

Debian Edu / Skolelinux Bullseye 11 Manual

: 26.02.2024

Contents

1	Manual for Debian Edu 11 Codename Bullseye	1
2	About Debian Edu and Skolelinux	1
2.1	.....	1
3		1
3.1	.....	1
3.1.1	.....	2
3.1.2	Main server	2
3.1.3	,	3
3.1.4	() LTSP	4
3.1.5	.....	4
3.1.6	.....	4
3.1.7	.....	5
3.2	.....	5
3.2.1	.....	5
3.2.2	.....	5
4		5
4.1	Hardware requirements	6
4.2	, ,	6
5		6
5.1	.....	6
5.2	-	7
6		7
6.1	.....	7
6.2	Download the installation media for Debian Edu 11 Codename Bullseye	7
6.2.1	amd64 i386	7
6.2.2	iso- netinst amd64 i386	8
6.2.3	BD iso images for i386 or amd64	8
6.2.4	.....	8
6.2.5	.....	8
6.3	Debian Edu	8
6.3.1	.....	8
6.3.2	.....	9
6.3.3	.....	9

6.3.4		9
6.3.5		13
6.3.6		15
6.3.7	USB- CD / Blu-ray	15
6.3.8	PXE	15
6.3.9	PXE	17
6.3.10		17
6.4		17
7		37
7.1		37
7.1.1	,	38
7.2	GOsa ²	38
7.2.1	GOsa ²	39
7.3	GOsa ²	39
7.3.1		39
7.3.2	,	40
7.3.3		41
7.3.4		42
7.4	GOsa ²	43
7.5	GOsa ²	43
7.5.1		46
7.5.2	/	46
8		47
8.1	, '	47
8.2		47
9		47
10	()	48
11		48
11.1		48
11.1.1		48
11.2		48
11.3		49
11.3.1	Munin	49
11.3.2	Icinga	49
11.3.3	Sitesummary	50
11.4	Debian Edu	50

12		50
12.1		50
12.2	Upgrades from Debian Edu Buster	51
12.2.1		51
12.2.2		53
12.3	Upgrades from older Debian Edu / Skolelinux installations (before Buster)	53
13	HowTo	54
14	HowTo	54
14.1	Configuration history: tracking /etc/ using the git version control system	54
14.1.1		54
14.2		55
14.2.1		55
14.3	ldapvi	55
14.4	(Kerberized) NFS	55
14.4.1		56
14.5	Standardskriver	56
14.6	JXplorer, LDAP	56
14.7	ldap-createuser-krb, a command-line tool	56
14.8	(stable-updates)	56
14.9	(backports)	56
14.10	CD	57
14.11		57
14.12		57
14.13		57
14.13.1	shutdown-at-night ()	58
14.14	Access Debian-Edu servers located behind a firewall	58
14.15	Installing additional service machines for spreading the load from main-server	58
14.16	wiki.debian.org	58
15		59
15.1	GOsa ²	59
15.1.1		59
15.2		60
15.2.1		60
15.3		60
15.4	Restrict ssh login access	61
15.4.1	LTSP	61
15.4.2	LTSP	61
15.4.3		62

16		62
16.1		62
16.2	DVD	62
16.3		62
17		62
17.1		62
17.1.1	LTSP	64
17.1.2	LTSP	64
17.1.3	LTSP chroot 32-	64
17.1.4	LTSP	65
17.1.5	LTSP	65
17.1.6	USB CD-ROM/DVD	65
17.1.7	, LTSP	65
17.2	PXE	65
17.2.1	PXE	65
17.2.2	PXE	65
17.2.3	PXE	66
17.3		66
17.4		66
17.4.1	Xrdp	66
17.4.2	X2Go	67
17.4.3		67
17.5		67
17.6	Windows Debian Edu pGina LDAP	68
17.6.1	pGina Debian Edu	68
17.6.2	pGina fork	68
17.6.3	pGina	68
18 Samba Debian Edu		69
18.1	Samba	69
19		70
19.1		70
19.2		70
19.3		70
20		70
20.1		70
20.2	Java	70
20.3		70
20.4	Thunderbird	70

21		71
21.1	Contribute locally	71
21.2	Contribute globally	71
21.3	. . . . .	71
21.4	. . . . .	71
22		71
22.1	. . . . .	71
22.1.1	. . . . .	71
22.1.2	. . . . .	72
22.1.3	. . . . .	72
22.1.4	. . . . .	72
22.2	. . . . .	72
23	New features in Debian Edu Bullseye	72
23.1	New features for Debian Edu 11 Codename Bullseye	72
23.1.1	. . . . .	72
23.1.2	. . . . .	72
23.1.3	. . . . .	73
23.1.4	. . . . .	73
23.1.5	. . . . .	73
24		73
25		74
25.1	. . . . .	74
25.1.1	PO	74
25.1.2	. . . . .	74
26	A – GNU	74
26.1	Manual for Debian Edu 11 Codename Bullseye	74
26.2	GNU GENERAL PUBLIC LICENSE	74
26.3	TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION	74
27	Appendix B - no Debian Edu Live CD/DVDs for Bullseye yet	77
27.1	Features of the Standalone image	77
27.2	Features of the Workstation image	77
27.3	Activating translations and regional support	77
27.4	Stuff to know	78
27.5	Known issues with the image	78

28 Appendix C - Features in older releases	78
28.1 New features for Debian Edu 10+edu0 Codename Buster released 2019-07-06	78
28.1.1	78
28.1.2	78
28.1.3	79
28.1.4	79
28.2 New features for Debian Edu 9+edu0 Codename Stretch released 2017-06-17	80
28.2.1	80
28.2.2	80
28.2.3	80
28.2.4	81
28.3	81



Skolelinux ()
LTSP () / LTSP, HowTo.
LTSP — LTSP
DHCP, DNS, DNS

Skolelinux.

3.1.1

DHCP 10.0.0.0/8, PXE, memtest

DHCP LTSP (192.168.0.0/24 192.168.1.0/24),

LDAP.

3.1.2 Main server

A Skolelinux network needs one main server (also called "tjener" which is Norwegian and means "server") which per default has the IP address 10.0.2.2 and is installed by selecting the Main Server profile. It's possible (but not required) to also select and install the LTSP Server and Workstation profiles in addition to the Main Server profile.

3.1.3

LTSP
Master Server, (LTSP Server).
DNS IPv4. DNS
(, ,).
Skolelinux DNS
(DNS), IP- .

DNS		
	rsyslog	syslog
	DNS (BIND)	
	DHCP	bootps
	NTP	ntp
Home Directories via Network File System	SMB / NFS	
	IMAP (Dovecot)	postoffice ()
	OpenLDAP	ldap
	GOsa ²	---
	Apache/PHP	www
	sl-backup, slbackup-php	backup (.)
	Proxy (Squid)	webcache
	CUPS	ipp
Secure Remote Login	OpenSSH	ssh
	CFEngine	cfengine
() LTSP	LTSP	ltsp
	Munin, Icinga Sitesummary	sitesummary

NFS
Unix SMB2/SMB3
(, ,
("smarthost"), IMAP.

(Squid).

DHCP. 10.0.0.0/8

IP- LTSP 192.168.0.0/24 (,

LTSP).

syslog- syslog ,

DNS DNS (*.intern), (" ") DNS.

DNS DNS , DNS.

—

Skolelinux.

NFS , Skolelinux

(NTP) NTP

LTSP.

3.1.4 () LTSP

Skolelinux LTSP, LTSP.

LTSP syslog

, :

- LTSP ,
 - NFS. LTSP ;
- LTSP `debian-edu-ltsp-install --diskless_workstation yes`.

3.1.5

(X-) , PXE,

X2Go, LTSP

— (32-) , LTSP NFS LTSP. :

DHCP TFTP ,

X2Go.

3.1.6

PXE ,

3.1.7

" " , , ' macOS
Windows.

3.2

Linux, Skolelinux, , ,
SSH . Kerberos TGT, kinit root.
LDAP.

3.2.1

: netinst BD. USB-
 , - ,
netinstall .

The installation should not ask any questions, with the exception of desired language, location, keyboard and machine profile (Main Server, Workstation, LTSP Server, ...). All other configuration will be set up automatically with reasonable values, to be changed from a central location by the system administrator subsequent to the installation.

3.2.2

Skolelinux ()
 , ,
 ,
 /skole/host/directory/. , /skole/tjener/home0/
 ,
 UNIX, (, " "),
 , umask , (002 007),
 , setgid (/),
 , umask Debian 022 (
), Debian Edu 002, ,
 (/etc/pam.d/common-session) umask 007,
 ,
 , , ,
 (,
).

4

Skolelinux. , .

4.1 Hardware requirements



LTSP, - LTSP.

- , Debian Edu / Skolelinux, 32- (Debian "i386", —
686) 64- (Debian "amd64") x86.
- 256 , 400 , .
- 1500 1024 ,
LibreOffice 2048 .
- :
 - combined main server + LTSP server: 60 GiB (plus additional space for user accounts).
 - LTSP: 40 .
 - : 30 .
- LTSP :
 - eth0 , (10.0.0.0/8),
 - eth1 LTSP.
- , , .

4.2 , ,

A list of tested hardware is provided at <https://wiki.debian.org/DebianEdu/Hardware/> . This list is not nearly complete 😊

<https://wiki.debian.org/InstallingDebianOn> — , Debian

5

5.1

- :
- You need exactly one main server, the tjener.
- .
- LTSP ; LDAP (DNS, DHCP), .
- LTSP / .
- , IP- .
- ()/ (.).

5.2

IP- 10.0.0.1 255.0.0.0

DHCP, DNS,

In case you already have a router but are unable to configure it as needed (eg because you are not allowed to do so, or for technical reasons), an older computer with two network interfaces can be turned into a gateway between the existing network and the Debian Edu one.

A simple way is to install Debian Edu on this computer; select 'Minimal' as profile during installation.

After installation, run `/usr/share/debian-edu-config/tools/configure-edu-gateway --firewall <yes|no>` which will make the following changes:

- Adjust the `/etc/network/interfaces` file.
- Change the hostname permanently to 'gateway'.
- Remove superfluous scripts.
- Enable IP forwarding and NAT for the 10.0.0.0/8 network.
- Install a firewall (optional).



6

6.1

We recommend that you read or at least take a look at the [release notes for Debian Bullseye](#) before you start installing a system for production use. There is more information about the Debian Bullseye release available in its [installation manual](#).



6.2 Download the installation media for Debian Edu 11 Codename Bullseye

6.2.1 amd64 i386

amd64 and i386 are the names of two Debian architectures for x86 CPUs, both are or have been build by AMD, Intel and other manufacturers. amd64 is a 64-bit architecture and i386 is a 32-bit architecture. New installations today should be done using amd64. i386 should only be used for old hardware.

6.2.2 iso- netinst amd64 i386

The netinst iso image can be used for installation from CD/DVD and USB flash drives and is available for two Debian architectures: amd64 or i386. As the name implies, internet access is required for the installation.

Once Bullseye has been released these images will be available for download from:

- <https://get.debian.org/cdimage/release/current/amd64/iso-cd/>
- <https://get.debian.org/cdimage/release/current/i386/iso-cd/>

6.2.3 BD iso images for i386 or amd64

This ISO image is approximately 5 GB large and can be used for installation of amd64 or i386 machines, also without access to the Internet. Like the netinst image it can be installed on USB flash drives or disk media of sufficient size.

Once Bullseye has been released these images will be available for download from:

- <https://get.debian.org/cdimage/release/current/amd64/iso-bd/>
- <https://get.debian.org/cdimage/release/current/i386/iso-bd/>

6.2.4

Detailed instructions for verifying these images are part of the [Debian-CD FAQ](#).

6.2.5

Debian <https://get.debian.org/cdimage/release/current/source/>

6.3 Debian Edu

When you do a Debian Edu installation, you have a few options to choose from. Don't be afraid; there aren't many. We have done a good job of hiding the complexity of Debian during the installation and beyond. However, Debian Edu is Debian, and if you want there are more than 57,000 packages to choose from and a billion configuration options. For the majority of our users, our defaults should be fine. Please note: if LTSP is intended to be used, choose a lightweight desktop environment.

6.3.1

- A. DHCP:
- , (IP 10.0.2.2/8).
 - , (), . - .
 - , .
 - .
- B. , - .
- "debian-edu-expert" ; , .
 - , - .
- C. / IP 10.0.0.1/8 (DHCP) :

- (DHCP),
 - 10.0.2.2/8 IP
 - 10.0.0.1 IP
 - 8.8.8.8 IP- DNS,
 - .
- D. ('):
- ISO- BD.
 - , (/) , .
 - " " (, DHCP " ").
 - .

6.3.2

- :
- Xfce ' LXDE, (106).
 - KDE GNOME , , LTSP.
 - Cinnamon GNOME.
 - MATE , .
 - LXDE 35 .
 - LXQt — (LXDE) (Qt, KDE).
- Debian Edu Xfce. , .

6.3.3

- `desktop=xxxx` (, , .). , , .
- Please note: If you want to install a desktop environment afterwards, don't use the Debian Edu meta-packages like e.g. [education-desktop-mate](#) because these would pull in all education related programs; rather install e.g. [task-mate-desktop](#) instead. One or more of the new school level related meta-packages *education-preschool*, *education-primaryschool*, *education-secondaryschool*, *education-highschool* could be installed to match the use case.
- - Debian Edu . [Debian Edu](#).

