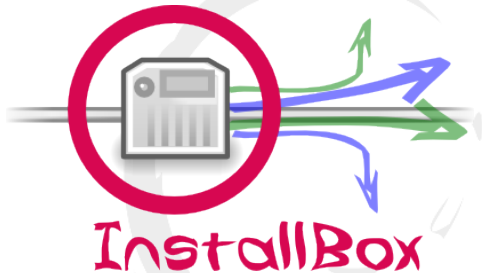


# apt install YOUR-NEIGHBORHOOD

Automatic Installation of Debian GNU/Linux

Andreas B. Mundt  
andi@debian.org



Your neighborhood ...

YOUR-NEIGHBORHOOD is now sitting  
in the NEW-queue, waiting for  
ftp-masters' approval ...

Just kidding ;-)



Your neighborhood ...

YOUR-NEIGHBORHOOD is now sitting  
in the NEW-queue, waiting for  
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Just kidding ;-)



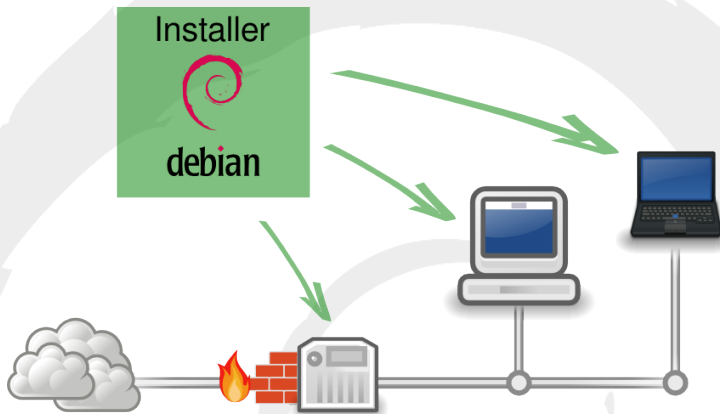
Every fortnight in the local pub . . .



- GNU/Linux meeting, workshop, helpdesk, . . .
- everybody is invited to drop by and help, get help, chat, . . .
- . . .or bring a laptop/computer ready to install Debian.



# How to install and configure Debian GNU/Linux?



- fetch installer media
- run the installation

- boot the system
- manual configuration



# Install Party

## Debian GNU/Linux Install-Party

Laptop/Rechner mitbringen

Debian ausprobieren und installieren  
(Dual Boot\*)

Sonntag, 1. Juni 2014, ab 17h

"Zum fröhlichen Nix"  
Blzubeuren

Debian ist ein komplettes Betriebssystem, bestehend aus Freier Software:  
Web-Browser, Office-Programme, E-mail, Bildbearbeitung, Multimedia, ...

Freie Software sind Programme, deren Lizenz die Freiheit der Benutzer in den Mittelpunkt stellt. Dazu gehört die Kontrolle über Software (durch Verfügbarkeit des Quellcodes für Analyse und Änderungen) sowie die Erlaubnis, diese Programme samt Verbesserungen zu verbreiten.

Eintritt frei!

\* Ein vorhandenes Betriebssystem muss installiert werden. Backups aller wichtigen Daten anfertigen!

## Debian GNU/Linux Install-Party

Laptop/Rechner mitbringen

Debian ausprobieren und installieren  
(Dual Boot\*)

12:00h bis 14:00h,  
Raum W1

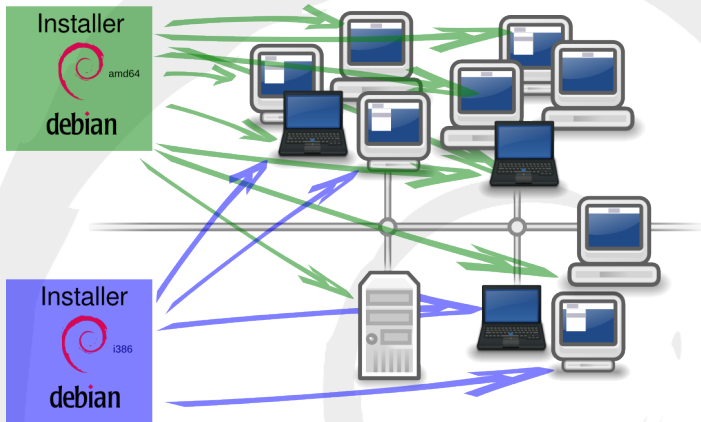
Debian ist ein komplettes Betriebssystem, bestehend aus Freier Software:  
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debian<sup>8</sup>  
jessie

\* Ein vorhandenes Betriebssystem muss installiert werden. Backups aller wichtigen Daten anfertigen!

... what about more and more installations ... ???



?



# Idea:

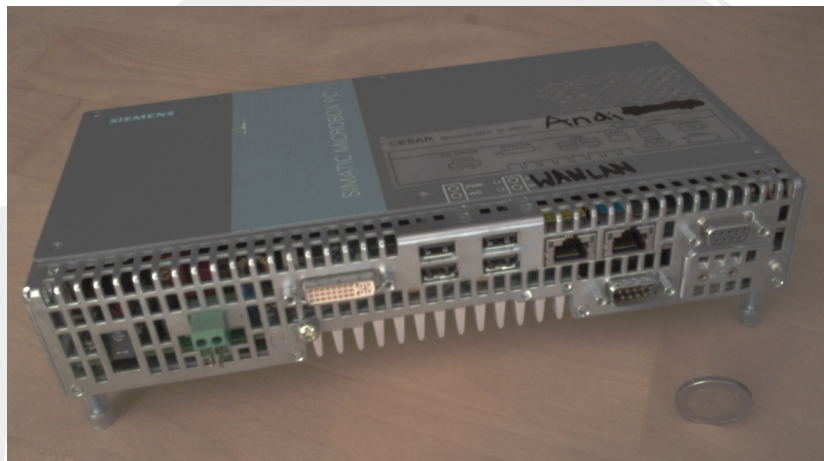


InstallBox





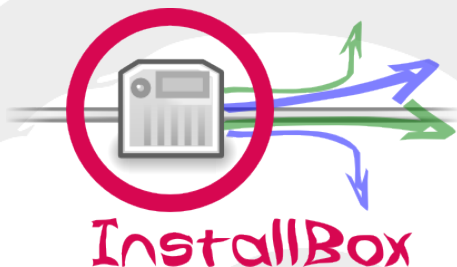
## The InstallBox in real hardware ...



