

Git 1

Missing session Lecture 2

Contents

- Version Control System
- Git
- Github
- Open source
- Simple tutorial

Version Control System (VCS)

- Imagine you're a writer...
 - while writing a book, various problems / situations can occur
 - Someone burned your draft
 - The writing went off at a tangent
 - Someone made feedback for you
 - You should collaborate with others
 - To manage / keep your writing safe, you need...
 - backup
 - log
 - platform to work / communicate with other authors
 - and else...

Version Control System

- Same problems can occur in *programming!*
- Imagine such situations...
 1. HDD(or SSD) breakdown
 2. Awful code...needs to go back
 3. Collaborate with other programmers
 4. Make some experimental feature...
 - which can affect other modules
- VCS will help you

Version Control System

- A component of software configuration management, which is the management of changes to document, computer programs, large web sites, and other collections of information
 - *Wikipedia*
- A system that records changes to a file or set of files over time so that you can recall specific versions later.
 - Git official website
- A category of software tools that help a software team manage changes to source code over time
 - Atlassian Cooperation

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=> **Version Control**

=> **Backup**

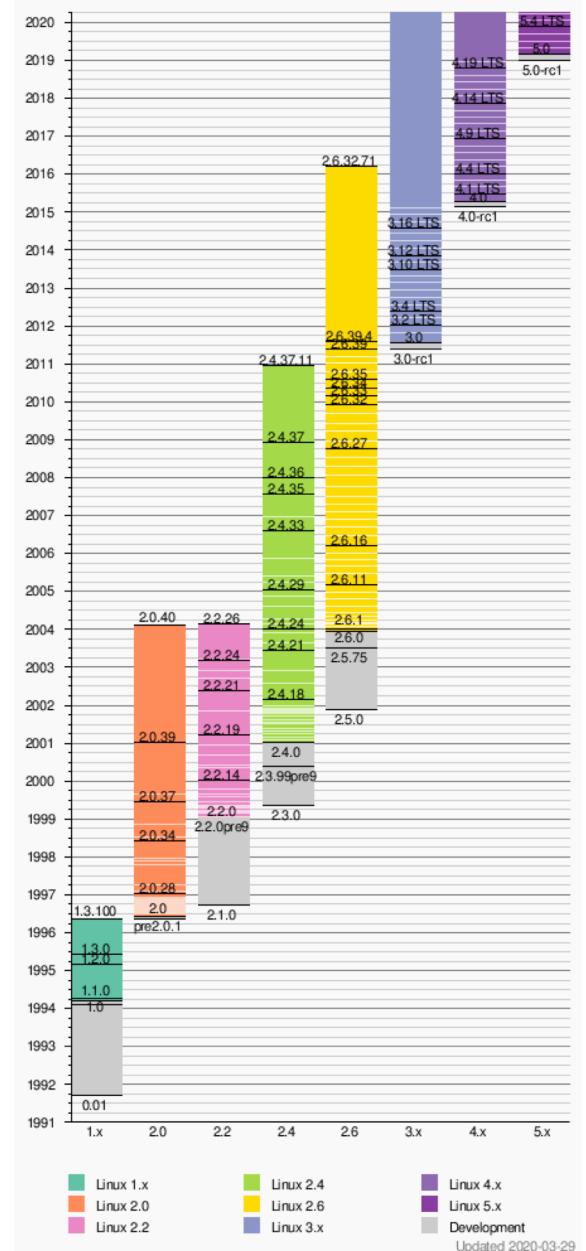
=> **Collaboration**

Three main purposes of version control system

Main purposes of Version Control System

- Version Control
 - Software has *versions*
 - *linux major releases*
 - *current development history of linux*

Merge tag 'nfsd-5.7' of git://git.linux-nfs.org/projects/cel/cel-2.6	...
 torvalds committed 3 days ago	
platform/x86: intel_int0002_vgpio: Use acpi_register_wakeup_handler()	...
 jwrdegoede authored and Rafael J. Wysocki committed 4 days ago	
ACPI: PM: Add acpi_[un]register_wakeup_handler()	...
 jwrdegoede authored and Rafael J. Wysocki committed 4 days ago	
Merge tag 'rtc-5.7' of git://git.kernel.org/pub/scm/linux/kernel/git/...	...
 torvalds committed 3 days ago	
Merge tag 'gpio-v5.7-1' of git://git.kernel.org/pub/scm/linux/kernel/...	...
 torvalds committed 3 days ago	
Merge tag 'dma-mapping-5.7' of git://git.infradead.org/users/hch/dma-...	...
 torvalds committed 3 days ago	
Merge tag 'threads-v5.7' of git://git.kernel.org/pub/scm/linux/kernel...	...
 torvalds committed 3 days ago	



