Git

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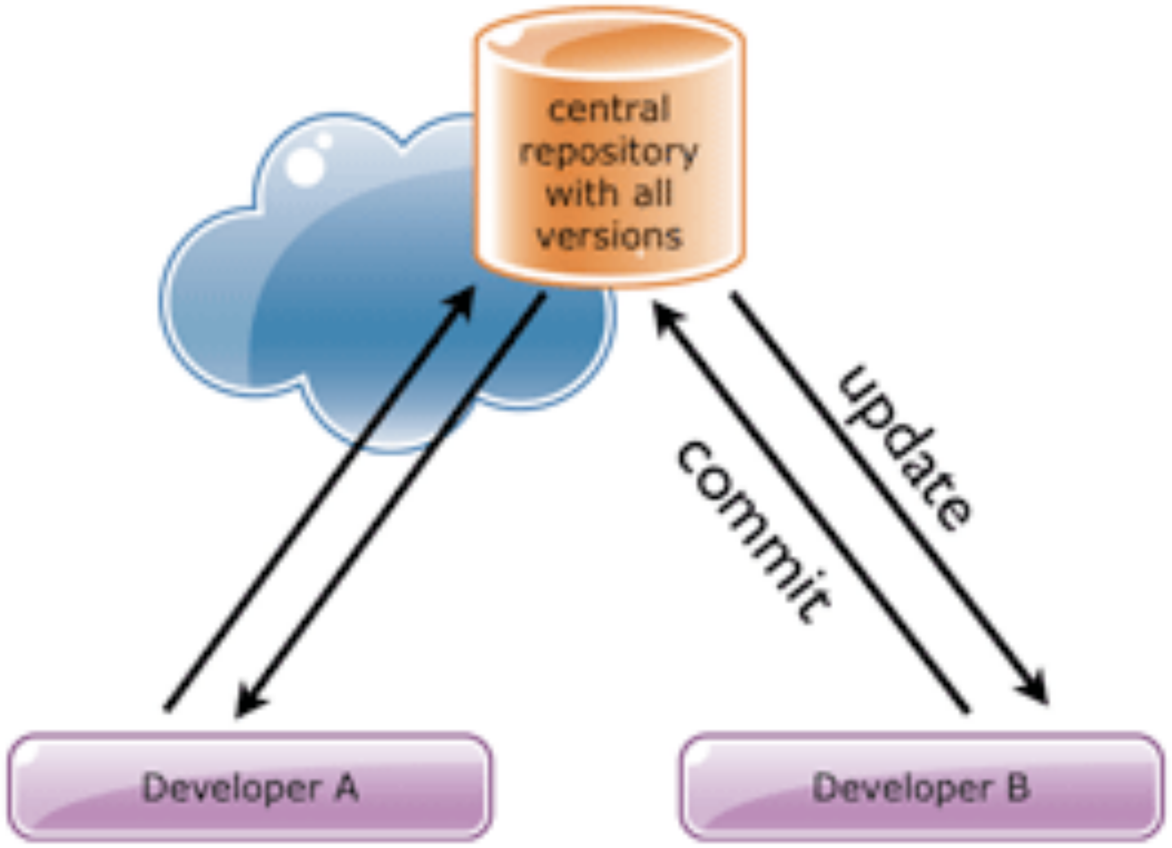
“Git is a free and open source **distributed** [分散的] version control system designed to handle everything from small to very large projects with speed and efficiency.”

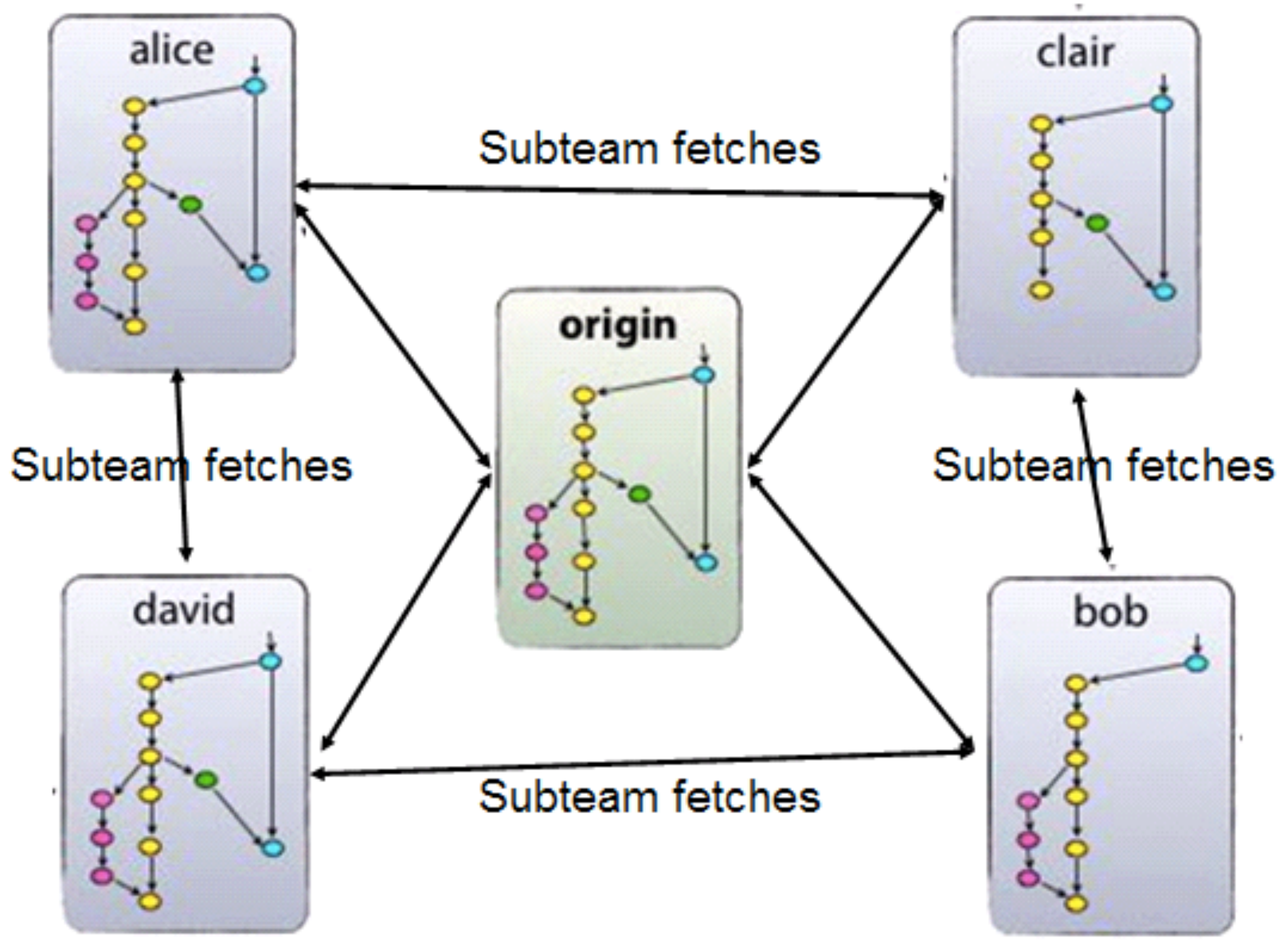
– https://git-scm.com/

1. 分布式

集中式


central repository with all versions
update
commit
Developer A
Developer B

分布式


alice
clair
origin
david
bob
Subteam fetches
Subteam fetches
Subteam fetches
Subteam fetches

git clone

```
git clone git@github.com:island205/barn.js.git
```

- mkdir barn.js & cd barn.js
- git init
- git remote add origin git@github.com:isl……
- git fetch origin
- git checkout master

