Git

What is Git?

it is a free and open-source version control system.

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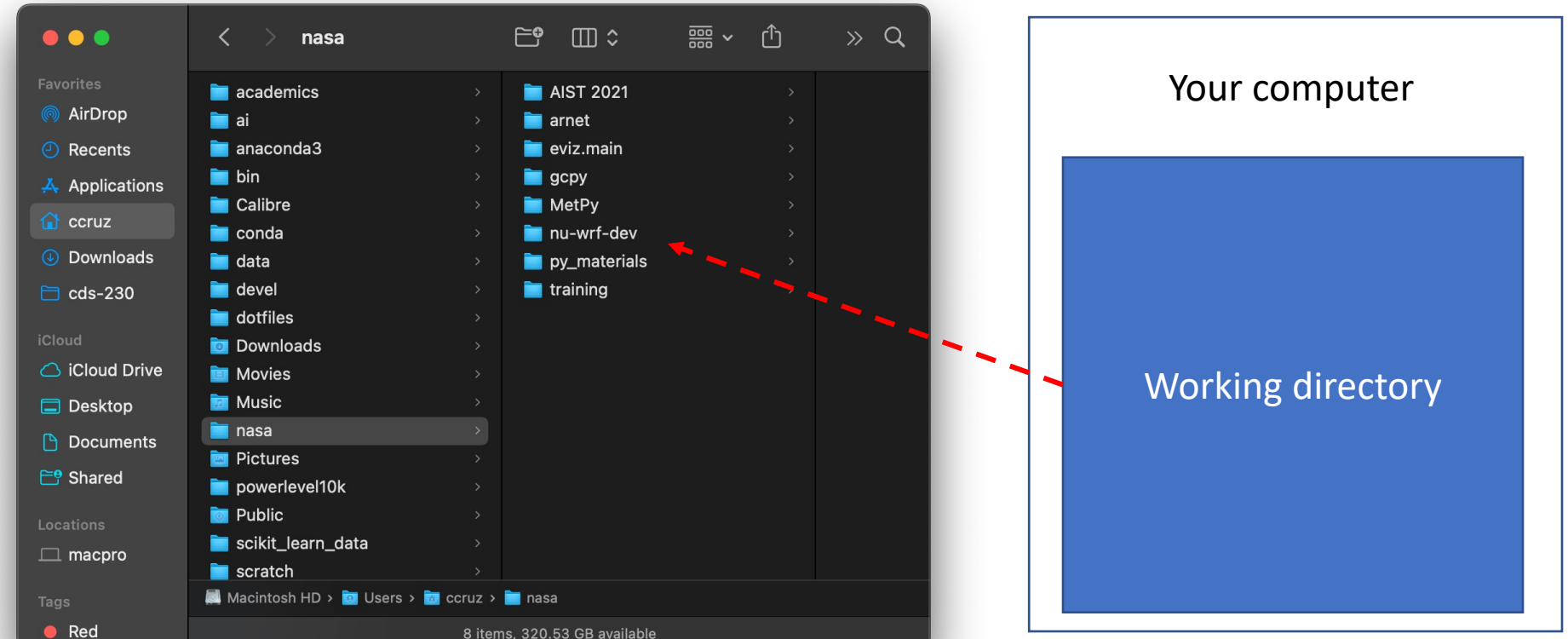
What is Version Control System?

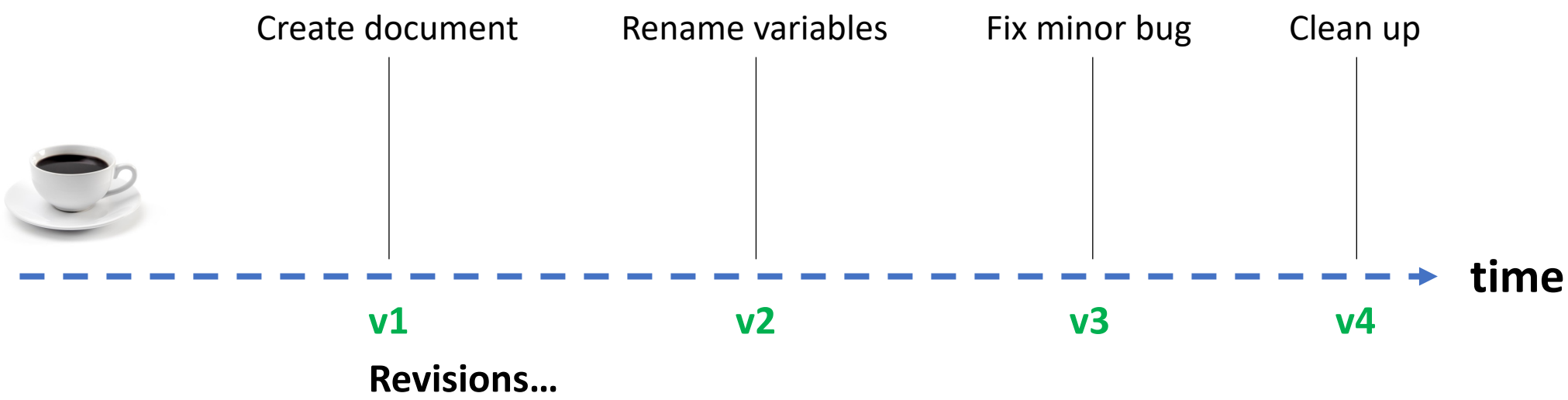
it refers to the management of changes to documents, specifically source code.


nasa
Favorites
AirDrop
Recents
Applications
ccruz
Downloads
cds-230
iCloud
iCloud Drive
Desktop
Documents
Shared
Locations
macpro
Tags
Red
academics
ai
anaconda3
bin
Calibre
conda
data
devel
dotfiles
Downloads
Movies
Music
nasa
Pictures
powerlevel10k
Public
scikit_learn_data
scratch
AIST 2021
arnet
eviz.main
gcpy
MetPy
nu-wrf-dev
py_materials
training
Macintosh HD › Users › ccruz › nasa
8 items, 320.53 GB available
Your computer
Working directory

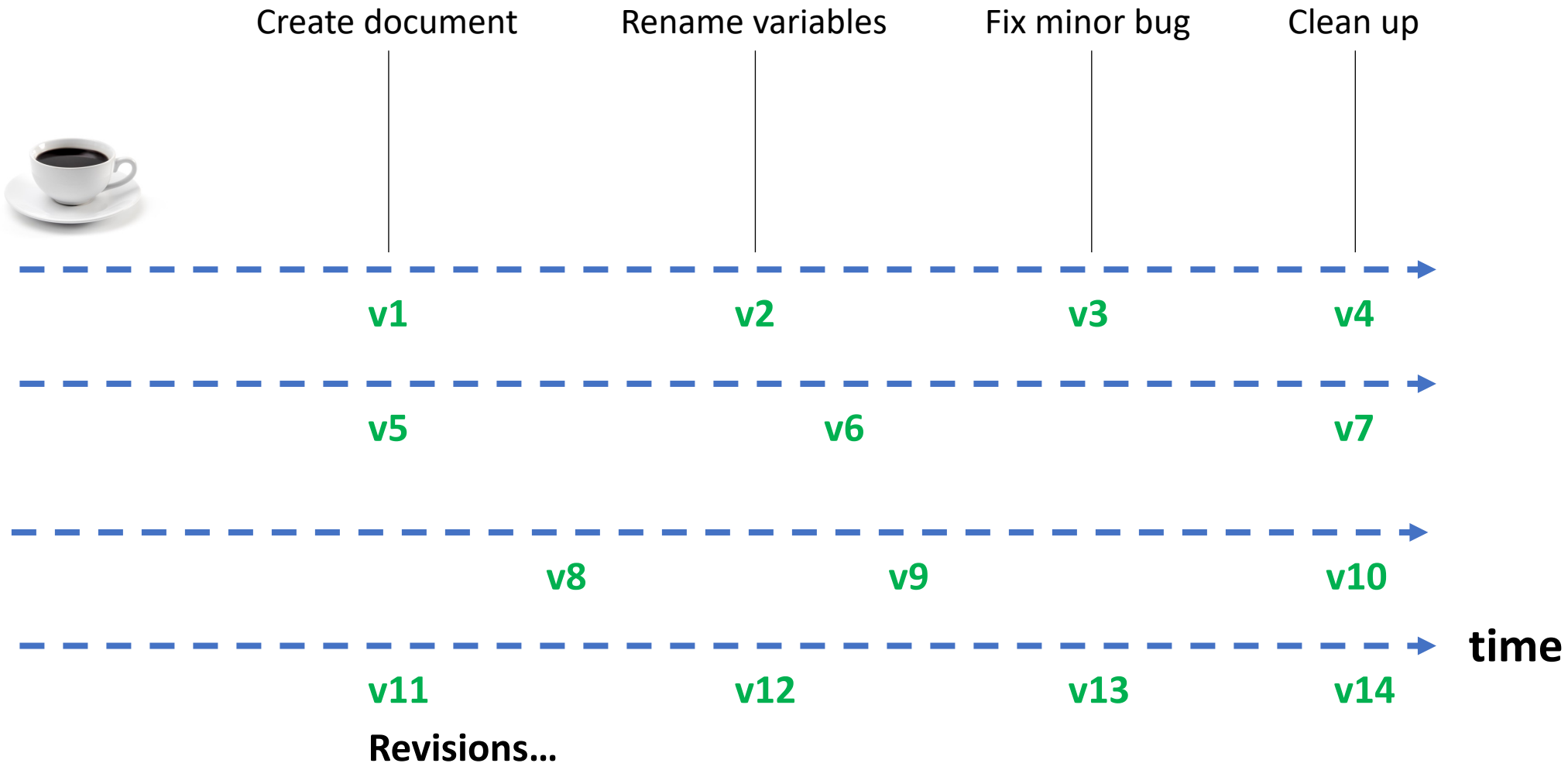
A Day in the Life of a Software Developer

