



# **Introduction to GitHub**

## Lesson 1



## Setting the Context

- What is Git – an overview
- What You Need to Know About Git

## Introduction to GitHub

- What is GitHub
- Signup on GitHub
- Branches are used to propose changes to GitHub projects
- Create or delete branches directly on GitHub
- Understanding Pull requests
  - Create a pull request to propose
  - Collaborate on changes to a repository
- Creating a Pull request from a fork
- Request a review for changes
- Change the base branch to compare the changes
- Commit changes on a pull request branch



## What is Git – an overview : Git Configuration

- Levels of Git Configuration
- Local : repository level (--local)
  - For example : while using a personal GitHub account
  - "git config -- local user.email a@b.org"
  - "git config -- local – list" to view the local configuration
  - "cat .git/config" or "vi ~/.git/config"
- Global : user level (--global)
  - For example : To know/reset your user level settings
    - "git config -- user.name <optionally new value>"
    - "git config -- user.email <optionally new value>"
    - "git config -- global – list"
    - "cat ~/.gitconfig" or "vi ~/.gitconfig"
    - "git config -- global pull.rebase true" defaulting pull to rebase
- System : all user level (--system)
  - For example : Setting UI color for all users
  - "git config – system color.ui true"



## What is GitHub

- GitHub is a collaboration platform.
- From software to legal documents, you can count on GitHub to help you do your best work with the collaboration and security tools your team needs.
- With GitHub, you can keep projects completely private, invite the world to collaborate, and streamline every step of your project.
- GitHub is also a powerful version control tool.
- GitHub uses Git, the most popular open source version control software, to track every contribution and contributor to your project--so you know exactly where every line of code came from.



## What is GitHub – Sharing a Git Configuration on GitHub

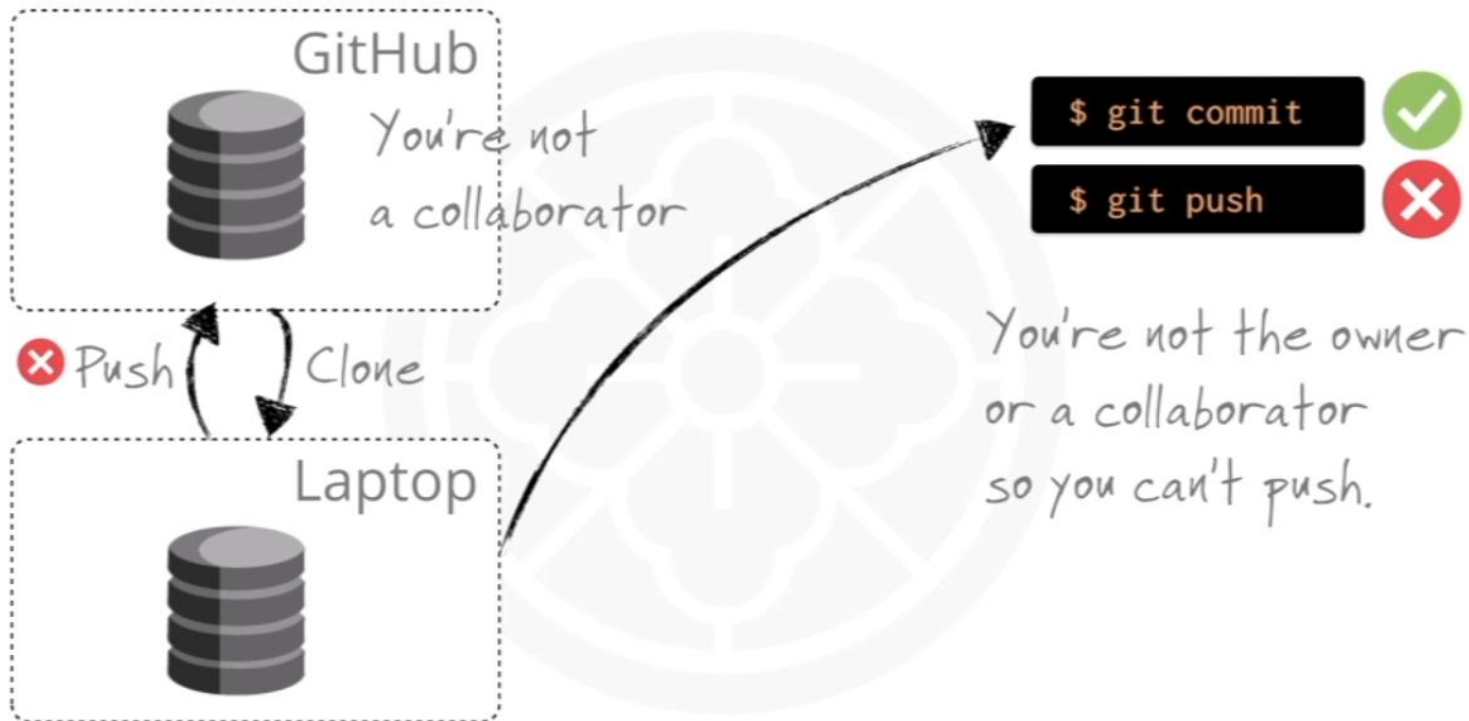
- Wiki Page
- Add the configuration files (dot files) to a repository on GitHub
- Global : user level (--global)
- System : all user level (--system)

# Setting the Context



## What is GitHub – Cloning :

- When you are not a Owner/Collaborator on a public repo, you can
  - Clone the repo
  - Commit the changes locally
- However you can not push it back to the repository.

