



WALCHAND COLLEGE OF ENGINEERING, SANGLI



# Walchand Linux Users' Group

Celebrates

## OPEN SOURCE DAY 2K24

### LEARN & CONTRIBUTE



Introduction to GIT

FREE  
FOR  
ALL

GIT Branching

GIT Commands

GitHub Contribution

Introduction to CI / CD

Principles of CI / CD

CI / CD Tools

CI / CD Pipelines



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OCT  
2024

[www.wcewlug.org](http://www.wcewlug.org)



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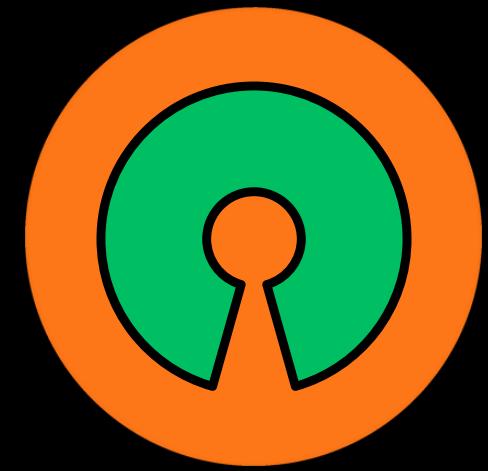
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# Table of Contents



Open Source



Git



Github



Version Control  
System



Git  
Commands

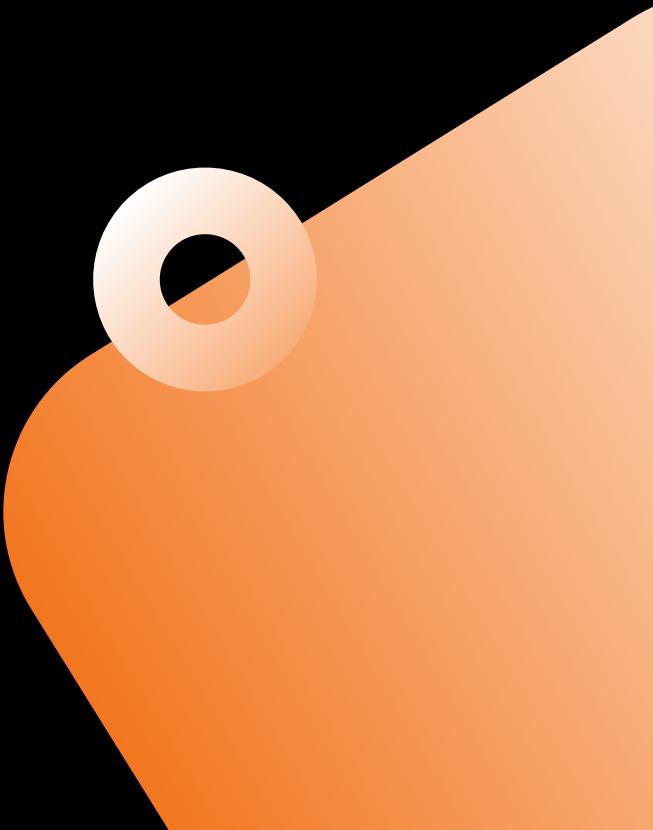
# WHAT IS OPEN SOURCE?

# Open Source

- » Free and accessible code
- » Collaborative development
- » Transparency and security
- » Flexibility and customization



# Examples of Open Source



# Examples of Open Source



VLC



VS Code



Linux



Blender



Git

# Version Control System

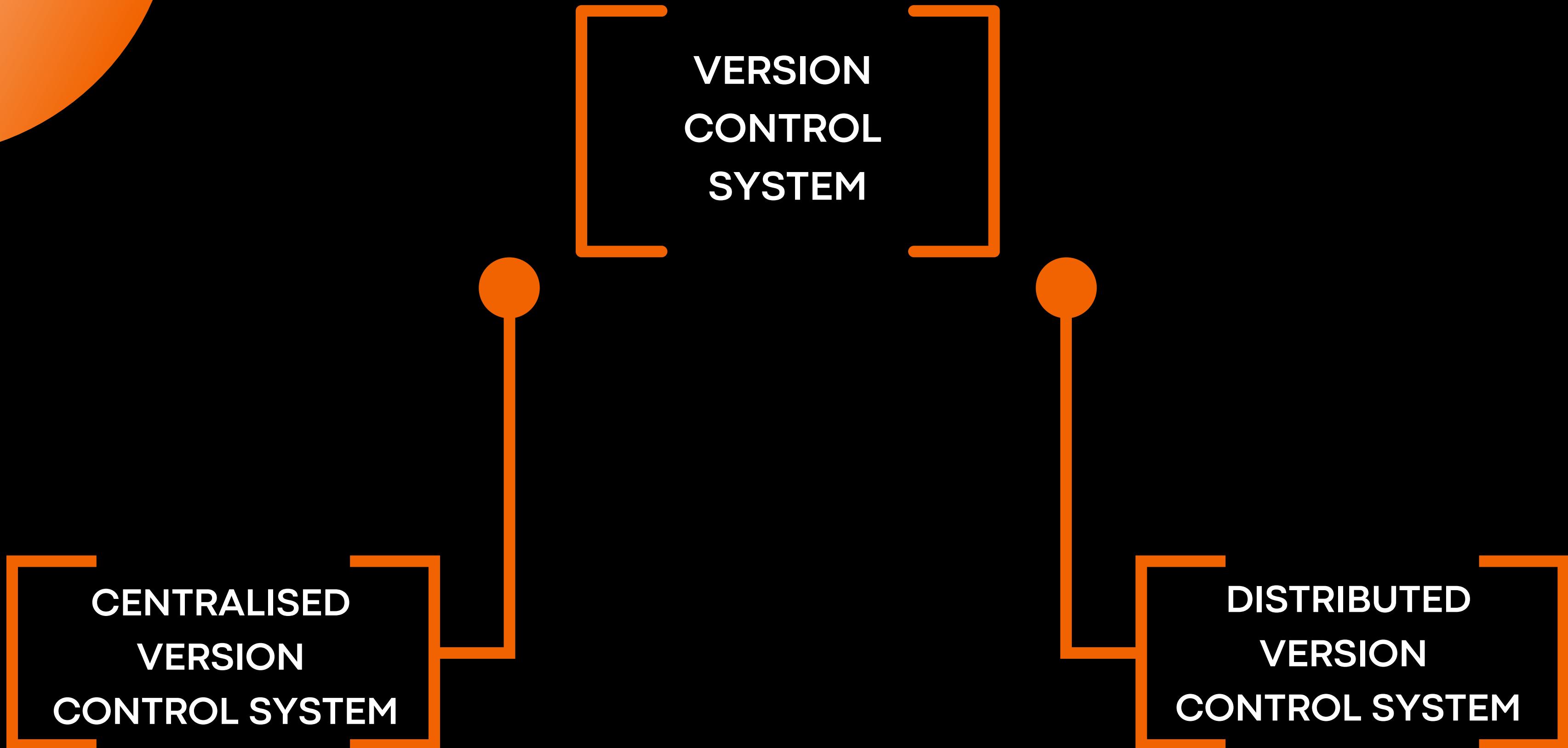
- »» Backs up your work
- »» Helps in error handling
- »» Maintains project log



