Debian Installation Tips

Hints for installing Debian 3.1 (Sarge)

About this list

This list is a collection of steps I took to solve problems with the installation of Debian, or to change the system according to my wishes. For some problems the solution was far from obvious and I had to look for quite some time to find a way. Some parts are special for my installation, some others (e.g. Euro support) are very general. There are plenty of websites with documentation on Debian, you can find some of them on my links page.

If this list contains errors or if you think that some description is incomplete or incorrect, feel free to write me an email (andreas.janssen@bigfoot.com)

1. Installation kernel

Debian Sarge can be installed using Kernel 2.6 as well as Kernel 2.4. Kernel 2.4 will be chosen by default. However, Kernel 2.6 offers, among other things, included support for ALSA, lm-sensors, extended CPU frequency control for laptops (e.g. powernod/speedstep, also without ACPI) and extended ACPI functions. Furthermore, the hotplug service, if used with Kernel 2.6, is able to load most driver modules for hardware components automatically, not only for hotplug components like USB or PCMCIA devices. The boot screen of the installation system offers you the possibility to get more information about available kernels and other options by pressing F1.

2. Boot parameters

If you are using certain hardware components/combinations, it can happen that the kernel crashes while booting. There is a list of boot parameters that you can use to switch of kernel functions during the installation. Often, these problems are caused by ACPI or APIC support, so if you have problems, try the following parameters:

`pci=noacpi`
: Uses common interrupt routing without ACPI instead of ACPI interrupt routing

`acpi=off`
: Deactivates ACPI (Advanced Configuration and Power Interface) completely. That way, also ACPI power save options are no longer available.

`nolapic`
: Don't use Local APIC (Advanced Programmable Interrupt Controller), even if it is activated according to the BIOS. The local APIC makes it possible to use more than the common 16 interrupts, however the (faulty) support on some systems can cause crashes.

`noapic`
: Switch off APIC

Further information on ACPI and APIC boot parameters can be found in the SuSE Support Database (http://portal.suse.com/sdb/de/2002/09/81_acpi.html)

3. Installation sources

During the installation, you should include the source security.debian.org additionally to your main installation sources (a DVD in my case). The installation program is

able to add these sources on its own so that you won't have to do it manually after the installation. You can change the list later by using `apt-setup`. After configuring your internet connection, you should also include an official Debian server in your list of sources. Many inofficial installation media, especially DVDs included with magazines, don't include all packages (Sarge will need about 14 CDs or 2 DVDs). By adding a server, you get access to the complete archive, including non-free components that are (partially) not distributed on CDs or DVDs. One of the official servers is ftp.de.debian.org, the lines in the configuration file */etc/apt/sources.list* could look like this:

```
deb http://ftp.de.debian.org/debian sarge main contrib non-free
deb http://security.debian.org sarge/updates main contrib non-free
```

4. Package selection after the installation

After installing the base system, further packages can be added using `dselect`, `tasksel` or `aptitude`. However, `dselect` is somewhat complicated, so if you don't yet have an overview over the packages, use `aptitude` or `tasksel`. In the beginning, the easiest way is to use tasks, that are groups of packages that together give you a certain functionality. An example is the *desktop* task which installs X windows, KDE and Gnome. Tasks can be installed using `tasksel` as well as `aptitude`.

5. Editors

After the installation, the editors `vi` (package *nvi*) and `nano` are available.

6. Package management

The basic programs for package management apart from `dpkg` are `apt-get` and `apt-cache`. `apt-get` installs or removes packages, `apt-cache` searches the package list.

`apt-get install <Name>`
: installs a package

`apt-get remove <Name>`
: removes a package

`apt-get --purge remove <Name>`
: removes a package and its configuration

ATTENTION: If you remove a package using `apt-get remove` and later delete its configuration files manually, they won't be reinstalled if you reinstall the package. In most cases you probably want to use `--purge`.

`apt-cache search <Term>`
: searches the package database and shows matching packages. Searches package names as well as package descriptions.

