

An overview of Version Control

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Team Working



Question

How do you share code?

Discussion



Working in a team, you need to share code – How?

- ❑ Email attachments?
- ❑ What if two people edit the same file at the same time?
- ❑ Google Docs or Dropbox?
 - ❑ No merging in Dropbox
 - ❑ Google Docs not meant for code
 - ❑ No syntax highlighting, etc.



Scenario #1

1. You change one part of a program (*it works*)
2. Your co-worker changes another part (*it works*)
3. You put them together (*it doesn't work!*)
4. Some change in one part must have broken something in the other part

What were all the changes?



Scenario #2

1. You make a number of improvements to a class
2. Your co-worker makes a number of **different** improvements to the **same** class

How can you merge these changes?

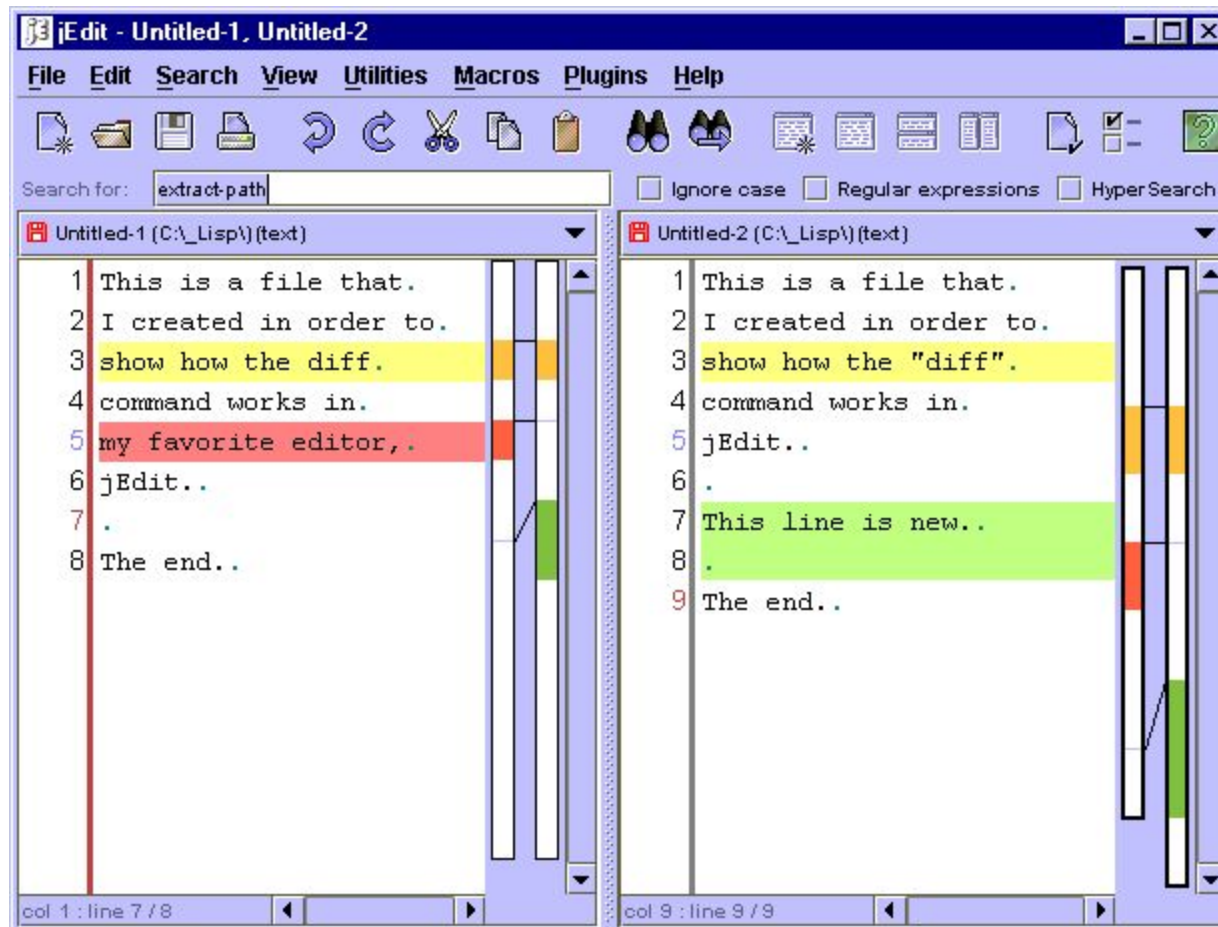


diff Tools

- ❑ There are a number of tools that help you spot changes (differences) between two files
- ❑ Tools include `diff`, `rcsdiff`, `jDiff`, etc.
- ❑ Of course, they won't help unless you kept a copy of the older version
- ❑ Differencing tools are useful for finding a *small* number of differences in a *few* files



diff Tools (Cont.)



