

SPARC-HOWTO.

Table of Contents

<u>SPARC-HOWTO</u>	1
Lionel, trollhunter Bouchpan-Lerust-Juéry <trollhunter@linuxfr.org>	1
1. Preface	1
2. SPARC, which one ?	1
3. Buying a SPARC workstation	1
4. Linux on SPARC: 2 kernels	1
5. Choosing a distribution	1
6. Working with the Openboot	2
7. Hard drive buses	2
8. CDROM: specific settings	2
9. SILO	2
10. Keyboard and mouse	2
11. X Window	2
12. SMP	2
13. The sound	2
14. Serial port	2
15. Ressources	2
16. Thanks	2
17. Copyright, Disclaimer and Trademarks	2
18. Revision History	2
1. Preface	3
2. SPARC, which one ?	3
2.1 Sun SPARC	3
2.2 Super SPARC	3
2.3 Micro SPARC	3
2.4 Hyper SPARC	4
2.5 Ultra SPARC	4
2.6 Deciphering the CPUs	5
Ross Technology	5
SM modules	5
Cypress	6
3. Buying a SPARC workstation	6
3.1 Gaigning a visual familiarity with SPARC hardware	6
3.2 Sun made hardware or clones ?	6
3.3 Where to buy	6
3.4 Checklist	7
4. Linux on SPARC: 2 kernels	9
5. Choosing a distribution	9
5.1 Caldera Open Linux	9
5.2 Debian GNU/Linux	9
5.3 Linux Mandrake	10
5.4 RedHat Linux	10
5.5 Slackware Linux	10
5.6 SuSe Linux	10
5.7 TurboLinux	10
6. Working with the Openboot	11
6.1 What is the OpenBoot?	11

Table of Contents

6.2 Diagnostics commands.....	11
6.3 Boot commands.....	12
6.4 Misc commands.....	12
7. Hard drive buses.....	12
7.1 SCSI-SCA.....	12
7.2 EIDE.....	12
7.3 FC-AL.....	12
8. CDROM: specific settings.....	13
9. SILO.....	13
10. Keyboard and mouse.....	13
11. X Window.....	13
12. SMP.....	13
13. The sound.....	15
14. Serial port.....	15
15. Ressources.....	15
15.1 Information sites.....	15
15.2 Auction sites.....	15
16. Thanks.....	16
17. Copyright, Disclaimer and Trademarks.....	16
17.1 Copyright.....	16
17.2 Administrativa.....	17
18. Revision History.....	17

SPARC–HOWTO.

Lionel, trollhunter Bouchpan–Lerust–Juéry
[<trollhunter@linuxfr.org>](mailto:trollhunter@linuxfr.org)

v0.0.3 November 2000

The SPARC family of microprocessors is a very good implementation of the RISC design, SPARC based workstations are usually very well engineered products, thus Linux on SPARC is a winning combination both in performance and ease of use. Actually this combination is not as widespread as the Linux/x86; this HOWTO should help you step by step to make an informed decision: try it you will not regret it.

1. [Preface.](#)

2. [SPARC, which one ?](#)

- [2.1 Sun SPARC](#)
- [2.2 Super SPARC](#)
- [2.3 Micro SPARC](#)
- [2.4 Hyper SPARC](#)
- [2.5 Ultra SPARC](#)
- [2.6 Deciphering the CPUs](#)

3. [Buying a SPARC workstation.](#)

- [3.1 Gaigning a visual familiarity with SPARC hardware](#)
- [3.2 Sun made hardware or clones ?](#)
- [3.3 Where to buy.](#)
- [3.4 Checklist](#)

4. [Linux on SPARC: 2 kernels.](#)

5. [Choosing a distribution.](#)

- [5.1 Caldera Open Linux.](#)
- [5.2 Debian GNU/Linux.](#)
- [5.3 Linux Mandrake.](#)
- [5.4 RedHat Linux.](#)
- [5.5 Slackware Linux.](#)
- [5.6 SuSe Linux.](#)
- [5.7 TurboLinux.](#)

6. Working with the Openboot.

- [6.1 What is the OpenBoot?](#)
- [6.2 Diagnostics commands.](#)
- [6.3 Boot commands.](#)
- [6.4 Misc commands.](#)

