Walchand College of Engineering, Sangli

Walchand Linux Users' Group

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OPEN SOURCE DAY

GIT

BASH

LEARN & CONTRIBUTE

Limited Seats	Hands-On

- Introduction to GIT
- Basic GIT commands
- Branching
- Advance Commands

Scan To Register

- Introduction to Shell
- Basic of Shell Scripting
- Loops and Functions
- Automation Scripts

3rd December

Venue: Main & Mini CCF

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FREE FOR ALL

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GIT

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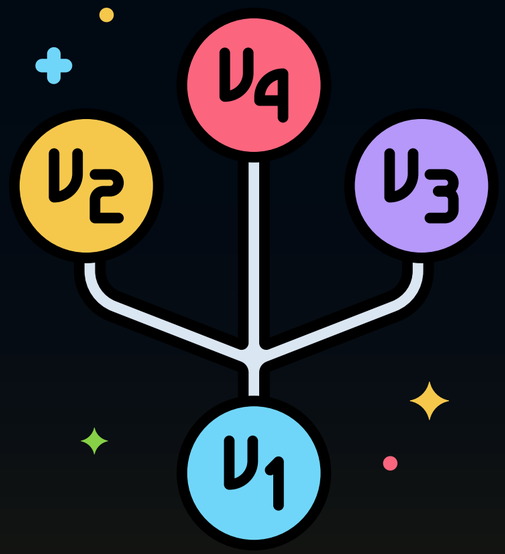
What is version control system ?

- A software tool that helps perform version control.
- Version control, aka source control, is tracking and managing changes to source code.



