

How does Git work?

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- * **‘git init’** add **‘.git/’** folder into your working directory
- * **‘git remote add <alias> <url>’** add connection to ‘remote’ into the **‘.git/config’**; ‘remote’ mustn’t be a geometric remote – it can be another Git-folder on the same machine!
- * add a **‘.gitignore’**, here is a **collection of templates** for it depends on languages and tools
- * **‘git config <--global/--local> --list’** check config

```
yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo
$ ll
total 4
drwxrwxrwx 1 root root  48 Mar  7 12:33 /
drwxrwxrwx 1 root root 4096 Mar  6 12:49 /

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo
$ git init
Initialized empty Git repository in /mnt/yw/SSD 250/00_projects/technical/Profes
sional/programming training/shells/linux/GitDemo/.git/

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ ll
total 4
drwxrwxrwx 1 root root 144 Mar  7 12:34 /
drwxrwxrwx 1 root root 4096 Mar  6 12:49 /
drwxrwxrwx 1 root root  48 Mar  7 12:34 /

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ 'git init' adds '.git/' and tracks all existed files under working directory[]
```

```
yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master [?]
$ git remote add origin git@github.com:ywinf/GitDemo.git

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master [?]
$ git config --local --list
core.repositoryformatversion=0
core.filemode=false
core.bare=false
core.logallrefupdates=true
remote.origin.url=git@github.com:ywinf/GitDemo.git
remote.origin.fetch=refs/heads/*:refs/remotes/origin/*

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master [?]
$ []
```