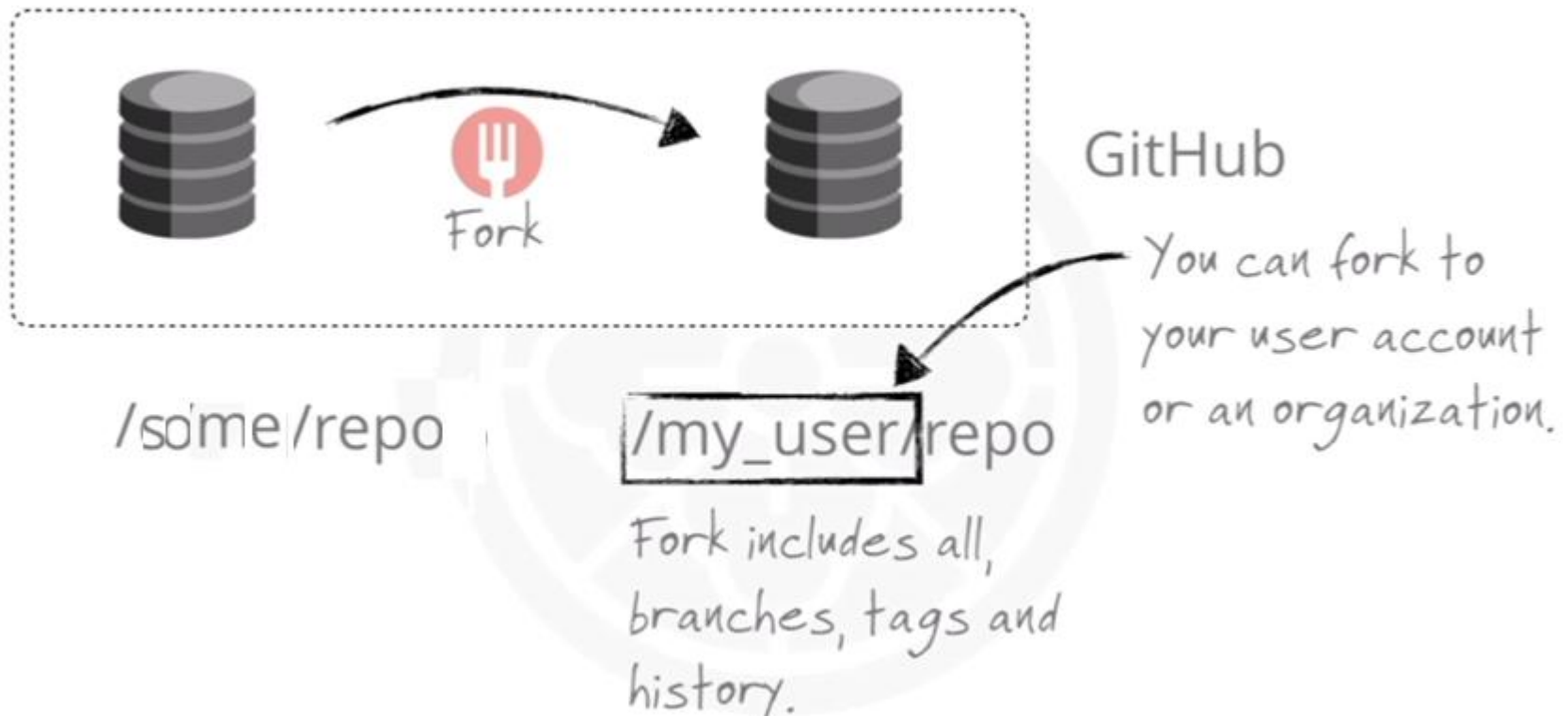


# Setting the Context



## What is GitHub – Forking :

- You can fork a project on a public repo

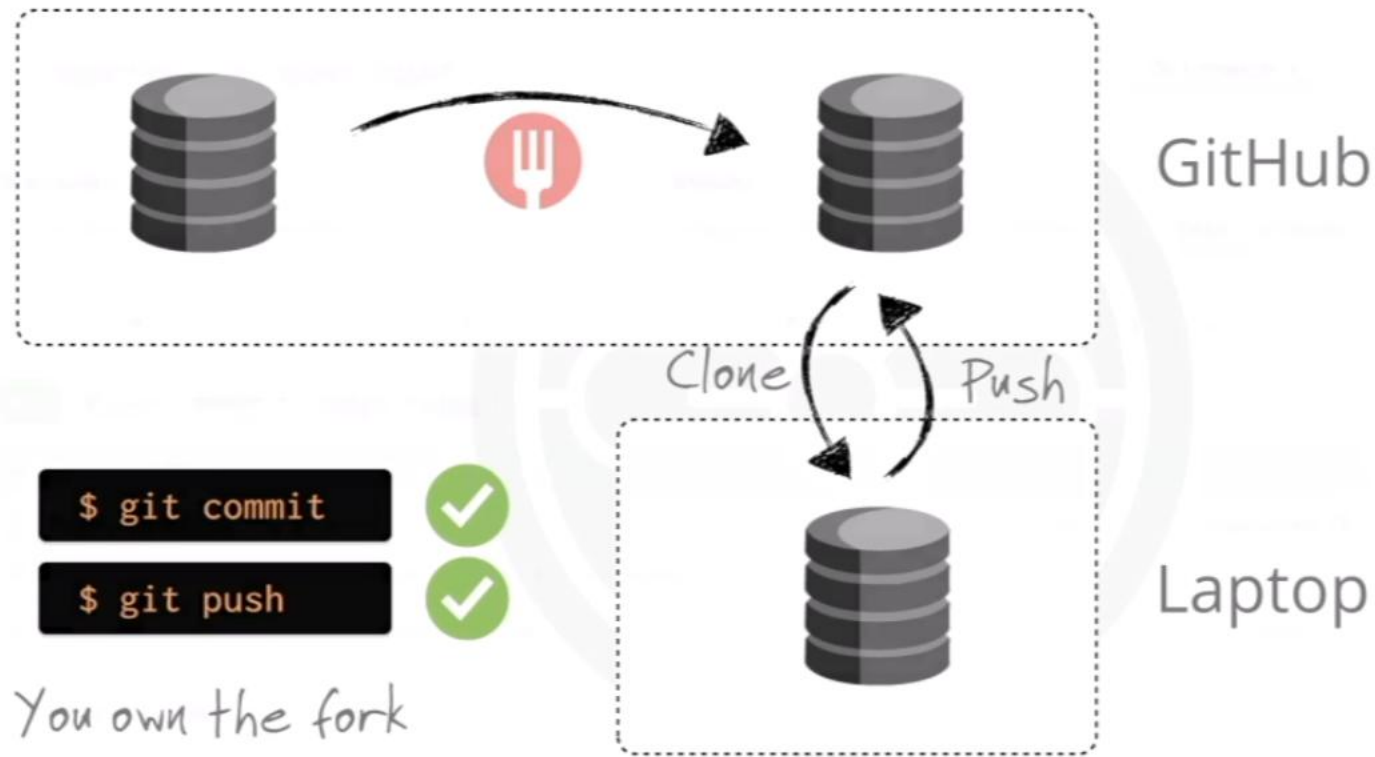


# Setting the Context



## What is GitHub – Forking :

- You can fork a project on a public repo, you can
  - Clone the forked locally
  - Commit the changes
  - Push it back to the forked repo



