Introduction to Git and GitFlow

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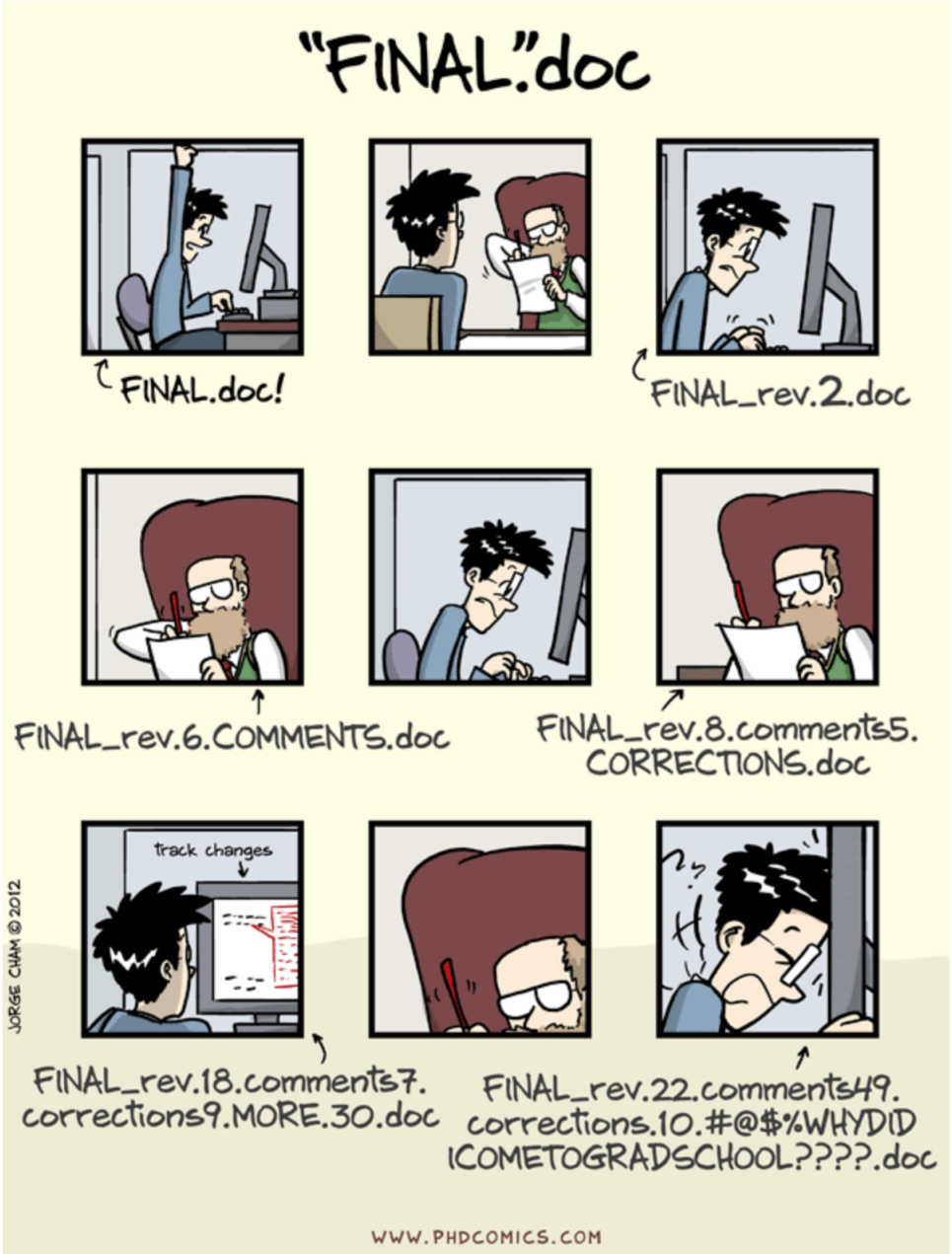
Version control

Also known as **revision control** or **source control**.

... "*is the management of changes:*

- *documents*
- *computer programs*
- *large web sites*
- *other collections of information ...* "

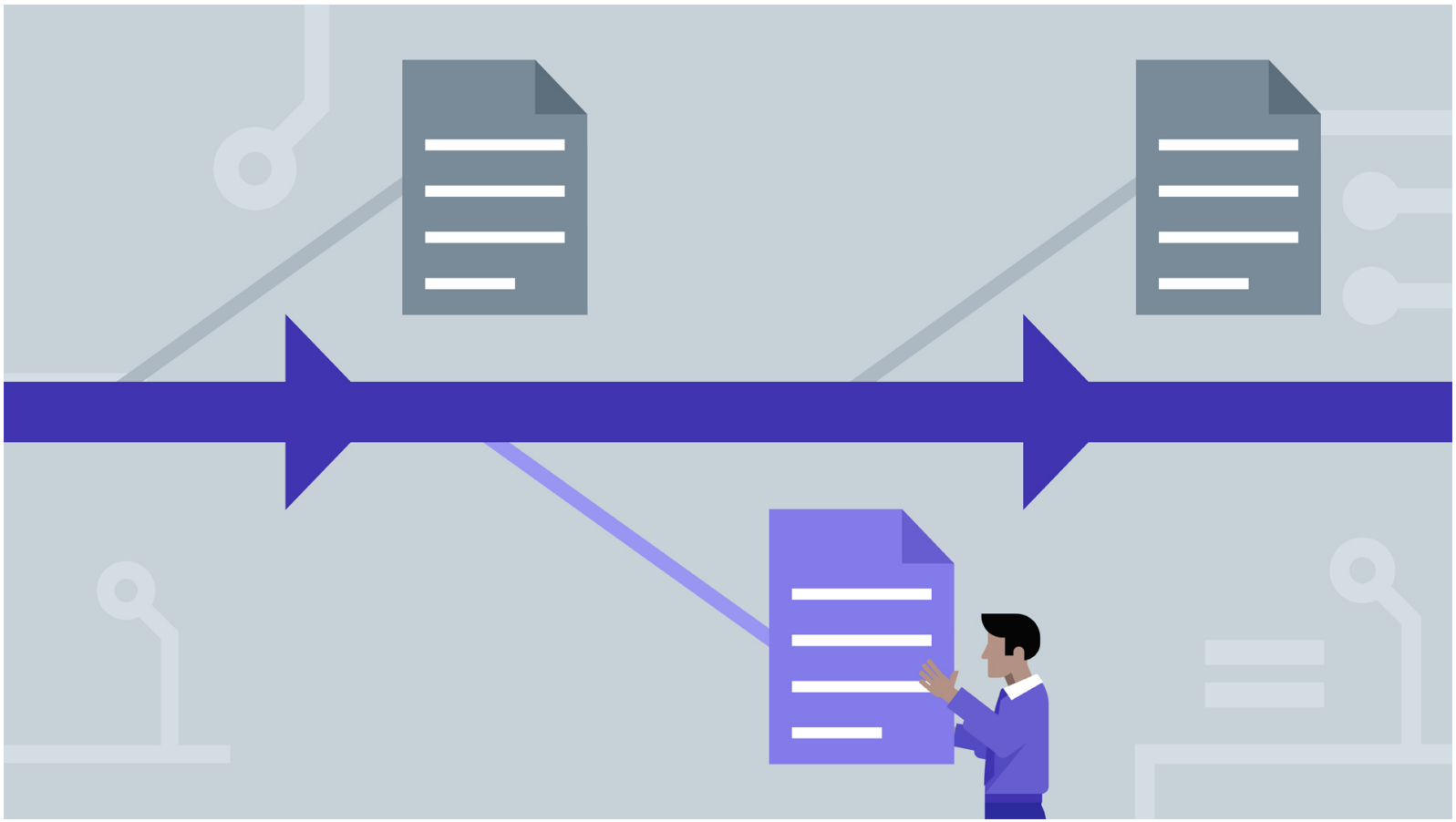
Why version control is important?



