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VERY LARGE TELESCOPE

┌ VLT Common Software ┐

Solaris Installation Manual

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1 INTRODUCTION

1.1 PURPOSE

The purpose of this manual is to help you install or upgrade the Solaris Operating System on Sun Microsystems computer system through to the point where the VLT Common Software itself can be installed or upgraded.

1.2 SCOPE

This document covers the following topics in the following order:

- prerequisites - including prerequisite information which you must gather before starting the installation
- configuring the hardware
- installing and configuring the core operating system
- installing applications and patches
- network configuration - including several Ethernet and ATM connection configurations
- miscellaneous configuration items
- upgrading to the FEB2000 OS configuration from previous version

This document assumes that you are familiar with basic system management activities for Unix systems. It is *not* a replacement for the standard Solaris installation documentation.

The procedure has been tested on Ultra 1, Ultra 2, Ultra 60, sparc 20 models. It may be valid for other models too. Although a certain level of flexibility in install-time configuration is attempted in this document, it is not feasible to support every conceivable combination of hardware and peripherals, so you are strongly advised to read through this document thoroughly to familiarize yourself with the steps and with any anomalies in your own setup.

1.3 REFERENCE DOCUMENTS

VLT-MAN-ESO 17200-0981 --- VLT SW Problem Report & Change Request User Manual

1.4 GLOSSARY

ATM

Asynchronous Transfer Mode. A form of digital transmission based on the transfer of units of information known as cells. It is suitable for the transmission of image, voice, video and data.

DNS

Domain Name System. A distributed hierarchical system for resolving hostnames into IP addresses.

LAN Emulation

A protocol to make an ATM network look and behave like an Ethernet or Token Ring LAN. The LANE protocol defines a service interface for higher layer (the network layer) protocols that is iden-

tical to that of existing LANs; and encapsulates data sent across the ATM network in the appropriate LAN MAC packet format. LAN Emulation allows interoperability between ATM and existing LAN technology.

LECS

LAN Emulation Configuration Server. The LECS is an entity that assigns individual LANE clients to particular ELANs by directing them to the LES that corresponds to the ELAN. There is logically one LECS per administrative domain, and it serves all ELANs within that domain.

LES

LAN Emulation Server. The LES implements the control function for a particular ELAN. There is only one LES per ELAN, and to belong to a particular ELAN means to have a control relationship with that ELAN's LES. Each LES is identified by a unique ATM address.

NTP

Network Time Protocol. A standard defined to facilitate accurate time synchronization across a network, either in hierarchical or peer-to-peer fashion.

1.5 STYLISTIC CONVENTIONS

VLT Common Software-specific abbreviations and acronyms are explained either in footnotes or in the glossary.

Certain sections of the installation procedure are optional. All such sections are identified as such in footnotes, and explanations are provided as to the circumstances under which it should be completed.

Courier font is used to indicate text displayed by, or to be entered into the system. Roman font is used to show displayed text, bold font for entered text, selected text or window buttons. Italicized text in angled brackets indicates placeholders or descriptions of fields.

Unix prompts indicate the login of the person a command should be run as. These prompts end with a hash, dollar or percent sign to indicate root login id, Bourne shell or C-shell/T-C-shell shells respectively. e.g.:

```
root# pwd
/sbin/init.d
root# echo "<your_name>"
<your_name>
root#
```

1.6 FEEDBACK

If you experience problems using this document, please let us know using one of the contact methods described in document "VLT SW --- Problem Report & Change Request User Manual VLT-MAN-ESO 17200-0981".

2 PREREQUISITES

Please use this section as a checklist: make sure you have compliant hardware, make sure you have copies of the required computer media, and note down the information that will be required later on, some of which you will be able to decide yourself, and some of which you must decide in liaison with your users and network administrators.

2.1 PREREQUISITE HARDWARE

All system installations require the following:

- Sun Sparc-based system with CDROM drive, DAT drive¹ and at least 4 Gb hard disk space
- graphics-capable monitor with keyboard and mouse (recommended) or serial-based terminal.

For systems requiring ATM networking, there are the following additional requirements:

- Sun ATM X1060A adapter card

2.2 PREREQUISITE COMPUTER MEDIA

All system installations require the following:

- Solaris 2.6 OS (Sparc)
- ESO-VLT-FEB2000-SUN-SOLARIS-PATCHES CD

Systems requiring ATM networking additionally require:

- ESO-VLT-FEB2000-SUN-PRODUCTS CD

2.3 PREREQUISITE DOCUMENTATION

This document is the only document required.

This document is distributed as part of the VLT Common Software Documentation Kit (both as a paper copy and as a postscript file under ./doc). However, you should check for late changes, errata, either by anonymous ftp (ftp.eso.org) or on the web (<http://www.eso.org/vlt/vltsoft>).

2.4 PREREQUISITE INFORMATION

2.4.1 BASICS

- What is the system to be named?
- How many hard disks does the system have attached?²

1. A DAT drive is not needed for the OS installation, but is required for the VLTSW installation.

2. If the system already has Solaris installed then you can issue the command "**prtconf**" to display a list of attached devices with SCSI ids and to see their sizes use "**format**", selecting each disk in turn, then typing "**partition**", then "**print**" and finally **CTRL-D** to quit.

