

# Git Version Control

## - A Beginners Guide

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# Overview

Aim to:

- Git basics - terms & concepts
- Distributed version control
- Repositories, branches, commits & stashes
- Demonstrate using the above
- Answer questions



# That's Wrong, Isn't It?

Some information may be “wrong”.

Examples are often the “standard” setup or typical ones.

Git is a very flexible tool and there are often multiple ways to achieve the same effect.

# Standard Code Project

Just edit files in a folder

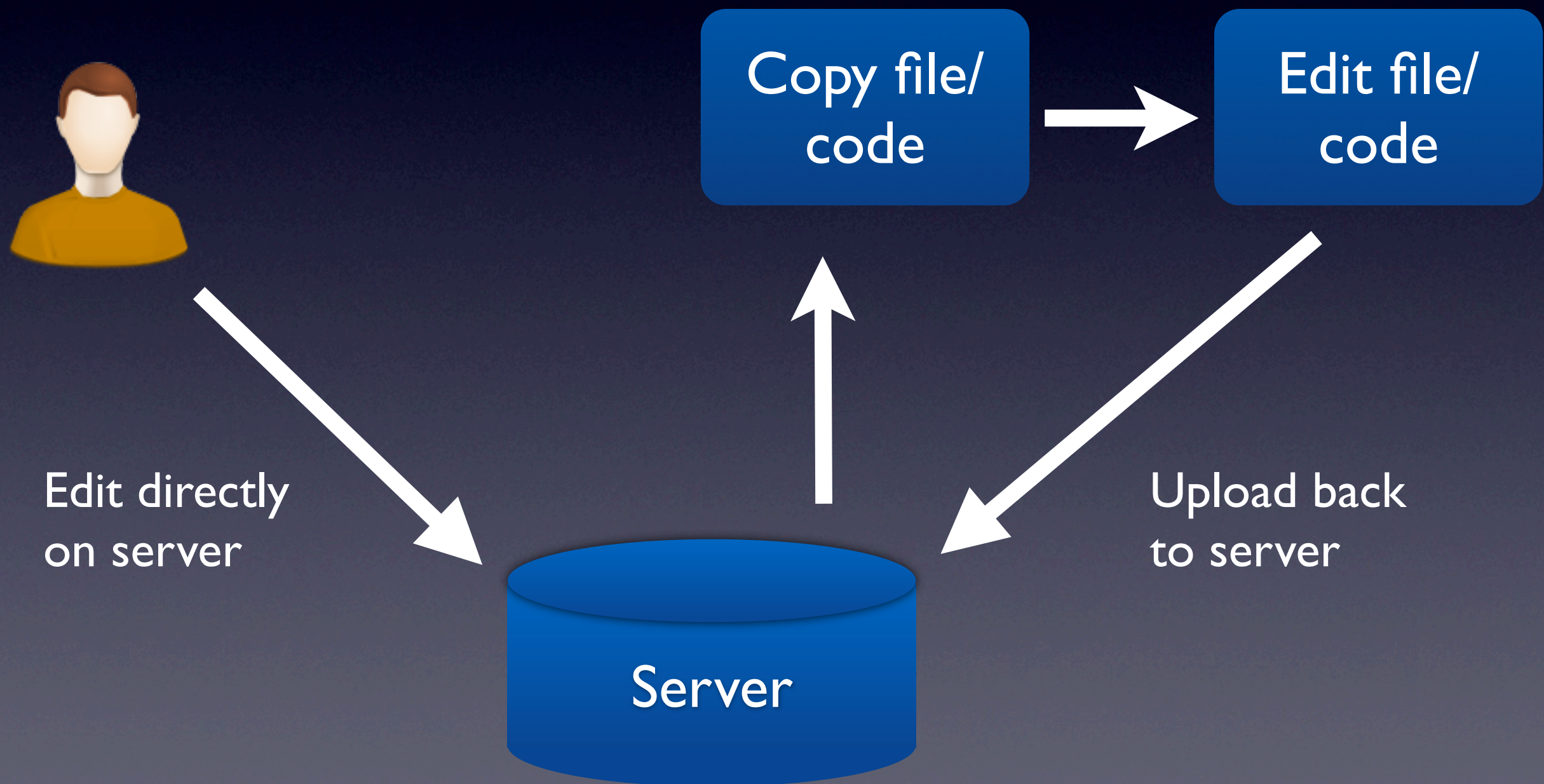
Folder may be backup up by user or organisation





# Standard Code Project

## - Server



# What is Git Version Control?

- Distributed version control system
- Suitable for simultaneous working
- Designed for code projects
- Creates a history of project



# Git Terms - Repository (repo)

- Data structure
- Describes the files and folders contained
- Commit history (change history)

# Git Terms - Commits

Commits are objects that contain:

- Time of commit
- A record of the file structure at time of commit
- A unique identifier
- Reference to previous commits using unique identifiers