A Day in the Life of a Software Developer

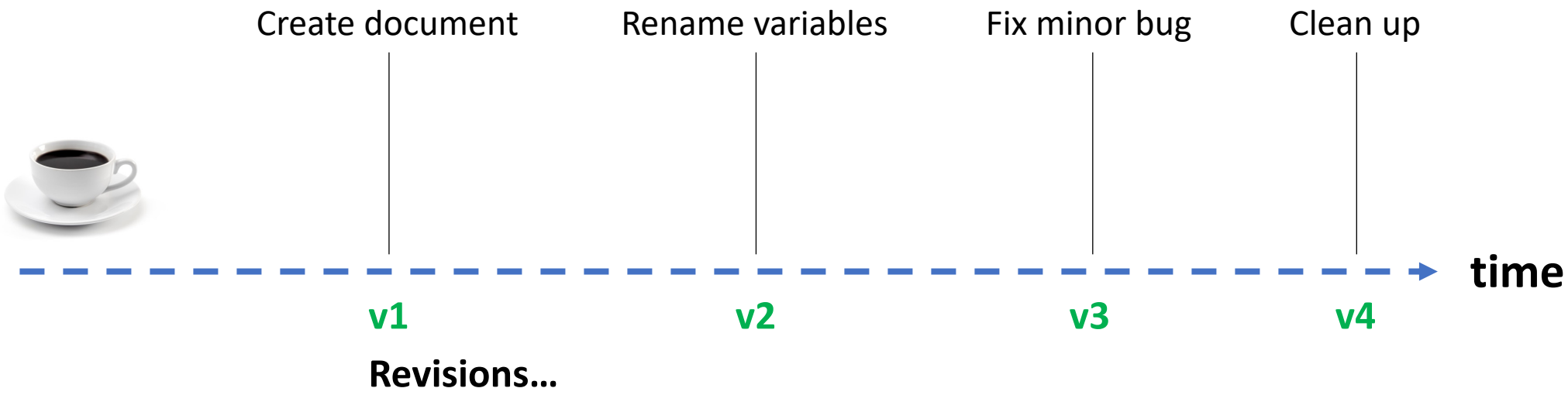
A Day in the Life of a Software Developer



After a few days…



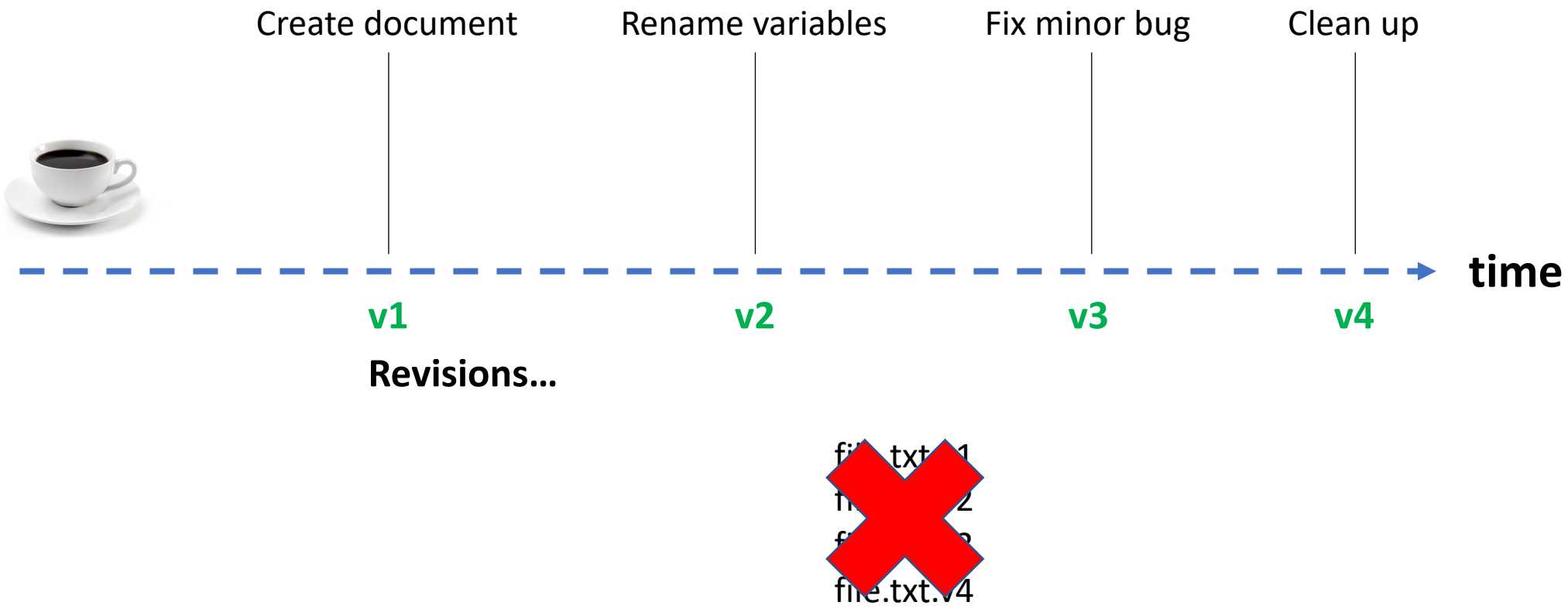
How do you handle file revisions?



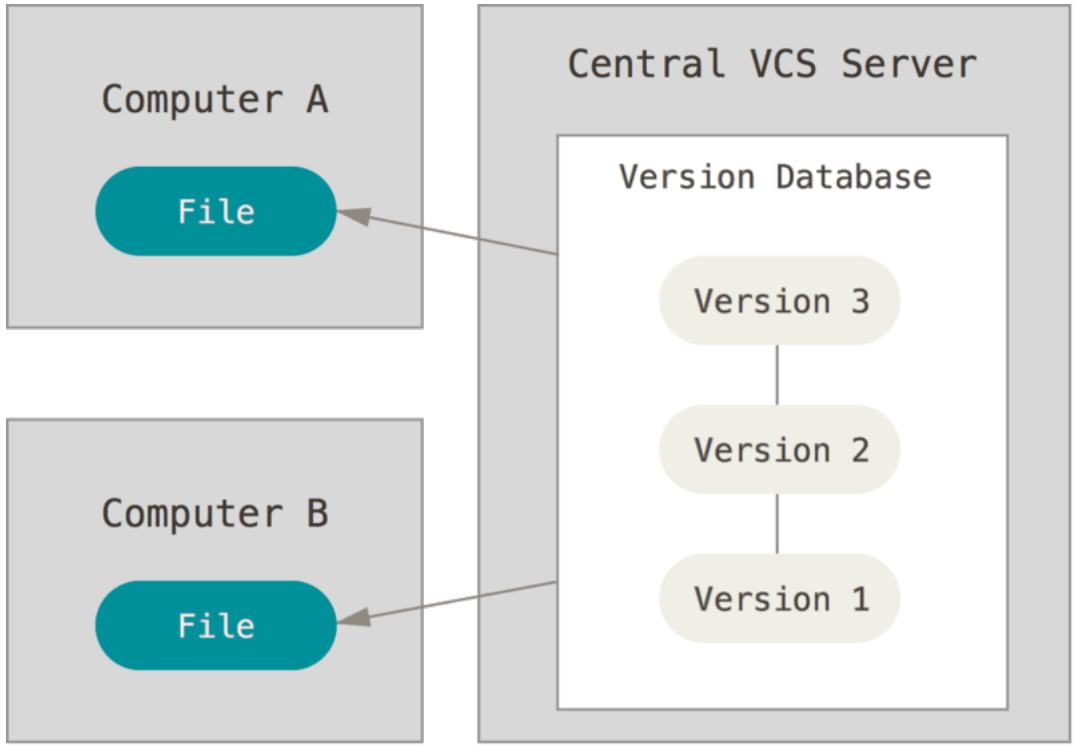
Revisions…

file.txt.v1
file.txt.v2
file.txt.v3
file.txt.v4

How do you handle file revisions?



