming up. Please wait!
```

the boot is complete. The Business Server is now running full UNIX and can be operated with standard UNIX commands. (Please refer to the UNIX manuals).

3.1.1 Stop the Boot Process

During
system-boot it is possible to stop the procedure and communicate with the system on a lower level than UNIX. It is necessary if you want to use another UNIX boot file.

It is only possible to stop the boot as long as the console shows the text: "**`Press Control C to stop the boot process`**".

1. Press the CTRL key while striking the letter key '**c**' .

Now the boot is stopped, and a menu appears on the console:

```
      *** SUPERMAX Business Server ***
=========================================
Press Control C to abort the boot process

Boot Procedure has been interrupted

0 : unix
1 : unix.old
2 : Tape
3 : Secondary boot disk

Select boot file (0-3) :
```

Fig. 3.1: Boot Menu.

You may now use another UNIX kernel, possibly from a boot tape. If you select '**0**' (**unix**), the Business Server boots using the default UNIX kernel.

If the disk administration system Veritas is installed on the Business Server you may select another boot disk by selecting item '**3**' in the menu, "Secondary boot disk". If the primary boot disk fails the Business Server will automatically boot from the secondary disk and show the following message on the console:

```
WARNING : WARNING : WARNING : WARNING
Disk c0t0d0 has failed. The system will boot
on secondary boot disk c1t0d0.
```

3.1.2 Boot After UNIX Relinking Error

If an error occurs during relinking of the UNIX kernel the boot will stop. You may now go back to a copy of the boot module which was in use before the relinking.

This is done as follows:

1. Press the CTRL key while striking the letter key '**c**' to invoke the boot menu.
2. Enter '**1**' to select the menu item '**1 : unix.old**'.
3. Now the Business Server boots as it did before the relinking.

After the boot and before you create a new UNIX kernel, the unix.old file must be copied back as default boot media:

1. Enter the following command from shell:

```
cp /stand/unix.old /stand/unix
```

The copying process may take several minutes, because **/stand** is a **bfs** disk system.

3.1.3 Troubleshooting

If the Business Server does not boot when you turn on the key switch and press the START button, you may check the following:

1. Ensure that the mains cable is plugged into a grounded electrical wall outlet, and that the wall outlet is switched on.
2. Ensure that the mains switch is set to 'ON'-position.

(Please refer to the section "The Rear of the Business Server", the chapter "The Enterprise Server").

3.2 How to Shut Down

If the Server is running you must shut down the system correctly. This means warning active users allowing them to close their programs and log out and allowing the Business Server to close open files, if any, perform other system jobs etc.

1. Log in as '**root**' on the Business Server console and execute the '**shutdown**' command.*(2)*

'**shutdown**' shuts down the UNIX system and powers off the Business Server.

3.2.1 Shutdown Without Console

If you want to shut down the UNIX system correctly and it is not possible to run the UNIX command '**shutdown**', you can try to shut down the system by means of the system button '**SHUTDOWN**':

1. Turn the key switch to the '**SYSTEM**' position, if it is not already there.
2. Press the system button '**SHUTDOWN**'.

   Now the shutdown procedure starts and the middle horizontal bar in the right LED seven segment of the activity indicator turns on.. The UNIX system is shut down in the same way as if you were using the UNIX command '**shutdown**'.
3. If the Business Server does not shut down in about five minutes it indicates that it is

not possible to shut down the system correctly.

Therefore you will have to turn the key switch to **'OFF'** to power down the Business Server without shutting down the UNIX system.

4. Updating UNIX

When a new UNIX version is installed on the Business Server, user files, applications and certain system files as **'/etc/passwd'** and **'/etc/profile'** will be saved.

Before starting the updating you must, however, be sure to have an updated and readable backup. (Please refer to the chapter "UNIX Backup/ Restore" and to your backup system manual).

4.1 Boot from Installation Medium

Firstly, the Business Server should be shut down correctly before updating. (Please refer to the chapter "Boot and Shutdown").Then you have to boot the Business Server from the updating medium. It is done like this:

1. Insert the floppy in the floppy drive and the boot tape in the correct tape drive.
2. Boot the Business Server in system mode (Please refer to the section "How to Boot" in the chapter "Boot and Shutdown").

Now the Business Server boots from the update medium, and certain system messages appear.

3. When the boot is completed the following message appears:

   Select terminal type (*type list*)

4. Enter the terminal type which is used as console and strike RETURN.
5. Certain system messages appear. Press any key when requested to make the boot proceed.
6. Now a herald screen appears. Press any key when requested to get to the 'Main Menu'.

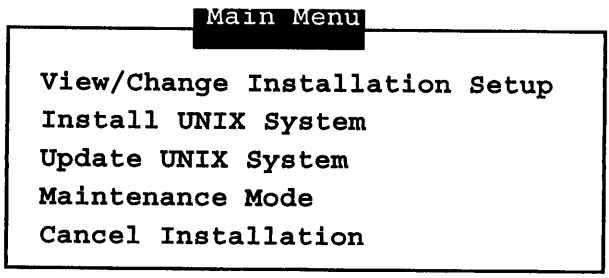

Fig. 4.1: Main Menu.

Here you can proceed with the update (see below) unless you want to modify the installation setup. (Please refer to the chapter "Re-Installing UNIX" below). The disk

configuration cannot be modified. This is only possible during a re-installation of the UNIX system!

4.2 Updating

How to update the UNIX:

1. Strike the arrow down-key to move down the cursor to '**Update UNIX System**' in '**Main Menu**'. Strike RETURN to select the item.

   Now the update program checks for necessary disk space. Afterwards a frame with the following text appears: "**Please confirm that a VALID backup is present before continuing**".

2. Strike the letter-key '**C**' if you have a valid backup.

   Otherwise, press the ESC-key to return to the Main Menu. Then select the menu item '**Cancel installation**' to terminate the installation program and get the chance to make a backup.

3. Now a frame with the headline "**Choose merge option**" appears. Strike RETURN

while the asterisk (*) is placed against the choice "**Automatically combine the files**".

If you do not want to use the automatic merge option strike the arrow down-key to move the asterisk and strike RETURN.

Then the existing files are saved, and after finishing the updating the update program sends mail to '**root**' with information about where to find the saved files. In this case you will have to merge the files manually.

Now the UNIX version on the Business Server is updated from the updating medium. The console shows what actually is happening.

When the update is complete a message appears.

1. Remove the update medium from the Business Server.
2. Turn the key switch to RUN position.
3. Strike the RETURN key to make the Business Server boot from the boot disk using the updated UNIX system.

Then the Business Server can be operated with standard UNIX commands again. (Please refer to the UNIX manuals).

1. Read mail, if any, sent to '**root**' during the update.

If you have to update applications it is done via the program '**sysadm**' *(3)* or from shell using the command '**pkgadd**' *(4)*.

5. The New Business Server

It is important not to turn on the new Business Server before it reaches the same temperature as the environment, especially when indoor and outdoor temperatures differ widely.

A new Business Server has UNIX and communications software pre-installed. When the machine is delivered and connected to the mains, you will only have to boot it and change system name, internet address, and check/ modify date and time zone before you start using the machine.

5.1 Modifying Node Name

How to modify the name of the Business Server (node name/uname):

1. Boot the Business Server in 'RUN' mode. (Please refer to the chapter "Boot and Shutdown", the section "Run-Boot").
2. Select '**runlevel s**' (single user mode).
3. Log in as '**root**'.

4. Start the administration program '**sysadm**' *(3)* using this command:

