



Introduction to code repository: Git

ALMA Common Software
Course Project



What is Git:

- ✧ Design goals
- ✧ Local Workflow
- ✧ Remote Workflow
- ✧ Branches
- ✧ Common commands

Project examples:

- ✧ Configuring Git for the project
- ✧ Cloning the repository
- ✧ First commit
- ✧ Pushing your changes
- ✧ Pulling other's changes
- ✧ Merge conflicts

Git is:

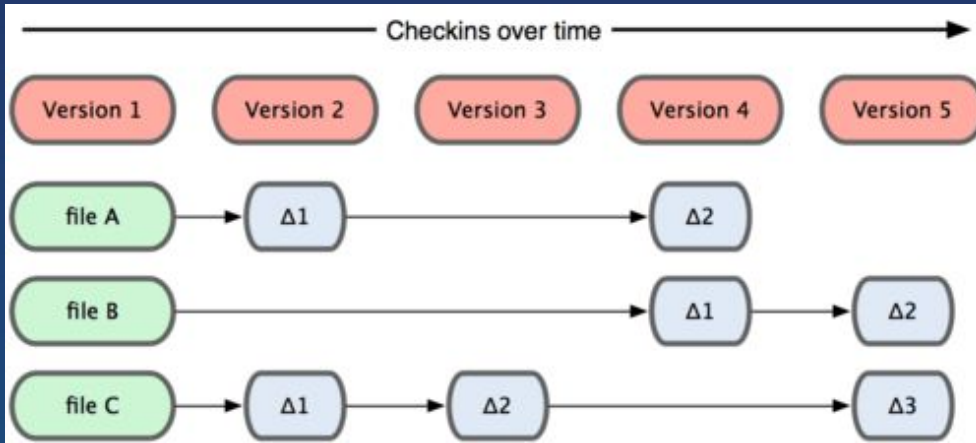
- ✧ Version Control System
- ✧ Distributed
- ✧ Decentralized

Git Design Goals:

- ✧ Speed
- ✧ Simple Design
- ✧ Strong support for big number of branches
- ✧ Fully Distributed
- ✧ Handle big projects effectively

Git doesn't delete:

- ✧ If you mess up, you can recover your stuff

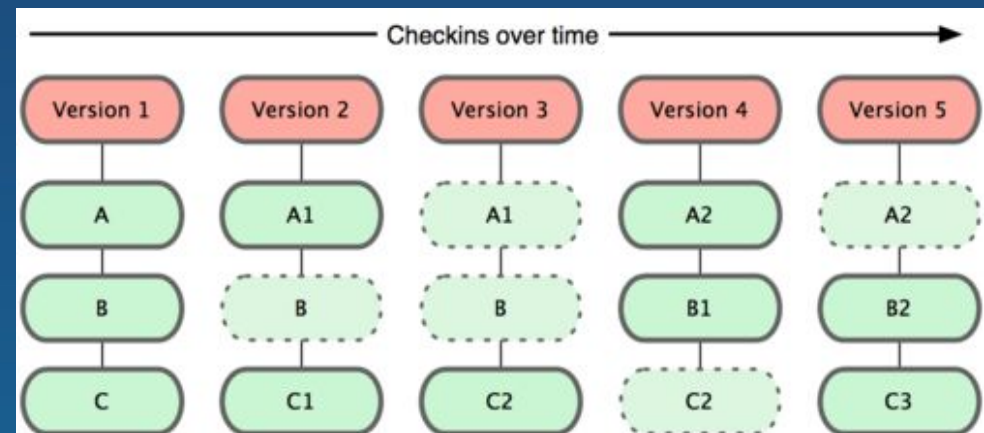


Other systems store information as a list of file-based changes

- CVS
- Subversion
- Perforce
- Bazaar

Git stores snapshots.
It is like a mini filesystem.

To be efficient, if files have not changed, Git doesn't store the file again, just a link to the previous identical file it has already stored.