`apt-cache show <packagename>`
: shows detailed information about a package

`apt-cache policy <packagename>`
: shows available versions of a package

Debian packages can of course also be installed manually by using `dpkg --install` *`packagename.deb`*.

7. Exim

Debian Sarge installs exim4 as the default mail transport agent. Unlike in Woody, exim is no longer started through inetd by default, but runs in standalone mode instead. Also, at least if you selected "local delivery only" in the configuration dialog,

it wil only listen on the loopback interface and cannot be reached from the outside. You can go back to the configuration dialog anytime by running

```
dpkg-reconfigure exim4-config
```

ATTENTION: If you only use exim to deliver local system mails, for example output from cron jobs, exim does not need to run in the background permanently. You can deactivate it and configure it not to be started automatically at boot time, for example using `sysv-rc-conf`.

8. Runlevels

Debian organizes runlevels differently from all other distributions. The principle is simple: 0, 1(S) and 6 are as usual, but 2,3,4 and 5 are all identical and boot the system normally. There is no special runlevel without network or without X. There are several ways to change the runlevels according to your wishes. The program `update-rc.d` from the base system is not to be recommended, because it is supposed to allow packages to create or remove links during installation/deinstallation. If you remove the links using `update-rc.d`, they will be automatically recreated once the package is updated. Instead, you should install and use programs like *sysv-rc-conf* oder *sysvconfig*.

9. Basic packages

Some of the packages that I added directly after installing the base system were *gzip*, *zip*, *unzip*, *bzip2*, *rar* and *unrar*. I installed *less* as a replacement for the *more* pager and *traceroute*. If your computer does not run 24/7, you should install *anacron*. It makes sure that cron jobs are executed that were scheduled for when the system was switched off.

10. Documentation

The most important documentation packages are *doc-linux-text* and *doc-linux-html*. They contain the HowTos of the Linux Documentation Projects (http://www.tldp.org/) . Apart from that, every package has its own documentation in */usr/share/doc/<PACKAGENAME>*. If you encounter problems with a package, this is where you should look for help first, especially the *README.Debian* or *README.Debian.gz* file that some packages have.

There is a list of other interesting documentation packages, including:

debian-reference
: The Debian Reference contains important information on how Debian works and how to manage system administration tasks the Debian was.

apt-dpkg-ref
: The Apt-DPKG-Reference gives you a short overview over the basic programs of the package management system.

debian-installer-manual
: The Debian installation manual

rutebook
: A detailed manual for administration of Linux systems. This package is included in the non-free section of Debian.

harden-doc
: Includes the Securing Debian Manual.

This is only a short overview of some selected packages, you can find more in `aptitude` under "Not Installed Packages/doc".

To get control over the manuals installed to many different locations, you should install the *dhelp* and *doc-base* packages. *dhelp* generates an overview of available documentation that can be searched conveniently using a web browser. Contrary to systems like *dwww* this works without installing a web server. You can find the generated overview under file:/usr/share/doc/HTML/index.html.

11. User groups

Debian follows a strict principle of security which grants normal users only little privileges by defailt. To do certain things they must be in the respecting group. The following groups are the most important ones:

- audio: Access to the sound card
- dip: Using dialout programs *pon/poff*
- cdrom: Access to the CD writer, using audio CDs
- games: Write access to high score lists and so on

If you install Sarge instead of Woody, users created during the installation will be in the most important groups automaticalls, except for dip. Running

```
adduser username dip
```

solves the problem.

ATTENTION: User permissions of the cdrom group only affect devices that are accessed through IDE-SCSI emulation (and real SCSI CD-ROMs). All IDE device files belong to the disk group. Because IDE-SCSI emulation is supposed to be deprecated in Kernel 2.6 you should change the group of the ide device files for CD-ROMs and writers (_not_ the hard disks) from disk to cdrom. If for example */dev/hdc* is the writer, that would look like this:

```
chgrp cdrom /dev/hdc
```

ATTENTION: If you installed Sarge using Kernel 2.6, you are probably running the udev daemon that will take care of this automatically. Use

```
ps aux | grep udev
```

to check if udev is active.