7. Hard drive buses.

- [7.1 SCSI-SCA.](#)
- [7.2 EIDE.](#)
- [7.3 FC-AL.](#)

8. CDROM: specific settings.

9. SILO.

10. Keyboard and mouse.

11. X Window.

12. SMP.

13. The sound.

14. Serial port.

15. Ressources.

- [15.1 Information sites.](#)
- [15.2 Auction sites.](#)

16. Thanks.

17. Copyright, Disclaimer and Trademarks

- [17.1 Copyright.](#)
- [17.2 Administrativia.](#)

18. Revision History.

1. Preface.

This document is a step by step guide meant to provide information in order to help you running Linux on SPARC based workstations, As these computers are quite different from PCs there is an hardware section, this should help you on understanding, how they work, what to expect from the various CPUs and models.

I am not a SPARC specialist, nor a Solaris or Linux guru, I am just someone who is really fond of well engineered product, and I wish to help you in choosing your hardware and finding information. Thus I have tried to write down this document in order to ease your path.

I hope this document will help you and you will have a lot of fun with your SPARC Workstation.

2. SPARC, which one ?

We are only dealing with, SPARC based workstations, in order to check, just type `uname -m` command and you should read something like `sparc4x` where `x` is blank, `c`, `d`, `m`, `u` if the system runs Solaris, or `sparc` for 32 bits SPARC architectures and `sparc64` for 64 bits SPARC architectures if it runs Linux. 2.2.x

SPARC stands for Scalable Processor ARCHitecture, it derives from research done between 1984–1988 on the RISC architecture at UC Berkeley. It exists 3 versions of this architecture, SPARC–V7, SPARC–V8 (32 bits) and SPARC–V9 (64 bits). As you are likely to encounter a lot of implementations of the SPARC architecture, I have summarized the main features of these processors.

2.1 Sun SPARC

This is quite obsolete, it is an implementation of the SPARC–V7 ; its main features are an Integer unit (IU), an external Floating Point Unit (FPU), an unified data + instruction 64KB direct associative cache, and an Memory Management Unit (MMU). There is a 4 stage pipeline for the integer instructions (fetch F, decode D, exec E, update WB) FPU and IU are synchronized

2.2 Super SPARC

This is Texas Instrument and Sun's brainchild, it is usually found at clock rates around 50Mhz featuring up to 1MB L2 cache, it is available both on single and dual processor modules (SparcStation 10 and SparcStation 20). The higher clock frequency I have encountered is 60Mhz.

On a technical point of view this is a SPARC–V8 implementation, it is a superscalar processor, having 2 caches, one for instruction the other one for data.

- The 20kB instruction cache is a 5 way associative.
- The 16KB data cache is 4 way associative.

2.3 Micro SPARC

This is once again Texas Instrument and Sun's brainchild, you can find it in the SparcStation Classic, SparcStation LX, at frequency up to 50Mhz. Its derivative the Micro SPARC II can be found in SparcStation 4, SparcStation 5 at frequencies up to 110Mhz.

SPARC-HOWTO.

On a technical point of view, its main features are a high level of integration, having 2 caches, one for instructions, the other one for data.

- A 4KB instruction direct associative cache.
- A 2KB data direct associative cache.

It is not possible to had an L2 cache. If wish to learn more about the MicroSPARC processor you can browse Sun's [Ultra SPARC](#) ressources.

2.4 Hyper SPARC

This processor was introduced by ROSS in 1993, it is usualy found in the SparcStation 10, and SparcStation 20, at frequencies up to 150Mhz (I have heard of 200Mhz dual processor modules, but Have not witnessed one yet). It can be found on single or dual processor modules.

On a technical point of view it is an implementation of the SPARC-V8, it is superscalar. It can be found with L2 cache up to 512KB

2.5 Ultra SPARC

The Ultra SPARC processor is an extension of the SPARC-V9 architecture, it is a 64 bits processor, it features some video processing instructions. It is found in all the workstation whose name start with Ultra.