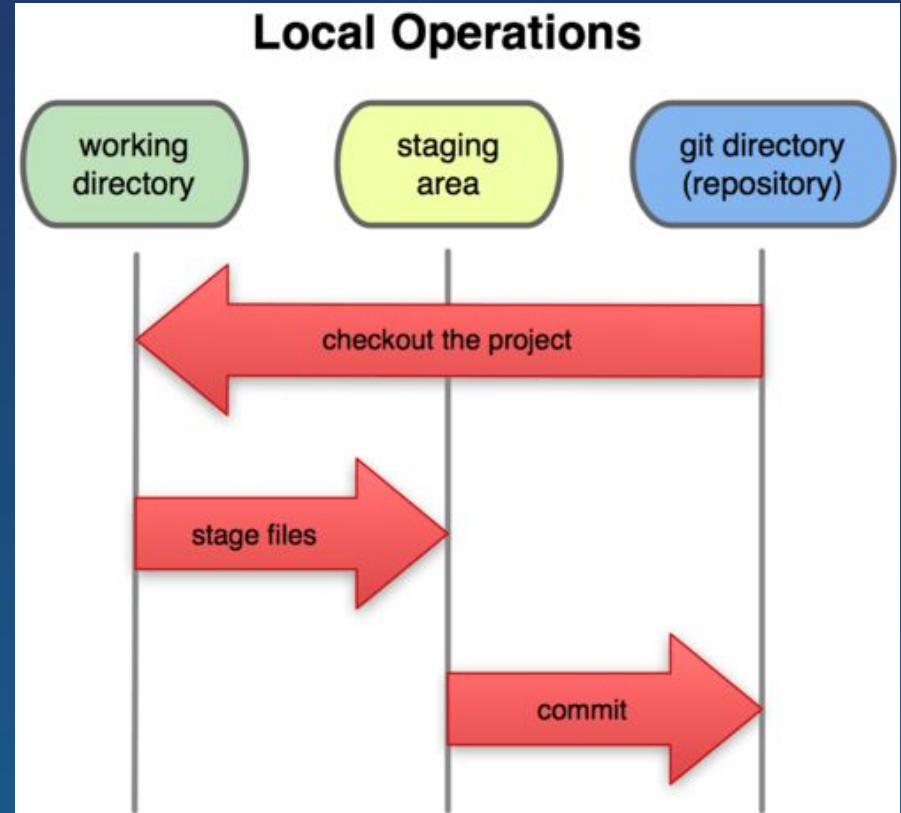


Local workflow:

- ✧ Working Directory
- ✧ Staging Area
- ✧ Repository (.git directory)

Commands:

- ✧ `git checkout`, `git log`, etc.
- ✧ `git add`, `git rm`, etc.
- ✧ `git commit`

