ADALTAS

Versioning with Git

Teacher

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Sergei Kudinov

Developer and Big Data engineer at Adaltas

sergei@adaltas.com

GitHub - github.com/sergkudinov

Objectives

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- **Versioning**
- **Git introduction**
- **Lab**

What is Versioning?

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Also known as:

- Version Control or Version Control System (VCS)
- Source Control Management (SCM)

What is Versioning?

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It is the practice of tracking and managing changes to software code.

SCM (or VCS) - tools that help you keep track of your code with a complete history of changes.

What do they manage?

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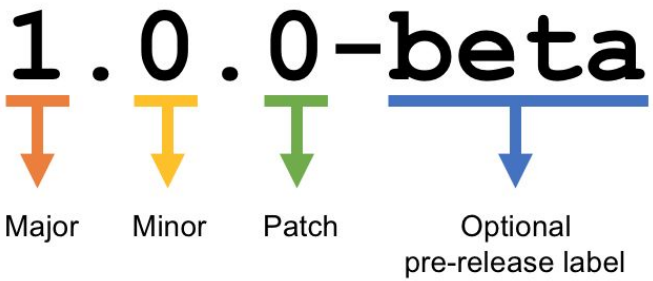
- Code (or any **text-based** documents)
- Project versions:
  - Global project version (**tags**, like `` `1.2.4-beta` ``)
  - Each modification is a «version»
- Change requests

Semantic Versioning (tag names)



- **MAJOR** - when incompatible API changes
- **MINOR** - when new functionality
- **PATCH** - when bug fixes
- **LABEL** - optional, for pre-releases

What types of VCS?

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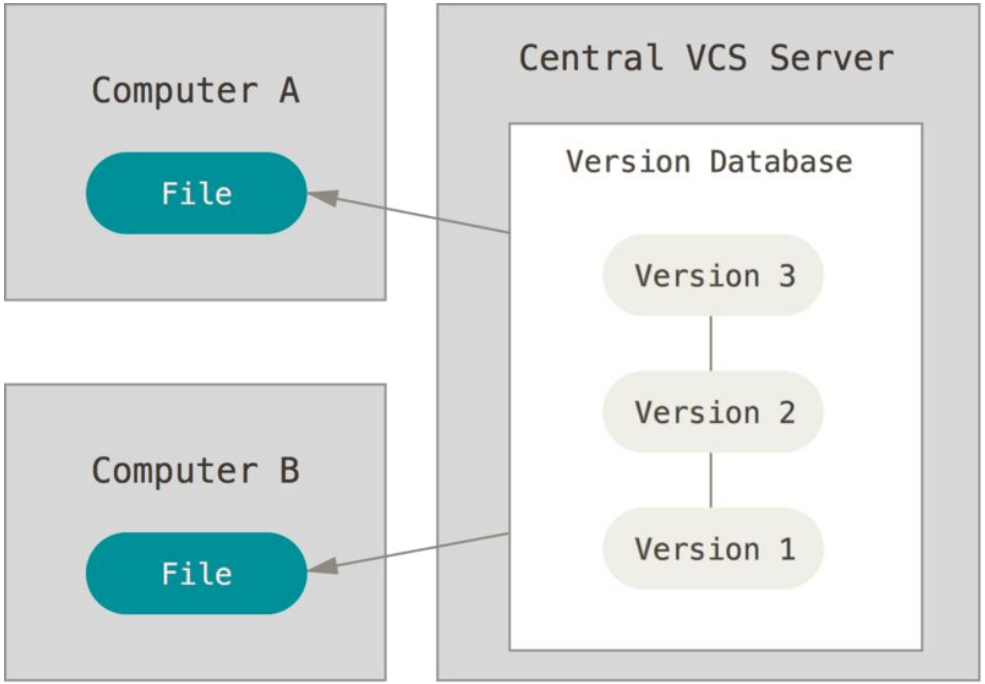
- Centralized
- Decentralized

