GESTION DE CODE & INTEGRATION CONTINUE

ENVIRONNEMENT DE DEVELOPPEMENT AVANCE

CREATIVE COMMONS BY

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NICOLAS ROUVIERE

- Développement depuis 2003
- Java / Python
- **Linux** / Windows
- GiT, SVN, Clearcase
- DevOps, équipe de 100+
- Airbus Defence & Space

nicolas.rouviere@gmail.com

CHUT CA COMMENCE

INTRODUCTION

DIFFERENCES ENTRE UN PROJET PERSO ET UN PROJET INDUSTRIEL ?

Johnny Appleseed

REPRODUCTIBILITE

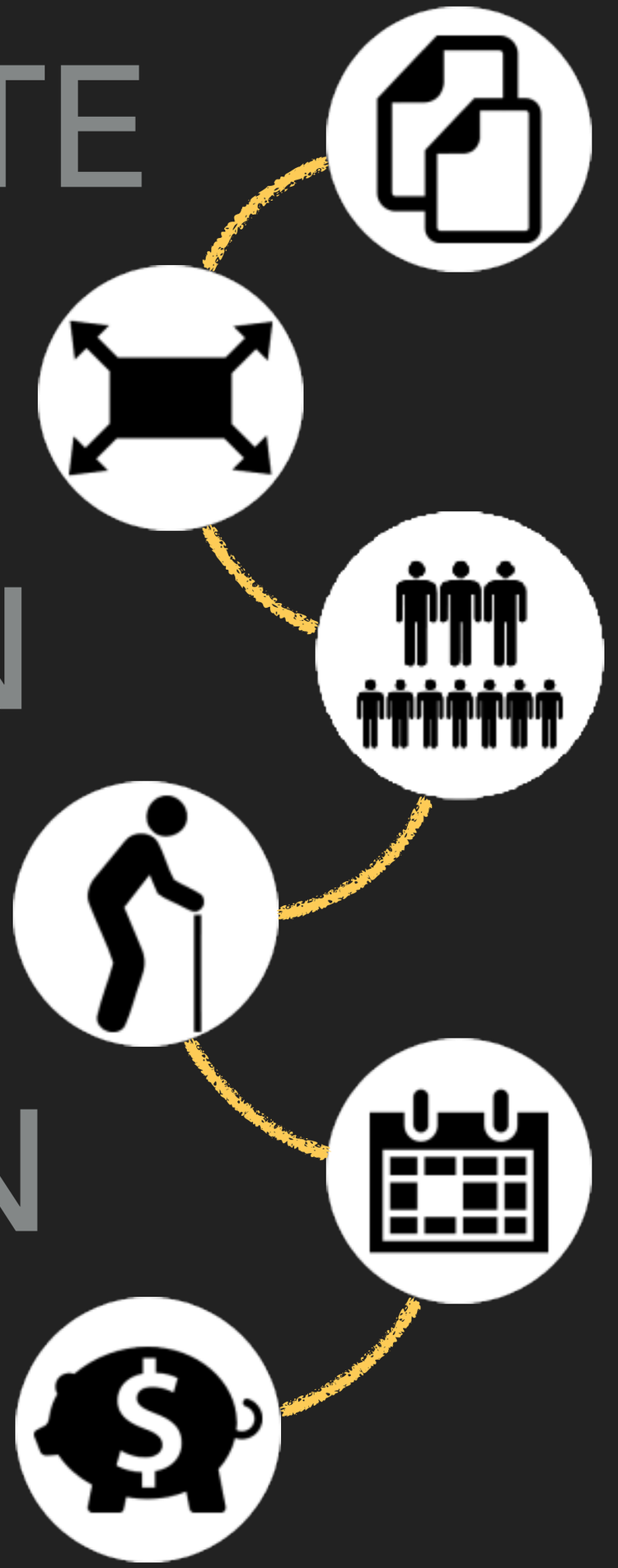
ECHELLE

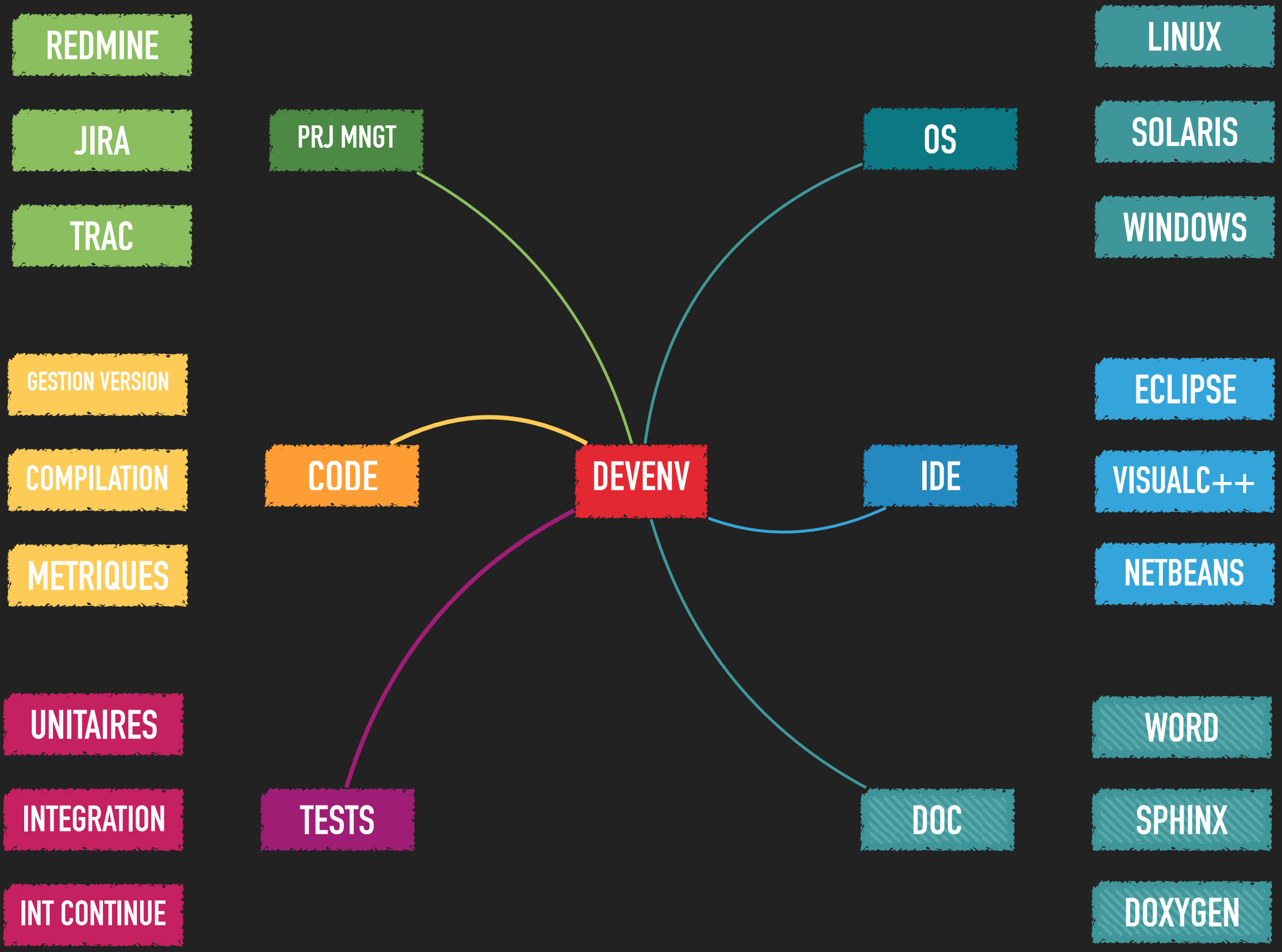
COLLABORATION

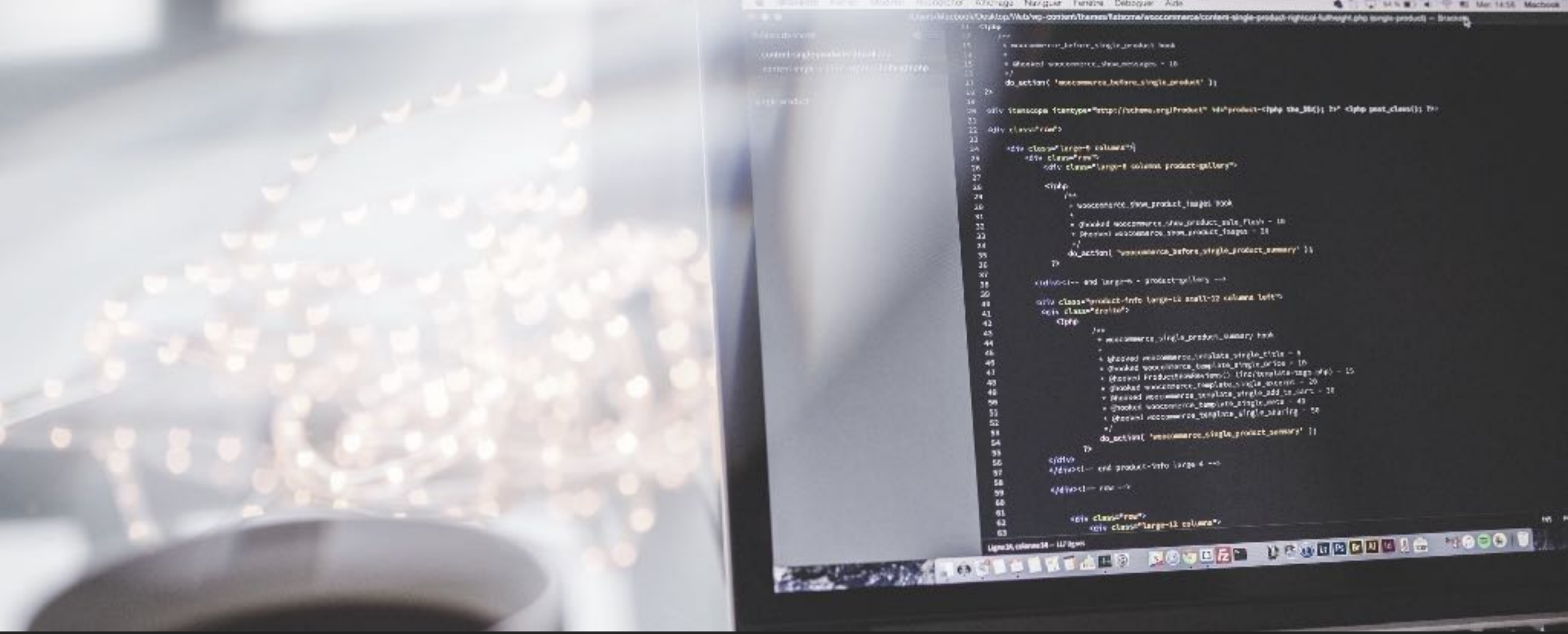
CODE LEGACY

DATES LIVRAISON

PROPRIETE




REDMINE
JIRA
TRAC
PRJ MNGT
OS
LINUX
SOLARIS
WINDOWS
GESTION VERSION
COMPILATION
METRIQUES
CODE
DEVENV
IDE
ECLIPSE
VISUALC++
NETBEANS
UNITAIRES
INTEGRATION
INT CONTINUE
TESTS
DOC
WORD
SPHINX
DOXYGEN



QU'EST CE QUE LA

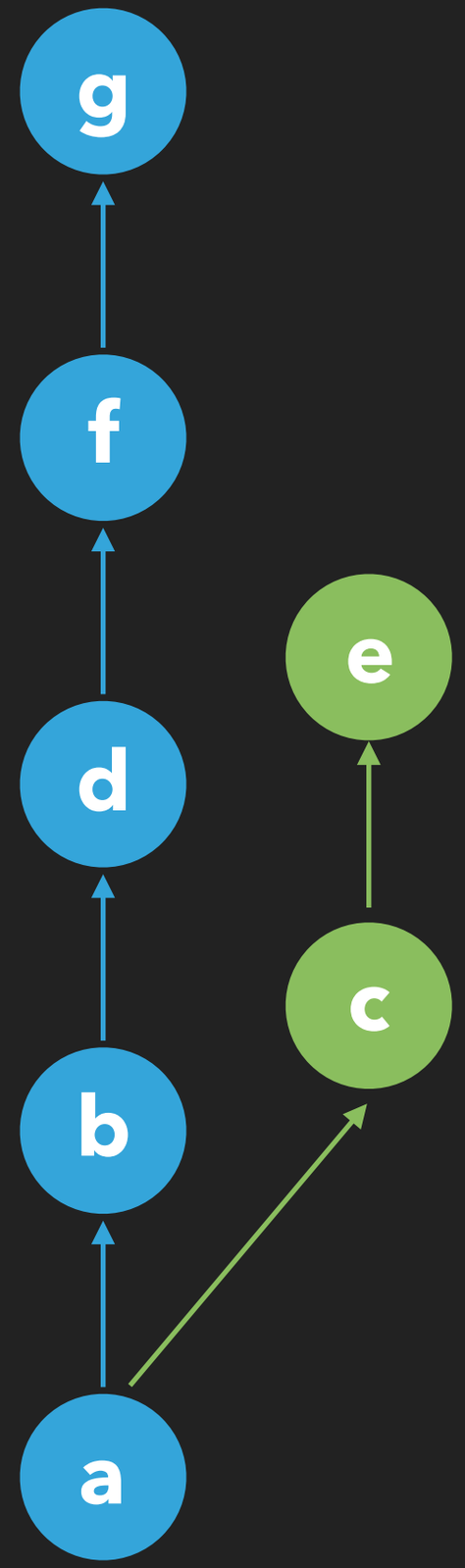
GESTION DE VERSION ?

NOM DE ZEUS MARTY

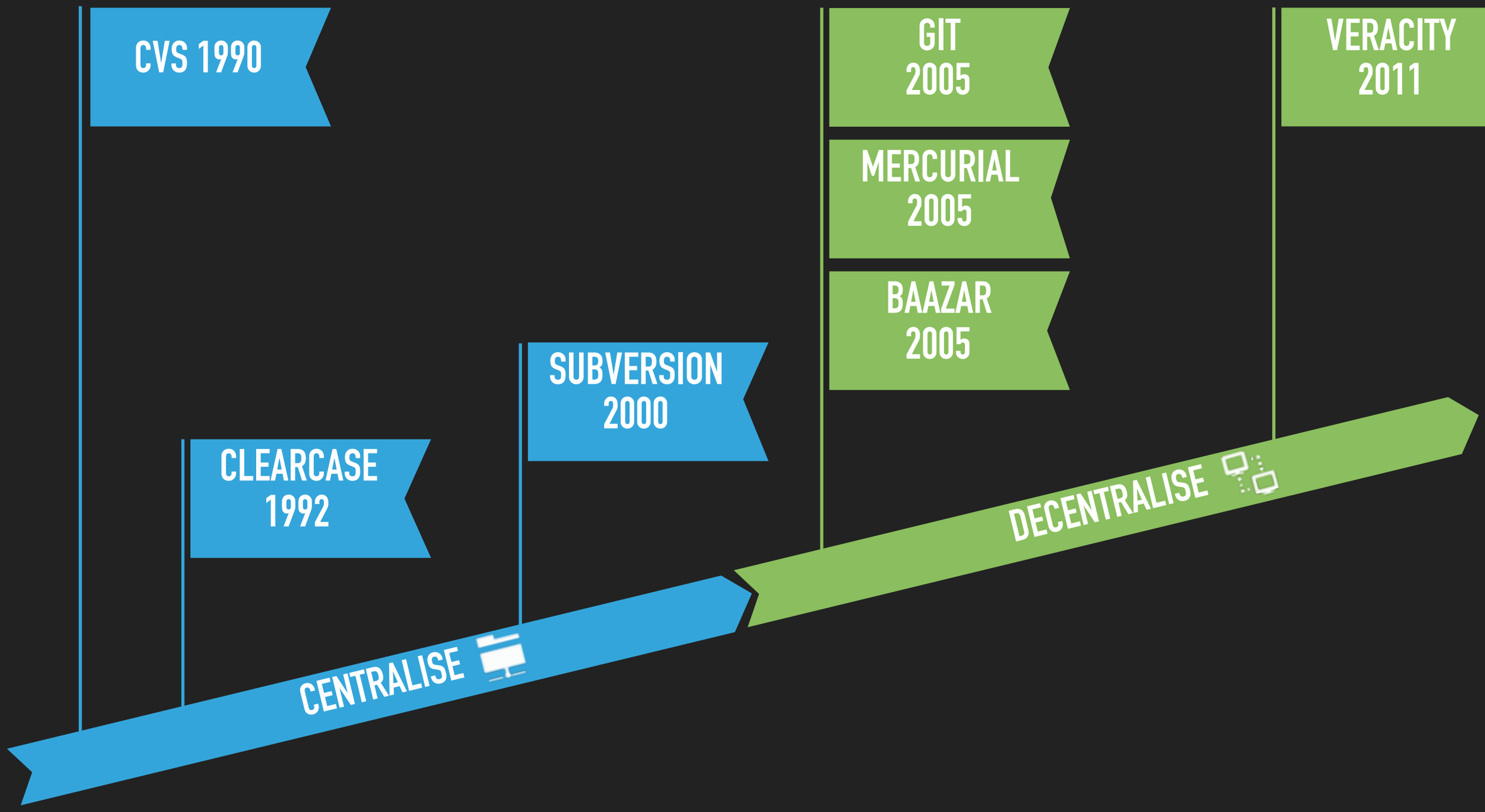
Emmet Brown

LA GESTION DE VERSION PERMET DE

- Sauver des états du code
- Collaborer sur du code
- Travailler de manière concurrente
- Gérer les conflits
- Marquer des versions
- Revenir en arrière



LES OUTILS DE VERSIONING

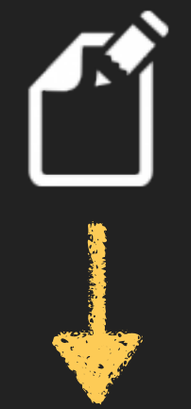


QU'EST CE QUE L'

INTEGRATION CONTINUE

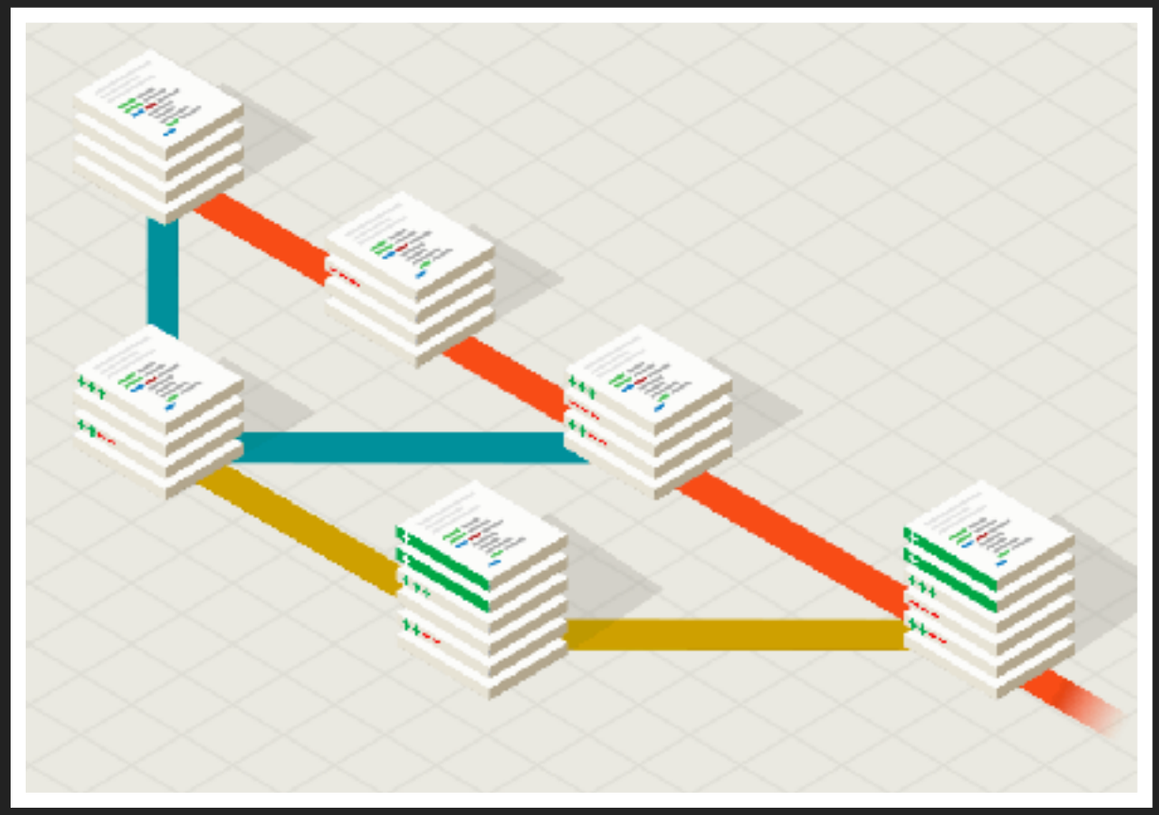
L'INTEGRATION CONTINUE PERMET DE

- Lancer les tests à chaque changement de code
- Prévenir en cas de regression
- Vérifier l'intégration des composants
- Tester sur plusieurs OS
- Livrer en continu



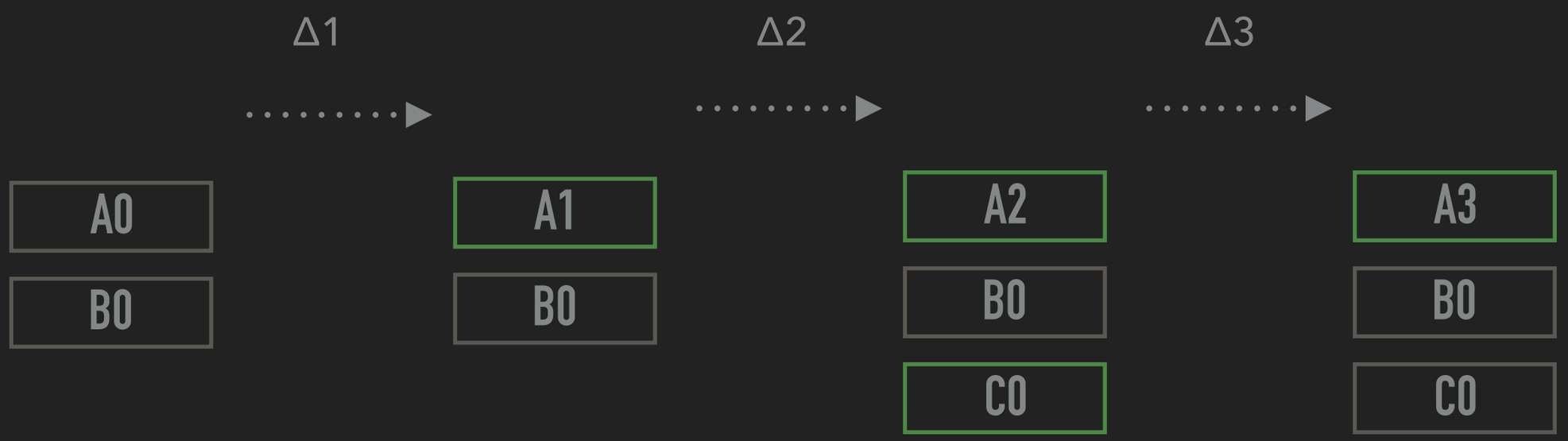
MENU

- GESTION DE CODE
  with git, gitlab, SourceTree
- INTEGRATION CONTINUE
  with gitlabci

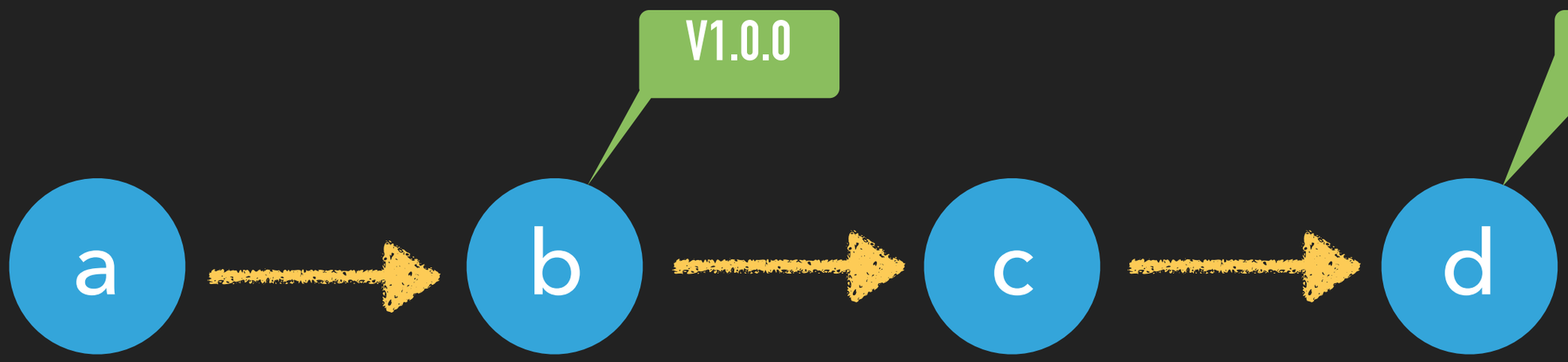


GESTION DE CODE

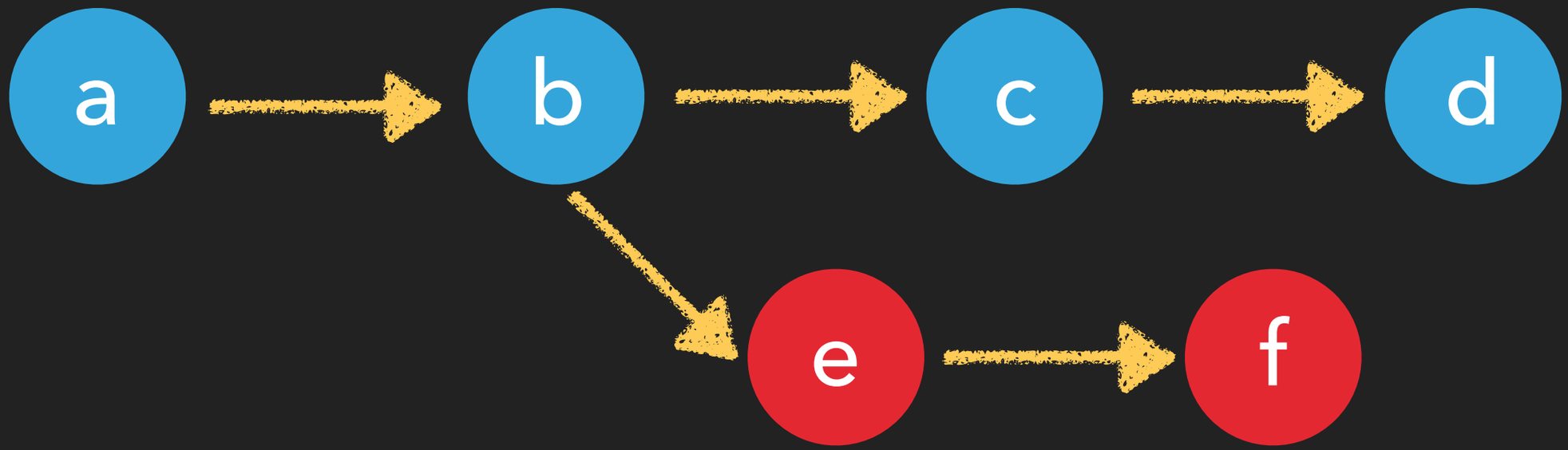
JALON DE CODE = COMMIT



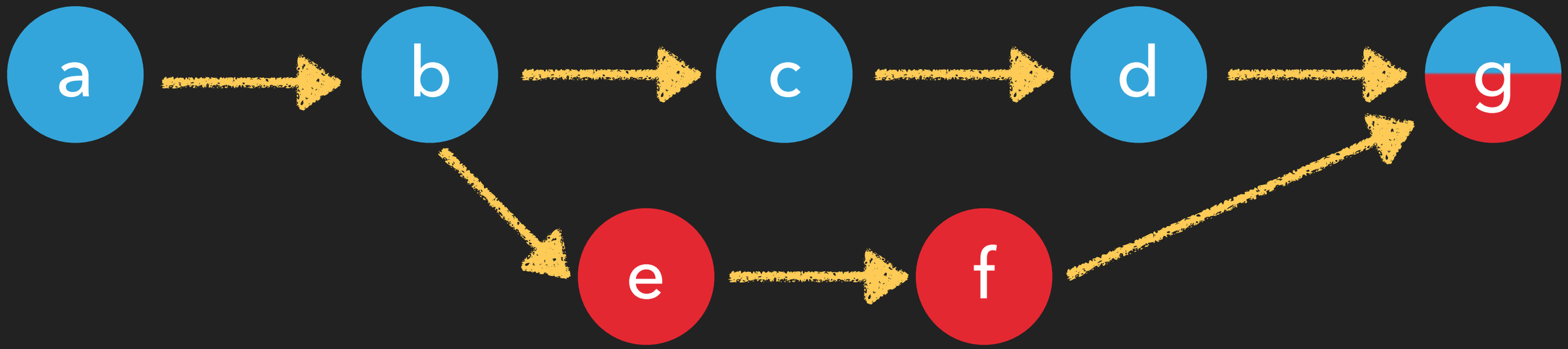
MARQUER UNE VERSION = TAG



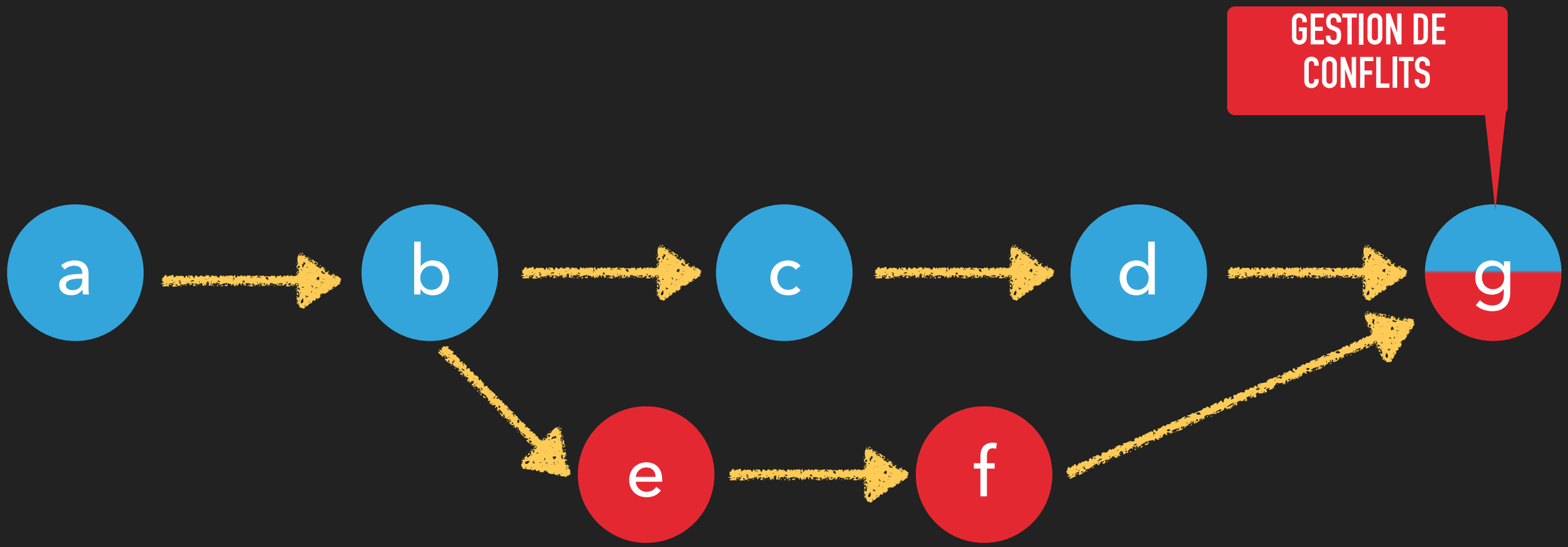
DÉVELOPPEMENT PARALLÈLE = BRANCHE



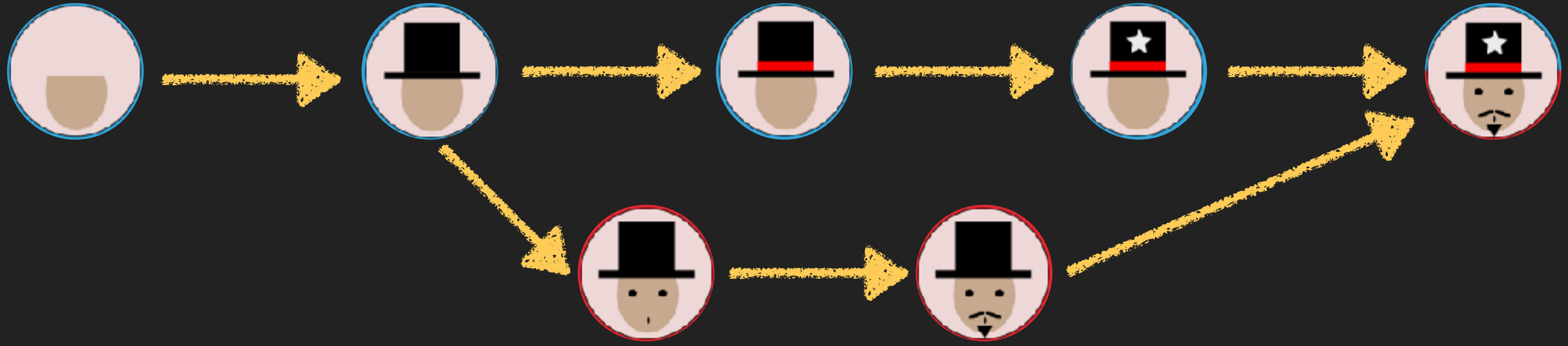
RÉINTÉGRER UNE BRANCHE = MERGE



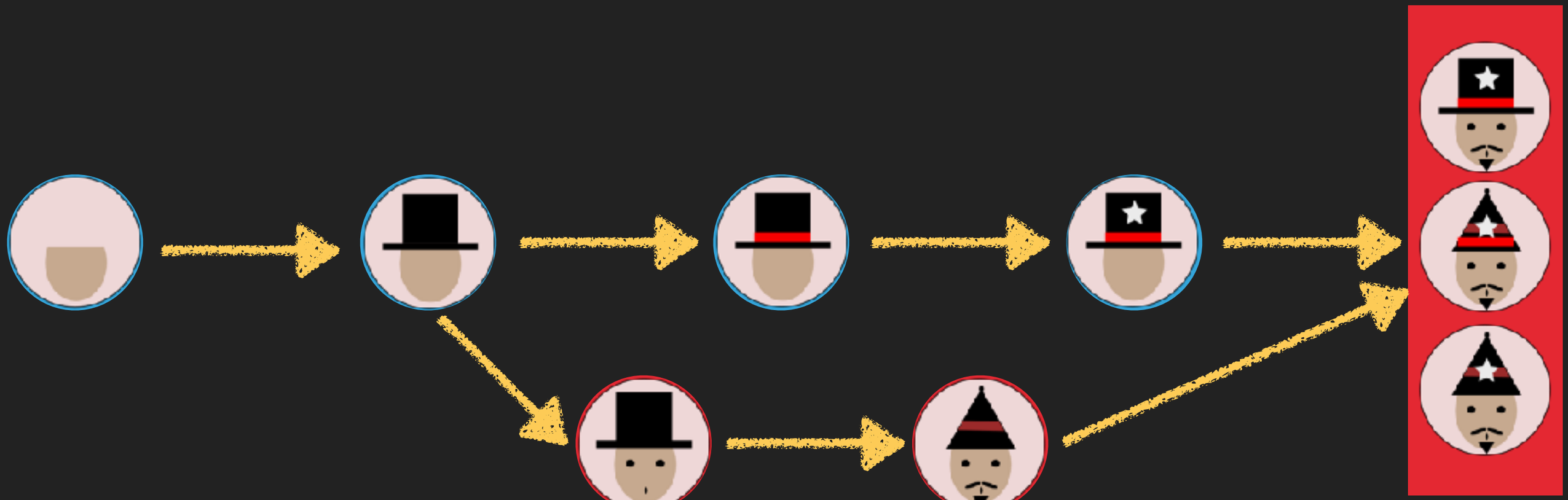
EDITER LE MÊME FICHIER EN // = CONFLIT

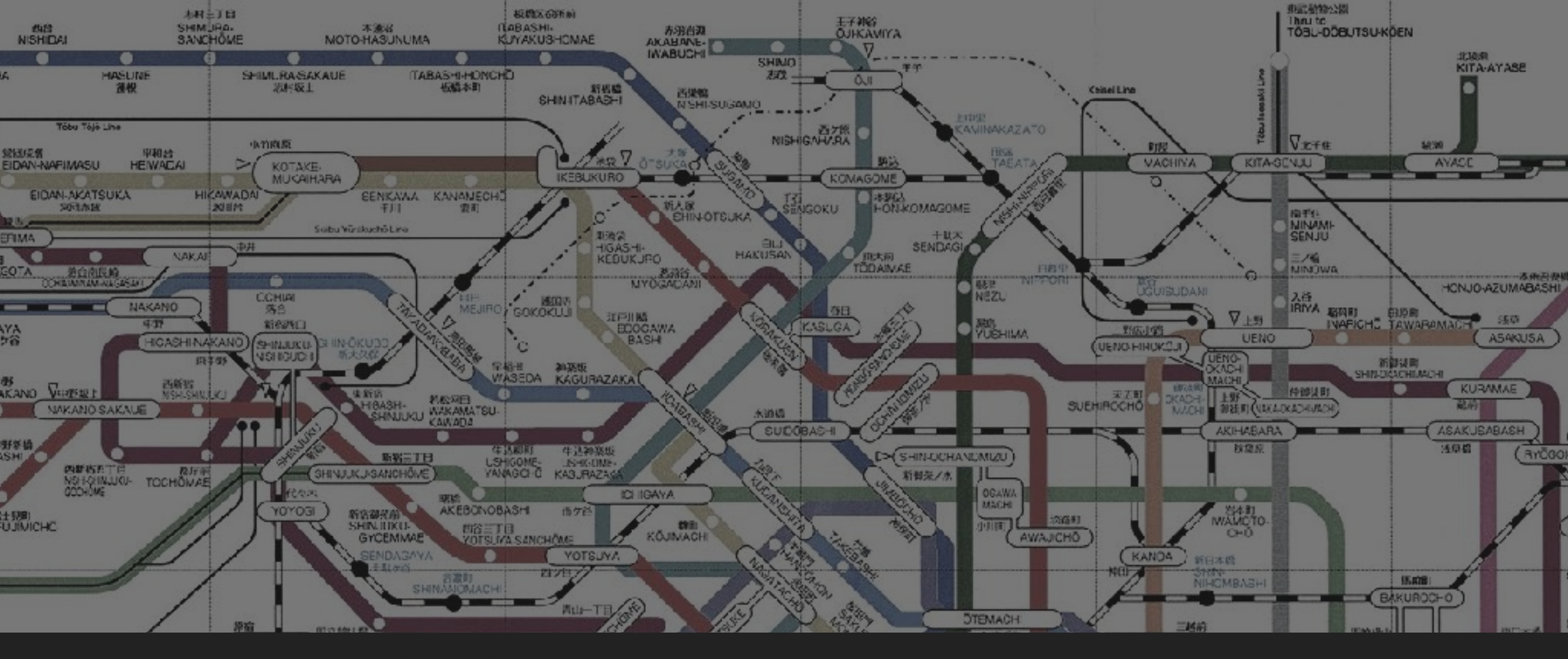


BRANCHER ET MERGER



BRANCHER ET CONFLIT





LA ROUTE ? LÀ OÙ ON VA, ON N'A PAS BESOIN DE ROUTE !

GIT INTRO

CRÉÉ PAR LINUS

- Créé en 2005
- Conçu pour gérer le noyau linux
- Logiciel libre GNU GPL V2

LINUS TORVALDS

DÉCENTRALISÉ

OPTIMISÉ

PUISSANT

DÉCENTRALISÉ

- Chaque noeud du réseau peut
  - Accéder à **tout** l'historique
  - Travailler sans réseau
  - Faire office de serveur

LINUS TORVALDS

DÉCENTRALISÉ

OPTIMISÉ

PUISSANT

OPTIMISÉ

- Rapide
- Compressé

LINUS TORVALDS

DÉCENTRALISÉ

OPTIMISÉ

PUISSANT

PUISSANT

- Maîtrise de l’historique
- Configuration avancée
- Tout est possible avec Git

LINUS TORVALDS

DÉCENTRALISÉ

OPTIMISÉ

PUISSANT

COMMANDES PHARE

- merge / rebase
- clone /push / pull
- branch / reset
- bisect

LINUS TORVALDS

DÉCENTRALISÉ

OPTIMISÉ

PUISSANT

QUITTE À VOYAGER DANS LE TEMPS AU VOLANT D'UNE VOITURE, AUTANT EN CHOISIR UNE QUI AIT DE LA GUEULE !

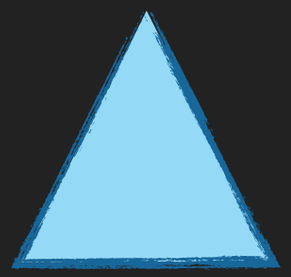
LE MODELE DE GIT

UN GRAPHE ORIENTE

objet commit

relation père fils

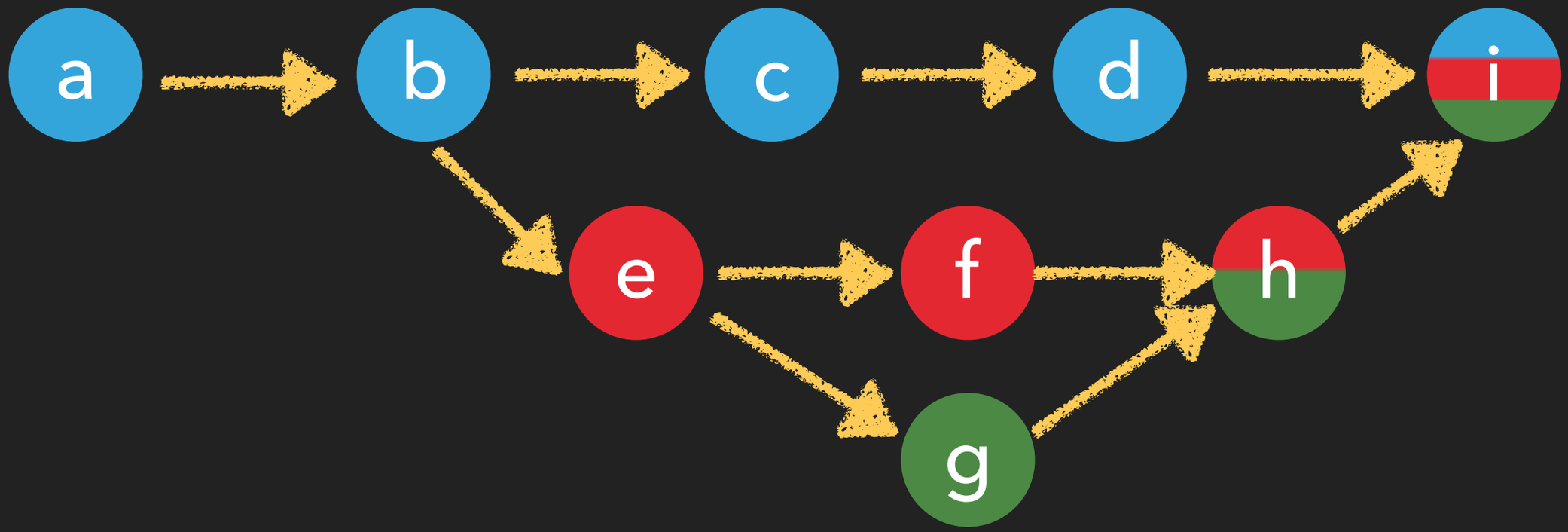
référence



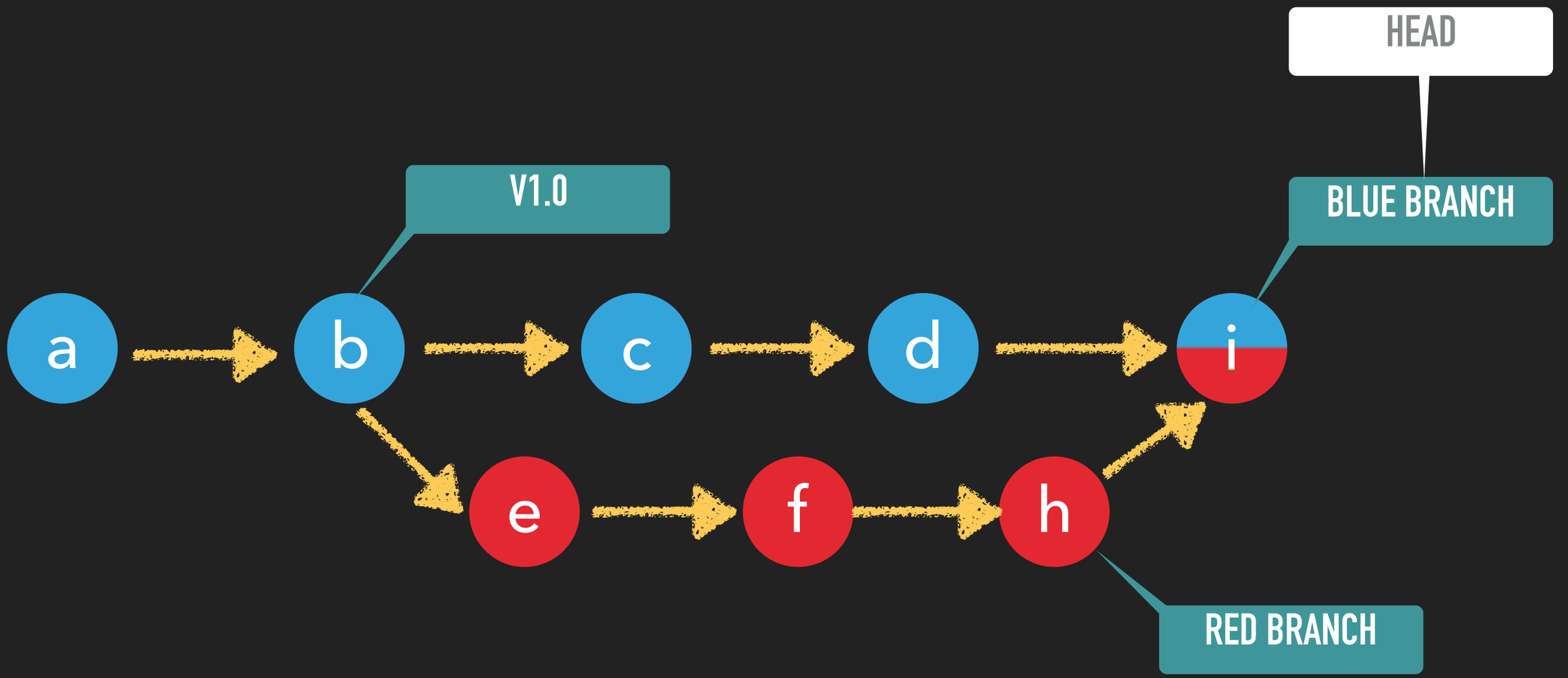
patch

COMMIT

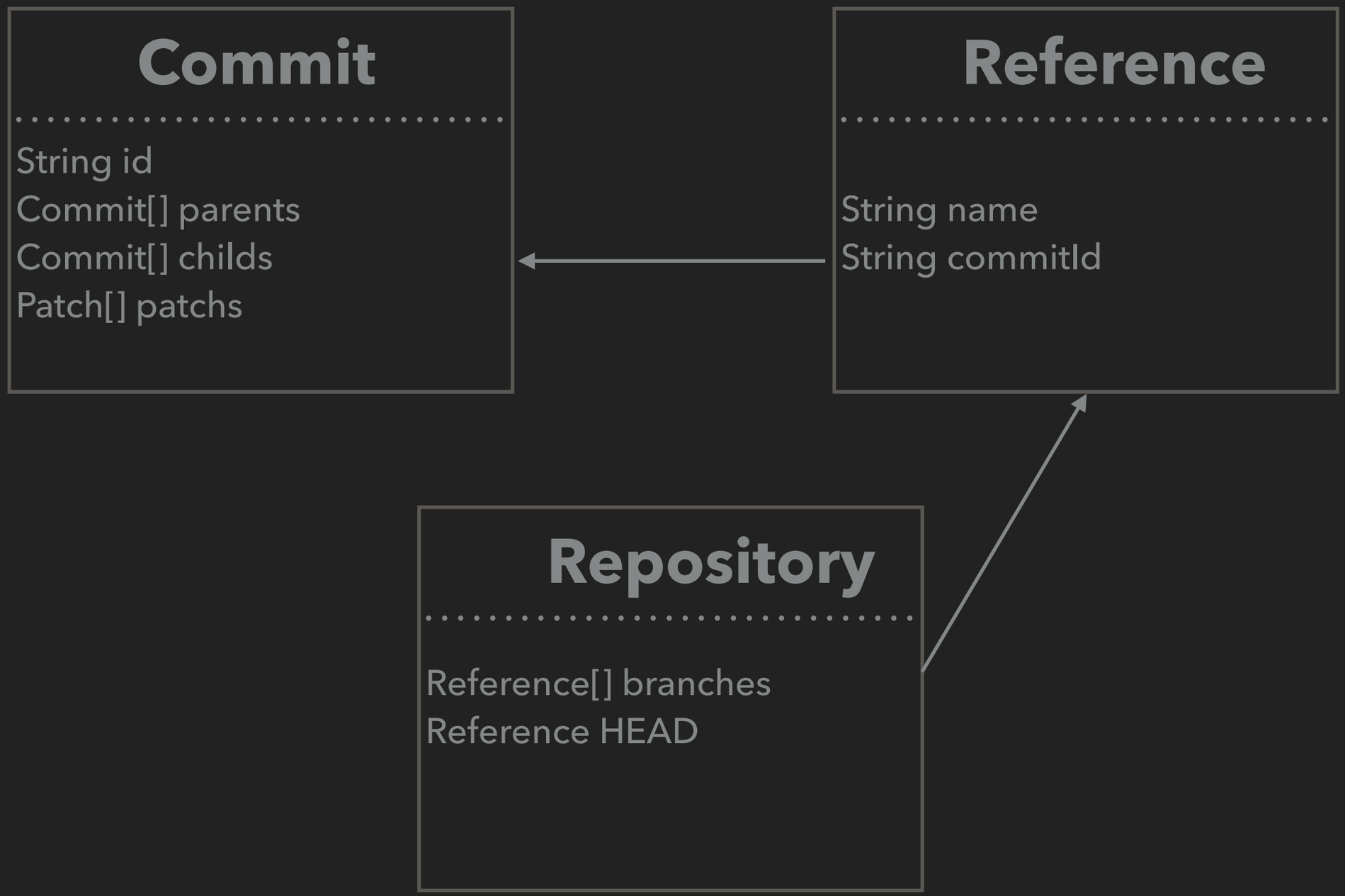
un **commit** a un ou plusieurs enfants qui ont un
ou plusieurs enfants qui ont un ou plusieurs parents



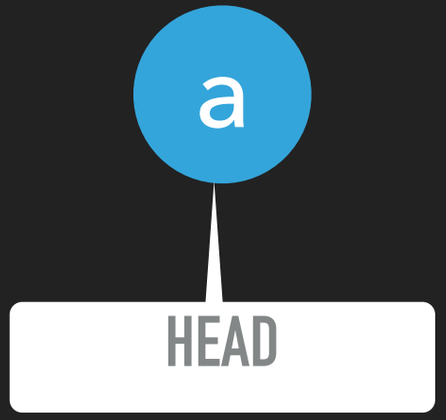
REFERENCE

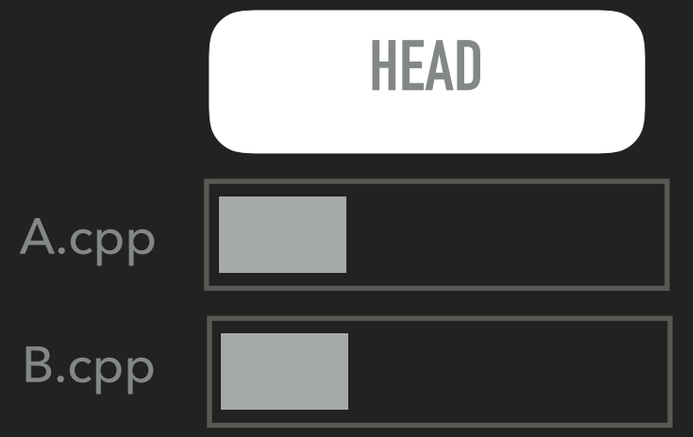


MODELE

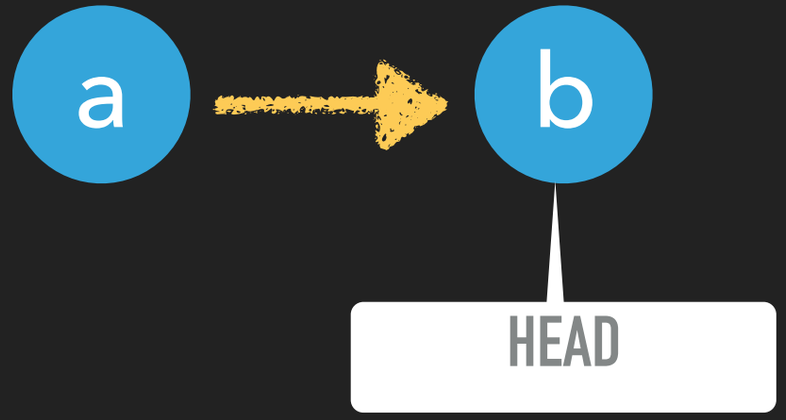

Commit
String id
Commit[] parents
Commit[] childs
Patch[] patchs
Reference
String name
String commitId
Repository
Reference[] branches
Reference HEAD