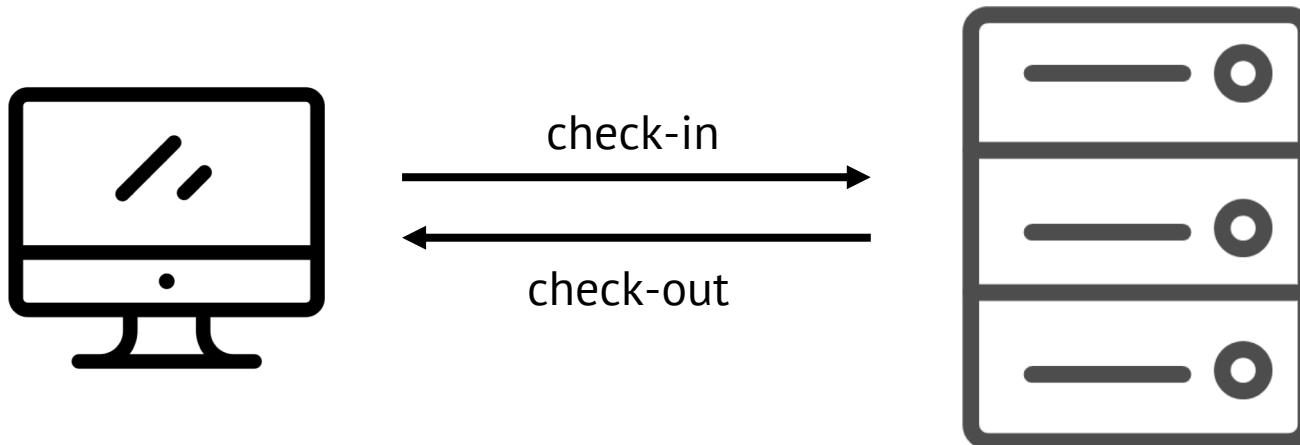
Updated 2020-03-29

Main purposes of Version Control System

- Imagine...
 - you need to record code history
 - code_draft.cpp
 - code_2.cpp
 - code_3.cpp
 - code_experimental.cpp
 - ...
 - Inefficient & burdensome
- Version control system:
 - automatically records the history
 - and also efficient!!