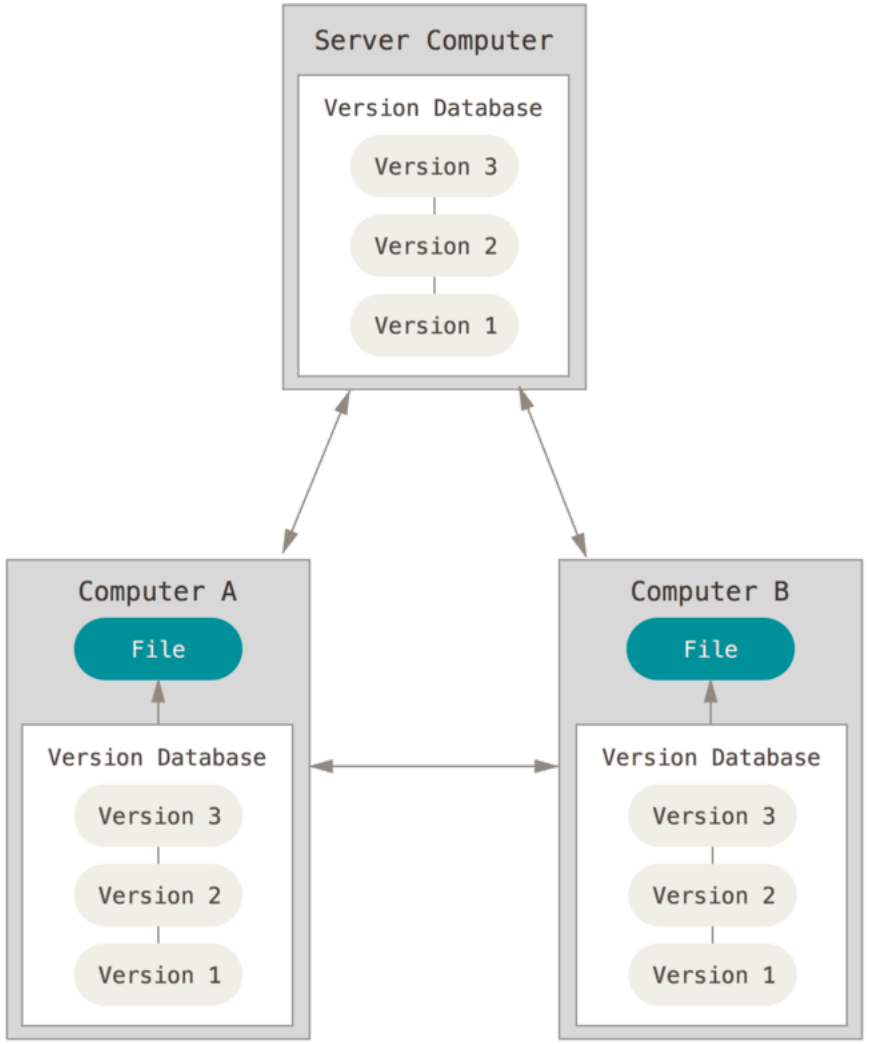
Why Git?



Older VCSs were centralized

Why Git?

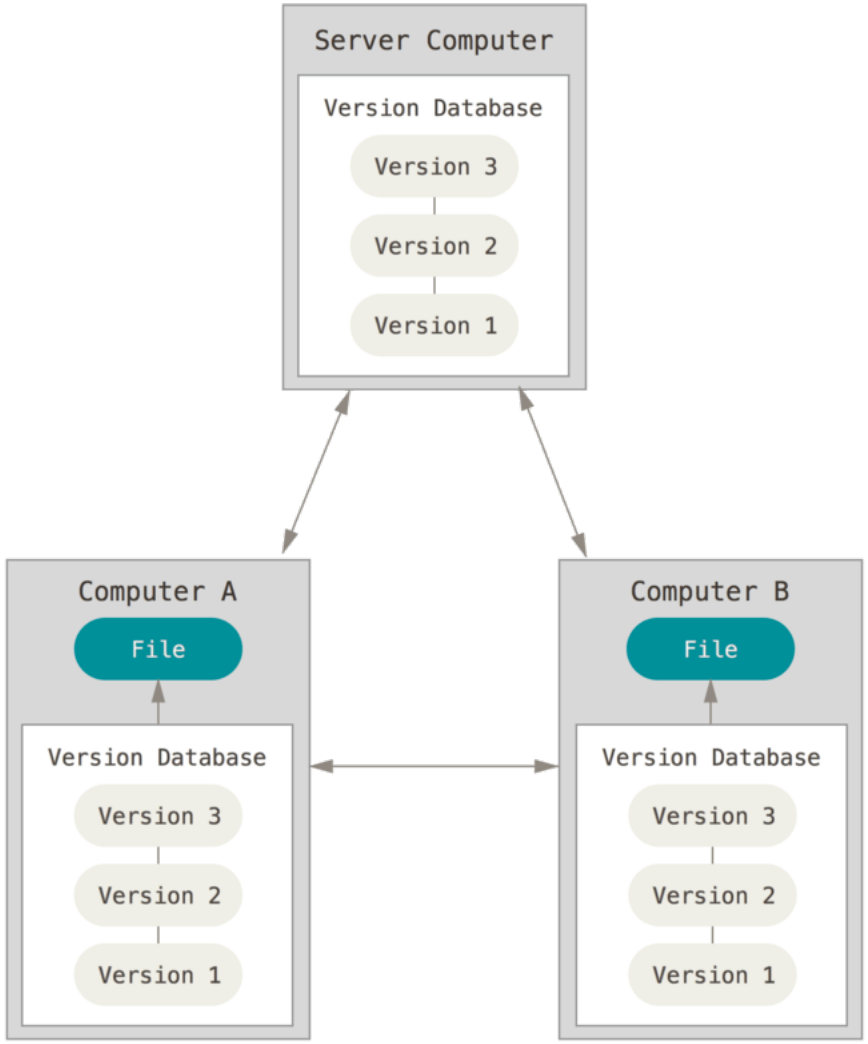
Git is Distributed



Why Git?

Git is Distributed

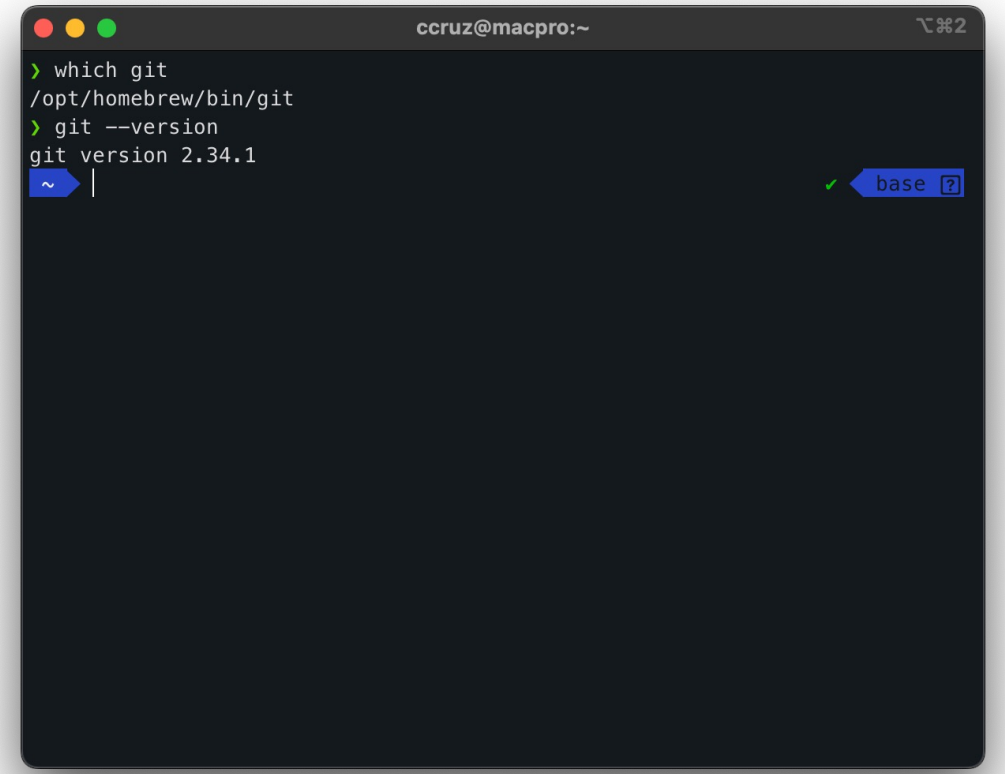
Facilitates collaboration



Interacting with the Operating System

Shell: software layer to interact with the OS. Examples: bash, zsh, csh

CLI: Command Line Interface



Terminal: Interface for Text commands

Interacting with the Operating System

Basic commands:

