LEARN THE BASICS OF GIT AND GITHUB

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Today We'll Cover...

- Who is Perry?
- A brief history of version control, Git and GitHub.
- What are they? Why are they used?
- How to set up Git?
- What is a commit? How do I stage code?
- What is a tag?
- What is a branch?
- How do I setup a new Github account?

Today We'll Cover...

- How do I pull/update code?
- What is the .git folder?
- Why cloning is important
- How to clone data down
- What is cherry picking?

Today We'll Cover...

- Feel free to use a laptop if you'd like to follow along. Familiarity with command-line is helpful but not required.
- Walkthrough: https://github.com/perryrivera/learn_the_basics_of_git_and_github/blob/main/git_basics_walkthrough.md
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About Perry

- Perry Rivera
- Fedora Ambassador since 2015
- Fun fact: My first Fedora version is Fedora Core 4
- Red Hat Customer Success Architect
  - DevOps team for demo.redhat.com (customers) partner.demo.redhat.com (partners)
  - We enable customers through our cutting-edge technologies like OpenShift virtualization and OpenShift AI
  - Our teams use Fedora as our daily driver

A Brief History of Version Control

- A long time ago...
- Software engineers would keep many versions/files around
  - coolprog1.c
  - coolprog2c
  - And so on..
- These poor souls, If they remembered, backed up these files, duplicating similar data

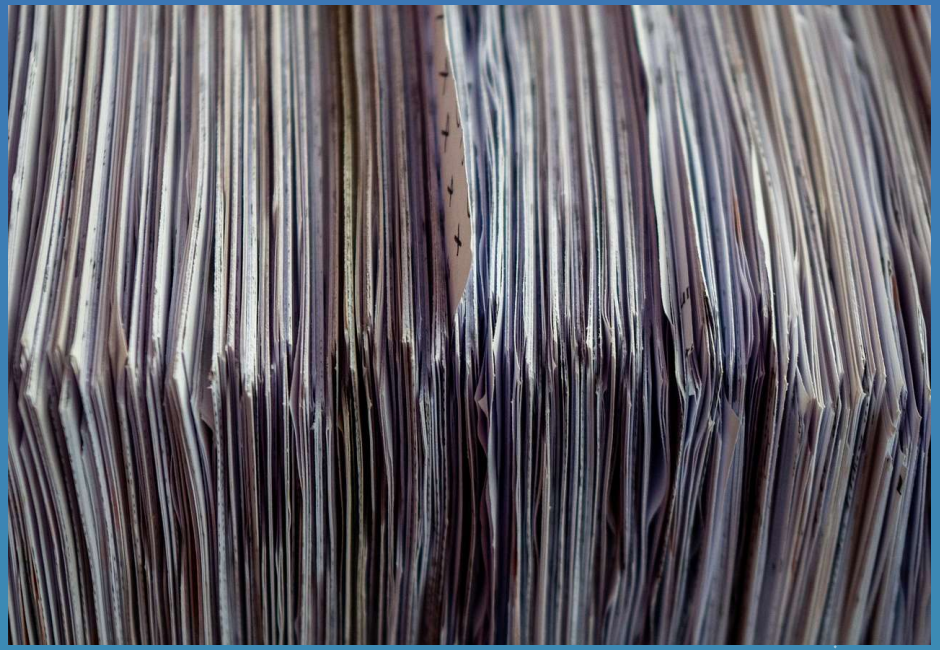
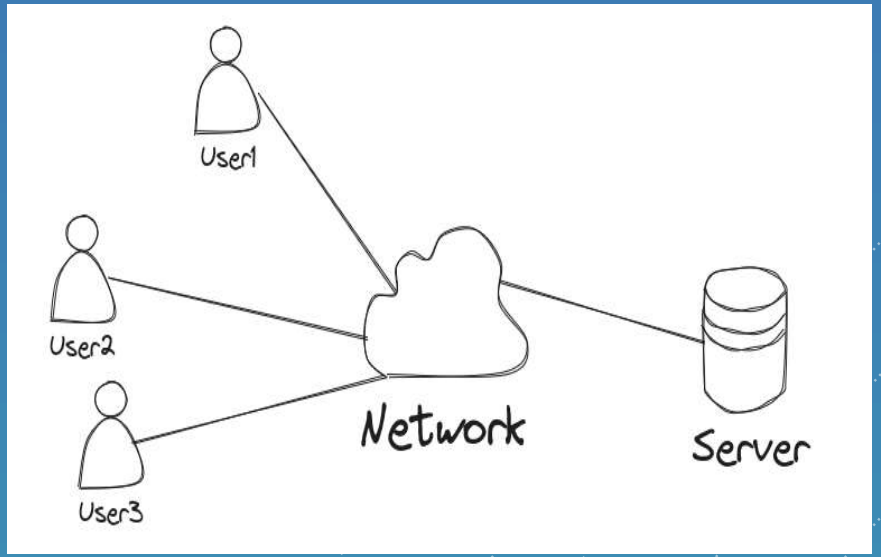