- What are their SCSI ids?
- What is the SCSI id of the disk you wish to use to install the operating system on?
- What is the SCSI id of the CDROM?
- How much physical memory does the system have?¹
- In what geographical area will the machine be located?
- Is the system to remain at ESO? If yes, then at ESO Headquarters Garching? If yes, then in DEV, VCM or elsewhere?

For systems remaining at ESO Headquarters Garching the following information should be useful:

- VCM machines have their timezone set to UTC offset 0.

2.4.2 NETWORK PARAMETERS

- Is the machine to be attached to a network?
- If the machine is to be attached to a network will the connection be with Ethernet or ATM or both?
- If the machine is to use an ATM connection, will it be in ELAN or Classical IP configuration?
- If it will use ATM in ELAN configuration, what is the LEC Selector?
- If it will use ATM in Classical IP configuration, will it be in 'Back to Back' configuration and what is the IP address of the system with which it will be connected?
- What will be the machine's IP address on each interface?
- What are the subnet masks for the networks on each interface?
- If there is a default gateway available then what is its name and IP address?
- If the system will use DNS, what is the machine's DNS domain name and what are the DNS server IP addresses and hostnames?
- If there is an NTP server available on the network, what is its name and IP address?
- Should the machine be configured as a NIS or NIS+ client?

For systems remaining at ESO Headquarters Garching the following information should be useful:

- All machines are connected to the network
- Only some VCM machines have ATM connections
- 'Subnet numbers' are used as LEC Selectors
- In VCM, the second and third character (e.g. 'tc', 'g0') are used as the ELAN name
- IP addresses on Ethernet are assigned by OSC/Networks
- IP addresses on ATM are assigned by Erik Allaert
- Default gateways outside VCM are <network_address>.199
- Default gateways on ATM vary; see Erik Allaert
- Default gateway names can be determined by reverse-lookup with nslookup
- DNS domain is hq.eso.org.

1. Use "`dmesg | grep -i avail`"

- DNS servers are 134.171.56.56 and 134.171.8.2 (in that order)
- For DEV systems te13 is an NTP server
- For VCM systems wg0time is an NTP server
- Suns are NOT to be configured as NIS or NIS+ clients

For systems at ESO Paranal or ESO La Silla, please consult local VLT and network administrators.

For systems elsewhere, please consult your local network administrators.

2.4.3 DISK LAYOUT

The most complex configuration consideration is the disk partitioning scheme. The table below shows a couple of configurations for particular hardware and peripheral configurations, together with some hints.

| disk | filesystem | Sun Ultra 1 with 2 Gb internal, 4 Gb external disks, 128 Mb RAM | Sun Ultra 60, 9 Gb disk, 256 Mb RAM ^a | Recommendation | Your system |
|------|---------------------|--|---|---------------------|-------------|
| 1 | / | 160 Mb | 160 | at least 160 Mb | |
| 1 | /usr/openwin | 400 Mb | 400 Mb | 400 Mb | |
| 1 | backup ^b | N/A | N/A | don't change this! | N/A |
| 1 | /var | 140 Mb | 160 Mb | at least 140 Mb | |
| 1 | (swap) | 256 Mb | 320 ^c | 2 * <system_memory> | |
| 1 | /opt | 260 Mb | 260 mb | at least 260 Mb | |
| 1 | /usr | 600 Mb | 600 Mb | at least 600 Mb | |
| 1 | (other allocations) | 0 Mb | 0 Mb | 0 Mb | |
| 1 | (unallocated) | 0 Mb | 0 Mb | 0 Mb | |
| 2 | (swap) | 0 Mb | 320 Mb | <none> | |
| 2 | /vlt | 1.75 Gb | 0 Mb | at least 1.5 Gb | |
| 2 | /vltdata | 512 Mb | 0 Mb | 512 Mb | |
| 2 | /data | 2 Gb | 0 Mb | at least 2 Gb | |
| 2 | (other allocations) | 0 Gb | 4 Gb | 0 Mb | |
| 2 | (unallocated) | 0 Mb | 0 Gb | 0 Mb | |

a. In this example, the second disk was allocated to only one partition, mounted as /diskb. Symbolic links were then used to map /vlt to /diskb/vlt etc.

b. also called 'overlap'

c. total swap is twice system memory, but it is divided between two disks.

3 CONFIGURING THE HARDWARE

3.1 ATM¹

Depending on your hardware, you may have to remove the graphics card from your system in order to free a slot for the ATM card. To do this, connect an ASCII text terminal to serial port A, halt the system if it is not already halted by pressing **STOP-A**, or if the ASCII text terminal is already attached by pressing the appropriate key sequence², and enter the commands:

```
ok setenv output-device ttya
ok setenv input-device ttya
ok setenv ttya-ignore-cd true
ok setenv tpe-link-test true
```

The supported ATM adapter has no jumpers to be set; just insert the card carefully into an empty SBus slot.

3.2 PERIPHERALS

Remember to terminate any SCSI connectors, and to use terminators appropriate to the SCSI bus type (SCSI II, Ultra-SCSI, etc).

