Version Control with Git

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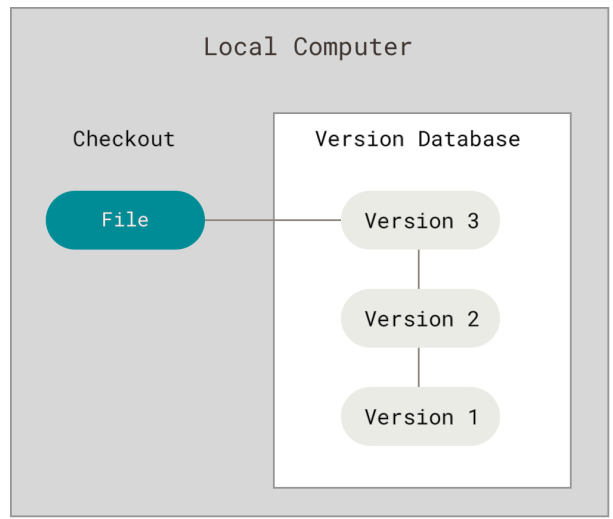
Version Control

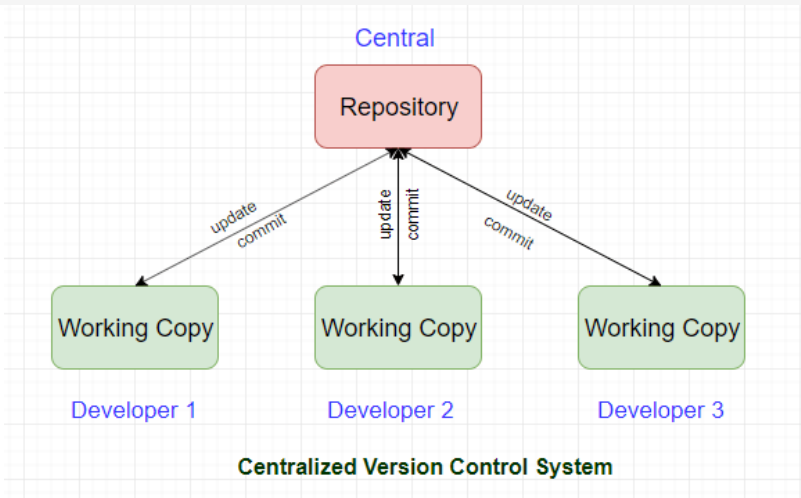
> Version Control known as source control, is the practice of tracking and managing changes to software code.

Local Version Control:



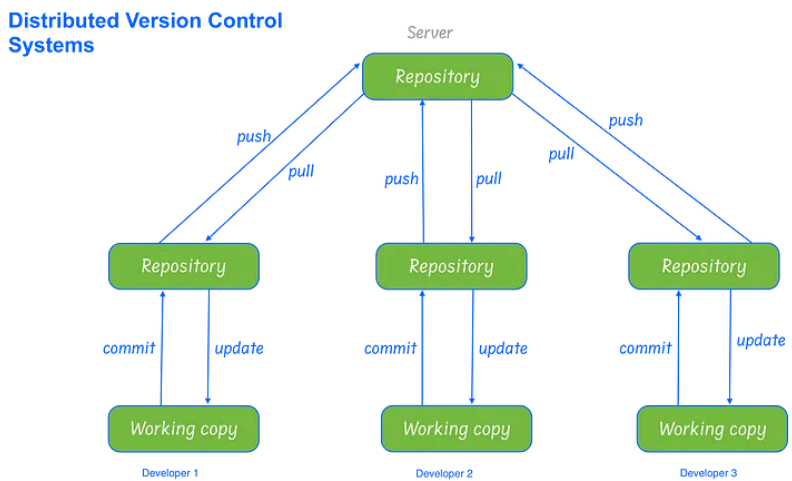
Centralized Version Control

Centralized Version Control System (CVCS) uses a central server to store all files and enables team collaboration.