Why version control is important?

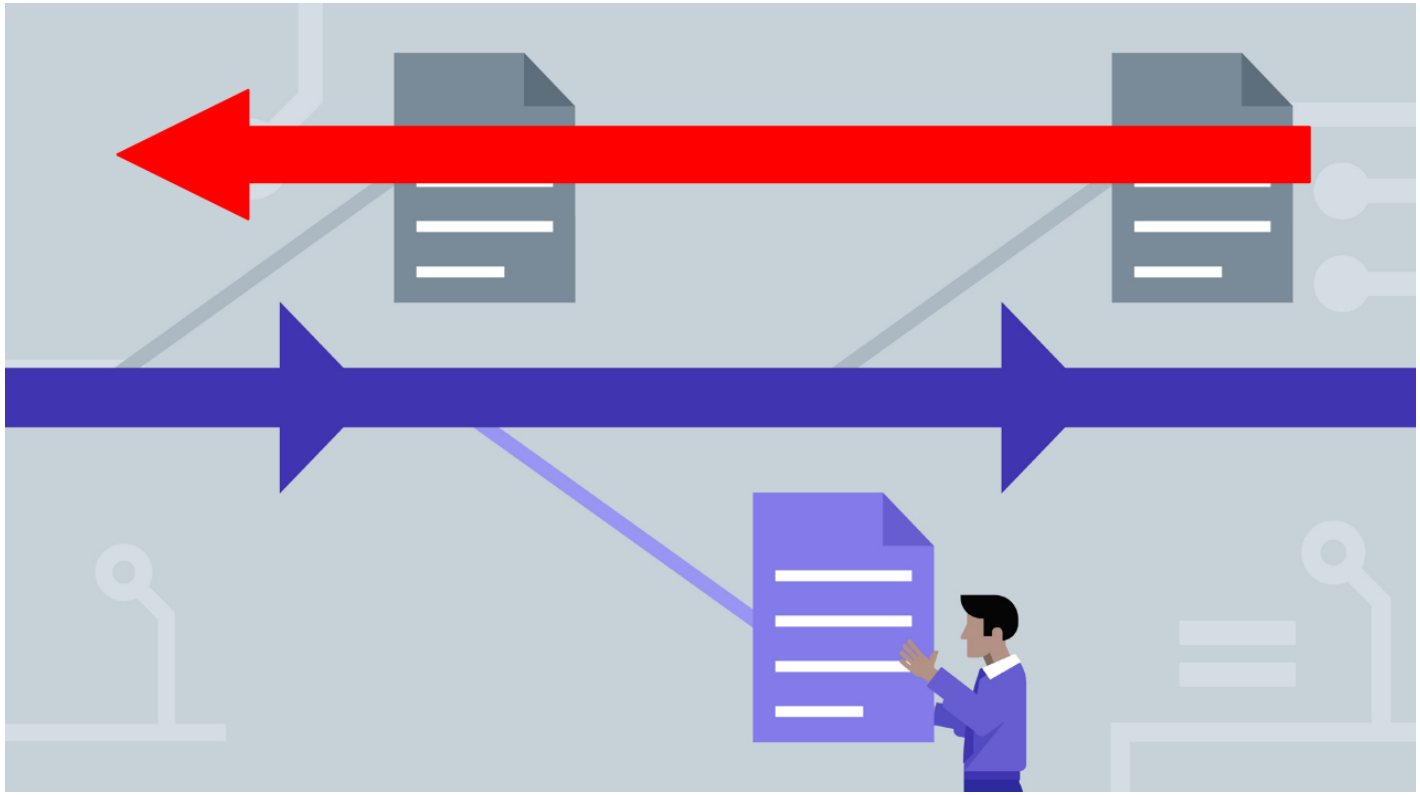
Storing **version** (properly).