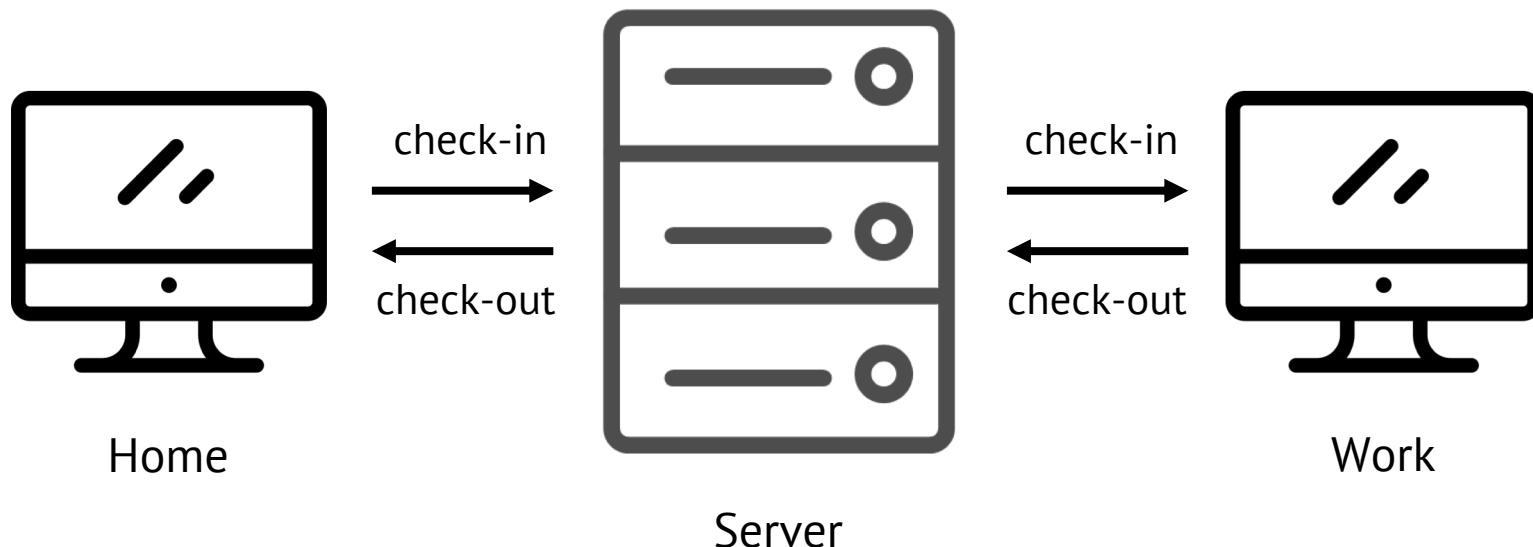
Main purpose of VCS

- Backup
- Even if your computer crashes, there is backup on the server
- Terminology!!
 - **Local Repository** (Your computer)
 - **Remote Repository** (Server)



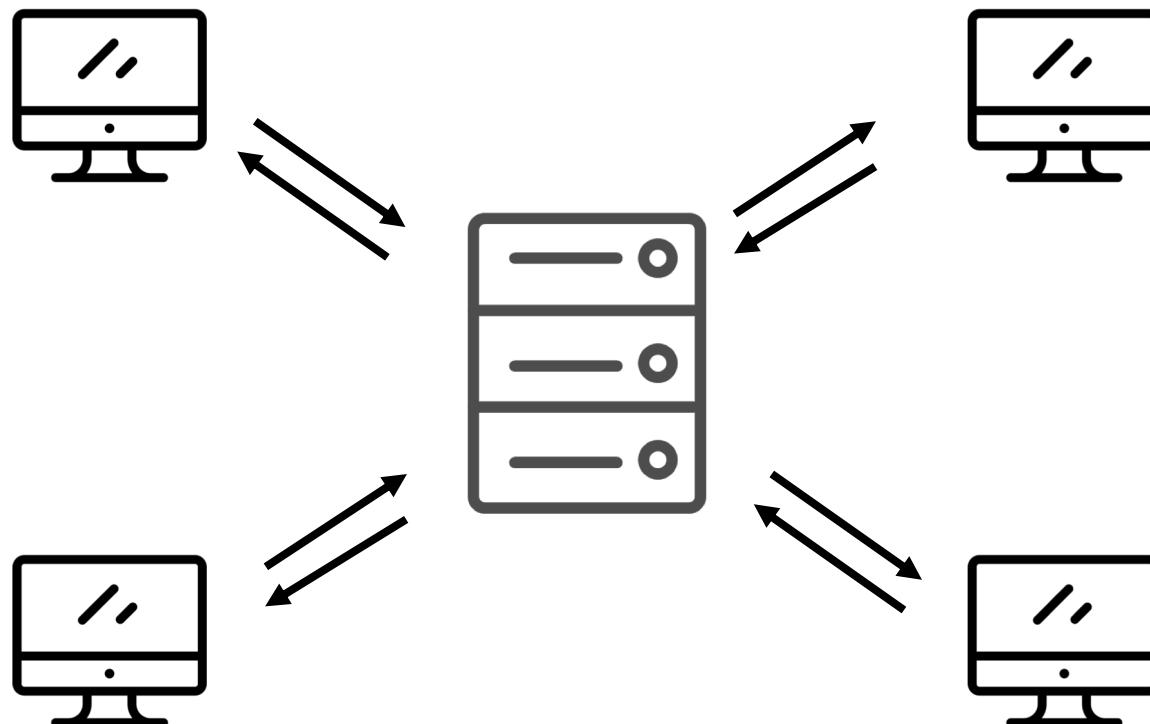
Main purpose of VCS

- Backup
- You can work everywhere,
 - by downloading / uploading your data from / to the server



Main purpose of VCS

- Collaborating
 - Easy collaboration with other programmers
 - Work in local repository, and upload it to remote repository!!



