

Version Control with Git

- Before we start
 - Sign up at github.com

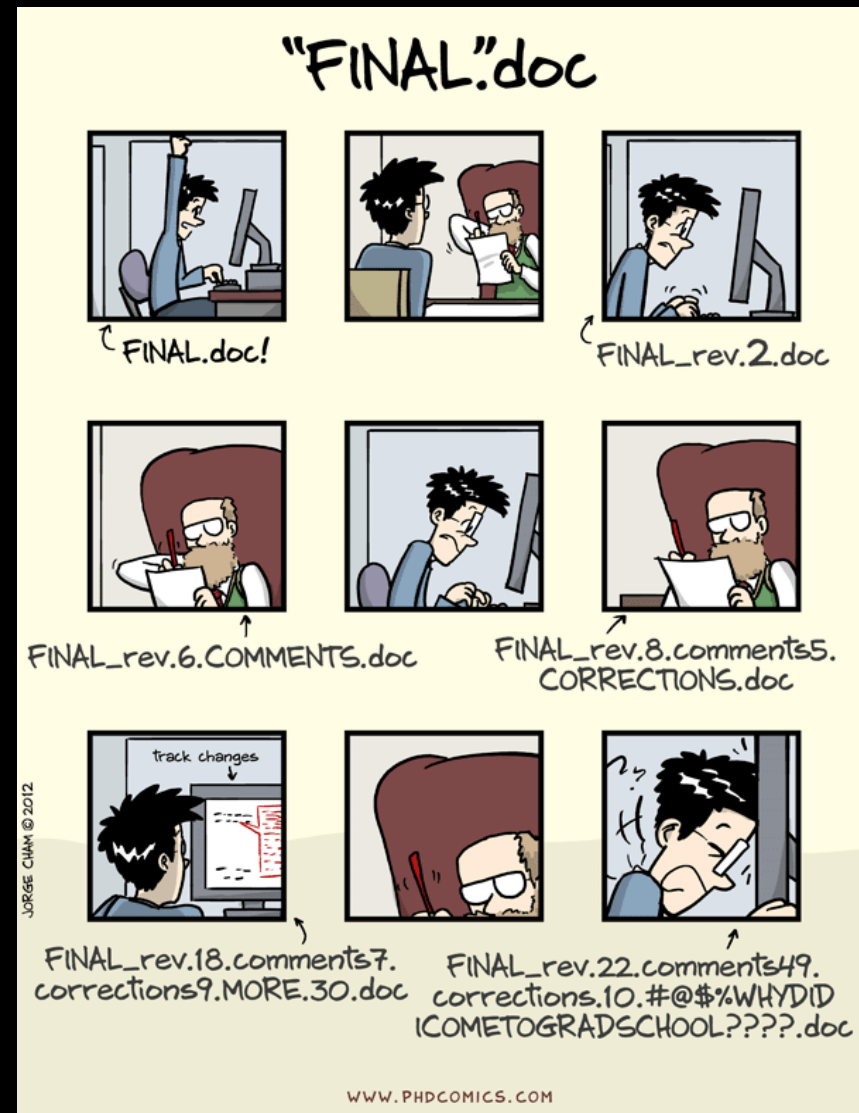
What is Version Control?