- Saving successive changes ("commit")
- Versioning (v0.1)



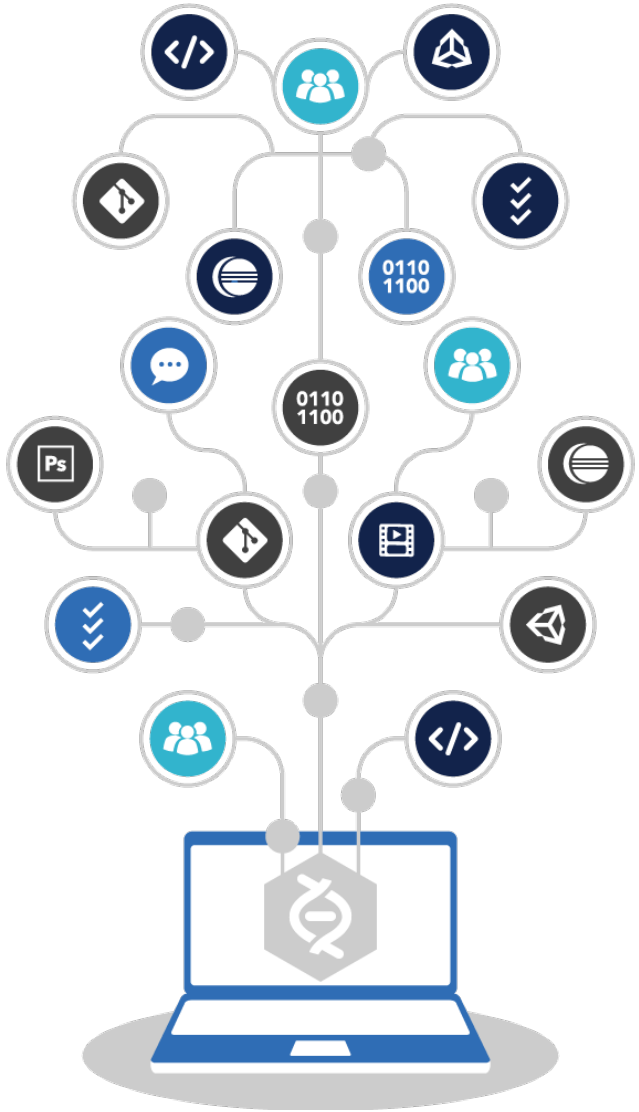
Why version control is important?

Restoring previous versions.



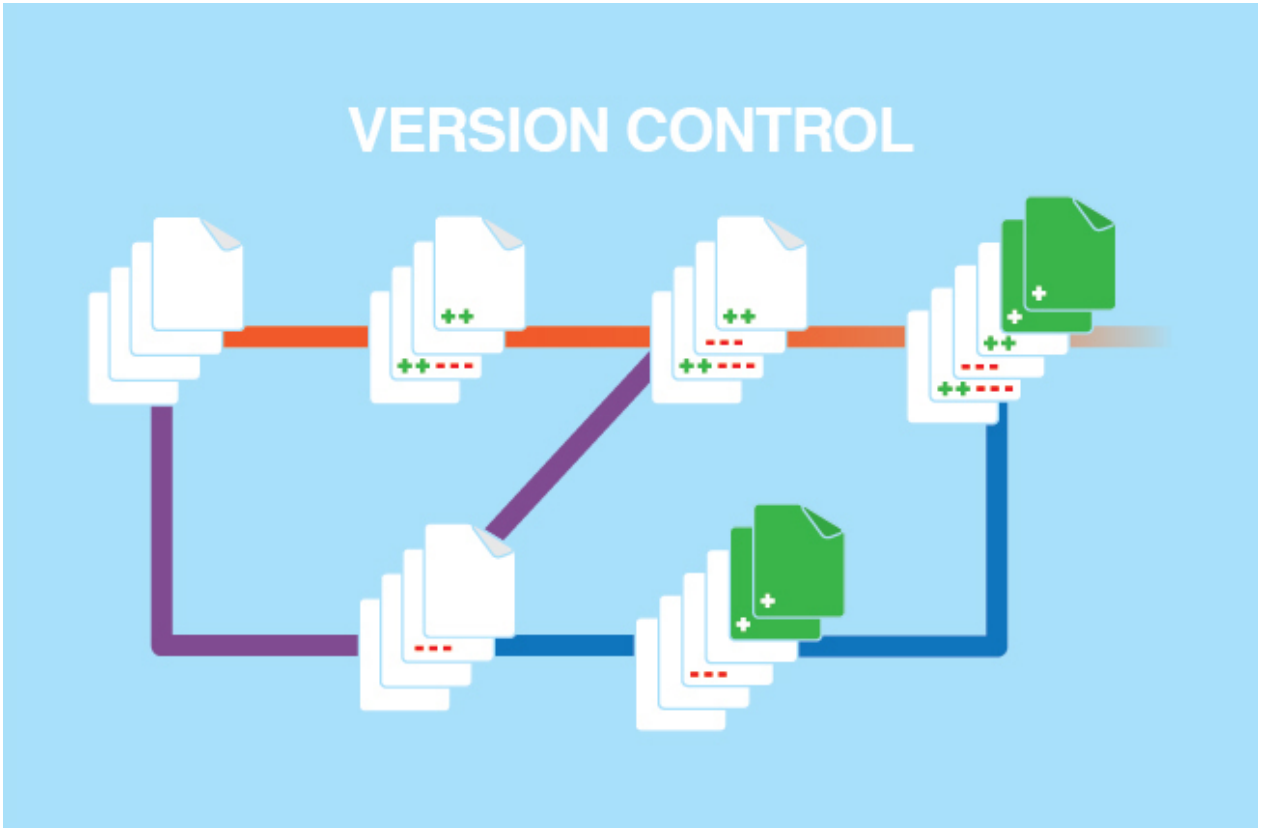
Why version control is important?

Collaborations (networking).



Why version control is important?

Save **time**.



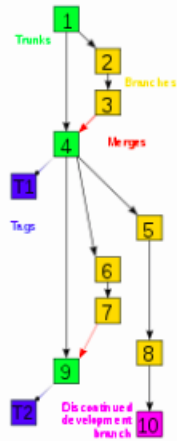
Version control software

V • T • E **Version control software** [hide]

Years, where available, indicate the date of first stable release. Systems with names *in italics* are no longer maintained or have planned end-of-life dates.

