

Version Control with Git

- Before we start
 - Sign up at github.com

What is Version Control?

(AKA revision control, source control)

- Tracks changes to files
- Any file can be tracked
- Text (.txt, .csv, .py, .c, .r etc.) works best
 - These allow smart *diff / merge* etc.

Why Use Version Control? #1

- A more efficient backup
- Reproducibility



Why Use Version Control? #2

- Teamwork



Version Control Tracks Changes



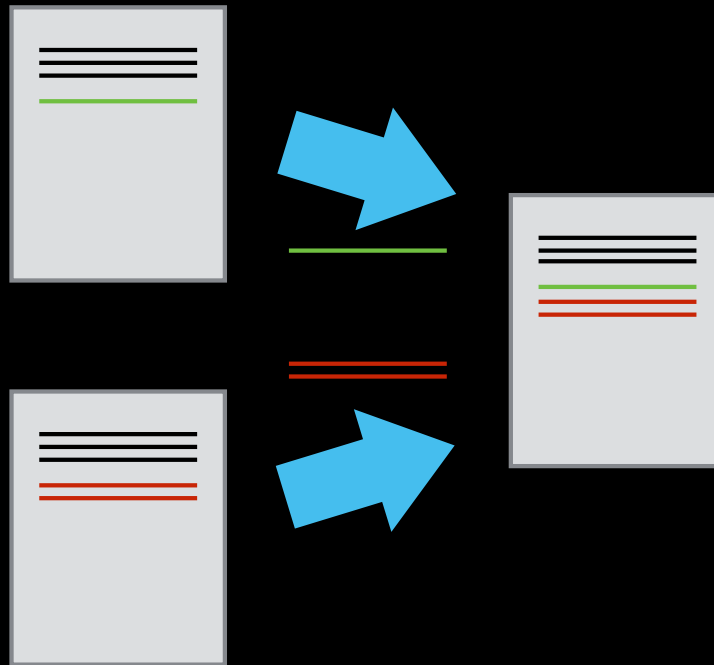
- Changes are tracked sequentially

Version Control Tracks Changes



- Different versions can be saved

Version Control Tracks Changes



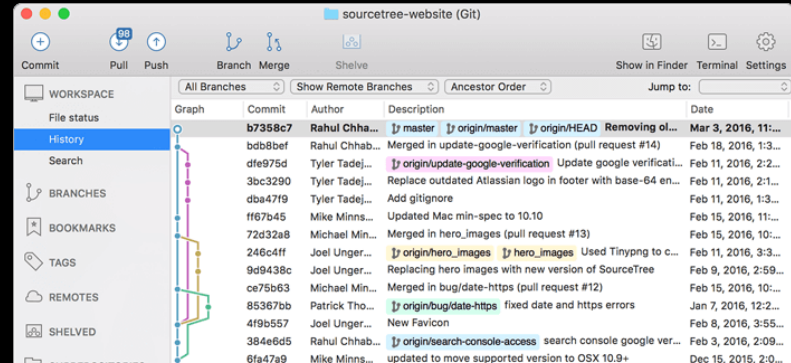
- Multiple versions can be merged

Version Control Alternatives

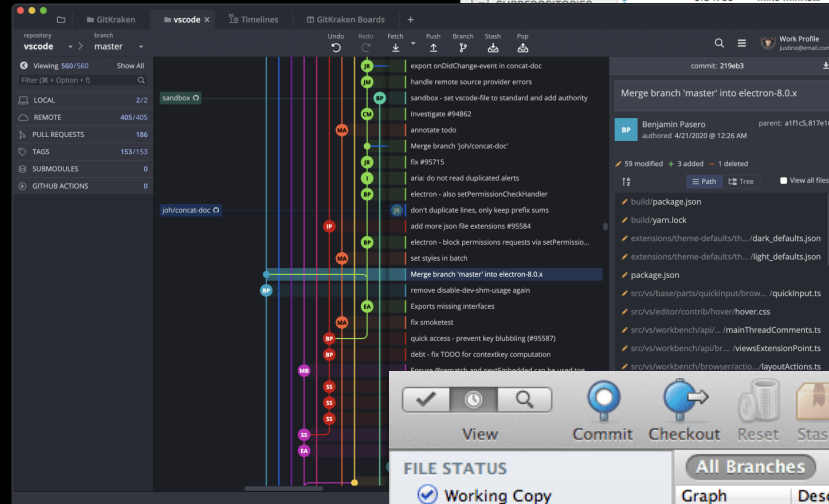
- Subversion (svn) - Centralised
- Mercurial (hg) - Distributed
- Git (git) – Distributed
 - Most widely used in academia!
- N.B. GitHub != git
 - Alternatives like GitLab exist