To more easily boot the CDROM, if possible ensure that the CDROM has SCSI ID 6.

1. If your system does not have ATM then skip this section.

2. The equivalent of the **STOP-A** sequence varies from one terminal to another. Consult your local sysadmin for the correct key sequence.

4 INSTALLING THE CORE OPERATING SYSTEM

4.1 BOOTING

Insert the 'Solaris 2.6' CDROM. If the system is off power it on, otherwise run the commands:

```
root# sync; sync; sync; halt
```

From the 'ok' prompt, verify that the CDROM drive and all other peripherals are attached by issuing the command:

```
ok probe-scsi-all
```

or if the hardware is older, try:

```
ok probe-scsi
```

If any of the peripherals are not detected then resolve the issue before proceeding.

Boot from the CDROM by entering the command:

```
ok boot cdrom
```

If this fails to boot, it may be because the CDROM is configured with a non-standard SCSI ID. In this case there should be a message similar to:

```
Boot device: /sbus/espdma@e,8400000/esp@e,8800000/sd@6,0:f File and args:
```

```
Can't open boot device
```

In this case, replace the SCSI ID, which in the above example is 6, with the SCSI ID of the CDROM and enter the command:

```
ok boot <boot_path>
```

where *<boot_path>* is the full boot device as reported by the system, but with the correct SCSI ID.

The system will then boot from the CDROM. This may take some time.

4.2 INSTALL OPTIONS AND FIRST DISK CONFIGURATION

At the menu "Select a Language", select "**English**" and at the menu "Select a Locale", select "**USA - English (ASCII only)**".

If you are using a text terminal then at the menu "What type of terminal are you using?" select the type according to what you are using.¹ Depending on what type of terminal you have, the keys for performing certain actions will vary.

At the "The Solaris Installation Program" screen, select "**Continue**".

1. If you selected "13", for a type not on the list then you will be additionally prompted for the terminal type.

At the “Identify This System” screen, select “**Continue**”.

At the “Host Name” screen, enter the unqualified hostname.¹

At the “Network Connectivity” screen, set:

Networked: [**X**] No²

At the “Time Zone” screen, select the time zone corresponding to your geographical location.

At the “Date and Time” screen, set the date and time, and at the “Confirm Information” screen, select “**Continue**”.

The system then reports that system identification is completed and starts the Solaris installation program.

At the “Solaris Interactive Installation” screen, select “**Initial**”, and at the next screen “**Continue**”.

At the “Allocate Client Services?” screen, select “**Continue**”.

At the “Select Languages” screen, select “**Continue**” without selecting any additional languages.

At the “Select Software” screen, select “**Entire Distribution plus OEM Support**”.

At the “Select Disks” screen, select the disk you have decided to install the OS on.

At the “Preserve Data?” screen, select “**Continue**”.

At the “Automatically Layout File Systems?” screen, select: “**Auto Layout**”, and then set:

File Systems for Auto-layout

[**X**] /

[**X**] /opt

[**X**] /usr

[**X**] /usr/openwin

[**X**] /var

[**X**] swap

At the “File System and Disk Layout” screen, select “**Customize**” and set the partition sizes according to those you decided earlier *for the first disk only*.³ Then select “**OK**” to return to the “File System and Disk Layout” screen, and assuming all data was correctly entered, select “**Continue**”.

At the “Mount Remote File Systems?” screen, select “**Continue**” and at the “Profile”

1. i.e. everything before the first “.” e.g. “tel” instead of “tel.hq.eso.org”.

2. Select “no” even if the system is networked; network configuration is dealt with after all patches have been applied.

3. Extending a partition requires that there is unallocated space on the disk into which to extend! For this reason it is probably easier to delete any unwanted partitions before increasing the sizes of others.

screen, assuming all data was correctly entered, select **“Continue”**.

4.3 LAUNCHING THE INSTALL

At the “Reboot After Installation” screen, set:

[X] Auto Reboot

and select **“Begin Installation”**. The system installation then starts.

Depending on your hardware this can take anywhere from 20 minutes to a couple of hours. During this time no user input is required. Eventually the system will display a window entitled “On this screen you can create a root password.”

4.4 COMPLETING THE CORE OS INSTALLATION

At the “On this screen you can create a root password.” screen, set the root password, following the prompts.

Solaris 2.6 in combination with certain hardware can power off after 30 minutes idle time. To disable this feature, at the prompt “Do you wish to accept this default configuration ...?”, respond **“n”**, and at the prompt “Should the system save your answer ...?”, respond **“y”**.

The system then completes booting up.