Local only	**Free/open-source**	RCS (1982) · SCCS (1972)
	Proprietary	PVCS (1985) · *QVCS* (1991)
Client–server	**Free/open-source**	CVS (1986, 1990 in C) · CVSNT (1998) · QVCS Enterprise (1998) · Subversion (2000)
	Proprietary	AccuRev SCM (2002) · ClearCase (1992) · *CMVC* (1994) · Dimensions CM (1980s) · *DSEE* (1984) · Endevor (1980s) · Integrity (2001) · Panvalet (1970s) · Perforce Helix (1995) · SCLM (1980s?) · Software Change Manager (1970s) · StarTeam (1995) · Surround SCM (2002) · Synergy (1990) · Team Concert (2008) · Team Foundation Server (2005) · Visual Studio Team Services (2014) · Vault (2003) · *Visual SourceSafe* (1994)
Distributed	**Free/open-source**	*ArX* (2003) · BitKeeper (2000) · *Codeville* (2005) · Darcs (2002) · *DCVS* (2002) · Fossil (2007) · Git (2005) · *GNU arch* (2001) · GNU Bazaar (2005) · Mercurial (2005) · Monotone (2003) · Pijul (2015) · *SVK* (2003) · Veracity (2010)
	Proprietary	*TeamWare* (1990s?) · Code Co-op (1997) · Plastic SCM (2006) · Team Foundation Server (2013) · Visual Studio Team Services (2014)
Concepts	Baseline · Branch · Changeset · Commit · Data comparison · Delta compression · Fork (Gated commit) · Interleaved deltas · Merge · Repository · Tag · Trunk	

Category · Comparison · List



What is Git?

Git is a distributed version control system for tracking changes in source code during the development of software.

Why use Git?

- **Popular and successful**
  - Active development
  - Fast
- **Distributed**
  - Work online and offline
  - Collaborate with large groups
- **Tracks any type of file**
  - Works best with text
- **Branching**
  - Smarter merges

What is GitHub Inc.?

GitHub is a web-based hosting service for version control using **Git**.

