Version Control and Forges

UMONS's Forge, Github, Bitbucket and more

Alexis Moinet
alexis.moinet@umons.ac.be

Signal Processing Department, numediart Institute
University of Mons, Belgium

July 2, 2015

Outline

Outline

Version Control Systems (VCS)

In short, VCSs are an answer to this dreadful observation:

Version Control Systems (VCS)

In short, VCSs are an answer to this dreadful observation[1]:

« I didn't change nothing but it ain't working anymore!? »

[1] Secondary effects may include preventing known cases of `myfile.m`, `myfile2.m`, `myfile-working.m`, `myfile-reallyworkingthistime.m`, `myfileMateiPasTouche.m`, `myfileNico.m`, `myfile.backup.m`, `myfile12345.m`, ...

Version Control Systems (VCS)

A Version Control System (VCS) is used to:

- Record the history of changes to a set of files:

Version Control Systems (VCS)

A Version Control System (VCS) is used to:

- Record the history of changes to a set of files:
  - who?

Version Control Systems (VCS)

A Version Control System (VCS) is used to:

- Record the history of changes to a set of files:
  - who?
  - what?

Version Control Systems (VCS)

A Version Control System (VCS) is used to:

- Record the history of changes to a set of files:
  - who?
  - what?
  - when?

Version Control Systems (VCS)

A Version Control System (VCS) is used to:

- Record the history of changes to a set of files:
  - who?
  - what?
  - when?
  - why?

Version Control Systems (VCS)

A Version Control System (VCS) is used to:

- Record the history of changes to a set of files:
  - who?
  - what?
  - when?
  - why?
- Travel across the history of changes

Version Control Systems (VCS)

A Version Control System (VCS) is used to:

- Record the history of changes to a set of files:
  - who?
  - what?
  - when?
  - why?
- Travel across the history of changes
- Revert changes

Version Control Systems (VCS)

A Version Control System (VCS) is used to:

- Record the history of changes to a set of files:
  - who?
  - what?
  - when?
  - why?
- Travel across the history of changes
- Revert changes
- Backup. **Not!** (but ...)

Centralized VCS

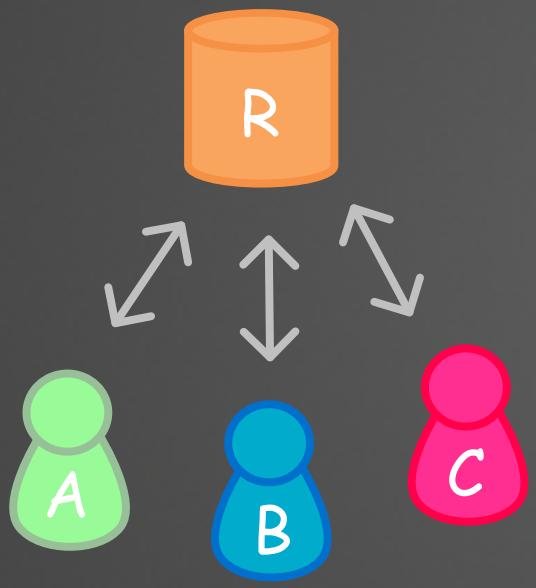
- One repository to rule ... (DB + service on a server).
  - network required
  - no local commits
  - no local access to history
- Users send and receive changes (***commits***) to/from the server
- Examples: CVS, Subversion (svn)