The Ultra SPARC II is an improvement of the Ultra SPARC, the Ultra SPARCIII is actually the second generation of Ultra SPARC processors, it was first introduced in the SunBlade 1000 Workstation. If wish to learn more about the UltraSPARC processors you can browse Sun's [Ultra SPARC](#) ressources.

You may read the [CPU-Design-HOWTO](#), this HOWTO has a lot of interesting links when it comes to studying the CPUs.

To summarize, the 32 bits workstations are the:

- The sun4 workstation is the sun4/330 model.
- The sun4c workstations are the SparcStation 1,2, IPC and IPX models.
- The sun4m workstations are the SparcStation 5, 10 and 20.

Only the SparcStation 10 and SparcStation 20 are SMP capable: up to 2 CPU modules.

For more information on the SparcStation 5, 10, 20 you can read Sun's [documentation](#) online or download it available.

The following model have an 64 bits UltraSPARC architecture (sun4u). SunUltra 1, 2, 5, 10, 30, 60, 80 and SunBlade 1000. The SunUltra 2, 60, 80 and SunBlade 1000 are SMP capable, with the Ultra 80 and SunBlade 1000 accepting up to 4 CPU modules, the SunUltra 2 and 60 accepting only 2 CPU modules.

The SunBlade 1000 is the latest one featuring Sun's latest marvel the Ultra III CPU, at a premium price of course. You can have a summary of the UltraWorkstation still in production at [Sun's](#) website.

A lot of information has been compiled in the [Sun hardware reference](#) that is found on AcesHardware's website, or on [SunHelp](#)'s website.

2.6 Deciphering the CPUs

At first, a reference like SM61 or RT-200-D-125/512 seems to be, to say the least, quite cryptic. Actually, understanding these references is really easy.

Ross Technology.

These CPUs's naming scheme is RT-a00-b-freq/cache where

- a is a digit:
 - ◆ 1 SparcStation 10.
 - ◆ 2 SparcStation 20.
 - ◆ 6 SPARC MP600 (not exactly a workstation).
- b is a letter:
 - ◆ D Dual CPU.
 - ◆ Q Quad CPU.
 - ◆ S Single CPU.
- freq The frequency expressed in Megahertz.
- cache The amount of cache memory expressed in Kilobytes.

When these modules are in a workstations the naming convention is HSxy, for example ywing is a SparcStation 20 HS22, thus it is easier to have a look inside the workstation.

SM modules.

This table is extracted from the [FAQABOSS](#)

Name	Speed(MHz)	Cache(MB)	Number of Processors	SuperSparc Series
SM20	33	0	1	I
SM30	36	0	1	I
SM40	40	0	1	I
SM41	40	1	1	I
SM50	50	0	1	I
SM51	50	1	1	I
SM512	50	1	2	I
SM51-2	50	2	1	I
SM61	60	1	1	I
SM61-2	60	2	1	I
SM71	75	1	1	II
SM71-2	75	2	1	II
SM81	85	1	1	II
SM81-5	85	2	1	II

Warning: the SM100 is a RT-600-D-40

Cypress.

Cypress manufactured SPARC compliant processors; AFAIK their naming scheme is CYnnn.

As you can see, this is easy to understand.

[3. Buying a SPARC workstation.](#)

You have decided to buy a SPARC based workstation, now you can tell what CPU each model sports, but can you tell how that particular model looks like? How its is inside?

Do not worry, this section will help you on that topic as well as providing you with some hints on how to inspect and test the hardware.

3.1 Gaining a visual familiarity with SPARC hardware

PC hardware is everywhere and usually one is quite familiar with it, this is not exactly the case with SPARC based hardware, even more when it comes to the innards of a workstation. The good news is that it exists some sites on the web, where you can find pictures of Sun hardware, with some very detailed shots, thus you should be able to instantly identify the model and its condition prior to buy it. The two main sites where I usually go are:

- [sun](#) In Sun's database, you can find technical data as well as picture of some of Sun's product, the pictures are crisp, and the hardware is always at its best, this is technically interesting, in order to compare brand new hardware and the used one that is usually featured on the two sites below.
- [HAL](#) This site features very detailed pictures of a lot of hardware, from CPU modules to Servers, even mice.
- [obsolyte](#) This site has different pictures, it is very useful too.