6.3.4

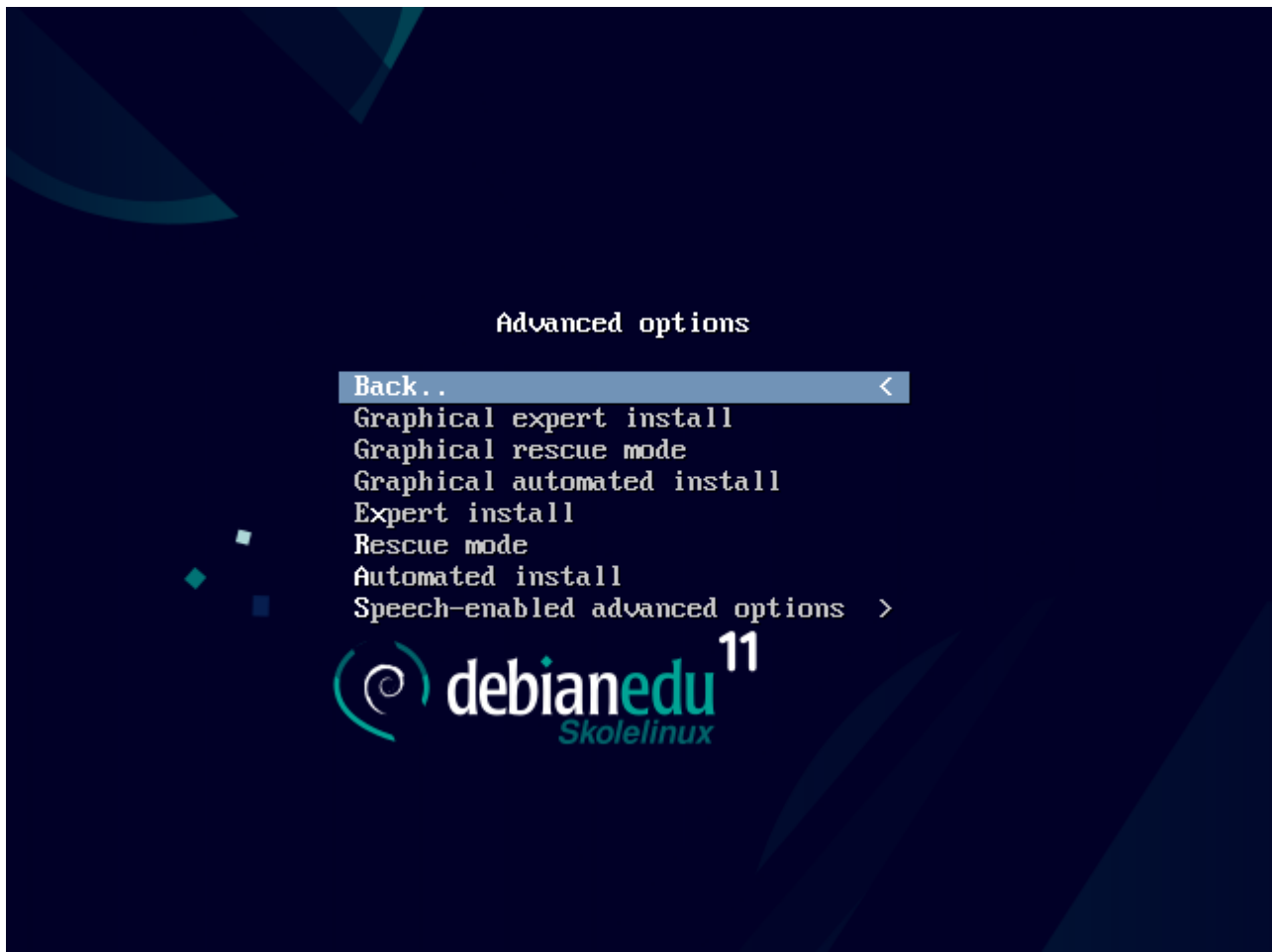
Installer boot menu on 64-bit Hardware



GTK,

>

; . . .



..

"preseed".

"preseed".



—

debian-edu-expert.

```

Welcome to Debian GNU/Linux! F1

This is a Debian 11 (bullseye) installation CD-ROM.
It was built 20210125-02:58; d-i 20210125-00:01:51.

HELP INDEX

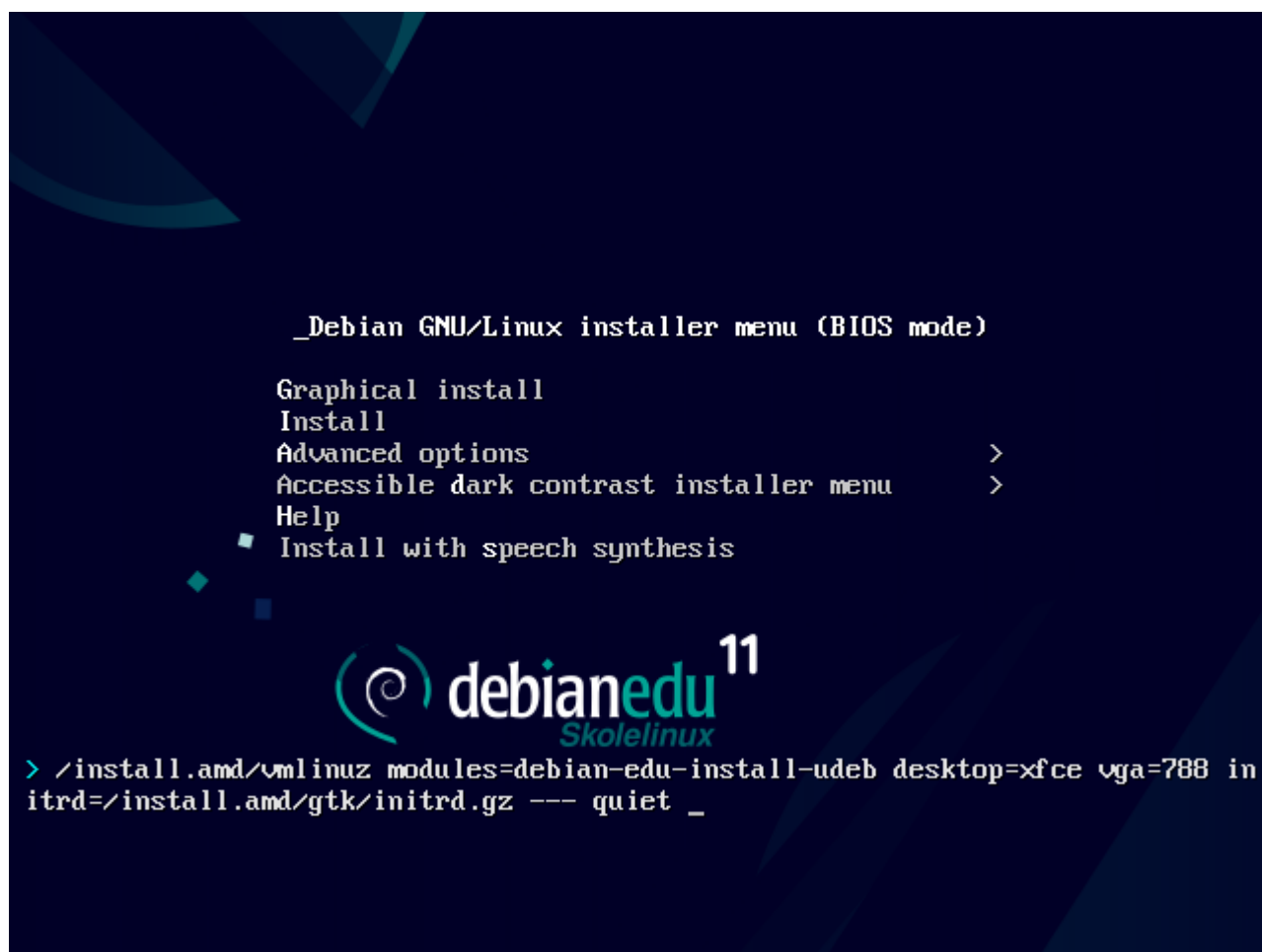
KEY      TOPIC

<F1>     This page, the help index.
<F2>     Prerequisites for installing Debian.
<F3>     Boot methods for special ways of using this CD-ROM
<F4>     Additional boot methods; rescue mode.
<F5>     Special boot parameters, overview.
<F6>     Special boot parameters for special machines.
<F7>     Special boot parameters for selected disk controllers.
<F8>     Special boot parameters for the install system.
<F9>     How to get help.
<F10>    Copyrights and warranties.

Press F2 through F10 for details, or ENTER to boot: _
```

<F>.

In both cases, boot options can be edited by pressing the TAB key (BIOS mode) or the E key (UEFI mode) in the boot menu; the screenshot shows the command line for **Graphical install**.



- You can use an existing HTTP proxy service on the network to speed up the installation of the main server profile from CD. Add e.g. `mirror/http/proxy=http://10.0.2.2:3128` as an additional boot parameter.
- If you have already installed the main server profile on a machine, further installations should be done via PXE, as this will automatically use the proxy of the main server.

- **GNOME** **Xfce,** `desktop=xfce` `xfce` `gnome.`
- **LXDE,** `desktop=lxde.`
- **LXQt,** `desktop=lxqt.`
- **KDE Plasma,** `desktop=kde.`
- **Cinnamon,** `desktop=cinnamon.`
- **MATE,** `desktop=mate.`

6.3.5

, (NICs), LTSP.

- ().
- , .
- ().

- *
 - * ! (tjener) , Workstation () LTSP
 - *
 - *
 - *
 - **LTSP**
 - * () LTSP.
 - () — LTSP
 - *
 - *
 - * This profile will install the base packages and configure the machine to integrate into the Debian Edu network, but without any services and applications. It is useful as a platform for single services manually moved out from the main-server.
 - , GOsa² () libpam-krb5.
 - LTSP**
 - LTSP-
 - LTSP,
 - 2
 - " " " "
 - " "
 - ! " ",
 - " "
 - <https://popcon.debian.org/>, —
 - 😊
 - Wait. If the selected profiles include LTSP Server then the installer will spend quite some time at the end, "Finishing the installation - Running debian-edu-profile-udeb..."
 - root " Debian Edu
 - : Skolelinux.
 - ⚠️ 5 (
 - SquashFS
 - LTSP /

6.3.6

6.3.6.1

), " (.). , (, , - ' (, ,).

6.3.6.2

USB Blu-ray

USB Blu-ray /etc/apt/sources.list . , :

```
deb http://deb.debian.org/debian/ bullseye main
deb http://security.debian.org bullseye-security main
```

6.3.6.3

-

A netinst installation (which is the type of installation our CD provides) will fetch some packages from the CD and the rest from the net. The amount of packages fetched from the net varies from profile to profile but stays below a gigabyte (unless you choose to install all possible desktop environments). Once you have installed the main-server (whether a pure main-server or combi-server does not matter), further installation will use its proxy to avoid downloading the same package several times from the net.

6.3.7

USB- CD / Blu-ray

It is possible to directly copy a CD/BD .iso image to USB flash drives (also known as "USB sticks") and boot from them. Simply execute a command like this, just adapting the file and device name to your needs:

```
sudo cat debian-edu-amd64-XXX.iso > /dev/sdX
```

X, , USB- :

```
lsblk -p
```

, . USB - Blu-ray.

6.3.8

PXE

For this installation method it is required that you have a running main server. When clients boot via the network, an iPXE menu with installer and boot selection options is displayed. If PXE installation fails with an error message claiming a XXX.bin file is missing, then most probably the client's network card requires nonfree firmware. In this case the Debian Installer's initrd must be modified. This can be achieved by executing the command: `/usr/share/debian-edu-config/tools/pxe-addfirmware` on the server.

This is how the iPXE menu looks with the **Main-Server** profile only:

```
iPXE boot menu - :10.0.2.2:
```

```
Installation:
```

```
Install Debian Edu/amd64 (64-Bit)
```

```
Install Debian Edu/i386 (32-Bit)
```

```
Other options:
```

```
Memory test
```

```
Enter iPXE configuration
```

```
Drop to iPXE shell
```

```
Boot from the first local disk
```

```
Exit iPXE and continue BIOS boot
```

iPXE

LTSP:

```
iPXE boot menu - :10.0.2.2:
```

```
Installation:
```

```
Install Debian Edu/amd64 (64-Bit)
```

```
Install Debian Edu/i386 (32-Bit)
```

```
Boot an image from the network in LTSP mode:
```

```
Plain X2Go Thin Client (64-Bit)
```

```
Diskless Workstation (server's SquashFS image)
```

```
Plain X2Go Thin Client (64-Bit, NFS rootfs)
```

```
Other options:
```

```
Memory test
```

```
Enter iPXE configuration
```

```
Drop to iPXE shell
```

```
Boot from the first local disk
```

```
Exit iPXE and continue BIOS boot
```

LDAP

GOsa².

LTSP,

6.3.9 PXE

```

PXE                                preseed      debian,
tjener:/etc/debian-edu/www/debian-edu-install.dat
d-i      pkgssel/include string my-extra-package(s)

PXE                                /etc/debian-edu/www/debian-edu-install.dat.
/etc/debian-edu/www/debian-edu-install.dat.local,
/usr/sbin/debian-edu-pxe

Further information can be found in the manual of the Debian Installer.

PXE,      mirror/http/proxy,mirror/ftp/proxy  preseed/early_command
tjener:/etc/debian-edu/www/debian-edu-install.dat
"#"      "export http_proxy="http://webcache:3128"; ".

iPXE /srv/tftp/ltsp/ltsp.ipxe

```

6.3.10

- , DVD- Blu-ray , [Debian](#),
[\(Preseeding\)](#) ,
(Debian) [CD/DVD](#).

6.4

So here is a screenshot tour through a graphical 64-bit Main Server + Workstation + LTSP Server installation and how it looks at the first boot of the main server and a PXE boot on the LTSP client network (thin client session screen - and login screen after the session on the right has been clicked).