Image by wal_172619 from Pixabay

Maybe Not So

A Brief History of Version Control

- Eventually, tools like rcs (Revision Control System), cvs (Concurrent Versions System), and later, svn (Subversion), were developed
- Software engineers would write code locally on their client systems and push their changes up to a server
- A server admin would have to back up user data *shudder*



Maybe Not So

A Brief History of Version Control

- Linus Torvalds observed limitations in cvs/svn
  - Client/server architecture was a central and potential single point of failure without backups
  - CVS tracked updates file-by-file, while SVN tracks an entire commit as a new revision
  - CVS had some issues with same-time commits
  - CVS didn't support binary files well (full copies of binaries versus binary-differenced commits)
  - Server did the heavy lifting for the code base

Maybe Not So

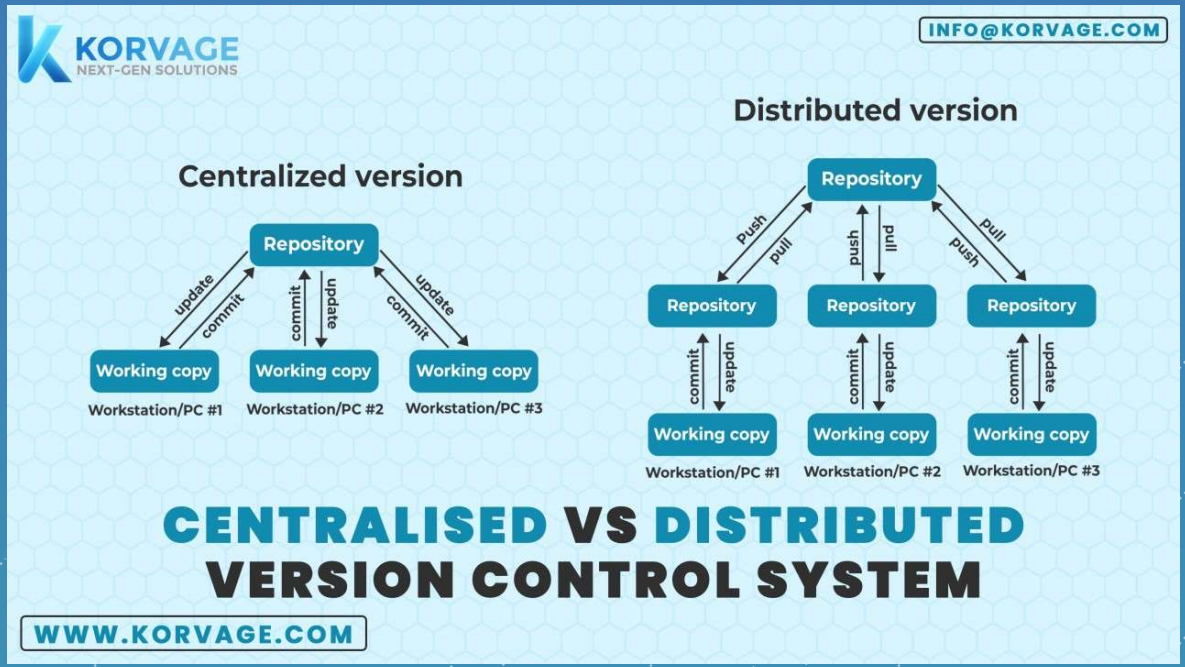
A Brief History of Version Control

- Linus Torvalds developed git as a result
  - Distributed architecture means everyone has a local copy of the entire repository, especially the history
  - Collaboration
  - Fast and asynchronous
  - Each directory has a complete history
  - This is a fast, efficient directory content manager.

Maybe Not So

A Brief History of Version Control

- Linus Torvalds developed git as a result
  - Distributed



Maybe Not So

A Brief History of Version Control

- How did it get its name?
  - git's historical commit message: "Initial revision of "git", the information manager from he**"
  - git - the stupid content tracker

