What is FAI?

- FAI = Fully Automatic Installation
- Unattended mass deployment
- From "empty disk" to "user can use the computer"
- Installation and configuration of the OS and all applications
- Do your own customization with FAI
FAI overview

install server

- nfsroot
- config space
  - ./hooks
  - ./class
  - ./disk_config
  - ./package_config
  - ./scripts
  - ./files

Debian mirror

mounted by kernel

NFS, svn, git, HTTP

install client

- ./fai/config/
- /target/
- /target/usr
- /target/var

provided via HTTP, FTP or NFS

local hard disk
The config space

|-- class/
 | |-- 10-base-classes
 | |-- 50-host-classes
 | |-- FAIBASE.var
 | `-- GERMAN.var

|-- disk_config/
 | |-- FAIBASE
 | |-- LVM
 | `-- foobar04

|-- basefiles/

|-- package_config/
 | |-- FAIBASE
 | |-- GERMAN
 | |-- XORG
 | |-- XFCE
 | `-- server07
Customization scripts and files

|-- scripts/
  |-- FAIBASE/
  |   |-- 10-misc Bourne shell script
  |   |-- 30-interface Bourne shell script
  |   `-- 40-misc Cfengine script
  `-- DEMO/
    |-- 10-misc Perl script
    `-- 30-demo Cfengine script

|-- files/
  `-- etc/
    `-- xorg.xonf/ fcopy /etc/X11/xorg.conf
        |-- FAIBASE
        |-- MATROX
        |-- CAD
        `-- demohost
Disk partitioning

Example: 

```
 disk_config disk1 preserve_always:8 fstabkey:uuid

 primary   /    4G-10G   ext4 rw,noatime,errors=remount-ro
 logical swap    1G    swap   rw
 logical /var 1G-2G ext4 rw
 logical /tmp 1G-2% ext4 rw
 logical /home 5G- ext4 defaults
```

- File systems: ext[2,3,4], vfat, xfs, ReiserFS, NTFS, brtfs
RAID, LVM

disk_config disk1
primary - 50-100 - -
primary swap 1G swap sw
primary - 2G-10G - -
logical - 0- - -
logical - 0- - -

disk_config disk2 sameas:disk1


disk_config raid
raid1 /boot disk1.1,disk2.1 ext4 rw
raid1 / disk1.3,disk2.3 ext4 rw,acl,user_xattr
raid1 - disk1.5,disk2.5 - -
raid1 - disk1.6,disk2.6 - -


disk_config lvm
vg volg1 md2,md3
volg1-usr /usr 8G-15G ext4 rw createopts="-O dir_index,resize_inode"
volg1-var /var 2G-8G ext4 rw createopts="-O dir_index,resize_inode"
volg1-hl /home/local 10G ext4 rw,acl,user_xattr,noexec,nosuid,nodev
The universal tool

debian  ubuntu

CentOS

Scientific Linux
Installing different distributions

- Use Debian nfsroot when installing Ubuntu, CentOS, SLC, ...
- No modification needed for: booting FAI, disk partitioning, software installation
- Each distribution needs a different base file (rinse)
- `sources.list` vs. `yum.repos.d` (easy)
- Adjust package names (easy)
- Adjust customization scripts (more changes)

|-- basefiles/
  |-- CENTOS6_32.tar.xz
  |-- CENTOS6_64.tar.xz
  |-- CENTOS7_64.tar.xz
  |-- SLC6_64.tar.xz
  `-- UBUNTU_1410.tar.xz
The universal tool

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</table>

TODO: cloud image installation: use dd, loopback mount, kpartx
FAI users

- Anonymous, financial industry, 32.000 hosts
- LVM insurance, 10.000 hosts
- City of Munich, 16.000 hosts
- Albert Einstein Institute, 1725 hosts
- Zivit, 260 hosts on two IBM z10 EC mainframes
- Archive.org, 200+ hosts
- XING AG, 300-400 hosts
- Opera Software, ~300 hosts
- Stanford University, 450 hosts
- MIT Computer science research lab, 200 hosts
- Mobile.de, ~600 hosts
- Electricité de France (EDF), 1500 hosts
- BUF, digital visual effects company, 1000 hosts
- ETH Zurich, systems group, ~300 hosts
- StayFriends, 700+ hosts
- Grml, creating eight different ISOs, daily builds
FAI - Fully Automatic Installation

FAI is a non-interactive system to install, customize, and manage Linux systems and software configurations on computers as well as virtual machines and cloud environments, from small networks to large-scale infrastructures like clusters and cloud environments.

It's a tool for unattended mass deployment of Linux. You can take one or more virgin PCs, turn on the power, and after a few minutes, the systems are installed, and completely configured to your exact needs, without any interaction necessary.

**Motto:** Plan your installation, and FAI installs your plan.

**NEWS**

- [26 Nov 2014] New FAI CD image available, FAI 4.3.1 - wheezy1
- [19 Nov 2014] FAI 4.3.1 released, bug fixes
- [24 Oct 2014] FAI 4.3 released, bfs support added
- [3 Jun 2014] FAI 4.2 released, new ISO images created
- [15 September 2011] CentOS and Scientific Linux CentOS support [more...]
- [21 Dec 2009] The FAI project celebrates its **10th anniversary**

**Features**

- Installs and updates Debian, Ubuntu, CentOS, RHEL, SUSE, ...
- Centralized deployment and configuration management
- Installs virtual machines using KVM, XEN or VirtualBox and Vserver
- Easy setup of software RAID and LVM
- Full remote control via ssh during installation
- Integrated disaster recovery system
- Every stage can be customized via hooks

Plan your installation and FAI installs your plan! :-)

http://fai-project.org
Demo time

- KVM with disk image in RAM
- Xfce installation via network (PXE boot)
- Building our own ISO image (+ gimp)
- Youtube search for: FAI 5.0