(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

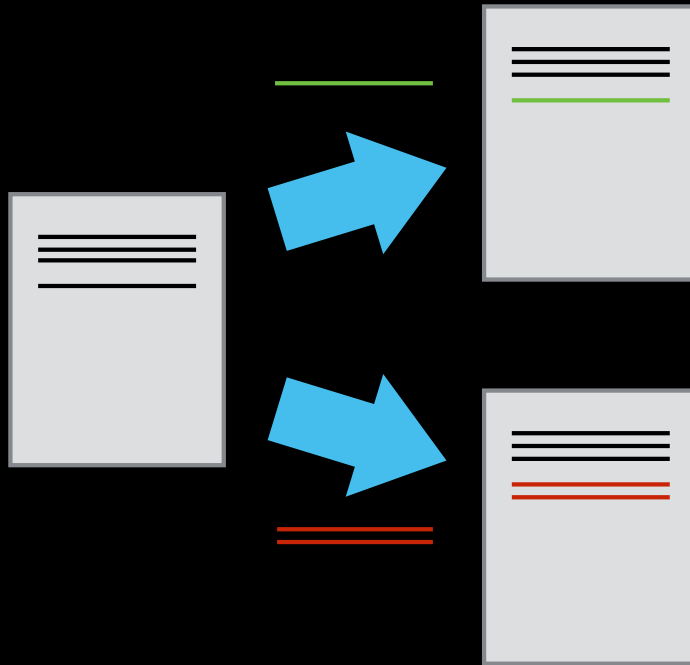


Version Control Tracks Changes



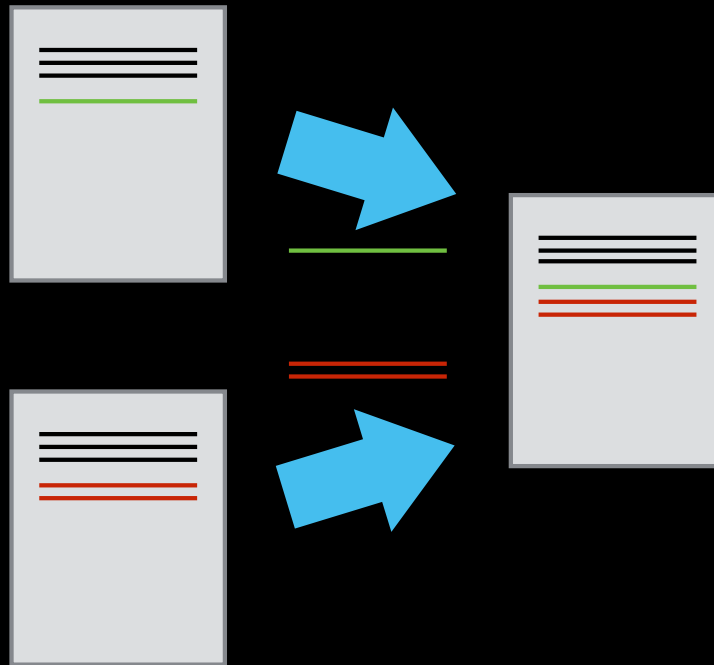