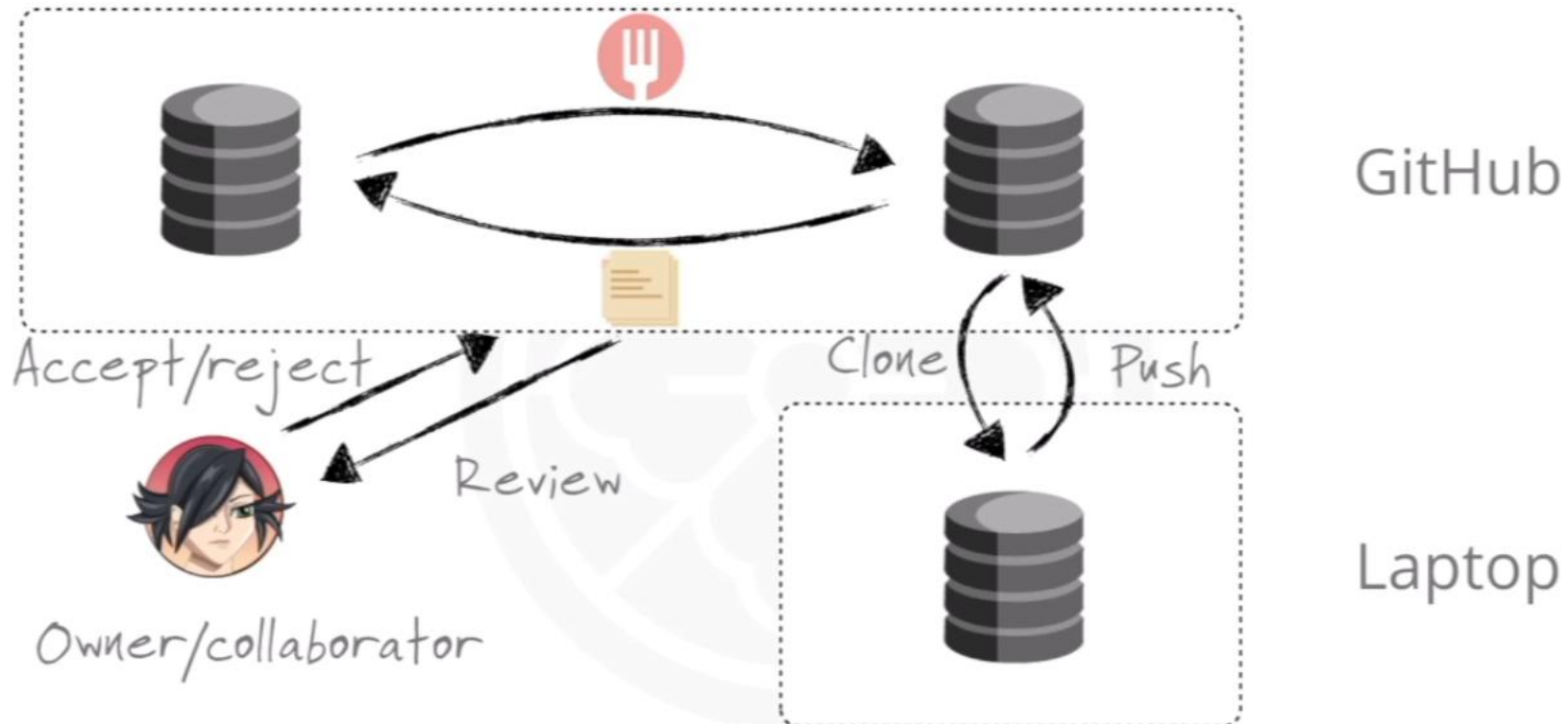


# Setting the Context



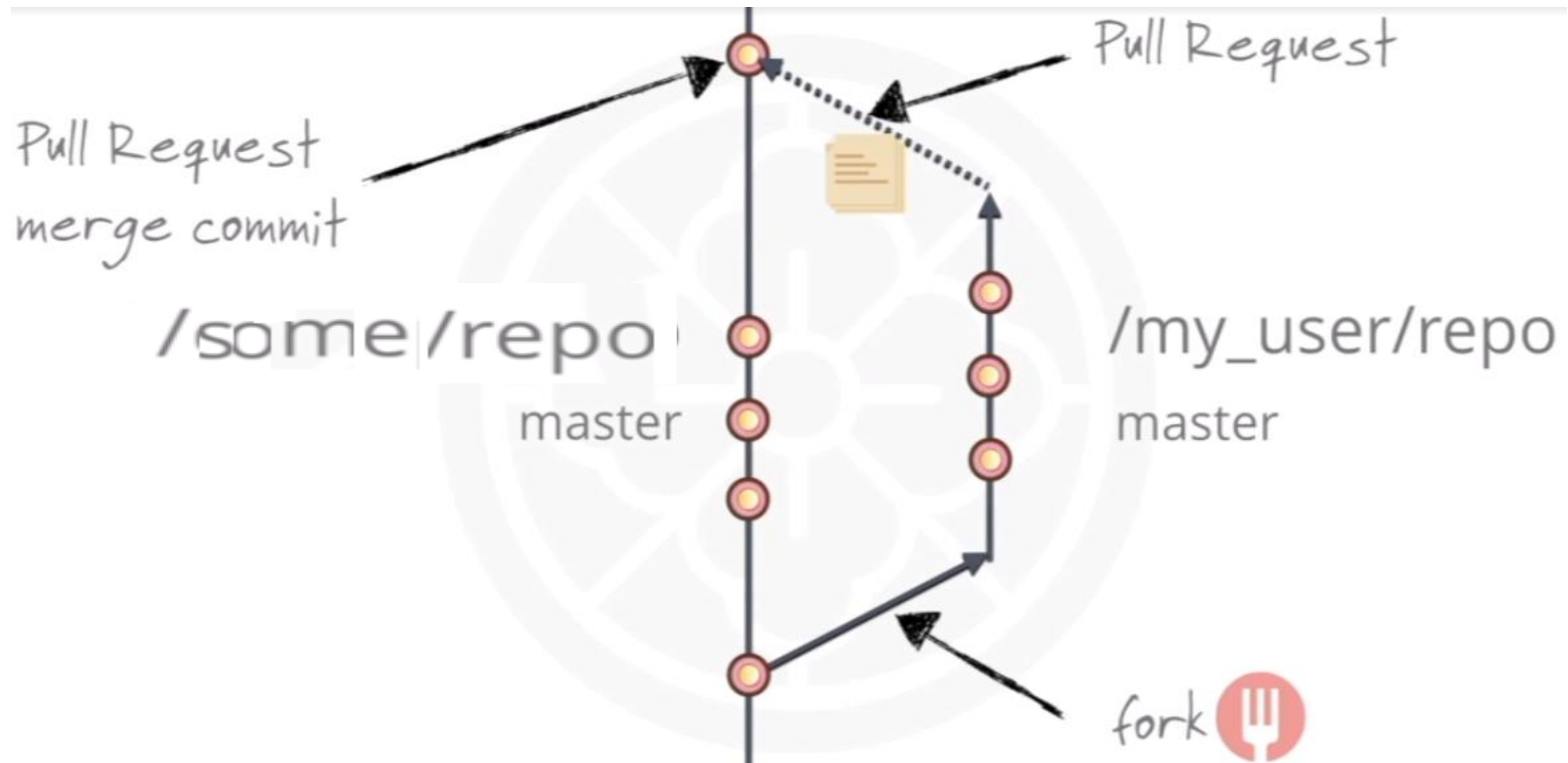
## What is GitHub – Pull Request :

- You can fork a project on a public repo, you can
  - Clone and Commit the changes locally
  - Push it back to the forked repo
- By Submitting a Pull Request, you can
  - Send a Pull Request to original repo owner/collaborator
  - It is reviewed by owner/collaborator
  - Changes are Accepted or Rejected



## What is GitHub – Pull Request :

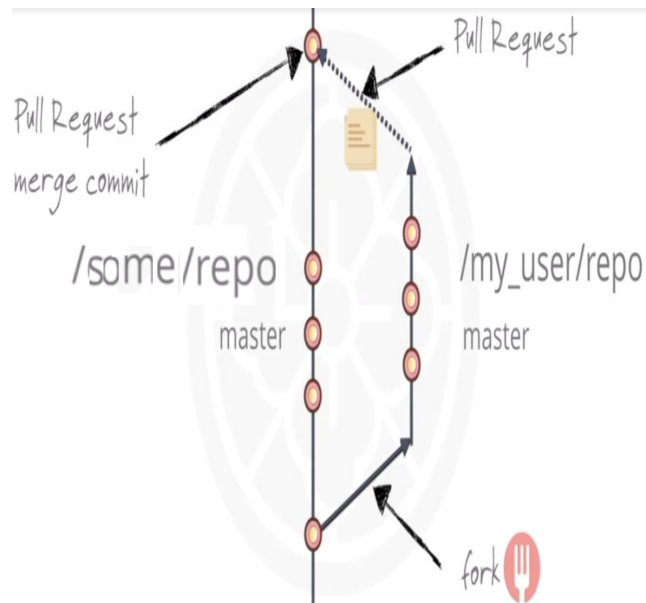
- We can think of Pull Request as a Branch
  - Forking creates a branch
  - You commit several times to the forked repo
- By Submitting a Pull Request, is like a Merge request
  - Forked repo branch is Merged into master Branch if Accepted