Directories

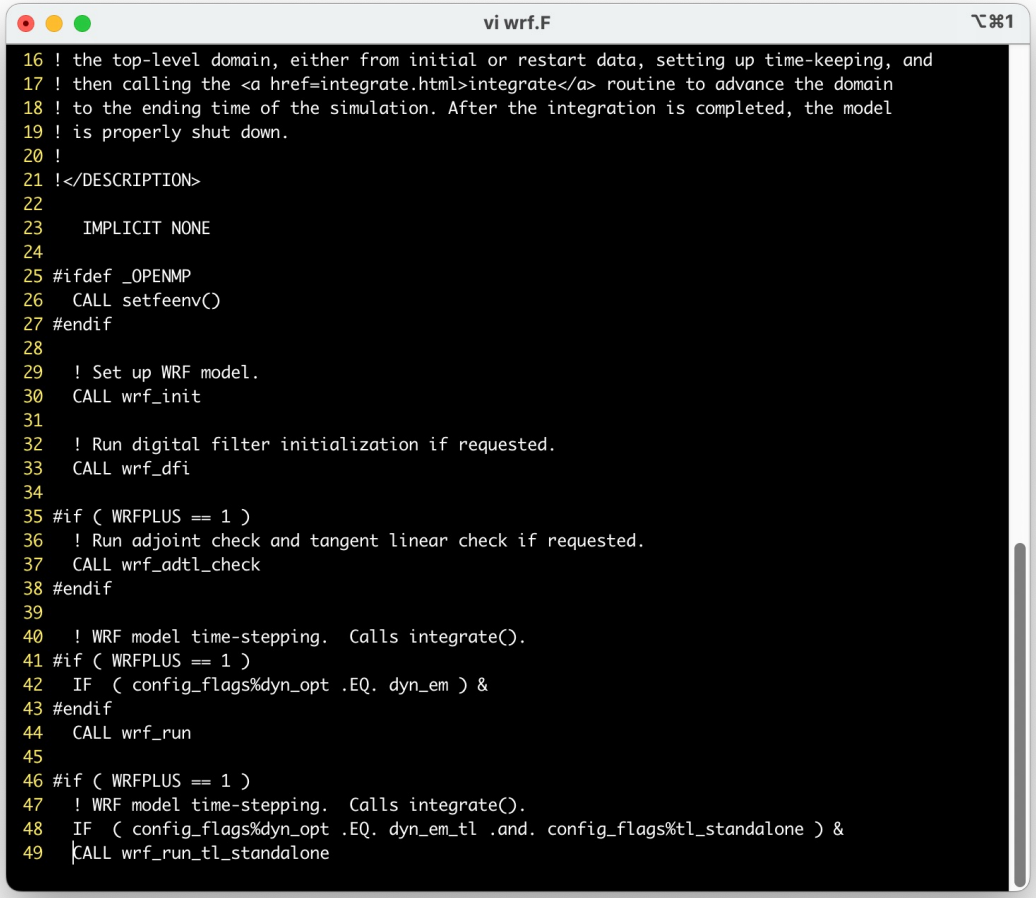
pwd : tells you where you currently are (the path)
mkdir dirname : create a new directory
cd dirname : change directory

Files

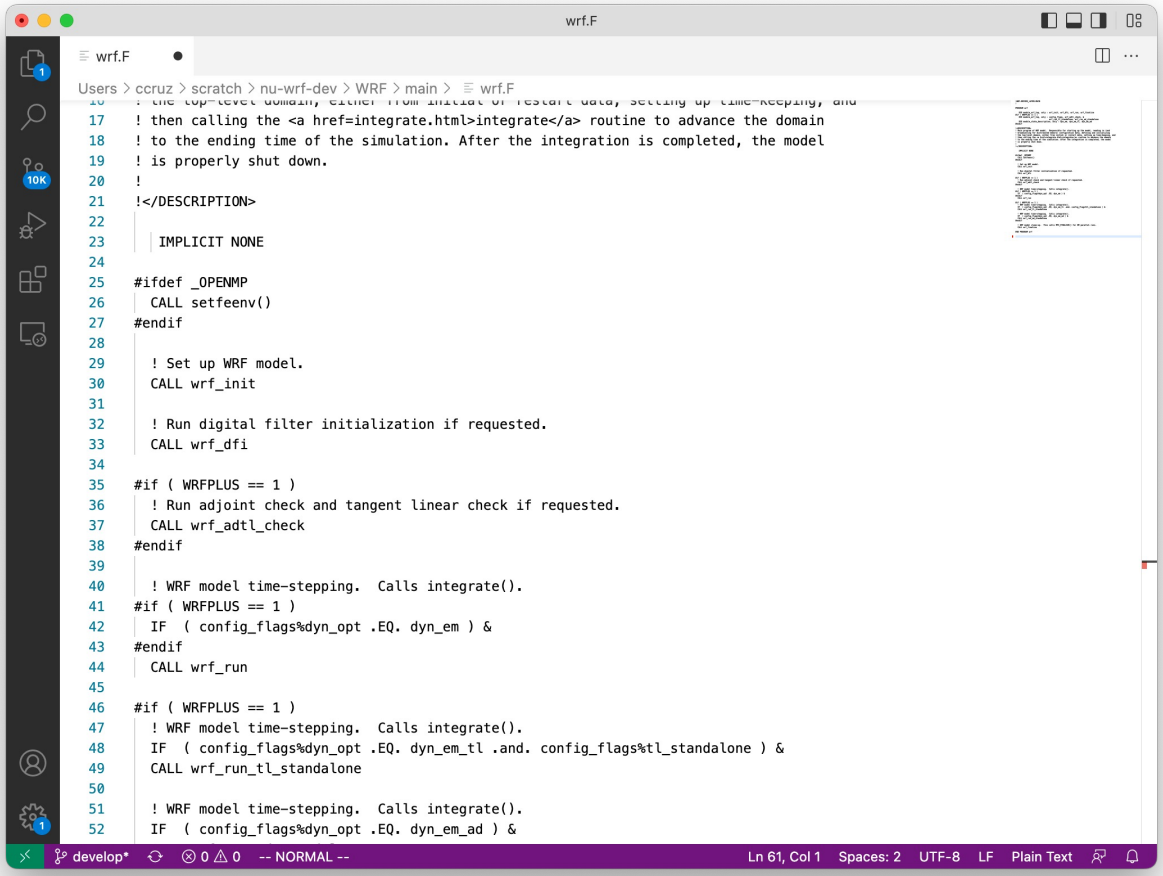
ls : list files
rm filename : remove a file
mv filename1 filename2 : rename a file
diff filename1 filename2 : compare two files
cat filename(s) : print file(s) contents
which : shows path of a command
echo : write to standard output

Creating and modifying files

Code Editor: **vim**, emacs, **nano**, IDEs,…

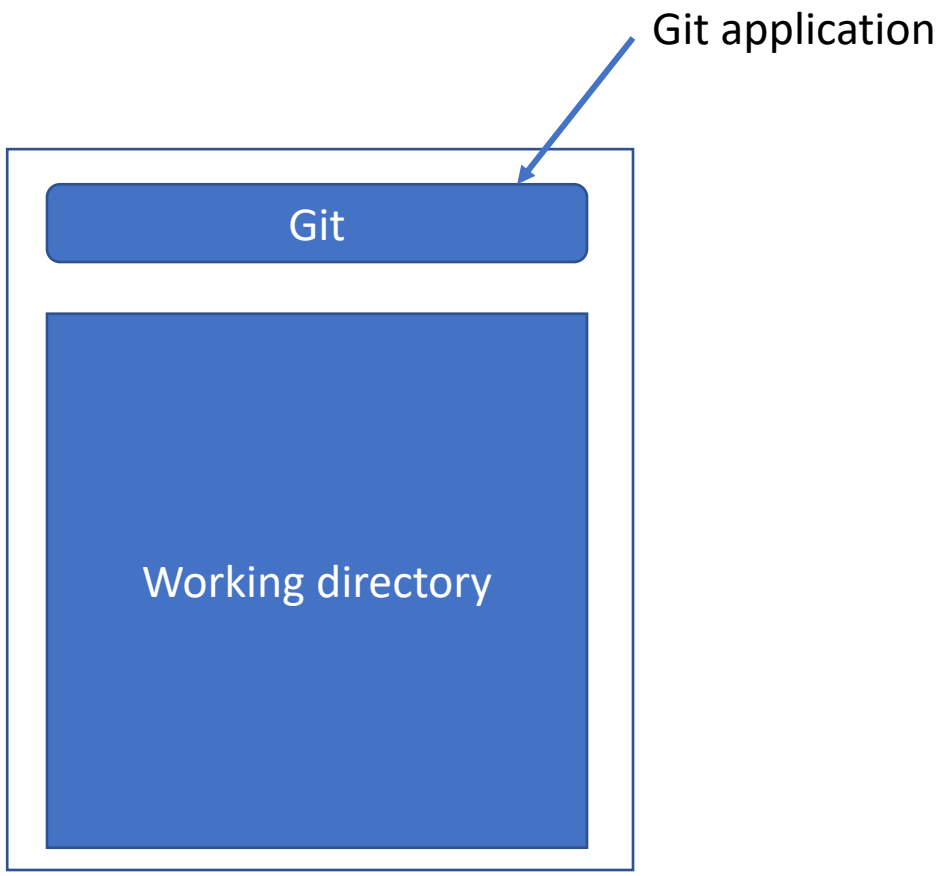


vim



Visual Studio

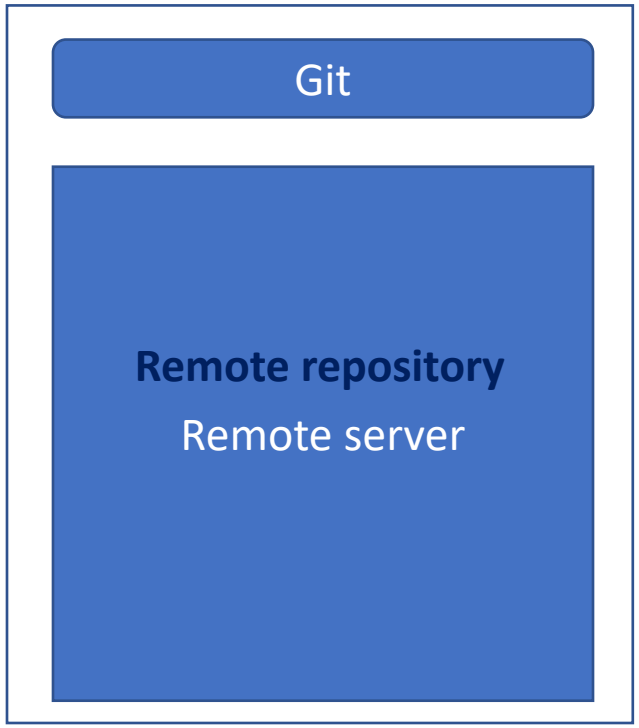
ccruz@macpro:~
⌥⌘2
❯ which git
/opt/homebrew/bin/git
❯ git --version
git version 2.34.1
~
base