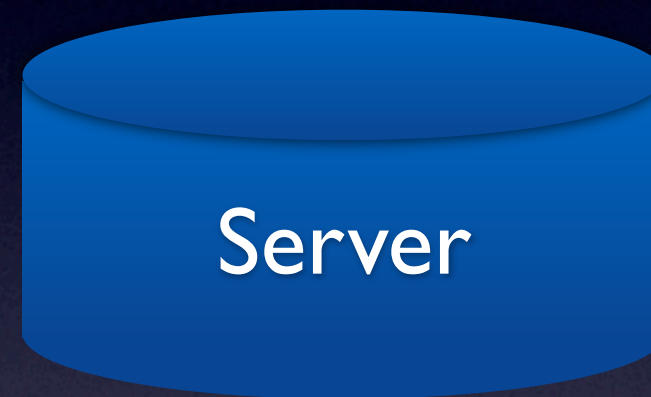


# Git - Distributed Version Control

- Every user has a full copy of the repository
- Available offline as your copy of the repository is stored locally
- 20 users means 20 backups (if commits have been synced)

# Distributed Version Control (typical)

Server containing project code (can be any computer)

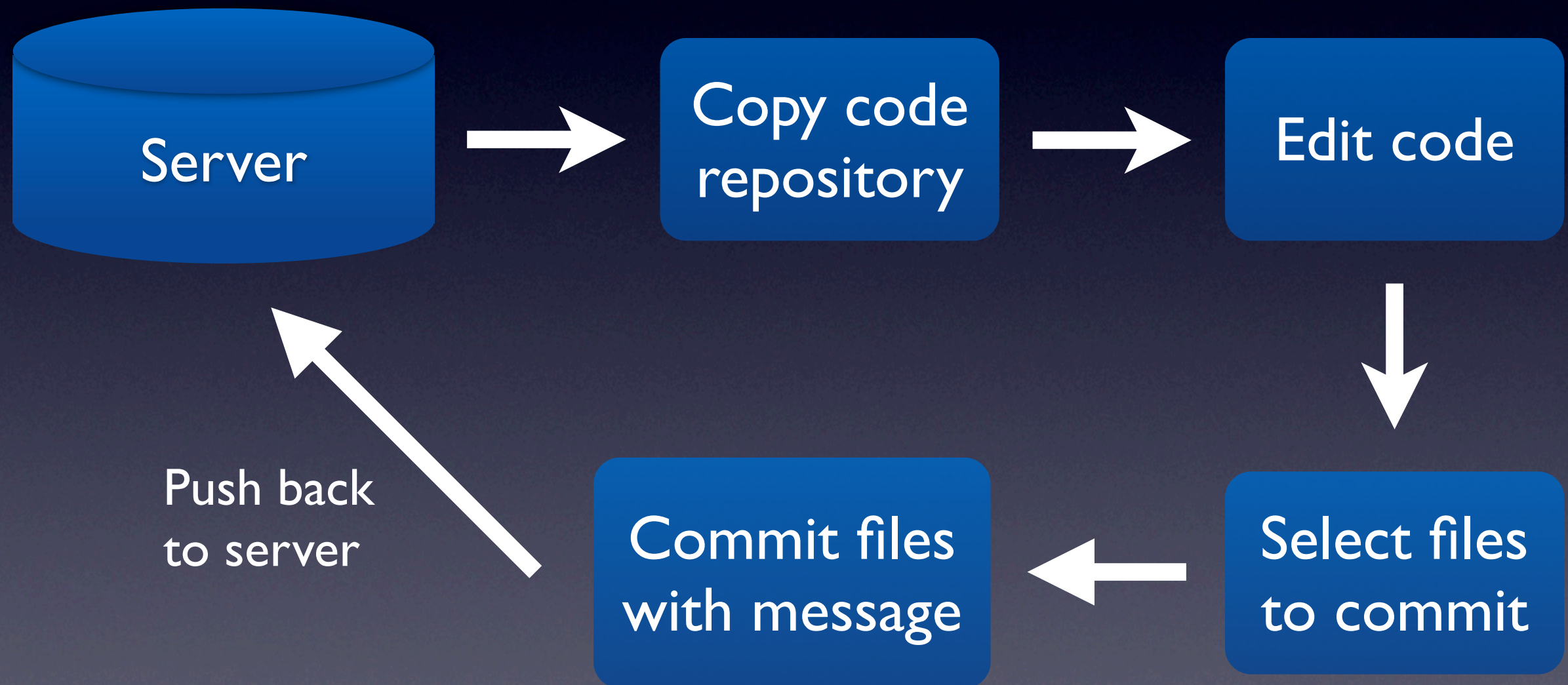


Multiple users editing their copy of the code