Git

- *Most famous* version control system
- Developed by ***Linus Torvalds*** (2015)
- Almost all of famous projects are managed by git
 - Including the programs we're using!!
 - gcc, visual studio code, extensions...

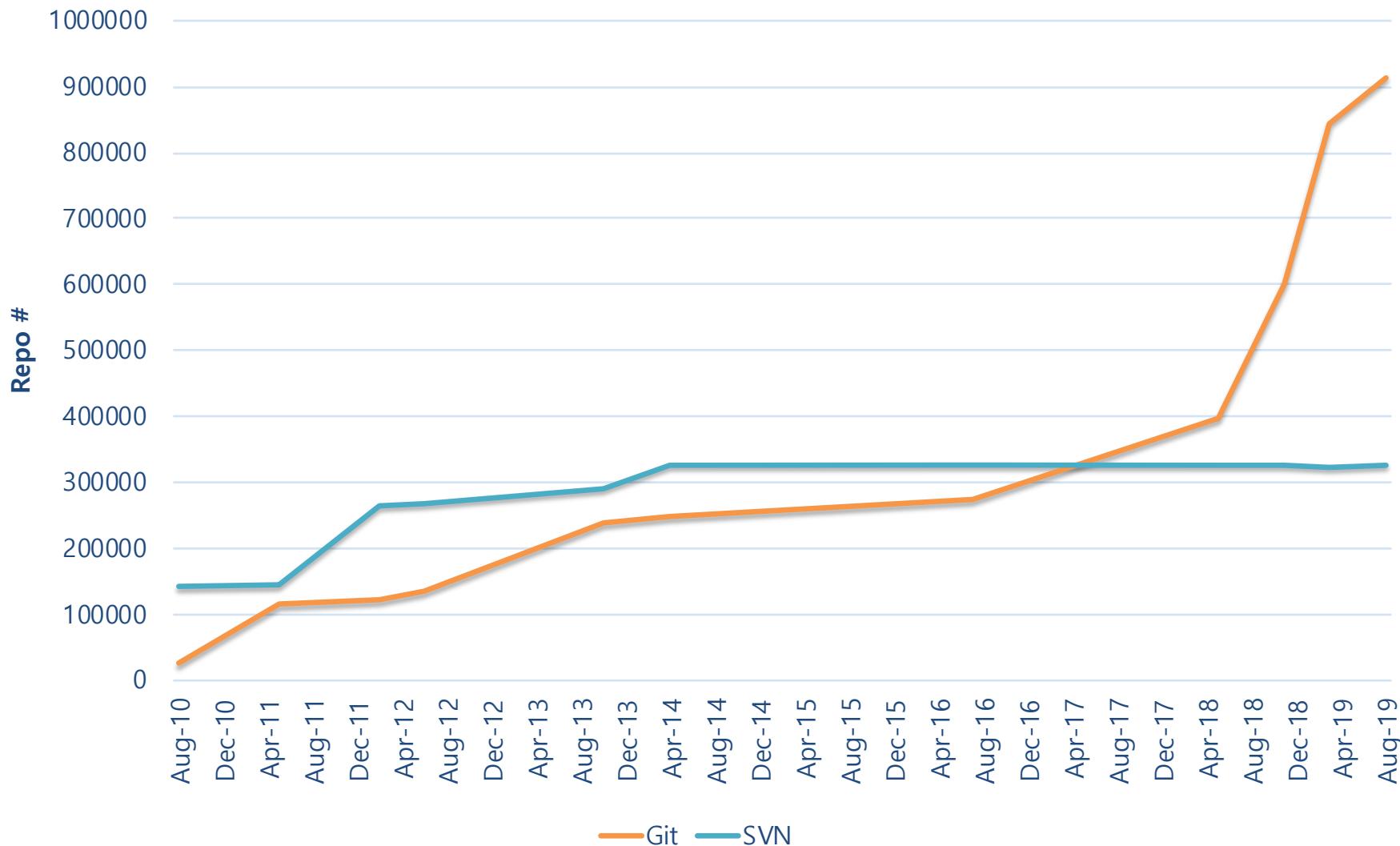


Git

- Why *Linus* developed git?
 - While developing linux...
 - He used VCS named *Bitkeeper*
 - However, one day...
 - Conflict b/w linux & bitkeeper occurred
 - As *linux* is open source project, meanwhile bitkeeper is commercial
 - Torvalds just made simple solution
 - Developing new VCS -> Git!!



