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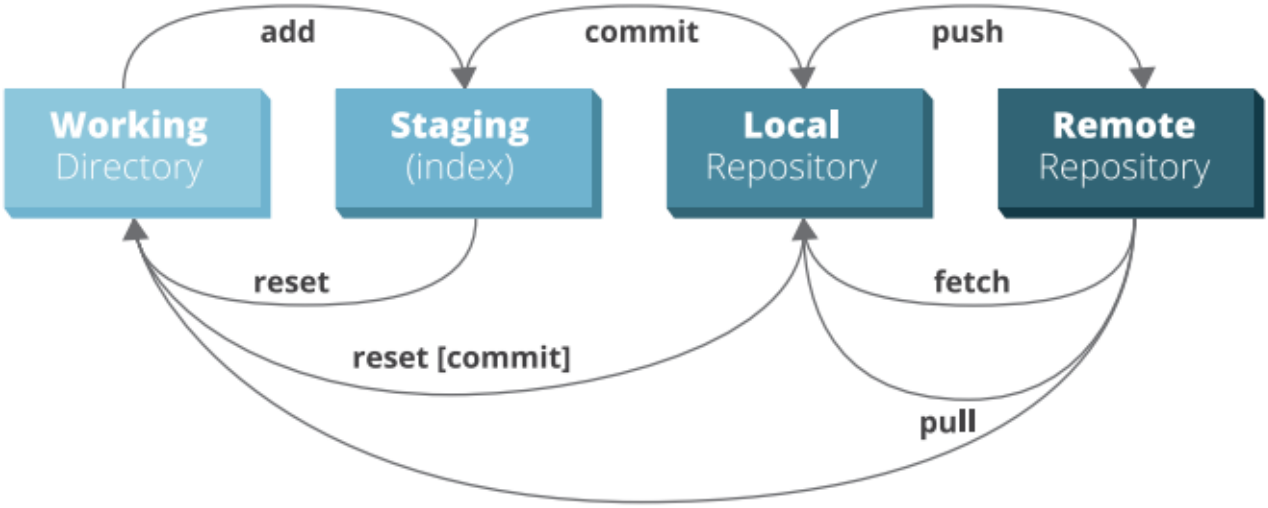
Git Cheatsheet: Commands, Tips and Tricks 

Contents

This is compilation of useful git commands, tips and tricks I created for myself since I kept forgetting some commands related to configuring, searching and managing git repositories. The format is simple, just a list with short descriptions for some common, and other less common, commands which I often find myself looking up online.

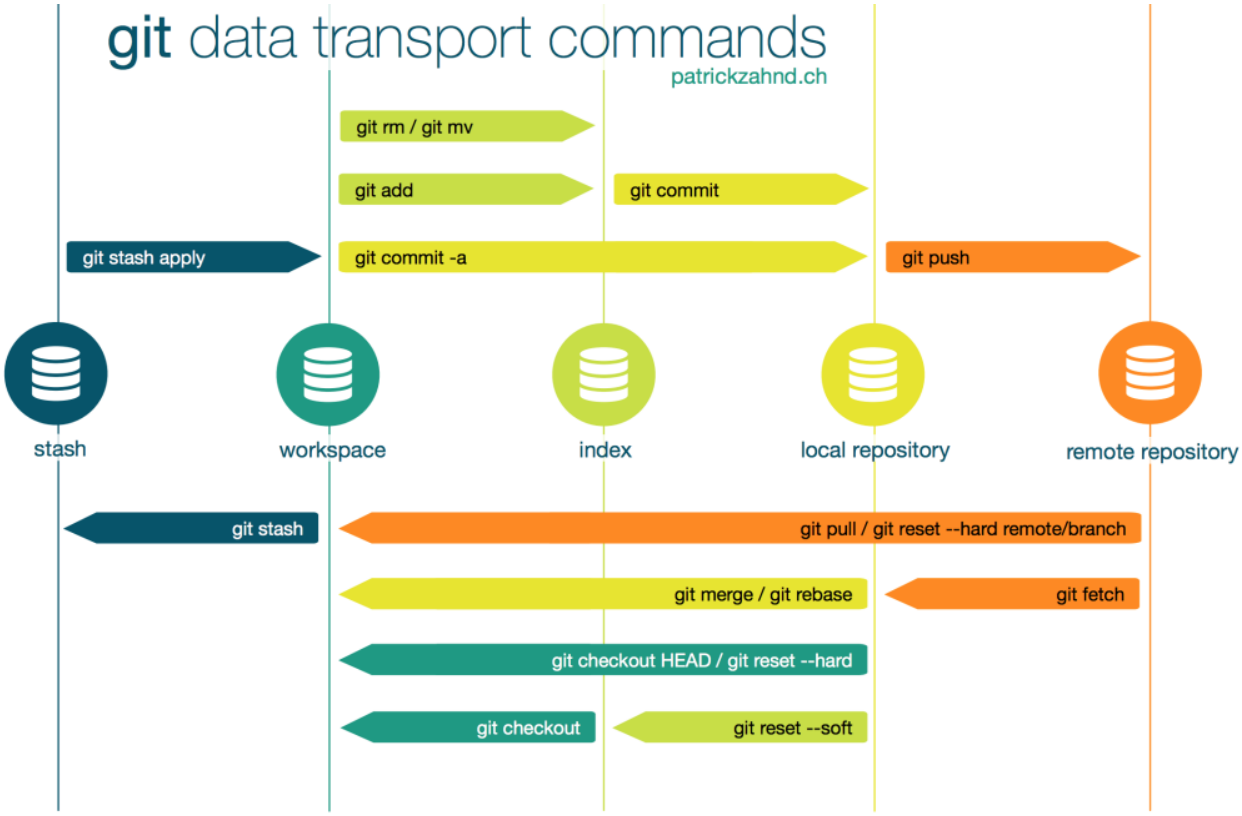
For those looking for a more beginner friendly introduction to git, I've written one in a previous blog post. Feedback via social media or email is always welcome. You can subscribe to my newsletter by entering your email on the sidebar if you are interested in receiving updates whenever I write something new.