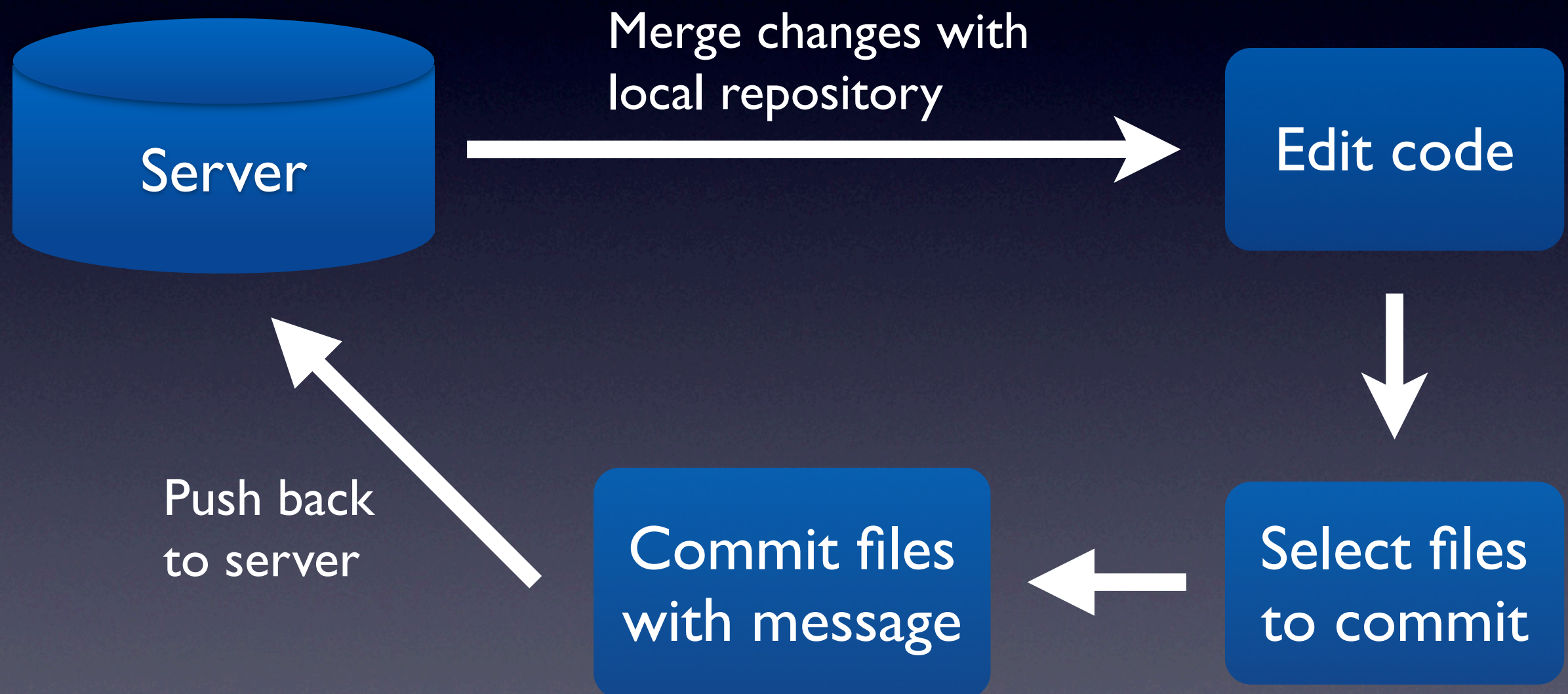




# Git Process (typical)



# Git Process Later On



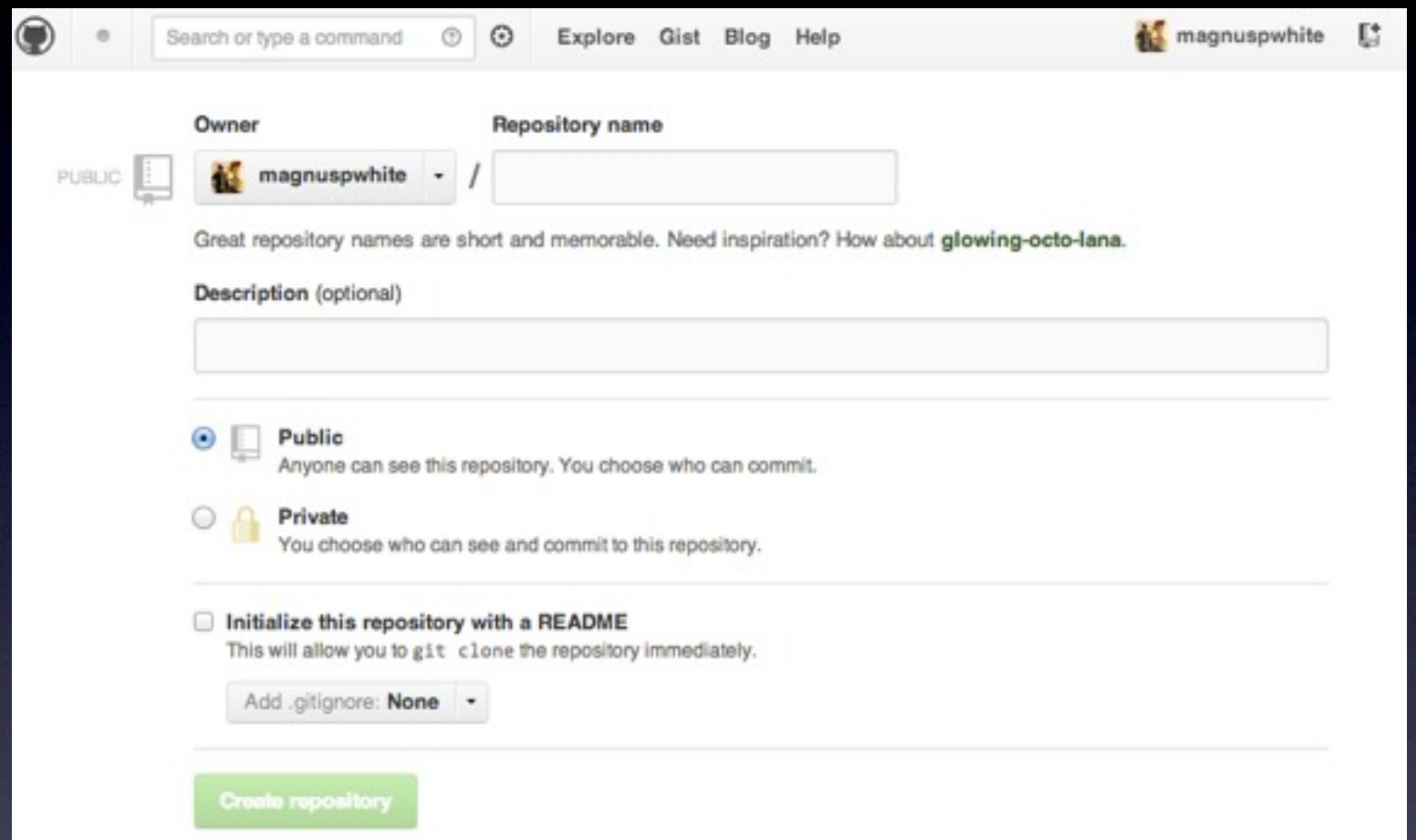


# How to Create a Repo

- Command line using Git
- Using a GUI software
- Web based service

# How to Create a Repo

Using GitHub -  
most popular  
open source Git  
repo site

A screenshot of the GitHub 'Create repository' form. The form is titled 'Create repository' and is for the user 'magnuspwhite'. It includes fields for 'Owner' (magnuspwhite), 