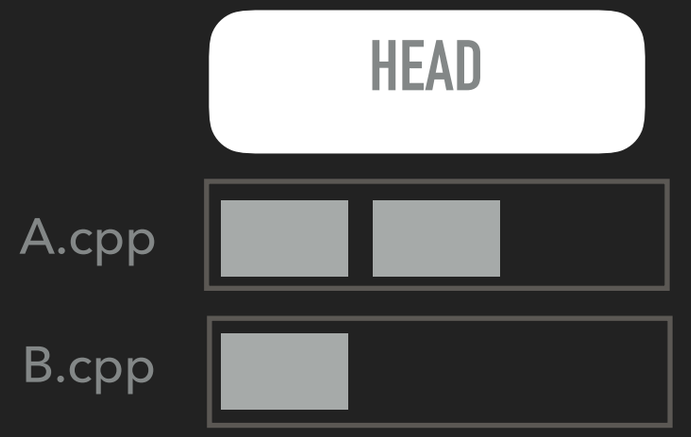
PATCH



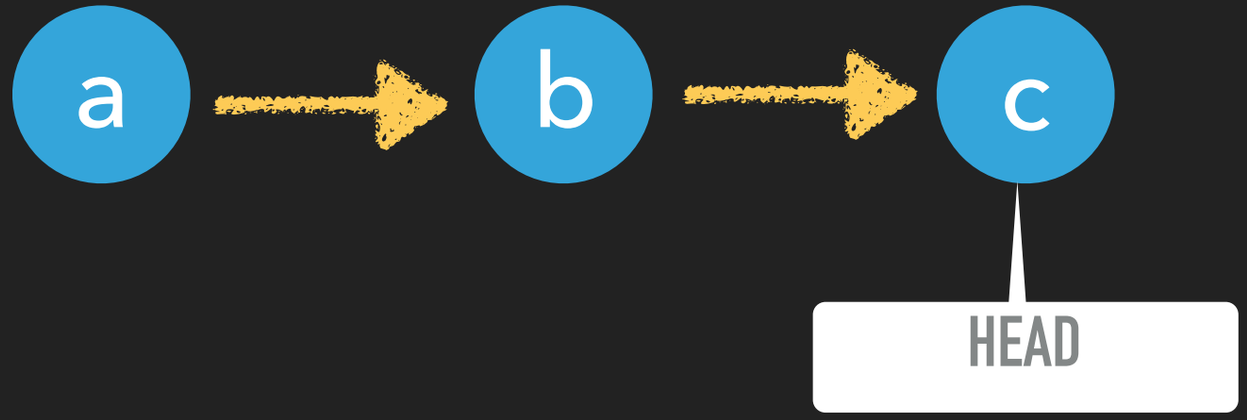


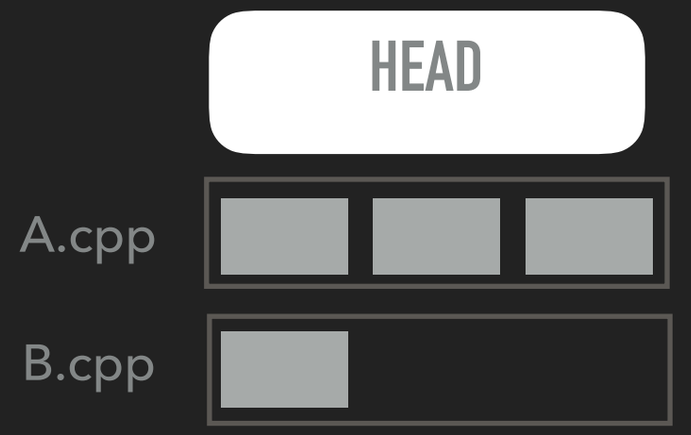
PATCH



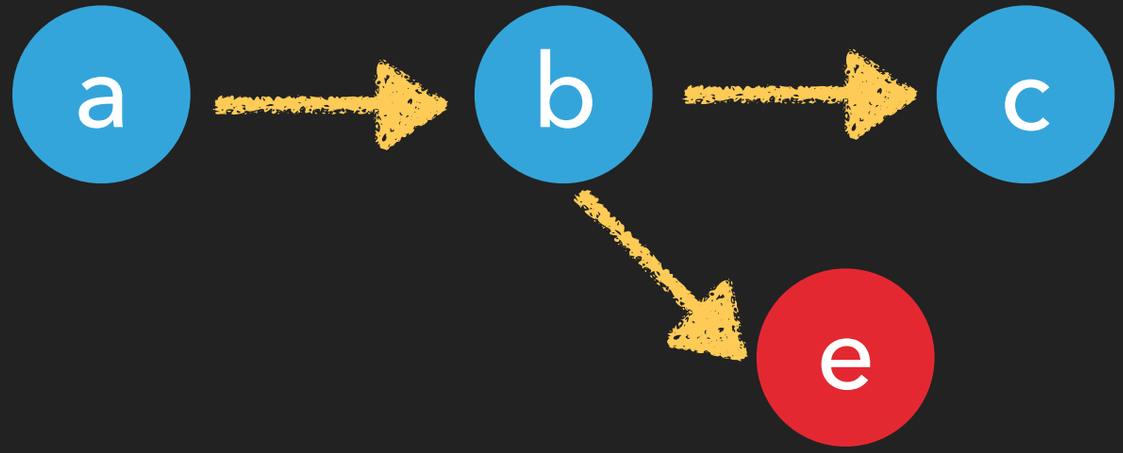


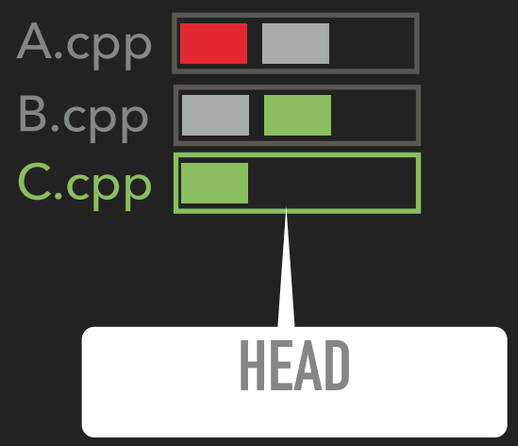
PATCH



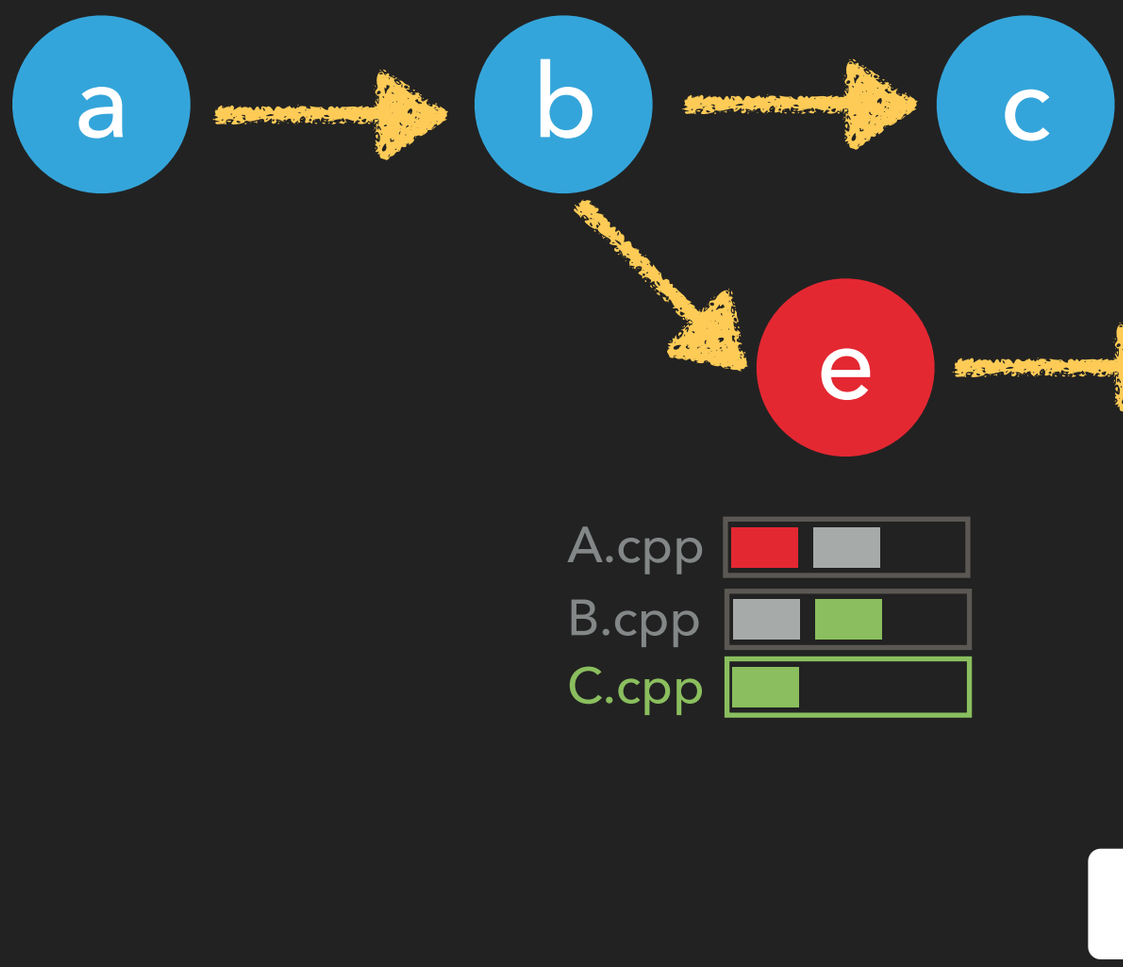


PATCH



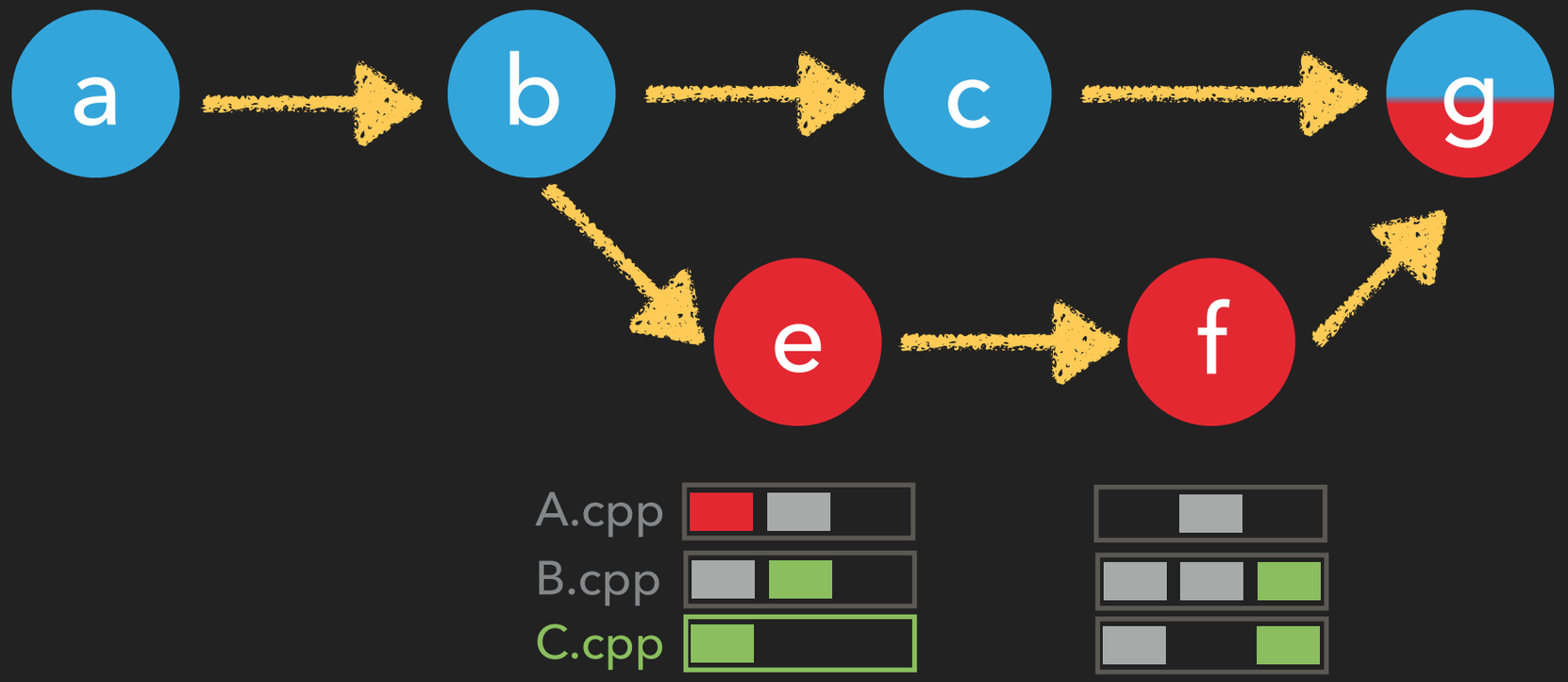


PATCH



PATCH


HEAD
A.cpp
B.cpp
A.cpp
B.cpp
C.cpp

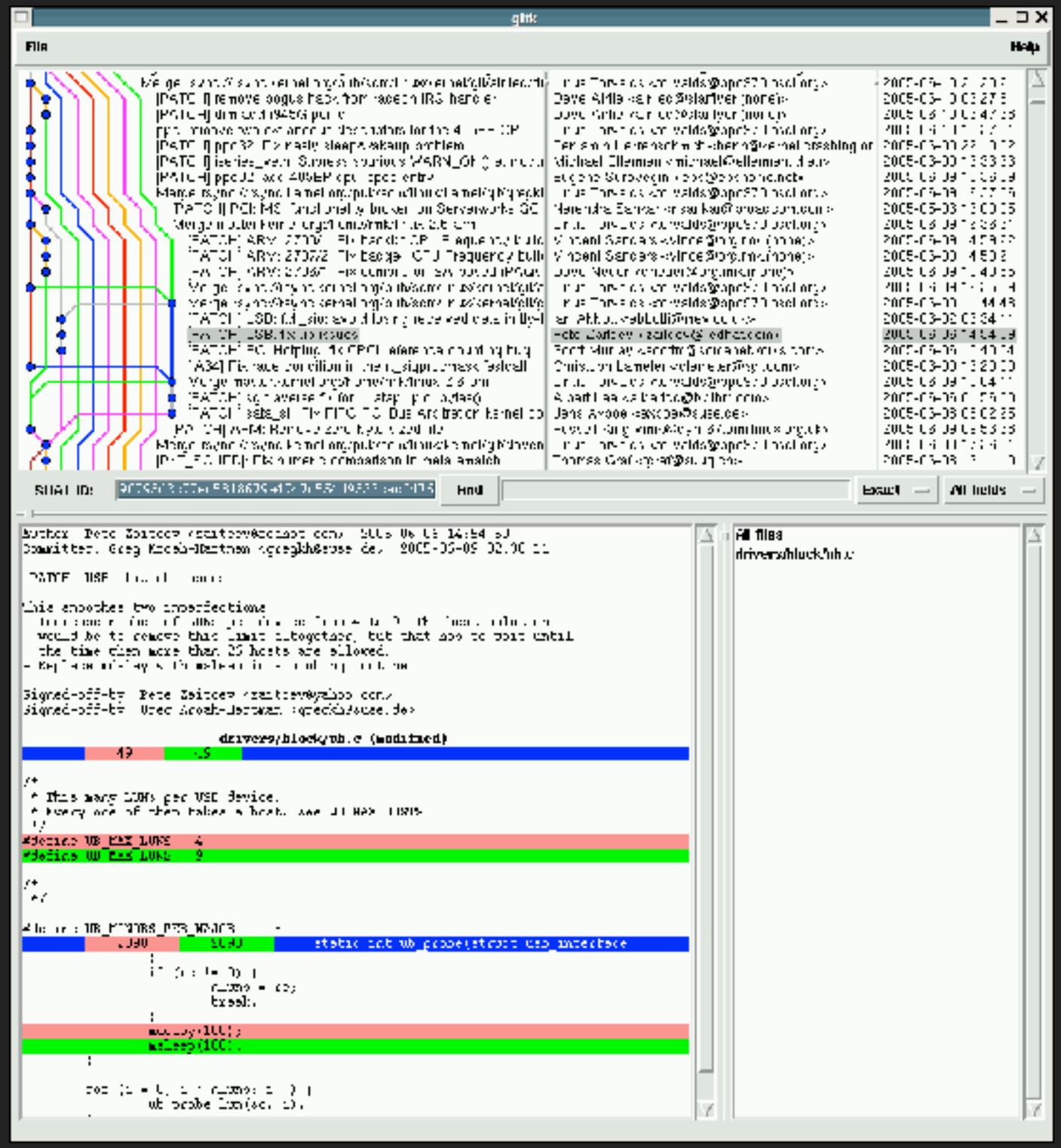

a
b
c
g
e
f
A.cpp
B.cpp
C.cpp
HEAD
A.cpp
B.cpp
C.cpp

SOURCETREE, GITK, ECLIPSE

LES CLIENTS GIT

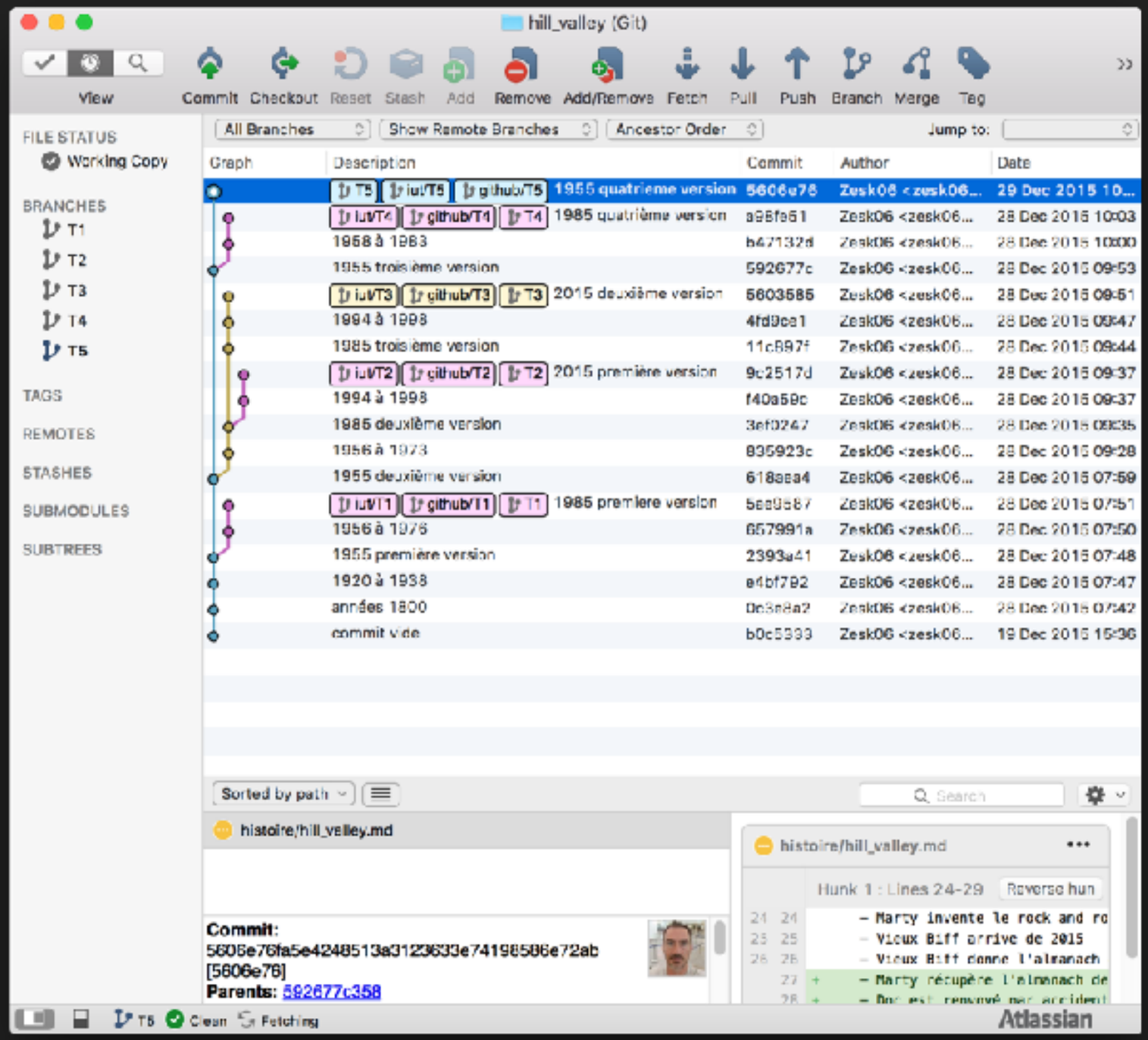
GITK

- Client *officiel*
- win/linux/mac
- moche
- efficace



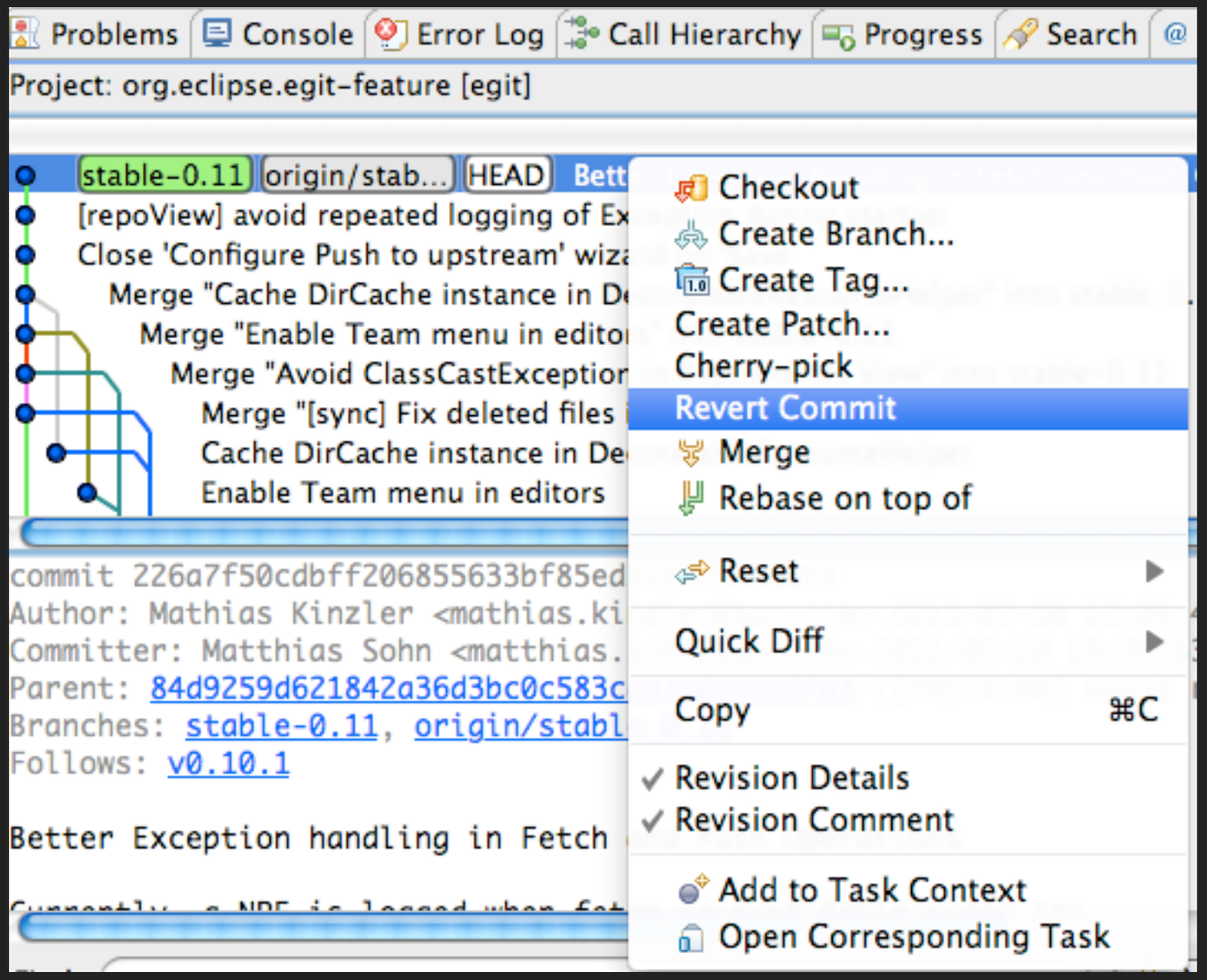
SOURCETREE

- Atlassian
- win/mac
- gitflow
- mercurial



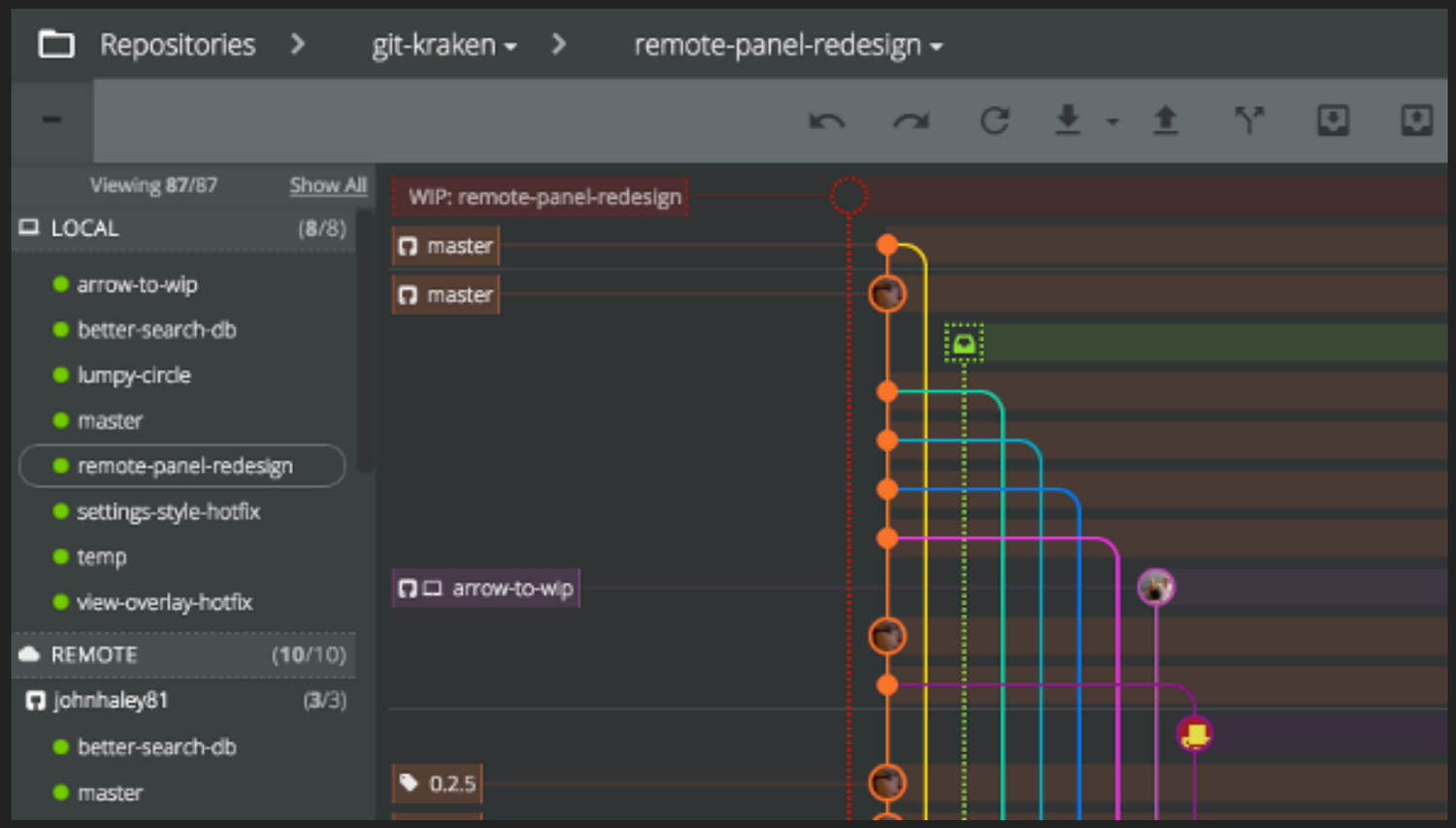
ECLIPSE EGIT

- eclipse
- win/linux/mac
- integrated



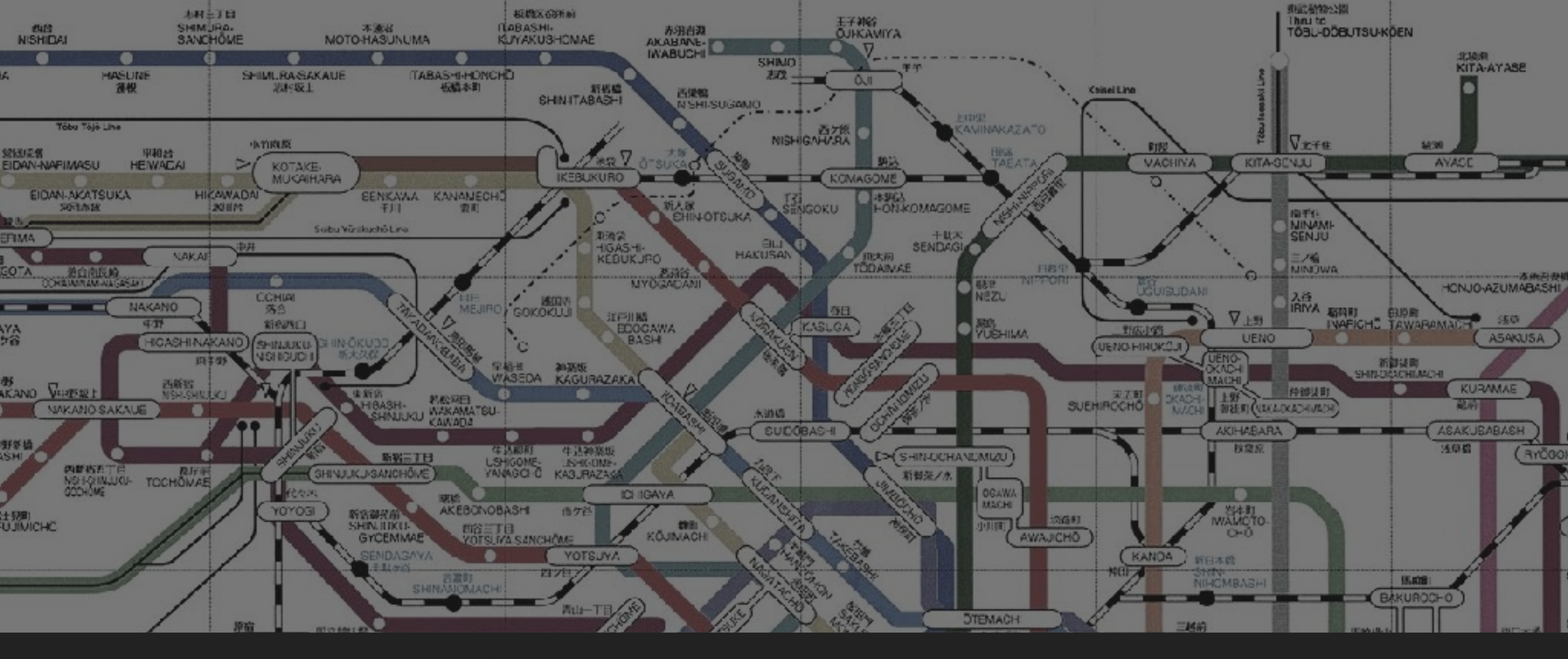
GITKRAKEN

- axosoft
- win/mac/linux
- fresh new
- free for NC use
- 60$ / year



AUTRES CLIENTS NOTABLES

- linux:
  - git-cola
  - gitg
- windows:
  - tortoise-git
  - git-extensions

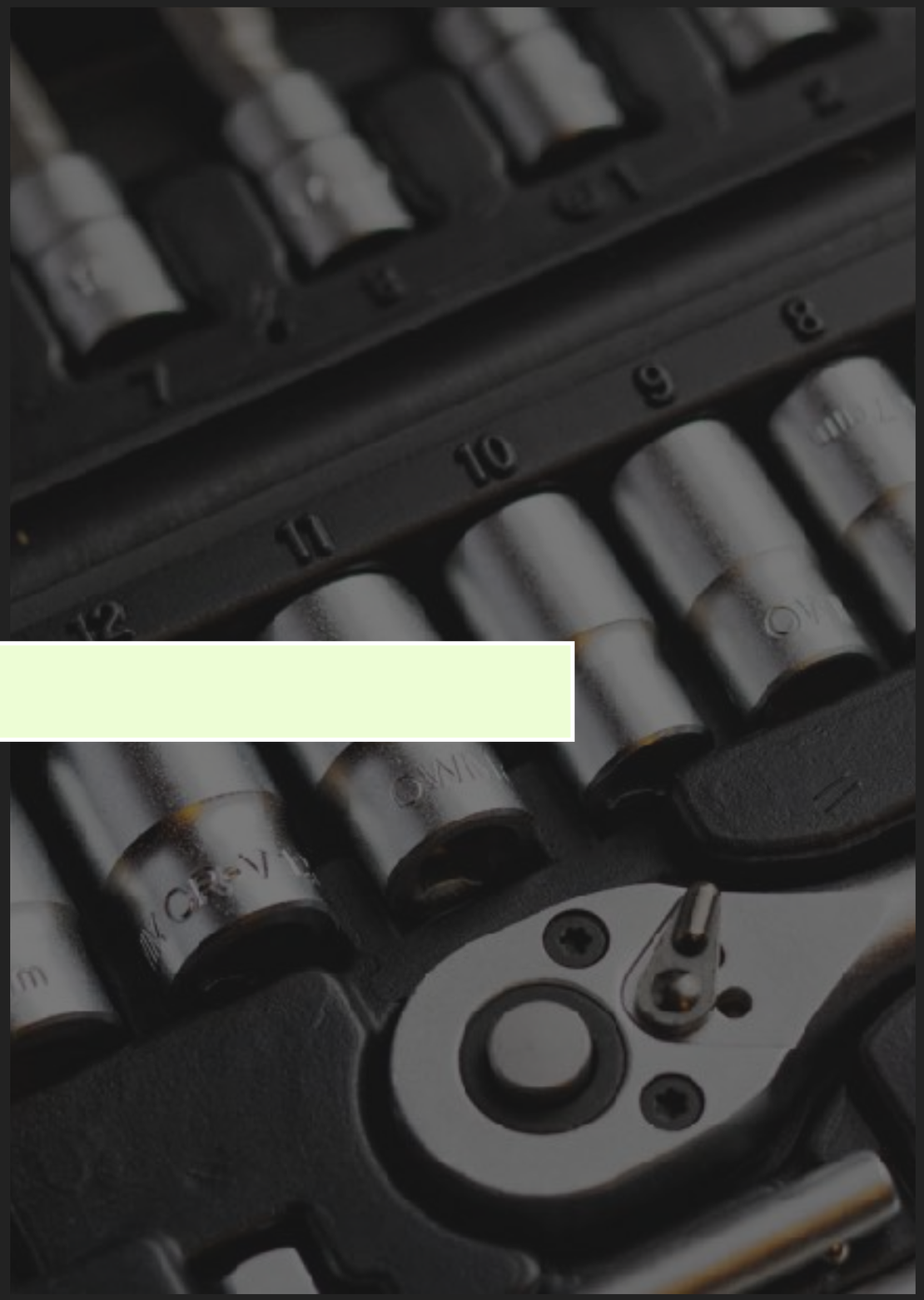


LA ROUTE ? LÀ OÙ ON VA, ON N'A PAS BESOIN DE ROUTE !

GIT EN SOLO

INSTALLEZ GIT!

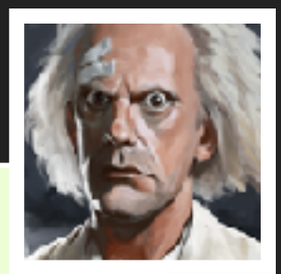
- Download tools
- Install tools



```
doc@labo$sudo apt-get install git gitk gitg
doc@labo$sudo dpkg -i Downloads/*.deb
```

git help [command]

- Affiche l'aide de command



```
doc@labo$git help help
```

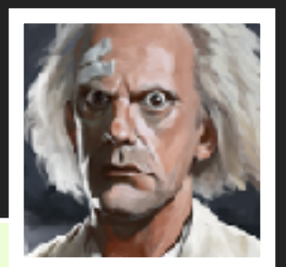
```
GIT-HELP(1)                       Git Manual                       GIT-HELP(1)

NAME
       git-help - Display help information about Git

SYNOPSIS
       git help [-a|--all] [-g|--guide]
a

DESCRIPTION
       With no options and no COMMAND or GUIDE given, the synopsis of the git
       command and a list of the most commonly used Git commands are printed
       on the standard output.

       If the option --all or -a is given, all available commands are printed
       on the standard output.

       If the option --guide or -g is given, a list of the useful Git guides
       is also printed on the standard output.
```

GIT EN SOLO

```
git config --global user.name “Emmett Brown”
git config --global user.email “emmett.brown@hill_valley.com”
```

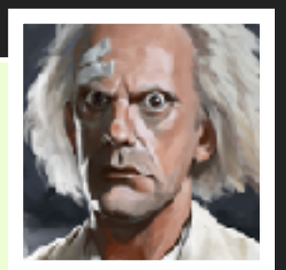
- Configurer son nom et son mail

```
doc@labo$git config --global user.name “Emmett Brown”
doc@labo$git config --global user.email “emmett.brown@hill_valley.com”
```



`git init [path]`

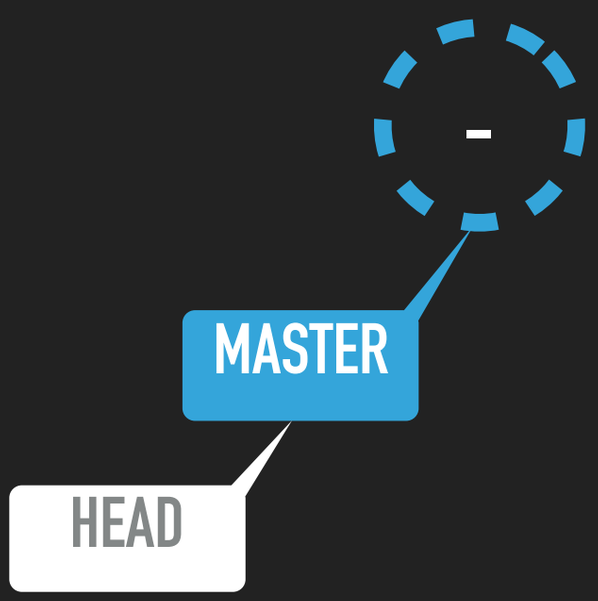
- Initialise une copie locale *working copy* dans le dossier path



```
doc@labo$ cd
doc@labo$ mkdir git
doc@labo$ cd git
doc@labo$ git init test
Initialized empty Git repository in /Users/doc/git/test/.git/
doc@labo$ cd test/
```

`git init [path]`

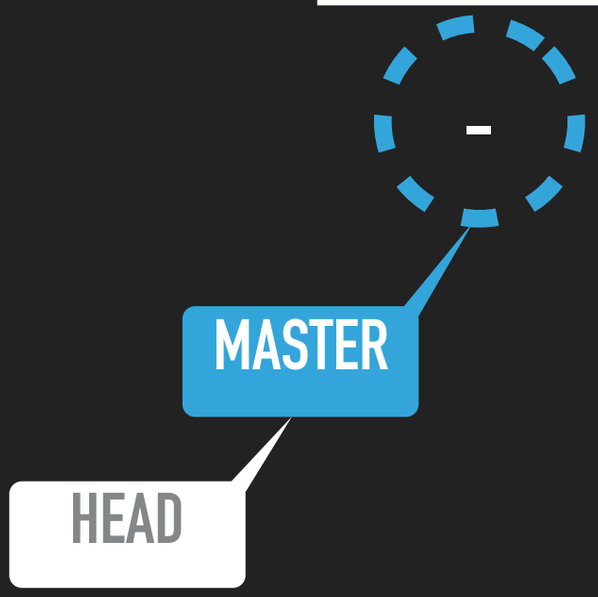
- Initialise une copie locale *working copy* dans le dossier path
- Crée un dossier .git dans path



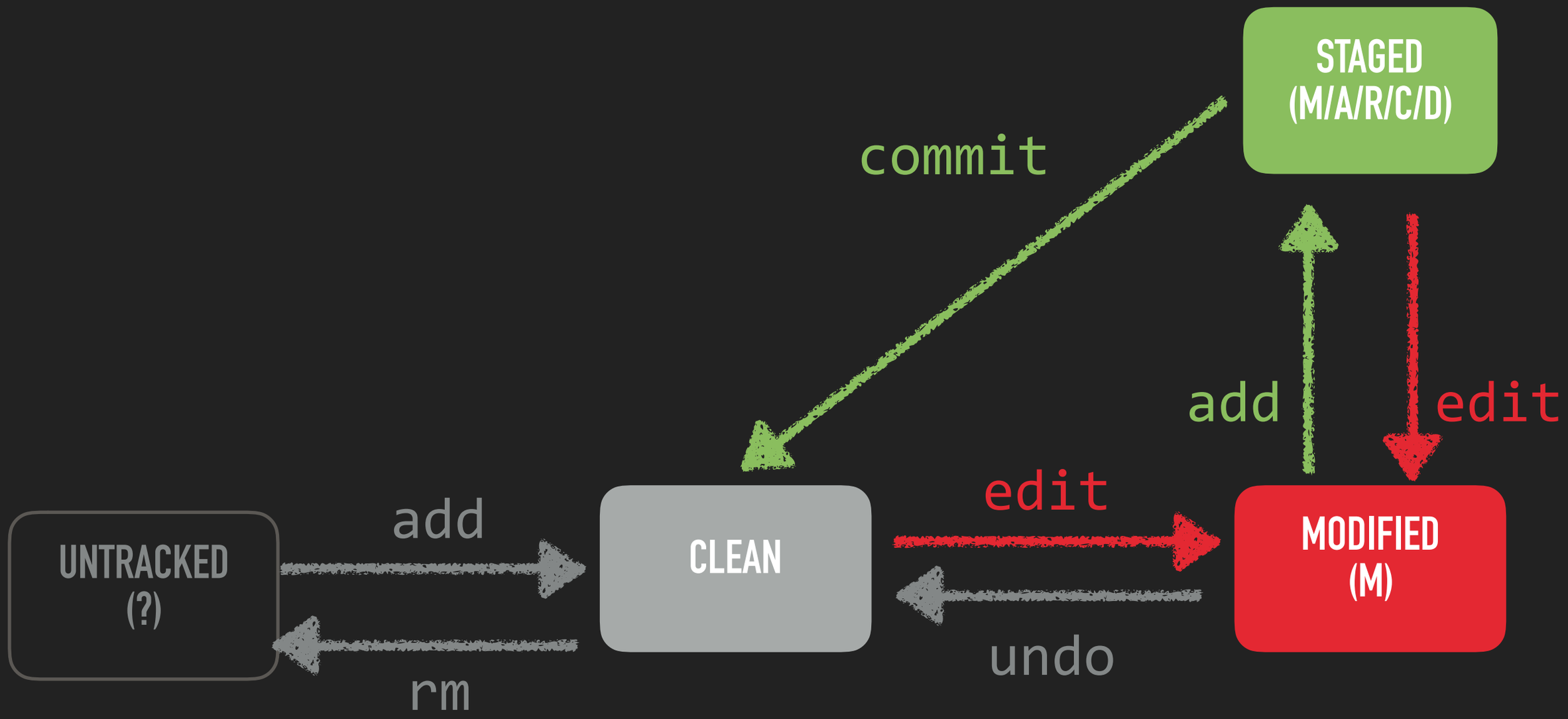
git status

- Donne le status des fichiers de la working copy

```
doc@labo$ git status
On branch master

Initial commit

nothing to commit (create/copy files and use "git add" to track)
```



LES ÉTATS D'UN FICHIER



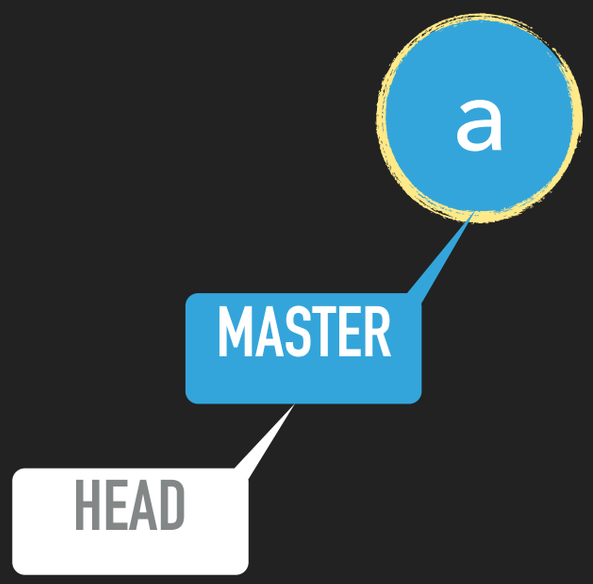
git add file...

- Ajoute le/les fichiers ou les modifications de fichier à l'index

```
doc@labo$ echo "# README" > README.md
doc@labo$ git status
On branch master

Initial commit

Untracked files:
  (use "git add <file>..." to include in what will be committed)

   README.md

nothing added to commit but untracked files present (use "git add" to track)

doc@labo$ git add README.md
doc@labo$ git status
On branch master

Initial commit

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)

   new file:   README.md
```

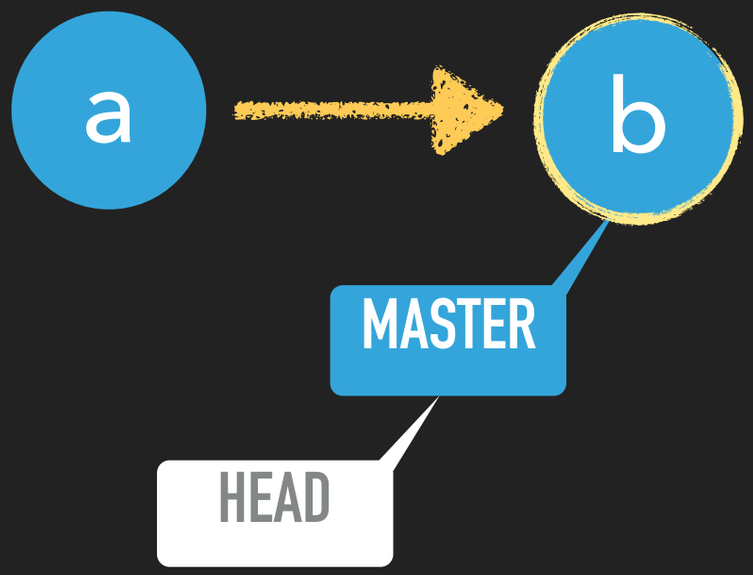
`git commit -m “commentaire”`

- Crée un object commit avec le message commentaire
- Se base sur les modifications présentes dans l’index / stage

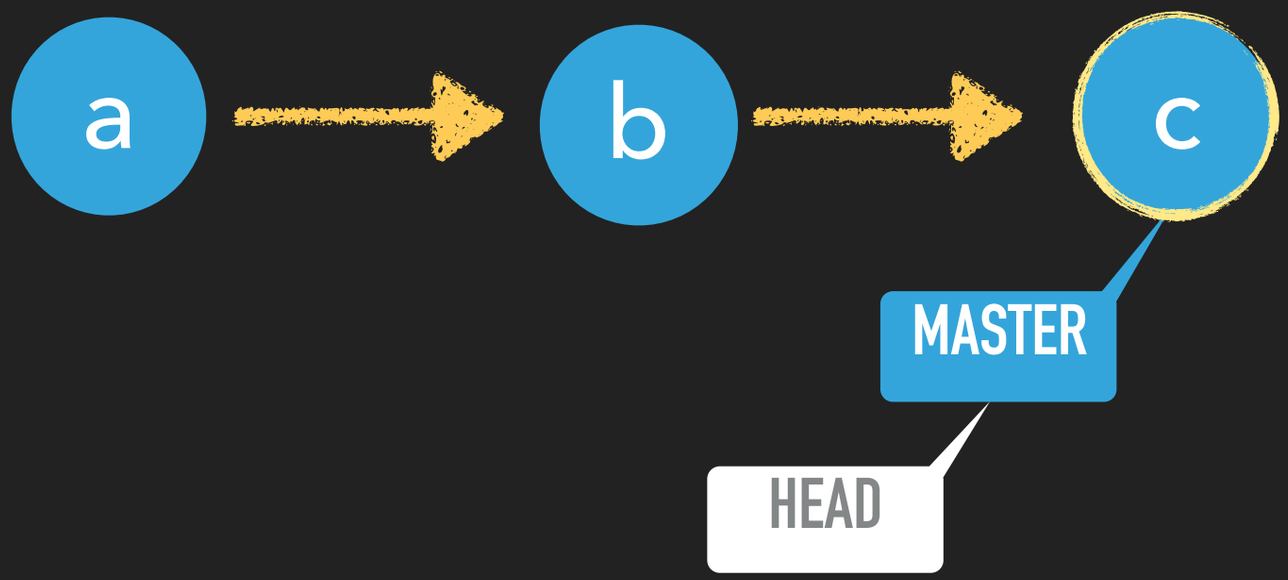


`git commit -m “deuxième commit”`

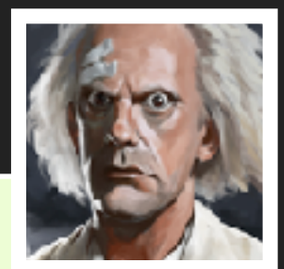
- Le nouveau commit à pour parent le commit pointé par HEAD
- La branche pointée par HEAD se déplace sur ce nouveau commit



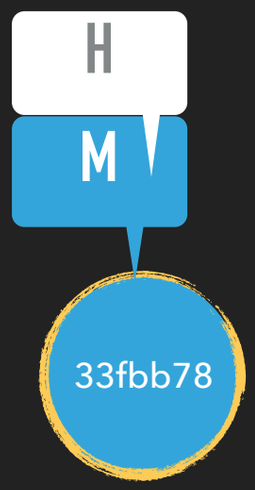
```
git commit -m “et encore un”
```



TROIS COMMITS



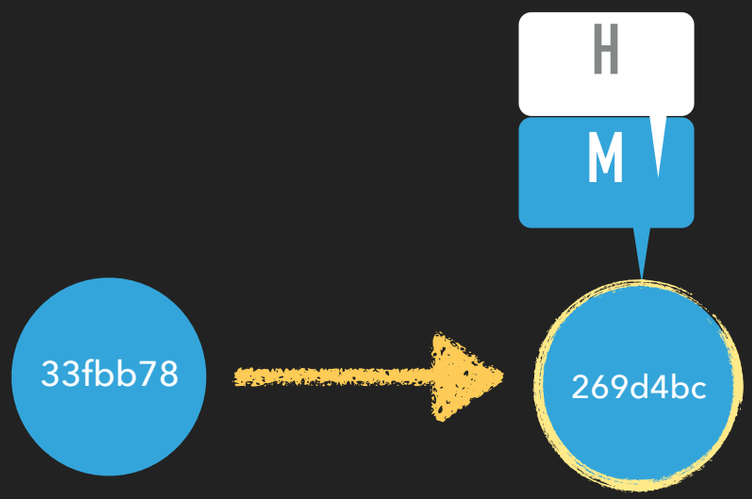
```
doc@labo$ doc@labo$ git commit -m "commentaire"
[master (root-commit) 33fbb78] commentaire
 1 file changed, 1 insertion(+)
 create mode 100644 README.md
```



TROIS COMMITS

```
doc@labo$ doc@labo$ git commit -m "commentaire"
[master (root-commit) 33fbb78] commentaire
 1 file changed, 1 insertion(+)
 create mode 100644 README.md
```

```
doc@labo$ echo "some text" >> README.md
doc@labo$ git add README.md
doc@labo$ git commit -m "deuxieme commit"
[master 269d4bc] deuxieme commit
 1 file changed, 1 insertion(+)
```

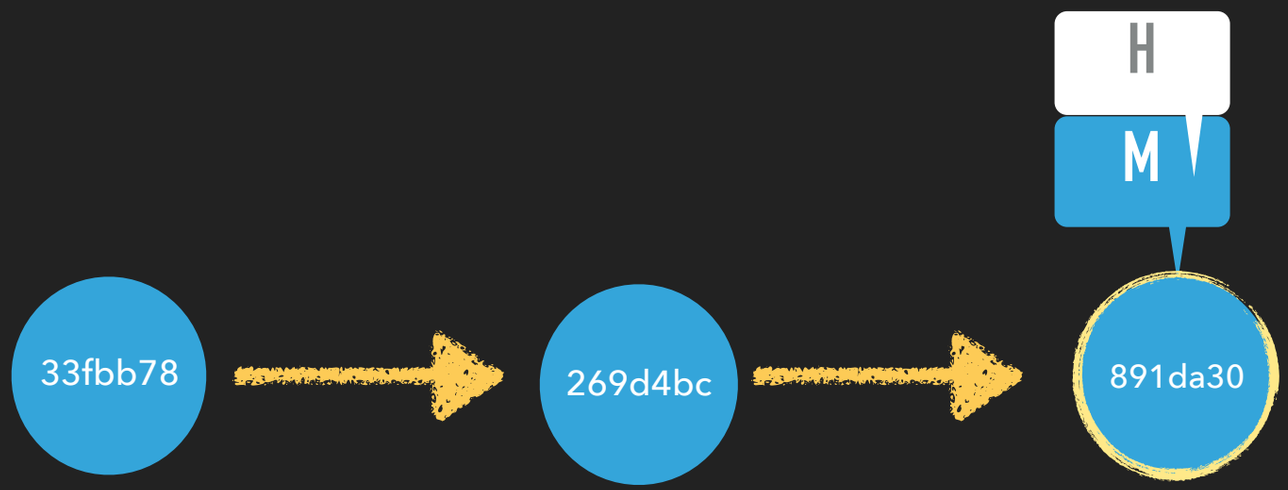


TROIS COMMITS

```
doc@labo$ doc@labo$ git commit -m "commentaire"
[master (root-commit) 33fbb78] commentaire
 1 file changed, 1 insertion(+)
 create mode 100644 README.md
```

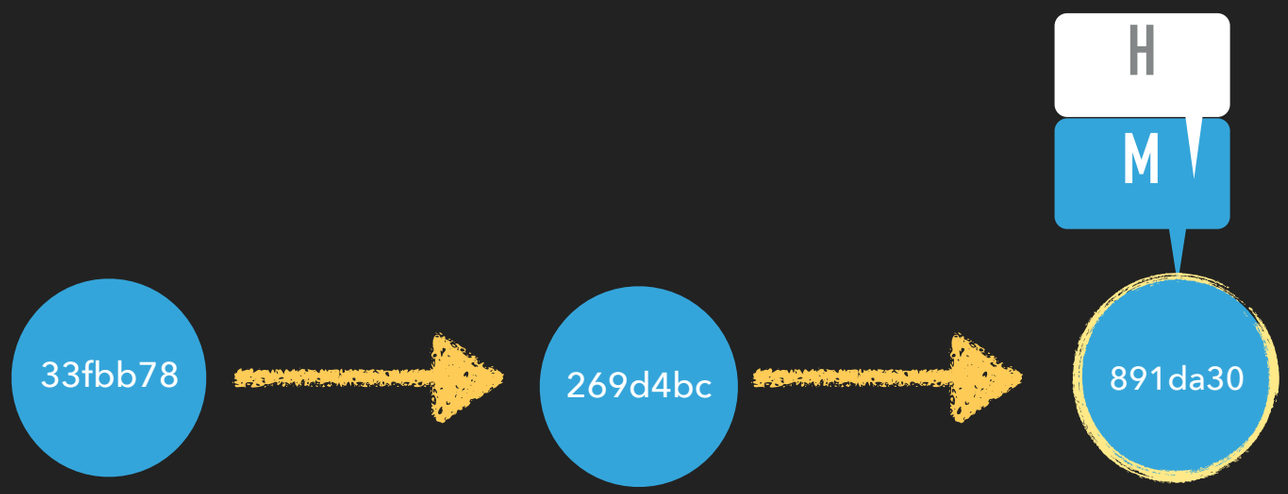
```
doc@labo$ echo "some text" >> README.md
doc@labo$ git add README.md
doc@labo$ git commit -m "deuxieme commit"
[master 269d4bc] deuxieme commit
 1 file changed, 1 insertion(+)
```

```
doc@labo$ echo "text again" >> README.md
doc@labo$ git add README.md
doc@labo$ git commit -m "et encore un"
[master 891da30] et encore un
 1 file changed, 1 insertion(+)
```



LE SHA1

- Identifiant de commit
- Fonction de HASH sur le PATCH, le commiter, la date
- Infalsifiable, Unique
- Sert de référence absolue, d'adresse pour trouver un commit



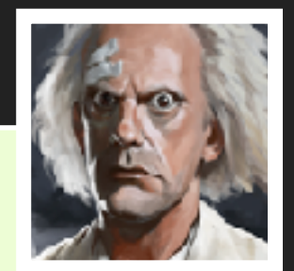
IGNORER DES FICHIERS

- On ne met pas dans la gestion de version:
  - Les produits de compilation: target, *.class, *.so, *.o
  - Les dépendances: *.jar, *.zip, *.exe

COMMENT IGNORER CES FICHIERS?

IGNORER DES FICHIERS

- Mettre les pattern à ignorer dans un fichier `.gitignore`
- `Commiter ce fichier !`



```
doc@labo$ git status
On branch master
Untracked files:
  (use "git add <file>..." to include in what will be committed)

    compiled.pyc
    foo.so
doc@labo$ echo "*.so" > .gitignore
doc@labo$ echo "*.pyc" >> .gitignore
doc@labo$ git status
On branch master
Untracked files:
  (use "git add <file>..." to include in what will be committed)

    .gitignore

nothing added to commit but untracked files present (use "git add" to track)
doc@labo$ git add .gitignore
doc@labo$ git commit -m "Ajout du fichier gitignore"
[master 43fe137] Ajout du fichier gitignore
 1 file changed, 2 insertions(+)
 create mode 100644 .gitignore
doc@labo$ git status
On branch master
nothing to commit, working directory clean
```

IGNORER DES FICHIERS

- Une collection de .gitignore disponible https://github.com/github/gitignore

EXERCICE 1.1

- Initialiser un repository git nommé cours_git dans votre dossier personnel
- Ajouter un fichier *README.md*
  Décrire les principales caractéristiques de git
  - https://github.com/adam-p/markdown-here/wiki/Markdown-Cheatsheet
  - http://dillinger.io/ pour un éditeur online
- Ajouter et commiter le README.md

README.md

```
# GIT

Le gestionnaire de conf en vogue dans nos
banlieues

## Caractéristiques

- rapide
- ...
```

EXERCICE 1.2

- Créer un dossier *commandes* et à l'intérieur de celui-ci
- Pour chaque commande vue:
  - Créer un fichier *commandes/*`nom_commande.md`
  - `Décrire la commande`
  - L'ajouter et le commiter

init.md

```
# git init

    git init [PATH]

## Description

Permet d'initialiser un repository git dans le dossier `PATH`

## Paramètres

- PATH: Le dossier de la working copy

## Examples d'utilisation

    git init ~/git/cours_git
```

ADD / COMMIT

- Initialiser une working copy:
  `git init mondossier`
- Voir le status:
  `git status`
- Ajouter une modification sur fichier.txt:
  `git add fichier.txt`
- Commiter le contenu du stage:
  `git commit -m “mon commentaire”`

« MAIS MERDE, QUAND SONT-ILS ?! »

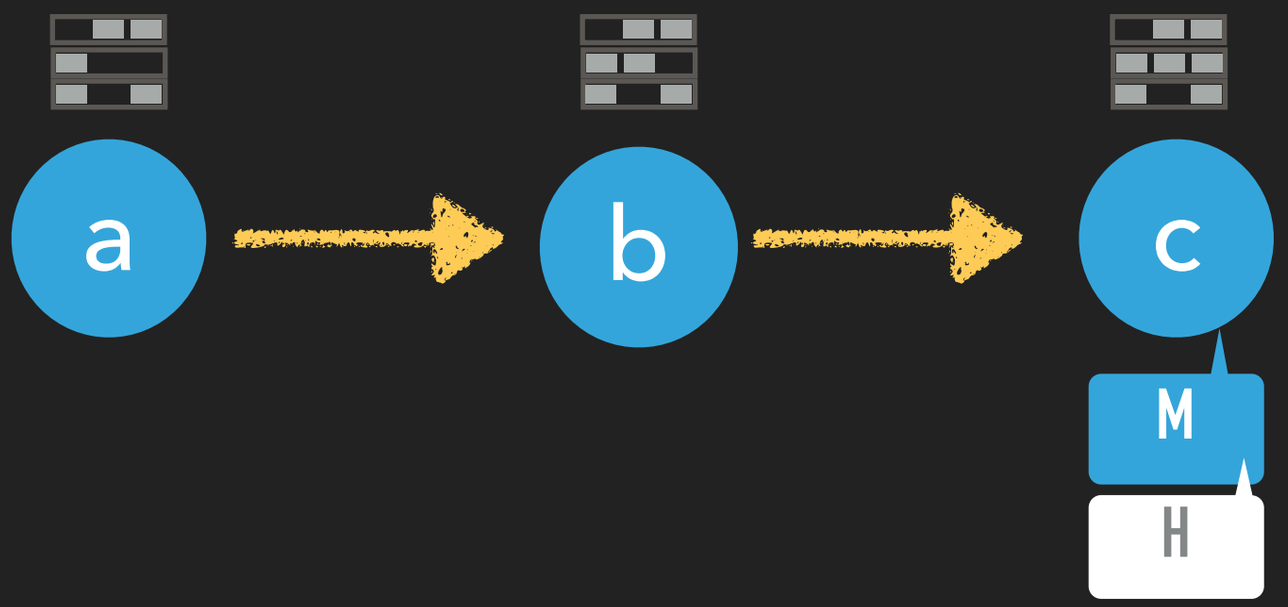
REVENIR EN ARRIERE

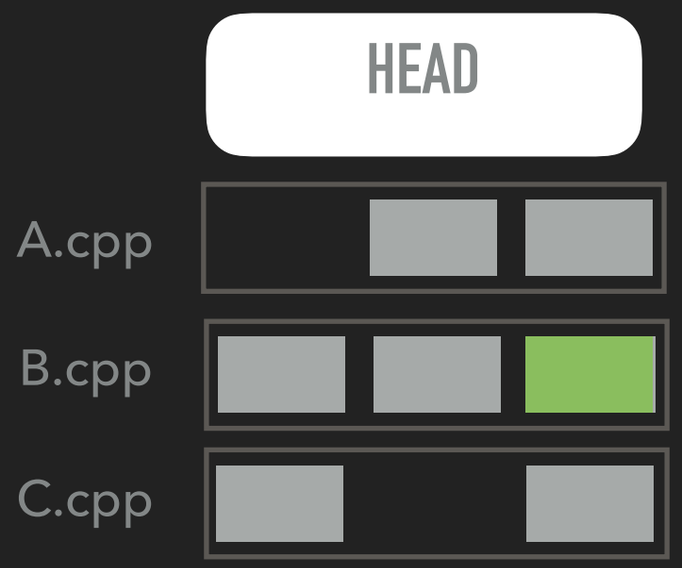
`git reset [mode] [ref]`

- ref:
  - Le commit où l'on veut revenir, SHA1 ou référence relative
  - HEAD par défaut
- mode:
  - `--soft`: conserve les modifications, les place dans l'index pour commit
  - `--mixed`: conserve les modifications (défaut)
  - `--hard`: abandonne TOUTES les modifications

`git reset [ref]`

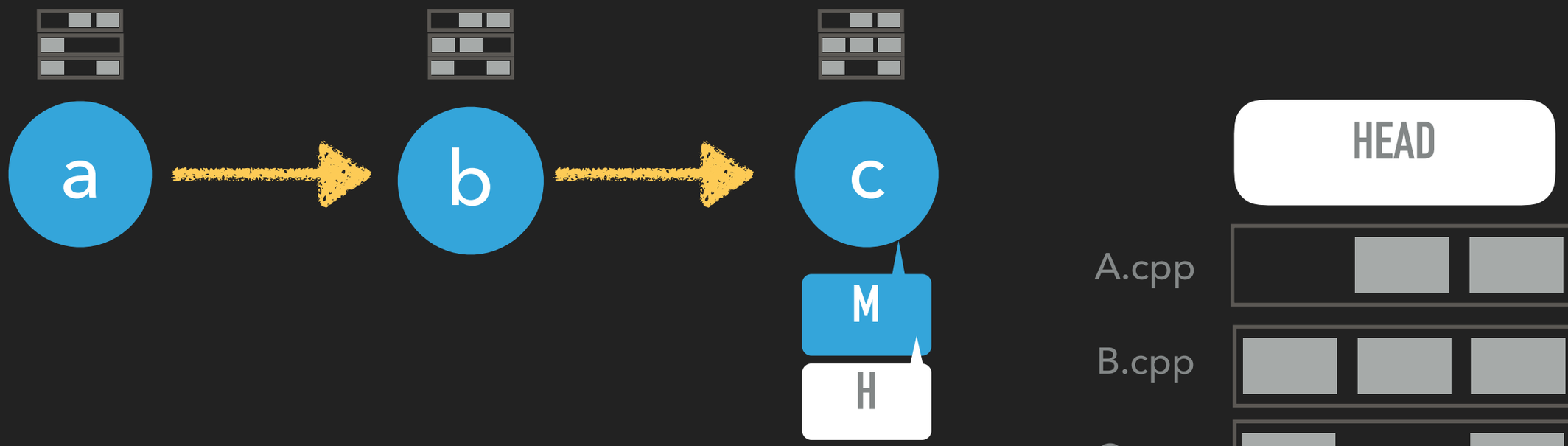
- Reset la branche courante sur la reference
  - git reset b
  - git reset HEAD~





`git reset --hard [ref]`

- Reset la branche courante sur la reference
  - git reset --hard b
  - git reset --hard HEAD~



LE MODE HARD

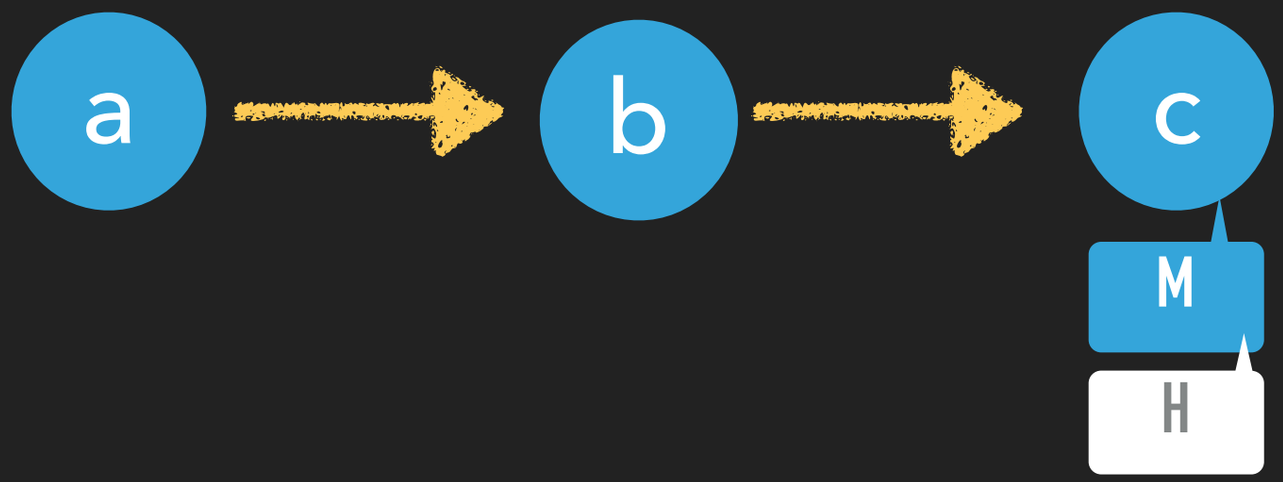
- abandonne TOUTES les modifications
  - y compris les modifications en cours!
  - pour toujours

ANCESTRY REFERENCES / REFERENCES RELATIVES

- ~: Le premier parent
  - HEAD~: Le premier parent
  - HEAD~~ ou HEAD~2: Le premier parent du premier parent (le grand père)
- ^*i*: Le *i*ème parent
  - HEAD^: Le premier parent
  - HEAD^2: Le second parent
  - HEAD^^: Le premier parent du premier parent (le grand père)

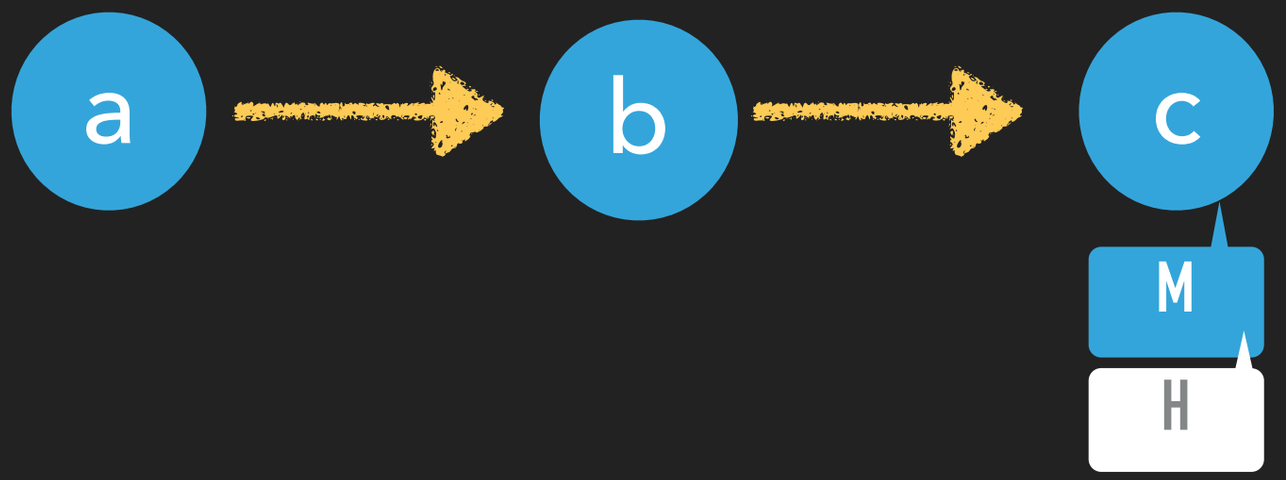
ANCESTRY REFERENCES / REFERENCES RELATIVES

- git reset HEAD~~ or git reset HEAD~2
- git reset HEAD^^



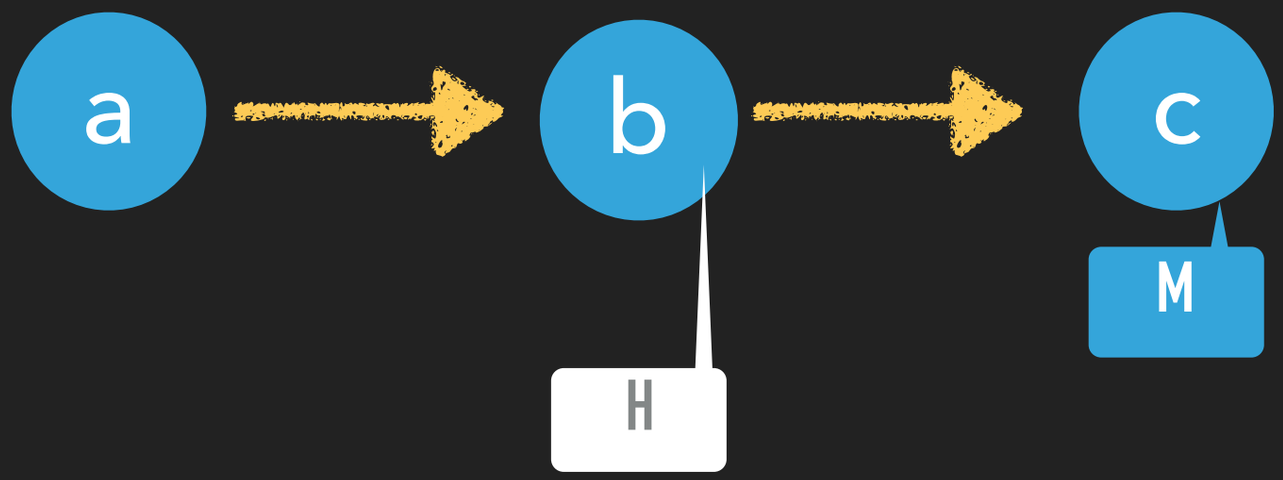
`git checkout [ref]`

- Déplace le HEAD sur la référence, branche ou commit
- Si des fichiers sont dans l'état modified, conserve ces modifications



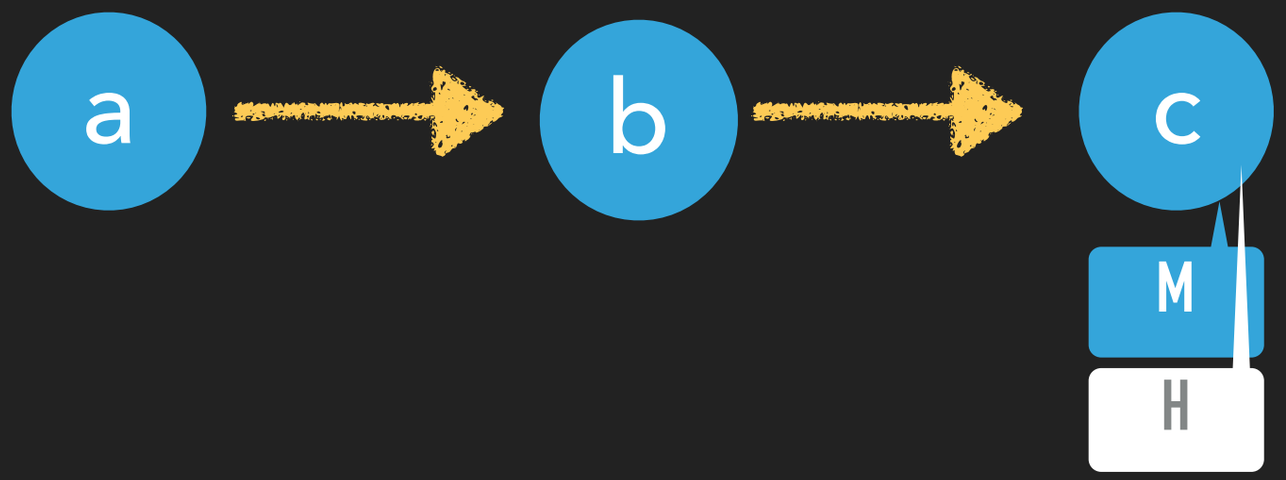
git checkout [ref]

- git checkout HEAD~



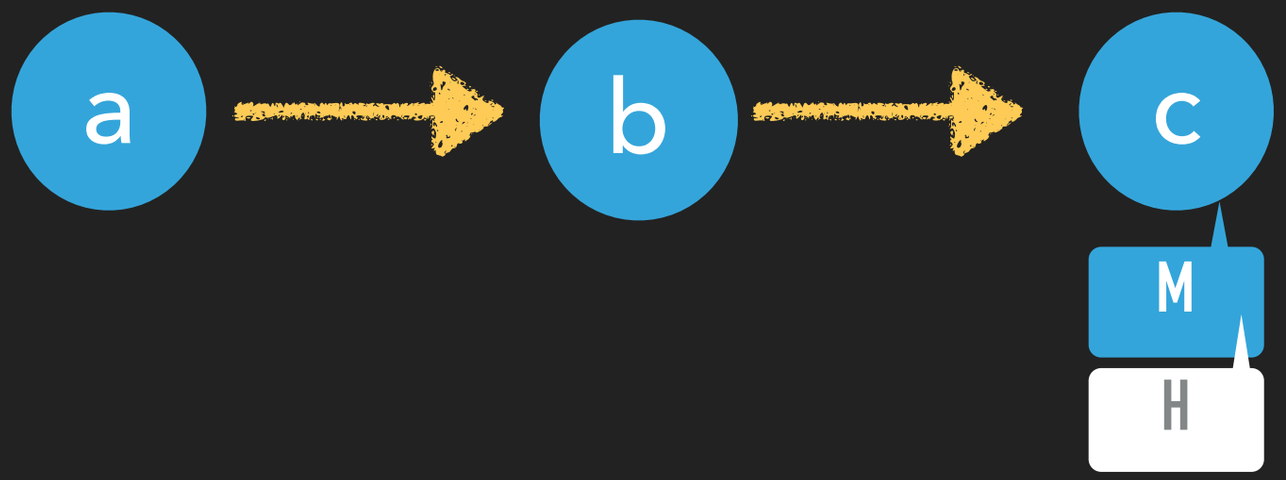
git checkout [ref]

- git checkout c



git checkout [ref]

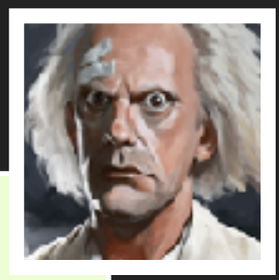
- git checkout master



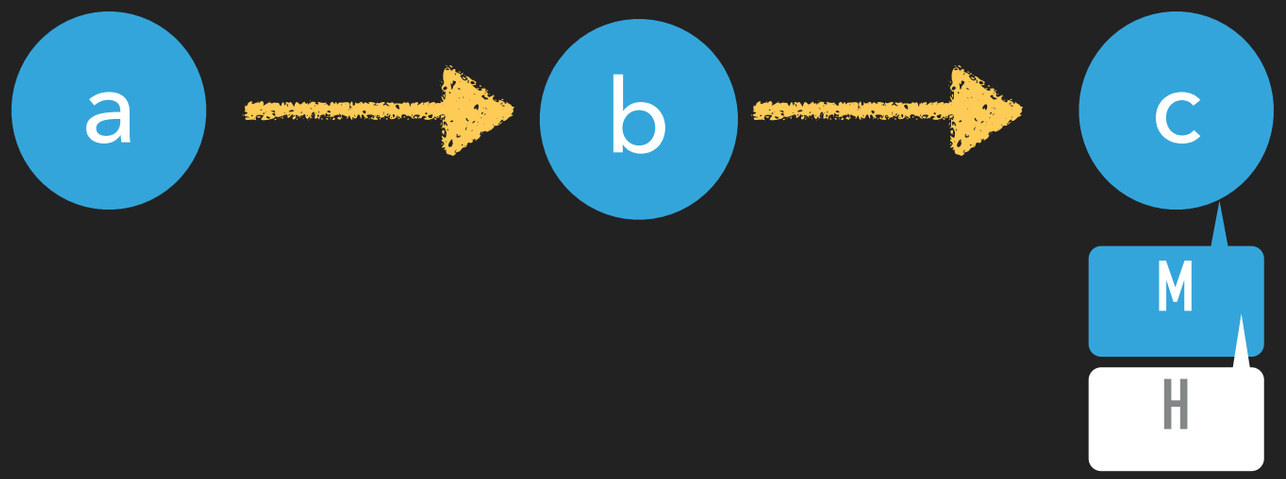
MODE TÊTE DÉTACHÉE

- Quand le HEAD ne pointe pas sur une branche
- Attention aux commit en tête détachée !