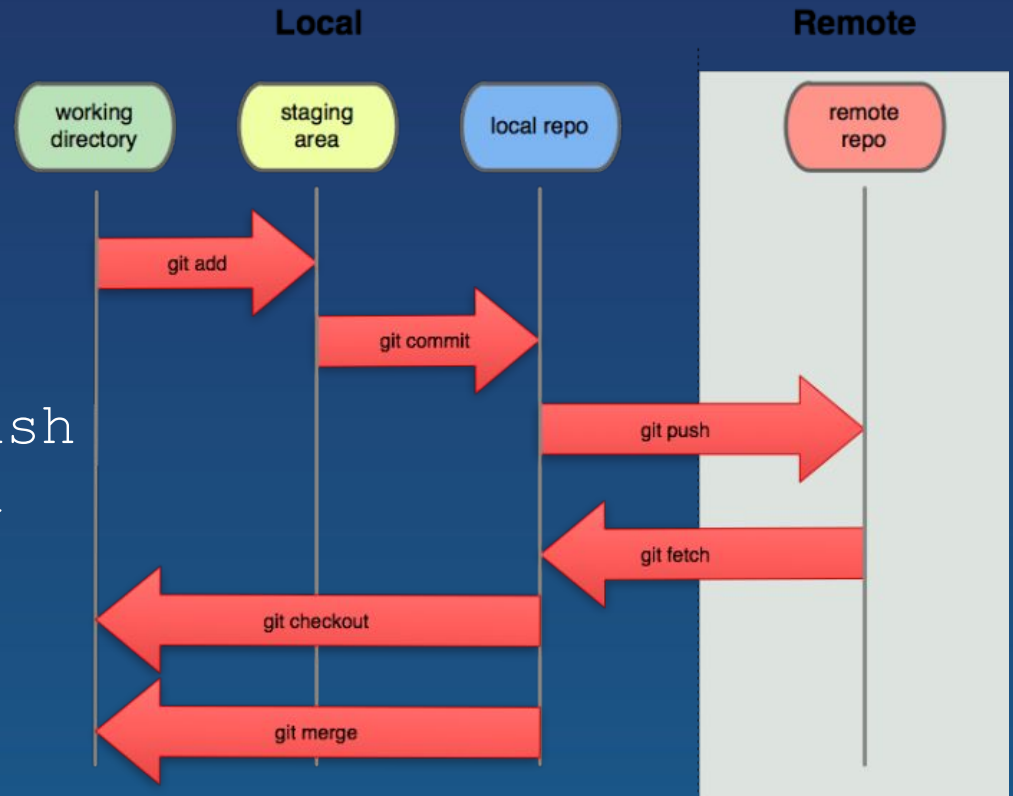


Remote workflow:

- ✧ Local repo
- ✧ Remote repo

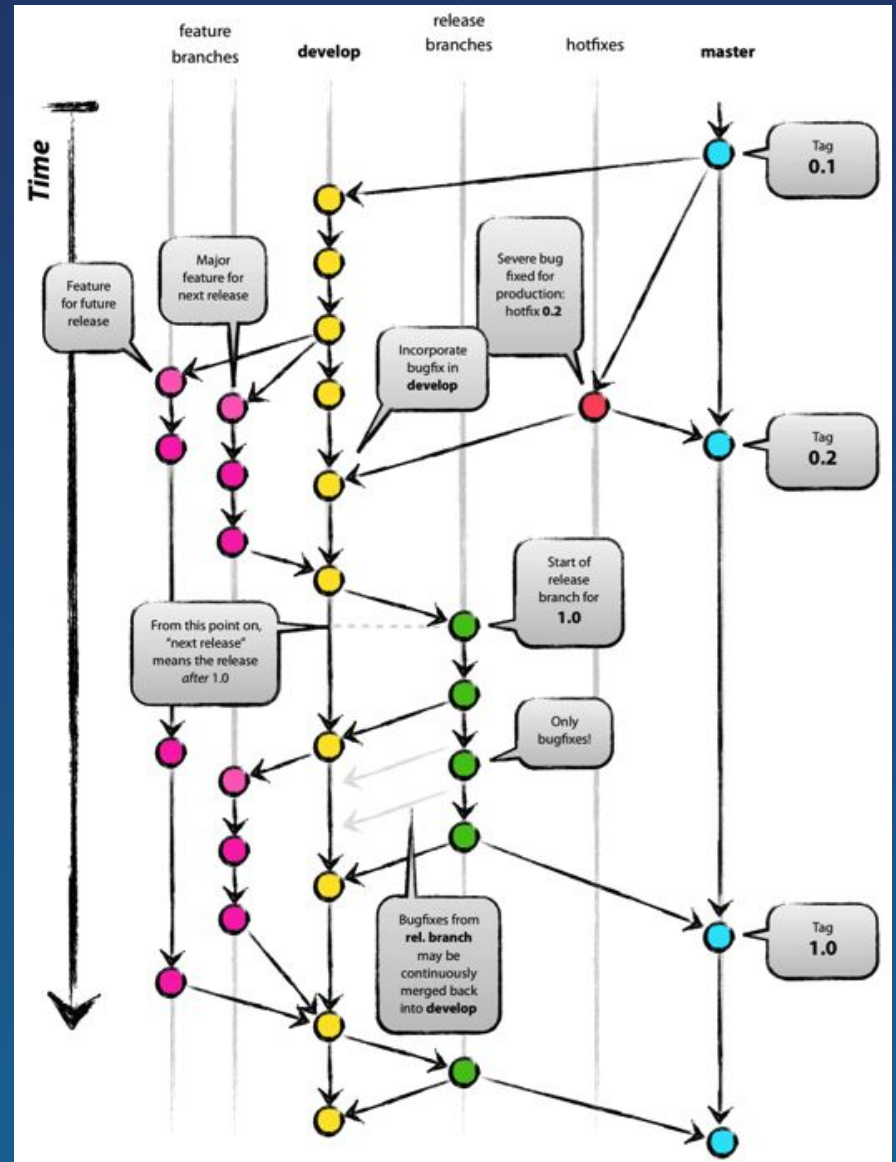
Commands:

- ✧ `git clone`
- ✧ `git fetch`, `git push`
- ✧ `git checkout`, `git merge`
- ✧ `git pull`



Kinds of branches:

- ✧ Master
- ✧ Hot fixes
- ✧ Release branches
- ✧ Development
- ✧ Feature branches
- ✧ Etc.



Configuration:

```
git config -global user.name "Username1"  
git config -global user.email "user1@acsws.cl"
```

Retrieving code:

```
git clone ssh://<user>@<server>:<project>  
git checkout <file>
```

Staging code:

```
git add <file>  
git rm <file>  
git reset HEAD -- <file>
```

Commit staged files:

```
git commit
```


Inspecting changes:

```
git log, git diff, git show  
gitk // (Graphical Tool)
```

Synchronizing code:

```
git fetch  
git merge  
git pull  
git push
```

Branching

```
git branch -a  
git checkout -b <branch>  
git checkout <branch>
```

Configuration:

```
git config -global user.name "Scheduler1"  
git config -global user.email  
"sched1@acsws.cl"
```

Cloning repository:

```
git clone almamgr@manager:git/ostm
```

First commit:

```
touch test_sched1  
git add test_sched1  
git commit
```

Pushing your changes:

```
git push
```

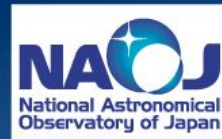
Pulling other's changes:

```
git pull
```

Merge conflicts:

- ✧ Very unlikely during this project
- ✧ Check files with issues, choose your version, the one being pulled or edit a mixed version
- ✧ Stage changes and then commit them
- ✧ Push changes to the remote repository

Questions?



Acknowledgements

ACS presentations were originally developed by the ALMA Common Software development team and has been used in many instances of training courses since 2004. Main contributors are (listed in alphabetical order): Jorge Avarias, Alessandro Caproni, Gianluca Chiozzi, Jorge Ibsen, Bogdan Jeram, Thomas Jürgens, Matias Mora, Joseph Schwarz, Heiko Sommer.

The Atacama Large Millimeter/submillimeter Array (ALMA), an international astronomy facility, is a partnership of Europe, North America and East Asia in cooperation with the Republic of Chile. ALMA is funded in Europe by the European Organization for Astronomical Research in the Southern Hemisphere (ESO), in North America by the U.S. National Science Foundation (NSF) in cooperation with the National Research Council of Canada (NRC) and the National Science Council of Taiwan (NSC) and in East Asia by the National Institutes of Natural Sciences (NINS) of Japan in cooperation with the Academia Sinica (AS) in Taiwan. ALMA construction and operations are led on behalf of Europe by ESO, on behalf of North America by the National Radio Astronomy Observatory (NRAO), which is managed by Associated Universities, Inc. (AUI) and on behalf of East Asia by the National Astronomical Observatory of Japan (NAOJ). The Joint ALMA Observatory (JAO) provides the unified leadership and management of the construction, commissioning and operation of ALMA.