Version Control System

A version control system (often called a source code control system) does these things:

- ❑ Keeps multiple (older and newer) versions of everything (not just source code)
- ❑ Requests comments regarding every change
- ❑ Allows “check in” and “check out” of files so you know which files someone else is working on
- ❑ Displays differences between versions



Why Version Control?

- ❑ It's a must in today's computing industry
- ❑ You can even version control documents
- ❑ Also called source control, code management, concurrent versioning, reversion control

- ❑ Advantages:
 - Track changes, keep logs of past development
 - Automatic backups
 - Allows teamwork



VCS in Job responsibilities (SO)

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as well
as backend developers and participate actively in shaping the future of our products.

English required (our internal lingua franca).
German is a bonus, but not a necessity.


Your professional qualification

- A great working attitude, willing and eager to learn and develop yourself and those around you
- Solid foundation in computer science, network protocols and IT security
- Deep Knowledge of object-oriented concepts and a strong passion for software engineering best practices
- Strong programming skills in **Java / Kotlin (Android)** or **Swift (iOS)**
- Solid knowledge of the **Android** or **iOS** SDK
- Experience developing responsive mobile apps that run well in screens of all sizes
- Interacting with REST APIs is second nature to you
- You care about network security
- Experience in unit and integration testing
- Experience with version control systems like Git
- Interest in mobile UX and collaborating with design teams
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- تسلط بر مفاهیم شی گرایی
- تسلط بر آخرین نسخه فریمورک لاراول (5.7)
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- آشنایی با مفاهیم و ابزارهای توسعه وب (HTML, JavaScript, CSS, jQuery, ...)
- آشنایی با PHP 7
- آشنایی با Git



Version Control System Types

- ❑ Distributed VCS: **Git**, Mercurial
- ❑ Centralized VCS: CVS, Perforce, **SVN**