_Debian GNU/Linux installer menu (BIOS mode)

Graphical install

Install

Advanced options

>

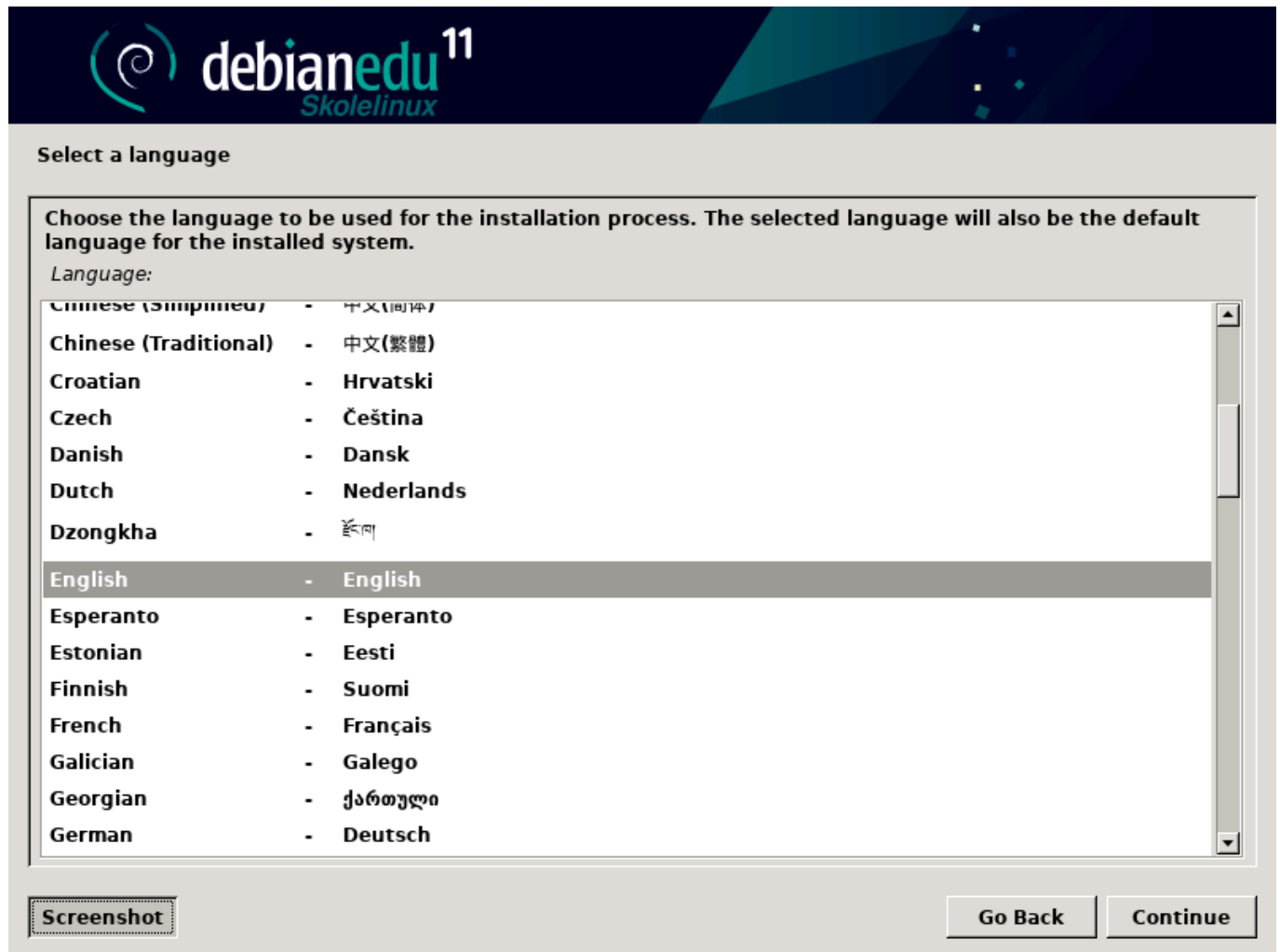
Accessible dark contrast installer menu

>

Help

■ Install with speech synthesis







Select your location

The selected location will be used to set your time zone and also for example to help select the system locale. Normally this should be the country where you live.

This is a shortlist of locations based on the language you selected. Choose "other" if your location is not listed.

Country, territory or area:

Ireland

Israel

New Zealand

Nigeria

Philippines

Seychelles

Singapore

South Africa

United Kingdom

United States

Zambia

Zimbabwe

other

Screenshot

Go Back

Continue







Choose Debian Edu profile

Profiles determine how the machine can be used out-of-the-box:

- **Main Server:** reserved for the Debian Edu server. It does not include any GUI (Graphical User Interface). There should only be one such server on a Debian Edu network.
- **Workstation:** for normal machines on the Debian Edu network.
- **Roaming Workstation:** for single user machines on the Debian Edu network which some times travel outside the network.
- **LTSP Server:** includes 'Workstation' and requires two network cards.
- **Standalone:** for machines meant to be used outside the Debian Edu network. It includes a GUI and conflicts with other profiles.
- **Minimal:** fully integrated into the Debian Edu network but contains only a basic system without any GUI.

Profile(s) to apply to this machine:

- ☒ **Main Server**
- ☒ **Workstation**
- ☐ **Roaming Workstation**
- ☒ **LTSP Server**
- ☐ **Standalone**
- ☐ **Minimal**

Screenshot

Continue



Really use the automatic partitioning tool?

This will destroy the partition table on all disks in the machine. REPEAT: THIS WILL WIPE CLEAN ALL HARD DISKS IN THE MACHINE! If you have important data that are not backed up, you may want to stop now in order to do a backup. In that case, you'll have to restart the installation later.

Really use the automatic partitioning tool?

☒ No

☐ Yes

Screenshot

Continue



Really use the automatic partitioning tool?

This will destroy the partition table on all disks in the machine. REPEAT: THIS WILL WIPE CLEAN ALL HARD DISKS IN THE MACHINE! If you have important data that are not backed up, you may want to stop now in order to do a backup. In that case, you'll have to restart the installation later.

Really use the automatic partitioning tool?

☐ No

☒ Yes

Screenshot

Continue



Participate in the package usage survey?

The system may anonymously supply the distribution developers with statistics about the most used packages on this system. This information influences decisions such as which packages should go on the first distribution CD.

If you choose to participate, the automatic submission script will run once every week, sending statistics to the distribution developers. The collected statistics can be viewed on <http://popcon.debian.org/>.

This choice can be later modified by running "dpkg-reconfigure popularity-contest".

Participate in the package usage survey?

☒ No

☐ Yes

Screenshot

Continue



Participate in the package usage survey?

The system may anonymously supply the distribution developers with statistics about the most used packages on this system. This information influences decisions such as which packages should go on the first distribution CD.

If you choose to participate, the automatic submission script will run once every week, sending statistics to the distribution developers. The collected statistics can be viewed on <http://popcon.debian.org/>.

This choice can be later modified by running "dpkg-reconfigure popularity-contest".

Participate in the package usage survey?

☐ No

☒ Yes

Screenshot

Continue



Set up users and passwords

You need to set a password for 'root', the system administrative account. A malicious or unqualified user with root access can have disastrous results, so you should take care to choose a root password that is not easy to guess. It should not be a word found in dictionaries, or a word that could be easily associated with you.

A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.

The root user should not have an empty password. If you leave this empty, the root account will be disabled and the system's initial user account will be given the power to become root using the "sudo" command.

Note that you will not be able to see the password as you type it.

Root password:

●●●●●●●●●●●●●●●●

☐ Show Password in Clear

Please enter the same root password again to verify that you have typed it correctly.

Re-enter password to verify:

●●●●●●●●●●●●●●●●

☐ Show Password in Clear

Screenshot

Go Back

Continue



Set up users and passwords

A user account will be created for you to use instead of the root account for non-administrative activities.

Please enter the real name of this user. This information will be used for instance as default origin for emails sent by this user as well as any program which displays or uses the user's real name. Your full name is a reasonable choice.

Full name for the new user:

Screenshot

Go Back

Continue



Set up users and passwords

Select a username for the new account. Your first name is a reasonable choice. The username should start with a lower-case letter, which can be followed by any combination of numbers and more lower-case letters.

Username for your account:

Screenshot

Go Back **Continue**



Set up users and passwords

A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.

Choose a password for the new user:

●●●●●●●●●●

☐ Show Password in Clear

Please enter the same user password again to verify you have typed it correctly.

Re-enter password to verify:

●●●●●●●●●●

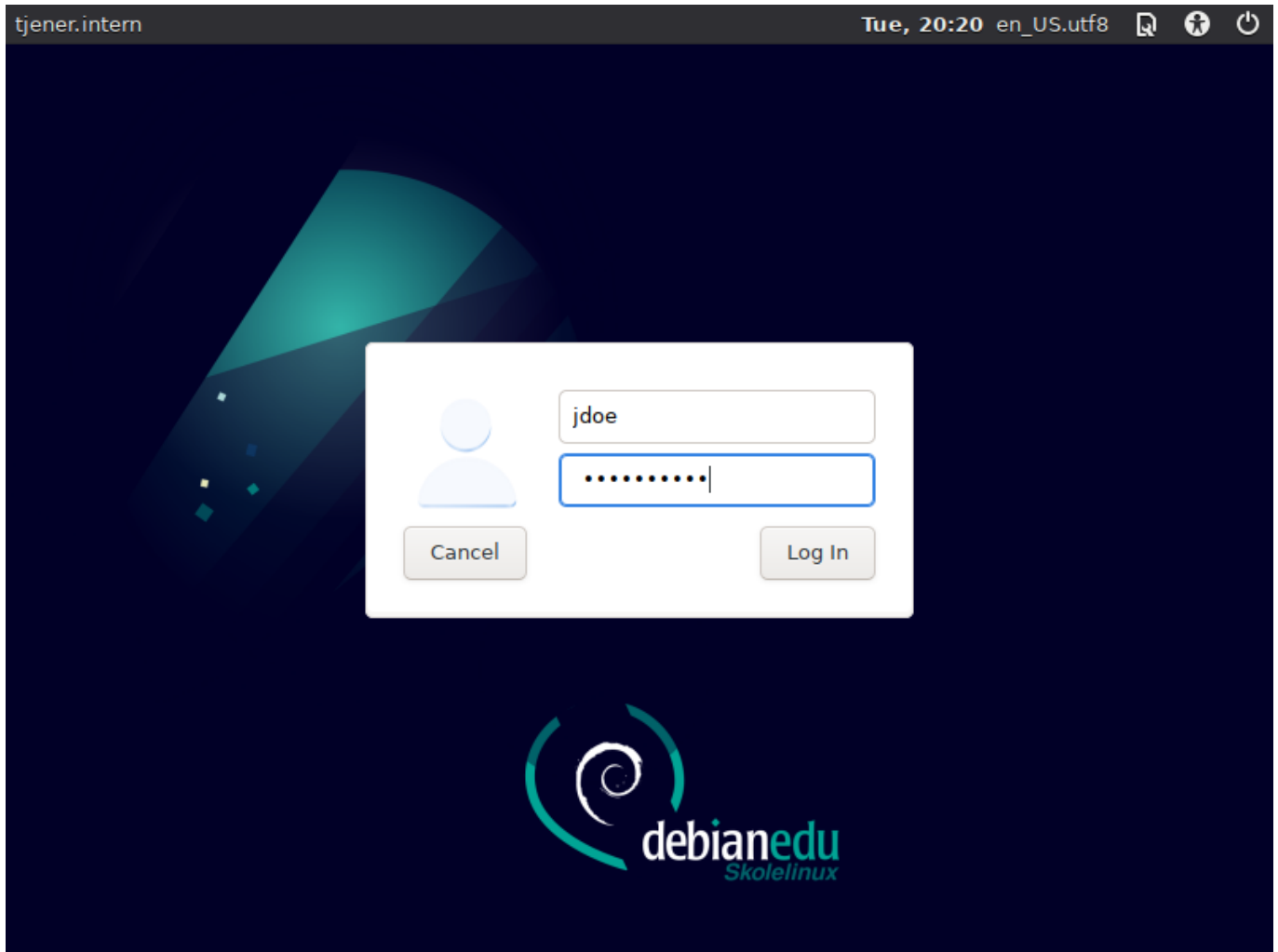
☐ Show Password in Clear

Screenshot

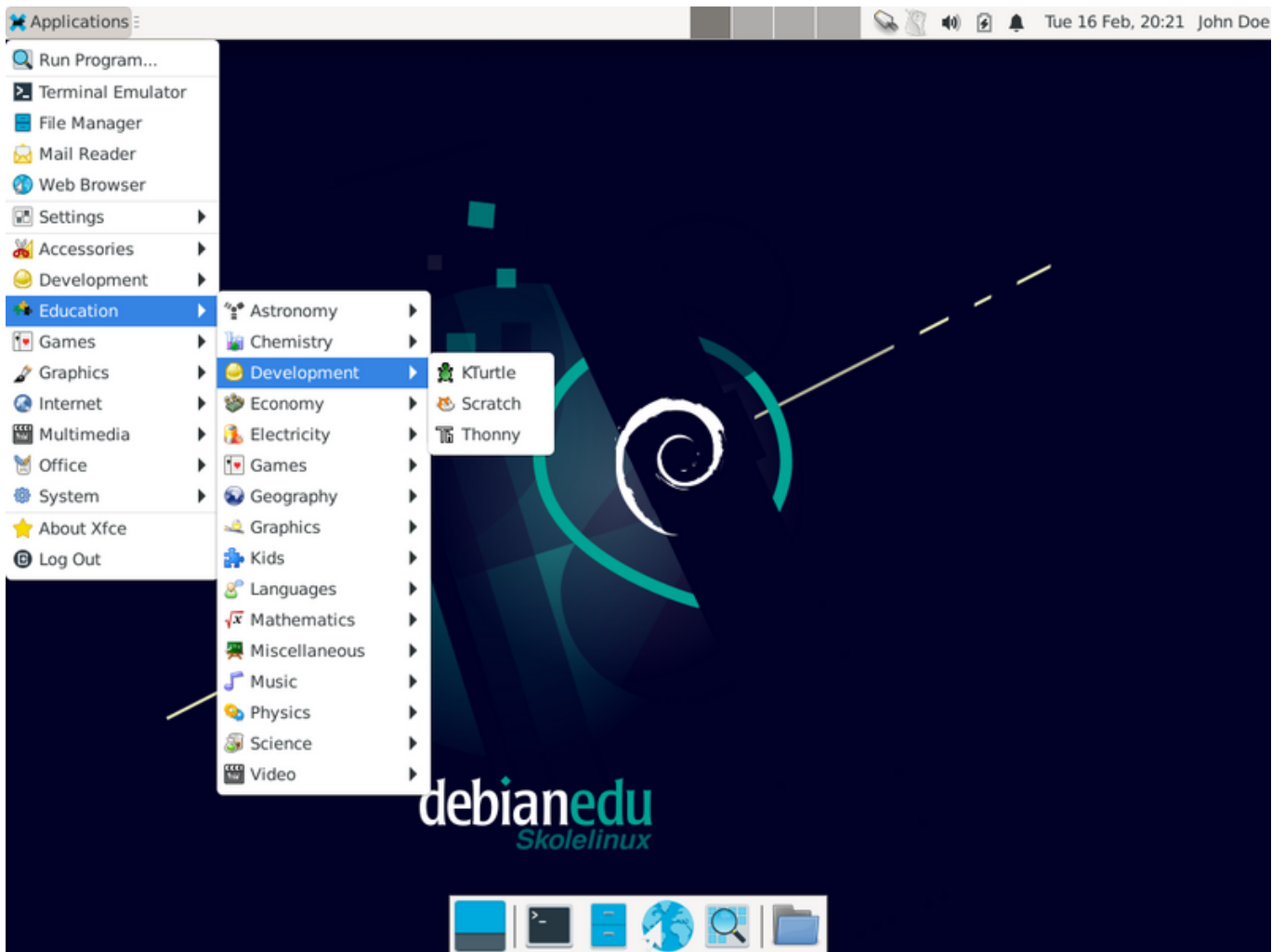
Go Back

Continue

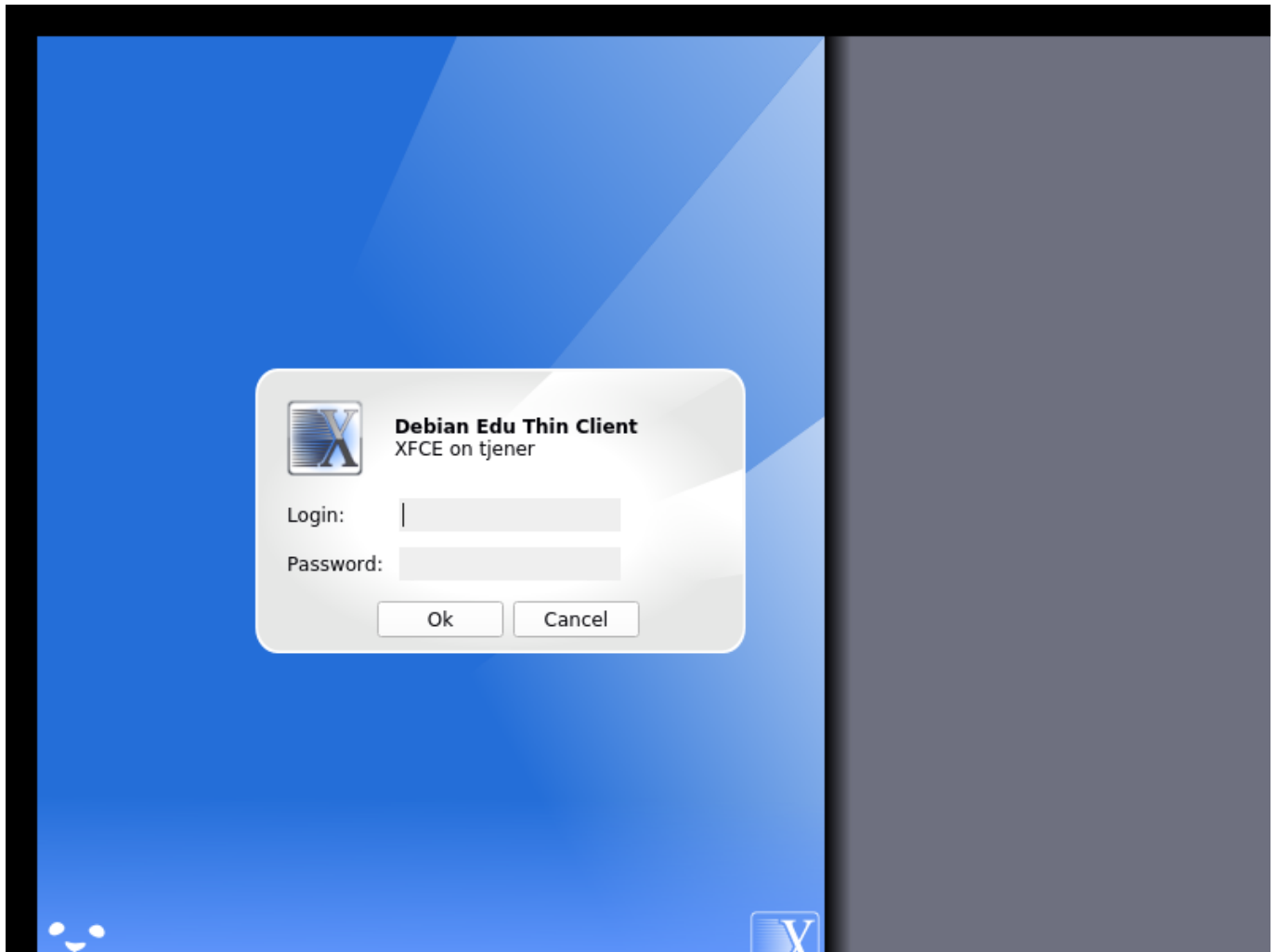












7

7.1

~). — , 700 (, , chmod o+x
sudo, root.
Debian Edu
:
1. .
2. GOsa².
3. GOsa².

There is additional information available elsewhere in this manual: the [New features in Bullseye](#) chapter should be read by everyone who is familiar with previous releases. And for those upgrading from a previous release, make sure to read the [Upgrades](#) chapter.



DNS- " " ("forwarder"). /etc/bind/named.conf.options IP- DNS- , DNS-

HowTo

7.1.1

(),

7.2 GOsa²

GOsa² — Debian Edu. GOsa²
(,) :

-
-
- NIS
- ,
- DNS
- DHCP

GOsa² Skolelinux () ,
(+ LTSP +).

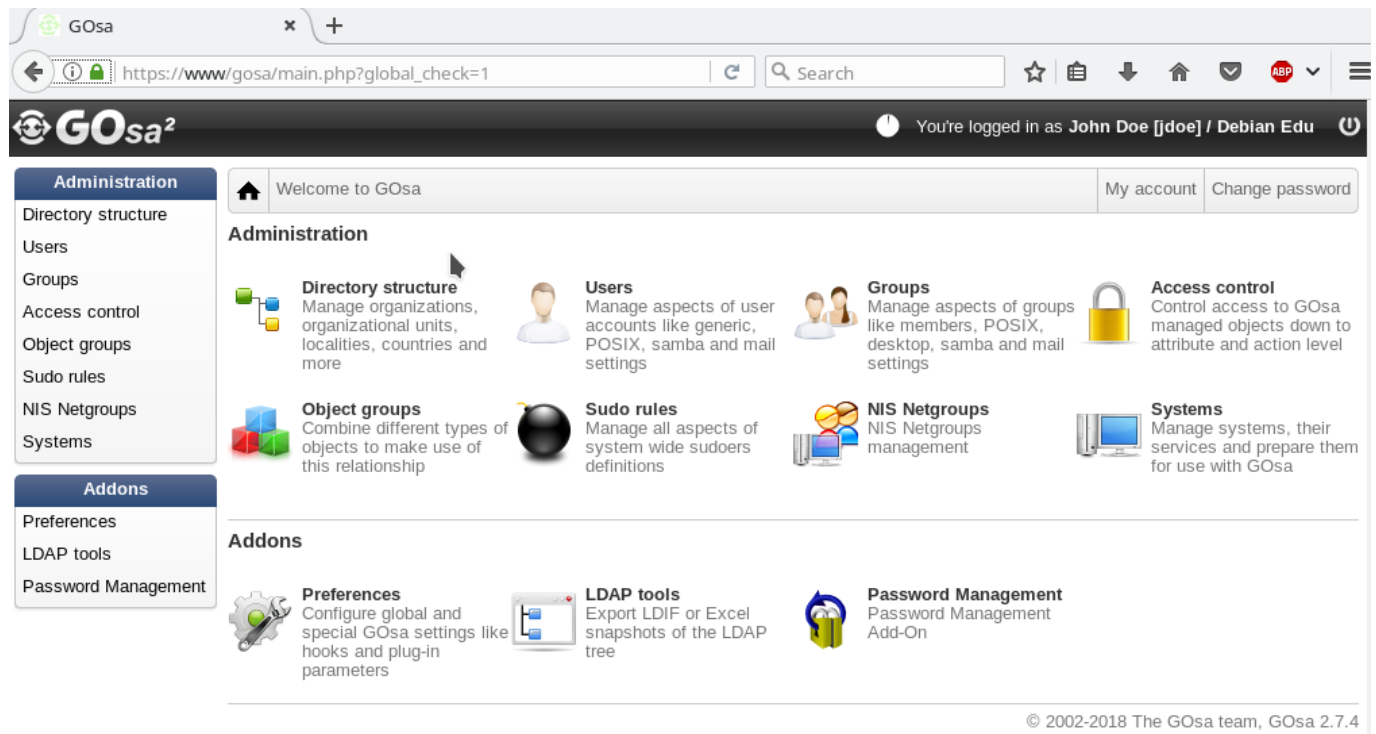
If you (probably accidentally) installed a pure main-server profile and don't have a client with a web-browser handy, it's easy to install a minimal desktop on the main server using this command sequence in a (non-graphical) shell as the user you created during the main server's installation (first user):

```
$ sudo apt update
$ sudo apt install task-desktop-xfce lightdm education-menus
### after installation, run 'sudo service lightdm start'
### login as first user
```

GOsa² URL- <https://www.gosa.org/>.

- If you are using a new Debian Edu Bullseye machine, the site certificate will be known by the browser.
- SSL. ,

7.2.1 GOsa²

 GOsa^2 GOsa².

GOsa².

Debian Edu

LTSP
LDAP

LDAP,
Skolelinux.

LDAP.

$$\text{GOsa}^2 \text{ — } /$$
GOsa²/LDAP

LDAP

LDAP

Debian Edu.

Debian Edu

LDAP.

HowTo/


 GOsa^2

7.3 GOsa²

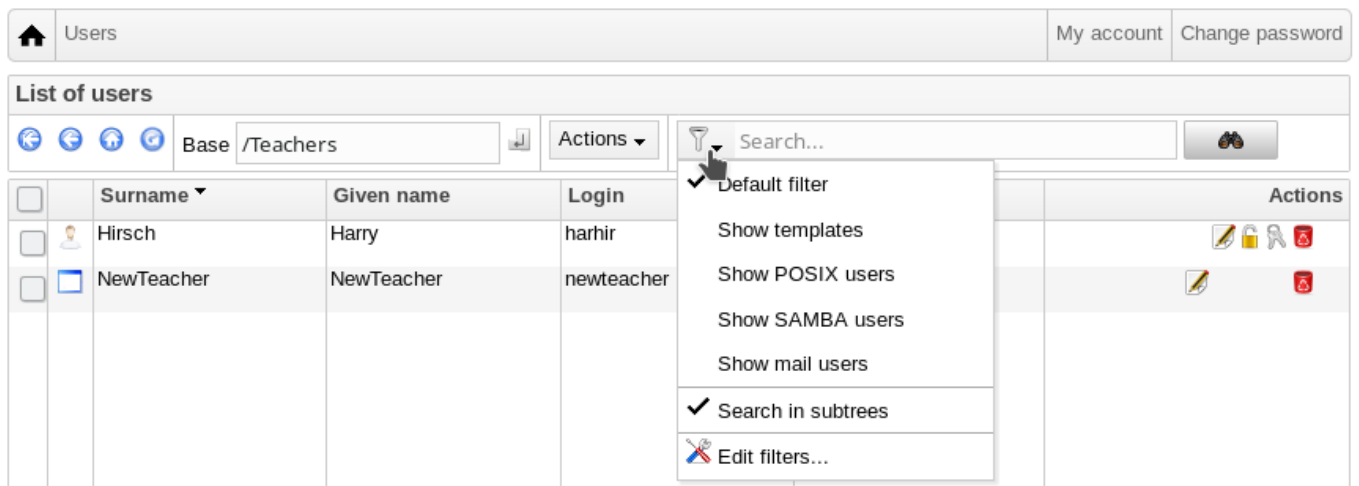
$$\text{GOsa}^2 \left(\frac{\dots}{\dots}, \dots \right).$$
$$\left(\frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} f(x) e^{-x^2} dx \right)^2 = \frac{1}{\pi} \int_{-\infty}^{\infty} f(x)^2 e^{-x^2} dx.$$

7.3.1

$\frac{1}{2}$	$\frac{1}{2}$		$\frac{1}{2}$	-	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
	-			$\frac{1}{2}$		$\frac{1}{2}$		-

- `(newstudent newteacher) (.).`
 - `GOSA2` , `GOSA2` , `ASCII.`
 - `(allowUIDProposalModification="true" "/etc/gosa/gosa.conf" /"location definition".)`
 - `GOSA2` , `(,)` , `" "` , `GOSA2` , `" "` , 
- Skolelinux.

7.3.2 ,

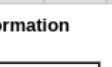



GOsa². " " , GOsa².
GOsa²/LDAP " "

[Home](#) [Users](#) harhir [My account](#) [Change password](#)

[Generic](#) [POSIX](#) [ACL](#) [References](#)


Personal information

	Last name*	<input type="text" value="King"/>	<div>Address <input type="text"/> Private phone <input type="text"/> Homepage <input type="text"/> Password storage <input type="text" value="ssha"/> Certificates Edit certificates... Restrict login to <input type="text"/> IP or network <input type="text"/> Add</div>
	First name*	<input type="text" value="Harry"/>	
	Login*	<input type="text" value="harhir"/>	
	Personal title	<input type="text"/>	
	Academic title	<input type="text"/>	
	Date of birth	<input type="text"/> 	
	Sex	<input type="text"/>	
	Preferred language	<input type="text"/>	
Base	<input type="text" value="/Students"/>		

[Change picture...](#)

7.3.3

() , GOsa² "Gosa". , GOsa², GOsa², GOsa².

Users

My account

Change password

To change the user password use the fields below. The changes take effect immediately. Please memorize the new password, because the user wouldn't be able to login without it.

New password

Repeat new password

Strength

Set password

Cancel

Beware of security implications due to easy to guess passwords!

7.3.4

```
localc). CSV GOsa2 : uid, (sn), ' (givenName) (password). , uid
| grep tjener/home | cut -d":" -f1). uid LDAP ( , getent passwd
```

CSV (GOsa2):

- " "
-
- CSV ()
- GOsa2

:

1. " LDAP"
2. " "
3. CSV ,
4. , (, NewTeacher NewStudent)
5. " "

, CSV, ,

Same applies to the password management module, which allows to reset a lot of passwords using a CSV file or to re-generate new passwords for users belonging to a special LDAP subtree.

Administration

Directory structure
Users
Groups
Access control
Object groups
Sudo rules
NIS Netgroups
Systems

Addons

Preferences
LDAP tools
Password Management

Welcome to GOsa

My accountChange password

Reset Passwords

With the GOsa2 Password Management Add-On you can mass reset user passwords in various ways.

Configure password reset options

Please configure options for this run of resetting user credentials.

☒ Upload a credentials file (CSV format).

File format: CSV, comma-separated, no quotes, two columns: <uid>, <userPassword>

Select CSV file for uploading:
Browse...
No file selected.

☐ Reset passwords of accounts in a certain organizational unit of the LDAP tree.

Change passwords for accounts in this OU subtree: skole - Debian-Edu

Length of auto-generated passwords: 12

Review upcoming password resets

7.4GOsa²

Groups

My accountChange password

GenericStartmenuACLReferences

Group nameclass_22_2024

DescriptionClass 22 graduating in 2024

Base/

☐ Force GID

☐ Samba group in domain DEFAULT

System trust

Trust modedisabled

Add

Group members

Add

OK

Cancel

Groups

My accountChange password

List of groups

Base /

Actions

Search...

	Name	Description	Properties	Actions
<input type="checkbox"/>	Students [all students]			
<input type="checkbox"/>	Teachers [all teachers]			
<input type="checkbox"/>	class_22_2024	Class 22 graduating in 2024		
<input type="checkbox"/>	gosa-admins	GOsa² Administrators		
<input type="checkbox"/>	jradmins	All junior admins in the institution		
<input type="checkbox"/>	nonetblk	Users that should be unaffected by network blocking		
<input type="checkbox"/>	pmuster	Group of user pmuster		
<input type="checkbox"/>	printer-admins	Printer Operators		

LDAP.