Git application
Git
Working directory

init

init: creates a new local repository with some specified name

init
add
commit
log
status
diff



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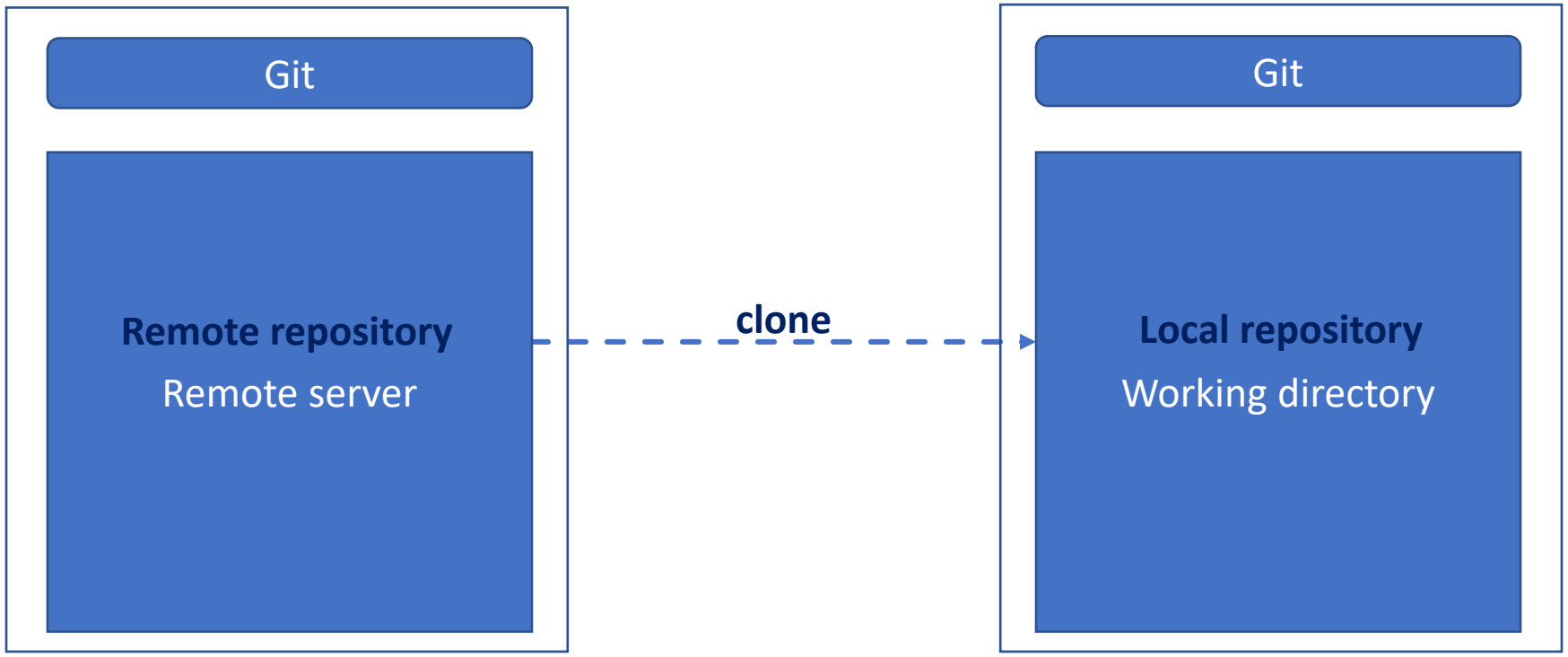
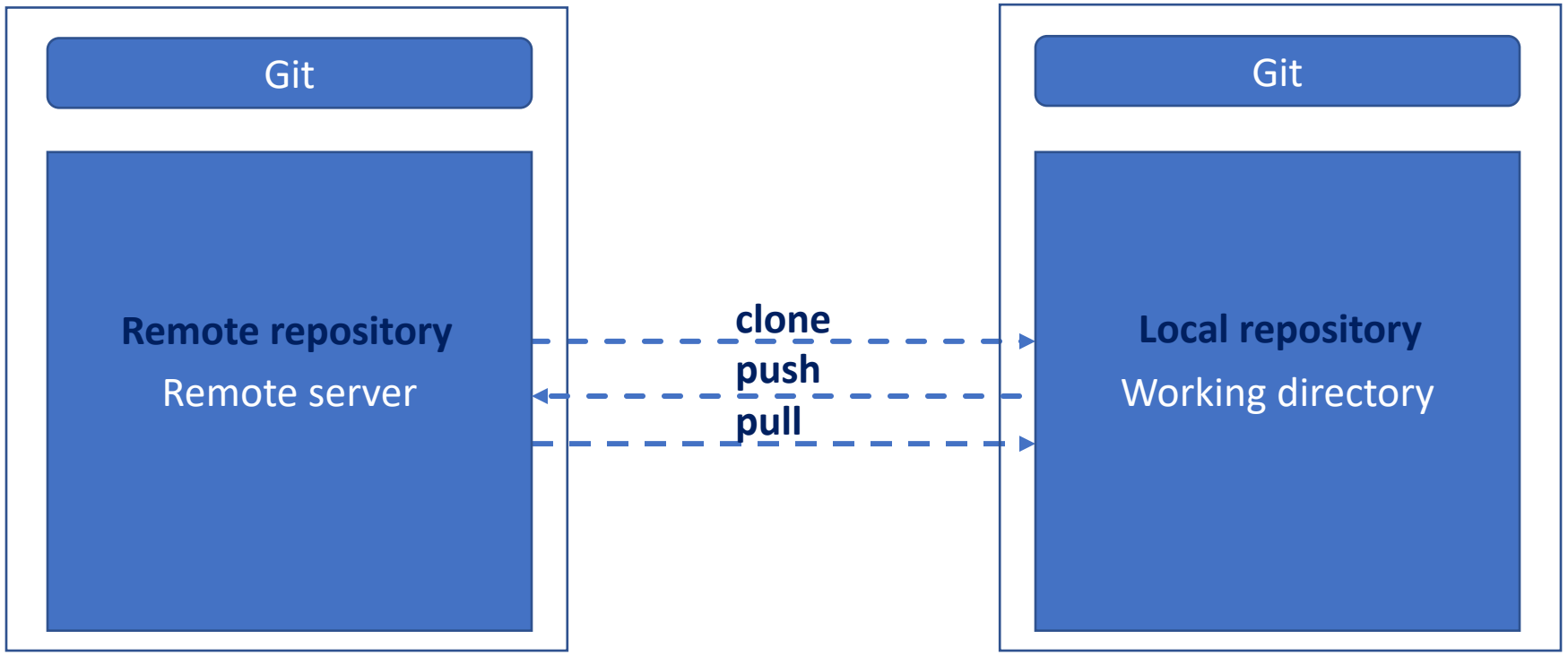
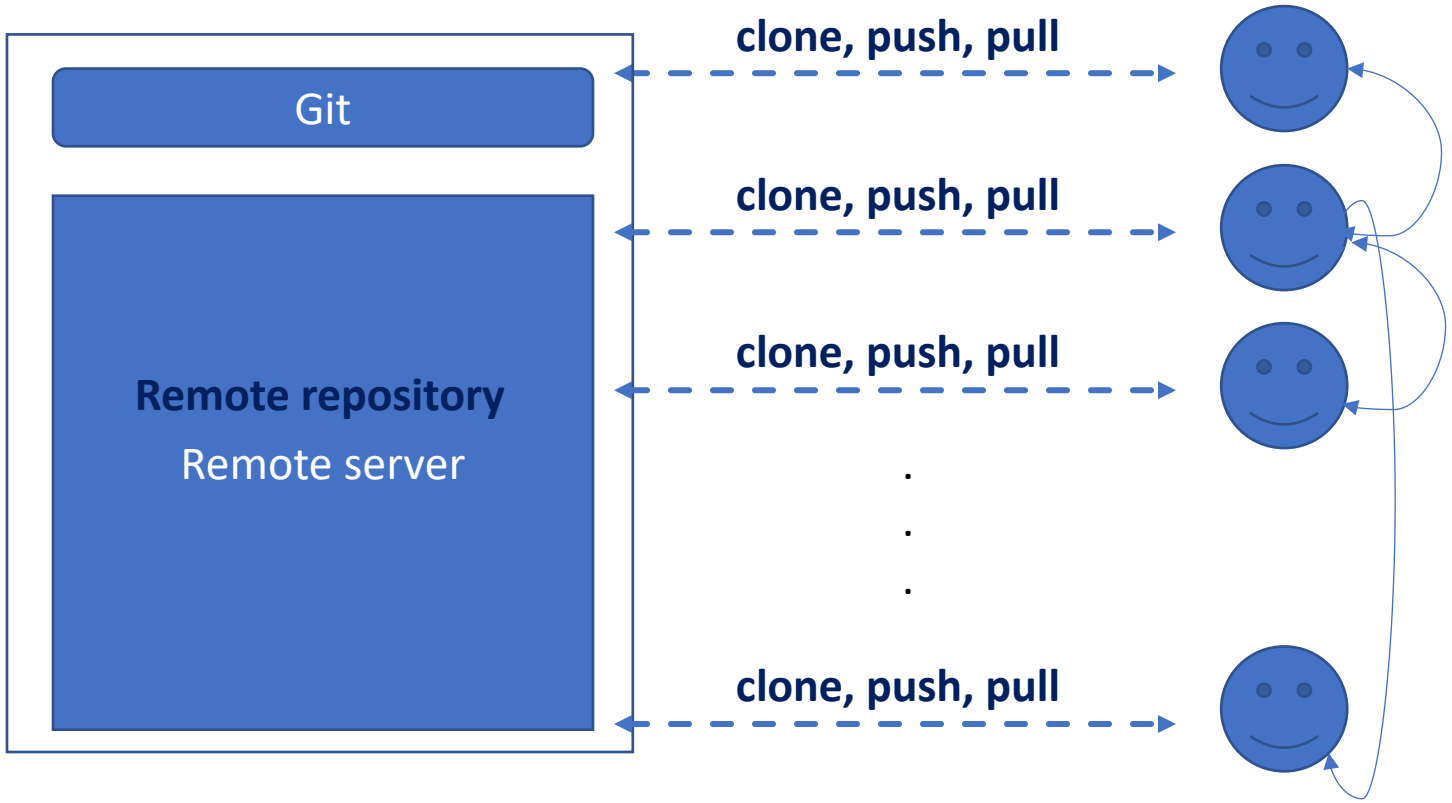
diff