Decentralized VCS

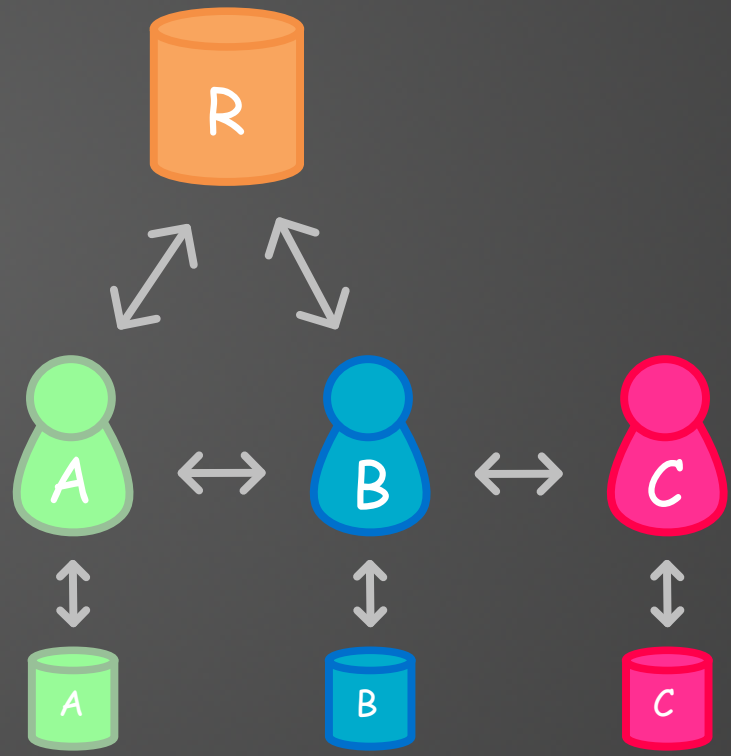
- Each user has its own "copy" (clone) of the repository locally:
  - stand-alone, no strings attached, no background process
  - local commits
  - full access to ***known*** history locally
- Users can share changes directly and/or through a server
- Branches, merges, pull requests
- Examples: Git, Mercurial (hg)

Workflows

Centralized



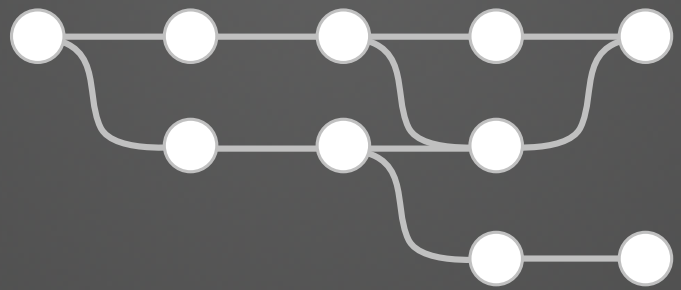
Decentralized



Timelines

Centralized (linear):

Decentralized (tree):



Clients

- Tortoise{Svn|Hg|Git}
- SourceTree (Mac, Win)
- Github (Mac, Win, ~~Android~~)
- IDE integration (Eclipse, Netbeans, VS, Xcode, vim, emacs, . . .)
- qgit, gitg, git gui, gitk, tig, . . .
- The Command Line™
- . . .

Clients

- Tortoise{Svn|Hg|Git}
- SourceTree (Mac, Win)
- Github (Mac, Win, ~~Android~~)
- IDE integration (Eclipse, Netbeans, VS, Xcode, vim, emacs, . . .)
- qgit, gitg, git gui, gitk, tig, . . .
- The Command Line™ (no kidding!)
- . . .

Git commands

- `git help`
- `git init / clone`
- `git add / commit`
- `git log / status / diff`
- `git fetch / merge / pull`
- `git push / remote`
- `git branch / checkout`
- ...
- Seriously: `git help`!!!

git init (1. Create a git repository)

```
git init A && cd A
```


```
git add file.txt readme.txt
git commit -m 'First commit'
```

...