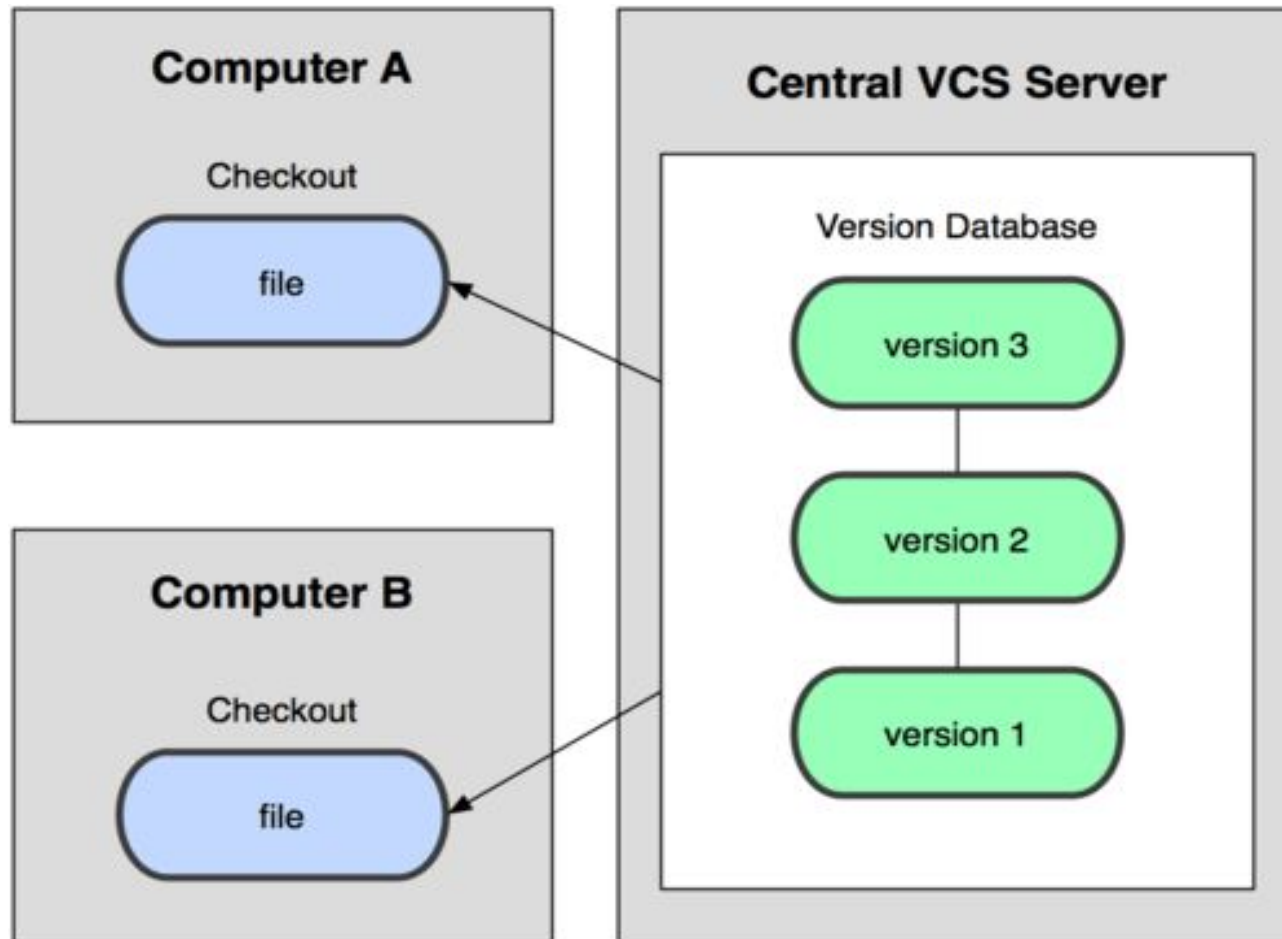
Version Control System: **Centralized**

The main difference between the two classes is that Centralized VCSs keep the history of changes on a central server from which everyone requests the latest version of the work and pushes the latest changes to. This means that everyone sharing the server also shares everyone's work. Sourceforge.net uses this type of versioning in their projects.

[\[https://www.oshyn.com/blogs/2012/june/version_control_systems_distributed_vs_centralized\]](https://www.oshyn.com/blogs/2012/june/version_control_systems_distributed_vs_centralized)



Centralized Version Control System



<https://git-scm.com/book/en/v1/Getting-Started-About-Version-Control>



Centralized Version Control System: **Subversion**

Subversion uses a centralized revision control model. **Ben Collins-Sussman**, one of the designers of Subversion, believes a centralised model would help prevent "insecure programmers" from hiding their work from other team members. Some users of version control systems see the centralised model as detrimental; famously, **Linus Torvalds** attacked Subversion model and its developers.



Limitation of Centralized Version Control

❏ Tell me! What do you think?



Limitation of Centralized Version Control

- ❑ Tell me! What do you think?
- ❑ If the main server goes down, developers can't save versioned changes
- ❑ Remote commits are slow
- ❑ Unsolicited changes might ruin development
- ❑ If the central database is corrupted, the entire history could be lost (security issues)



