Git: Version Control System



References:

- PPT: https://github.com/shashwatx/git_101/blob/master/presentation.pptx
- Babel Git: https://git.babel.es:4433/
- SETUP: https://github.com/shashwatx/git_101/blob/master/SETUP_GIT_DOC.MD
- WSL: https://winaero.com/blog/enable-wsl-windows-10-fall-creators-update/
- MobaXTerm: https://mobaxterm.mobatek.net/download.html
- git-create: https://github.com/shashwatx/git_101/blob/master/scripts/git-create.sh
- Gitlab Access Token: https://docs.gitlab.com/ee/user/profile/personal-access-tokens.html



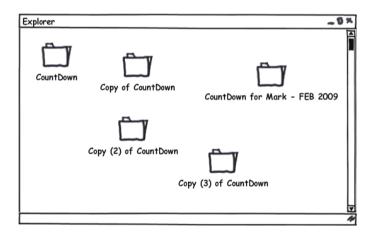
1.
The Problem

How do you maintain and share code?





- Copy? Email? Dropbox?
- Latest version?
- Roll back?
- Almost impossible to maintain if the number of people working in the project is large





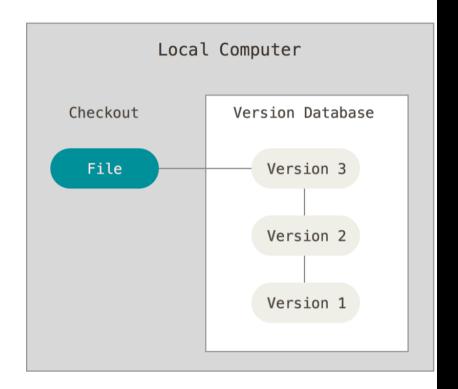
2.

Version Control System



Version Control: What is it?

- ► A method for recalling versions of a codebase
- ► Keeping a record of changes
- ► Who did what and when in the system
- ► Save yourself when things inevitably go wrong

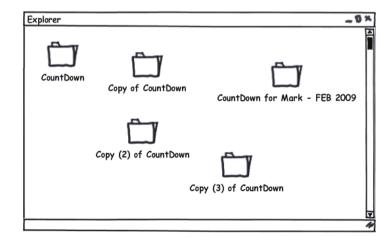




Version Control: Why?

Single Developer Workflow

- Back-ups of the project. Fearlessly modify code
- ► Create a "checkpoint" in the project at any stage:
- ► Tagging: Mark certain point in time
- ▶ Branching: Release versions and continue development





Version Control: Why?

Team Workflow

- Everything in "Individual"
- Allow multiple developer to work on the same codebase
- Merge changes across same files: handle conflicts
- Check who made which change: blame/praise



Version Control: Types

► Centralised VCS

► Distributed VCS



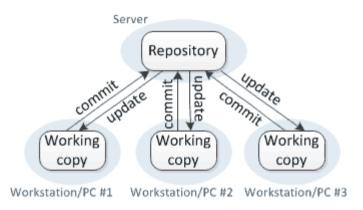
Centralised VCS

- A **single** authoritative data source (repository)
- Check-outs and check-ins are done with reference to this central repository



Centralised VCS

Centralized version control





Centralised VCS

Examples:

- Concurrent Version System (CVS)
- Subversion (SVN)

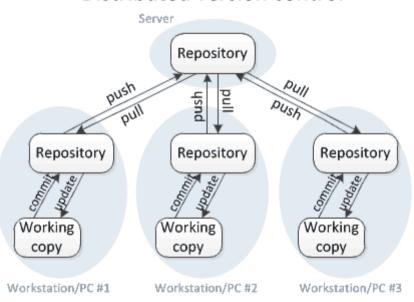


- No single repository is authoritative
- Data can be checked in and out from any repository

Distributed VCS



Distributed version control



Distributed VCS



Examples

- Git
- Mercurial

Distributed VCS



3.

Git

--everything-is-local



- Free, open source
- Fully distributed
- Handle small files very effectively
- Tracks contents, not files
- Data = Snapshot
- Created by Linus Torvalds in less than 2 weeks





Git: Stages

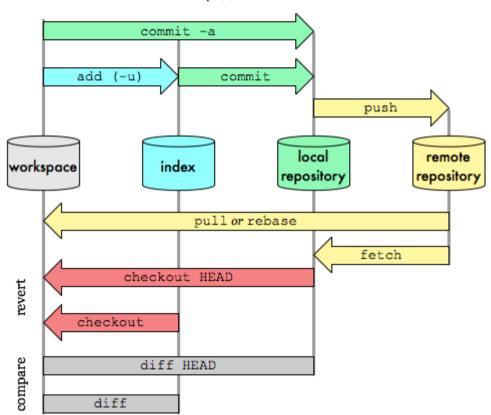
Four stages:

- Working directory
- Staging/Index directory
- Local repository
- Remote repository



Git: Outline

Git Data Transport Commands





Setup

- git init
- git clone <remote-url>

Save username and password.

git config –global credential.helper store
git config --global push.default current



Show commit logs

• git log



Commit logs

```
Author: mourill <rohit.das950@gmail.com>
       Sun May 28 15:19:21 2017 +0530
Date:
   Same as before
   Signed-off-by: mouril1 <rohit.das95@@gmail.com>
Author: mourill <rohit.das950@gmail.com>
       Sun May 28 15:14:12 2017 +0530
Date:
   Penultimate changes, I guess...
   Signed-off-by: mouril1 <rohit.das95@gmail.com>
Author: mourill <rohit.das950@gmail.com>
       Sun May 28 14:28:53 2017 +0530
Date:
   Still changing
   Signed-off-by: mourill <rohit.das95@@gmail.com>
```



View changes

• git diff



View changes

```
git diff 80x24
diff --git a/README.md b/README.md
index 24ff7ab..f121786 100644
--- a/README.md
+++ b/README.md
 @@ -1 +1,4 @@
LaTeX files
(END)
```



Add changed files to the index

• git add -u



Create "snapshots" of your codebase

git commit

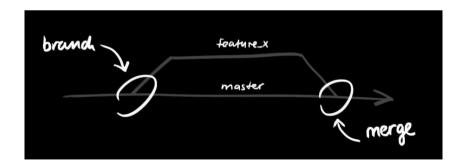
Push to remote

• git push origin master



Branches

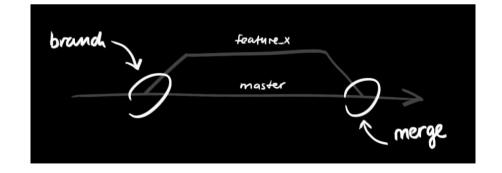
• git checkout –b
branch-name>





Merge other branches

• git merge





Result?

The development process of the Linux kernel is maintained using Git

The Linux kernel development process has:

- Over 2000 individual contributors per year
- Grows by nearly 300,000 lines per year



THANK YOU!

Roberto Olmedo roberto.olmedo@babel.es

Shashwat Mishra shashwat.mishra@babel.es

