Source Control

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Magpie Education

Introduction

Hatless Studios (2019 - 2020)

- Software Engineer
- Implementing, testing and documenting software
- Introduced branching strategies and code quality methods

Magpie Education (2020 - Present)

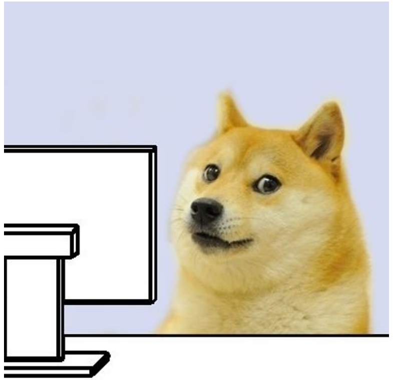
- Lead Developer
- Technical strategy and product management
- Integration, deployment and infrastructure (AWS)

And also, a third-year MSci Computer Science student at the University of Exeter!

Agenda

What are we learning about?

- Source control
- Effective collaboration
- Branching strategies
- Pull requests and code review



Source control

1. Distribution

   How should I share my files? Where can I get yours from?

2. Versioning

   What is the latest code? How do I view an old version?

3. Collaboration

   How do we work together without conflict?

4. Release

   What’s an effective way to deploy my product?

Distribution

Sharing files is a tricky problem to solve.

USB Drive

- Suitable for 1 person
- Distribution takes days/weeks
- Tends to be the only version

Cloud Storage

- Suitable for a team
- Distribution takes seconds
- Hard to track, gets out-of-sync

Distribution

Can we isolate the positives of each solution?

Version Control System

- Track individual changes
- Keep collaborators separated
- Deal with conflicts at the end

Repository Hosting

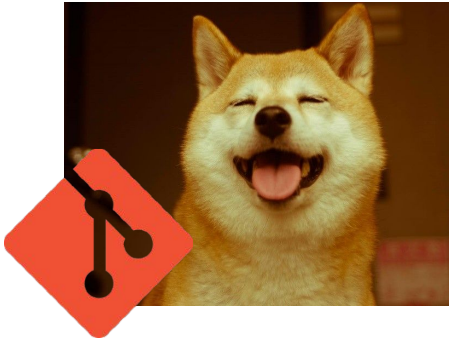
- Suitable for entire organisations
- Distribution still takes seconds
- No falling out of sync due to VCS

Distribution: Git

Git is the most popular VCS, built by *Linus Torvalds*

- Supported natively by *GitHub* and *GitLab*
- Makes up for 87% of *Stack Overflow* questions on version control systems (RhodeCode)
- Suitable for speed, file integrity, and support for distributed, non-linear workflows

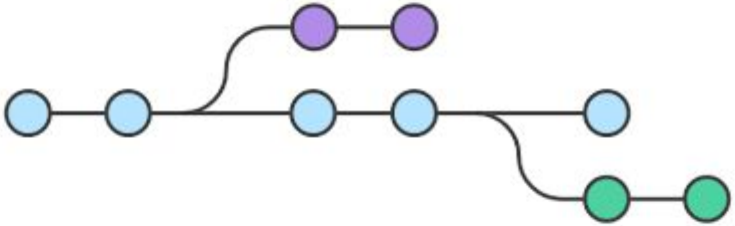
Effectively, it’s purpose-built for **software development**.



Distribution: Git

The repository starts as a default branch (*master*, *main*).

1. A new branch is made from the default branch.
2. The branch is used to make changes in isolation.
3. The supporting branch is then merged into the default branch.



Distribution: GitHub

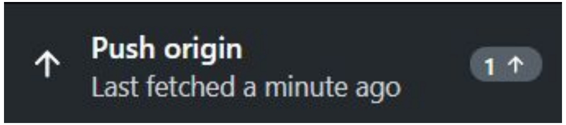
GitHub is largest host of source code in the world.

- Unlimited free public and private repositories
- Centralised storage, access control, issue tracking and collaboration
- Free static web hosting with *GitHub Pages*, useful for wikis and documentation
- Free automation pipelines with *GitHub Actions* to build, release and deploy applications

Distribution

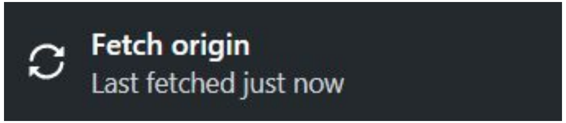
How should I share my changes?

Push to the Git repository.



