



02

Chapter

Distributed Version Control The GitLab example

2I1AC3 : Génie logiciel et Patrons de conception

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“Il est facile se tirer une balle dans le pied avec git, mais il est également facile de revenir à un pied précédent et de le fusionner avec sa jambe actuelle.”

Jack William Bell

Outline

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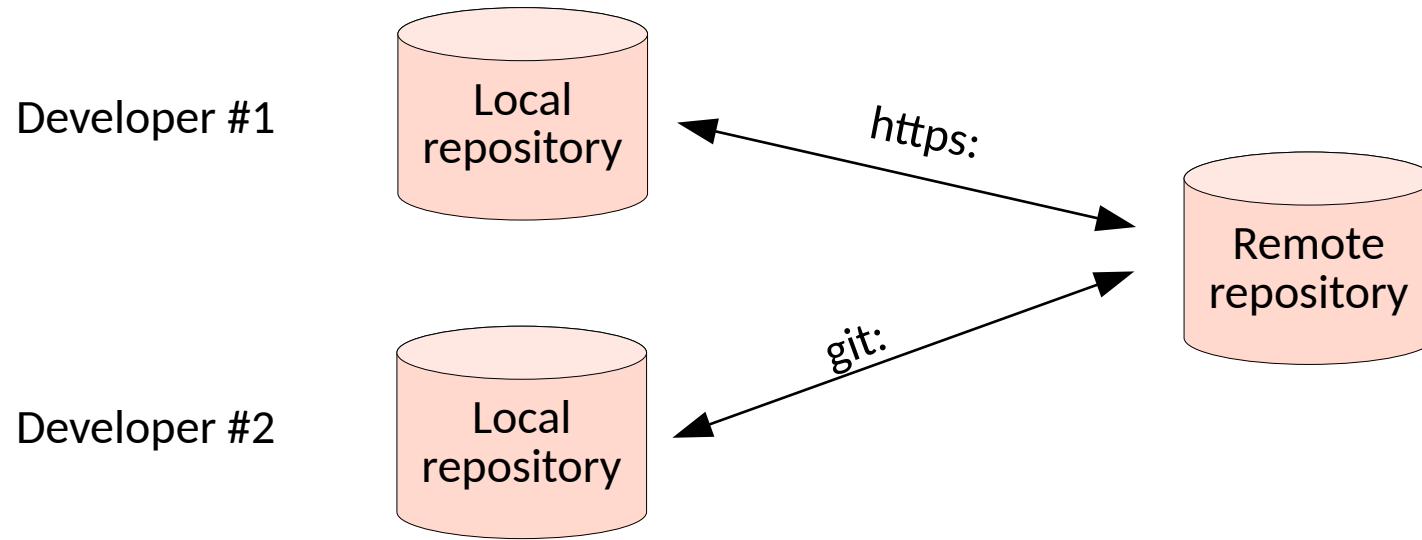
Centralized
Versus
Distributed
Version Control

Centralized vs Distributed

- Centralized version control systems use client-server approach to version control.
 - Each contributor has a synchronized copy of the repository.
 - ▶ Need permanent connection to network.
- Distributed version control systems use a peer-to-peer approach to version control.
 - Each contributor has a distinct copy of the repository.
 - ▶ Can be used offline.

Git Communication Protocols

- 2 secure communication protocols: *git* and *https*



Setting the Communication Protocol

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■ Using the https protocol

- Needs to enter the password for each transaction
- **Hint:** cache the password

```
$ git config --global credential.helper 'cache --timeout=7200' # 2 hours
```

■ Using Git protocol

- Needs SSH keys.
- Procedure
 - 1) Create SSH keys (Generates the public and private keys in folder: ~/.ssh)

```
$ ssh-keygen -t rsa -b 2048
```

- 1) Add public key on the server side
- 2) Check your key

```
$ ssh -T git@gitlab.ecole.ensicaen.fr
```

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Remote Repository

Create remote repository

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- Installed on a server accessible by way of URL
(e.g. *https://www.ecole.ensicaen.fr/~rclouard/*)
 - Create a remote repository

```
$ git init --bare lab1.git  
$ cd lab1.git  
$ git update-server-info  
$ cd hooks  
$ mv post-update.sample post-update
```