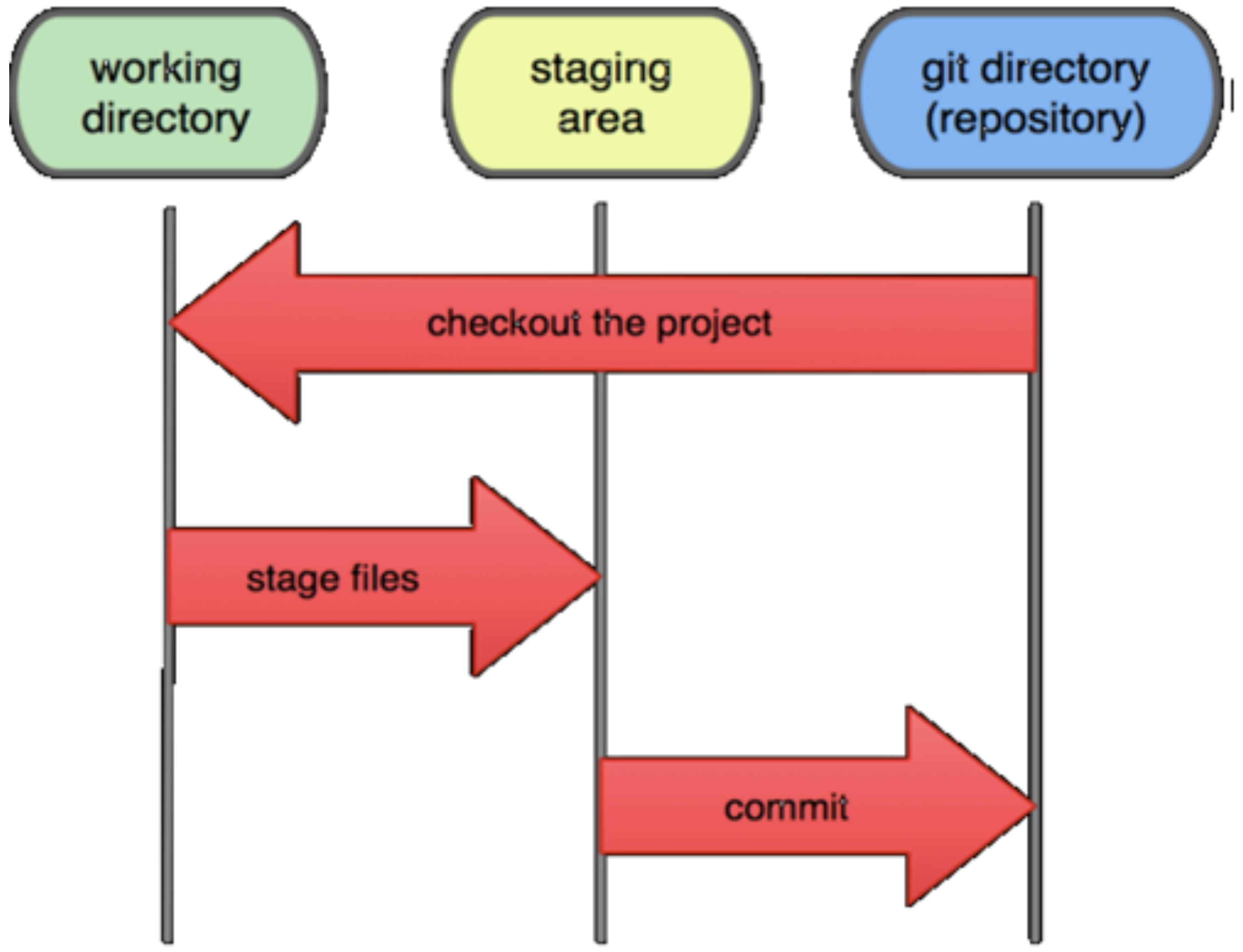
git pull

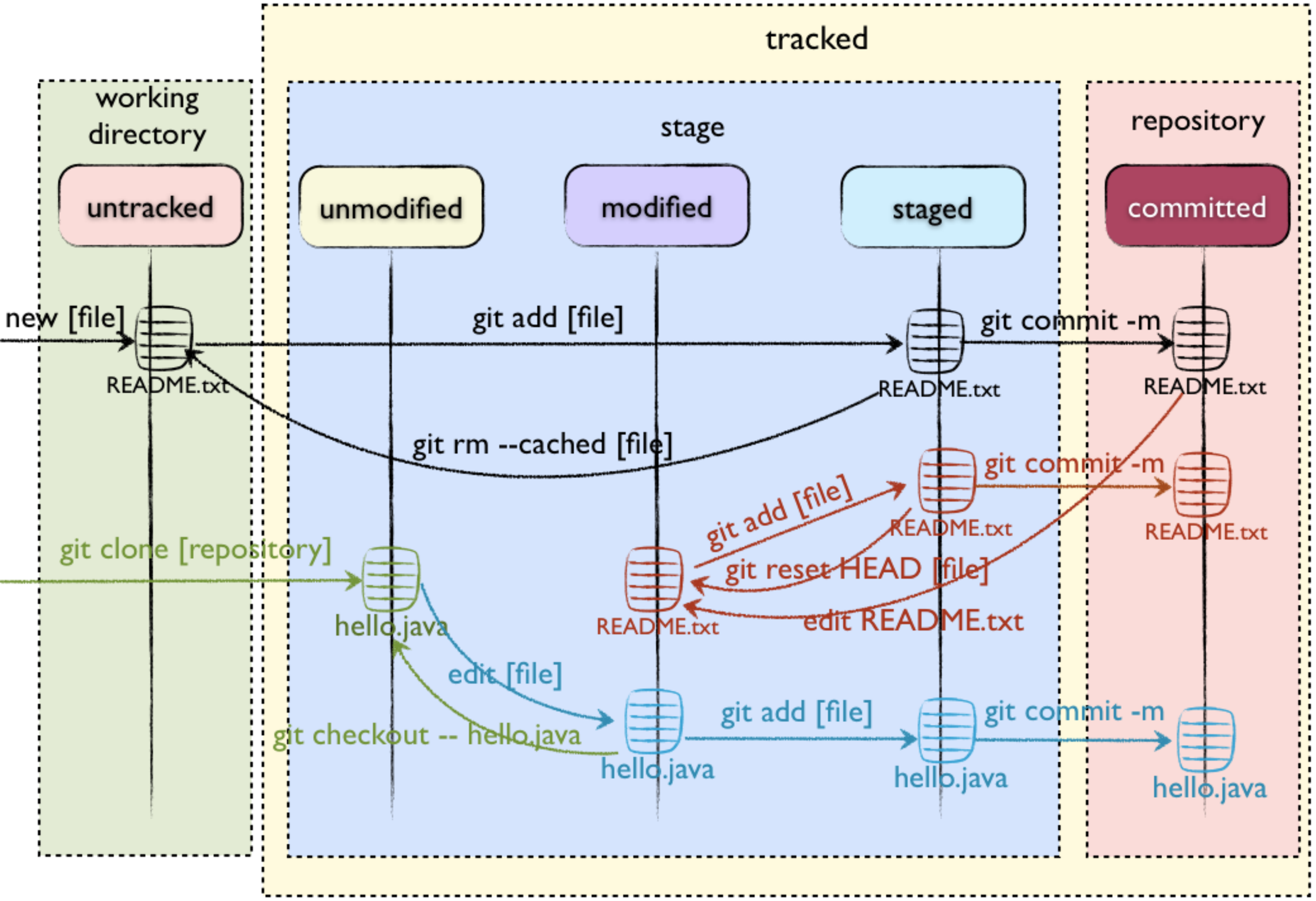
- git fetch origin
- git merge origin/master

git push

- git push origin master
- git push origin :master

2. 工作区、暂存区和版本库


working directory
staging area
git directory (repository)
checkout the project
stage files
commit


