

# Git Cheat Sheet

## Settings

- show git configuration:

```
git config --list
git config --get user.name
```

- set configuration:

```
git config --global --add user.name "John Doe"
git config --add color.ui "auto"
```

--global makes the setting global for all repos.

- some common settings:

Setting	Meaning
user.name	User name.
user.email	User email.
color.ui	Use colors ("auto!")?
core.editor	Which editor to use?

## Basic Git

- Create a repository:

```
cd projDir
git init
```

- Add files to version control:

```
git add file1 file2
```

or

```
git add *
```

If the files have been added before, they will be included in the 'staging area' and thus committed with the next git commit.

- Status, log and information:

```
git status
git log
git show [object]
```

[object] may be a commit, branch or something like stash@{0}.

- Commit changes:

```
git commit changedFile -m "Commit message."
```

or

```
git commit -a
```

Open the editor specified by core.editor for editing the commit message and then commit all changed files (skip staging files).

```
git commit file1 file2
```

Only commit file1 and file2, open editor for editing the commit message.

- change last commit:

```
git commit --amend
```

Opens the text editor to change to commit message. Also notices files that have been changed and staged (git add file) or removed.

- remove file from version control:

- also remove file from disk:

```
git rm file
```

- keep file on disk:

```
git rm --cached file
```

- go back to fileName's last committed version:

```
git checkout -- fileName
```

- get help:

```
git stash --help
```

shows the man page for git stash.

- rename a versioned file:

```
git mv oldName newName
```

- diff for all files:

```
git diff
```

diff for a single file:

```
git diff fileName
```

diff for changes that are already staged:

```
git diff --cached
```

- let git ignore certain files: create a file .gitignore and add it to the repo:

```
# comment
*.so
!bla.so
TODO
```

This makes git ignore the file TODO and all .so files, except bla.so.

## Branches

- list branches:

```
git branch
```

Add -r for remote branches, use -a for remote and local branches.

- create new branch:

```
git branch newBranch
```

Create a branch and check it out immediately:

```
git checkout -b newBranch
```

- change to a branch:

```
git checkout branchName
```

- delete branch:

```
git branch -d branchName
```

for branches that branch off HEAD;

```
git branch -D branchName
```

for any branch.

- merge other branch into current branch:

```
git merge other
```

- push all branches to remote repository:

```
git push --all
```

- rename a branch:

```
git branch -m oldBranch newBranch
```

- checkout single files from another branch to current branch:

```
git checkout branchToUse fileName
```

- create a tracking branch that follows remote changes:

```
git branch --track myBranch remoteAlias/theirBranch
```

Alternatively,

```
git pull theirBranch
```

will fetch 'origin/theirBranch' and merge with the local theirBranch branch.

## Git Notions

- HEAD: pointer the branch we are on.
- branch: pointer to a commit.
- commit: snapshot of the git 'filesystem' including information on parent commits/snapshots.
- working directory: copies of files under version control.
- staging area: copy of the git 'filesystem' to be included in the next commit.

## Using git with remote repositories

- add alias myRepo for remote repository:

```
git remote add remoteAlias ssh://user@host.domain.tld/directory/myRepo
```

- show aliases for remote repositories:

```
git remote
git remote show remoteAlias
```

The second line gives details (also on branches).

- rename a remote:

```
git remote rename oldAlias newAlias
```

- remove a remote (and all tracking branches already fetched):

```
git remote rm remoteAlias
```

- clone a copy of a remote repository and create a local repository with a suitable remote origin set:

```
git clone URL
```

`clone` will get create a subfolder, fill (fetch) the subfolder with the contents of the repo and then create and checkout the default branch.

- retrieve all remote branches with

```
git fetch remoteAlias
```

No local branches will be altered (merging possibly needed).

- get a specific branch from the remote and start working in it:

```
git checkout -b branchName origin/branchName
```

- fetch a remote branch and merge it with the current branch:

```
git pull remoteAlias branchName
```

The working copy shall be clean for this operation.

- after a branch has been deleted from a remote repo,

```
git prune remoteAlias
```

will delete the remote-tracking branches that do not exist in the remote anymore.

- push local changes back to the remote with

```
git push remoteAlias branchName
```

A different name for the branch will be used by

```
git push remoteAlias localBranchName:remoteBranchName
```

- delete remote branch:

```
git push remoteAlias :branchName
```

## With central repository

- Create a repository on central server:

```
mkdir foo
cd foo
git init --bare --shared foo.git
```

```
chgrp -R dev foo.git (optional)
```

shared makes the repo group writable. bare means there is no working copy.

- push local repo to server:

```
cd localRepo
git push ssh://user@host.domain.tld/home/user/foo.git '*:*
```

(this pushes the local repo with everything to the server)

- clone new working directory that tracks the one on the server:

```
git clone ssh://user@host.domain.tld/home/user/foo.git newRepo
```

- after hacking in newRepo, update repo on server:

```
cd newRepo
git push
```

For more options, see above.

## With GitHub

- create repository repoName from the web interface
- teach local repository about the remote one:

```
cd repoName
git remote add origin git@github.com:githubuser/repoName.git
```

- push files to GitHub:

```
cd repoName
git push
```

- to clone the GitHub repo:

```
git clone git@github.com:githubuser/repoName.git newRepo
```

- push changes back to GitHub:

```
cd repoName
git push
```

For more options, see above.

## Discarding changes in working copy

There are at least two different ways to reset to working directory to the last versioned status:

### Checkout: Forget about changes

```
git checkout -- fileName
```

resets fileName to the last checked in version - changes in the working directory are lost!

```
git checkout name
```

gets back to commit commitName. Note that information on HEAD is lost in this case. However, git reflog still remembers where HEAD was.

## Stashes: keep changes

- changes in a working directory may be 'stashed' away:

```
git stash save "Status before going back"
```

- stashes are listed with:

```
git stash list
```

- apply the stash on top of the stack again:

```
git stash apply
```

keeps to stash saved, whereas

```
git stash pop
```

applies the stash and also removes the stash from the list.

- delete a stash:

```
git stash drop
```

deletes the stash on top of the stack, whereas

```
git stash drop stash@{0}
```

deletes the stash `stash@{0}`.

## Graphical tools

- `git gui`: Perform adding, committing, branching etc. graphically.

- `gitk`: View commit history and branches.
- `git difftool`: View diffs graphically (needs setting `diff.tool`).

## Links

- Git reference: <http://gitref.org/>
- "Pro Git" book: <http://progit.org/>
- Git community book: <http://book.git-scm.com/>
- Git with central server: <http://toroid.org/ams/git-central-repo-howto>

## TODO

- info on merging
- learn rebasing
- fix bugs (that certainly do exist in here)