5 OPERATING SYSTEM CONFIGURATION

5.1 SUPER-USER HOME DIRECTORY¹

Login as root. Change root's home directory to /root by running:

```
root# umask 022
root# mkdir /root
root# TERM=<your_terminal_type>
root# export TERM
root# vi /etc/passwd
```

and change the line for root to:

```
root:x:0:1:<system_name> Super-User:/root:/sbin/sh2
```

Then run:

```
root# vi /etc/default/login
```

and comment out the definition of "CONSOLE", so the line reads:

```
#CONSOLE=/dev/console
```

Verify things are okay *before* logging out by running:

```
root# telnet localhost
```

and verifying that you can log in as root. Then log right out and back in again and run:

```
root# rm -fr /.dt* /.Xauthority /.cpr_config /.new
root# vi /root/.profile
```

and add the following lines at the bottom of the file:

```
PS1="\`uname -n`# "
export PS1
umask 022
```

5.2 CONFIGURING A SECOND HARD DISK³

To identify which disk the OS is on, run the command:

```
root# df -k /
```

-
1. If this procedure is being completed by staff at an external consortia then this section is optional, although it is recommended in order to keep / clear of root's personal 'dot' files.
 2. The GECOS field is changed so that 'From: ' line in mail messages clearly states the source of any automatically generated mail messages. If root's mail is relayed to a central mail system then it can be difficult to identify the source of a message otherwise.
 3. If your system has only one hard disk, skip this section.

Then, with careful consideration, run:

```
root# format
```

and select the second disk. To modify the partition table for the second disk, run:

```
format> partition  
partition> print
```

Then by selecting each partition number in turn, modify the partition parameters as decided earlier. Then to write the modified partition table back to the disk, run the command:

```
partition> label
```

Then quit out of the format command as follows:

```
partition> quit  
format> quit
```

Create new file systems on each partition of the second disk, again carefully considering the command line arguments, with the command:

```
root# newfs /dev/dsk/<partition_device_path>
```

Create the necessary mount points, which will depend on your partition scheme, but should probably include some of the following directories:

```
root# mkdir /vlt /vltdata /data /diska /diskb
```

Add corresponding entries to /etc/vfstab, and then mount the created partitions with the command:

```
root# mountall
```

If there is a swap partition on the second disk then this will also require an entry in /etc/vfstab.

5.3 CONFIGURING THE CDROM

The CDROM requires no special configuration on Solaris.

5.4 KERNEL CONFIGURATION

Add the following lines to /etc/system:

```
set rstchown = 01
```

1. In order for this to take effect the system must be rebooted, but we go on to install patches first which also require a reboot to take effect, so we kill two birds with one stone.

6 INSTALLING APPLICATIONS AND PATCHES

6.1 INSTALLING UNLICENSED APPLICATIONS

6.1.1 INSTALLING ATM APPLICATIONS¹

Insert the “ ESO-VLT-FEB2000-SUN-PRODUCTS CDROM”in the drive, log in as root and enter the commands:

```
root# cd /cdrom/cdrom0
root# pkgadd -d sunatm_2_1 SUNWatm SUNWatmu SUNWatma
```

All questions should be answered with “y”.

Eject the CDROM with the command:

```
root# cd /
root# eject
```

6.2 INSTALLING LICENSED APPLICATIONS

There are no licensed applications to be installed.

6.3 INSTALLING PATCHES

6.3.1 SUN RECOMMENDED PATCH BUNDLE

Ensure that root is logged in. Insert the ‘ESO-VLT-SUN-SOLARIS-PATCHES’ CDROM. The CDROM should be automatically mounted by the volume manager.

Run the following commands:

```
root# cd /cdrom/cdrom0/2.6_Recommended
root# ./install_cluster
```

and when prompted “Are you ready to continue with the install? [y/n]: “, then respond “y”. The patch installation then continues without intervention. Note that it is possible that certain patches report error codes 2 or 8²; no other error codes should be displayed.

6.3.2 Y2K PATCHES

Insert the ‘ESO-VLT-FEB2000-SUN-SOLARIS-PATCHES’ CDROM, login as root and run the commands:

```
root# cd /cdrom/cdrom0/2.6_y2000_ALL
root# ./install_cluster
```

1. Skip this section if the system does not have ATM.

2. These mean that the patch is already installed or not appropriate to the hardware and software configuration.

and when prompted “**Are you ready to continue with the install? [y/n]:** “, then respond “**y**”. The patch installation then continues without intervention. Note that it is possible that certain patches report error codes 2 or 8¹; no other error codes should be displayed.

6.3.3 INDIVIDUAL PATCHES

To install the remaining Solaris patches, run²:

```
root# cd /cdrom/cdrom0
root# for DIR in ??????-??; do
> ( cd $DIR && ./installpatch `pwd` )
> done
```

6.3.4 INSTALLING ATM PATCHES³

Insert the ESO-VLT-FEB2000-SUN-SOLARIS-PATCHES CDROM, and run the following commands⁴:

```
root# cd /cdrom/cdrom0
root# for DIR in ATM/?????-??; do
> ( cd $DIR && ./installpatch `pwd` )
> done
```

6.3.5 ESO-PACKAGED SOFTWARE

To install the ESO-packaged software, run:

```
root# cd /cdrom/cdrom0
root# for PKG in *.pkg; do
> pkgadd -n -d $PKG all
> done
```

After the patches have been installed, reboot the system with the command:

```
root# sync; sync; sync; reboot -- -r
```

6.4 APPLYING MANUAL PATCHES

6.4.1 CONFIGURING TCSH

One of the products on the ‘ESO-VLT-FEB2000-SUN-SOLARIS-PATCHES’ CDROM is tcsh. It gets installed under /opt. This means that symbolic links need to be set up to point to this from bin and man directories already in users’ PATHs. (It also means that the tcsh binary will be in the same loca-