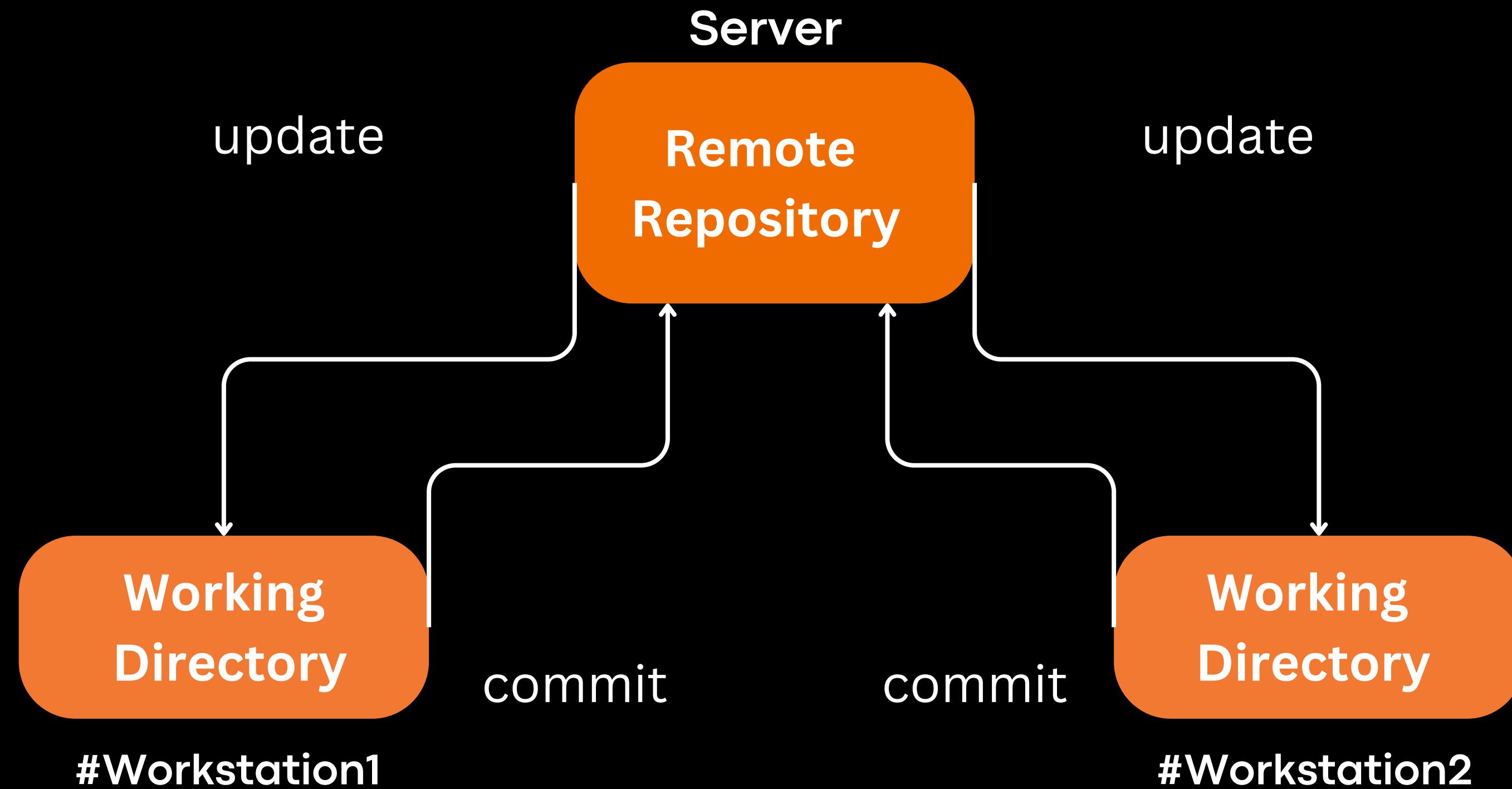
# Version Control System

- » Manages multiple versions
- » Audits changes
- » Simplifies code integration





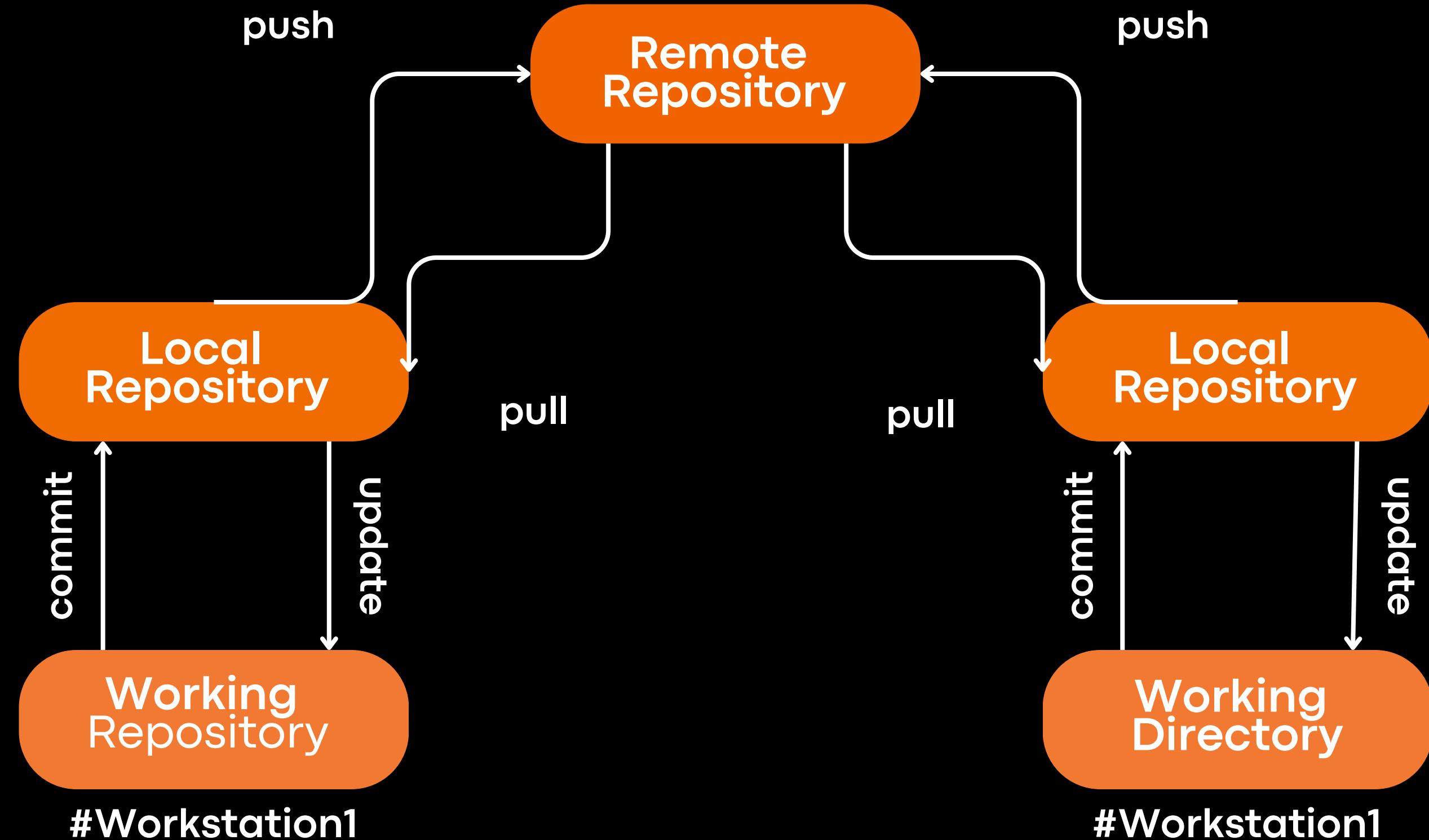
# Centralised VCS

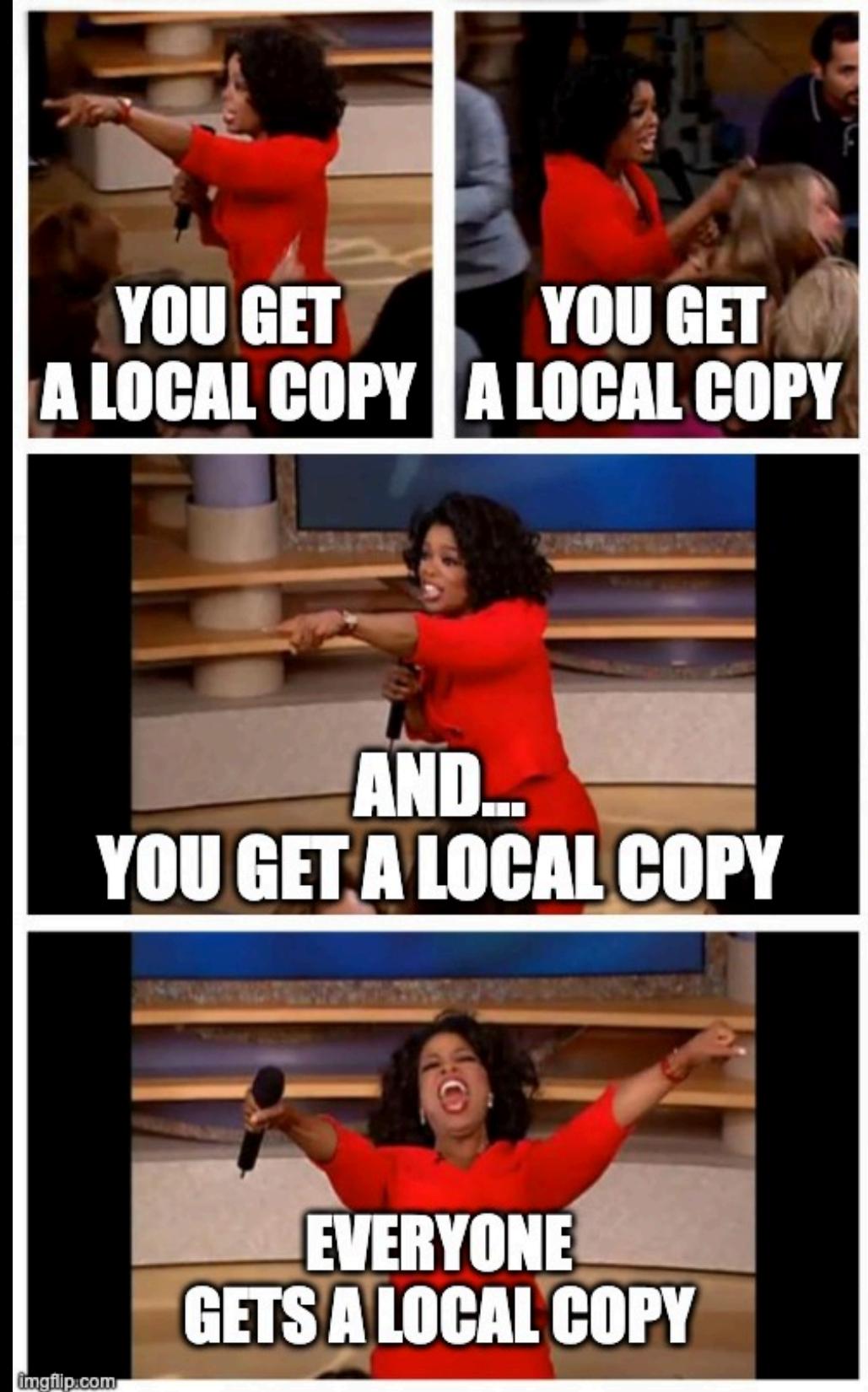


# Centralised VCS

- »» Uses a single, central repository
- »» Requires a constant connection to the central server for collaboration
- »» Offers limited or no offline access
- »» Central server failure halts work for all users
- »» e.g. Subversion(SVC), Perforce

# Distributed VCS





# Distributed vCS

- »» Each user has a full copy of the repository
- »» Full offline access to the project's history
- »» Users can work locally even if the central server fails
- »» E.g. Mercurial, Git