You can find more information on CD writing unter Tip 22.

It is _not_ a good idea to add users to the disk group to solve CD writing permission problems. This allows direct read/write access to all IDE and SCSI disks, their boot sectors and partitions. All file-system level security functions like user and group permissions will become useless. It is not necessary to be in any special groups in order to mount CDROMs, because the mount programs will always run with root permissions.

12. PPP Configuration

You can use the `pppconfig` program to configure a modem connection. After finishing the configuration, you can use the `pon` and `poff` commands to connect and disconnect. If you want to be able to use `ifup` and `ifdown` as well, you need to make an entry for your connection in */etc/network/interfaces*. For a normal dialup connection it looks like this:

```
# PPP interface
iface ppp0 inet ppp
provider <name of the connection used in pppconfig>
```

ATTENTION: Only for T-Online users: the T-Online user name contains the # character. If you enter the username in `pppconfig`, the part after that character will be regarded as a comment and ignored. To solve the problem, enter a backslash first (\#). That way connecting will work.

13. X11

In order to install XFree86, you can simply select some meta packages via `apt-get` that depend on all important components. *x-window-system* and *x-window-system-core* are available. These packages do not contain any programs, but only dependencies. The package *x-window-system* depends on *x-window-system-core* and some other packages. *x-window-system* installs a complete X environment, including the terminal emulator *xterm*, the login manager *xdm*, X font server *xfs* and the window manager *twm*. Especially users of KDE or Gnome should perhaps only install *x-window-system-core* and then use the respecting alternatives of their desktop environment, e.g. the login manager *kdm* od *gdm*.

14. X Configuration

Apart from configuring the X server using the tools *xf86cfg* and *xf86config* which are included with XFree, you can also configure the X server using *debconf*. During the installation Debconf asks several questions, for example the type of the graphic card and the freuencies of the monitor. You can rerun this dialog later using

```
dpgk-reconfigure xserver-xfree86
```

ATTENTION: If you changed the configuration file yourself, debconf won't touch it anymore. Later changes through debconf will have no effect because debconf saves the changes in its internal database, but doesn't recreate the configuration file. In this case you can manually call `dexconf`, which will generate a new confguration file from the debconf database.

ATTENTION: By default, you are offered to use the kernel framebuffer. Apparently I am not the only user for whom this setting doesn't work. If the X server doesn't run right away, maybe it is because of this setting.

ATTENTION: The file dpkg-reconfigure creates is called XF86Config-4. Other configuration programs create XF86Config. The X server (version 4) first tries to load XF86Config. Only if this file does not exist it will try to read XF86Config-4. Maybe you need to remove XF86Config manually if you used some other configuration program before running dpkg-reconfigure.

15. TrueType fonts in X

If you use Sarge, it is relatively easy to use TrueType fonts, for example from the packages *ttf-bitstream-vera*, *ttf-freefont* or *msttcorefonts* in X. These fonts can now be administrated through *defoma*, the Debian Font Manager. All you need to do is to install the package *x-ttcidfont-conf*:

```
apt-get install x-ttcidfont-conf
```

Afterwards you add a line for the TrueType directory to the Files section of the X configuration file */etc/X11/XF86Config-4*, preferrably directly above all other

FontPath entries:

```
FontPath  "/var/lib/defoma/x-ttcidfont-conf.d/dirs/TrueType"
```

16. Installing your own TrueType fonts

In Debian, fonts can be managed by *defoma*, the Debian Font Manager. It registers the Fonts to applications which tell *defoma* how to do this using a plugin. Examples are *gs*, *fontconfig* and also *x-ttcidfont-conf* which in turn makes the fonts available to X (see Tip 15). The advantage is that is sufficient to register the fonts to *defoma*, which will take care of the rest of the configuration. Here is a short walkthrough on how to do it:

First you copy all your TrueType fonts to a suitable directory, for example `/usr/local/share/fonts/truetype`. Next you create a so called *hints* file for *defoma* which contains informations about the fonts. You do this using the `defoma-hints` program. Make sure that the *libft-perl* package is installed. After that you can create the *hints* file:

```
defoma-hints -c --no-question truetype \
/usr/local/share/fonts/truetype/* \
> /etc/defoma/hints/ownfonts.hints
```

Now you register this file to *defoma*:

```
defoma-font register-all /etc/defoma/hints/ownfonts.hints
```

The last thing you have to do is to apply the new configuration. The quickest way is to call

```
defoma-reconfigure
```

It updates the fonts database for all registered applications. To use the new fonts in your current X session, run

```
xset fp rehash
```

17. KDE

Sarge includes, apart from Gnome, Xfce4, WindowMaker and many other window managers, also the desktop environment KDE 3.3. The easiest way to install KDE is to select the *kde* meta package. It depends on the group packages like *kdebase*, *kdenetwork* and *kdegames* that you maybe know from other distributions. Contrary to other distributions, these group packages are not monolithic, but are also only meta packages that depend on the applications like Konqueror, Kmail and Knode. That way you can easily install KDE, but if you want you include certain applications in your installation and exclude others.

ATTENTION: If you installed *xdm* and now want to use *kdm* instead, you can run

`dpkg-reconfigure kdm` or
`dpkg-reconfigure xdm` to choose which login manager will be used. If you prefer kdm, you can remove xdm. You should use --purge to remove the start scripts as well:

```
apt-get --purge remove xdm
```

If you want german language support, install *kde-i18n-de*.

18. Printing with Cups

I use the Cups printing system. After installation, it can be configured easily using the web interface. You should install the following packages:

- *cupsys*
- *cupsys-driver-gimpprint*
- *foomatic-filters-ppds*
- *cupsys-bsd*
- *gs-esp*

Owners of HP printers should install the following packages instead of *cupsys-driver-gimpprint*:

- *foomatic-db-hpijs*
- *hpijs*

After Cups has been started, you can reach the configuration program using a browser under the address http://localhost:631.

ATTENTION: When installing *cupsys-bsd*, debconf asks if you want to start the BSD compatibility server. In most cases this is not necessary. This server is only needed if the printer is supposed to appear like a LPD printer in your network. If the printer is not used over the network, or if you use Cups or Samba (Windows shares) in your network, you do not need to activate the server. Locally installed applications can use the printer like a LPD device without the server running.

19. Security and Cups

Using the default settings, Cups is listening on all network interfaces. If you only use your printer locally on the computer it is directly connected to, or if the printer is exported over the network using some other system like Samba, you can reconfigure Cups not to listen on all interfaces. To do this, edit the file */etc/cups/cupsd.conf* and search `Listen`. Below a comment, you will find the line `Port 631`. Replace it by

```
Listen 127.0.0.1:631
```

Next, restart Cups. `netstat -l` should now display `localhost:ipp` in the Cups line.

20. Package lists

Apart from the normal installation sources, I added the following to my */etc/apt/sources.list*:

```
# official servers
deb ftp://ftp.de.debian.org/debian sarge main contrib non-free
deb ftp://security.debian.org/debian-security sarge/updates main contrib
non-free

# multimedia
deb http://www.debian-multimedia.org sarge main
```

From the apt repository at debian-multimedia.org you can get some multimedia packages which are not included in Debian because of legal questions or license

issues. This includes the mp3 encoder *lame*, Acrobat Reader 7 (packages *acroread* and *mozilla-acroread*), *flashplayer-mozilla* and *mplayer*.

Apart from that there are many more sources for packages that are not at all included in Debian or only available in older versions. You can find these sources for Sarge in the Unofficial APT repositories (http://www.apt-get.org) .