'Repository name' (empty), and 'Description (optional)' (empty). There are radio buttons for 'Public' (selected) and 'Private'. A checkbox for 'Initialize this repository with a README' is checked. Below this is a dropdown for 'Add .gitignore: None'. A green 'Create repository' button is at the bottom.

(or through the GitHub software)

Command line

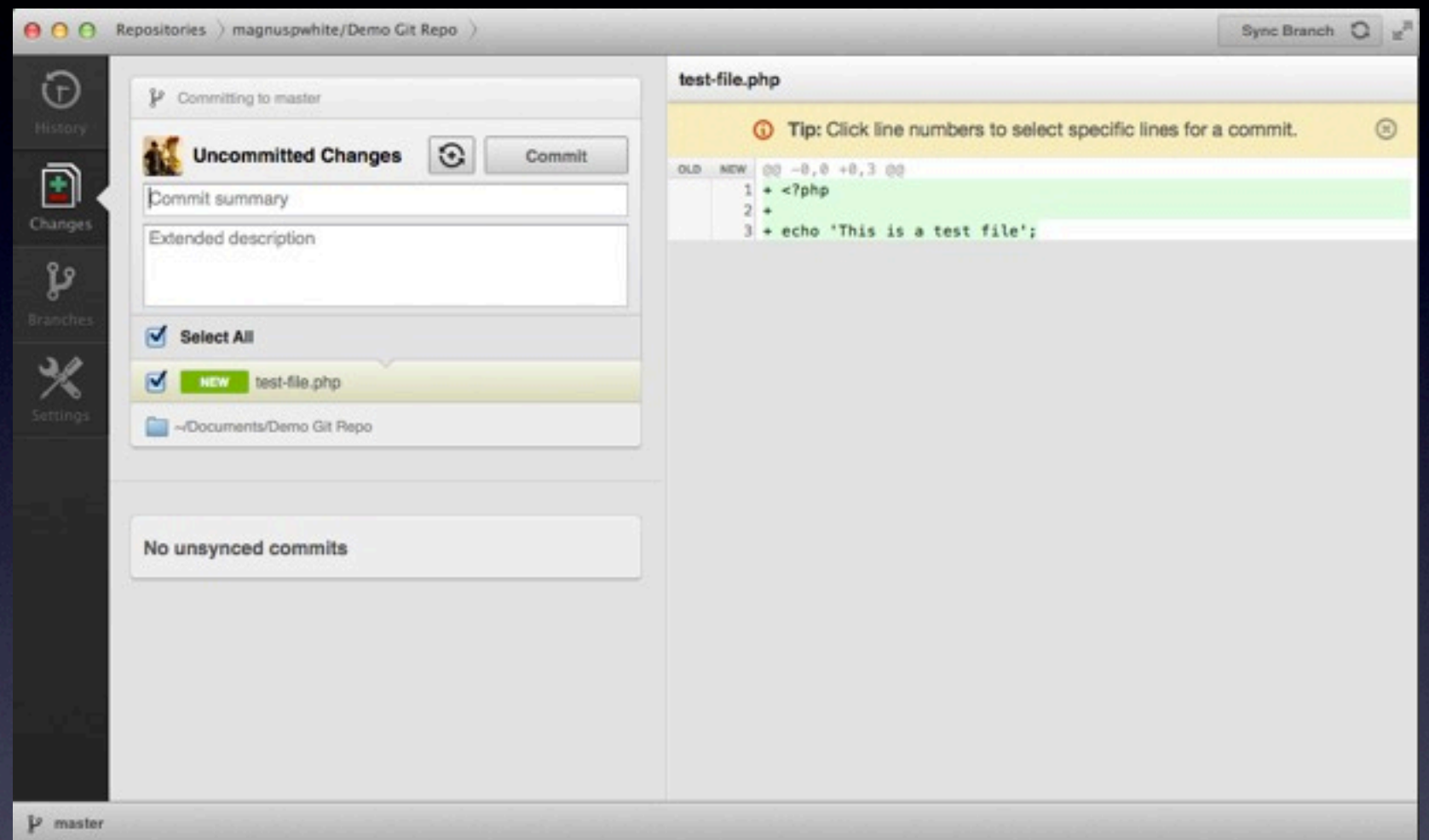
```
mkdir test-project  
cd test-project  
git init
```