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- We can think of Pull Request as a Branch
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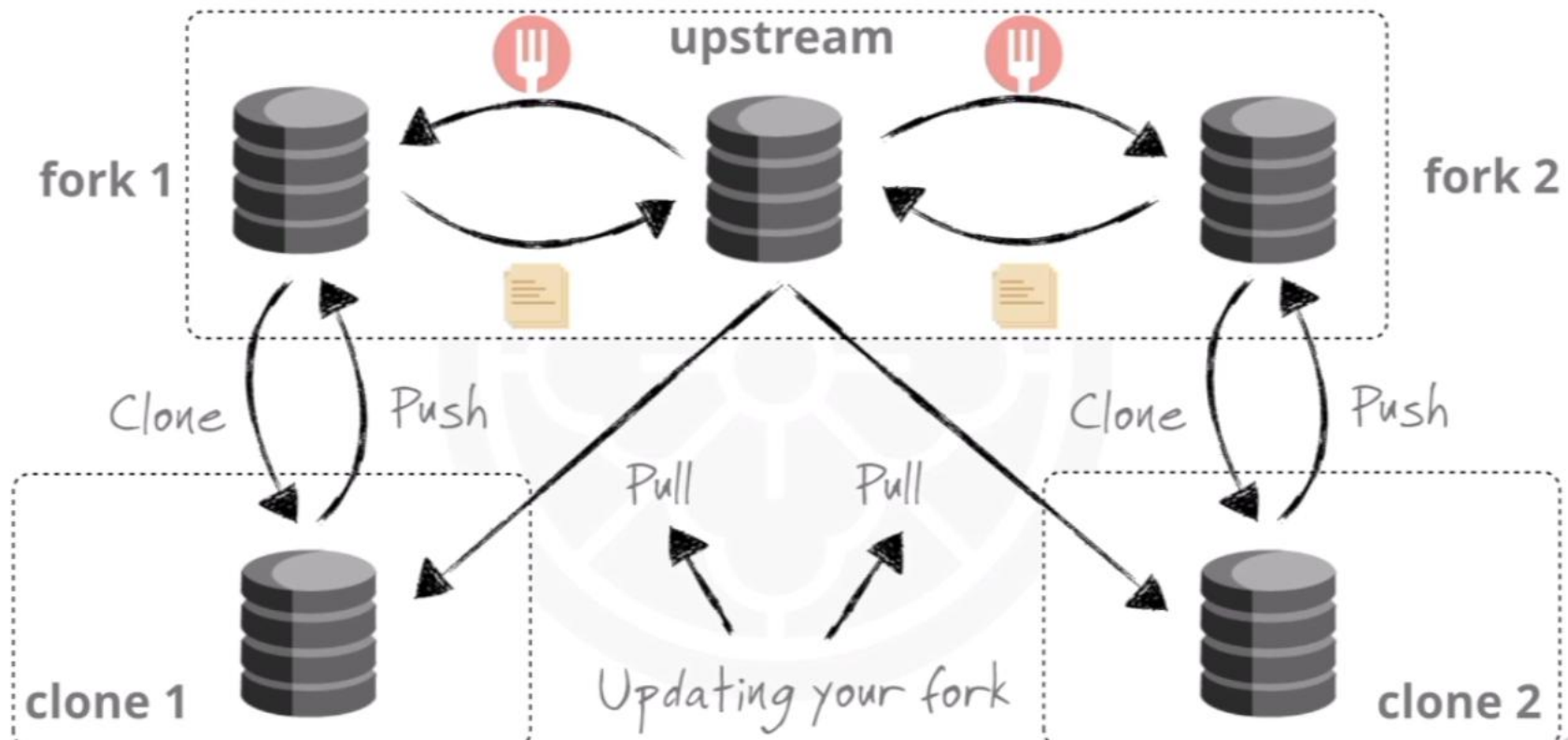
Anyone can comment on a PR

They can also checkout your branch, commit and add their changes to your PR.

The owner or any collaborator can merge in your PR.

## What is GitHub – Updating Fork with accepted Pull Requests(PR) :

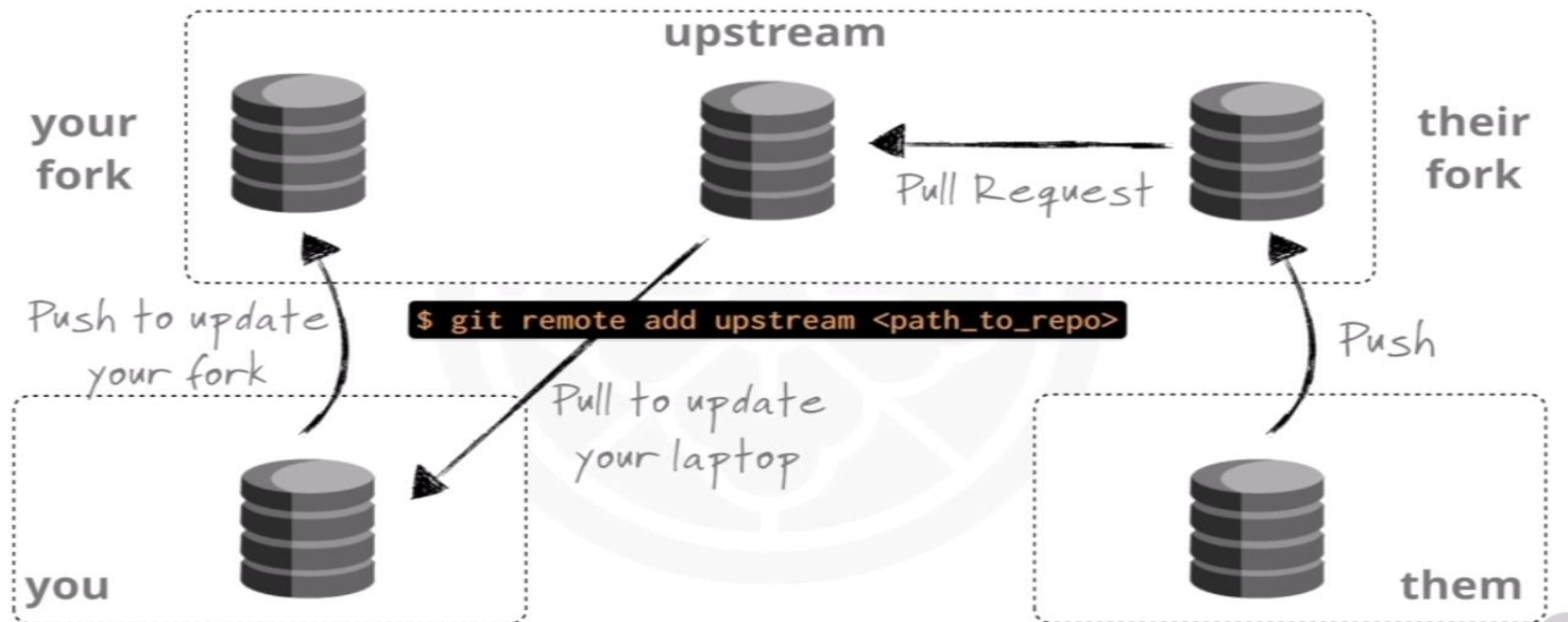
- Think of two devs have their own Forks of a upstream repo
  - After Forking they create their local clones
  - Push several times to the forked repo
- Created Pull Requests, which duly get accepted
  - Now the local repo has to be updated accordingly





## What is GitHub – Updating Fork with accepted Pull Requests(PR) :

- Think of two devs have forks of a upstream repo
  - After Forking they create their local clones
  - Push several times to the forked repo
- Care Pull Requests, which duly get accepted
  - Now the local repo has to be updated accordingly
  - On local clone, declare the original repo as its remote & fetch changes
  - Merge into local repo to update it
  - And then push to your fork to update





## What is GitHub – Updating Fork with accepted Pull Requests(PR) :

- Commands to update your Fork for every Pull Request accepted
  - On local clone, declare the original repo as its remote
  - Fetch the changes
  - Merge into local repo to update it
  - And then push to your fork to update