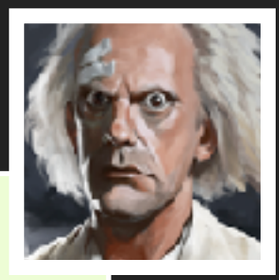
MODE TÊTE DÉTACHÉE



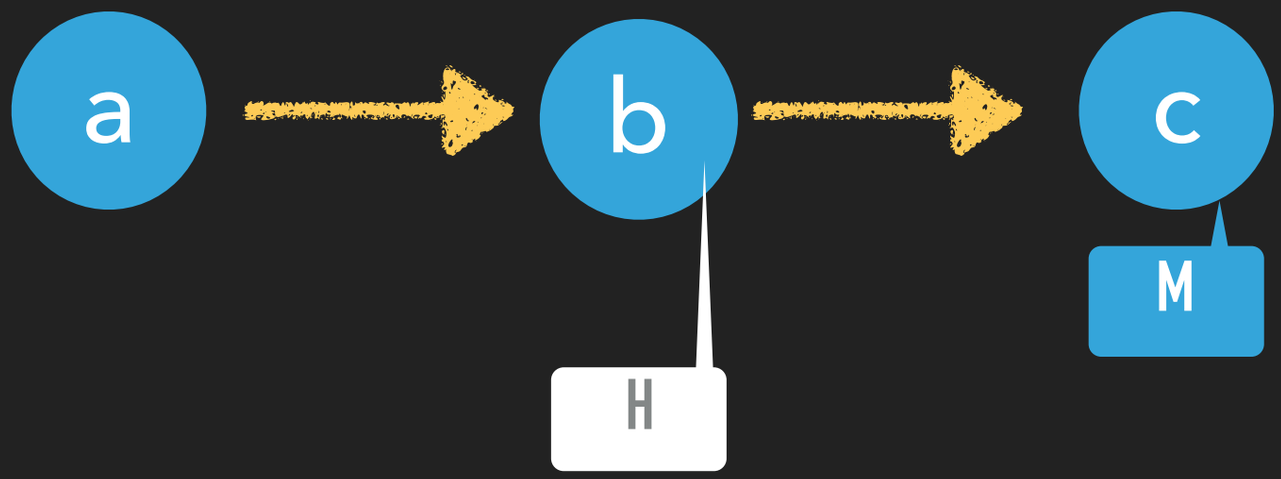
```
doc@labo$ git checkout HEAD~
Note: checking out 'HEAD~'.

You are in 'detached HEAD' state. You can look around, make experimental
changes and commit them, and you can discard any commits you make in this
state without impacting any branches by performing another checkout.

If you want to create a new branch to retain commits you create, you may
do so (now or later) by using -b with the checkout command again. Example:

  git checkout -b <new-branch-name>

HEAD is now at 891da30... et encore un
doc@labo$ git st
HEAD detached at 891da30
nothing to commit, working directory clean
```



MODE TÊTE DÉTACHÉE

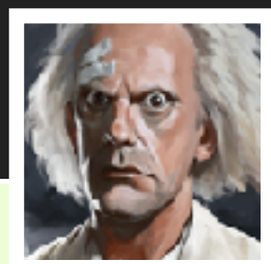


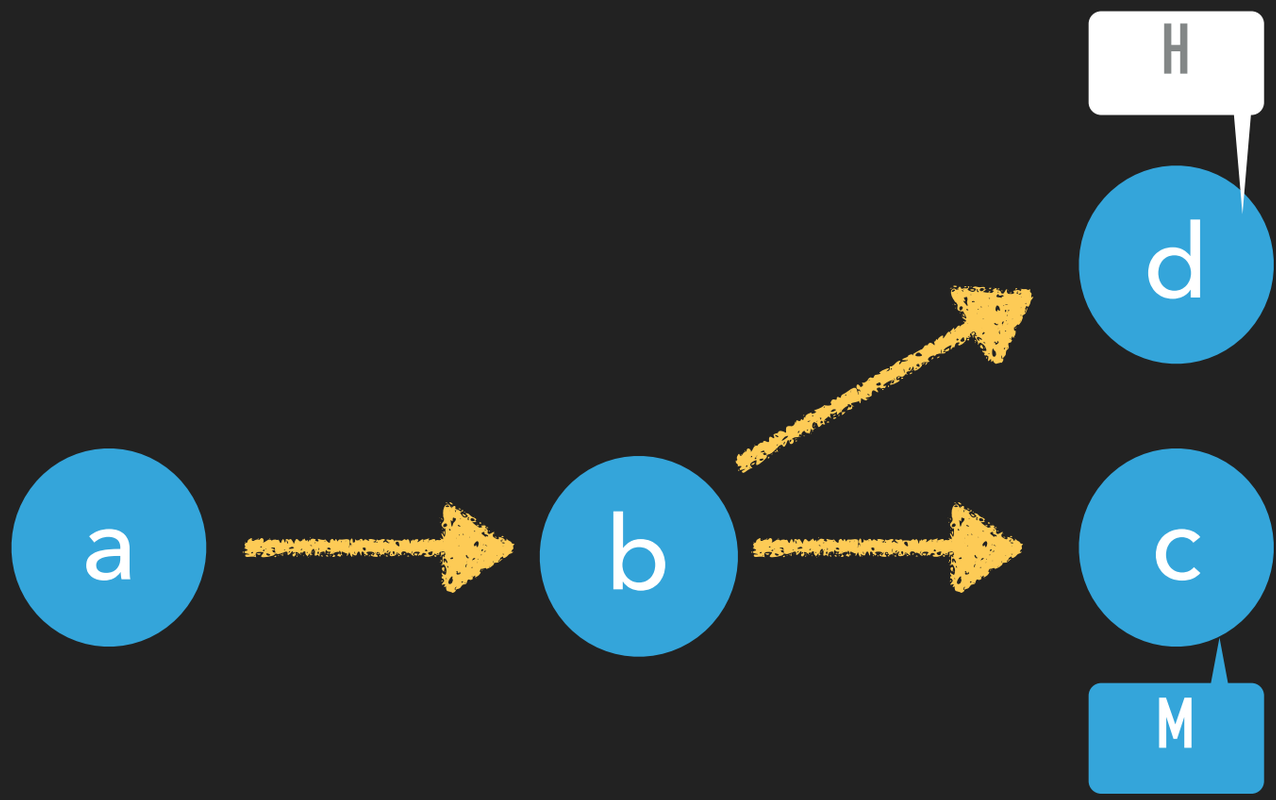
```
doc@labo$ git checkout HEAD~
Note: checking out 'HEAD~'.

You are in 'detached HEAD' state. You can look around, make experimental
changes and commit them, and you can discard any commits you make in this
state without impacting any branches by performing another checkout.

If you want to create a new branch to retain commits you create, you may
do so (now or later) by using -b with the checkout command again. Example:

  git checkout -b <new-branch-name>

HEAD is now at 891da30... et encore un
doc@labo$ git st
HEAD detached at 891da30
nothing to commit, working directory clean
```



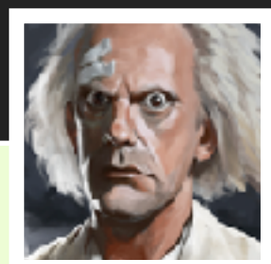
MODE TÊTE DÉTACHÉE

```
doc@labo$ echo "Pas la tete" >> README.md
doc@labo$ git add README.md
doc@labo$ git commit -m "commit en tete detachee"
[detached HEAD dee2c9c] commit en tete detachee
 1 file changed, 1 insertion(+)
```

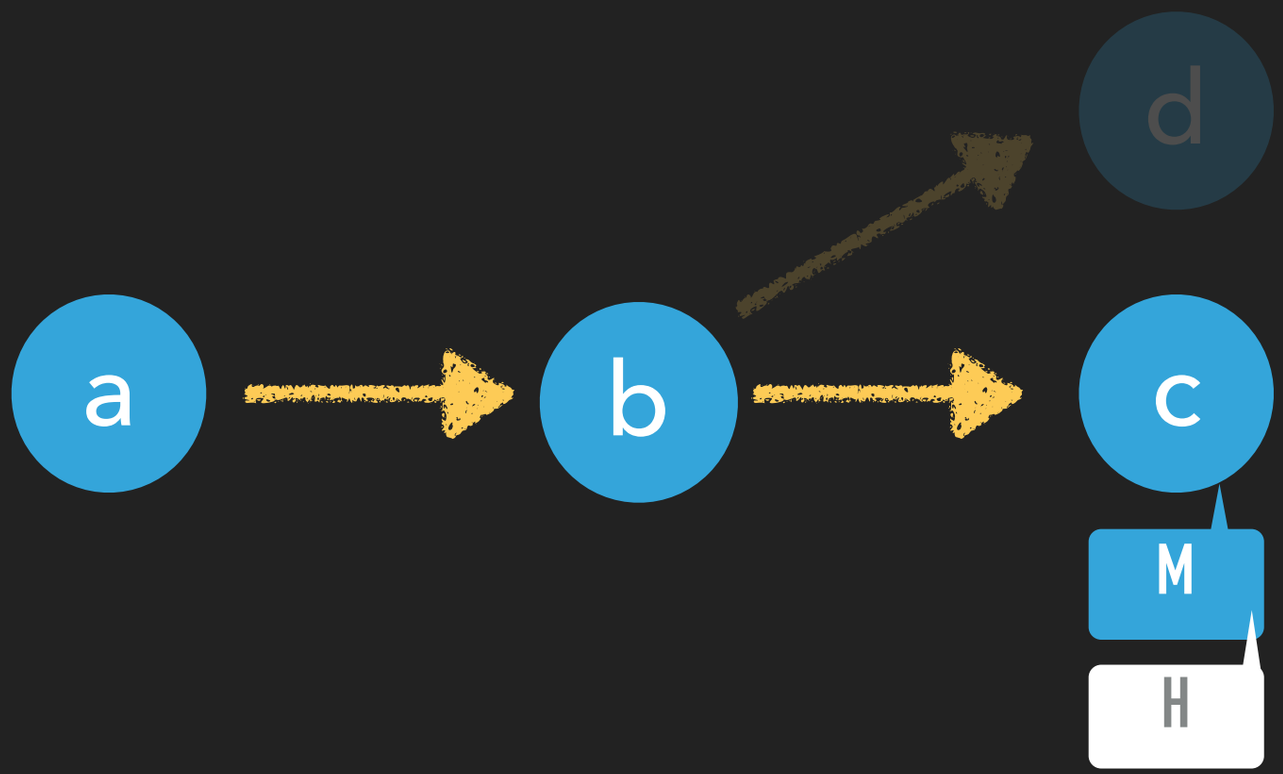




MODE TÊTE DÉTACHÉE



```
doc@labo$ git checkout master
Warning: you are leaving 1 commit behind, not connected to
any of your branches:

  dee2c9c commit en tete detachee

If you want to keep it by creating a new branch, this may be a good time
to do so with:

 git branch <new-branch-name> dee2c9c

Switched to branch 'master'
```

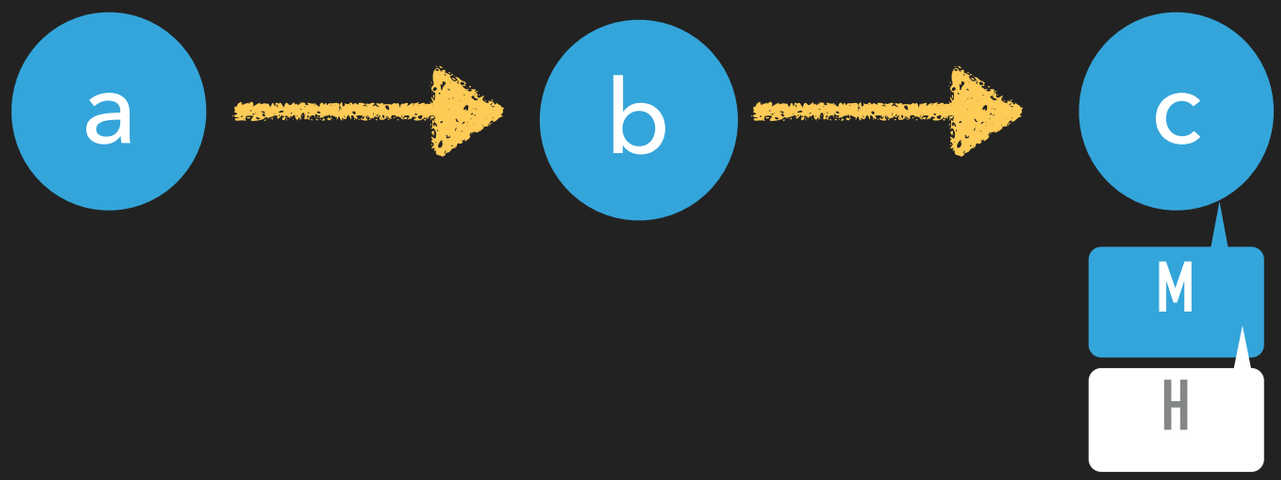


git branch

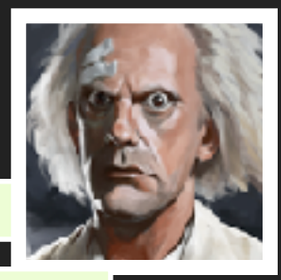
- Donne la liste des branches
- Donne la branche courante
- Permet de créer/renommer/déplacer/effacer des branches

git branch name [ref]

- Créé une branche qui porte le nom name
- Sur le commit pointé par la référence
- Si ref n’est pas précisé, créé une branche sur le commit pointé par HEAD



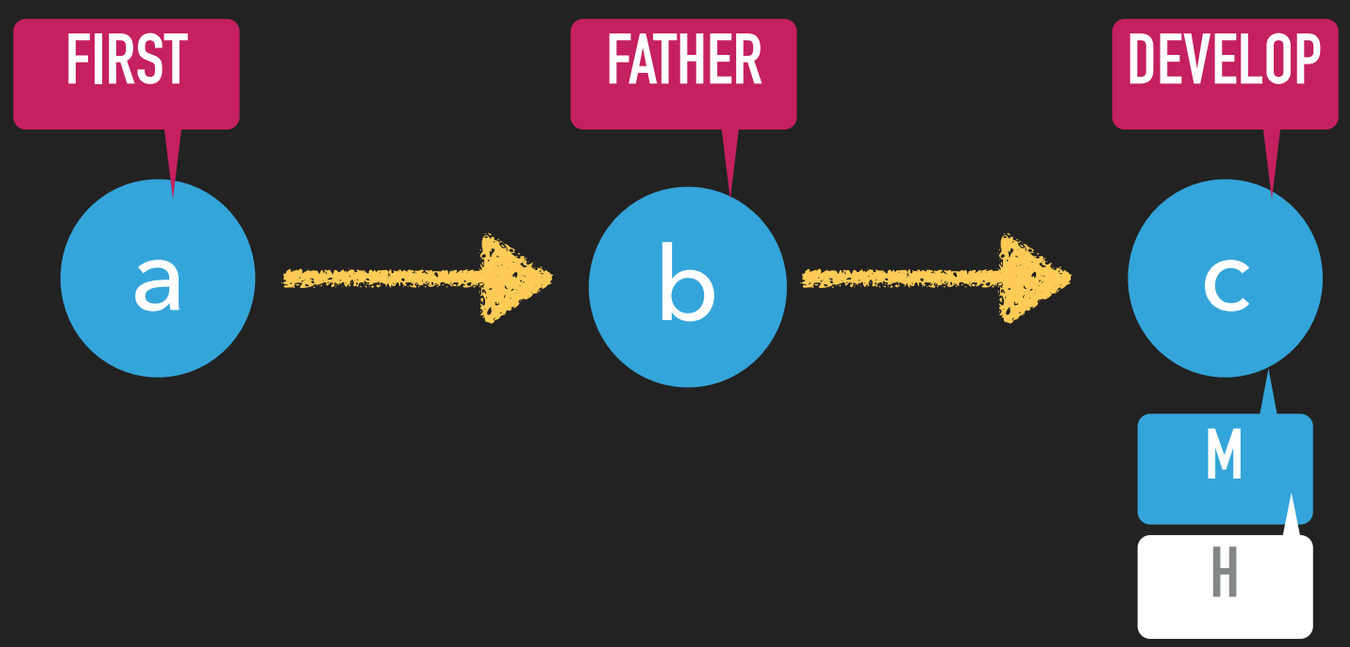
git branch name [ref]



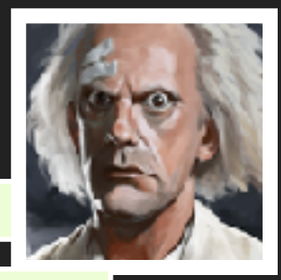
```
doc@labo$ git branch develop
```

```
doc@labo$ git branch father HEAD~
```

```
doc@labo$ git branch first a
```



git branch name [ref]

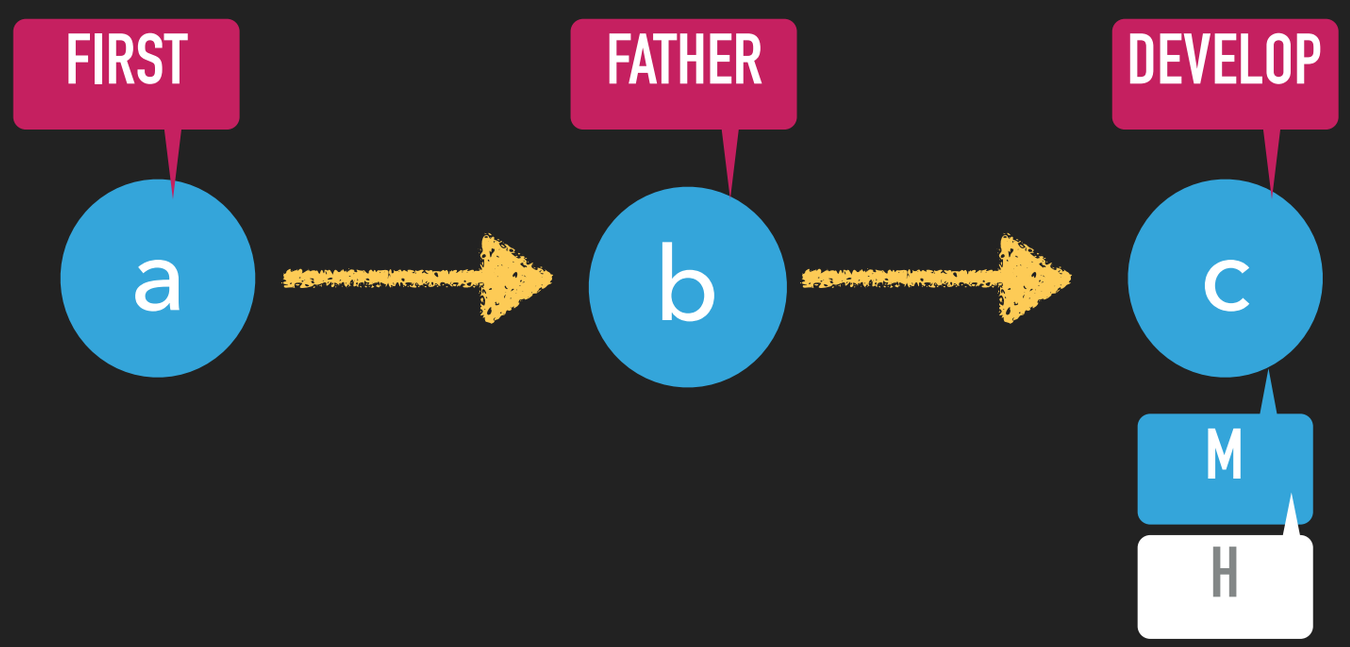


```
doc@labo$ git branch develop
```

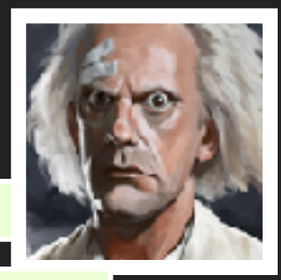
```
doc@labo$ git branch father HEAD~
```

```
doc@labo$ git branch first a
```

```
doc@labo$ git branch -f first HEAD~
```



git branch name [ref]

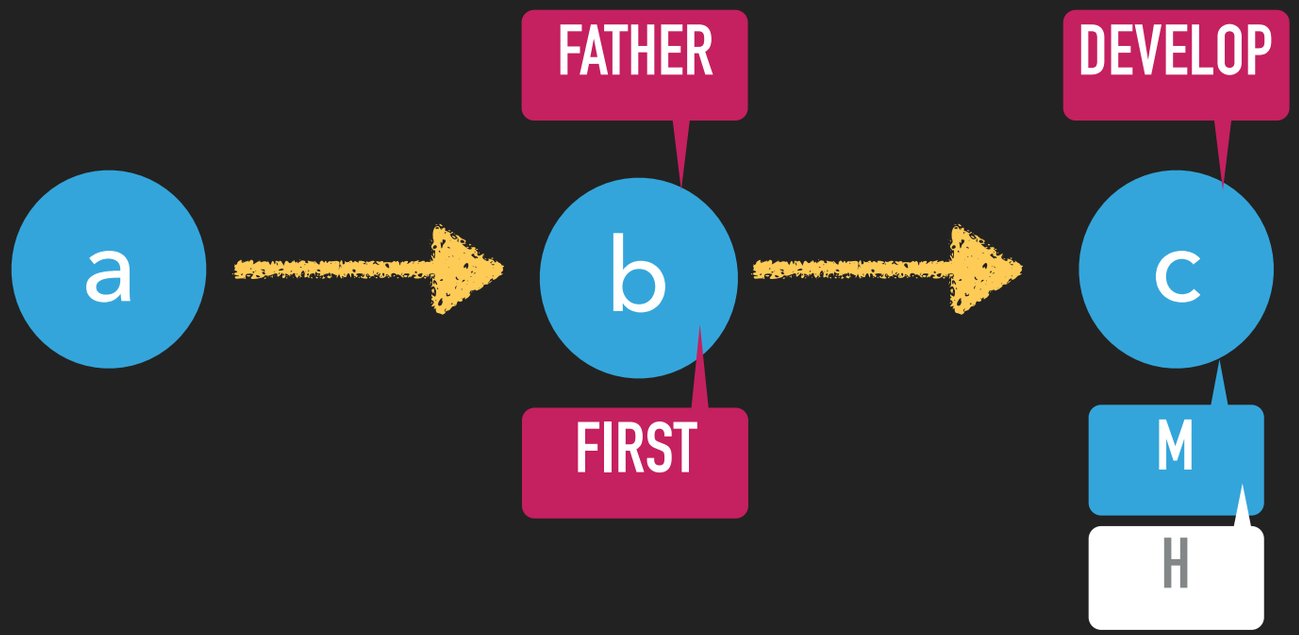


```
doc@labo$ git branch develop
```

```
doc@labo$ git branch father HEAD~
```

```
doc@labo$ git branch first a
```

```
doc@labo$ git branch -f first HEAD~
```



EXERCICE 2.1: MAUVAIS COMMIT

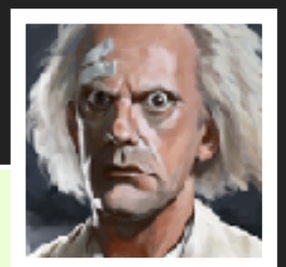
- Reprendre le repository `cours_git`, branche `master`
- Rajouter un fichier *commandes/ooops.md*.
- L’ajouter et le commiter, il appartient à la branche `master`
- Faire en sorte que master ne contienne plus ce commit

```
doc@labo$ cd ~/git/cours_git
doc@labo$ echo “ooops” >> commandes/ooops.md
doc@labo$ git add commandes/ooops.md
doc@labo$ git commit –m “Je voulais pas commiter"
```

EXERCICE 2.2: MAUVAIS COMMENTAIRE

- Rajouter un fichier *commandes/reset.md* avec un contenu intéressant
- Le commiter avec un commentaire erroné
- Annuler ce commit en gardant les modifications et le refaire avec un bon commentaire

```
doc@labo$ echo “# reset” >> commandes/reset.md
doc@labo$ git add commandes/reset.md
doc@labo$ git commit –m “Je ne C pas aicrire"
```



EXERCICE 2.3: BRANCHE

- Sur `master`:
  Créer le fichier
  commandes_en/.gitkeep
  L'ajouter et le commiter

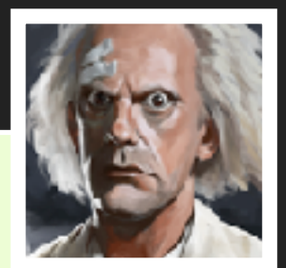
init.md

```
# git init

    git init [PATH]

## Description

Initialize a repository in `PATH`

## Parameter

- PATH: the repository path

## Usage

    git init ~/git/cours_git
```

- Créer une branche `anglais`

- Sur `anglais`, *créer le fichier*
  commandes_en/init.md
  L'ajouter et le commiter

```
doc@labo$ mkdir commandes_en && touch commandes_en/.gitkeep
doc@labo$ git add commandes_en && git commit -m “creation dossier”
doc@labo$ git branch anglais
doc@labo$ git checkout anglais
Switched to a new branch ‘anglais'
doc@labo$ echo “# init” >> commandes_en/init.md
doc@labo$ git add commandes_en/init.md
doc@labo$ git commit -m “Added init.md”
```



EXERCICE 2.4: BRANCHE 2

- Se repositionner sur la branche `master`
- Ajouter la description de la commande checkout dans *commandes/checkout.md*
- L’ajouter et le commiter

EXERCICE 2.5: MAUVAISE BRANCHE

- Se placer sur master
- Créer un fichier en anglais dans *commandes_en/reset.md* avec du contenu, l'ajouter et le commiter sur master
- Annuler ce commit sur master tout en conservant les modifications et le refaire sur la branche `anglais`

```
doc@labo$ echo “# I DO SPEAK ENGLISH” > commandes_en/reset.md
doc@labo$ git add commandes_en/reset.md
doc@labo$ git commit -m “commit sur la mauvaise branche -- mince alors“
```

RESET / BRANCH

- Créer une branche feature_name:
  `git branch feature_name`

- Se positionner sur une branche feature_name:
  `git checkout feature_name`

- Annuler le dernier commit en conservant les modifications:
  `git reset HEAD^`

- Annuler le dernier commit en PERDANT les modifications:
  `git reset --hard HEAD^`

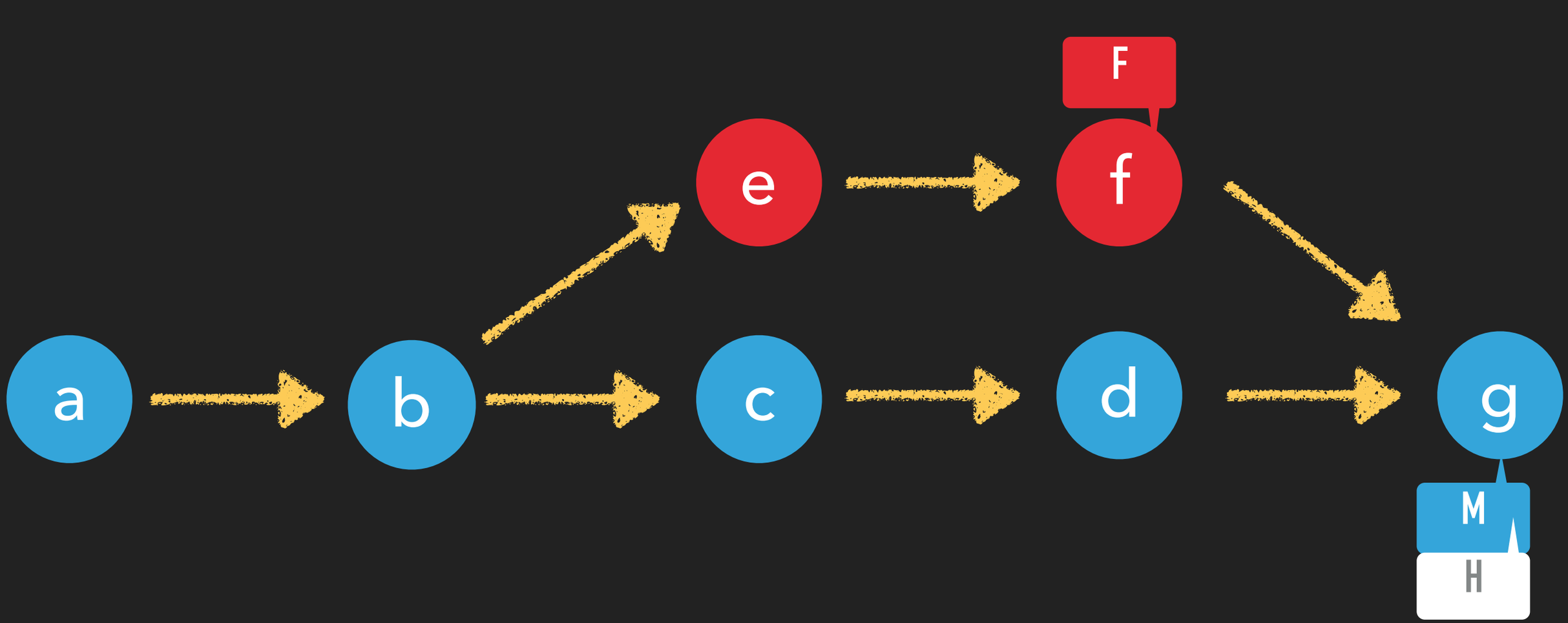
PERSONNE NE ME DIT QUE J'AI LES FOIES.

MERGE

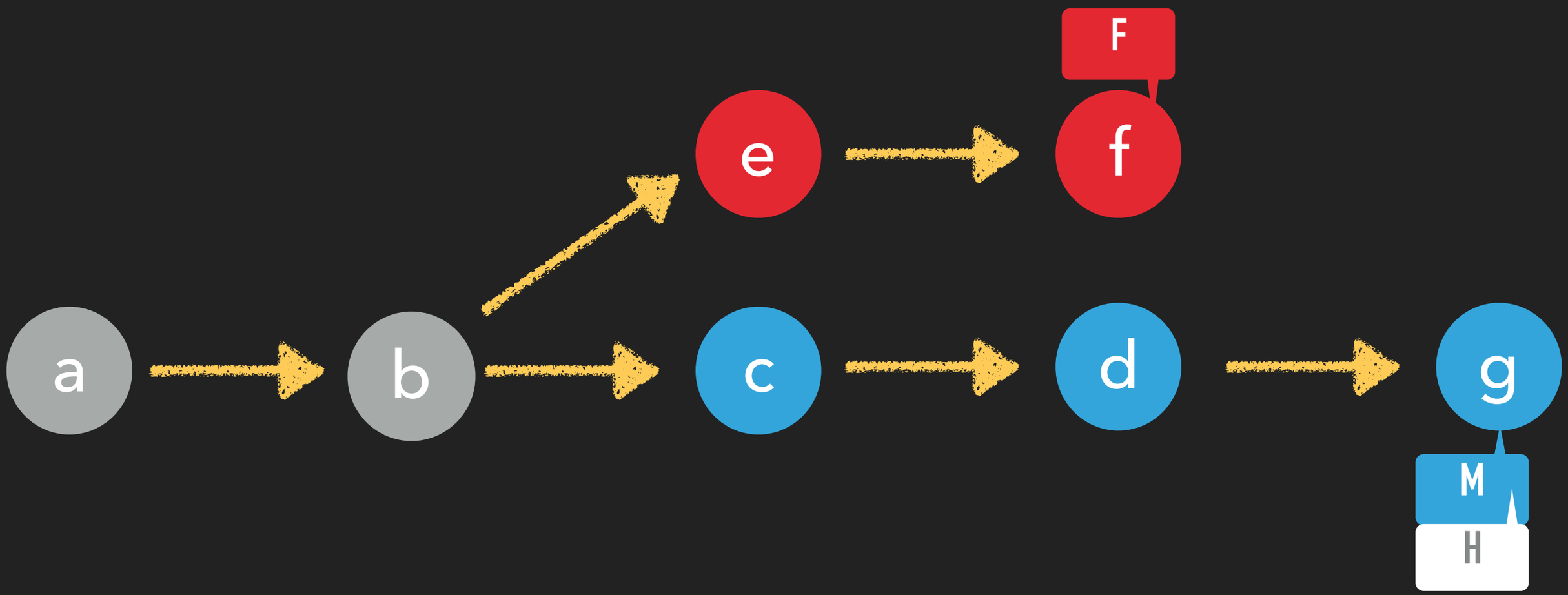
MERGE

- C’est la reunion de deux historiques
- Créé un commit qui a deux parents
- *Peut* créer des conflits

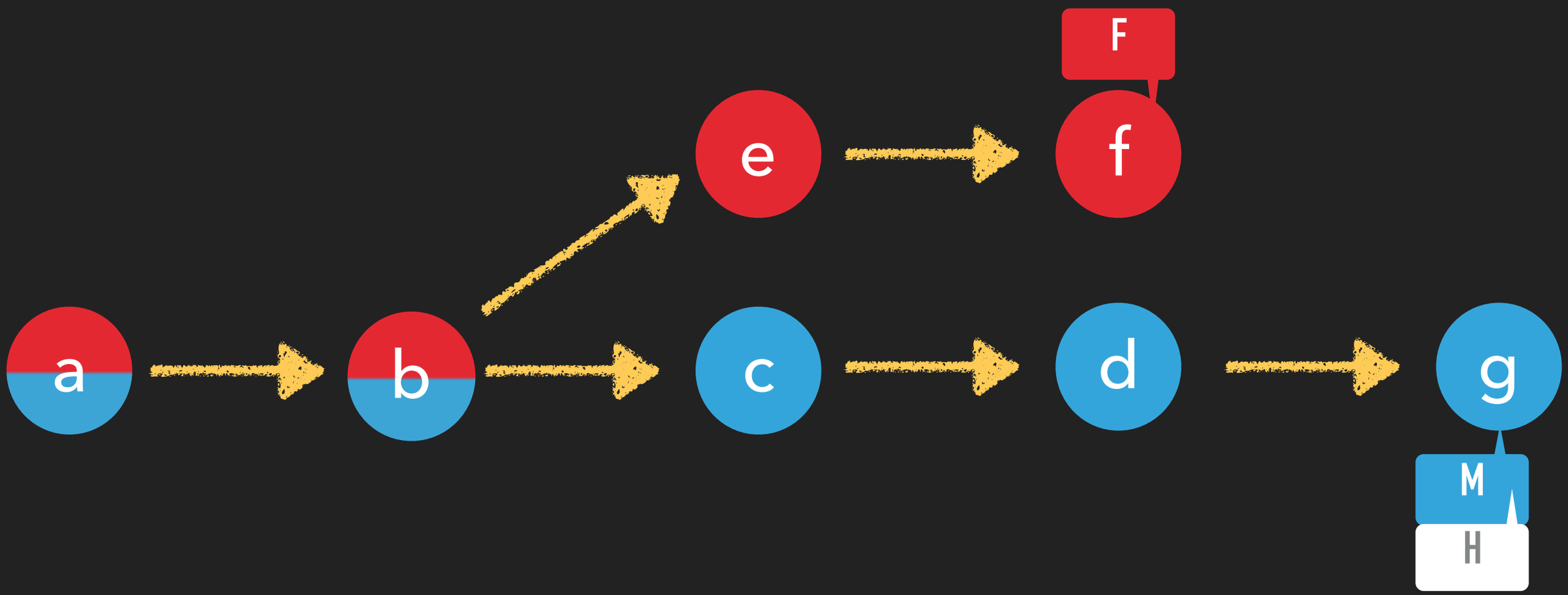
MERGE



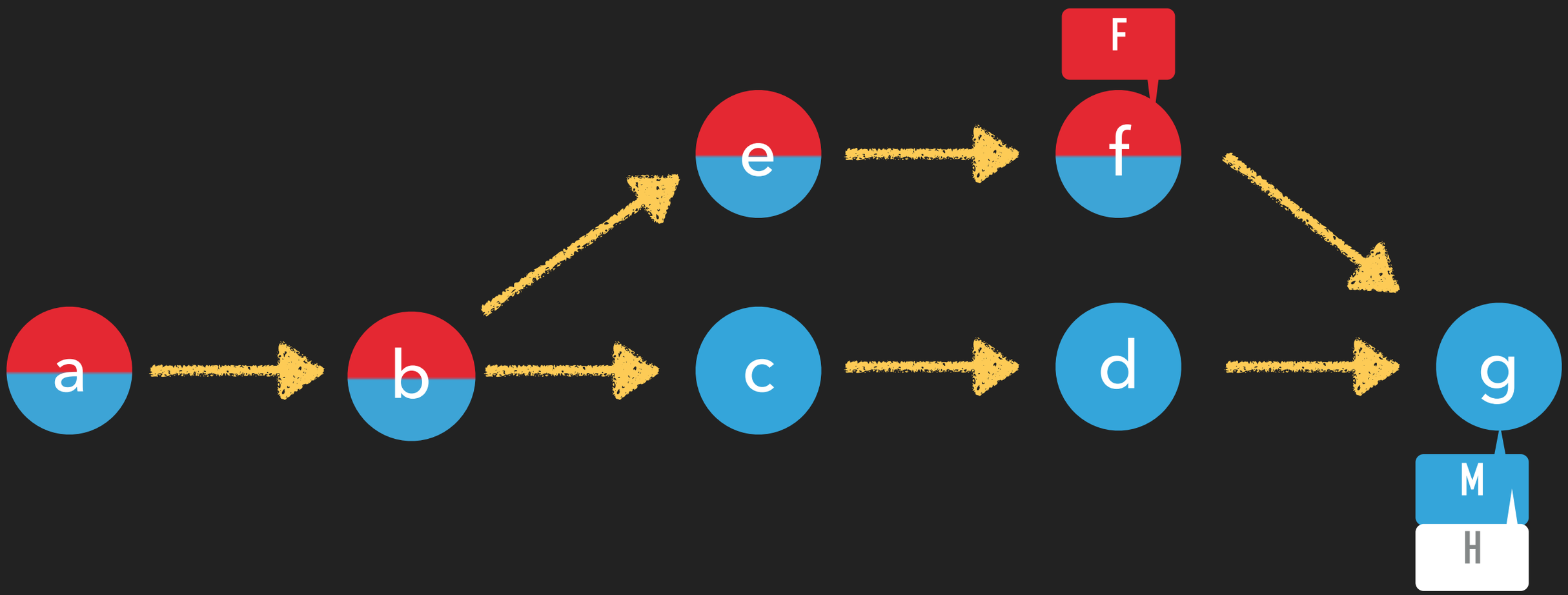
MERGE ET APPARTENANCE



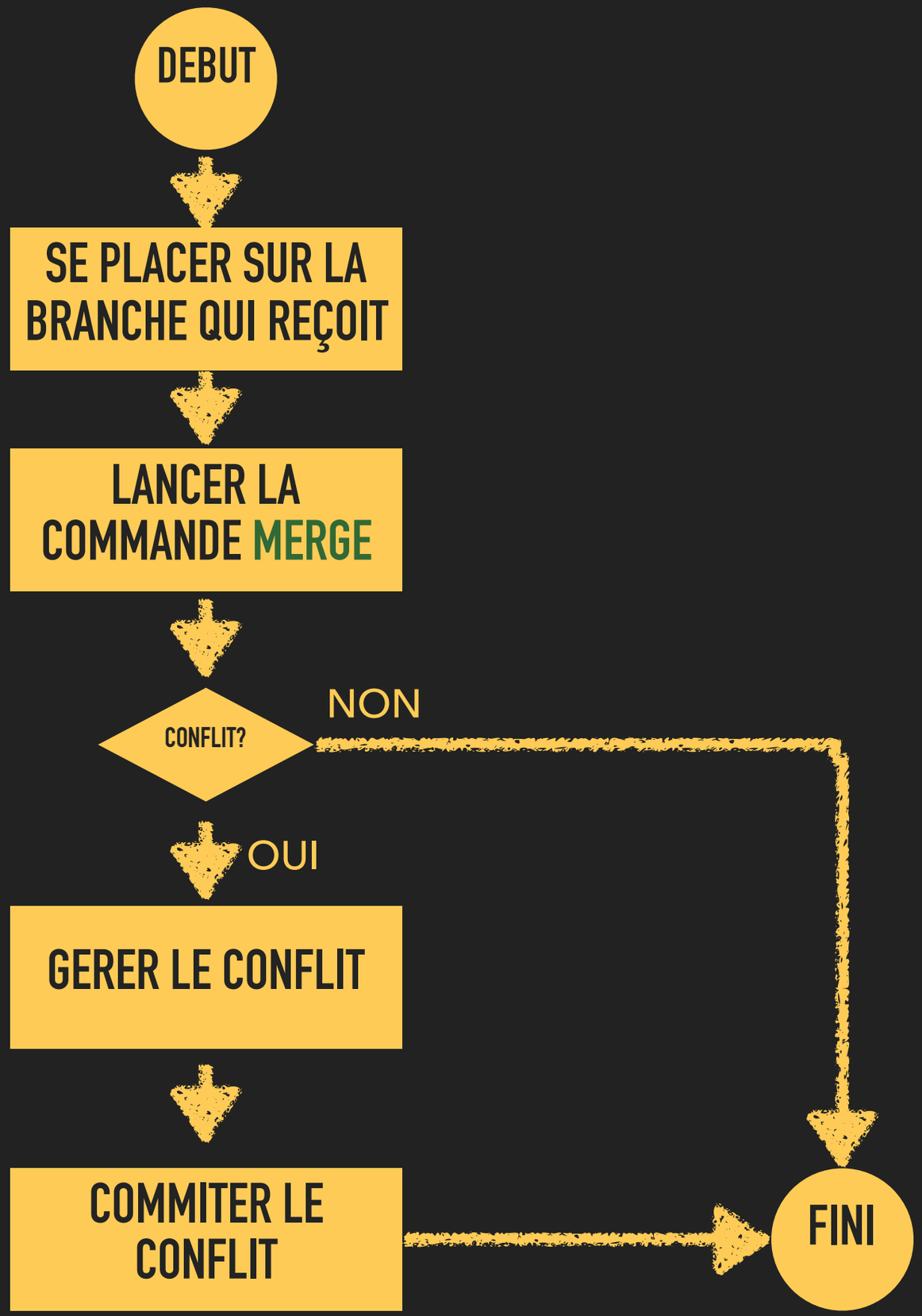
MERGE ET APPARTENANCE



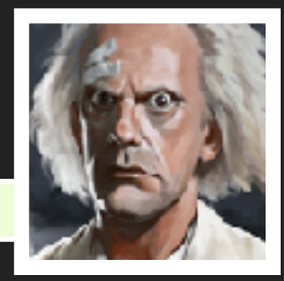
MERGE ET APPARTENANCE



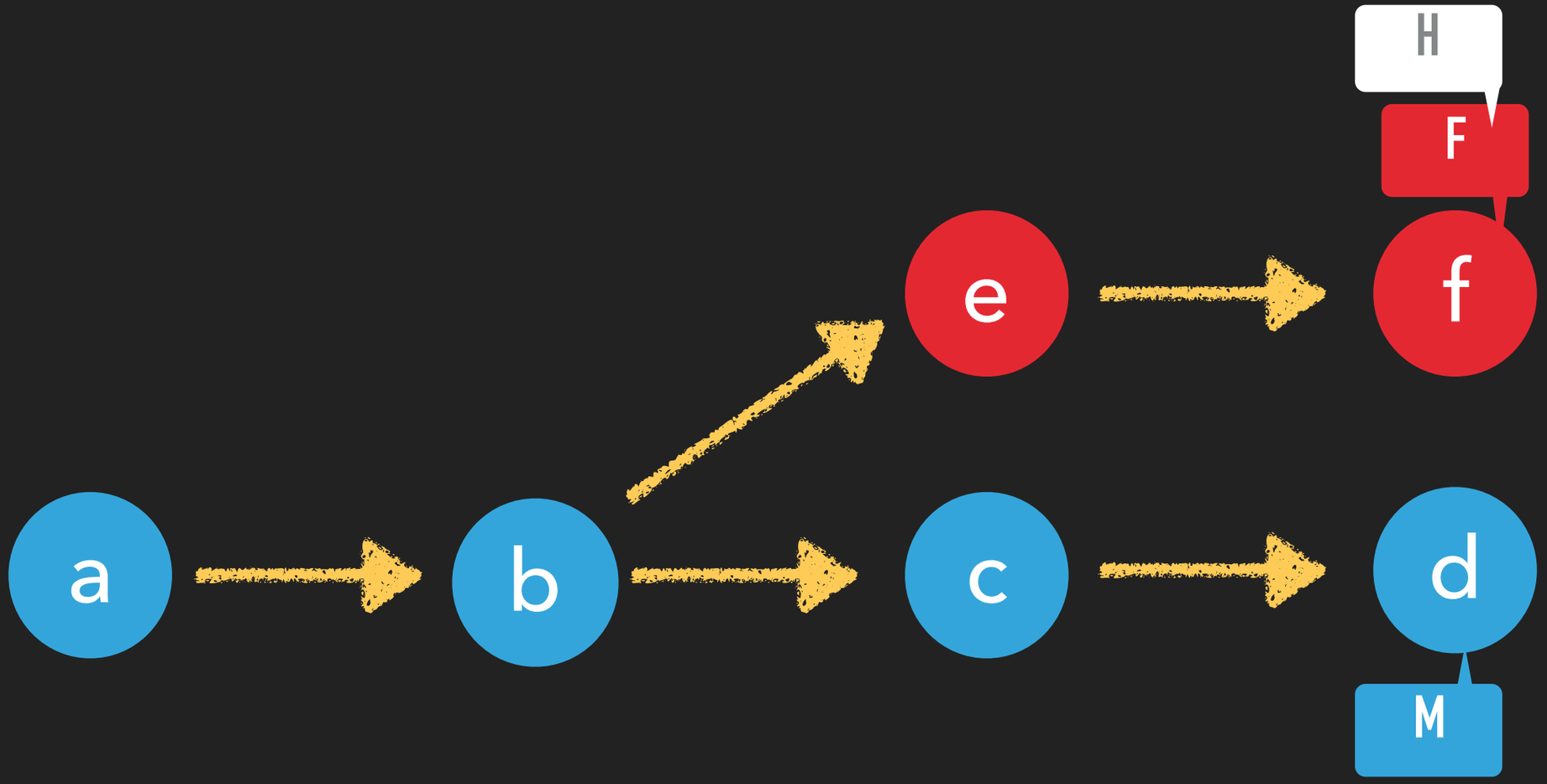
LES ETAPES DU MERGE



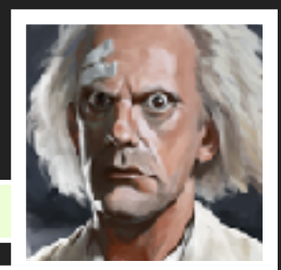
git merge branch -m “message”



```
doc@labo$ git checkout master
```

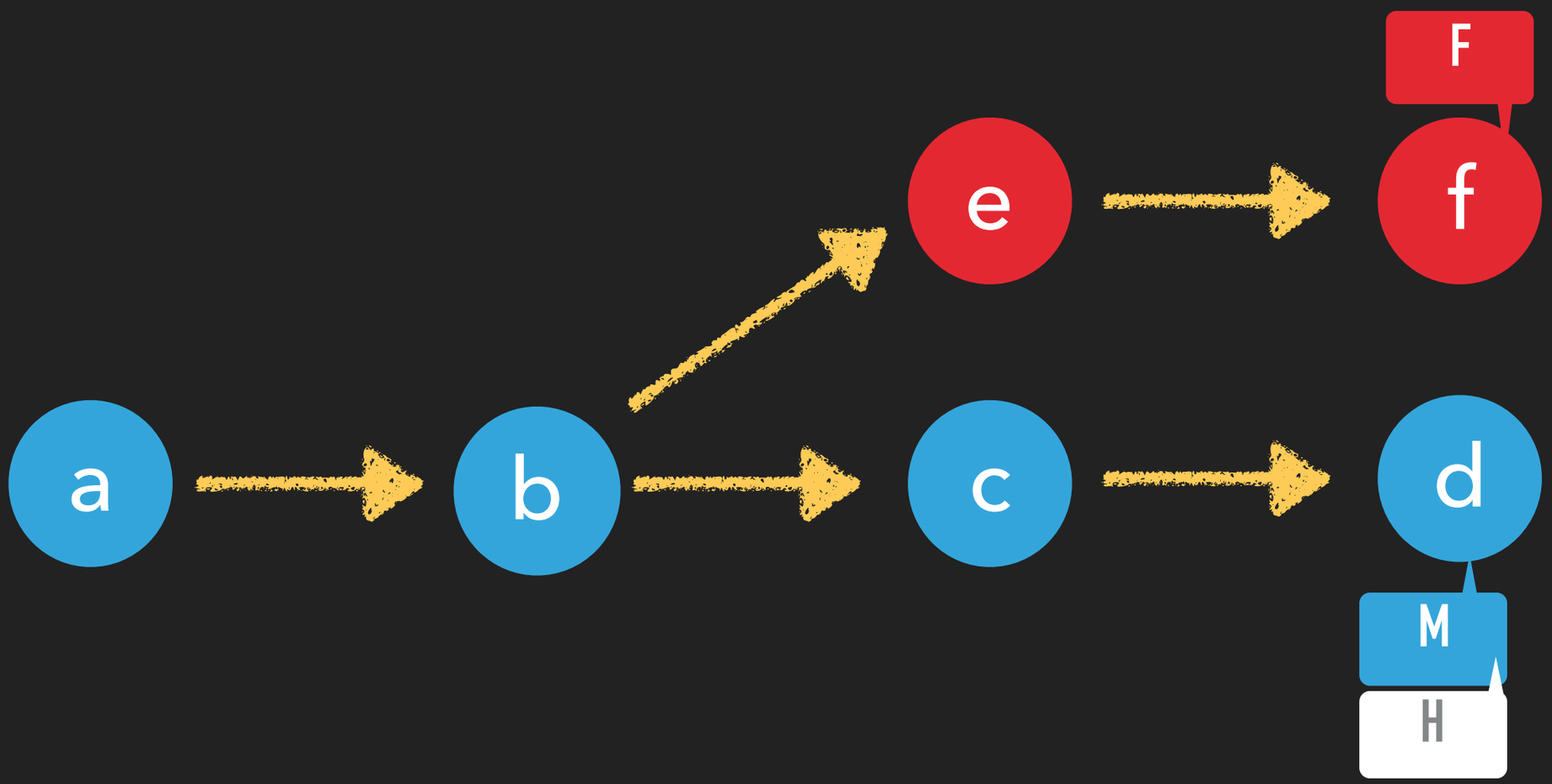


git merge branch -m “message”

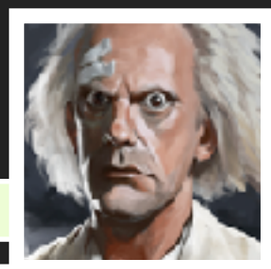


```
doc@labo$ git checkout master
```

```
doc@labo$ git merge feature –m “merge de la feature dans master”
```

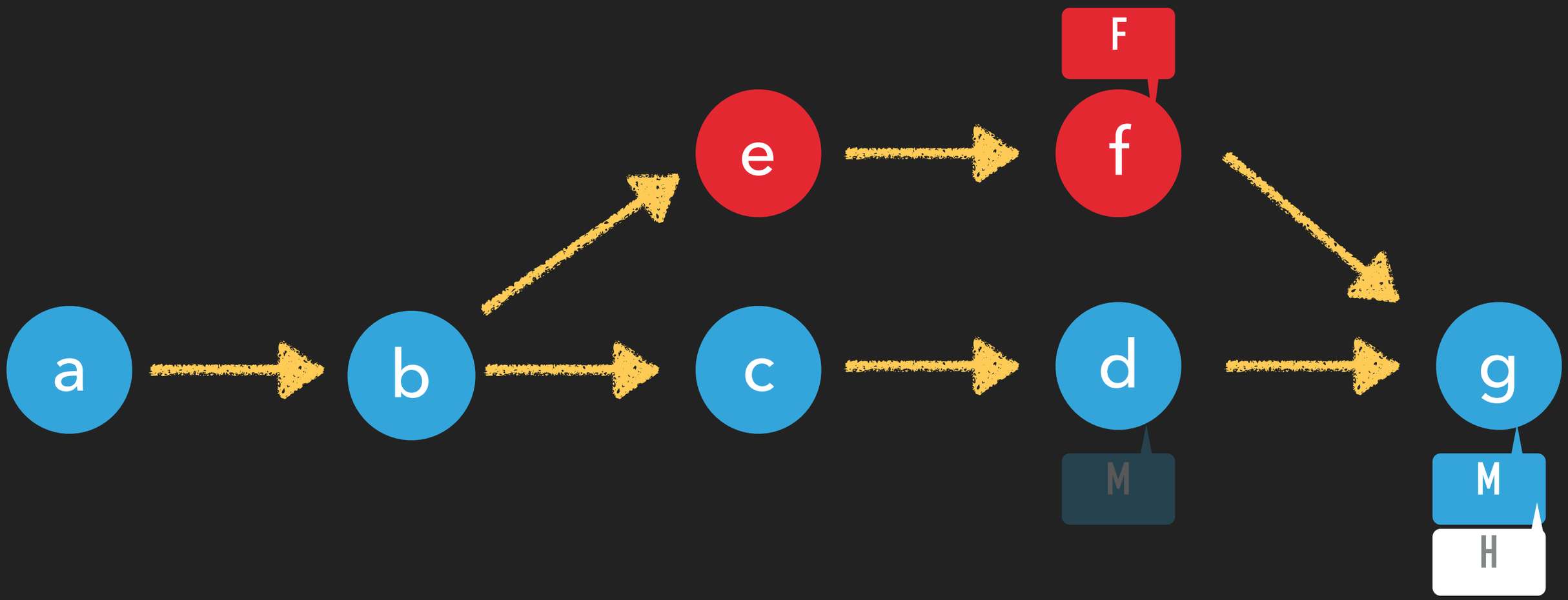


git merge branch -m “message”



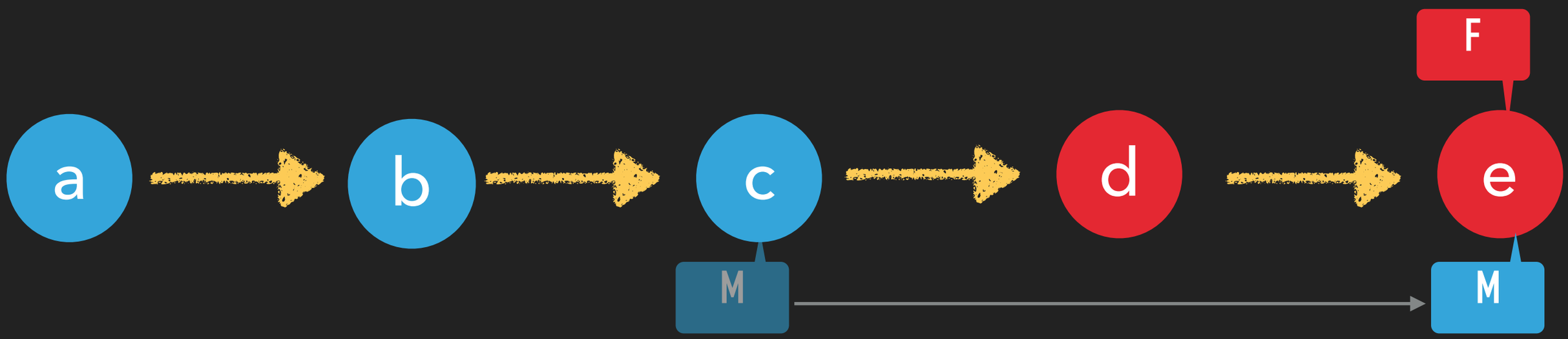
```
doc@labo$ git checkout master
```

```
doc@labo$ git merge feature –m “merge de la feature dans master”
Merge made by the 'recursive' strategy.
 commandes/ideefolle.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 commandes/ideefolle.txt
```