3.2 Sun made hardware or clones ?

On the one hand, it is very easy to find information on Sun hardware, while it can be difficult to find it for clone systems on the other hand it should be more fun to work with exotic hardware.

Clone systems have been or are still manufactured, at least by:

- Fujitsu.
- Ross
- Tadpole/RDI manufactures SPARC based laptops.
- [Tatung](#)
- Toshiba, used to manufacture SPARC based laptops: The AS1000.

3.3 Where to buy.

Of course if you buy first hand hardware everything should be fine, but if you decide to go for second hand hardware, you will have to decide how you want to buy it, and you should be able to test it by yourself.

Second hand hardware can be brought from Sun as refurbished hardware, at auction websites, or in specialised stores, or directly from companys that upgrade their hardware.

3.4 Checklist

When it comes to second hand hardware one has to be as cautious as possible about the source, and the condition of that hardware.

For the source of the hardware, if you can track it, it is a very good point. If you can't track it, it is up to you to decide if you trust the seller or not (If the seller cannot give you the reference of the hardwre and if, obviously he/she is clueless about Sun hardware, you should switch to condition red).

Another interesting point is to see if check is accepted as a payement.

If you can check the hardware before buying it then first have a general look at it, search for cracks, for stains; check the connector's pin. If this first inspection is OK, then ask to see the inside, look for spills, watch carefully the connectors, then if it is OK ask to see it running, watch carefully boot messages, issue the `dmesg|more` or if it runs Solaris you can issue the `more /var/adm/messages` command, and also very important listen to your computer, do you hear unusual noises? Does it smell OK?. Then enter the OpenBoot by the `stop+a` command and run some tests (see the OpenBoot section). When you have decided to purchase it, it is very important that you always make sure that the workstation you are purchasing is the one you have tested: always keep an eye on it, do not let someone go to the backoffice with it for example, do not accept to leave without your workstation.

Then, when you are at home, recheck it as if it was the first time you see it. If it comes with CDROM drive, try to mount/umount a few CDs and read them in order to check that device. If there is a floppy disk read/write/format a few floppys, this should be a good test.

Of course, it exists tools to automaticaly test the hardware, but usualy you do not have them when you need them, thus the script below relies only on ressources provided by a Linux base system.

You should run the following script for three days, basicaly it is going to use the CDROM, floppy and hard drive, and to reboot the computer every 3 hours. This should stress it,

```
#
# Enter this in the crontab(5)
# run the torture.sh script every 3 hours if possible
#
0 */3 * * * /root/torture.sh
```

Where `torture.sh` is

```
#!/bin/sh

#
# these are for controlling the loops
# the CDLIMITS and FDLIMITS
# are for the CD and FD loops
#
```

SPARC-HOWTO.

```
CPT=1
CDLIMIT=3
FDLIMIT=10

#
# to which devices are
# CDROM and floppy attached
#
CDROM=/dev/sr0
FLOPPY=/dev/fd0

#
# where is the program we
# intend to compile

PATH=/path_to_big_package_to_compile

#
# this section is meant to
# test the CDROM and floppy drives
# comment what you do not need to
# test

while [ $CPT -le $CDLIMIT ]
do
#
# CDROM drive
#

mount -rt iso9660 $CDROM /cdrom
find /cdrom -exec cat {} \; >>/dev/null 2>/dev/null &
umount /cdrom
CPT=$((CPT+1))
done

#
# floppy drive
#
CPT=1
while [ $CPT -le $FDLIMIT ]
do
mke2fs -c $FLOPPY >/dev/null 2>&1
mount -t ext2 $FLOPPY /floppy
cd /bin/
cp dd ps echo sh /floppy
find /floppy -exec cat {} \; >>/dev/null 2>/dev/null &
umount /floppy
CPT=$((CPT+1))
done

#
# The big, intensive
# compilation
#

cd $PATH

#
# now compile
#
make
```

3.4 Checklist

```
#
#
# we remove every .a .o .s and every executable
#
find $PATH -name "*. [aos]" -exec rm -f {} \; >/dev/null 2>&1
find $PATH -exec test -x {} \; -exec rm -f {} \; >/dev/null 2>&1

#
# time to reboot
#
reboot
```

Of course you should run this script once in order to know how much time it takes to complete, this is just an idea on how to automate things.