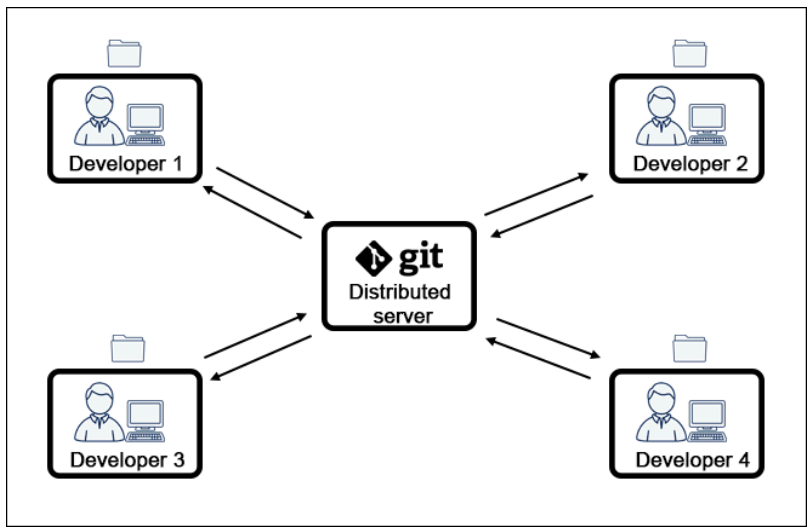
Distributed Version Control

Distributed Version Control System (DVCS) allows clients to create mirrored repositories. These data backups can be easily be placed on the server to replace any lost information.



Git

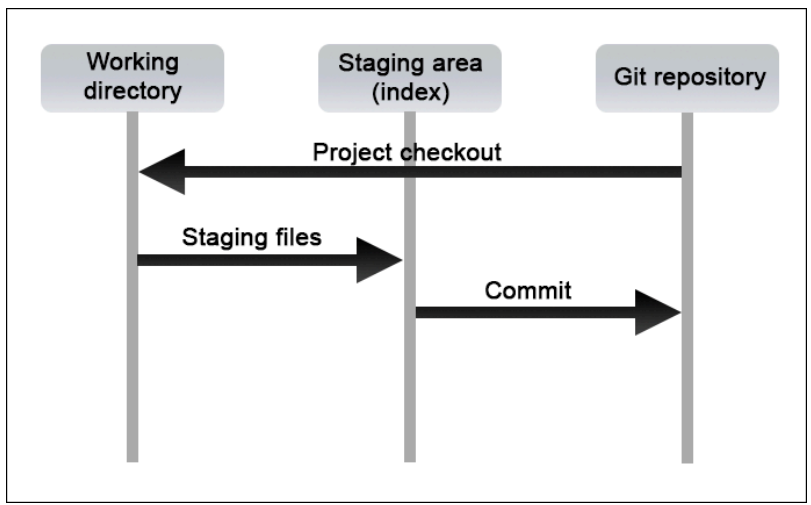
Git is a distributed version control system that is widely used for source code management.



How Git Works

Git stores data as snapshots of the project over time. It uses a three-stage approach to manage the project.

- Working Directory
- Staging Area
- Repository



Install Git

- Download Git from git-scm.com
- Check the installation by running `git --version`

Configure Git

> Set your name and email address to identify your commits.

- `git config --list --show-origin` to list all configurations
- `git config --global user.name "Your Name"`
- `git config --global user.email johndoe@example.com`

Create a Git Repository

> Create a new Git repository or clone an existing one.

- `git init` to create a new repository
- `git clone <url>` to clone an existing repository

Git Commands

- `git status` to check the status of the repository
- `git add <file>` to add files to the staging area
- `git commit -m "Message"` to commit changes
- `git diff` to show changes between commits
- `git push` to push changes to the remote repository
- `git pull` to pull changes from the remote repository
- `git log` to show commit history
- `git branch` to list branches
- `git branch <branch>` to create a new branch
- `git checkout <branch>` to switch branches
- `git merge <branch>` to merge branches
- `git remote -v` to show remote repositories

Cheatsheet: Atlassian Git Cheatsheet

Git Ignore

> Create a `.gitignore` file to exclude files and directories from being tracked by Git.

Git != GitHub

> Git is a version control system, while GitHub is a remote repository hosting service.

Create a GitHub Repository

- Create a new repository on GitHub
- `git remote add origin <repository-url>` to add a remote repository
- `git remote -v` to verify the remote repository
- `git push -u origin main` to push changes to the remote repository

Set Up SSH Key to GitHub

- Generate a new SSH key
- `ssh-keygen -t rsa -b 4096 -C "your_email@example.com"`
- Add the SSH public key to GitHub from `~/.ssh/id_rsa.pub` or `/c/Users/username/.ssh/id_rsa.pub` file

Git Branching

> Branching allows you to work on different features or bug fixes without affecting the main codebase.

- `git branch` to list branches
- `git branch <branch>` to create a new branch
- `git checkout <branch>` to switch branches
- `git merge <branch>` to merge branches

Collaborate on GitHub

Thank you ❤️

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