git init (2. Create a remote and push to it)


```
git init R --bare
```

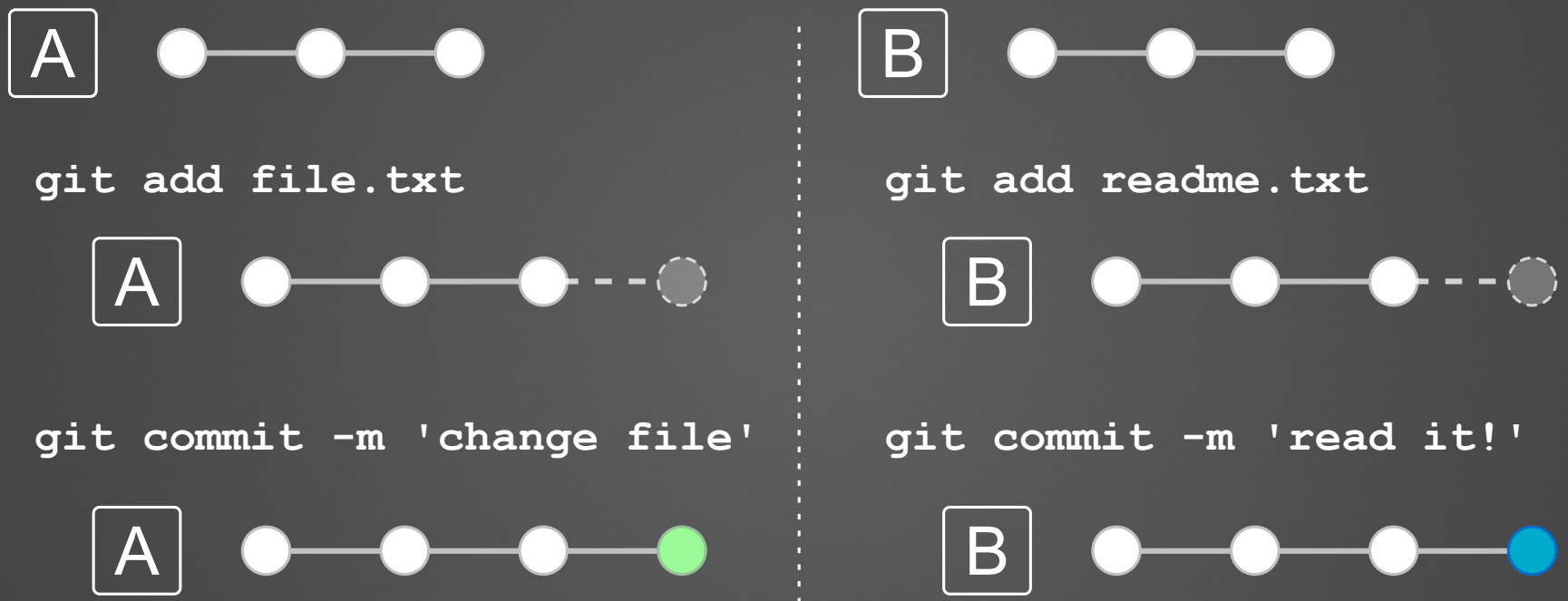

```
cd A
git remote add origin /path/to/R
git push
```

git clone

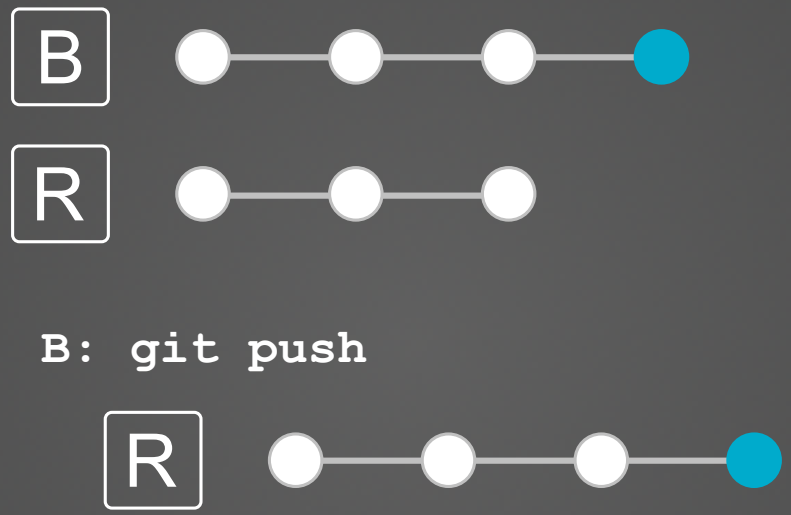

```
git clone R A
```


```
git clone R B
```