4. Linux on SPARC: 2 kernels.

Actually Linux on SPARC architecture comes in two flavors:

- A 32 bits kernel for the Sun SPARC, Super SPARC, Micro SPARC and Hyper SPARC Processors.
- A 64 bits kernel for UltraSPARC based workstations.

In both case most applications run in 32 bit (32 bit userland). There is a comprehensive [FAQ](#) on [UltraLinux's](#) website.

5. Choosing a distribution.

You are very lucky, it seems that you can pick the one you like. In order to help you with this task here are some links, that should help you to make an informed decision.

5.1 Caldera Open Linux.

The 2.2 release of OpenLinux for SPARC platform can be downloaded at

<ftp://ftp.openlinux.org/pub/sparclinux/>

You can join the mailing list by sending a mail to [< majordomo@openlinux.org >](mailto:majordomo@openlinux.org) with subscribe sparclinux in the body.

5.2 Debian GNU/Linux.

Debian GNU/Linux runs on SPARC platform; you can find a lot of informations about this port at the <http://www.debian.org/ports/sparc/> webpage

You can join the mailing list by sending a mail to [< debian-sparc-request@lists.debian.org >](mailto:debian-sparc-request@lists.debian.org) with subscribe as the subject.

5.3 Linux Mandrake.

Mandrake corporate server for SPARC can be downloaded at <ftp://rpmfind.net/linux/Mandrake/iso/corporate-1.0/sparc>

It consists of two ISOs, the core distribution is the *inst.iso one and the other one, *ext.iso, is the extension CD.

5.4 RedHat Linux.

The latest RedHat Linux distribution is the 6.2; you can download it at <ftp://rufus.w3.org/linux/redhat/redhat-6.2/sparc/> for example.

The mailing list can be joined by sending a mail at

[<sparc-list-request@redhat.com>](mailto:sparc-list-request@redhat.com) with subscribe as the subject.

At the time of this writing RedHat has announced its intention not to support anymore SPARC Linux in the future.

5.5 Slackware Linux.

This distribution is unsupported at the time of this writing, and is not available as ISO. You can download it at <ftp://ftp.slackware.com/pub/slackware/unsupported/protopkg/>

5.6 SuSe Linux.

The SuSe Linux 7.0 distribution is quite complete, you have 4 ISOs to download. You can grab it at the following URL: <ftp://ftp.suse.com/pub/suse/sparc>

You can join the mailing list by sending a blank mail to [<suse-sparc-subscribe@suse.com>](mailto:suse-sparc-subscribe@suse.com)

5.7 TurboLinux.

[TurboLinux](#) Workstation 6.1 for intel ships with a SPARC developer release CD.

To install Linux on a SPARC based computer, should be straightforward if you follow the informations provided by your distribution.

To boot from a floppy drive you have to have an install image on a floppy disk and to issue the `boot floppy` from the OpenBoot.

If your workstation does not have a CDROM or a floppy drive, you can always try to perform a network installation using NFS as explained by this French document: <http://www.linux-france.org/article/materiel/sparc-install/Sparc-netinstall.html>. Basically, you have to set up an NFS server and to boot your workstation using the `boot net vmlinux nfsroot=192.168.52.12:/tmp` in order to access the image that is exported by the 192.168.52.12 workstation on the /tmp directory.

6. [Working with the Openboot.](#)

In this section, I will give you an overview of what is the OpenBoot, and you will be given the main commands you need to know in order to test your hardware and to install Linux.

6.1 What is the OpenBoot?

If you are used to PC hardware, you are used to interact with its BIOS. SPARC computers have an Openboot, it may seem to be like your BIOS, but it is actually far more powerful. The Openboot performs the following tasks:

- Testing and initializing the hardware.
- Starting the operating System.
- Giving you access to a set of tools to program and to debug it.

The programming language is FCode, if you can program the Forth language, you can program it.

In this section, we will just use a small set of the OpenBoot's capabilities, in order to test hardware and to boot the system. First you have to enter in the OpenBoot, just hit the `stop` and `a` keys simultaneously. Then you should see a `ok` prompt, if instead you see the `>` prompt then type `n`. Now you can proceed to the next section.