LDAP.

unix,

7.5GOsa²

, IP- , MAC- ' ("intern"). Debian Edu. , LDAP GOsa², Debian Edu .

```

(
),
Principal
keytab
GOsa²
root
keytab
GOsa²
root
/usr/share/debian-edu-config/tools/gosa-modify-host <hostname> <IP>

```

keytab netdevices.

NFS,

To add a machine, use the GOsa² main menu, systems, add. You can use an IP address/hostname from the preconfigured address space 10.0.0.0/8. Currently there are only two predefined fixed addresses: 10.0.2.2 (tjener) and 10.0.0.1 (gateway). The addresses from 10.0.16.20 to 10.0.31.254 (roughly 10.0.16.0/20 or 4000 hosts) are reserved for DHCP and are assigned dynamically.

MAC- 52:54:00:12:34:10 IP- GOsa², MAC- , ' IP;
IP (Propose ip), 10.0.0.0/8, 10.0.0.2,
10.0.0.x x>10 x<50 x>100

/

GOsa² sitesummary2ldapdhcp.
, sitesummary2ldapdhcp -h
sitesummary2ldapdhcp, IP.
DHCP DNS, (),

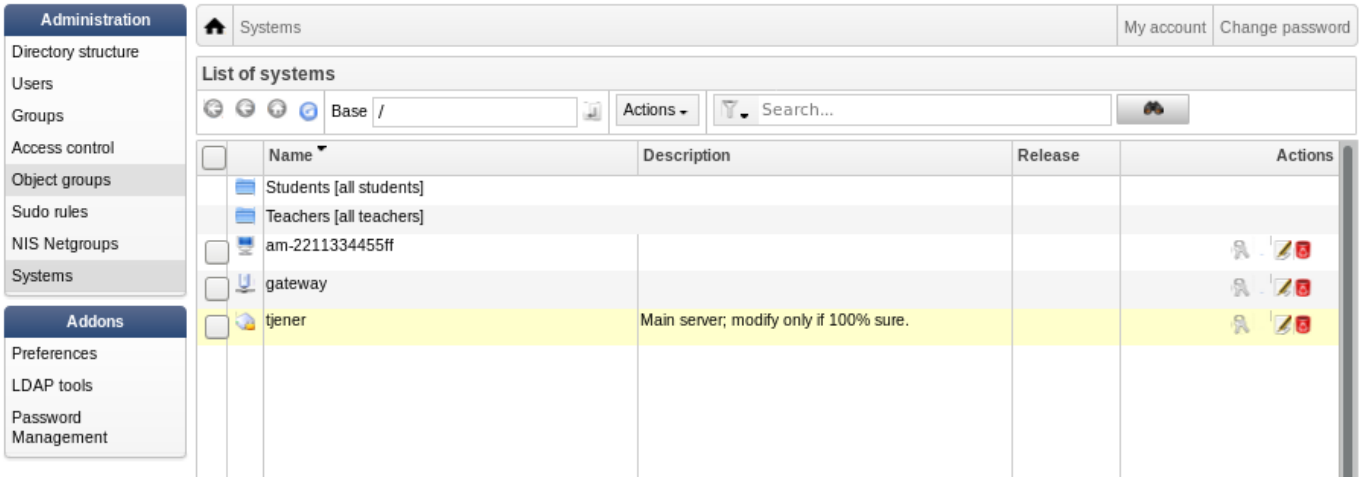
```

root@tjener:~# sitesummary2ldapdhcp -a -i ether-22:11:33:44:55:ff
info: Create Gosa machine for am-2211334455ff.intern [10.0.16.21] id ether-22:11:33:44:55: ←
ff.

Enter password if you want to activate these changes, and ^c to abort.

Connecting to LDAP as cn=admin,ou=ldap-access,dc=skole,dc=skolelinux,dc=no
enter password: *****
root@tjener:~#

```



Systems

am-2211334455ff

My account

Change password

Generic NIS Netgroup ACL References

Properties

Workstation name*
am-2211334455ff

Description

Location

Base*
/

Mode
Activated

Syslog server
default

☐ Inherit time server attributes NTP server

ntp

tjener Add Delete

Network settings

IP-address
10.0.16.21 Propose IP

MAC-address*
22:11:33:44:55:ff Auto detect

☐ Enable DHCP for this device

☐ Enable DNS for this device

Systems

am-2211334455ff

My account

Change password

Generic NIS Netgroup ACL References

Properties

Workstation name*
ws01.intern

Description

Location

Base*
/

Mode
Activated

Syslog server
default

☐ Inherit time server attributes NTP server

ntp

tjener Add Delete

Network settings

IP-address
10.0.0.2

MAC-address*
22:11:33:44:55:ff Auto detect

☒ Enable DHCP for this device
Parent node
(tjener) dhcp Edit settings

☒ Enable DNS for this device
Zone
TJENER/intern
TTL
DNS records
Add

⌂

Systems

ws10.intern

unconfigured

My account

Change password

Please select the desired NIS Netgroups

🔍

Base /

📄

🔍

Search...

🔍

<input type="checkbox"/>	Common name	Description
<input type="checkbox"/>	Students [all students]	
<input type="checkbox"/>	Teachers [all teachers]	
<input type="checkbox"/>	all-hosts	All netgroup members
<input type="checkbox"/>	cups-queue-autoflush-hosts	Flush CUPS print queues automatically every night
<input type="checkbox"/>	cups-queue-autoreenable-hosts	Re-enable CUPS print queues automatically every hour
<input type="checkbox"/>	fsautoresize-hosts	Run debian-edu-fsautoresize automatically
<input type="checkbox"/>	ltsp-server-hosts	All LTSP-servers
<input type="checkbox"/>	netblock-hosts	Hosts where network blocking should be enabled
<input type="checkbox"/>	printer-hosts	All machines with a printer
<input type="checkbox"/>	server-hosts	All servers
<input type="checkbox"/>	shutdown-at-night-hosts	Enable shutdown-at-night automatically
<input type="checkbox"/>	shutdown-at-night-wakeup-hosts-blacklist	Don't wake up systems in this netgroup via shutdown-at-night tool
<input type="checkbox"/>	workstation-hosts	All workstations

DNS ; su -c ldap2bind.

7.5.1

7.5.2

/

GOsa² LDAP ().

For example, adding a machine to a NetGroup does not modify the file access or command execution permissions for that machine or the users logged in to that machine; instead it restricts the services that machine can use on your main-server.

(NetGroups)

- all-hosts
- cups-queue-autoflush-hosts
- cups-queue-autoreenable-hosts
- fsautoresize-hosts
- ltsp-server-hosts
- netblock-hosts
- printer-hosts
- server-hosts
- shutdown-at-night-hosts
- shutdown-at-night-wakeup-hosts-blacklist
- workstation-hosts

NetGroup :

- (fsautoresize-hosts)
 - ' Debian Edu LVM, .
- (shutdown-at-night-hosts shutdown-at-night-wakeup-hosts-blacklist)
 - Debian Edu .
- (cups-queue-autoflush-hosts cups-queue-autoreenable-hosts)
 - Debian Edu - .
- (netblock-hosts)
 - Debian Edu machines in this group will be allowed to connect to machines only on the local network. Combined with web proxy restrictions this might be used during exams.

8

<https://www.intern:631.> CUPS,
/ /
GOsa² printer-admins. . , ,

8.1

, '

p910nd .

- /etc/default/p910nd (USB):
 - P910ND_OPTS="-f /dev/usb/lp0"
 - P910ND_START=1
- <https://www.intern:631;> AppSocket/HP JetDirect (
 - ,) socket://<IP ' >:9100 URI .

8.2

. IP- GOsa²
AppSocket/HP JetDirect.

9

The default configuration in Debian Edu is to keep the clocks on all machines synchronous but not necessarily correct. NTP is used to update the time. The clocks will be synchronised with an external source by default. This can cause machines to keep the external Internet connection open if it is created when used.



' ISDN , .

("#"). NTP, root /etc/ntp.conf. server
, ntpq -c lpeer. service ntp restart. ,

10 ()

```
root    debian-edu-fsautoresize -n. " " ( )
```

11

11.1

```
apt full-upgrade.
```

```
apt root: apt update ( ) apt
full-upgrade ( ).
```

```
C - -
```

```
LC_ALL=C apt full-upgrade -y
```



```
debian-edu-config, Cfengine. ls -ltr
/etc/cfengine3/debian-edu/. , LC_ALL=C cf-agent -D installation.
```



It is important to run `debian-edu-ltsp-install --diskless_workstation yes` after LTSP server upgrades to keep the SquashFS image for diskless clients menu in sync.



```
LTSP, PXE debian-edu-pxeinstall.
```

```
cron-apt apt-listchanges
```

```
cron-apt , ( ),
apt full-upgrade.
```

```
unattended-upgrades ,
```

wiki.debian.org/UnattendedUpgrades.

```
apt-listchanges
```

```
apt
```

11.1.1

Running `cron-apt` as described above is a good way to learn when security updates are available for installed packages. Another way to stay informed about security updates is to subscribe to the [Debian security-announce mailinglist](https://www.debian.org/security/announce/), which has the benefit of also telling you what the security update is about. The downside (compared to `cron-apt`) is that it also includes information about updates for packages which aren't installed.

11.2

```
root. https://www.slbackup-php. , SSL,
```



Note: the site will only work if you temporarily allow `ssh root` login on the backup server (main server 'tjener' by default).

By default `tjener` will back up `/skole/tjener/home0`, `/etc/`, `/root/.svk` and LDAP to `/skole/backup` which is under the LVM. If you only want to have spare copies of things (in case you delete them) this setup should be fine for you.



```
$ sudo rdiff-backup -r <date> \
  /skole/backup/tjener/skole/tjener/home0/user \
  /skole/tjener/home0/user_<date>
```

```
/skole/tjener/home0/user < > /skole/tjener/home0/user_< >
( )
```

Maintenance

tjener Choose Oldest snapshot to keep: 2013-07-02T22:30:04+02:00 Delete older

MENU

- [Status](#)
- [Config](#)
- [Restore](#)
- [Maintenance](#)
- [Logout](#)

11.3

11.3.1 Munin

Munin <https://www.munin/>.

Munin, sitesummary. munin-node Munin. Munin — cron. sitesummary (root sitesummary-update-munin. /etc/munin/munin.conf. munin-node-configure, /usr/share/munin/plu /etc/munin/plugins/.

Information about Munin is available from <http://munin-monitoring.org/>.

11.3.2 Icinga

Icinga — <https://www.icingaweb2/>. LTSP" nagios-nrpe-server. Icinga /etc/icinga/sitesummary-template-contacts.cfg notify-by-nothing host-notify-by-email notify-by-email. Icinga /etc/icinga/sitesummary.cfg. Cron /var/lib/sitesumm Icinga /var/lib/sitesummary/icinga-generated.cfg.post. Icinga <https://www.icinga.com/> icinga-doc.

11.3.2.1 Icinga

Icinga.

11.3.2.1.1 DISK CRITICAL - : /usr 309 MB (5% inode=47%):

(/usr/) . : (1) (2) .
 /var/, APT apt clean. LVM ,
 debian-edu-fsautoresize. fsautoresize-hosts .

11.3.2.1.2 APT CRITICAL: 13 (13).

New package are available for upgrades. The critical ones are normally security fixes. To upgrade, run 'apt upgrade && apt full-upgrade' as root in a terminal or log in via ssh to do the same.

Debian, , unattended-upgrades
 chroots LTSP.

11.3.2.1.3 ! : = 2.6.32-37.81.0, = 2.6.32-38.83.0

' Debian Edu , . ,

11.3.2.1.4 : CUPS - 61

CUPS . -
 cups-queue-autoreenable-hosts, -
 cups-queue-autoflush-hosts . ,

11.3.3 Sitesummary

Sitesummary , . /var/lib/sitesummary/entri
 , /usr/lib/sitesummary/ .

A simple report from sitesummary without any details is available from <https://www/sitesummary/>.

Some documentation on sitesummary is available from <http://wiki.debian.org/DebianEdu/HowTo/SiteSummary>

11.4 Debian Edu

Debian Edu, , " " " "

12



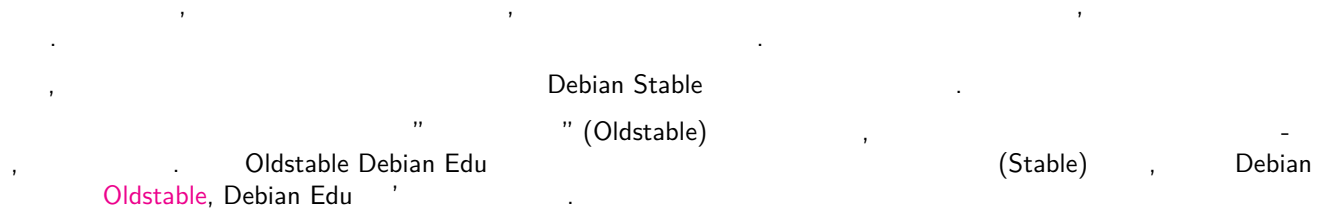
, , . **Debian Edu/Skolelinux**

Please read this chapter and the **New features in Bullseye** chapter of this manual completely before attempting to upgrade.

12.1

Debian . Debian Edu , , , Debian
 . (, Debian Edu . Debian
 311188.)

In general, upgrading the servers is more difficult than the workstations and the main-server is the most difficult to upgrade.



12.2 Upgrades from Debian Edu Buster



Be prepared: make sure you have tested the upgrade from Buster in a test environment or have backups ready to be able to go back.

Please note that the following recipe applies to a default Debian Edu main server installation (desktop=xfce, profiles Main Server, Workstation, LTSP Server). (For a general overview concerning Buster to Bullseye upgrade, see: <https://www.debian.org/releases/bullseye/releasenotes>)

```

X ( ), — , root.
apt , / apt -f install, apt -y full-upgrade.

```

12.2.1

- , :

```

apt update
apt full-upgrade

```

- Cleanup the package cache:

```
apt clean
```

- Prepare and start the upgrade to Bullseye (new security entry):

```

sed -i 's/buster/bullseye/g' /etc/apt/sources.list
sed -i 's#/debian-security bullseye/updates# bullseye-security#g' /etc/apt/sources.list
export LC_ALL=C # optional (to get English output)
apt update
apt full-upgrade

```

- apt-list-changes: ; <return> , <q> .
root', (mailx mutt).
- debconf, " , ;
return.
- restart services: Choose Yes.
- openssh-server: " .
- /etc/plymouth/plymouthd.conf: Choose Y.
- Samba: " .
- Kerberos servers: Enter 'kerberos' and hit 'OK'.
- /etc/default/slapd: Choose N.