21. Mount points

Contrary to Woody, but according to recent versions of the Linux Filesystem Hierarchy Standard (FHS) (http://www.pathname.com/fhs/) , mount points for removable media are no longer created in the root directory, but in the /media directory. You can of course change the mount points manually. If you however change the moint point for your installation medium, *apt* will be confused. You can set the standard mount point for apt by creating the file */etc/apt/apt.conf* and making the following entry:

```
Acquire::cdrom::mount "/media/cdrom";
```

22. CD writing

Most users own an IDE cd writer. If you use kernel 2.6, you won't need the ide-scsi emulation anymore like for kernel 2.4. Instead you can use the normal ide-cd driver. By default, only members of the *cdrom* group are allowed to access the device files. If you use IDE devices, you need to change the permissions, because IDE device files belong to the *disk* group by default. I described how to to that in Tip 11.

There are several programs for CD writing available in Debian, for example `cdrecord` and `cdrdao` for the commandline and *k3b* and *xcdroast* for X. *k3b* is a KDE program which is easy to use and offers a lot of functions.

ATTENTION: The k3b setup assistant suggests that you change the permissions for your cd writing programs and device files and to create a group *cdwriter*. This is _not_ necessary.

23. Web browser

Debian Sarge includes several web browsers, for example *Mozilla*, *Mozilla Firefox* and the KDE browser *Konqueror*. If you only want to use the Mozilla browser, but not the mail and news client, you can install *mozilla-browser* and *mozilla-psm* instead of the *mozilla* package.

24. Language settings

To get system-wide german-language support, install the *locales* and *localeconf* packages. By running

```
dpkg-reconfigure locales
```

you can select the desired locales and have them generated. By installing *localeconf* you can conveniently configure exceptions for each setting. You can for example configure *locales* to use `de_DE@euro` as your system-wide standard, but set `LC_COLLATE` to *C* to prevent side-effects like a changed order in the `sort` program.

25. The Euro

To get Euro support you need to install some packages:

- *euro-support*

- *euro-support-console*
- *fonty*

- *euro-support-x*
- *xfonts-base-transcoded*
- *xfonts-100dpi-transcoded*
- *xfonts-75dpi-transcoded*

You need to select a matching font for the console. You can do that by using fonty. In the configuration dialog (which you can later rerun by executing `dpkg-reconfigure fonty`) you select *ISO15*, next restart *console-tools*.

In X everything should be configured correctly, but perhaps you need to select fonts with the Euro symbol in your applications. The Bitstream Vera fonts fall into this category and also look quite nice.

26. Driver modules

Driver modules that are supposed to be loaded on every system boot can be added to */etc/modules*. However, if you use kernel 2.6 and the hotplug agent, modules for most of your hardware should be loaded automatically. The *psmouse* module which you need for mice with an PS/2 connector is an exception. You should add it to */etc/modules* because otherwise applications like X won't be able to find your mouse.

27. Options for drivers

With the introduction of kernel 2.6, the format for driver options changed. They used to be stored in */etc/modutils*, and the `update-modules` program generated the file */etc/modules.conf* from it. This still works for kernel 2.4, but for kernel 2.6 you need to make your changes directly in */etc/modprobe.d*. The file */etc/modprobe.conf* is not necessary and can even cause problems, because when it exists the contents of */etc/modprobe.conf* will be ignored. You can learn more about the new format, options and commands that are run when modules are loaded by reading the *modprobe.conf* man page.

28. Bash completion

For some time Bash has been supporting programmable completion. Instead of only completing file and directory names using the tabulator key, completion will also work for options and parameters of certain programs. For example you can autocomplete package names for `apt-get` or host names for `ssh` (if these are listed in *~/.ssh/known_hosts*). Debian Sarge already includes bash completion, but you need to activate it. To do that open your *~/.bashrc* and remove the comment characters from these lines:

```
#if [ -f /etc/bash_completion ]; then
#  . /etc/bash_completion
#fi
```

To have these functions available in login shells as well, open your *~/.bash_profile* and remove the comment characters in front of these lines:

```
#if [ -f ~/.bashrc ]; then
#    source ~/.bashrc
#fi
```

The settings will become active the next time you log in.