https://funsizedatabytes.substack.com/p/git-on-with-it?utm_campaign=post&utm_medium=web

Maybe Not So

A Brief History of Version Control

- How did it get its name?
  - Per Wikipedia, "git" can mean anything, depending on your mood:
    - random three-letter pronounceable word not used by any common UNIX command.
    - stupid. contemptible and despicable. simple. Take your pick..
    - "global information tracker": you're in a good mood, and it actually works for you.

Installing git

- It comes pre-installed on some systems
- So, take it for a spin:
  - git version
  - If you get a version number as a response, you're all set
  - If not, refer to https://github.com/git-guides/install-git

How to set up Github Account

- https://github.com/
- Upper right-hand corner: Sign up
- Supply an e-mail, username, and password
- Other alternatives (not covered here):
  - Gitlab
  - Gitea
  - Bitlocker
  - And more...

Should I choose Free or Paid GitHub?

- There's an array of choices...it depends on your needs...
- Check out:
  - https://github.com/pricing
  - Take a look at the add-ons too and Compare Features section.
- If starting out, maybe start with the Free and go from there...

Generating a New Token

- Generate a token
  - https://docs.github.com/en/authentication/keeping-your-account-and-data-secure/managing-your-personal-access-tokens#creating-a-fine-grained-personal-access-token
    - Click your picture
    - Click Settings. On the left hand menu, scroll down and click Developer settings
    - Click Personal Access Tokens
    - Click Tokens (classic)
    - Click Generate New Token
    - Click Generate New Token (classic)