The Git Workflow



Git Workflow

`http://files.zeroturnaround.com/pdf/zt_git_cheat_sheet.pdf`



Git in Time Workflow

`https://patrickzahnd.ch`

Configuration

```
# show current values for all global configuration parameters
git config --list --global

# let git automatically correct typos such as "comit" and "pussh."
git config --global help.autocorrect 1

# set a username globally
git config --global user.name "username"`

# set an email address globally
git config --global user.email "email@provider.com"

# always --prune for git fetch and git pull
git config --global fetch.prune true

# remove the previously set username globally
git config --global --unset user.name

# color the git console
git config color.ui true

# set the tool used by git for diffing globally
git config --global diff.tool mytool

# set the tool used by git for merging globally
git config --global merge.tool mytool

# remove the previously set configuration value globally
git config --global --unset myparameter

# allows populating the working directory sparsely, that is,
# cloning only certain directories from a repository
git config core.sparseCheckout true

# instruct git to retrieve only some directory in addition to
# those listed in `.git/info/sparse-checkout
echo "some/directory/inside/the/repository" >> .git/info/sparse-checkout

# define which whitespace problems git should recognize (any whitespace
# at the end of a line, mixed spaces or tabs)
git config --global core.whitespace trailing-space,space-before-tab

# tells Git to detect renames. If set to any boolean value, it will
# enable basic rename detection. If set to "copies" or "copy", it will
# detect copies, as well.
git config --global diff.renames copies

# if set, git diff uses a prefix pair that is different from the standard "a/"
# and "/b" depending on what is being compared.
git config --global diff.mnemonicprefix true

# always show a diffstat at the end of a merge
git config --global merge.stat true

# no CRLF to LF output conversion will be performed
git config --global core.autocrlf input
```

```
57
58 # whenever pushing, also push local tags
59 git config --global push.followTags true
60
61 # show also individual files in untracked directories in status queries
62 git config --global status.showUntrackedFiles all
63
64 # always decorate the output of git log
65 git config --global log.decorate full
66
67 # the git stash show command without an option will show the stash in patch form
68 git config --global stash.showPatch true
69
70 # always set the upstream branch of the current branch as the branch to be
71 # pushed to when no refspec is given
72 git config --global push.default tracking
73
74 # ignore the executable bit of files in the working tree
75 git config core.fileMode false
```

Git .ignore Syntax

`file`	match a particular file
`.file`	match a hidden file
`directory/`	match a directory
`directory/directory/`	match a subdirectory
`directory/directory/*.extension`	match all files with a certain extension in a subdirectory
`directory/directory/**/*.extension`	recursively match all files with a certain extension in a subdirectory
`/*`	match everything
`!file`	do not match file

Git Workflow

Initialize and Clone

```
# initialize a git repository in the current working directory
git init

# clone a remote repository over https
git clone https://remote.com/repo.git

# clone a remote repository over ssh
git clone ssh://git@remote.com:/repo.git

# recursively clone a repository over https
git clone --recursive https://remote.com/repo.git

# recursively clone a repository over ssh
git clone --recursive ssh://git@remote.com:/repo.git
```

Track, Add and Commit

```
# start tracking a file or add its current state to the index
git add file

# add everything which is tracked and has been changed to the index
git add -u

# add everything which is untracked or has been changed to the index
git add .

# commit to local history with a given message
git commit -m "message"

# add all changes to already tracked files and commit with a given
# message, non-tracked files are excluded
git commit -am "message"

# modify the last commit including both new modifications and given message
git commit --amend -m "message"

# perform a commit with an empty message
git commit --allow-empty-message -m
```