# Commit Files

- Staged & Unstaged

Using GitHub  
software -  
changes files are  
listed showing  
differences in  
files



Command line

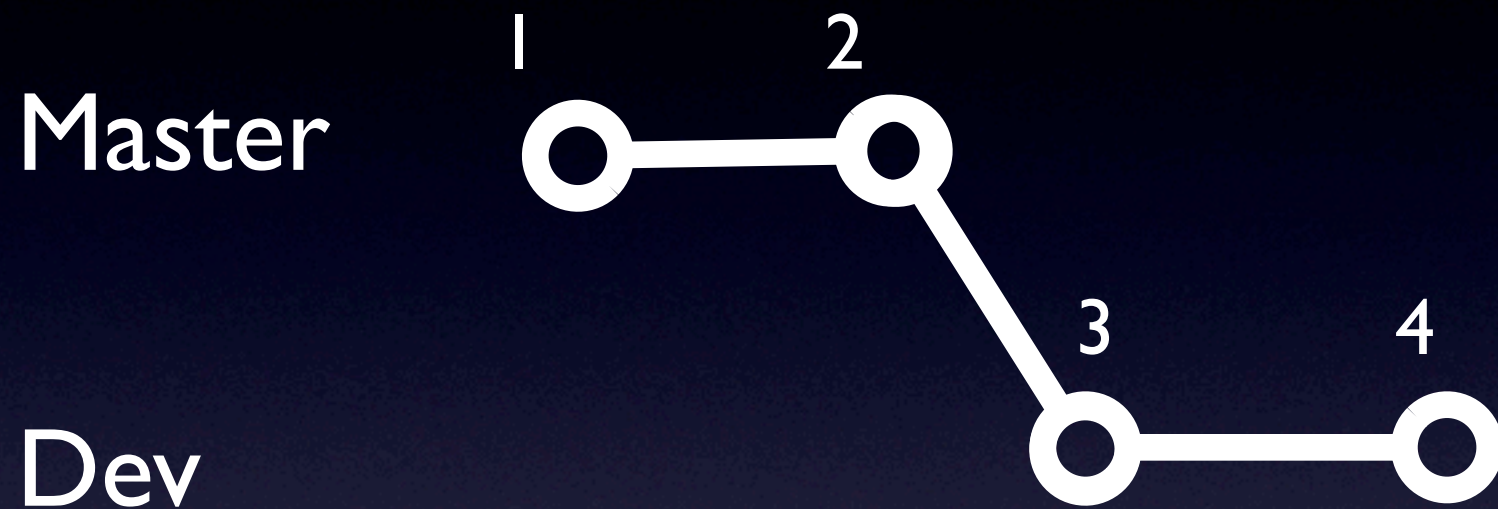
```
cd test-project  
git add .  
git commit -m "commit using command line"
```