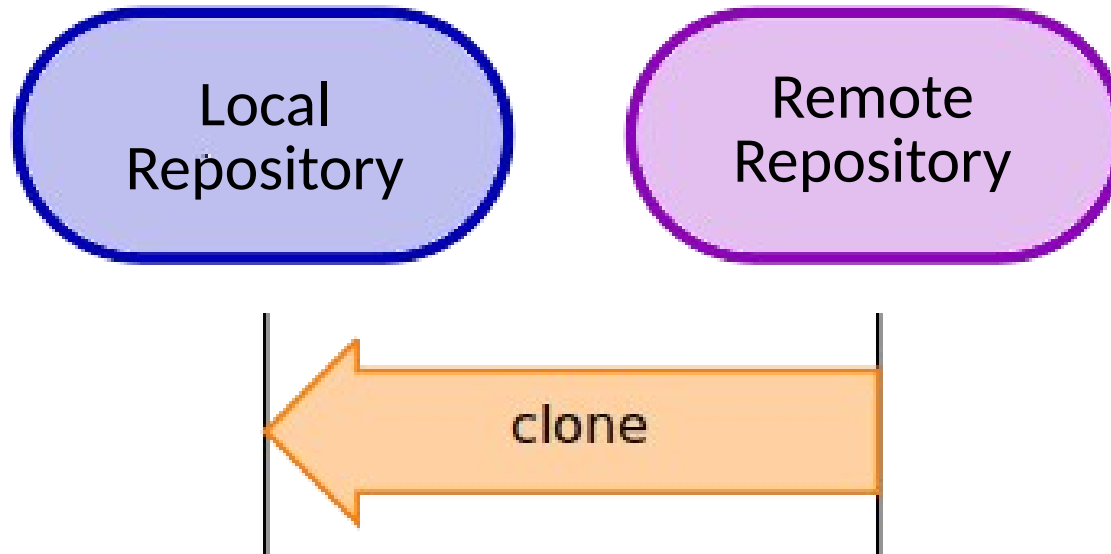
Local Repository ↔ Remote Repository

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- Get a copy of the remote repository

```
$ git clone https://www.ecole.ensicaen.fr/~rclouard/projet.git  
$ cd projet
```

- Remote repository is named “origin” by default



Local Repository ↔ Remote Repository

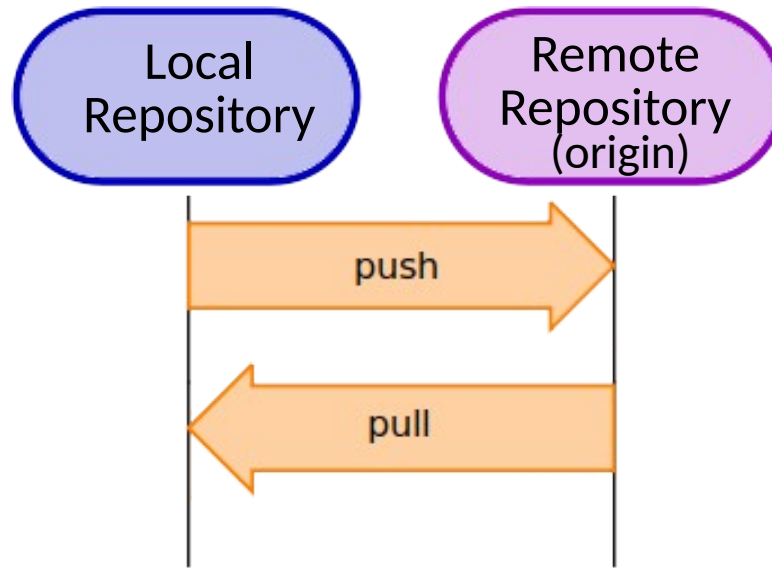
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- Push the version of the local repository to the remote repository

```
$ git push  
$ git push origin main
```

- Pull the version from the remote repository to the local repository

```
$ git pull
```



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Remote repository with GitLab

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- GitLab is a free web-based collaborative software platform (*aka forge*) based on Git.
 - Local version hosted by ENSICAEN
 - ▶ `https://gitlab.ecole.ensicaen.fr`

- Git Repository
 - Managed by “maintainer” (“version manager”)
 - ▶ modify the “main” branch
 - ▶ add / remove developers from the project

GitLab Features

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- Kanban board
 - Issues

The image displays a GitLab Kanban board with four columns: Open, In Progress, In Test, and Closed. Each column contains issue cards with titles, labels, and IDs.

- Open** (1 issue):
 - Update Mysql Database (Backend, #41)
- In Progress** (2 issues):
 - Add import track from Polar (workflow, feature, #44)
 - Add import track from Suunto (workflow, feature, #43)
- In Test** (1 issue):
 - Add Garmin connection (workflow, feature, #42)
- Closed** (6 issues):
 - Revised events (Backend, Enhancement, #40)
 - Bug with superman (Backend, Bug, Priority:high, #39)
 - Live: keep current position of orienteer (In Test, feature, #23)
 - Encrypt data sending (Backend, In Test, #38)
 - Add more detail statistics for the route (Enhancement, Frontend, User, #4)
 - Add security for POST request (Backend, Security, #16)
 - Change creation of route to handle multiple routes

■ CI/CD facilities

- Create yaml file *.gitlab-ci.yml*

```
image: gradle:jdk16

variables:
  # Using a fresh runtime for each build to
  GRADLE_OPTS: "-Dorg.gradle.daemon=false"
  # Variable for the runner at ENSICAEN
  http_proxy: http://193.49.200.22:3128
before_script:
  - chmod +x gradlew
  - mv gradle.properties.ci gradle.properties
  - apt-get install findutils

stages:
  - build
  - test

unit_test:
  tags :
    - gitlab-runner-ensicaen
  stage: test
  coverage: '/Coverage Total: ([0-9]{1,3})%/'
  only:
    - master
  script:
    - ./gradlew -Pci --console=plain test jacocoTestReport
    - cat build/jacocoHtml/index.html | grep -o 'Total[^%]*%' | sed 's/<.*>/ /; s/Total/Coverage Total:/'

build: ....
```

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