6.2 Diagnostics commands.

The OpenBoot, gives you a lot of commands to test and to gather information about your hardware.

- `.version` Displays version and date of the startup PROM.
- `banner` You will see the banner, that is displayed at power-on. It is useful to gather some data about CPUs.
- `pcia-probe-list` Test PCI on computers that have a PCI bus.
- `module-info` This will display the Buses clockspeed, and processors frequency and amount of cache.
- `probe-scsi` This will test all devices connected to the on board SCSI controller.
- `probe-scsi-all` This will test all devices connected to all the SCSI controllers.
- `show-devs` This displays all installed and probed devices.
- `show-sbus` Use this, if you just want to display a list of installed and probed SBus devices.
- `test-all` This will test all devices in the system that have a self test program.
- `test floppy` If a floppy drive is installed, it will test it reminding you to have a formatted floppy disk inside.
- `test-memory` If the system `diag-switch?` is set to `true`, this will test the memory.
- `test net` This will test the network interfaces
- `watch-aui` This will test the AUI ethernet link. You will see `'.'` for good packets and `'X'` for bad ones. Strike any key to abort.
- `watch-clock` This will test the real time clock chip, it will tick once a second. To stop this test strike any key.
- `watch-net` This will check the network connection (both AUI and TP). You will see `'.'` for good packets and `'X'` for bad ones. Strike any key to abort.
- `watch-net-all` This will test all Ethernet interfaces. You will see `'.'` for good packets and `'X'` for

bad ones. Strike any key to abort. When you abort one, it will test the next one.

- `watch-tpe` This will check the TPE ethernet interface. You will see '.' for good packets and 'X' for bad ones. Strike any key to abort.

6.3 Boot commands.

The OpenBoot allows you to boot from various devices, the command you are the more likely to enter are below.

- `boot` Boot kernel from default device.
- `boot cdrom` Boot kernel from CDROM drive.
- `boot net-tpe` Boot kernel from network urnel from CDROM drive, this is the command you are the more likely to type when installing Linux.
- `boot net` Boot kernel from network using auto-selected interface.
- `boot net-aui` Boot kernel from network using AUI interface.
- `boot net-tpe` Boot kernel from network using TPE interface.
- `boot tape` Boot default file from tape.

6.4 Misc commands.

- `eject-floppy` Ejects the floppy.
- `power-off` Poweroff the workstation.

You can poweroff your workstation, when you are working with the OpenBoot : just type `power-off`

For more informations on the OpenBoot you can read it's

7. [Hard drive buses.](#)

Depending on their architecture, the worstations are likely to feature one of the following hard drive buses.

7.1 SCSI-SCA.

An SCSI connector is located at the rear of the Workstation; the SCA chanel is found on the internal bus of the SPARC Worstations, it can be basicaly seen as an SCSI bus that provides power supply and assigns SCSI ID to the peripherals.

7.2 EIDE.

This is found for example in an Ultra 5 or Ultra 10 workstations

7.3 FC-AL

It is used by the SunBlade 1000 workstation.

8. [CDROM: specific settings.](#)

The easiest way to install linux on SPARC workstation is to use a CDROM. If your workstation does not have a CDROM you can plug an external SCSI CDROM drive, but there are two things to do or you are doomed to fail:

- When you issue the `boot cdrom` command, the CDROM is mapped to ID6.
- Your CDROM player's block size should be setted up on 512.

As a rule of thumb, nearly all CDROM drives can be assigned to ID #6 but be carefull about the block size setting.

9. [SILO.](#)

The Sparc Improved Boot LOader (SILO), is the boot loader that is used in the SPARC architecture. It allows you to boot Linux, Solaris or SunOS. It can load a Linux kernel from ext2, iso9660, UFS or ROMFS. From the SILO's README:

This is the first attempt at a complete boot loader for Linux on the Sparc. Because of the lack of space on the bootblock, we have to do it in two steps, the first step is a very simple loader based on Peter Zaitcev's silo (we will call this the first stage loader) which should fit in 512B and its sole purpose is to load a more complete bootstrap loader, herein refered to as the second stage boot loader. The cool thing about the second stage loader we implemented is that it makes use of the ext2 library (provided with the ext2fs tools) and some ufs code, and thus allows the loader to access any file on a ext2 fs and ufs, uses silo.conf, handles gunzipping and a lot of other things. This is different from Linux/i386 lilo which needs a map for each kernel. In silo we just keep one map file for the second stage loader, we don't expect you to be changing the second stage loader on your daily routine (you can do so, you will just need to use a tool to reinstall the maps).