tracked
working directory
stage
repository
untracked
unmodified
modified
staged
committed
new [file]
README.txt
git add [file]
README.txt
git commit -m
README.txt
git rm --cached [file]
git commit -m
README.txt
README.txt
git add [file]
git reset HEAD [file]
edit README.txt
README.txt
git clone [repository]
hello.java
edit [file]
git checkout -- hello.java
hello.java
git add [file]
hello.java
git commit -m
hello.java

git commit

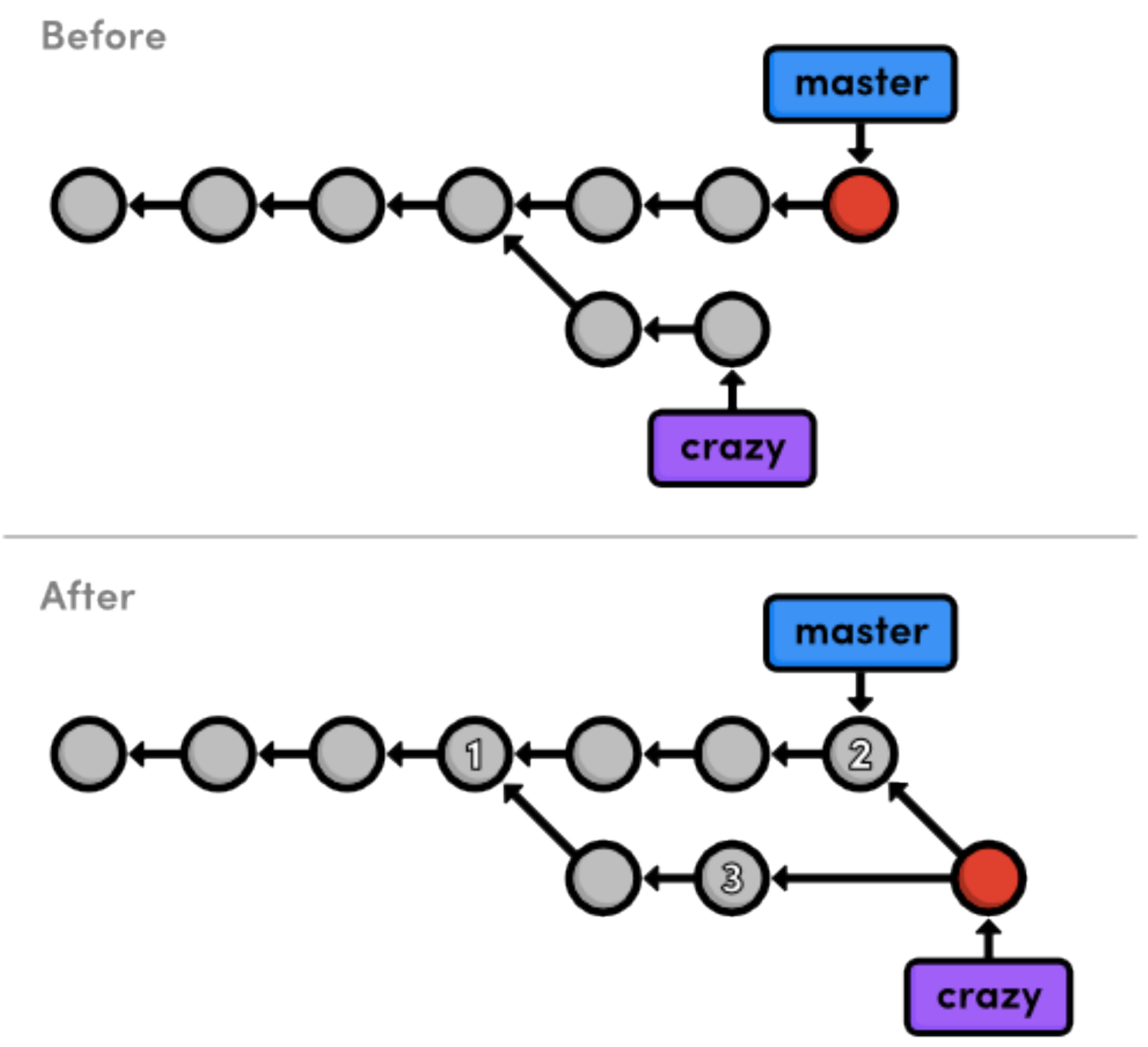
- git commit
- git commit -a
- git commit -a -m ‘what did you do’

git stash

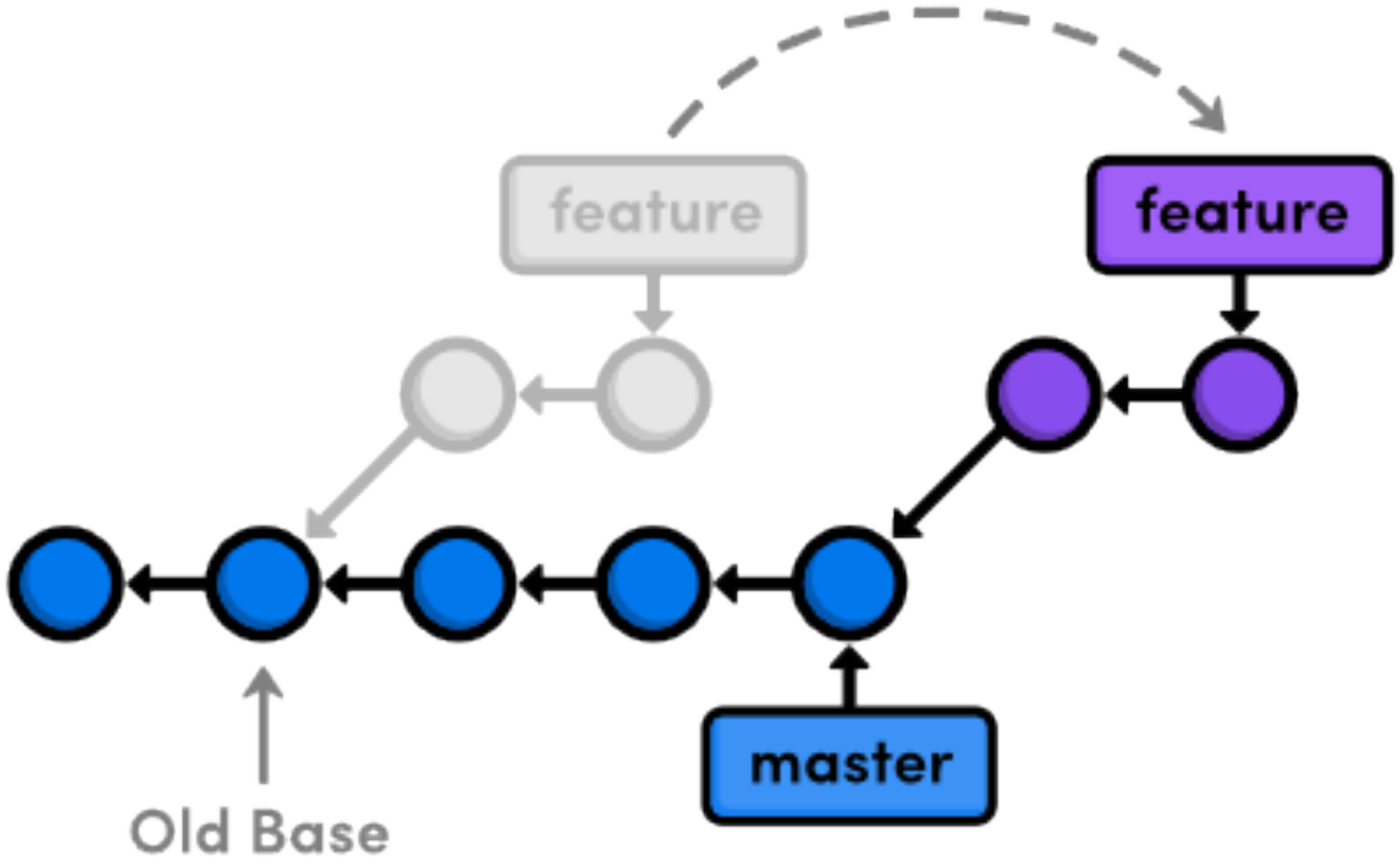
- git stash
- git stash apply
- git stash drop
- git stash pop