Add remote for upstream

```
$ git remote add upstream <path_to_repo>
```

Fetch changes

```
$ git fetch upstream
```

Merge them into master

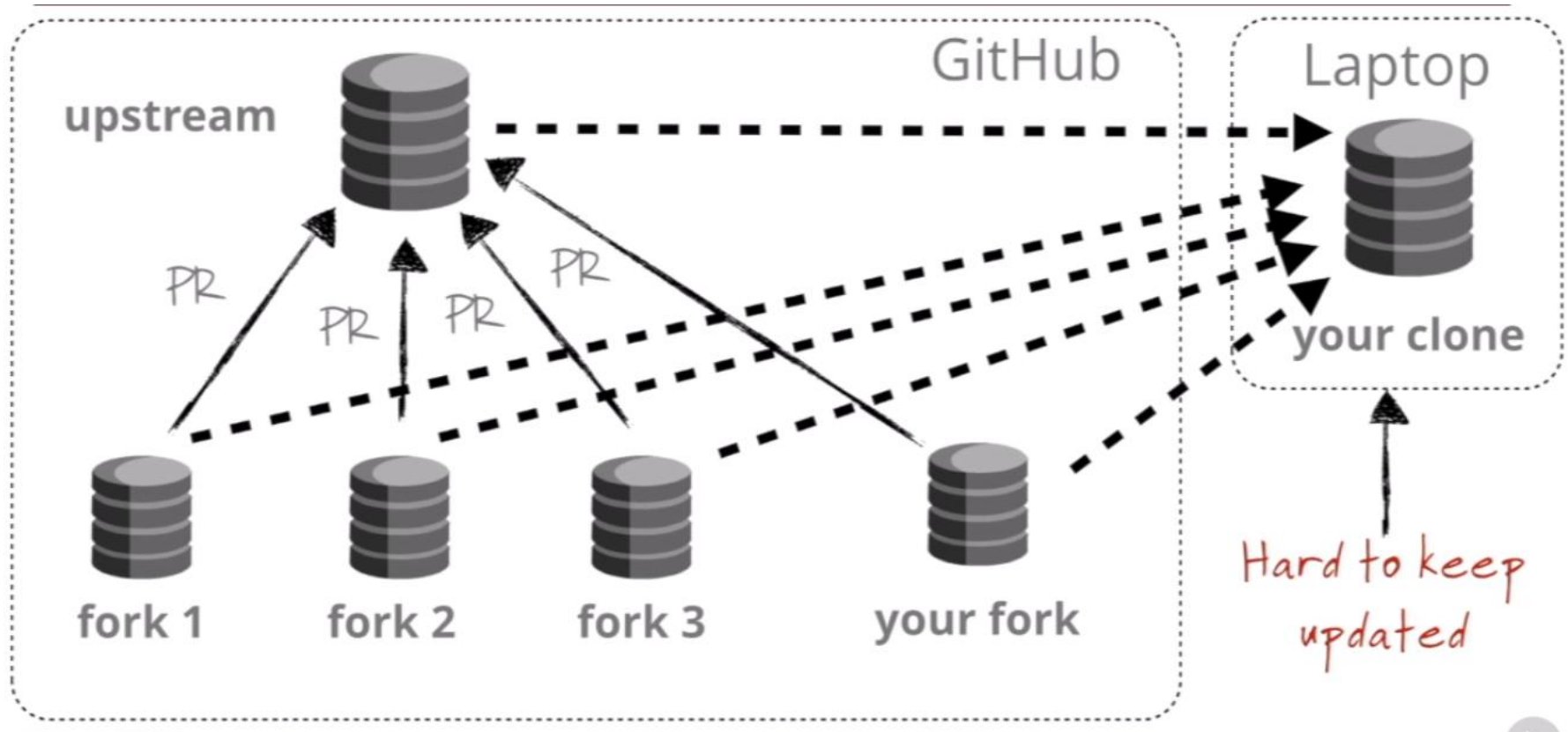
```
$ git merge upstream/master master
```

Push them to your remote

```
$ git push origin master
```

## What is GitHub – Multi Repository Workflow Challenges

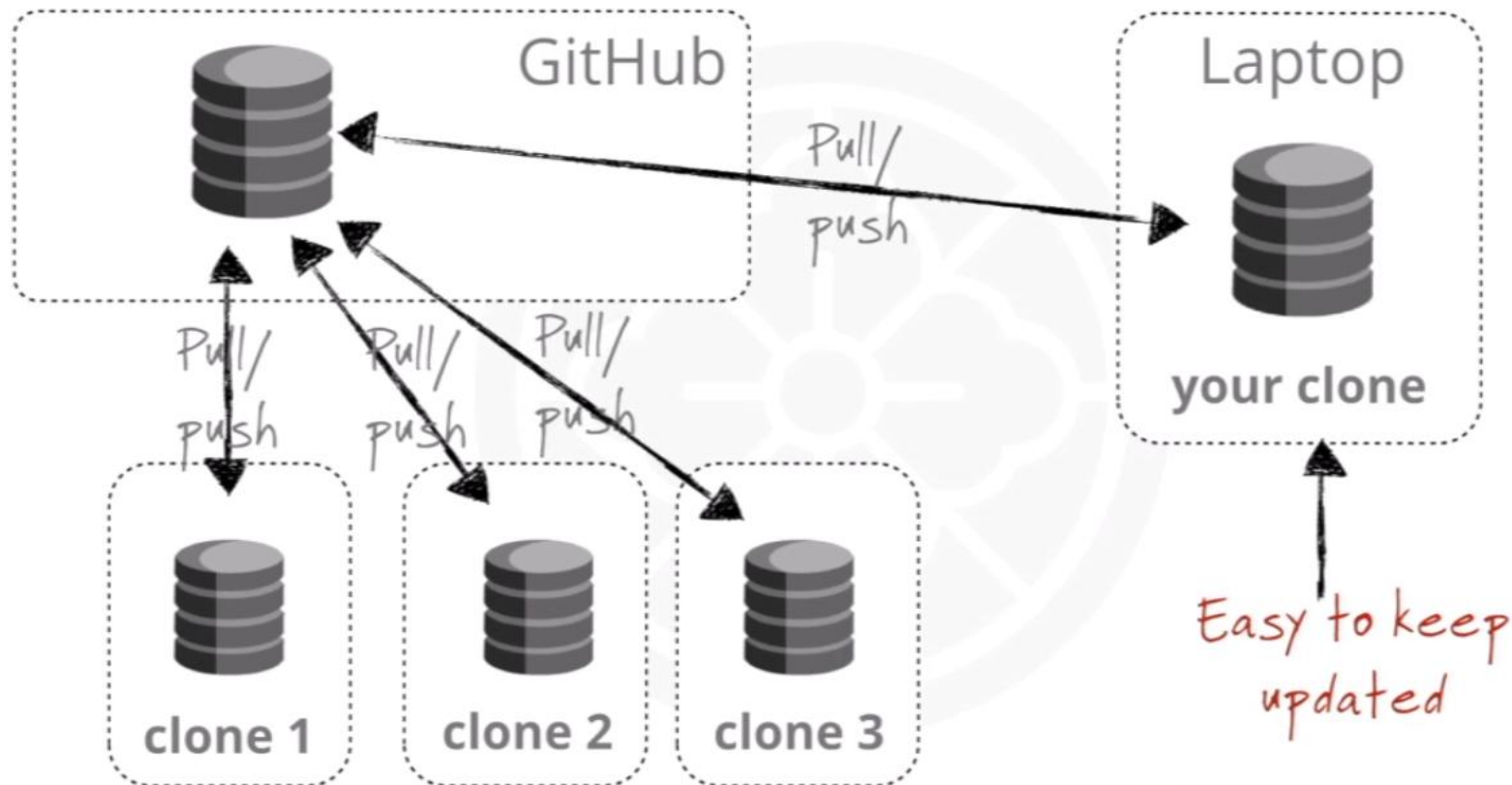
- Maintaining Multi repository Workflows is a challenging task
  - Especially while you try to keep your local codebase, up-to-date with PRs that are yet to be accepted from other forks in your team





