

# การบริหารจัดการ Source Code ด้วย



# git

สถาบัน ไออีมซี

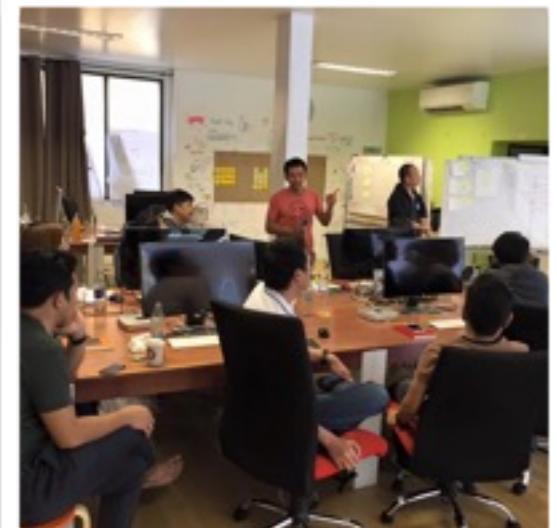
วันพุธที่ 16 - วันพฤหัสบดีที่ 17 มีนาคม พ.ศ. 2559

# บริษัท สยามชานาญกิจ จำกัด

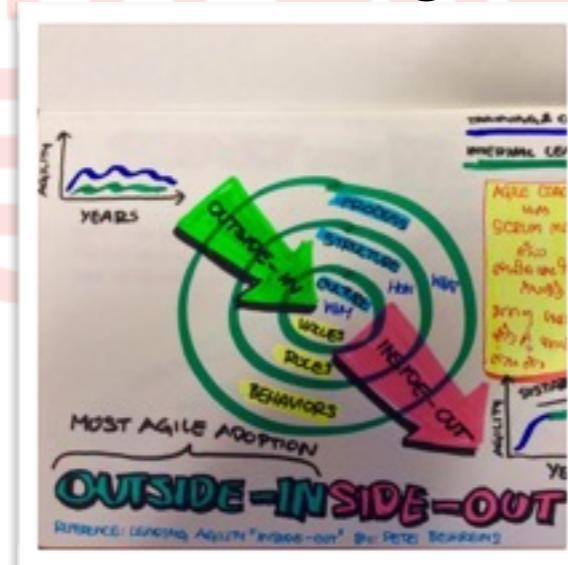
พุทธศักราช ๒๕๕๖

## การพัฒนา Software มันต้องสร้างด้วยแบบนี้ และมีความสุข ทั้งผู้จ้าง ผู้สร้าง และผู้ใช้

Training



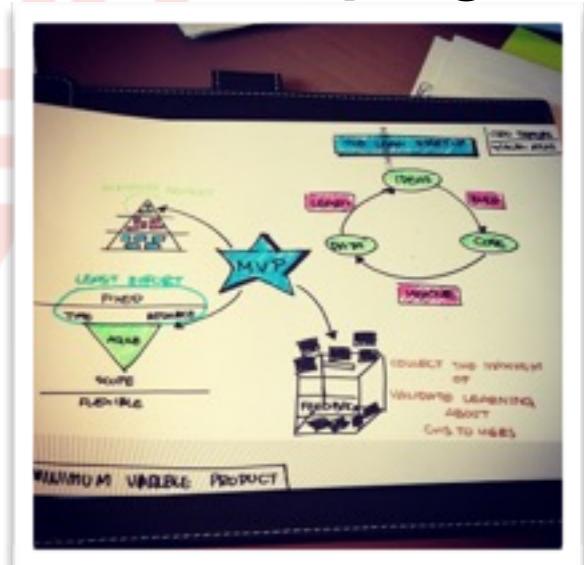
Enabling



Coaching



Developing



Agile for Software Development + Engineering Practices

Software Quality + Software Testing + IT Service Management (ITIL v3)



# สมเกียรติ ปุยสูงเนิน (ปุย)

Developer + Agile Coach + Technical Coach

Agile Practitioner

บริษัท สยามชำนาญกิจ จำกัด

Owner + Blogger @ [somkiat.cc](http://somkiat.cc)

email: [somkiat@scrum123.com](mailto:somkiat@scrum123.com)

twitter: [@somkiat](https://twitter.com/somkiat)

facebook: [facebook.com/somkiatspns](https://facebook.com/somkiatspns)



