

GIT

Git : git stands for the global information tracker

VCS: version control system is used to maintain multiple versions of the safe file /an application .

Ex : v1 ----- v2----- v3 history of version can be stored

Vcs is a system that records changes to a file or set of files overtime so that you can recall specific version later .

Advantages of the vcs:

A Version Control System (VCS) helps manage changes to files, especially in software projects. Here's why it's useful:

1. Saves History – You can go back to older versions if needed.
2. Teamwork – Multiple people can work on the same project without messing up each other's work.
3. Try New Ideas – You can create separate branches to test changes before adding them to the main project.
4. Keeps Track – It records who made what changes and why.
5. Reduces Mistakes – Helps fix problems by letting you compare and combine changes easily.
6. Safer Storage – Your work is backed up and protected, even if your computer crashes.

Functions of VCS:

1. To allow multiple developers to work simultaneously
2. Doesn't allow over writing
3. Vcs maintain history of each & every version .

What is Git?

Git is a popular version control system. It was created by Linus Torvalds in 2005.

It is used for:

- Tracking code changes
- Tracking who made changes
- Coding collaboration

Git types:

CVCS : centralized version control system

1. Single Central Server – All versions of the project are stored in one central place.
2. Requires Internet – Developers must connect to the server to access or update files.
3. Slower Operations – Since every action depends on the server, it can be slower.

4. Risk of Data Loss – If the central server crashes, all history may be lost.

DVCS : Decentralized version control system/ distributed :

Every Developer Has a Copy – Each person gets a full copy of the project, including its history.

Works Offline – You can make changes without an internet connection and sync later.

Faster Operations – Most actions (like commits) happen on your local machine.

Safer Backup – Since every developer has a copy, data loss is less likely.

Examples – Git, Mercurial, Bitbucket.

Difference Between Git, GitHub, and GitLab

1. Git
 - A version control system (VCS) that tracks changes in files and allows collaboration.
 - Works locally on your computer.
2. GitHub
 - A cloud-based platform for hosting Git repositories.
 - Provides features like pull requests, issue tracking, and CI/CD integration.
 - Used for collaboration, open-source projects, and team management.
3. GitLab
 - Similar to GitHub but with more built-in DevOps features like CI/CD and security testing.
 - Can be self-hosted on your own server for more control.
 - Preferred by organizations needing more privacy and automation tools.

Difference Between Version Control System (VCS) and Collaboration

Version Control System (VCS)

- A tool that helps track changes in files over time.
- Allows developers to save versions, revert changes, and manage code efficiently.
- Examples: Git.

Collaboration

- A process where multiple people work together on a project.
- Involves communication, teamwork, and coordination.
- Can be done using tools like GitHub, GitLab.