# Debian für Ein- und Umsteiger
## Debian GNU/Linux Tipps und Tricks

Andreas B. Mundt

andi@debian.org

Tübix 2016

11. Juni 2016

# Outline

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# The Debian Project

*Wikipedia[1]:*

*". . . a non-commercial distribution and one of the earliest, . . .*
*. . . maintained by a volunteer developer community . . .*
*. . . with a strong commitment to free software principles*
*   and democratic project management."*

- founded 1993 by Ian A. Murdock
- Debian Developers ($\sim$ 1000 DDs)
- Debian Maintainers ($\sim$ 250 DMs)
- and many more contributors

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[1] https://en.wikipedia.org/wiki/Linux_distribution#Popular_distributions

# The Debian Project

A Brief History of Debian Appendix A - The Debian Manifesto (1994)[2]:

- ... developed openly in the spirit of Linux and GNU

- ... a non-commercial distribution that will be able to effectively compete in the commercial market



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[2] https://www.debian.org/doc/manuals/project-history/ap-manifesto.html
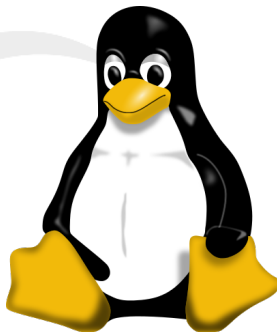
# Foundational Documents

- "Social Contract" with the Free Software Community

- Debian Free Software Guidelines (DFSG)

- Debian Constitution

# "Social Contract" with the Free Software Community[3]

1. Debian will remain 100% free
2. We will give back to the free software community
3. We will not hide problems
4. Our priorities are **our users and free software**
5. Works that do not meet our free software standards

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[3]https://www.debian.org/social_contract

# Debian Free Software Guidelines (DFSG)

1. Free Redistribution
2. Source Code
3. Derived Works
4. Integrity of The Author's Source Code
5. No Discrimination Against Persons or Groups
6. No Discrimination Against Fields of Endeavor
7. Distribution of License
8. License Must Not Be Specific to Debian
9. License Must Not Contaminate Other Software
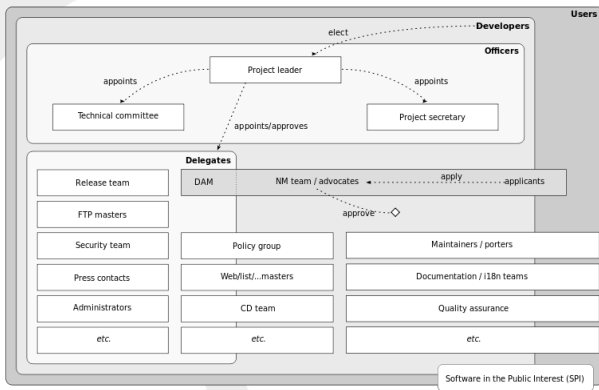10. Example Licenses

$\Rightarrow$ FSF four freedoms': run, study, redistribute and improve

# Debian Constitution[5]

"organisational structure for formal decision-making"

