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Delivering science and technology
to protect our nation
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Getting git.

An introduction to git version control & methodologies

Presented by CSCNSI

`git` --the-basics

What is git ?

“Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.” (git-scm.com)

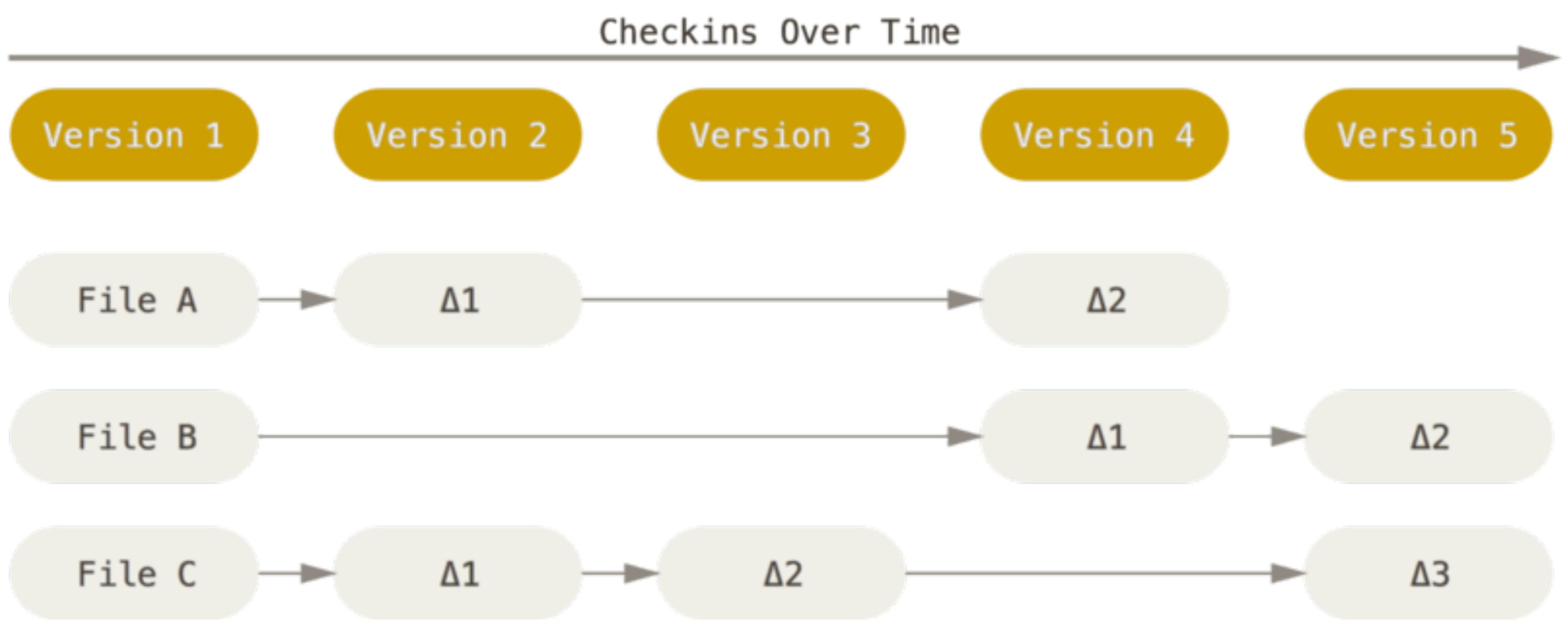
- **git** is *free* and *open sourced*
- **git** is *fast* and *efficient*
- **git** is *decentralized* version control
  - there is no "main" or "master" repo
- **git** is designed to handle *non-linear* development
  - allow many developers to work in parallel

What `git` does
(extremely incomplete)