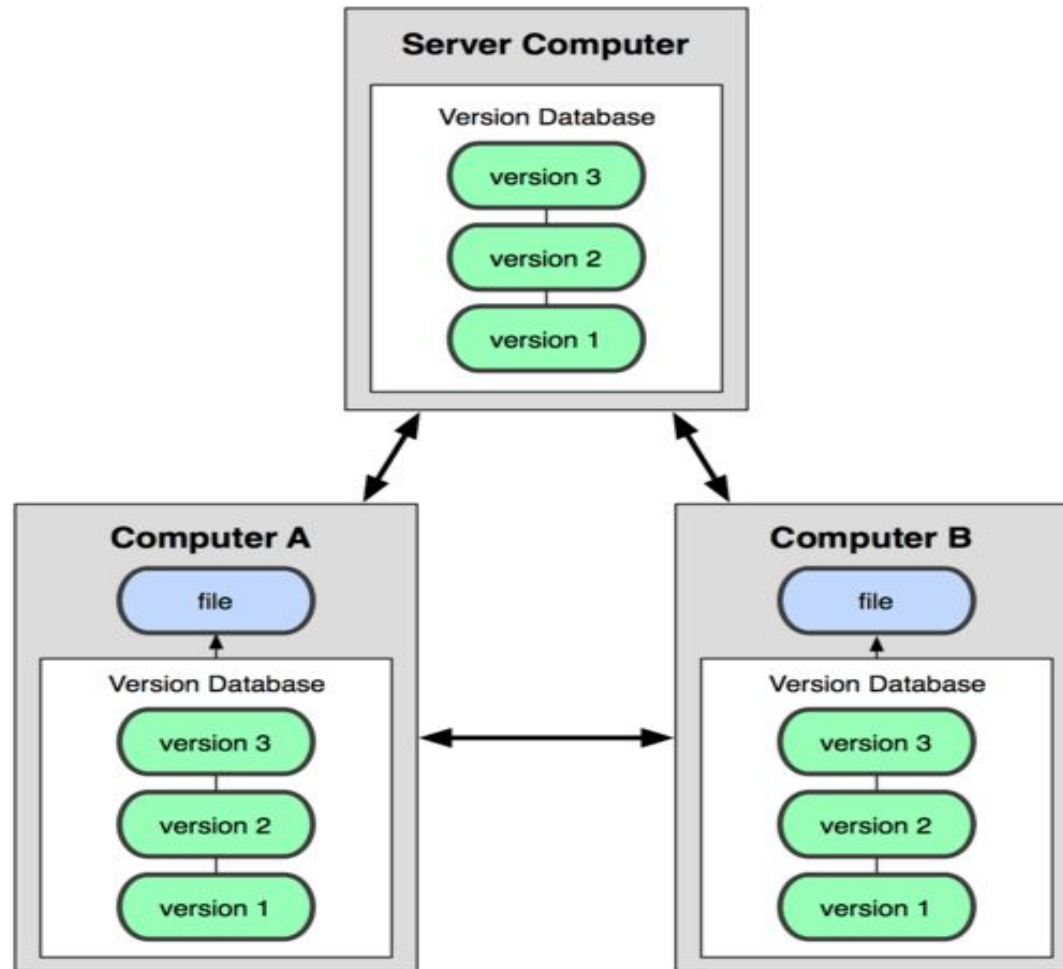
Version Control System: **Distributed**

On the other hand, on a Distributed VCS, everyone has a local copy of the entire work history. This means that it is not necessary to be online to change revisions or add changes to the work. “Distributed” comes from the fact that there isn’t a central entity in charge of the work’s history, so that anyone can sync with any other team member. This helps avoid failure due to a crash of the central versioning server. Open source projects, such as Mozilla Firefox, tend to use this type of versioning.

[\[https://www.oshyn.com/blogs/2012/june/version_control_systems_distributed_vs_centralized\]](https://www.oshyn.com/blogs/2012/june/version_control_systems_distributed_vs_centralized)



Distributed Version Control System



<https://git-scm.com/book/en/v1/Getting-Started-About-Version-Control>



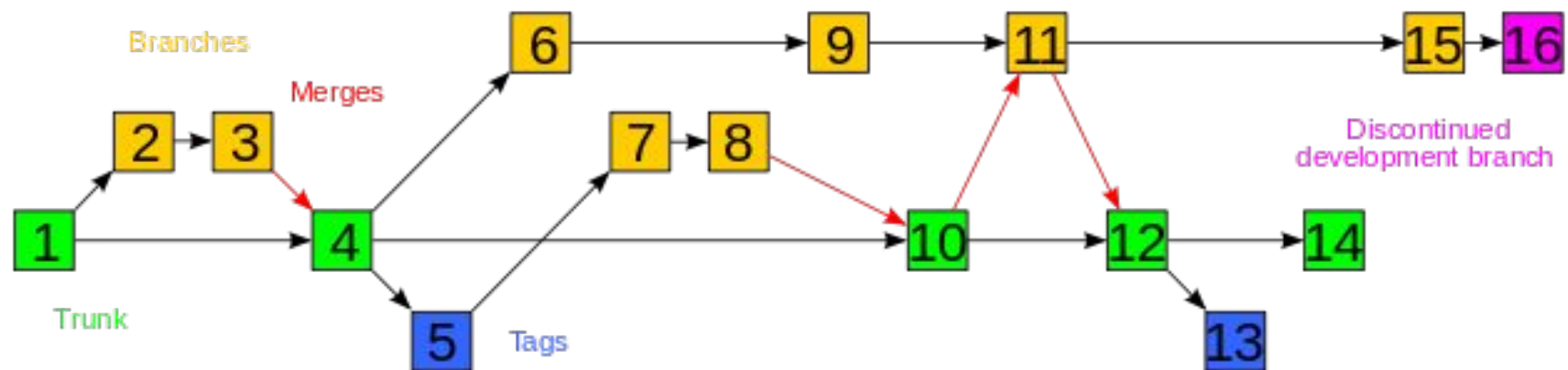
Commands

- ❑ Local operations (same as previous in CVCS):
 - ❑ update/commit
 - ❑ tag/branch
 - ❑ log/di
- ❑ Remote operations (new concepts in DVCS):
 - ❑ Pull: **Get** all *changesets* from origin *repo*
 - ❑ Push: **Send** your *changesets* to origin



Branch and Tag

- ❑ A branch is a separate line of development.
- ❑ Tagging refers to labeling the repository at a certain point in time so that it can be easily found in the future.

