

# Fully Automatic Installation



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## What is FAI ?

- System for unattended Linux installation
- Installs and configures the whole OS and all additional software
- Centralized configuration management and administration
- Scalable and flexible rollout method for Linux migration
- Linux deployment in only a few minutes

## Why use FAI ?

- Manual installation takes hours, FAI just minutes
- Recurring tasks are boring and lead to errors
- You need an infrastructure management
- You want to save time

## Features

- Installs Debian GNU/Linux, Ubuntu, Mandriva, Suse, Solaris,...
- Useful for XEN and Vserver host installations
- **Class concept** supports heterogeneous configuration and hardware
- Update running system without installation (e.g daily maintenance)
- **Central configuration repository** for all install clients
- **Advanced disaster recovery system**
- Reproducible installation
- **Automatic documentation** in central repository
- Automated hardware inventory
- Hooks can extend or customize the normal behavior
- Full **remote control** via ssh during installation process
- *Shell, perl, expect and cfengine* script support for customization
- FAI runs on i386, AMD64, PowerPC, Alpha, SPARC and IA64 architecture
- Fast automatic installation for Beowulf clusters
- **GUI for FAI using GOsa**

## Availability

- Homepage: <http://www.informatik.uni-koeln.de/fai>
- Open source under GPL license
- Detailed documentation, mailing lists, IRC channel
- Official Debian packages, ISO images of demo CD
- Commercial support available

## FAI at work

Terminals with ssh connection to an install client during an installation

```

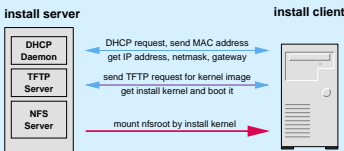
root@host:~# ssh root@192.168.1.100
root@192.168.1.100:~#
root@192.168.1.100:~# cat /etc/fstab
#  /  ext3 defaults 1
#  /boot /boot ext3 defaults 2
#  /var /var ext3 defaults 3
#  /usr /usr ext3 defaults 3
#  /opt /opt ext3 defaults 3
#  /home /home ext3 defaults 3
#  /tmp /tmp ext3 defaults 3
#  /usr/local /usr/local ext3 defaults 3
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```

## The three steps of FAI

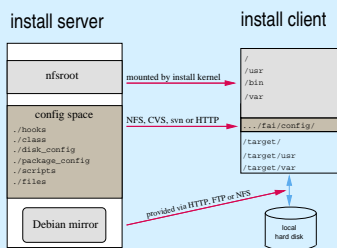
### 1 - Boot host

- Boot via network card (PXE), CD-ROM or floppy



- Now a complete Linux OS is running without using local hard disks

### 2 - Get configuration data



### 3 - Run installation

- partition local hard disks and create filesystems
- install software using apt-get command
- configure OS and additional software
- save log files to install server, then reboot new system

## Examples of installation times

Host CPU	MHz	RAM	disk type	software installed	installation time
Pentium 4	3000	1024MB	SATA	300 MB	105 sec
Pentium 4	3000	1024MB	SATA	1100 MB	6 min
Pentium 4	3000	1024MB	SATA	2200 MB	10 min
Athlon	800	512MB	IDE	300 MB	4 min
Athlon	800	512MB	IDE	1100 MB	17 min
Athlon	800	512MB	IDE	2200 MB	32 min
Pentium III	850	256MB	IDE	180 MB	3 min
PentiumPro	200	128MB	IDE	800 MB	28 min

# FAI

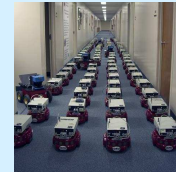
Plan your installation, and FAI installs your plan.



## FAI users

- City of Munich, several hundreds, (14.000 hosts planned)
- Linux Information Systems AG, >1000 hosts
- Albert Einstein Institute, 800 hosts
- Lycos Europe, 3000 hosts
- Host Europe, 250 hosts
- Thomas Krenn AG, 500 per month
- MIT Computer science research lab, 200 hosts
- Electricité de France (EDF), France, 200 hosts
- France Telecom, TRANSPAC, France, 300 hosts
- Danmarks Meteorologiske Institut, 85 hosts
- OPIT Solutions AG, Swizerland, 80 hosts
- University of New Orleans, USA, 72 node Beowulf cluster
- Brown University, Dep. of Computer Science, USA, 300+ hosts
- Ewetel, ISP and telco, 65 hosts at 3 locations
- High Performance Computing Center North, HPC2N, 2 clusters of top500.org, 192 dual Opteron, 120 dual Athlon
- Netcologne, Pironet, Linuxhotel, ZEDAT FU-Berlin, DESY, mc-wetter.de, ALTANA Pharma AG, Networking4all BV, Move Next BV, Belgacom NV/SA, easynet GmbH, Minick AG, Technische Universität München

## Examples of FAI installations



**The Centibots Project**  
 100 autonomous robots funded by the DARPA SRI International Artificial Intelligence Center, USA



**Lucidor cluster**  
 90 Dual Itanium2 900 MHz  
 6 GB RAM per node  
 Center for Parallel Computers, Sweden



**Genome research cluster**  
 168 IBM HS20 Blades  
 2x2.8 GHz P4  
 The Sanger Institute  
 Cambridge, UK



**The MERLIN cluster**  
 180 Dual AMD MP2200  
 1 GB RAM per node  
 Albert Einstein Institute  
 Golm, Germany



**IITAC cluster**, top500.org  
 356 opterons, 80 zeons  
 Trinity Centre for High Performance Computing,  
 University of Dublin, Ireland



**Computer Science lab**  
 308 workstations, 127 servers  
 University of West Bohemia  
 Czech Republic