# DO YOU KNOW HIM?

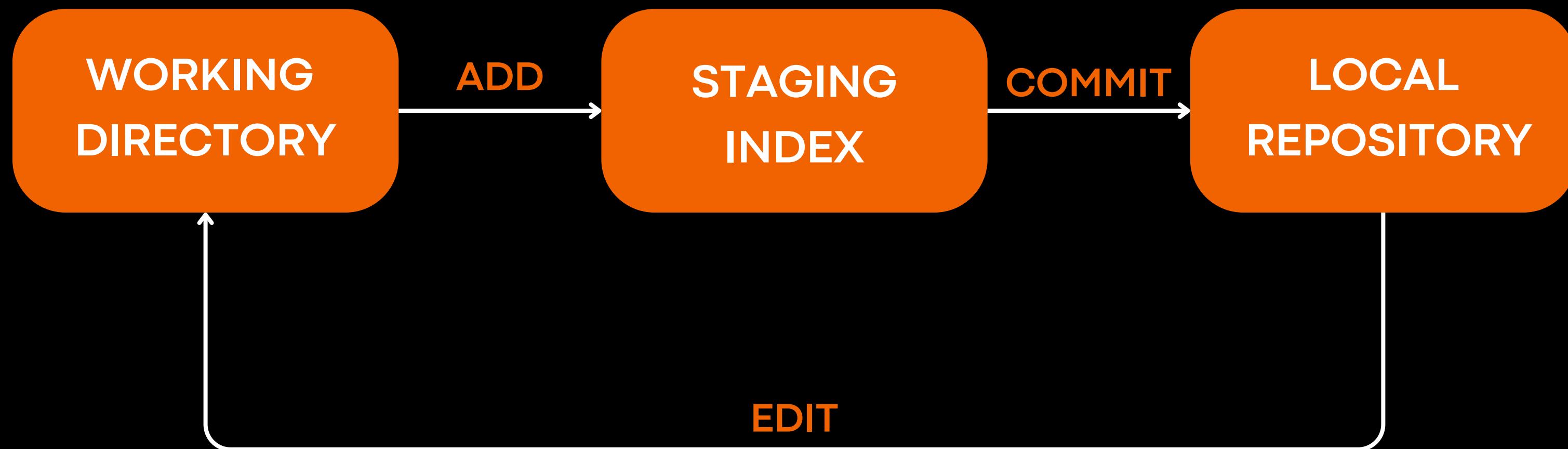


# GIT History

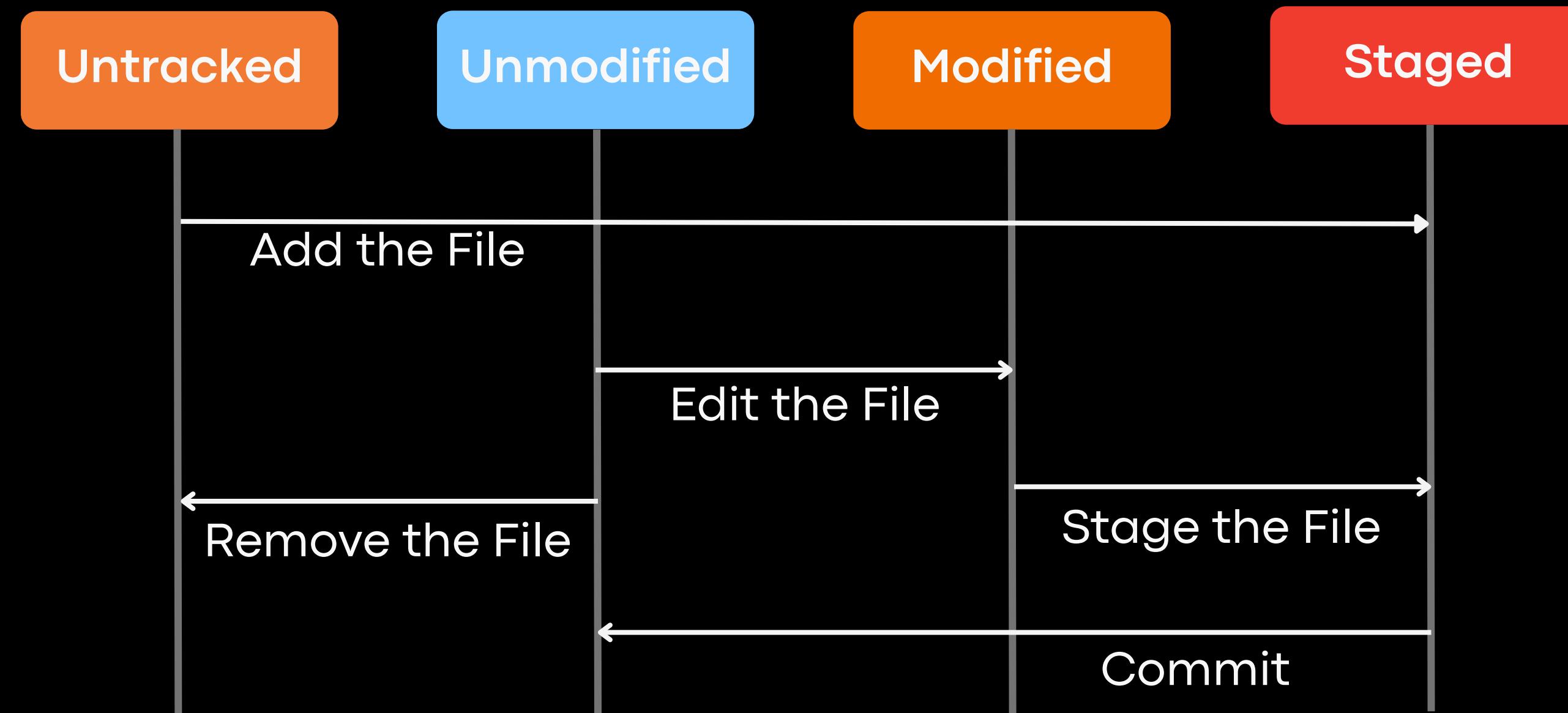
- »» Created by Linus Torvalds in 2005
- »» Replaced BitKeeper
- »» Speed, security and distributed development
- »» Most widely used version control system



# GIT Architecture



# How GIT Works?





# GIT

Distributed VCS

Installed on a local machine

Version control and tracking changes

Used offline for version control

Open source

# GITHUB

Cloud based host for storing git repositories

Accessed online on a web browser

Storage and collaboration

Requires internet for collaboration

Proprietary software