GitHub

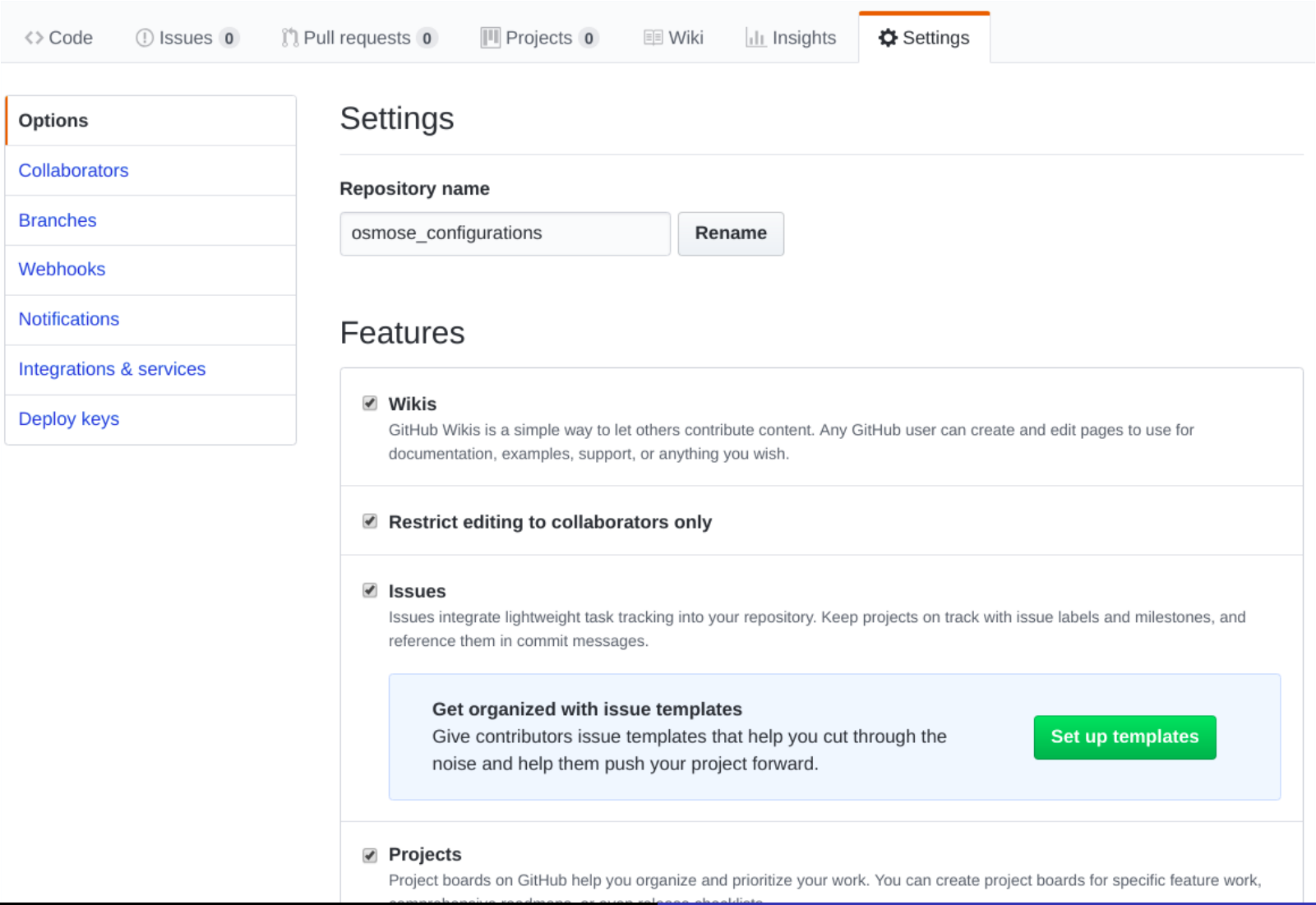
Download logo

Download mark

Download Octocat

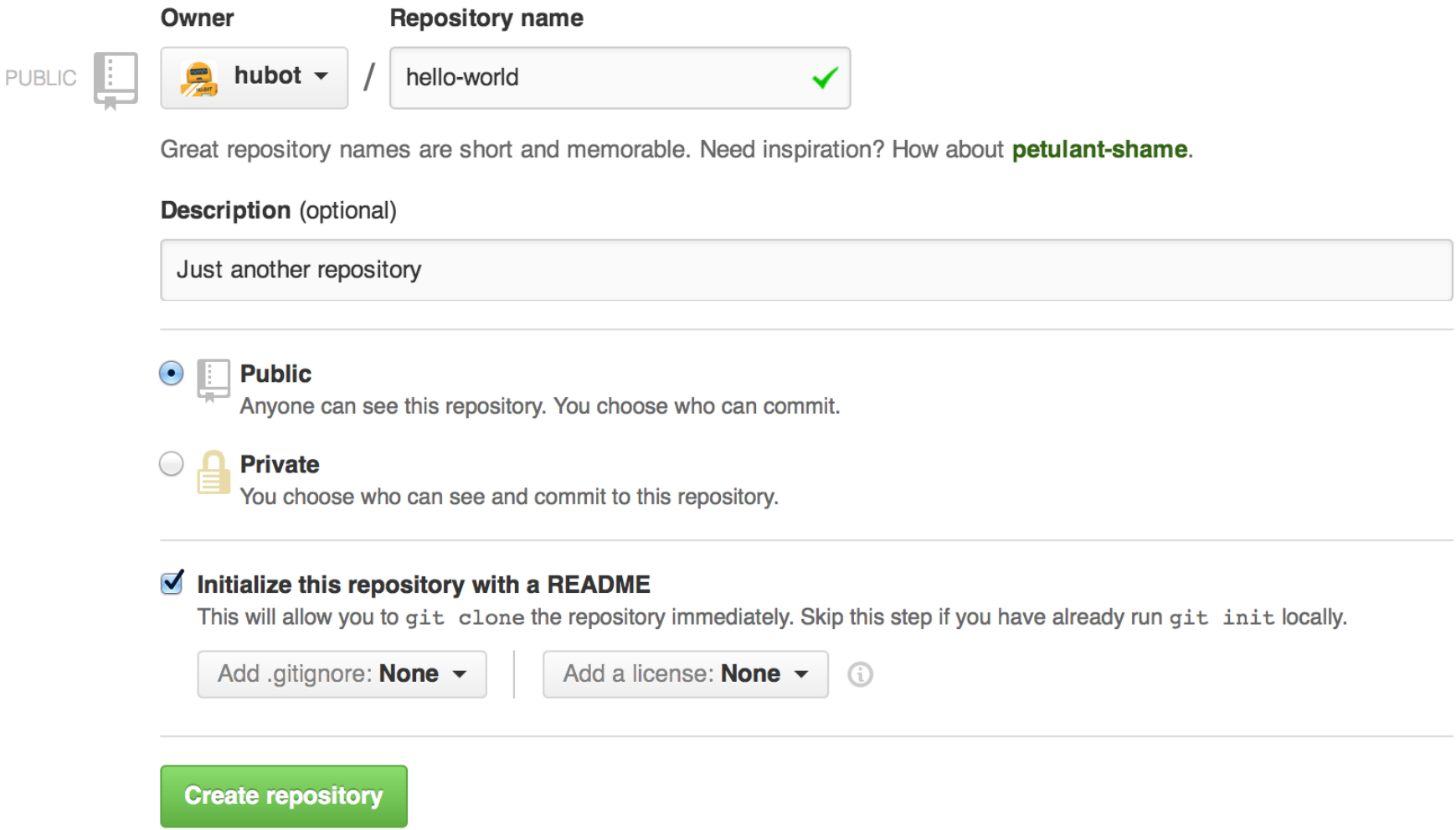
GitHub Inc.

- Access to the control and collaboration features for every **project**.



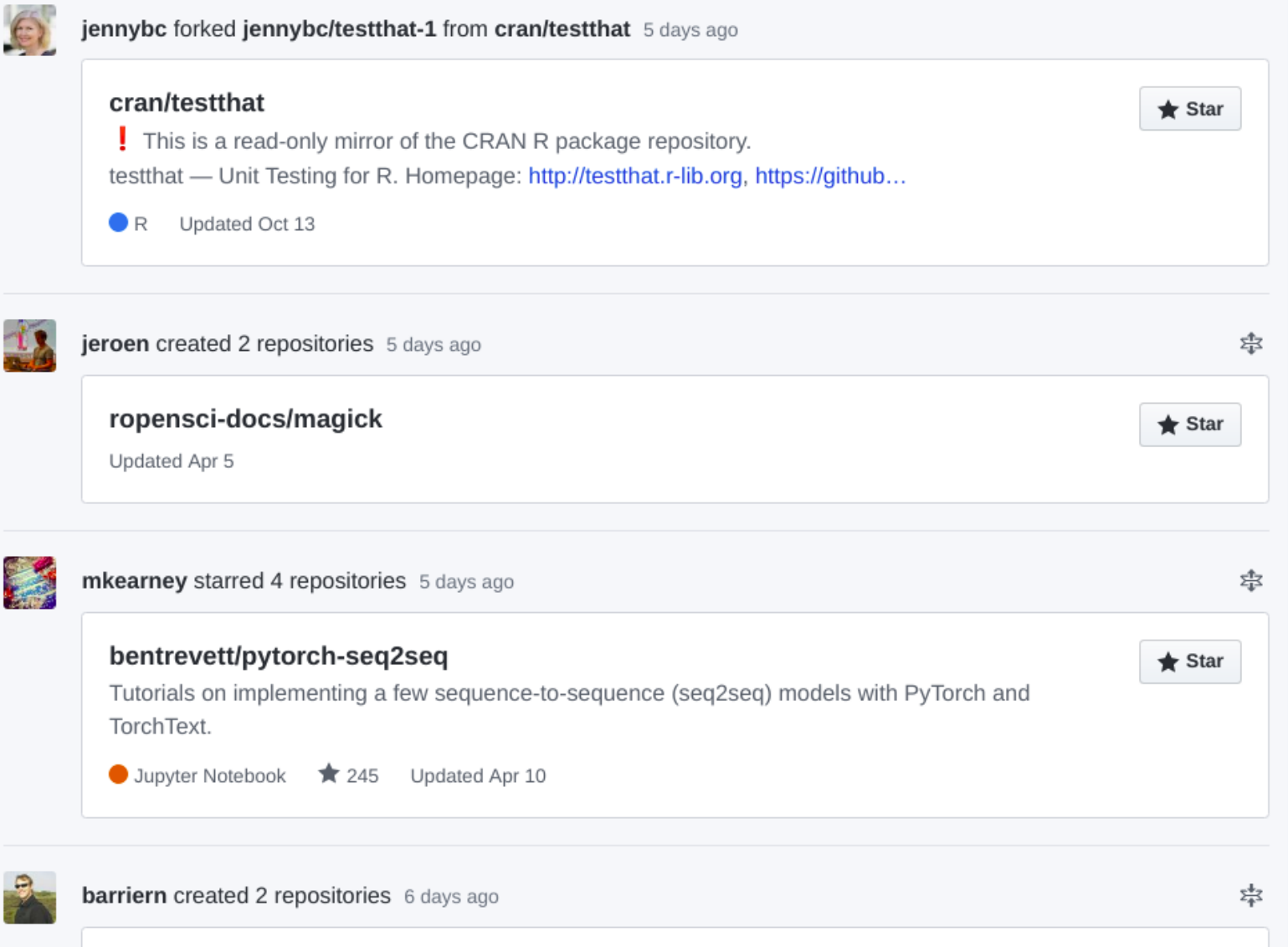
GitHub Inc.