... or just use a virtual machine on your laptop<sup>1</sup> ...

<sup>1</sup>Use the host's wlan NATed as external interface and bridge the internal LAN interface to the hardware interface.





- **(Virtual) Hardware**

- ▶ 2 NICs
- ▶ ~ 10 GiB disk space

- **Network Configuration**

- ▶ external network (WAN):  
DHCP
- ▶ internal network (LAN):  
192.168.0.0/24

- **Debian Netboot Installer**

- ▶ PXE boot, netinstall
- ▶ boot menu: amd64, i386, ...

- **Services (LAN)**

- ▶ DHCP, DNS and TFTP
- ▶ package cache



# Overview

- 1 Introduction and Motivation
- 2 The InstallBox: Installation and Configuration**
  - DHCP and DNS: dnsmasq
  - TFTP and Netboot Installer: di-netboot-assistant
  - IP-Forwarding: shorewall
  - Redirection and Package Cache: squid
- 3 Preseeding
- 4 Debian-LAN: Fully Automatic Installation with FAI
- 5 Summary and Conclusions



## DHCP and DNS: preparations

Start with a standard jessie installation (ssh-server but no desktop):

- eth0 is connected to the internet (DHCP)
- eth1 is not yet connected

After first boot:

Install etckeeper:

```
apt install etckeeper
```

Append static configuration for internal (LAN) interface:

```
cat >> /etc/network/interfaces <<EOF
allow-hotplug eth1
iface eth1 inet static
    address 192.168.0.10
    netmask 255.255.255.0
EOF
```

## DHCP and DNS: preparations

Start with a standard jessie installation (ssh-server but no desktop):

- eth0 is connected to the internet (DHCP)
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After first boot:

Install etckeeper:

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iface eth1 inet static
    address 192.168.0.10
    netmask 255.255.255.0
EOF
```

# DHCP and DNS: install and configure dnsmasq

## Install dnsmasq:

```
apt install dnsmasq
```

## Modifications in /etc/dnsmasq.conf:

```
-#interface=
```

```
+interface=eth1
```

```
-#dhcp-range=192.168.0.50,192.168.0.150,12h
```

```
+dhcp-range=192.168.0.50,192.168.0.150,2h
```



## TFTP and Netboot Installer: di-netboot-assistant

Install and prepare di-netboot-assistant:

```
apt install di-netboot-assistant
mkdir /var/lib/tftpboot
di-netboot-assistant install jessie
di-netboot-assistant install jessie --arch=i386
```

Configure dnsmasq' built-in tftp server in /etc/dnsmasq.conf:

```
-#dhcp-boot=pxelinux.0
+dhcp-boot=debian-installer/pxelinux.0

-#enable-tftp
+enable-tftp

-#tftp-root=/var/ftpd
+tftp-root=/var/lib/tftpboot
```

So far ...

Restart dnsmasq:

```
systemctl restart dnsmasq.service
```



- ✓ DHCP IP address
- ✓ DNS resolution
- ✓ PXE installer boot
- ✗ web access
- ✗ package cache





# IP-Forwarding with shorewall<sup>2</sup>

## Install shorewall

```
apt install shorewall
```

## /etc/default/shorewall

```
-startup=0  
+startup=1
```

## /etc/shorewall/shorewall.conf

```
-IP_FORWARDING=Keep  
+IP_FORWARDING=Yes
```

## Fetch two-interfaces example configuration:

```
cd /usr/share/doc/shorewall/examples/two-interfaces/  
cp interfaces masq policy rules stoppedrules zones \  
/etc/shorewall/
```

---

<sup>2</sup>Alternative approach: Enable packet forwarding for IPv4 by uncommenting  
`#net.ipv4.ip_forward=1` in `/etc/sysctl.conf`.

# IP-Forwarding with shorewall

Modify /etc/shorewall/policy:

-loc	net	ACCEPT
+loc	all	ACCEPT
+\$FW	all	ACCEPT

Modify /etc/shorewall/rules:

-SSH(ACCEPT)	loc	\$FW
+SSH(ACCEPT)	all	\$FW



- ✓ DHCP IP address
- ✓ DNS resolution
- ✓ PXE installer boot
- ✓ web access
- ✗ package cache



# Package Cache: squid

## Install squid3

```
apt install squid3
```

## /etc/squid3/squid3.conf

```
-#acl localnet src 192.168.0.0/16      # RFC1918 possible internal
+acl localnet src 192.168.0.0/16      # RFC1918 possible internal

-#http_access allow localnet
+http_access allow localnet
  http_access allow localhost

# maximum_object_size_in_memory 512 KB
+maximum_object_size_in_memory 10240 KB

# maximum_object_size 4 MB
+maximum_object_size 512 MB

#cache_dir ufs /var/spool/squid3 100 16 256
+cache_dir aufs /var/spool/squid3 10000 16 256
```

## Package Cache: squid

### Package cache<sup>3</sup>/etc/squid3/squid3.conf

```
# Add any of your own refresh_pattern entries above these.
#
+# refresh pattern for debs and udebs
+refresh_pattern deb$    129600 100% 129600
+refresh_pattern udeb$   129600 100% 129600
+refresh_pattern tar.gz$ 129600 100% 129600
+refresh_pattern tar.xz$ 129600 100% 129600
+refresh_pattern tar.bz2$ 129600 100% 129600
+
+# always refresh Packages and Release files
+refresh_pattern \/(Packages|Sources)(|\.bz2|\.gz|\.xz)$ \
                                0 0% 0 refresh-ims
+refresh_pattern \/(Release(|\.gpg))$ 0 0% 0 refresh-ims
+refresh_pattern \/(InRelease)$ 0 0% 0 refresh-ims
```

<sup>3</sup> <https://sources.debian.net/src/squid-deb-proxy/0.8.11/squid-deb-proxy.conf/>

## Intercepting Package Cache

We want the clients to use the package cache transparently<sup>4</sup>.