Graphical Version Control

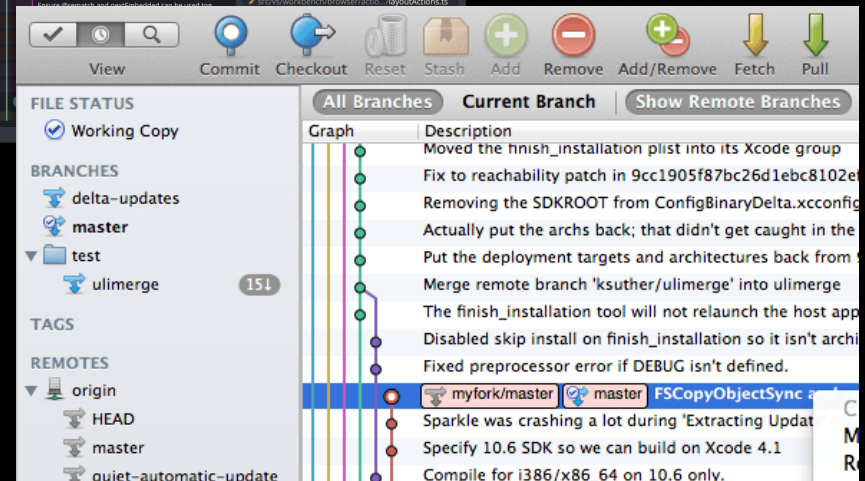
- SourceTree



- Git Kraken



- Git GUI



Local Configuration

- `git config`

Getting Demo Files

- `git clone`