1. These mean that the patch is already installed or not appropriate to the software configuration.
2. Note that this procedure generates warnings related to the use of installpatch scripts in future Solaris releases.
3. Skip this section if the system does not have ATM.
4. Note that this procedure generates warnings related to the use of installpatch scripts in future Solaris releases.

tion as for previous releases of the VLT Common Software.) Run the following commands as root:

```
root# TS=`date '+%Y%m%d%H%M'`
root# cd /bin
root# [ -f tcsh ] && mv tcsh tcsh.$TS
root# ln -s /opt/UCBtcsh/bin/tcsh tcsh
root# cd /usr/man/man1
root# [ -f tcsh.1 ] && mv tcsh.1 tcsh.1.$TS
root# ln -s /opt/UCBtcsh/man/man1/tcsh.1 tcsh.1
```

In Addition, add the following entries to /etc/shells if they are not already there:

```
/sbin/sh
/sbin/csh
/usr/bin/sh
/usr/bin/csh
/usr/bin/tcsh
/bin/sh
/bin/csh
/bin/tcsh
/bin/ksh
/usr/bin/ksh
```


7 NETWORK CONFIGURATION

7.1 CONFIGURING NETWORK INTERFACES

7.1.1 CONFIGURING THE ETHERNET INTERFACE

As root run:

```
root# sys-unconfig  
Do you want to continue (y/n) ? y  
ok boot
```

When the machine boots it will prompt for much of the same information as when the machine was first booted from the CDROM. This should be answered as before.

Eventually the system prompts for the hostname again, which should be entered as before, and then it prompts for the IP address, which should be entered and, assuming the information entered was correct, confirm it.

At the "Name Service" screen, select the appropriate name lookup service for your network ¹.

At the "Subnet" screen, when prompted "System is part of a subnet", respond "**y**", and when prompted enter the correct subnet mask for the network the system is on.

As before, specify the timezone information, confirm the date and time, set the root password, and at the power management questions answer "**n**" and then "**y**".

The system then reboots.

7.1.2 CONFIGURING ATM INTERFACES²

As mentioned earlier, there are three possible ATM connection configuration scenarios supported by this document:

- ATM ELAN (LAN Emulation)
- Classical IP over ATM
- "Back to Back" Classical IP over ATM

7.1.2.1 CONFIGURING LAN EMULATION³

This connection configuration is expected to be used over the VLT LANs.

Login as root. With SUN ATM software version ??? (ABA to SAY!!!!), run the command:

```
root# /etc/opt/SUNWconn/bin/atmadmin
```

1. For DNS, select "**Other**".

2. If you don't have an ATM interface, then skip this section.

3. Complete this section if you will use ELAN as your network connection,.

With older versions of the Sun ATM software run the command:

```
root# /opt/SUNWatm/bin/atmadmin
```

The initial screen should list the "ba0" interface is installed on the system.

At the "Enter interface name or option" prompt, select "modify system parameters" with "s", then select "not an ATM agent" with "n", and go back to previous menu with "p".

Then select the interface to configure with "ba0".

Select "Physical layer" with "y", then "sonet" and then select "Uni signalling" with "u" and at the "Enter UNI value" prompt, enter the value "3.1" and go back to previous menu with "p".

Select "ILMI address registration" with "i", enable it with "e" and go back to the previous menu with "p".

Select "LAN Emulation" with "l" and create a new LANE instance with "c", set the instance number to "1".

Modify the LAN Emulation parameters on ba0 by select "lane1".

Select "hostname or IP address" with "i" and enter the system's hostname on the ATM interface.

Leave the local ATM address alone.

Select "c" to indicate LECS is present.

Select "a" to set the LECS ATM address and enter the LECS address, select "e" to enter the designated ELAN name, and then select "p" to return to the previous menu.

Select "x" to exit, "s" to save the configuration, and "y" to confirm saving.

7.1.2.2 CONFIGURING CLASSICAL IP OVER ATM¹

This is a faster protocol which is still under investigation. If you need to test it, configure it by logging in as root and running the command:

```
root# /opt/SUNWatm/bin/atmadmin
```

The initial screen should list the "ba" interface is installed on the system.

At the "Enter interface name or option" prompt select "s", then select "not an ATM SNMP agent" with "n", and go back to previous menu with "p".

Then select the interface to configure with "ba0".

1. Complete this section *only* if you have decided to use Classical IP over ATM or Back to Back Classical IP over ATM as a network connection.

Select "Uni signalling" with "**u**" and enter the value "**3.1**" and go back to previous menu with "**p**".

Select "ILMI address registration" with "**i**", enable it with "**e**" and go back to the previous menu with "**p**".

Select "Classical IP" with "**c**", configure as a client with "**c**", select "IP address or hostname" with "**i**" and enter the system's hostname on the ATM interface.

Select "**a**" to set the ATM ARP server address and enter the string of 20 colon-separated octets (13 for the prefix, 6 for the MAC address, 1 for the selector)¹. Then enter "**p**" to return to the previous menu.