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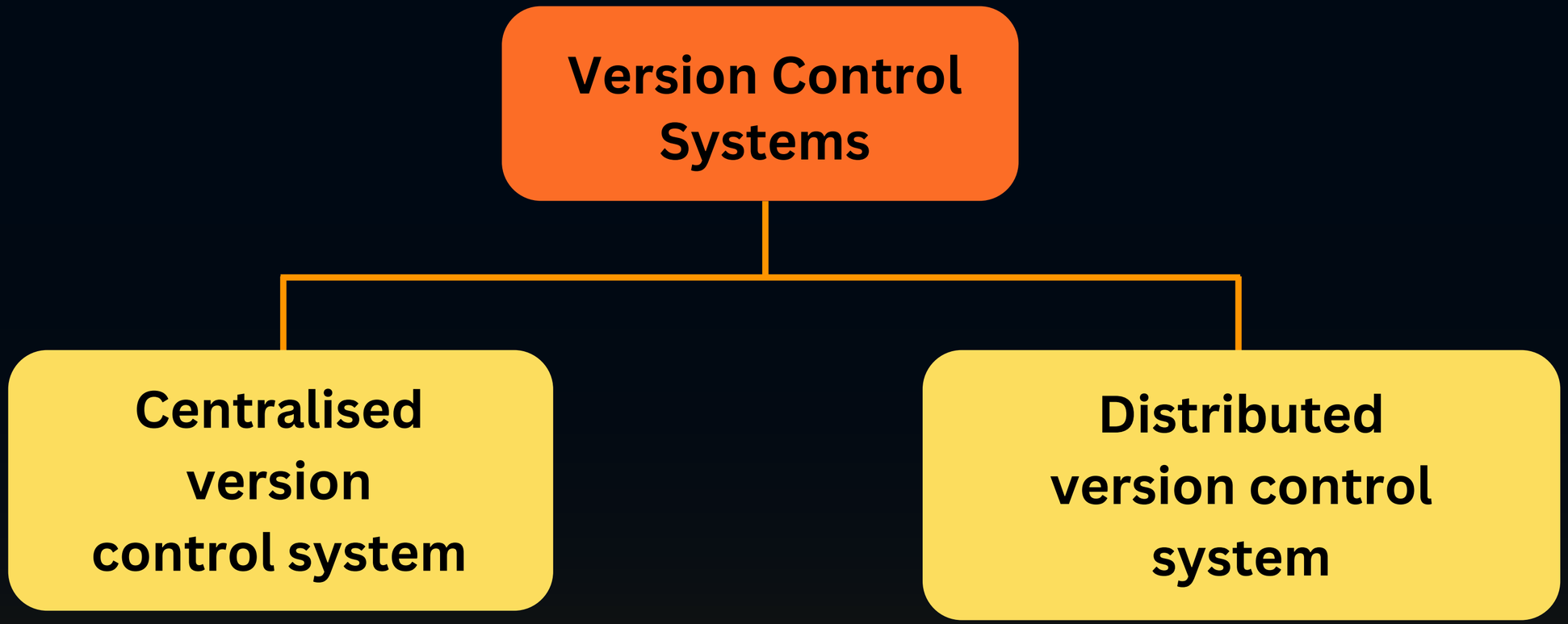