3. 分支与合并

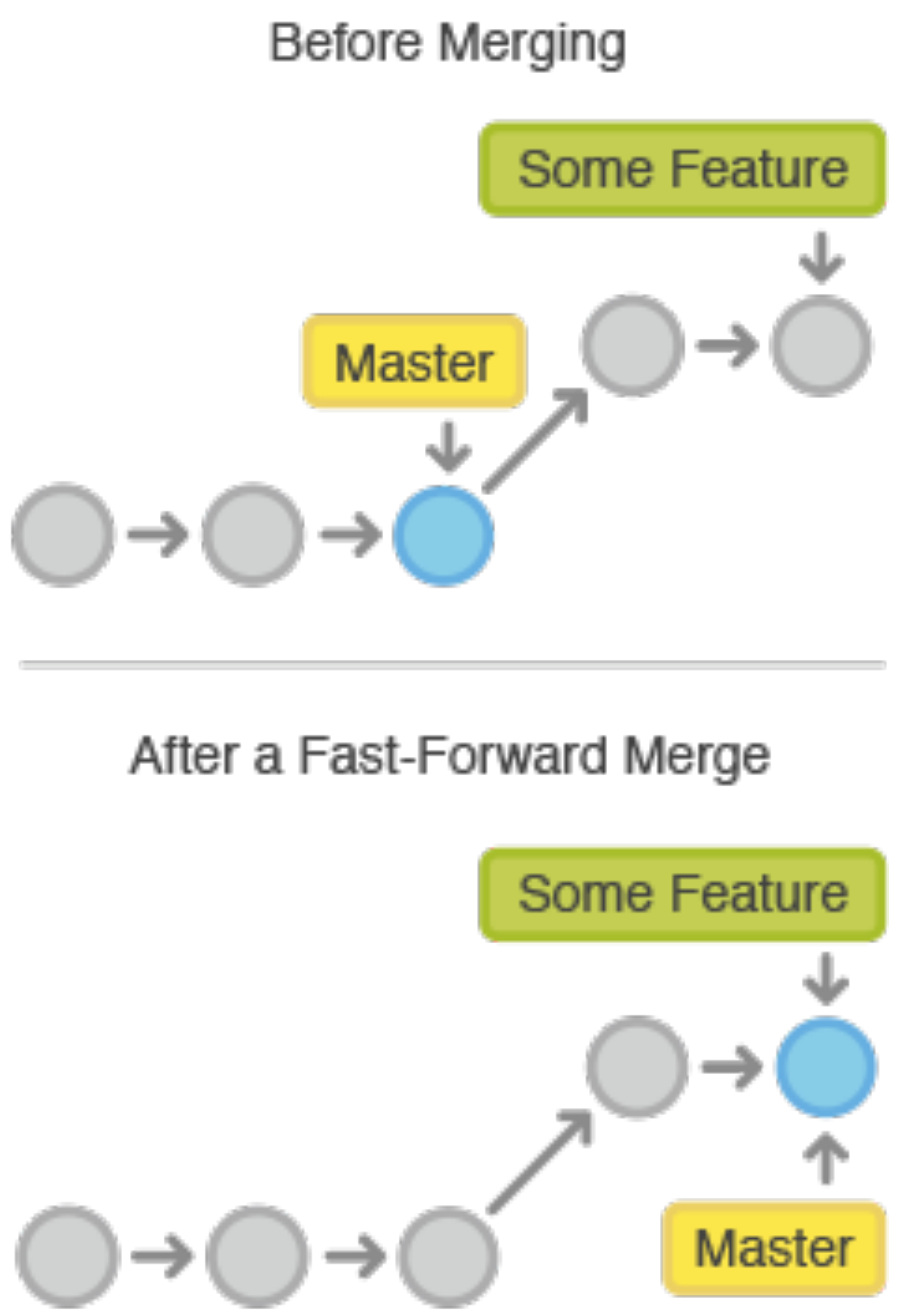
git merge master



git rebase master



git merge master [fast-foreword]