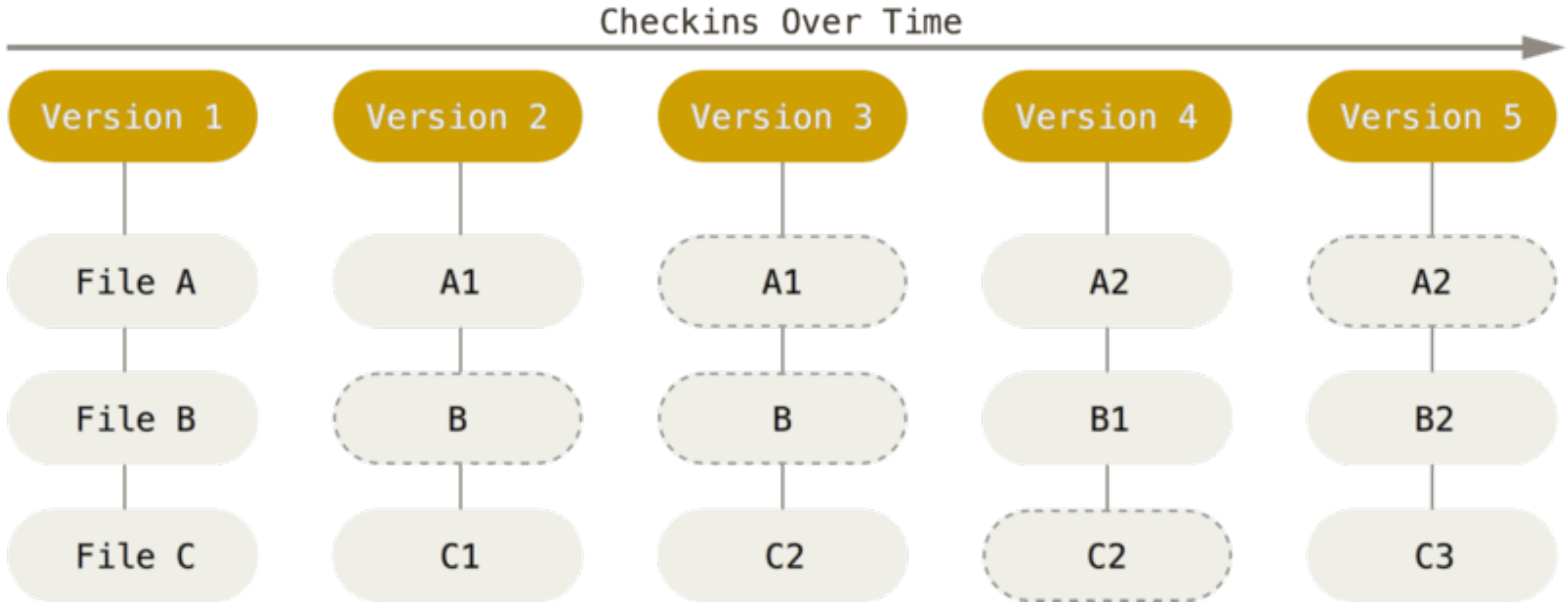
- Manages a revision history of a directory full of stuff (*commit, checkout*)
- Can sync that directory with other directories (*cloning, pushing, pulling*)
- Can manage multiple histories of one directory (*branching, tagging*)
- Provides tools for collaboratively working on directories (*merging, rebasing*)
- Provides assurances that the stuff is intact as advertised (*hashes, signing*)

How `git` does what it does

- Stores local repository information in a special directory, `.git`, in the base directory of the repo
  - Including config info, like who else we might want to synchronize with, called *remotes*
- Keeps snapshots-in-time of the contents of the directory, a *commit*
  - Note: this is *different* than how most version control works
- Keeps a pointer to the current snapshot (the *HEAD*), and populates the directory with its contents
- Tries to be smart about not storing the same data twice (copy-on-write-ish), keeps hashes, etc.