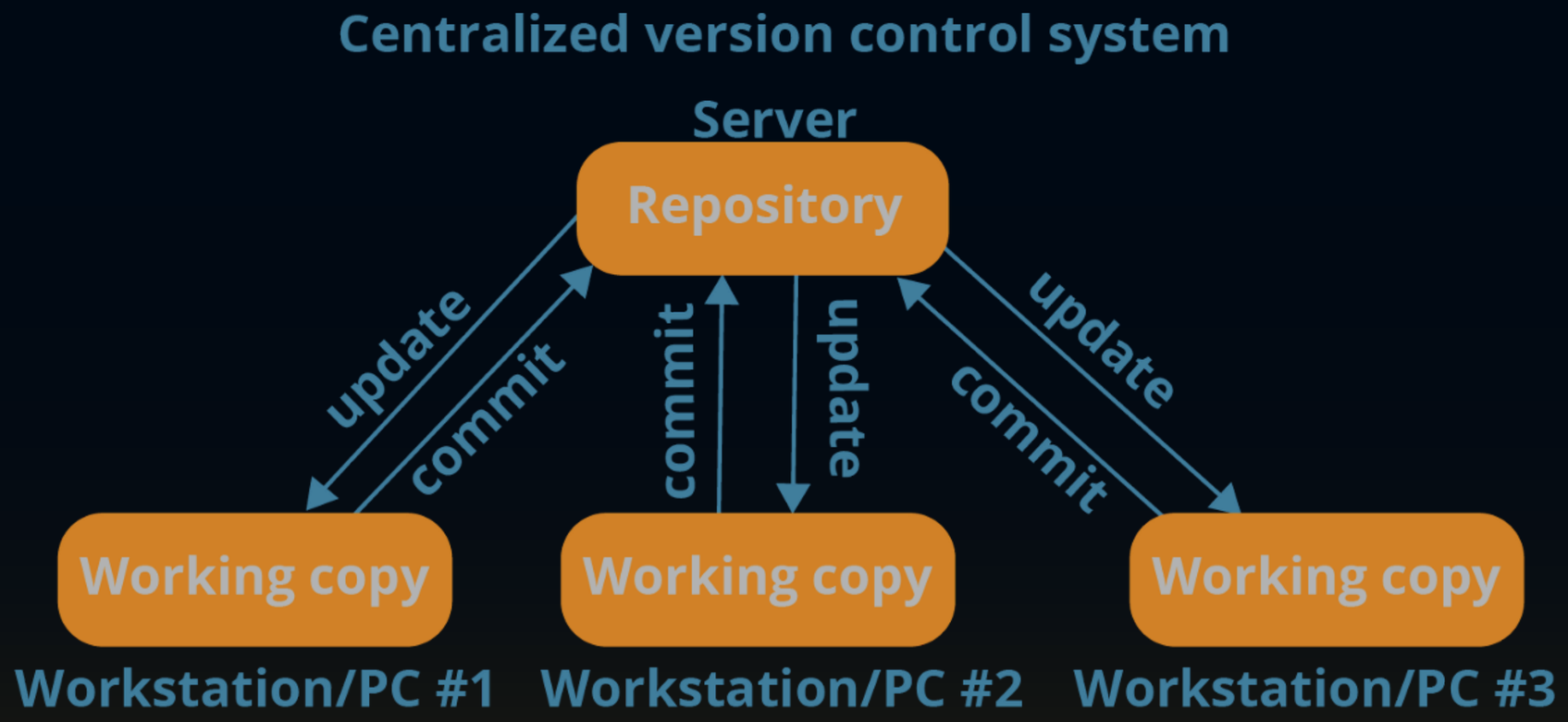
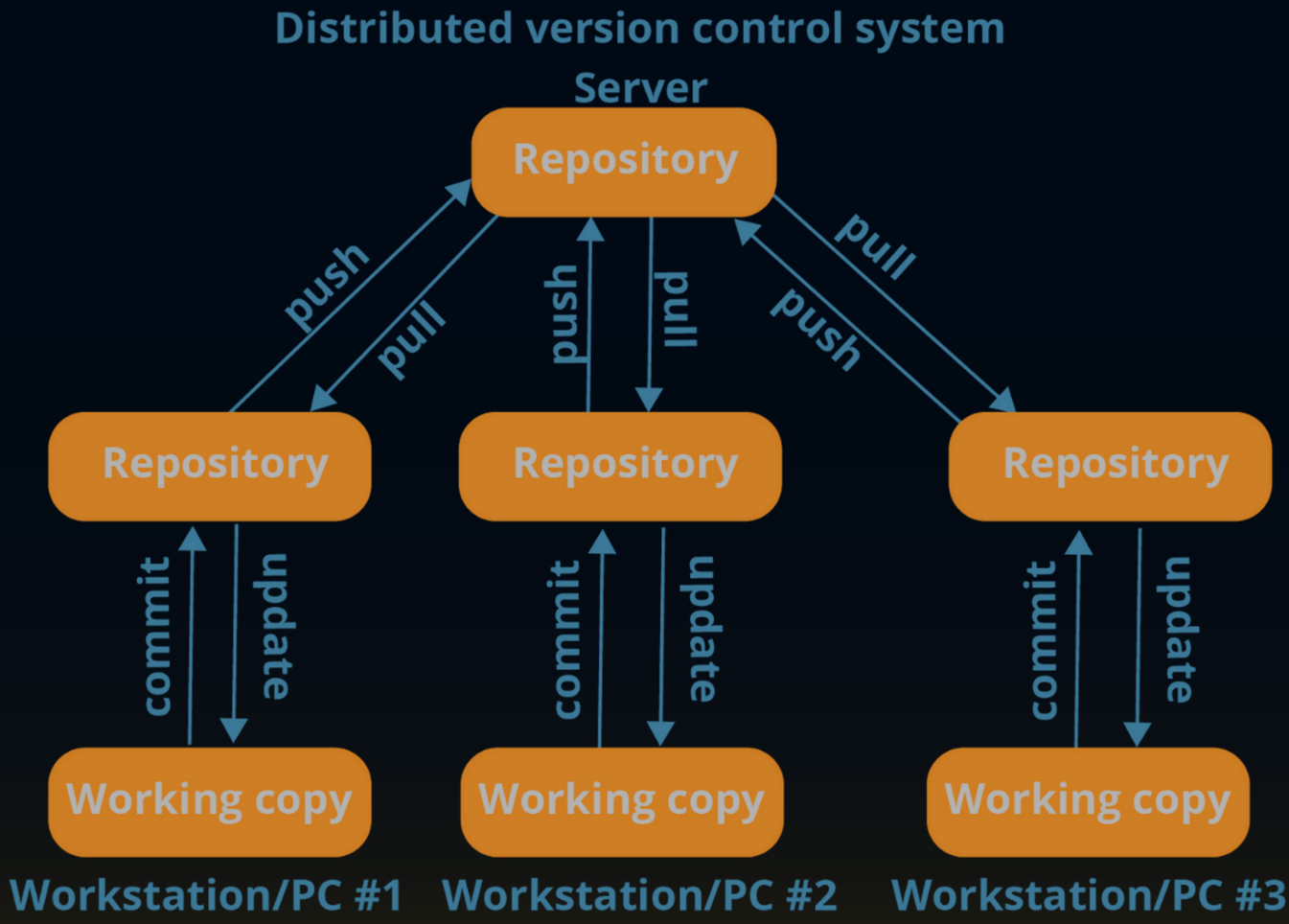