# Basic linux Commands



```
$ pwd
```

Prints the working directory



```
$ ls
```

Lists the files in a directory



```
$ mkdir <directory name>
```

Creates an empty directory



```
$ cd <directory name>
```

Changes directory



```
$ touch <file name>
```

Creates a file



```
$ cat <file name>
```

Displays the file content

# INSTALLING GIT



## Linux:



```
$ sudo apt install git-all
```

## Windows:



<https://git-scm.com/downloads/win>

# CONFIGURING GIT

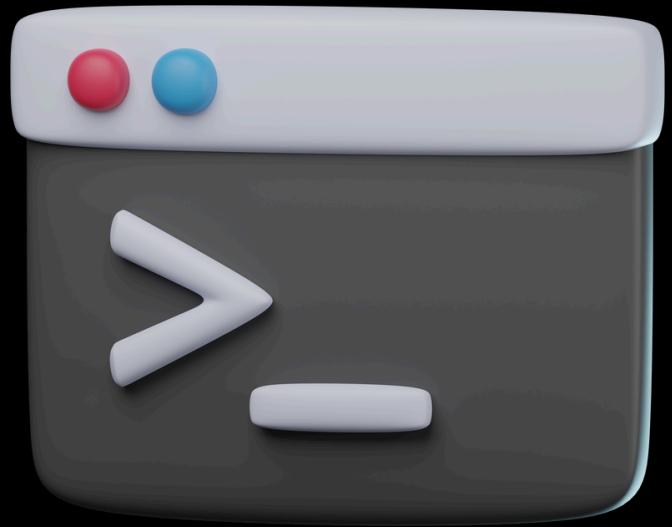


```
$ git config --global user.name "your-name"
```



```
$ git config --global user.email "your-email"
```