# Other Features

- Branches
- Merging
- Forking repositories
- Stashes
- Pull Request



# Branches

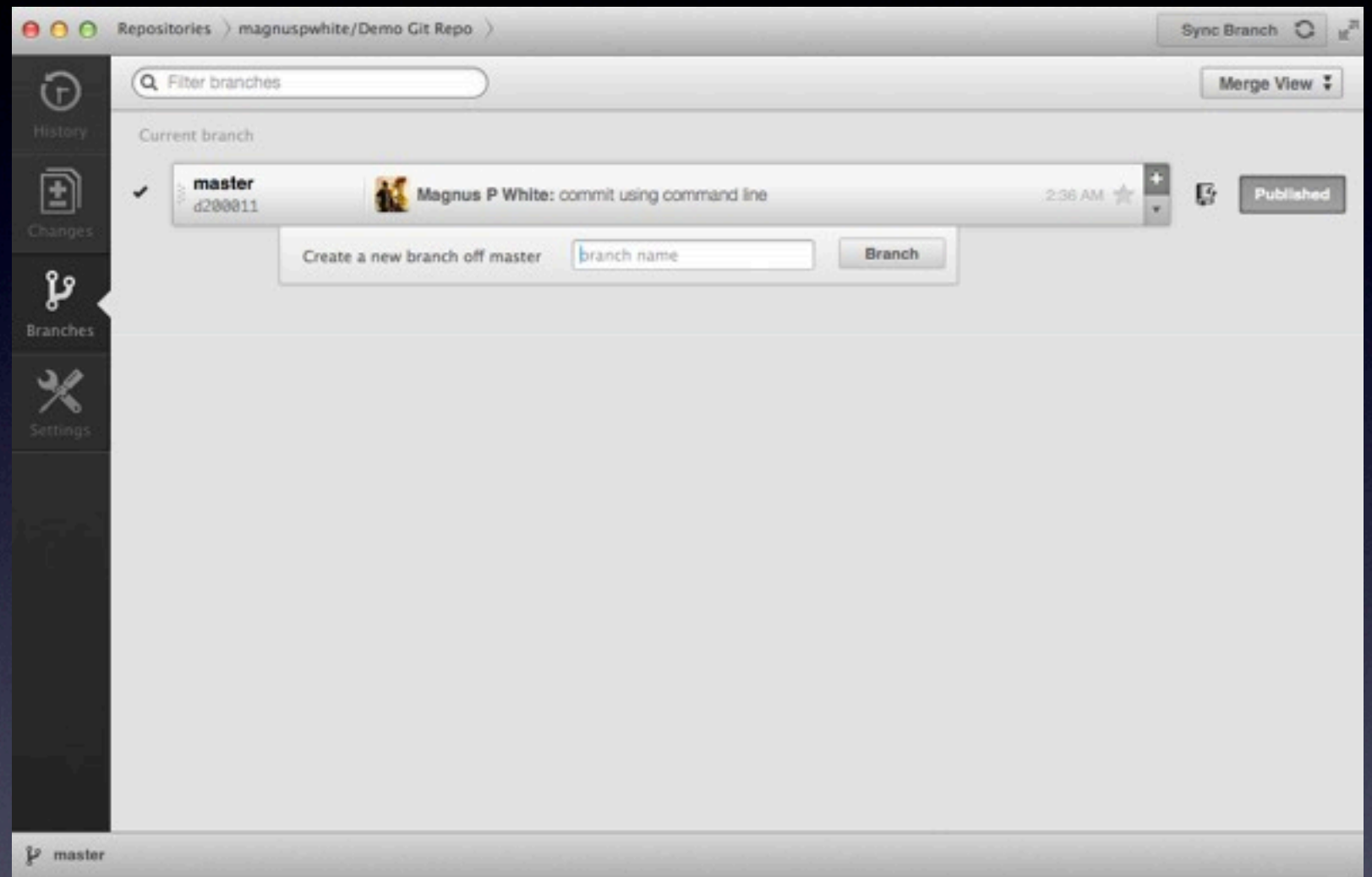


Created a new branch called **Dev**. This has 2 new commits which the **Master** branch does not.

**Dev** contains commits 1-4. **Master** contains commits 1 & 2.

# Creating Branches

Using GitHub  
software - select  
branches tab and  
use the + symbol.  
Don't forget to  
publish it.



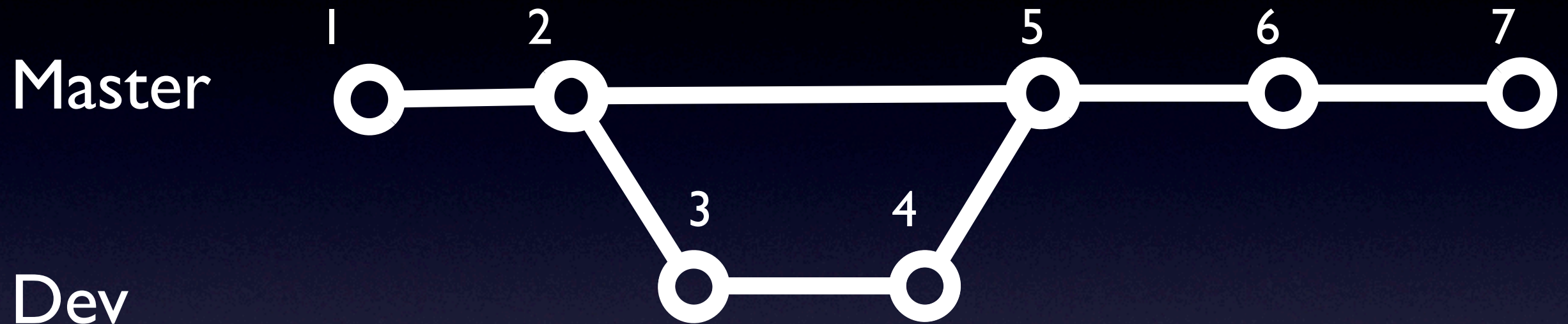
Command line

```
cd test-project  
git branch command
```

(creates a new branch with name command)