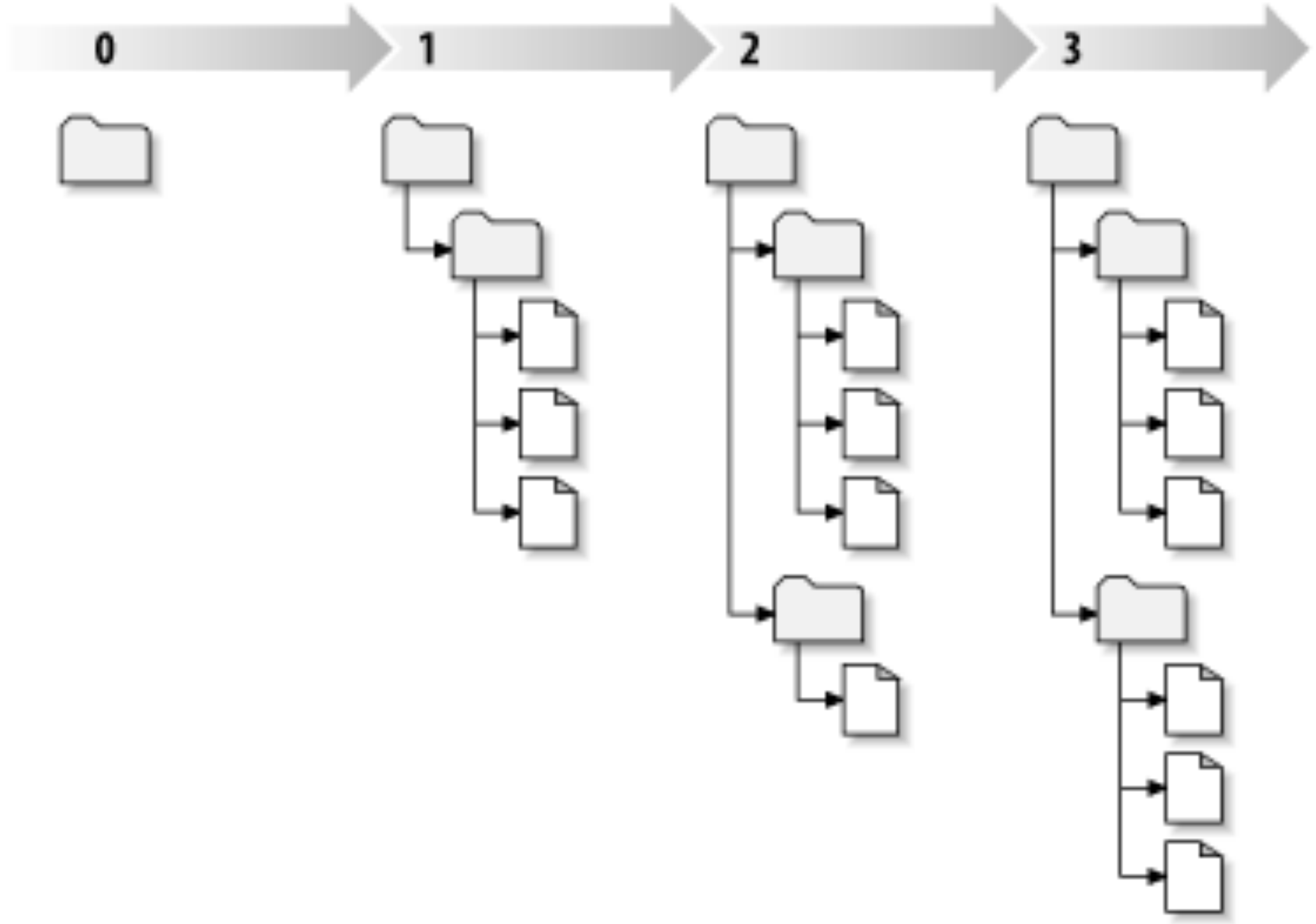


问题

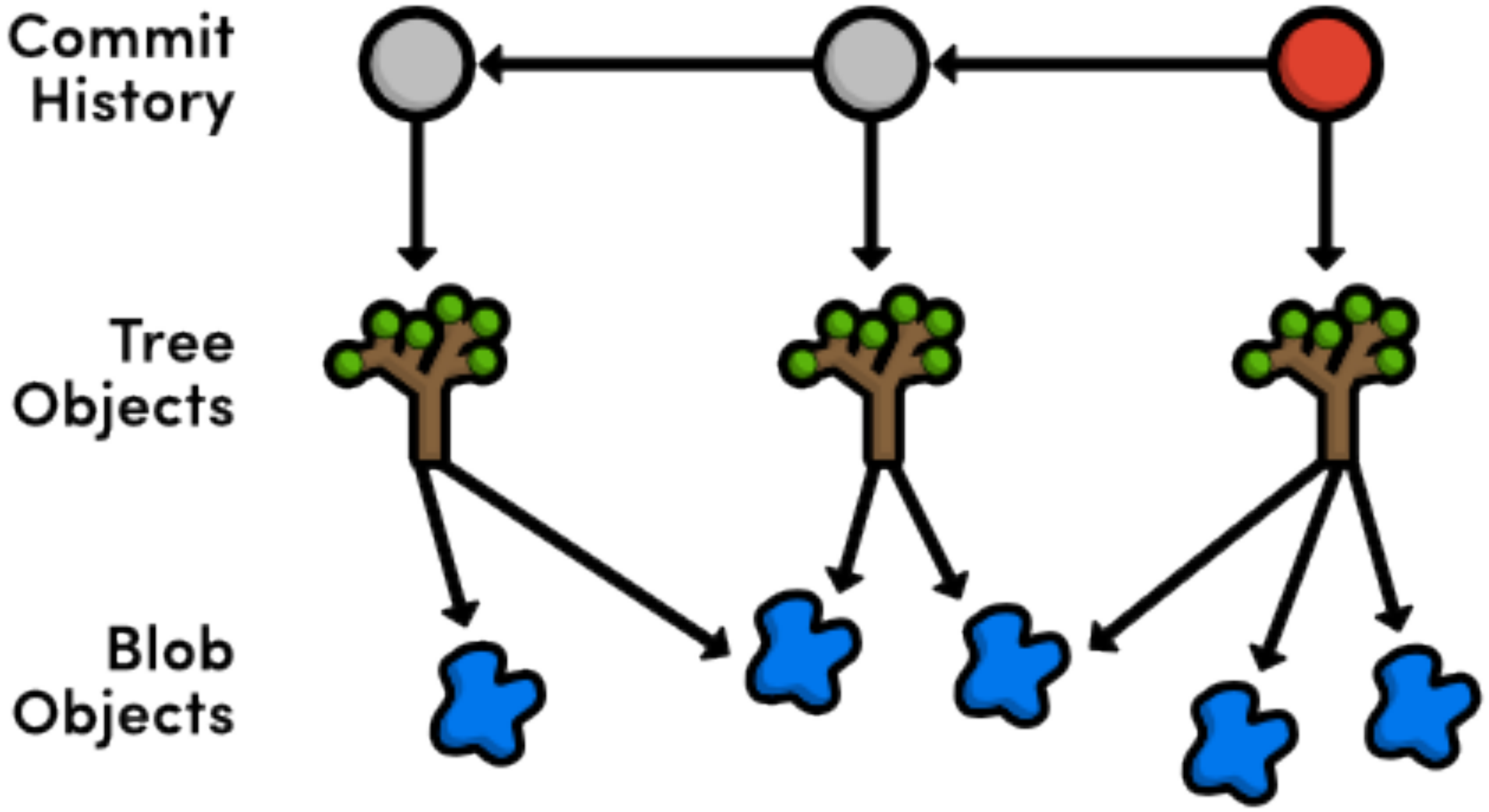
- 两个分支分别开发同一个需求的不同部分，怎么办?
- 比较两个分支，比较不同分支的同一个文件?
- 什么是一个正常的操作流程?
- 如何处理冲突?

4. Git 核心

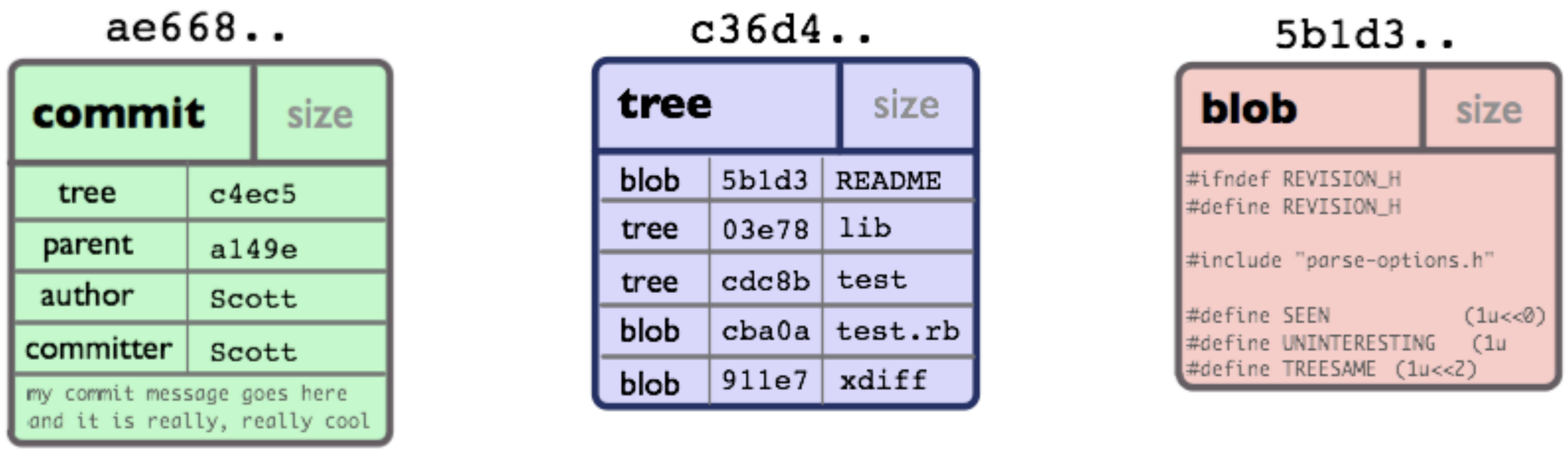
每个版本都快照



快照优化



Object（数据存储）



ae668..

commit	size
tree	c4ec5
parent	a149e
author	Scott
committer	Scott

```
my commit message goes here
and it is really, really cool
```

c36d4..

