Git Introduction

Wednesday, April 9, 2025 1:53 AM

Git - Version Control System

What does it do? Really big save button.

- Historical record of all changes made in a Git repository
- While Git works on your local machine, GitHub is a remote storage facility on the web for

Note: let's read the Git handbook

Git 1.1 - About Version Control

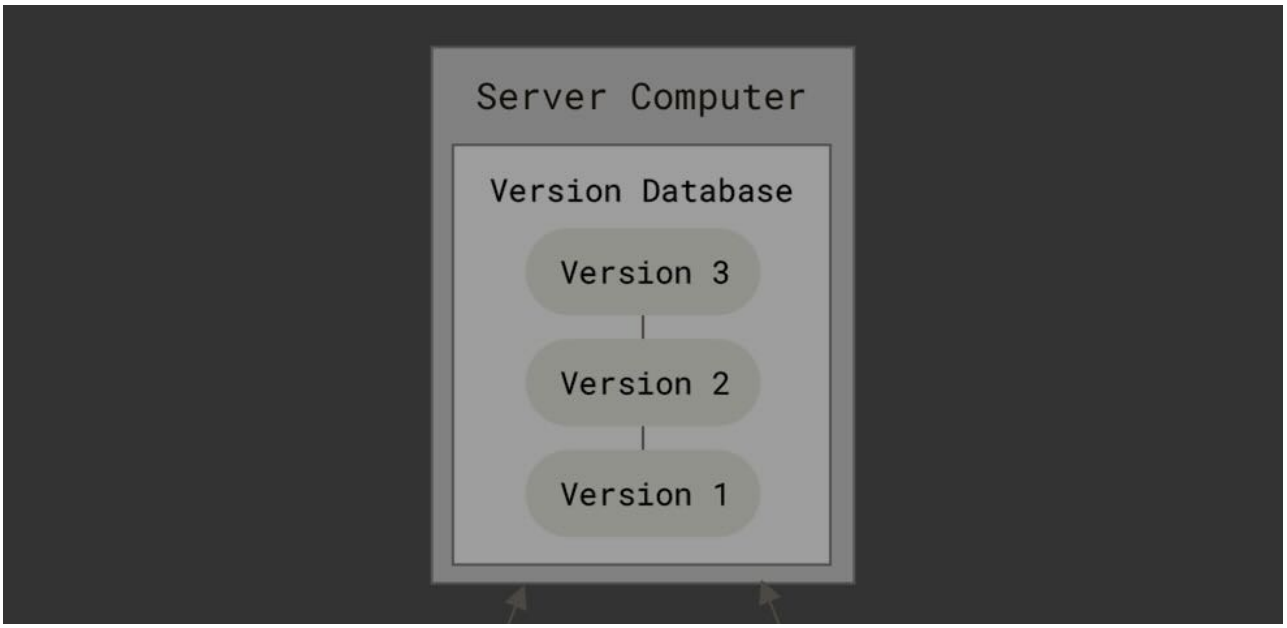
Version control is a system that records changes to a file or set of files over time so that you ca

CVCS- centralized VCS (for developer collaborations)

- Main issue: when the entire history of the project is in one place, there's a high risk in los