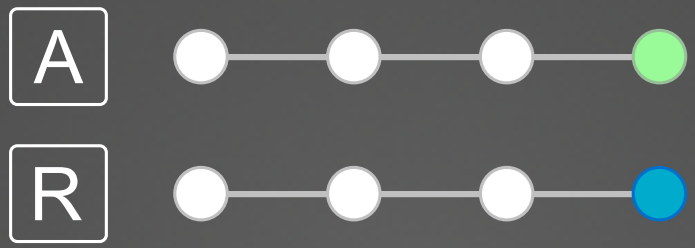
git add/commit



git push

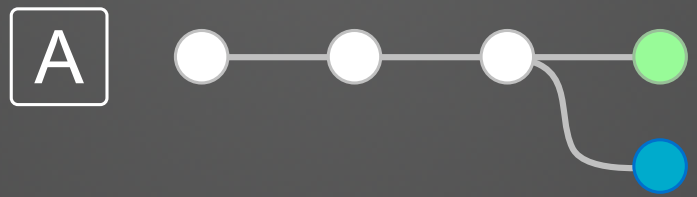


git fetch



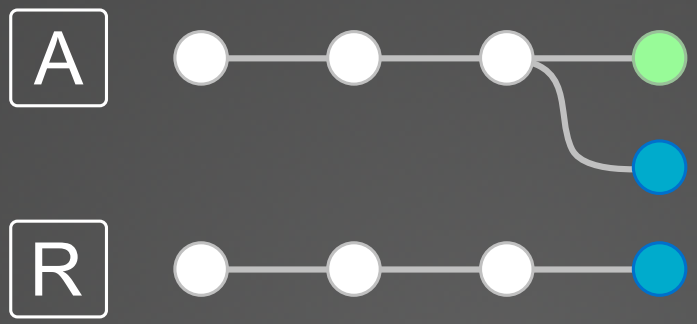
A: git push → error

A: git fetch

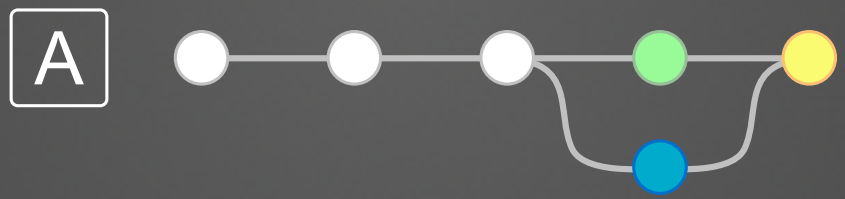


A: git merge
or
A: git rebase
→ git pull

git merge/rebase



A: git merge



A: git rebase

A: git push

Outline

Software Forge

From Wikipedia:

Software Forge

From Wikipedia:

« A forge is a web-based collaborative software platform for both sharing computer applications and developing them. »

Software Forge

From Wikipedia:

« A forge is a web-based collaborative software platform for both sharing computer applications and developing them. »

- web-based
- collaborative
- (software) project management

Software Forge - services

A forge usually provides tools such as:

- Source code repository, code review
- Issue tracker (tickets, bugs)
- Target, milestones, calendar
- Wiki, website, documentation
- Mailing-lists, discussions, meetings
- Automatic build, test units

Software Forge - examples

- **Github**: MAGE, MotionMachine
- **Bitbucket** (git, hg): mediacycle (a long long time ago)
- **Allura** (git, hg, cvs, svn, ...): SourceForge
- **Gitlab**: PREDATTOR
- **Trac** (git, hg, svn, ...): mediacycle (server died)
- **Redmine** (git, hg, svn, ...): UMONS's Forge ➜ mediacycle (finally ...)
- ...

UMONS

https://forge.umons.ac.be

Outline

Demo Forge

- Starting a new project:
  1. Create a project *foo* with the Forge
  2. Clone it:
     - `git clone https://forge.umons.ac.be/git/foo`

Demo Forge

- Starting a new project:
  1. Create a project *foo* with the Forge
  2. Clone it:
     - `git clone https://forge.umons.ac.be/git/foo`

- Add an existing git project:
  1. Create a project *bar* with the Forge
  2. Push the local repository to the Forge:
     - `git remote add origin https://forge.umons.ac.be/git/bar`
     - `git push` or `git push -u origin master` (the first time)