`https://github.com/Southampton-RSG/swc-ramp-git`

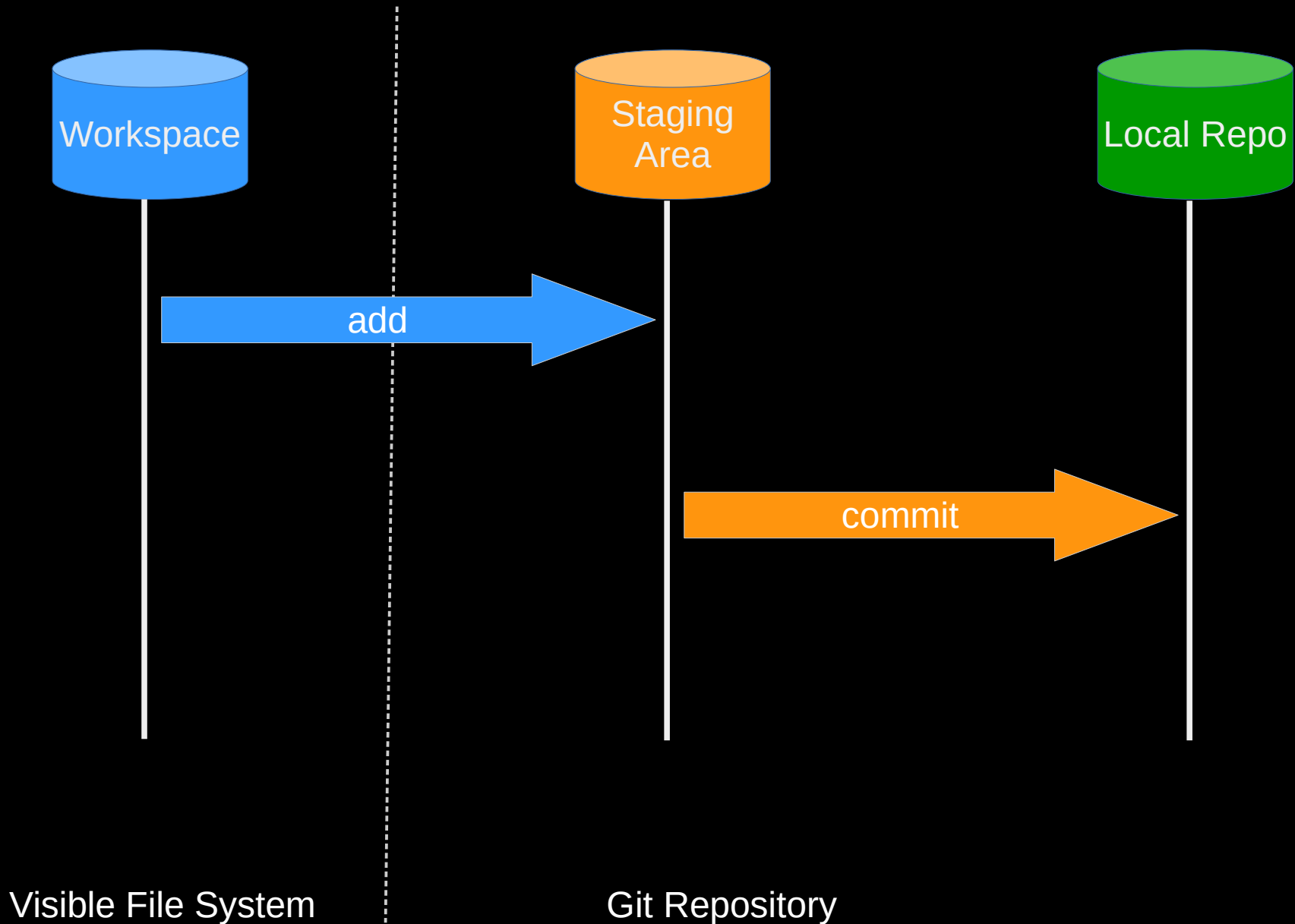
Creating a Repository

- `git init`
- `git status`

Tracking Changes to Files

- `git add`
- `git commit`