CVCS


Centralized version control system
Server
Repository
update
commit
commit
update
update
commit
Working copy
Working copy
Working copy
Workstation/PC #1
Workstation/PC #2
Workstation/PC #3

DVCS


Distributed version control system
Server
Repository
push
pull
push
pull
pull
push
Repository
Repository
Repository
commit
update
commit
update
commit
update
Working copy
Working copy
Working copy
Workstation/PC #1
Workstation/PC #2
Workstation/PC #3

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Benefits of version control system

- Allows collaboration
- Tracks changes over time
- Multiple version management
- Previous versions can be retrieved
- Informs us about Who, What, When, Why changes have been made

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GIT HISTORY

- Developed by Linus Torvalds
- Released on 7 april 2005
- Current core maintainer : Junio C Hamano
- It was a replacement to bitkeeper to manage linux kernel changes

BitKeeper

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What is GIT?

- An open source tool.
- A distributed version control system.
- Git is used to track changes in the source code, enabling multiple developers to work together on non-linear development.

Characteristics

- Open source & free

- Cross-platform

- Fast & secure

- Can work without internet connectivity

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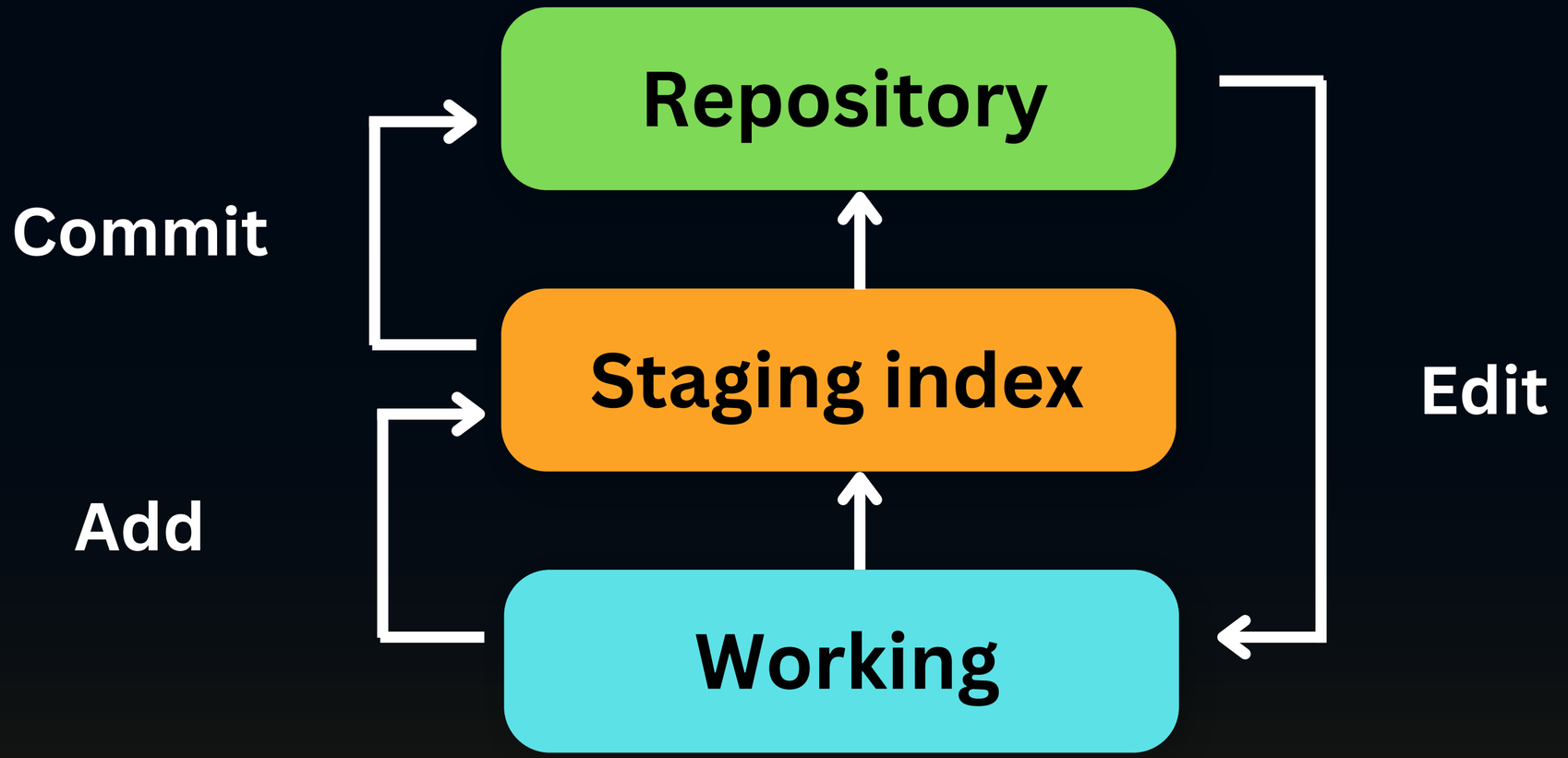
GIT Architechture