Select "**x**" to exit and "**s**" to save the configuration.

7.1.2.3 CONFIGURING 'BACK TO BACK' CLASSICAL IP OVER ATM²

The ATM back-to-back connection is used as a direct high-speed data link between the Sparc and HP. The ATM interfaces are configured with "Classical IP over ATM" and are connected back-to-back with a fibre crossing the transmit and receive sockets. To run this protocol the ATM interfaces are on a different subnet than the ethernet interfaces i.e. they are on a dedicated subnet. Both nodes are configured as ATM ARP Servers (see also HP Configuration Guide, Chapter "Creating a back-to-back connection" and "Back-to-back with non-HP systems").

Configure it by logging in as root and running the command:

```
root# /opt/SUNWatm/bin/atmadmin
```

The initial screen should list the "ba" interface is installed on the system.

At the "Enter interface name or option" prompt select "**s**".

Then select the interface to configure with "**ba0**".

Select "Uni signalling" with "**u**" and enter the value "**3.1**" and go back to previous menu with "**p**".

Select "ILMI address registration" with "**i**", disable it with "**d**" and go back to the previous menu with "**p**".

Select "Physical layer" with "**y**", enter "**sonet**", and go back to the previous menu with "**p**".

Then select "Classical IP" with "**c**", configure as standalone with "**t**", select "IP address or hostname" with "**i**", enter the system's hostname on the ATM interface, and select "Destination IP address or hostname" with "**d**", enter the peer's IP address or hostname. Then select "**v**" for PVC and "**s**" for ARP server.

1. The prefix should come from your network administrator, the MAC address is obtainable from "**ifconfig ba0**", the selector should be set to "**00**".

2. Complete this section *only* if you have decided to use Back to Back Classical IP over ATM as a network connection.

Select “**x**” to exit and “**s**” to save the configuration.

7.1.3 CONFIGURING THE DEFAULT INTERFACE

Edit `/etc/defaultrouter` with the command:

```
root# vi /etc/defaultrouter
```

and add only the fully-qualified IP address of the defaultrouter.

7.2 CONFIGURING HOST NAME LOOKUP SERVICES

7.2.1 /etc/resolv.conf

If there are one or more DNS servers available on your network then run the command:

```
root# vi /etc/resolv.conf
```

and add enter the text:

```
domain <your_domain_name>
nameserver <first_DNS_server's_IP> <second_DNS_server's_IP>
```

7.2.2 /etc/hosts

The correct format for `/etc/hosts` is:

```
<IP_address> <fully_qualified_hostname> <optionally_unqualified_hostname_and_aliases>
```

Therefore, ensure that `/etc/hosts` contains at least:

```
127.0.0.1 localhost      loopback
<system_IP_address>    <fully_qualified_system_hostname>    <unqualified_system_hostname>    loghost
```

7.2.3 /etc/nsswitch.conf

As root, edit `/etc/nsswitch.conf` and if necessary adjust the settings to those below:

```
passwd: files
group: files
hosts: files1
hosts: files dns2
hosts: files nis3
networks: files
protocols: files
rpc: files
ethers: files
```

1. Use this setting for the ‘hosts’ entry if you do not have DNS or NIS available.

2. Use this setting for the ‘hosts’ entry if you have DNS available.

3. Use this setting for the ‘hosts’ entry if you have configured the machine as a NIS client.

```
netmasks: files
bootparams: files
publickey: files
netgroup: files
automount: files
aliases: files
services: files
sendmailvars: files
```

7.2.4 CONFIGURING A CACHING-ONLY NAMESERVER¹

Running a caching-only nameserver can provide hostname lookup speeds which are faster than either a central DNS server or use of /etc/hosts, while still providing a zero-maintenance DNS system. To configure this system set the 'hosts' entry in /etc/nsswitch.conf as below:

```
hosts: files dns
```

As root, create /etc/named.boot containing²:

```
directory /var/named
forwarders <IP_address(es)_of_your_DNS_servers>
primary 0.0.127.IN-ADDR.ARPA db.127.0.0
cache . db.cache
```

and edit /etc/resolv.conf to only contain:

```
domain <your_DNS_domain>
nameserver 127.0.0.1
```

Then run:

```
root# mkdir -p /var/named
```

Create the DNS cache /var/named/db.cache which is available from the URL ftp://ftp.rs.inter-nic.net/domain/named.root.³

Create the DNS localhost source information file /var/named/db.127.0.0⁴ containing:

```
@                IN                SOA                <fully_qualify_hostname>.
root.<fully_qualified_hostname>. (
                                1          ; Serial
                                10800       ; Refresh every 3 hours
                                3600        ; Retry every hour
                                604800      ; Expire after a week
                                86400 )    ; Minimum ttl of 1 day
```

1. This must be completed for ESO development machines. Other sites should follow site DNS policy.

2. For convenience, a copy of this file is available on the patches CDROM, in the directory /cdrom/cdrom0/named, but you must replace all occurrences of DNSIP with the IP address of your own network's DNS servers.

