The GIT

Programming Concepts in Scientific Programming

EPFL, Master class

September 23, 2019

Source repository

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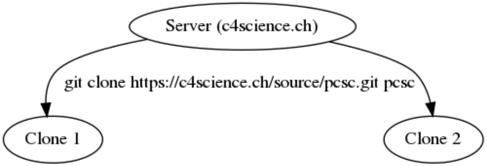
This is the standard of most **Version control systems** such as **GIT** or **SVN**.

GIT

- Git is a free distributed version control system (DVCS), used for source code management (SCM)
- Git operates on a decentralized architecture, so every git working directory has the complete history
- Git was initially designed and created by Linus Torvalds for Linux kernel development
- EPFL has a GIT repository service (`http://c4science.ch`)

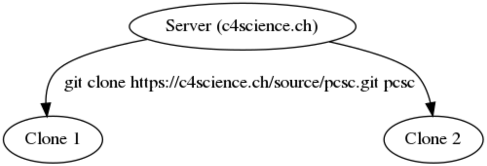
GIT - Cloning

```
git clone https://c4science.ch/source/pcsc.git pcsc
```



GIT - Cloning

```
git clone https://c4science.ch/source/pcsc.git pcsc
```



- The *working copy* is the state (can be modified) of a selected branch (definition comes later)
- To know the status of the working copy:

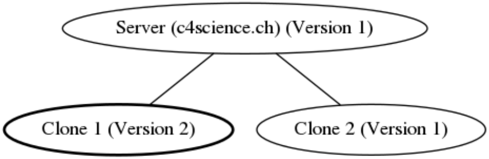
  ```
  git status
  ```

- See the log

  ```
  git log
  ```

GIT - Commit your modifications

```
git commit -m "I made an interesting modification" file.cc
```



GIT - Branches

- Branching means you diverge from the main line of development and continue without perturbing the code
- Branches can evolve independently
- The main branch in GIT is *usually* called *master*
- GIT doc on branches

GIT - Branches

- See/create branches:

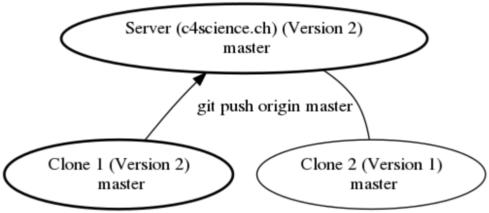
```
git branch
```

- Change the working copy to another branch.

```
git checkout stable-branch
```

GIT - Push your modifications

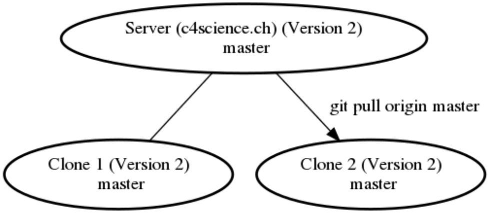
```
git push origin master
```



This operation sends the current branch and merges it into the remote branch

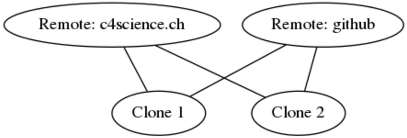
GIT - Pull modifications

```
git pull origin master
```



This operation actually fetches the remote branch and merges into current branch

GIT - remotes



- You can pull/push from/to more than a single distant server (remote)
- list the declared remotes:

```
git remote -v
```

- add/remove remotes

```
git remote add/remove
```

GIT - commands

```
git log
```

```
git checkout
```

```
git add file.cc
```

```
git rm file.cc
```

```
git mv file.cc
```

```
git commit -m nice message" file.cc
```

```
git push remote branch_name
git push origin master
```

```
git pull remote branch_name
git pull origin master
```

```
git diff
git diff revision_hash
```

```
git help whatever_command
```

GIT - resources

- Cheat Sheet: http://ndpsoftware.com/git-cheatsheet.html
- Simple guide: http://rogerdudler.github.io/git-guide/
- Nice tutorial: http://learngitbranching.js.org/

c4science.ch

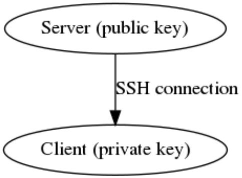
What is c4science ?

C4Science is a co-creation platform, curation and code sharing. This platform includes:

- Version management system
- Common authentication to all Swiss universities to local + external collaborators
- Social dimension (wikis, bug tracking, ...)
- Code test system (continuous integration)
- Swiss alternative to github

Connect to c4science

The recommended way to connect to the c4science server (and actually any distant linux machine) is through the SSH protocol:



- You need a pair of keys: one public and one private
- They are stored in the directory *.ssh* in your home directory
- The public can be distributed, the private should stay **secret**
- A good habit is to generate one key-pair per client and never transport the private key