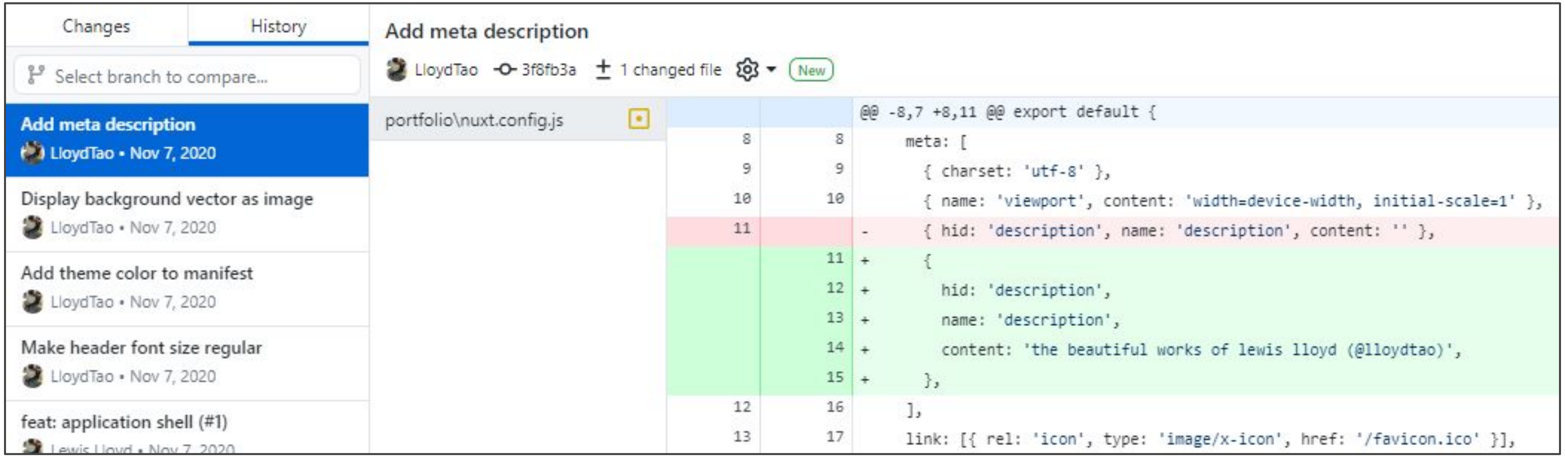
Where can I get yours from?

Fetch from the Git repository.



Versioning

- A Git repository is a linear series of individual changes
- You can access any point in the commit history



Add meta description
LloydTao • Nov 7, 2020

Display background vector as image
LloydTao • Nov 7, 2020

Add theme color to manifest
LloydTao • Nov 7, 2020

Make header font size regular
LloydTao • Nov 7, 2020

feat: application shell (#1)
Lewis Lloyd • Nov 7, 2020

Add meta description

LloydTao 3f8fb3a 1 changed file

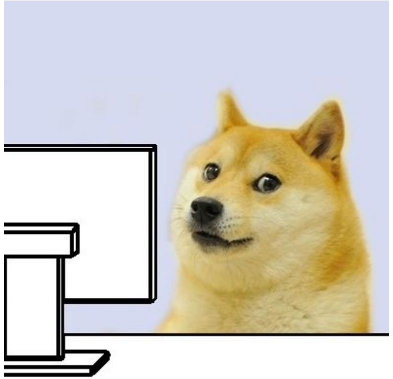
portfolio\nuxt.config.js

```
@@ -8,7 +8,11 @@ export default {
     meta: [
       { charset: 'utf-8' },
       { name: 'viewport', content: 'width=device-width, initial-scale=1' },
-      { hid: 'description', name: 'description', content: '' },
+      {
+        hid: 'description',
+        name: 'description',
+        content: 'the beautiful works of lewis lloyd (@lloydtao)',
+      },
     ],
     link: [{ rel: 'icon', type: 'image/x-icon', href: '/favicon.ico' }],
```

Versioning: Latest

What is the latest code?

- Any code pushed to the repository is intentional
- No communication or team effort is required
- Fetch the latest and you're up to date!

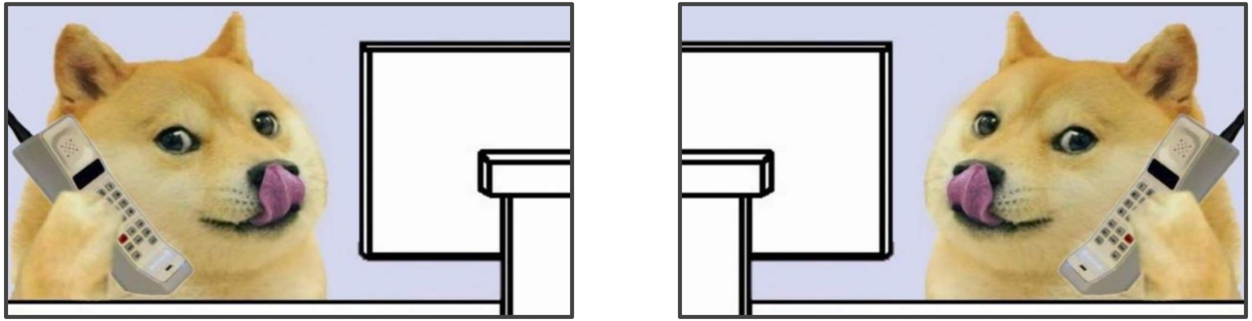


Collaboration

We’ve solved file sharing, but we have a new problem.

Code is fragile.