- Changes are tracked sequentially

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

Local Configuration

- `git config`

Getting Demo Files

- `git clone`
`https://github.com/software saved/2020-04-30-ramp-swc`

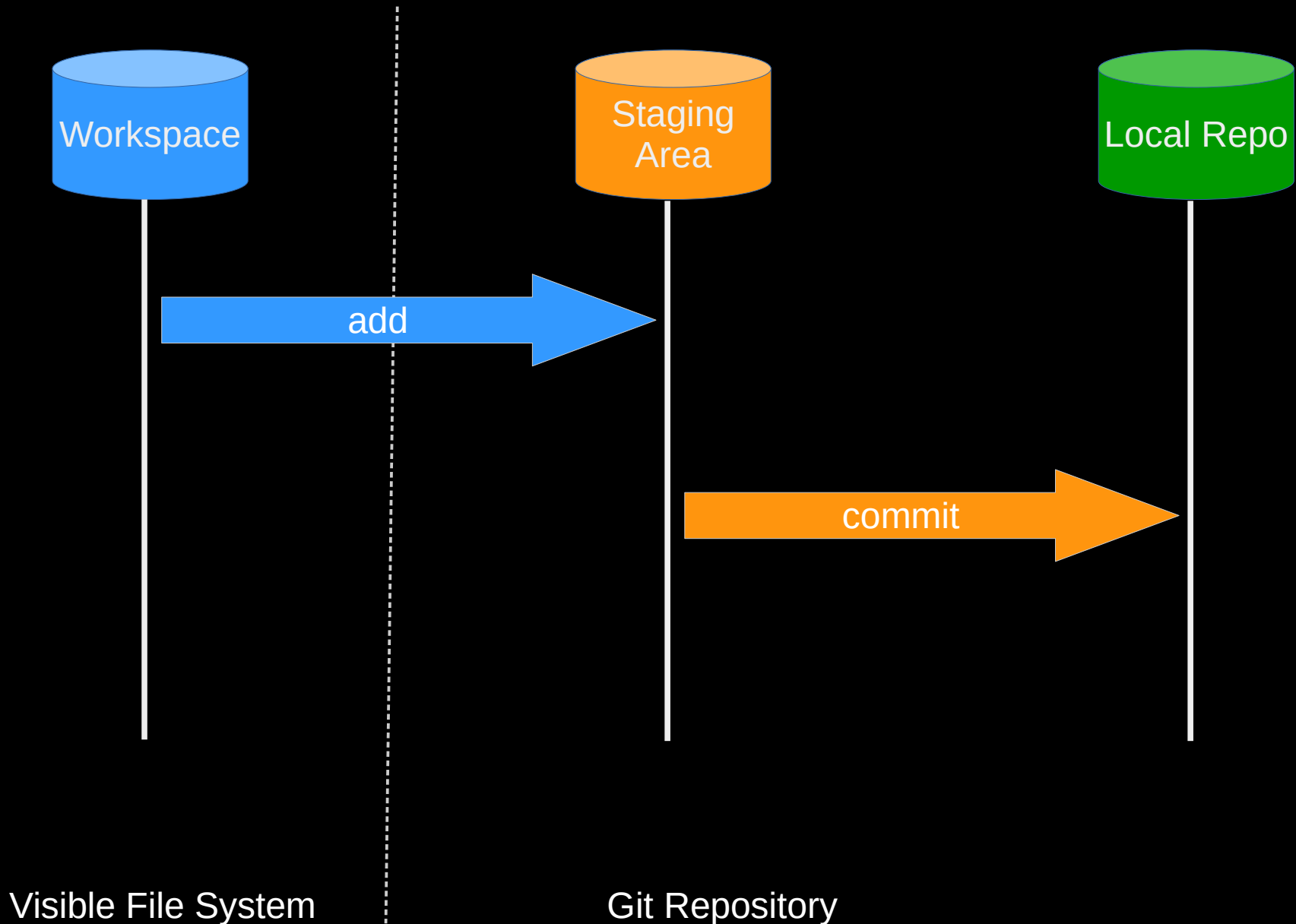
Creating a Repository

- `git init`
- `git status`

Tracking Changes to Files

- `git add`
- `git commit`

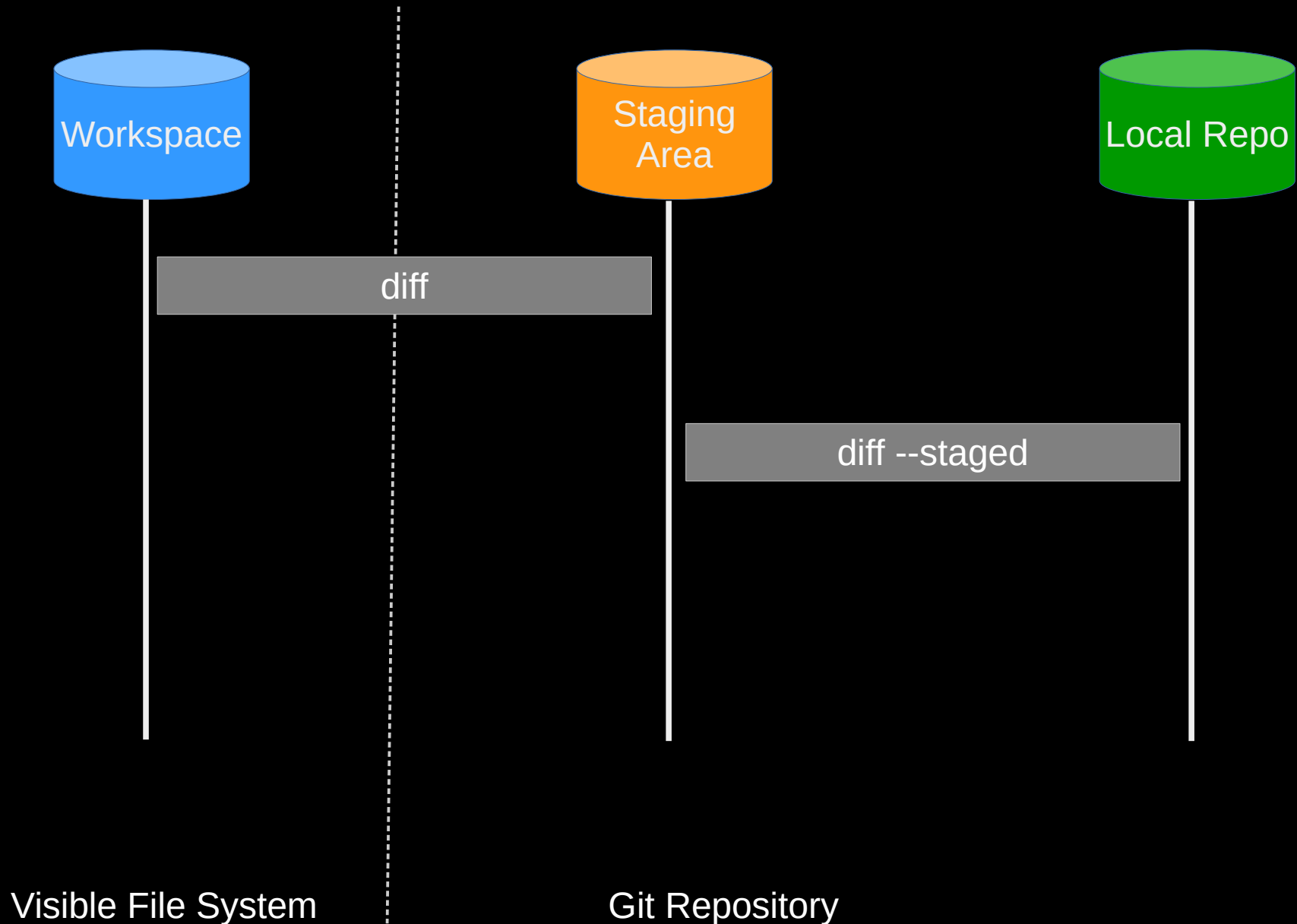
