Git Complete Course

•••

By Kanzal Qalandri

Install Git

```
sudo apt install git          # For Ubuntu and Debian
sudo yum install git          # For RedHat
sudo  dnf install git         # For Fedora
```

Command:	🟧
Text:	⬜

Setup Starship.rs (Optional)

1: `curl -sS https://starship.rs/install.sh | sh`

2: `vi ~/.bashrc`

3: `eval "$(starship init bash)"`   # Add this line at the end of .bashrc file

4: Copy File content from here.

5: `vi ~/.config/starship.toml`

6: Paste the file that you copied from github here and save.

Git Init

1: First Create a folder for practicing git (mkdir Your-Folder)

2: And cd into the newly created folder.

3: git init # Initializes a new Git repository in the current directory

The git init command is the first step in creating a new Git repository. It creates a .git directory in the current directory, which contains all of the necessary files for Git to track changes to your code.

Configure Git

1: git config --global user.name “Your Name”

2: git config --global user.email “your-email@gmail.com”

3: git config --global -e   # Check Configuration

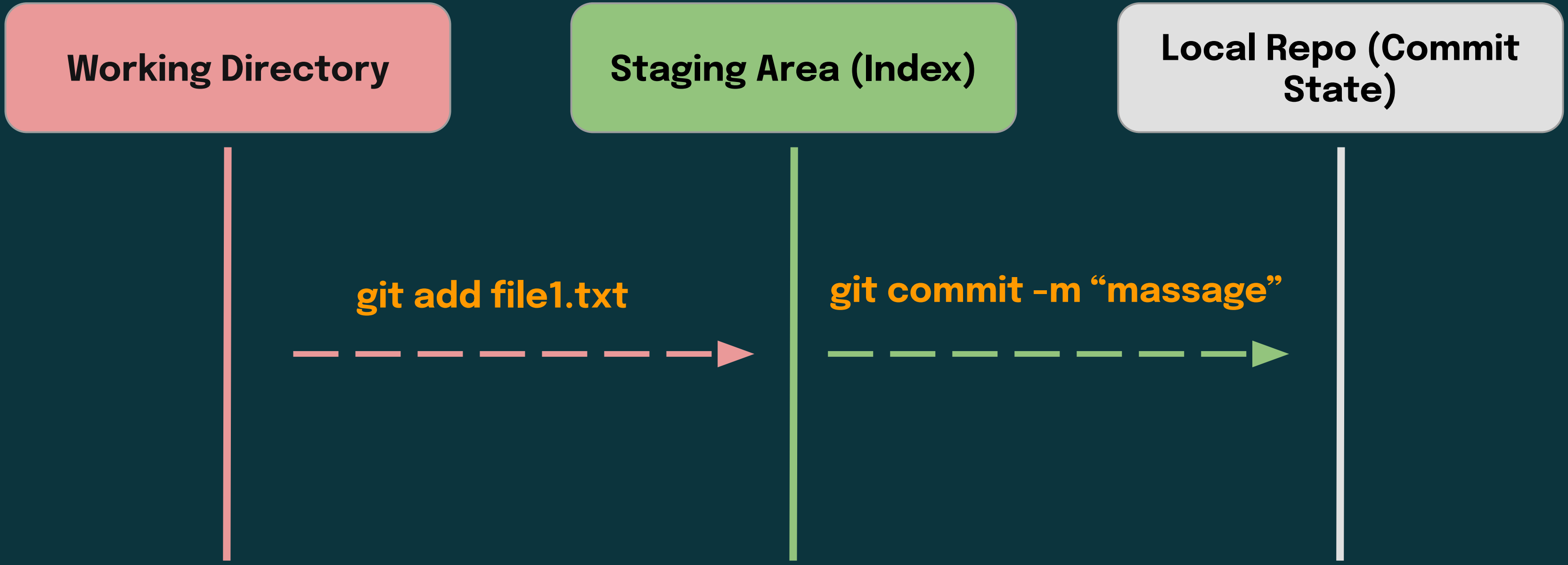
First Commit

1: Create a file file1.txt with some content.

2: git add file1.txt # Add file to the staging area

3: git commit -m “a good massage” # Created first commit

Git 3 Tier Architecture Workflow



git add / Staging Area

The git add command is used to add changes from working directory to the staging area.

The staging area is a temporary holding area for changes that you want to include in your next commit. Once you have added changes to the staging area, you can commit them to the repository with the git commit command.

```
1:   git add <filename>   # Add single file to the staging area
2:   git add .            # Add all changed files in the current directory to Index
3:   git ls-files         # List all files present in Index (Staging Area).
```

Git Commit

The git commit command is used to create a permanent snapshot of the changes that have been added to the staging area. Once you have committed changes, they cannot be undone without explicitly reverting the commit.

```
1:    git commit -m “commit message”    # Create a Commit

2:    git log                           # List all previous commits

3:    git ls-tree <commit-id>           # List all files present in particular commit
```

The commit message should be a brief description of the changes that you have made.

Git Show

1: git ls-tree <commit-id>

Above command will show files present in a particular commit.

2: git show <file-id>

Using git ls-tree <commit-id> you will get files list with their file id on that particular point of time. So, use git show <file-id> to view the content of any file at that point of time.