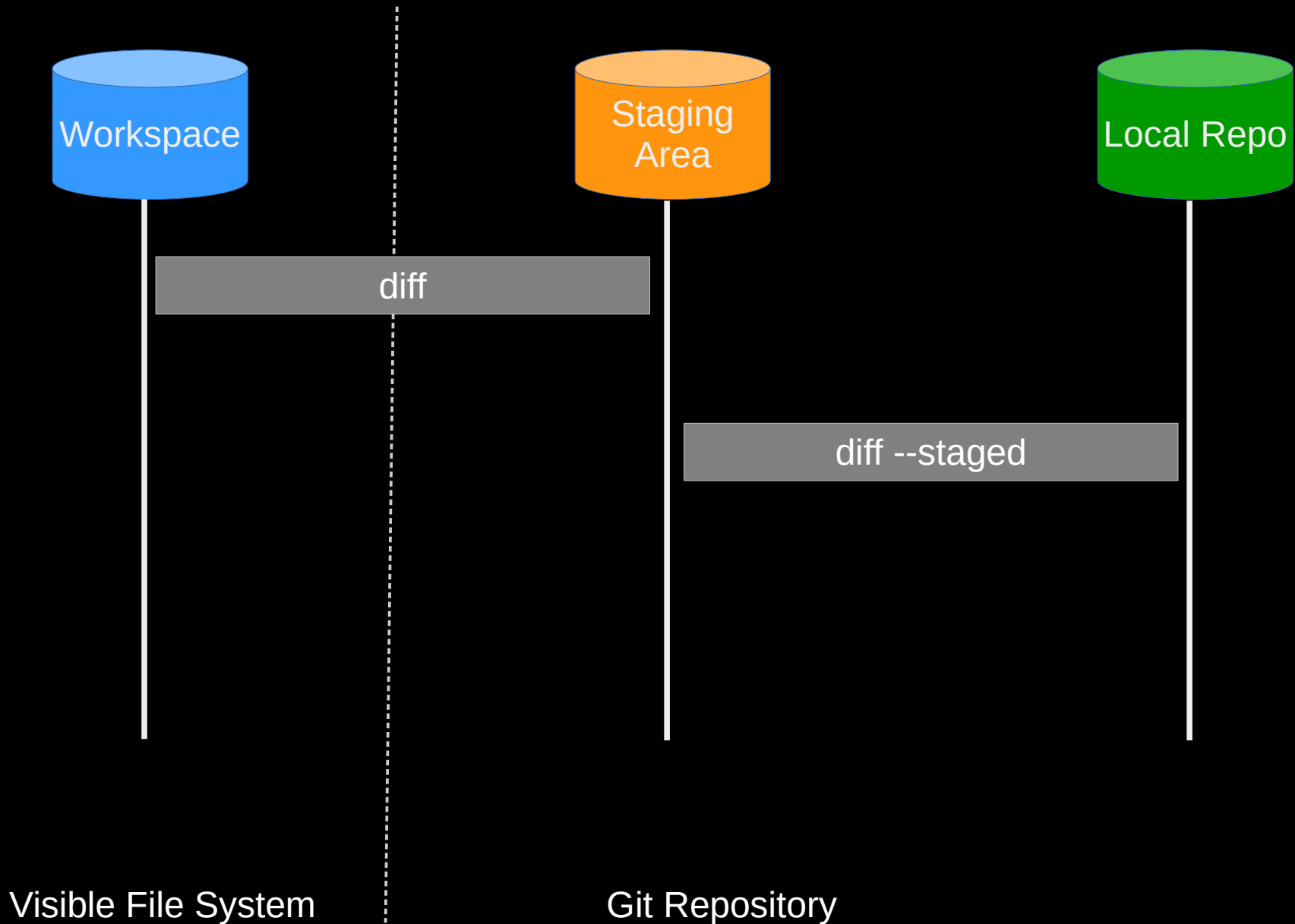
Git – add and commit



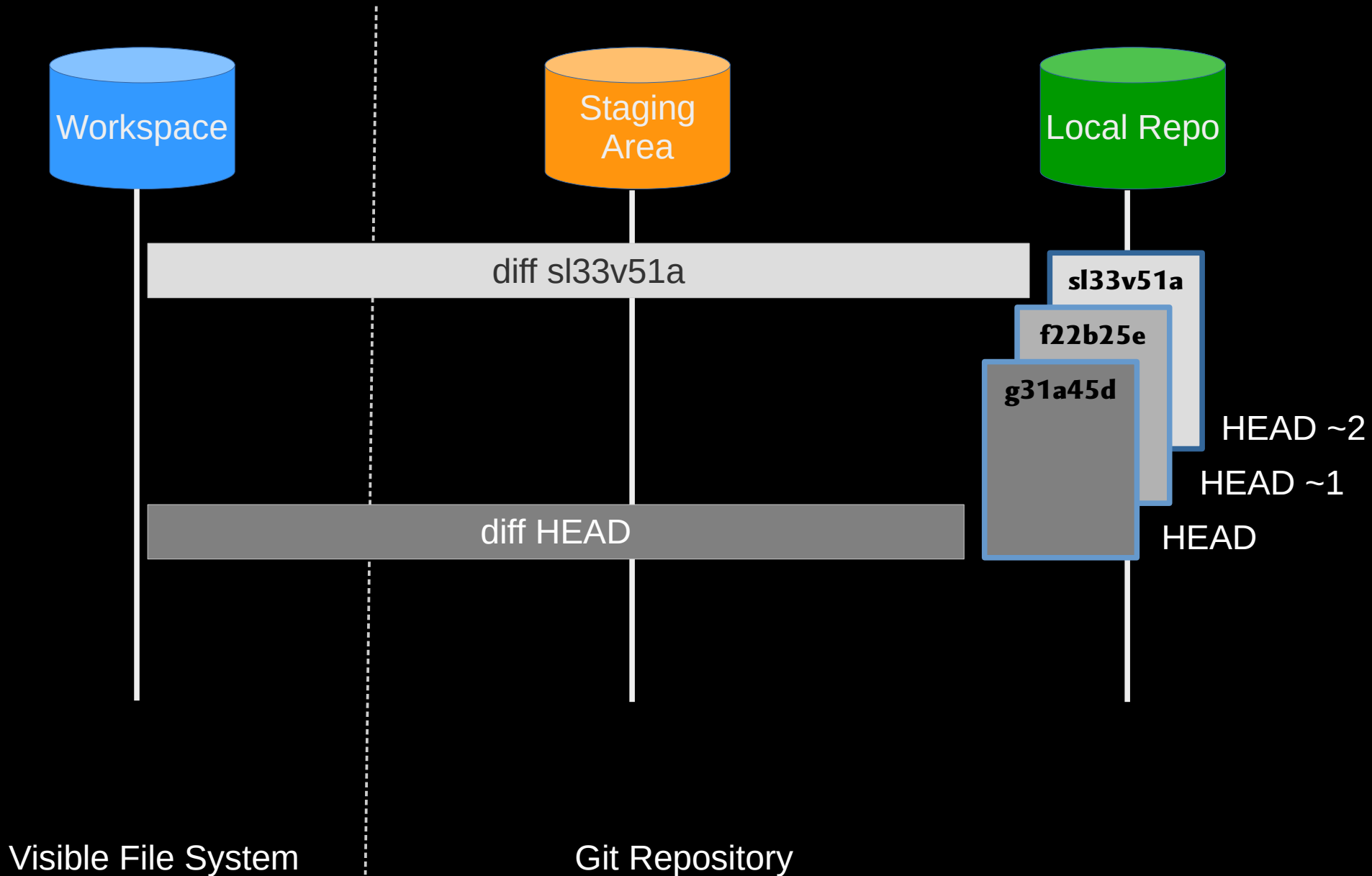
Exploring History #1

- `git log`
- `git diff`

Git - diff #1



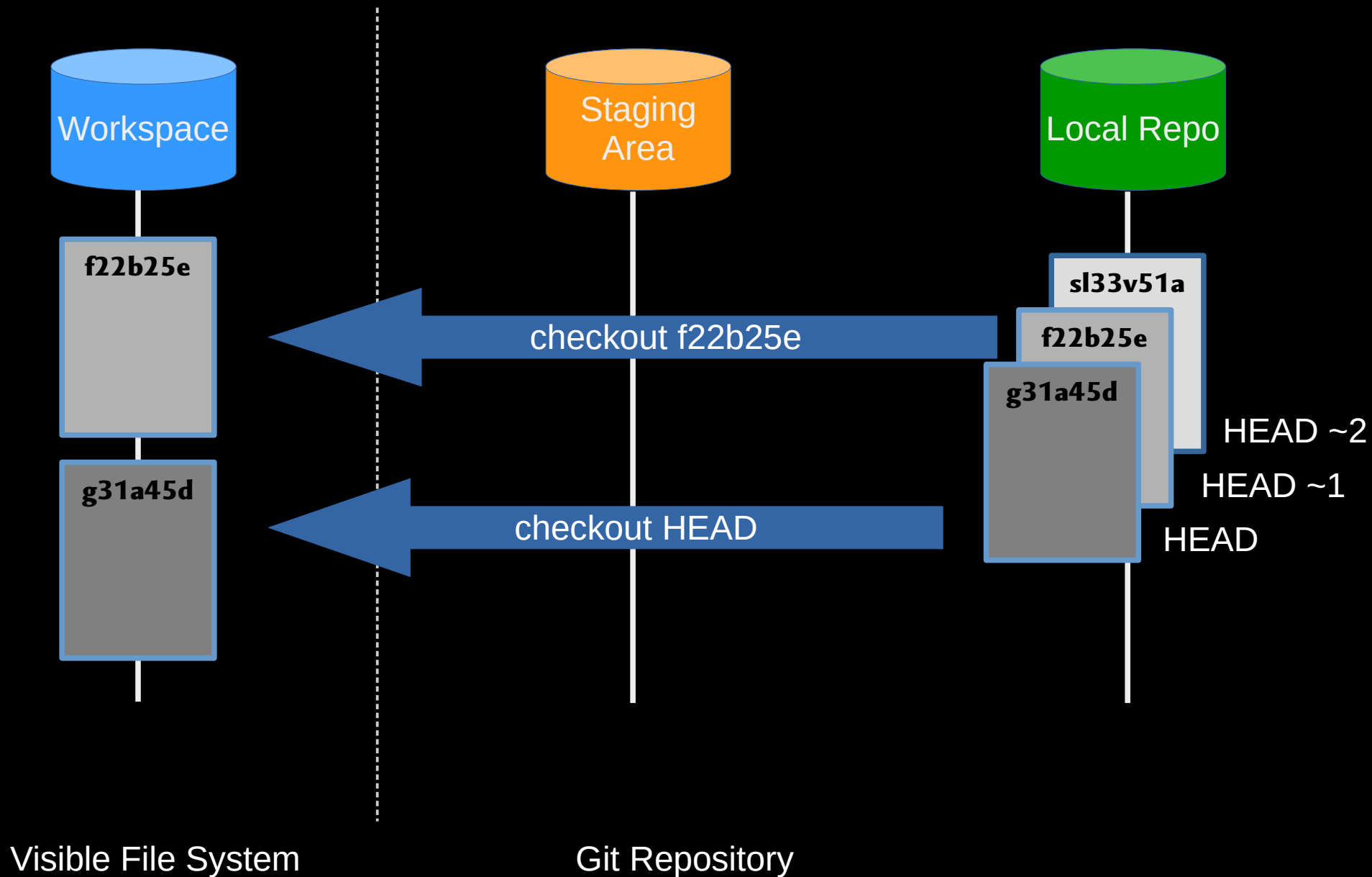