Demo Github

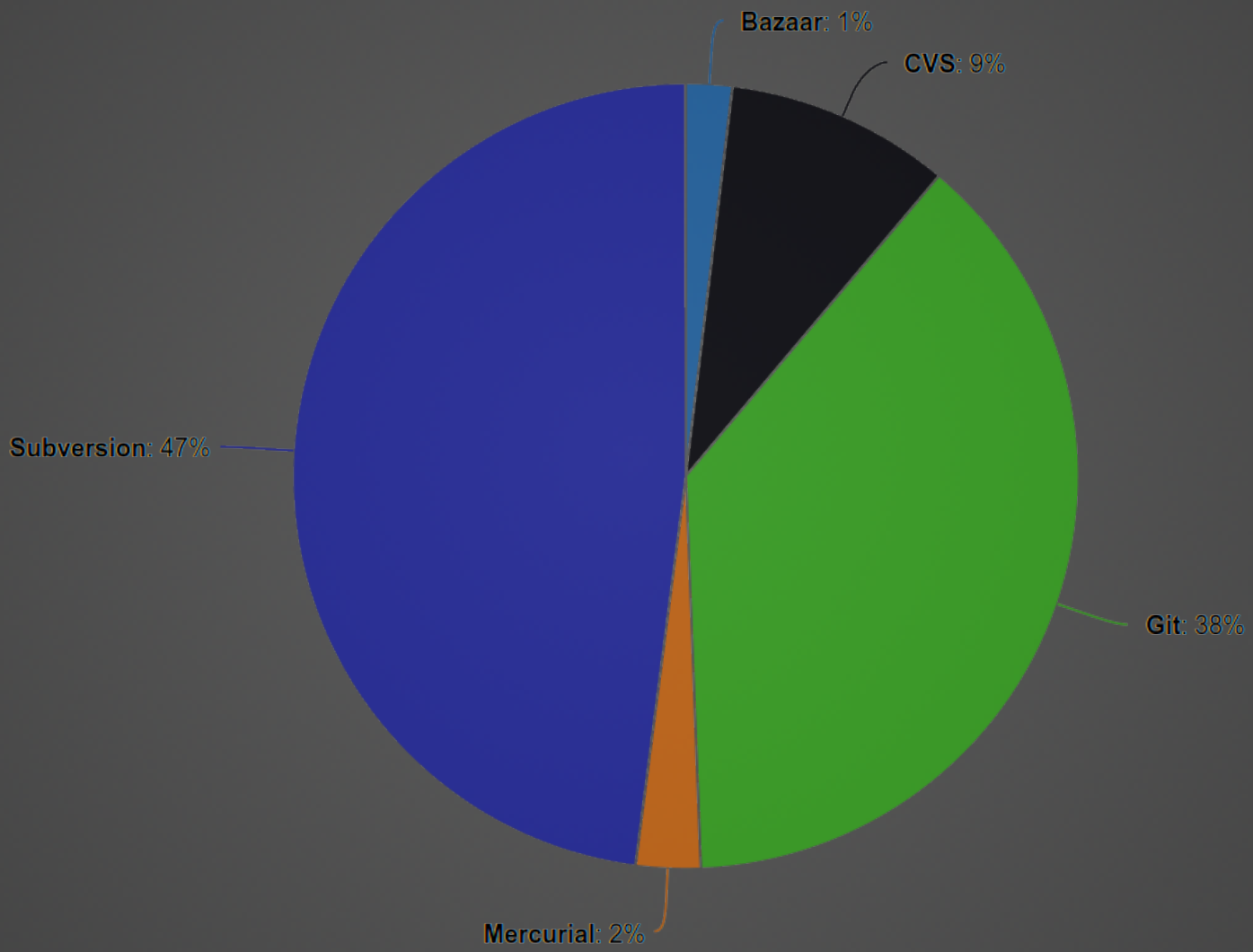
1. Create a project with Github
   - `git clone` (new project)
     or
   - `git remote ...` and `git push ...` (pre-existing git)
2. Fork it!
3. Pull request!