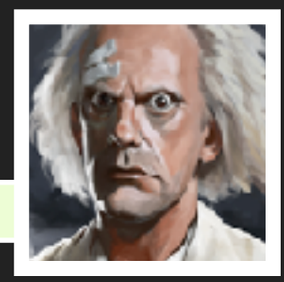


LE MERGE FAST FORWARD

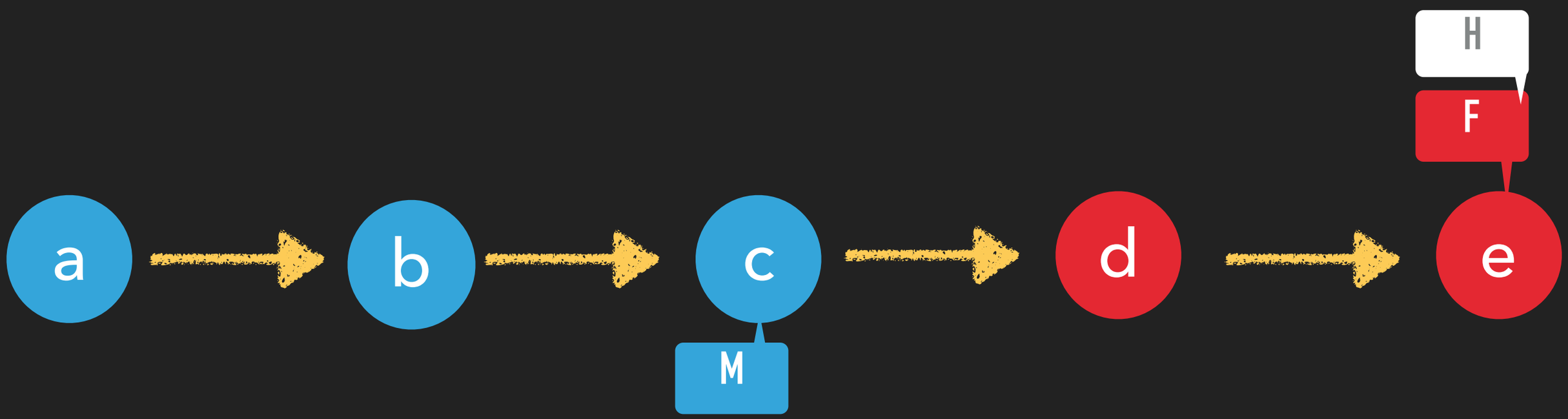
- Se produit quand la branche à merger est une descendante directe
- La branche courante avance à la branche à merger
- On appelle ce mécanisme le *fast-forward*



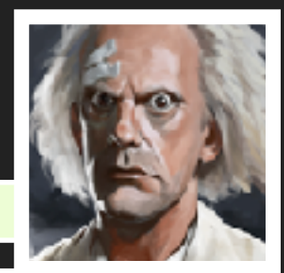
git merge branch -m “message”



```
doc@labo$ git checkout master
```

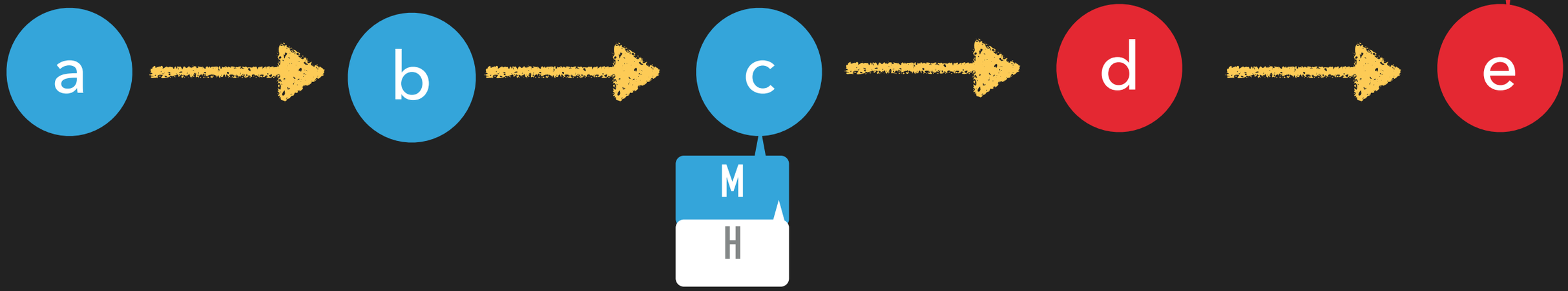


git merge branch -m “message”

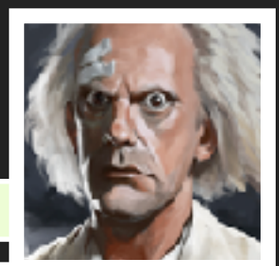


```
doc@labo$ git checkout master
```

```
doc@labo$ git merge feature
```

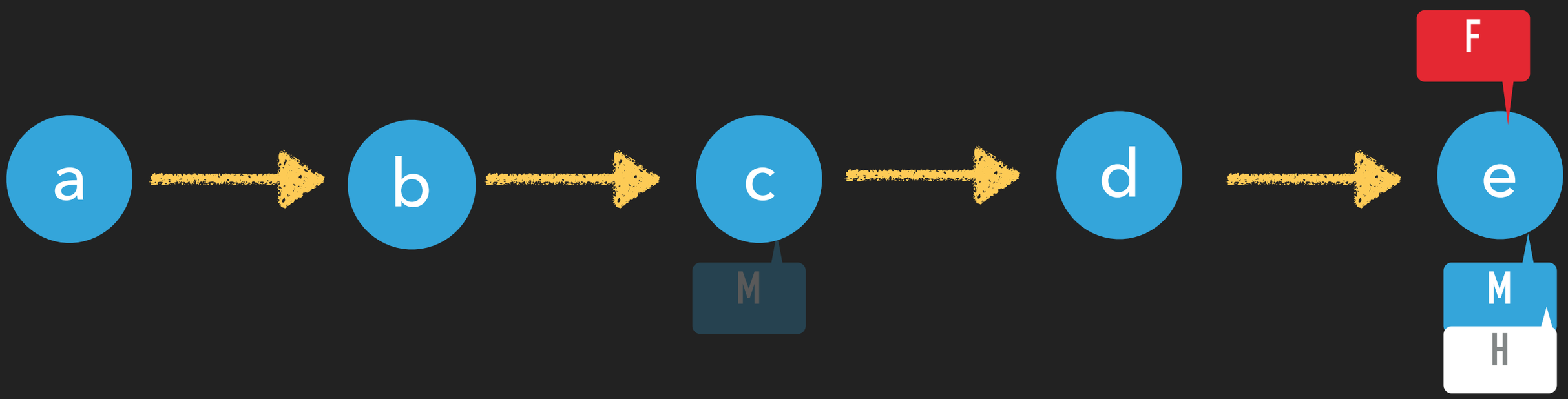


git merge branch -m “message”



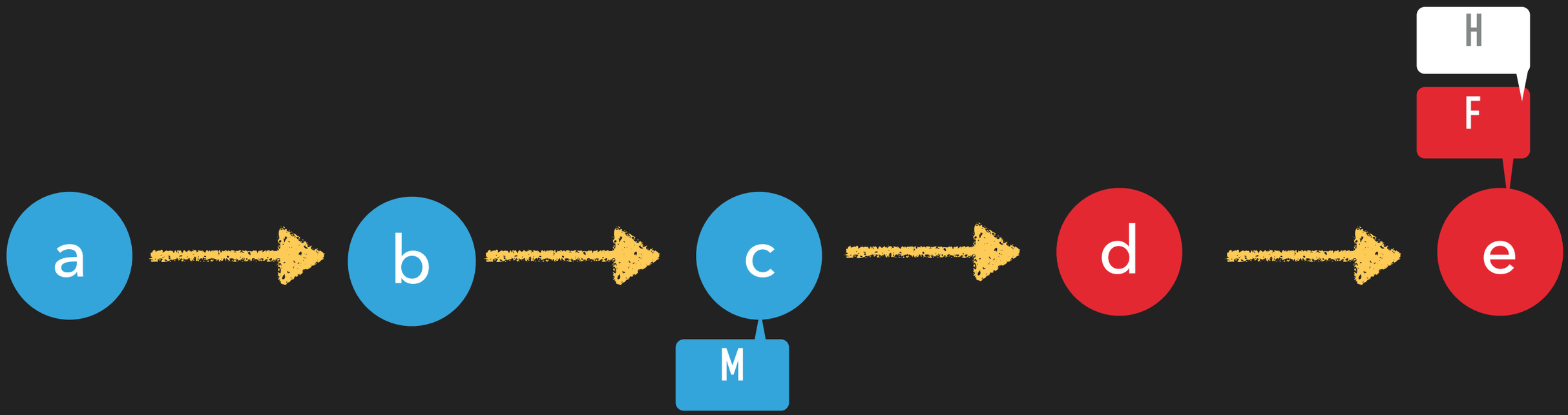
```
doc@labo$ git checkout master
```

```
doc@labo$ git merge -m "haha" feature
Updating 7ca71b9..759a26a
Fast-forward (no commit created; -m option ignored)
 commandes/ideefolle.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 commandes/ideefolle.txt
```



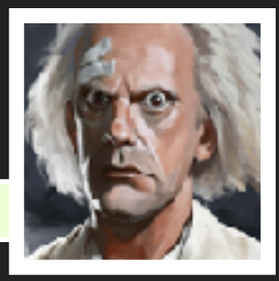
git merge --no-ff branch -m “pas de fast forward”

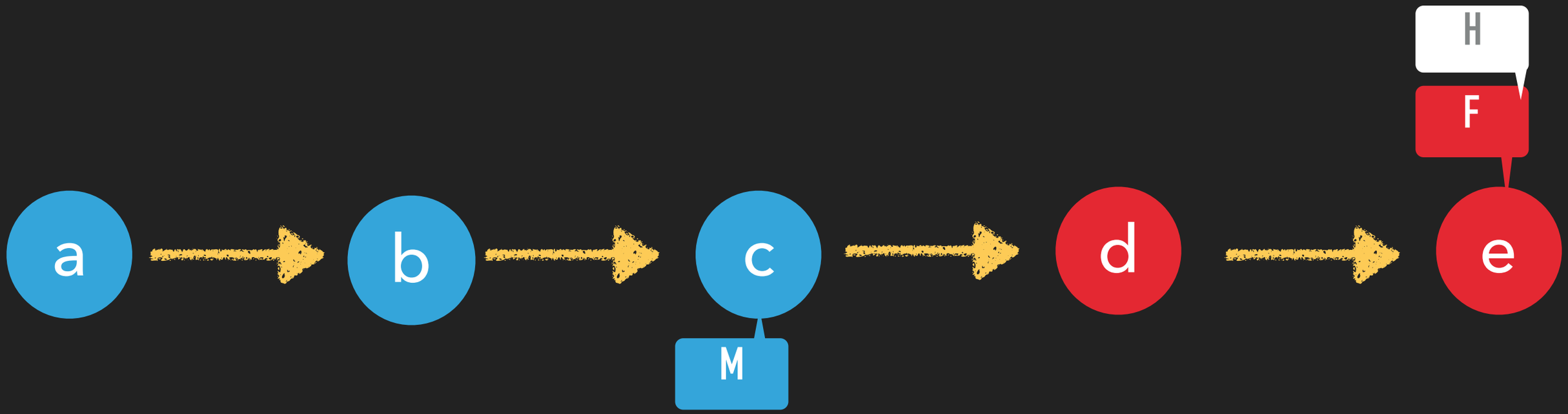
- --no-ff: no fast forward
- Crée un commit de merge, vide de patch en cas de descendance directe



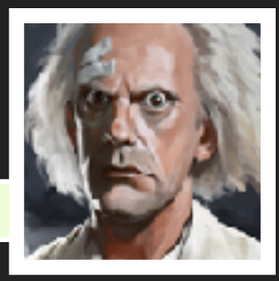
git merge --no-ff branch -m “pas de fast forward”

```
doc@labo$ git checkout master
```



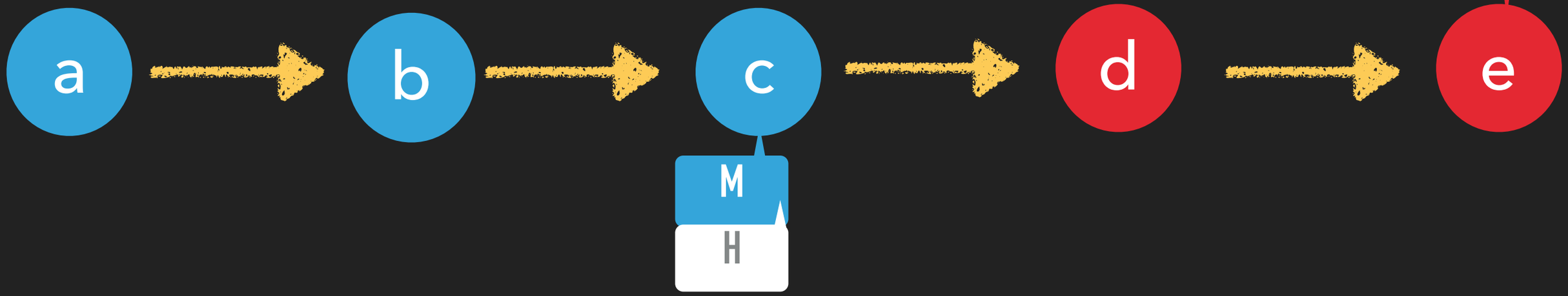


git merge --no-ff branch -m “pas de fast forward”

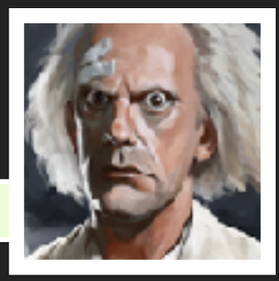


```
doc@labo$ git checkout master
```

```
doc@labo$ git merge --no-ff feature -m "pas de fast forward"
Merge made by the 'recursive' strategy.
 commandes/ideefolle.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 commandes/ideefolle.txt
```

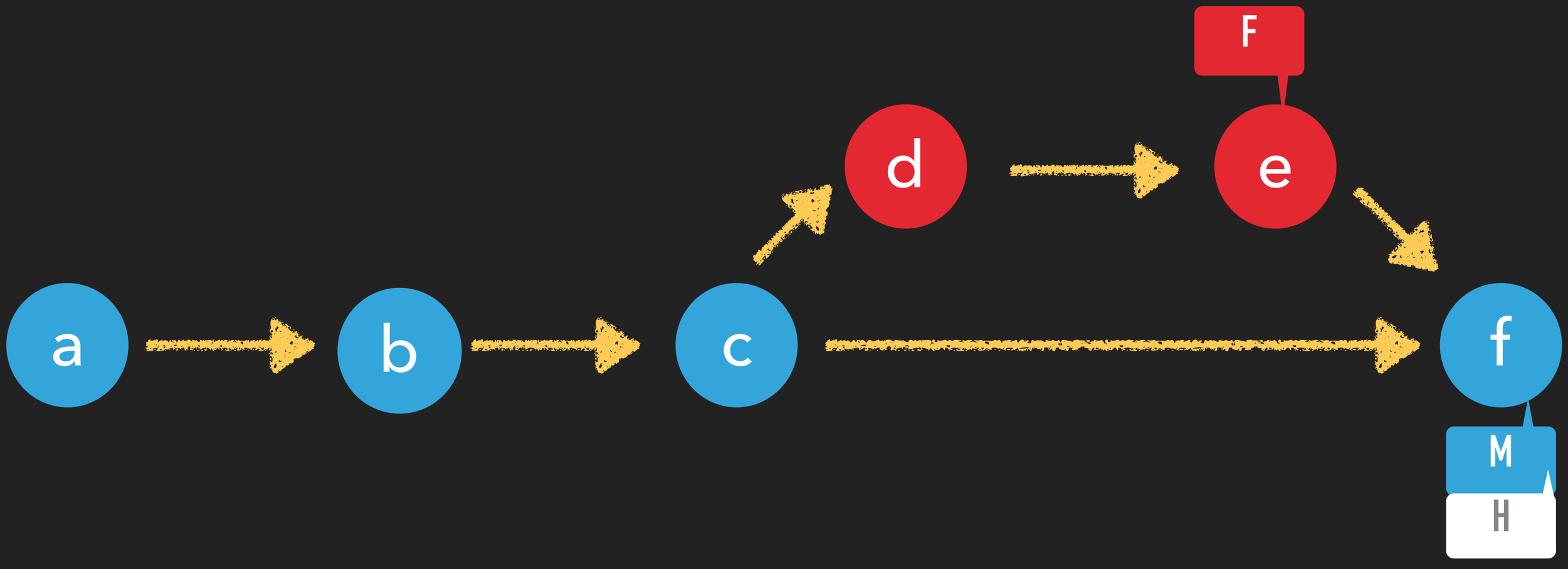


git merge --no-ff branch -m “pas de fast forward”



```
doc@labo$ git checkout master
```

```
doc@labo$ git merge --no-ff feature -m "pas de fast forward"
Merge made by the 'recursive' strategy.
 commandes/ideefolle.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 commandes/ideefolle.txt
```



TU AS LES FOIES MAC FLY

CONFLITS

LES SITUATIONS DE CONFLIT

- Se produit lors d'un merge
- Si deux branches éditent le même fichier de *manière concurrente*
- Un conflit est levé, le merge (ou le rebase) sont mis en pause
- Il faut résoudre le conflit avant de continuer

LES ÉDITIONS CONCURRENTES

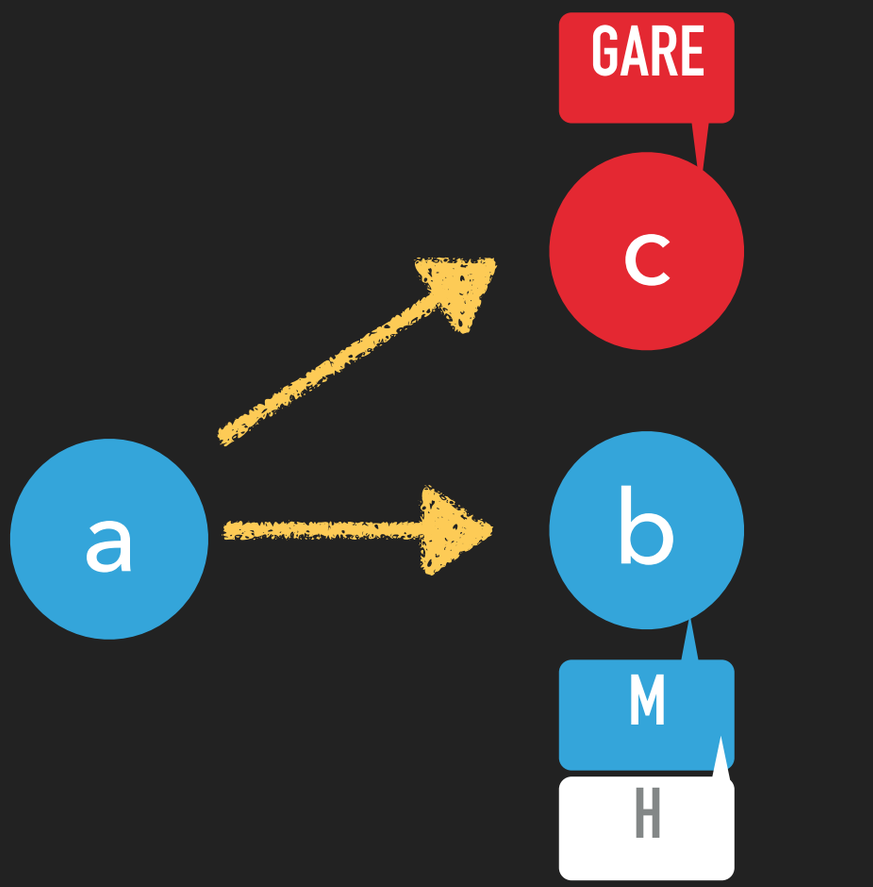
- Si une branche modifie un fichier que l'autre a effacé
- Si une branche modifie la même ligne que l'autre
- ...
- Modifier un fichier renommé ou déplacé ne provoque pas de conflit

RESOLUTION D'UN CONFLIT

```
doc@labo$ git checkout master
doc@labo$ git merge gare –m “gare au merge”
```

rendezvous.md

```
# rendez vous

- Lieu: gare
- Heure: 15:00
```



rendezvous.md

```
# rendez vous

- Lieu: centre ville
- Heure: 15:00
```

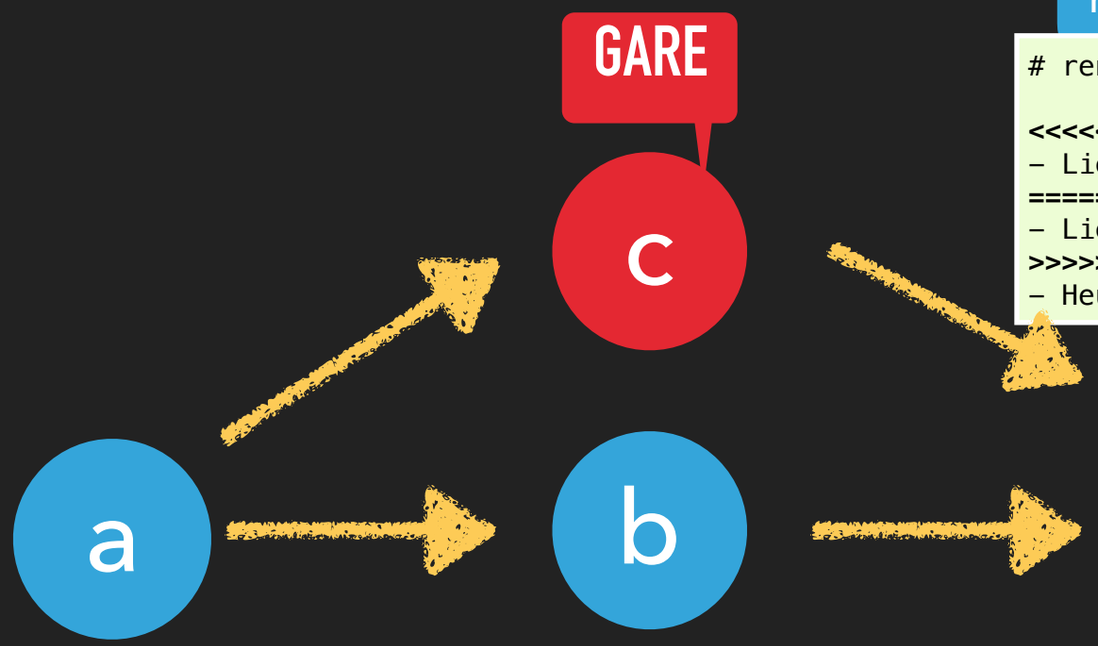
rendezvous.md

```
# rendez vous

- Lieu: mairie
- Heure: 15:00
```

RESOLUTION D'UN CONFLIT

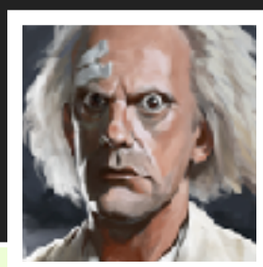
rendezvous.md

```
# rendez vous

- Lieu: gare
- Heure: 15:00
```



rendezvous.md

```
# rendez vous

<<<<<<< HEAD
- Lieu: mairie
=======
- Lieu: gare
>>>>>>> gare
- Heure: 15:00
```



```
doc@labo$ git checkout master
doc@labo$ git merge gare -m “gare au merge”
Auto-merging rendezvous.md
CONFLICT (content): Merge conflict in rendezvous.md
Automatic merge failed; fix conflicts and then
commit the result.
```

```
doc@labo$ git status
On branch master
You have unmerged paths.
  (fix conflicts and run "git commit")

Unmerged paths:
  (use "git add <file>..." to mark resolution)

    both modified:   rendezvous.md

no changes added to commit (use "git add" and/or
"git commit -a")
```

rendezvous.md

```
# rendez vous

- Lieu: centre ville
- Heure: 15:00
```

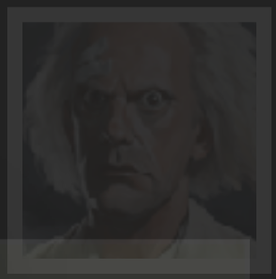
rendezvous.md

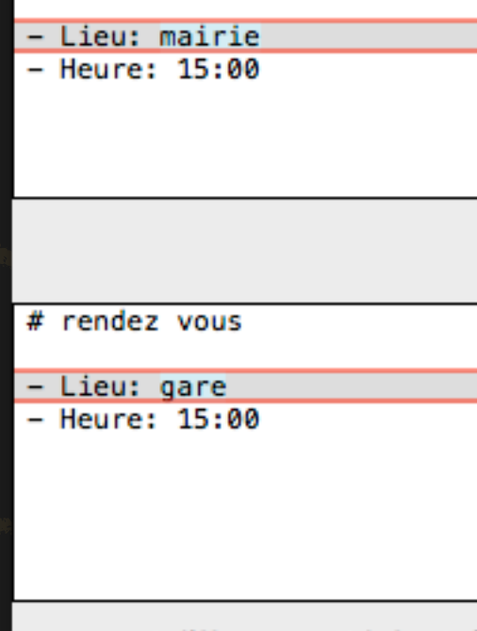
```
# rendez vous

- Lieu: mairie
- Heure: 15:00
```

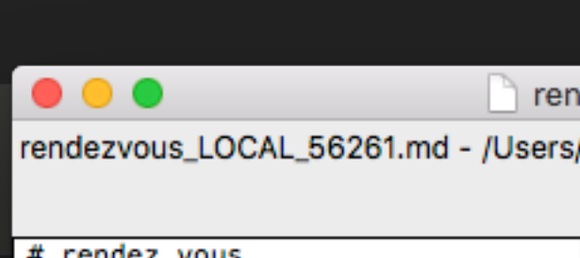
RESOLUTION D'UN CONFLIT

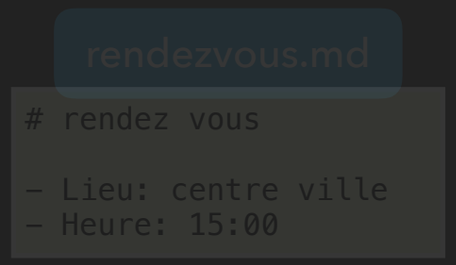
rendezvous.md

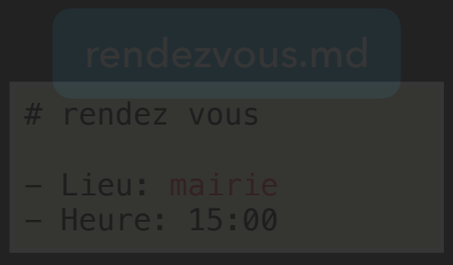
```
# rendez vous

<<<<<<< HEAD
- Lieu: mairie
=======
- Lieu: gare
>>>>>>> gare
- Heure: 15:00
```











RESOLUTION D'UN CONFLIT

rendezvous.md

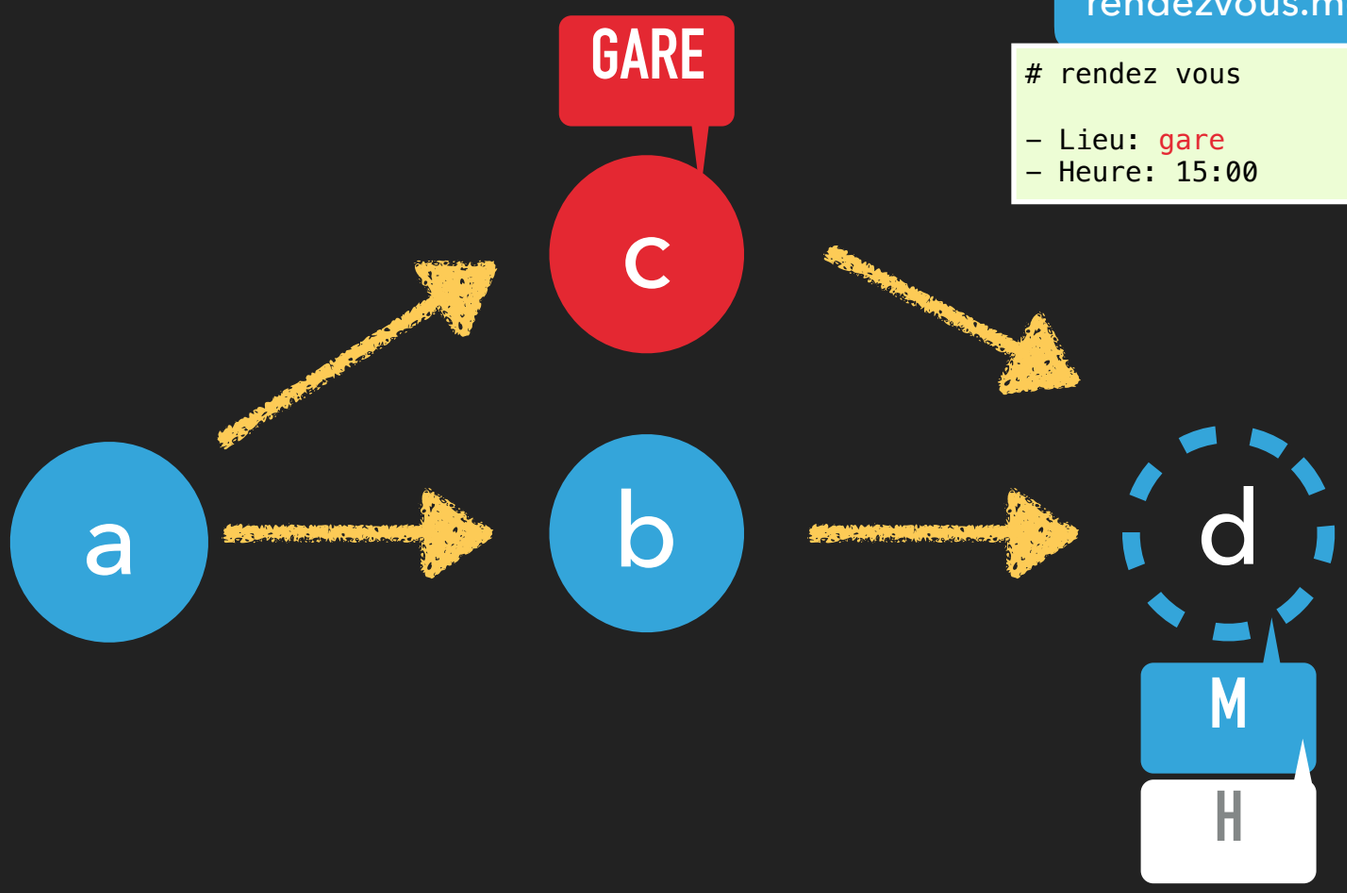
```
# rendez vous

- Lieu: gare
- Heure: 15:00
```

```
doc@labo$ git checkout master
doc@labo$ git merge gare -m “gare au merge”
Auto-merging rendezvous.md
CONFLICT (content): Merge conflict in rendezvous.md
Automatic merge failed; fix conflicts and then
commit the result.
```

rendezvous.md

```
# rendez vous

- Lieu: gare
- Heure: 15:00
```

```
doc@labo$ git status
On branch master
You have unmerged paths.
  (fix conflicts and run "git commit")

Unmerged paths:
  (use "git add <file>..." to mark resolution)

    both modified:   rendezvous.md

no changes added to commit (use "git add" and/or
"git commit -a")
```




```
doc@labo$ git show gare:rendezvous.md > rendezvous.md
doc@labo$ git status
On branch master
All conflicts fixed but you are still merging.
  (use "git commit" to conclude merge)

Changes to be committed:

    modified:   rendezvous.md

doc@labo$ git commit -m “gare au merge”
[master 04ac40f] gare au merge
```

rendezvous.md

```
# rendez vous

- Lieu: centre ville
- Heure: 15:00
```

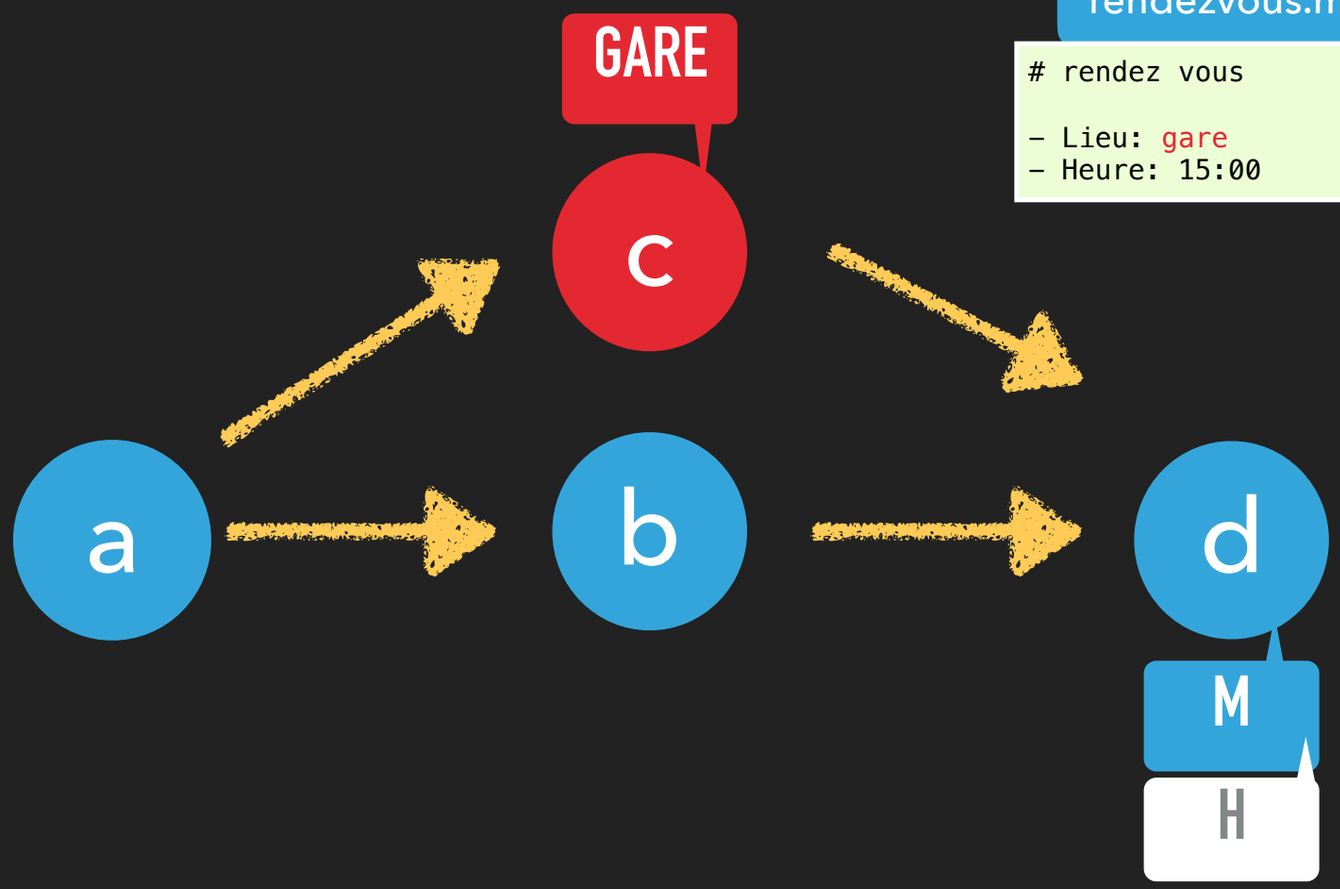
rendezvous.md

```
# rendez vous

- Lieu: mairie
- Heure: 15:00
```

RESOLUTION D'UN CONFLIT

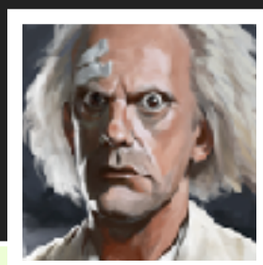
rendezvous.md

```
# rendez vous

- Lieu: gare
- Heure: 15:00
```



rendezvous.md

```
# rendez vous

- Lieu: gare
- Heure: 15:00
```



```
doc@labo$ git checkout master
doc@labo$ git merge gare -m “gare au merge”
Auto-merging rendezvous.md
CONFLICT (content): Merge conflict in rendezvous.md
Automatic merge failed; fix conflicts and then
commit the result.
```

```
doc@labo$ git status
On branch master
You have unmerged paths.
  (fix conflicts and run "git commit")

Unmerged paths:
  (use "git add <file>..." to mark resolution)

    both modified:   rendezvous.md

no changes added to commit (use "git add" and/or
"git commit -a")
```

```
doc@labo$ git show gare:rendezvous.md > rendezvous.md
doc@labo$ git status
On branch master
All conflicts fixed but you are still merging.
  (use "git commit" to conclude merge)

Changes to be committed:

    modified:   rendezvous.md

doc@labo$ git commit -m “gare au merge”
[master 04ac40f] gare au merge
```

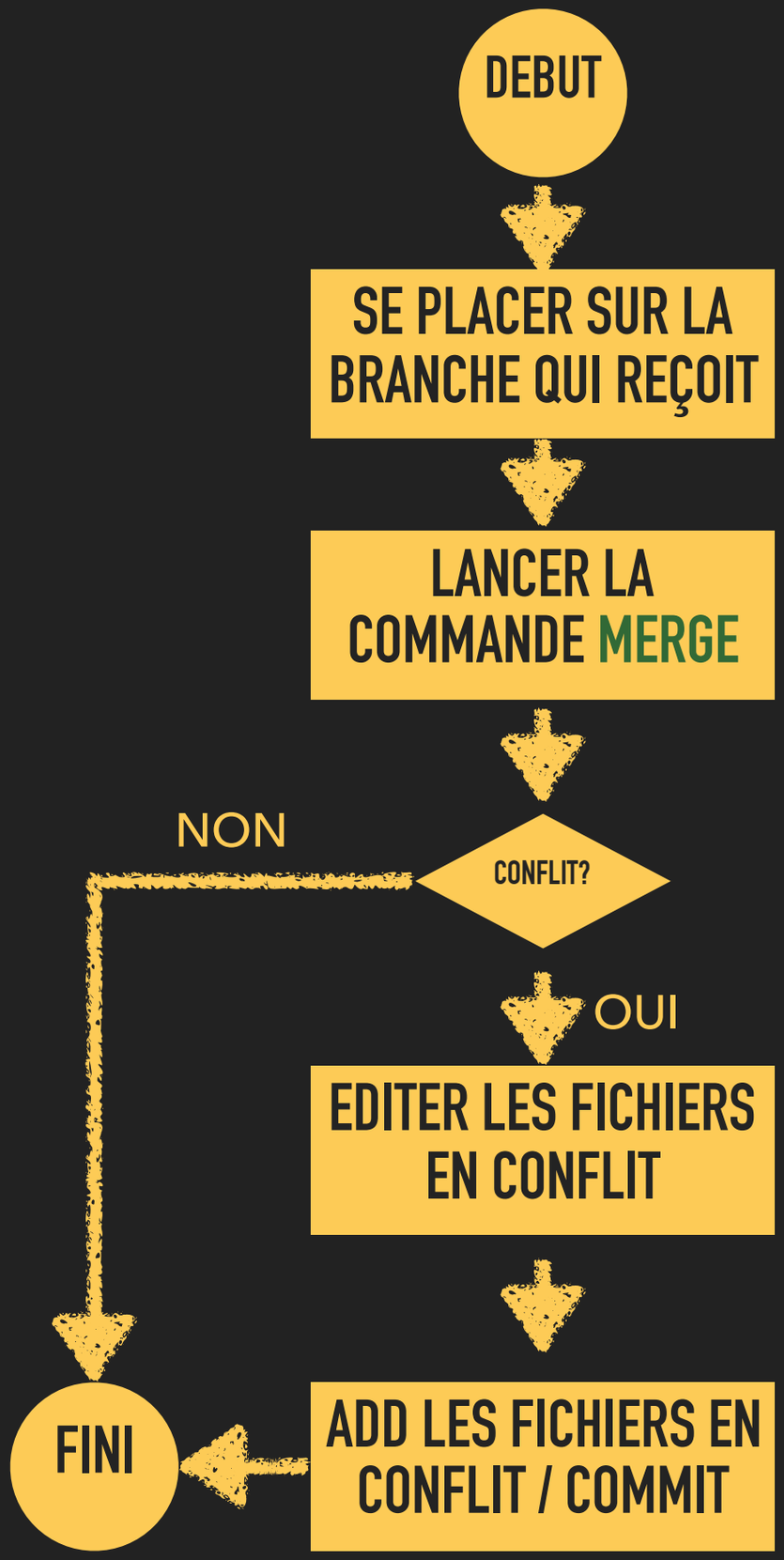
rendezvous.md

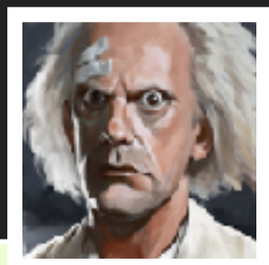
```
# rendez vous

- Lieu: centre ville
- Heure: 15:00
```

rendezvous.md

```
# rendez vous

- Lieu: mairie
- Heure: 15:00
```

GIT EN SOLO





```
doc@labo$ git checkout master
doc@labo$ git merge gare -m “gare au merge”
Auto-merging rendezvous.md
CONFLICT (content): Merge conflict in rendezvous.md
Automatic merge failed; fix conflicts and then
commit the result.
```

```
doc@labo$ git status
On branch master
You have unmerged paths.
  (fix conflicts and run "git commit")

Unmerged paths:
  (use "git add <file>..." to mark resolution)

    both modified:   rendezvous.md

no changes added to commit (use "git add" and/or
"git commit -a")
```

```
doc@labo$ git show gare:rendezvous.md > rendezvous.md
doc@labo$ git add rendezvous.md
doc@labo$ git status
On branch master
All conflicts fixed but you are still merging.
  (use "git commit" to conclude merge)

Changes to be committed:

    modified:   rendezvous.md

doc@labo$ git commit -m “gare au merge”
[master 04ac40f] gare au merge
```

MERGE

- Merger / réintégrer une branche feature_name:
  `git merge --no-ff feature_name -m “commentaire”`

- Gérer un conflit sur fichier.txt:
  `git add fichier.txt`
  `git commit -m “commentaire de merge”`

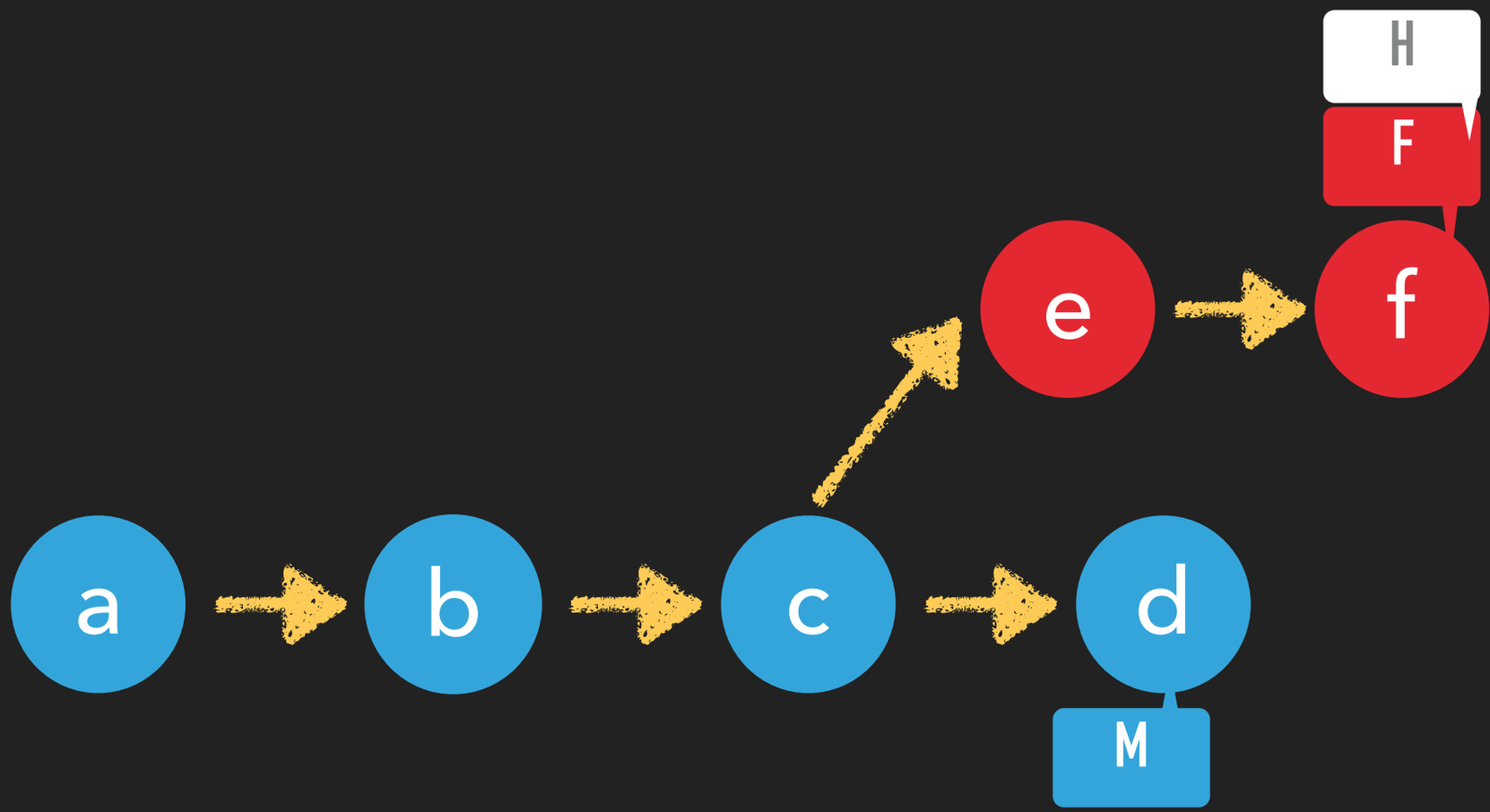
- Abandonner un merge en cours:
  `git merge --abort`

TU TE TIRES AILLEURS, TRIPLE BUSE !

REBASE

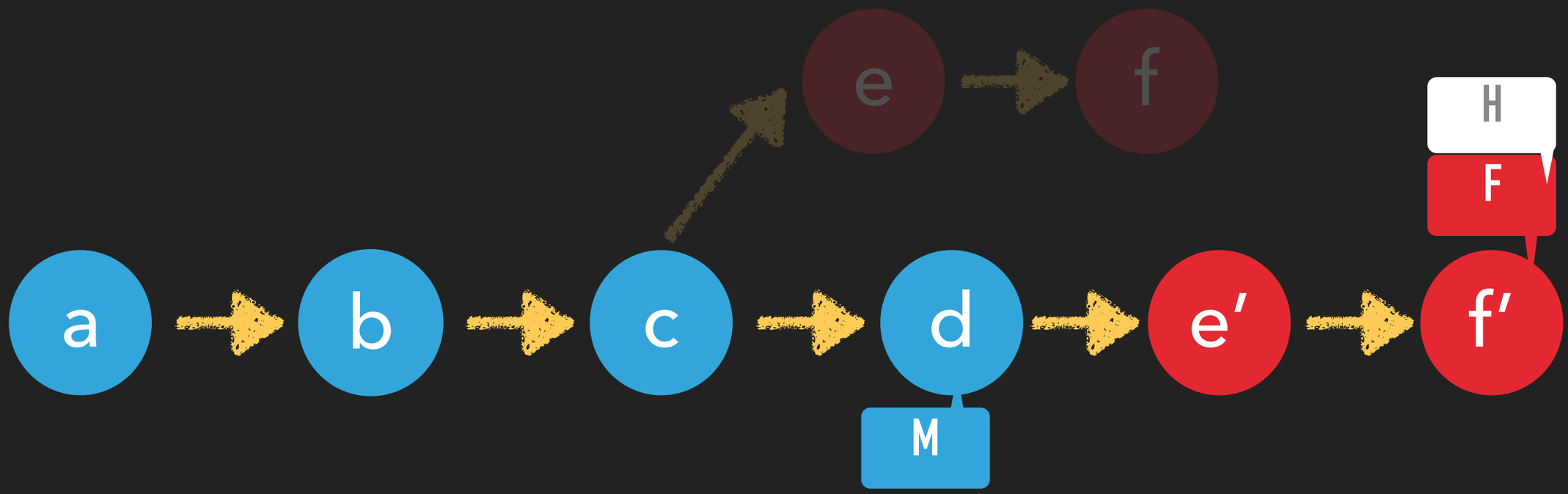
LE REBASE PERMET DE

- Déplacer la base de la branche, ou rebaser la branche.
- Utile pour récupérer un fix dans sa branche sans merger



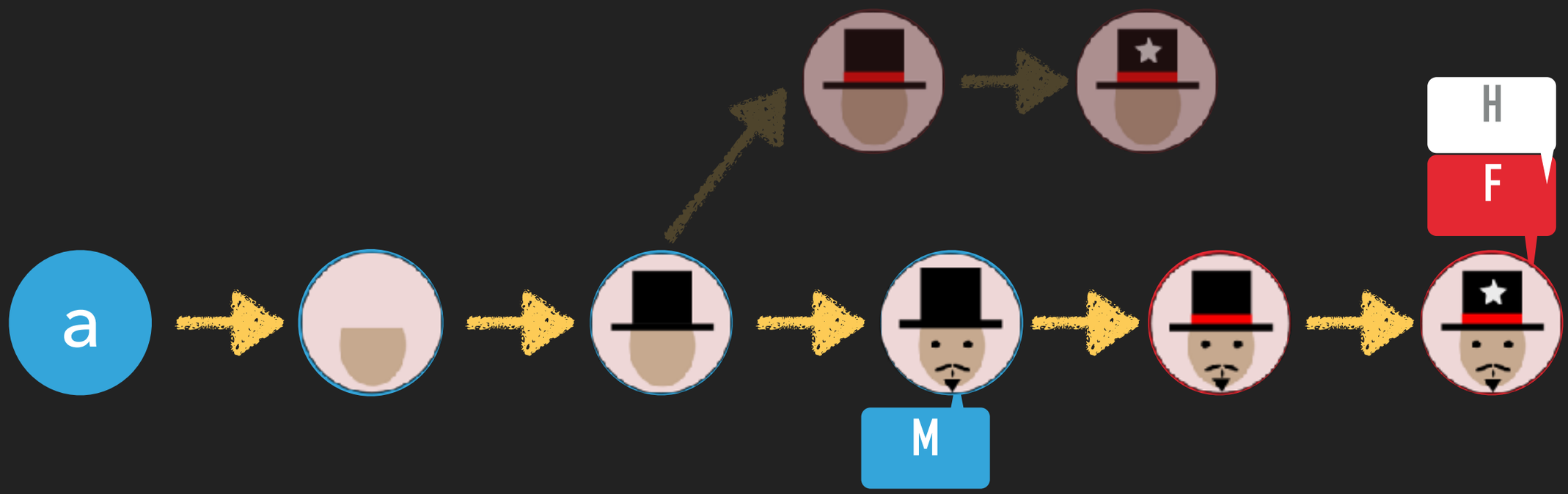
LE REBASE PERMET DE

- Déplacer la base de la branche, ou rebaser la branche.

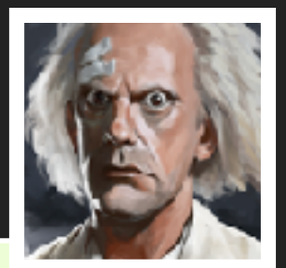


LE REBASE PERMET DE

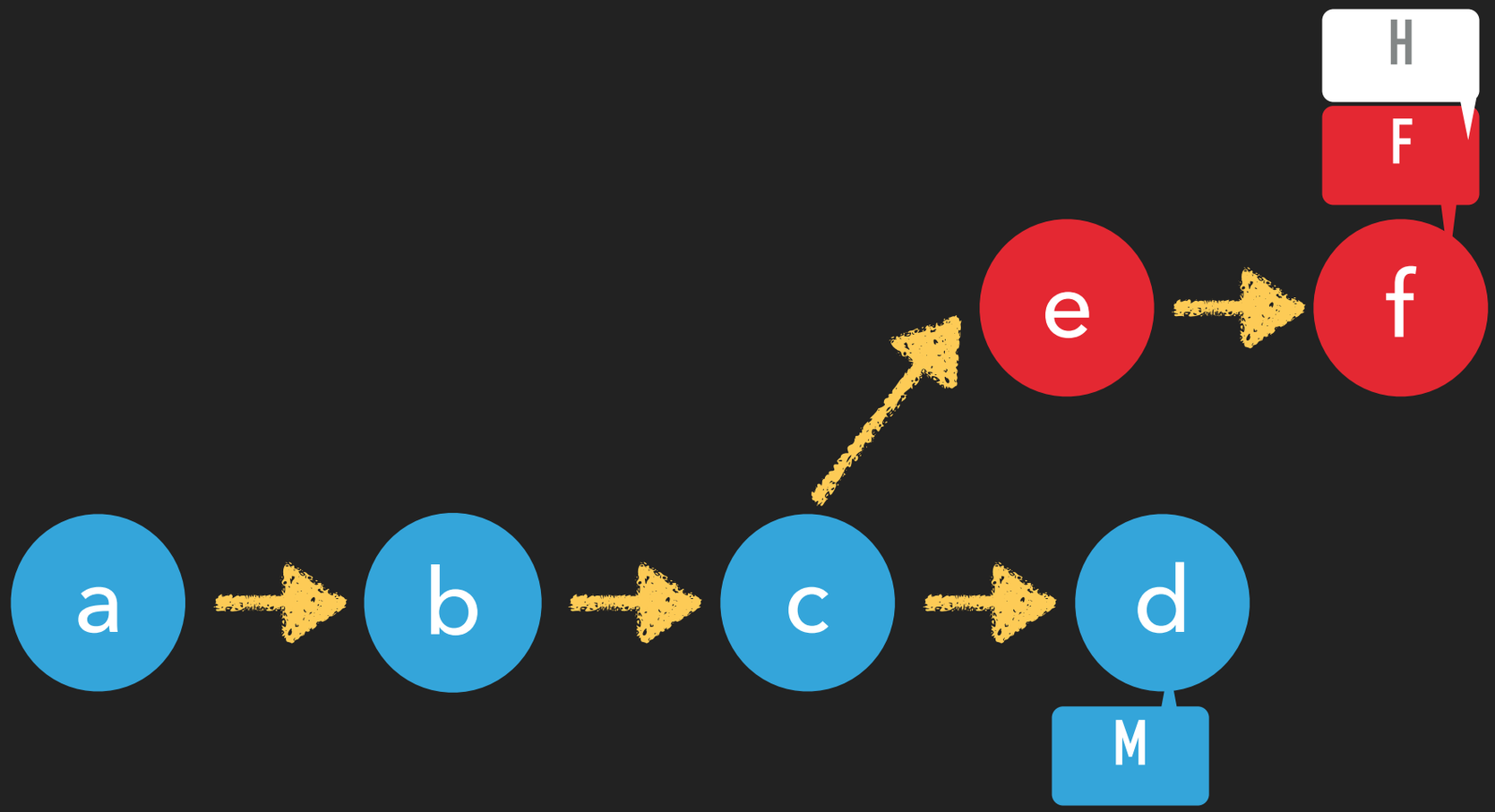
- Déplacer la base de la branche, ou rebaser la branche.