```
sysadm
```

5. Select '**system_setup**' in the '**sysadm**' start menu "UNIX System V Administration. (Use the arrow down-key and RETURN to select).
6. Select '**nodename**' in the now shown menu, "System Name, Date Time and Initial Password Setup". (See 5 above).
7. Select '**set**' in the new menu, "Display and Set System Name and Node Name of the Machine". (See 5 above).
8. Enter the new name for the Business Server in the field "**Network Nodename**" (max. 7 characters. Avoid national characters and special characters which are not represented in 7-bit ASCII).
9. Strike the function-key SAVE to save the new name.
10. Strike the function-key CANCEL twice to step back two menus.

Besides, it is necessary to edit the file '**/etc/saf/nbt/_pmtab**'. It is very important that the field which holds the name of the Business Server, i.e. the field which starts and ends with quotations marks ("), is PRECISELY 16 CHARACTERS long!

The uname of the Business Server should only be 7 characters long. Immediately after the name the string '**.login**' must be found. Then you will have to fill in spaces until the field contains precisely 16 characters between the two quotations marks. The line could look like this:

```
nb:u:root:reserved::"John.login        "::c:: \
/usr/lib/saf/ttymon -g -h -m
```

The Business Server in the example is named '**John**'. To this uname is added the string '**.login**', 10 characters in all. Therefore 6 spaces are added to fill the field with precisely 16 characters.

1. Edit the file '**/etc/saf/nbt/_pmtab**' with an editor, for example '**vi**'.
2. Modify the old Business Server name (uname) in the first line of the file.

3. Add or delete spaces after '**.login**' to give the field its precisely 16 characters between the two quotation marks.
4. Save the file.

It is necessary to modify the name of the Business Server in certain other system files which also hold the internet address. These modifications are therefore described as an integral part of the address modification in the below section "Modify Internet Address etc.".

5.2 Modifying Date/Time Zone

Having modified the node name, you will have to check year, date, time and time zone and, if necessary, modify this information:

1. Select '**datetime**' in the '**sysadm**' menu "System Name, Date Time and Initial Password Setup".
2. Select '**display**' in the menu "Display and Set System Date and Time".

3. Check whether the information is correct. If not you will have to modify it (go to 4.), otherwise skip to 8.
4. Strike the function-key CANCEL to return to the previous menu.
5. Select '**set**' in the menu "Display and Set System Date and Time".
6. Enter date, time (if you use 12-hour-indication you must fill in the field AM/PM too), and select time zone. (The function-key CHOICES shows the various time zones).
7. Strike the function-key SAVE to save the new date/time zone.
8. Press the function-key CANCEL until all menus are closed except for the start menu "UNIX System V Administration".
9. Terminate '**sysadm**' by means of striking the function-keys CMD-MENU, and select '**exit**' in the Command menu.

Certain system files hold the internet address and the name of the Business Server (node name). The next section describes how to insert the new address and the new name in these files instead of the old one.

5.3 Modifying Internet Address etc.

To modify the internet address of the Business Server you must modify the system files which hold the address. In some of these files you will have to modify the node name (uname) too:

1. Start the following program to edit the 'interface' file:

   ```
   /etc/confnet.d/configure -i
   ```

2. Now an interactive program starts. Here you will be asked to enter system name, address and possibly subnet mask too. *(8)*

If the Business Server has more network interfaces (BAIOs or submodules) using different addresses, please follow the instructions in the section "BAIO Configuration" in the chapter "Networking".

The '**configure**' program adds a line containing name and address for each network interface to the file '**/etc/hosts**', but it does not remove the old lines. Therefore, you will have to delete them manually:

1. Edit the file **'/etc/inet/hosts'** with an editor, for example '**vi**'
2. Delete all lines containing old names and addresses of the Business Server.
3. Save the file.

5.3.1 Modifying Port Monitor Services

The Internet address is also used by the port monitor for the TCP communication. To make it work correctly you also have to modify the Internet address there.

1. Start '**sysadm**' and select the menu item '**ports**'.
2. In the '**ports**' menu select the menu item '**port_services**'.
3. In the '**port_services**' menu select the menu item '**modify**'.
4. Select the service '**0**' from the list.

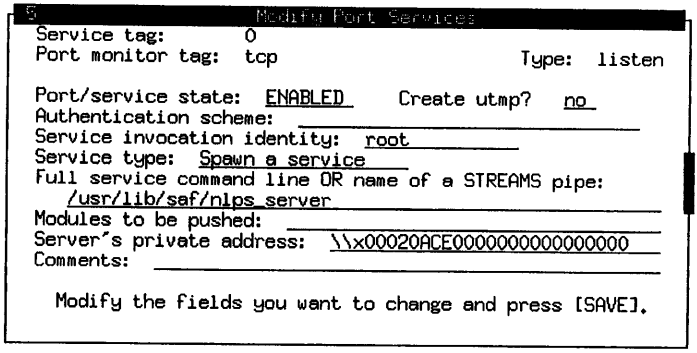

Fig. 5.1: Modify Port Services

5. Move the cursor to the '**Server's private address**' field.

6. Modify the 8 characters after the initial '**\\x00020ACE**' to 8 zeroes. Do not change the characters '**\\x00020ACE**'!

7. Count the zeroes after the initial '**\\x00020ACE**'. If there are less than 24 you must fill in zeroes until there are exactly **24** of them.

   In the above example the **Server's private address** field should contain the following value

   \\x00020ACE000000000000000000000000

8. Strike the SAVE-key to save the modification.

9. Select the port service '**lpd**' and make the same modification concerning the characters after '**\\x0020203**' as described above for the '**0**' service.
10. Close '**sysadm**'.

5.4 Completing the Modifications

After a boot the Business Server will be ready for use:

1. Enter the following command and strike RETURN:

```
init 6
```

When the Business Server is up again it is ready for use. Please refer to the UNIX manuals for further information.

Installation of additional software is described in the installation guides included in the software packages and in the UNIX manuals.

5.5 Day-to-Day Running

When the new Business Server is taken into normal service, it is important to keep certain information about the server available.

1. Fill in the check lists in the chapter "Check Lists".

   Keep the **logbook,** which is delivered with the Business Server, on a safe and well-known place. The logbook contains information about the Business Server configuration etc.

2. When the Business Server configuration is modified, print out the new configuration and insert the print in the logbook to keep it up to date.

3. Keep the Logtape, which also is delivered with the Business Server, on a well-known and safe place.

4. The tape contains a backup of the Business Server's UNIX system, i.e. of vital directories and information about the root disk configuration. This tape is together with the installation medium necessary to be able to boot the server, if a serious error

should occur on the root disk. Therefore, it is very important to keep the logtape up to date. (Please refer to the below section "UNIX Backup").

5. Make a backup plan which ensures that the information on the hard disks can be reestablished. (Please refer to the below section "Backup").

5.6 Backup

It is necessary to make a backup of the hard disks in the Business Server to make it possible to reestablish the saved information after a unintended deletion or modification, or after a disk error.

There are two major backup tasks: UNIX backup and data backup.

5.6.1 UNIX Backup

UNIX backup is a backup of the operating system including system configuration information, disk configuration information etc.

If the UNIX system is modified, for example the disk configuration, it is necessary to make a new UNIX backup. To make this backup you must use the 'unix_backup' program. (Please refer to the chapter "UNIX Backup/Restore").

If you include the directories '/', '**/stand**', '**/usr**' and '**/var**' in the data backup (see below), it is only necessary to make a new UNIX backup when then disk configuration (partitioning etc.) is modified.

5.6.2 Data Backup

Data backup is a backup of the data on the Business Server, e.g. applications and user data as documents, database transactions and scripts.

This type of backup can be made manually using '**cpio**' or '**dskback**' or by means of Supermax Backup System, which is DDE's own backup program. (Please refer to the manual "Supermax Backup System").

It is important to make a backup strategy which ensures that all data are backed up according to their modification speed. I.e. data which often are modified must be backed up at short

intervals. Data which seldom are modified, for example applications, can be backed up at longer intervals.

6. Re-Installing UNIX

If you want to modify the installation setup of a Business Server radically, for example to move the root disk, change file system type etc. you must reinstall UNIX.

Re-installation deletes ALL data on the disks! Therefore, it is necessary to make a total backup of applications, important system files etc. for example using '**cpio**' before installation to be able to restore the system after installation.

If an error occurs in the file systems '/' ('root'), '**/stand**', '**/usr**', or '**/var**' the Business Server is unable to boot. In this case you can restore the file systems using a UNIX backup. (Please refer to the chapter "UNIX Backup/Restore").

If you only want to update the UNIX on the Business Server with a new version, please refer to the chapter "Updating UNIX".

Before installation you should check that the check lists in the chapter "Check Lists" at the end of this book are complete to ensure that all necessary information is available.

6.1 Boot from Installation Medium

During installation the Business Server must be booted from the installation medium, for example from tape. It is done like this:

1. Insert the floppy in the floppy drive and the boot tape in the correct tape drive.
2. System-boot the Business Server. (Please refer to the chapter "Boot and Shutdown", the section "System-Boot").

Now the Business Server boots from the installation medium, and some system messages appear.

When the boot is completed the following text appears:

```
Select terminal type (type list)
```

1. Enter the terminal type to be used as console and strike RETURN.
2. Again system messages appears. Press any key to proceed.

3. Now the herald display of the installation program appears. Press any key to see the 'Main Menu' of the installation program.

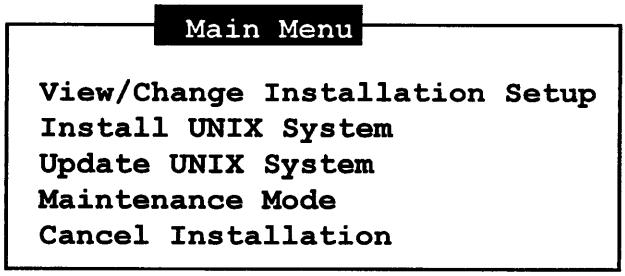

Fig. 6.1: Main Menu.

It is possible to terminate the installation by selecting the menu item '**Cancel Installation**'.

6.1.1 Operating the Setup Menus

To select a menu item in the 'Main Menu' and the other menus of the installation program you have to:

1. Press the arrow down/up to move the cursor to the menu item in question.
2. Strike RETURN to select.

To return to the previous menu after checking/modifying you will have to:

1. Strike the ESC-key. (Or CTRL-3 if the terminal has no ESC-key).

6.2 Modifying the System Setup

The installation program suggests a default setup. You only have to modify system name, internet address, date, time and time zone. Please refer to the below sections for a detailed description of how to modify parameters.

1. Select the menu item 'View/Change Installation Setup'.

In the View/Change Installation Setup menu you may modify the 5 parameters shown in fig. 6.2:

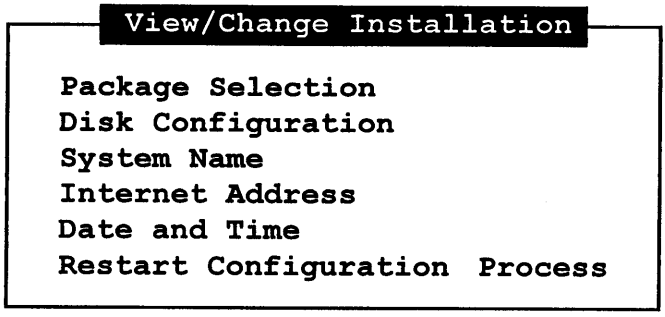

Fig. 6.2: View/Change Installation Setup.

If you want to discard modifications before the installation is complete you may start over again with a standard installation when selecting the last menu item 'Restart Configuration Program'.

6.2.1 Selecting Program Packages

Selecting default installation all the UNIX program packages will be installed. If you want to avoid installation of some of the packages it must be done in the 'Package Selection' menu.

1. Select the item 'Package Selection' in the 'View/Change Installation Setup' menu.

Package Selection

Base System	(*)	XWIN GWS Fonts	(*)
Printer Support	(*)	Internet Utilities	(*)
Network Support Utilities	(*)	Commands Networking Extension	(*)
Graphics Utilities	(*)	Distributed File System Utilities	(*)
Adobe Type Manager	(*)	Remote Procedure Calls Utilities	(*)
Desktop Manager	(*)	Network File System Utilities	(*)
Motif Runtime Package	(*)	Software Packaging Tools	(*)
Ethernet Hardware Support	(*)	Optimizing C Compilation System	(*)
Networked Graphics	(*)	XWIN GWS Development	(*)
Terminfo Utilities	(*)	MoOLIT Development	(*)
Advanced Commands	(*)	Motif Development	(*)
BSD Compatibility	(*)	Desktop Manager	(*)
OA&M	(*)	UNIX Online Manual	(*)
Applications and Demos	(*)		

Fig. 6.3: Package selection menu.

How to avoid installing a program package:

1. Strike the arrow down/up to move the cursor to the program package in question.
2. Delete the asterisk (*) by pressing the space bar.

If an asterisk is deleted by mistake repeat the above for the deleted package. The space bar re-inserts a deleted asterisk.

Applications etc. must be installed after the UNIX installation, either via '**sysadm**' *(3)* or using '**pkgadd**' *(4)*.

6.2.2 Modifying the Disk Configuration

It is possible to select other file system types than the default values for the various disk slices apart from the root, swap, and boot disk slice. You can also modify the size of the slices, their location etc.

Notice, that only disk slice **0** (device node **c0t0d0s0**) and **1** (device node **c0t1d0s0**) are configured during installation. Other disk slices, if any, must be configured from UNIX after the installation by means of '**disksetup**'. *(5)*

1. Select 'Disk Configuration' in the 'View/ Change Installation Setup' menu.
2. Select the menu item 'File systems' in the 'Disk configuration' menu.

Now the menu shows the defaults for the file systems which are created during installation.

File Systems

File System	Description	Type	Size
/	Root File System	vxfs	207
/dev/swap	Swap Slice	slice	256
/stand	Boot File System	bfs	20
/usr	usr File System	vxfs	484
/home	User File System	vxfs	1000
/dev/dump	Dump Slice	off	
/var	Add-ons File System	vxfs	34
/home2	2nd User File System	off	
/tmp	Temporary File System	memfs	8
/var/tmp	Temporary File System	memfs	8
	Disk 1 Available Size (MB):		1003
	Disk2 Available Size (MB):		1000

Fig. 6.4: Disk configuration menu.

Modifying File Systems

Before modifying the file systems it is recommended to refer to the UNIX manuals. ***(6)***

How to modify type, size, and location:

1. Move the cursor to the value to be modified. (ARROW DOWN/UP moves down/up and TAB RIGHT moves to the next column and from the last column to the right to next line in the first column to the left).
2. Strike the function-key F2 to pop up a menu showing the choices for the field in question.
3. Press ARROW DOWN/UP to move the cursor to the desired value, and strike the RETURN-key to insert the value into the field.

Advanced Options

Some of the file system types offer advanced options, for example to modify file system block size and limit the number of inodes.

How to use the advanced options:

1. Move the cursor to the value to be modified. (See 1 above).

2. Strike the function-key F6 to pop up a menu showing the advanced options, if any, to the field in question:

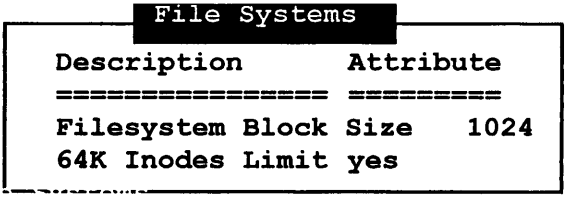

Fig. 6.5: Advanced options, example.

3. Move the cursor to the desired value, and strike the RETURN-key to insert the value in the field.

6.2.3 Modifying the System Name

It is possible to modify the name (node name) which was assigned to the system earlier.

The name must consist of up to 7 characters. (Avoid national characters and special characters which are not represented in 7-bit ASCII). The name must differ from others on the same network.

1. Select the menu item "System Name in 'Main Menu'.

2. Enter a name in the frame which now appears on the screen.

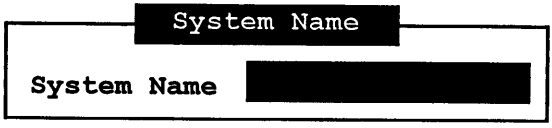

Fig. 6.6: System name dialogue.

6.2.4 Modifying Internet Address

If the internet address of the Business Server must be modified it is done like this:

1. Select the menu item 'Internet Address' in 'Main Menu'.

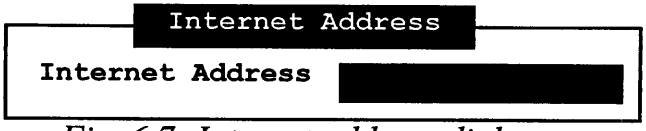

Fig. 6.7: Internet address dialogue.

2. Enter the new internet address in the frame which now appears on the console screen.

6.2.5 Modifying Date, Time, Time Zone

How to modify year, date, time, and time zone:

Select the menu item **'Date and Time'** in **'Main Menu'** to see the 'Date and Time' dialogue.

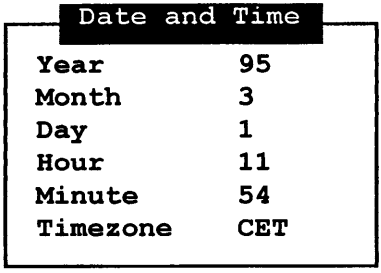

Fig. 6.8: Date and Time dialogue.

1. Enter correct year, date, and time.
2. Select the correct time zone. The function-key F2 shows the choices, and RETURN selects what the cursor points out.

Certain choices invoke submenus. To select in these submenus use the same method as described above.

6.3 Installation

When the installation parameters are as wanted you may start the installation:

1. Strike the ESC-key in the 'View/ Change ...' menu to return to 'Main Menu'.
2. Select the menu item 'Install UNIX System'.

If the system cannot find the internet address or the system name you will be prompted for it before the installation starts:

1. Enter the internet address or the system name when the system is prompting for it and strike RETURN.

Now UNIX will be installed on the Business Server. The console shows how the installation proceeds.

6.4 Completing the Installation

When the installation is complete a message about completing the installation appears.

1. Remove the installation medium from the Business Server.
2. Turn the key switch to RUN position.

3. Strike RETURN to make the Business Server boot using the newly installed UNIX system.

When the boot is completed a message appears:

```
The system is coming up. Please wait.
Node: <system name>
Setting up new kernel environment

INIT: : SINGLE USER MODE
Type Ctrl-d to proceed with normal
startup (or give root password for Single
User Mode):
```

1. Strike Ctrl-d.

   Now the following text appears:

   ```
   Enter new runlevel (0-6, s or S):
   ```

2. Enter **3** and strike the RETURN-key to select runlevel 3.
3. Now you will have to enter a password for '**root**'. Enter the root password and reenter it when requested.
4. Then you will have to enter a password for '**sysadm**'. Enter the sysadm password and reenter it when requested.

5. At last a frame containing system messages appears. Strike the RETURN-key.

Now the Business Server is coming up with a normal login:

```
Console login:
```

Afterwards you can operate the Business Server with standard UNIX commands. (Please refer to the UNIX manuals).

1. Read mail, if any, sent to '**root**' during installation.

7. Networking

This chapter describes how to connect the Business Server to one or more Ethernets.It is necessary that the Business Server contains at least one MIOC with one or two Ethernet submodlues.

Using domain name server you will have to configure this service explicitly. (Please refer to the section "Domain Name Server" below).

If the Business Server has more Ethernet submodules you will have to carry out further network configuration. (Please refer to the section "More Ethernet Submodules" below).

If you want to change the TCP/IP configuration please refer to the UNIX manual "Network Administration".

7.1 Domain Name Server

If you want to use domain name server you will have to configure information about domain and name server:

1. Edit the file '**/etc/resolv.conf**' with an editor, e.g. '**vi**'.
2. Enter domain name and IP address of the name server ***(8)*** and save the file.
3. Edit the file '**/etc/inet/hosts**' with an editor, e.g. '**vi**'.
4. Enter the IP address followed by the name of the name server, of gateways and other important servers, one host per line, and save the file.

7.1.1 More Ethernet Submodules

If there are more Ethernet submodules on an Business Server each of them must have:

- name
- internet address (IP address)
- subnet mask, if the network is divided into subnets

Fill in the check list placed after the chapters of this manual to make sure that all information is available before starting the configuration.

Mapping between the physical Ethernet connector and the name of the Ethernet device

depends on the unit number of the MIOC and the location of the Ethernet submodule. Ethernet device are numbered **/dev/eth_0, /dev/eth_1** etc. where **eth_0** is located on the MIOC which has the lowest unit number and the lowest submodule number. **/dev/eth_1** belongs to the lowest number but one etc.

You may also check which device for example **/dev/eth_0** is linket to in the **/dev** directory. A device named **/dev/eth*xyy*0** indicates that it belongs to MIOC number ***x***, submodule ***yy***. Notice that ***yy*** is either '**01**' or '**02**'!

When reinstalling UNIX on the Business Server the name and address which is entered during the reinstallation is given to the first Ethernet submodule. (Please refer to the chapter "Re-Installing UNIX"). To be able to use more Ethernet submodules in a Business Server, each Ethernet submodule must have its own name and address.

The Business Server must be booted and at least in runlevel 1. (Please refer to the chapter "Boot and Shutdown"). The network configuration is made from UNIX as described below.

1. Log in as '**root**'.
2. Enter the following command:

```
/etc/confnet.d/configure -i
```

3. Now an interactive program starts which prompts for names, IP addresses and subnet masks, if any, etc. *(9)*

Notice: If you use the same name which was assigned to the Business Server during installation of UNIX (**uname -n**) as name for the 1. device in '**/etc/confnet.d/configure -i**' you must be sure that the contents of the field '**nametoaddr_libs**' in the file '**/etc/netconfig**' are arranged in this order: *(8)*

```
/usr/lib/resolv.so,/usr/lib/tcpip.so
```

7.2 Changing Existing Internet Address

If you want to change the internet address of the Business Server please refer to the chapter "The New Business Server", the section "Modifying Internet Address Etc."

8. UNIX Backup/Restore

A **UNIX backup** is a special backup of the file systems '/' (root), '**/usr**', '**/var**', and '**/stand**'. It also contains information necessary for disk restore.

The UNIX backup is used to restore one or more of the above mentioned file systems after a serious error and in this way it can bring the Business Server back to normal operation.

The UNIX backup can only be used to restore the file systems mentioned above. It is therefore important to back up the other disks/slices too by means of a normal backup system.

The UNIX backup is not a bootable medium. Therefore, if '/' ('root') or '**/stand**' is badly damaged, it is only possible to boot from the installation medium.

When you receive a pre-installed Business Server you will also receive a tape containing a UNIX backup. It is important to make a new UNIX backup, when the file systems '/', '**/stand**', '**/usr**', and '**/var**' are changed. (See

the section "Making a UNIX Backup" below). Remember to keep the UNIX backup and the installation medium on a safe place!

The only tape unit to use for 'UNIX backup' is the 1/4" tape streamer which is used for booting the system. File systems included on the UNIX backup ('/', '**/stand**', '**/usr**' and '**/var**') should therefore not be of a size larger than the tape drive can handle.

8.1 Making a UNIX Backup

To make a UNIX backup of the running system you will have to do as follows:

1. Read the on-line manual page concerning **unix_backup** carefully.
2. Log in as '**root**'.
3. Insert a tape in the 1/4" streamer tape unit which is used for installing/updating the UNIX system.
4. Start the backup script using the command:

```
/usr/dde/bin/unix_backup -v <device>
```

If the tape unit has the device name '**ctape1**', this name must be inserted instead of '*<device>*'.

If the tape streamer uses 525KB tapes the option **-z 525000** must be added after **-v**.

5. Now the script calculates how many tapes the backup needs. A screen message shows the result. Make sure you have the required number of tapes ready for use.
6. Enter **OK** and strike RETURN to start the backup.
7. Insert a new tape when a screen message tells you to do so. Enter **OK** and strike RETURN, when the new tape is ready.

When the backup is complete a message appears:

```
Backup end.
```

The UNIX backup is now complete.

1. Check the log files placed in **/tmp/res_unix** (can also be found on the tape).
2. Read the '**mail**' sent to '**root**' about where the backup is placed on the tape.

8.2 Restoring with 'UNIX Backup'

To restore the file systems '/' ('root'), '**/usr**', '**/var**', and '**/stand**' on an Business Server by means of a UNIX backup (see above) you have to do as follows:

1. Insert the installation tape in the tape unit.
2. Turn the system key to 'SYSTEM'-position, and strike the system key 'START'.
3. When the system is coming up, enter the terminal type and strike RETURN.
4. When the text **"Welcome to SVR4.2 installation"** appears on the console remove the installation tape, insert the tape with the UNIX backup instead and strike any key to continue.
5. When 'Main Menu' appears select 'Maintenance mode' (see below) to activate a shell.
6. Read in the contents of the UNIX backup on the '**/tmp**' disk using the command:

```
cpio -idumlvC 10240 </dev/rmt/ctape1
```

Now all files needed for preliminary disk setup are available on the '**/tmp**' disk.

8.2.1 Examining the 'vtoc'

First you have to find out whether the disk '**vtoc**' is all right. This is done by comparing it with the '**vtoc**' from the UNIX backup. If the disk has not been used before skip to the section "Creating a 'vtoc' on a Disk" below.

1. Print the disk '**vtoc**' to a file using the following command:

   ```
   prtvtoc -f /tmp/vtoc_file \
   /dev/rdsk/c0t0d0s0
   ```

   If '**prtvtoc**' fails the '**vtoc**' is damaged. (Skip to the section "Create 'Vtoc' on a Disk" below).

2. Compare the two '**vtoc**'s by means of the following commands:

   ```
   cat /tmp/res_unix/vtoc_c0t0d0s0\
   vctoc_file
   cat vctoc_file
   ```

If the two '**vtoc**'s differ, you will have to find the reason: Is the backup too old, or is it the '**vtoc**' from a wrong disk?

8.2.2 Creating a 'vtoc' on a Disk

If the '**vtoc**' is damaged, or if the disk in question is a new disk without '**vtoc**', you must create a new '**vtoc**' using '**disksetup**'. *(5)*

1. Enter the following command:

```
disksetup -I /dev/rdsk/c0t0d0s0
```

'**disksetup**' prompts for the disk setup. After you have decided which disk slices to create you must enter their sizes:

```
How many slices/filesystems do you want
created on the disk (1 - 15)? 1

Please enter the absolute pathname (e.g.,
/usr3) for slice/filesystem 1 (1 - 32
chars)? /xx

Enter the filesystem type for this slice
(vxfs,ufs,s5,sfs), type 'na' if no
filesystem is needed, or press <ENTER> to
use the default (vxfs): <ENTER>
```

```
Specify the block size from the following
list (1024, 2048, 4096, 8192), or press
<ENTER> to use the first one: <ENTER>

Should /xx be automatically mounted
during a reboot?
Type "no" to override auto-mount or press
enter to enable the option: <ENTER>

You will now specify the size in
cylinders of each slice. (One megabyte of
disk space is approximately xxx
cylinders.)
How many cylinders would you like for /xx
(0 - ?????)?

Hit <ENTER> for 0 cylinders: <ENTER>
Notice: The selections you have made will
leave ????? cylinders unused.

You have specified the following disk
configuration: A /xx file system with 0
cylinders (0,0 MB)
Is this allocation acceptable to you
(y/n)? y
```

When you have answered all questions the '**vtoc**' is made on the disk.

Now the new '**vtoc**' can be replaced by the one from the UNIX backup:

1. Enter the following command: ***(10)***

```
edvtoc -f /tmp/vtoc_c0t0d0s0 \
/dev/rdsk/c0t0d0s0
```

NOTICE: a copy of the program '**edvtoc**' is saved on the 'UNIX backup'. It can now be read as '**/tmp/res_unix/edvtoc**'.

8.2.3 Examining the File System

When the Business Server is booted from the installation tape, it tries to find a file system on the disk: '**/dev/dsk/c0t0d0s0**'.

If there is a file system, and if it is intact, it will be mounted to '**/mnt**', '**/mnt/usr**', '**/mnt/stand**', and '**/mnt/var**'. Otherwise you will have to restore the file system and mount it as described in the next section.

8.2.4 Restoring the File System

To restore the file system do as follows (only for the file systems which are NOT intact!):

1. Run the following commands to repair the file system on the disk slices:

```
sh /tmp/res_unix/fsck_root.sh
```

```
sh /tmp/res_unix/fsck_usr.sh
sh /tmp/res_unix/fsck_stand.sh
sh /tmp/res_unix/fsck_var.sh
```

or the following commands to make a new file system on the disk slices:

```
sh /tmp/res_unix/mkfs_root.sh
sh /tmp/res_unix/mkfs_usr.sh
sh /tmp/res_unix/mkfs_stand.sh
sh /tmp/res_unix/mkfs_var.sh
```

2. Mount the '**root**' disk to '**/mnt**' by running the following command:

```
sh /tmp/res_unix/mount_root.sh
```

3. Make directories for further file systems under '**root**' by starting the following program:

```
sh /tmp/res_unix/mk_mount_point
```

4. Mount further file systems, if necessary, by running the following commands:

```
sh /tmp/res_unix/mount_usr.sh
sh /tmp/res_unix/mount_stand.sh
sh /tmp/res_unix/mount_var.sh
```

5. Change directory to '**/mnt**' and read in the backup. (Notice that the backup has been taken without initial '/'!)

```
cd /mnt
cpio -idumlvC 10240 < /dev/rmt/tape1n
```

6. If there are more '**cpio**' archives repeat the above commands for each.
7. Change to the directory '/', and unmount the mounted file systems.
8. Boot the Business Server again.

8.3 Maintenance Mode

After booting by means of the installation medium the Business Server has a primitive root installed in memory (also called RAM disk). If installed the UNIX operating system with all utilities is mounted under '**/mnt**'.

The menu item '**Maintenance mode**' in the installation setup '**Main menu**' gives access to a **korn shell** and a restricted number of utilities on the primitive root. Some of these utilities are simulated as functions in the shell. They are taken from '**/funcrc**' on the RAM disk.

The shell function list:

```
chmod    date    find    mount    umount
rm       cp      cat     grep     modadmin
chroot   mkdir   ln
```

The PATH is set to:

```
:/usr/bin:/sbin:/etc:/usr/sbin:/mnt/sbin:
/mnt/usr/sbin:/mnt/usr/bin
```

This can give some problems if '**root**' is mounted on '**/mnt**'! If you try to use the shell function you will get '**/mnt/sbin/mount**'. This will give you an error like this :

```
# mount /dev/dsk/c0t0d0s3 /mnt/usr
UX:mount: ERROR: cannot open vfstab
```

To avoid this use the following command instead:

```
# sh_mount /dev/dsk/c0t0d0s3 /mnt/usr
```

This will do for umount to! If you want the shell function instead of the UNIX utility under '**/mnt**' you can use the prefix '**sh_**'. An example:

```
sh_mount
```

To see mounted file system use '**df**':

```
# df
/           ():   6481 blocks      204 files
/mnt        ():   756028 blocks    63612 files
/mnt/usr    ():   363552 blocks    45398 files
#
```

If you want to umount '**/mnt**' and you cannot succeed because it is busy every time you try to do it, use '**umountall**' instead:

```
# df
/           ():  6481 blocks      204 files
/mnt        ():  756028 blocks    63612 files
/mnt/stand  ():  52473 blocks     500 files
/mnt/usr    ():  363552 blocks    45398 files
/mnt/var    ():  336258 blocks    41938 files
#
# umountall
Invalid argument
Invalid argument
#df
/           ():  6481 blocks      204 files
#
```

8.3.1 The Contents of the RAM Disk

On the RAM disk you will also find the following files:

```
./etc:
ap            conf          confnet.d
default       disk.ele      disk.elebig
disk.elesm    fs            group
inst          machid        passwd     scsi
```

```
./etc/fs/bfs: fsck   fstyp    mkfs

./etc/fs/s5:  fstyp  labelit  mkfs

./etc/fs/sfs: fstyp  labelit  mkfs

./etc/fs/ufs: fsck   fstyp    labelit  mkfs

./etc/fs/vxfs:fsck   fstyp    labelit  mkfs

./sbin:
cp        grep        init        instlist
instsh    labelit     maketape    memsize
mkfs      putdev      sh


./usr/bin:
awk       buffer    carrier   cpio      cut
dd        expr      find      ksh       ls
mkdir     rm        rmail     stty      tee
tput      uncompress          vi        winxksh
xargs     xksh


./usr/lib:
libc.so.1        libc.so.patch   libcrypt.so
libdl.so         libgen.so        libm.so
libmalloc.so     libw.so


./usr/sadm/install/bin:
libdecomp.so  pkginstall
```

```
./usr/sbin:
check_devs  diskset   upfdisk      partsize
pkgadd      pkginst   prtvtoc       removef
scroll      swap


./usr/sbin/pkginst:
chkmrgfiles  chkpkgrel     olscripts
patch        pkgmrgconf    pkgsavfiles
up_cleanup   up_merge      updebug
```

8.3.2 File System Check on 'root' Disk

Under '**/etc/fs**' is a directory for each file type containing the file system utilities for this particular file system.
To make a file system check on the root disk (vxfs file system) do as follows :

1. Log in as '**root**'.
2. Issue the following commands:

```
cd /etc/fs/vxfs
./fsck -o full /dev/rdsk/c0t0d0s1
```

The option '**-o full**' will force a full file system check, and not only a log replay.

8.4 Restore Files from SMOS

If you want to restore files copied via **sysadm**, from a Supermax server running the operating system SMOS, it can NOT be done via **sysadm** on the Business server because the file header format is different on the two systems.

If Supermax Backupsystem is installed on the Business server, the **hdr** command can make the files accessible as shown in the following example:

```
# /usr/sadm/ddebkup/bin/hdr -R \
  /dev/rmt/ntape
```

The program winds the tape past the header, and **cpio** can now be used for reading in the files.

9. Crash Dumps

If an error occurs in the UNIX kernel of the Business Server, a dump of the memory will automatically be written to the swap disk.

The size of the crash dump is equal to the size of the memory of the Business Server. I.e. 256Mb memory gives a dump of 256Mb. This means that the size of the swap disk should be at least the size of the memory.

Even if the dump does not include the entire memory, it is though possible to get some information out of it.

When booting the Business Server after the UNIX error you may let the Business Server save the dump automatically or you may save it manually (see the descriptions in the following sections). Both methods are based on the **savecore** utility.

If you use the automatic method, you must be sure that '**/var/adm/crash**' has room for a dump of the entire memory! Otherwise you risk loosing the dump. If you are not sure, it is

recommendable to use the manual method, because it allows you to save the dump to another directory or even to a tape, if there is not space enough in the selected directory.

The crash dumps are numbered in succession with a number which is increased by '1' for each new dump. Therefore, it is possible to keep succeeding dumps in the same directory without one overwriting the other.

9.1 Save Dump Automatically

The dump is saved automatically in this way:

1. Run-boot the Business Server.

The **savecore** utility is automatically invoked when the Business Server goes from runlevel **s** (single user mode) to runlevel **3** after boot.

Savecore then moves the dump saved to the swap disk to **/var/adm/crash**, if possible. If this is impossible, and the Business Server starts to swap after reaching runlevel **3**, the dump saved to the swap disk is lost.

9.2 Save Dump Manually

The dump is saved manually in this way:

1. System-boot the Business Server. (Please refer to the section "System-boot" in the chapter "Boot and Shutdown").
2. Select runlevel **s** (single user mode).
3. Log in as '**root**'.
4. Enter the following command:

   a. to copy the dump from the swap disk to the **/var/adm/crash** directory:

   ```
   /sbin/savecore
   ```

   b. or this command to save the dump in the directory named *<dump_dir_name>*:

   ```
   /sbin/savecore -d <dump_dir_name>
   ```

   If necessary, remember to mount the device containing *<dump_dir_name>*.

   c. or the following command to save the dump in a file named *<file_name>*:

   ```
   /sbin/savecore -o <file_name>
   ```

If necessary, mount the device containing *<file_name>*. *<file_name>* may be a tape device, e.g. **/dev/rmt/ctape1**.

Savecore checks the destination device to see if there is room for the dump, unless when saving to a tape.

If there is not sufficient space you may add the option **-z** to the **savecore** command. This option causes **savecore** to compress the dump using the standard compressing utility. When using the **-z** option the destination file name is suffixed **.Z**, except when saving to tape. When compressing **savecore** does not check whether there is room for the dump.

9.3 'User Mode Panic'

If necessary, it is possible to provoke a panic and with this a crash dump. Do as follows:

1. Log in as '**root**'.
2. Enter the command:

```
uadmin 131 42845011
```

10. Maintenance and Cleaning

During normal service the Business Server only has few demands to the environment:

- temperature 10° - 35° Celsius/ 40° and 95° Fahrenheit.
- no direct sunlight which may cause a drastic temporary increase of the temperature.
- humidity 20 - 80% (non-condensing).

Besides, the machine must be maintained and cleaned to secure optimum running conditions.

Shocks and bumps, for example during transportation over doorsteps, must be avoided, because it may damage the peripheral units, especially the disks.

10.1 Distances to the Business Server

It is necessary to keep at minimum 100 mm of free space on all four sides of a running Business Server to secure sufficient airflow.

When servicing the Business Server further space must be established to make hardware replacement etc. possible.

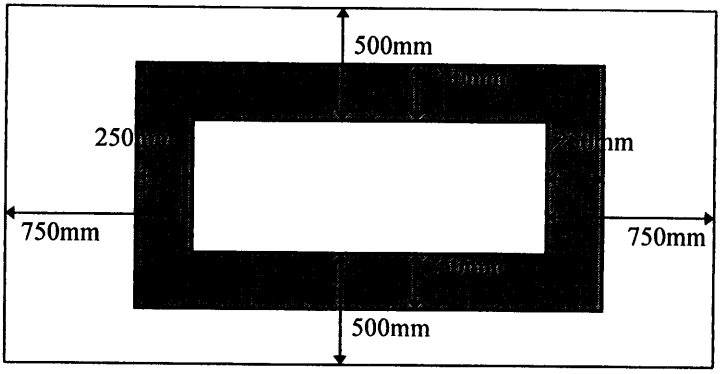

Fig. 11.1 Distances during service.

On figure 11.1 the dark shaded area illustrates the necessary space around the Business Server during normal operation. The light shaded area illustrates the space required during service and maintenance.

10.2 Keeping the Business Server Clean

It is necessary to keep the inlet and outlet ports of the Business Server uncovered and free of dust etc. to secure the cooling of the machine.

10.3 Maintaining Peripheral Units

It is important not to expose the peripheral units of the Business Server, i.e. floppy disk drive, tape units, and CD ROM drive to major quantities of dust (paper dust from printers, concrete dust from concrete drilling in connection with rebuilding etc.), moisture, or large temperature fluctuations.
Do not expose the peripheral units of the Business Server to magnetism or static electricity, either.

The removable storage media which are used in the peripheral units of the Business Server, i.e. tapes, diskettes, and CD ROMs, must have the same temperature as the room where the Business Server is placed before they are taken into use.

10.3.1 The Diskette Drive

Do not use other diskettes than 'high density 3.5" micro floppy disk' in the diskette drive of the Business Server.

10.3.2 The Tape Streamer Units

The Business Server streamer tape units must be cleaned once a week if you are using it daily. When a new tape is taken into use, you ought to clean the tape unit afterwards.

To clean the unit use a cleaning tape of a type recommended by Supplier.

10.3.3 The Video Streamer Units

If the Business Server is equipped with a video streamer for 8 mm tape, it is important to use the tapes which are recommended by the Supplier.

Remember to clean the video streamer once a month or after 30 GB data transfer to avoid read/ write errors.

The two light emitting diodes on the front of the video streamer start blinking regularly when the unit needs cleaning.

To clean the unit use a cleaning tape of a type recommended by Supplier.

10.3.4 The DAT Streamer Unit

If the Business Server is equipped with a DAT streamer, it is important to use the tapes which are recommended by the Supplier.

Remember to clean it once a month or after about 30 GB data transfer to avoid read /write errors.
The orange light emitting diode on the front of the DAT unit starts blinking regularly when the DAT unit needs cleaning.

To clean the unit use a cleaning tape of a type recommended by Supplier.

10.3.5 CD ROM Unit

If the Business Server is equipped with a CD ROM unit you must take care that the surface of the CD ROM and the caddy do not get scratches or grease marks.

11. Device Numbering

11.1 The Business Server

Fill in this check list before you start using the new Business Server. And remember to update if system name or internet address is changed.

System name	
Internet address	
Installation number	

11.2 Ethernet Submodules

If the Business Server has more Ethernet submodules each having its own internet address etc., it is important to fill in this form. All information is thus available before configuration or re-establishing of the Business Server:

MIOC 0, Sub 1: Device name	
IP host name	
IP address	
Subnet mask	
MIOC 0, Sub 2: Device name	

IP host name	
IP address	
Subnet mask	
MIOC , Sub 1: Device name	
IP host name	
IP address	
Subnet mask	
MIOC , Sub 2: Device name	
IP host name	
IP address	
Subnet mask	
MIOC , Sub 1: Device name	
IP host name	
IP address	
Subnet mask	
MIOC , Sub 2: Device name	
IP host name	
IP address	
Subnet mask	

Information about the items in the form, see *(8)* and *(9)*.

11.3 Disk Device Numbering

Each DIOC3 has connections for two SCSI cables with up to seven disks on each. They are numbered using the following syntax

```
/dev/dsk/cCtTdDsS
```

C = SCSI cable number. DIOC3 unit number **14** has two cables. The upper cable on the board is number **0**; the lower cable is number **1**. If you add a DIOC3 with unit number **13**, the upper cable gets number **2** and the lower cable number **3**. In the same way a DIOC3 with number **12** gets the cable numbers **4** and **5**, and a MIOC with number **11** gets cable numbers **6** and **7**.

T = bud-id. Is normally set by means of one or more jumpers on the SCSI drive. Bud-id **7** is reserved DIOC3.

D = LUN number. Is normally **0**.

S = disk slice number.

Major/minor numbers for SCSI devices are dynamic. It means that they are automatically renumbered if you install or remove SCSI devices.

The harddisk containing the boot device MUST always be installed as **/dev/dsk/c0t0d0s0**, e.g.

on SCSI cable **0** and bus-id **0** on a DIOC3 with unit number **14**.

11.4 Numbering TTY Devices

It is possible to connect TTY devices to TERM8/32 submodules on MIOC and SIOC2 boards. Their numbering has the following syntax:

```
/dev/ttyXYZZ
```

X = unit number of MIOC or SIOC2 board

Y = submodule number

For **MIOC** applies:
0 = Console and service port login
1 = Submodule number 1
2 = Submodule number 2

For **SIOC2** applies:
0 = All 16 - 64 RS-232 connections
1 = Parallel printer

ZZ = Is index starting from **00**.

Examples:

SIOC2 with unit No **2**, RS-232 connection **1**:

```
/dev/tty2001
```

SIOC2 with unit No **2**, parallel printer:

```
/dev/tty2100
```

MIOC with unit No **1**, 2 TERM32 submodules. The two first RS232 connections on each sub-module are numbered:

```
/dev/tty2100
/dev/tty2232
```

The console is always connected to **/dev/tty0000**.

12. Index