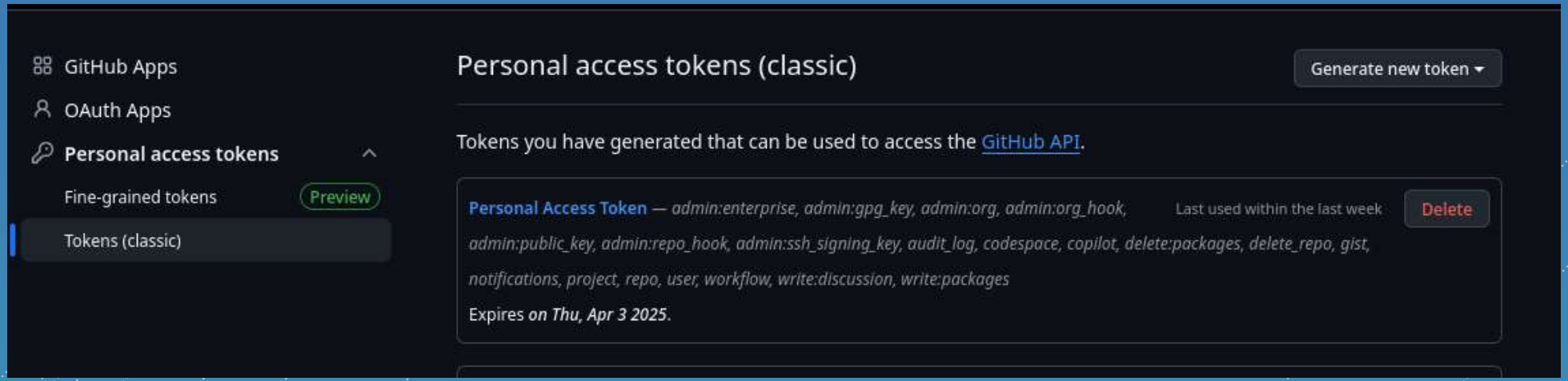
Generating a New Token

- Generate a token
  - (cont'd)
    - Note: Personal Access Token DD/MM/YYYY
    - Expiration: (leave at 30 days)
    - Access: If it's just you, choose toplevel checkboxes
    - Click Generate token
  - IMPORTANT: Make sure to copy and secure your token in a vault, such as KeePassXC

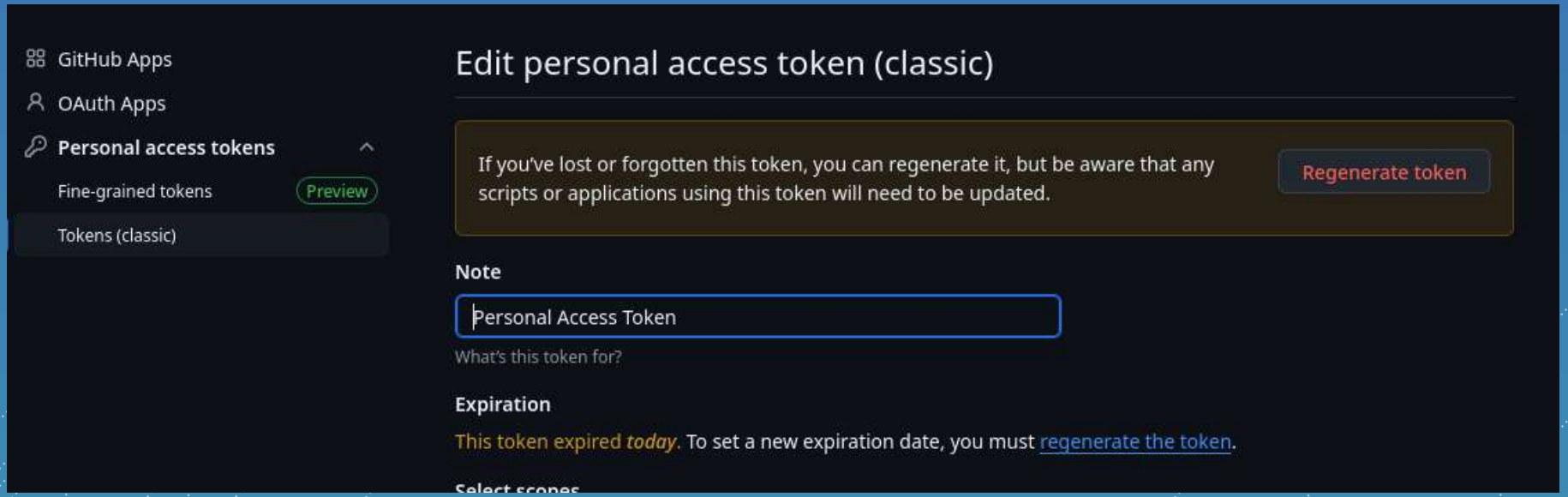
Re-generating a Token

- Re-generate a token
  - Click your picture
  - Click Settings. On the left hand menu, scroll down and click Developer settings
  - Click Personal Access Tokens
  - Click Tokens (classic)
  - Click on the token you created about a month ago...
  - Click Re-generate Token.