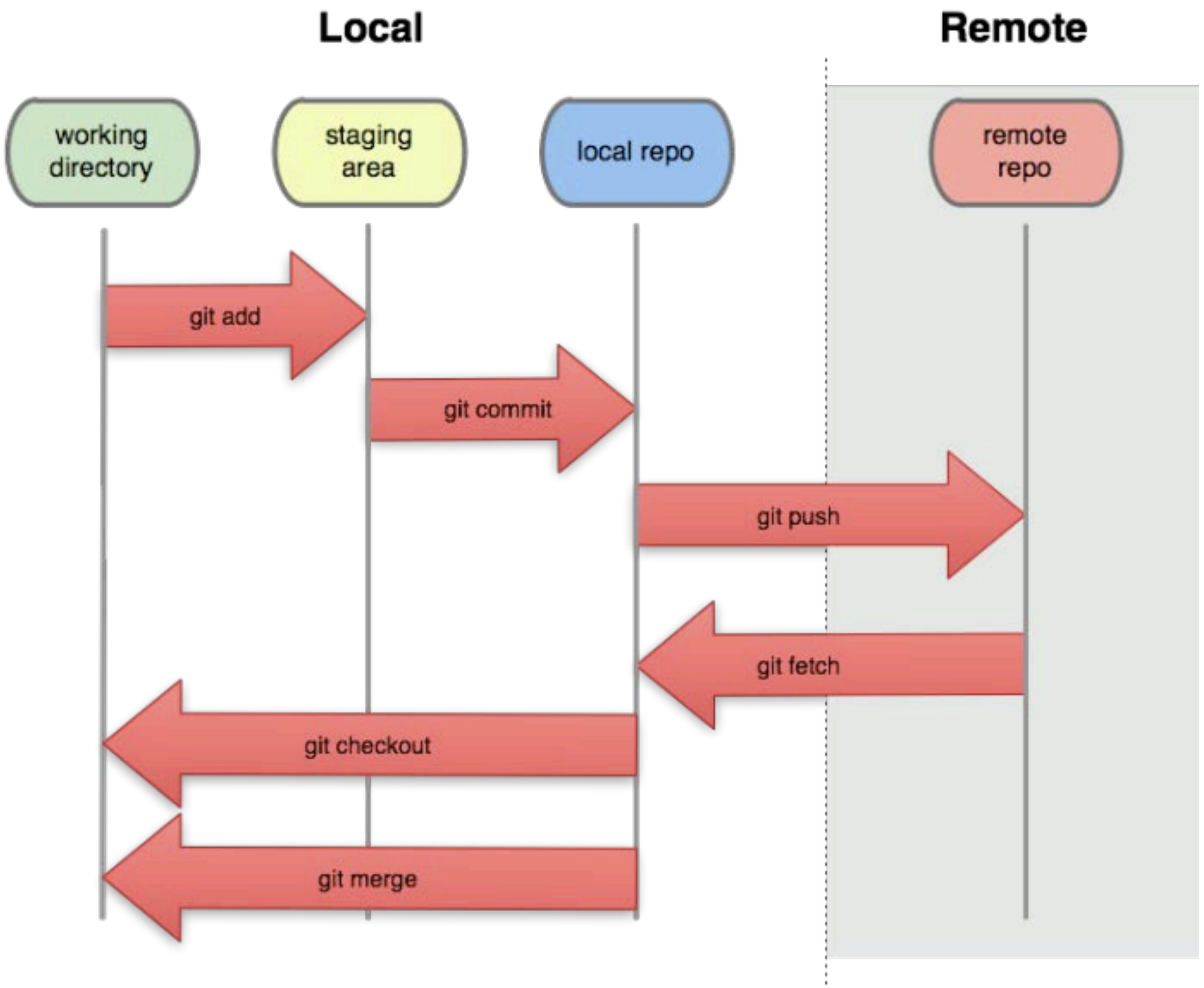
Other VCS



Git

`git` works locally

- Git does not use a central repository
- Instead, you work in your own local copy
- But if you make a new commit you can *push* it elsewhere (to a *remote*)
  - ...or if they make a new commit you can *pull* it to your copy
- Multiple people can work on individual histories of commits, or *branches*
  - You can *checkout* a remote's branch
  - You can *merge* changes from that branch