```
/etc/shorewall/rules
```

```
ACCEPT          $FW          net          icmp
#
+REDIRECT       loc          3129         tcp          www
```

```
/etc/squid3/squid3.conf
```

```
# Squid normally listens to port 3128
http_port 3128
+http_port 3129 intercept
```

```
Test with: tailf /var/log/squid3/access.log
```

```
... TCP_MISS/200 ... GET http://.../debian-lan-config_0.21_all.deb ...
... TCP_MEM_HIT/200 ... GET http://.../debian-lan-config_0.21_all.deb ...
```

---

<sup>4</sup>Without explicitly telling clients to do so.

# Done!



- ✓ DHCP IP address
- ✓ DNS resolution
- ✓ PXE installer boot
- ✓ web access
- ✓ package cache



## ... PXE Booting the Client ...

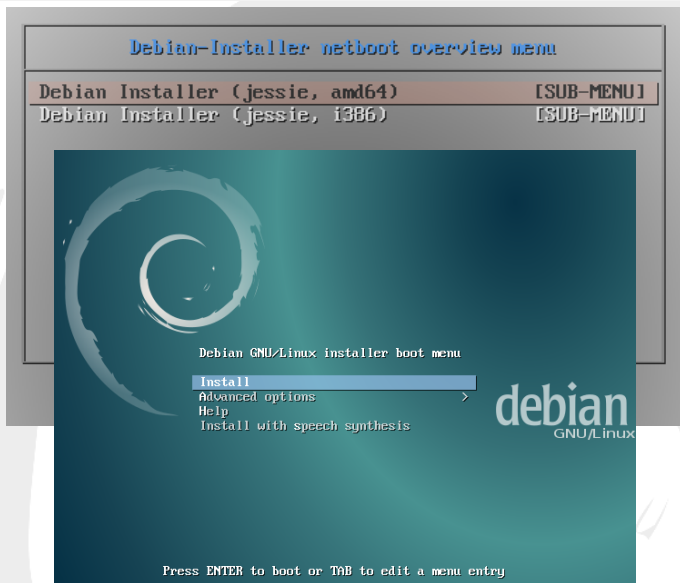
Debian-Installer netboot overview menu

Debian Installer (jessie, amd64)	[SUB-MENU]
Debian Installer (jessie, i386)	[SUB-MENU]

Press [Tab] to edit options



# ... PXE Booting the Client ...

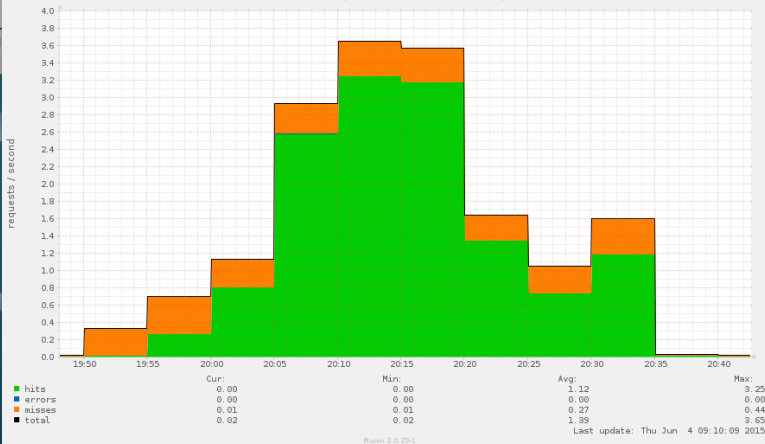




# ... PXE Booting the Client ...

## Debian-Installer netboot overview menu

Squid client requests - from Wed Jun 3 19:48:05 2015 to Wed Jun 3 20:42:32 2015



Press ENTER to boot or TAB to edit a menu entry

# Overview

- 1 Introduction and Motivation
- 2 The InstallBox: Installation and Configuration
- 3 Preseeding
  - Answering Questions
  - Providing the Preconfiguration
  - Example `preseed.cfg`
  - Boot Parameters
  - Completely Automatic Installation
- 4 Debian-LAN: Fully Automatic Installation with FAI
- 5 Summary and Conclusions





## How is it done?

- Prepare a preconfiguration file<sup>6</sup>
- Make it available (http, tftp, ...)
- Tell the installer where and how to fetch the file

Use the InstallBox' TFTP server:

```
cd /var/lib/tftpboot
mkdir -p d-i/jessie/
cp /path/to/preseed.cfg /var/lib/tftpboot/d-i/jessie/
```

Make "installbox" resolvable for the clients:

Modify /etc/hosts:

```
127.0.0.1    localhost
-127.0.1.1  installbox
+127.0.1.1  localhost
+192.168.0.10 installbox
```

<sup>6</sup><https://www.debian.org/releases/jessie/example-preseed.txt>

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```

<sup>6</sup><https://www.debian.org/releases/jessie/example-preseed.txt>

# The Preseed File