- /etc/cups/cups-files.conf: Choose N.
- /etc/munin/munin.conf: Choose N.

■ :

```
cf-agent -v -D installation
service squid restart
```

- Setup and configure the Icinga2 web interface:
 - Run `apt install icinga2-ido-mysql`, always choose **No** if asked by debconf.
 - Run `/usr/share/debian-edu-config/tools/edu-icinga-setup`
- Get the new Debian Edu Homeworld artwork:

```
apt install debian-edu-artwork-homeworld
apt purge debian-edu-artwork-buster          # unless Buster artwork should be kept as an ↵
alternative
```

- Adjust Xfce panel configuration:

```
rm -f /etc/xdg/xfce4/panel/default.xml.cfsaved
mv /etc/xdg/xfce4/panel/default.xml.dpkg-new /etc/xdg/xfce4/panel/default.xml
```

- Cope with new LTSP and related changes:

```
rm -f /etc/default/tftpd-hpa          # to remove no longer needed modifications
rm -rf /var/lib/tftpboot              # to remove no longer used tftp base directory
dpkg-reconfigure -p low tftpd-hpa     # first prompt: keep ''tftp'' as system account, second ↵
    : change TFTP root directory to  ''/srv/tftp''
                                      # third: keep address and port, last one: enter '-- ↵
                                      secure'' as additional option

service tftpd-hpa restart
rm -rf /opt/ltsp                      # cleanup old LTSP base directory
# The next steps will need quite some execution time.
debian-edu-ltsp-install --arch amd64 --diskless_workstation no thin_type bare    # if 64-Bit ↵
    thin client support is wanted
debian-edu-ltsp-install --arch i386 --diskless_workstation no thin_type bare    # if 32-Bit ↵
    thin client support is wanted
debian-edu-ltsp-install --diskless_workstation yes                             # to create diskless workstation image ↵
    from the server's file system
debian-edu-pxeinstall                  # to add PXE installation files and ↵
    related iPXE menu items
```

- Cope with move to iPXE:

Create a file *ipxe.ldif* with the following content:

```
dn: cn=dhcp,cn=tjener,ou=servers,ou=systems,dc=skole,dc=skolelinux,dc=no
changetype: modify
add: dhcpOption
dhcpOption: space ipxe
dhcpOption: ipxe-encap-opts code 175 = encapsulate ipxe
dhcpOption: ipxe.menu code 39 = unsigned integer 8
dhcpOption: ipxe.no-pxedhcp code 176 = unsigned integer 8
dhcpOption: arch code 93 = unsigned integer 16
```

Then run `ldapadd -ZD 'cn=admin,ou=ldap-access,dc=skole,dc=skolelinux,dc=no' -W -f ipxe.ldif` to apply the changes.

Modify some more DHCP settings in LDAP, e.g. using an editor like `ldapvi`. Make sure, DHCP related entries match those contained in the `/etc/ldap/gosa-server.ldif` file. Entries concerned are:

```
81 cn=intern,cn=dhcp,cn=tjener,ou=servers,ou=systems,dc=skole,dc=skolelinux,dc=no
83 cn=subnet00.intern,cn=dhcp,cn=tjener,ou=servers,ou=systems,dc=skole,dc=skolelinux,dc= ↵
no
85 cn=subnet01.intern,cn=dhcp,cn=tjener,ou=servers,ou=systems,dc=skole,dc=skolelinux,dc= ↵
no
```

- Cope with GOSa changes - use new `gosa.conf`, fix LDAP access:
 - `cp /etc/gosa/gosa.conf /etc/gosa/gosa.conf.buster` # backup
 - `cp /usr/share/debian-edu-config/gosa.conf.template /etc/gosa/gosa.conf` # new `gosa.conf` file
 - Search for `adminPassword` and `snapshotAdminPassword` in `/etc/gosa/gosa.conf` and replace `$GOSAPWD` with the random password found in `/etc/gosa/gosa.conf.orig` for those entries.
 - `rm /etc/gosa/gosa.secrets`
 - Run `gosa-encrypt-passwords`
 - Run `service apache2 restart`
- Cope with Kerberos encryption type changes:
 - `sed -i 's/supported_enctypes/#supported_enctypes/' /etc/krb5kdc/kdc.conf`
 - Run `service krb5-kdc restart`
- Cope with Samba changes:
 - Add first user's Samba account: `smbpasswd -a <first username>`. Once users change their password, the related Samba account will be created.
- , :
- ,
- GOSa²,
- , LTSP ,
- ,
- ,
- ,
- ,
- / .

12.2.2

Do all the basic things like on the main-server and without doing the things not needed. If not yet done, configure the machine to use Kerberos for mounting home directories, see the [getting started](#) chapter for details.

12.3 Upgrades from older Debian Edu / Skolelinux installations (before Buster)

To upgrade from any older release, you will need to upgrade to the Buster based Debian Edu release first, before you can follow the instructions provided above. Instructions are given in the [Manual for Debian Edu Buster](#) about how to upgrade to Buster from the previous release, Stretch. Likewise the Stretch manual describes how to upgrade from Jessie.

13 HowTo

- HowTo
- HowTo
- HowTo
- HowTo
- HowTo Samba
- HowTo
- HowTo

14 HowTo

Debian Edu

14.1 Configuration history: tracking /etc/ using the git version control system

```
etckeeper      /etc/          Git
,              ,              ,              ,              .      git      /etc/.git/.
```

To look at the history, the command `etckeeper vcs log` is used. To check the differences between two points in time, a command like `etckeeper vcs diff` can be used.

man etckeeper.

$$\vdots$$

```
etckeeper vcs log
etckeeper vcs status
etckeeper vcs diff
etckeeper vcs add .
etckeeper vcs commit -a
man etckeeper
```

14.1.1

```
etckeeper vcs log
```

```
etckeeper vcs status
```

commit' , :

```
etckeeper vcs commit -a /etc/resolv.conf
```

14.2

Debian Edu , /boot/, LVM. Linux, 2.6.10,
/
(, , 20), fsck ,
/
/site/etc/fsautoresizetab /etc/fsautoresizetab. /usr/share/debian
-n
fsautoresize-hosts.

When the partition used by the Squid proxy is resized, the value for cache size in `etc/squid/squid.conf` needs to be updated as well. The helper script `/usr/share/debian-edu-config/tools/squid-update-cachedir` is provided to do this automatically, checking the current partition size of `/var/spool/squid/` and configuring Squid to use 80% of this as its cache size.

14.2.1

(LVM) LVM LVM.
lvextend, home0 30 ,
:
lvextend -L30G /dev/vg_system/skole+tjener+home0
resize2fs /dev/vg_system/skole+tjener+home0

To extend home0 by additional 30GiB, you insert a '+' (-L+30G)

14.3 ldapvi

ldapvi — LDAP
:
ldapvi --ldap-conf -ZD '(cn=admin)'
: ldapvi export EDITOR=vim , vi.

To add an LDAP object using `ldapvi`, use object sequence number with the string `add` in front of the new LDAP object.

 : ldapvi — LDAP; JXplorer.

14.4 (Kerberized) NFS

Using Kerberos for NFS to mount home directories is a security feature. As of Bullseye, LTSP clients won't work without Kerberos. The levels *krb5*, *krb5i* and *krb5p* are supported (*krb5* means Kerberos authentication, *i* stands for integrity check and *p* for privacy, i.e. encryption); the load on both server and workstation increases with the security level, *krb5i* is a good choice and has been chosen as default.

14.4.1

- root
- `ldapvi -ZD '(cn=admin)', sec=krb5i sec=krb5 sec=krb5p.`
- `/etc/exports.d/edu.exports :`

```
/srv/nfs4      gss/krb5i(rw, sync, fsid=0, crossmnt, no_subtree_check)
/srv/nfs4/home0 gss/krb5i(rw, sync, no_subtree_check)
```

- `run exportfs -r`

14.5 Standardskriver

`/usr/share/doc/standardskriver`
`/etc/standardskriver.cfg`, `/usr/share/doc/standardskriver/examples/standardskriver`

14.6 JXplorer, LDAP

LDAP, jxplorer, .

```
host: ldap.intern
port: 636
Security level: ssl + user + password
User dn: cn=admin,ou=ldap-access,dc=skole,dc=skolelinux,dc=no
```

14.7 ldap-createuser-krb, a command-line tool

`ldap-createuser-krb` is a small command line tool to create LDAP users and set their passwords in Kerberos. It's mostly useful for testing, though.

14.8 (stable-updates)

Since the Squeeze release in 2011, Debian has included packages formerly maintained in volatile.debian.org in the [stable-updates suite](#).

`stable-updates`, `: stable-updates`

14.9 (backports)

Debian Edu . ; : , .
 backports.debian.org.
 — (,) Debian () (, ,),
 Debian, - Debian Edu. , ,
 :

```
echo "deb http://deb.debian.org/debian/ bullseye-backports main" >> /etc/apt/sources.list
apt-get update
```

```
" " , , " " tuxtype:
```

```
apt install -t bullseye-backports tuxtype
```

Backports () . , backports : main, contrib non-free.

14.10 CD

If you want to upgrade from one version to another (for example from Bullseye 11.1 to 11.2) but you do not have Internet connectivity, only physical media, follow these steps:

CD / DVD / Blu-ray / USB apt-cdrom :

```
apt-cdrom add
```

```
(man) apt-cdrom(8):
```

- apt-cdrom - APT. apt-cdrom ,
- - APT, apt-cdrom, ,
- CD .
- , :

```
apt update
apt full-upgrade
```

14.11

killer — perl, , ,

cron .

14.12

unattended-upgrades — Debian, .

/var/log/unattended-upgrades/; /var/log/dpkg.log /var/log/apt/.

14.13

It is possible to save energy and money by automatically turning client machines off at night and back on in the morning. The package `shutdown-at-night` will try to turn off the machine every hour on the hour from 16:00 in the afternoon, but will not turn it off if it seems to have users. It will try to tell the BIOS to turn on the machine around 07:00 in the morning, and the main-server will try to turn on machines from 06:30 by sending wake-on-lan packets. These times can be changed in the crontabs of individual machines.

```
, :
```

- The clients should not be shut down when someone is using them. This is ensured by checking the output from `who`, and as a special case, checking for the `ssh` connection command to work with X2Go thin clients.
-
- There are two different methods available to wake up clients. One uses a BIOS feature and requires a working and correct hardware clock, as well as a motherboard and BIOS version supported by `nvrwakeup`; the other requires clients to have support for wake-on-lan, and the server to know about all the clients that need to be woken up.

14.13.1 shutdown-at-night ()

On clients that should turn off at night, touch `/etc/shutdown-at-night/shutdown-at-night`, or add the hostname (that is, the output from `'uname -n'` on the client) to the netgroup "shutdown-at-night-hosts". Adding hosts to the netgroup in LDAP can be done using the G0sa² web tool. The clients might need to have wake-on-lan configured in the BIOS. It is also important that the switches and routers used between the wake-on-lan server and the clients will pass the WOL packets to the clients even if the clients are turned off. Some switches fail to pass on packets to clients that are missing in the ARP table on the switch, and this blocks the WOL packets.

To enable wake-on-lan on the server, add the clients to `/etc/shutdown-at-night/clients`, with one line per client, IP address first, followed by MAC address (ethernet address), separated by a space; or create a script `/etc/shutdown-at-night/clients-generator` to generate the list of clients on the fly.

`/etc/shutdown-at-night/clients-generator` sitesummary:

```
#!/bin/sh
PATH=/usr/sbin:$PATH
export PATH
sitesummary-nodes -w
```

, (shutdown-at-night), ng-utils

```
#!/bin/sh
PATH=/usr/sbin:$PATH
export PATH
netgroup -h shutdown-at-night-hosts
```

14.14 Access Debian-Edu servers located behind a firewall

, autossh. SSH.

14.15 Installing additional service machines for spreading the load from main-server

In the default installation, all services are running on the main-server, tjener. To simplify moving some to another machine, there is a *minimal* installation profile available. Installing with this profile will lead to a machine, which is part of the Debian Edu network, but which doesn't have any services running (yet).

, :

- install the *minimal* profile using the *debian-edu-expert* boot-option
- /
- /
- disable the service on main-server
- update DNS (via LDAP/G0sa²) on main-server

14.16 wiki.debian.org

FIXME: The HowTos from <https://wiki.debian.org/DebianEdu/HowTo/> are either user- or developer-specific. Let's move the user-specific HowTos over here (and delete them over there)! (But first ask the authors (see the history of those pages to find them) if they are fine with moving the howto and putting it under the GPL.)

- <https://wiki.debian.org/DebianEdu/HowTo/AutoNetRespawn>

15.2

15.2.1

```
group=teachers    permissions=2770           ,           "assignments",
```

```
#!/bin/bash
home_path="/skole/tjener/home0"
shared_folder="assignments"
permissions="2770"
created_dir=0
for home in $(ls $home_path); do
    if [ ! -d "$home_path/$home/$shared_folder" ]; then
        mkdir $home_path/$home/$shared_folder
        chmod $permissions $home_path/$home/$shared_folder
        #set the right owner and group
        # "username" = "group name" = "folder name"
        user=$home
        group=teachers
        chown $user:$group $home_path/$home/$shared_folder
        ((created_dir+=1))
    else
        echo -e "the folder $home_path/$home/$shared_folder already exists.\n"
    fi
done
echo "$created_dir folders have been created"
```

15.3

- `GOsa2`, `nas-server.intern`, `nas-server.intern`, `NFS`
- `'nas-server.intern'`, `'nas-server.intern'`, `NFS`

```
root@tjener:~# showmount -e nas-server
Export list for nas-server:
/storage                10.0.0.0/8
root@tjener:~#
```

```
IP- /storage. ( NFS tjener:/etc/exports,
```

- , "nas-server.intern" LDAP.
- GOsa², ldapvi LDAP

```
ldapvi --ldap-conf -ZD '(cn=admin)' -b ou=automount,dc=skole,dc=skolelinux,dc=no
' , ' LDAP . ( "/"&" ' LDAP ,
"nas-server.intern", LDAP.)
```

```
add cn=nas-server,ou=auto.skole,ou=automount,dc=skole,dc=skolelinux,dc=no
objectClass: automount
cn: nas-server
automountInformation: -fstype=autofs --timeout=60 ldap:ou=auto.nas-server,ou= ↵
    automount,dc=skole,dc=skolelinux,dc=no
```

```

add ou=auto.nas-server,ou=automount,dc=skole,dc=skolelinux,dc=no
objectClass: top
objectClass: automountMap
ou: auto.nas-server

add cn=/,ou=auto.nas-server,ou=automount,dc=skole,dc=skolelinux,dc=no
objectClass: automount
cn: /
automountInformation: -fstype=nfs,tcp,rsiz=32768,wsiz=32768,rw,intr,hard,nodev, ↵
nosuid,noatime nas-server.intern:/&

```

- `tjener.intern:/etc/fstab,` `tjener.intern` :
- `mkdir` , `"/etc/fstab"` `mount -a.`
- `"nas-server.intern"` `"/tjener/nas-server/storage/"` -
- , `LTSP` `LTSP.`

15.4 Restrict ssh login access

There are several ways to restrict ssh login, some are listed here.

