

# easy filesystem hierarchy (efsh) v0.2

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## 1 Preamble

### 1.1 Motivation

Current Linux FHS is too complex. I want something short, that is easy to understand and maintain. And not Linux specific.

### 1.2 Disclaimer

This document is a pre-release, but can still be used as a guideline.

### 1.3 Copying

Feel free to copy it unmodified.  $\text{\LaTeX}$  source.

### 1.4 Changes

Send changes to me via e-mail. Preferred in diff -u format to the

### 1.5 Intended audience

Sysadmins and Unix operating system creators.

### 1.6 Development

The source of this document can be found at

- <http://www.nico.schottelius.org/docs/efsh/>

## 2 The easy filesystem hierarchy

The main ideas of efsh, what it is about and how it looks like.

### 2.1 Simplicity

Today's systems tend to get more complex, resulting in unmaintainable status. Thus the base of your system must be as easy to understand as possible.

### 2.2 Usability

Admins are lazy and they need something they can remember intuitively.

### 2.3 Keep the root (/) clean

The root is seen in almost all situations and should contain only the essential directories. There should be no files in the root.

## 2.4 Do not mix different packages

Each software package should have its own area. So you can

- `rm -rf` it easily,
- see what files belong to it and
- install many different (or even same) versions in parallel.

## 3 The paths

Now it is time to define, what belongs to where.

### 3.1 `/bin`

Contains only basic binaries.

### 3.2 `/boot`

Contains system specific boot files and configuration.

### 3.3 `/dev`

Contains the device files.

### 3.4 `/etc`

Contains only essential configuration files.

#### 3.4.1 `/etc/.efsh`

Contains the version of `efsh` the filesystem hierarchy is compliant to. As I really recommend to not pollute basic directories, I use a dot-file<sup>1</sup>. This is necessary, because we need to place some kind of information file into the filesystem, that is early and easily available, so tools can detect the `efsh` version.

### 3.5 `/home`

Contains **all** data from users and servers. That means no data dispersion like in `/usr/local/www` and `/usr/local/pgsql` or `/var/lib/www` or ... **All** data belongs below **/home**. The main idea is to never make the `sysadmin` search for data, but to make it available in a single place.

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<sup>1</sup>Files starting with a dot (".") are hidden files in Unix operating systems and not shown in a standard directory listing.

### 3.5.1 /home/groups

Contains data from the groups. So people can easily work together. It is recommended that `/home/groups/groupname` is setgid, so new files are owned by the right group.

### 3.5.2 /home/services

Contains data from the services.

### 3.5.3 /home/users

Contains data from the users. That means all home directories (with the exemption of the root users home directory).

## 3.6 /lib

Contains only basic libraries.

## 3.7 /mnt

Contains temporarily mounted filesystems. Permanently mounted filesystems belong to where they are needed (for instance `/home/services/mail/queue`).

## 3.8 /proc

Contains a virtual filesystem containing all processes.

## 3.9 /root

Home directory of the root user. Must be on `/` to prevent problems, if `/home` is not accessible.

## 3.10 /sbin

Contains only basic super user binaries. Permissions should be 0750, root:root.

## 3.11 /tmp

Can be used for temporary files.

## 3.12 /usr

Contains non basic software packages.

## 3.13 /usr/bin

Contains links to binaries under `/usr/packages/*/bin`.

### 3.14 `/usr/include`

Same as in `/usr/bin`, only headers are linked from `/usr/packages/*/include`.

### 3.15 `/usr/lib`

Same as in `/usr/bin`, only libraries are linked from `/usr/packages/*/lib`.

### 3.16 `/usr/packages`

Contains the software packages in a subdirectory for each version:

- `/usr/packages/gpm-2.0`
- `/usr/packages/apache-2.2p12+hotfix42`
- `/usr/packages/apache-2.2.1`
- ...