```
/var/www/html/d-i/jessie/preseed.cfg
```

```
## Skip root account:
```

```
d-i passwd/root-login boolean false
```

```
## Apt setup:
```

```
d-i apt-setup/non-free boolean true
```

```
d-i apt-setup/contrib boolean true
```

```
d-i mirror/http/mirror string ftp-stud.hs-esslingen.de
```

```
d-i mirror/http/mirror seen false
```

```
## Package selection:
```

```
tasksel tasksel/desktop multiselect kde
```

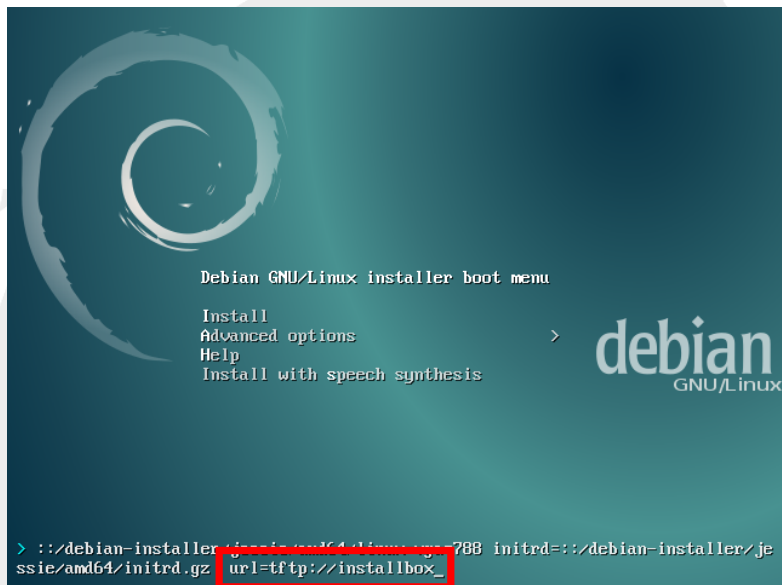
```
## Individual additional packages to install:
```

```
d-i pkgsel/include string firmware-linux xul-ext-adblock-plus
```

```
## This command is run just before the install finishes:
```

```
d-i preseed/late_command string in-target \  
systemctl enable systemd-timesyncd.service
```

# Installer Boot Parameter



The image shows a terminal window with a teal background and a white spiral logo in the top left. The text in the terminal is as follows:

```
Debian GNU/Linux installer boot menu

Install
Advanced options >
Help
Install with speech synthesis

> ::/debian-installer/g... url=tftp://installbox_
```

The terminal prompt is currently on the line `> ::/debian-installer/g... url=tftp://installbox_`, where the text `url=tftp://installbox_` is highlighted with a red rectangular box.



# Installer Boot Parameter

```
Jun 10 16:51:52 netcfg[1526]: DEBUG: Success!  
Jun 10 16:51:52 netcfg[1526]: DEBUG: Writing DHCP stanza for eth0  
Jun 10 16:51:52 netcfg[1526]: INFO: Detected eth0 as a hotpluggable device  
Jun 10 16:51:52 netcfg[1526]: DEBUG: Success!  
Jun 10 16:51:53 main-menu[162]: (process:1525): udhcpd (v1.22.1) started  
Jun 10 16:51:53 main-menu[162]: (process:1525): Sending discover...  
Jun 10 16:51:53 main-menu[162]: (process:1525): Sending select for 192.168.0.71...  
Jun 10 16:51:53 main-menu[162]: (process:1525): Lease of 192.168.0.71 obtained, lease time 3600  
Jun 10 16:51:53 main-menu[162]: DEBUG: resolver (libc6-udeb): package doesn't exist (ignored)  
Jun 10 16:51:53 main-menu[162]: INFO: Menu item 'network-preseed' selected  
Jun 10 16:51:53 preseed: successfully loaded preseed file from tftp://installbox/d-i/jessie/./preseed.cfg  
Jun 10 16:51:53 main-menu[162]: DEBUG: resolver (libc6-udeb): package doesn't exist (ignored)  
Jun 10 16:51:53 main-menu[162]: INFO: Menu item 'choose-mirror' selected  
Jun 10 16:51:53 anna-install: Queuing udeb apt-mirror-setup for later installation
```

```
> ::/debian-installer/jessie/amd64/linux-logs-788 initrd=::/debian-installer/jessie/amd64/initrd.gz url=tftp://installbox_
```

# Installer Boot Parameter

Please press Enter to activate this console.

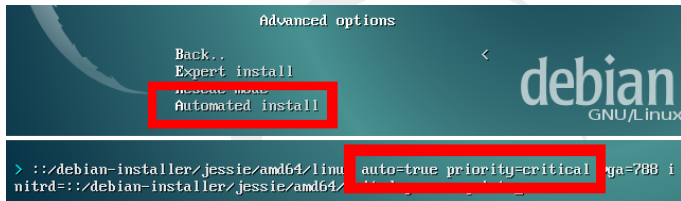
BusyBox v1.22.1 (Debian 1:1.22.0-9+deb8u1) built-in shell (ash)  
Enter 'help' for a list of built-in commands.

```
~ # grep preseed /var/log/syslog
Jun 10 16:51:53 main-menu[162]: INFO: Menu item 'network-preseed' selected
Jun 10 16:51:53 preseed: successfully loaded preseed file from tftp://installbox/d-i/jessie/./preseed.cfg
Jun 10 16:51:53 ~ #
Jun 10 16:51:53 main-menu[162]: (process:1525): Sending discover...
Jun 10 16:51:53 main-menu[162]: (process:1525): Sending select for 192.168.0.71...
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```

```
> ::/debian-installer/jessie/amd64/linutils-gdb-788 initrd=::/debian-installer/jessie/amd64/initrd.gz url=tftp://installbox_
```

## Further Notes

- Preconfiguration files may be specified by the DHCP server<sup>7</sup>.
- Boot parameters can also be used to preseed questions<sup>8</sup>.
- Use the boot parameter “DEBCONF\_DEBUG=5” to find variables that need to be preseeded.
- Default values can be modified as well<sup>9</sup>.
- The boot parameters “auto=true priority=critical” delays the locale and keyboard questions until after there has been a chance to preseed them (i.e. until the network is up)<sup>10</sup>.