15.4.1 LTSP

LTSP , (. `sshusers`) `/etc/ssh/sshd_config` .

SSH `sshusers.`

GOsa :

- `sshusers` (, ' , `gosa-admins`).
- `sshusers.`
- `AllowGroups sshusers` `/etc/ssh/sshd_config`.
- `service ssh restart.`

15.4.2 LTSP

The default LTSP diskless client setup doesn't use ssh connections. Update the SquashFS image on the related LTSP server after the ssh setup has been changed is enough.

X2Go thin clients are using ssh connections to the related LTSP server. So a different approach using PAM is needed.

- `pam_access.so` `/etc/pam.d/sshd` LTSP.
- () `alice, jane, bob john` - , , `/etc/security/access.conf,` :

```

+ : alice jane bob john : ALL
+ : ALL : 10.0.0.0/8 192.168.0.0/24 192.168.1.0/24
- : ALL : ALL
#

```

If only dedicated LTSP servers are used, the 10.0.0.0/8 network could be dropped to disable internal ssh login access. Note: someone connecting his box to the dedicated LTSP client network(s) will gain ssh access to the LTSP server(s) as well.

15.4.3

If X2Go clients were attached to the backbone network 10.0.0.0/8, things would be even more complicated and maybe only a sophisticated DHCP setup (in LDAP) checking the vendor-class-identifier together with appropriate PAM configuration would allow to disable internal ssh login.

16

16.1

To support multiple languages these commands need to be run:

- `dpkg-reconfigure locales` (`root`) (`UTF-8`).
- `dpkg-reconfigure locales` (`root`) (`UTF-8`).

```
apt update
/usr/share/debian-edu-config/tools/install-task-pkgs
/usr/share/debian-edu-config/tools/improve-desktop-l10n
```

Users will then be able to choose the language via the LightDM display manager before logging in; this applies to Xfce, LXDE and LXQt. GNOME and KDE both come with their own internal region and language configuration tools, use these. MATE uses the Arctica greeter on top of Lightdm without a language chooser. Run `apt purge arctica-greeter` to get the stock Lightdm greeter.

16.2 DVD

libdvdcss. Debian (Edu).
Debian libdvd-pkg, /etc/apt/sources.list
contrib.

```
apt update
apt install libdvd-pkg
```

debconf, dpkg-reconfigure libdvd-pkg.

16.3

fonts-linex () "Abecedario" — .

17


17.1

LTSP.



Bullseye, LTSP

- SquashFS LTSP.

- LTSP. Debian Edu X2Go .
- LTSP LTSP GOsa². .
- LTSP, **LTSP**. *LTSP* man ltsp. , ltsp image / SquashFS Debian Edu), ltsp initrd /boot), ltsp ipxe iPXE (LTSP. **debian-edu-ltsp-install** — ltsp, ltsp initrd ltsp ipxe. (— 64-Bit 32-Bit). man debian-edu-ltsp-install . *debian-edu-ltsp-install*:
- `debian-edu-ltsp-install --diskless_workstation yes SquashFS ()`.
- `debian-edu-ltsp-install --diskless_workstation yes --thin_type bare 64-` .
- `debian-edu-ltsp-install --arch i386 --thin_type bare 32- (chroot SquashFS)`. `bare () (, desktop Firefox ESR display () desktop (, ') display (, desktop)`. **debian-edu-ltsp-ipxe** — ltsp ipxe. , /srv/tftp/ltsp/ltsp.ipxe Debian Edu. [server] /etc/ltsp/ltsp.conf , ' iPXE (, -). **debian-edu-ltsp-initrd** — ltsp initrd. , initrd (/srv/tftp/ltsp/ltsp.img) . [clients] /etc/ltsp/ltsp.conf. **debian-edu-ltsp-chroot** — *ltsp-chroot*, LTSP5. LTSP chroot (, ,). LTSP, () . GOsa². PXE (X-) LTSP LTSP. Debian Edu  Xfce): -> X2Go, (Tweaks) Window Manager -> (Compositor). **LTSP** LTSP , " " (non-free) . PXE , XXX.bin, initrd LTSP " " . LTSP :

- , () :

```
apt update && apt search ^firmware-
```

- , (), , firmware-linux, :

```
apt -y -q install firmware-linux
```

- SquashFS , :

```
debian-edu-ltsp-install --diskless_workstation yes
```

- X2Go, :

```
/usr/share/debian-edu-config/tools/ltsp-addfirmware -h
```

- .
SquashFS, . chroot /srv/ltsp/x2go-bare-amd64:

```
ltsp image x2go-bare-amd64
```

17.1.1 LTSP

LTSP Ethernet: 10.0.0.0/8 (),
(LTSP).
— , — iPXE. 5
.
iPXE /etc/ltsp/ltsp.conf. -1
. debian-edu-ltsp-ipxe.

17.1.2 LTSP

192.168.0.0/24 — LTSP, LTSP. LTSP
chroot i386 amd64 LTSP, LTSP
/etc/network/interfaces eth1. DNS DHCP 192.168.1.0/24.
- LDAP. ldapvi

17.1.3 LTSP chroot 32-

chroot SquashFS :

```
debian-edu-ltsp-install --arch i386 --thin_type bare
```

man debian-edu-ltsp-install.

17.1.4 LTSP

man ltsp.conf : <https://ltsp.org/man/ltsp.conf/>
[clients] /etc/ltsp/ltsp.conf . , :
debian-edu-ltsp-initrd

17.1.5 LTSP

LTSP .
LTSP .

17.1.6 USB CD-ROM/DVD

USB DVD/CD-ROM , ' ,
,
USB X2Go bare ('), '
Xfce .

17.1.6.1 LTSP

USB LTSP, LTSP ' .

17.1.7 , LTSP

- ' LTSP (USB,).
- LTSP GOSa² IP- .
- , <https://www.intern:631> ; AppSocket/HP
JetDirect () socket://<IP LTSP>:9100 ' URI.

17.2 PXE

PXE (Preboot eXecution Environment). LTSP Debian Edu
iPXE.

17.2.1 PXE

iPXE, , debian-edu-pxeinstall. /etc/debian-edu/pxeinstall.conf .

17.2.2 PXE

The PXE installation will inherit the language, keyboard layout and mirror settings from the settings used when installing the main-server, and the other questions will be asked during installation (profile, popcon participation, partitioning and root password). To avoid these questions, the file /etc/debian-edu/www/debian-edu-install.dat can be modified to provide preselected answers to debconf values. Some examples of available debconf values are already commented in /etc/debian-edu/www/debian-edu-install.dat. Your changes will be lost as soon as debian-edu-pxeinstall is used to recreate the PXE-installation environment. To append debconf values to /etc/debian-edu/www/debian-edu-install.dat during recreation with debian-edu-pxeinstall, add the file /etc/debian-edu/www/debian-edu-install.dat.local with your additional debconf values.

PXE / .

17.2.3


PXE

```
, , /etc/debian-edu/www/debian-edu-install.dat.local:

#add the skole projects local repository
d-i apt-setup/local1/repository string http://example.org/debian stable main ↔
    contrib non-free
d-i apt-setup/local1/comment string Example Software Repository
d-i apt-setup/local1/source boolean true
d-i apt-setup/local1/key string http://example.org/key.asc

/usr/sbin/debian-edu-pxeinstall.
```

17.3

debian-edu-config , 10.0.0.0/8 . /usr/share/debian-edu-config/tools/subnet
LDAP , .
 , Debian Edu, . 192.168.0.0/24 192.168.1.0/24
LTSP.

There is no easy way to change the DNS domain name. Changing it would require changes to both the LDAP structure and several files in the main server file system. There is also no easy way to change the host and DNS name of the main server (tjener.intern). To do so would also require changes to LDAP and files in the main-server and client file system. In both cases the Kerberos setup would have to be changed, too.

17.4

LTSP

xrdp x2goserver.

17.4.1 Xrdp

Xrdp , Microsoft Windows ,
LTSP, xrdp, —
, Windows ,
, xrdp , VNC RDP.

Xrdp comes without sound support; to compile the required modules this script could be used.

```
#!/bin/bash
# Script to compile / recompile xrdp PulseAudio modules.
# The caller needs to be root or a member of the sudo group.
# Also, /etc/apt/sources.list must contain a valid deb-src line.
set -e
if [[ $UID -ne 0 ]] ; then
    if ! groups | egrep -q sudo ; then
        echo "ERROR: You need to be root or a sudo group member."
        exit 1
    fi
fi
if ! egrep -q ^deb-src /etc/apt/sources.list ; then
    echo "ERROR: Make sure /etc/apt/sources.list contains a deb-src line."
    exit 1
fi
TMP=$(mktemp -d)
PULSE_UPSTREAM_VERSION="$(dpkg-query -W -f='${source:Upstream-Version}' pulseaudio)"
XRDP_UPSTREAM_VERSION="$(dpkg-query -W -f='${source:Upstream-Version}' xrdp)"
sudo apt -q update
```

```
# Get sources and build dependencies:
sudo apt -q install dpkg-dev
cd $TMP
apt -q source pulseaudio xrdp
sudo apt -q build-dep pulseaudio xrdp
# For pulseaudio 'configure' is all what is needed:
cd pulseaudio-$PULSE_UPSTREAM_VERSION/
./configure
# Adjust pulseaudio modules Makefile (needs absolute path)
# and build the pulseaudio modules.
cd $TMP/xrdp-$XRDUPSTREAM_VERSION/sesman/chansrv/pulse/
sed -i 's/^PULSE/#PULSE/' Makefile
sed -i "/#PULSE_DIR/a \
PULSE_DIR = $TMP/pulseaudio-$PULSE_UPSTREAM_VERSION" Makefile
make
# Copy modules to Pulseaudio modules directory, adjust rights.
sudo cp *.so /usr/lib/pulse-$PULSE_UPSTREAM_VERSION/modules/
sudo chmod 644 /usr/lib/pulse-$PULSE_UPSTREAM_VERSION/modules/module-xrdp*
# Restart xrdp, now with sound enabled.
sudo service xrdp restart
```

17.4.2 X2Go

X2Go LTSP ' - — — Linux,
 Windows macOS. . X2Go.
 , X2Go, killer LTSP (. 890517).

17.4.3

- freerdp-x11 RDP VNC.
- RDP - Windows. rdesktop.
- VNC (Virtual Network Computer) Skolelinux. xvnviewer.
- x2goclient — X2Go ().

17.5

freeRADIUS , . , *freeradius* *win-*
bind /usr/share/debian-edu-config/tools/setup-freeradius -server
 / . — EAP-TTLS/PAP PEAP-MSCHAPV2.
freeRADIUS.

- / (shared secret) (/etc/freeradius/3.0/clients.conf).
- / LDAP(/etc/freeradius/3.0/users).
- ' (/etc/freeradius/3.0/huntgroups)



End user devices need to be configured properly, these devices need to be PIN protected for the use of EAP (802.1x) methods. And most important: users need to be educated to install the freeradius CA certificate on their devices to be sure to connect to the right server. This way the password can't be caught in case of a malicious server. The site specific certificate is available on the internal network.

- <https://www.intern.freeradius-ca.pem> (Linux)
- <https://www.intern.freeradius-ca.crt> (Linux, Android)
- <https://www.intern.freeradius-ca.der> (macOS, iOS, iPadOS, Windows)

, Apple — mobileconfig. CA freeRADIUS, Windows

17.6 Windows Debian Edu pGina LDAP

17.6.1 pGina Debian Edu

, pGina (- -)
LDAP.
<https://www.gosa>, . **pguser** *pwd.777*.

17.6.2 pGina fork

pGina 3.9.9.12 , LDAP pGina:

C:\Program Files\pGina.fork\Plugins\pGina.Plugin.Ldap.dll

17.6.3 pGina

Debian Edu, LDAP SSL 636.
, pGina LDAP
(HKEY_LOCAL_MACHINE\SOFTWARE\pGina3.fork\Plugins\0f52390b-c781-43ae-bd62-553c77fa4cf7).

17.6.3.1 LDAP

- LDAP (): **10.0.2.2** (- " ")
- LDAP : **636** (' SSL)
- : 10
- SSL: ()
- TLS: ()
- : ()
- DN: **uid=pguser,ou=people,ou=Students,dc=skole,dc=skolelinux,dc=no**
- ("pguser" — LDAP)
- : *pwd.777* ("pguser")

17.6.3.2

' :

- :
- DN: ()
- : **(&(uid=%u)(objectClass=person))**

17.6.3.3

- `ldapurl` :
- `ldapurl` : LDAP: (`ldap://[server]:[port]`)
- `ldapurl` : (`ldap://[server]:[port]` ; `'`)

17.6.3.4 ()

- LDAP: `[v]`, `[v]`, `[v]`, `[_]`
- : `[v]`, `[v]` ()

17.6.3.5

- : LDAP,
- : LDAP,
- :
- <http://mutonufoai.github.io/pgina/download.html>
- <http://mutonufoai.github.io/pgina/documentation/plugins/ldap.html>
- <https://serverfault.com/questions/516072/how-to-configure-pgina-ldap-plugin>

18 Samba Debian Edu

Samba SMB2/SMB3 , `/etc/samba/smb-debian-edu.conf` .

As Samba has dropped the insecure SMB1 protocol, the option to setup Samba as NT4-style PDC is gone.

`site` , `'` , `/usr/share/debian-edu-config/smb.conf.edu-site` `/etc/samba.` `smb.conf.edu-`
`site` , `smb-debian-edu.conf`.

- `/etc/samba/smb.conf.edu-site`.
- Samba `smbpasswd` () GOsa².
- Samba `smbpasswd -d < >`, `smbpasswd -e < >`
- `chown root:teachers /var/lib/samba/usershares` (usershares)
"students".

18.1 Samba

Linux, Android, macOS, iOS, iPadOS, Chrome OS Windows ,
(). , Android, SMB2/SMB3,
(LAN). [X-plore](#) [Total Commander](#) [LAN](#) .
`\\tjener\<username>` `smb://tjener/<username>`.