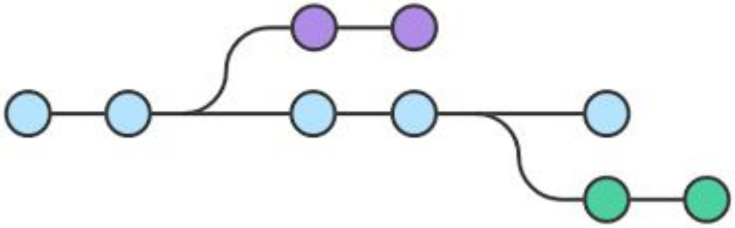
How can remote collaborators ensure code integrity?



Collaboration: Branches

We need to avoid conflicts in two places: **during** and **after** development.

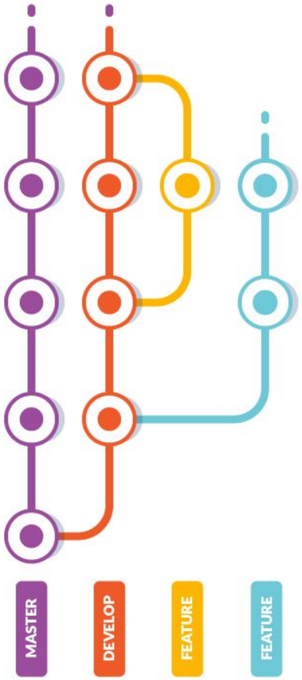
- To avoid conflicts **while** developing, we use branches
- This allows us to push our changes to the centralised repository without overwriting or breaking someone else's changes



Collaboration: Branching Strategy

To avoid conflicts **after** developing, we need to branch in a certain way

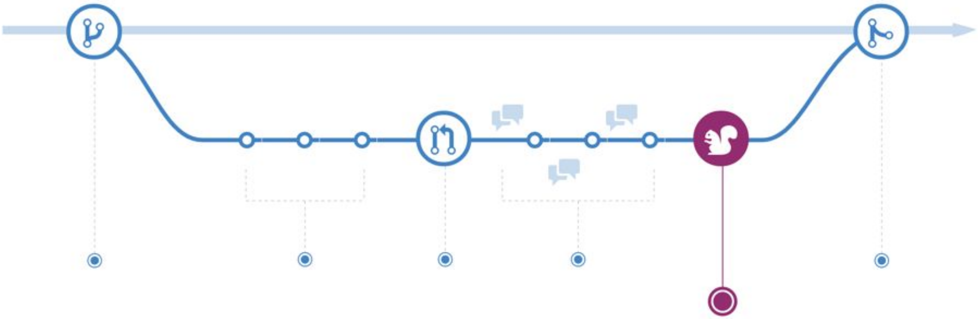
- Various workflows are used to achieve this
- In general, they involve developing an individual feature per-branch
- As long as the feature does not go out-of-scope, conflicts are minimised
- A senior member of your team (i.e. lead developer) is responsible for identifying and isolating these features



Collaboration: Pull Requests

When merging back into the default branch, we need to ensure **code quality**

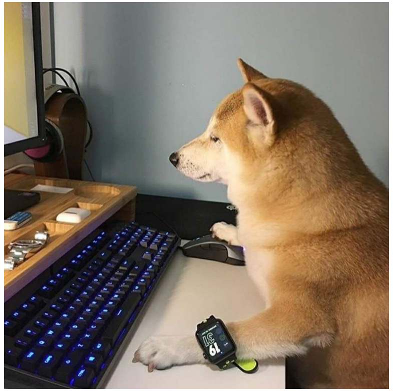
- A *pull request* is a branch maintainer asking to have their branch's commits pulled into the default branch
- At this point, the code is reviewed by a peer or senior developer
- Pipelines can run at PR time to automatically build and test the code



Release

Getting your code into production is a complex task

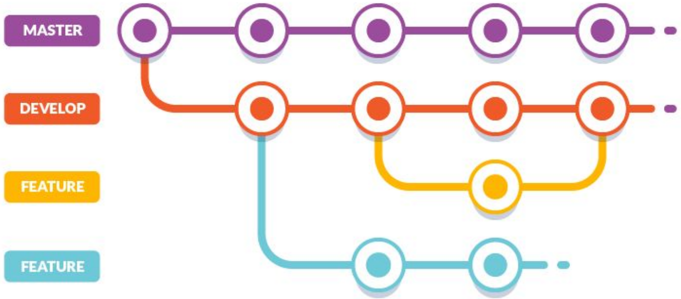
- Software development is an ongoing activity
- New features and bug fixes are constantly rolled out
- Each iteration of the product must be production-ready



Release: Branching Strategy

The branching strategy is integral for releases

- The default branch remains in a production-ready state
- Each merge introduces feature-complete code
- Any pushes to the default branch trigger a deployment pipeline



Conclusion

1. Distribution

   Use a version control system to track changes, and host the files remotely.

2. Versioning

   Developers will only push intentional code, so you can just fetch the latest changes.

3. Collaboration

   Keep features in separate branches, and review code before merging it in.

4. Release

   Keep one branch in a production-ready state.

Questions

Any questions?

Wrapping up

Stay in touch!

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