# รวัชชัย จงสุวรรณไพศาล (บอย)

Developer + Agile Coach + Technical Coach

Agile Practitioner

บริษัท สยามชำนาญกิจ จำกัด

email: [thawatchai@scrum123.com](mailto:thawatchai@scrum123.com)

twitter: @boyone

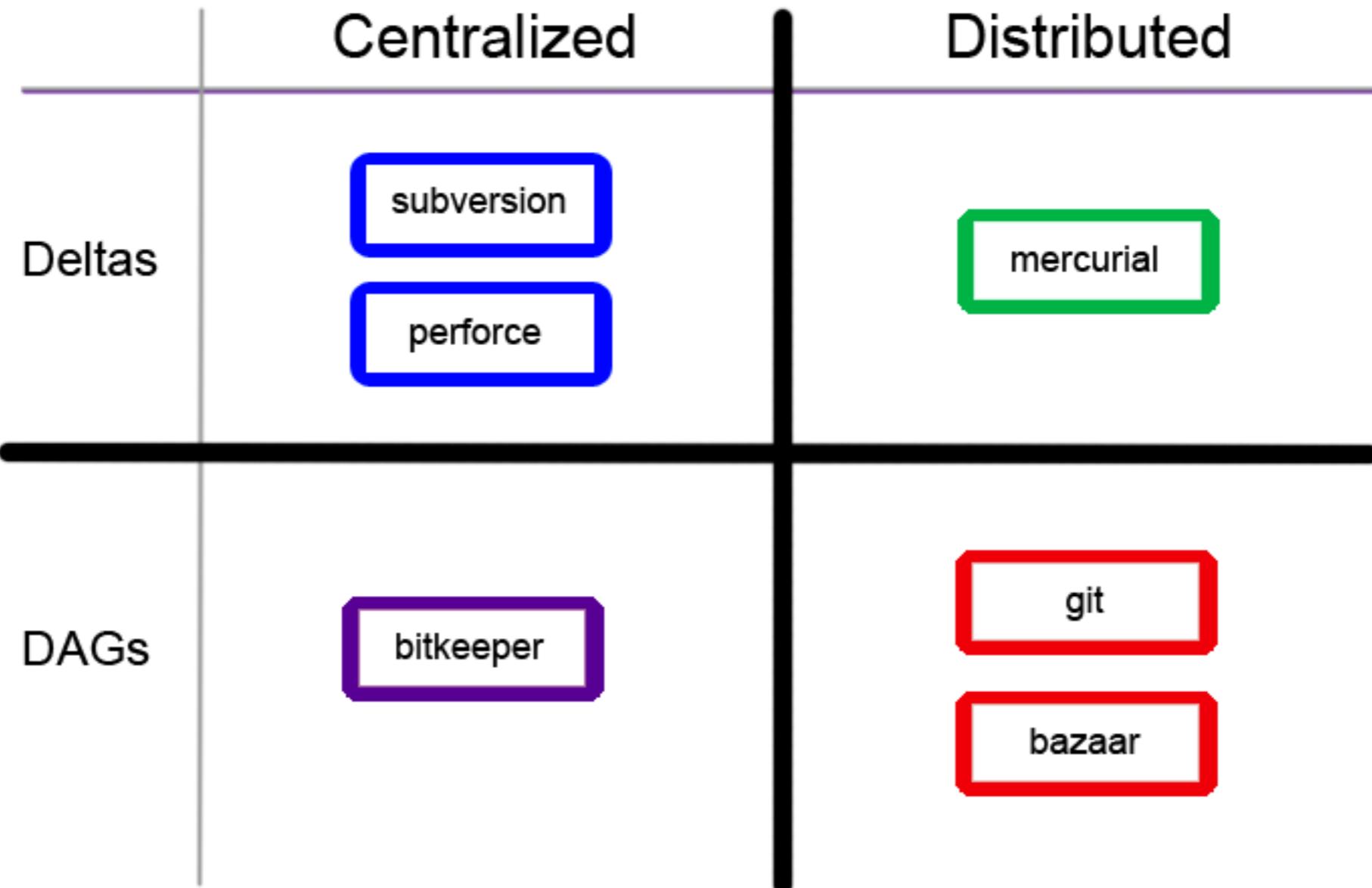
facebook: [facebook.com/boyone](https://facebook.com/boyone)