19

Debian, , apt install <package> (root).

19.1

stable/education-development — , (,) . , , , Debian Edu.

19.2

 : , , Eoptes Veyon, Eoptes Veyon.

19.3

Squidguard e2guardian.

20

20.1

GOsa². <https://www.gosa/>.
GOsa² , Kerberos (krbPrincipalKey), LDAP (userPassword) Samba — .
PAM GDM, Kerberos (Samba GOsa² (LDAP)).
GOsa².

20.2 Java

Java " " OpenJDK Java runtime.

20.3

; , TLS. ,
exim4 , dpkg-reconfigure exim4-config.
Thunderbird, jdoe .
jdoe@postoffice.intern.

20.4 Thunderbird

- Thunderbird
- " "
- .

- , " " (SSO) Kerberos
- " "
- IMAP, SMTP, "STARTTLS" "Kerberos/GSSAPI"; ,
- " "

21

21.1 Contribute locally

Currently there are local teams in Norway, Germany, the region of Extremadura in Spain, Taiwan and France. "Isolated" contributors and users exist in Greece, the Netherlands, Japan and elsewhere.

The [support chapter](#) has explanations and links to localised resources, as *contribute* and *support* are two sides of the same coin.

21.2 Contribute globally

Internationally we are organised into various [teams](#) working on different subjects.

Most of the time, the [developer mailing list](#) is our main medium for communication, though we have monthly IRC meetings on #debian-edu on irc.debian.org and even, less frequently, real gatherings, where we meet each other in person. [New contributors](#) should read our <https://wiki.debian.org/DebianEdu/ArchivePolicy>.

, Debian Edu — .

21.3

Debian Edu uses the Debian [Bug Tracking System \(BTS\)](#). View existing bug reports and feature requests or create new ones. Please report all bugs against the package [debian-edu-config](#). Take a look at [How To Report Bugs](#) for more information on bug reporting in Debian Edu.

21.4

! - , : , , FIXME (" ").
(), , .

The source of the text is a wiki and can be edited with a simple webbrowser. Just go to <https://wiki.debian.org/DebianEdu/Documentation/Bullseye/> and you can contribute easily. Note: a user account is needed to edit the pages; you need to [create a wiki user](#) first.

— ! , , .

22

22.1

22.1.1

- <https://wiki.debian.org/DebianEdu>

- <https://lists.debian.org/debian-edu> -
- #debian-edu on irc.debian.org - IRC channel, mostly development related; do not expect real time support even though it frequently happens 😊

22.1.2

- #skolelinux irc.debian.org - IRC

22.1.3

- <https://lists.debian.org/debian-edu-german> -
- <https://www.skolelinux.de> - official German representation
- #skolelinux.de irc.debian.org - IRC

22.1.4

- <http://lists.debian.org/debian-edu-french> - support mailing list

22.2

, , <https://wiki.debian.org/DebianEdu/Help/ProfessionalHelp>.

23 New features in Debian Edu Bullseye

23.1 New features for Debian Edu 11 Codename Bullseye

23.1.1

- New version of Debian Installer from Debian Bullseye, see its [installation manual](#) for more details.
- New artwork based on the [Homeworld theme](#), the default artwork for Debian 11 Bullseye.
- Debian (chroot LTSP. (" " + " LTSP")
(X2Go) . SquashFS ()
LTSP ,

23.1.2

- , Debian 11 Bullseye, :
 - Linux 5.10
 - KDE Plasma 5.20, GNOME 3.38, Xfce 4.16, LXDE 11, MATE 1.24
 - LibreOffice 7.0
 - GCompris 1.0
 - Rosegarden 20.12
 - LTSP 21.01
 - Debian Bullseye 59000 .
 - More information about Debian 11 Bullseye is provided in the [release notes](#) and the [installation manual](#).

23.1.3

- 29 , 22 — .
- [Debian Edu Bullseye](#) , , , , , (), () .
- .

23.1.4

- TLS/SSL . Debian Edu-CA .
- LTSP, , . X2Go.
- Netboot () iPXE PXELINUX — LTSP.
- `/var/lib/tftpboot` `/srv/tftp`.
- *LTSP*, PXE `debian-edu-pxeinstall`.
- Firefox ESR Chromium DuckDuckGo.
- Chromium Google.
- Kerberos TGT .
- freeRADIUS EAP-TTLS/PAP PEAP-MSCHAPV2.
- Samba " " SMB2/SMB3; .
- GOSa² , ' Samba, Samba LDAP.
- PXE Debian () .
- CUPS `ipp.intern`, CUPS , `printer-admins`.
- Icinga .

23.1.5

- see [the Debian Edu Bullseye status page](#).

24

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"GPL v2 - ' " . ! ,

25

The Debian Edu Bullseye Manual is fully translated to Dutch, French, German, Italian, Japanese, Norwegian Bokmål, Portuguese (Portugal) and Simplified Chinese.

On Weblate, work is in progress for translations to Polish, Romanian, Swedish and Traditional Chinese.

There is an [online overview of shipped translations](#).

25.1

25.1.1 PO

As in many free software projects, translations of this document are kept in PO files. More information about the process can be found in `/usr/share/doc/debian-edu-doc/README.debian-edu-buster-manual-translations`.

25.1.2

Some language teams have decided to translate via Weblate. See <https://hosted.weblate.org/projects/debian-edu-documentation/debian-edu-bullseye/> for more information.

26 A – GNU

26.1 Manual for Debian Edu 11 Codename Bullseye

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END OF TERMS AND CONDITIONS

27 Appendix B - no Debian Edu Live CD/DVDs for Bullseye yet



Debian Edu Live CD/DVDs for Bullseye are not available at the moment.

27.1 Features of the Standalone image

- XFCE desktop
- All packages from the Standalone profile
- All packages from the laptop task

27.2 Features of the Workstation image

- XFCE desktop
- All packages from the Workstation profile
- All packages from the laptop task

27.3 Activating translations and regional support

To activate a specific translation, boot using `locale=ll_CC.UTF-8` as a boot option, where `ll_CC.UTF-8` is the locale name you want. To activate a given keyboard layout, use the `keyb=KB` option where `KB` is the desired keyboard layout. Here is a list of commonly used locale codes:

Language (Region)	Locale value	Keyboard layout
Norwegian Bokmål	nb_NO.UTF-8	no
Norwegian Nynorsk	nn_NO.UTF-8	no
German	de_DE.UTF-8	de



French (France)	fr_FR.UTF-8	fr
Greek (Greece)	el_GR.UTF-8	el
Japanese	ja_JP.UTF-8	jp
Northern Sami (Norway)	se_NO	no(smi)

A complete list of locale codes is available in `/usr/share/i18n/SUPPORTED`, but only the UTF-8 locales are supported by the live images. Not all locales have translations installed, though. The keyboard layout names can be found in `/usr/share/keymaps/amd64/`.

27.4 Stuff to know

- The password for the user is "user"; root has no password set.

27.5 Known issues with the image

-  There are no images yet 

28 Appendix C - Features in older releases

28.1 New features for Debian Edu 10+edu0 Codename Buster released 2019-07-06

28.1.1

- This is the first time Debian Edu installation images are available at <https://cdimage.debian.org>, thus these are official Debian images.
- New version of debian-installer from Debian Buster, see its [installation manual](#) for more details.
- New artwork based on the [futurePrototype theme](#), the default artwork for Debian 10 Buster.
- New default desktop environment Xfce (replacing KDE).
- New CFEngine configuration management (replacing unmaintained package cfengine2 with cfengine3); this is a major change, for details see [the official CFEngine documentation](#).
- The architecture of the LTSP chroot now defaults to the server one.

28.1.2

- Everything which is new in Debian 10 Buster, eg:
 - Linux kernel 4.19
 - Desktop environments KDE Plasma Workspace 5.14, GNOME 3.30, Xfce 4.12, LXDE 0.99.2, MATE 1.20
 - Firefox 60.7 ESR and Chromium 73.0
 - LibreOffice 6.1
 - Educational toolbox GCompris 0.95
 - Music creator Rosegarden 18.12

- GOsa 2.74
- LTSP 5.18
- Debian Buster includes more than 57000 packages available for installation.
- More information about Debian 10 Buster is provided in the [release notes](#) and the [installation manual](#).

28.1.3

- Translation updates for the templates used in the installer. These templates are now available in 76 languages, of which 31 are fully translated. The profile choice page is available in 29 languages, of which 19 are fully translated.
- The Debian Edu Buster Manual is fully translated to French, German, Italian, Danish, Dutch, Norwegian Bokmål and Japanese.
 - Partly translated versions exist for Polish, Spanish, Simplified Chinese and Traditional Chinese.

28.1.4

- The BD ISO image can be used for offline installations again.
 - New school level related meta-packages *education-preschool*, *education-primaryschool*, *education-secondaryschool* and *education-highschool* are available. None of them is installed by default.
 - Some packages rather belonging to preschool or primaryschool level (like *gcompris-qt*, *childsplay*, *tuxpaint* or *tuxmath*) are no longer installed by default.
 - Site specific modular installation. It is now possible to install only those educational packages that are actually wanted. See the [installation](#) chapter for more information.
 - Site specific multi-language support. See the [Desktop](#) chapter for more information.
 - LXQt 0.14 is offered as a new choice for the desktop environment.
 - New GOsa²-Plugin *Password Management*.
 - Unusable options have been removed from the GOsa² web interface.
 - New netgroup available to exclude systems belonging to the *shut-down-at-night-hosts* netgroup from being woken up.
 - New tool Standardskriver (Default printer). See the [Administration](#) chapter for more information.
 - New tool Desktop-autoloader. It allows performance improvements for LTSP diskless clients. See the [NetworkClients](#) chapter for more information.
 - Improved TLS/SSL support inside the internal network. A RootCA certificate is used to sign server certificates and user home directories are configured to accept it at account creation time; besides Firefox ESR, also Chromium and Konqueror can now use HTTPS without the need to allow insecure connections.
 - Kerberized *ssh*. A password isn't needed anymore for connections inside the internal network; root needs to run `kinit` first to enable it.
 - Kerberized NFS. It is now possible to use more secure home directory access, see the [Administration](#) chapter for more information.
 - Added configuration file `/etc/debian-edu/pxeinstall.conf` with examples to make site specific changes easier.
 - Added configuration file `/etc/ltsp/ltsp-build-client.conf` with examples to make site specific changes easier.
 - New tool `/usr/share/debian-edu-config/tools/edu-ldap-from-scratch`. It allows to re-generate the LDAP database just like it has been right after the main server installation. The tool might also be useful to make site specific changes easier.
-

- With *X2Go server* now available in Debian, the related packages are now installed on all systems with Profile *LTSP-Server*.
- Support for running Java applets in the Firefox ESR browser has been dropped upstream.
- Support for nonfree flash has been dropped from the Firefox ESR browser.
- Like it has been before Stretch, Debian 10 doesn't install the `unattended-upgrades` package by default, see the [Maintenance](#) chapter for more information about security upgrades.

28.2 New features for Debian Edu 9+edu0 Codename Stretch released 2017-06-17

28.2.1

- New version of `debian-installer` from Debian Stretch, see its [installation manual](#) for more details.
- The "Thin-Client-Server" profile has been renamed to "LTSP-Server" profile.
- New artwork based on the "[soft Waves](#)" theme, the default artwork for Debian 9 Stretch.

28.2.2

- Everything which was new in Debian 9 Stretch, eg:
 - Linux kernel 4.9
 - Desktop environments KDE Plasma Workspace 5.8, GNOME 3.22, Xfce 4.12, LXDE 0.99.2, MATE 1.16
 - * KDE Plasma Workspace is installed by default; to choose one of the others see this manual.
 - Firefox 45.9 ESR and Chromium 59
 - * Iceweasel has been re-renamed to Firefox! 😊
 - Icedove has been re-renamed to Thunderbird and is now installed by default.
 - LibreOffice 5.2.6
 - Educational toolbox GCompris 15.10
 - Music creator Rosegarden 16.06
 - GOsa 2.7.4
 - LTSP 5.5.9
 - Debian Stretch includes more than 50000 packages available for installation.
 - More information about Debian 9 Stretch is provided in the [release notes](#) and the [installation manual](#).

28.2.3

- Translation updates for the templates used in the installer. These templates are now available in 29 languages.
- The Debian Edu Stretch Manual is fully translated to German, French, Italian, Danish, Dutch, Norwegian Bokmål and Japanese. The Japanese translation was newly added for Stretch.
 - Partly translated versions exist for Spanish, Polish and Simplified Chinese.

28.2.4

- Icinga replaces Nagios as monitoring tool.
- kde-spectacle replaces ksnapshot as screenshot tool.
- The free flash player gnash is back again.
- Plymouth is installed and activated by default, except for the 'Main Server' and 'Minimal' profiles; pressing ESC allows to view boot and shutdown messages.
- Upon upgrade from Jessie the LDAP data base has to be adjusted. The sudoHost value 'tjener' has to be replaced with 'tjener.intern' using GOSa² or an LDAP editor.
- The 32-bit PC support (known as the Debian architecture i386) now no longer covers a plain i586 processor. The new baseline is the i686, although some i586 processors (e.g. the "AMD Geode") will remain supported.
- Debian 9 enables unattended upgrades (for security updates) by default for new installations. This might cause a delay of about 15 minutes if a system with a low uptime value is powered off.
- LTSP now uses NBD instead of NFS for the root filesystem. After each single change to an LTSP chroot, the related NBD image must be regenerated (`ltsp-update-image`) for the changes to take effect.
- Concurrent logins of the same user on LTSP server and LTSP thin client are no longer allowed.

28.3

Debian Edu, :

- Debian Edu 8+edu0 Jessie 2016-07-02.
- Debian Edu 7.1+edu0 Wheezy 2013-09-28.
- Debian Edu 6.0.7+r1 Squeeze, 2013-03-03.
- Debian Edu 6.0.7+r1 Squeeze, 2013-03-03.
- Debian Edu 6.0.4+r0 Squeeze, 2012-03-11.
- Debian Edu 5.0.6+edu1 Lenny, 2010-10-05.
- Debian Edu 5.0.4+edu0 Lenny, 2010-02-08.
- Debian Edu 3.0r1 Terra, 2007-12-05.
- Debian Edu 3.0r0 Terra 2007-07-22. Debian 4.0 Etch, 2007-04-08.
- Debian Edu 2.0, 2006-03-14. Debian 3.1 Sarge, 2005-06-06.
- Debian Edu 1.0 Venus 2004-06-20. Debian 3.0 Woody, 2002-07-19.

C Jessie; / .