<sup>7</sup> <https://www.debian.org/releases/jessie/amd64/apbs02.html.en#preseed-dhcp>

<sup>8</sup> <https://www.debian.org/releases/jessie/amd64/apbs02.html.en#preseed-bootparms>

<sup>9</sup> <https://www.debian.org/releases/jessie/amd64/apbs05.html.en#preseed-seenflag>

<sup>10</sup> <https://www.debian.org/releases/jessie/amd64/apbs02.html.en#preseed=auto>

# Completely Automatic Installation

- Add necessary boot parameters to di-netboot-assistant
- Preseed all questions asked
- Boot preseeded installer entry automatically by default

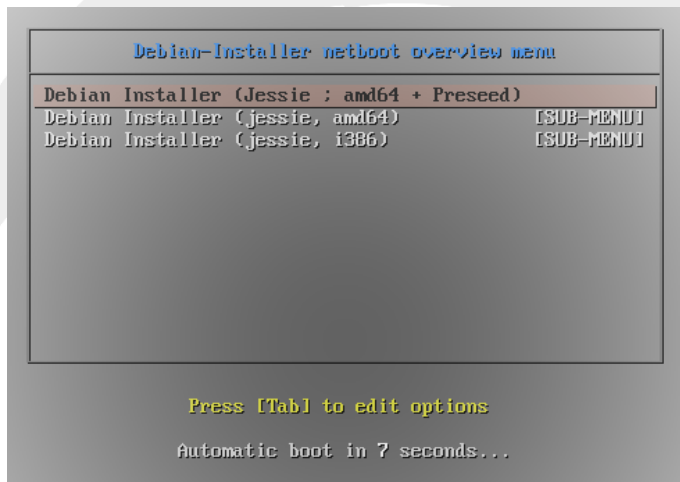
Modify `/etc/di-netboot-assistant/pxelinux.HEAD`:

```
+LABEL quick
+  MENU LABEL Debian Installer (Jessie ; amd64 + Preseed)
+  kernel ::/debian-installer/jessie/amd64/linux
+  append initrd=::/debian-installer/jessie/amd64/initrd.gz \
          auto=true priority=critical url=tftp://installbox
+TIMEOUT 100
```

Execute:

```
di-netboot-assistant rebuild-menu
```

# Done!



## Debian-Installer netboot overview menu

Debian Installer (Jessie ; amd64 + Preseed)

Debian Installer (jessie, amd64)

[SUB-MENU]

Debian Installer (jessie, i386)

[SUB-MENU]

```
> ::/debian-installer/jessie/amd64/linux initrd=::/debian-installer/jessie/amd64/initrd.gz auto=true priority=critical url=tftp://installbox_
```

Press [Tab] to edit options

Automatic boot in 7 seconds...



# Limitations

Preseeding is fine for more or less standard installations. For more complex configurations, limitations are obvious:

- Complicated preconfiguration file
- Not very structured, fragile
- Limited logging capabilities
- Inefficient testing
- ...

## Solution:

Use a configuration management utility<sup>11</sup> like puppet, chef, ansible, cfengine, ..., or FAI.

---

<sup>10</sup>[https://en.wikipedia.org/wiki/Comparison\\_of\\_open-source\\_configuration\\_management\\_software](https://en.wikipedia.org/wiki/Comparison_of_open-source_configuration_management_software)

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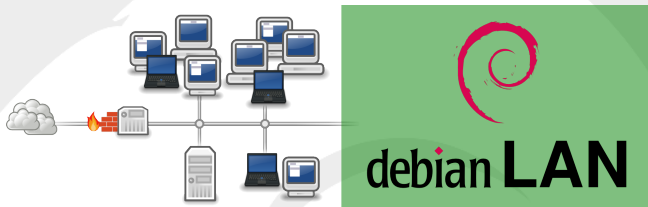
# Overview

- 1 Introduction and Motivation
- 2 The InstallBox: Installation and Configuration
- 3 Preseeding
- 4 Debian-LAN: Fully Automatic Installation with FAI**
  - The Debian-LAN Project
  - A short Introduction to FAI
  - Debian-LAN FAI Classes
  - Installation Procedure
- 5 Summary and Conclusions



# The Debian-LAN Project<sup>12</sup>

The goal of the "Debian Local Area Network Project is to make setting up a local network as easy as possible in Debian.



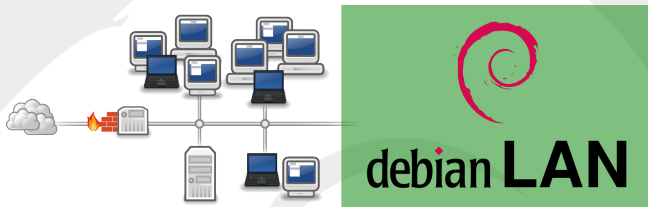
## Challenges:

- simple installation/setup, maintenance and upgrade
- flexibility to implement local modifications and extensions
- only use Debian stable repositories