Git vs. SubVersion



Git vs. Subversion

- cf) Why still lots of SVN repo?
 - Easy to learn (quite intuitive!!)
 - Lots of companies still use SVN...
 - due to old programmers
 - or to maintain legacy code



Covid-19 made old administration systems to be revised!!
Shows the power of legacy code / programmers...

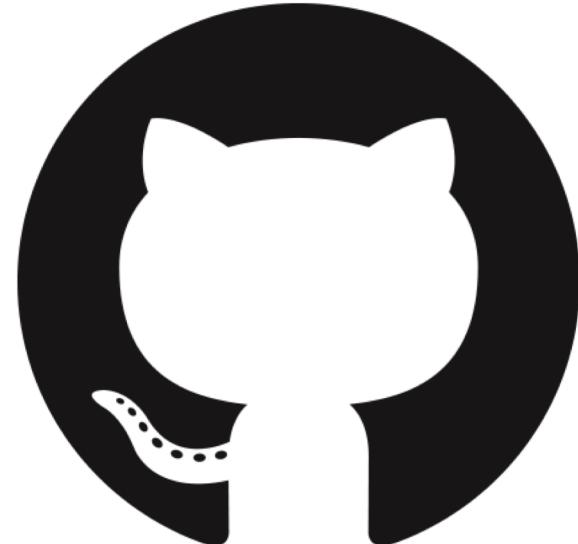
COBOL: ancient programming language (1959)

Git

- Okay...why git??
- For programmers, learning git is essential!!
- Because..
 - everybody makes mistakes
 - every computer can be crashed
 - every development can get sidetracked
- Also...
 - Almost every modern programmer is familiar to git
 - Almost every IT company requires git capability for their newcomers
 - Almost every open source project is managed with git
 - Want some contribution? Learn git!!

Github

- Provides web hosting service for version control using git
- Released in 2008
- Acquired by *Microsoft* (2018)
- Supports the functionalities of git & it's own features
 - Pull Request
 - Wiki
 - Issue
 - Fork
 - and else...



Github

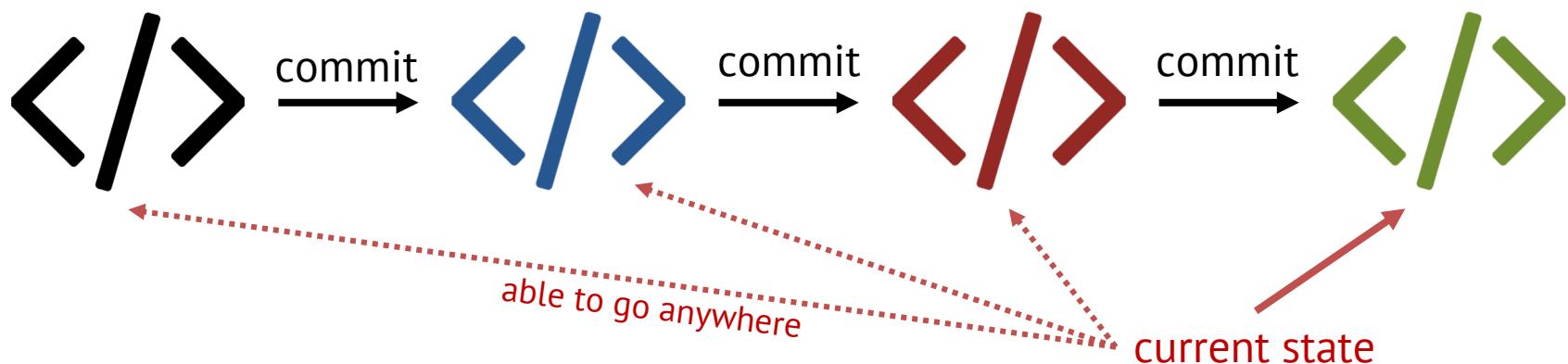
- Lots of famous open source projects are publicized in Github
 - Linux (Operating System)
 - Mozilla Firefox (Web browser)
 - Thunderbird (e-mail management platform)
 - Pytorch (ML Library)
 - Wordpress (Blogging platform)
 - MySQL (Database management system)
 - Apache (HTTP Web Server)
 - Git
 - Github