3. An old version of this file is also available on the patches CDROM, in the directory /cdrom/cdrom0/named.

4. This file is also available on the patches CDROM. Replace all occurrences of FQHN with the fully qualified hostname of the system.

```
          IN      NS      <fully_qualified_hostname>.  
1         IN      PTR      localhost.
```

Finally, in order for the changes to take effect, stop and start named as follows:

```
root# ps -ef | grep named  
root# kill <named_pid>  
root# in.named
```

To check that everything is working correctly use nslookup twice to lookup the same remote host; note that the second lookup is faster than the first, and the second is reported as a " Non-authoritative answer". e.g.:

```
root# nslookup www.somi.sk  
Server: localhost  
Address: 127.0.0.1
```

```
Name:      ultrasomi.somi.sk  
Address:   194.154.247.13  
Aliases:   www.somi.sk
```

```
root# nslookup www.somi.sk  
Server: localhost  
Address: 127.0.0.1
```

```
Non-authoritative answer:  
Name:      ultrasomi.somi.sk  
Address:   194.154.247.13  
Aliases:   www.somi.sk
```

7.3 TESTING NETWORK CONNECTIVITY

Login as root and run:

```
root# sync; sync; sync; reboot
```

When the machine is back up, then log in as root and verify that each network interface is correctly configured with:

```
root# netstat -nr  
root# ifconfig <each_interface_in_turn>  
root# ping <first_hop_on_each_interface>
```

7.3.1 TESTING THE DEFAULT NETWORK INTERFACE

Run the command:

```
root# ping gate.demon.co.uk
```

7.3.2 TESTING THE ATM CONFIGURATION

There are a number of troubleshooting and diagnostic hints in the ATM manuals. Once the VLT Common Software is installed, you can make some performance benchmarks using:

```
vltmgr% dxfbenchmark
```

7.4 CONFIGURING NETWORK SERVICES

7.4.1 NFS

Using the VLT Common Software requires a system to be configured both as an NFS client and as an NFS server. Create VLTSW directories if they do not exist, e.g.:

```
root# cd /diska  
root# mkdir vlt vltdata data home
```

and add entries to /etc/dfs/dfstab for the VLTSW directories, e.g.:

```
share -F nfs -o rw=localhost /diska/data  
share -F nfs -o rw=localhost /diska/vltdata  
share -F nfs -o rw=localhost /diska/vlt  
share -F nfs -o rw=localhost /diska/home
```

Then reboot the system with:

```
root# sync; sync; sync; reboot
```

7.4.2 NTP SERVERS¹

Log in as root and add the following single line to /etc/inet/ntp.conf, which probably does not exist yet:

```
server <fully-qualified_hostname_of_NTP_server> version 3 prefer
```

and start the NTP daemon with the command:

```
root# /etc/init.d/xntpd start
```

7.4.3 DISABLING SENDMAIL DAEMON²

If you wish to disable inbound mail for security then as root run the following commands:

```
root# cd /etc/rc2.d  
root# mv S88sendmail OFF.S88sendmail
```

and to enable periodic outbound queue processing (for mails whose first delivery attempt failed),

1. If there is no NTP server available on your network, skip this section.
2. Within ESO this is obligatory.

run the following commands:

```
root# EDITOR=vi  
root# export EDITOR  
root# crontab -e
```

Adding the entry:

```
0,10,20,30,40,50 * * * * /usr/lib/sendmail -q
```

8 SITE-SPECIFIC CONFIGURATION

8.1 FOR CONSORTIA AND OTHER EXTERNAL INSTITUTES ONLY¹

Site-specific configuration for external sites is obviously somewhat beyond the scope of this document. However, what follows in this section and the sections dedicated to site-specific configuration within ESO may be useful. If you are unsure what to do, then seek help from your local Unix systems administrators.

8.1.1 ACCESS TO NFS SERVERS

If there are central software repositories available on your network then you will need to alter either `/etc/fstab` for permanent NFS mounts, or `/etc/auto_master` and `/etc/auto_direct` for automounted NFS mounts. These are probably best copied and carefully merged from a similar system within the same group at your site.

Remember to update remote systems' exports lists and re-export everything.

8.1.2 ADDING USERS AND USER ENVIRONMENTS

Since NIS has not been configured, the easiest way to create a large amount of accounts is to copy the relevant files from another system. This you can do either with `ftp` or `remsh` with a suitable `.rhosts` entry on the other system.

Files to consider are:

```
/etc/passwd
/etc/group
/etc/profile
/etc/csh.login
/etc/auto_master
/etc/auto_home
```

Typically, the files cannot be simply installed as replacements, but must be carefully merged with existing files (e.g. to preserve `root`'s password). So it may be useful to consider the approach used in the following example:

```
root# rcp <remote_host>:/etc/passwd /etc/passwd.new
root# diff /etc/passwd /etc/passwd.new | more
```

8.2 FOR ESO/DEV AND ESO/INS ONLY

8.2.1 ROCON CONFIGURATION

Add the following entries to `/root/.rhosts`:

```
localhost root
<unqualified_system_name> root
```

1. This excludes sites receiving systems from ESO which are to be sent directly to Paranal.

```
<fully_qualified_system_name> root
tel6.hq.eso.org root
```

Add the host to the 'rocon' database, by running the following command on tel6:

```
tel6# rocon -e
```