## What is GitHub – Introducing Single Repository Workflow

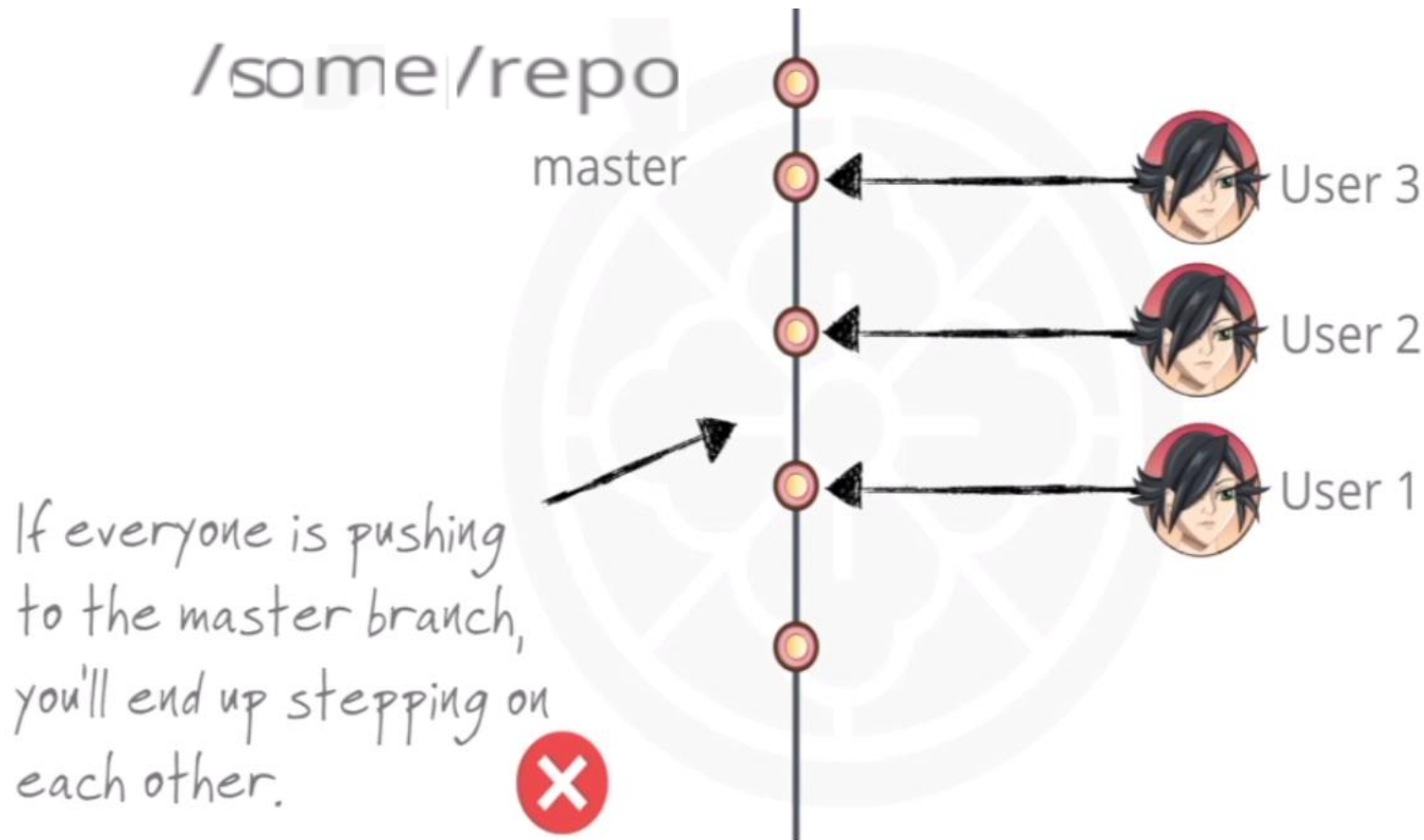
- It is easy to use Single repository Workflows
  - Especially while collaborating with central repository, in your team, every one can clone the central repo, pull or push the changes on it. NO Fork required in this case.





## What is GitHub – Caution : Single Repository Workflow

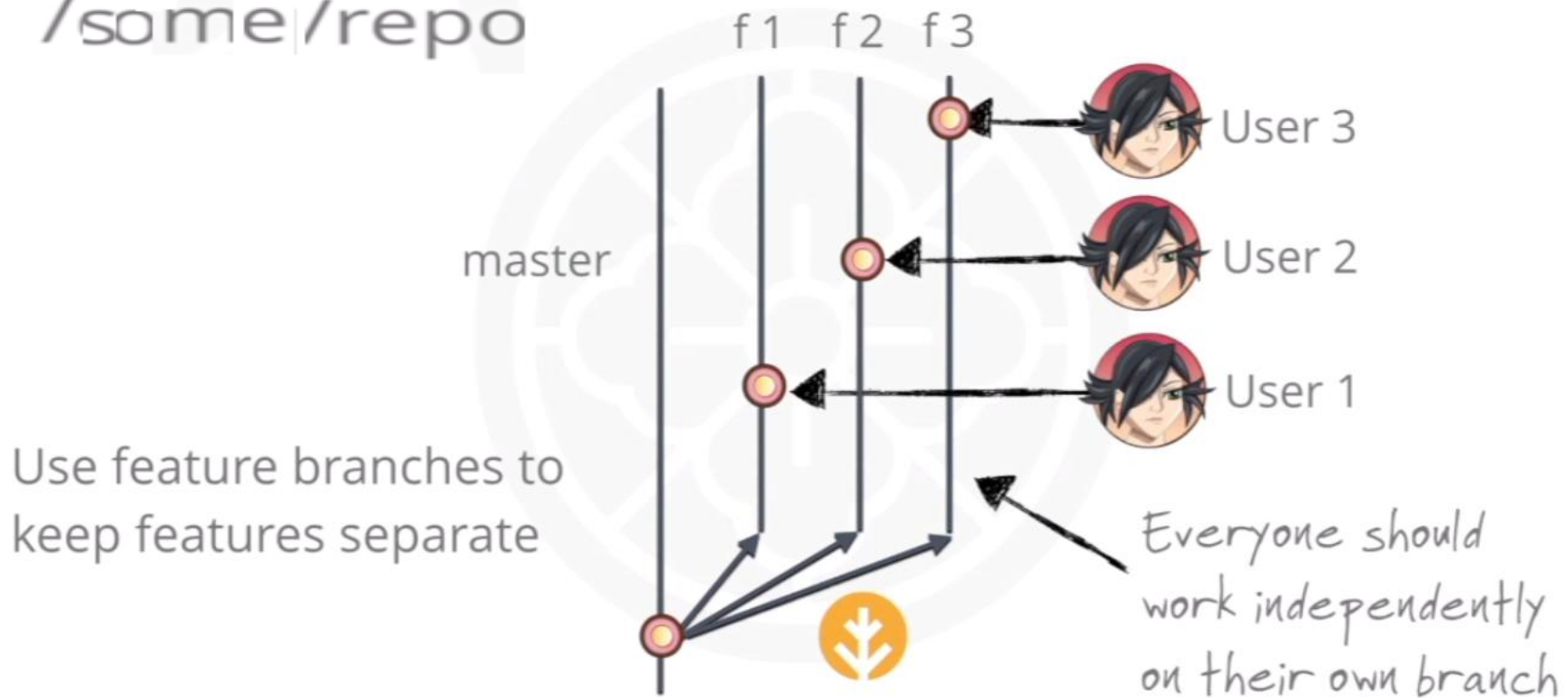
- Due to use Single repository Workflows, there can be regular Conflicts