- Developers
- Project Leader
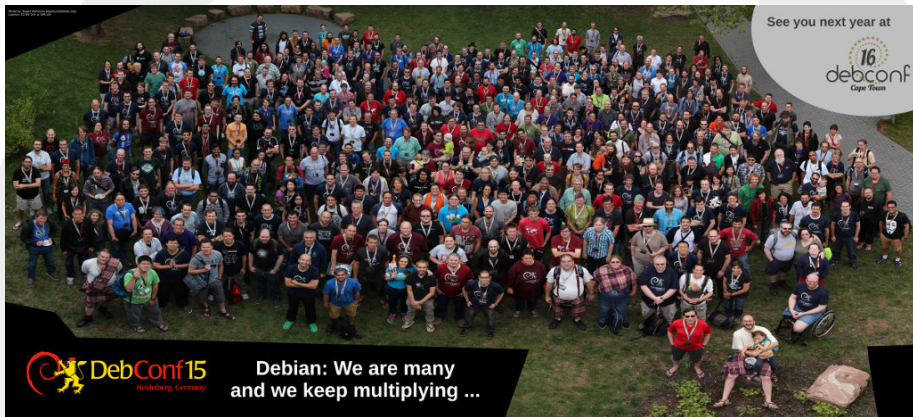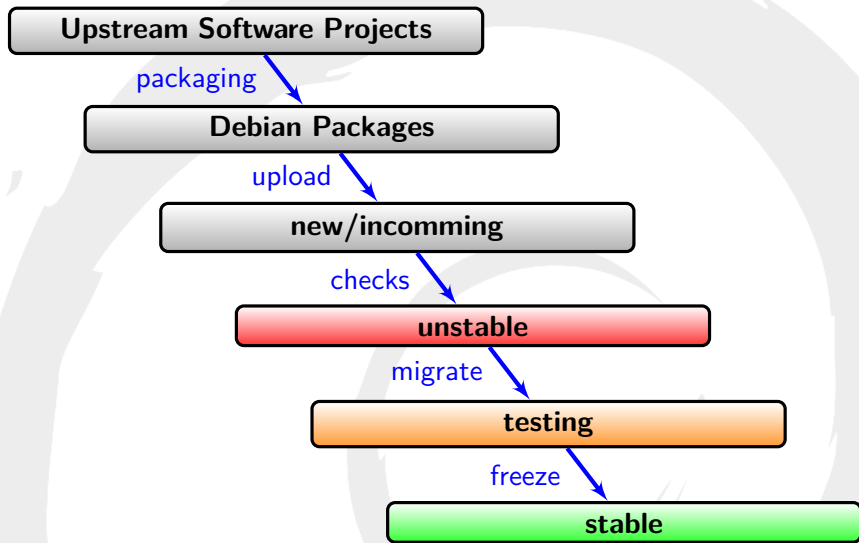- Technical Committee
- Delegates
- Project Secretary



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4 https://en.wikipedia.org/wiki/File:Debian-organigram.svg
5 https://www.debian.org/devel/constitution

# Unser Projekt!

# Debian Development and Release Process



**Upstream Software Projects**

*packaging*

**Debian Packages**

*upload*

**new/incomming**

*checks*

**unstable**

*migrate*

**testing**

*freeze*

**stable**

# Debian Releases[6] . . .

- **stable release**
  - released $\sim$ every 2 years
  - currently: **Debian 8 "jessie"** (released April 2015)
  - only security updates and bugfixes

- **testing distribution**
  - currently: **Debian 9 "stretch"** (full freeze February 2017)
  - steady flow of updates and new packages from unstable
  - "rolling release"

- **unstable distribution**
  - codename always **"sid"**
  - unstable with regard to dependencies
  - steady flow of updates and new packages


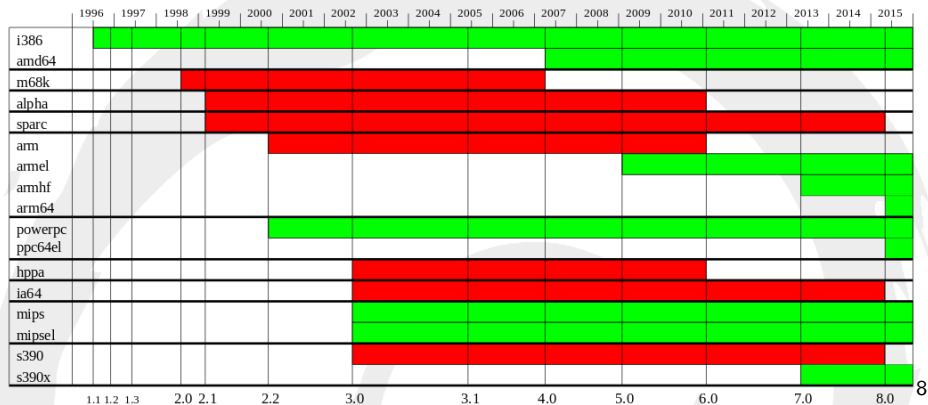
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- **Debian Long Term Support (LTS)**
  - ▶ Extends the lifetime of all Debian stable releases to $\geq 5$ years
  - ▶ Debian LTS team takes over security maintenance
  - ▶ Debian 7 "Wheezy" from April 2016 until May 2018
  - ▶ Debian 8 "Jessie" from May 2018 until Spring 2020
  - ▶ Done by volunteers and companies interested



[7] https://wiki.debian.org/LTS                    Logo: vauss@free.fr, CC-BY-SA: https://wiki.debian.org/vauss