Re-generating a Token



Re-generating a New Token



Set the Stage...

- In your home directory, define a spot to set up repositories, e.g. repo
- mkdir repo && cd $_ [be sure to use double ampersand!]

Image by faraindahouse from Pixabay

How to Create a Repository

- In a browser, again using your username: https://github.com/perryrivera?tab=repositories
- In the upper-right hand side, click the New button
  - Repository name: my-first-repo
  - Description: my-first-repo
  - Select Private
  - Click Create repository

How to add a remote repository to your local repository

- In a terminal:
  - cd ~/repo
  - Create project directories under this, e.g. gitstudy, coolproject, etc.
  - cd into each directory

How to add a remote repository to your local repository

- In a terminal:
  - git init
    - Creates hidden .git metadata that the git command uses
  - Add a remote repository to your local repository. Use your git username
    - git remote add origin https://github.com/perryrivera/my-first-repo.git
    - NOTE: If you get error fatal: “not a git repository”, did you do a git init yet???

How to add a remote repository to your local repository (Example)

- mkdir my-first-repo
- cd my-first-repo
- git remote add origin <url>
- git clone <url>
- git status
- git push

How to Set Up git

- git clone <url>
  - Use clone to get a copy of a remote repository
  - How do I figure out <url>
    - Go to the place where you'd like to clone:
      - e.g. https://github.com/perryrivera/my-test-repo
      - Click the green Code button:

      - Click the copy button
        to the right of the https url:

How to Set Up git

- git clone <url> [continued]
  - How do I figure out <url>
    - Paste this into your command, e.g.:
      - git remote add origin https://github.com/janeuser/my-test-repo.git
      - git clone https://github.com/janeuser/my-test-repo.git
  - https://docs.github.com/en/repositories/creating-and-managing-repositories/cloning-a-repository

How to Set Up Global Config

- While still in ~/repo/my-first-repo
  - git config --global user.email "janeuser@gmail.com"
  - git config --global user.name "Jane User"
  - git config --list

How to Stage and Add Files

- echo blah > this_is_my_first_textfile
- ls
  - this_is_my_first_textfile
- git add <file>
  - Or, for multiple untracked files in current and subdirectories, use git add .
- git commit <file>
  - Enter commit message, e.g. Initial Commit

How to Tag A File

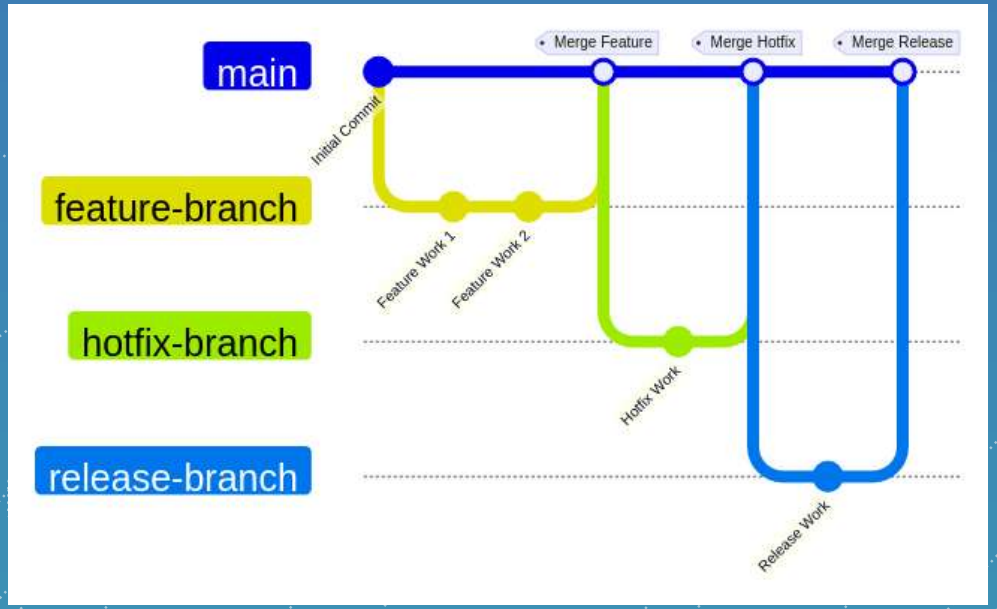
- Use it to tag the last commit
- Simple Tag: git tag
  - git tag release4 [annotation is last commit message]
- Annotative Tag
  - git -a tag v5.4.2 “Silver Edition Release v5.4.2”
- git log --one-line
- git tag -n