Centralized VCS

- Needs network

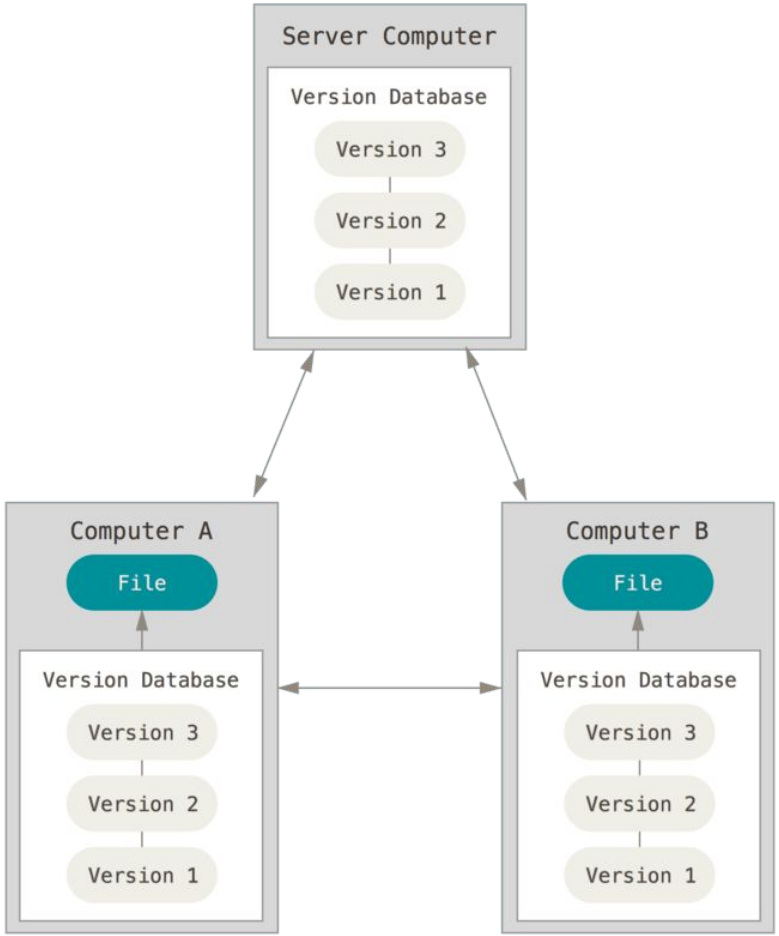
- Single Point of Failure



Decentralized VCS

+ Local work is possible

- Workflow is more complex



Why learning Git?

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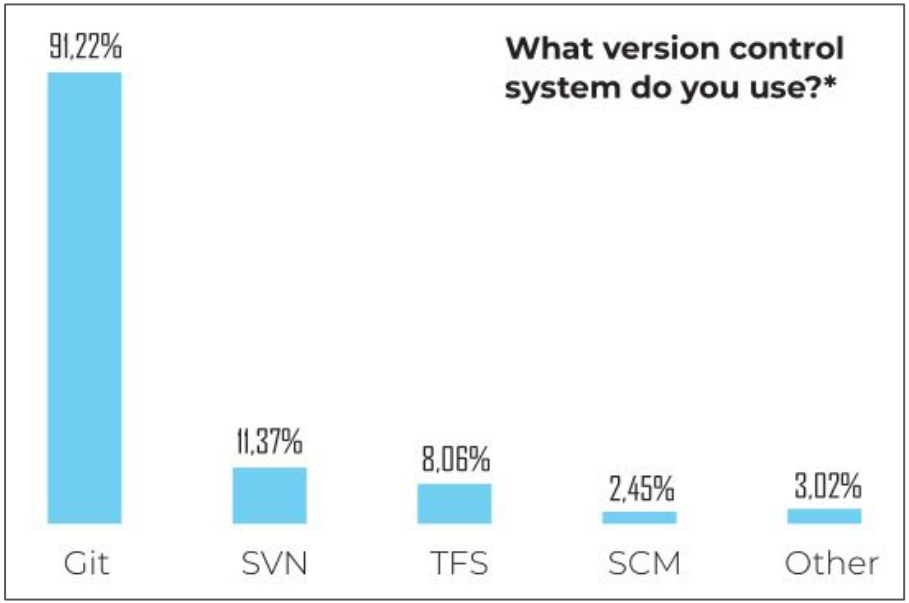
- Alternative to **SVN** (Subversion, created in 2000)



From *State of software development in 2019,* **codingsans.com**

What is Git?

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- **The most popular VCS**
- **Decentralized**
- **Open Source and free**
- Created in **2005** by Linus Torvalds ------→

Git repository

- **Is a set of versioned files**

  With entire history of changes

- **Copied to a local folder**

  “.git” folder at the root of a project

- **The users choose the files to version**

Common scenario

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1. Checking out remote changes

   `git clone` or `git pull`

2. Editing a file

   eg: add a new function “attack()” to the “player.js” file

3. Adding a file to “staging area” for the next commit

   `git add player.js`

Common scenario

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4. Commit the modification to the local repository:

```
git commit -m "Add player attack"
```

5. Send local modifications to the **remote** repository

```
git push
```

6. Resolution of any conflicts:

   Code modification + commit

Conflict resolution

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Conflicts - are modifications made on the same line

Must be resolved manually:

- edit files with a resolver tool (or text editor)
- commit the files
- push to the **remote branch**