# Architectures and Release Cycle



$+$ inofficial ports as part of *Unstable*

# Outline

# Installation Media

- **stable:**
  - https://www.debian.org/releases/jessie/debian-installer/
  - http://get.debian.org/debian-cd/

- **testing** daily/weekly images:
  - https://www.debian.org/devel/debian-installer/
  - http://get.debian.org/cdimage/

- **Images with non-free firmware:**
  - http://get.debian.org/cdimage/unofficial/non-free/
    cd-including-firmware/

. . . or just click the download link on https://www.debian.org:

$\rightarrow$ multi-arch netinstall image: debian-8.5.0-amd64-i386-netinst.iso

# Download and Verify the Image

**Download image and checksum file:**

```
$ wget http://cdimage.debian.org/debian-cd/8.5.0/multi-arch/iso-cd/
                                    debian-8.5.0-amd64-i386-netinst.iso
$ wget http://cdimage.debian.org/debian-cd/8.5.0/multi-arch/iso-cd/MD5SUMS
```

**Calculate the checksum:**

```
$ md5sum  debian-8.5.0-amd64-i386-netinst.iso
6753c353cef5f5336079d94562ad15c3 debian-8.5.0-amd64-i386-netinst.iso
```

**Compare with the checksum in the corresponding file:**

```
$ cat MD5SUM
6753c353cef5f5336079d94562ad15c3 debian-8.5.0-amd64-i386-netinst.iso
```

# Experts: Verify the Authenticity of the Downloads

For serious business:

- Verify the signature of the checksum files[9]:

```
Download detached signature(s) (sha1sum, sha256sum, sha512sum):
$ wget http://cdimage.debian.org/debian-cd/8.5.0/multi-arch/iso-cd/MD5SUMS.sign
```

- Check it:

```
gpgv --keyring debian-role-keys.gpg MD5SUMS.sign MD5SUMS

gpgv --keyring /usr/share/keyrings/debian-role-keys.gpg  MD5SUMS.sign MD5SUMS
gpgv: Signature made Sun 05 Jun 2016 06:59:57 PM EEST
gpgv:                 using RSA key DA87E80D6294BE9B
gpgv: Good signature from "Debian CD signing key <debian-cd@lists.debian.org>"
```

```
gpgv --keyring debian-role-keys.gpg SHA512SUMS.sign SHA512SUMS

gpgv --keyring /usr/share/keyrings/debian-role-keys.gpg  SHA512SUMS.sign  SHA512SUMS
gpgv: Signature made Sun 05 Jun 2016 06:59:56 PM EEST
gpgv:                 using RSA key DA87E80D6294BE9B
gpgv: Good signature from "Debian CD signing key <debian-cd@lists.debian.org>"
```

[9]https://www.debian.org/CD/verify.en.html

# Create CD/DVD or a Bootable USB Stick

All Debian images are hybrid-images:

- Burn the downloaded CD/DVD image on a CD/DVD.

- Or create a:

Bootable USB stick with CD or DVD image[10]:

```
# cp debian-8.5.0-amd64-i386-netinst.iso  /dev/sdX
# sync
```

- Replace /dev/sdX by your device (consult dmesg).

- Make sure the device is not mounted.

- Use umount /dev/sdX in case it is.

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[10]https://www.debian.org/releases/stable/amd64/ch04s03.html.en
Note: All data will be destroyed on the stick.

# Booting the Installer

- Enable booting from CD/DVD or USB stick in the BIOS/UEFI
  - Press `F2` or `F11` or `Entf` or `Esc` or ...
  - UEFI: Disable Secure Boot
  - Sometimes a boot menu is available: `F12`
  - Consult the WWW or the documentation of your machine

- Disable "Fast Startup" aka "Fast Boot":
  - "Systemsteuerung"-"Energieoptionen"-"Netzschalterverhalten ändern"-"Einige Einstellungen sind nicht verfügbar": → uncheck "Schnellstart aktivieren"
  - "System Settings"-"power options"-"Choose what the power button does" → uncheck "Turn on fast startup"

- Shut down all other operating systems properly (no hybernation/sleep state)

- In general: Avoid booting any other operating systems accidentally. It might start installing updates on shutdown ... ;-)