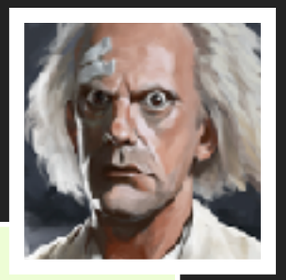
git rebase master



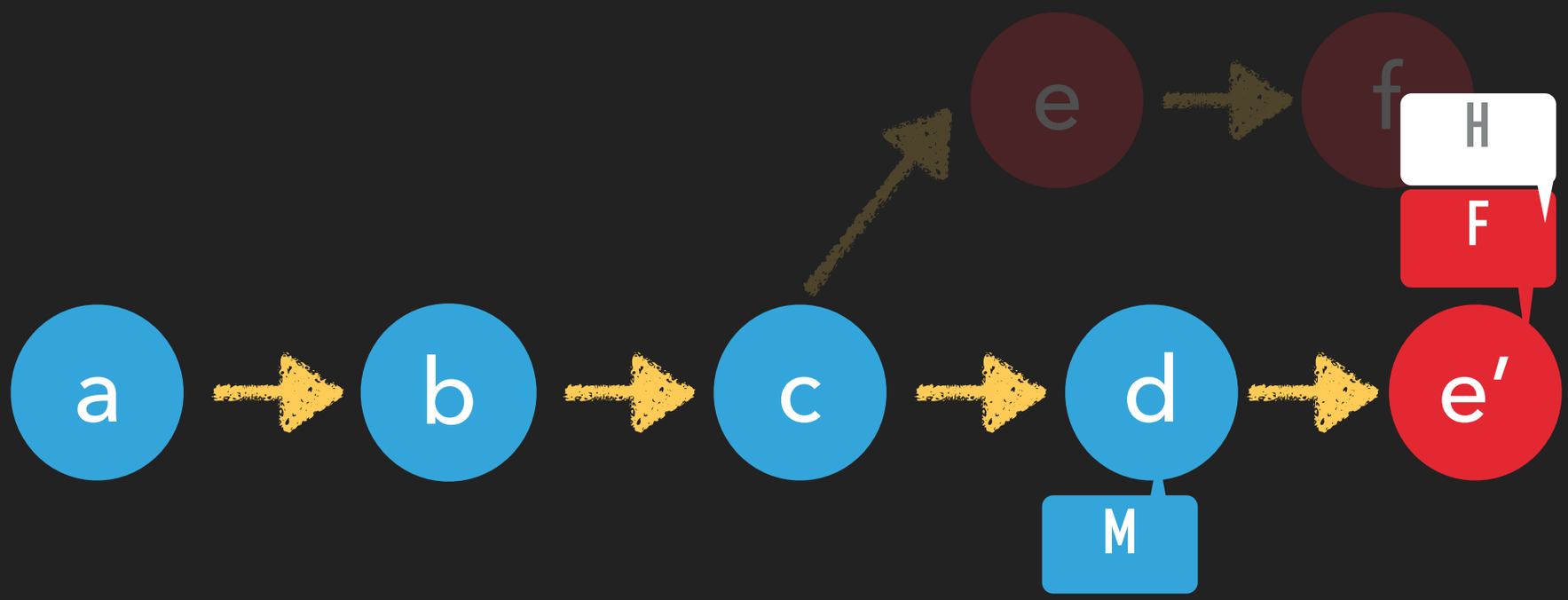
```
doc@labo$ git checkout feature
doc@labo$ git rebase master
First, rewinding head to replay your work on top of it...
```



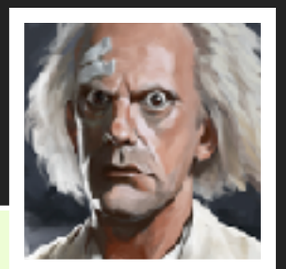
git rebase master



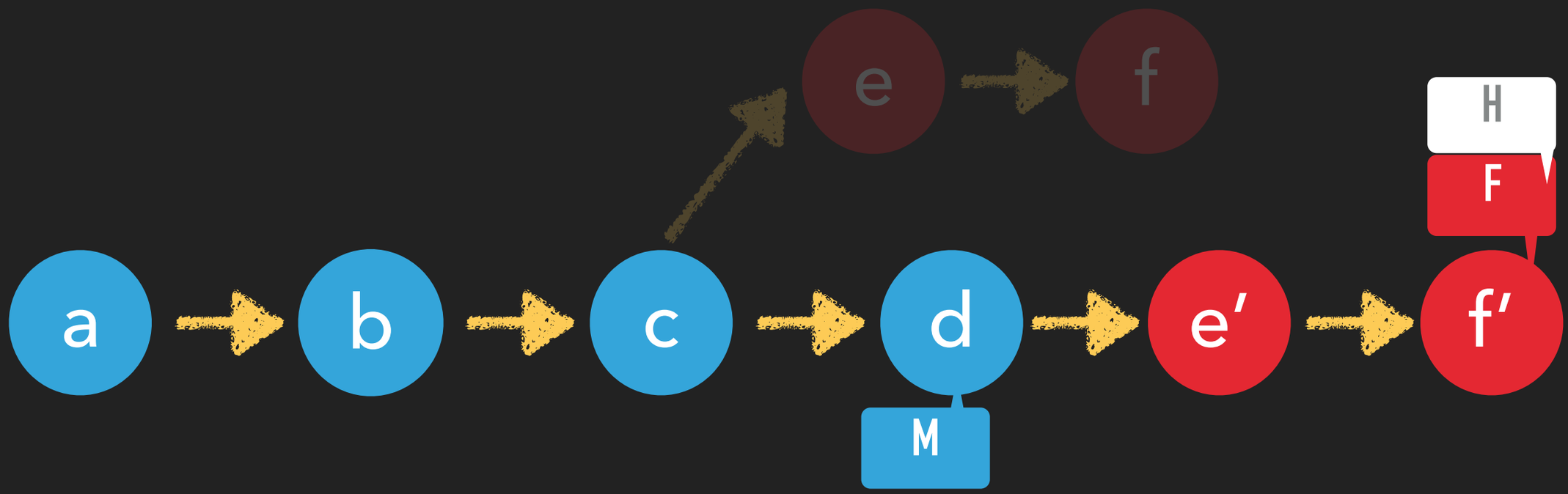
```
doc@labo$ git checkout feature
doc@labo$ git rebase master
First, rewinding head to replay your work on top of it...
Applying: un commit a rebaser (e -> e’)
```



git rebase master



```
doc@labo$ git checkout feature
doc@labo$ git rebase master
First, rewinding head to replay your work on top of it...
Applying: un commit a rebaser (e -> e')
Applying: un autre commit a rebaser (f -> f')
```



git rebase -i master

- rebase interactif
- permet de configurer le replay
  - changer l'ordre des commit
  - édition de commentaire
  - merge de commit
  - édition des fichiers
- Utilisé surtout pour changer les commentaires

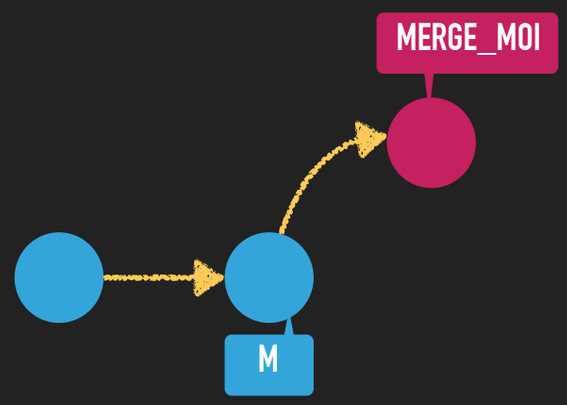
```
pick 52c1584 un commit a rebaser
pick cfbcdad un autre commit a rebaser

# Rebase 1cff4c8..cfbcdad onto 1cff4c8 (2 command(s))
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
#
# These lines can be re-ordered; they are executed from top to bottom.
#
# If you remove a line here THAT COMMIT WILL BE LOST.
#
# However, if you remove everything, the rebase will be aborted.
#
# Note that empty commits are commented out
```

LES CONFLITS DANS UN REBASE

- Les conflits lors d'un rebase sont à résoudre au fur et à mesure du replay
- On résout un conflit de rebase avec
  - `git add fichier_en_conflit...`
  - `git rebase --continue`
- Abandon du rebase avec
  - `git rebase --abort`

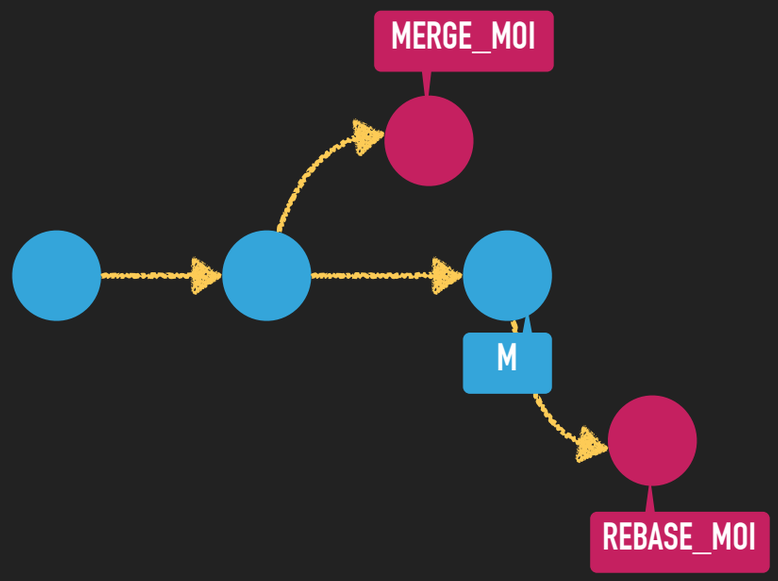
EXERCICE 3.1: NOUVELLE BRANCHE

- Reprendre le repository `cours_git`, branche `master`
- Créer une nouvelle branche `merge_moi` et se positionner dessus
- Rajouter le fichier *merge.md* dans le dossier *commandes*, *add* + *commit*



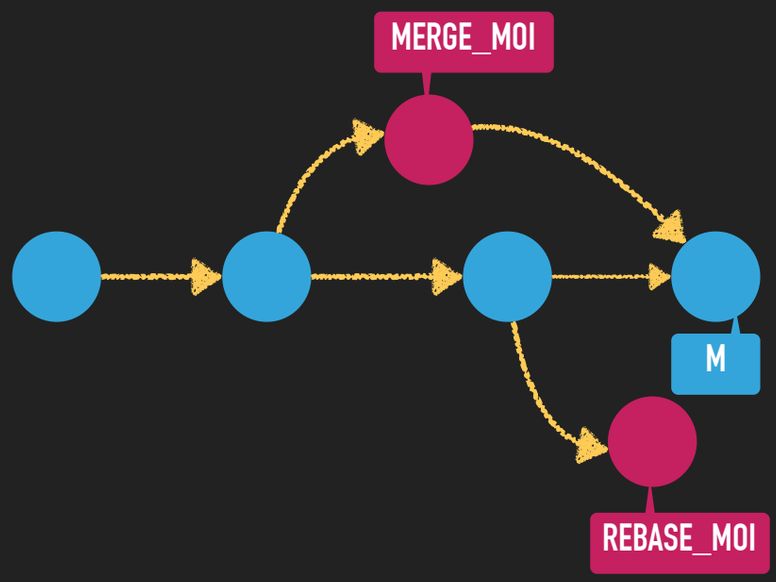
EXERCICE 3.2: NOUVELLE BRANCHE

- retourner sur master, ajoutez une ligne au README.md, add + commit
- Créer une nouvelle branche `rebase_moi` à partir de `master` et se positionner dessus
- Rajouter le fichier *rebase.md* dans le dossier *commandes*, *add + commit*



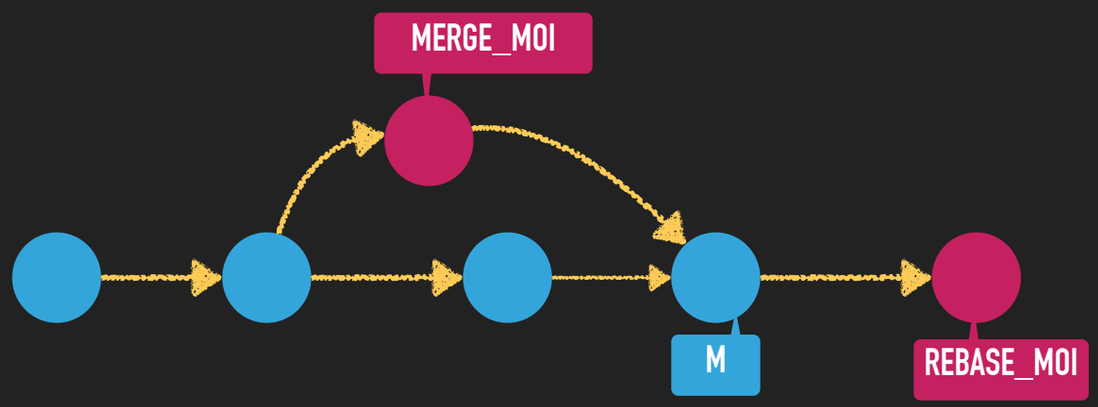
EXERCICE 3.3: MERGE DE LA BRANCHE MERGE

- Merger la branche `merge_moi` dans `master`
- `master` contient maintenant le fichier *merge.md*



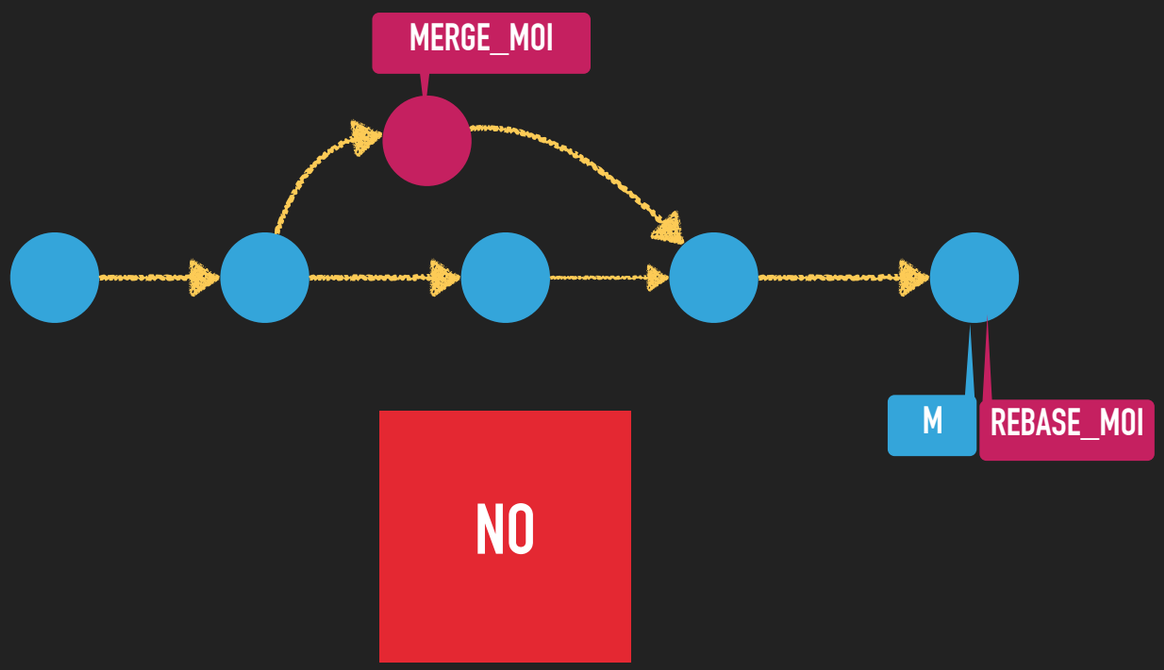
EXERCICE 3.4: REBASE DE LA BRANCHE REBASE

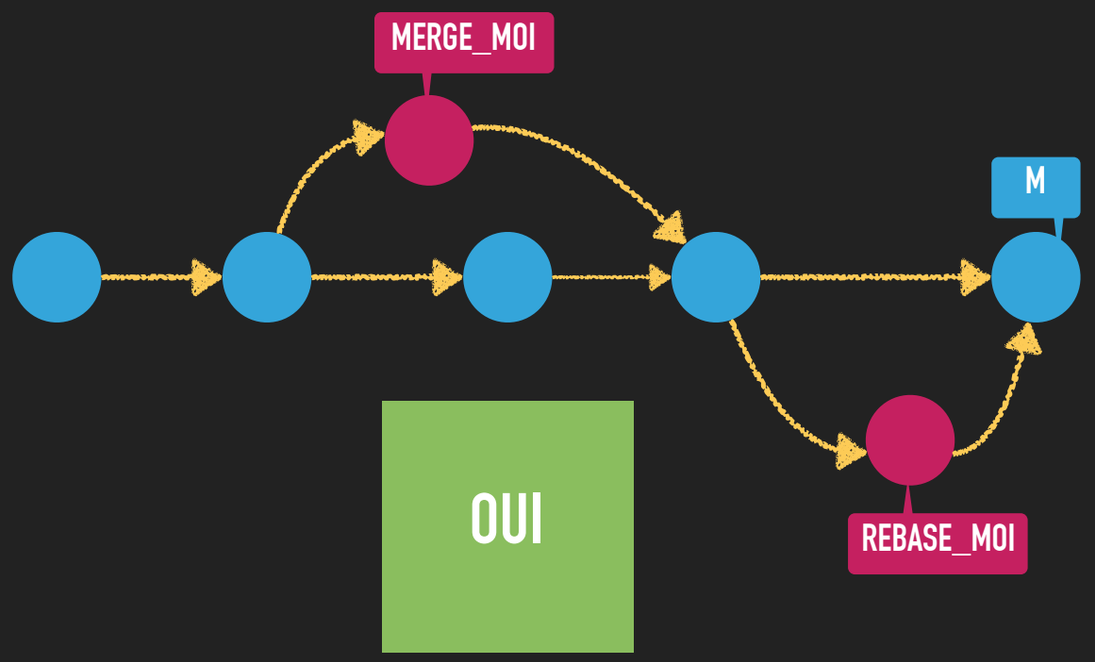
- Se placer sur `rebase_moi`, le fichier *merge.md* n'existe pas sur la branche `rebase_moi`.
- Rebaser la branche `rebase_moi` sur la branche `master`
- Le fichier merge.md est maintenant présent dans la branche `rebase_moi`



EXERCICE 3.5:MERGE DE LA BRANCHE REBASE

- Merger la branche `rebase_moi` sur master
- Faire en sorte qu'un commit de merge soit créé malgré la situation de descendance directe
- en cas d'erreur: `git reset --hard HEAD^`





REBASE

- Rebaser une branche sur develop:
  `git rebase develop`

- Gérer un conflit sur fichier.txt:
  `git add fichier.txt`
  `git rebase --continue`

- Abandonner le rebase
  `git rebase --abort`

FAUT RÉFLÉCHIR, MCFLY, FAUT RÉFLÉCHIR !

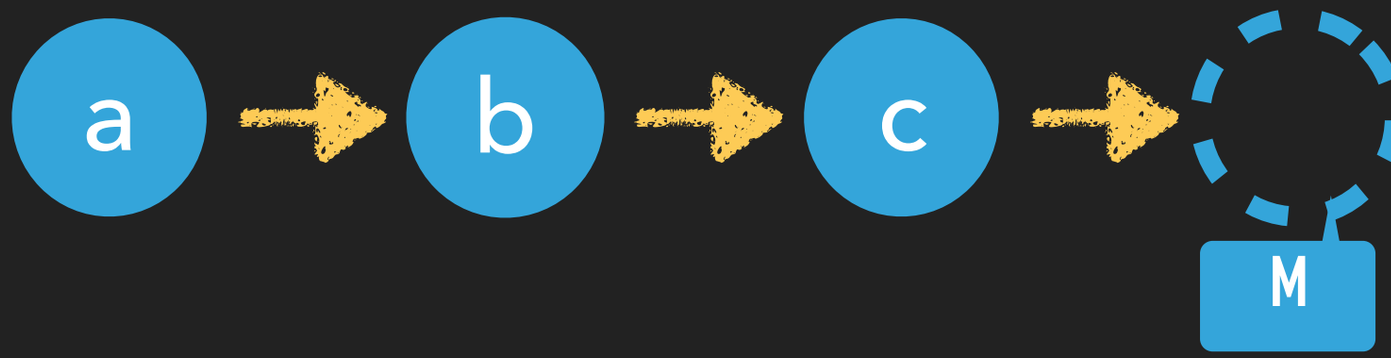
DES COMMANDES EN VRAC

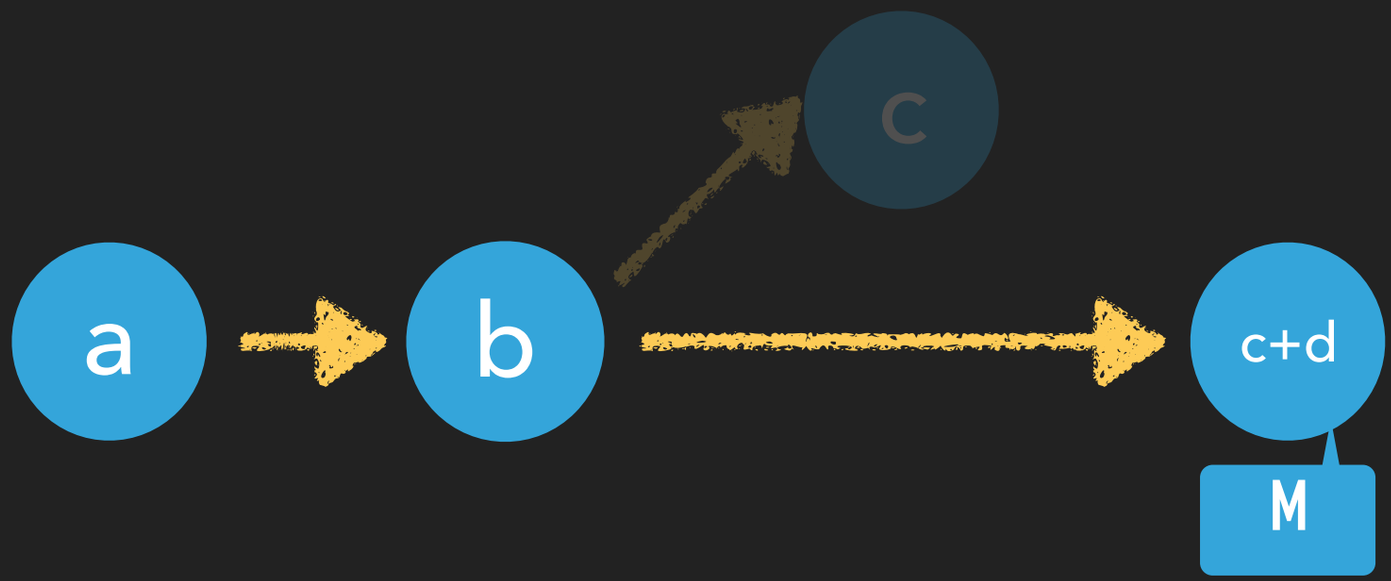
git [add|rm|mv] <file>...

- add: planifier l'ajout d'un fichier
- rm: planifier l'effacement d'un fichier
- mv: renommer/déplacer un fichier

git commit --amend -m “surcharge le précédent”

- --amend permet de merger le commit créé avec le précédent





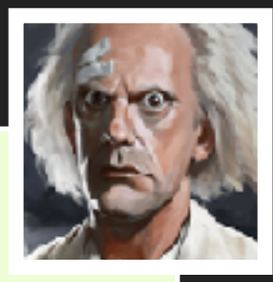
`git tag TAGNAME -m “ceci est un tag”`

- Créé une référence de type *tag*
- Contrairement à une branch un *tag* ne bouge pas
- Se placer sur un *tag* nous met en tête détachée
- `-a` pour annoté, ou `-m` pour message, permet d’ajouter des infos sur le tag

`git config --global`

- Sans `--global` la configuration est locale au repository dans lequel la commande est lancée
- Avec `--global` la configuration est valable pour tous les repository

LE FICHIER DE CONFIGURATION GLOBAL



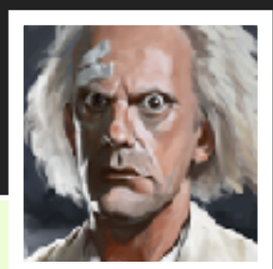
~/.gitconfig

```
[user]
    name = Emmett Brown
    email =emmett.brown@hill_valley.com
[push]
    default = simple
[alias]
    co = checkout
    ci = commit
    st = status
    br = branch
[core]
    excludesfile = /Users/emmett/.gitignore_global
    autocrlf = input
```

LES OPTIONS PRINCIPALES

- `git config --global user.name “Marty MacFly”`
- `git config --global user.email “m.mfly@hvlly.com”`
- `git config --global core.autocrlf false`
- `git config --global core.filemode false`
- `git config --global push.default simple`

git config alias.ALIAS ‘commande longue’



```
git config --global alias.co checkout
git config --global alias.ci commit
git config --global alias.st status
git config --global alias.br branch
git config --global alias.hist 'log --pretty=format:"%h %ad | %s%d [%an]" --graph --date=short'
git config --global alias.type 'cat-file -t'
git config --global alias.dump 'cat-file -p‘

doc@labo$ git st
# On branch develop
nothing to commit (working directory clean)
```

CHEAT SHEET - [HTTP://OVERAPI.COM/GIT](http://overapi.com/git)

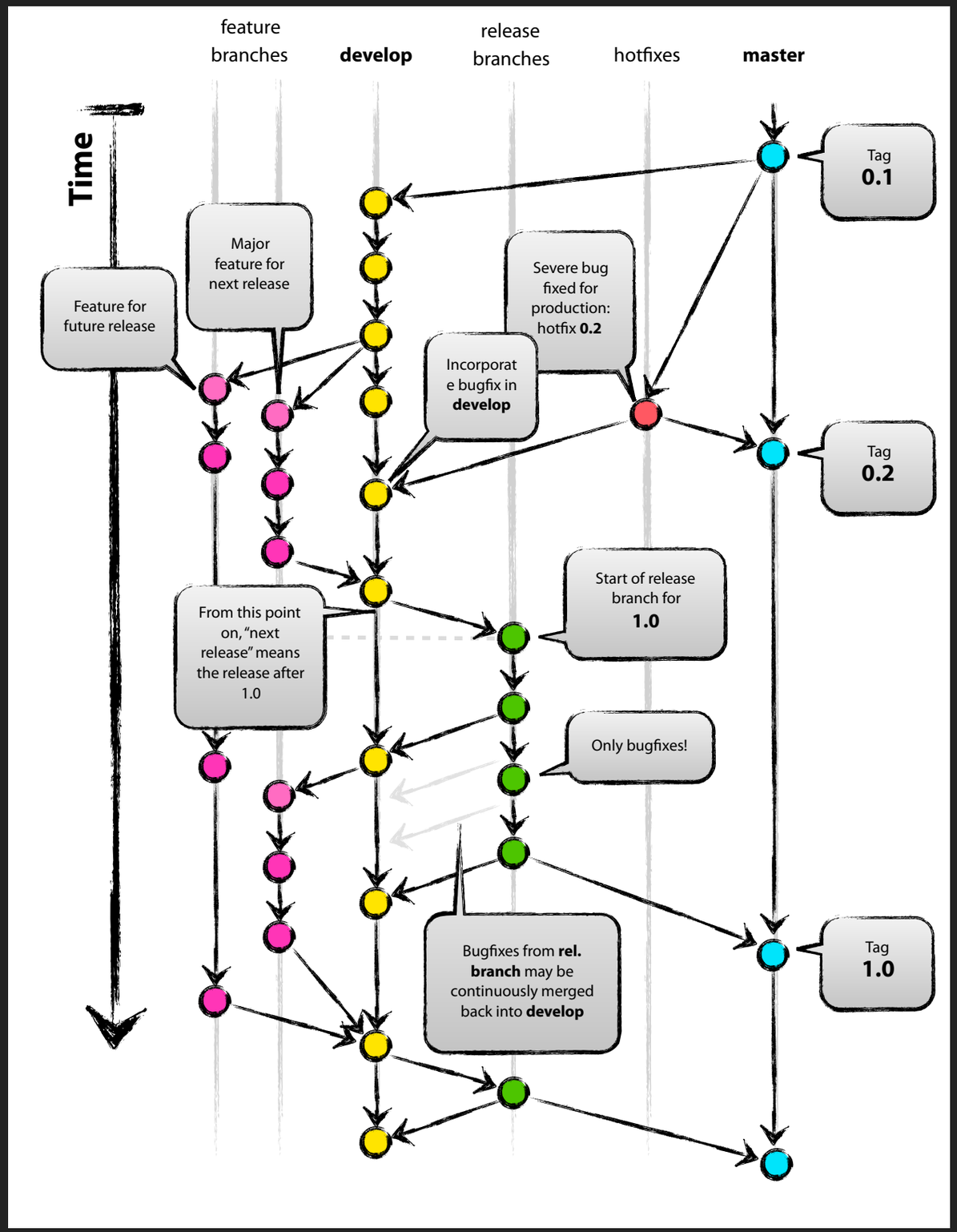
LES TYPES DE BRANCHES

NVIE.COM

NVIE.COM

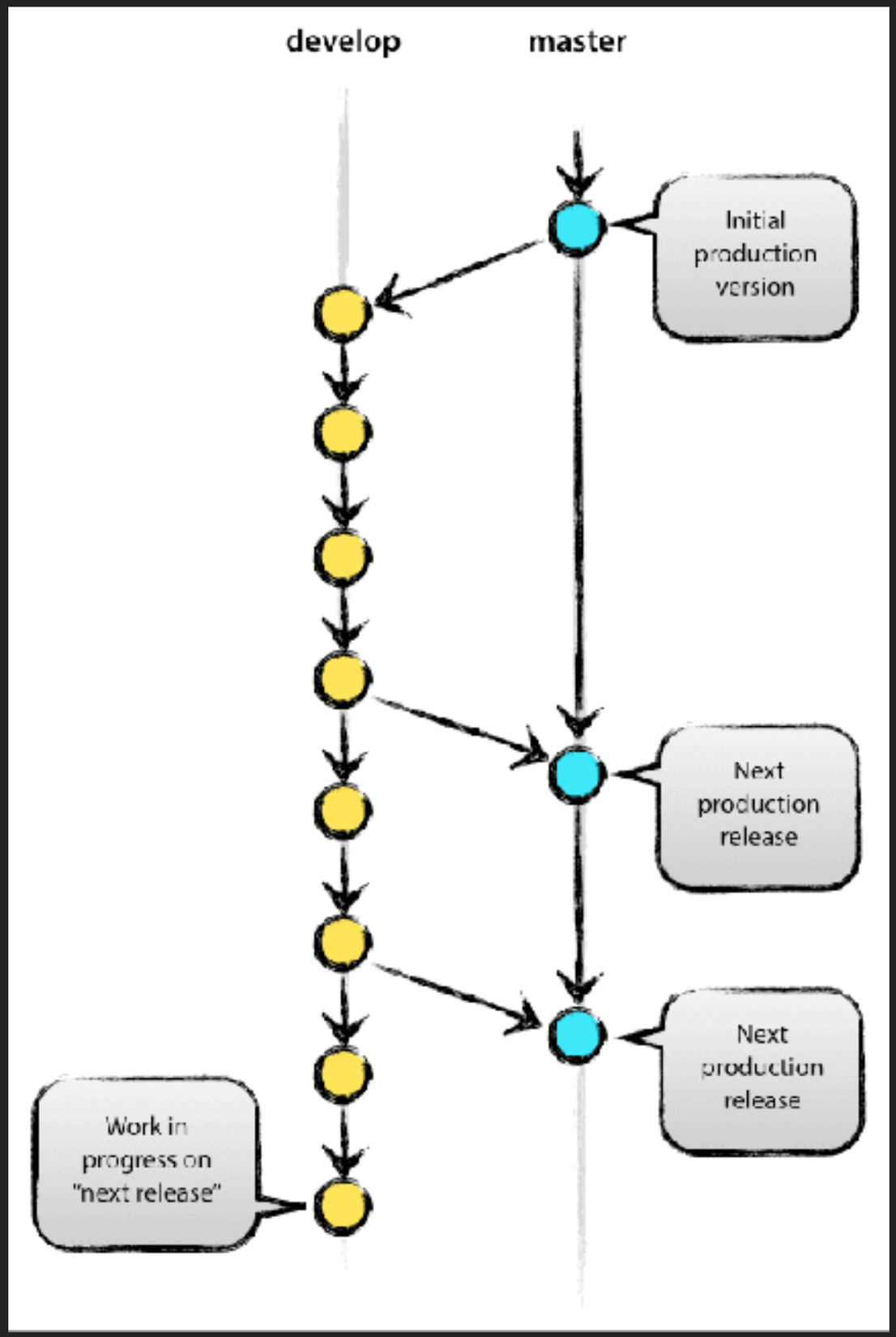
GUIDE DE BRANCHES

- Règles de création de branches
- Règles de nommage de branches
- **master**, **develop**, **feature**, **release**, **hotfix**
- Que faire dans chaque branche



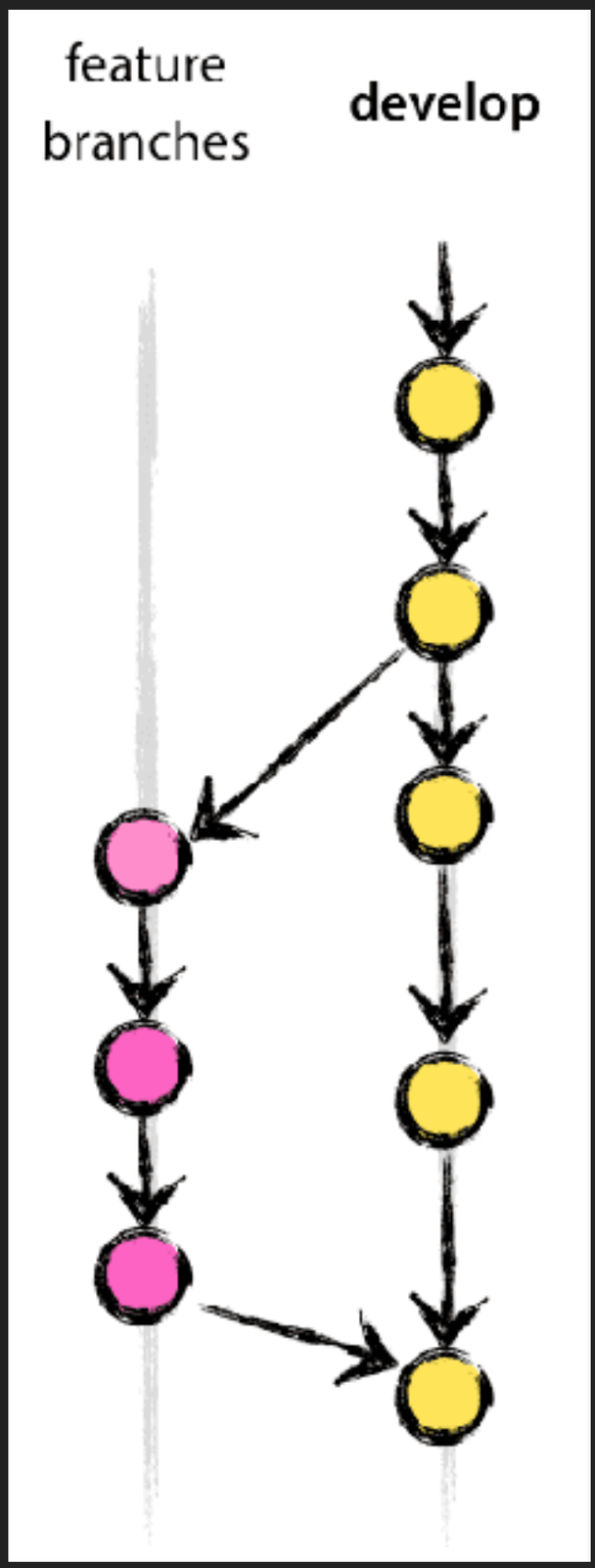
BRANCHES PRINCIPALES

- **master**
  - stable
  - production
- **develop**
  - instable
  - développement actif
  - préparation de la prochaine release



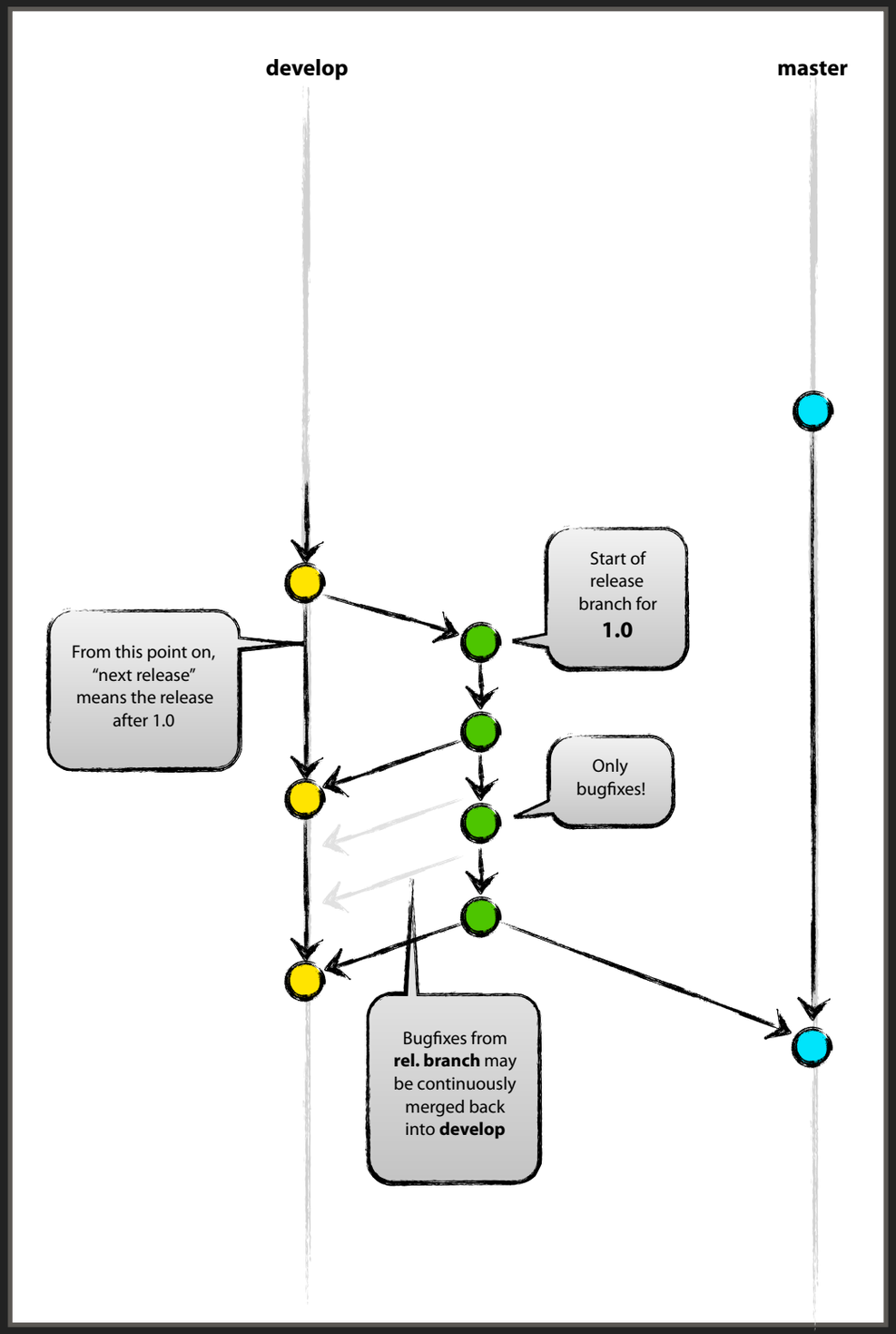
BRANCHES DE FONCTIONNALITÉ

- **feature/***
  - **UNE** fonctionnalité par branche
  - merge dans develop
- merge-request/pull-request



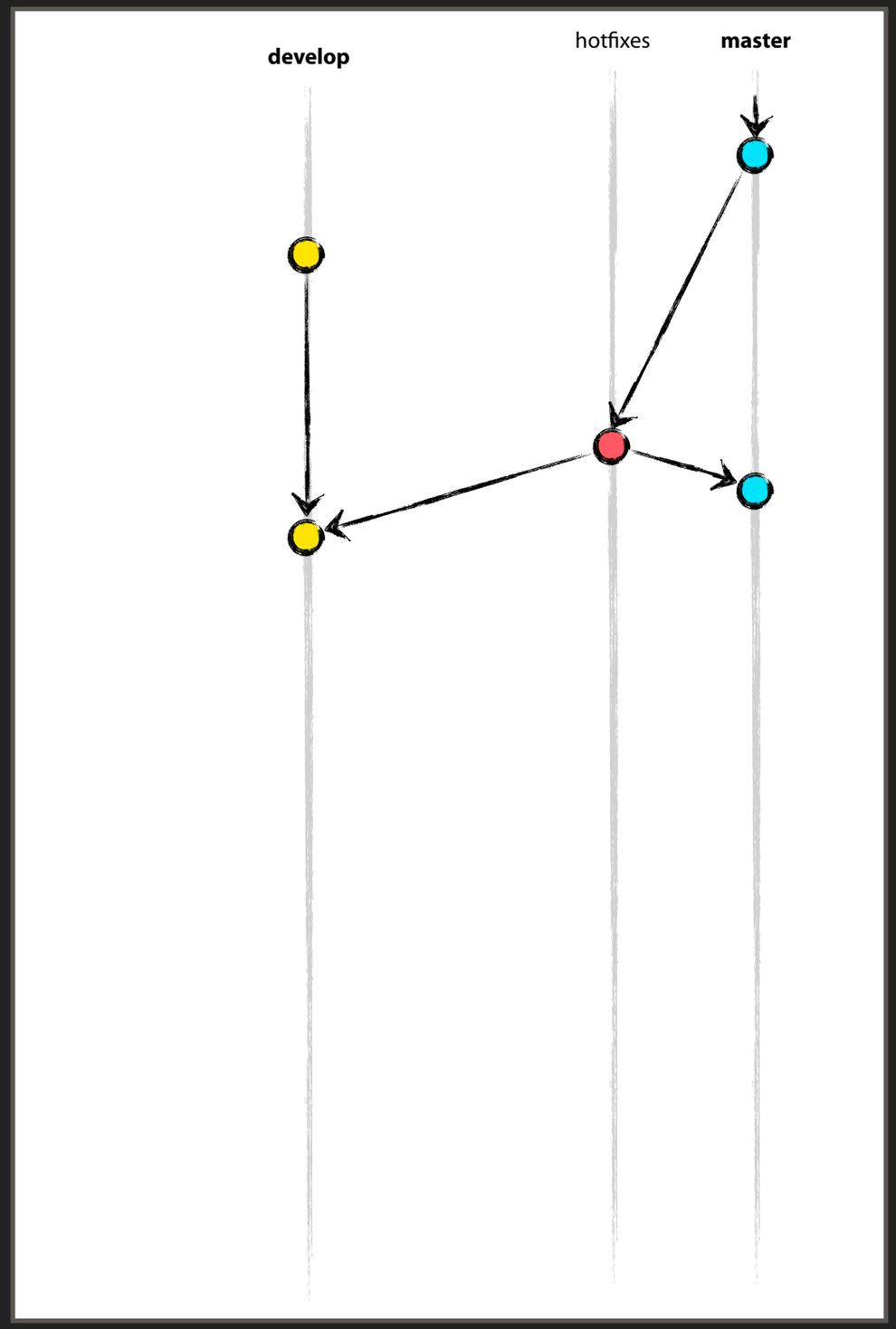
BRANCHE DE LIVRAISON

- **release/***
  - modifications relatives à une livraison
  - Remplissage de la note de version
  - Correction de bugs mineurs
  - merge dans **master** et **develop**



BRANCHE DE HOTFIX

- **hotfix/***
  - correction de bug sur version livrée
  - merge dans **master** et **develop**



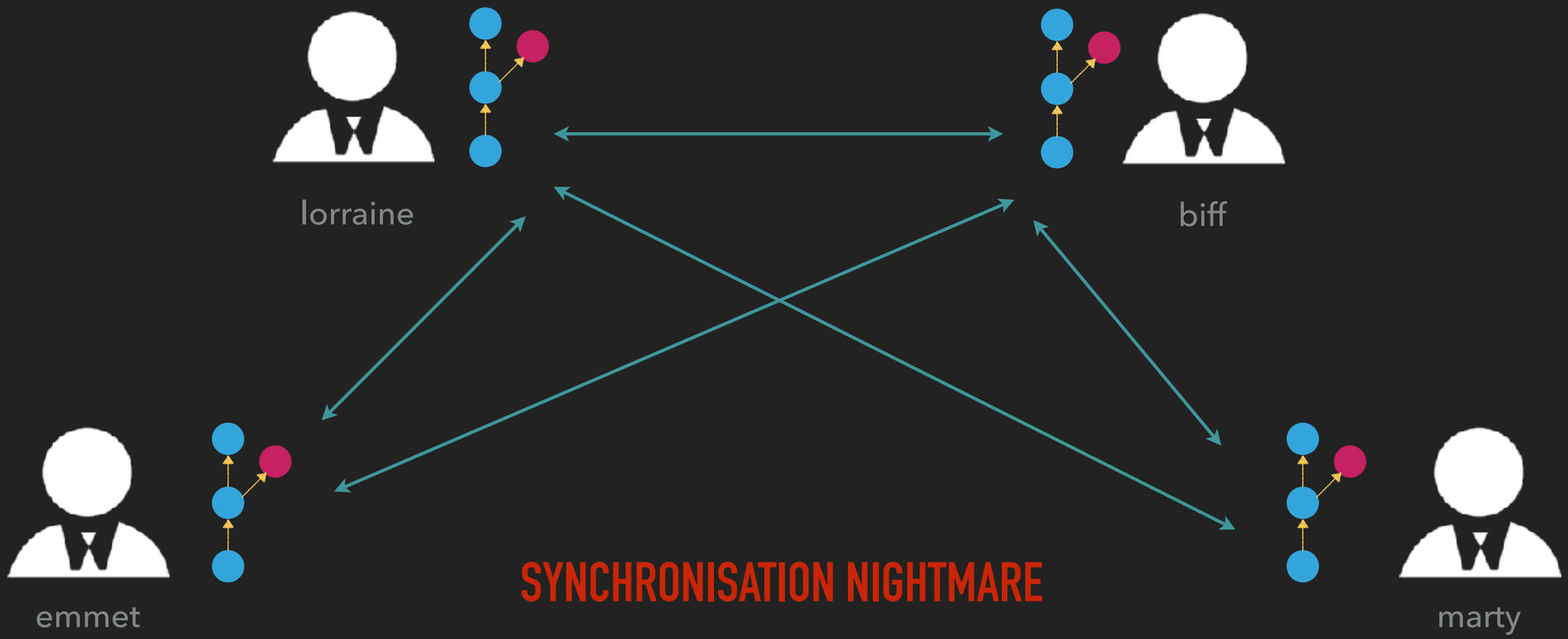
NVIE.COM

- Les branches principales:
  master et **develop**
- Les branches de fonctionnalités:
  feature/* ou feature-*
- Les branches de release
  `release/*` ou **`release-*`**
- Les branches de hotfix
  `hotfix/*` ou **`hotfix-*`**

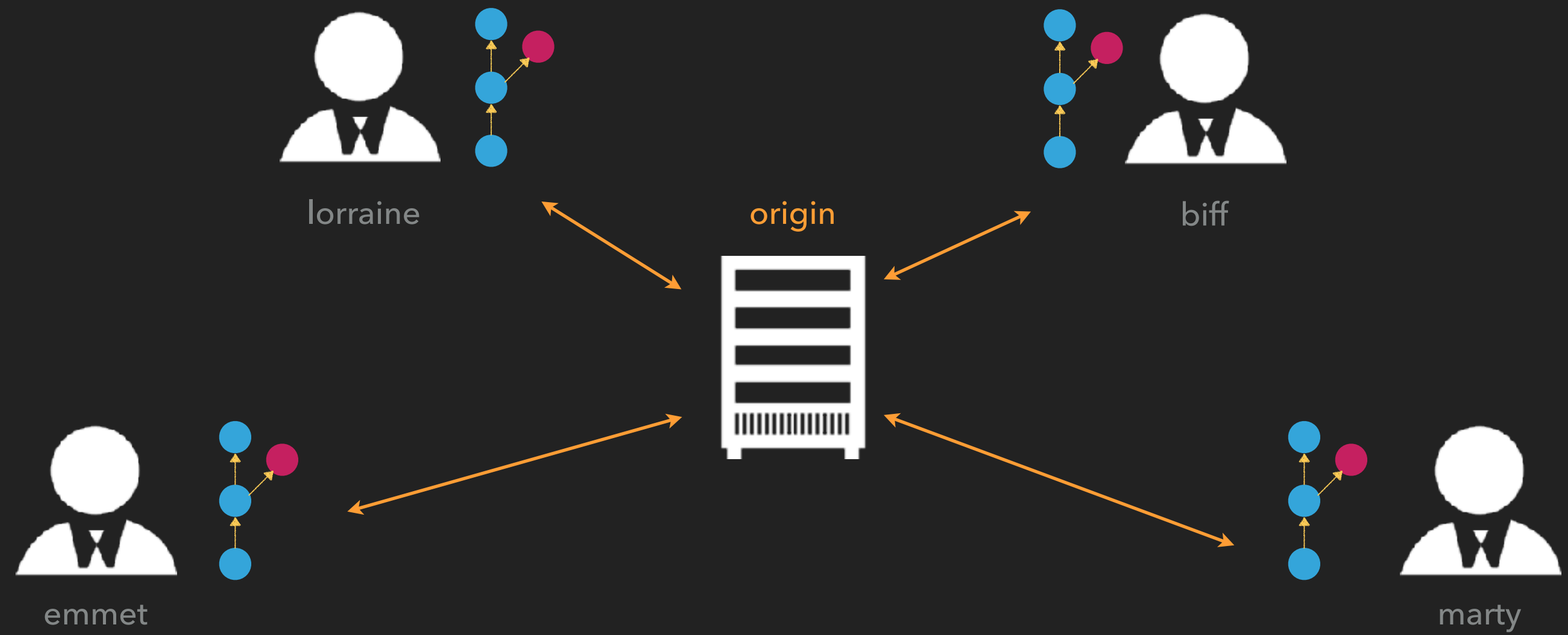
2,21 GIGOWATTS !!! 2,21 GIGOWATTS !!! MON DIEU !!!

GIT MULTIJOUEURS

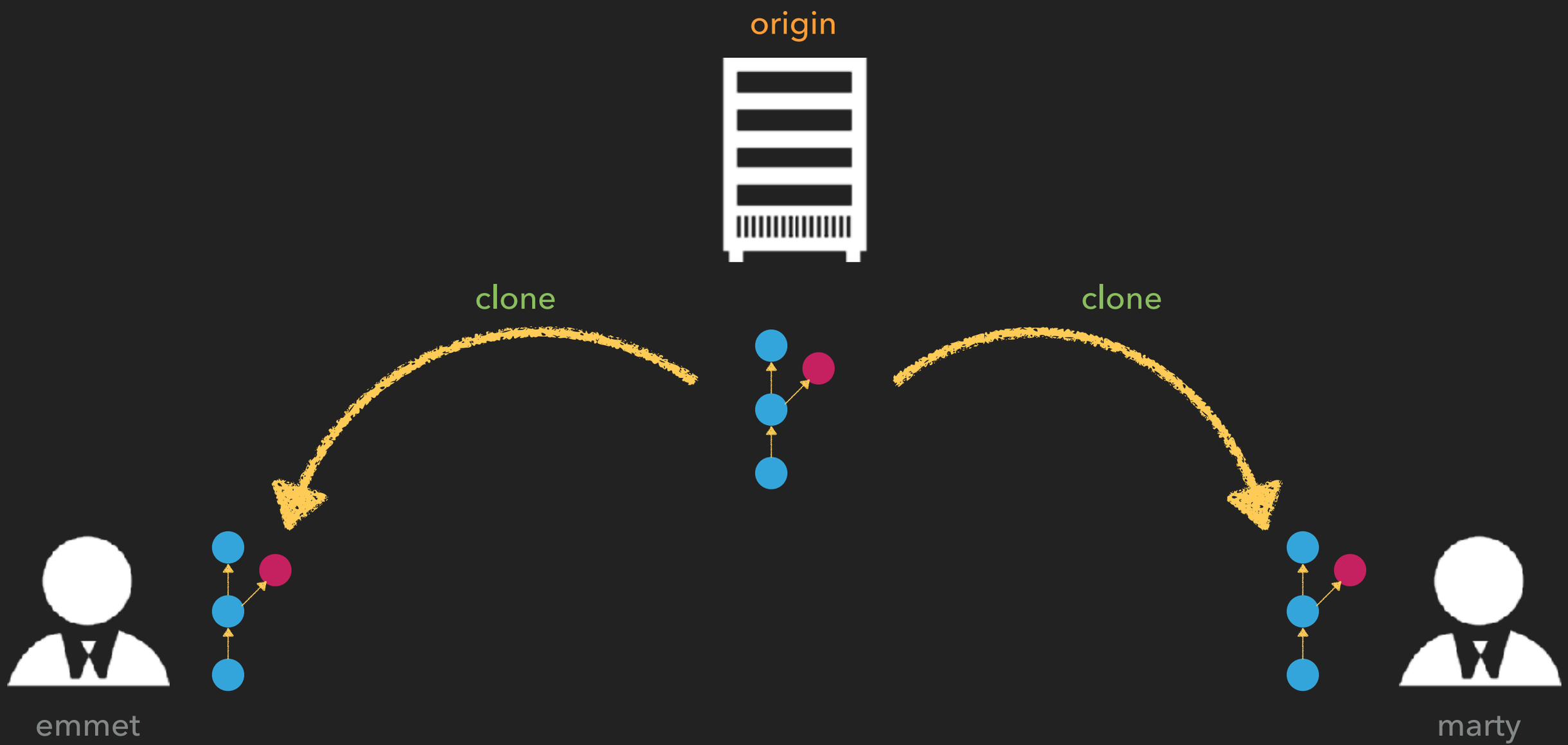
DES REMOTES PAR MILLIERS



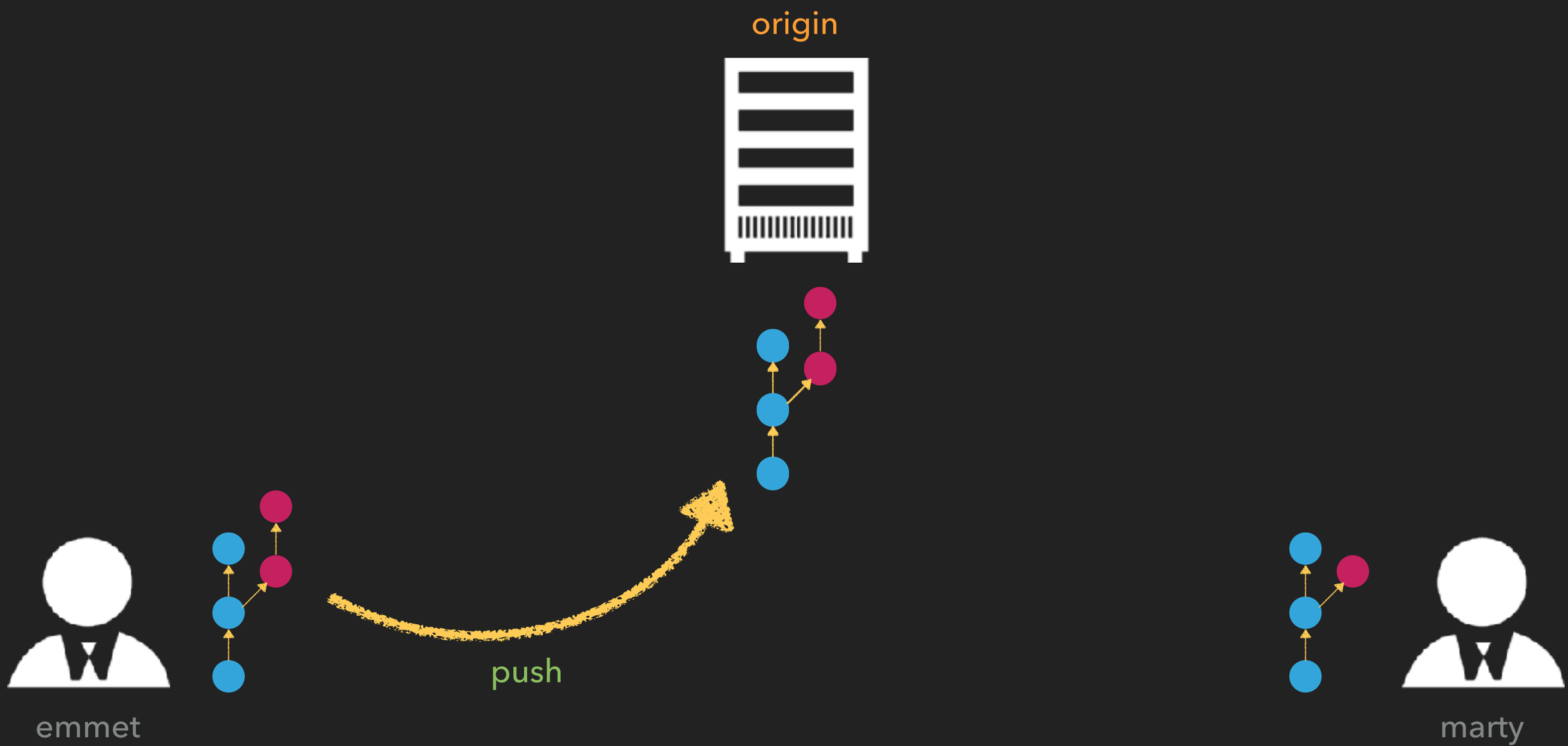
DES REMOTES PAR MILLIERS MAIS UNE SEULE ORIGINE



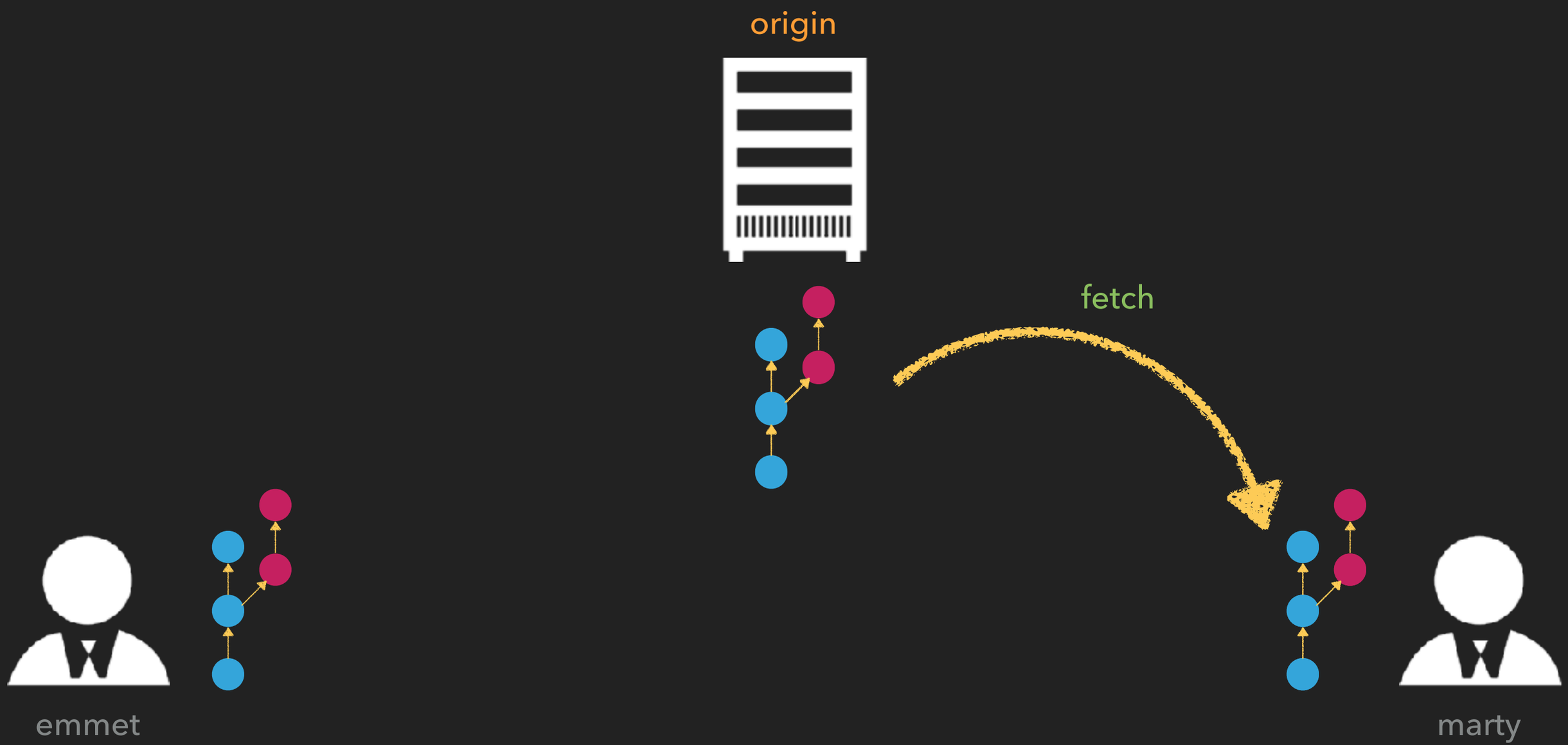
CREER LA COPIE LOCALE



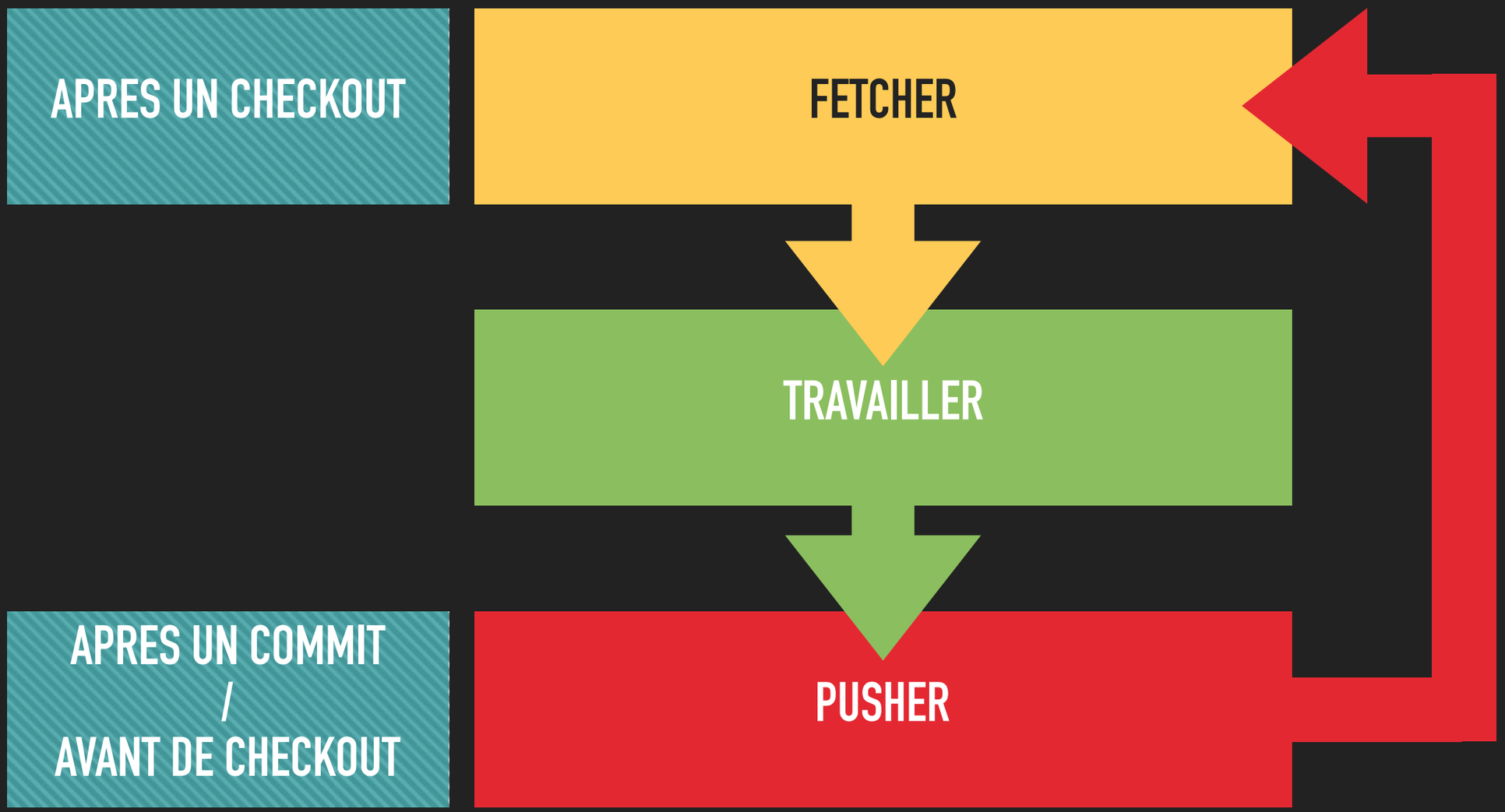
TRAVAILLER ET POUSSER



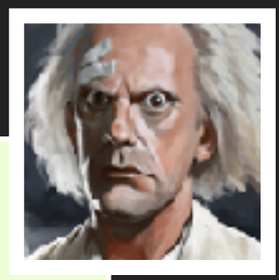
RÉCUPÉRER AVANT DE TRAVAILLER



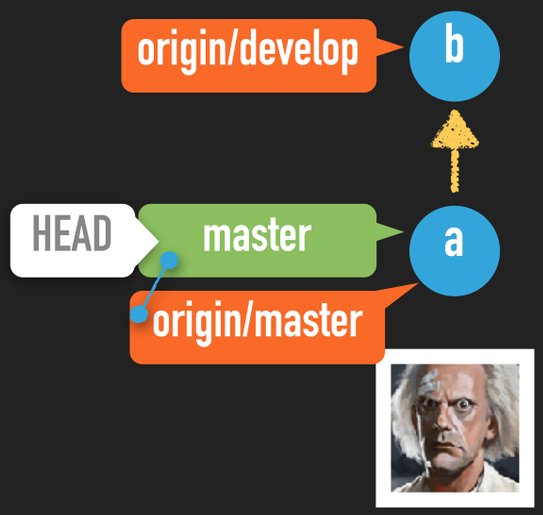
LES 3 PHASES DU TRAVAIL À PLUSIEURS

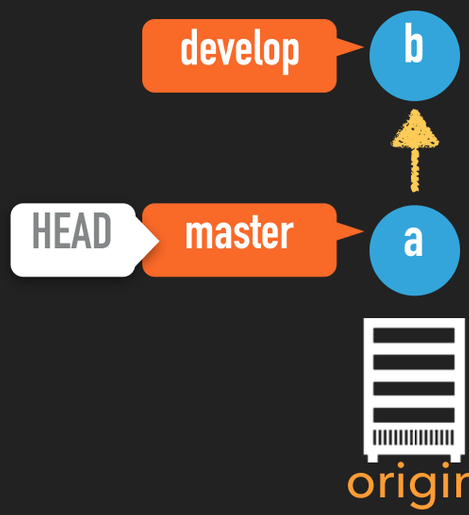


git clone url [path]



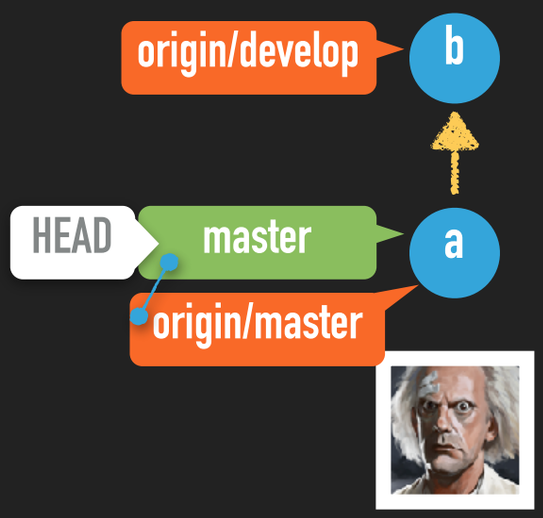
```
doc@labo$ git clone ssh://git@algec.iut-blagnac.fr:2200/git_training/basic.git
Cloning into 'basic'...
remote: Counting objects: 6, done.
remote: Compressing objects: 100% (5/5), done.
remote: Total 6 (delta 0), reused 0 (delta 0)
Receiving objects: 100% (6/6), 628 bytes | 0 bytes/s, done.
Checking connectivity... done.
doc@labo$ cd basic/
doc@labo$ ls
README.md
doc@labo$ git branch
* master
doc@labo$ git branch -r
  origin/HEAD -> origin/master
  origin/develop
  origin/master
```

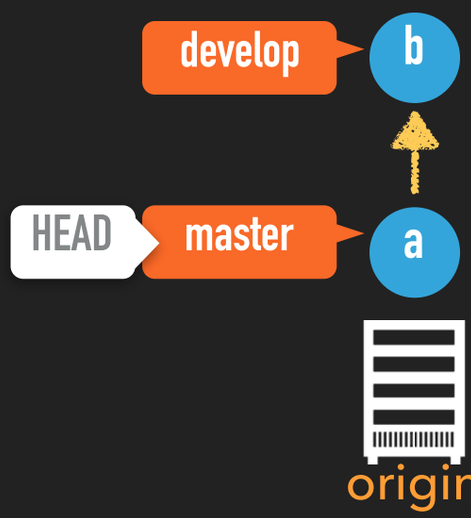




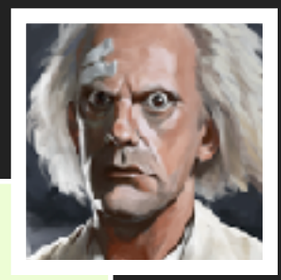
git clone url [path]

- Un clone du repository est créé dans path
- TOUS les commits sont clonés
- La position de chaque branche du serveur est notée en local origin/branchname
- Le HEAD se place sur la branche par défaut du serveur

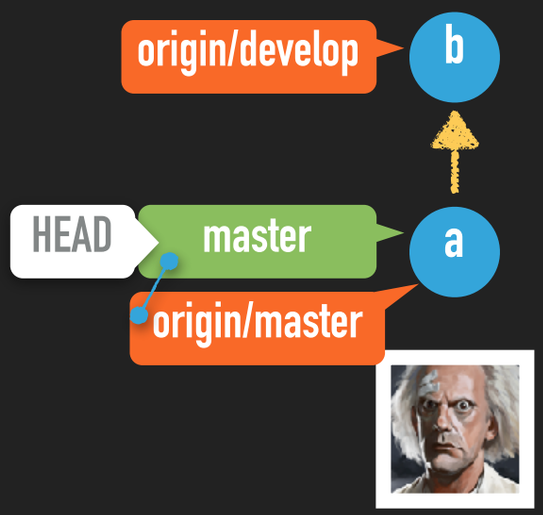


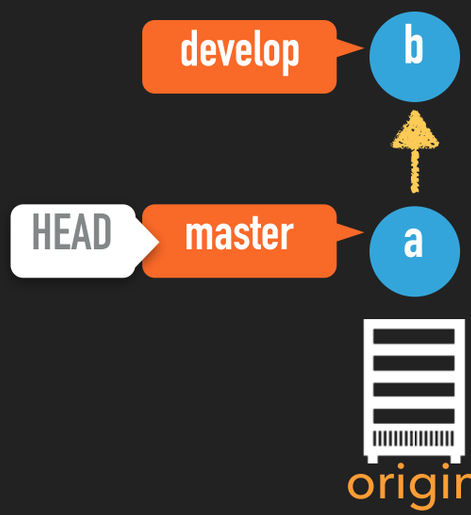


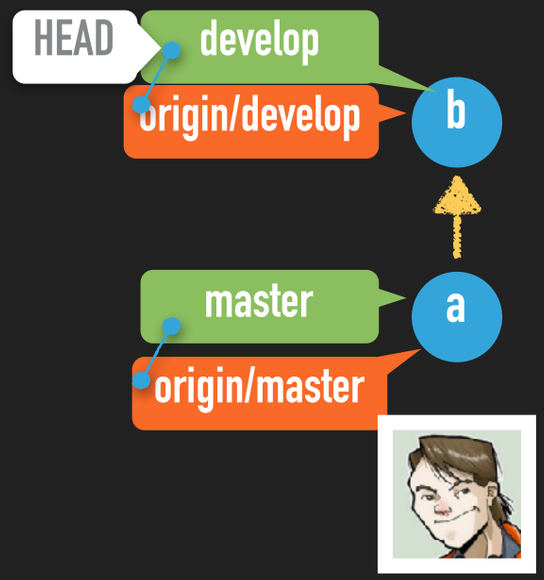
git checkout [ref]



```
doc@labo$ git branch
* master
doc@labo$ git checkout develop
Branch develop set up to track remote branch develop from origin.
Switched to a new branch ‘develop'
git branch
* develop
  master
```