# Merging

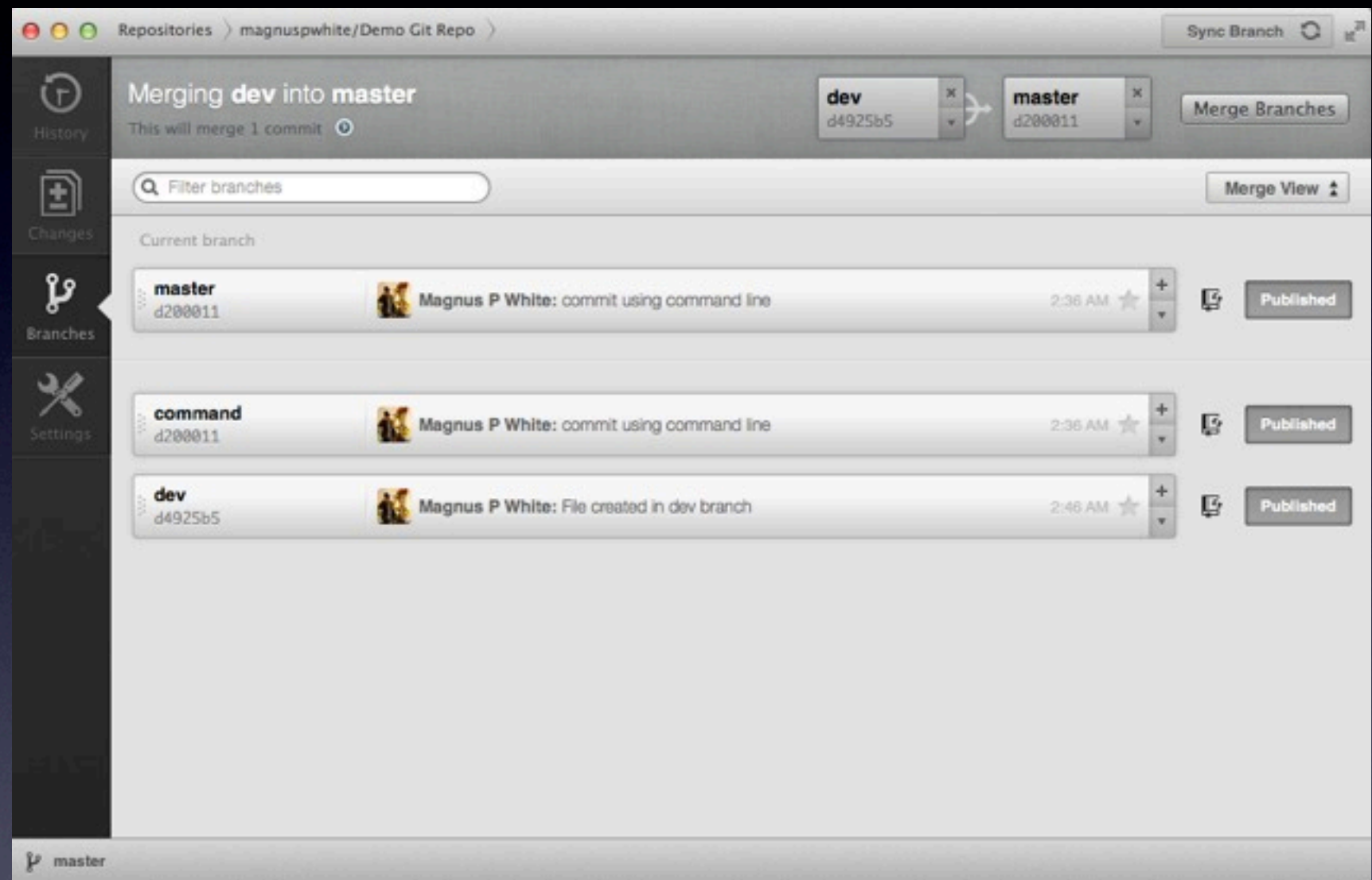


Commits 3 & 4 are merged into **Master**.

**Master** now contains commits 1-7.

# Merging Branches

Using GitHub software - select merge branches as drag in the branches to merge.



Command line

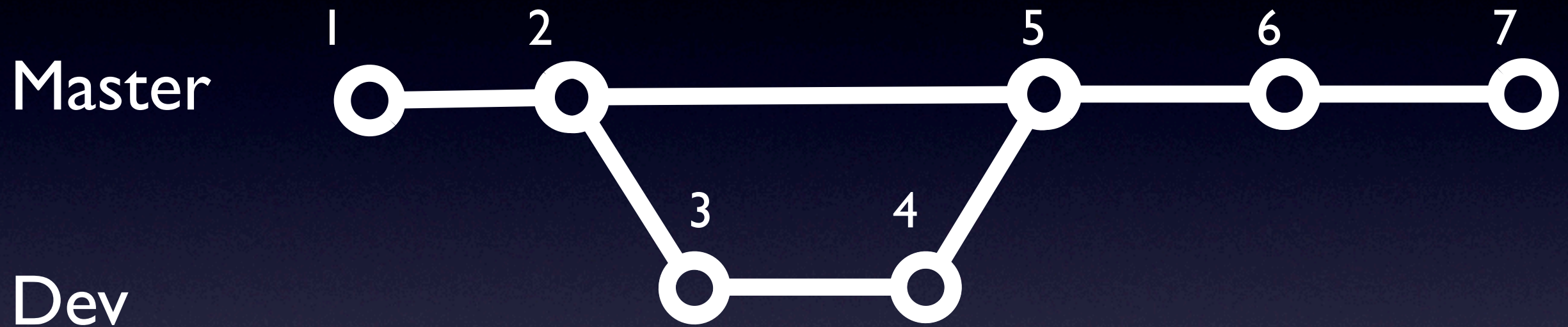
```
cd test-project  
git checkout master  
git merge dev
```

(switch to master branch, then merge dev into the current branch - i.e. master)