# Choose Architecture (BIOS, multi-arch installer)
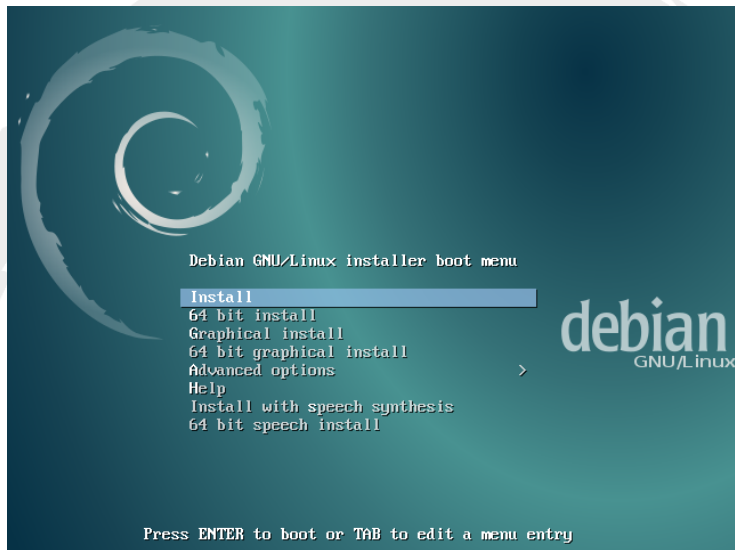
# Choose Architecture (UEFI, multi-arch installer)

# Dual Boot Partitioning

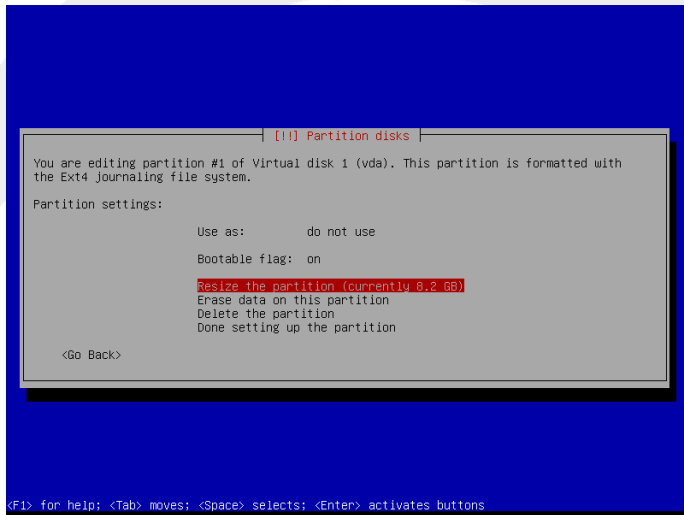The critical part of the installation. Choose **"Manual"**:
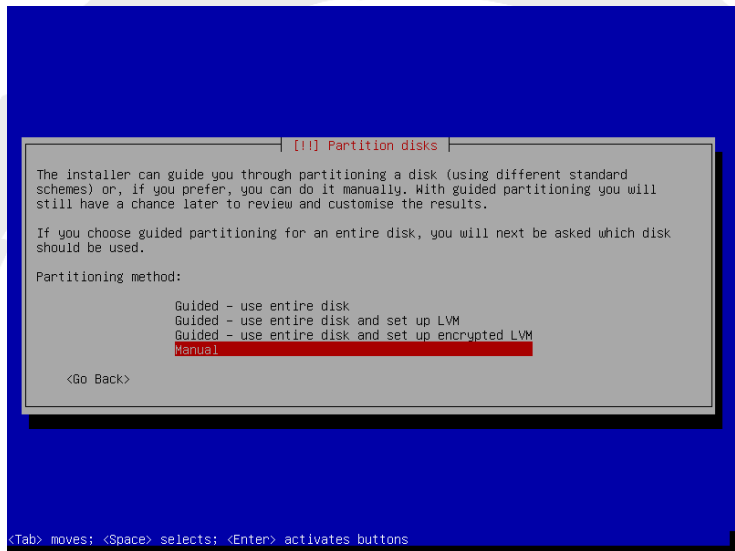
# Dual Boot Partitioning