Git Diff

1: `git diff` # diff b/w working directory and Index.

2: `git diff --staged` # diff b/w Index and last commit.

Setup a Better Diff tool (VSCode):

```
git config --global diff.tool vscode

git config --global difftool.vscode.cmd 'code --wait --diff $LOCAL $REMOTE'
```

3: `git difftool` # To view diff on VSCode

Remove Files

```
git rm <file-name>
```

git rm is a command in Git used to remove files from both the working directory and the staging area, effectively deleting them from the repository while also staging the removal for the next commit.

Renaming Files

```
git  mv <file-name>
```

git mv is a Git command used to move or rename files and directories within a repository. It automatically stages the changes, combining the actions of renaming the file and staging it for the next commit.

Ignoring Files

In Git, the .gitignore file is a powerful tool that allows developers to specify certain files and directories to be ignored by Git. This means these files will not be tracked or staged, making it essential for excluding temporary files, build artifacts, and sensitive information from version control.

```
git rm <file-name> --cached        #Remove file just from Index
```

Status & Short Status

git status is a Git command that provides a detailed view of the current state of your repository. It shows which files are modified, which files are staged for the next commit, and which files are not being tracked.

git status -s or git status --short is a more concise version of git status. It provides a compact summary of the repository's status, displaying only essential information. It uses a two-letter status code to represent the changes:

?? for untracked files

A for files staged and waiting to be committed

M for modified files

D for deleted files

Git Restore

1: git restore <file-name>   # working area <<< Index

git restore file-name used to discard all the changes that we make in working area with the file present in Index.

2: git restore --staged <file-name>   # Index <<< Commit

git restore --staged file-name used to discard all the changes in the Index with the file version present in last commit.

Git Tags

In Git, tags are references to specific points in Git history, typically used to mark release points or significant commits. There are two types of tags: annotated and lightweight.

```
git tag -a v1.0 -m "Release version 1.0"   # Annotated Tags

git tag v1.0                               # Lightweight Tags

git show <tag-name>          # Displays information about the specified tag

git tag            # Lists all tags in the repository

git push origin <tag-name>        # Pushes a specific tag to the remote repository

git push origin --tags          # Pushes all tags to the remote repository

git tag -d <tag-name>            # Deletes a local tag

git push origin --delete <tag-name>        # Deletes a remote tag
```

Branching

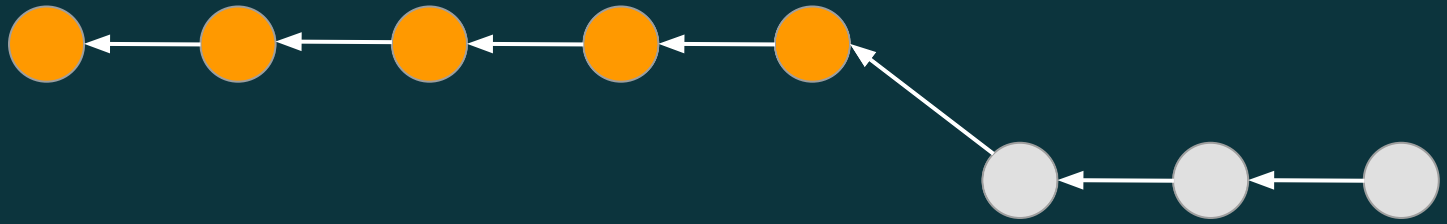
Branching Theory

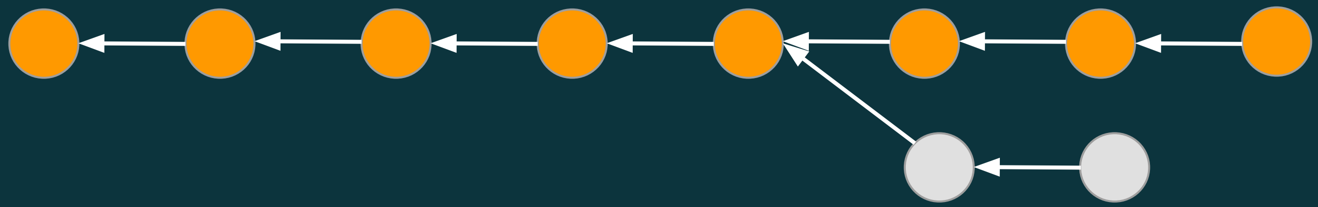
- Branches in version control systems, such as Git, are parallel lines of development that allow multiple team members to work on different features or tasks simultaneously
- Each branch represents an independent line of commits and its changes Branches are like labels that point to a specific commit within the commit history graph.
- By default, Git creates a branch called "master" that initially points to the last commit in the repository.
- When you create a new branch, it is created as a new pointer that starts from the same commit as the current branch.
- As you make new commits, the branch pointer moves forward, always pointing to the latest commit in that branch.

Create a Branch

```
1:  git branch <new-branch-name>      # Create a Branch
2:  git switch <branch-name>          # Switch between branches
3:  git switch -C <branch-name>       # 2 in 1 (Create and Switch)
```

Branch Examples





Merging

Types of Merging

1: Fast Forward Merges

2: 3-way Merges