Pointers

- From Git:
  - `https://git-scm.com/doc`
  - `https://git-scm.com/book/en/v2` (epub, mobi, pdf, html)
- From Github:
  - `https://try.github.io`
- From Atlassian (Bitbucket):
  - `https://www.atlassian.com/pt/git/tutorial`
  - `https://www.atlassian.com/pt/git/workflows`
- Branching:
  - `http://nvie.com/posts/a-successful-git-branching-model`

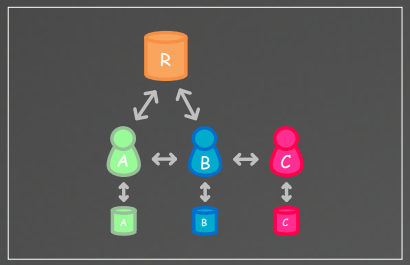
Outline

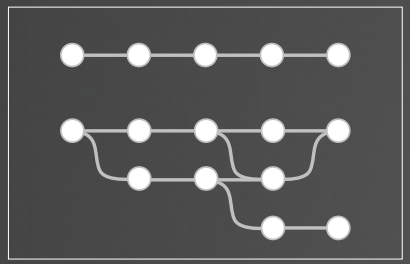
Market shares

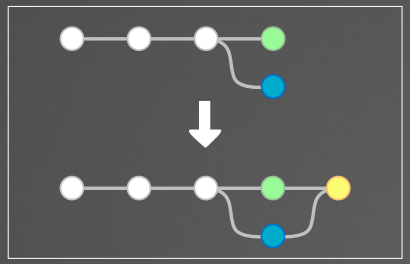


Source: `https://www.openhub.net/repositories/compare`

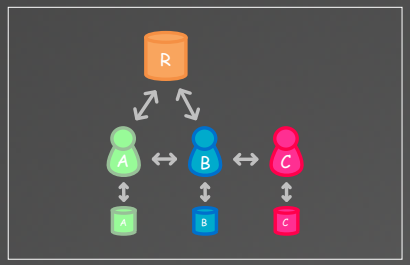
DVCS

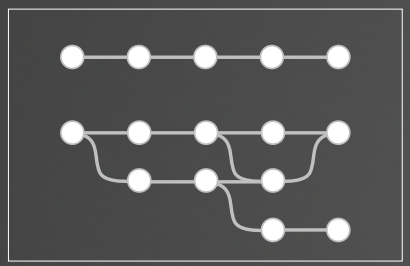


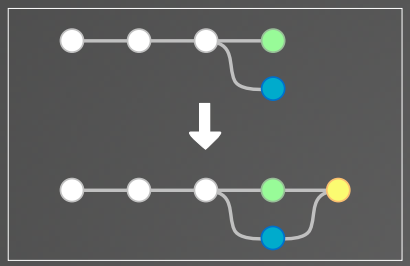




DVCS





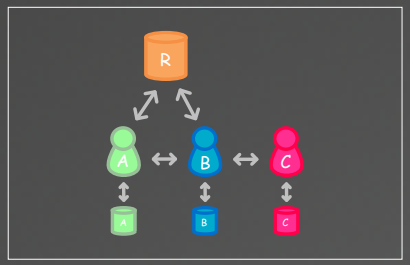


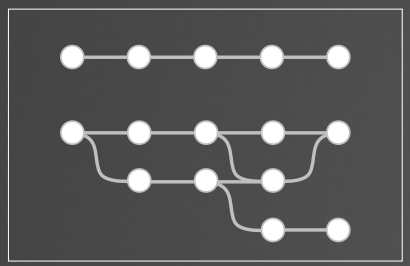
FORGE

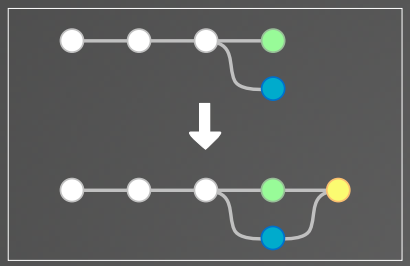
```
git clone ...
git remote add ...
git push
git fetch
```

https://forge.umons.ac.be

DVCS







FORGE

```
git clone ...
git remote add ...
git push
git fetch
```

https://forge.umons.ac.be

Things I didn't talk about ...

... and should have.

- branches!!!
- tags + GPG signing
- configuration options (`.git/config`)
- ignore files (`.gitignore`)
- reverts, rewrite history
- hooks (`.git/hooks/`)
- bisect
- cherry-pick
- ...