29. Compiling drivers

In order to compile drivers that are not part of the Debian kernel, you don't necessarily need to install the complete kernel sources. Usually it is sufficient to install the headers:

```
apt-get install kernel-headers-$(uname -r)
```

should install the headers package matching your current kernel. Apart from that you should also install *kernel-package* and *build-essential*. A complete description would be too long, but there is an explanation available in the *newbiedoc* package. You can also use the *module-assistant* package which helps you to install all dependencies necessary for compiling driver modules.

30. Orphaned packages

Debian includes programs that can search for packages which no other package does depend on. *deborphan* is one of them, it will search the *libs* and *oldlibs* sections by default. It can however also search the complete package list. *debfoster* includes more functions, it can remember packages that are not needey anymore according to the package management, but that you want to keey anyway. *aptitude* can remember which packages were installed automatically due to dependencies, and remove them as well.

31. Java

Sadly Sun does not offer .deb packages of its JRE and JSDK. But the program *java-package* can create debs from the bin files (not the RPM versions). When the deb is installed, symbolic links to the most important executables, man pages and the Java browser plugin included will be created. *java-package* is included in Sarge.

ATTENTION: Instead of building the package on your own you can also add the following line to your */etc/apt/sources.list*:

```
deb http://www.tux.org/pub/java/debian/ sarge non-free
```

These packages are also available for unstable and contain the Blackdown Java runtime environment.

32. Grub and the framebuffer

Kernel 2.4 and 2.6 allow you to use text consoles at high resolutions. There are several framebuffer drivers for different graphic cards, and also the VESA framebuffer driver (vesafb), which should work will all modern cards. To use it you pass a parameter to the kernel that sets the desired resolution and color depth. It you use Grub, add the *vga* option to the *kernel* line in */boot/grub/menu.lst*:

```
title Debian GNU/Linux, kernel 2.6.9-custom
root (hd0,5)
kernel /vmlinuz-2.6.9-custom root=/dev/hda7 ro quiet vga=0x317
savedefault
boot
```

The setting `vga=0x317` will configure your console to use a resolution of 1024x768 and 16 bits color depth. You can find more information on available modes in the Framebuffer HOWTO which is included in the *doc-linux-text* and *doc-linux-html* packages.

ATTENTION: If your kernel entries were created automatically, all options that you added manually will be overwritten when you run the *update-grub* program. There is a way to have your settings added to automatically created entries by changing the `kopt` line in your */boot/grub/menu.lst*:

```
# kopt=root=/dev/hda7 ro
```
is changed to
```
# kopt=root=/dev/hda7 ro quiet 0x317
```

After saving the file, run *update-grub* to apply your changes.

33. Multimedia keyboards

Many keyboards, for desktop PCs as well as for laptops, have attitional keys, for example to control the sound volume or to start certain programs like web browsers. Debian includes several programs to configure these additional keys. I use *hotkeys*. It is quite small, includes standard configuration files for common keyboard models like Logitech's itouch series, allows you to connect the keys to any commands you like and offers an onscreen display. All you need to do is to start the program after you logged into X, like this:

```
hotkeys -Z -t itouch
```

How you can automatically start it depends on the window manager/desktop environment you use. If you use KDE it is sufficient to copy an executable script that contains the program call to *~/.kde/Autostart*

The option are explained in the manual. To find out which key produces which keycode you can use the `xev` program. You can find more information on multimedia keyboards on the Homepage of Malte J. Wetzhttp://www.mathematik.uni-marburg.de/~wetzmj/index.php?viewPage=mmkey.html