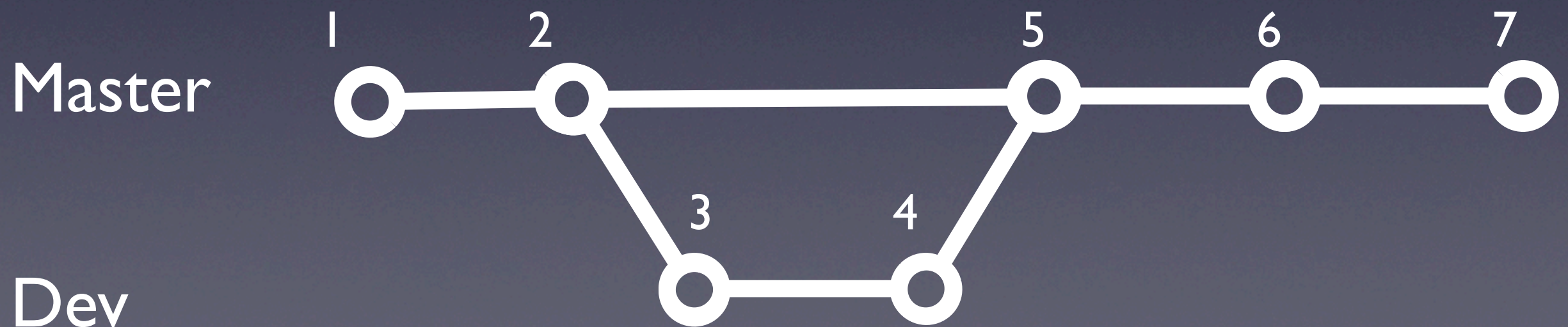


# Forking Repos

Original Repo

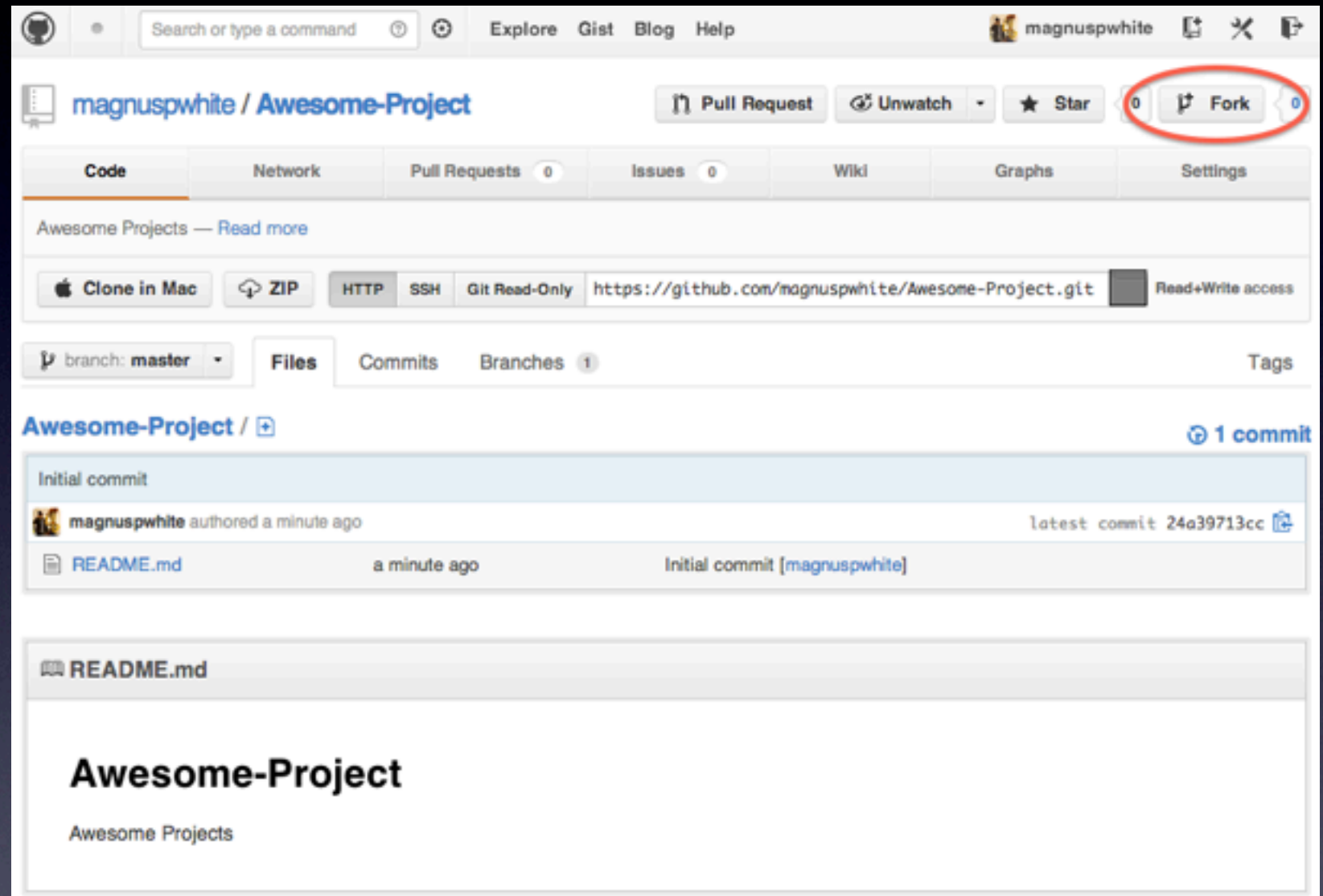


Forked Repo



# Forking Repos

Using GitHub site  
- select **fork** on  
the project you  
wish to fork



Command line

```
mkdir awesome-project  
cd awesome-project  
git clone https://github.com/magnuswhite/  
Awesome-Project.git
```



# Other Features

## Stashes

- Temporary storage of uncommitted code
- Only stored locally
- Only offered by some Git clients

## Pull Requests

- After a repo is forked, you can make changes to it
- If you want to push the changes back to the original repo, issue a pull request

# Demonstration

- Creating repos
- Committing files
- Branches
- Forking
- Any questions?



# Git Version Control

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