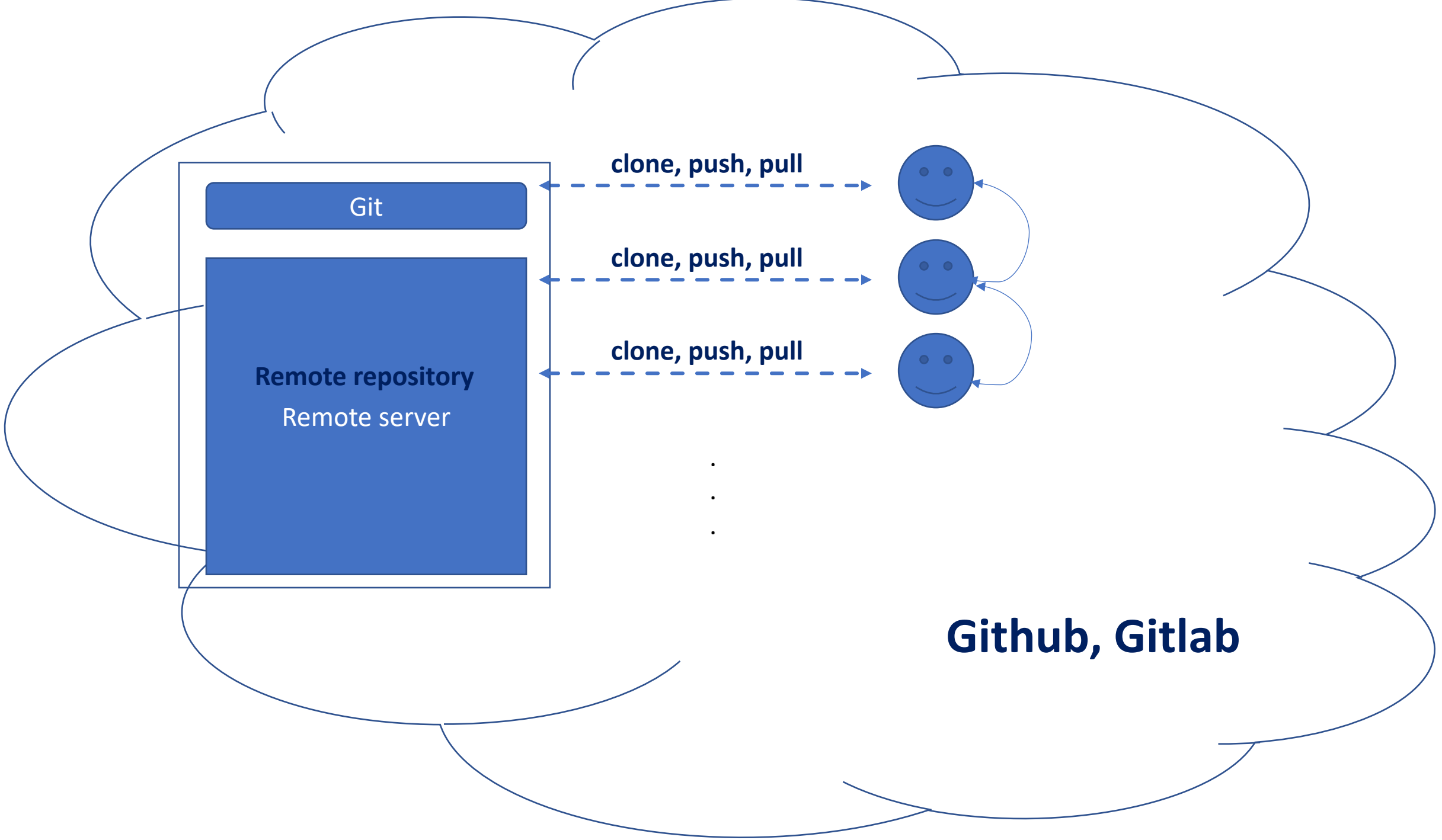
init
add
commit
log
status
diff



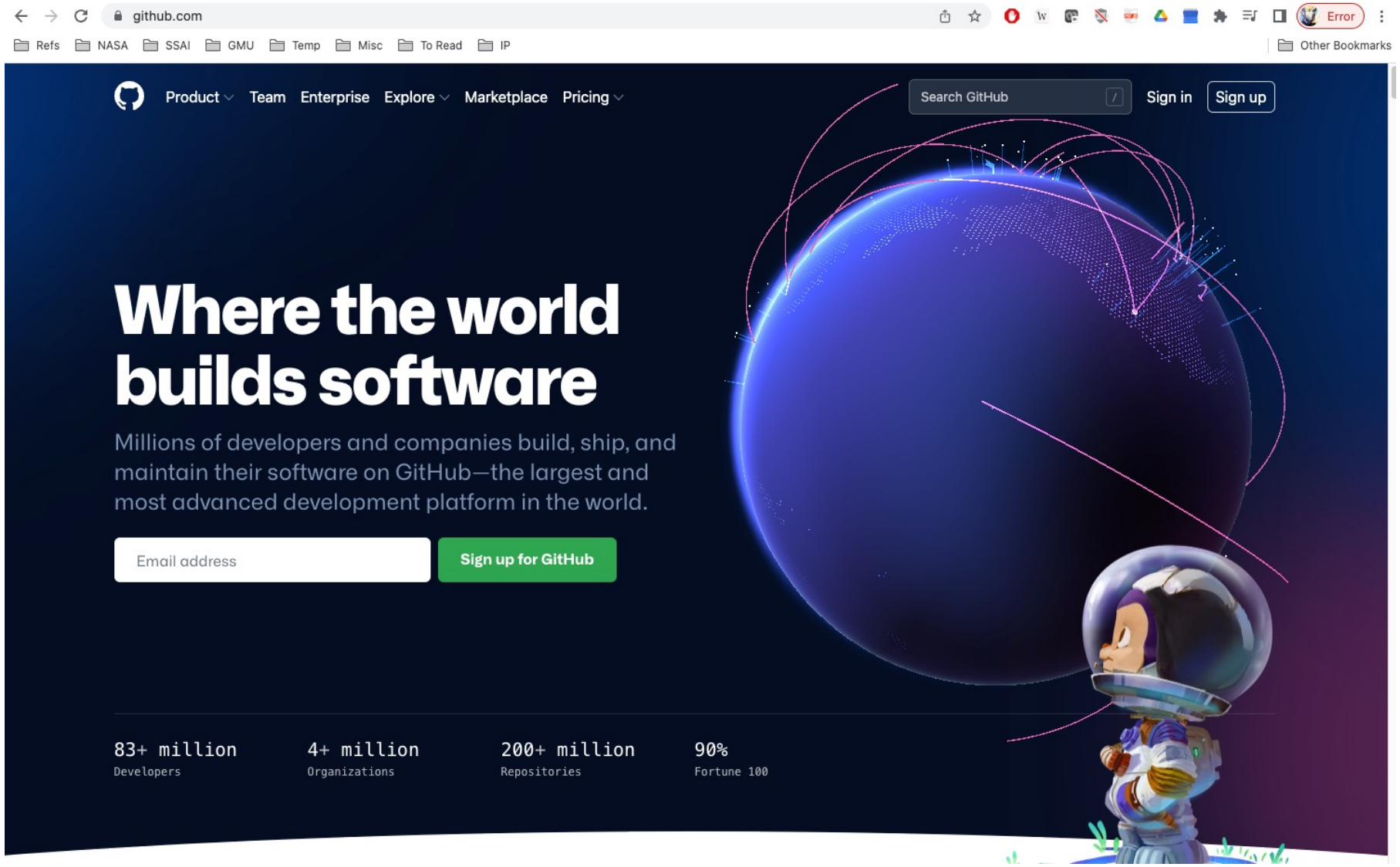
init
add
commit
log
status
diff



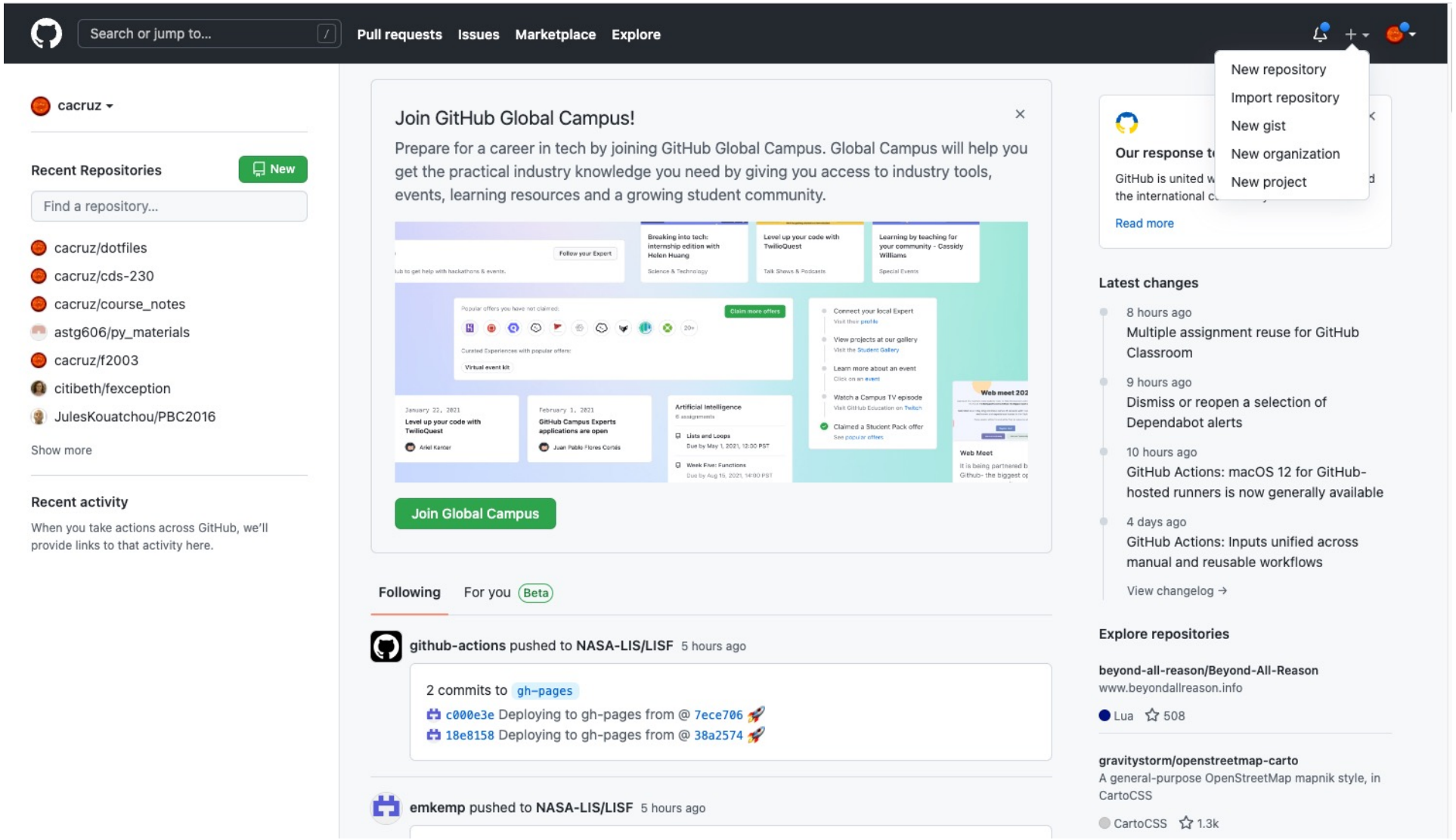
Collaboration


Git
Remote repository
Remote server
clone, push, pull
clone, push, pull
clone, push, pull
Github, Gitlab

GitHub


github.com
Refs
NASA
SSAI
GMU
Temp
Misc
To Read
IP
Other Bookmarks
Error
Product
Team
Enterprise
Explore
Marketplace
Pricing
Search GitHub
Sign in
Sign up
Where the world builds software
Millions of developers and companies build, ship, and maintain their software on GitHub—the largest and most advanced development platform in the world.
Email address
Sign up for GitHub
83+ million
Developers
4+ million
Organizations
200+ million
Repositories
90%
Fortune 100

GitHub


Search or jump to...
Pull requests
Issues
Marketplace
Explore
New repository
Import repository
New gist
New organization
New project
cacruz
Recent Repositories
New
Find a repository...
cacruz/dotfiles
cacruz/cds-230
cacruz/course_notes
astg606/py_materials
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Recent activity
When you take actions across GitHub, we'll provide links to that activity here.