Actually, IMHO it is easier to use than LILO.

10. [Keyboard and mouse.](#)

Most of the sun4m workstation have a special connector for the keyboard. In this case the mouse is connected indifferently to left or the right side of the keyboard. Some workstations have a PS2 connector, it is very easy to spot the difference. The keyboards you are the more likely to encounter are the type4 and type5.

11. [X Window.](#)

XFree, usualy, runs fine on theses systems. The XServer for the Sun hardware should be the Xsun, XsunMono or Xsun24 one.

12. [SMP.](#)

Ouaich, SMP is supported, and I am sure that ROSS's dual CPU modules are supported as you can see by yourself:

8. CDROM: specific settings.

```
piou@ywing:~ > cat /proc/cpuinfo
cpu           : ROSS HyperSparc RT625 or RT626
fpu           : ROSS HyperSparc combined IU/FPU
promlib       : Version 3 Revision 2
prom          : 2.25
type          : sun4m
ncpus probed  : 2
ncpus active  : 2
Cpu0Bogo     : 125.33
Cpu1Bogo     : 125.33
MMU type      : ROSS HyperSparc
invall       : 0
invmm        : 0
invrnge      : 0
invpg        : 0
contexts     : 4096
CPU0         : online
CPU1         : online
piou@ywing:~ >
```

The SparcStation 10 and SparcStations 20 are SMP capable machine and according to the [FAQABOSS](#) the following combinations are known to work :

- 2xSM40 (model 402)
- 2xSM41 (model 412)
- 2xSM51 (model 512)
- 2xSM512 (model 514)
- 2xSM61 (model 612)
- 2xSM71 (model 712)
- 2xSM81 (model 812)

And, as stated earlier, CPU modules in SparcStations 10 and can run a different clock speeds, the following ones __SHOULD__ work:

- 2xSM50
- SM41, SM51
- SM41, SM61
- SM51, SM61
- SM71, SM81

If you want to learn more about SMP and Linux you can read the [SMP-HOWTO](#)

How does it performs? Well, it is fast, really fast. Some of the java Demos can run faster on a dual HyperSparc 125Mhz 128MB (ywing) than on a dual celeron BP6 433@433Mhz 192MB (calimero). The same applies for the Gimp. When it comes to compiling calimero runs faster than ywing. Both computers running 2.2.16 kernel and calimero's hard disk subsystem is full SCSI.

One important detail when you plan to have different CPU modules in your computer is to have the same kind of modules, you cannot mix SuperSparc and HyperSparc for example, but you can have an odd number of CPUs, for example 3. They are said to be able to run modules at different clock speed as written in this

article form [AcesHardware](#) , but I have not witnessed it.

I plan to upgrade `ywing` to 4 CPU in order to see how the performance scales.

13. [The sound.](#)

The sound is supposed to work under Linux, using the `ioctl` application. On my SparcStation 20, the sound works fine under Solaris8, but I have not yet managed to hear anything under Linux (The Sound of Silence?).

You can read the Linux/Sparc audio webpage at [sparcaudio](#) for more informations.

14. [Serial port.](#)

Sun workstations ususalaly have 2 serial ports, but on sun4m workstation there is usually only one serial connector at the rear, you need a special Y cable in order to have access to both ports.

15. [Ressources.](#)

The following sites are given for your information, I am independent from them and does not represent them. If you would like to suggest a website or to add any information do not hesitate to email me.