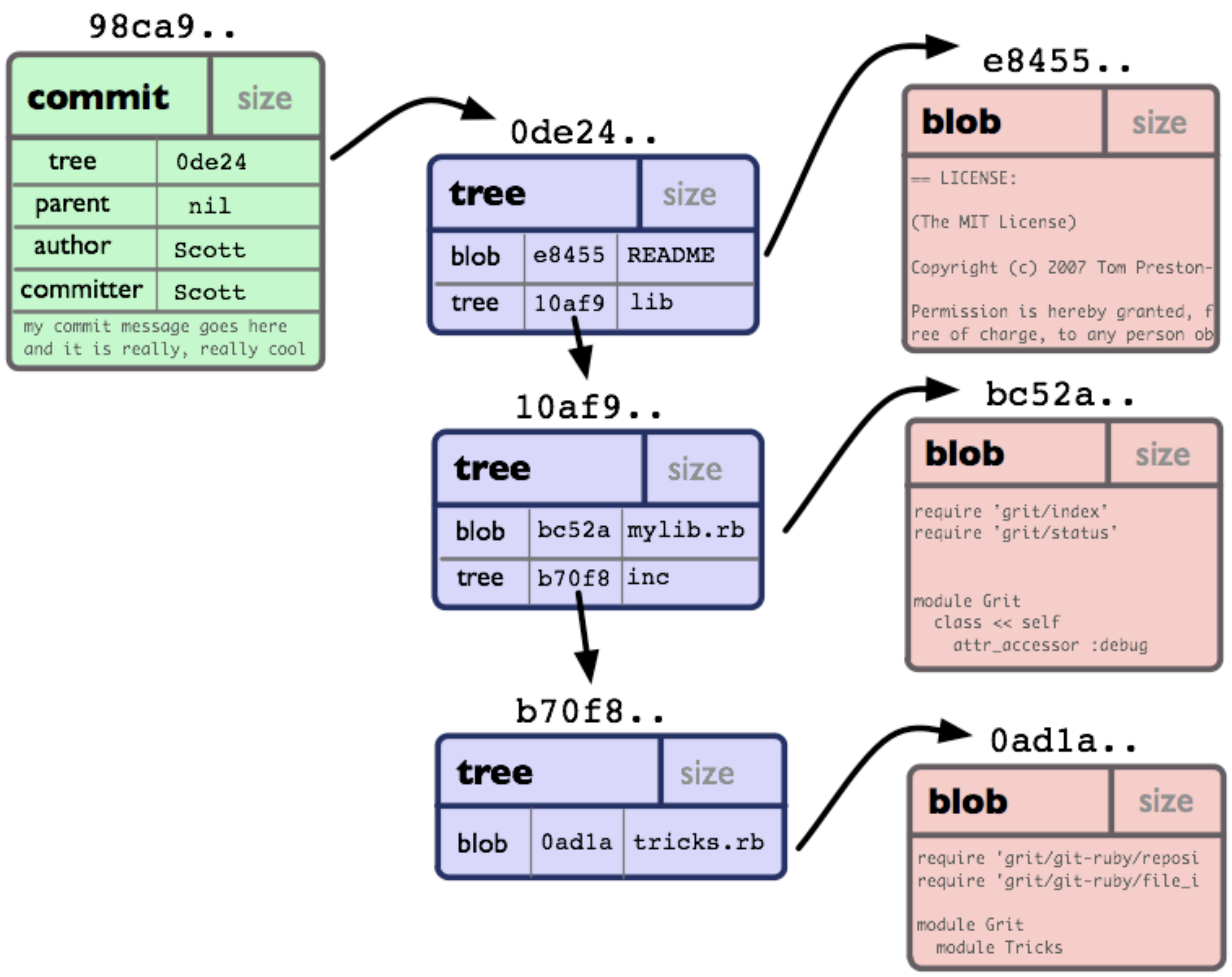
tree	size	
blob	5b1d3	README
tree	03e78	lib
tree	cdc8b	test
blob	cba0a	test.rb
blob	911e7	xdiff

5b1d3..

blob	size

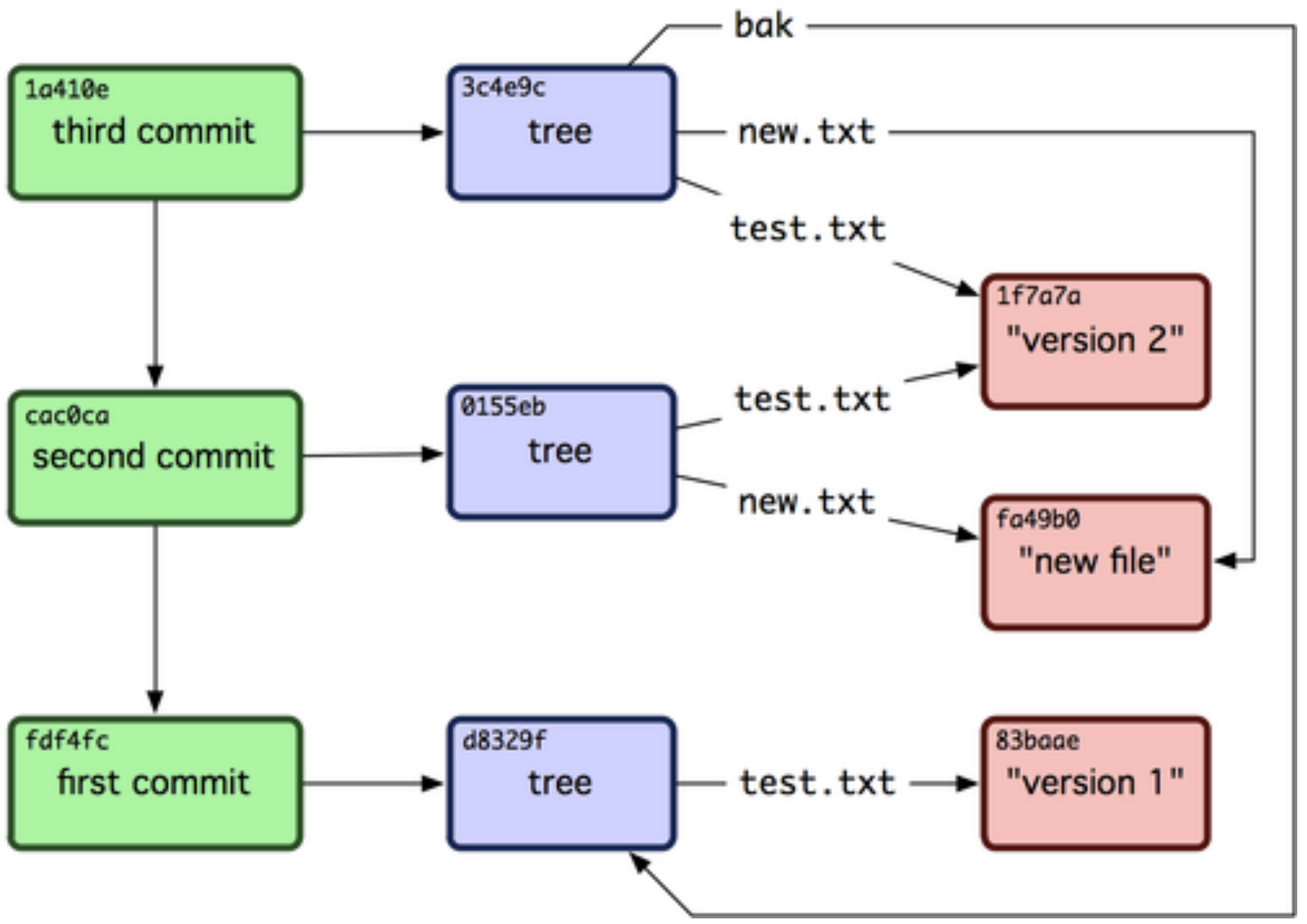
```
#ifndef REVISION_H
#define REVISION_H

#include "parse-options.h"

#define SEEN              (1u<<0)
#define UNINTERESTING   (1u
#define TREESAME  (1u<<2)
```