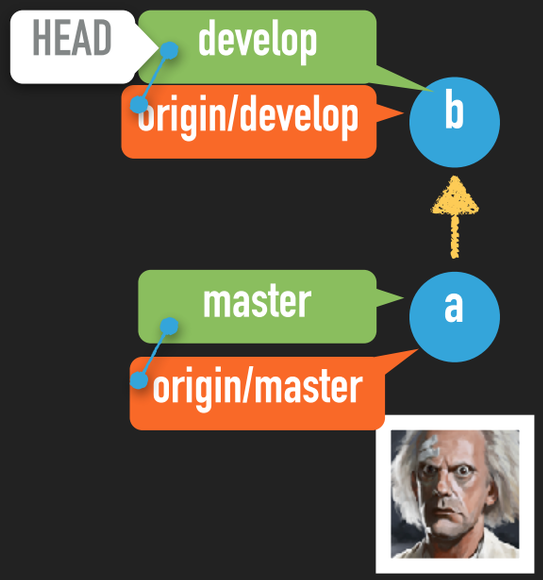


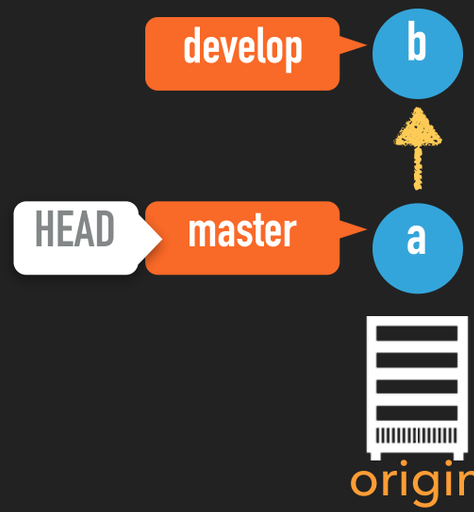


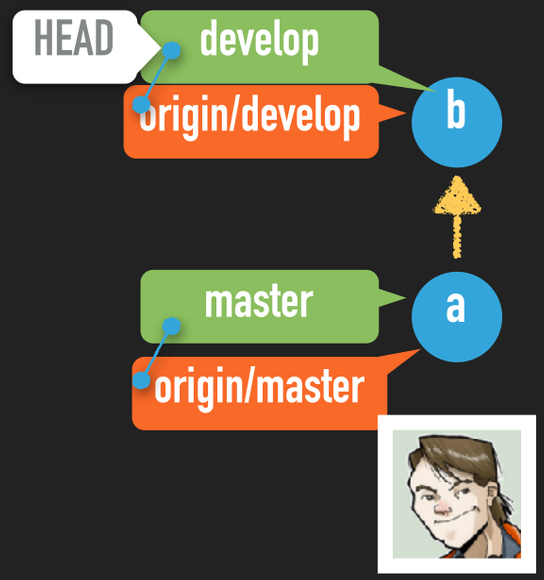


git status

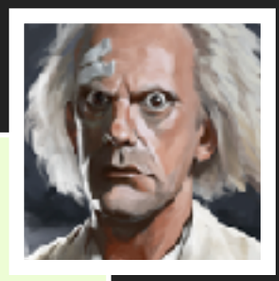
```
doc@labo$ echo “nouvelle ligne” >> README.md
doc@labo$ git add README.md
doc@labo$ git commit –m “Ajout d’un commit sur develop”
doc@labo$ git commit –a –m "Ajout d'un commit sur develop"
[develop 505fb26] Ajout d'un commit sur develop
 1 file changed, 1 insertion(+), 1 deletion(–)
```





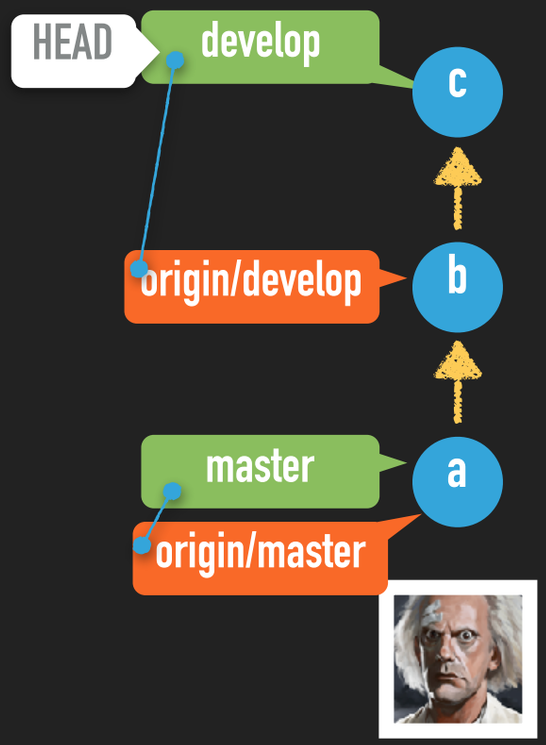


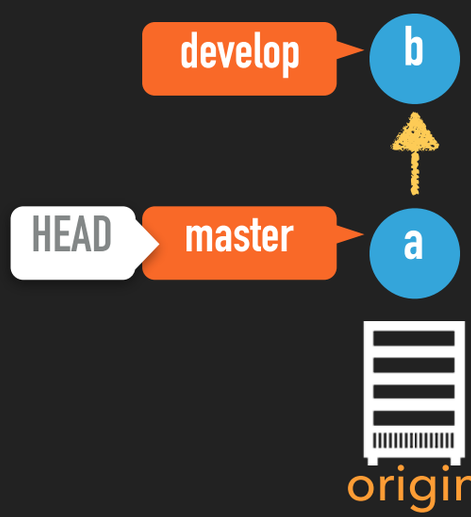
git status

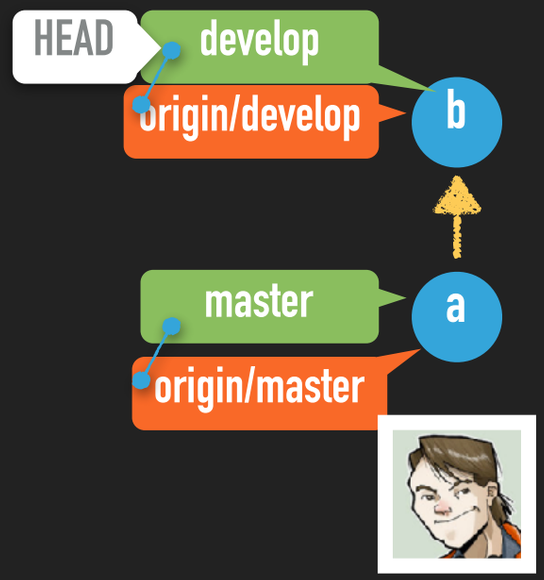


```
doc@labo$ echo “nouvelle ligne” >> README.md
doc@labo$ git add README.md
doc@labo$ git commit -m “Ajout d’un commit sur develop”
[develop 505fb26] Ajout d'un commit sur develop
 1 file changed, 1 insertion(+), 1 deletion(-)
```

```
doc@labo$ git status
On branch develop
Your branch is ahead of 'origin/develop' by 1 commit.
  (use "git push" to publish your local commits)
nothing to commit, working directory clean
```



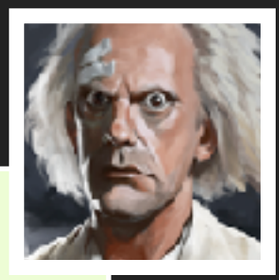




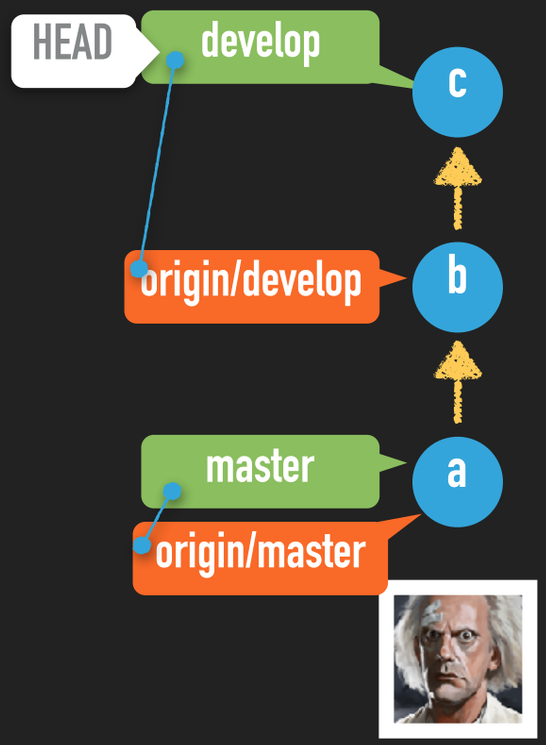
git push

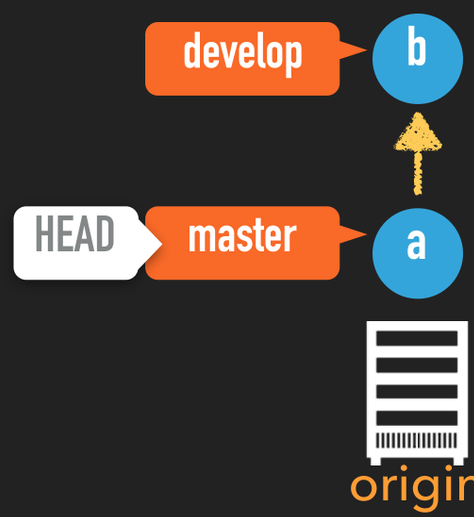
- Envoie la branche courante
- et TOUS les commits permettant d’y accéder
- sur la branche suivie
- sur le serveur

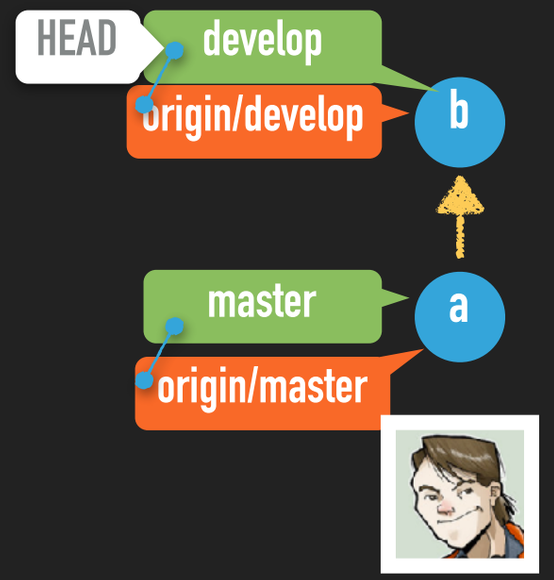
git push



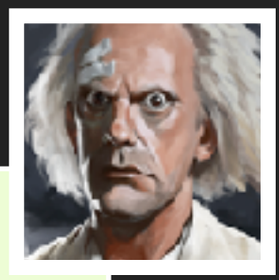
```
doc@labo$ git push
Counting objects: 3, done.
Delta compression using up to 8 threads.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 328 bytes | 0 bytes/s, done.
Total 3 (delta 1), reused 0 (delta 0)
To ssh://git@algec.iut-blagnac.fr:2200/git_training/basic.git
   b98d62d..505fb26  develop -> develop
```



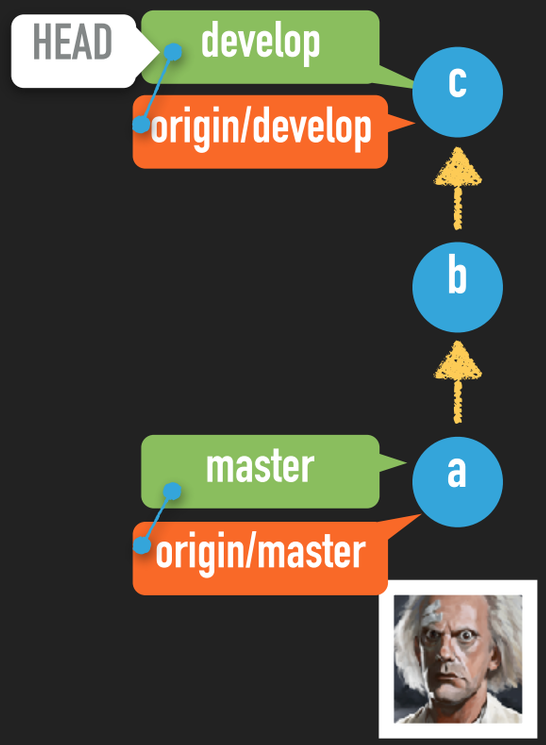


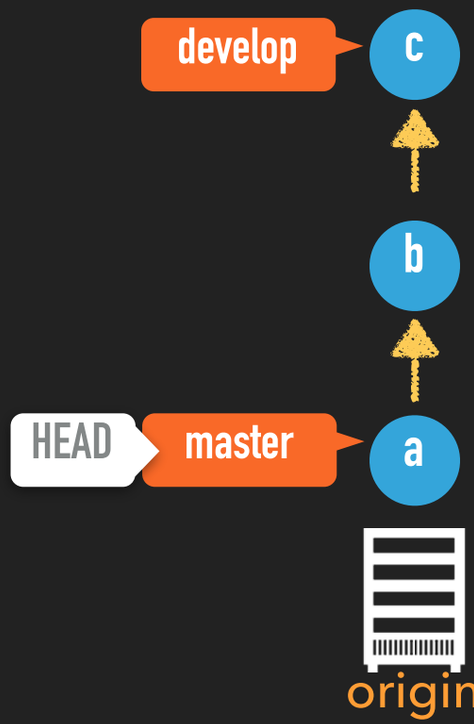


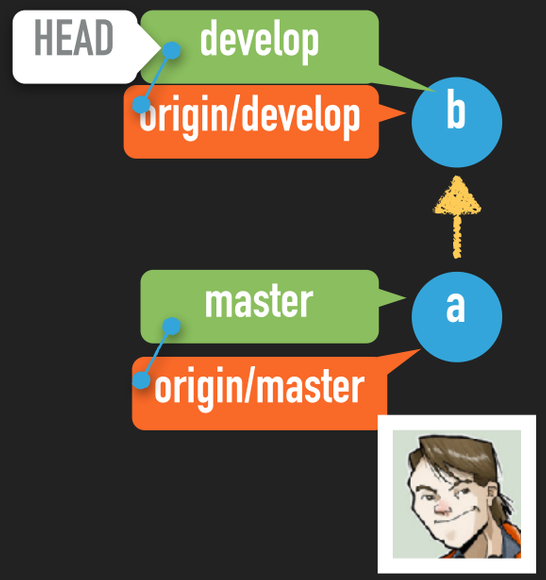
git push



```
doc@labo$ git push
Counting objects: 3, done.
Delta compression using up to 8 threads.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 328 bytes | 0 bytes/s, done.
Total 3 (delta 1), reused 0 (delta 0)
To ssh://git@algec.iut-blagnac.fr:2200/git_training/basic.git
   b98d62d..505fb26  develop -> develop
```







```
git push -u              origin nouvelle_branche
git push --set-upstream origin nouvelle_branche
```

- Quand une branche n’a jamais été poussée
- Quand la branche n’existe pas sur le serveur
- Il faut préciser
  - le serveur de destination origin
  - son nom nouvelle_branche
  - et établir le lien de suivi -u
- Et après, on peut faire des git push

git push --follow-tags

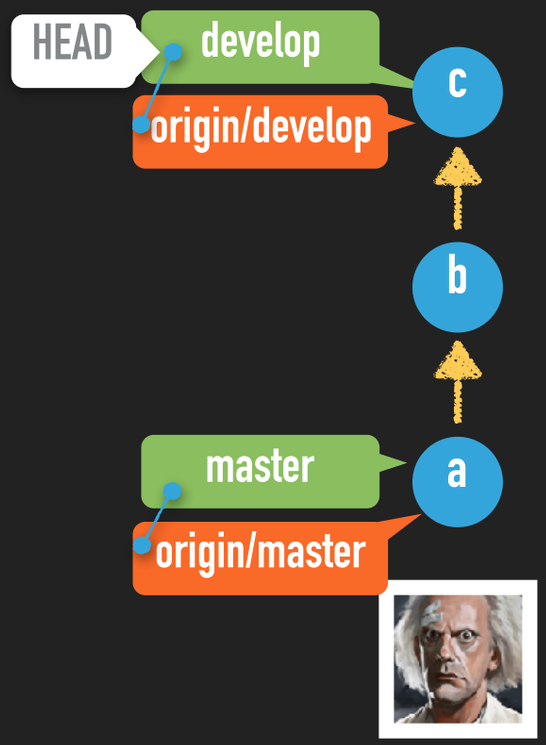
- Permet d’envoyer les tags présents sur la branche sur le serveur

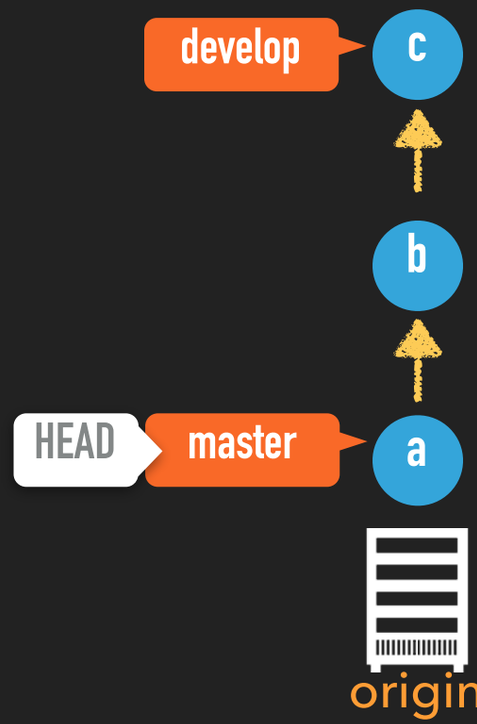
git fetch

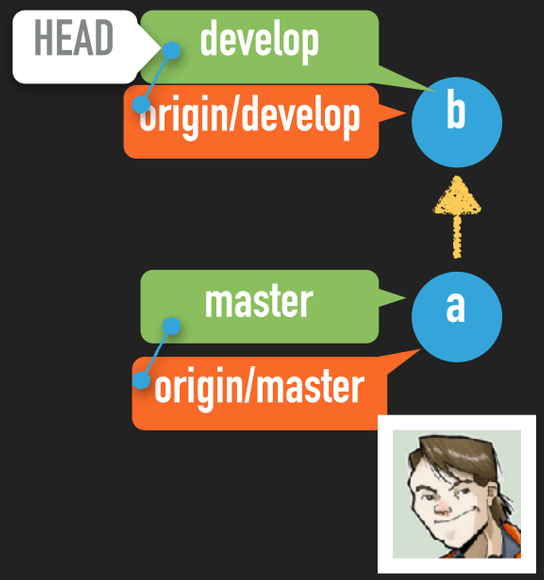
- Récupère TOUS les commits du serveur
- et les références, branches et tags
- met à jour les branches origin/xxxxx
- ne mène JAMAIS à un conflit

git fetch

```
marty@lycee$ git fetch
remote: Counting objects: 3, done.
remote: Compressing objects: 100% (3/3), done.
Unpacking objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0)
From ssh://algec.iut-blagnac.fr:2200/git_training/basic
   476382d..931e7cd  develop    -> origin/develop
```



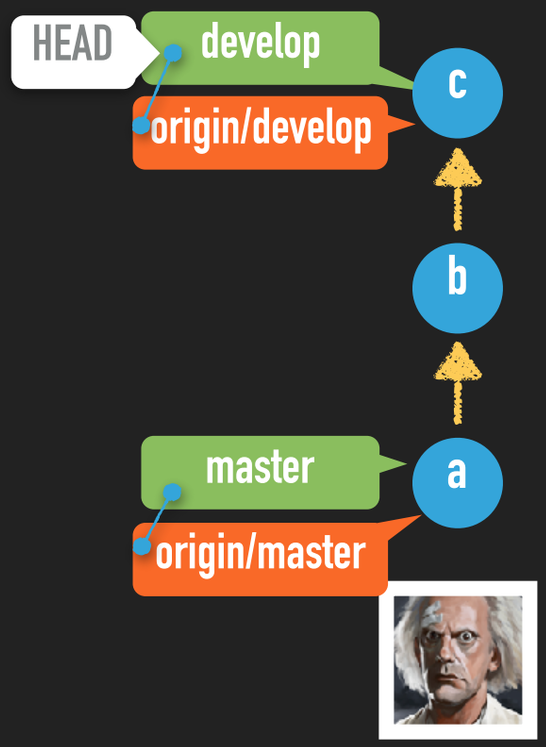


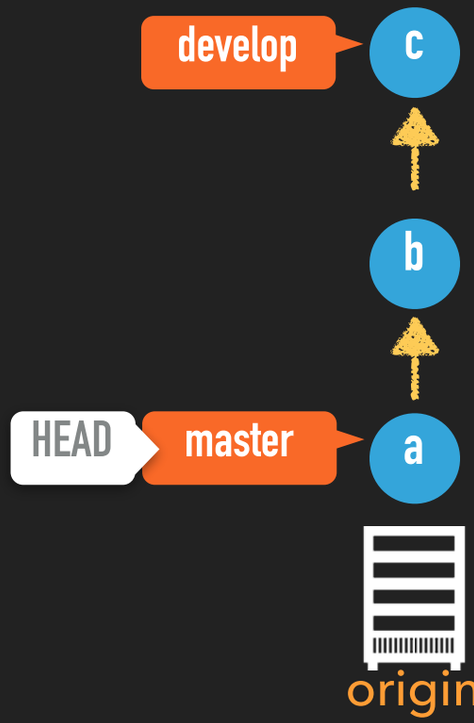


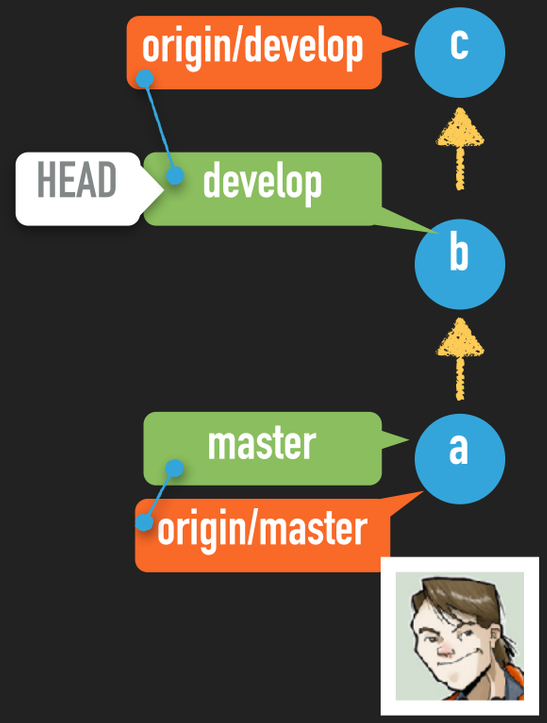
git fetch

```
marty@lycee$ git fetch
remote: Counting objects: 3, done.
remote: Compressing objects: 100% (3/3), done.
Unpacking objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0)
From ssh://algec.iut-blagnac.fr:2200/git_training/basic
   476382d..931e7cd  develop    -> origin/develop
```

```
marty@lycee$ git status
On branch develop
Your branch is behind 'origin/develop' by 1 commit, and can be fast-forwarded.
  (use "git pull" to update your local branch)
nothing to commit, working directory clean
```



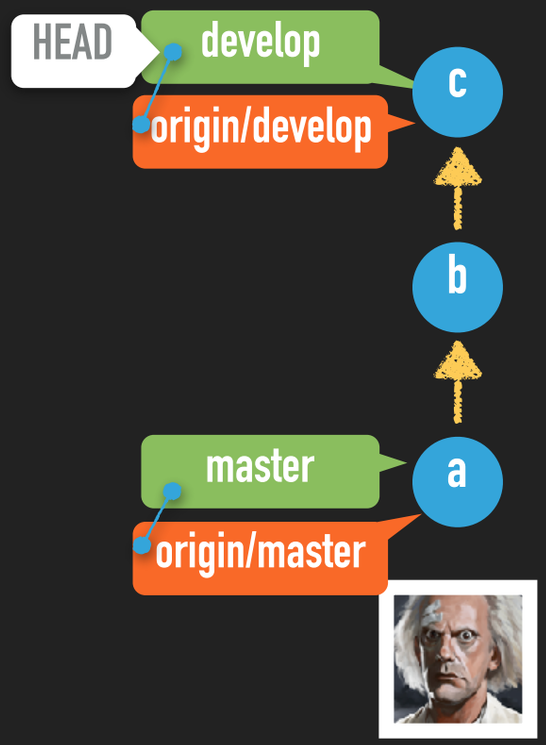


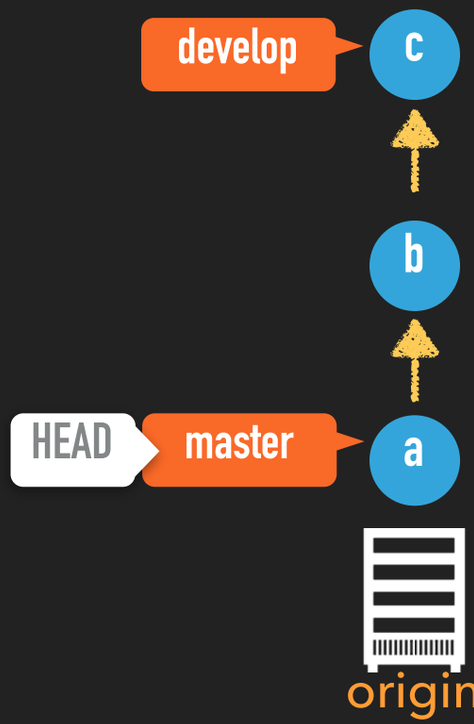


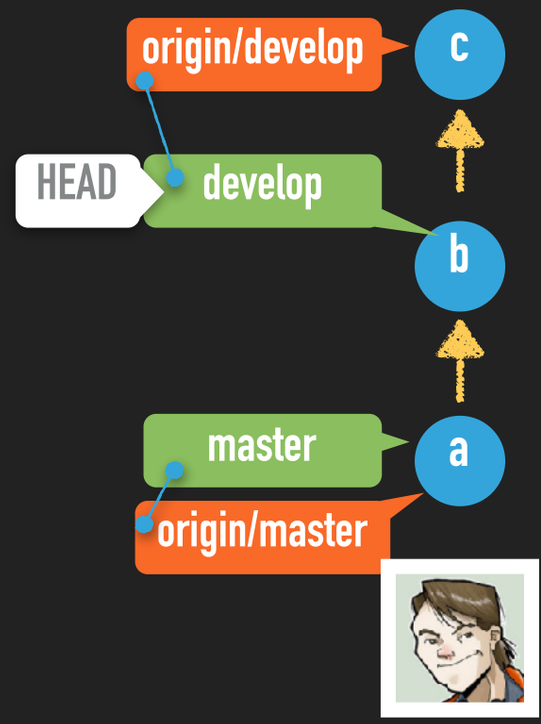
git merge origin/develop

```
marty@lycee$ git status
On branch develop
Your branch is behind 'origin/develop' by 1 commit, and can be fast-forwarded.
  (use "git pull" to update your local branch)
nothing to commit, working directory clean
```

```
marty@lycee$ git merge origin/develop
Updating 476382d..931e7cd
Fast-forward
 CHANGELOG.md | 1 +
 1 file changed, 1 insertion(+)
```



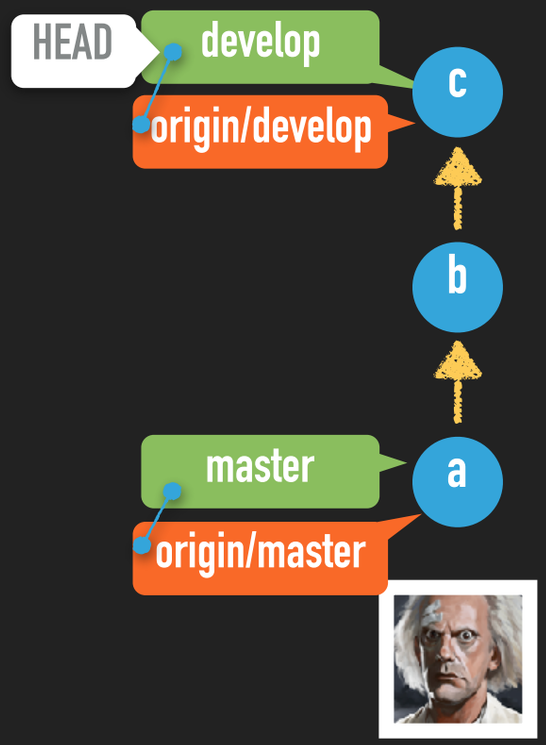


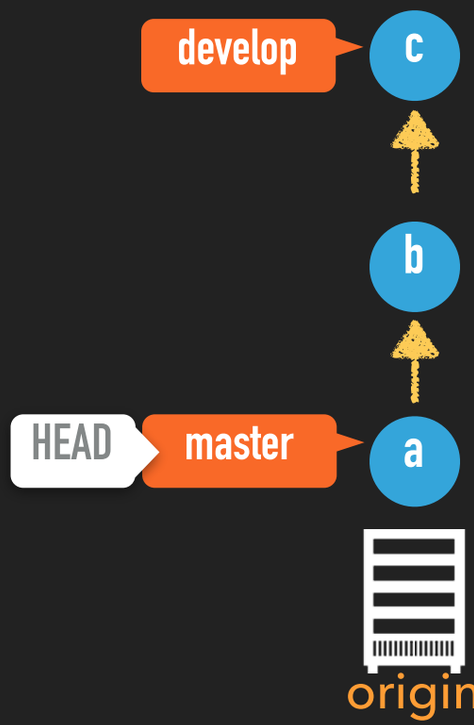


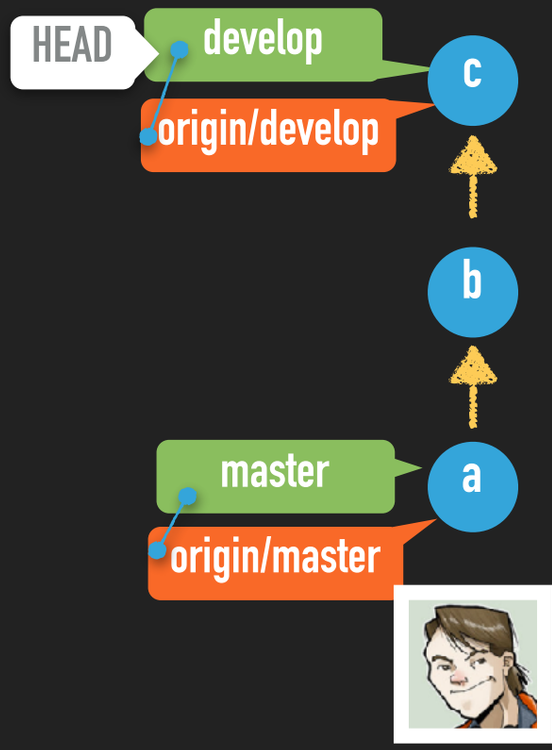
git merge origin/develop

```
marty@lycee$ git status
On branch develop
Your branch is behind 'origin/develop' by 1 commit, and can be fast-forwarded.
  (use "git pull" to update your local branch)
nothing to commit, working directory clean
```

```
marty@lycee$ git merge origin/develop
Updating 476382d..931e7cd
Fast-forward
 CHANGELOG.md | 1 +
 1 file changed, 1 insertion(+)
```





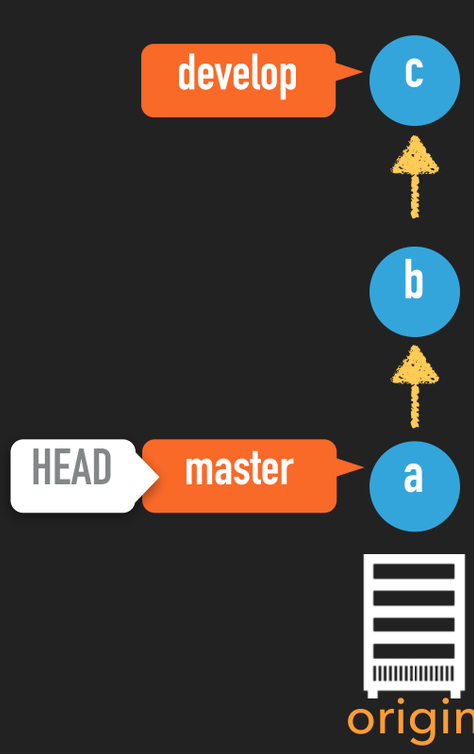


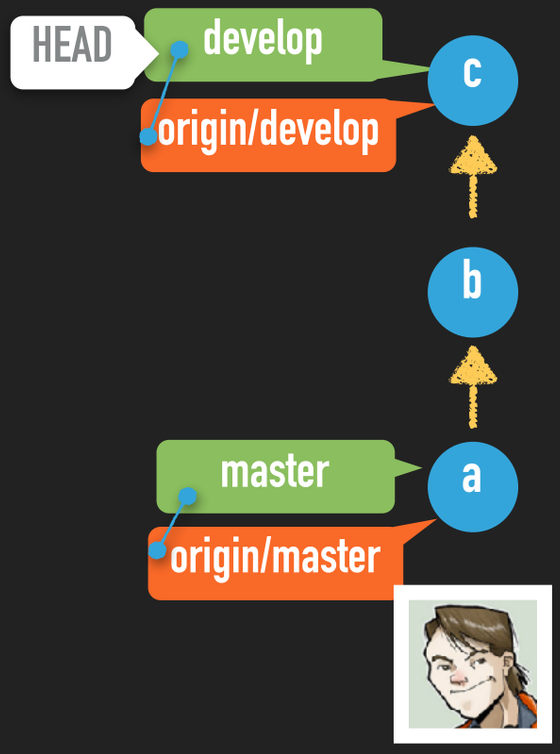
git fetch + git merge = git pull

- Plutôt que d’enchainer fetch + merge
- on peut faire directement pull
- Comme le pull contient une action de merge
- il peut conduire à un CONFLIT
- Ne merge que la branche courante

git fetch + git merge = git pull

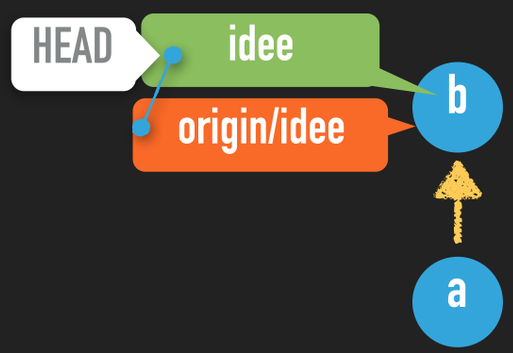
```
marty@lycee$ git pull
remote: Counting objects: 3, done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 3 (delta 1), reused 0 (delta 0)
Unpacking objects: 100% (3/3), done.
From ssh://algec.iut-blagnac.fr:2200/git_training/basic
   931e7cd..3009b83  develop    -> origin/develop
Updating 931e7cd..3009b83
Fast-forward
 CHANGELOG.md | 1 +
 1 file changed, 1 insertion(+)
```

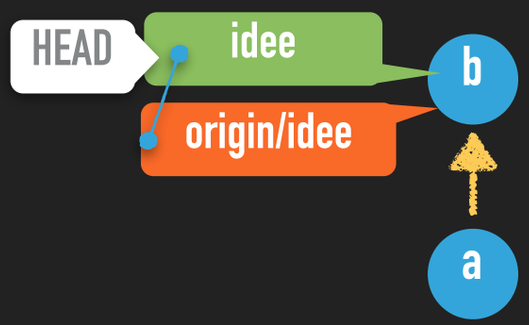




BOSSER À DEUX SUR UNE BRANCHE

git commit

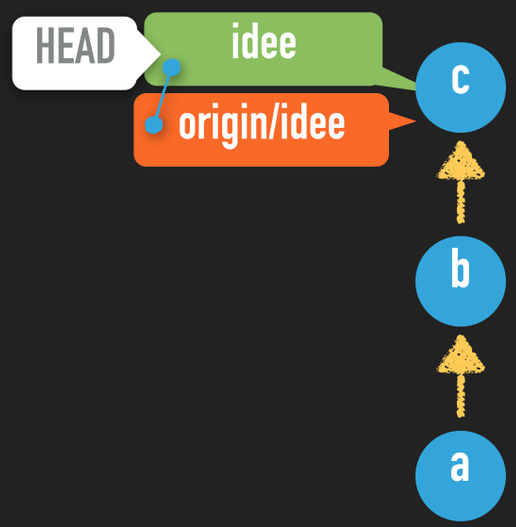


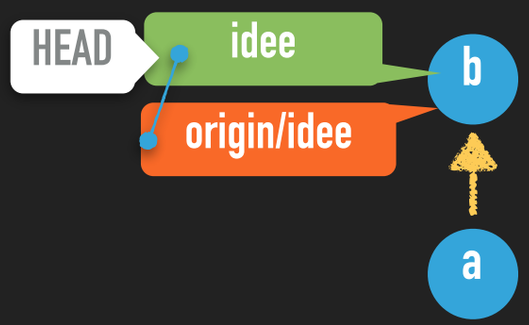


BOSSER À DEUX SUR UNE BRANCHE

git commit
git push

git commit

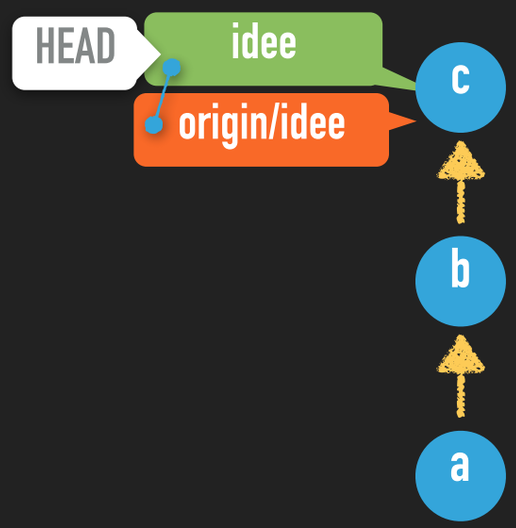


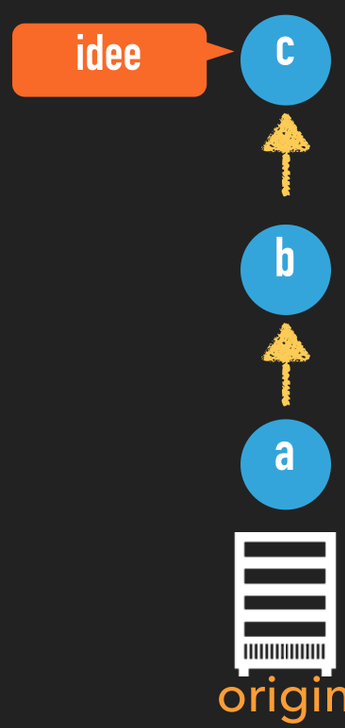


BOSSER À DEUX SUR UNE BRANCHE

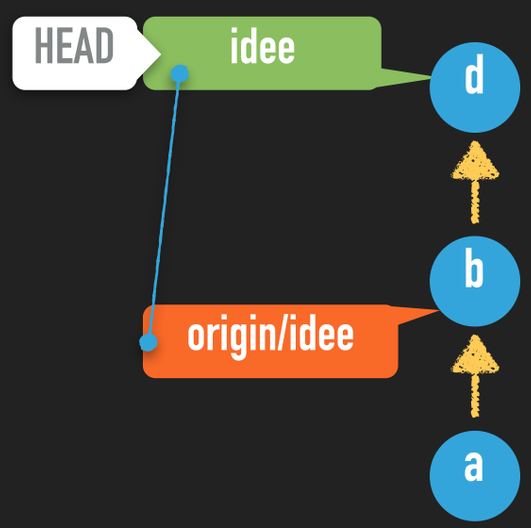
git commit
git push

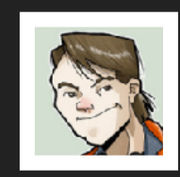
git commit
git push
push rejected





c ≠ b
CONFLIT

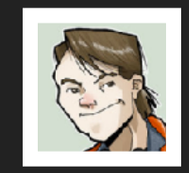


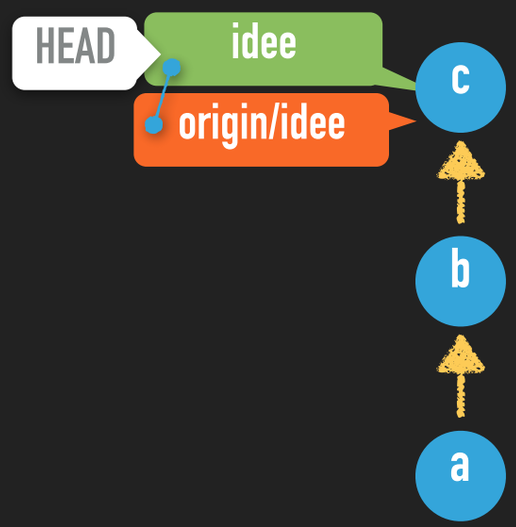


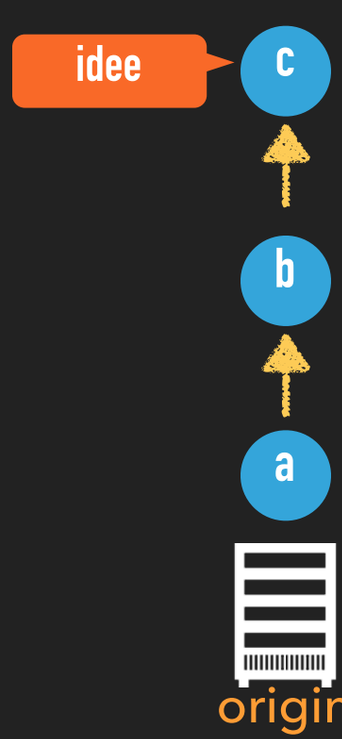
BOSSER À DEUX SUR UNE BRANCHE

git commit
git push

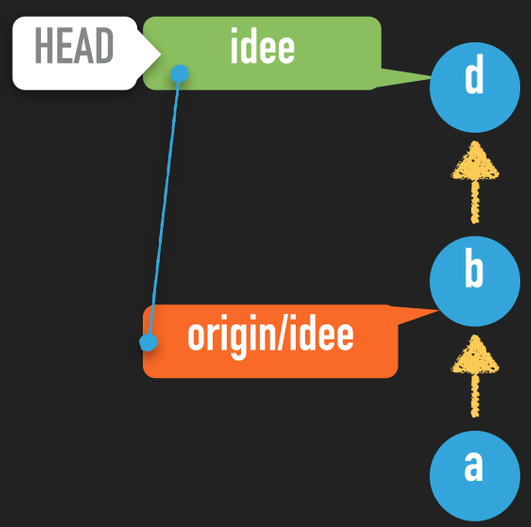
git commit
git push
push rejected : pull first
git pull

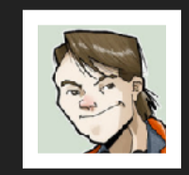






c ≠ b
CONFLIT

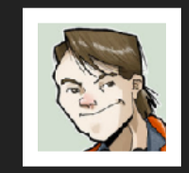


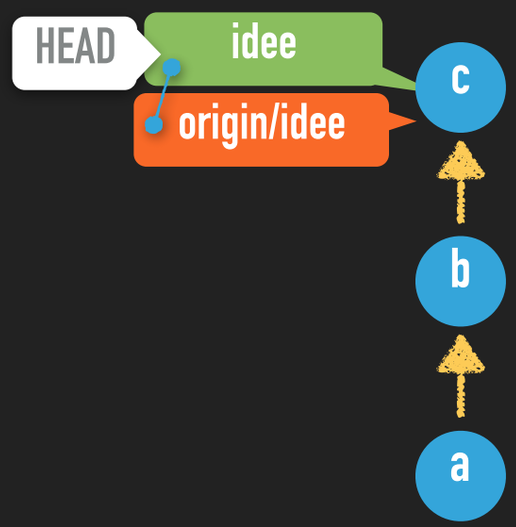


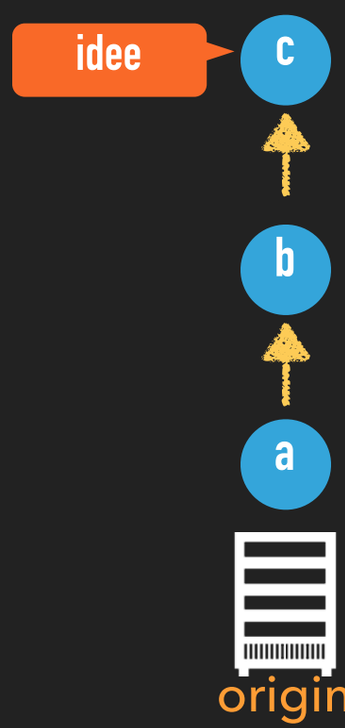
BOSSER À DEUX SUR UNE BRANCHE

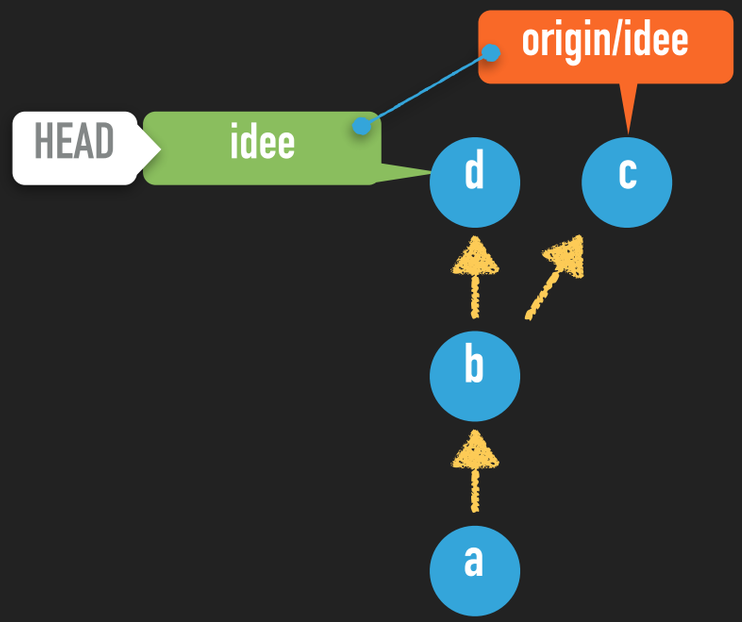
git commit
git push

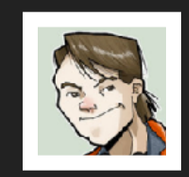
git commit
git push
push rejected : pull first
git pull fetch phase







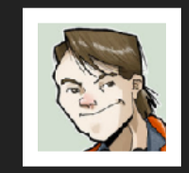




BOSSER À DEUX SUR UNE BRANCHE

git commit
git push

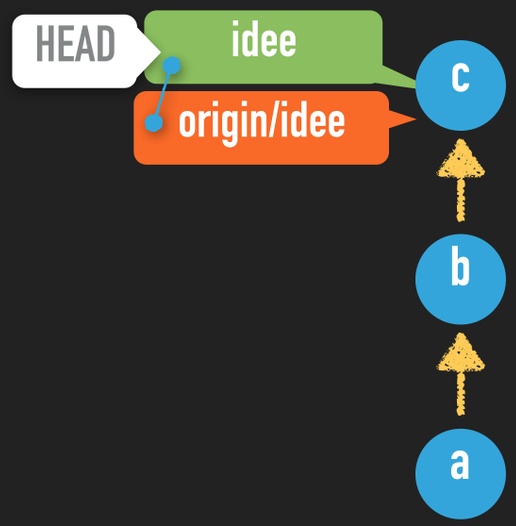
git commit
git push

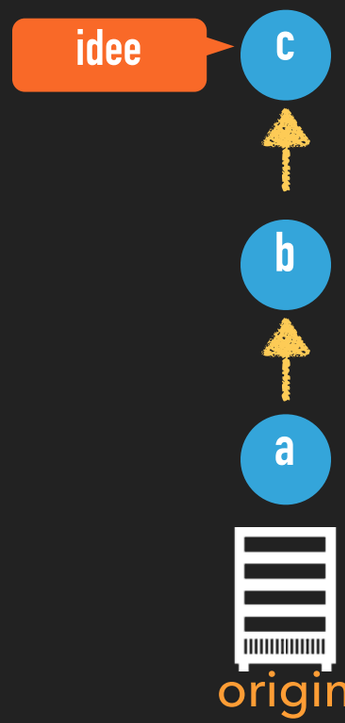


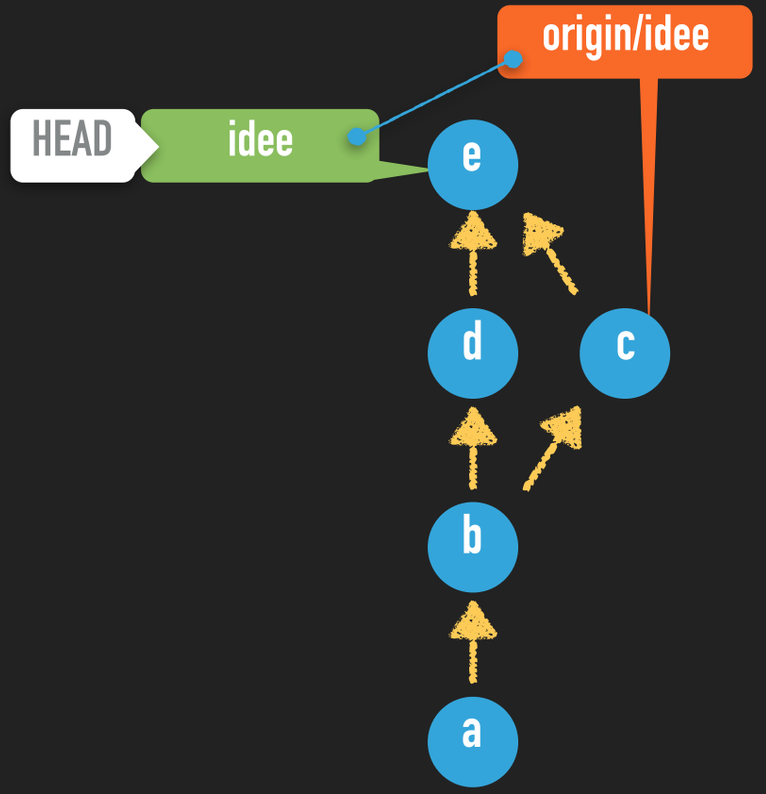
push rejected : pull first

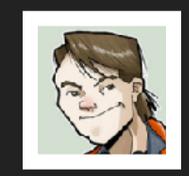
git pull merge phase

git push



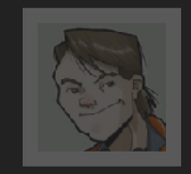




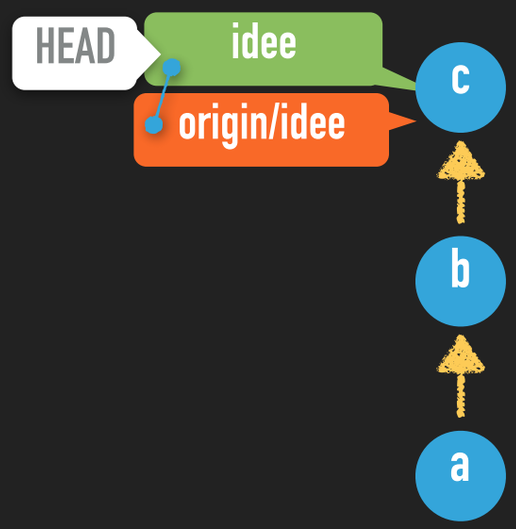


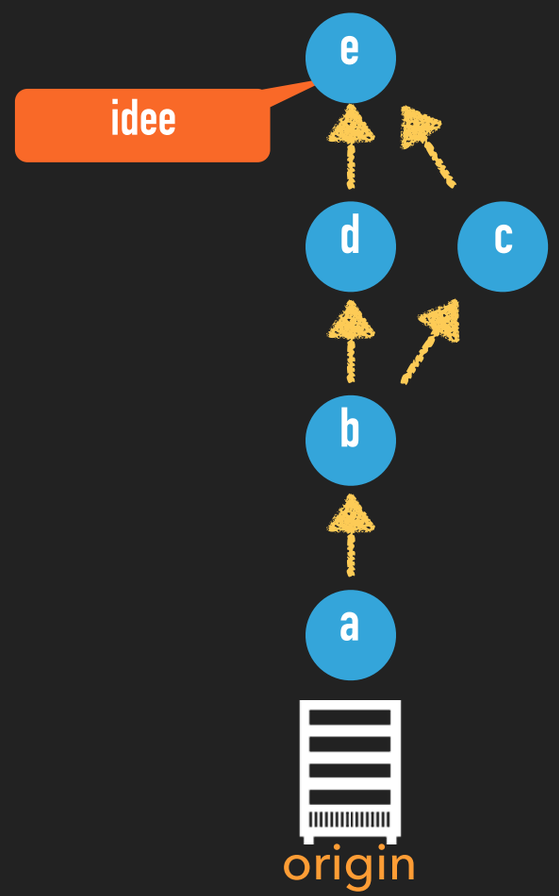
BOSSER À DEUX SUR UNE BRANCHE

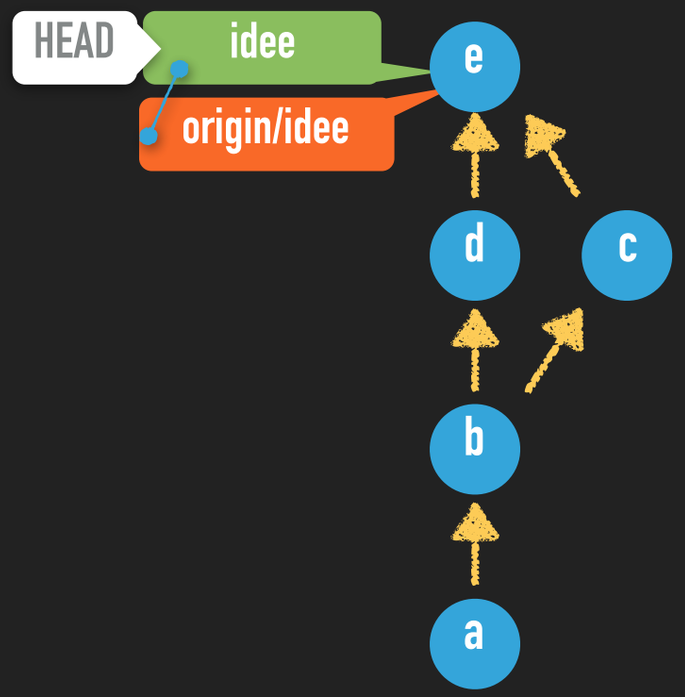
git commit
git push
git pull

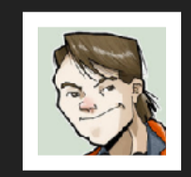


git commit
git push
push rejected : pull first
git pull merge phase
git push





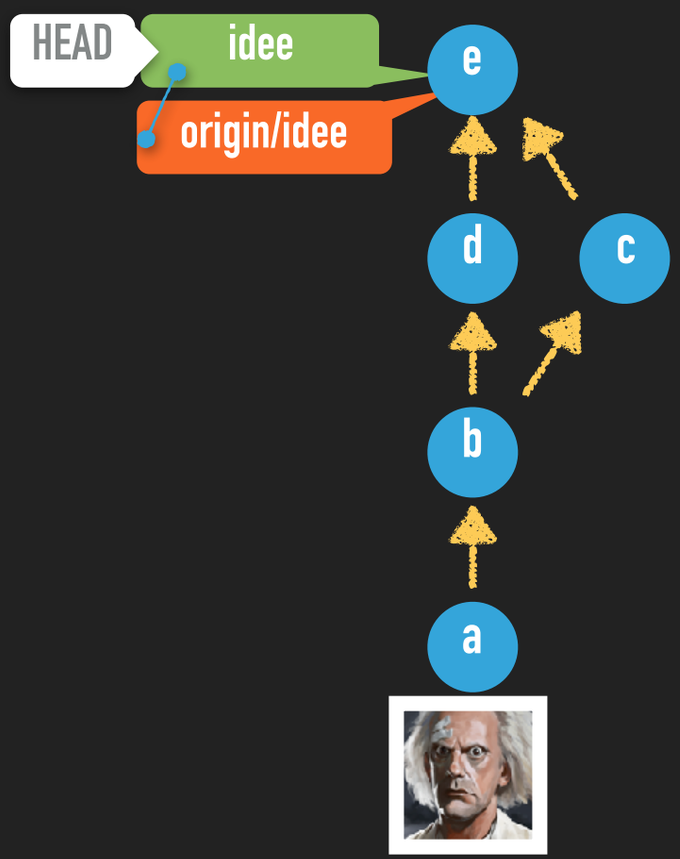


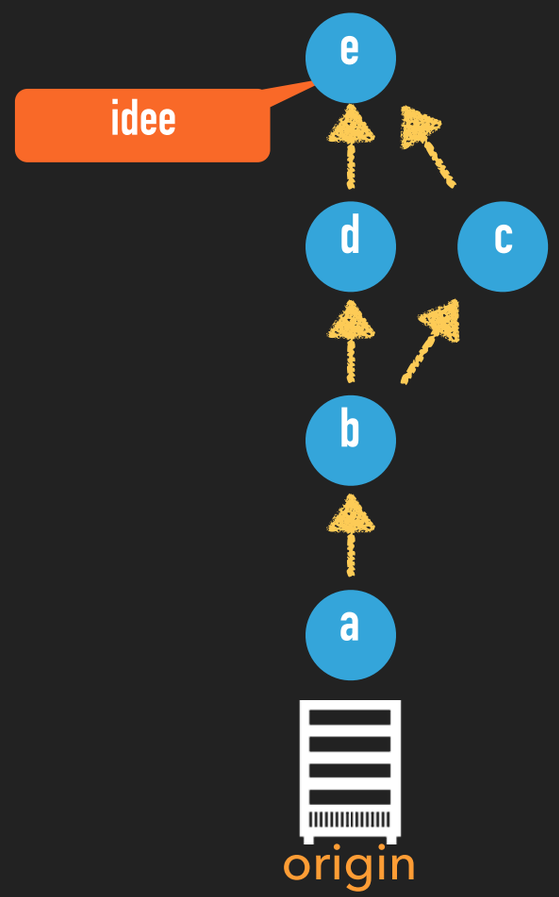


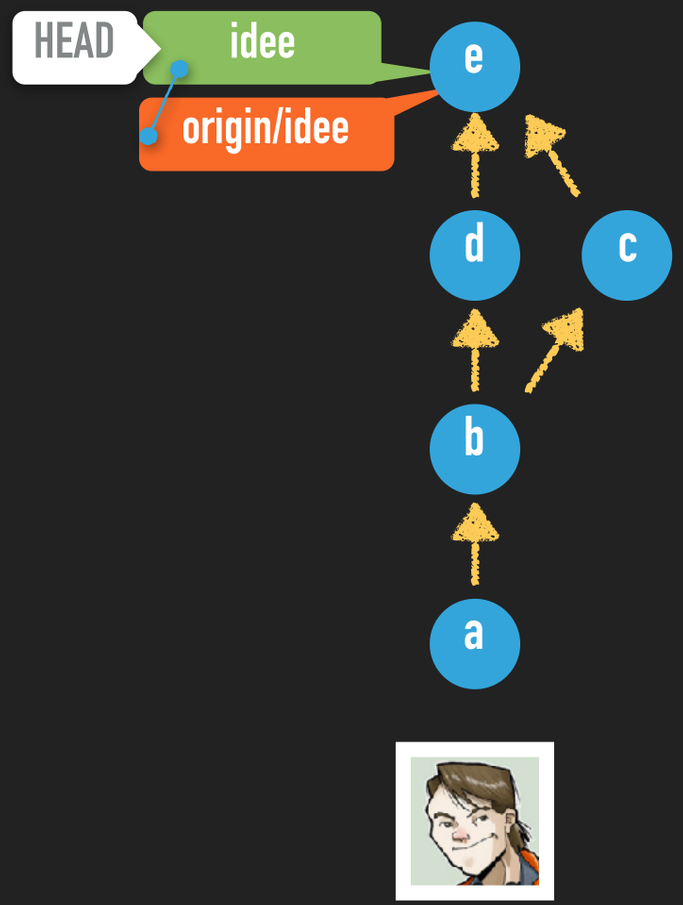
BOSSER À DEUX SUR UNE BRANCHE

git commit
git push
git pull

git commit
git push
push rejected : pull first
git pull merge phase
git push







git pull --rebase

- remplace le merge de la phase de merge par un rebase
- Permet de garder un historique linéaire
- Peut mener à un conflit
- à utiliser si on est à deux sur une même branche