8.2.2 HOME AND SOFTWARE SERVER CONFIGURATION

Edit /etc/auto_master, remove all lines and then add the following lines:

```
/-                /etc/auto_direct    -rw,bg,nosuid,intr
/home             /etc/auto_home      -rw,bg,nosuid,intr
```

and the following to /etc/auto_direct:

```
/usr/server      -ro,soft,bg,suid    te43:/usr/server
/software        -ro,soft          te43:/software
/vltscm          -rw,soft          tel13:/vltscm
```

and run the commands:

```
root# true > /etc/auto_home
root# mkdir /usr/server /software /vltscm /homelink
```

Log in to te43 and add this system to the exports list for /usr/server and /software in the file /etc/dfs/dfstab, afterwards running the command:

```
te43# unshareall; shareall
```

Log in to tel13 and add this system to the exports list for /vltscm in the file /etc/exports, afterwards running the command:

```
tel13# exportfs -av
```

Log in to tel6 and run:

```
tel6# update_nonis_slaves -p -g -a -v -r
tel6# cd /usr/server/src/src/distribution/passwd_prog
tel6# remsh <system_name> mv /usr/bin/passwd /usr/bin/passwd.orig
tel6# rm -f control/all_done control/<system_name>.rcped
tel6# vi Makefile
```

and add this system to the Makefile. Then run:

```
tel6# make
```

8.2.3 UPDATING AUTOMATED ROOT CRONTAB DISTRIBUTION

Log in to tel6 and run:

```
tel6# cd /usr/server/src/src/distribution/crontab_root
```

```
tel6# cp te43.crontab <name_of_system>.crontab
tel6# vi <name_of_system>.crontab
```

and edit the file to suit local needs. Then run:

```
tel6# vi Makefile
```

and add an entry for this system to the file, and then run:

```
tel6# touch <name_of_system>.crontab
tel6# make
```

8.2.4 ROOT USER CONFIGURATION

Run the following commands:

```
root# mkdir /root/bin
root# vi /root/.profile
```

and add the following the bottom of root's .profile:

```
PATH=$HOME/bin:$PATH:/usr/server/bin:/usr/server/sbin
MANPATH=$MANPATH:/usr/server/man
```

8.2.5 RWHO CONFIGURATION

Create an rwhod startup script in /etc/init.d/rwhod¹ and create the links:

```
root# ln -s /etc/init.d/rwhod /etc/rc3.d/S99rwhod
root# ln -s /etc/init.d/rwhod /etc/rc0.d/K00rwhod
root# mkdir /var/spool/rwho
```

8.2.6 ISSUE AND MOTD CONFIGURATION

On tel6 run:

```
tel6# cd /usr/server/src/src/distribution/issue
tel6# touch <system_name>.issue
tel6# vi Makefile
```

and add the name of the system to the file. Then run:

```
tel6# make
tel6# cd /usr/server/src/src/distribution/motd
tel6# touch <system_name>.motd
tel6# vi Makefile
```

and add the name of the system to the file. Then run:

1. For convenience, a suitable script is included on the patches CDROM in /cdrom/cdrom0/misc/rwhod.

```
tel6# make
```

8.2.7 PRINTERS

On tel6 as root, run:

```
tel6# addprn <system_name> all
```

8.2.8 SENDMAIL CONFIGURATION

The system has already been configured not to relay mail and to flush the mail queue periodically. The ESO/DEV machines require this in order to relay vital sys admin information via mail. There remains only to configure the system to route mail via ESO's mail hub. To do this run the following commands on tel6:

```
tel6# rcp te43:/etc/mail/sendmail.cf /tmp  
tel6# rcp /tmp/sendmail.cf <system_name>:/etc/mail
```

8.2.9 PURIFY CACHE CONFIGURATION

As root run the following commands:

```
root# mkdir /var/tmp/pure-cache  
root# chmod 777 /var/tmp/pure-cache
```

Finally, to make effective the changes listed in this section so far, now reboot the system with the command:

```
root# sync; sync; sync; reboot
```

8.3 FOR ESO/ODT ONLY

8.3.1 REMOUNT /diska AS /export/home

Run the following commands as root:

```
root# umount /diska  
root# vi /etc/vfstab
```

change the mount point for what was /diska to /export/home, then run:

```
root# mkdir -p /export/home  
root# mount /export/home  
root# ln -s /export/home /diska
```

8.4 FOR ESO/PARANAL AND ESO/VCM ONLY

9 MISCELLANEOUS CONFIGURATION

9.1 USING A TEXT TERMINAL

If the keyboard is removed then the system will use ttya as the console. It also makes sense to disable CDE login starting as follows:

```
root# mv /etc/rc2.d/s99dtlogin /etc/rc2.d/K10dtlogin
```


10 UPGRADING TO FEB2000

10.1 UPGRADING TO FEB2000 FROM OCT99

10.2 INSTALLING ATM PATCHES¹

Install ATM patches as described in section 6.3.4.

10.3 INSTALLING Y2K PATCHES

Install Y2K as described in section 6.3.2.

1. Skip this section if there is no ATM card present or the ATM product software is not installed.

