Git

Basics

Bare basics

semantic versioning

https://semver.org/

clone

- `git clone <url>` clone an arbitrary repository

add

- `git add .` add all files to stage

commit

- `git commit -m "some commit message"` commit staged changes with inline commit message

~~checkout~~ -> switch

- switch: git-scm.com
  - `git switch -c <branch-name>` create new branch and switch to it
- checkout:
  - ~~`git checkout <branch-name>` checkout the branch with given name~~
  - ~~`git checkout -b <branch-name>` create and checkout a new branch with given name~~

remotes

- `git push`
- `git fetch`
- `git pull`

log

`git log`

- `--graph` show visual graph in the terminal

- `--all` list all branches, not only current branch

alias in `~/.gitconfig`:

```
[alias]
lg1 = log --graph --abbrev-commit --decorate --format=format:'%C(bold blue)%h%C(reset) -
%C(bold green)(%ar)%C(reset) %C(white)%s%C(reset) %C(dim white)-
%an%C(reset)%C(auto)%d%C(reset)' --all
lg2 = log --graph --abbrev-commit --decorate --format=format:'%C(bold blue)%h%C(reset) -
%C(bold cyan)%aD%C(reset) %C(bold green)(%ar)%C(reset)%C(auto)%d%C(reset)%n''
%C(white)%s%C(reset) %C(dim white)- %an%C(reset)'
lg = lg1
```

config

local

```
git config user.email "your_email@abc.example"
git config user.name "Example Name"
```

filemode

ignore filemod: `git config (--global) core.fileMode false`

lineend

on linux: `git config --global core.autocrlf input`

on windows: `git config --global core.autocrlf true`

to keep `LF` as end of line in the repo. check git docs

store credentials

- in plaintext in `~/.git-credentials`
  - `git config --global credential.helper store`
  - add personal accesstoken to credetinal files:

```
git credential approve << EOF
protocol=https
host=gitlab.com
username=private-token
password=<<your personal access token>>
EOF
```

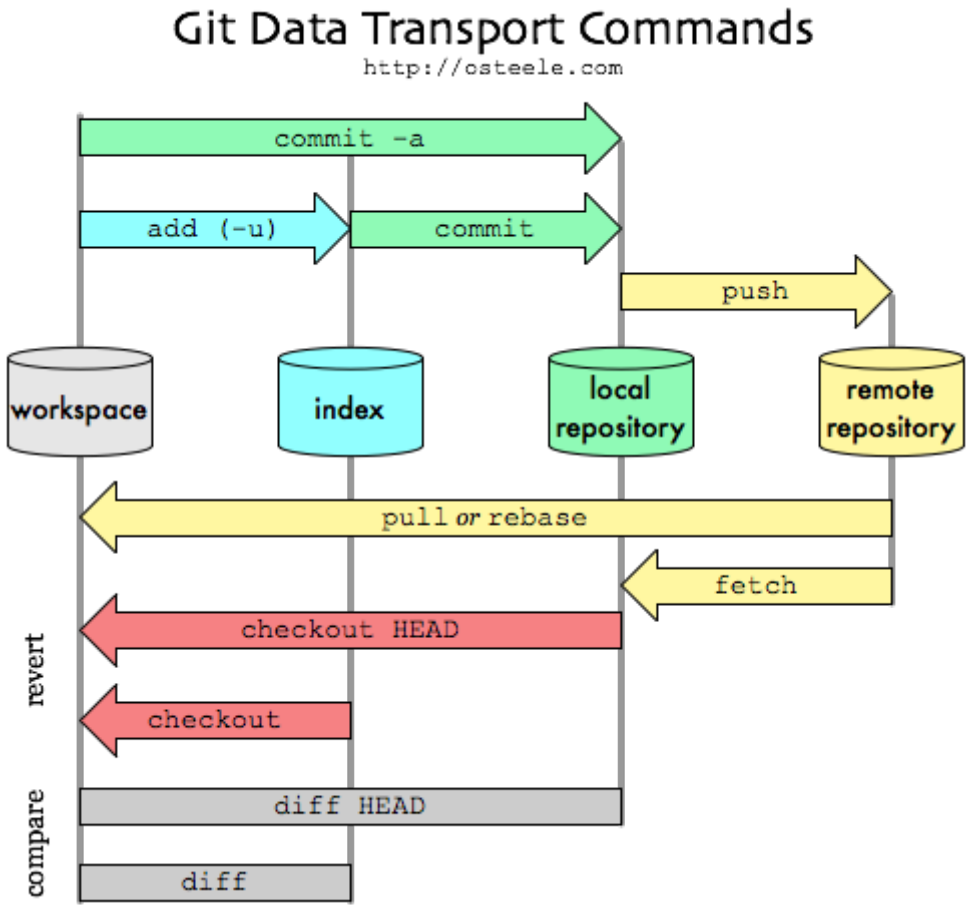
- content in files:

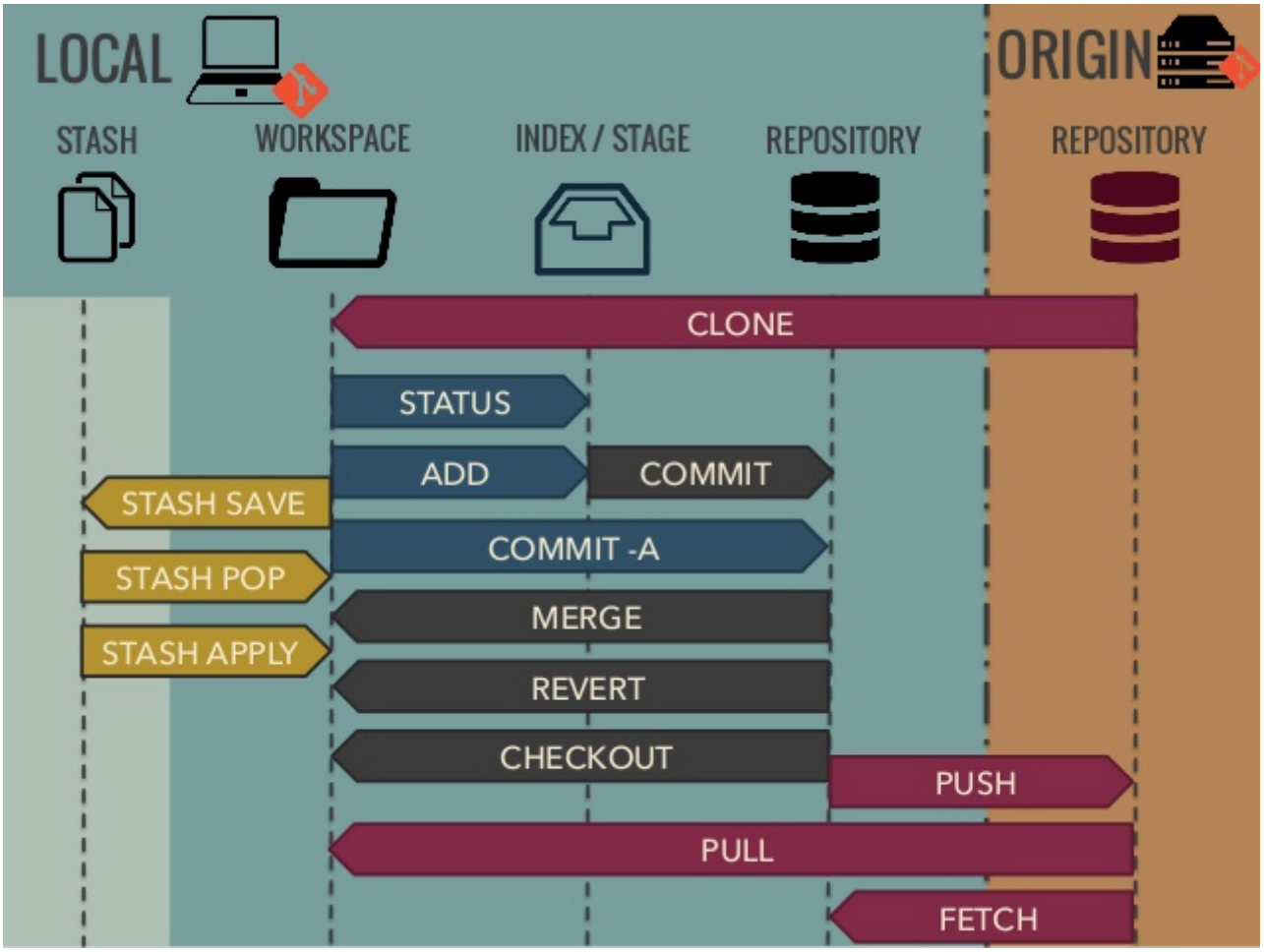
```
# ~/.gitconfig
[user]
    email = myMail@mymail.com
    name = Me
[credential]
    helper = store

# ~/.git-credentials
https://private-token:............@gitlab.com
```

- in cache
  - `git config credential.helper 'cache --timeout=<timeout>'`
  - timeout in seconds (default 900 sec)

others


Git Data Transport Commands
http://osteele.com
commit -a
add (-u)
commit
push
workspace
index
local repository
remote repository
pull or rebase
fetch
checkout HEAD
revert
checkout
compare
diff HEAD
diff


LOCAL
ORIGIN
STASH
WORKSPACE
INDEX / STAGE
REPOSITORY
REPOSITORY
CLONE
STATUS
ADD
COMMIT
STASH SAVE
COMMIT -A
STASH POP
MERGE
STASH APPLY
REVERT
CHECKOUT
PUSH
PULL
FETCH

Stash / Worktree

git stash

git worktree

git gitkraken use

add new worktree

`git worktree add <path> <branch>`

- `--force` force creating a new worktree (e.g. create new worktree with already checked out branch)

list worktrees

`git worktree list`

remove unused worktree

`git worktree remove [-f] <worktree>`

- Unclean worktrees or ones with submodules can be removed with `--force` or `-f`.