34. DMA mode for hard disks and CDROMs

If you use recent Debian kernels, the DMA mode should be activated automatically. You can however also activate it - as well as other settings - manually by using `hdparm`. Unlike Woody, hdparm in Sarge includes its own configuration file in which you can configure your settings. The file is calles */etc/hdparm.conf*. Here is an example for my hard disk (hda) and my CD writer (hdc):

```
/dev/hda {
    quiet
    lookahead = on
    mult_sect_io = 16
    io32_support = 3
    dma = on
    interrupt_unmask = on
    keep_settings_over_reset = on
}

/dev/hdc {
    quiet
    io32_support = 3
    dma = on
    interrupt_unmask = on
    keep_settings_over_reset = on
```

```
}
```

ATTENTION: Bevor you change settings using `haparm`, read the manual. Some options, especially `interrupt_unmask`, can cause data loss if your hardware does not support them. The `keep_setting_over_reset` option should _only_ be used if all other settings have proven to work, because the system won't be able to switch back to safe settings if you used this option.

35. Log console

It is possible to display the syslog contents on a virtual console. That way you can always quickly take a look at your log without having to open the log file yourself. There are several ways to configure a log console. You can configure your syslog daemon to directly display messages on a virtual console, or run a pager like `less`. The latter has the advantages of allowing you to scroll and search the log directly. Debian includes the *console-log* package which will automativally configure two log consoles, with the exim log in console 8 and the syslog on console 9. You can change these settings in the configuration file */etc/console-log.conf*.

36. Sound with ALSA

Debian includes kernel 2.6, which unlike kernel 2.4 does not only include the old OSS sound drivers, but also ALSA. To activate sound you need to take some steps. First, install the following packages:

- *alsa-base*
- *alsa-oss*
- *alsa-utils*

On most systems the hotplug service should load the necessary drivers automativally. If it doesn't, you can run the `alsaconf` program which will look for sound cards and add the proper modules to */etc/modprobe.d/sound*. After that you need to add your user account to the *audio* group to be allowed to access the sound devices:

```
adduser andreas audio
```

Next you can use `alsamixer` or some other mixer software to configure the sound volume. That should be all. However there are some common problems that I will adress here:

I. Modues are not being loaded, or settings from /etc/modprobe.d are not applied

The `alsaconf` program looks for sound cards and creates matching entries in */etc/modprobe.d/sound*. With these entries, the modules can be automatically loaded when the sound card is accessed the first time after booting, even without hotplug or discover1. However, sometimes `alsaconf` creates an empty */etc/modprobe.conf*. If this file exists, all information from */etc/modprobe.d* will be ignored. You can safely remove */etc/modprobe.conf*, all entries will be read directly from */etc/modprobe.d*.

II. ALSA does not work because hotplug loads OSS first, then ALSA

Until some time ago, hotplug loaded the OSS drivers first, then ALSA. Because of that ALSA could not access the sound card because OSS was blocking it. Recent versions of the *alsa-base* package (1.0.4-2 or newer) solve the problem by telling hotplug not to load OSS at all.

III. ALSA does not work because discover1 loads the OSS drivers before hotplug can load ALSA

The Debian Sarge base system includes *discover1*, a system for hardware autodetection. In automatically load the OSS drivers. This is good for users of kernel 2.4 without ALSA, but for users of kernel 2.6 it prevents sound from working. The problem is solved in *alsa-base* 1.0.6a-4 or newer. It tells *discover1* not to load the OSS drivers. This will however only work if *discover1* 1.7.2 or newer is installed.

IV. After logging into KDE, the volume settings are wrong

After booting, the sound card is muted. The ALSA init script restores the volume stored when the computer was shut down it it was configured that way (`dpkg-reconfigure alsa-base`). After configuring the sound card, you can change the volume using `alsamixer` and then run `/etc/init.d/alsa stop` to save the settings immediately. KDE also restores the volume when you login, but it will restore the volume stored in the KDE settings. You should configure the volume in KDE using `alsamixer` or `kmix` and then save the settings in KDE or configure KDE not to change the volume settings automatically anymore. You can find both settings in the KDE control center under Sound & Multimedia => Mixer.