Git vs. Github

- Git
 - version control system
 - developers install locally to manage their code
- Github
 - online service
 - provides remote repository
 - developers (who use git) can connect and upload / download their resources
- Simple example: We can find [Git in Github!!](#)

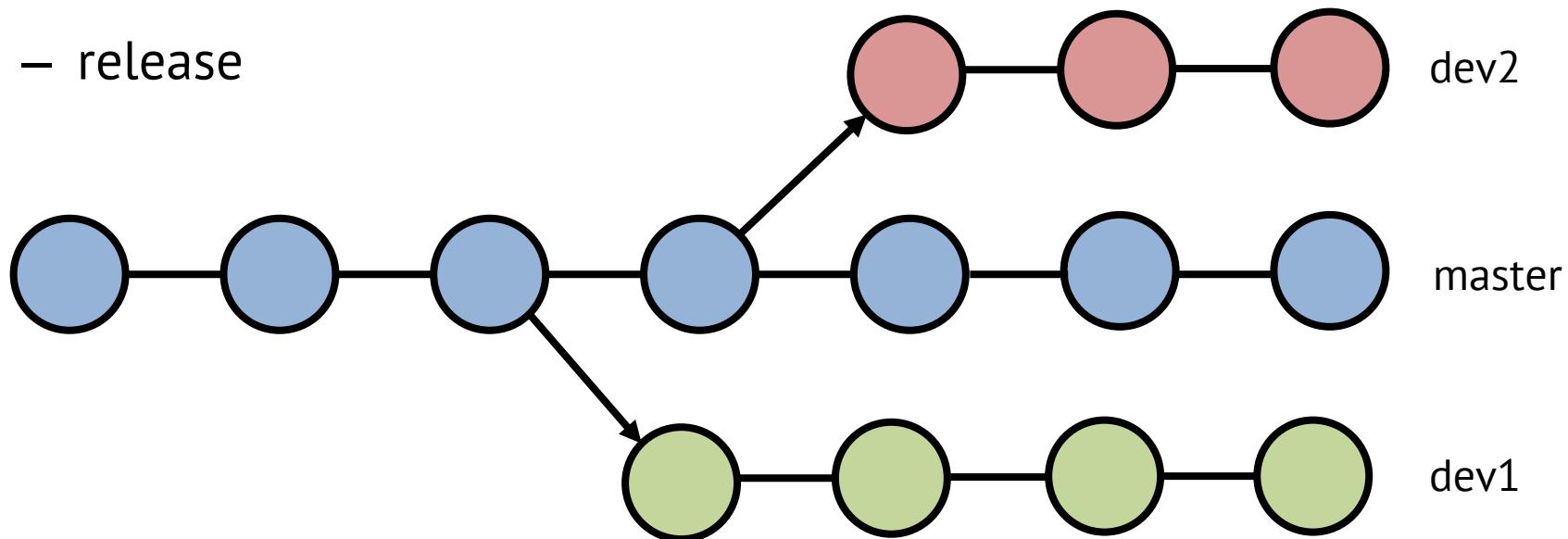
Git functionalities

- Recording history
 - records the evolution of the code
 - provides way to go back (*checkout*)
 - ***commit*** each change