- Work with public and private **repositories**.

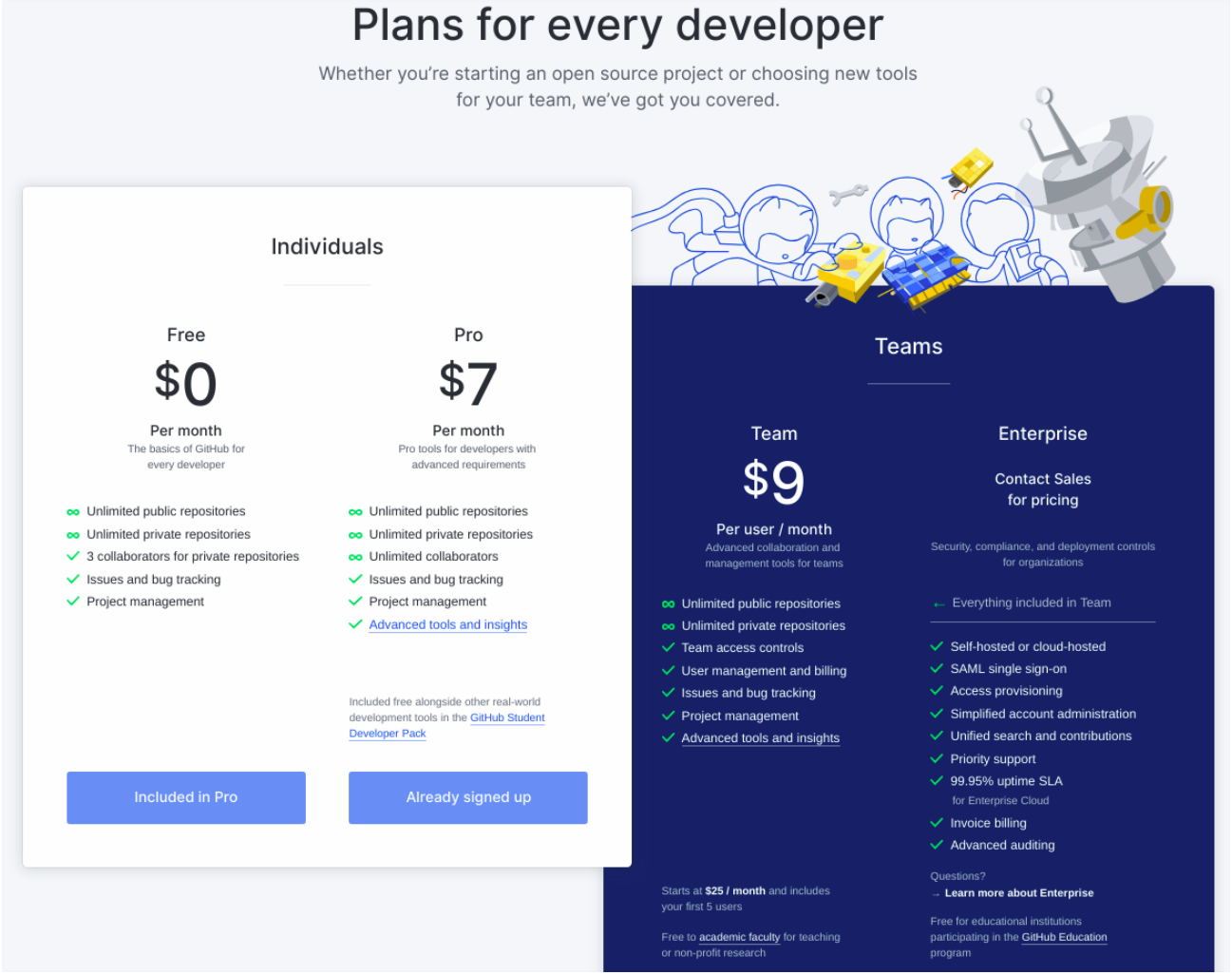


GitHub Inc.

- Develop a **networking**.



- **Plans** for enterprise, teams, pro and free accounts.



GitHub Inc.