# GIT COMMANDS





```
$ git init
```

Initialises a Git repository



```
$ git status
```

Checks the status of git repository



```
$ git add <file_name>
```

Adds the file to the staging area



```
$ git add .
```

Adds all the files in the Working Directory to staging area



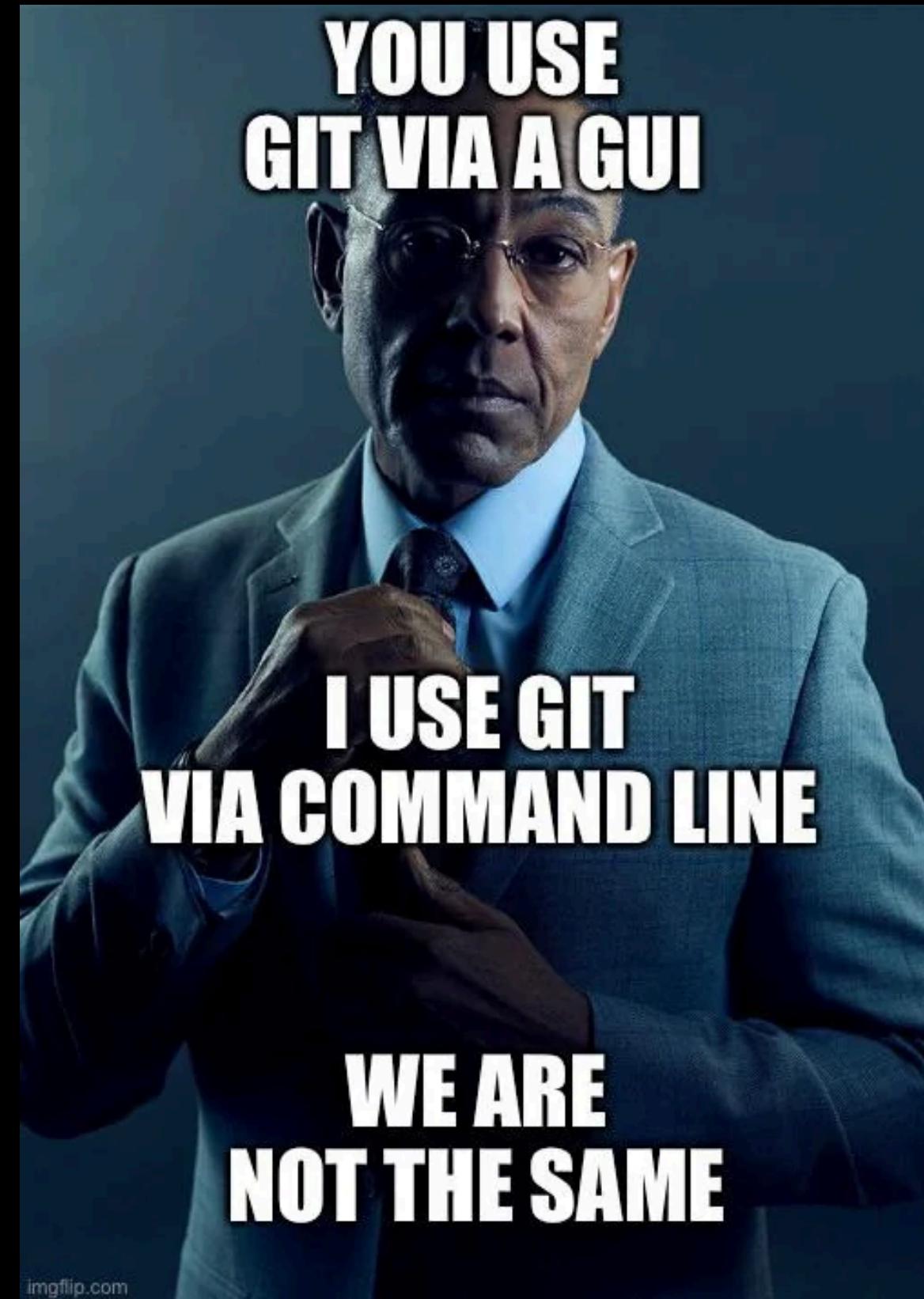
```
$ git commit -m "Commit message"
```

Commits your changes to local repository



```
$ git log
```

To view the commit history



# GIT BRANCHING



# Branching Commands



```
git branch  
git branch -a
```

To list all local branches



```
git branch <branch name>
```

To create a new branch

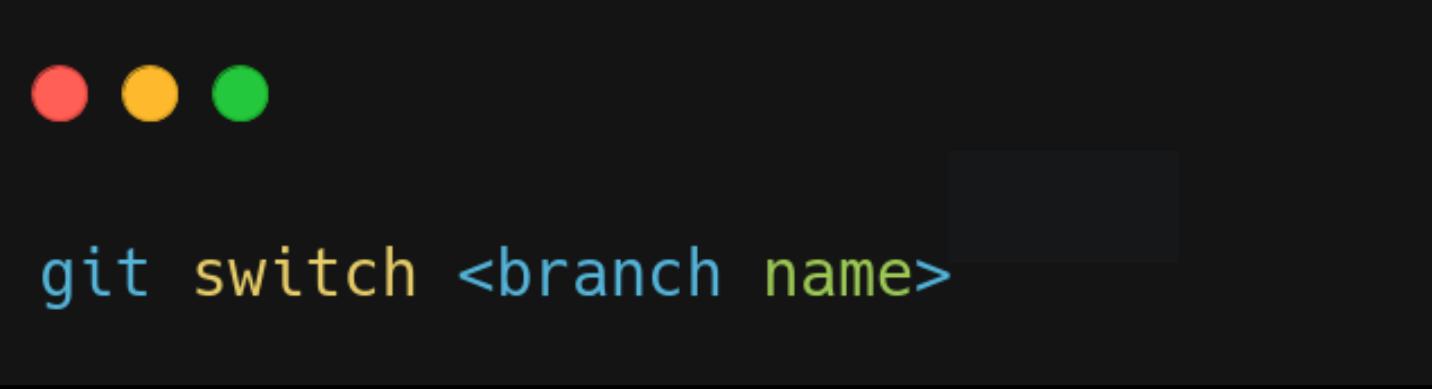
```
● ● ●  
git branch -m <old name> <new name>
```