Pushing the file to origin’s repo

- git push --set-upstream origin master
  - Enter username
  - Enter password, which is a copy of your Personal Access Token. This is good for 30days (or whatever duration you set previously..).

Why do we want to branch? How to create a branch?

- Use it to branch off the default/main branch for new development / feature
-



Why do we want to branch? How to create a branch?

- Use it to branch off the default/main branch for new development /feature
- git branch firstBranch
- git checkout firstBranch
  - touch bugfix1
  - touch bugfix2
  - git add bugfix1
  - git add bugfix2

Why do we want to branch? How to create a branch?

- git checkout firstBranch (continued)
  - git stash
  - ls
  - git stash apply
  - ls
  - git commit
  - git push --set-upstream origin firstBranch
- git checkout main
- ls

Recap

We covered:

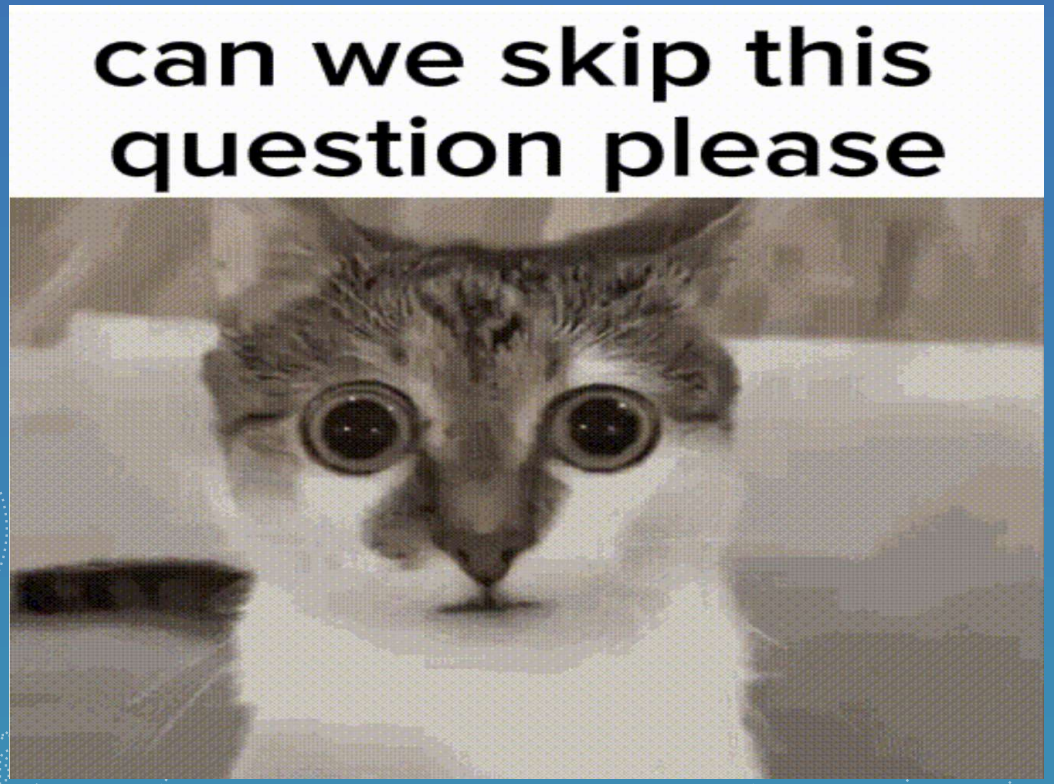
- A whirlwind view of version control, Git and GitHub and why they're useful
- The importance of the .git folder
- GitHub setup
- Pulling and updating code