Git – add and commit



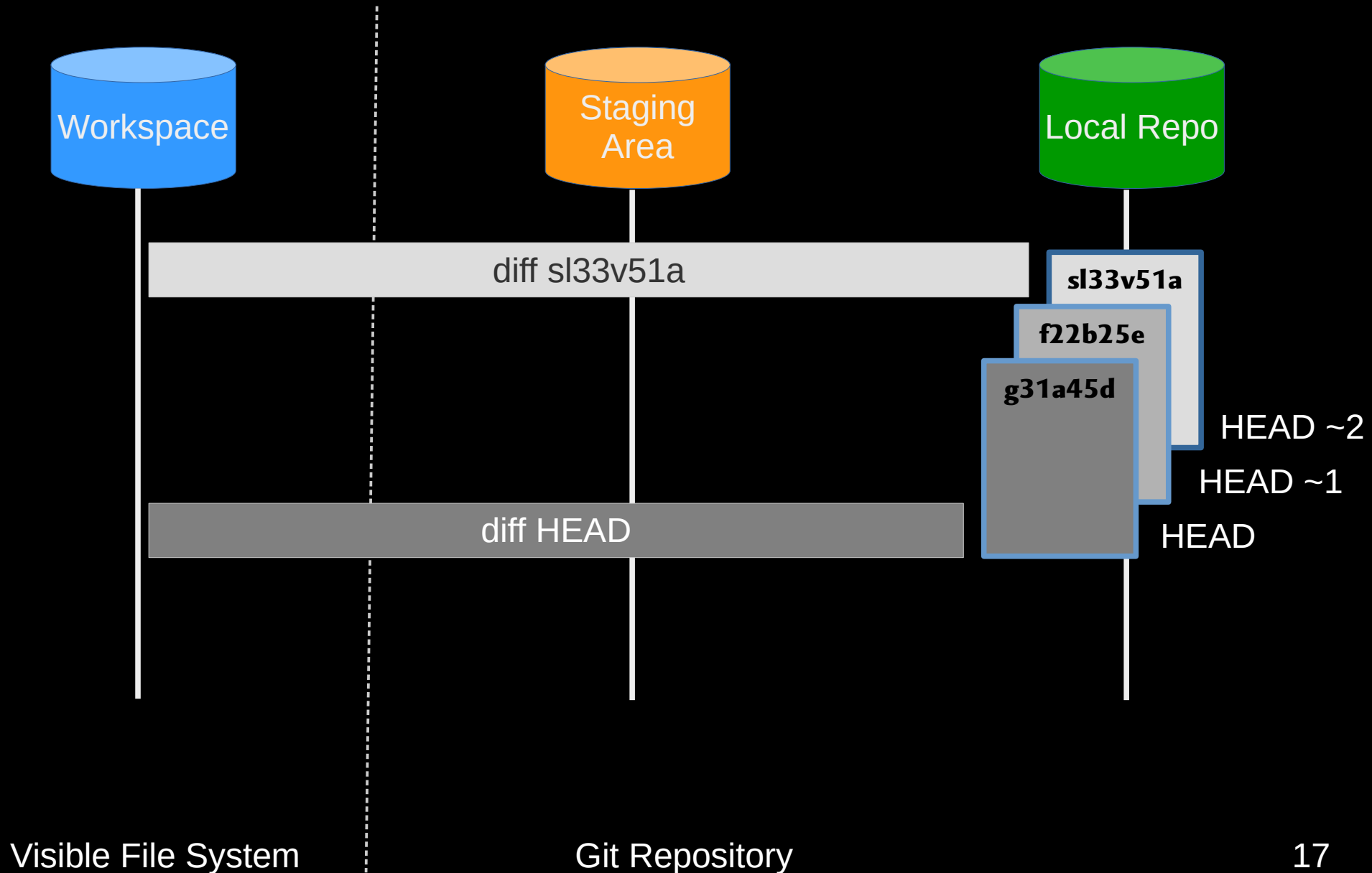
Exploring History #1

- `git log`
- `git diff`

Git – diff #1



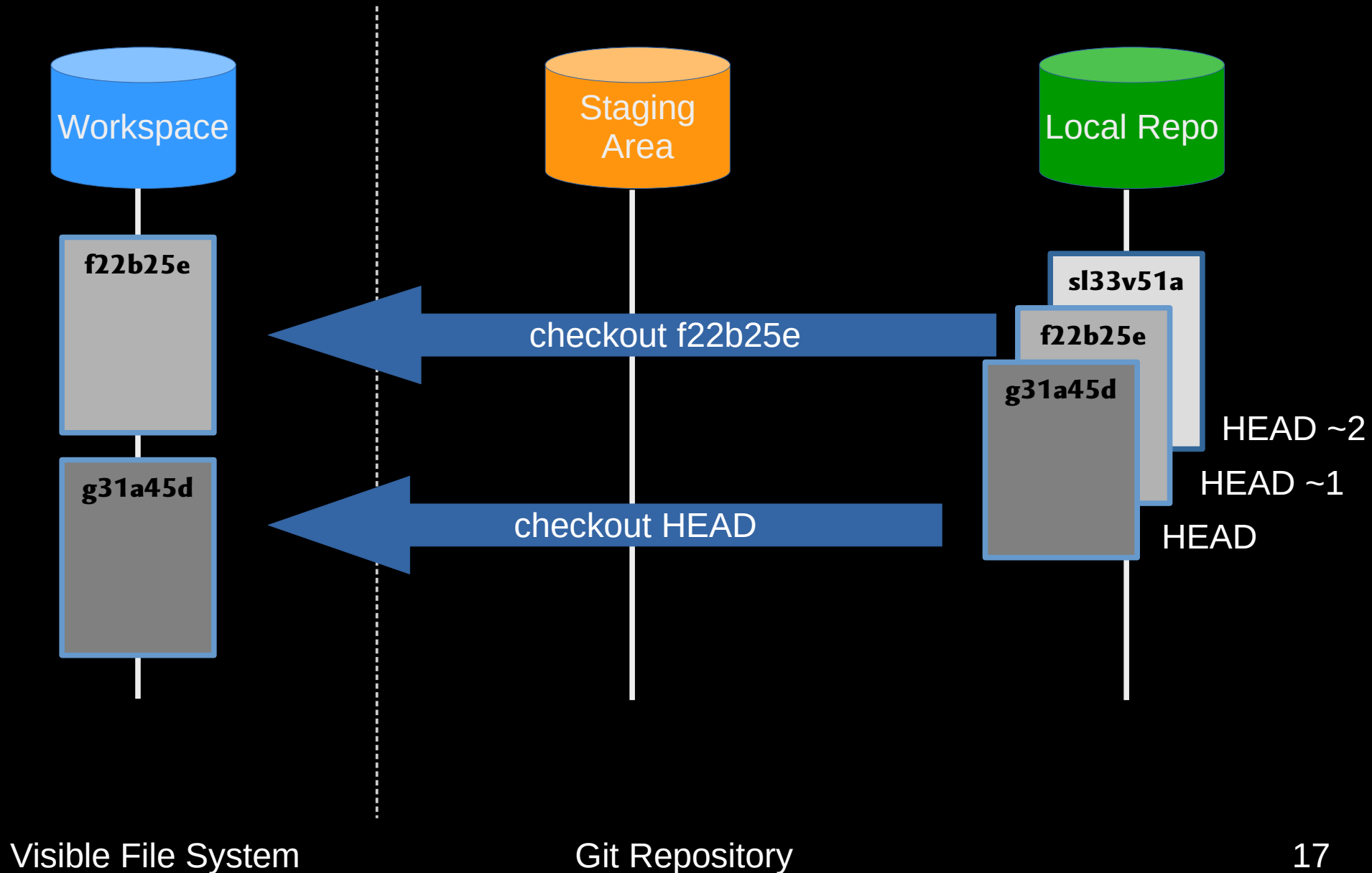