<sup>12</sup><https://wiki.debian.org/DebianLAN>

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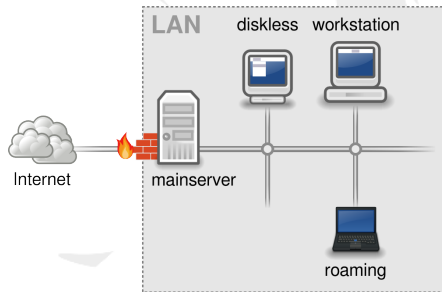
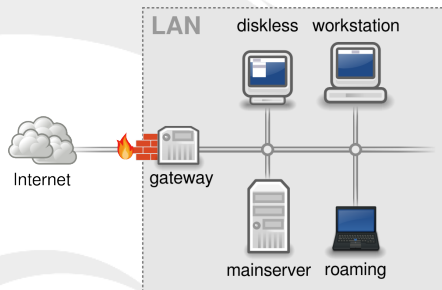
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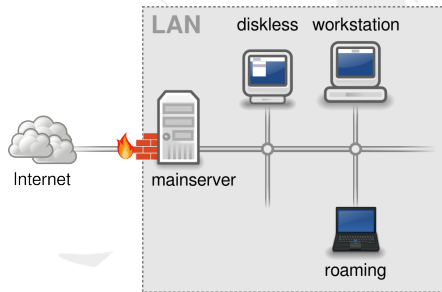
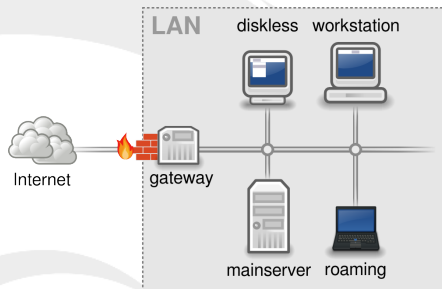
# The Debian-LAN System

- **gateway:**
  - ▶ firewall, masquerading
- **mainserver** (provides all services):
  - ▶ authentication (Kerberos)
  - ▶ directory service (LDAP)
  - ▶ kerberized NFSv4 homes
  - ▶ email: SMTP/IMAP Server
  - ▶ ...
- **workstation** (desktop):
  - ▶ Gnome, KDE, Xfce, LXDE, ...
  - ▶ customized package selection
- **diskless** (workstation):
  - ▶ root-FS mounted from mainserver, PXE-boot
- **roaming** (workstation):
  - ▶ credentials cached for off-line use



# The Debian-LAN System

- **gateway:**
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- **workstation** (desktop):
  - ▶ Gnome, KDE, Xfce, LXDE, ...
  - ▶ customized package selection
- **diskless** (workstation):
  - ▶ root-FS mounted from mainserver, PXE-boot
- **roaming** (workstation):
  - ▶ credentials cached for off-line use



# The Debian-LAN System

- **gateway:**

- ▶ firewall, masquerading

- **mainserver** (provides all services):

- ▶ authentication (Kerberos)
- ▶ directory service (LDAP)
- ▶ kerberized NFSv4 homes
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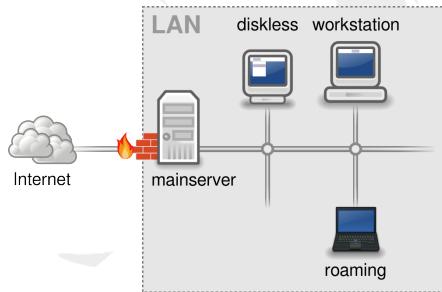
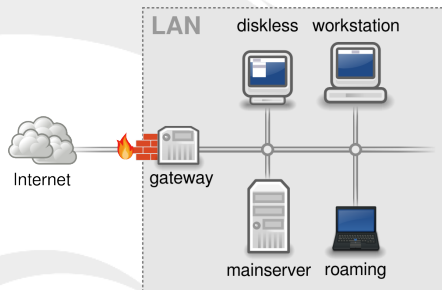
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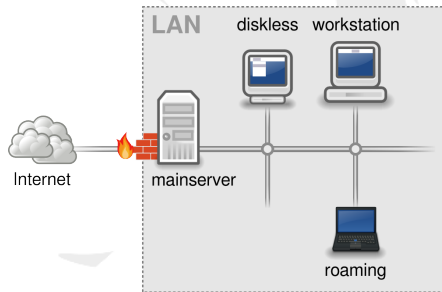
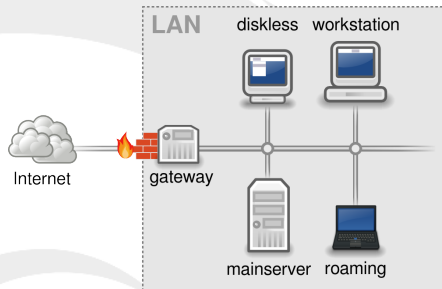
- **roaming** (workstation):

- ▶ credentials cached for off-line use



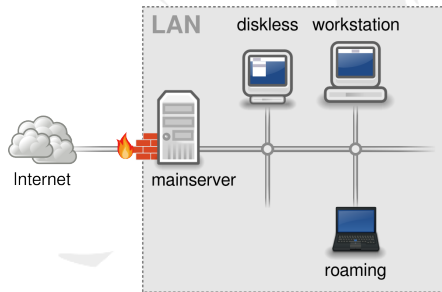
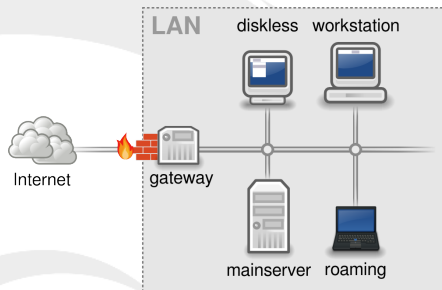
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# Implemented Services

- DNS and DHCP
- Kerberos KDC
- LDAP
- home directories distributed via kerberized NFSv4
- GOSa for user management
- kerberized local email: exim, dovecot
- intranet (users' homepages)
- ICINGA and Munin system monitoring
- disk quota
- proxy (Squid)
- APT package cache
- local APT repository
- firewall (shorewall)
- etckeeper
- system backup (dirvish)
- network installation / FAI server (PXE)
- ...



# Fully Automatic Installation (FAI): Class Concept



## FAI Classes

FAIBASE  
DEBIAN  
FAISERVER  
DISKLESS\_SERVER  
FIREWALL  
CUPS\_SERVER  
PROXY  
NTP\_SERVER  
DNS\_SERVER  
NFS\_SERVER  
MAIL\_SERVER  
LDAP\_CLIENT  
LDAP\_SERVER  
KERBEROS\_CLIENT  
KERBEROS\_KDC  
KDC\_LDAP

## Implementation

skripts

packages

debconf  
(preseeding)

files

...