Pick the partition to shrink (usually the "C:" in windows):
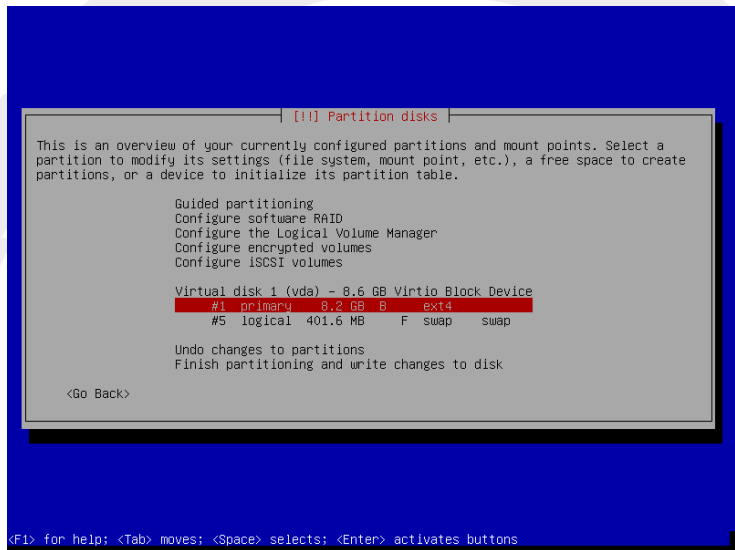
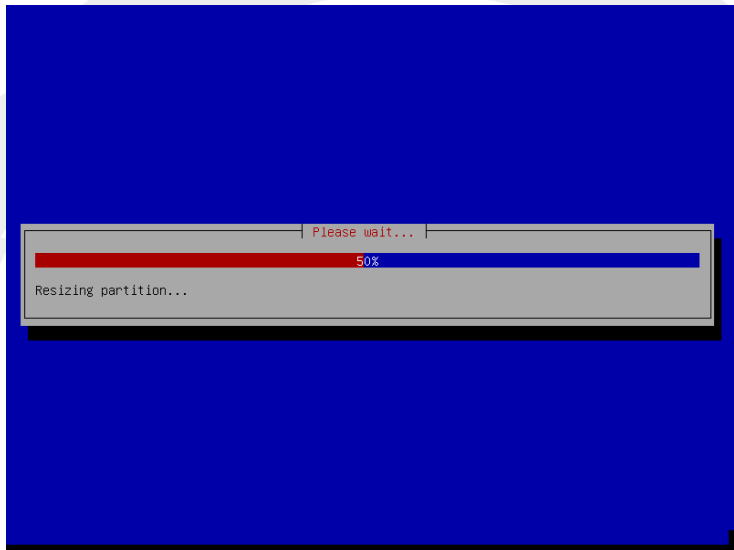# Dual Boot Partitioning

Choose **"Resize the partition (...)"**:
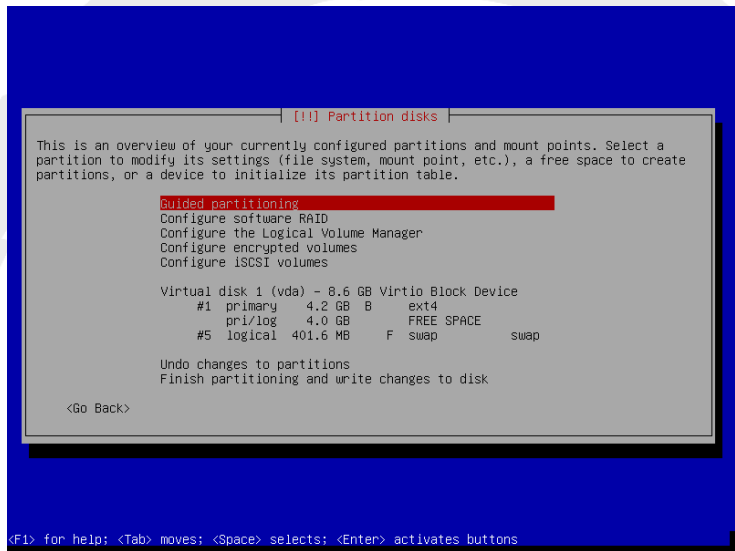


... and enter the new size.