Git – diff #2



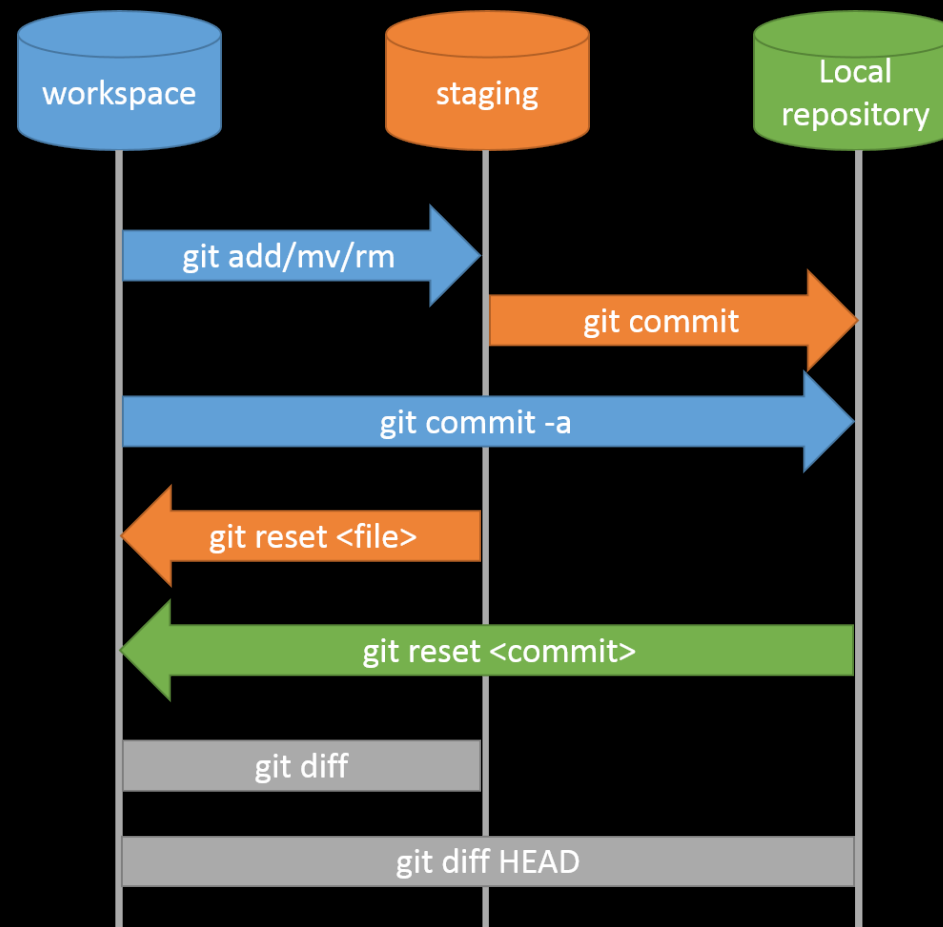
Restoring Files

- `git checkout`

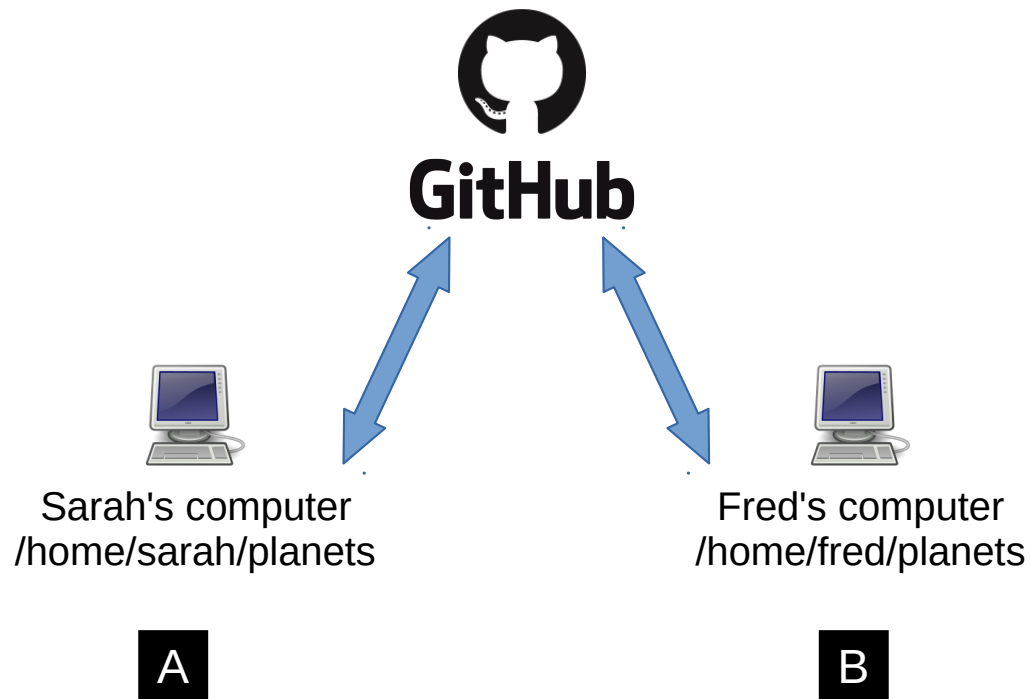
Git - restoration



Git Workflow – Local Repo.