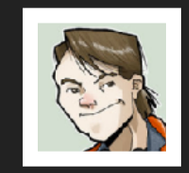
GIT PULL AVEC REBASE

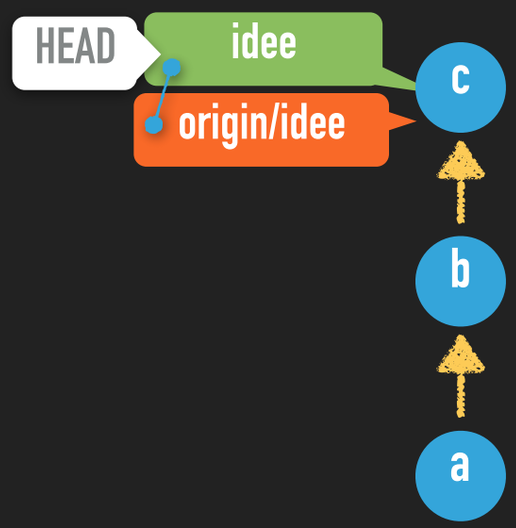
git commit
git push

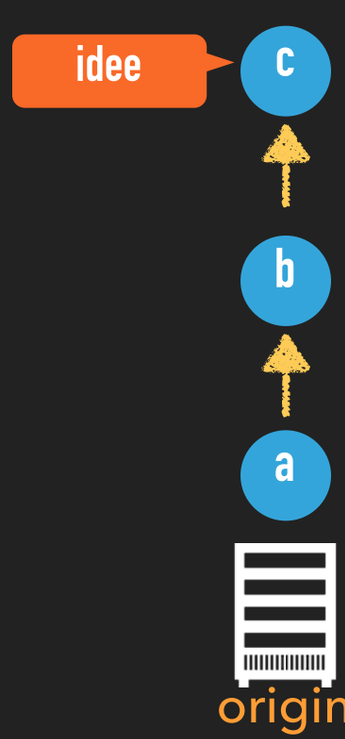
git commit
git push

push rejected : pull first

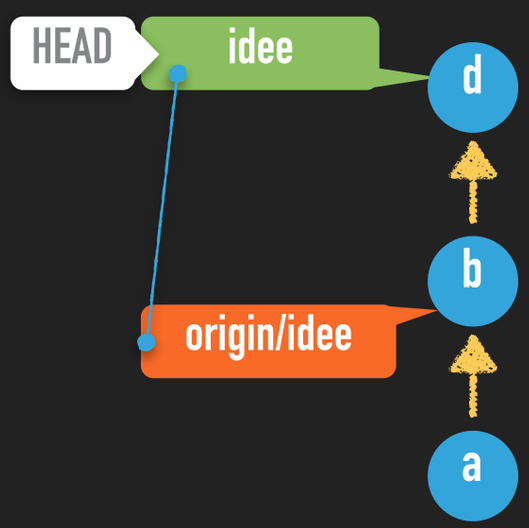
git pull --rebase

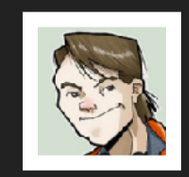






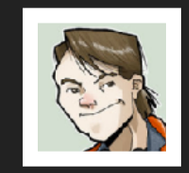
c ≠ b
CONFLIT



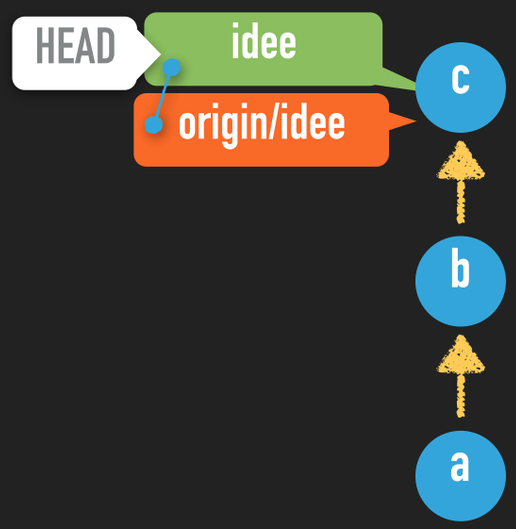


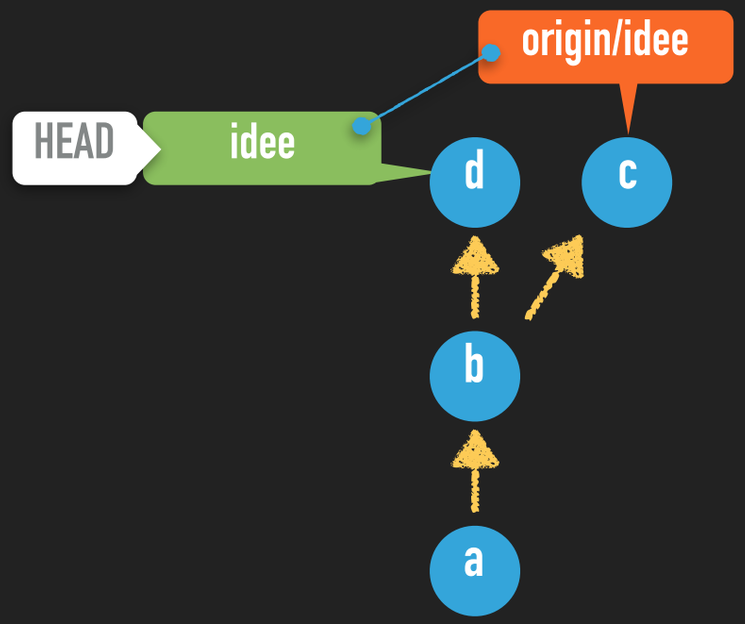
GIT PULL AVEC REBASE

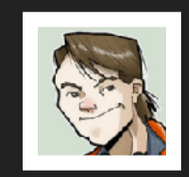
git commit
git push



git commit
git push
push rejected : pull first
git pull --rebase fetch phase



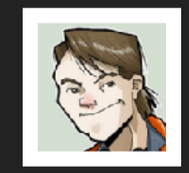




GIT PULL AVEC REBASE

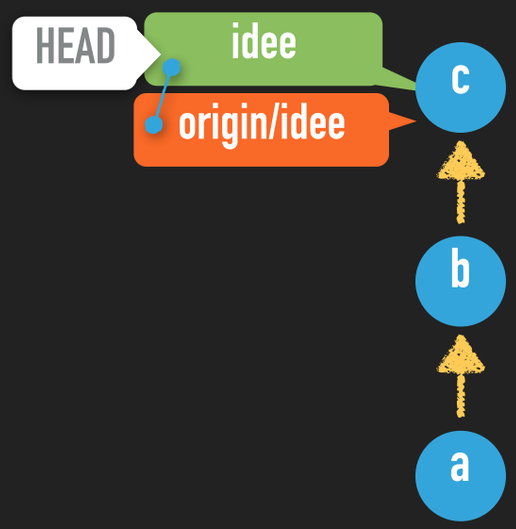
git commit
git push

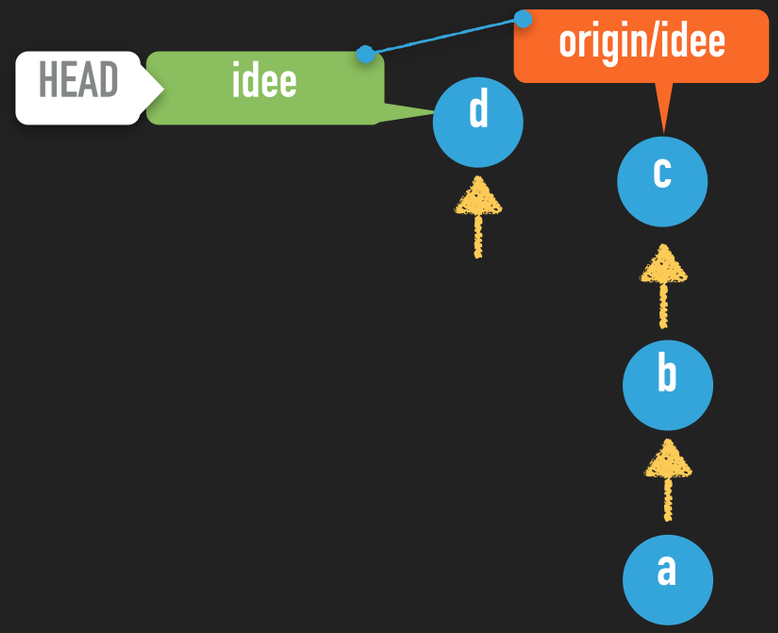
git commit
git push

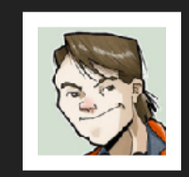


push rejected : pull first

git pull --rebase rebase phase

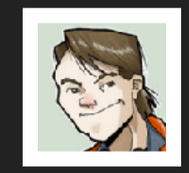




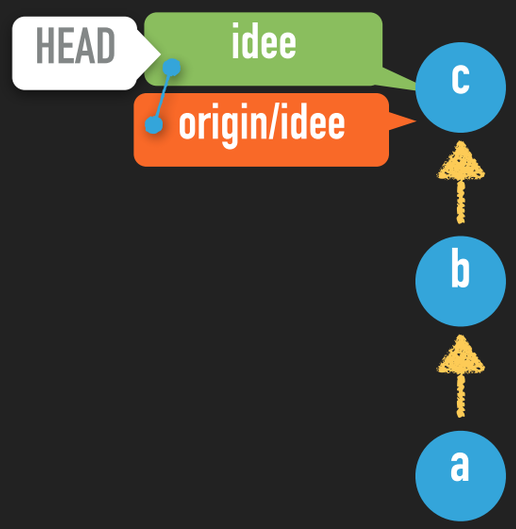


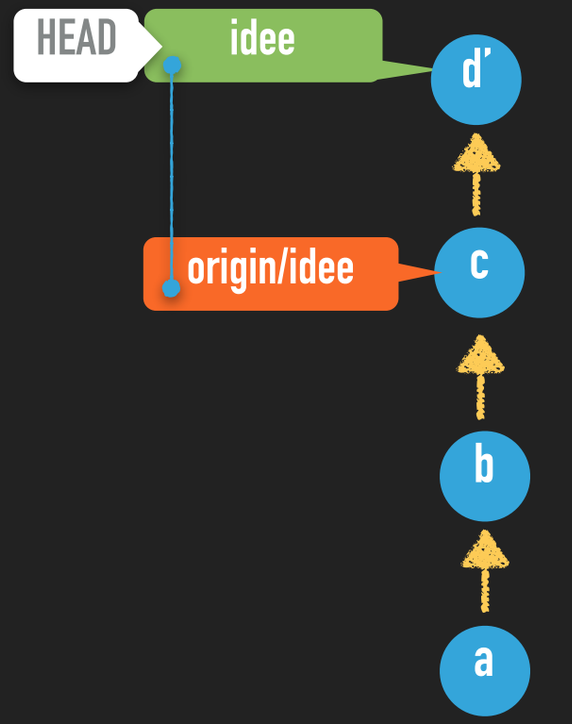
GIT PULL AVEC REBASE

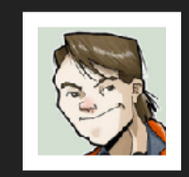
git commit
git push



git commit
git push
push rejected : pull first
git pull --rebase rebase phase
git push

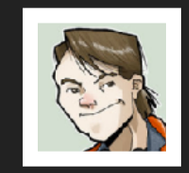




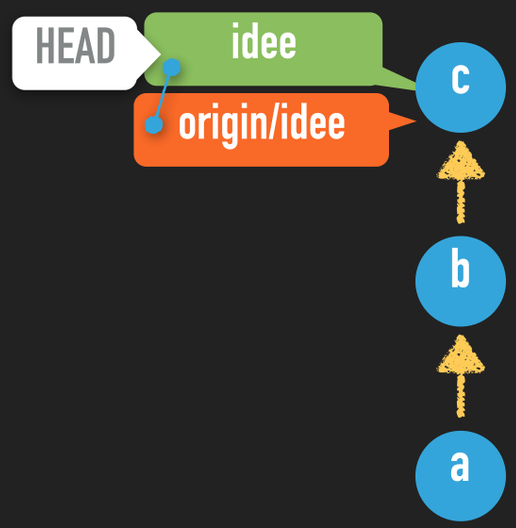


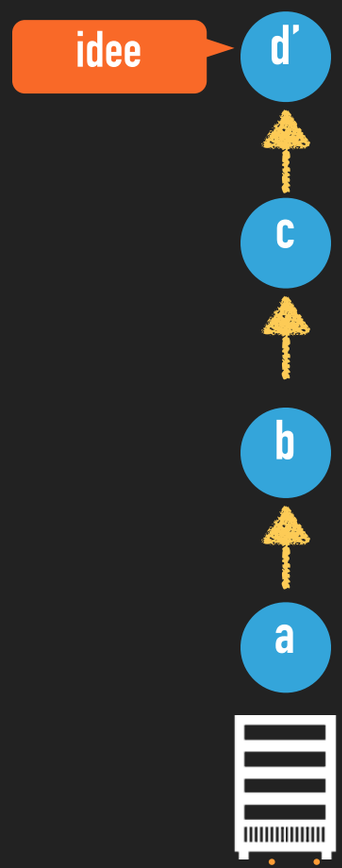
GIT PULL AVEC REBASE

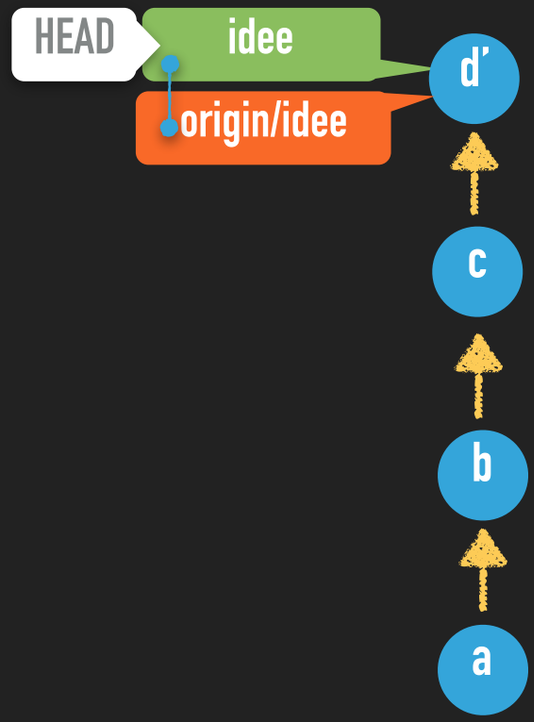
git commit
git push

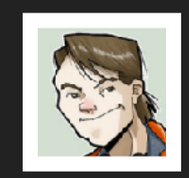


git commit
git push
push rejected : pull first
git pull --rebase rebase phase
git push









CLONE/PUSH/PULL

- Cloner un repo depuis une url:
  `git clone url`

- Envoyer uniquement la branche courante feature-name:
  `git push -u origin feature-name`
  `git push`

- Récupérer toutes les modifications (sans danger):
  `git fetch`

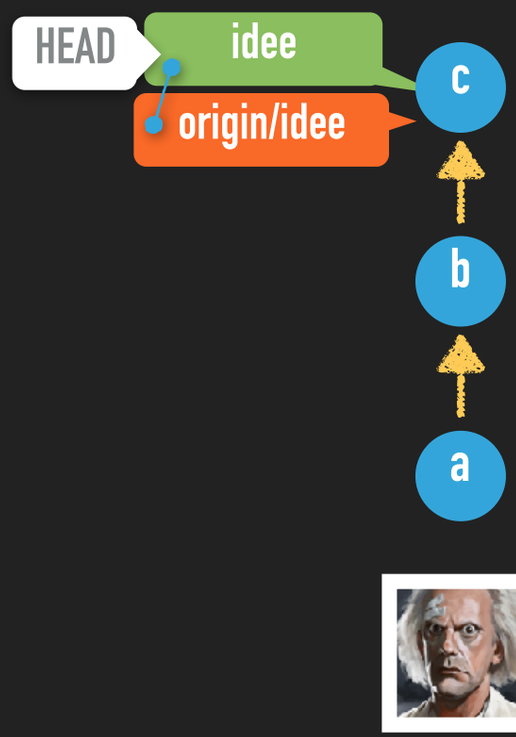
- Récupérer toutes les modifications ET merger la branche courante (risque de conflit):
  `git pull`

FAUT RÉFLÉCHIR, MCFLY, FAUT RÉFLÉCHIR !

RE-PUSH D'UN RESET

PUSHER UN RETOUR EN ARRIÈRE : DANGER ?

git reset --hard HEAD^



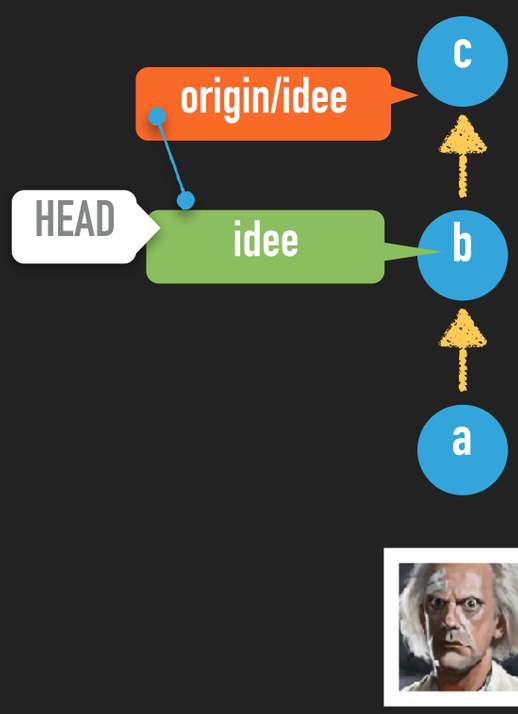
PUSHER UN RETOUR EN ARRIÈRE : DANGER ?

git reset --hard HEAD^

git push **push rejected : pull first**

```
doc@labo$  git push
To ssh://git@algec.iut-blagnac.fr:2200/git_training
 ! [rejected]        develop -> develop (non-fast-
error: failed to push some refs to 'ssh://git@al                /git_training/basic.git'
hint: Updates were rejected because the tip of                  ind
hint: its remote counterpart. Integrate the
hint: 'git pull ...') before pushing again
hint: See the 'Note about fast-forwards'
```

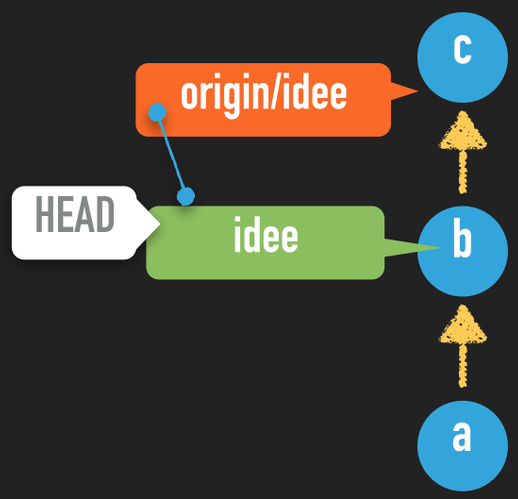
NE PAS FAIRE PULL !



c ≠ b
CONFLIT

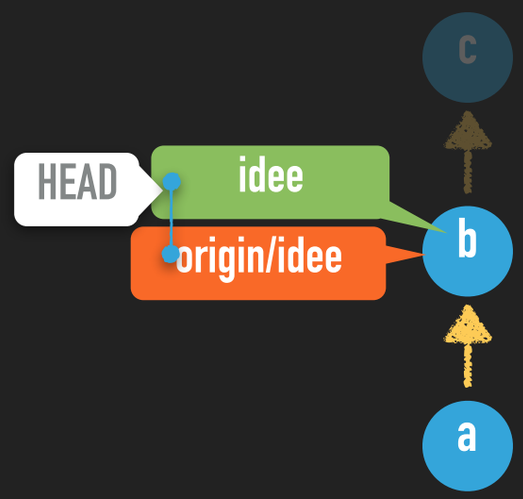
git push -f

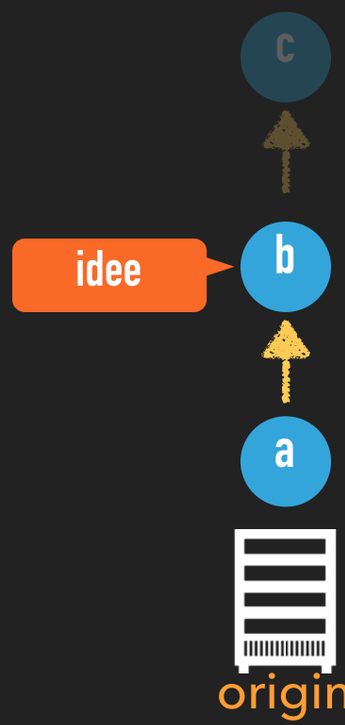
git reset --hard HEAD^
git push -f



git push -f

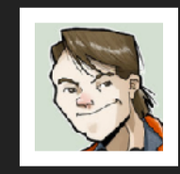
git reset --hard HEAD^
git push -f

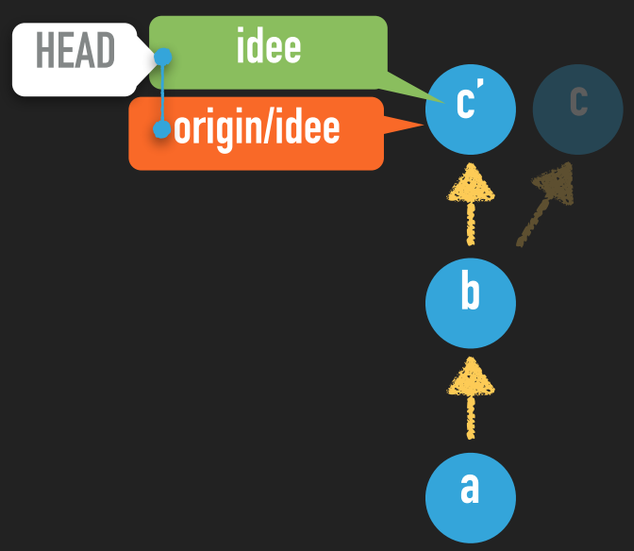


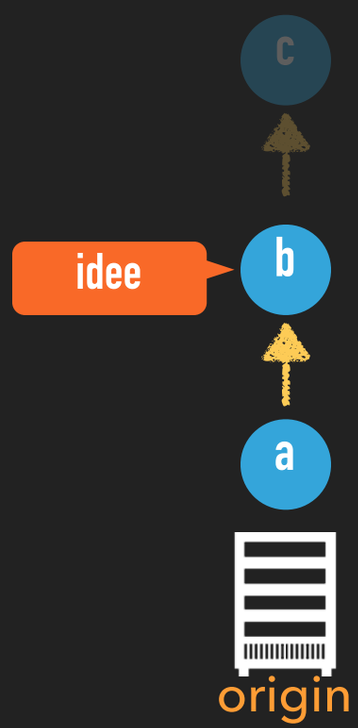


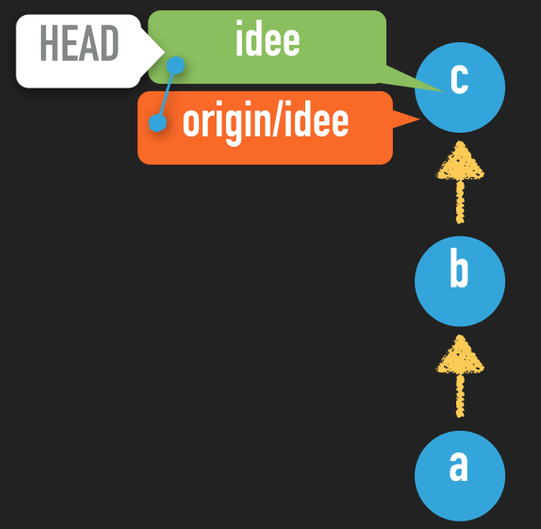
OÙ EST LE DANGER?

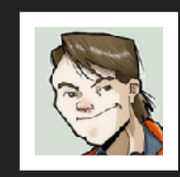
git reset --hard HEAD^
git push -f
git commit -m “je recommence”
git push





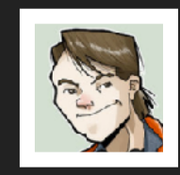


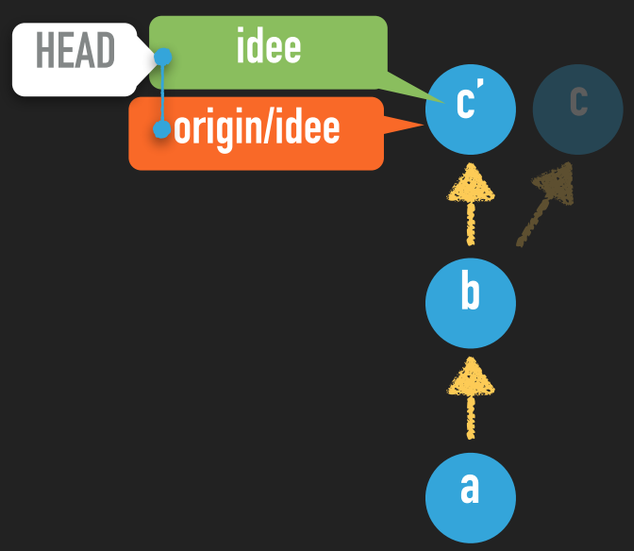


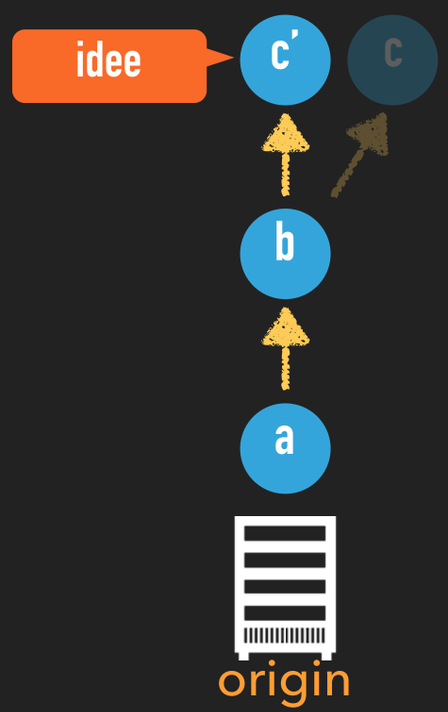


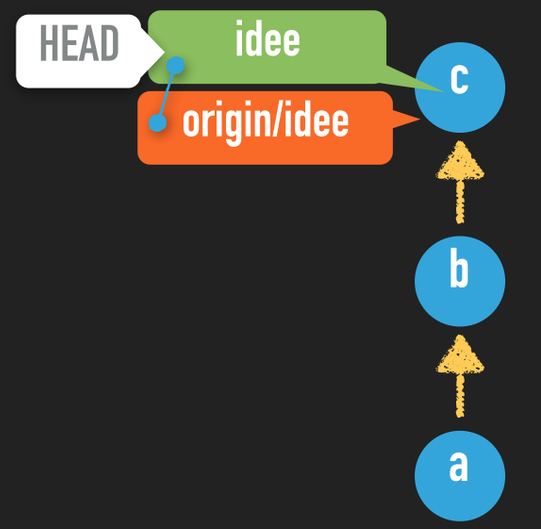
OÙ EST LE DANGER?

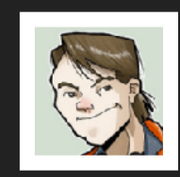
git reset --hard HEAD^
git push -f
git commit -m “je recommence”
git push











OÙ EST LE DANGER?

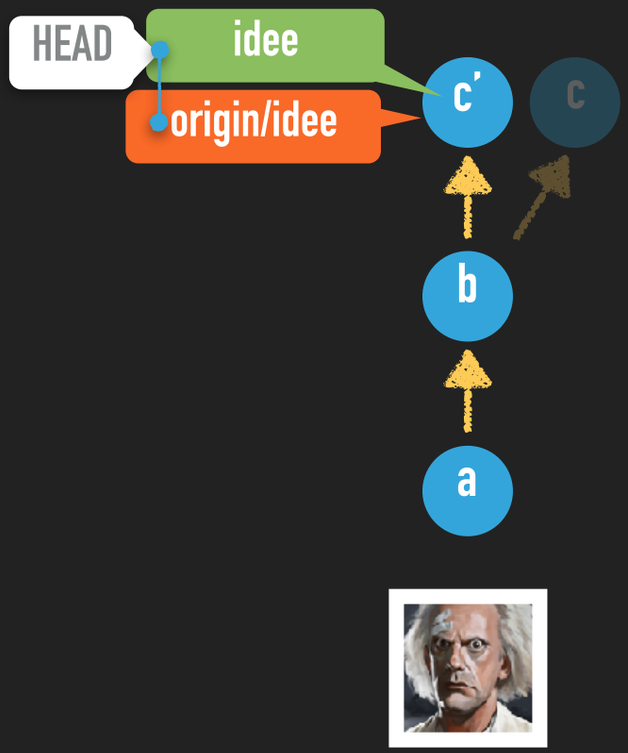
git reset --hard HEAD^
git push -f
git commit -m “je recommence”
git push

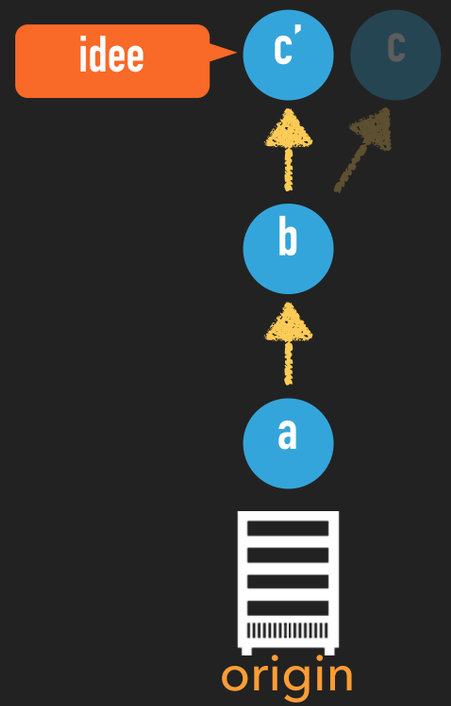
git commit -m “a moi”

git pushpush rejected : pull first

```
marty@lycee$ git push
To ssh://git@algec.iut-blagnac.fr:2200/git_training
 ! [rejected]        develop -> develop (non-fast-
error: failed to push some refs to 'ssh://git@al                /git_training/basic.git'
hint: Updates were rejected because the tip of                  ind
hint: its remote counterpart. Integrate the
hint: 'git pull ...') before pushing again
hint: See the 'Note about fast-forwards'
```

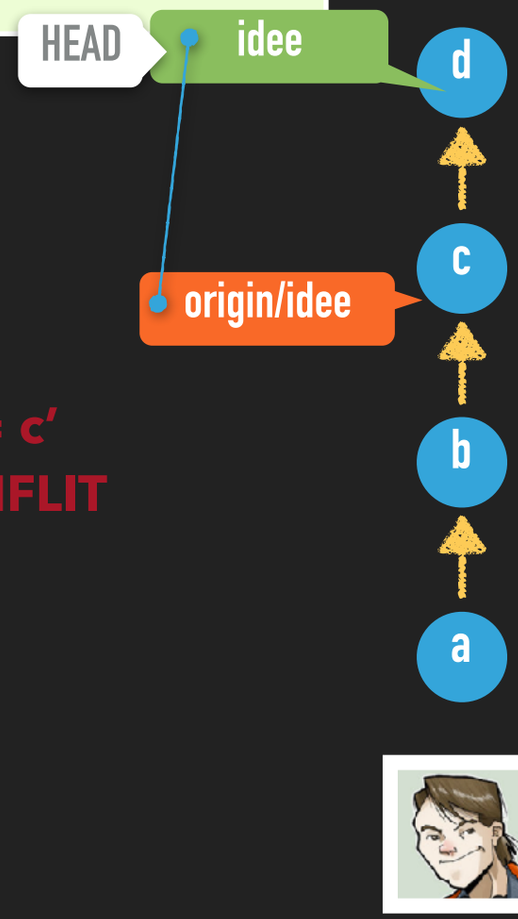
NE PAS FAIRE PULL !





origin

c ≠ c'
CONFLIT

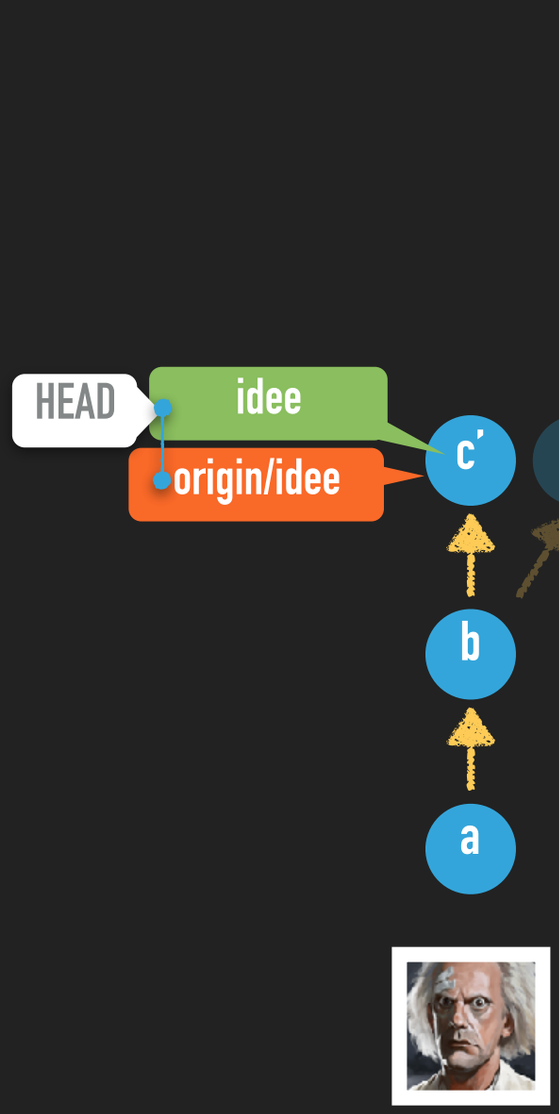


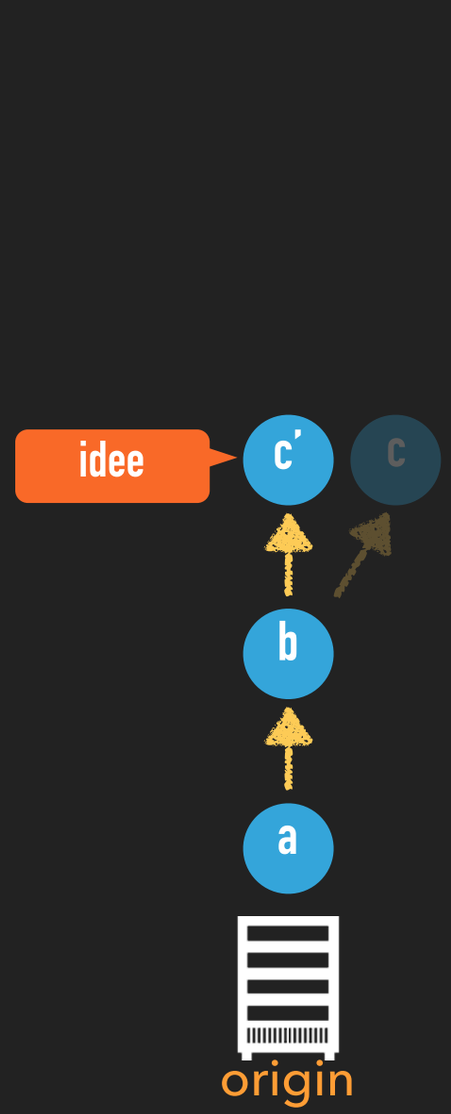
OÙ EST LE DANGER?

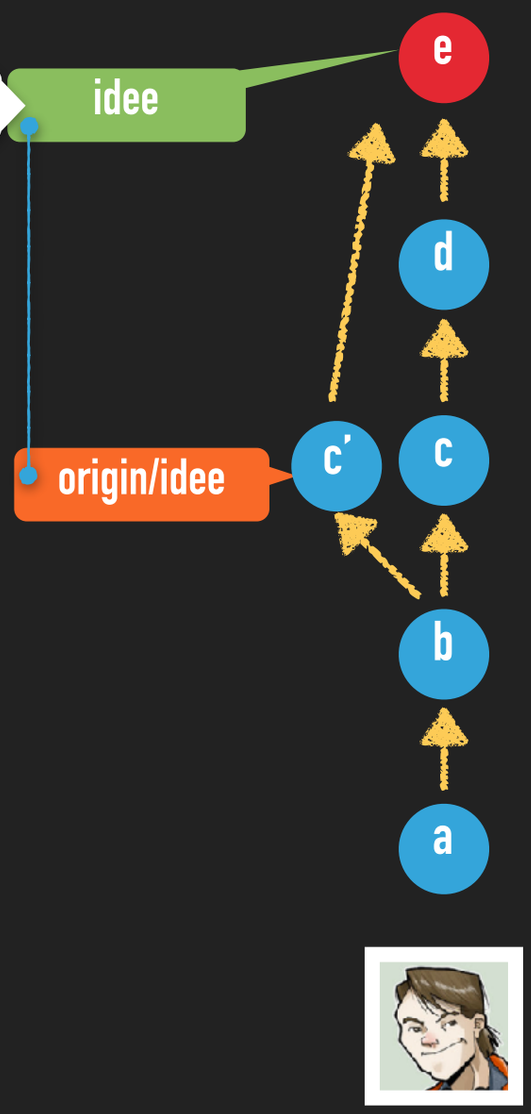
git reset --hard HEAD^
git push -f
git commit -m “je recommence”
git push

git commit -m “a moi”

git push
git pull

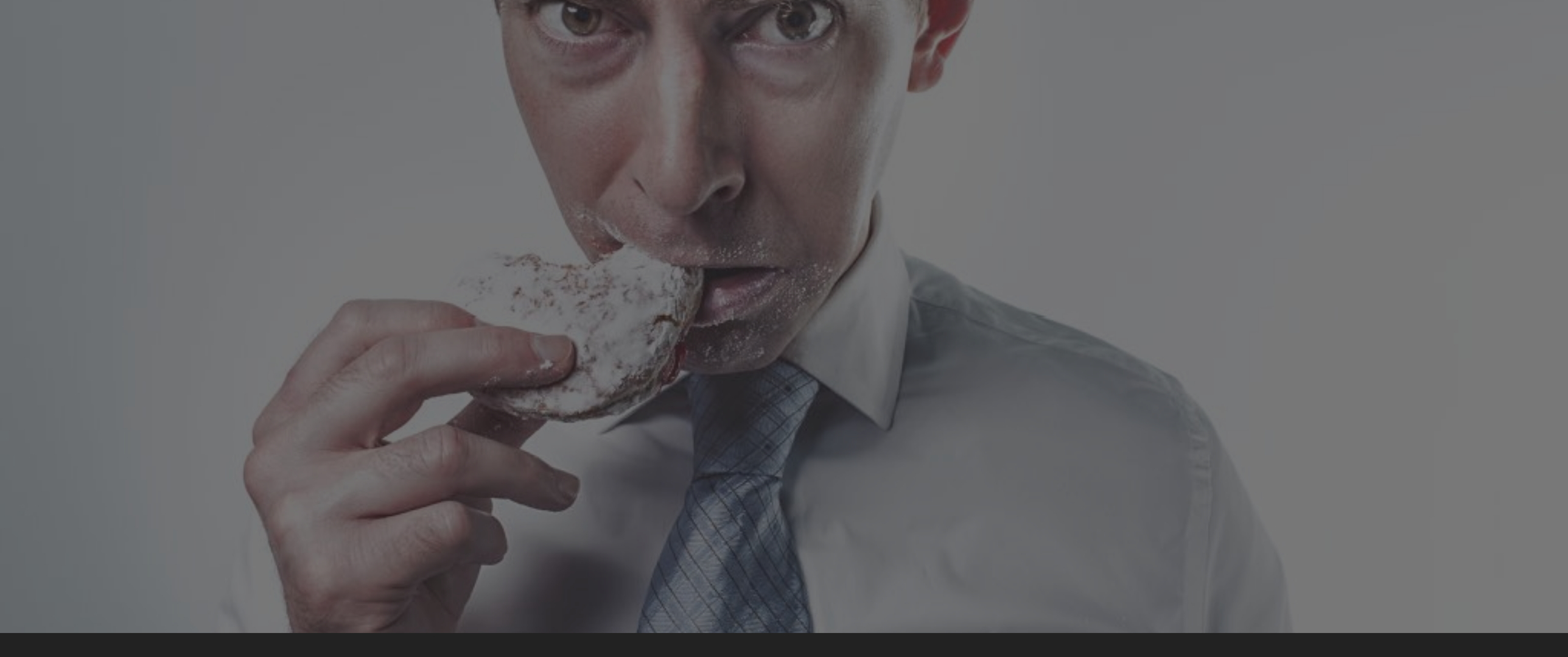






LES COMMANDES QUI NECESSITENT UN PUSH -F

- :
  ```
  git branch -f
  git reset
  git commit --amend
  git rebase
  git pull --rebase
  ```
- Ne **PAS** faire git **pull** ensuite
- Faire tourner 7 fois son clavier dans sa bouche
- Puis faire git **push** **-f**
- Prévenir les collègues sur la branche impactée



FAUT RÉFLÉCHIR, MCFLY, FAUT RÉFLÉCHIR !

DES COMMANDES EN VRAC 2

git remote [add|set-url|remove]

- add: ajoute un nouveau remote

```
git remote add mon_serveur ssh://serveur.url.com/project.git
```

- set-url: change l'url d'un remote existant

```
git remote set-url mon_serveur ssh://uneautre.url.com/project.git
git remote set-url origin      ssh://uneautre.url.com/nouveau_nom.git
```

- remove: enlève un remote existant

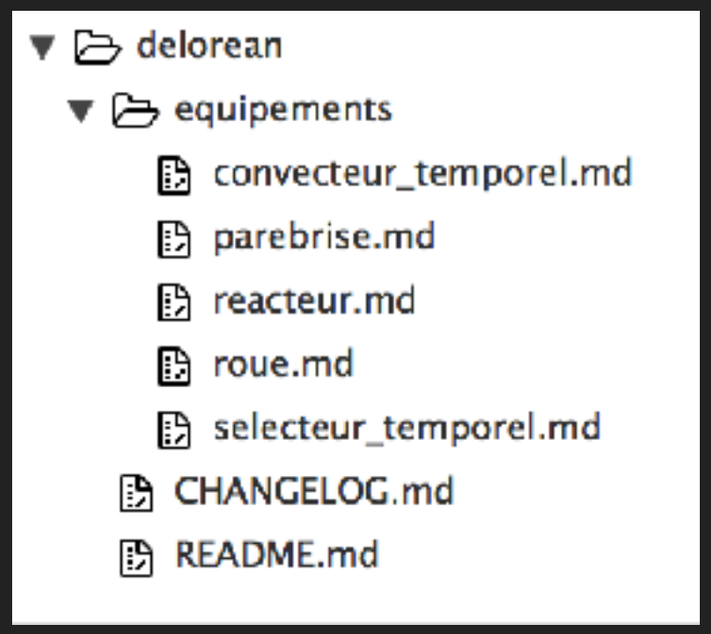
```
git remote remove mon_serveur
```

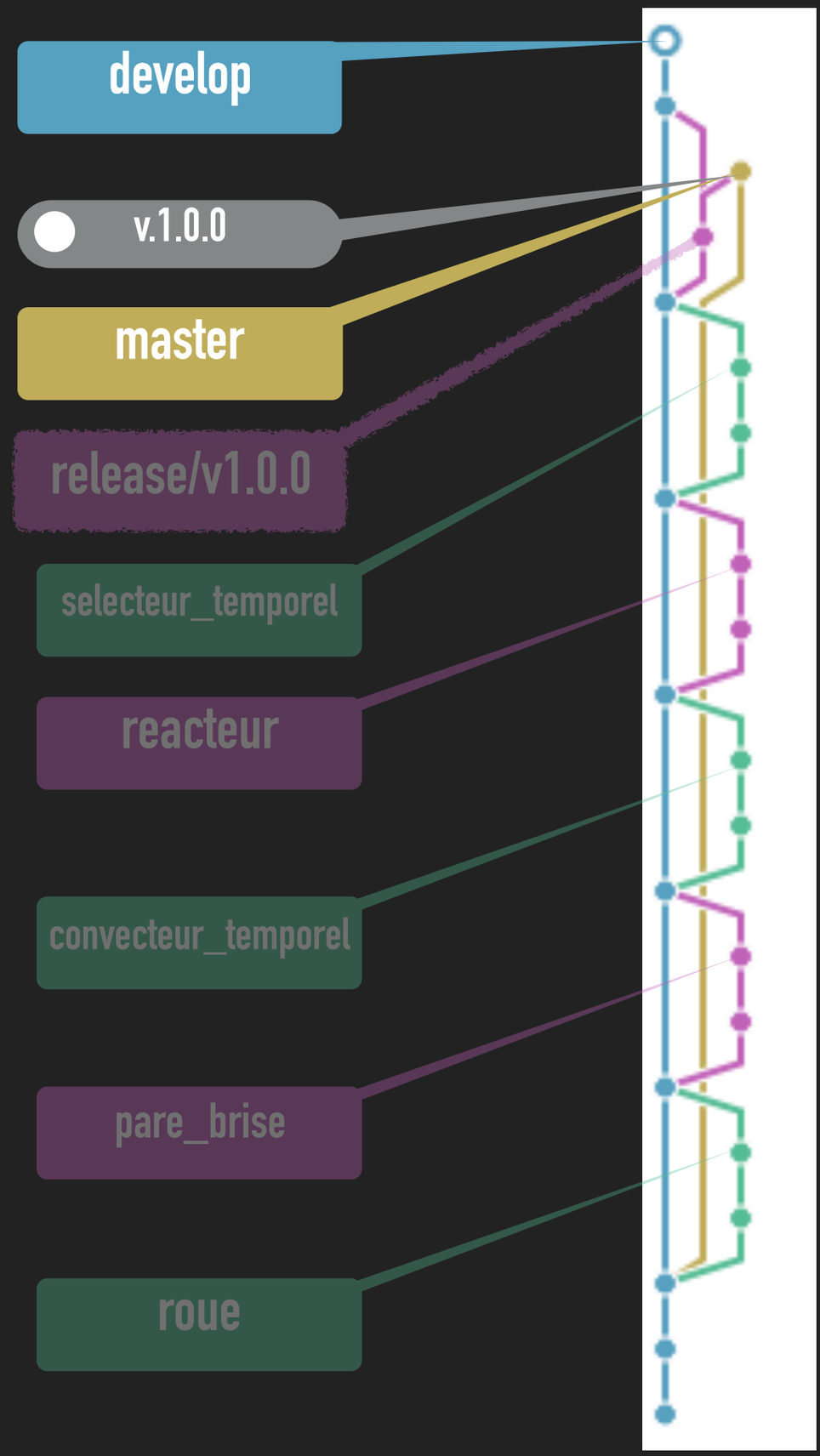
LES VOYAGES DANS LE TEMPS SONT BEAUCOUP TROP DANGEREUX.

DELOREAN V2

DESCRIPTION PROJET DELOREAN

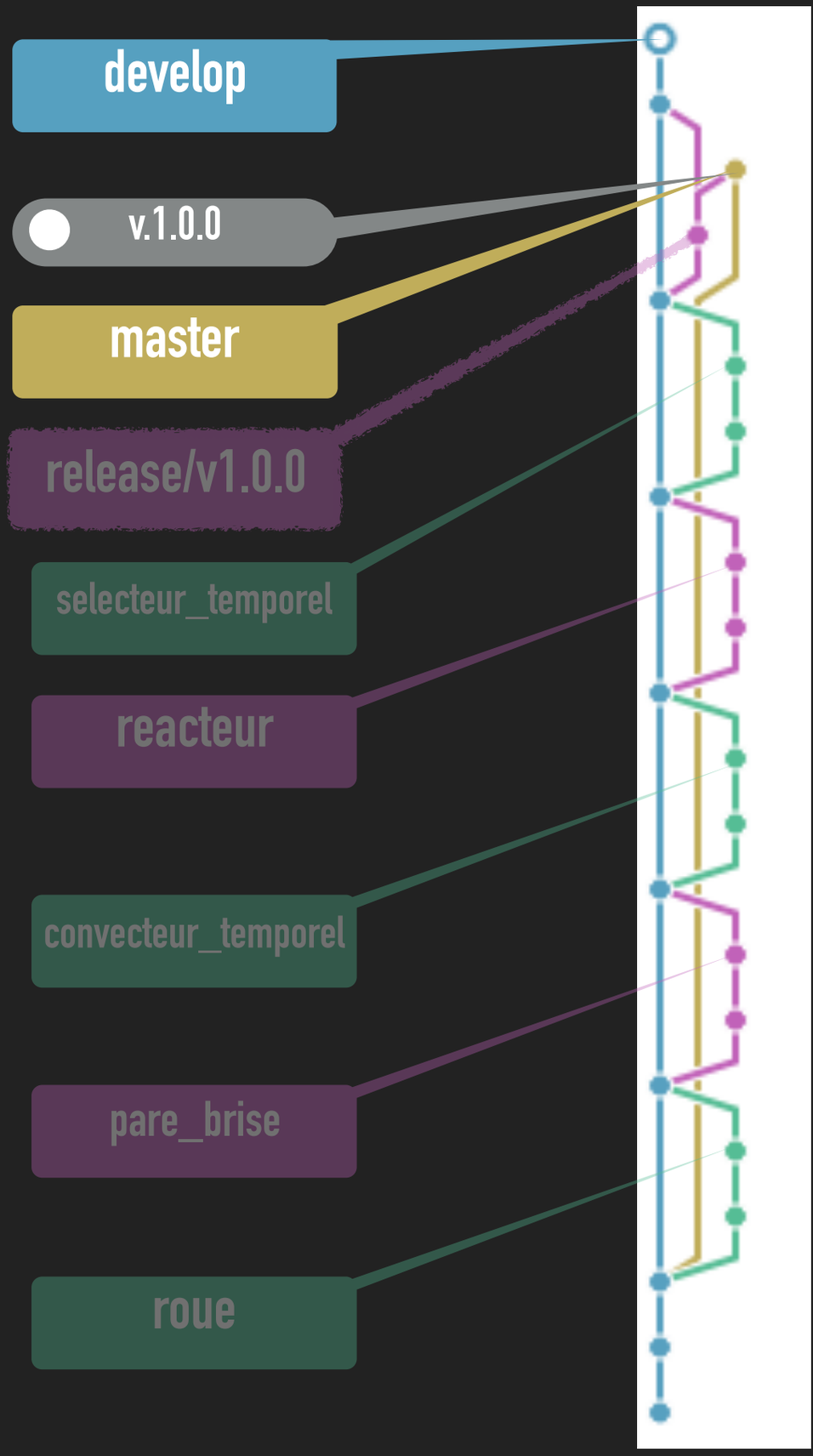
- Un fichier README.md, un CHANGELOG.md
- Un dossier equipements/ qui contient un fichier par équipement
- Une v1.0.0 déjà taguée





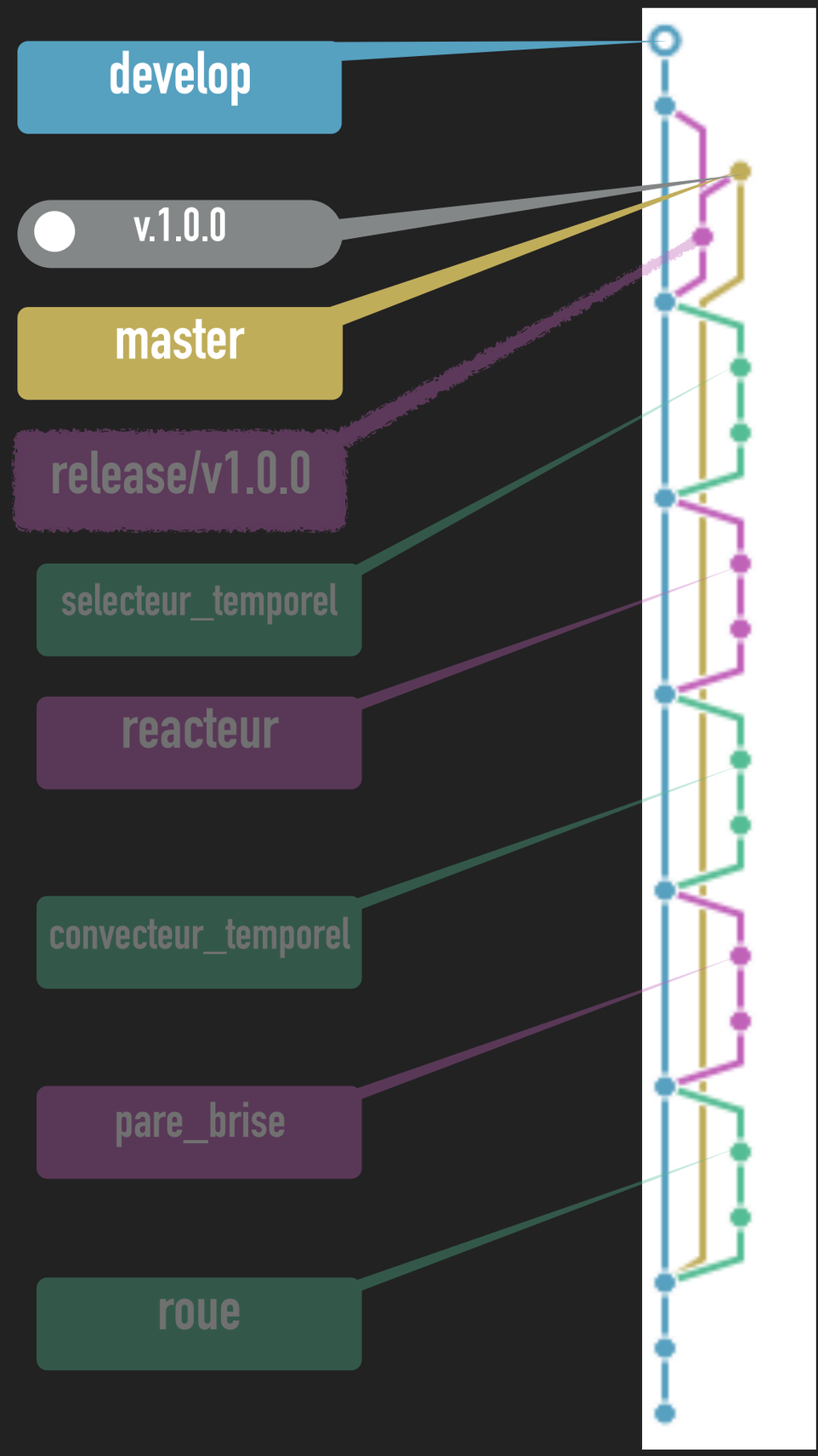
LA DELOREAN V1.1.0

- Ajout de la climatisation
- Ajout d’une lentille anti gravitationnelle
- Amélioration du réacteur en réacteur à détritus
- Amélioration du pare brise en pare brise anti-UVB
- Correction de bugs



LA DELOREAN V1.1.0

- Respect des règles de nommage des branches
  - feature/XXXX
  - release/vX.X.X
  - develop
  - master
- L’erreur est ~~permise~~ conseillée!



LA DELOREAN V1.1.0

LES ACTIONS

LE PERSO

DELOREAN V2

MARTY

- Crée la branche climatisation
- Ajoute un équipement *climatisation.md* sur la branche climatisation
- Fait deux commits sur la branche climatisation

IL N'EST PAS DIT QUAND FAIRE PUSH/PULL
A VOUS DE VOIR

GENERER DES CLÉS SSH

- Générez une paire de clés ssh
  ssh-keygen.exe
  -> id_rsa et id_rsa.pub dans $HOME/.ssh
- Ajoutez votre clé ssh id_rsa.pub sur le compte gitlab
- https://gitlab_server/profile/keys

CLONER LE PROJET

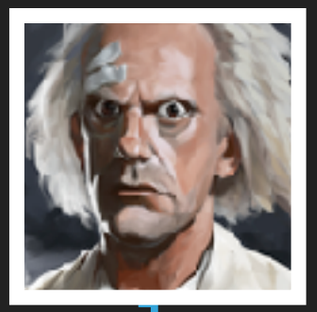
- En binôme, deux par projet, clonez:
  - ssh://git@algec.iut-blagnac.fr:2200/git_training_2016/delorean-{01-20}.git
- Choisissez un rôle: Doc ou Marty
- Veillez à bien avoir configuré nom prénom et mail pour que je puisse attribuer les notes

NOUVELLE FEATURE

- Crée la branche `reacteur_dechet`
- Change le fichier reacteur.md pour qu'il consomme des détritus
- Commit le fichier reacteur.md sur la branche `reacteur_dechet`

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

REINTEGRATION DE FEATURE



- Réintègre la branche reacteur_dechet dans develop

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

NOUVELLE FEATURE

- Crée la branche climatisation
- Ajoute un équipement *climatisation.md* sur la branche climatisation
- Fait deux commits sur la branche climatisation

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

QUICKFIX

- Sur la branche develop, ajoute une caractéristique sur la roue.md (un mode hiver par exemple)
- Commit le changement de fichier sur la roue

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

REINTEGRATION DE FEATURE

- Réintègre la branche climatisation dans develop

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

NOUVELLE FEATURE

- Crée la branche `lentille_gravitationnelle`
- Ajoute un équipement *`lentille_gravitationnelle.md`* sur la branche `lentille_gravitationnelle`
- Fait deux commits sur la branche `lentille_gravitationnelle`

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

TRAVAIL À DEUX SUR UNE BRANCHE

- Reprend le travail du doc sur la branche `lentille_gravitationnelle`
- Ajoute un commit supplémentaire sur la branche `lentille_gravitationnelle`

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

RÉINTÉGRATION DE BRANCHE

- Réintègre la branche `lentille_gravitationnelle` dans `develop`

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

NOUVELLE FEATURE

- Crée la branche pare_brise_plus
- Ajoute une caractéristique dans parebrise.md
  - filtre anti UVB
- commit l’amélioration sur pare_brise_plus

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

CORRECTION DE BUG DANS DEVELOP

- Corrige le bug dans parebrise.md sur la branche develop
- commit le bug fix sur develop

RÉCUPÉRATION DE LA CORRECTION DANS LA BRANCHE

- Récupère le bugfix sur le parebrise.md du doc depuis develop dans sa branche pare_brise_plus
- Change une autre caractéristique du parebrise.md et la commit dans la branche pare_brise_plus

RÉINTÉGRATION DE BRANCHE

- Réintègre la branche `pare_brise_plus` dans `develop`

C'EST L'HEURE DE LA LIVRAISON!