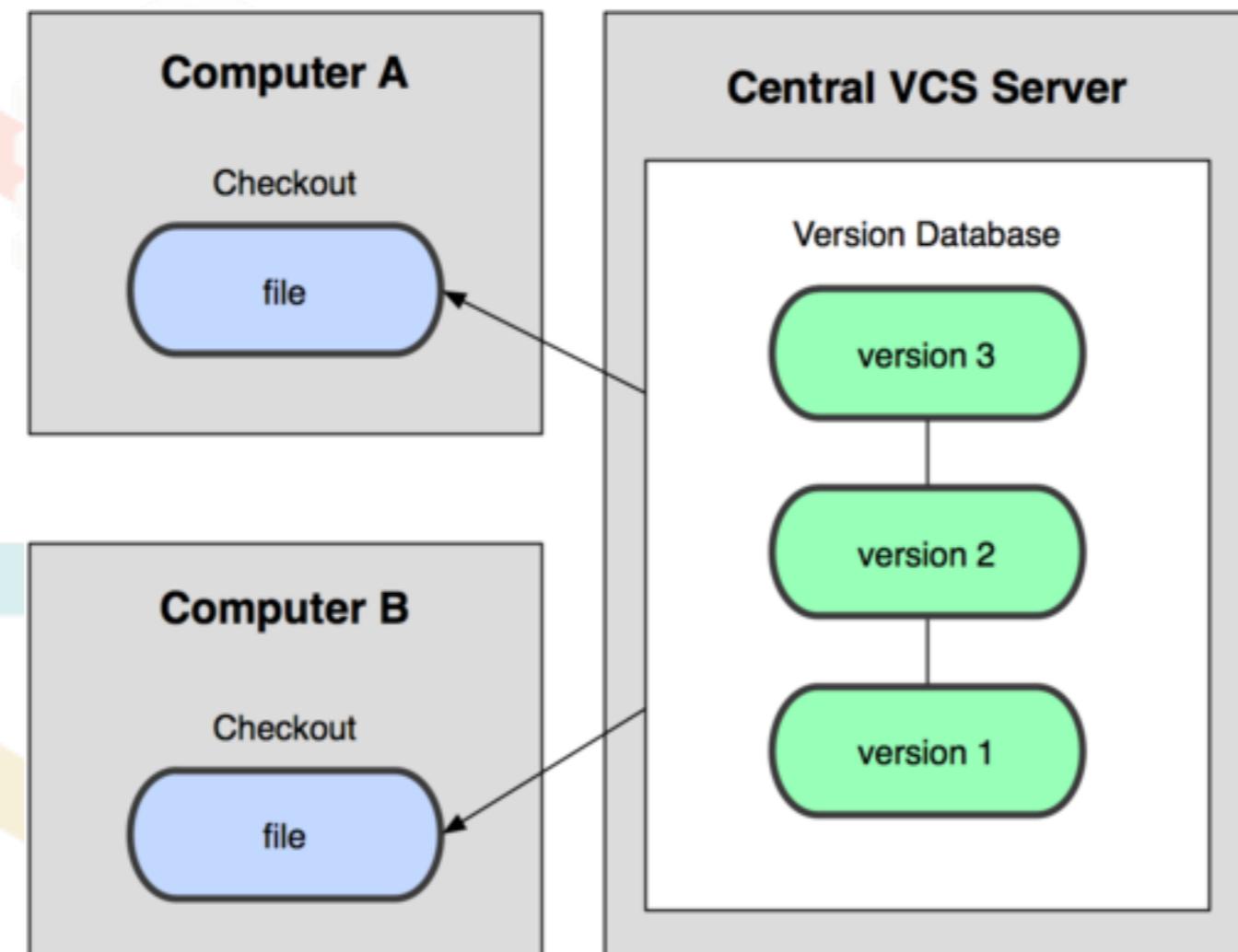


KEEP  
CALM  
AND  
GIT PUSH  
ORIGIN MASTER

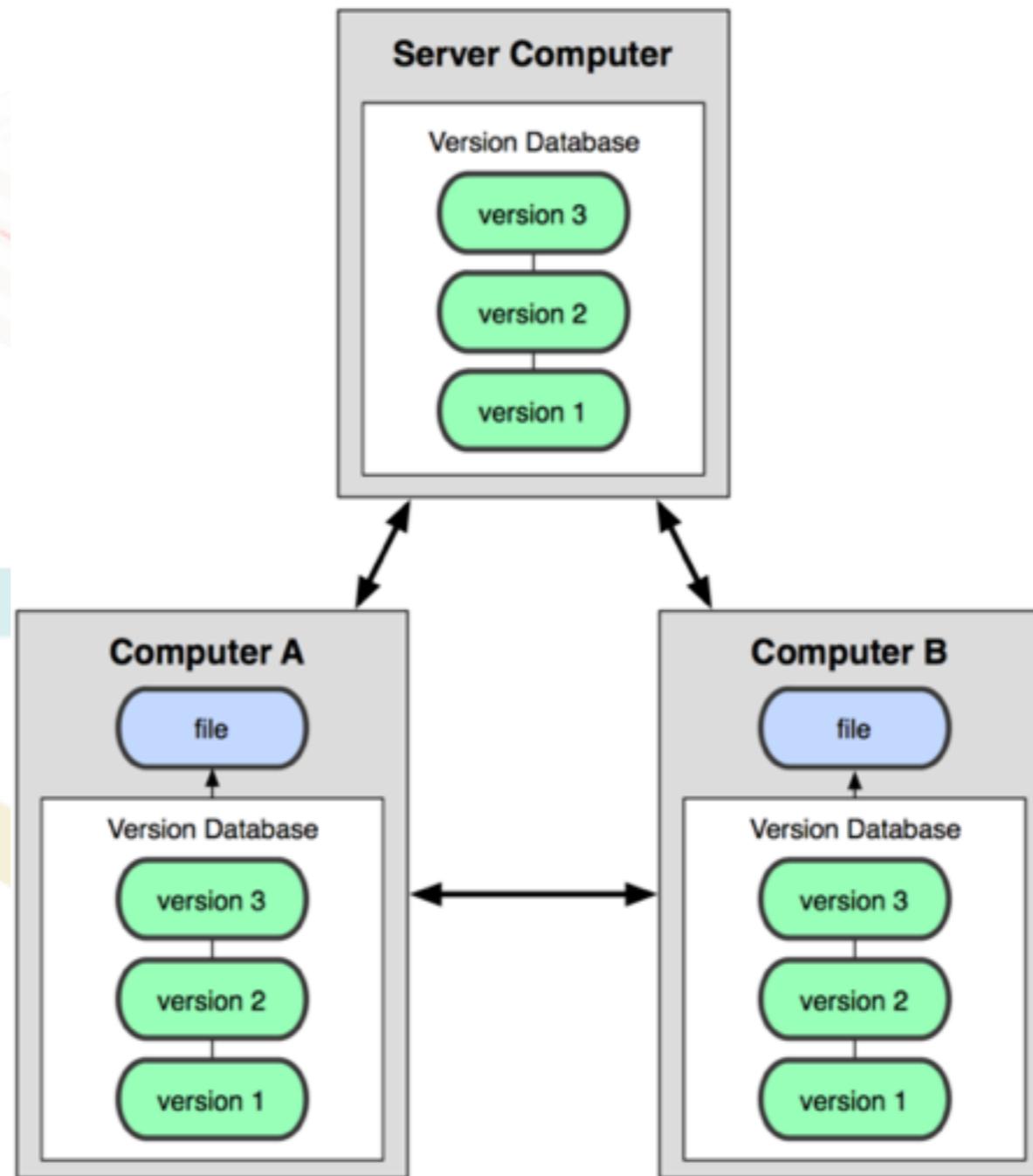
# Version Control



# Centralized Version Control

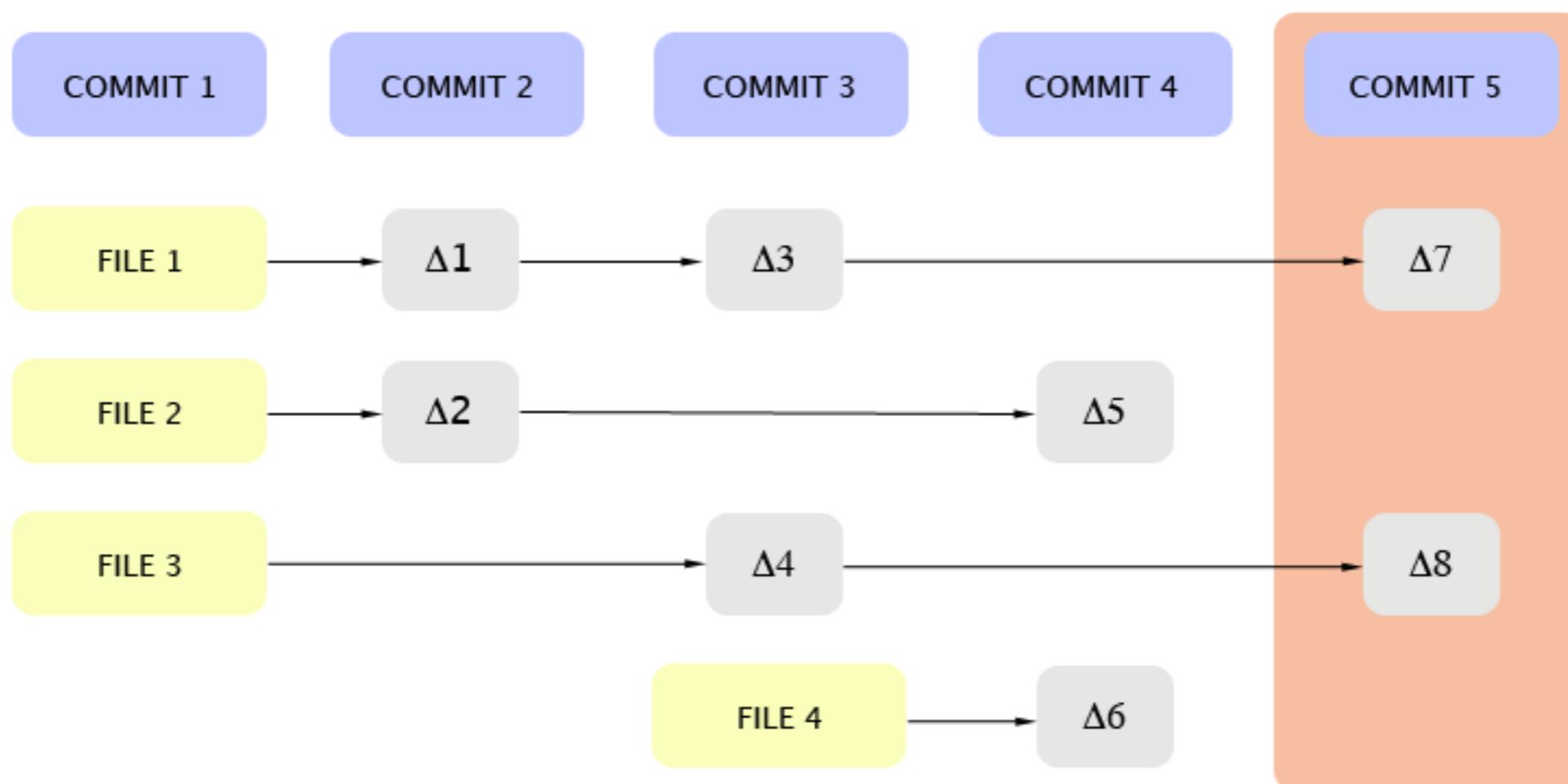


# Distributed Version Control



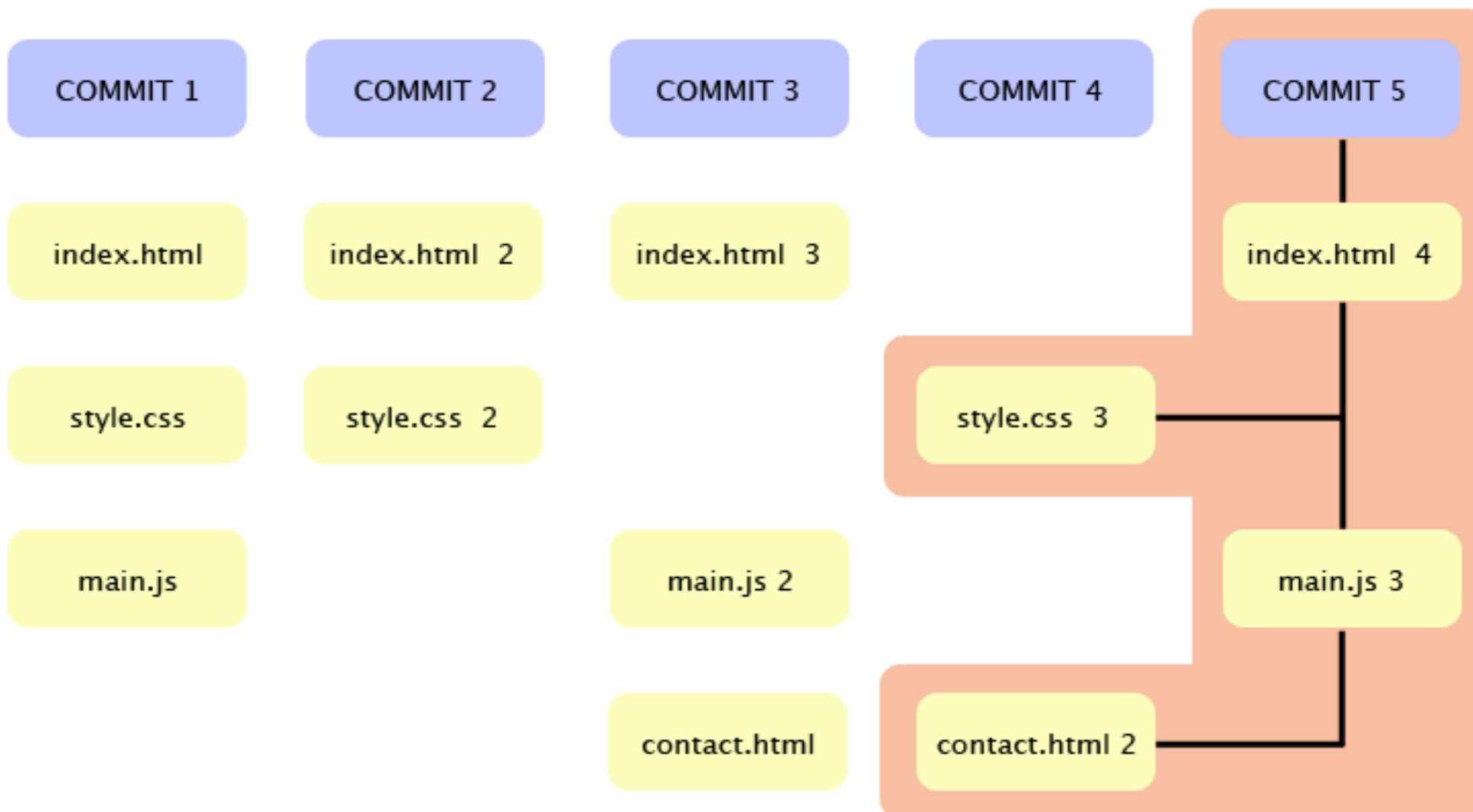
# Delta Repository

## DELTA-BASED REPOSITORY



# DAG Repository

## DAG-BASED REPOSITORY



# เป้าหมายของการออกแบบ Git

Speed

Simple design

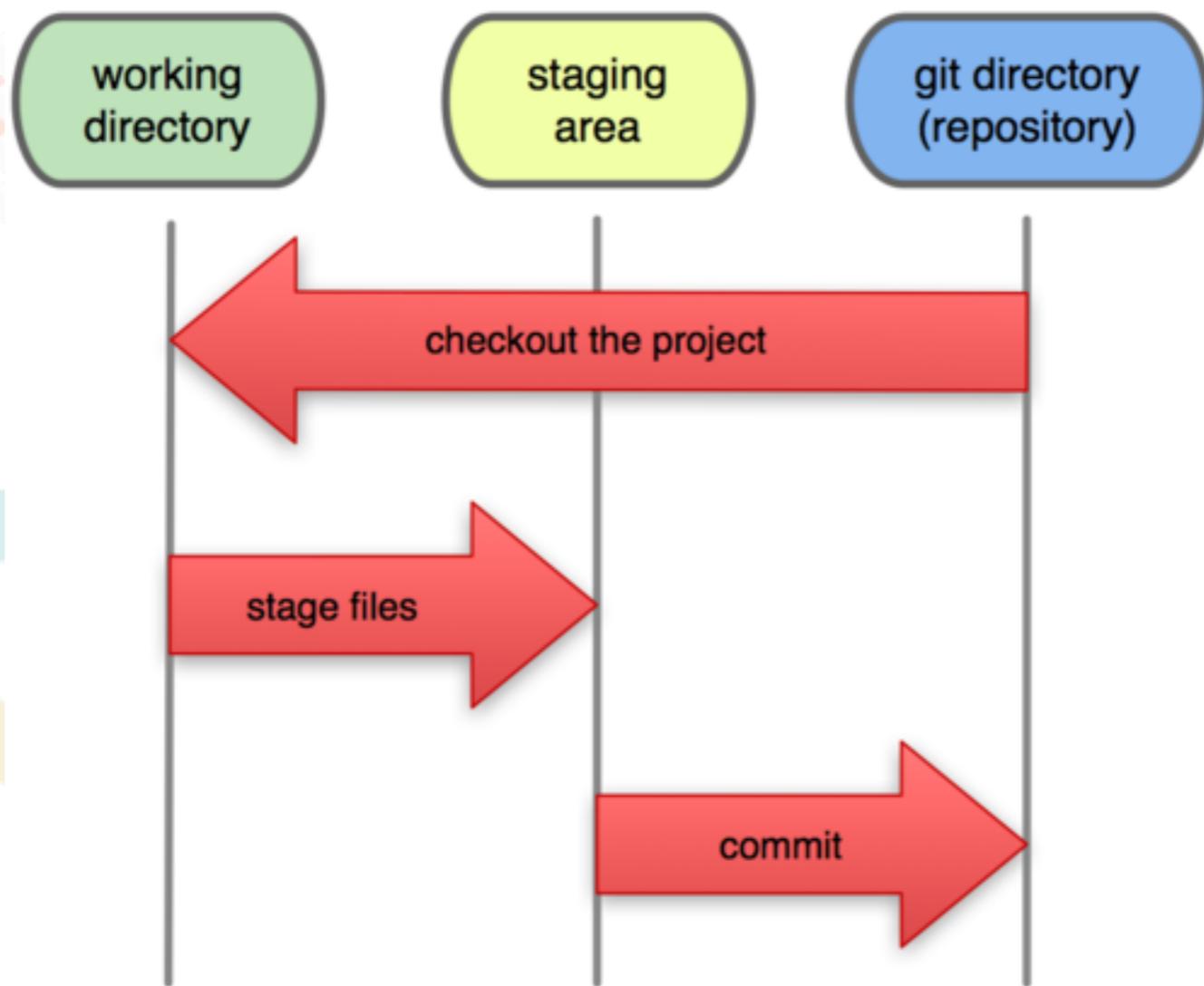
Support for many parallel branches

Fully distributed