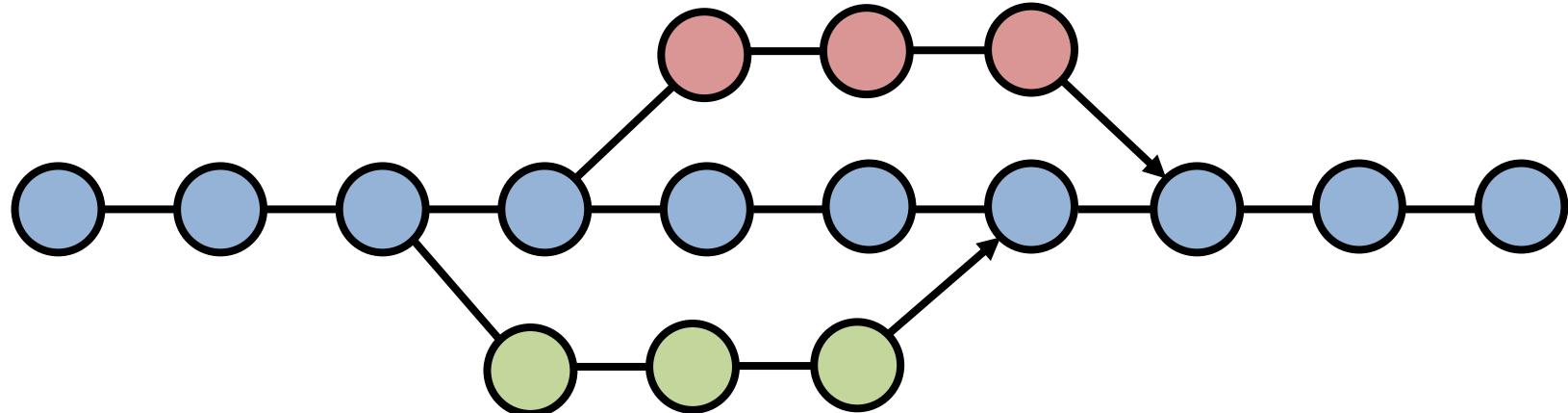
Git functionalities

- Branching
 - developing with others
 - need to test some experimental features
 - bug fix
 - release



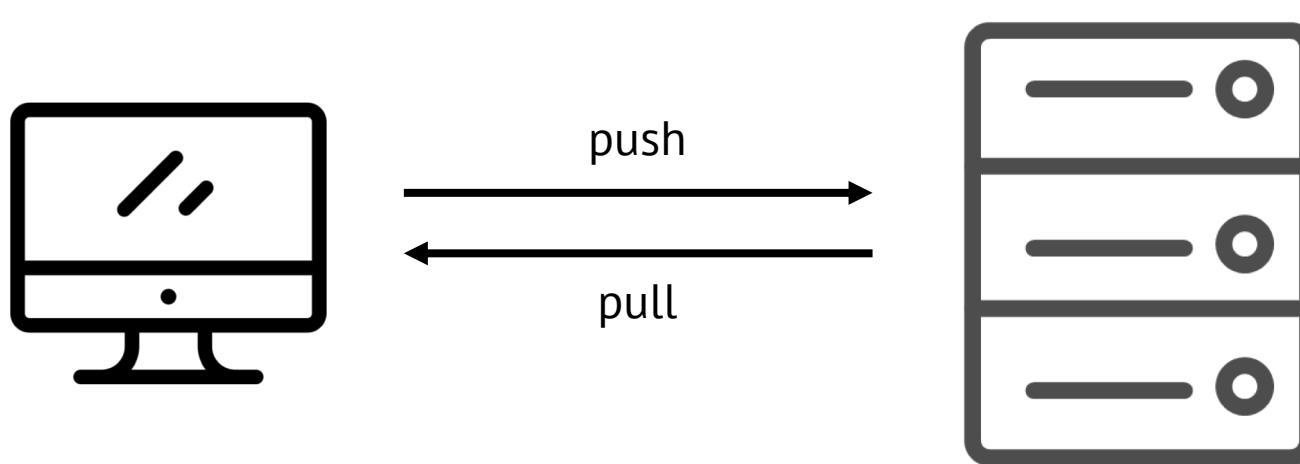
Git functionalities

- Merge
 - merge the code from different branches
 - automatic merge...but sometimes makes conflict
 - Conventional way to combine works