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Following
For you
Beta
github-actions pushed to NASA-LIS/LISF 5 hours ago
2 commits to gh-pages
c000e3e Deploying to gh-pages from @ 7ece706
18e8158 Deploying to gh-pages from @ 38a2574
emkemp pushed to NASA-LIS/LISF 5 hours ago
Our response t
GitHub is united w
the international c
Read more
Latest changes
8 hours ago
Multiple assignment reuse for GitHub Classroom
9 hours ago
Dismiss or reopen a selection of Dependabot alerts
10 hours ago
GitHub Actions: macOS 12 for GitHub-hosted runners is now generally available
4 days ago
GitHub Actions: Inputs unified across manual and reusable workflows
View changelog →
Explore repositories
beyond-all-reason/Beyond-All-Reason
www.beyondallreason.info
Lua 508
gravitystorm/openstreetmap-carto
A general-purpose OpenStreetMap mapnik style, in CartoCSS
CartoCSS 1.3k

Working with Git

Git Customization

- **System:** /etc/gitconfig
- **User:** $HOME/.gitconfig
- **Project:** my_project/.git/config

Git commands to edit configuration:

git config --system (system)
git config --global (user)
git config (project)

$ git config --global user.name "[name]"

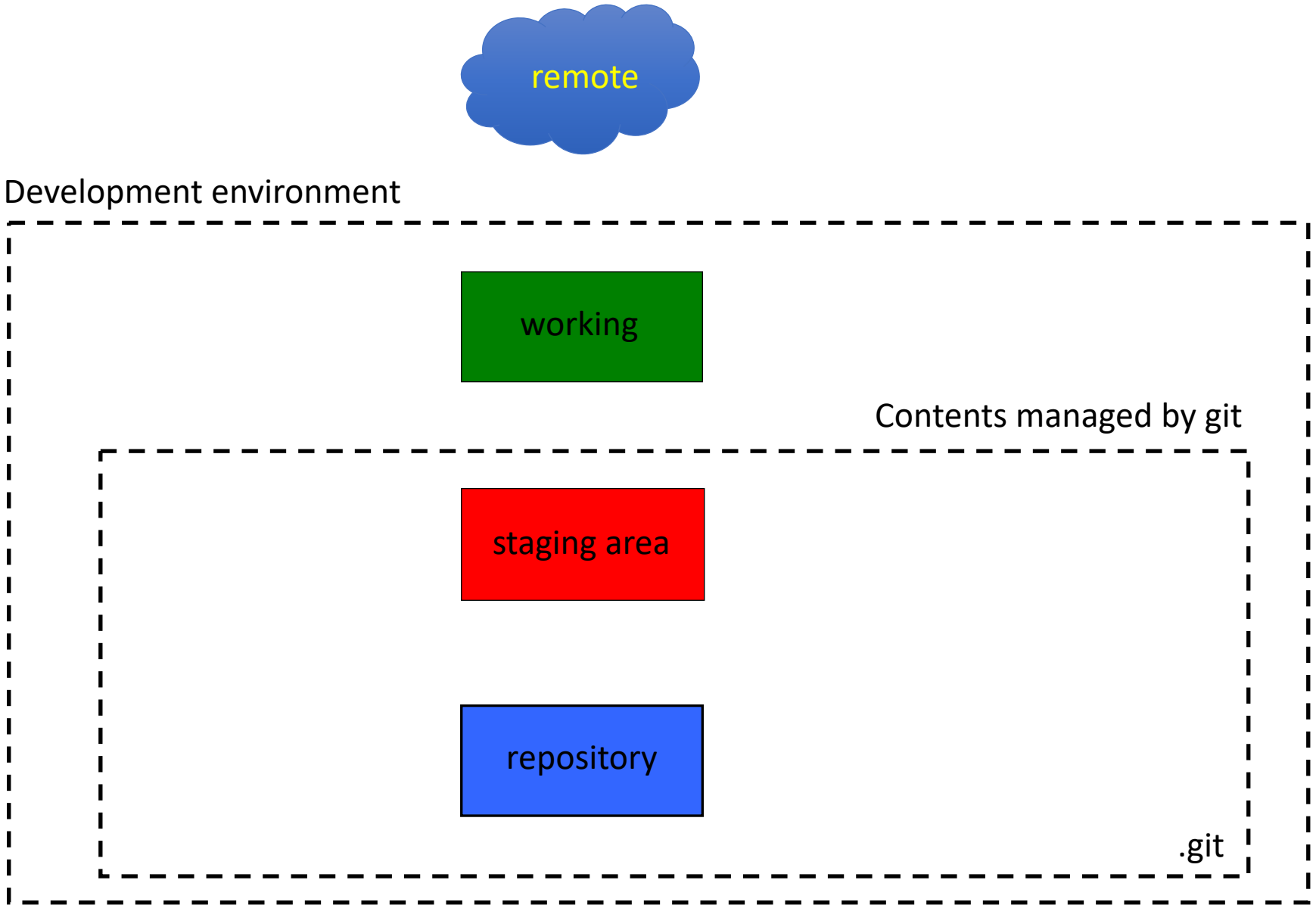
Sets the name you want attached to your commit transactions