Collaboration

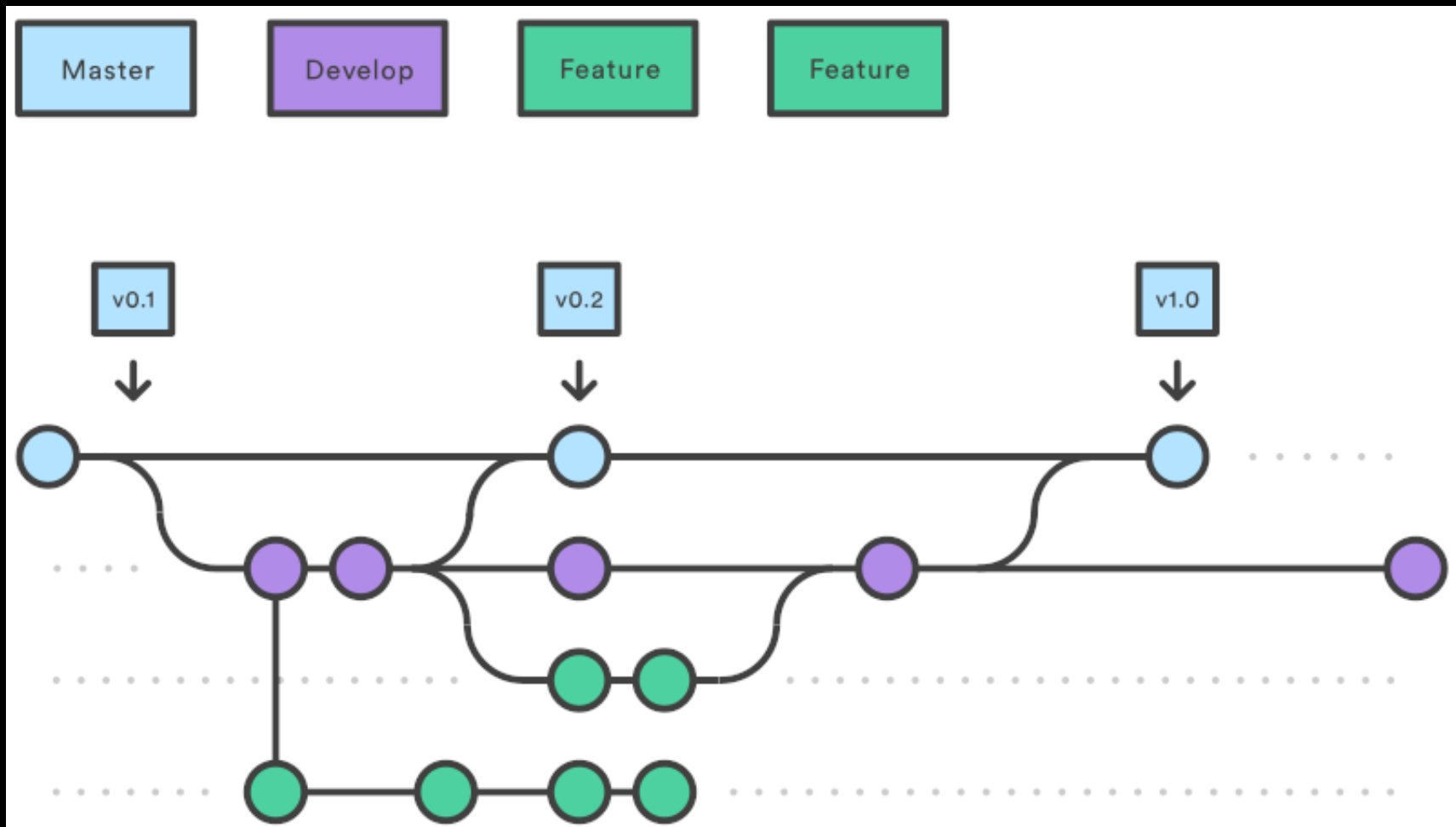


Collaboration:

Remote Repositories

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

Collaboration: Branches



Collaboration:

Creating Branches

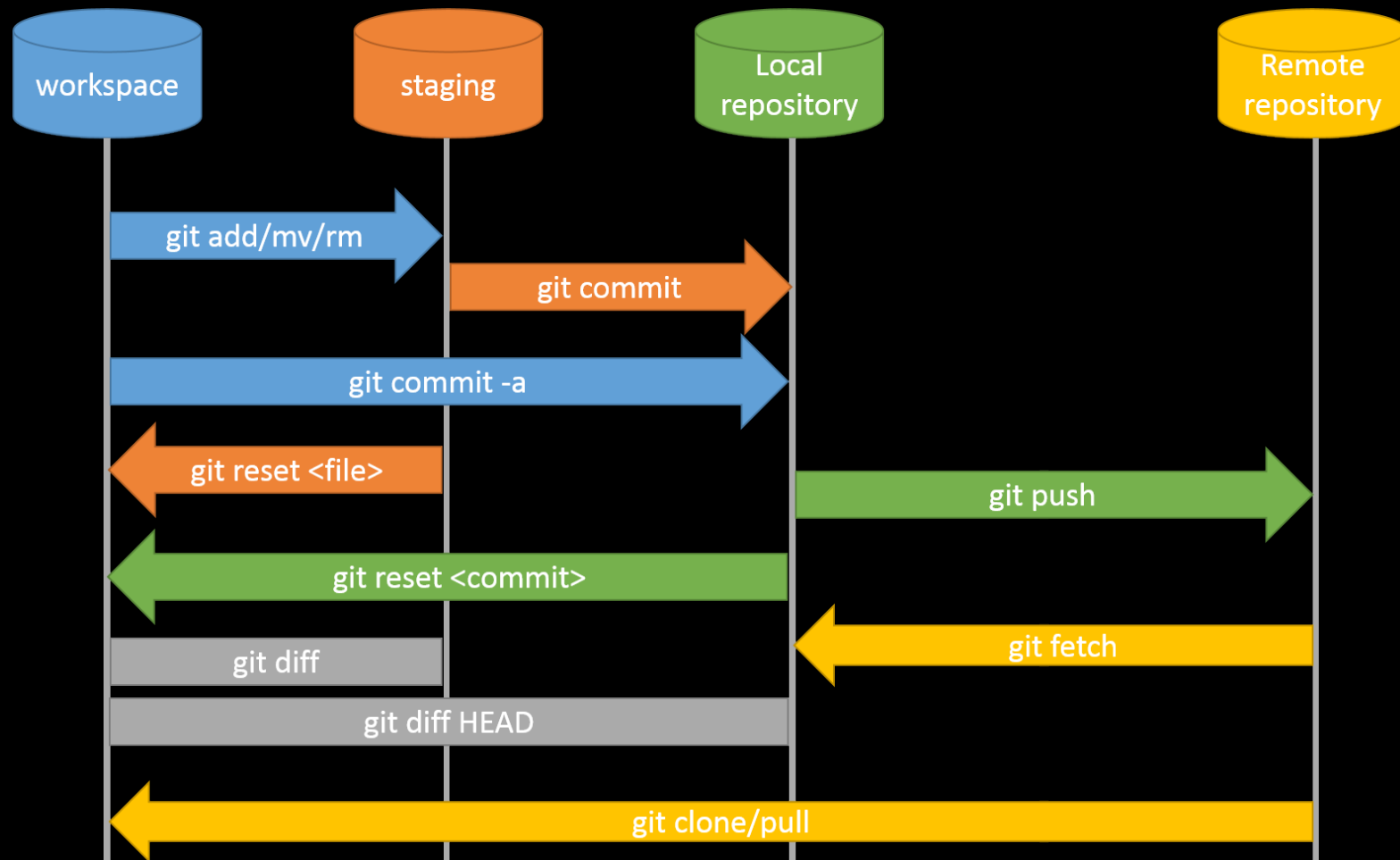
- `git branch dev`
- `git checkout dev`

Collaboration:

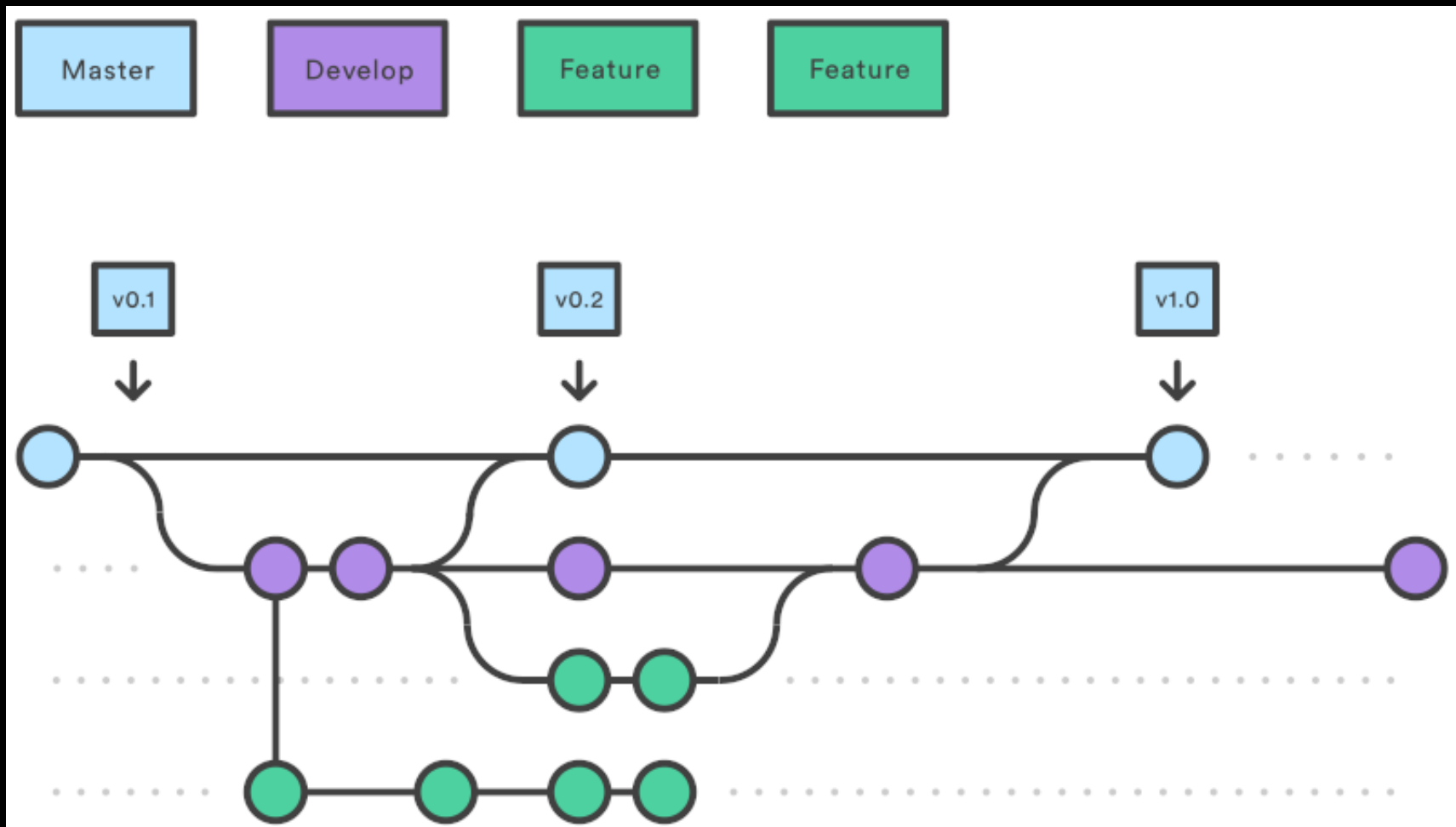
Creating Branches 2

- 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>