- * **‘git add -A’** & **‘git add .’** both add all modification to ‘staged’, but **‘-A’** works under any folder/subfolder
- * **‘git rm <files>’** remove files which are **tracked** but modified / deleted means → ‘unstaged; useful option includes **‘-f / -n / r / --cached / --’** etc.
- * **‘git clean -df’** remove files which are **untracked** and unstaged, **‘-d’** for directory while **‘-f’** for file
- * **‘git reset’** is for undoing changes; diff. opt. **‘--soft’**, **‘--mixed’** & **‘--hard’** are for diff. use cases; **‘--hard’** is hard!! and it will delete all of your local changes!
- * **‘git status’** / **‘git log <--stat>’** / **‘git reflog’** as helper

```
yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master [?]
$ git status
On branch master
Untracked files:
  (use "git add <file>..." to include in what will be committed)
    first.txt
    second.txt

nothing added to commit but untracked files present (use "git add" to track)

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master [?]
$ git add -A

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master [+]
$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    new file:   first.txt
    new file:   second.txt

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master [+]
$ git reset 'second.txt'

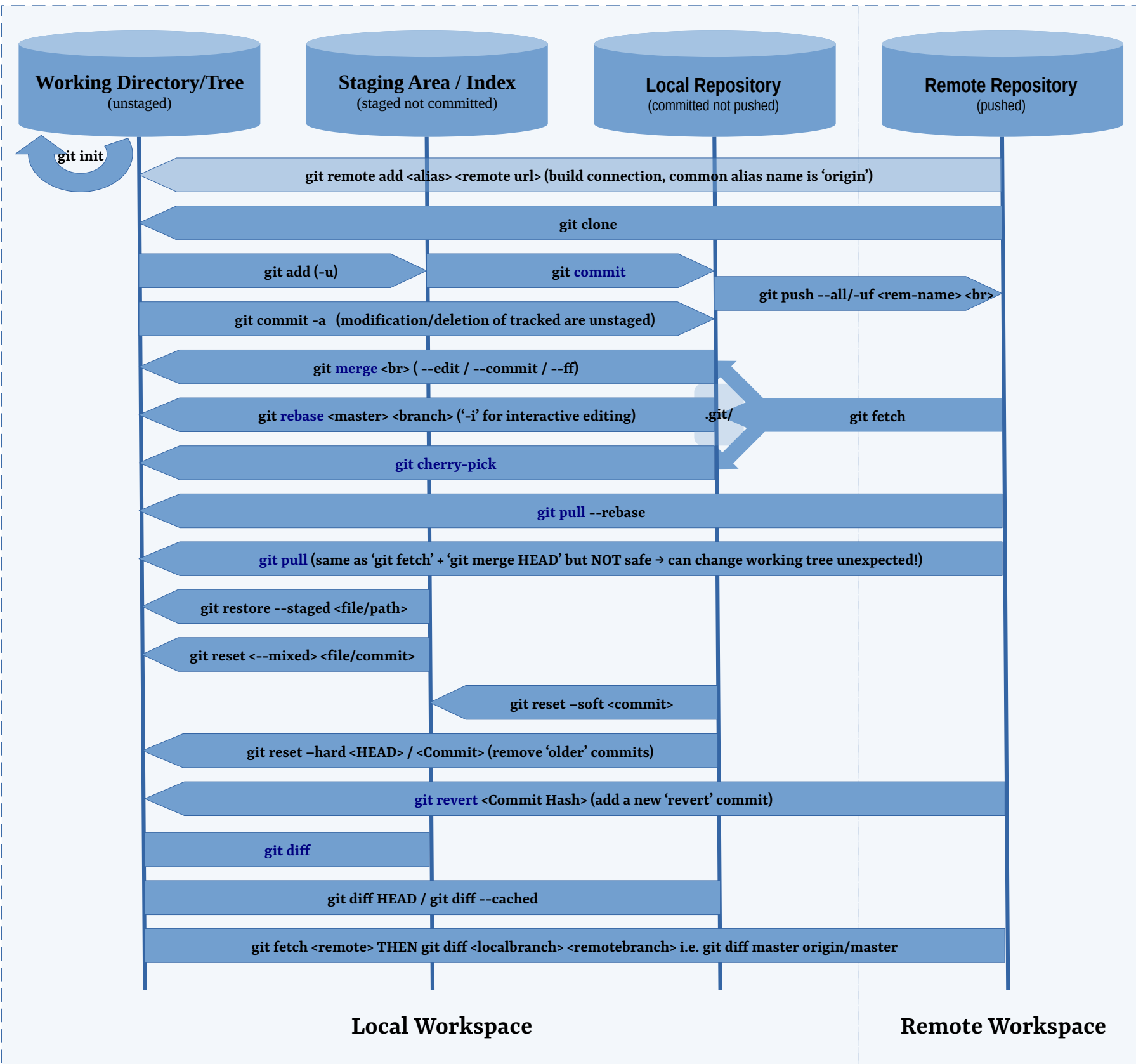
yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master [?]
$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    new file:   first.txt

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    second.txt
```

- * **‘git checkout -b
’** or **‘git branch
’** or **‘git switch -c
’** builds a new branch **‘
’**
- * **‘git checkout
’** or **‘git switch
’** to switch to the branch named **‘
’**
- * **‘git branch -d / -D
’** delete the branch **‘
’**
- * **‘git reflog’** list all commit history
- * **‘git config --global alias.<name> <cmd str.>’** help you to remember long cmd, as follows ‘adog’

```
yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ git config --global alias.adog 'log --all --decorate --oneline --graph'

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ git adog
* 82f3778 [origin/feature02_01: feature02_01] add feature02_01.txt
* 104494a [origin/feature02: feature02] add a new feature02.txt
* 404040c [origin/feature01: feature01] add feature01.txt on the branch feature01
* 807001e [HEAD -> master, origin/master] add second.txt with changes.
* 8cf4c7d add first.txt
* 8213c32 init commit: add a .gitignore
```



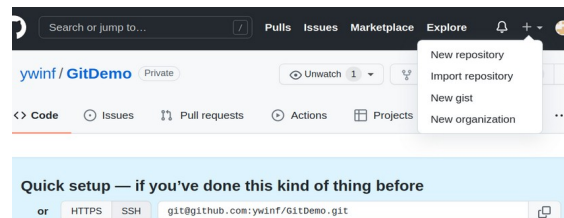
- * **‘git stash’** store modify temporily
- * **‘git stash list’** list stack content
- * **‘git stash pop’** pop up the first
- * **‘git stash drop’** discard from top
- * **‘git stash clean’** clean the stack