Merge, Rebase, Reset, Clean

merge vs rebase

https://www.atlassian.com/git/tutorials/merging-vs-rebasing

Make the current Git branch a master branch

```
git checkout better_branch
git merge --strategy=ours master    # keep the content of this branch, but record a merge
git checkout master
git merge better_branch             # fast-forward master up to the merge
```

rename branch (local and remote)

- `git branch -m master main` - rename master to main
- `git push -u origin main` - push branch with new name
- set remote default branch in remote repo.
- protect new brunch, unprotect old branch (in remote repo)
- `git push origin --delete master` - delete branch in remote repo

reset last commit(s)

- undo the last commit (changes will be in place)
- `git reset --soft HEAD~`
- `git reset --soft HEAD~2` undo the last two commits

merge (force remote)

- drop local changes (incl commits)

```
git fetch --all
git reset --hard origin/master
```

mergetool

- installed merge tool like meld necessary
  - `sudo apt install meld`
  - configure it: https://stackoverflow.com/questions/34119866/setting-up-and-using-meld-as-your-git-difftool-and-mergetool

```
[diff]
    tool = meld
[difftool]
    prompt = false
[difftool "meld"]
    cmd = meld "$LOCAL" "$REMOTE"

[merge]
    tool = meld
[mergetool "meld"]
    # Choose one of these 2 lines (not both!) explained below.
    cmd = meld "$LOCAL" "$MERGED" "$REMOTE" --output "$MERGED"
 #   cmd = meld "$LOCAL" "$BASE" "$REMOTE" --output "$MERGED"
```

- merge

  ```
  git checkout master
  git merge branch_name
  ```

  - start mergetool: `git mergetool`
- diff
  - `git difftool BRANCH_NAME -- FILE`

clean up

`git clean -d -x ( -n | -i | -f )`

will remove untracked files

- including directories (`-d`)
- files ignored by git (`-x`)

- `-n`, `-i` or `-f` must be specified
  - perform a dry-run (`-n`)
  - interactive mode (`-i`)
  - delete all without asking (`-f`)

Hooks

git hooks

pre-commit-msg

This example adds the branch name as prefix to the commit message:

- create the file `~/.githooks/prepare-commit-msg`

```
#!/bin/sh
#
# Automatically adds branch name every commit message.
#
NAME=$(git branch | grep '*' | sed 's/* //' | cut -d '_' -f 1)

echo "[$NAME]"': '$(cat "$1") > "$1"
```

- make the file executable `sudo chmod +x ~/.githooks/prepare-commit-msg`
- execute `git config --global core.hooksPath ~/.githooks` to use this hook at every repository

pre-push example

- create the file `~/.githooks/pre-push`

```
while true; do
    read -r -p "Have you executed 'composer test' already? (y|n): " yn < /dev/tty
    case $yn in
        [Yy]*) exit 0 ;;
        [Nn]*)
        echo "\e[31mPlease execute the command first \e[39m";
        exit 1;
        ;;
        *) echo "Please answer [y]es or [n]o." ;;
```

```
    esac
done
```

- execute `git config --global core.hooksPath ~/.githooks` to use this hook at every repository

GUI / visualize

CLI ui

show logs in a graph

`git log --oneline --graph --color --all --decorate`

for linux use `alias gg="git log --oneline --graph --color --all --decorate"` in `~/.bashrc`

lazygit

lazygit on Github

GUI

Github / Gitlab

Common

create patch from commit

add

- `.patch` for a patch file or
- `.diff` for a plain diff file

as a suffix onto commit links or merge request links.

examples:

- https://github.com/magento/magento2/commit/18dee3d979ed8ee68a44324e892e6b7f570c987c.diff

Gitlab special

gitlab personal access token

- go to `https://gitlab.com/-/profile/personal_access_tokens`
  - rights: `read_repository` and `write_repository`
  - add line in `~/.git-credentials`: `https://private-token:{{token}}@gitlab.com`

Special usecases

rename branch

- `git checkout <old_name>`
- `git branch -m <new_name>` (move/rename the local branch)
- `git push origin -u <new_name>` (push new branch to remote)
- `git push origin --delete <old_name>` (remove old branch from remote)

clone repo in existing folder

- with clone:

```
git clone https://myrepo.com/git.git temp
mv temp/.git code/.git
rm -rf temp
```

- without clone (use fetch):

```
git init
git remote add origin {{url_of_clone_source}}
git fetch origin
git checkout master # delete files that are blocking
```