DVSA – distributed VCS

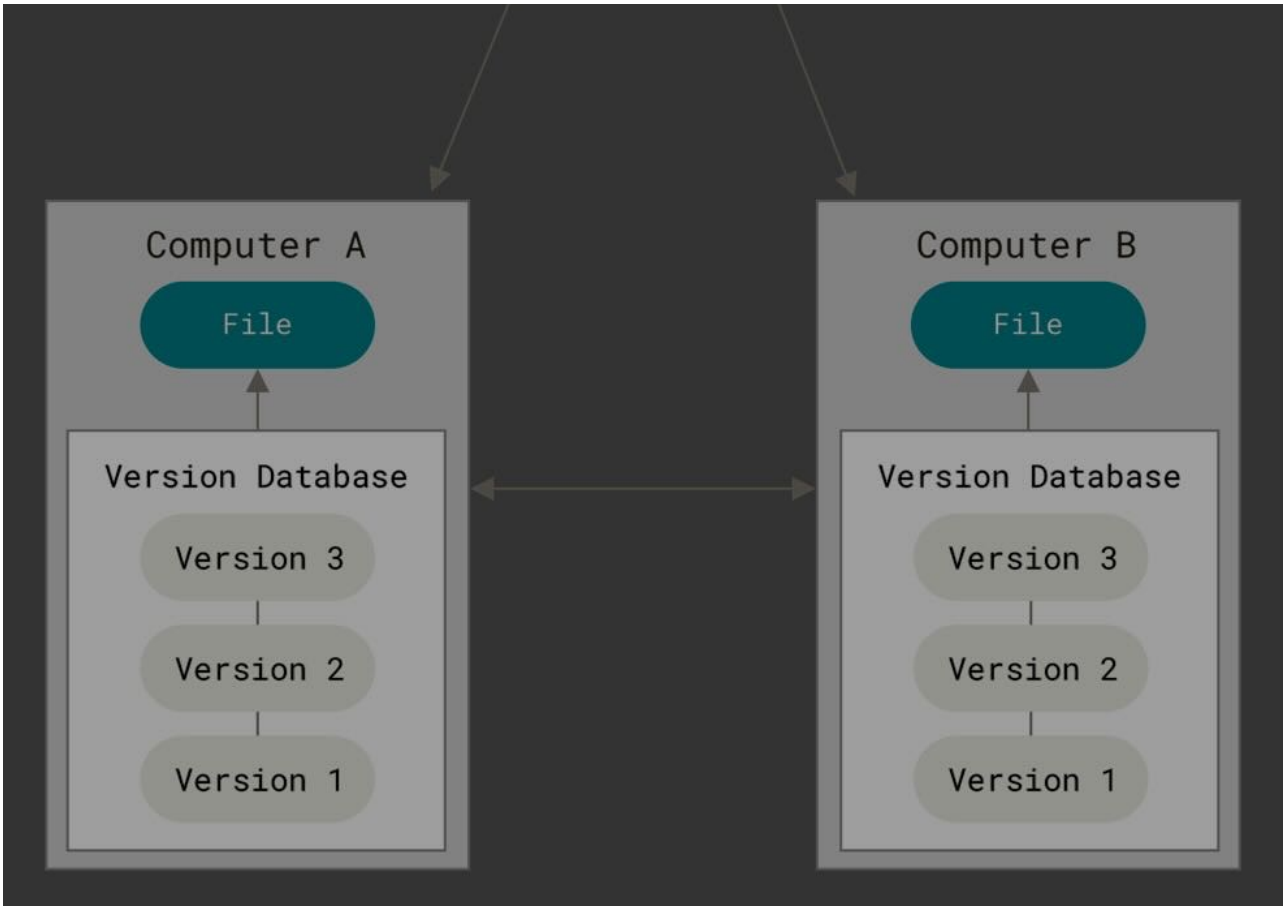
- Basically, what Git is
- Every remote system/clone is essentially a backup of the whole project



r all your coding projects.

n recall specific versions later.

sing everything



1.2 - Short History of Git

Git was developed by the Linux kernel dev team after a falling out with BitKeeper (the old VCS)

1.3 - What is Git?

Main difference between Git & other VCS': how Git thinks about its data.

"Snapshots, not differences."

- Other VSC thinks about data as a series (list) of changes to each file -> delta based versio
- This means storing a set of files and the changes made to each file over time

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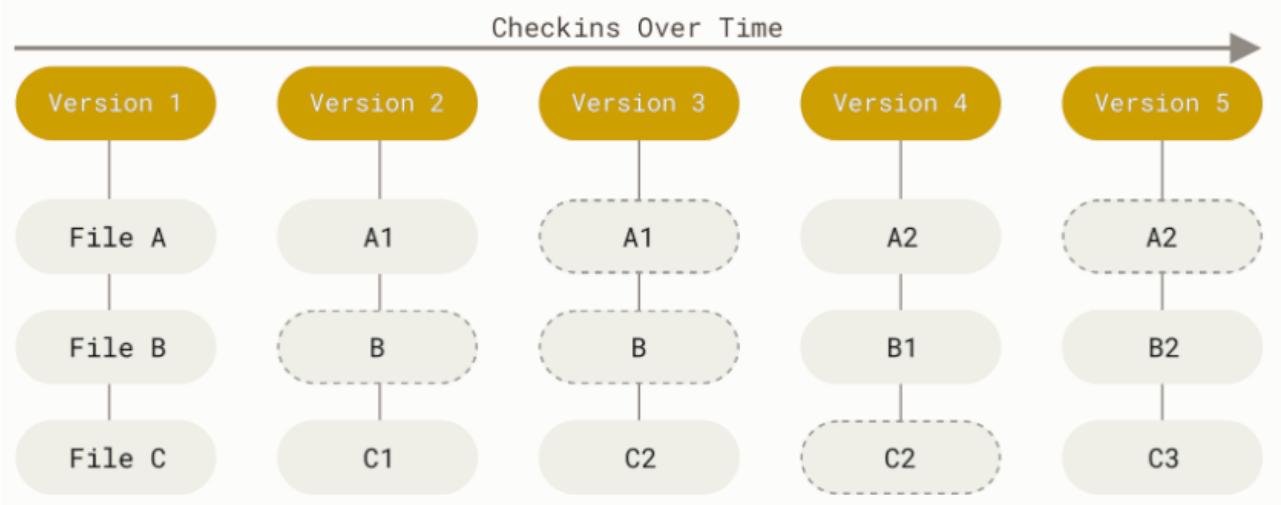
n control