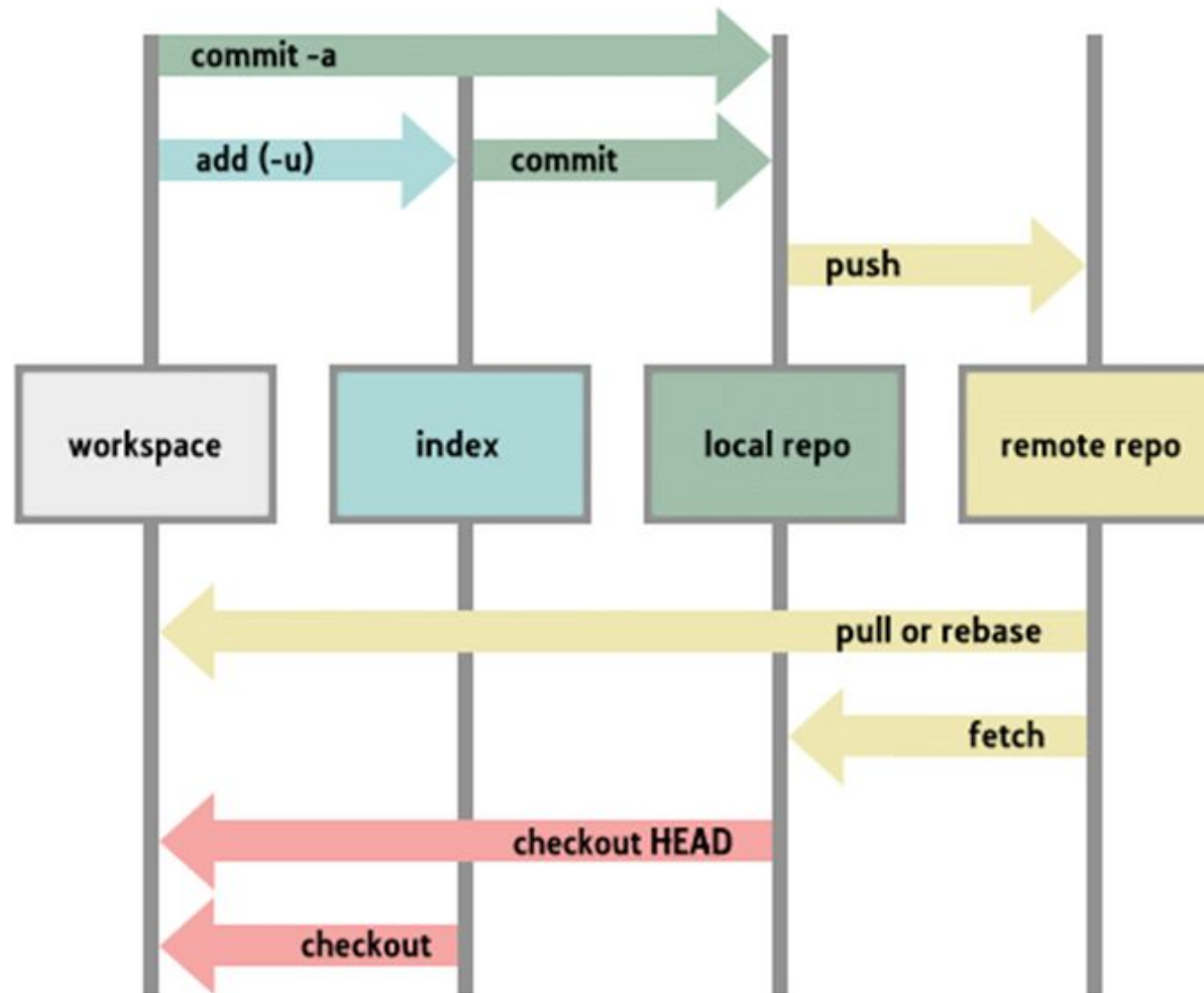


Git

- ❑ Designed for code
- ❑ What git does for you:
 - Version control and source control
 - Tracks all changes submitted to the codebase
 - Revert changes
 - Create working branches without affecting stable releases
 - Tells you when there are merge conflicts
- ❑ Why **git**?
 - Because “everyone” is using it
 - You’ll likely use it in industry



Git Structure



Q&A

Thanks!