# Dual Boot Partitioning
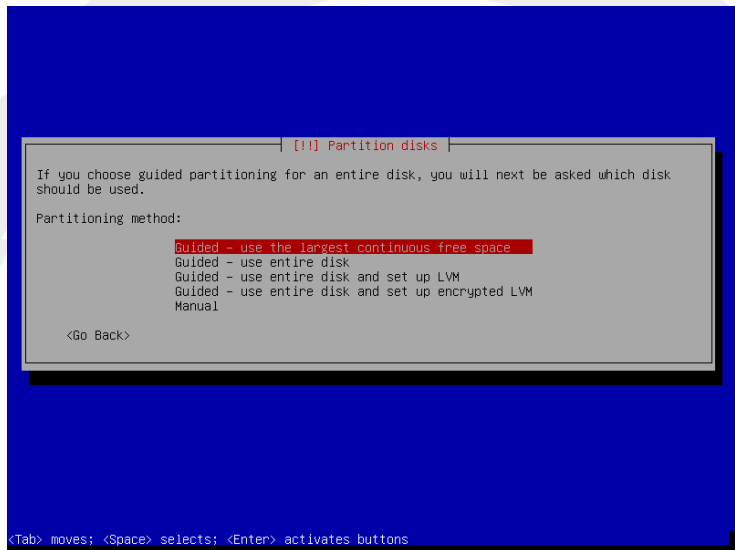
Resizing can take a **very long** time – do not panic!

# Dual Boot Partitioning

Free space is available now. Choose **"Guided partitioning"**:

# Dual Boot Partitioning

Choose **"Guided – use the largest continuous free space"**:

# Dual Boot Partitioning

Final check. A root ("/") and a swap ("swap") partition are available:

# Dual Boot Partitioning (Graphical Installer)

# Dual Boot Partitioning (Graphical Installer)
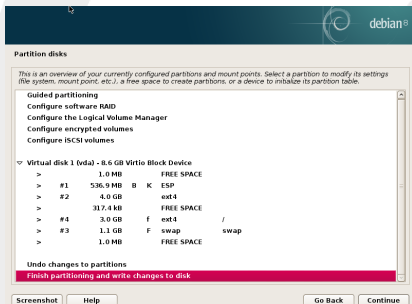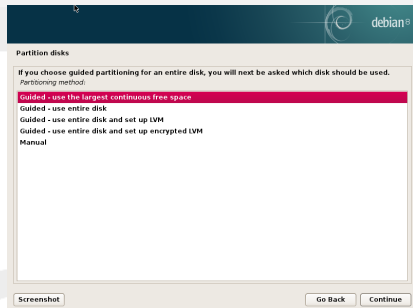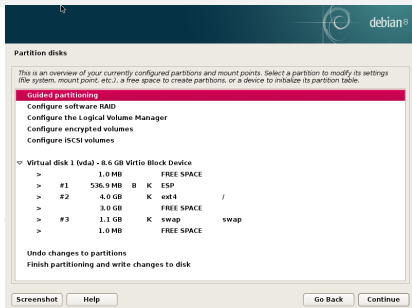


Optional:

1. Shrink the partition from within windows.

2. Then choose **"Guided – use the largest continuous free space"**.

# Tasksel: Choose your Desktop Environment(s)



- Debian supports several desktop environments, default is GNOME.
- Support depends on the maintainers of the corresponding packages.
- After installation, other desktops can be added with `tasksel` too.

# UEFI Quirks

There are broken UEFI implementations[11] around, and after installation only windows is available:

- Try if the boot menu (F12) lists Debian.
- Try to boot Debian or a rescue system and use `efibootmgr` to change the boot order.
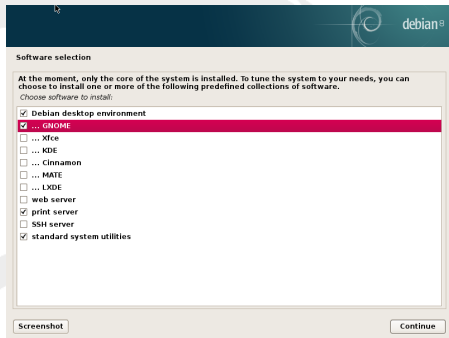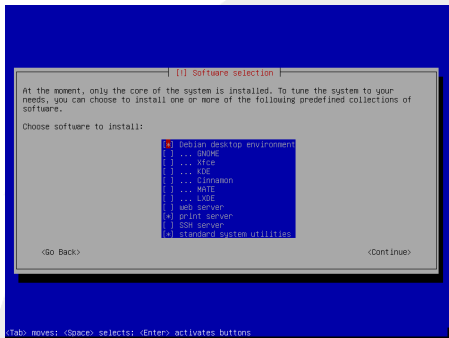- If the modified settings are ignored and still windows is booted directly, find the relevant bootloader (`bootmgfw.efi`, `bootx64.efi` ?), do a backup, and overwrite it with `grubx64.efi`:

```
From within the system:
# cd /boot/efi/EFI/
try:
# cp Debian/Boot/grubx64.efi Boot/bootx64.efi
and/or:
# cp -r Microsoft/ MicrosoftOrig
# cp Debian/Boot/grubx64.efi Microsoft/Boot/bootmgfw.efi
```