To rename the branch

```
● ● ●
```

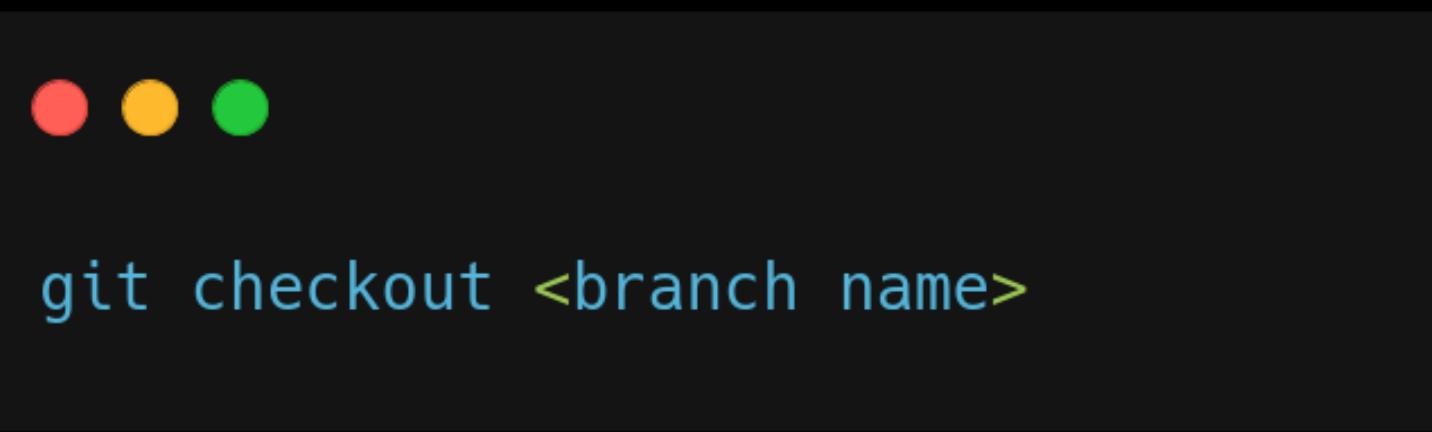
```
git branch -d <branch name>
```

To delete a branch



```
git switch <branch name>
```

To switch to an existing branch



```
git checkout <branch name>
```

To switch to an existing branch

```
git checkout -b <branch name>
```

To create and switch to a new branch

```
git diff <branch1> <branch2>
```

To compare differences between two branches



```
git branch -a
```

List all branches in a Git repository, including both local and remote branches

# Merging Commands



```
git merge <branch name>
```

To merge another branch into current branch



```
git show
```

To view the changes that cause merge conflicts

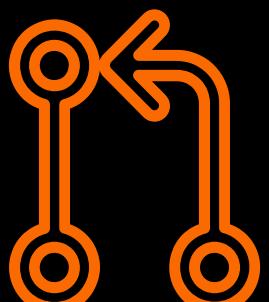
# What is a Pull Request?

Proposal to merge changes

Discussion

Allowing for code review

Approval before integration

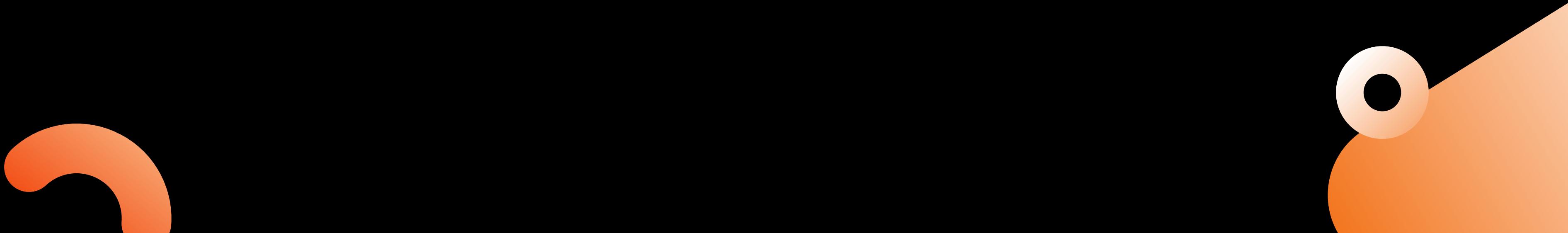


# OPEN SOURCE CONTRIBUTION



# Steps

- » Sign up / Sign in
- » Go to the repository you want to contribute to



## » Fork the repository

A fork is a copy of a repository

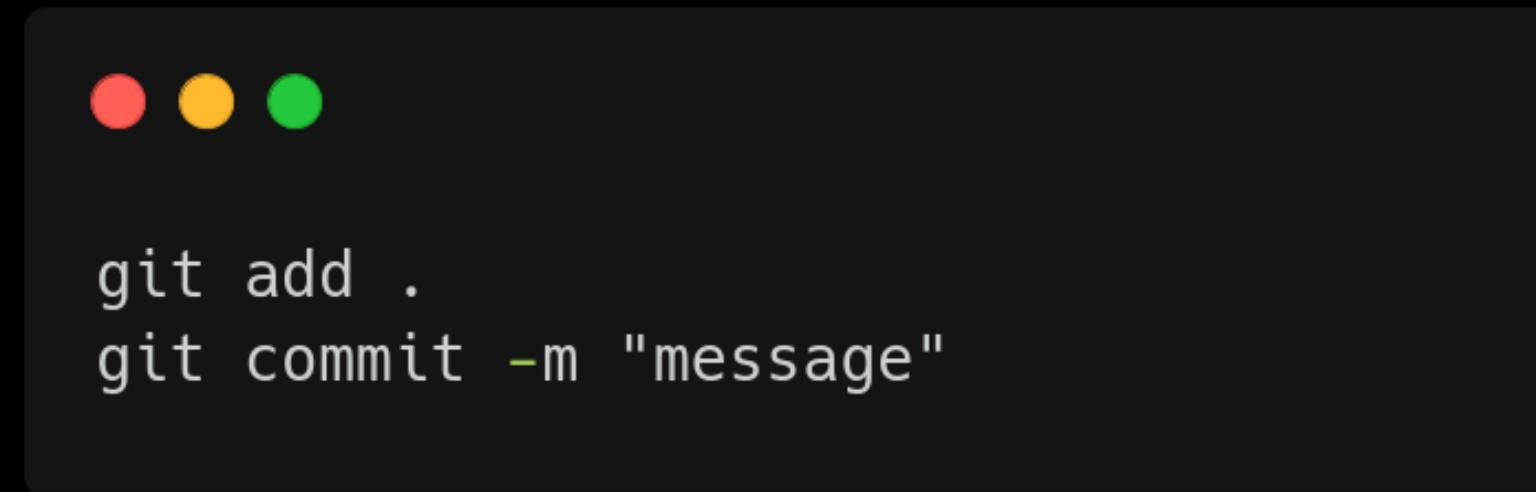
## » Clone Your fork



```
git clone <repository_url>
```