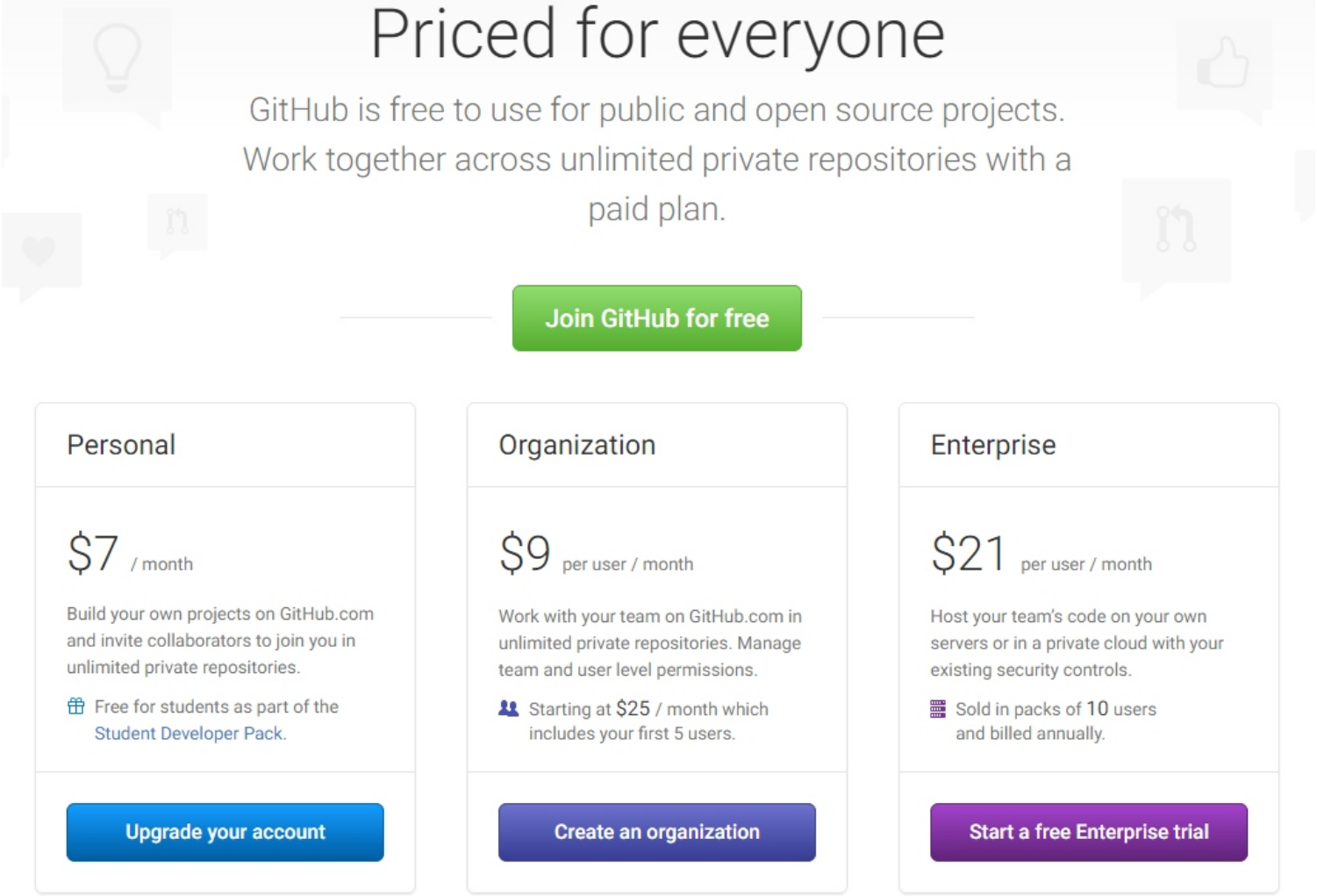
- Is the **largest** host of source code in the world! *(28 million users, 57 million repositories (28 million public) - June 2018)*.

Register a GitHub account

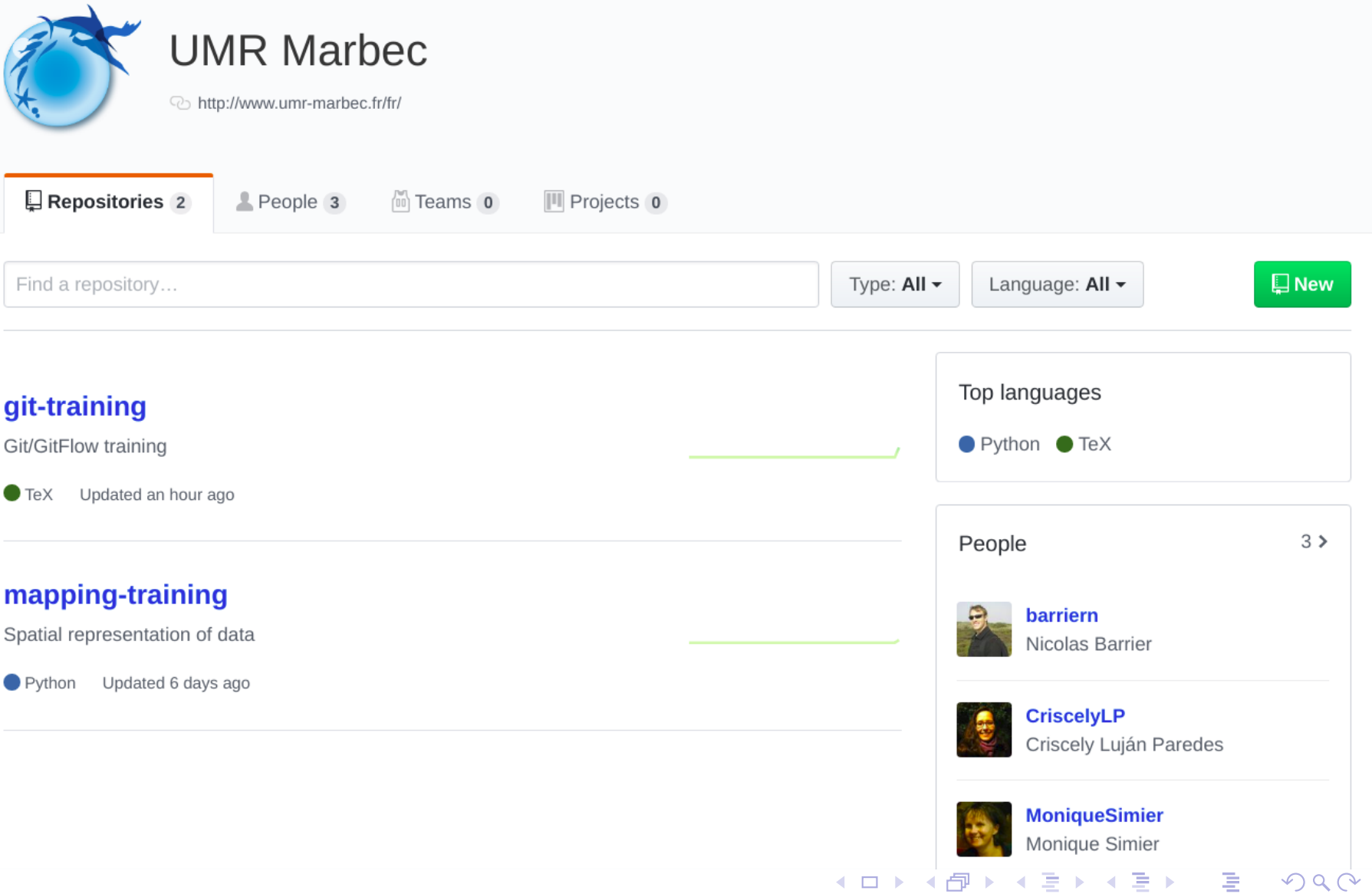
- Create an account in ★GitHub is free!
- Free private repositories
  - Students, faculty, and educational / research staff: ★GitHub Education.
  - Official nonprofit organizations and charities: ★GitHub for Good.