$ git config --global user.email "[email address]"

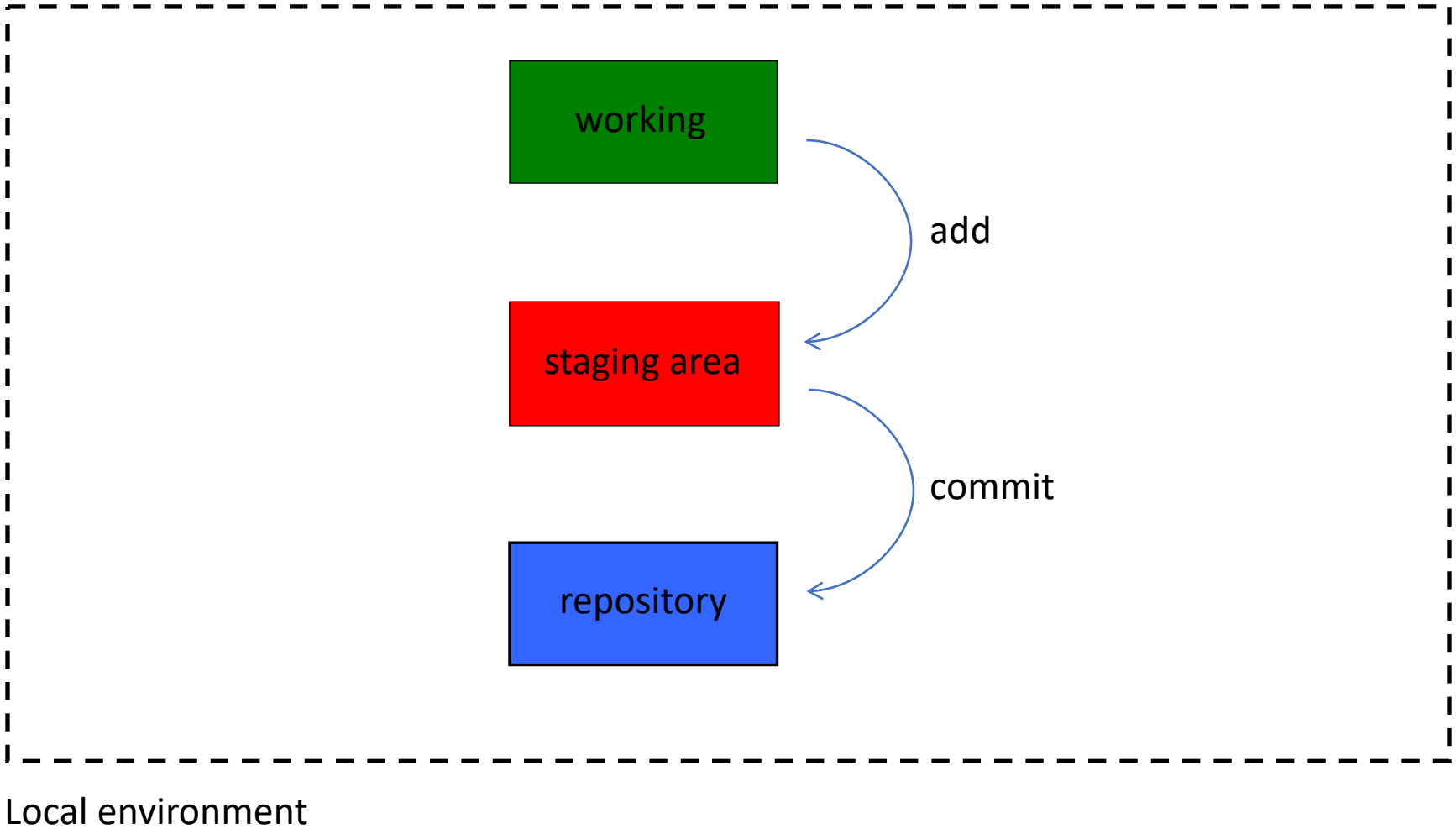
Sets the email you want attached to your commit transactions

$ git config --global color.ui auto

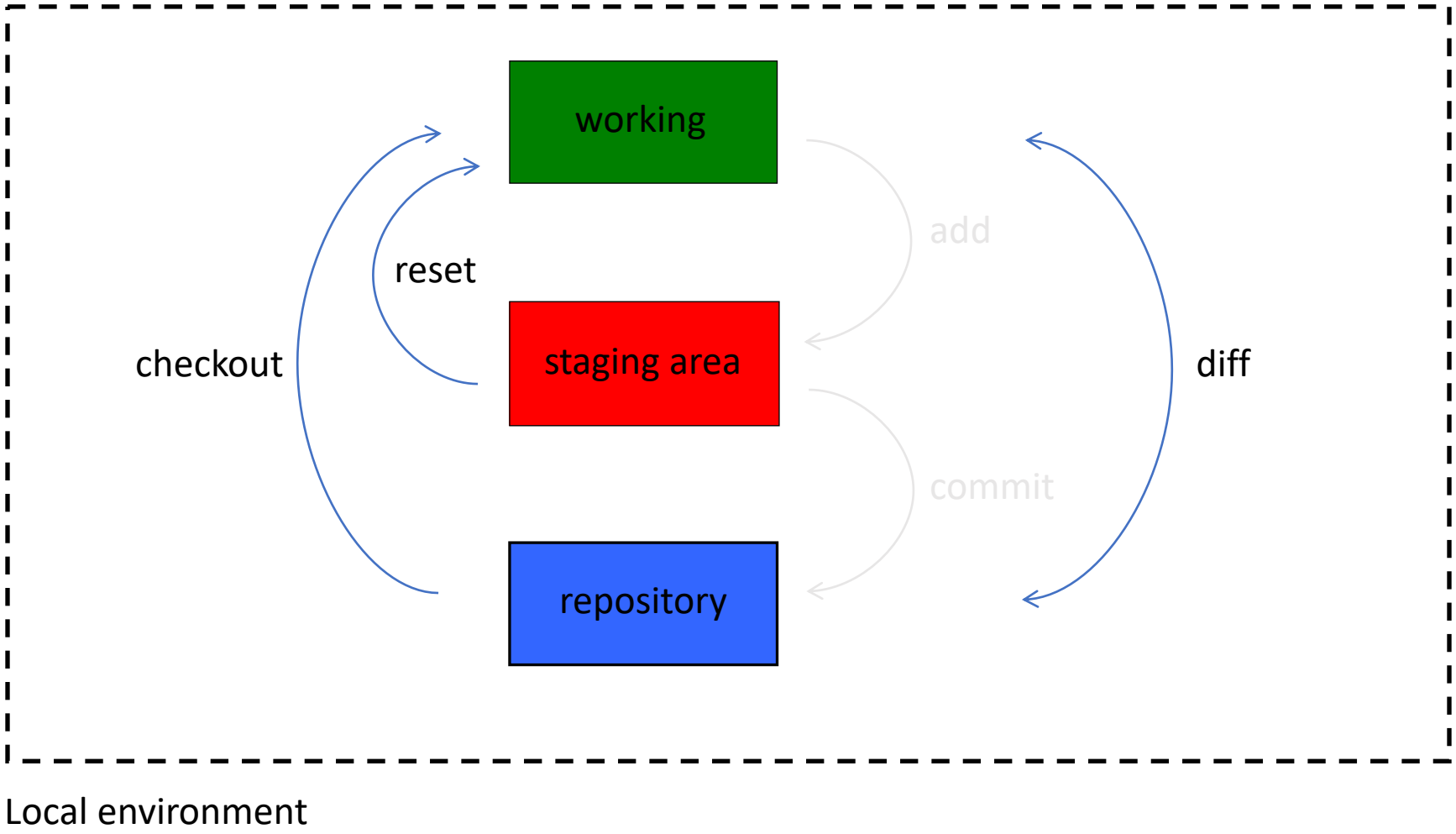
Enables helpful colorization of command line output


remote
Development environment
working
Contents managed by git
staging area
repository
.git

Git Workflow



Git Workflow



Basic Git Commands

Create repositories

$ git init [project-name]

Creates a new local repository with the specified name

$ git clone [url]

Downloads a project and its entire version history

Make changes

$ git status

Lists all new or modified files to be committed

$ git add [file]

Snapshots the file in preparation for versioning

$ git reset [file]

Unstages the file, but preserve its contents

$ git diff

Shows file differences not yet staged

$ git diff --staged

Shows file differences between staging and the last file version

$ git commit -m "[descriptive message]"

Records file snapshots permanently in version history

Group changes

$ git branch

Lists all local branches in the current repository

$ git branch [branch-name]

Creates a new branch

$ git checkout [branch-name]

Switches to the specified branch and updates the working directory

$ git merge [branch]

Combines the specified branch's history into the current branch

$ git branch -d [branch-name]

Deletes the specified branch

Review history

$ git log

Lists version history for the current branch

$ git log --follow [file]

Lists version history for a file, including renames

$ git diff [first-branch]...[second-branch]

Shows content differences between two branches

$ git show [commit]

Outputs metadata and content changes of the specified commit