- » Make your changes
- » Commit your changes



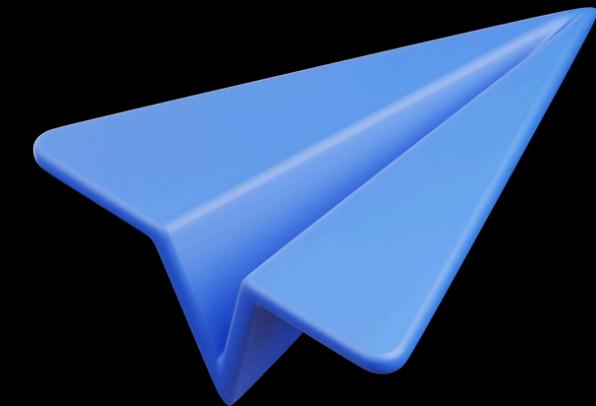
```
git add .  
git commit -m "message"
```



## » Push your changes



```
git push origin main
```



## » Create pull request

Go to the original repository and create a pull request from your branch

# Review and discussion

Implement your changes like writing code, fixing bugs, or improving documentation



# Merge the pull request

Once approved, your changes will be merged into the main branch.

# Advanced Commands



```
git revert
```

Used to create a new commit that undoes the changes made by a specific previous commit



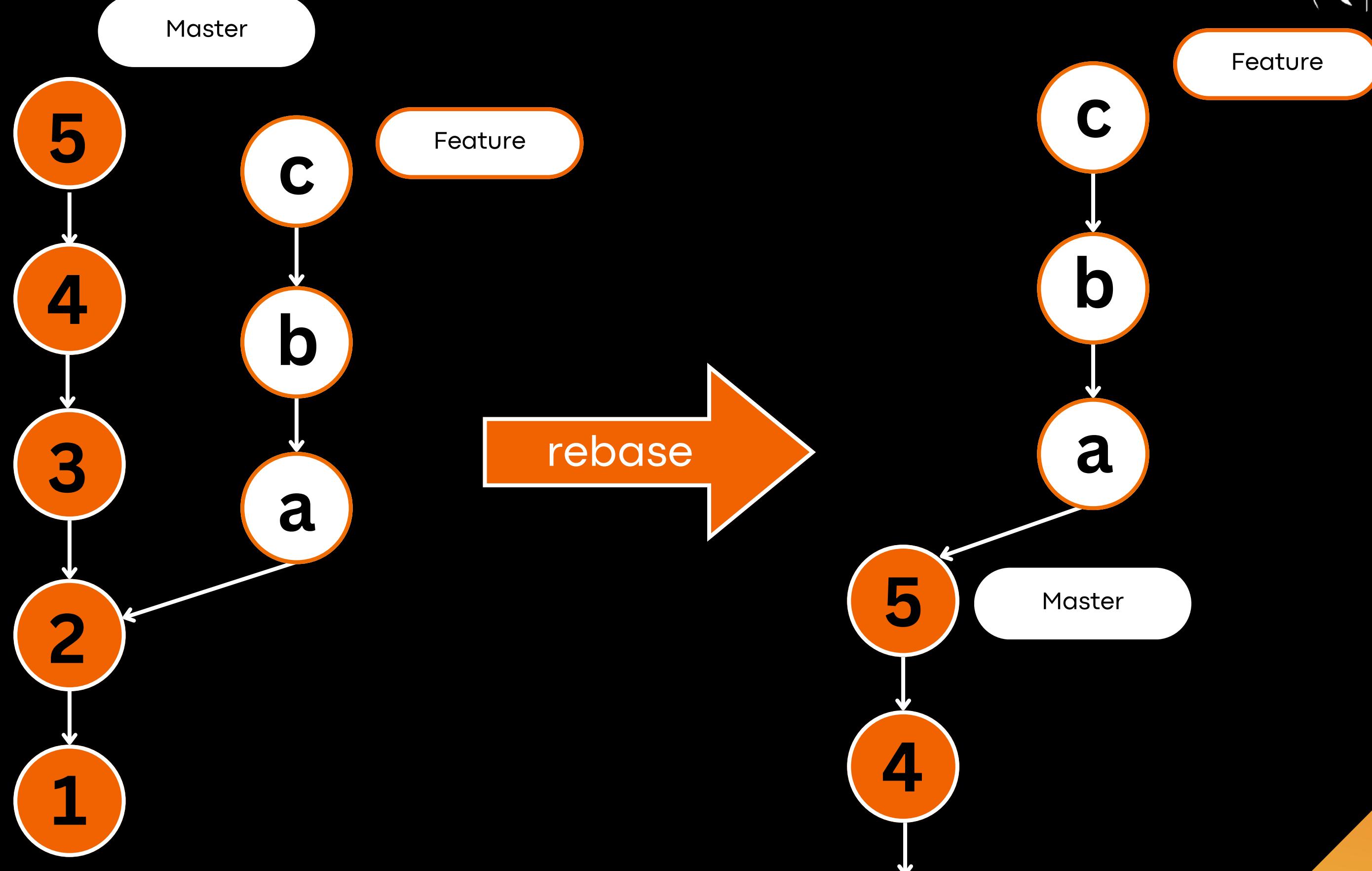
```
git reset
```

Used to undo changes and modify the commit history



```
git rebase <branch name>
```

Used to move the commits of the current branch on top of another branch



# SESSION BREAK