[11] http://wiki.osdev.org/Broken_UEFI_implementations
https://en.wikipedia.org/wiki/Unified_Extensible_Firmware_Interface#Firmware_issues

# Outline

# Non-Free Firmware is a Problem

- Buggy and we can't fix it.
- More and more powerful.
- We are fooled, not only by carmakers.
- We can't control it, perhaps agencies do.
- We are dependent on the ones that have control.



Debian Social Contract:

"Our priorities are **our users and free software**"

# Firmware Package Repositories

- Non-free firmware is not part of Debian[13].
- As a service, Debian provides the sections:
  - ► `contrib`   free software, but depends on non-free software
  - ► `non-free`   software not compliant to the DFSG

To enable[14]:

```
$ sudo apt edit-sources
deb http://httpredir.debian.org/debian/ jessie    main contrib non-free
...
deb http://security.debian.org/ jessie/updates    main contrib non-free
...
# jessie-updates, previously known as 'volatile'
deb http://httpredir.debian.org/debian/jessie-updates    main contrib non-free
```

main    ⟶    main   contrib   non-free

---

[13]https://www.debian.org/distrib/packages
[14]sed -i.orig "s/ main/ main contrib non-free/" /etc/apt/sources.list

# Recommended Firmware

CPU microcode:

```
$ sudo apt update
[...]
$ sudo apt install firmware-linux
[...]
The following NEW packages will be installed:
     amd64-microcode firmware-linux firmware-linux-free
     firmware-linux-nonfree intel-microcode iucode-tool
```

# Missing Firmware Example 1

**Fetch information about missing firmware:**

```
$ dmesg | grep firmware
 usb 1-12: firmware: failed to load zd1211/zd1211_ub (-2)
 usb 1-12: Direct firmware load for zd1211/zd1211_ub
                                  failed with error -2
 zd1211rw 1-12:1.0: couldn't load firmware. Error number -2
```

**Find missing firmware package:**

```
$ apt search zd1211rw
Sorting... Done
Full Text Search... Done
firmware-zd1211/stable 3.0.0.56-3 all
  binary firmware for the zd1211rw wireless driver
```

# Missing Firmware Example 2

### Fetch information about missing firmware:

```
$ dmesg | grep firmware
 ieee80211 phy1: rt2x00lib_request_firmware: Info -
                        Loading firmware file 'rt73.bin'
 rt73usb 1-3:1.0: firmware: failed to load rt73.bin (-2)
```

### Find missing firmware package:

```
$ apt search rt73usb
[...]
firmware-ralink/stable 0.43 all
  Binary firmware for Ralink wireless cards

$ apt search rt73.bin
[...]
firmware-ralink/stable 0.43 all
  Binary firmware for Ralink wireless cards
```

# Missing Firmware Example 3

Only the missing file is known, apt search finds no package.

### Install apt-file:

```
$ sudo apt install apt-file
[...]
$ sudo apt-file update
[...]
```

### Search for the package containing the file:

```
$ apt-file search rt73.bin
firmware-misc-nonfree: /lib/firmware/rt73.bin
```

$\implies$ Install the missing package!

# Outline

# Why Backports?

Problem:

- Brand new hardware is not supported by the Debian-stable kernel.

- A package did not make it into the release. It is not available in *stable* because:
  - ▸ it had (release critical) RC-Bugs,
  - ▸ it did not exist during freeze yet.

- A newer version of a package is needed.

Solution:

$\Rightarrow$ The backports-archive allows to provide newer packages for the stable distribution.