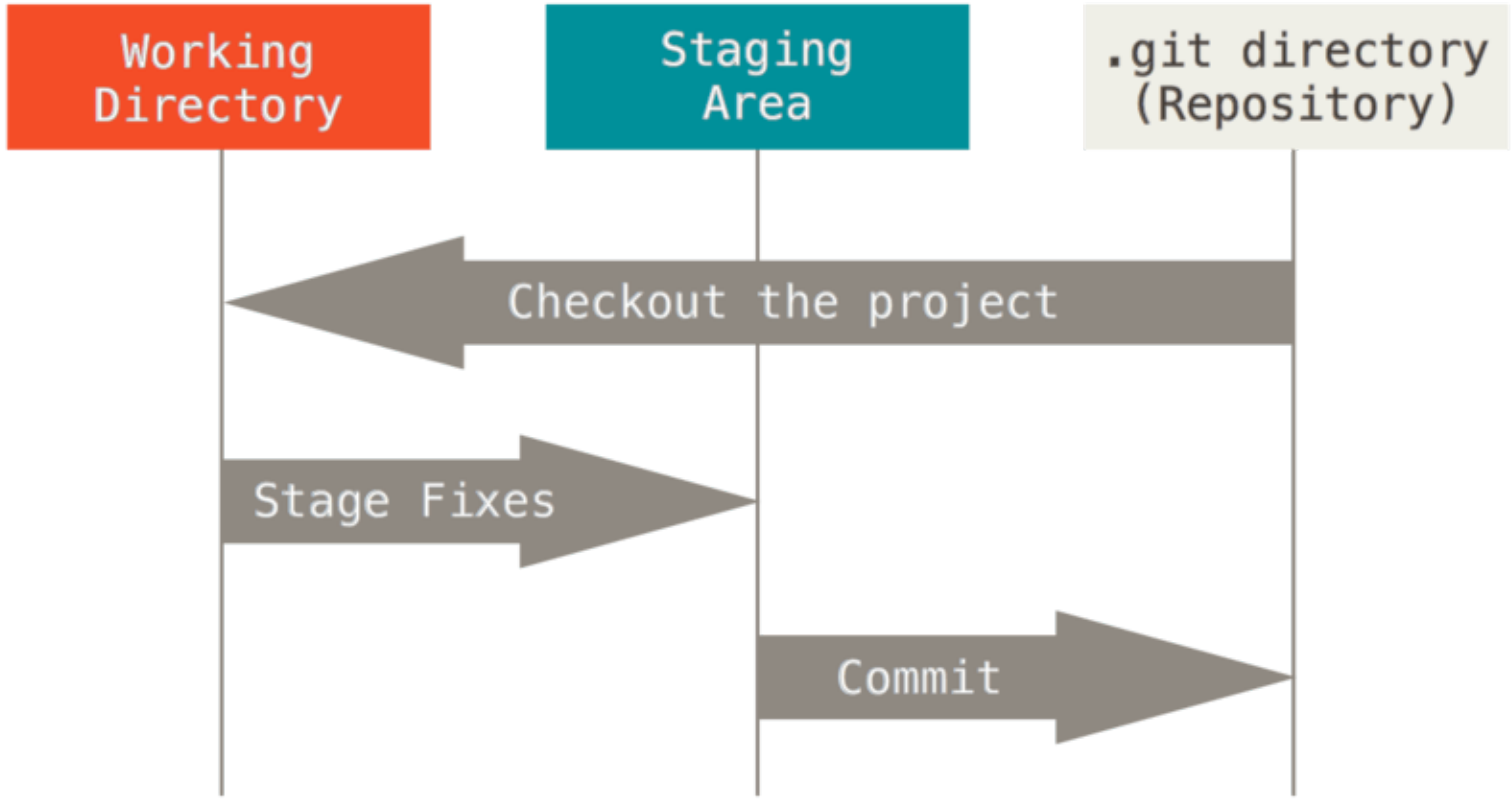


https://greenido.files.wordpress.com/2013/07/git-local-remote.png?w=696&h=570

The `git` repo state

A working copy of a repo can be in one of three states:

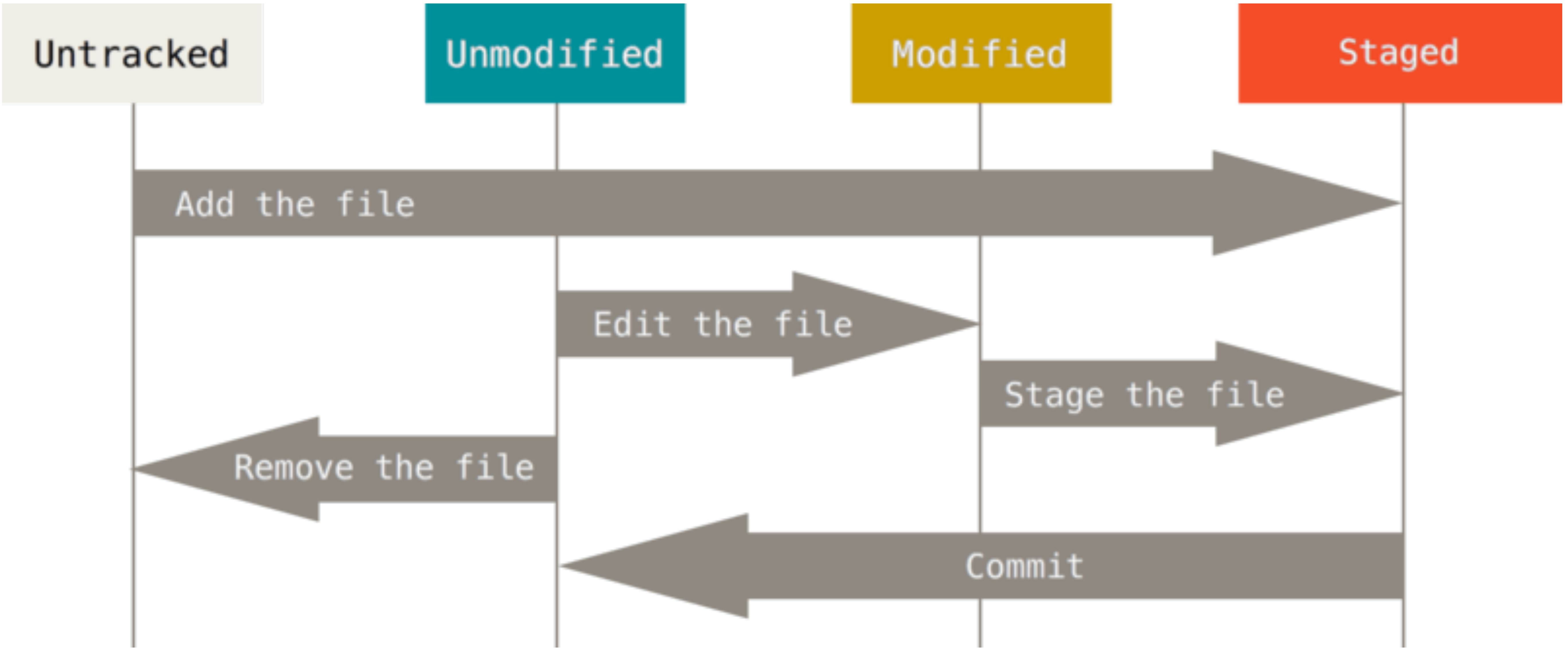
- ***Committed*** means that the data is safely stored in your local database, i.e. completely matches an existing commit.
- ***Modified*** means that you have changed the file but have not committed it to your database yet.
- ***Staged*** means that you have marked a modified file in its current version to go into your next commit.