15.1 Information sites.

- Ace's Hardware: <http://www.aceshardware.com/> An hardware information site having a SPARC area, actually the whole site runs on a SparcStation 20 SM71, 128MB ! Ouaich, definitively not an Intel clone.
- ArsTechnica: <http://arstechnica.com/cpu/index.html> ArsTechnica is an information website with a good CPU section.
- Black-Cube: <http://www.black-cube.net/Sun/> Pictures of various SPARC hardware : IMHO great site.
- LinuxDoc: <http://www.linuxdoc.org> homesite of the LDP.
- Obsolyte: <http://www.obsolyte.com/sunPICS/> Nice pictures from various sun Hardware.
- SPARC International, Inc. <http://www.sparc.org/> As the name implies, a lot of information about SPARC architecture.
- Sun: <http://docs.sun.com/> the starting node to access documentation on Sun Microsystems website.
- SunHelp: <http://sunhelp.org> A good source of information about Sun Hardware and Solaris OS. Has a lot of links and good documentation on site.
- UltraLinux: <http://www.ultralinux.org/> If you need information about the Linux Kernel on SPARC architecture it is a very good place: "Bring your penguin into the Sun".

15.2 Auction sites.

Among the various Auction websites available on the net you can try theses ones. Remember to be very cautious when you purchase hardware (see the Buying a SPARC workstation section.)

- Ebay: <http://www.ebay.com> Ebay, and its regional sites have got a lot of Workstations.
 - Ibazar: <http://www.ibazar.com/> The French Ibazar site has ususal a lot of Workstations.
 - Yahoo! Auctions: <http://auctions.yahoo.com/> This is the well known site.
-

16. [Thanks.](#)

Among the many people who showed me how great Unix and the Unix machine can be, some people have earned a special place I would like to thank them:

- My "Vieux matou" Michel F. Who gave me my first account on a real Unix machine, and took the time to answer my questions, showing me among other things how to take advantage of the hardware's feature.
- Nathalie S. Who was always able to guess at the speed of light what went wrong and fixed it on the fly. And took time to install the tools I needed.
- Yves D. Who among other things always welcomed my questions, and whose office was always open even late in the evening.

Both of them beeing real Sysadmin and teachers from the trenches, have a very deep knowledge and understandement of the Hardware and Software.

17. [Copyright, Disclaimer and Trademarks](#)

17.1 Copyright.

Copyright © 2000 by Lionel, trollhunter Bouchpan-Lerust-Juéry. This document may be distributed under the terms set forth in the GNU Free Documentation Licence <http://www.gnu.org/copyleft/fdl.txt> .

This documentation is distributed in the hope that it will be useful, but without any warranty. The information in this document is correct to the best of my knowledge, but there's a always a chance I've made some mistakes, so don't follow everything too blindly, especially if it seems wrong. Nothing here should have a detrimental effect on your computer, but just in case I take no responsibility for any damages ocurred from the use of the information contained herein.

In this document you will encounter some commercial products and brands. Theses products are cited for information purpose, it is not an endorsement from the author. The trademarks belong to their respective owners.

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.1 or any later version published by the Free Software Foundation; with the Invariant Sections being : "Copyright, Disclaimer and Trademarks" "Preface.", "SPARC, which one ?", "Buying a SPARC workstation.", "Linux on SPARC: 2 kernels.", "Choosing a distribution.", "Working with the Openboot.", "Hard drive buses.", "CDROM: specific settings.quot;, "SILO.", "Keyboard and mouse.", "X Window.", "SMP.", "The sound.", "Serial port.", "Ressources.", "Thanks.", "Revision History.",

, with the Front-Cover Texts being "title" and "abstract." , and with no Back-Cover Texts .

17.2 Administrativa.

This text is included in the LINUX DOCUMENTATION PROJECT <http://www.linuxdoc.org/HOWTO>.

The latest version of this document is available in HTML format at

<http://www.theWearables.com/mirrors/SPARC-HOWTO/SPARC-HOWTO.html> If you need a postscript file, you can grab it at <http://www.theWearables.com/mirrors/SPARC-HOWTO/SPARC-HOWTO.ps.gz>

If you wish to mirror it or to translate it, please contact me.

Lionel, Trollhunter Bouchpan-Lerust-Juéry <trollhunter@linuxfr.org> or at <boucli27@altavista.net>

18. [Revision History.](#)

- November 2000. v0.0.3
 - November 2000. First release v0.0.1
-