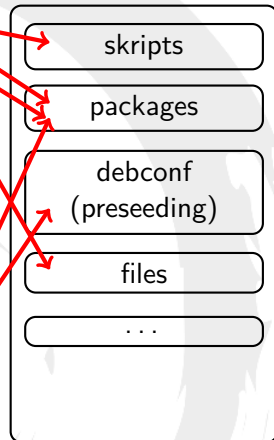
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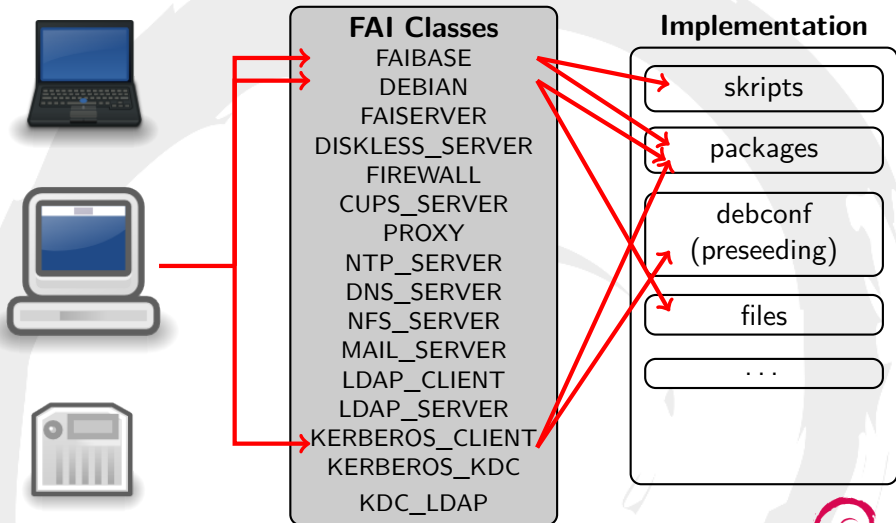
**FAI Classes**

- FAIBASE
- DEBIAN
- FAISERVER
- DISKLESS\_SERVER
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- KERBEROS\_KDC
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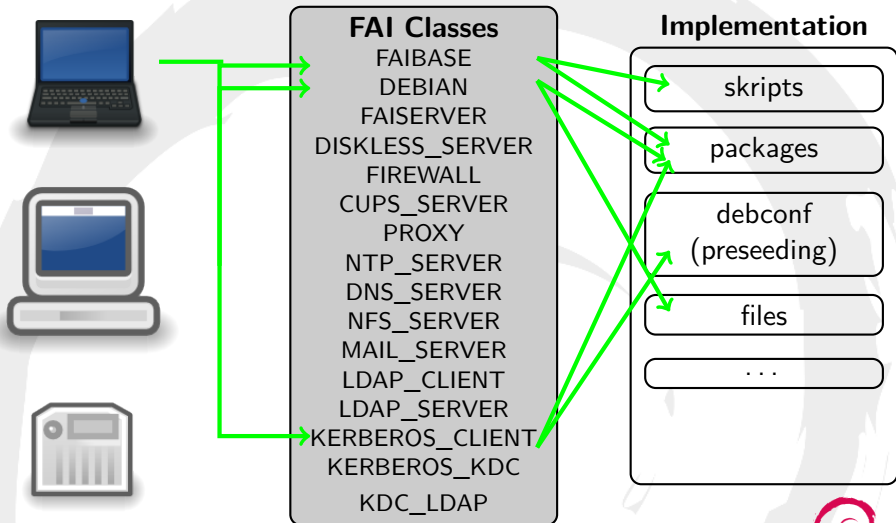
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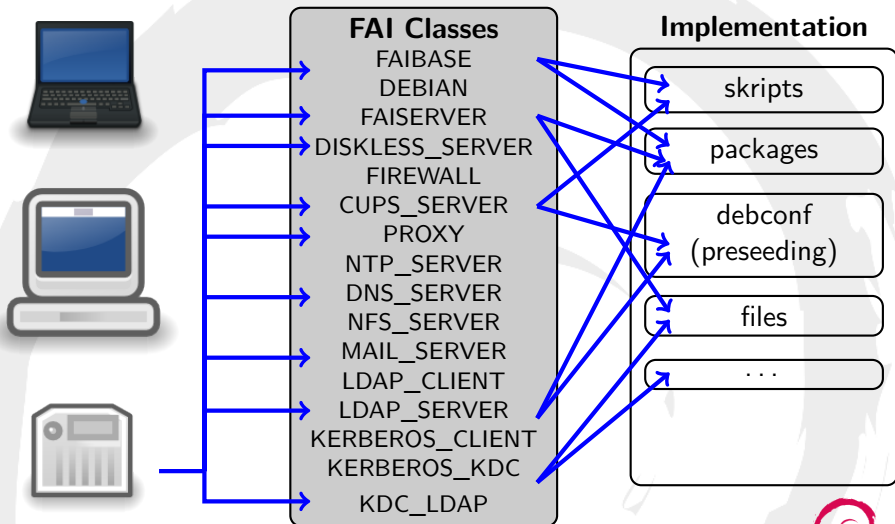
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# Fully Automatic Installation (FAI): Class Concept

## FAI's class concept:

- every hostname is mapped on a set of classes
- classes define the complete setup:
  - ▶ actions (partitioning, package selection, ...)
  - ▶ configuration (debconf, scripts, ...)
- classes are defined in the FAI config space

## FAI config space<sup>13</sup> (top level):

```
-- config
|-- class/           (map hostname to classes, define variables)
|-- debconf/        (populate debconf database, preseeding)
|-- disk_config/    (define the hard disk setup)
|-- files/          (files to be copied to the target machine)
|-- hooks/          (hooks to be run during installation)
|-- package_config/ (package selection to be installed)
|-- scripts/        (scripts to be run after installation)
'-- tests/          (final test, verbose logging of actions)
```

<sup>13</sup>The config space is a certain directory structure with [text files](#).