Branches

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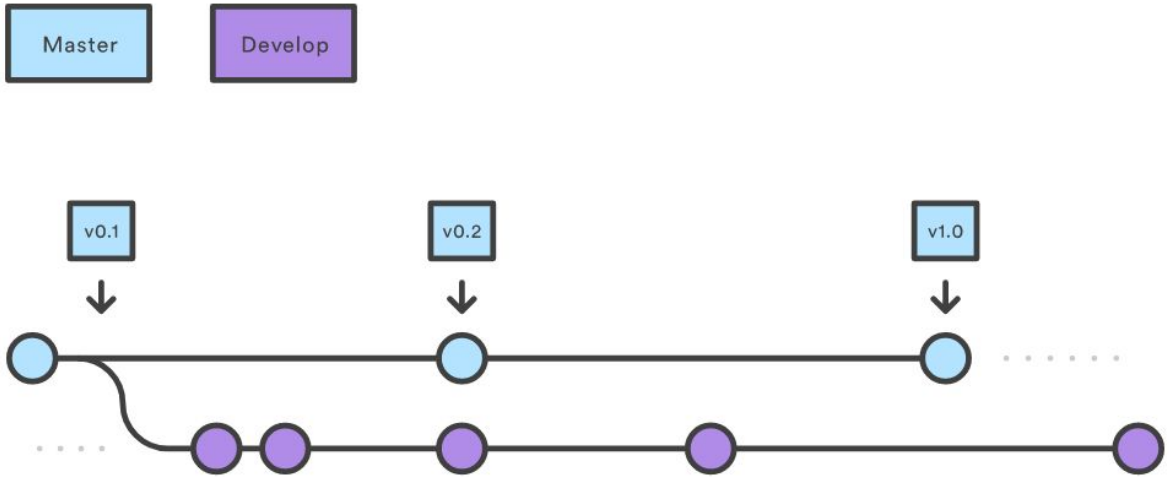
- 1 branch = 1 separate versioning space → **isolation of changes**



Managing a git repository

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- Git commands:
  - `pull`, `push`, `merge` ...
  - through a graphical interface: GitHub Desktop, Fork, GitKraken...
- Git remote repositories:
  - on GitHub, GitLab, self-hosted...

Git ignore

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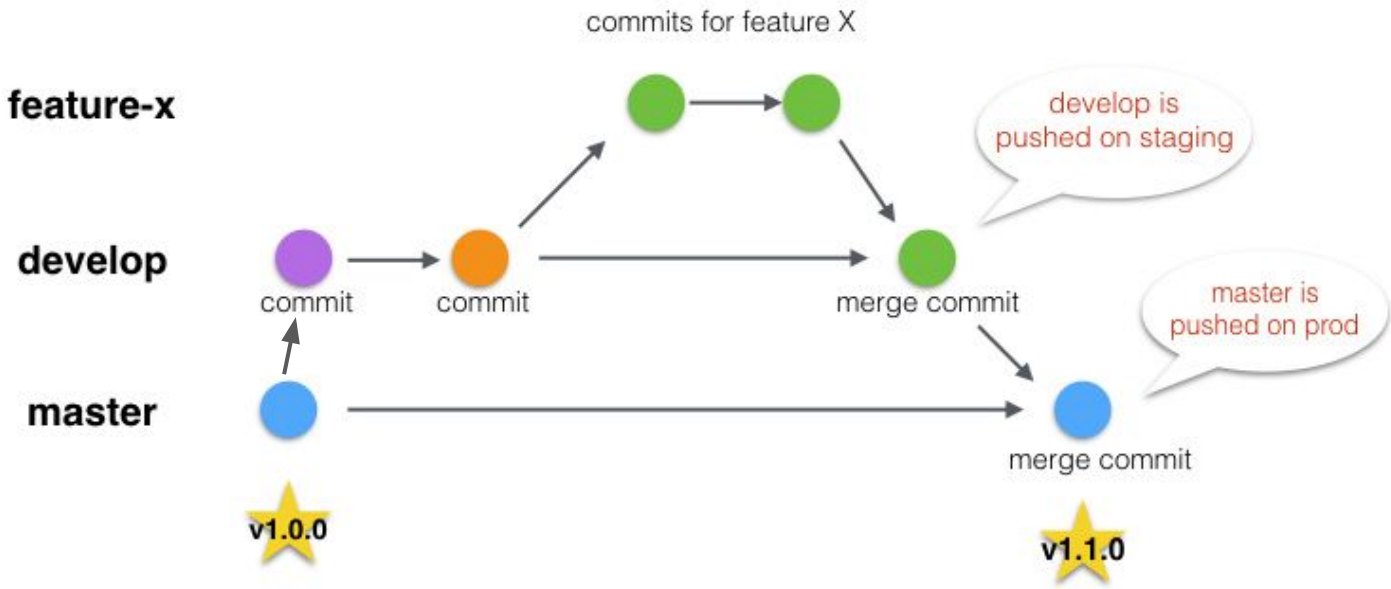
- The “.gitignore” file contains the files to ignore
- Works with wildcards
  - `.*` : ignore all files starting with a “.”
- Useful for ignoring files specific to your environment:
  - codeblocks or VScode files
  - “node_modules” folder in Node.js

Git Flow

Typical organization of versioning:



Where can you use Git?

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- Software development
- Writing (books, articles, theses)
- Whatever requires tracking the history...

Go further

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1. Learn the difference between **merge and rebase**:

   https://dzone.com/articles/merging-vs-rebasing

2. Learn **Conventional Commits** - a specification for writing commit messages:

   https://www.conventionalcommits.org/en/v1.0.0-beta.2/