Register a GitHub account

- Pay for private repositories
  - Individual cost is 7 dollars per month: ★GitHub Pricing.



Marbec in github



Institutionnal repository

GitHub is a private US company. There are also *institutional* repositories on which Git can be used:

- Sourcesup: this is a Renater platform (login possible from any French research institute or through CRU accounts)
- Forge Ifremer: very close to SourceSup (Ifremer extranet account required)
- IRD GitLab: GitLab IRD platform (IRD account required).

However, the projects hosted on these repositories may have less visibility...

Git clients

Git and Git client **are not** the same! Like R and RStudio is not the same thing!

Git client:

- IDE (Integrated development environment)!
- Make the experience more pleasant providing a richer visual representation.

Some Git clients:

- ★SourceTreen
- ★GitKraken
- ★GitUp
- ★SmartGit
- ★git-cola
- ... others...
- **RStudio**

Git workflows

There are several ways to use GIT (we talk about **workflows**).

- *Centralized workflow*: one main branch, everyone commit in the same place.
- *Feature Branch Workflow*: developments are made in dedicated branches (feature branches), which are regularly merged to the master one.
- **Gitflow Workflow**: Strict branching model designed around the project release.

Source: `https://www.atlassian.com/git/tutorials/comparing-workflows`

GitFlow branches

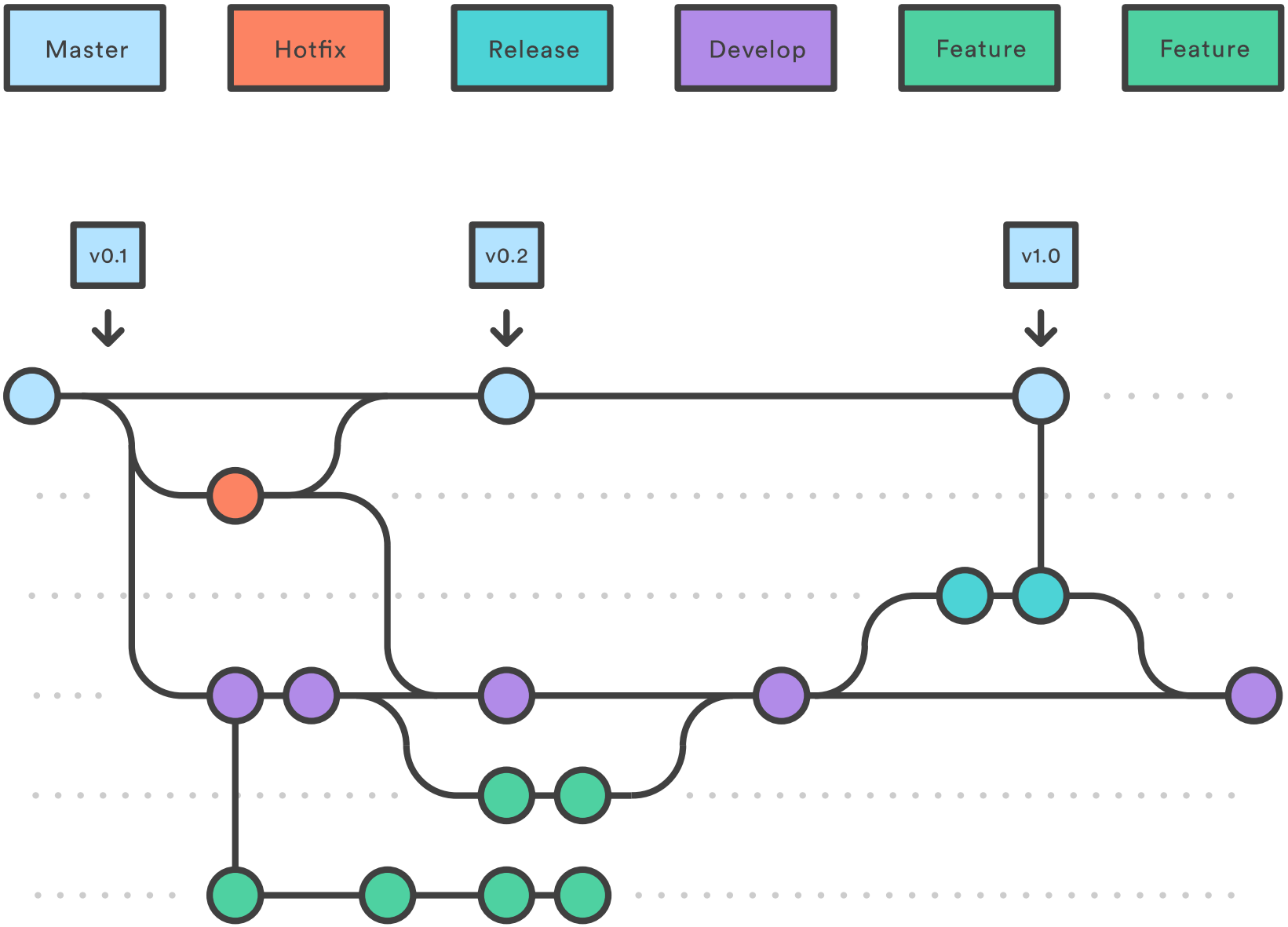
GitFlow workflow contains two main branches:

- *master:* official release history. Branch which is shared to the world!
- *develop:* integration branch for features

It also contains additional temporal branches:

- *feature*: feature branches (one for each new feature to add to the code)
- *release*: branch created when enough features have been added (new version of the code)
- *hotfix*: branch for maintenance and bug correction of the production release

In summary...



References

- https://nvie.com/posts/a-successful-git-branching-model/
- https://www.atlassian.com/git/tutorials/comparing-workflows
- https://danielkummer.github.io/git-flow-cheatsheet/
- https://gist.github.com/JamesMGreene/cdd0ac49f90c987e45ac
- https://blog.xebia.fr/2018/03/28/gitflow-est-il-le-workflow-dont-jai-besoin/