https://git-scm.com/book/en/v2

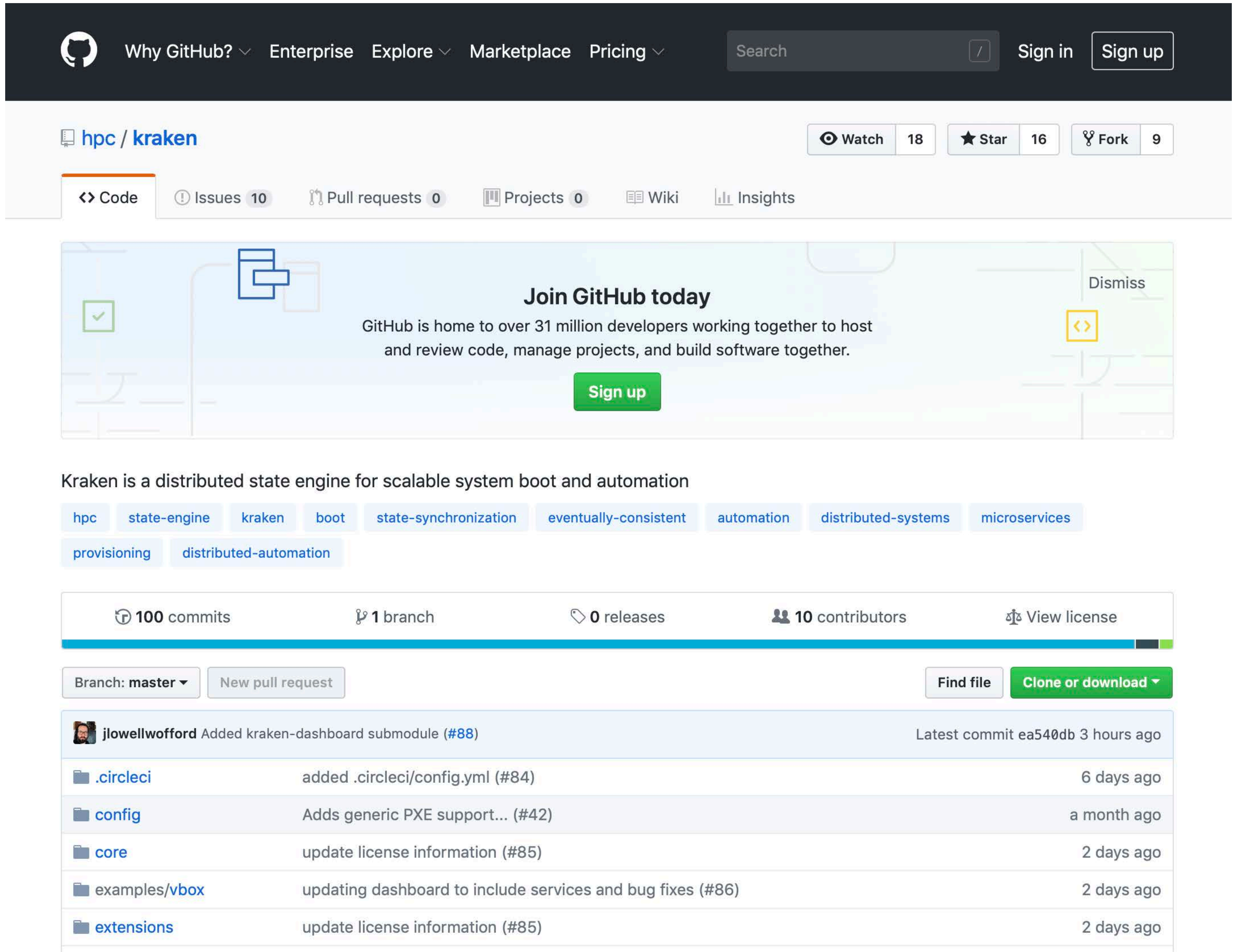
Basic `git` workflow

1. *init* a new repo, or *clone* one from somewhere else
2. create/delete/modify files in the repo
3. *add* files to the staged commit
4. *commit* the changes
5. GOTO 2, or...
   - *push* those commits to elsewhere
   - *checkout* an old commit
   - *pull* someone else's changes from elsewhere



What is GitHub?

- *Github should not be confused with Git*
- Github (https://github.com) is a website dedicated to hosting git repositories
- Github offers some great add-on features:
  - A vast community of open source developers
  - An add-on workflows for collaboration, like "Pull Requests"
  - Loads of add-ons like Continuous Integration (CI) and automated testing tools
  - …and much more.



Join GitHub today

GitHub is home to over 31 million developers working together to host and review code, manage projects, and build software together.

