Version Control Systems

KATHLEEN MALONE

Version Control System

Now that we will be writing and testing larger applications, how do we keep track of all our files, edits and versions?

Have you found yourself saving different versions of a file, like Project1.java and Project1_backup.java, just in case?

Version control is a system that records changes to a file or set of files over time so that you can recall specific **versions** later.

Before VCS

If you made a mistake, the old version of your code could be lost forever

Multiple copies of old versions of projects were stored as back up

One person owned the final version of a project

Teams working together on the same files was challenging

Git

Most popular VCS

Created by **Linus Torvalds**, the creator of the **Linux OS**

Is open source and free

Hugely popular

Github

Git and Github are 2 different things!

Git is the decentralized VCS

- Decentralized means that the Git project versions are stored locally on each user's system AND remotely.

Github is a hosting platform of the remote Git projects

- You must have Git installed locally to use and store projects on Github

Git and Github Combo

Very powerful!

Combination of source control and cloud storage

Makes for easy collaboration among team members

Team members can work locally and store remotely

Git Terminology

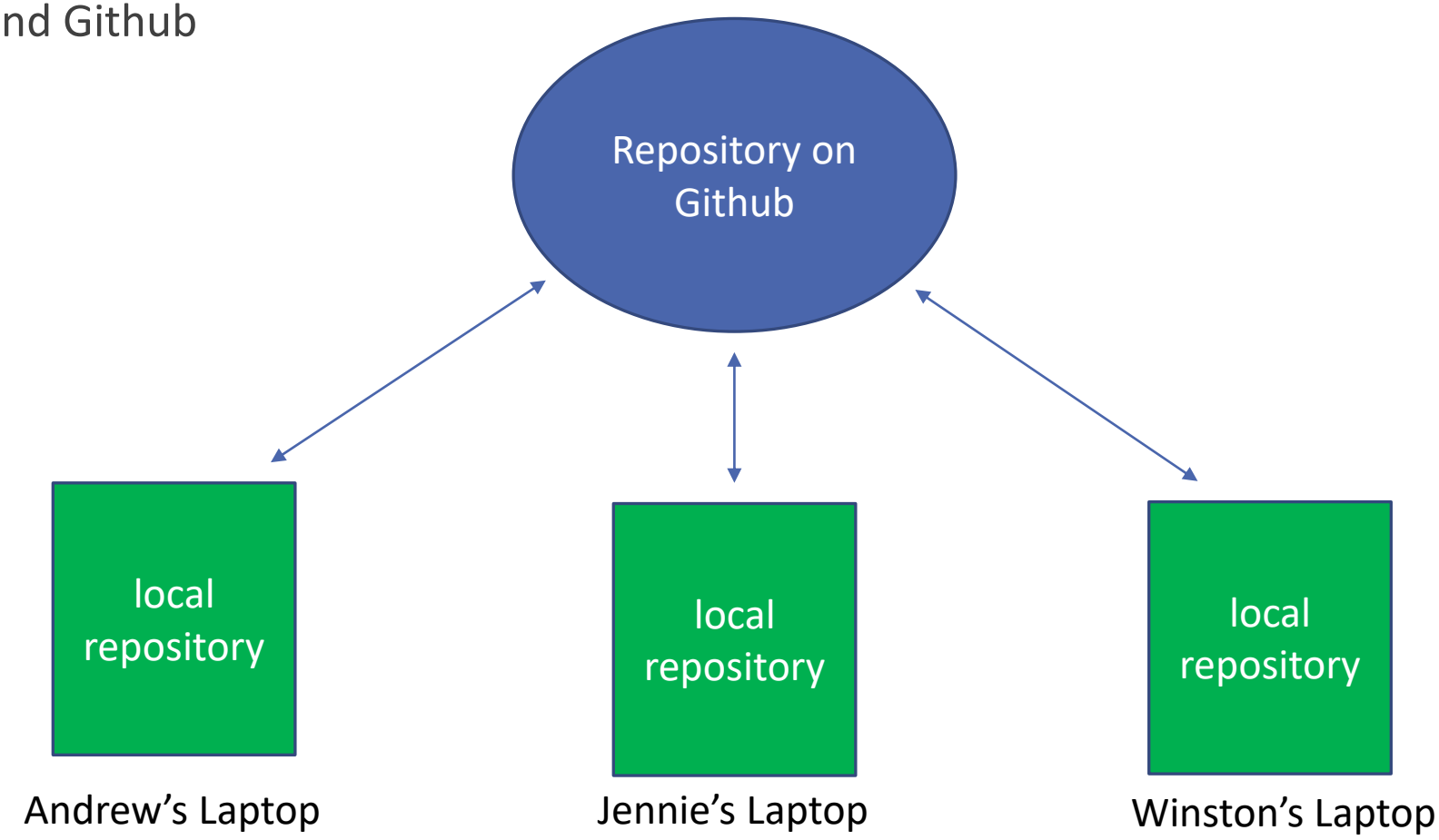
Repository – used to store a project

Local Repository – repository on user's laptop

Remote Repository – repository located remotely

Example

Git and Github



Git Actions

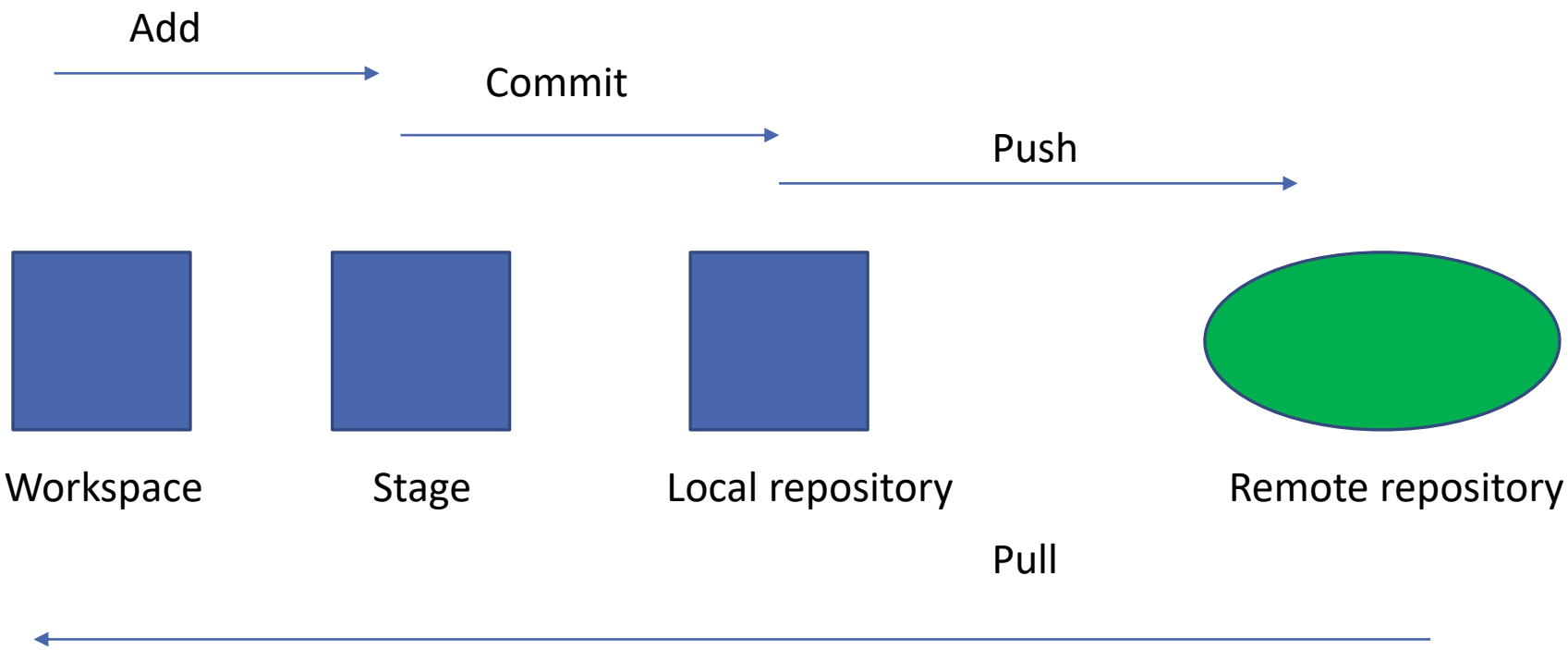
From the local user to the remote repository:

- **Add** – Add a file to a local staging area
- **Commit** – Adds any changes of the file to the local repository
- **Push** – Adds changed files to the remote repository

From the remote repository to the local user:

- **Pull** – gets any changes from the remote repository and adds directly to the local repository

Git Workflow



Git commands

Some useful Git commands:

git init – initialize a local directory as a Git repository

git clone <url of remote repository> - downloads the remote repository into the local git workspace

git add <filename> - add a file to the local Git staging area

git add . – add all files in the directory to the local staging area

git commit -m “comments” – commit all staged files to the local repository

git push – push all staged files to a remote repository

git pull – pull files from remote repository to local repository and workspace

git merge – merge files with conflicts from the remote repository into the local repository

The command line

Some useful command line commands:

pwd – display full path of current location

ls – list the contents of the directory

cd (on Mac) cd~(PowerShell) – go to home directory

cd <directory_name> - change directories one level deep to the given name

cd .. – change directories one level up

cd ../../ - change directories 2 levels up

mkdir <directory_name> – make a new directory

cp </full_path/filename> </full_path/new filename> - copy a file to a new location or filename

rm </full_path/filename> - delete file

rm –r <full_path/filename> - delete directory and all of its contents

cat <filename> (most other shells) – view file contents