# Fully Automatic Installation (FAI): Examples

**Example:** The host 'gateway' is associated with the following classes:

```
FAIBASE DEBIAN DHCP FIREWALL GATEWAY_A
```

All packages defined in these classes will be installed and configured accordingly.

**Example:** What happens to hosts associated with the FIREWALL class?

```
$ find config/ -name FIREWALL
  config/package_config/FIREWALL
  config/scripts/FIREWALL
```

- package 'shorewall' will be installed<sup>14</sup>
- the firewall will be configured<sup>15</sup>

---

<sup>14</sup> [https://sources.debian.net/src/debian-lan-config/0.21/fai/config/package\\_config/FIREWALL/](https://sources.debian.net/src/debian-lan-config/0.21/fai/config/package_config/FIREWALL/)

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# The Debian-LAN FAI Classes

The mainserver maps onto the following classes<sup>16</sup> in the Debian-LAN FAI config space:

- |                   |                |                    |
|-------------------|----------------|--------------------|
| 1 FAIBASE         | 8 LOG_SERVER   | 15 LDAP_SERVER     |
| 2 DEBIAN          | 9 PROXY        | 16 KERBEROS_CLIENT |
| 3 FAISERVER       | 10 NTP_SERVER  | 17 KERBEROS_KDC    |
| 4 LVM8_A          | 11 DNS_SERVER  | 18 KDC_LDAP        |
| 5 DISKLESS_SERVER | 12 NFS_SERVER  | 19 SERVER_A        |
| 6 FIREWALL        | 13 MAIL_SERVER | 20 GOSA            |
| 7 CUPS_SERVER     |                |                    |

workstations map onto:

- |           |               |                   |
|-----------|---------------|-------------------|
| 1 FAIBASE | 5 CUPS_CLIENT | 9 KERBEROS_CLIENT |
| 2 DEBIAN  | 6 LOG_CLIENT  | 10 CLIENT_A       |
| 3 DHCPD   | 7 LDAP_CLIENT | 11 XORG           |
| 4 LVM5_A  | 8 NFS_CLIENT  | 12 DESKTOP        |

<sup>16</sup> <https://sources.debian.net/src/debian-lan-config/0.21/fai/config/class/50-host-classes/>

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# FAI: install and softupdate Procedure

## FAI install

- boot FAI live system (CD/USB or PXE) on the target machine
- mount FAI config space on the live system
- map hostname to set of classes
- install the target machine dependent on its classes:
  - ▶ partition local hard disk
  - ▶ configure packages (debconf database)
  - ▶ install packages
  - ▶ configure target system (run scripts)
- reboot from the local hard disk

## FAI softupdate (already installed machine)

- mount FAI config space on the system
- map hostname to set of classes
- dependent on the associated classes:
  - ▶ configure packages (debconf database)
  - ▶ install packages
  - ▶ configure target system (run scripts)



# FAI: install and softupdate Procedure

## FAI install

- boot FAI live system (CD/USB or PXE) on the target machine
- mount FAI config space on the live system
- map hostname to set of classes
- install the target machine dependent on its classes:
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  - ▶ configure packages (debconf database)
  - ▶ install packages
  - ▶ configure target system (run scripts)
- reboot from the local hard disk

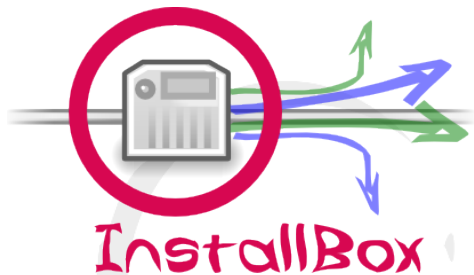
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# Summary and Conclusions

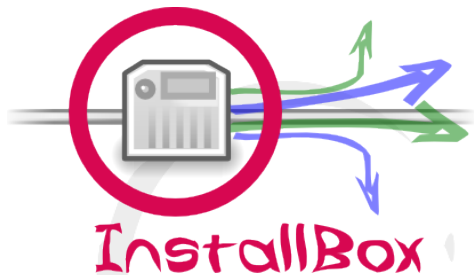
- Set up your own **InstallBox** with:  
`dnsmasq`, `di-netboot-assistant`, `shorewall`, `squid`  
and a few lines of configuration.



- Add **preseeding** to get rid of boring questions.
- For more complex installations: Take a look at [FAI](#) and [Debian-LAN](#).

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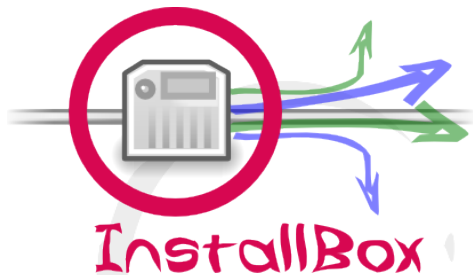


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# Further Reading and Resources

- `di-netboot-assistant` package:  
<http://packages.debian.org/di-netboot-assistant>
- Debian Documentation “Preseeding”:  
<https://www.debian.org/releases/jessie/amd64/apb.html.en>
- Debian-LAN Wiki:  
<https://wiki.debian.org/DebianLAN>
- Debian-LAN presentation:  
<https://people.debian.org/~andi/Vaumarcus2013.pdf>

Illustrations remixed from: <https://openclipart.org/>



# Questions?

- 1 Introduction and Motivation
- 2 The InstallBox: Installation and Configuration
- 3 Preseeding
- 4 Debian-LAN: Fully Automatic Installation with FAI
- 5 Summary and Conclusions

Thank you very much!