Status and Diagnostics

```
git status                  # show status of the working directory
git status -s               # show short version status

git show HEAD               # show commit at the head of current branch
```

```
git show mycommit             # show commit with object ID mycommit
git show HEAD:folder/file     # show version of folder/file at HEAD
```

Checking Out

```
# replace file-name with the latest version from the current branch
git checkout -- filename

# in case fileorbranch is a file, replace fileorbranch with the latest version
# of the file on the current branch. In case fileorbranch is a branch, replace
# the working tree with the head of said branch.
git checkout fileorbranch

# replace the current working tree with commit 05c5fa
git checkout 05c5fa

# replace the current working tree with the head of the main branch
git checkout main
```

Remotes

```
# show the remote branches and their associated urls
git remote -v

# adds an https url as remote branch under the name origin
git remote add -f origin https://remote.com/repo.git

# adds an ssh url as remote branch under the name origin
git remote add -f origin ssh://git@remote.com:/repo.git

# remove the remote with ID origin
git remote remove -f origin

# set an https url for the remote with ID origin
git remote set-url origin https://remote.com/repo.git

# set an ssh url for the remote with ID origin
git remote set-url origin ssh://git@remote.com:/repo.git

# clean up remote non-existent branches
git remote prune origin

# set the upstream branch, to which changes will be pushed, to origin/main
git branch --set-upstream-to=origin/main

# set foo as the tracking branch for origin/bar
git branch –track foo origin/bar

# update local tracking branches with changes from their respective remote ones
git fetch

# update local tracking branches and remove local references to
```

```
# non-existent remote branches
git fetch -p

# delete remote tracking branch origin/branch
git branch -r -d origin/branch

# update local tracking branches and merge changes with local working directory
git pull

# given one or more existing commits, apply the change each one introduces,
# recording a new commit for each. This requires your working tree to be clean
git cherry-pick commitid

# push HEAD to the upstream url
git push

# push HEAD to the remote named origin
git push origin

# push HEAD to the branch main on the remote origin
git push origin main

# push and set origin main as upstream
git push -u origin main

# delete previous commits and push your current one
# WARNING: never use force in repositories from which other have pulled [1]
# https://stackoverflow.com/a/16702355
git push --force all origin/main

# a safer option to force-push that will not overwrite work on the remote
# branch if more commits were added ensuring someone else's work is not overwrit
git push --force-with-lease

# turn the head of a branch into a commit in the currently checked out branch ar
git merge --squash mybranch
```

Revert and Reset

```
# figures out the changes introduced by commitid and introduces a new commit unc
git revert commitid

# does the same but doesn't automatically commit
git revert -n commitid

# updates the index and the HEAD to match the state of commit id.
# changes made after this commit are moved to “not yet staged for commit”
git reset commitid

# sets only the HEAD to commitid
git reset --soft commitid

# sets the HEAD, index and working directory to commitid
git reset --hard commitid

```

```
# sets the HEAD, index and working directory to origin/main
git reset --hard origin/main
```

The Stash

```
# take all changes made to working tree and stash them in a new dangling commit,
# the working tree in a clean state
# DISCLAIMER: this does not include untracked files
git stash

# stash everything into a dangling commit, including untracked files
stash save --include-untracked

git stash push file # push individual or multiple files to the stash

# apply the changes which were last stashed to the current working tree
git pop

# show the stash of commits
git stash list

# apply a particular commit in the stash
git stash apply

# apply the second-to-last commit in the stash
git stash apply stash@{2}

# drop the second-to-last commit in the stash
git stash drop stash@{2}

# stash only the changes made to the working directory but keep the index unmodi
git stash --keep-index

# clear the stash
git stash clear
```

Working with Submodules

```
# add a submodule to a repository and clone it
git submodule add https://domain.com/user/repository.git submodules/repository

# add "ignore = all" to .gitmodules in order to ignore all changes in submodules
cat <<eof >> .gitmodules
[submodule "mysubmodule"]
     path = myrepo
     url = git@gitlab.com:jdsalaro/myrepo.git
     ignore = all
eof

# while in a repository which contains submodules, they can be recursively
# updated by issuing the following command
```

```
git submodule init
git submodule update

# this an faster way of updating all submodules
git submodule update --init --recursive

# clone a repository which contains references to other repositories as submodul
git clone --recursive

# remove completely a submodule
submodule='mysubmodule';\
git submodule deinit $submodule;\
rm -rf .git/modules/$submodule;\
git config --remove-section $submodule;\
git rm --cached $submodule
```