To handle large project like Linux kernel

# Git Workflow

## Local Operations



# Who use Git

## Companies & Projects Using Git

Google

facebook

Microsoft

twitter

LinkedIn

NETFLIX



# Practice Git on Browser

<https://try.github.io>

## 1.1 · Got 15 minutes and want to learn Git?

Git allows groups of people to work on the same documents (often code) at the same time, and without stepping on each other's toes. It's a distributed version control system.

Our terminal prompt below is currently in a directory we decided to name "octobox". To initialize a Git repository here, type the following command:

git init

A screenshot of a terminal window titled "TryGit—1155x310". The window has a dark background and a light gray header bar. In the header bar, there are three small circular icons on the left and a house icon followed by "TryGit—1155x310" on the right. The main area of the terminal shows the text "Press enter to submit commands" followed by a single greater-than sign (>) indicating where input is expected.

# Install Git

<http://git-scm.com/>

The screenshot shows the official Git website (<http://git-scm.com/>). At the top left is the Git logo with the tagline "git --distributed-even-if-your-workflow-isnt". A search bar is at the top right. The main content area features two columns of text and icons. The left column highlights Git's distributed nature with a diagram of seven white boxes connected by red and blue lines. The right column features a large graphic of a tablet displaying the latest source release information. Below the main content are four circular icons with text: "About", "Documentation", "Downloads", and "Community".