快照（一个 commit）



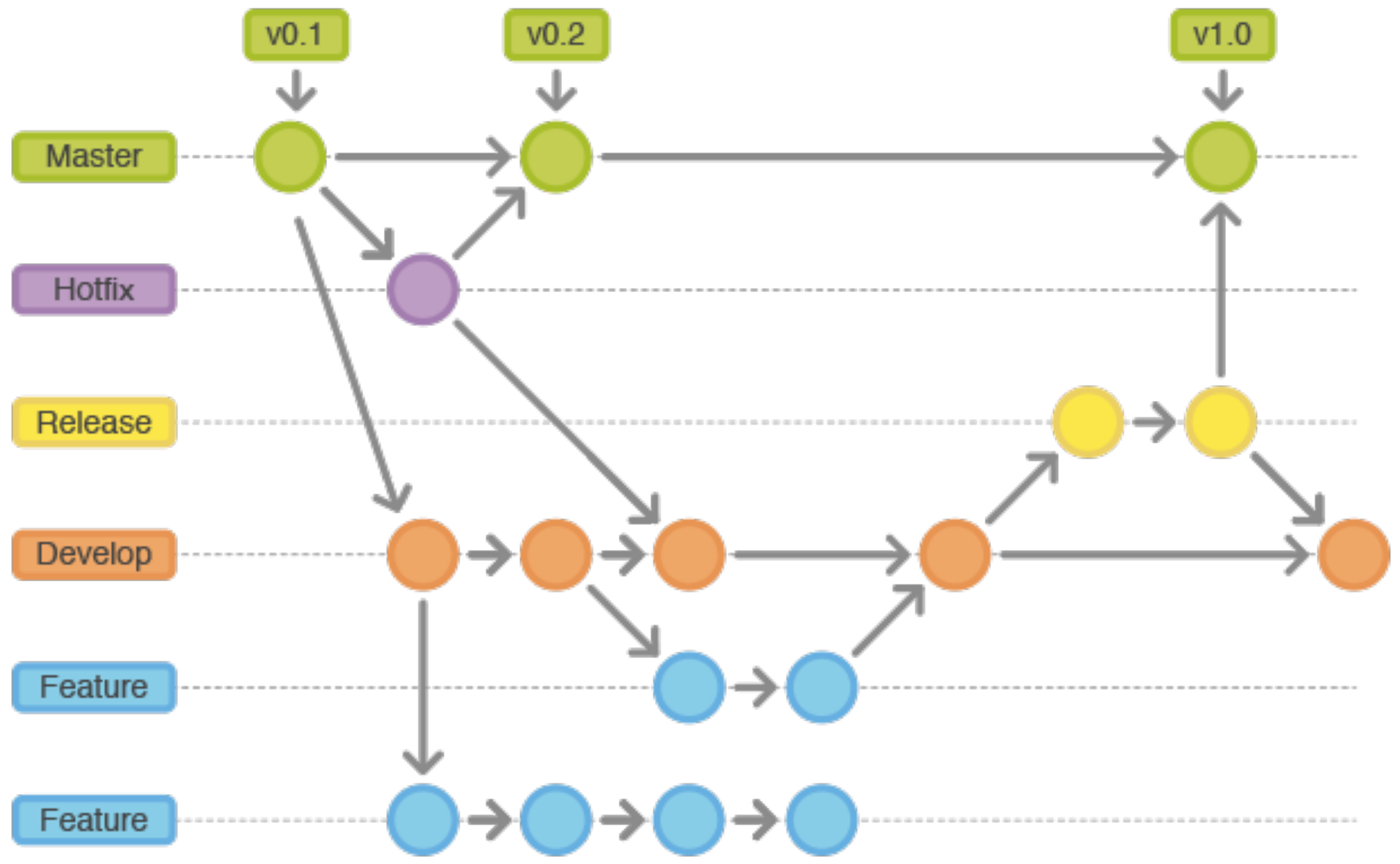
98ca9..
commit
size
tree
0de24
parent
nil
author
Scott
committer
Scott
my commit message goes here
and it is really, really cool
0de24..
tree
size
blob
e8455
README
tree
10af9
lib
10af9..
tree
size
blob
bc52a
mylib.rb
tree
b70f8
inc
b70f8..
tree
size
blob
0ad1a
tricks.rb
e8455..
blob
size
== LICENSE:
(The MIT License)
Copyright (c) 2007 Tom Preston-
Permission is hereby granted, f
ree of charge, to any person ob
bc52a..
blob
size
require 'grit/index'
require 'grit/status'
module Grit
class << self
attr_accessor :debug
0ad1a..
blob
size
require 'grit/git-ruby/reposi
require 'grit/git-ruby/file_i
module Grit
module Tricks

commit link

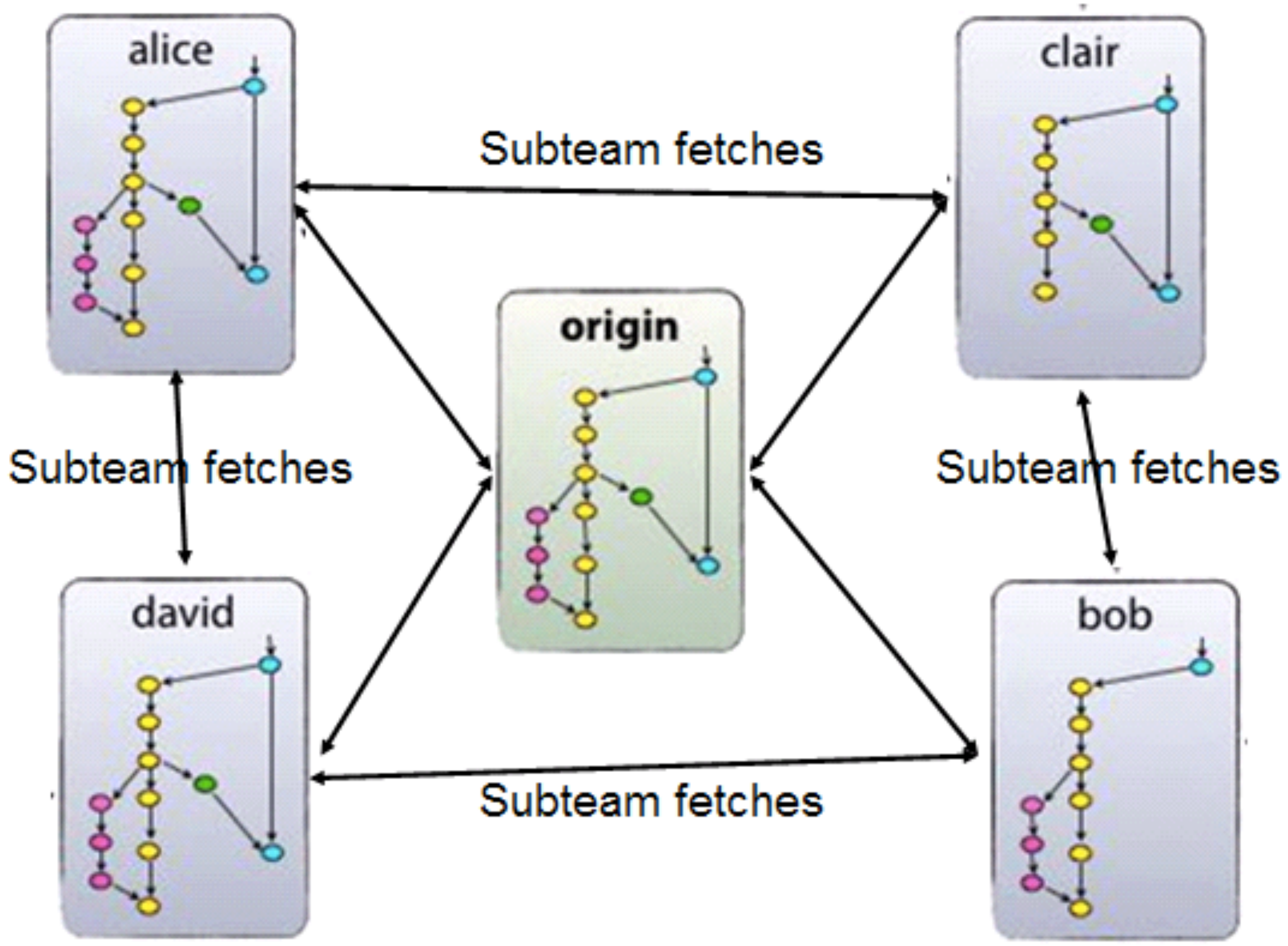


1a410e
third commit
3c4e9c
tree
bak
new.txt
test.txt
1f7a7a
"version 2"
cac0ca
second commit
0155eb
tree
test.txt
new.txt
fa49b0
"new file"
fdf4fc
first commit
d8329f
tree
test.txt
83baae
"version 1"