Searching

```
#list the latest tagged revision which includes a given commit
git name-rev --name-only commitid

# find the branch containing a given commit
git branch --contains commitid

# show commits which have been cherry-picked and applied to main already
git cherry -v main

# look for a regular expression in the log of the repository
git show :/regex
```

Other Tips and Tricks

ls-files and ls-tree

```
# list files contained in the current HEAD or in the head of the
# main branch respectively
git ls-tree --full-tree -r HEAD
git ls-tree -r main --name-only
git ls-tree -r HEAD --name-only

# list ignored files
git ls-files -i
```

Diffing

```
# diff two branches
git diff branch1..branch2

# perform a word-diff instead of a line-diff
git diff --word-diff

git diff --name-status main..branchname
git diff --stat --color main..branchname
git diff > changes.patch
git apply -v changes.patch
```

Cleaning

```
# perform a dry run and list untracked files or directories that
# would be removed without actually doing so
git clean -n

#remove untracked files from the working tree
git clean -f

# removes untracked files and directories
git clean -f -d

# same as above but also removes ignored files
git clean -f -x -d

# same as above but does so through the entire repo
git clean -fxd :/
```

Git log

```
git whatchanged myfile
git log --after="MMM DD YYYY"
git log --pretty=oneline
git log --graph --oneline --decorate --all
git log --name-status

git log --pretty=oneline --max-count=2
git log --pretty=oneline --since='5 minutes ago'
git log --pretty=oneline --until='5 minutes ago'
git log --pretty=oneline --author=<name>
git log --pretty=oneline --all

git log --pretty=format:'%h %ad | %s%d [%an]' --graph --date=short

git log --grep regexp1 --and --grep regexp2
git log --grep regexp1 --grep regexp2
git grep -e regexp1 --or -e regexp2
```

Set an SSH key for git access

```
ssh-keygen -t rsa -C "user@server.com"
cat id_rsa.pub

#remote of the repository must point to ssh url
git remote set-url origin ssh://git@server.com:/repo.git

#don't forget to upload your public key to the respective server
```

Now the following can be put inside `~/.ssh/config`.

```
host server.com
 HostName server.com
 IdentityFile ~/.ssh/id_rsa_server
 User git
```

List all dangling commits

```
git fsck --no-reflog | awk '/dangling commit/ {print $3}'
```

Leave the current commit as the only commit in the repository

```
git checkout --orphan new
git add -A
git commit -am "Initial commit"
git branch -D main
git branch -m main
```

Remove a file from the repository

```
git filter-branch -f --prune-empty --index-filter \
  'git rm --cached -r -q -- . ; git reset -q $GIT_COMMIT -- myfile' -- --all
```

Set up a Git Repository using Git LFS

In GitLab projects you must enable git LFS as described in this HOWTO.

```
git init
git remote add origin git@domain.com:user/repository.git

```

```
git lfs track '*.7zip'
git lfs track "*.avi"
git lfs track "*.bak"
git lfs track "*.bin"
git lfs track '*.bin'
git lfs track "*.bk"
git lfs track "*.bmp"
git lfs track "*.csv"
git lfs track "*.dat"
git lfs track "*.data"
git lfs track "*.db"
git lfs track "*.dll"
git lfs track "*.doc"
git lfs track "*.docx"
git lfs track "*.exe"
git lfs track "*.gif"
git lfs track '*.gz'
git lfs track "*.ico"
git lfs track '*.iso'
git lfs track "*.jar"
git lfs track "*.jpg"
git lfs track "*.list "
git lfs track "*.mp4"
git lfs track "*.mpg"
git lfs track "*.msi"
git lfs track "*.o"
git lfs track "*.obj"
git lfs track "*.odt"
git lfs track "*.odp"
git lfs track "*.pcap"
git lfs track "*.pcapng"
git lfs track "*.pdf"
git lfs track "*.pickle"
git lfs track "*.png"
git lfs track "*.ppt"
git lfs track "*.pptx"
git lfs track "*.pyc"
git lfs track '*.rar'
git lfs track "*.tar"
git lfs track '*.tar.gz'
git lfs track "*.wmv"
git lfs track "*.webp"
git lfs track "*.xcf"
git lfs track "*.xls"
git lfs track "*.xlsx"
git lfs track '*.zip'

git add .
git commit -m "Initial commit"
git push -u origin main
```

Change Author and Committer

```
git filter-branch --force --env-filter '
    if [ "$GIT_COMMITTER_NAME" = "OLD_NAME" ];
```

```
    then
        GIT_COMMITTER_NAME="NEW_NAME";
        GIT_COMMITTER_EMAIL="NEW_EMAIL";
        GIT_AUTHOR_NAME="NEW_NAME";
        GIT_AUTHOR_EMAIL="NEW_EMAIL";
    fi' -- --all
```

‹ Seneca: We Suffer more from Imagination than Reality

Git Hooks Basics ›