**git** --distributed-even-if-your-workflow-isnt

Search entire site...

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

Git is **easy to learn** and has a **tiny footprint with lightning fast performance**. It outclasses SCM tools like Subversion, CVS, Perforce, and ClearCase with features like **cheap local branching**, convenient **staging areas**, and **multiple workflows**.

Learn Git in your browser for free with [Try Git](#).

**About**  
The advantages of Git compared to other source control systems.

**Documentation**  
Command reference pages, Pro Git book content, videos and other material.

**Downloads**  
GUI clients and binary releases for all major platforms.

**Community**  
Get involved! Bug reporting, mailing list, chat, development

Latest source Release  
**2.7.3**  
Release Notes (2016-03-10)  
[Downloads for Mac](#)

# Configuration Git on Local Machine

```
$git config --global user.name “your name”
```

```
$git config --global user.email “your email”
```

```
$git config -l
```

# Create a repository

Windows

Select git bash

Mac or  
Linux

Open Terminal

\$mkdir *workspace*

\$git **init**

# Repository structure

\$git **init**

```
.git
├── HEAD
├── branches
├── config
├── description
└── hooks
    ├── applypatch-msg.sample
    ├── commit-msg.sample
    ├── post-update.sample
    ├── pre-applypatch.sample
    ├── pre-commit.sample
    ├── pre-push.sample
    ├── pre-rebase.sample
    ├── prepare-commit-msg.sample
    └── update.sample
├── info
│   └── exclude
└── objects
    ├── info
    └── pack
└── refs
    ├── heads
    └── tags
```

# Checking the status

\$touch *README*

\$git **status**

```
On branch master
```

```
Initial commit
```

```
Untracked files:
```

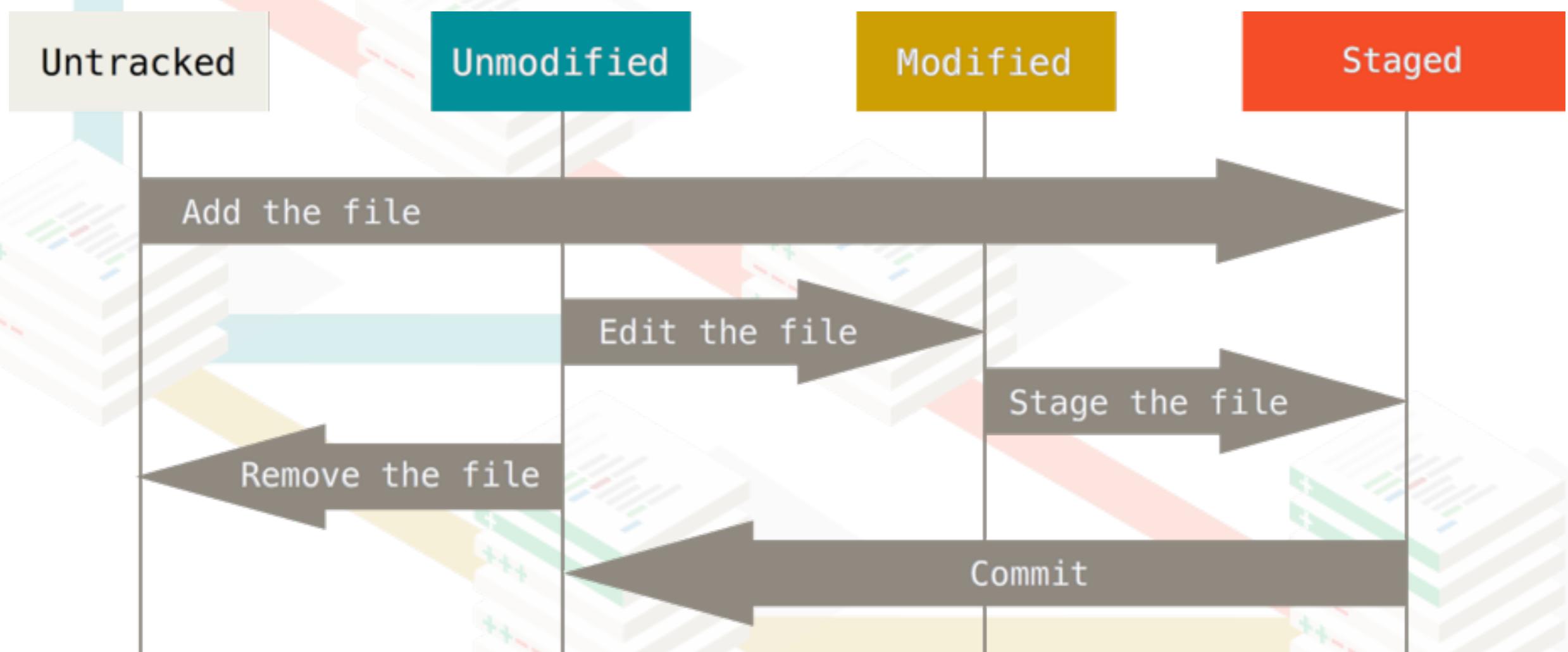
```
(use "git add <file>..." to include in what will be committed)
```

```
 README
```