仓库（commit tree）



分布式


alice
clair
origin
david
bob
Subteam fetches
Subteam fetches
Subteam fetches
Subteam fetches

底层命令

- `find .git/objects -type f | sort`
- `git cat-file -t master`
- `git cat-file commit master`
- `git ls-tree [tree-hash]`

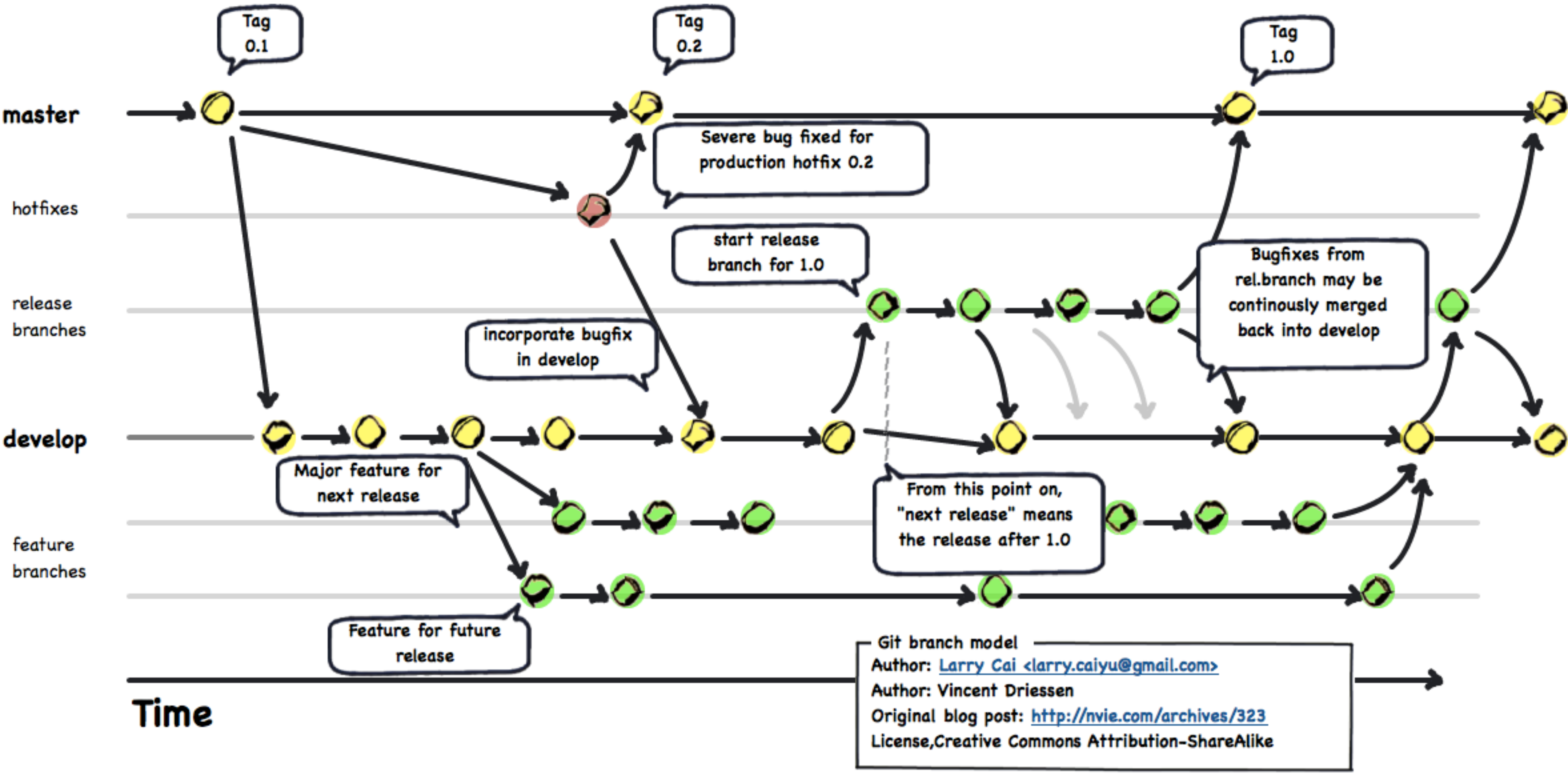
问题

- 分支是什么?
- master 是不是分支?
- tag 是什么?
- HEAD 是什么?

5. 高级命令

- git reflog
- git revert
- git reset –hard
- git commit –amend
- git cherry-pick

6. 基于 git-flow 的工作流


Tag 0.1
Tag 0.2
Tag 1.0
master
hotfixes
release branches
develop
feature branches
Severe bug fixed for production hotfix 0.2
start release branch for 1.0
incorporate bugfix in develop
Bugfixes from rel.branch may be continously merged back into develop
Major feature for next release
From this point on, "next release" means the release after 1.0
Feature for future release
Time

Git branch model
Author: Larry Cai <larry.caiyu@gmail.com>
Author: Vincent Driessen
Original blog post: http://nvie.com/archives/323
License,Creative Commons Attribution-ShareAlike

功能开发

- git fetch && git checkout develop
- git checkout -b feature/change-page-title
- git commit …
- git commit …
- 在 gitlab 上发起 merge request
- git branch -D feature/change-page-title

提交测试

- git fetch && git checkout develop
- git checkout -b release/20150623
- git tag dev_20150623_01
- git push release/20150623
- 在 release/20150623 上修改测试提出的问题
- git commit …
- git commit …
- git tag dev_20150623_02

回归测试

- git checkout release/20150623
- git tag reg_20150623_01
- git push reg_20150623_01

完成上线

- git fetch && git checkout master
- git merge release/20150623
- git tag reg_20150623
- git push origin master reg_20150623

- git fetch && git checkout develop
- git merge release/20150623
- git push origin develop

- git branch -D release/20150623
- git push origin :release/20150623

线上问题

- git checkout reg_20150623
- git checkout -b hotfix/title-error
- 修复线上问题
- git commit …
- git tag hot_20150623_01
- git push hotfix/title-error hot_20150623_01
- git commit …
- git commit …
- git tag hot_20150623_02
- git push hot_20150623_02

成功修复

- git fetch && git checkout master
- git merge hotfix/title-error
- git tag hot_20150623

- git fetch && git checkout develop
- git merge hotfix/title-error
- git push origin master develop hot_20150623

- git branch -D hotfix/title-error
- git push origin :hotfix/title-error

注意

- develop 和 master 是常驻分支
- feature/xxxx release/xxxx hotfix/xxxx 都是临时分支，用完删除
- release 和 hotfix 需要同时合并回 master 和 develop 分支

<u>git flow 备忘清单</u>

还有什么问题?