Git: snapshots over time

- Every commit takes a picture of what the files look like at that time
- Git stores a reference to that snapshot
- For efficiency, if nothing changes, Git links the previous identical snapshot that was alrea
- E.g. a stream of snapshots



About Git: nearly every operation is local

- Git has integrity… every commit is checksummed
- Generally only adds data to the project

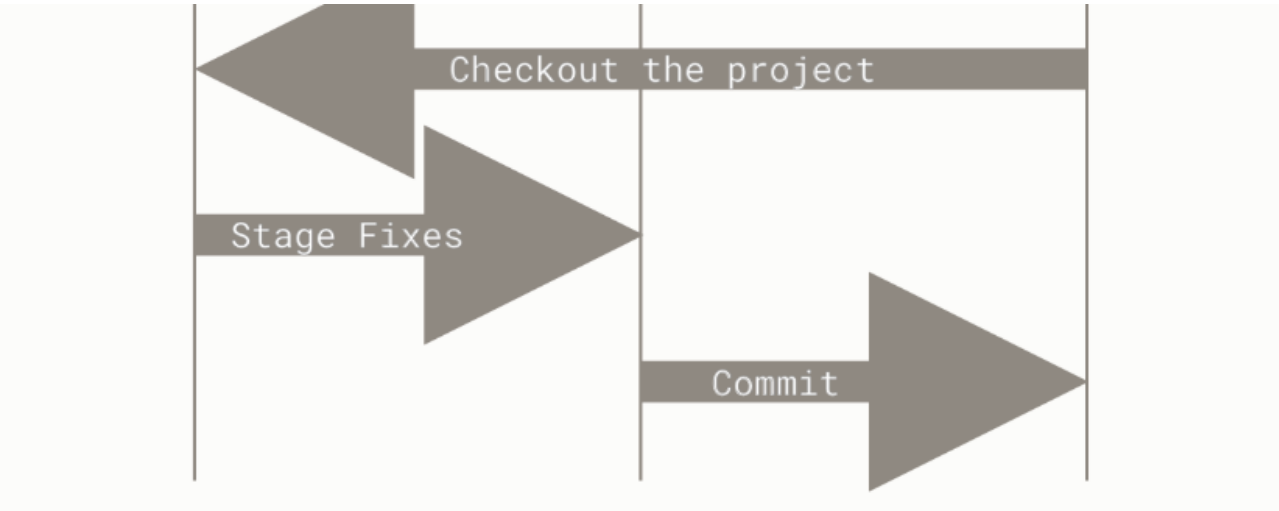
The Three States

1. Modified means that you have changed the file but have not committed it to your databa
2. Staged means that you have marked a modified file in its current version to go into your
3. Committed means that the data is safely stored in your local database.

The Three "Areas" of Git

dy stored

ase yet.
next commit snapshot.



- The **working tree** is a single checkout of one version of the project. These files are pulled
  the Git directory and placed on disk for you to use or modify.
- The **staging area** is a file, generally contained in your Git directory, that stores informatio
  commit. Its technical name in Git parlance is the “index”, but the phrase “staging area” w
- The **Git directory** is where Git stores the metadata and object database for your project.
  Git, and it is what is copied when you clone a repository from another computer.

Basic git workflow:

1. You modify files in your working tree.
2. You selectively stage just those changes you want to be part of your next commit, which
   staging area.
3. You do a commit, which takes the files as they are in the staging area and stores that sna
   directory.

Note: If a particular version of a file is in the Git directory, it’s considered **committed**. If it has b
staging area, it is **staged**. And if it was changed since it was checked out but has not been stage

1.4 - CLI with Git

You can run all git commands from the command line. See next note.

About Git & GitHub

Cloud based platform- store, share, & work on projects

out of the compressed database in

n about what will go into your next
works just as well.
This is the most important part of

adds only those changes to the

pshot permanently to your Git

een modified and was added to the
d, it is **modified**.

The “collaboration” feature is made possible due to Git, an open source version control softwa

- Git & Github are NOT the same thing
- GitHub is built upon Git

Git: intelligently tracks file changes

In a Git-based workflow, to collaborate with others on a project, you would:

1. Create a branch off of the main project files
2. Make edits safely either on this new branch or alternatively on a cloned local copy
3. Let Git intelligently merge your specific changes back into the main file without Impacti
4. Let’s Git tracks all changes to the project so you keep an updated version

Git & GitHub Together

re

ng others’ edits