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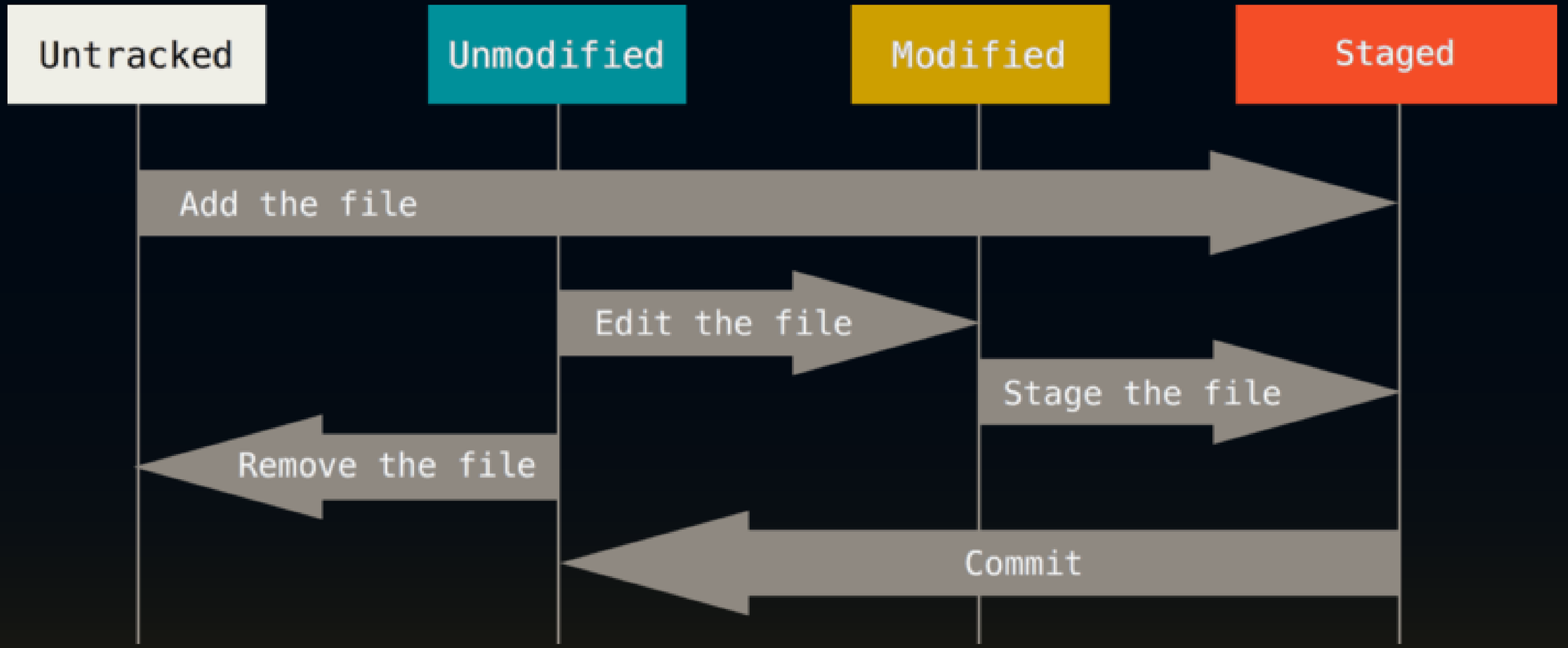
How does GIT work?



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GIT Installation

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GIT Repository

- A Git repository is the .git folder inside a project.
- This repository tracks all changes made to files in your project, building a history over time.

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Local Repository

- The local repository is a Git repository that is stored on your computer.
- Commits are made and updates are taken from the local repository.