Git - diff #2



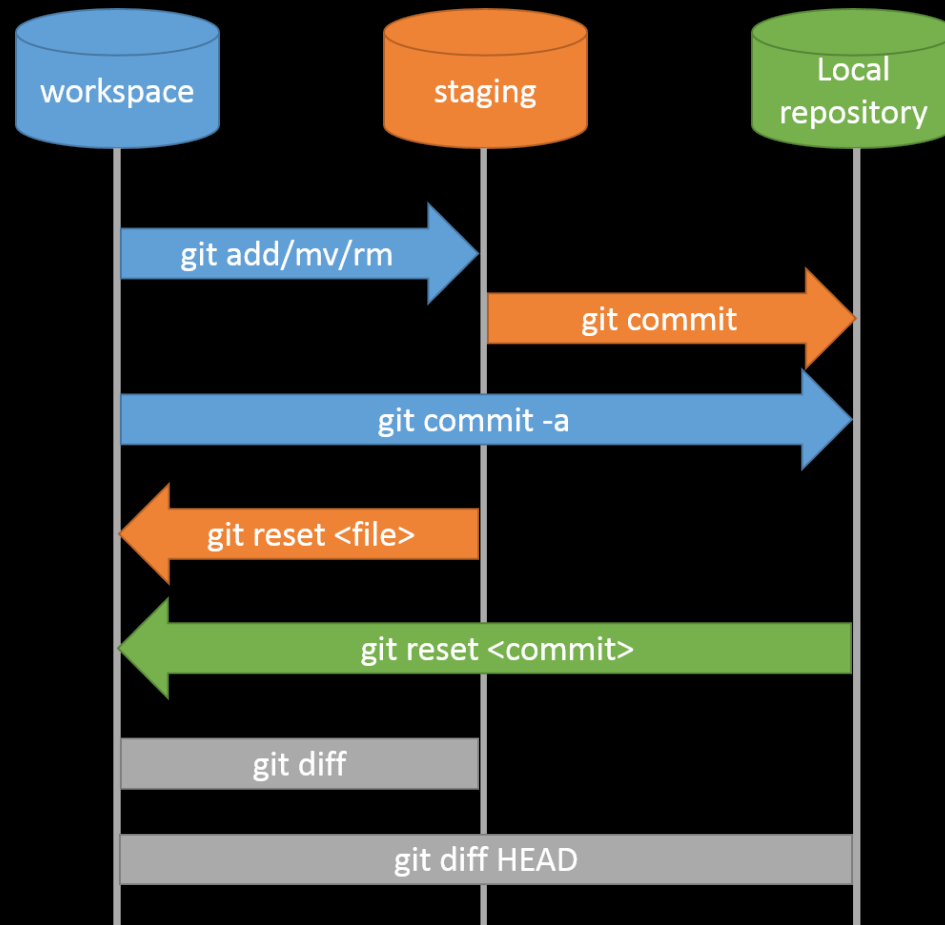
Restoring Files

- `git checkout`

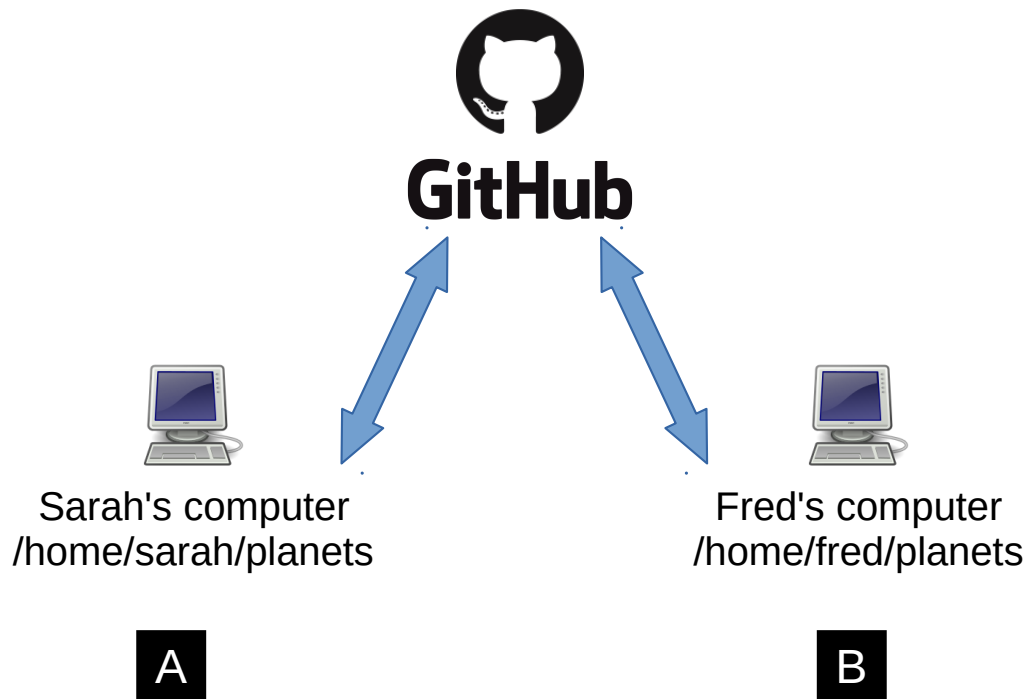
Git - restoration



Git Workflow – Local Repo.