V. Sound is played on the wrong device, or not at all

If you have several sound devices (several sound cards, but also one sound card and one TV card), it can happen that the wrong device is used as the default output device. If the TV card is selected as the default device, this usually means that no output is possible at all. The command `cat /proc/asound/cards` lists for which cards ALSA drivers are loaded:

```
andreas@sirius:~$ cat /proc/asound/cards
0 [Live ]: EMU10K1 - Sound Blaster Live!
Sound Blaster Live! (rev.8) at 0xe400, irq 18
1 [Bt878 ]: Bt87x - Brooktree Bt878
Brooktree Bt878 at 0xdddff000, irq 19
```

There are several ways to change the default device system-wide:

The sequence in which the drivers are loaded is changed

If there are no other settings, ALSA will select the first device as default for which a driver is loaded. By adding the module for the desired default device to the top of */etc/modules* you can make sure that this device is selected as default.

The default device is configured in the ALSA configuration file

You can create a system-wide ALSA configuration file `/etc/asound.conf` and configure the default devices there:

```
pcm.!default {
    type hw
    card 1
}

ctl.!default {
```

```
    type hw
    card 1
}
```

You can find more information on `asound.conf` in the Documentation of the ALSA project (http://www.alsa-project.org/alsa-doc/doc-php/asoundrc.php ?module=Generic) .

The index of the sound devices is configured using driver options

You can tell all ALSA drivers which index the device should have. The device with index 0 will be the default device. If you use kernel 2.6 you can make these changes in `/etc/modprobe.d/sound`, if you use kernel 2.4 you can make them in `/etc/modutils/sound`. If you use kernel 2.4 you also need to run `update-modules`. Here is an example:

```
options snd-emu10k1 index=0
options snd-bt87x index=1
```

37. Nvidia driver

Sarge includes the closed-source graphic card driver from Nvidia. It is necessary for hardware 3D acceleration. Sadly this is not possible using the open-source `nv` driver that comes with XFree86. To install the driver you need to follow these steps:

1. Add non-free to your `/etc/apt/sources.list`
   Because the Nvidia driver is not free software, it cannot be distributed in the Debian main archive. It is distributed in an archive for non-free software. To access it you need to change your package lists. Here is an example:

   ```
   deb ftp://ftp.de.debian.org/debian sarge main
   ```

   For all listed Debian servers (including security.debian.org) you need to change `main` to `main contrib non-free`

2. Update package lists
   After changing `/etc/apt/sources.list` you need to run `apt-get update` to download the new package lists. After that you will be able to install the necessary packages.

3. Installing packages needed to compile the nvidia driver
   There aren't prebuild nvidia module packages available for all Debian kernels. You can however easily build your own package and install it. For this you need to install *module-assistant*, *build-essential* and *nvidia-kernel-source*:

   ```
   apt-get install module-assistant build-essential nvidia-kernel-source
   ```

4. Run module-assistant
   Now *module-assistant* can prepare your system and compile and install the driver:

   ```
   module-assistant update
   module-assistant prepare
   module-assistant auto-install nvidia-kernel-source
   ```

5. Install nvidia-glx
   Additionally you need to *nvidia-glx* package that includes the Nvidia GLX

libraries:

```
apt-get install nvidia-glx
```

6. Reconfigure XFree
   At last you need to reconfigure XFree to use the nvidia driver instead of the nv driver (see Tip 14). When asked for the driver for your card, select `nvidia` instead of `nv`, and also deactivate the `dri` and `glcore` modules in the module configuration. The `glx` module needs to be activated. After restarting XFree it should be using the nvidia driver. You can check 3D acceleration by running programs like *tuxracer* or *glxgears*.

ATTENTION: After updating the *nvidia-kernel-source* package or changing to a new kernel version, you need to recompile the nvidia kernel driver (see 4).

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