

Version Control

VERSION CONTROL System :

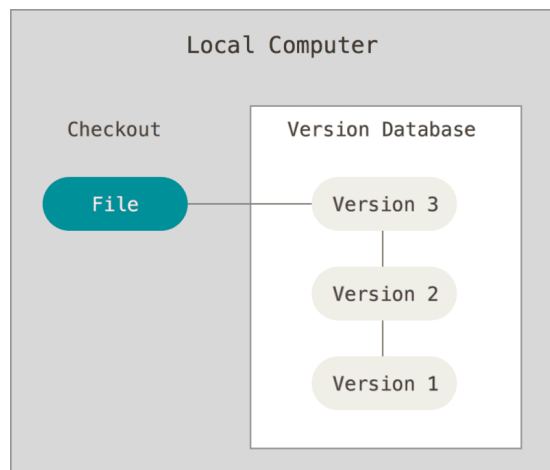
Version control is a system that records changes to a file or set of files over time so that you can recall specific versions later.

If you are a graphic or web designer and want to keep every version of an image or layout (which you would most certainly want to), a Version Control System (VCS) is a very wise thing to use. It allows you to revert selected files back to a previous state, revert the entire project back to a previous state, compare changes over time, see who last modified something that might be causing a problem, who introduced an issue and when, and more. Using a VCS also generally means that if you screw things up or lose files, you can easily recover. In addition, you get all this for very little overhead.

Local Version Control Systems:

Many people's version-control method of choice is to copy files into another directory (perhaps a time-stamped directory, if they're clever). This approach is very common because it is so simple, but it is also incredibly error prone. It is easy to forget which directory you're in and accidentally write to the wrong file or copy over files you don't mean to.

To deal with this issue, programmers long ago developed local VCSs that had a simple database that kept all the changes to files under revision control.

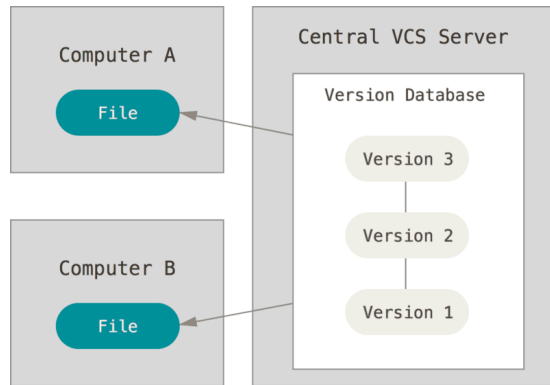


Local version control diagram

One of the most popular VCS tools was a system called RCS, which is still distributed with many computers today. RCS works by keeping patch sets (that is, the differences between files) in a special format on disk; it can then re-create what any file looked like at any point in time by adding up all the patches.

Centralized Version Control Systems:

The next major issue that people encounter is that they need to collaborate with developers on other systems. To deal with this problem, Centralized Version Control Systems (CVCSs) were developed. These systems (such as CVS, Subversion, and Perforce) have a single server that contains all the versioned files, and a number of clients that check out files from that central place. For many years, this has been the standard for version control.



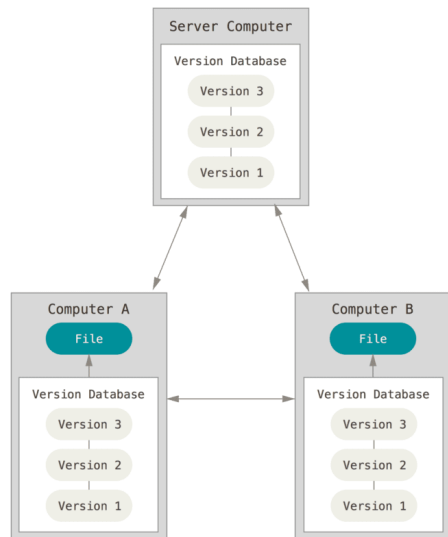
Centralized version control diagram

This setup offers many advantages, especially over local VCSs. For example, everyone knows to a certain degree what everyone else on the project is doing. Administrators have fine-grained control over who can do what, and it's far easier to administer a CVCS than it is to deal with local databases on every client.

However, this setup also has some serious downsides. The most obvious is the single point of failure that the centralized server represents. If that server goes down for an hour, then during that hour nobody can collaborate at all or save versioned changes to anything they're working on. If the hard disk the central database is on becomes corrupted, and proper backups haven't been kept, you lose absolutely everything — the entire history of the project except whatever single snapshots people happen to have on their local machines. Local VCS systems suffer from this same problem — whenever you have the entire history of the project in a single place, you risk losing everything.

Distributed Version Control Systems:

This is where Distributed Version Control Systems (DVCSs) step in. In a DVCS (such as Git, Mercurial, Bazaar or Darcs), clients don't just check out the latest snapshot of the files; rather, they fully mirror the repository, including its full history. Thus, if any server dies, and these systems were collaborating via that server, any of the client repositories can be copied back up to the server to restore it. Every clone is really a full backup of all the data.



Distributed version control diagram

So, A Version Control System(VCS) is a tool that manages different versions of source code. A source code manager(SCM) is another name for a Version Control System. Git is an SCM(and therefore a VCS!).