Each software package should contain its own `bin`, `include`, `lib`, `libexec`, `sbin`, `share`, ..., if needed.

### 3.17 `/usr/sbin`

Contains links to binaries under `/usr/packages/*/sbin`. Same as in `/usr/bin`, only super user binaries are linked from `/usr/packages/*/sbin`.

### 3.18 `/usr/share`

Contains links to files under `/usr/packages/*/share`.

### 3.19 `/var`

Contains variable data like logs.

#### 3.19.1 `/var/log`

Contains the system logfiles.

## 4 Operating specific paths

There should be less possible. But as we have to carry on history, we have to support them until we find a better solution.

## 4.1 Linux

### 4.1.1 /sys

Contains kernel information.

## 5 Obsoleted paths

### 5.1 /media

Is senseless, as we have /mnt. Do not put unnecessary paths into the root directory.

### 5.2 /opt

Is replaced by /usr/packages.

### 5.3 /usr/libexec

Is not necessary, the binaries in libexec are only called by the same package (per definition) and are thus best placed into "‘/usr/packages/*name*/libexec’".

### 5.4 /usr/local

There is no need to make a mess in /usr/local with different software packages, if each package can have its own mess in /usr/packages/*name*.

## 6 Misc

To make it easier to understand how it looks like.

### 6.1 Real life examples

Efsh is not only theory, but already in use.

#### 6.1.1 /etc/.efsh

Contains "0.1.1" (without the quotes, including a new line).

#### 6.1.2 /home/users/nico

This is my home directory on all servers and hosts I manage.



### 6.1.3 `/home/groups/finance`

Contains documents from the finance department. The directory has ACLs<sup>2</sup> applied, so every new document is read and writable by all members of the finance group.

### 6.1.4 `/home/services/ftp`

Contains the ftp root directory.

### 6.1.5 `/home/services/www/nico/org/schottelius/unix/www`

Contains the www data of *unix.schottelius.org*, which is owned by *nico*. The access and error log is placed below */home/services/www/nico/org/schottelius/unix/logs*, which is **not** owned by *nico*, but by the *www* user.

### 6.1.6 `/home/services/www/nico/nico.schottelius.org`

The idea is pretty similar to the example above, except that this scheme does not make problems with subdomains (which may be named "www" or "logs"). The proposed permissions are:

- `/home/services/www/nico/nico.schottelius.org`: root:root, 0755
- `../www`: nico:nico, 0755
- `../logs`: www:www, 0750

### 6.1.7 `/usr/packages/eboard-1.0.4`

Eboard in version 1.0.4.

### 6.1.8 `/usr/packages/wmii-hg`

Wmii installed from mercurial (hg).

### 6.1.9 `/usr/packages/wmii-hg-20071102.1`

Wmii installed from mercurial (hg), but with the version appended, so I can have more than one version from mercurial installed.

### 6.1.10 `/usr/packages/xscreensaver-5.04/libexec/*`

Screensavers from the xscreensaver package.

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<sup>2</sup>Access control lists

## 6.2 The future

Efsh is in a quite early development state and is missing non-Linux operating specific details. Though it will not grow much anymore, as it is intended to be small.

## 6.3 Thanks go to ...

In chronological order

- Dominik Meister
  - For correcting typos
- Tonnerre Lombard
  - For critics

## 6.4 Changelog

The changelog is placed at the end of the document, so interested readers **can** find it, but new readers are **not forced** to read it.

### 6.4.1 v0.2: (13th May 2010)

- Mainly a cleanup

### 6.4.2 v0.1.1: (4th of February 2008)

- Added changelog section
- Added examples section
- Fixed some typos
- Added new paths:
  - /etc/.efsh
  - /usr/libexec
  - /usr/local
  - /var/log
  - /tmp

### 6.4.3 v0.1: Initial release (4th of February 2008)

First time written down in an easy-to-change ( $\text{\LaTeX}$ ) and easy-to-view (pdf) format.