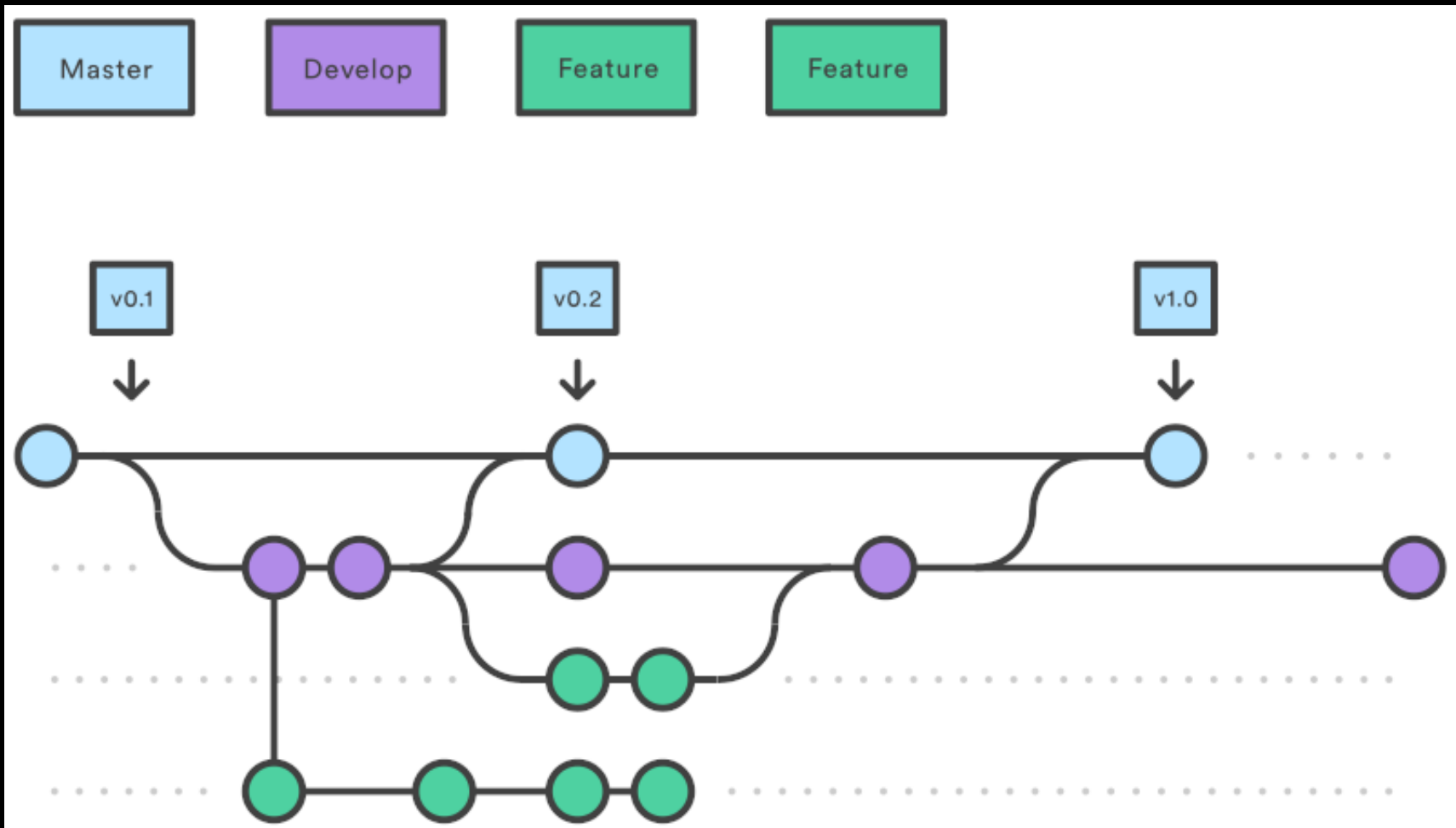
Collaboration



Collaboration: Remote Repositories

- Sign in <https://github.com/>
- Create repository
- `git remote add`
- `git push`