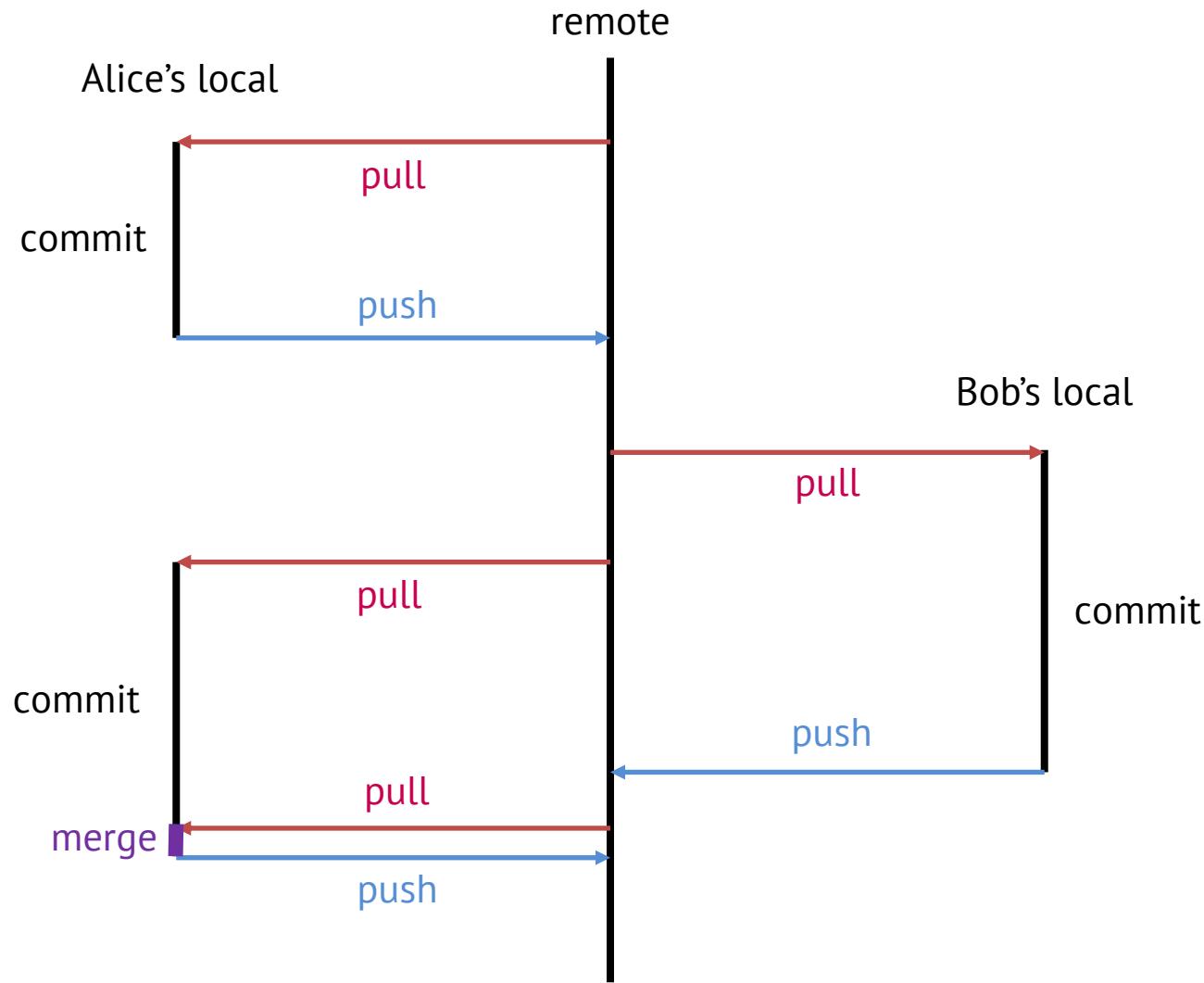
Git functionalities

- Communicate with remote repository
 - Github provides remote repository
- ***push*** (upload) / ***pull*** (download) data
- For backup / collaboration



Git functionalities

- Collaboration with *push / pull*



Git functionalities

- Show history
 - show differences b/w commits
 - show the owner of certain code (to *blame* the author...)
 - show entire history (*log*)
 - *helps to control / manage project repository*

```
| * b0adc5f fixed issue where charge_now is greater than charge_full resulting in batt percentage greater than 100
|/
| * 75552da Merge pull request #249 from IngoHeimbach/master
|/
| * e8688fd Renamed all occurrences of "OSX" to "MACOS" in the macos notification count plugin
|/
| * f0d94c0 Merge pull request #248 from IngoHeimbach/master
|/
| * 55a1ae2 Added a segment for querying macOS notification counts
| * 92ffff05 Merge pull request #247 from dominikduda/master
|/
| * 50d1748 Rename prefix_mode_indicator to mode_indicator, add copy mode indication, update colors and style
| * 62fb530 Merge pull request #245 from dominikduda/master
|/
|/
| * 1fad6b7 Add return 0
| * e02d6de Add prefix_mode_indicator.sh
|/
| * f34031b Merge pull request #241 from mingchaoyan/master
|/
| * 367ae05 no logger necessary set-option -g status-utf8 on
| * bcf7bee Merge pull request #1 from erikw/master
|/
|/
| * cf5a96a Merge pull request #240 from TakkuMattsu/modify_vcs_branch_name
|/
| * 62a8c5f Modify vcs branch name
|/
|:
```

history of *tmux-powerline*

Thank you!!

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