- * **‘.git/objects/’**: all commits
- * **‘.git/refs/head/’**: refs to local repo.
- * **‘.git/refs/remote/’**: refs to remote repo.
- * **‘.git/config/’**: local configs

- * **‘git help <cmd>’** / **‘git <cmd> --help’** help you to understand <cmd> more
- * **‘git help -c’** list all available commands
- * **‘git help -a’** list all cmds and your own aliases
- * **‘git help -g’** list available guides or tutorials for example ‘everyday’
- * **‘git --version’** give the version

- * **‘git reset --amend <commit>’** edits commit msg.
- * **‘git rebase -i HEAD-n’** edit ‘squash’ commit interactively
- * **‘git mv <existing-path> <new-path>’** change path and stage the move
- * **‘git log’**: ‘branchB..branchA’ / ‘--follow file’ / ‘--stat -M’ / ‘--oneline’ etc. for diff. use cases

- * **‘git clone <url>’** copy the remote repo. to local repo. & working directory; if <url> is a supermodule, its submodules will not be copied automatically, this shall be done by **‘git submodule update --init <--remote> <--recursive>’**
- * For using SSH protocol: generate (**ssh-keygen**) the SSH Keys and then put the public-key onto the Remote Server i.e. Github;
- * For using HTTP protocol: create and save token & **‘git config credential.helper store’** to cache login data



- * **‘git remote add <alias> <url>’** add a remote connection ‘alias’,
- * **‘git remote rm <alias>’** delete it and
- * **‘git remote rename <alias> <new>’** rename it ‘new’
- * **‘git remote -v’** / **‘git remote show <alias>’** show info about remote
- * **‘git push <remote-name> <branch-name>’** push local branch to remote
- * **‘git push <alias> --delete <branch-name>’** delete a remote branch <branch-name> on <alias>
- * **‘git branch -r’** list branch on remote

```
yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ git remote
origin

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ git remote -v
origin git@github.com:ywinf/GitDemo.git (fetch)
origin git@github.com:ywinf/GitDemo.git (push)

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ git remote show origin
* remote origin
Fetch URL: git@github.com:ywinf/GitDemo.git
Push URL: git@github.com:ywinf/GitDemo.git
HEAD branch: master
Remote branches:
  feature01 tracked
  feature02 tracked
  feature02_01 tracked
  master tracked
Local branch configured for 'git pull':
  master merges with remote master
```

- * **‘git fetch’** affects ONLY inside of the **‘.git/’** !
- * **‘git fetch <remote>’**: get all branch of remote
- * **‘git fetch <remote> <branch>’**: get branch of remote
- * **‘git fetch --all’**: get all remotes
- * **‘git fetch --dry-run’** perform only a demo fetch

```
yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ git fetch --all
Fetching origin
remote: Enumerating objects: 4, done.
remote: Counting objects: 100% (4/4), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 780 bytes | 390.00 KiB/s, done.
From github.com:ywinf/GitDemo
 8b7001e..574ffdc master    -> origin/master

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ git diff master origin/master
diff --git a/new_from_github.txt b/new_from_github.txt
new file mode 100644
index 0000000..93dd223
--- /dev/null
+++ b/new_from_github.txt
@@ -0,0 +1 @@
+new file created on github

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ git branch
  feature01
  feature02
  feature02_01
* feature01

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ git log --oneline master..origin/master
574ffdc (origin/master) Create new_from_github.txt

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ git merge origin/master
Updating 8b7001e..574ffdc
Fast-forward
 new_from_github.txt | 1
 1 file changed, 1 insertion(+)
 create mode 100644 new_from_github.txt

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
$ git diff master origin/master

yu@yu-HP-Compaq-Elite-8300-SFF in GitDemo on master
```