GIT

GIT stands for Global Information Tracker.
Git is a distributed version control system (DVCS) that helps developers track changes in their code, collaborate efficiently, and manage project history. It allows multiple developers to work on the same project simultaneously without conflicts while maintaining a full history of modifications.

Advantages of VCS:
Collaboration :- Multiple developers can work on the same project simultaneously without overwriting each other's changes.
Version History & Tracking :- Maintains a complete record of changes, allowing developers to track modifications and revert to previous versions if needed.
Branching & Merging :- Developers can create separate branches to work on features independently and later merge them into the main project.
Backup & Recovery :- Protects against accidental data loss, as previous versions of files can be restored easily.
Code Integrity :- Helps prevent conflicts and ensures code consistency across teams.
Auditability :- Provides a clear log of who made changes, when, and why, which is useful for debugging and accountability.
Continuous Integration & Deployment (CI/CD) :- VCS integrates well with automation tools for testing, building, and deploying applications efficiently.
Supports Experimentation :- Developers can try new features in separate branches without affecting the main codebase.
Security & Access Control :- In hosted VCS platforms like GitHub, GitLab, and Bitbucket, permissions can be managed to control who can make changes to the codebase.
Efficiency :- Reduces manual effort in managing code changes, making the development process faster and smoother.

VCS:
Tracks and manages changes to files over time.
Stores multiple versions of a file and allows rollback.
Allows multiple people to work on the same file independently and merge changes later.
Identifies and helps merge conflicting changes.
Supports branching to develop features separately and merging them back.
Keeps a detailed log of changes, including who made them and when.

COLLABORATION:
Helps teams communicate and work together in real time.
Typically provides shared access to documents but does not track detailed version history like VCS.
Focuses on real-time editing, where multiple people can edit a document at the same time.
Usually lacks an advanced merging system; conflicts must be resolved manually.
Often does not have branching; changes are immediate.
May have version history but often lacks detailed logs.

Popular Git Hosting Services:
GitHub – Most widely used for open-source projects.
GitHub is a cloud-based Git repository hosting service that allows developers to store, manage, and collaborate on projects. It is built around Git and provides additional features like:
Web-based interface for Git repositories.
* Pull requests & code reviews for better collaboration.
* Issue tracking to manage bugs and feature requests.
* CI/CD integrations for automated testing and deployment.
* Free public repositories, with paid plans for private repositories.
GitLab – Offers CI/CD integration.
GitLab is another Git repository hosting service, similar to GitHub, but with a stronger focus on DevOps and CI/CD (Continuous Integration/Continuous Deployment).
Self-hosted or cloud-based options available.
* Built-in CI/CD pipeline for automated testing & deployment.
* More security features compared to GitHub (especially in enterprise versions).
* Free private repositories (unlike GitHub’s earlier restrictions).
Bitbucket – Supports Git and Mercurial repositories.