Recap

We also covered:

- Staging and committing code
- Cloning code
- Branching basics

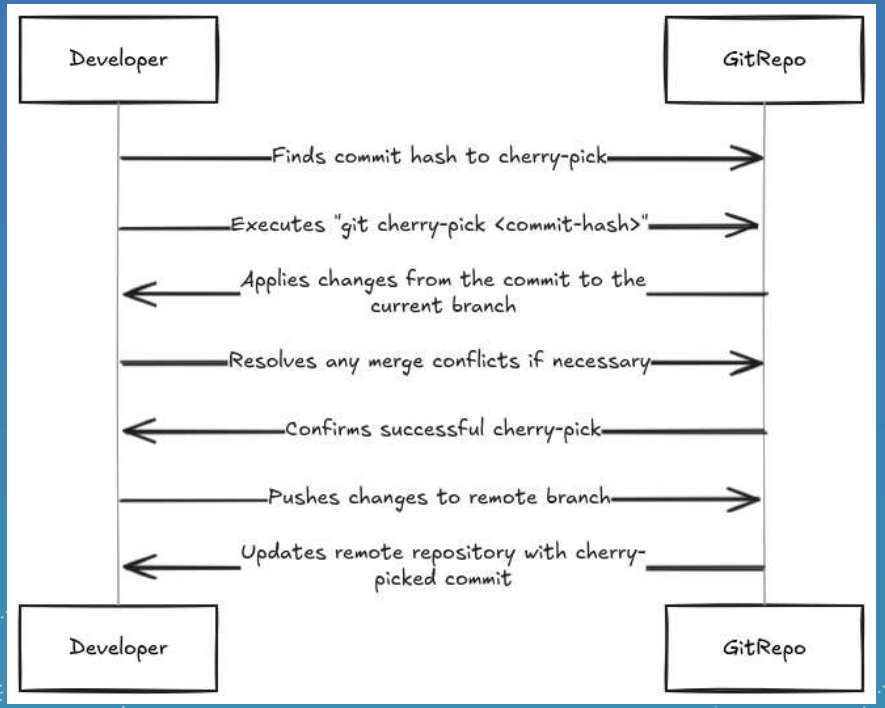
ANY QUESTIONS?



THANK YOU

APPENDIX

How to Cherry-pick Files



How to Cherry-pick Files

- Find the commit you want
- git log <name of committed file>
  - Copy the commit id
- git checkout featureBranch
- git pull

How to Cherry-pick Files

- git checkout main
- git pull
- git cherry-pick <commitID>
- git push origin/featureBranch

Resources

- Step by Step Cherry-Pick
  - https://www.youtube.com/watch?v=HQU8Y38KgdA
  - https://stackoverflow.com/questions/62788703/git-how-to-cherrypick-commit-from-one-branch-and-create-pull-request-for-anothe
  - https://www.atlassian.com/git/tutorials/cherry-pick
- Git for Ages 4 and Up: https://youtu.be/1ffBJ4sVUb4?si=veY4Om7NKlBSp1vt

Resources

- Atlassian's Git Cheatsheet
  https://www.atlassian.com/git/tutorials/atlassian-git-cheatsheet
- Using GitHub with git / GitHub
  https://code.visualstudio.com/docs/sourcecontrol/overview

  Be sure to check out the Next Steps links at the bottom, too

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