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/ls
    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.