- Créé la branche de livraison `release/v1.1.0`
- Remplit le fichier CHANGELOG.md
- Commit le CHANGELOG.md

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

NOUVELLE FEATURE

- Crée la branche `toit_ouvrant` depuis `develop`
- Ajoute l’équipement `toit_ouvrant.md`
- Commit le fichier sur `toit_ouvrant`
- Ajoute un autre commit sur `toit_ouvrant`

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

QUICK FIX DE DERNIÈRE MINUTE

- sur `release/v1.1.0`
  - Corrige le bug du selecteur_temporel
  - Ajoute la correction du bug dans CHANGELOG.md
- Commit CHANGELOG.md et le bug

ADD | COMMIT | BRANCH | CHECKOUT | FETCH | PULL | PUSH | RESET | REBASE | TAG

RÉINTÉGRATION DE BRANCHE

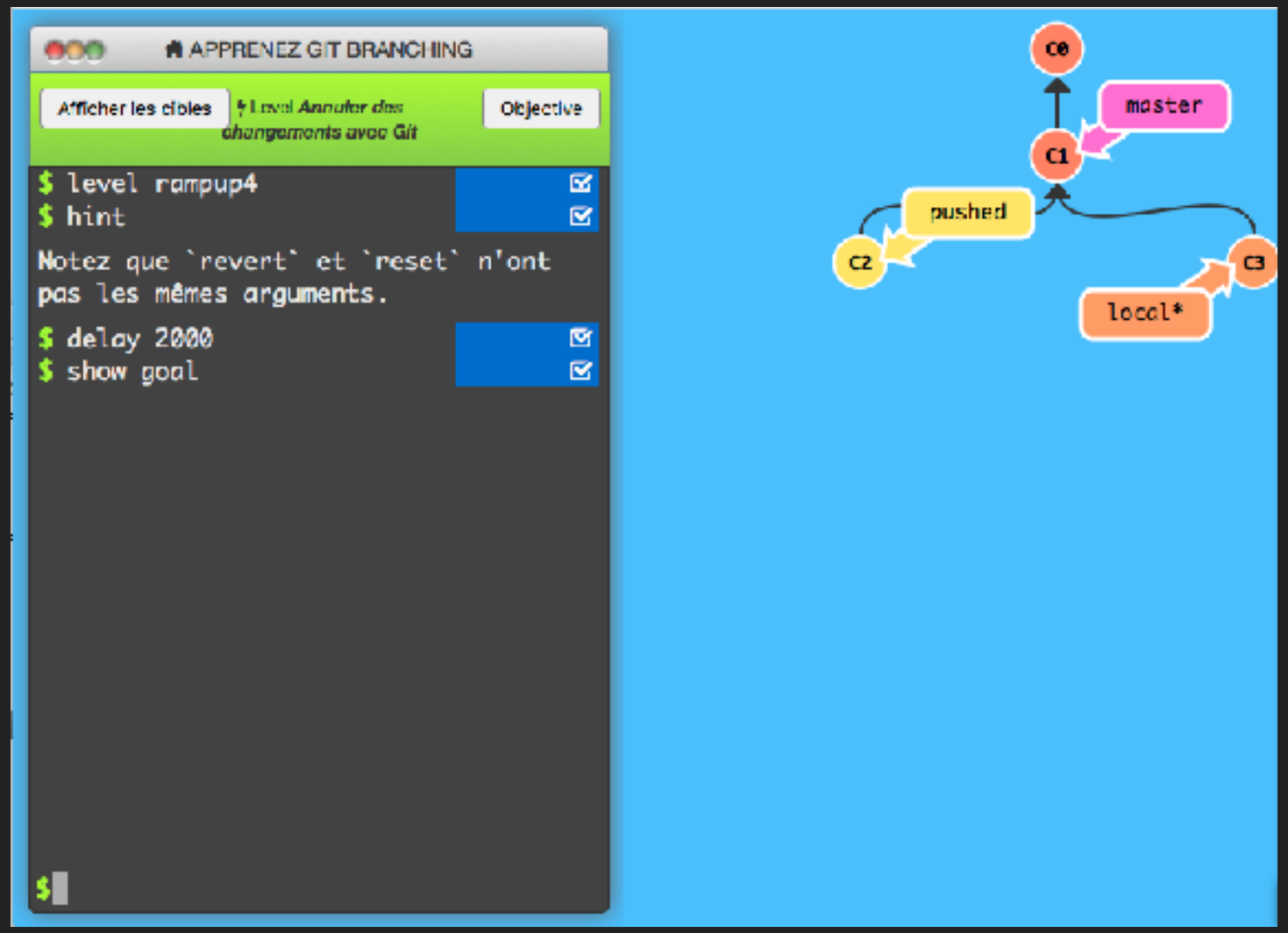
- Réintègre la branche `toit_ouvrant` dans `develop`

FIN DE RELEASE

- Merge la branche `release/v1.1.0` dans `master`
- Pose le tag `v1.1.0` sur `master`
- Merge la branche `release/v1.1.0` dans `develop`

POUR CEUX QUI VEULENT S'AMUSER (OUI OUI)

- Games: http://pcottle.github.io/learnGitBranching/



LE FUTUR N'EST JAMAIS ÉCRIT À L'AVANCE POUR PERSONNE

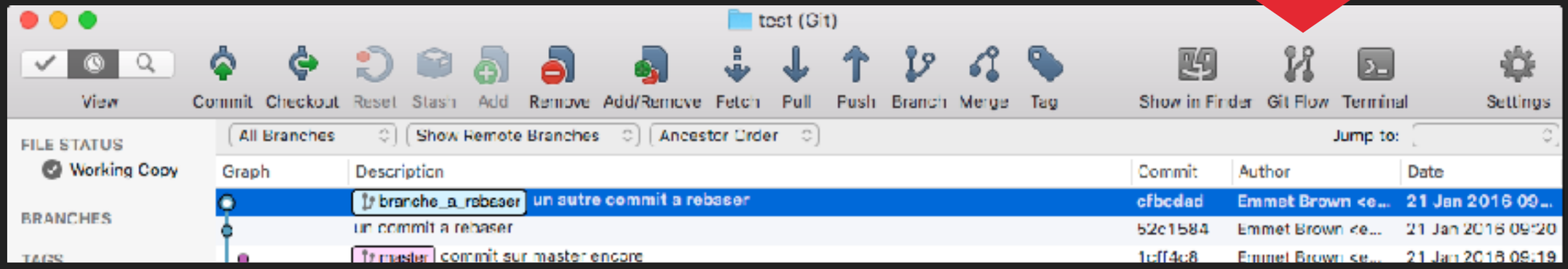
GITFLOW

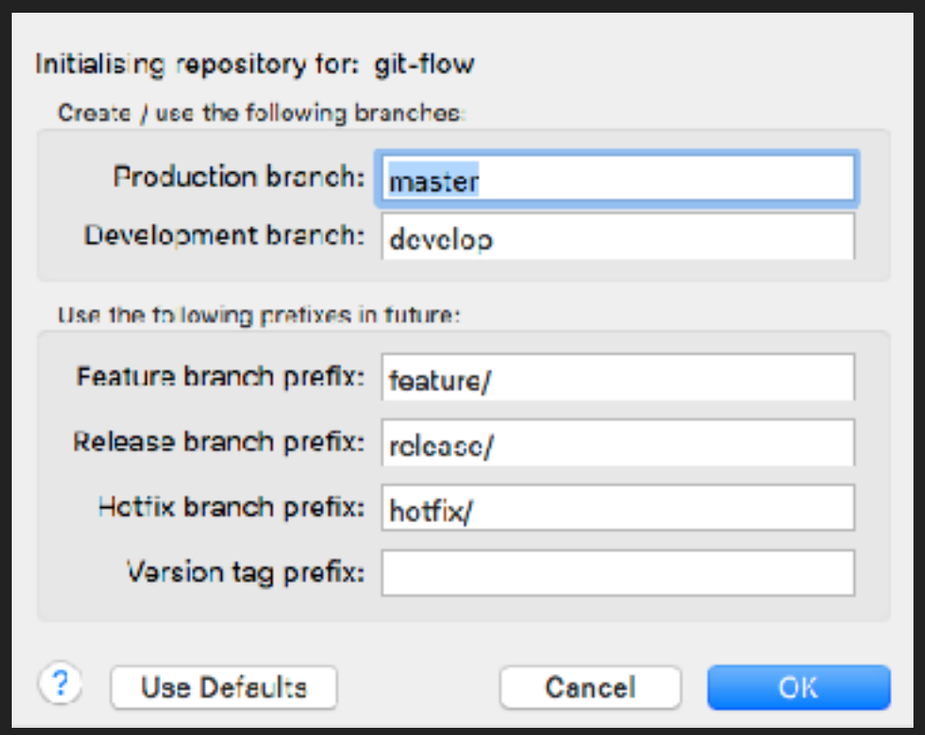
UNE COMMANDE POUR FAIRE DU NVIE SIMPLEMENT

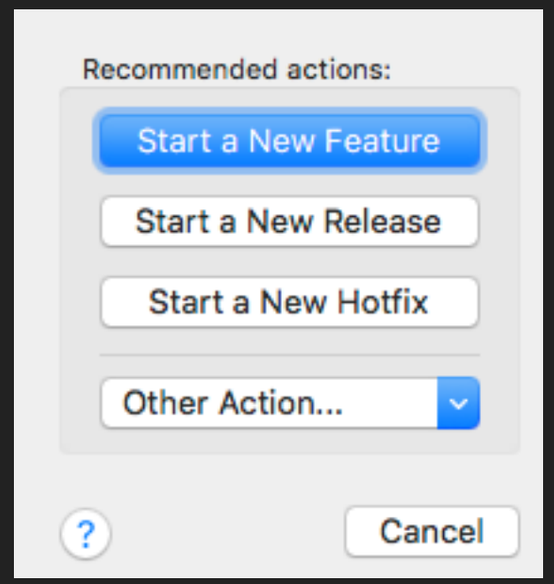
- https://github.com/nvie/gitflow
- une surcouche à git
- git flow feature start / finish / rebase
- git flow release start / finish

UNE COMMANDE POUR FAIRE DU NVIE SIMPLEMENT

- Bouton gitflow dans SourceTree





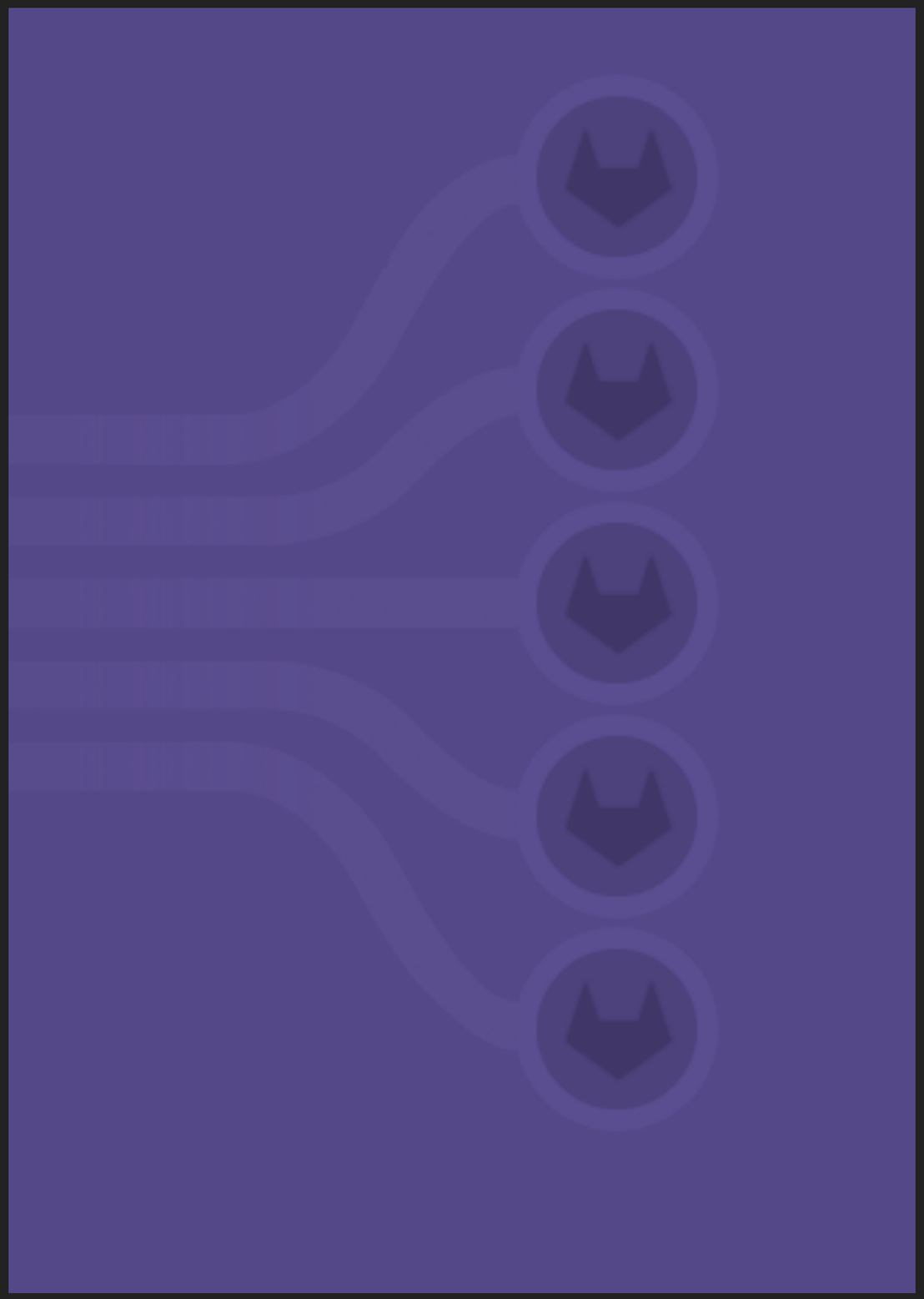


LES PRINCIPES DE

GITLAB

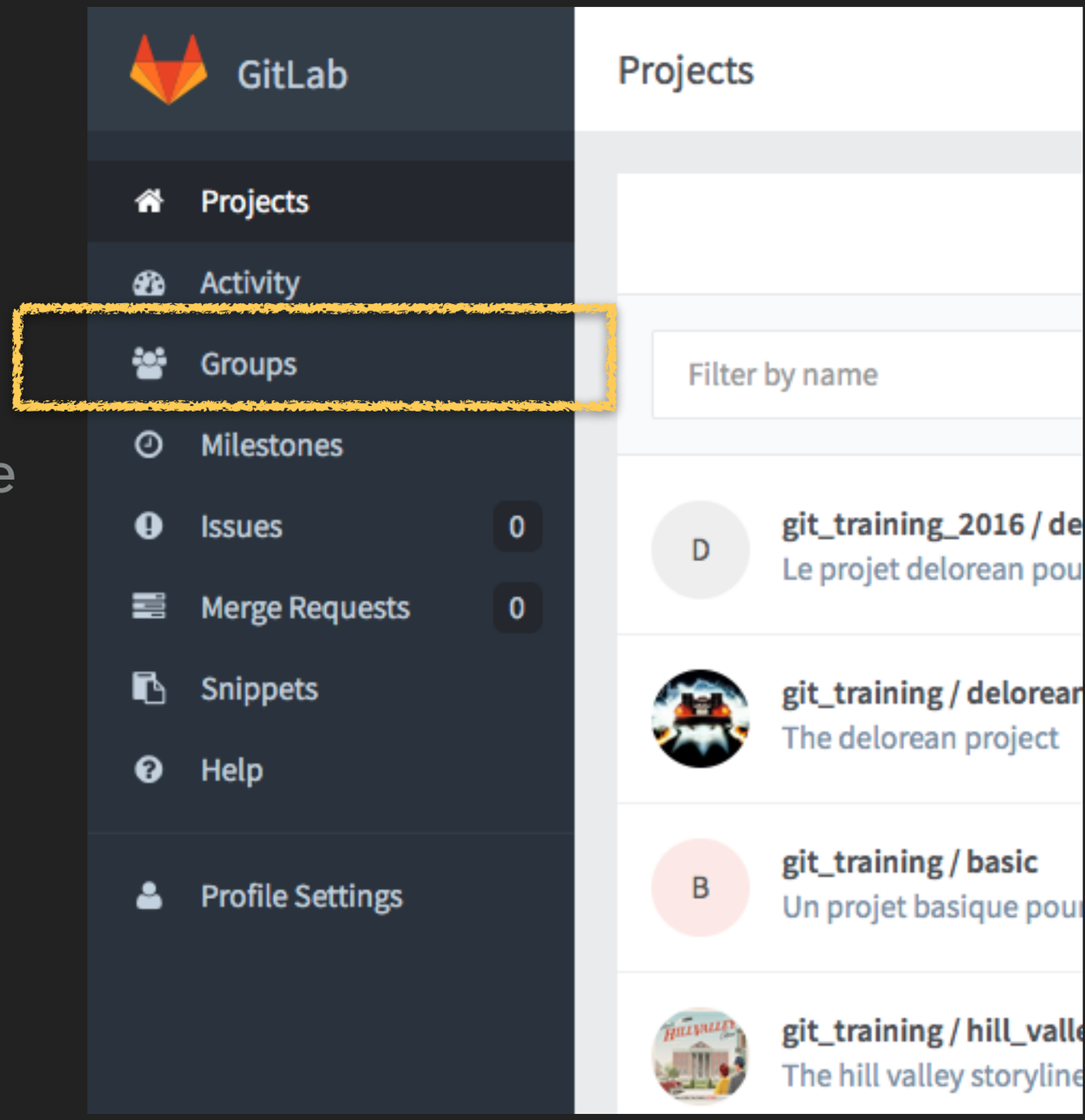
GITLAB

- open source (dans sa version CE)
- https://about.gitlab.com/
- gestion de repository
- projets, groupes de projets
- utilisateurs, équipe
- intégration continue
- revue de code



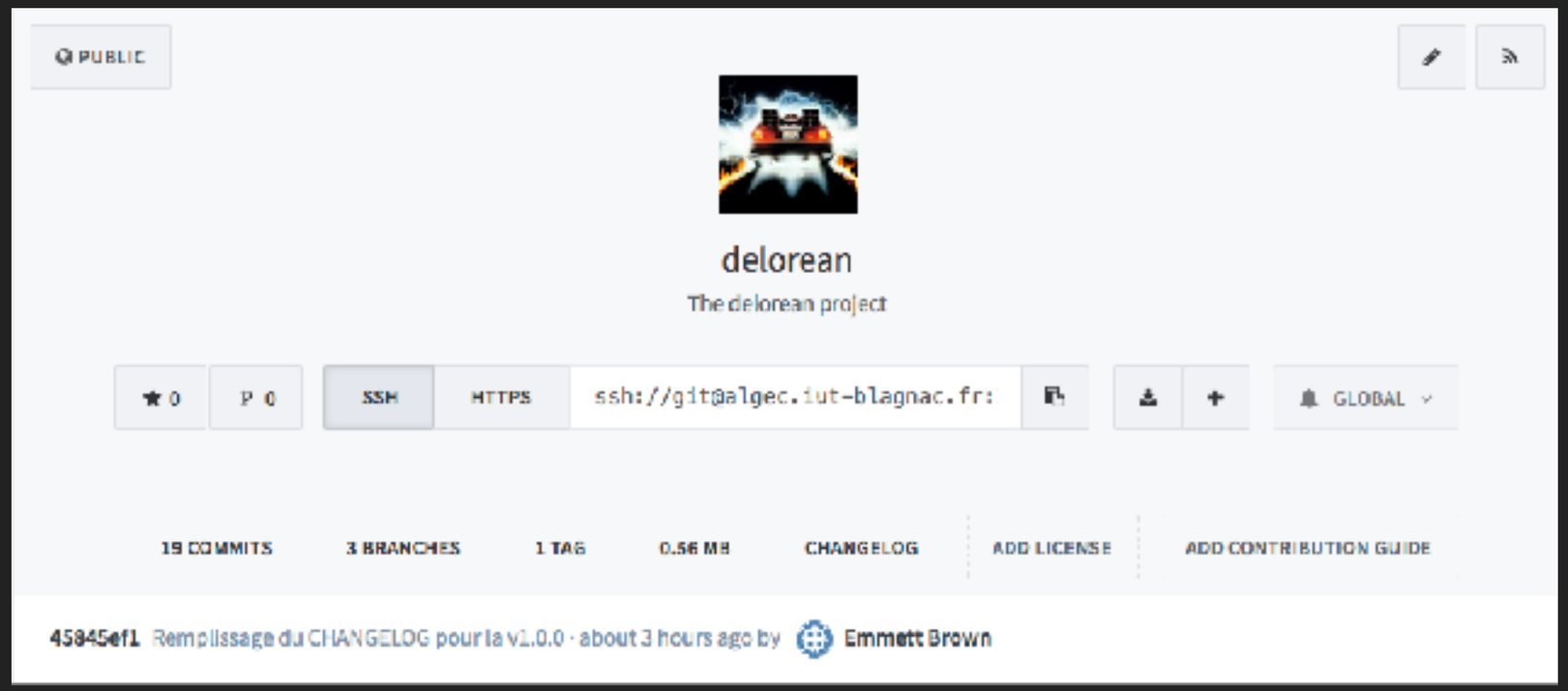
GESTION DE REPOSITORY

- Les projets sont organisés par groupes ou namespaces
- Chaque utilisateur à un namespace personnel
- On peut créer des groupes de projets



PROJET

- une URL d’accès
- Un README.md
- Un flux d’activité



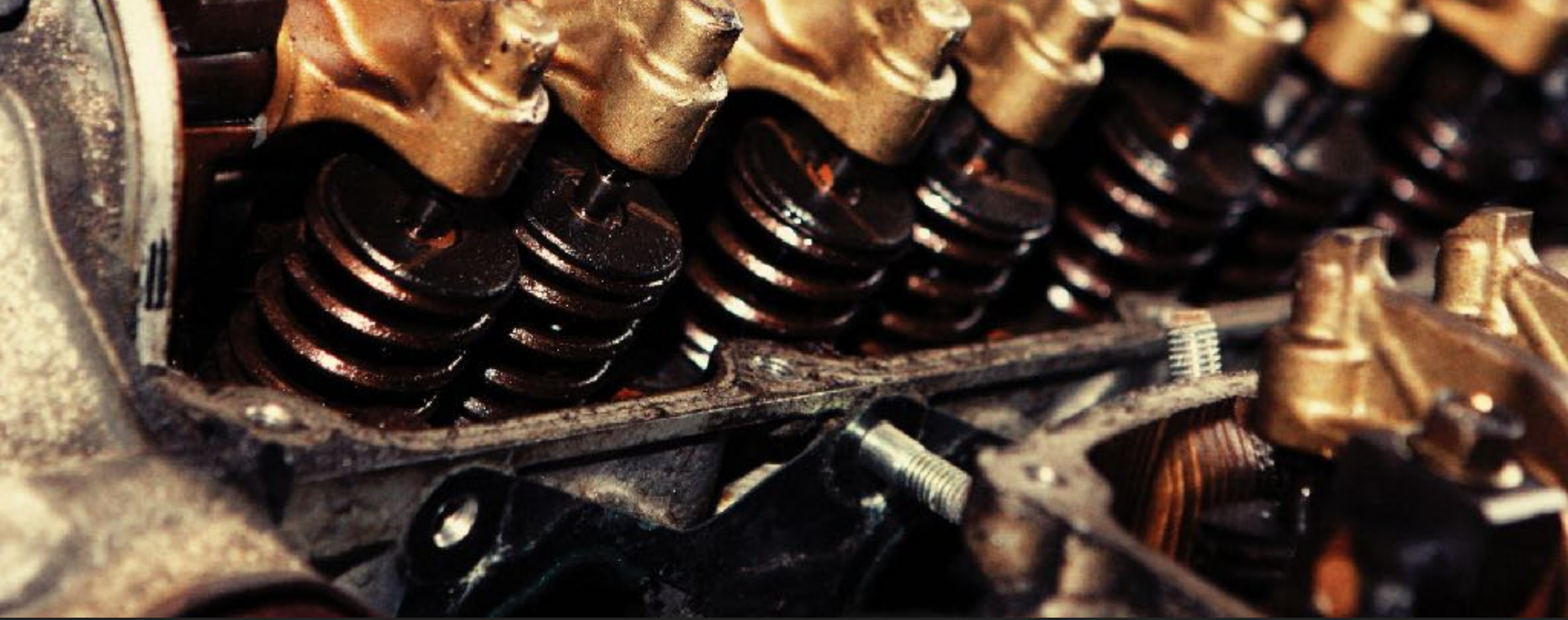
- Un gestionnaire d’anomalies, un wiki, des snippets, des builds
- Des stats
- Des merge requests

GESTION D'ISSUES

- simple: OUVERT/FERME
- Assignation
- description au format markdown
- Lien avec le code:
  git commit -m '#1 un commentaire en lien avec l'issue 1'
  git commit -m 'fixes #1 ce commentaire fermera l'issue 1 dès son merge dans develop'

MERGE REQUEST

- Les branches master et develop peuvent être protégées
  Seul le owner du projet peut pusher dessus
  Seul le owner du projet merge les branches dessus
- Les développeurs doivent demander une merge-request
- Revue de code
- Merge en ligne!



LES PRINCIPES DE

GITLAB-CI

TESTER SON CODE À CHAQUE COMMIT

- automatiser ses tests
- ajouter un fichier de description des tests dans son repo
- gitlab le détecte et mandate un runner pour executer les tests
- chaque commit est décoré avec les résultats de tests

LES TYPES DE TEST

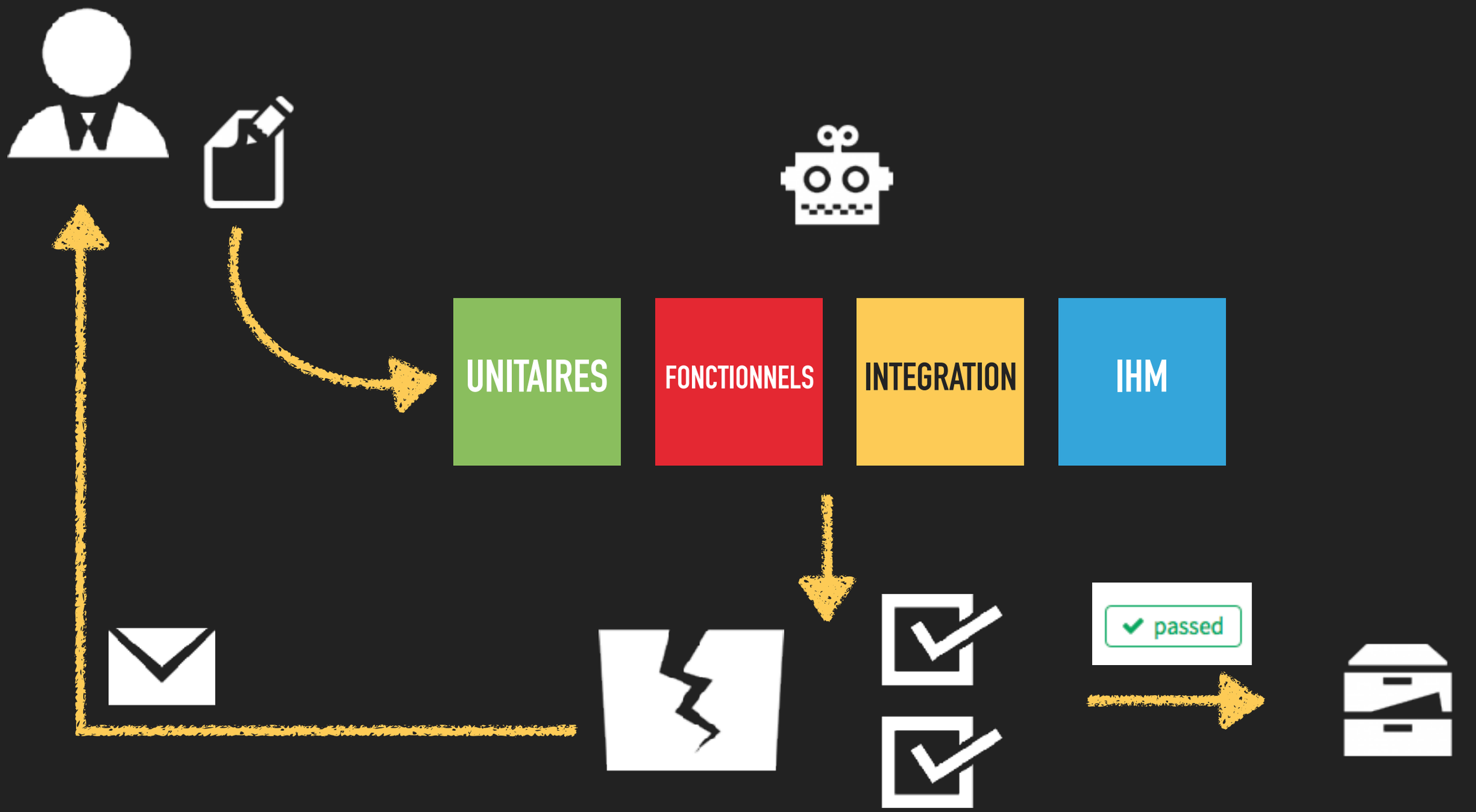
UNITAIRES

FONCTIONNELS

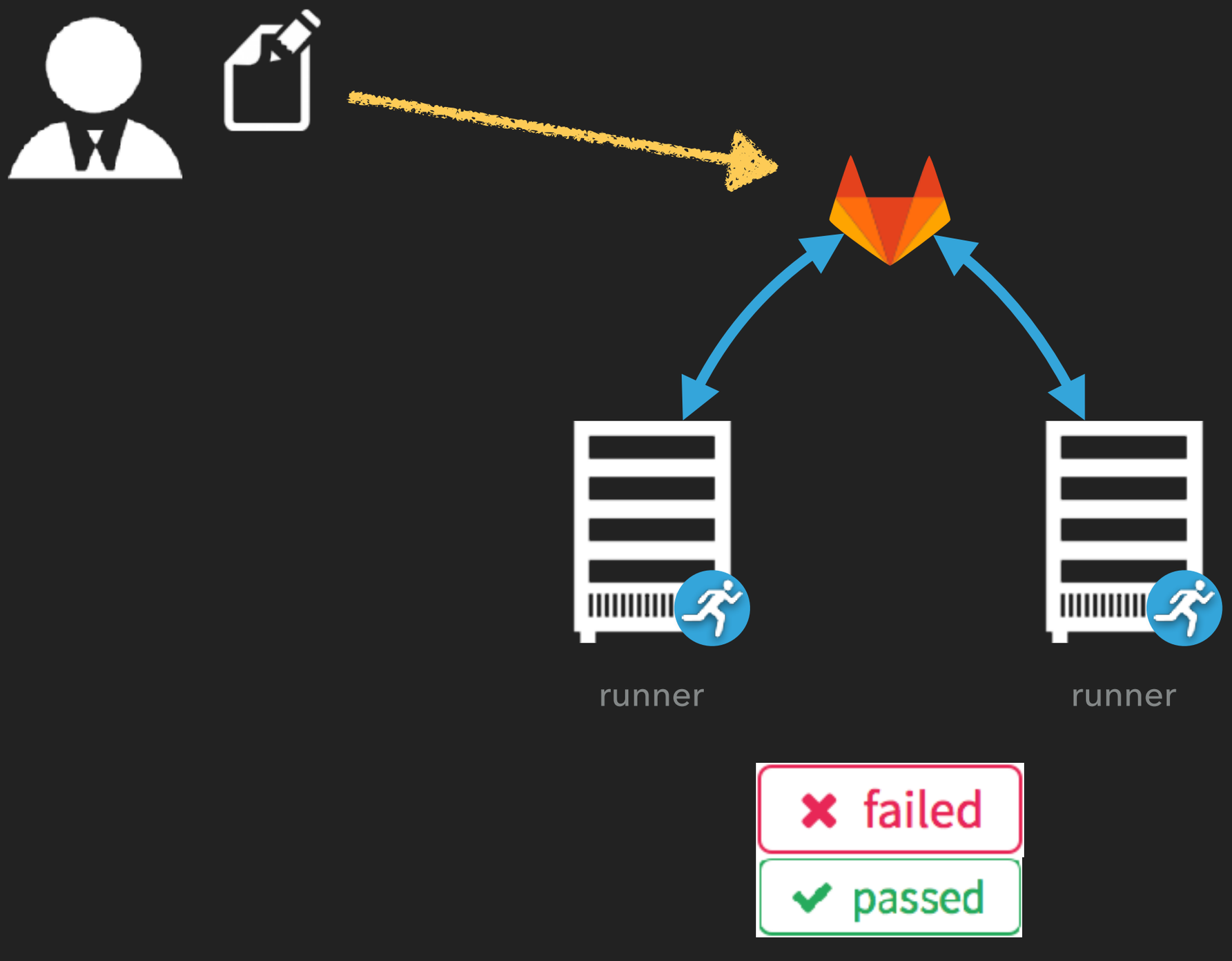
INTEGRATION

IHM

LA RELEASE CONTINUE



GITLAB CI UN SERVEUR DES RUNNERS

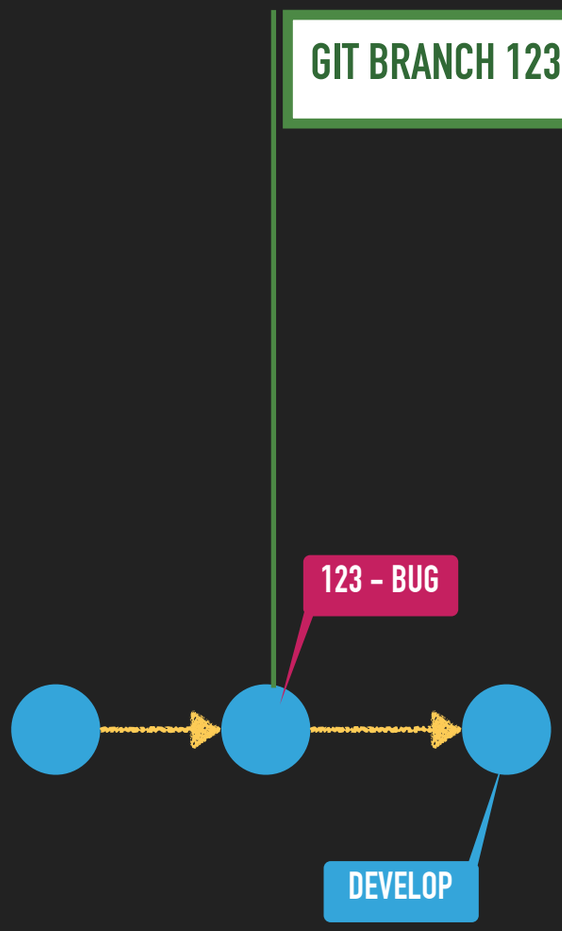


.gitlab-ci.yml

.gitlab-ci.yml

```yaml
stages:
- build
- test
- deploy
- cleanup

build_job:
  stage: build
  script:
  - make build

test_job:
  stage: test
  script:
  - make test

deploy_job:
  stage: deploy
  script:
  - make deploy

cleanup_job:
  stage: cleanup
  script:
  - cleanup after builds
  when: always
```

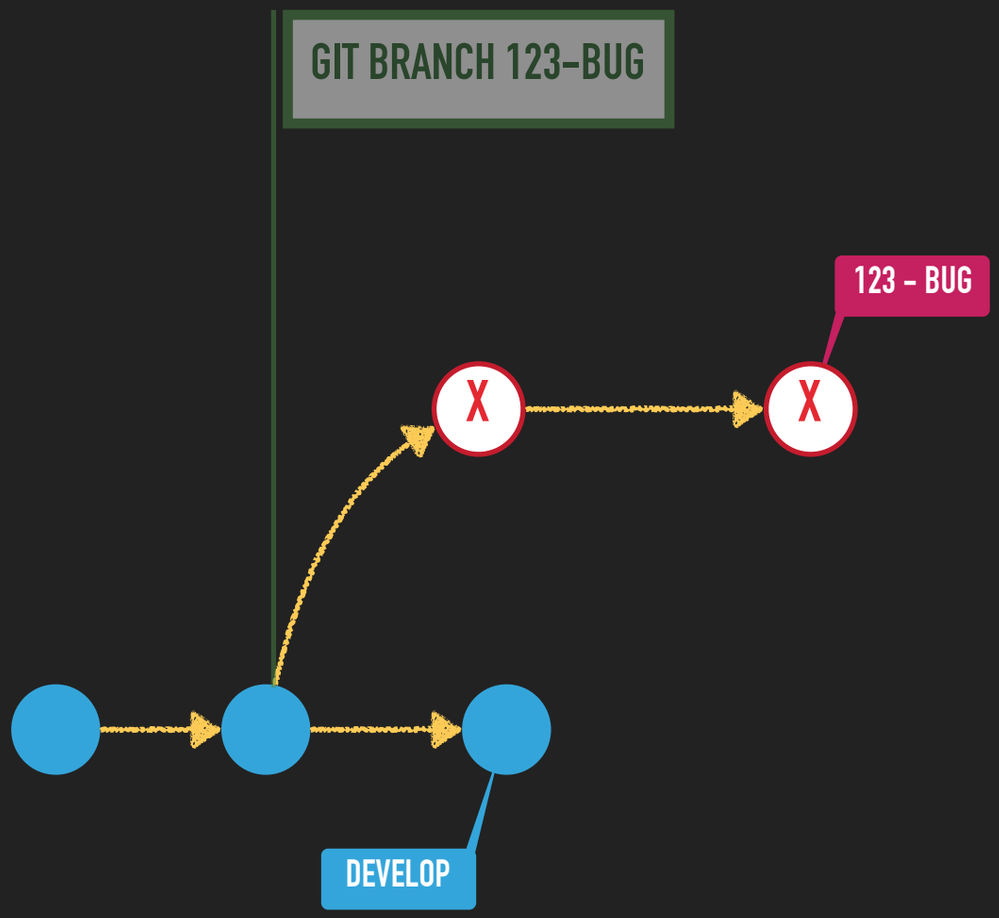
MANAGE ISSUE 123 WITH GITLAB



dev team

dev leader

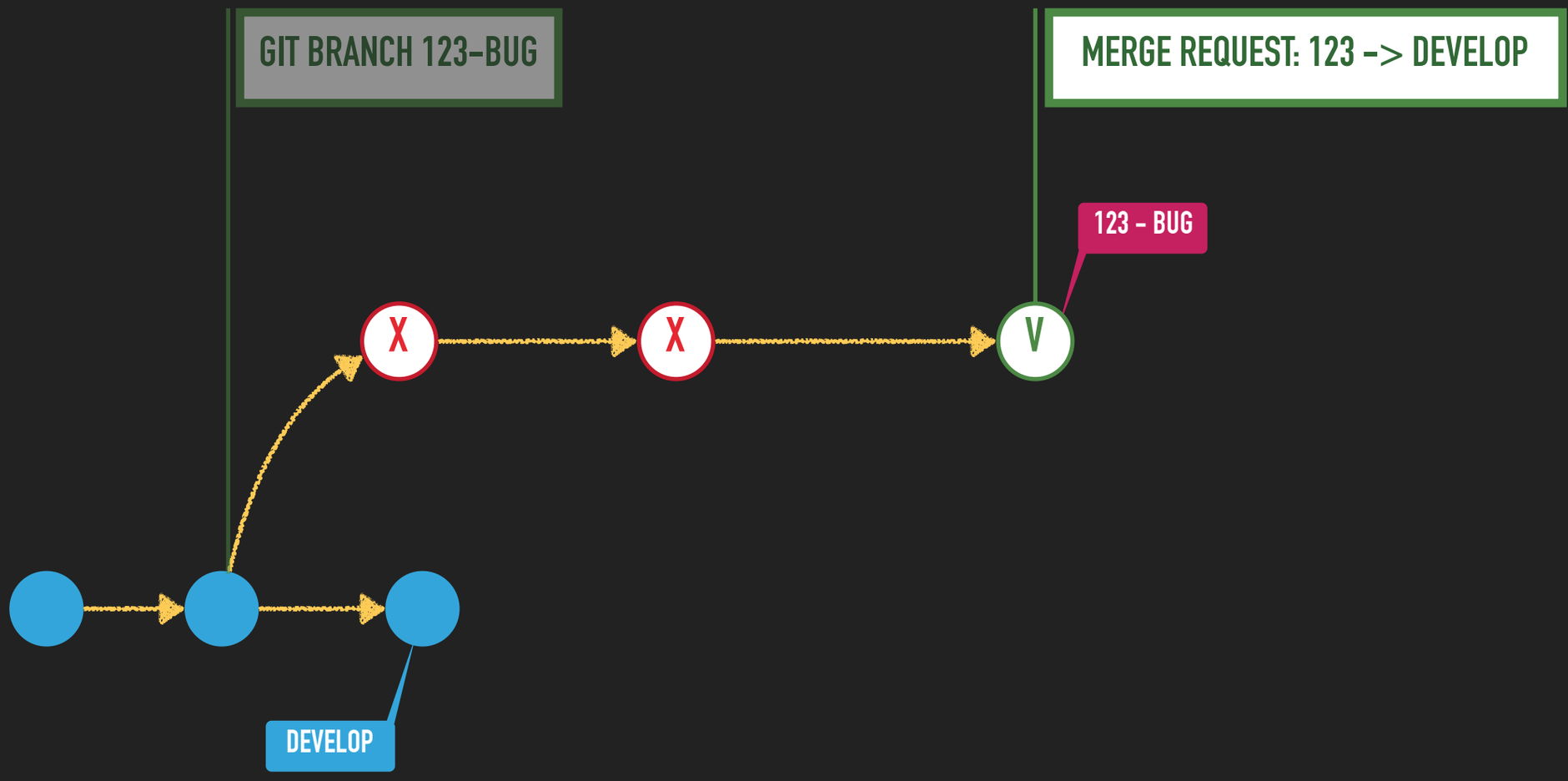
MANAGE ISSUE 123 WITH GITLAB



dev team

dev leader

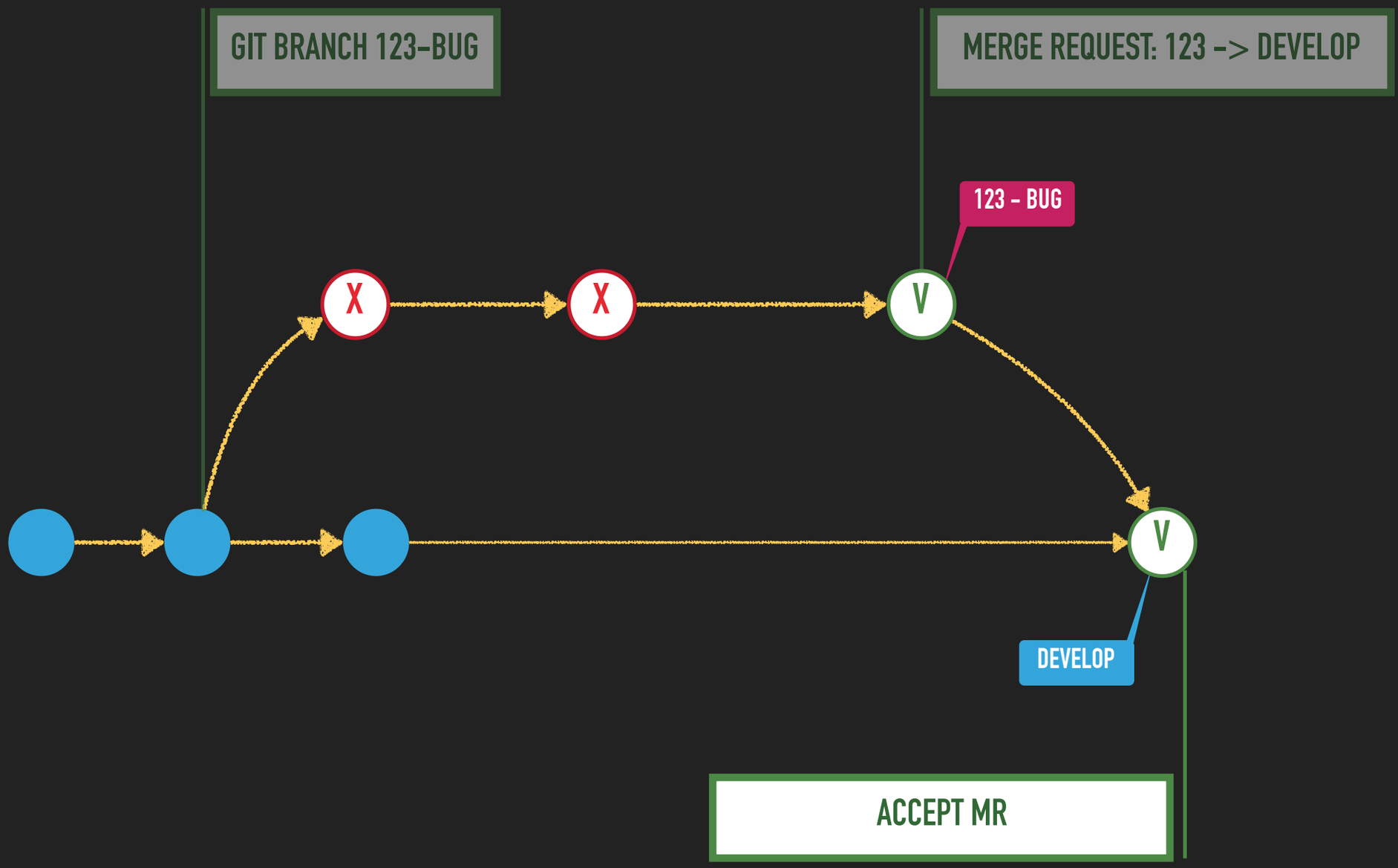
MANAGE ISSUE 123 WITH GITLAB



dev team

dev leader

MANAGE ISSUE 123 WITH GITLAB



dev team

dev leader

LES VOYAGES DANS LE TEMPS SONT BEAUCOUP TROP DANGEREUX.

DELOREAN V2

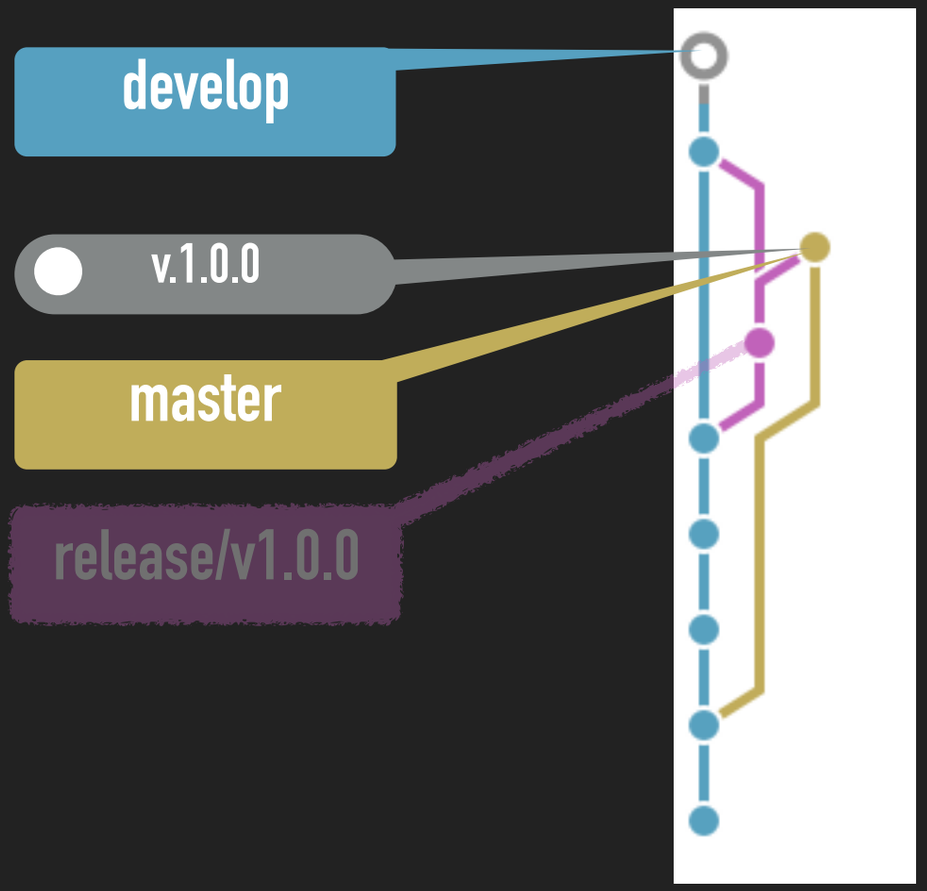
CLONER LE PROJET

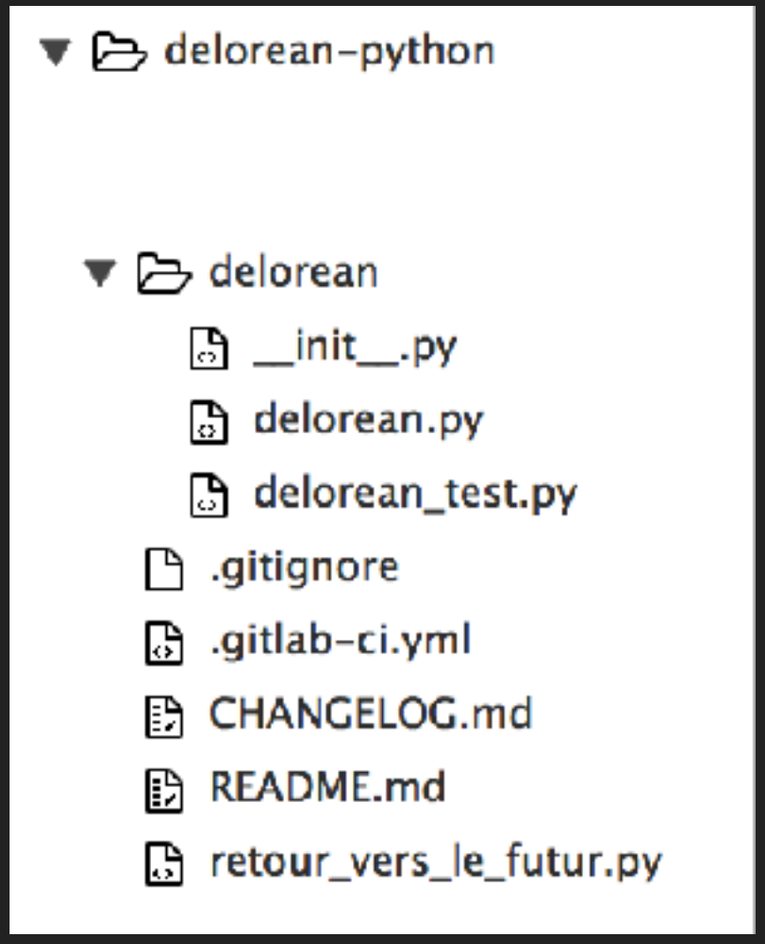
- En binôme, deux par projet, clonez:
  - ssh://git@algec.iut-blagnac.fr:2200/git_training_2017/delorean-python-{01-20}.git
- Indiquez vos noms/mails dans le README.md
  commit + push dans **develop**

```
# Réalisé par:

- PRENOM NOM ELEVE 1, prenom.nom@monmail.com
- PRENOM NOM ELEVE 2, prenom2.nom2@monmail.com
```

DESCRIPTION PROJET DELOREAN

- Un fichier README.md, un CHANGELOG.md
- Une v1.0.0 déjà taguée





delorean/delorean.py

```
class Delorean(object):
    """A delorean class"""
    def __init__(self):…
    def set_speed(self, speed):…
    def get_speed(self):…
    def insert_plutonium(self):…
    @property
    def has_plutonium(self):…
    def set_target_date(self, target_date):…
    def get_date(self):…
    def __speed_changed(self):…
```

(develop)$ python retour_vers_le_futur.py

```python
from delorean.delorean import Delorean

print 'Doc construit une delorean'
delo = Delorean()
print 'Nous sommes le %s' % delo.get_date()


print 'Doc refait le plein de plutonium'
delo.insert_plutonium()

print 'Doc programme un voyage dans le temps pour retourner en 1955'
delo.set_target_date('05/11/1955')

print 'Doc accelere jusqu a 89mph'
delo.set_speed(89)

print '####### VOYAGE DANS LE TEMPS #########'
print 'Nous sommes le %s' % delo.get_date()
```

```
/usr/bin/python /Users/booba/git/delorean-python/retour_vers_le_futur.py
Doc construit une delorean
Nous sommes le 2016-01-29
Doc refait le plein de plutonium
Doc programme un voyage dans le temps pour retourner en 1955
Doc accelere jusqu a 89mph
Delorean traveled in time to 05/11/1955
####### VOYAGE DANS LE TEMPS #########
Nous sommes le 1955-11-05

Process finished with exit code 0
```

RECOMMANDATIONS TP

- Lever des issues pour chaque item de travail (4 issues)
- Indiquer le numéro d’issue dans le commentaire
  `git commit -m “#1: correction du bug”`
- Tester en local avant de pusher
- Suivre l’état des tests après un push
- Travaillez en séquence, pas en parallèle
- Livrez la v1.1.0
- N’oubliez pas de PUSHER votre travail avant de partir

EVALUATION

- 100% des méthodes testées
- Tests OK
- 100% de couverture de code
- workflow NVIE suivi (branches de feature, release, master)
- Tag v1.1.0 posé sur master

TEXT

A FAIRE (VISIBLE DANS LE README.MD)

TODOs V1.1.0

BUG selecteur

- Corriger le bug du selecteur temporel pour que les tests passent

Ajout lentille gravitationnelle

- ajouter la méthode `enable_antigravity_lens(self)` dans la classe `Delorean`
- ajouter la méthode `disable_antigravity_lens(self)` dans la classe `Delorean`
- ajouter la méthode `is_flying(self)` dans la classe `Delorean` qui renvoie `True` quand la lentille est activée.
- ajouter le test `test_delorean_antigravity()` dans `delorean_test.py`

Amélioration du réacteur en reacteur à déchets

- remplacer la méthode `insert_plutonium(self)` par la méthode `insert_waste(self)` dans la classe `Delorean`
- remplacer la méthode `has_plutonium(self)` par la méthode `has_waste(self)` dans la classe `Delorean`
- remplacer la méthode `test_delorean_insert_plutonium()` par la méthode `test_delorean_insert_waste(self)` dans `delorean_test.py`

Ajout climatisation

- ajouter la méthode `set_temperature(self, temperature)` dans la classe `Delorean`
- ajouter la méthode `get_temperature(self)` dans la classe `Delorean`
- ajouter le test `test_delorean_temperature()` dans `delorean_test.py`

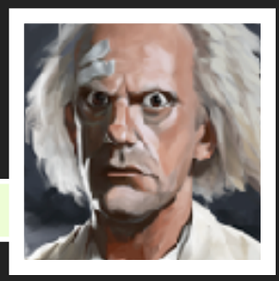
BONUS

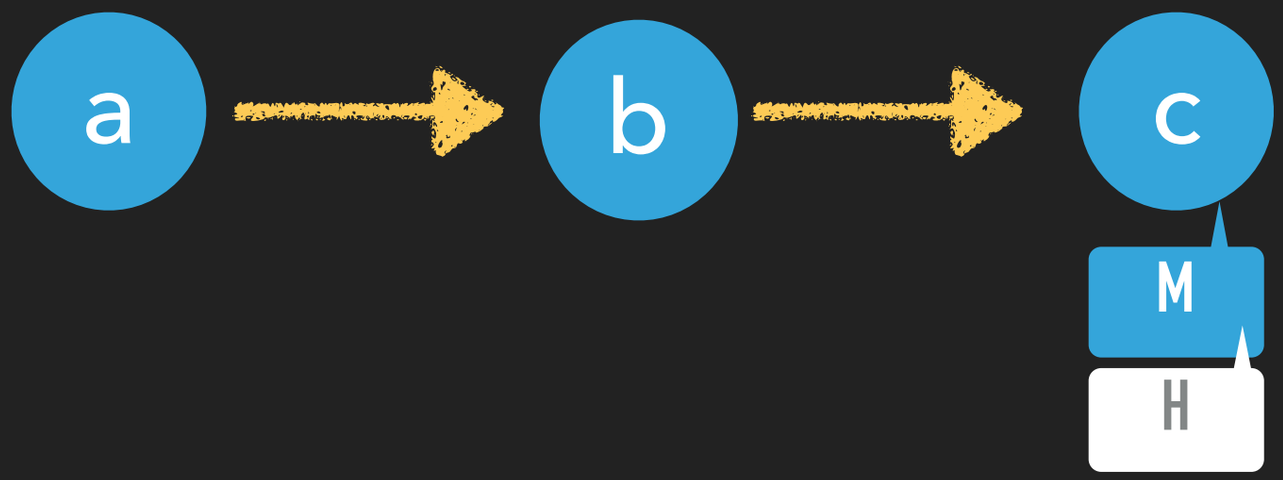
- Ajouter un stage doc dans .gitlab-ci.yml
- Générer la documentation python du module

ET APRES

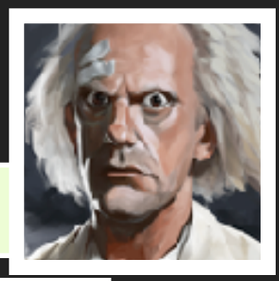
git checkout -b name [ref]

```
doc@labo$ git checkout -b ideefolle
```



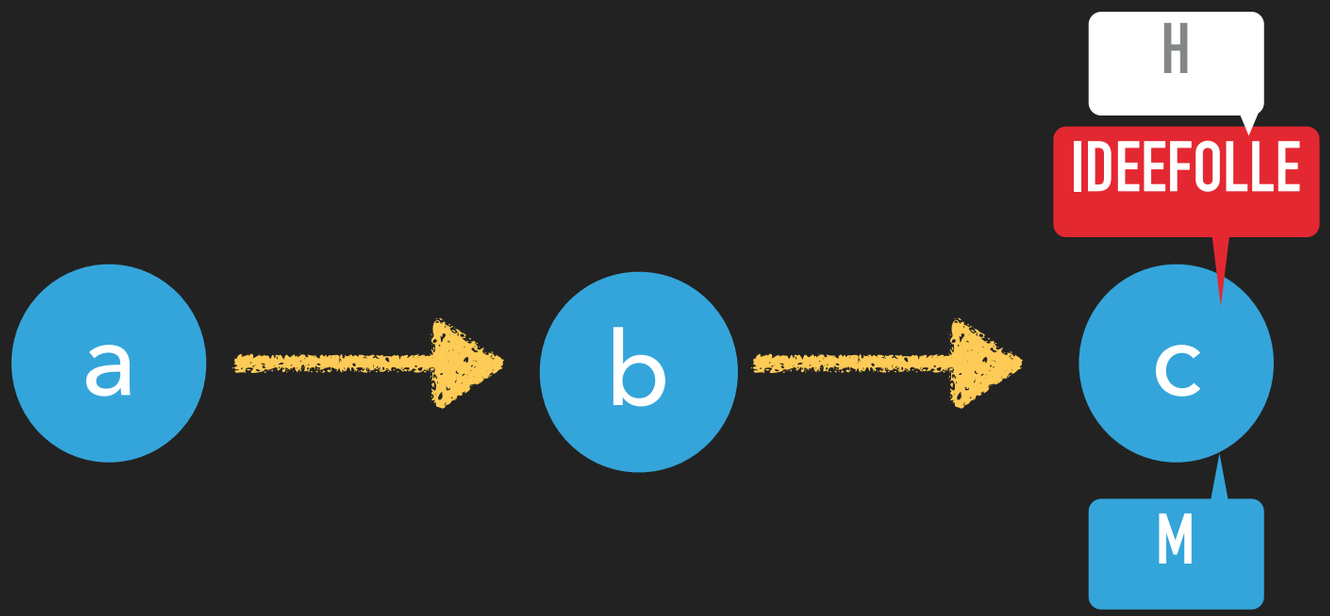


git checkout -b name [ref]

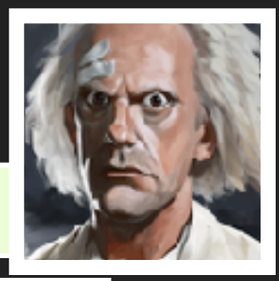


```
doc@labo$ git checkout -b ideefolle
Switched to a new branch 'ideefolle'
```

```
doc@labo$ echo "cette commande est folle" >> commandes/ideefolle.txt
doc@labo$ git add commandes/ideefolle.txt
doc@labo$ git commit -m "ajout d'une idée folle"
[ideefolle 759a26a] ajout d'une idée folle
 1 file changed, 1 insertion(+)
 create mode 100644 commandes/ideefolle.txt
```



git checkout -b name [ref]



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Switched to a new branch 'ideefolle'
```

```
doc@labo$ echo "cette commande est folle" >> commandes/ideefolle.txt
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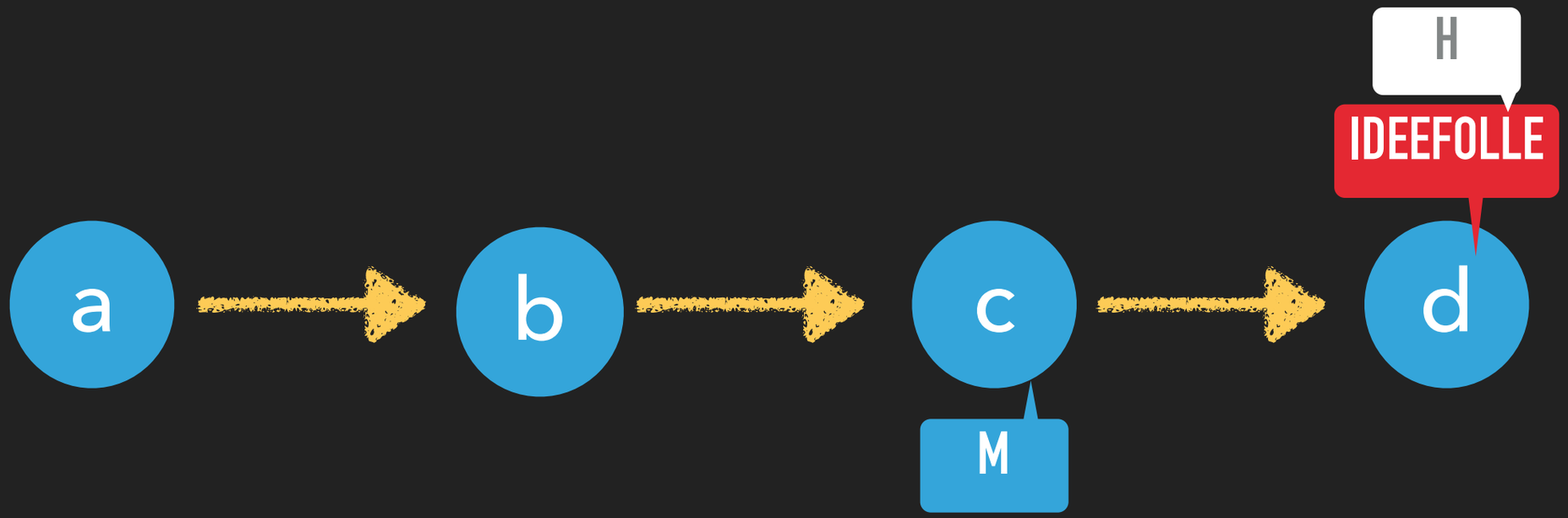
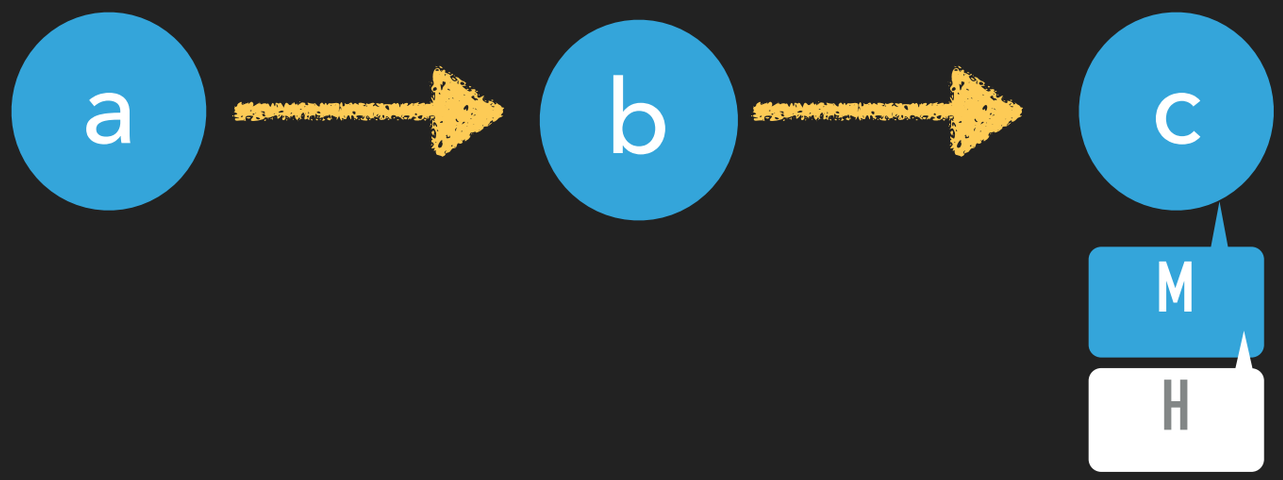


`git reset [ref] -- file...`

- Reset le ou les fichiers dans l'état où ils étaient à ref
- Ex:
  git reset a -- README.md
  git reset HEAD~~ -- README.md

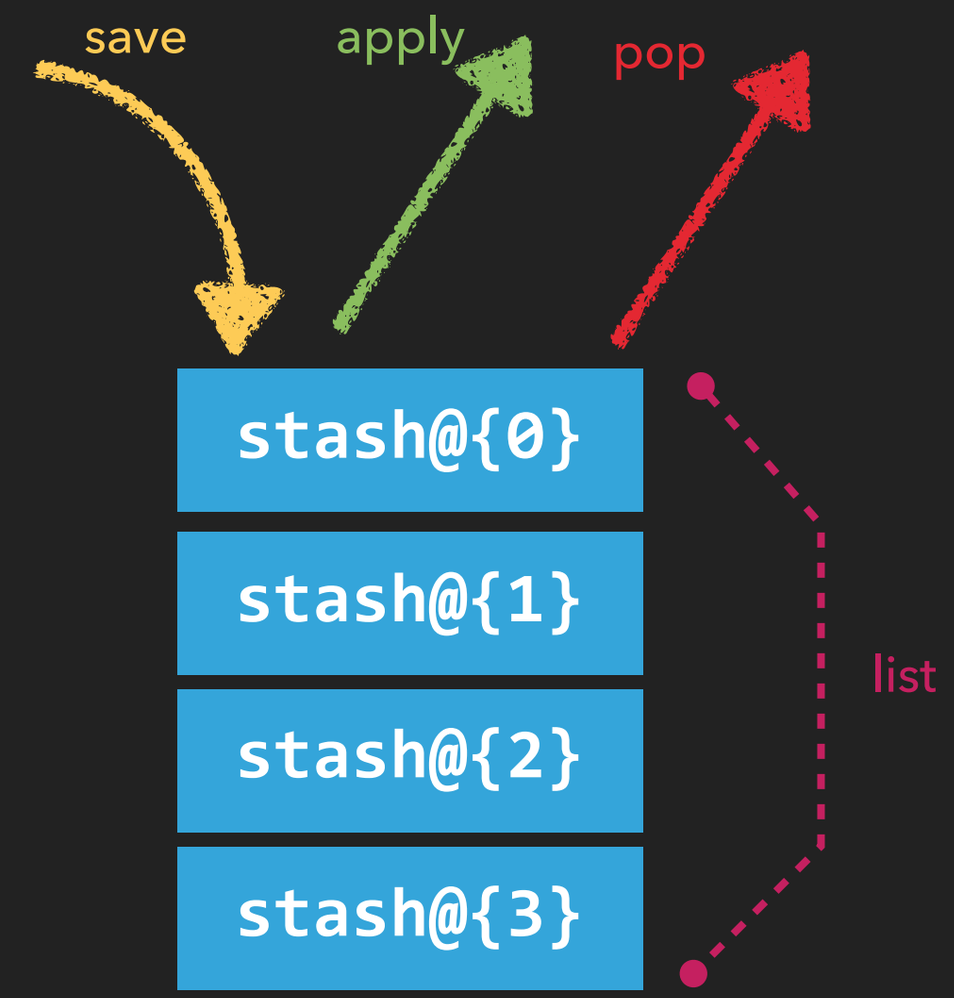


`git bundle bundlefile fromref..toref`

- TBC

git stash [save (--all) [<message>] [pop|apply|list]

- Permet de:
  - save: sauver les modifications en cours dans un stash
  - apply: ré-appliquer les modifications du dernier stash
  - pop: ré-applique les modifications du dernier stash ET le supprime
  - list: liste les stash en cours
- Utile quand on veut mettre ses modifications de coté avant un merge/ rebase/checkout



INFOZESK@GMAIL.COM

MERCI!

CREDITS

- Icons made on http://flaticons.net/
- https://git-scm.com/
- A successful git branching model nvie.com
- stock images from https://stocksnap.io/

CREDITS

- Marty avatar http://paulorocker.deviantart.com
- Doc avatar: impossible de trouver l'auteur de l'image, mais merci!