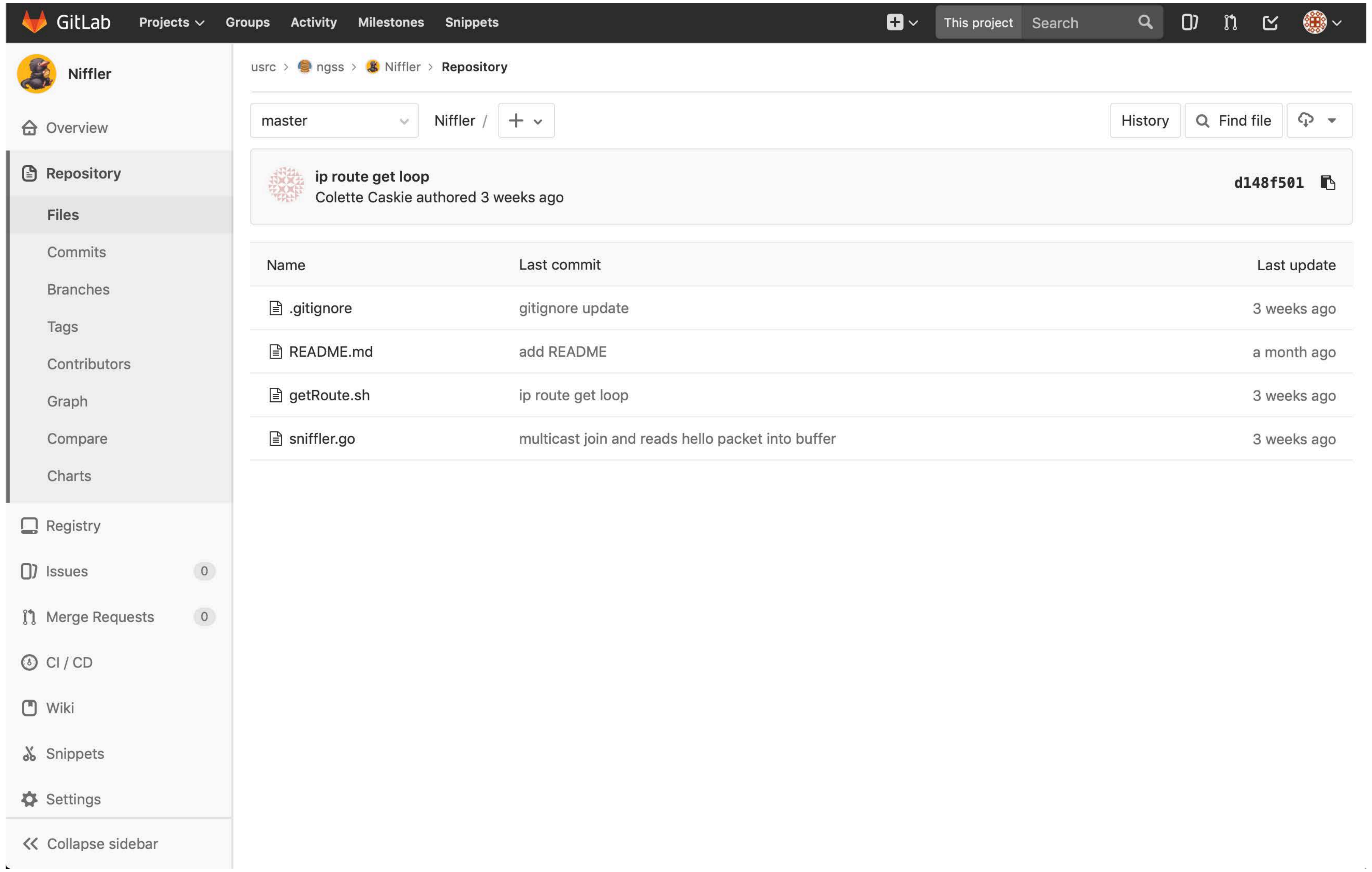
Kraken is a distributed state engine for scalable system boot and automation

jlowellwofford Added kraken-dashboard submodule (#88) Latest commit ea540db 3 hours ago

.circleci	added .circleci/config.yml (#84)	6 days ago
config	Adds generic PXE support... (#42)	a month ago
core	update license information (#85)	2 days ago
examples/vbox	updating dashboard to include services and bug fixes (#86)	2 days ago
extensions	update license information (#85)	2 days ago

What is GitLab?

- *Gitlab should not be confused with Git or Github*
- Gitlab is a project for hosting Github-like sites
- LANL has multiple Gitlab instances:
  - https://git.lanl.gov
  - https://gitlab.newmexicoconsortium.org
- Gitlab has many of the features of Github
  - Pull request workflows (called “Merge” requests)
  - Continuous Integration (CI)
  - …



ip route get loop
Colette Caskie authored 3 weeks ago
d148f501

Name	Last commit	Last update
.gitignore	gitignore update	3 weeks ago
README.md	add README	a month ago
getRoute.sh	ip route get loop	3 weeks ago
sniffler.go	multicast join and reads hello packet into buffer	3 weeks ago

Questions?