

NAME

development - introduction to FreeBSD development process

DESCRIPTION

FreeBSD development is split into three major subprojects: doc, ports, and src. Doc is the documentation, such as the FreeBSD Handbook. To read more, see:

<https://docs.FreeBSD.org/en/books/fdp-primer/>

Ports, described further in ports(7), are the way to build, package, and install third party software. To read more, see:

<https://docs.FreeBSD.org/en/books/porters-handbook/>

The last one, src, revolves around the source code for the base system, consisting of the kernel, and the libraries and utilities commonly called the world.

The Committer's Guide, describing topics relevant to all committers, can be found at:

<https://docs.freebsd.org/en/articles/committers-guide/>

FreeBSD src development takes place in the project-hosted Git repository, located at:

<https://git.FreeBSD.org/src.git>

The push URL is:

<ssh://git@gitrepo.FreeBSD.org/src.git>

There is also a list of public, read-only Git mirrors at:

<https://docs.FreeBSD.org/en/books/handbook/mirrors/#external-mirrors>

The 'main' Git branch represents CURRENT; all changes are first committed to CURRENT and then usually cherry-picked back to STABLE, which refers to Git branches such as 'stable/13'. Every few years a new STABLE is branched from CURRENT, with an incremented major version number. Releases are then branched off STABLE and numbered with consecutive minor numbers.

The layout of the source tree is described in its *README.md* file. Build instructions can be found in build(7) and release(7). Kernel programming interfaces (KPIs) are documented in section 9 manual

pages; use ‘`apropos -s 9 .`’ for a list. Regression test suite is described in `tests(7)`. For coding conventions, see `style(9)`.

To ask questions regarding development, use the mailing lists, such as `freebsd-arch@` and `freebsd-hackers@`:

`https://lists.FreeBSD.org`

To get your patches integrated into the main FreeBSD repository use Phabricator; it is a code review tool that allows other developers to review the changes, suggest improvements, and, eventually, allows them to pick up the change and commit it:

`https://reviews.FreeBSD.org`

To check the latest FreeBSD build and test status of CURRENT and STABLE branches, the continuous integration system is at:

`https://ci.FreeBSD.org`

FILES

`/usr/src/CONTRIBUTING.md` FreeBSD contribution guidelines

`/usr/src/tools/tools/git/git-arc.sh` Phabricator review tooling

EXAMPLES

Check out the CURRENT branch, build it, and install, overwriting the current system:

```
git clone https://git.FreeBSD.org/src.git src
cd src
make -sj8 buildworld buildkernel installkernel
shutdown -r now
```

After reboot:

```
cd src
make -j8 installworld
reboot
```

Rebuild and reinstall a single piece of userspace, in this case `ls(1)`:

```
cd src/bin/ls
```

```
make clean all install
```

Quickly rebuild and reinstall the kernel, only recompiling the files changed since last build; note that this will only work if the full kernel build has been completed in the past, not on a fresh source tree:

```
cd src
make -sj8 kernel KERNFAST=1
```

To rebuild parts of FreeBSD for another CPU architecture, first prepare your source tree by building the cross-toolchain:

```
cd src
make -sj8 toolchain TARGET_ARCH=aarch64
```

Afterwards, to build and install a single piece of userspace, use:

```
cd src/bin/lb
make buildenv TARGET_ARCH=aarch64
make clean all install DESTDIR=/clients/arm
```

Likewise, to quickly rebuild and reinstall the kernel, use:

```
cd src
make buildenv TARGET_ARCH=aarch64
make -sj8 kernel KERNFAST=1 DESTDIR=/clients/arm
```

SEE ALSO

git(1), witness(4), build(7), hier(7), ports(7), release(7), tests(7), locking(9), style(9)

HISTORY

The **development** manual page was originally written by Matthew Dillon <dillon@FreeBSD.org> and first appeared in FreeBSD 5.0, December 2002. It was since extensively modified by Eitan Adler <eadler@FreeBSD.org> to reflect the repository conversion from CVS: <https://www.nongnu.org/cvs/> to Subversion: <https://subversion.apache.org/>. It was rewritten from scratch by Edward Tomasz Napierala <trasz@FreeBSD.org> for FreeBSD 12.0.