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Remote Repository

- The remote repository is a Git repository that is stored on server.

- Changes are pushed to and pulled from the local repositories to the remote repositories.

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GITLAB

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What is GitLab ?

- It is an open source.
- It provides internet hosting services.

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Git VS GitLab

- Git is a tool.
- You can install it locally on the system.
- It is a service.
- It is hosted on the web. It is exclusively cloud-based.

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Git VS GitLab

- It focuses on code sharing and version control.
- It lacks a user management feature.

- It focuses on centralized source code hosting.
- It has a built-in user management feature.

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BASIC LINUX COMMANDS

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- touch <file_name>
- cat <file_name>
- cat >> <file_name>
- rm -d <directory_name>
- rm <file_name>
- rm -r <directory_name>
- mkdir <directory_name>
- history

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GIT COMMANDS

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```
$ git init
```

: Start a new git repository

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

: Configure the name of the user

```
$ git config --global user.email "youremail@email.com"
```

: Configure the email of the user

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```
$ git add
```

: Adds the files in the staging index

```
$ git status
```

: Show the state of the working directory and staging index

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

: Saves the changes that are staged using the git add

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```
$ git log
```

: Show the record of commits

```
$ git remote add origin <link>
```

: Create, view, and delete connections to other repositories

```
$ git push origin master
```

: Upload local repository content to a remote repository

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```
$ git pull origin master
```

: Fetch and download content from a remote repository

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Branching in GIT

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BRANCHING COMMANDS

```
$ git branch <branch_name>
```

: Creates a branch with given name

```
$ git branch
```

: List all branches

```
$ git checkout <branch_name>
```

: Switches to the defined branch

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BRANCHING COMMANDS

```
$ git checkout -b <branch_name>
```

: Creates a branch with name and switches in it

```
$ git branch -d branch_name
```

: Deletes a branch

```
$ git branch -m <old_branch> <new_branch>
```

: Renames a branch

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BRANCHING COMMANDS

```
$ git switch <branch_name>
```

: Switches to the defined branch

```
$ git switch -c <branch_name>
```

: Creates a branch with name and switches in it

```
$ git switch -
```

: Switch to previously branch

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ADVANCED COMMANDS

1. rebase
2. revert
3. blame
4. diff
5. clean

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git rebase

- Used to integrate changes from one branch to another.
- Used in the master/main branch and other feature branches as well.
- Syntax : git rebase <branch-name>

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git rebase Vs merge

- Use rebase when you want to keep a linear commit history.
- Does not create any commit at rebasing.
- Use merge in cases where you want a set of commits to be grouped in history.
- Creates a final commit at merging.

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git revert

- Used to revert some existing commits.
- Used to record some new commits to reverse the effect of some earlier commits.
- Syntax : git revert <commitId>

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git revert Vs reset

- Creates a new commit and undoes the effect of particular/multiple commits.
- Used in remote repository.

- Does not create a new commit it just goes back to the previous commit.
- Used in local repository.

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DEMO

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git blame

- Used to examine the contents of a file line by line and see when each line was last modified and who the author of the modifications was.
- Syntax : git blame <file-name>

git blame flags

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COMMANDS	DESCRIPTION	SYNTAX
git blame -L <start>,<end>	Show only specific lines	git blame -L <start>, <end> <file-name>
git blame -n	Show number of line in the file	git blame -n <file-name>
git blame -s	Suppress author name & timestamp from the output	git blame -s <file-name>

DEMO

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git diff

- Used to show changes between two commits, commit and working tree.
- Compares working directory and stagging area.
- Syntax : git diff

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git clean

- Removes untracked files from the working tree.
- Remove all or specified files based upon the option/flags provided.
- Syntax : git clean <flag>

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git clean flags

COMMANDS	DESCRIPTION	SYNTAX
git clean -n	Shows all files which will get removed	git clean -n
git clean -n -d	Shows all files and directories which will get removed	git clean -n -d

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COMMANDS	DESCRIPTION	SYNTAX
git clean -f	Removes all untracked files	git clean -f
git clean -f -d	Removes all untracked files and directories	git clean -f -d
git clean -i	Show what would be done and clean files interactively	git clean -i

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Thank You!!