Collaboration: Branches



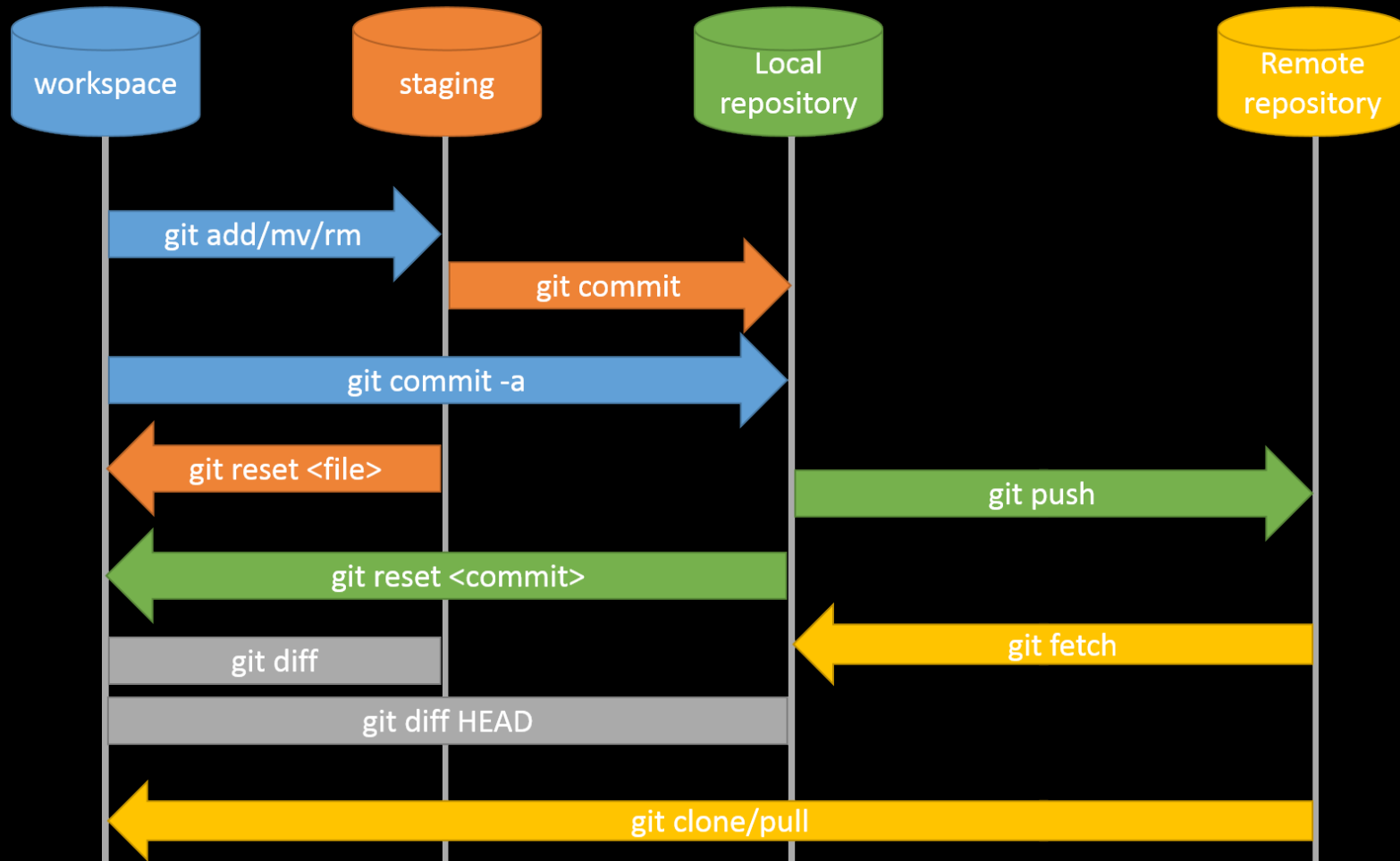
Collaboration: Creating Branches

- `git branch dev`
- `git checkout dev`

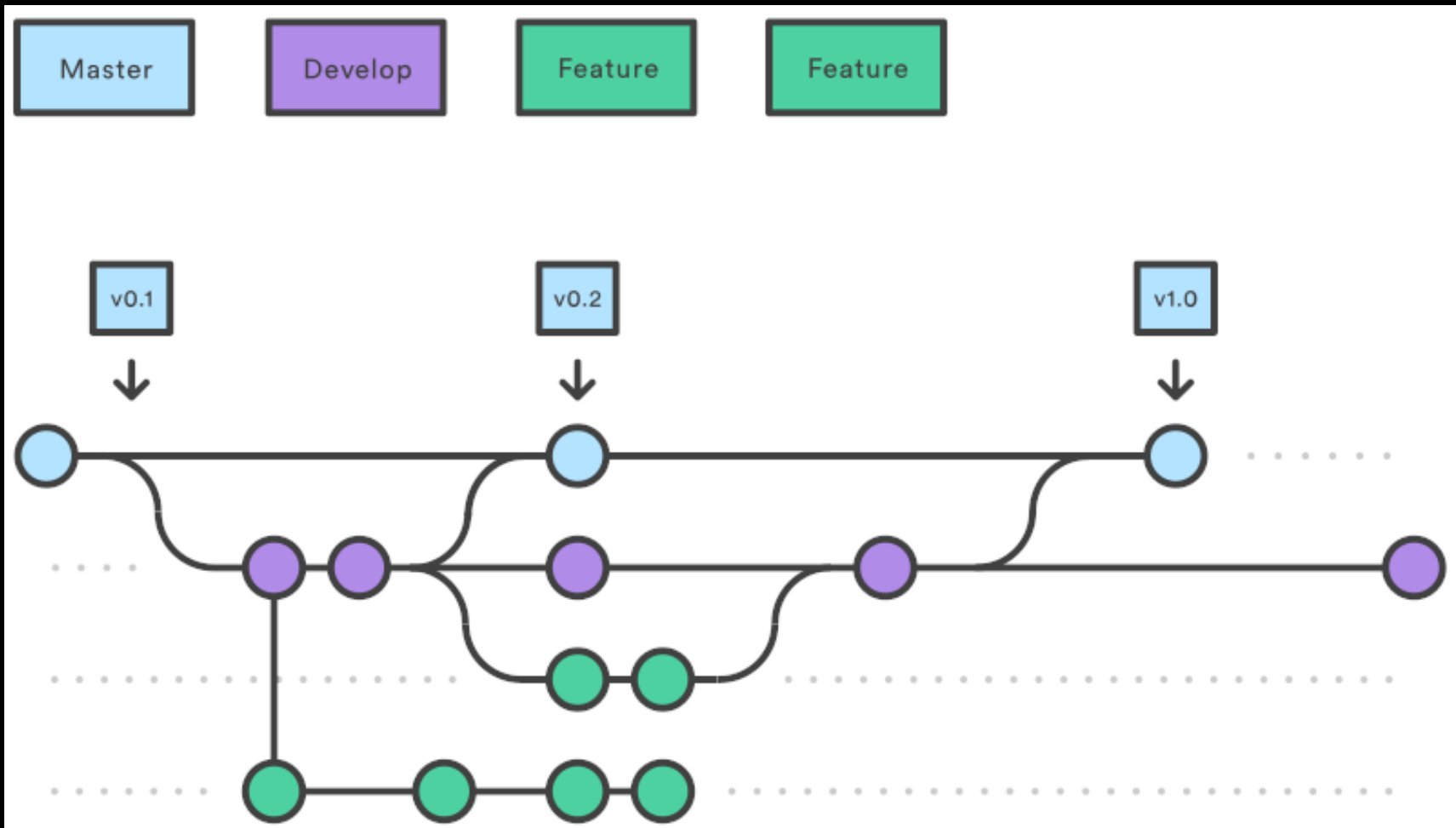
Collaboration: Creating Branches 2

- Create rainfall_conversion.py
- `git add rainfall_conversion.py`
- `git commit -m`

Git Workflow – Remote Repo.



Collaboration: Branches



Collaboration:

Feature Branch Exercise

- Check out 'dev'
- Create a new branch called 'docs'
- Create and add README.md
- Push to GitHub and merge back to 'dev'
- Pull the changes back to your computer

What next?

- Ignore files / Merging
- <https://software-carpentry.org>