## What is GitHub – Feature Branches

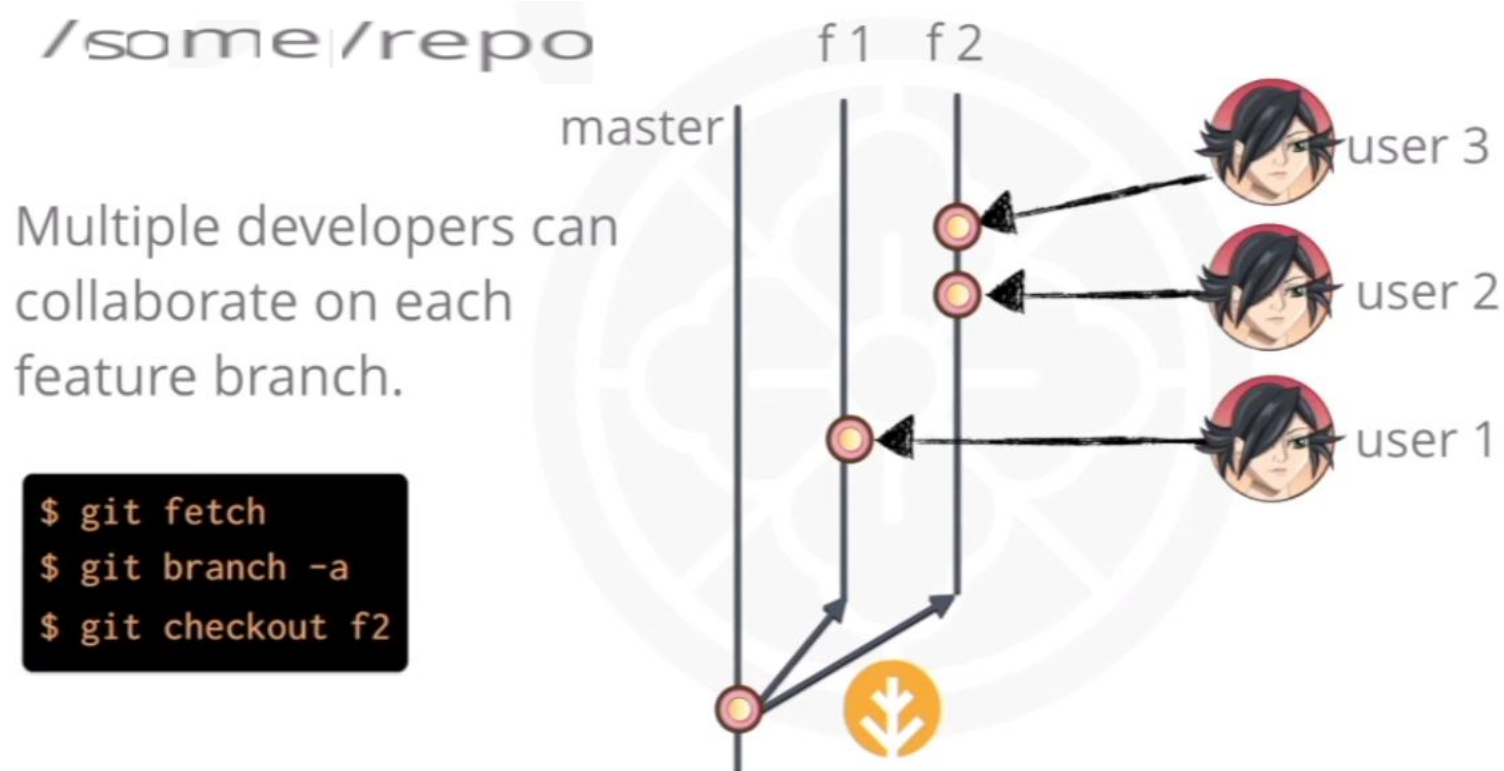
- Feature Branches can be used for independent development on Single repository Workflows

/some/repo



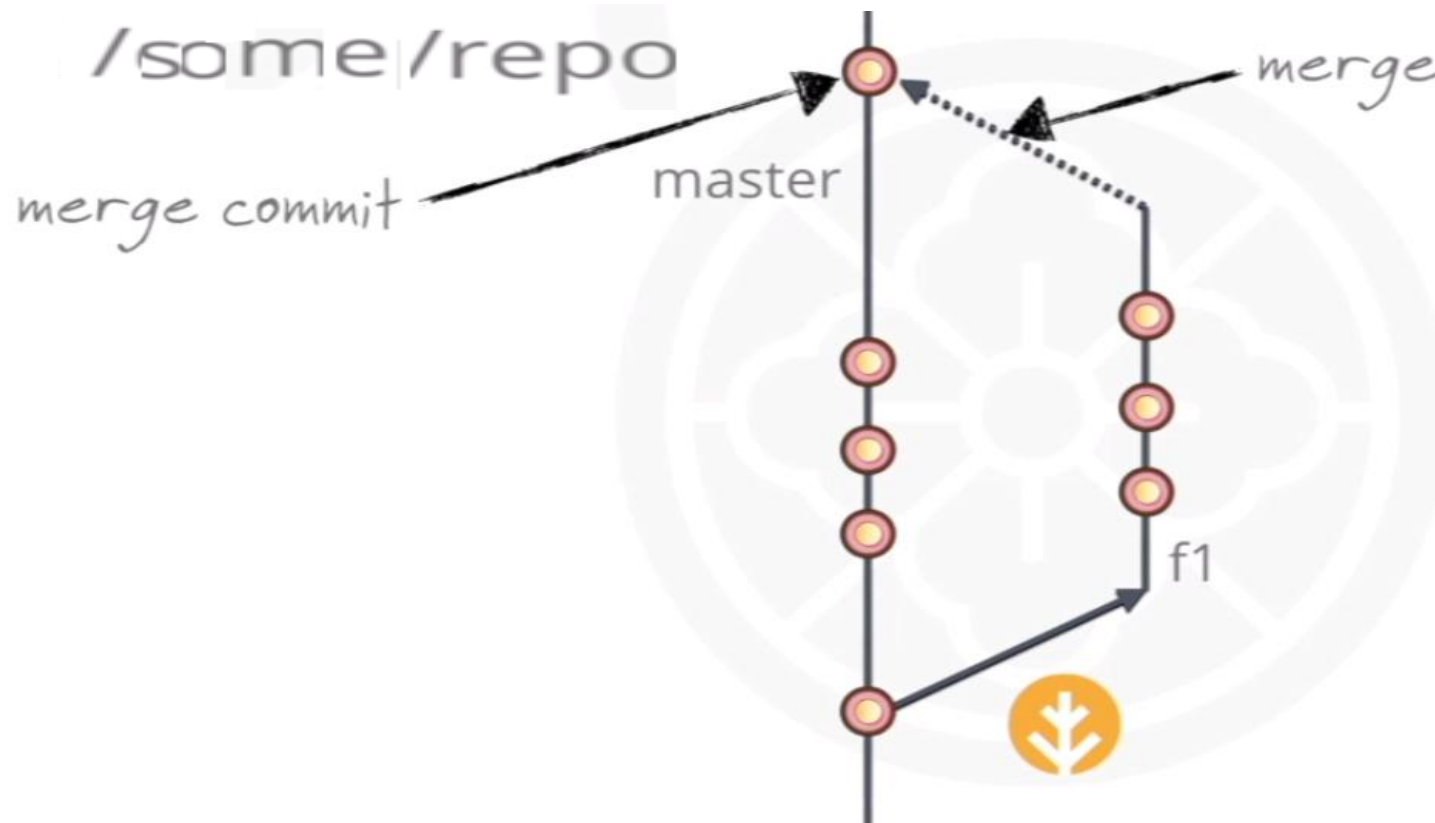
## What is GitHub – Collaborating on Feature Branches

- Feature Branches can be used for independent development on Single repository Workflows. Each developer can ...
  - Fetch the changes from the remote repo
  - List all existing branches
  - Checkout the branch that has been recently pushed to GitHub