# Enable Backport Repositories

To enable[15]:

```
$ sudo apt edit-sources
deb http://httpredir.debian.org/debian/ jessie  main
deb http://httpredir.debian.org/debian/ jessie-backports  main
...


$ sudo apt update
...
```

---

[15]http://backports.debian.org/Instructions/#index2h2

# Install a Backported Version

By default, a package will be installed from stable. To choose the version from backports[16]:

```
$ sudo apt  -t jessie-backports   install   <PACKAGE>
...
```

Brand new hardware, latest kernel needed:
```
$ sudo apt -t jessie-backports install linux-image-amd64
...

The following NEW packages will be installed:
  irqbalance libnuma1 linux-image-4.3.0-0.bpo.1-amd64
The following packages will be upgraded:
  linux-image-amd64

...
```

---

[16] http://backports.debian.org/Instructions/#index3h2

# Iceweasel and Icedove

Debian-stable and -testing only provide ESR-versions (Extended Support Release) for Iceweasel and Icedove. For other versions try:

`http://mozilla.debian.net`

# Outline

# Getting Help

- Debian Mailing Lists: `https://lists.debian.org/`
  - ▸ `https://lists.debian.org/debian-announce/`
  - ▸ `https://lists.debian.org/debian-backports-announce/`
  - ▸ `https://lists.debian.org/debian-user-german/`
  - ▸ ...
- Debian IRC: `https://wiki.debian.org/IRC`
- Debianforum.de: `https://debianforum.de`
- YOUR RECOMMENDED SOURCE HERE

Other good sites:

- `https://ubuntuusers.de/`
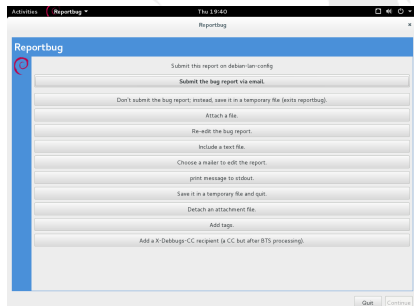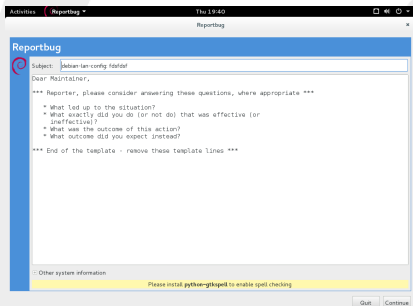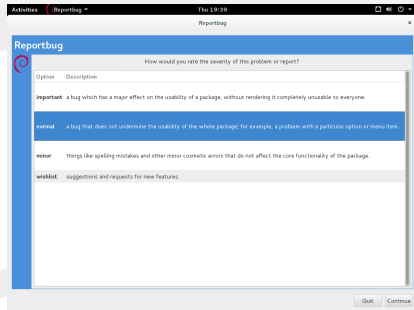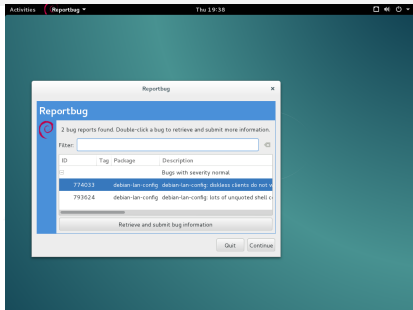- `https://wiki.archlinux.org/`
- ...

# Bug Reporting

## Run `reportbug`:

```
$ reportbug
Welcome to reportbug! Since it looks like this is the first time you have used
reportbug, we are configuring its behavior. These settings will be saved to the file
"/home/andi/.reportbugrc", which you will be free to edit further. Please choose
the default operating mode for reportbug.

1 novice    Offer simple prompts, bypassing technical questions.
2 standard  Offer more extensive prompts, including asking about
            things that a moderately sophisticated user would be
            expected to know about Debian.
3 advanced  Like standard, but assumes you know a bit more about
            Debian, including "incoming".
4 expert    Bypass most handholding measures and preliminary
            triage routines. This mode should not be used by
            people unfamiliar with Debian's policies and
            operating procedures.
Select mode: [novice]
```

# Bug Reporting (GUI)

# Summary

# Enjoy Debian!

## Vielen Dank.
Slides: `http://people.debian.org/~andi/`

## Questions?

Some pictures: `https://openclipart.org/`