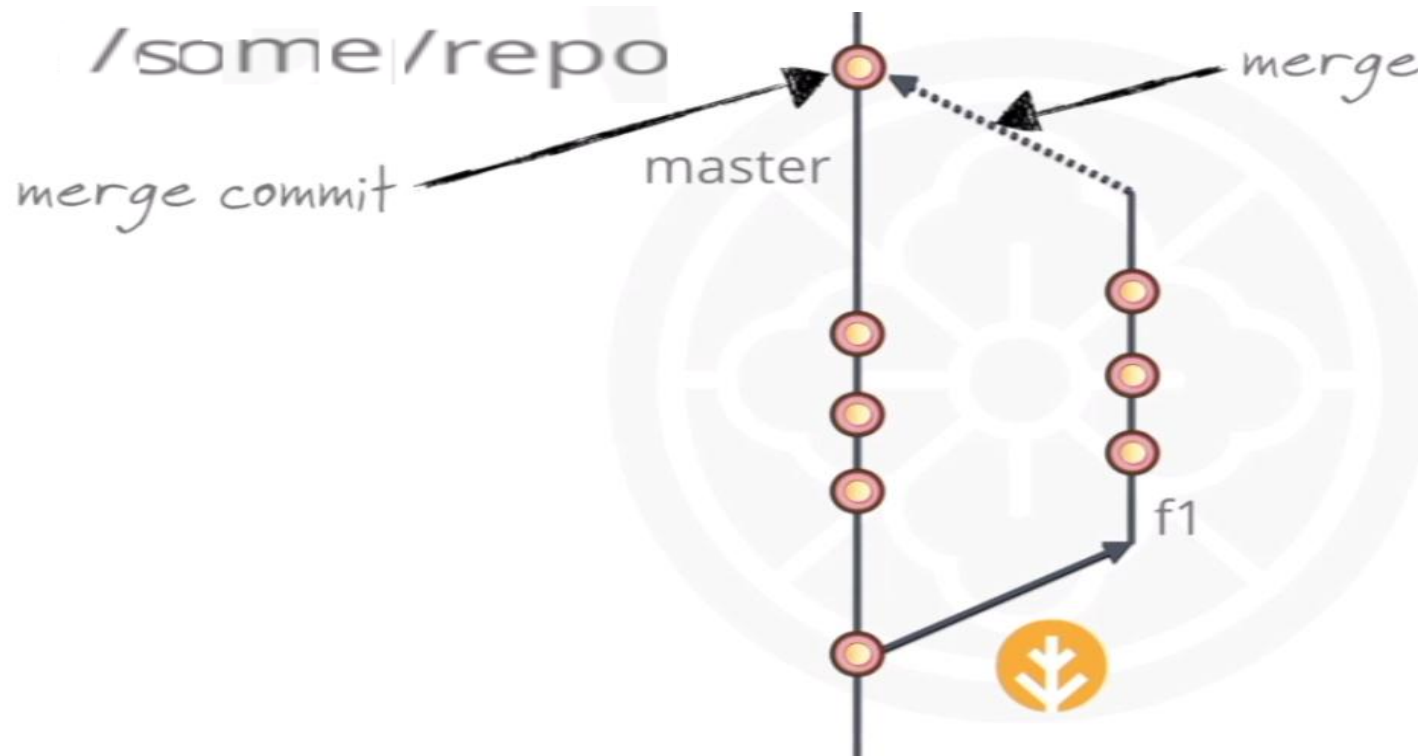
## What is GitHub – Merging the Development back to Master

- Once a Feature is done ...
  - Assuming that the right branch is checkout
  - Merge the changes on the Master branch
  - Push the changes to GitHub



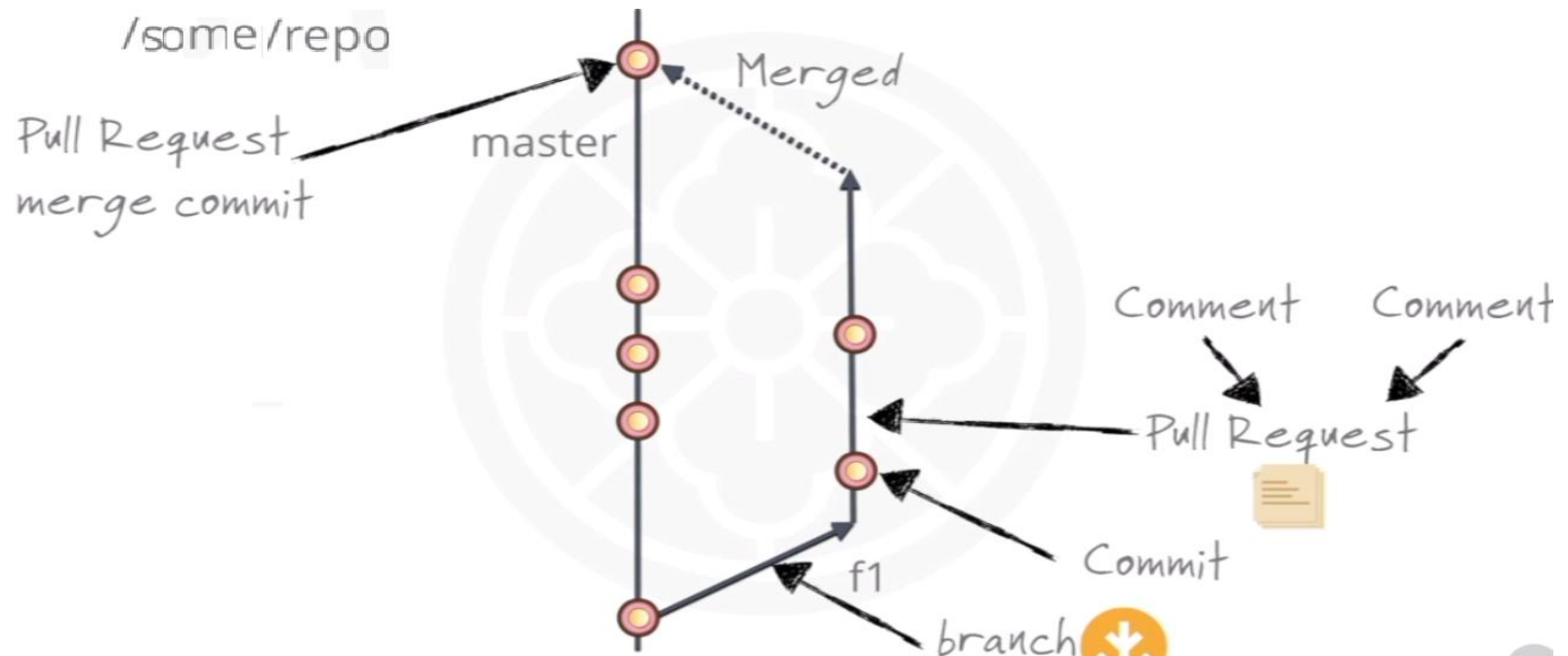
## What is GitHub – Pull Requests are used for Review on GitHub

- Pull Requests can be used for review.
- With Pull Request you can have multiple developers collaborating on a branch and commenting on it directly on GitHub
- Every developer creates own branch and work on single repo
- Once work is done, create a Pull request and merge into the master branch



## What is GitHub – Collaborating on Pull Requests

- For Working on a single repo in a team
  - Create a branch, Do the first commit
  - Create a pull request, you will receive comments
  - Make changes , Push them upto GitHub
  - These changes will automatically be added to the Pull Request.
  - This is because, Pull requests point head of a branch not to a particular commit
  - Then either merge through GitHub GUI or commit merge and push through the command prompt CUI





## What is GitHub – Commands used while Collaborating on Pull Requests

Download all branches from GitHub

```
$ git fetch
```

View all of the branches *includes remote tracking branches in red*

```
$ git branch -a
```

Checkout a local copy of a remote branch

```
$ git checkout <branch_name>
```

Test code, make any changes and then commit and push changes

```
$ <make edits>  
$ git commit  
$ git push
```

# Summary : We discussed ...



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