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

# Lift Cycle of File Status

```
$touch README
```



# Checking the status

```
$git add README
```

```
$git status
```

```
On branch master
```

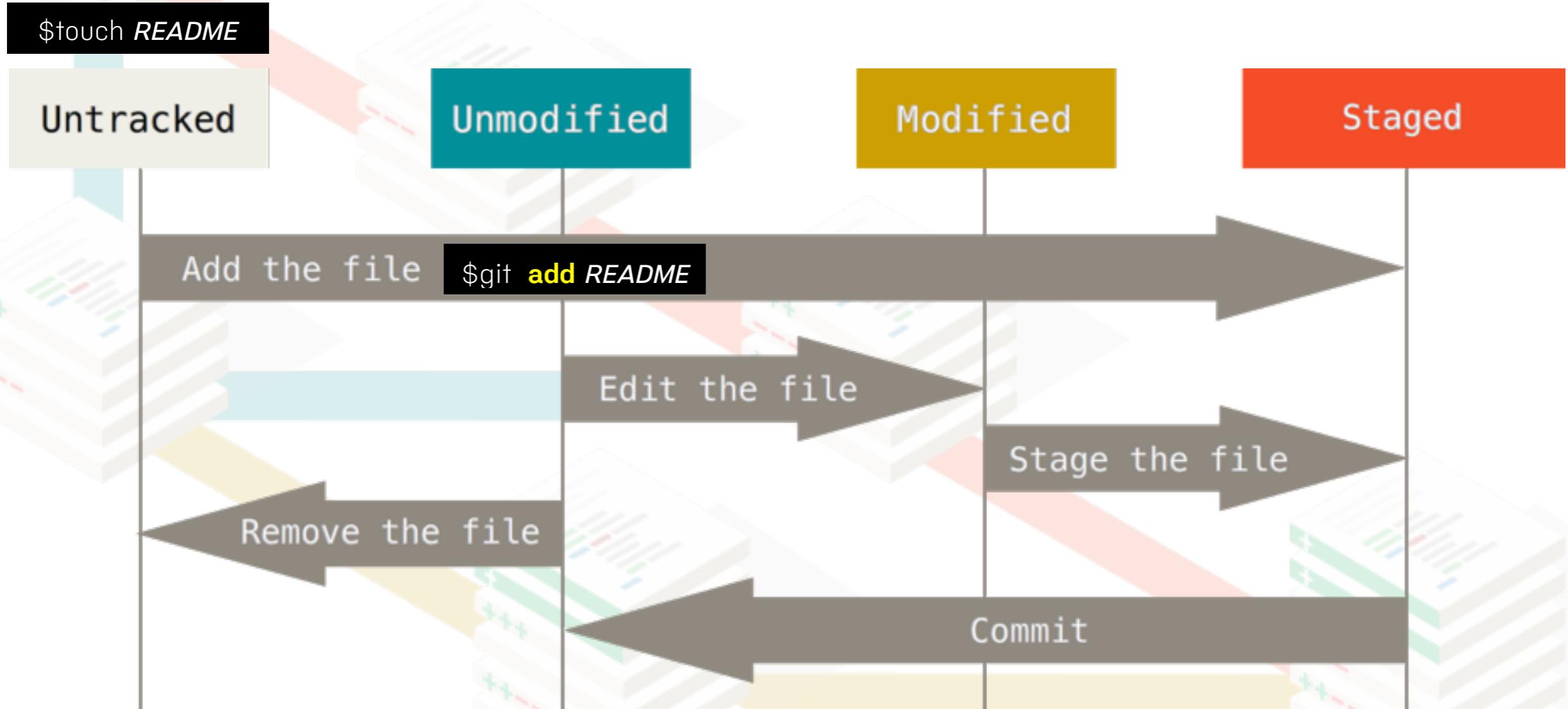
```
Initial commit
```

```
Changes to be committed:
```

```
(use "git rm --cached <file>..." to unstage)
```

```
new file: README
```

# Lift Cycle of File Status



# Ignore files and folders

\$touch *.gitignore*

\$vi *.gitignore*

\$git **add** *.gitignore*

\$git **status**

# View staged and unstaged change

\$echo "test" > README

\$git **status**

```
On branch master
Initial commit

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

    new file:  .gitignore
    new file:  README

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

    modified:   README
```

# See difference of file

\$git **diff**

```
diff --git a/README b/README
index e69de29..9daeafb 100644
--- a/README
+++ b/README
@@ -0,0 +1 @@
+test
```

# See difference of file with history

\$git **diff** --cached

\$git **diff** --staged

```
diff --git a/.gitignore b/.gitignore
new file mode 100644
index 0000000..e69de29
diff --git a/README b/README
new file mode 100644
index 0000000..e69de29
```

# Commit your changes

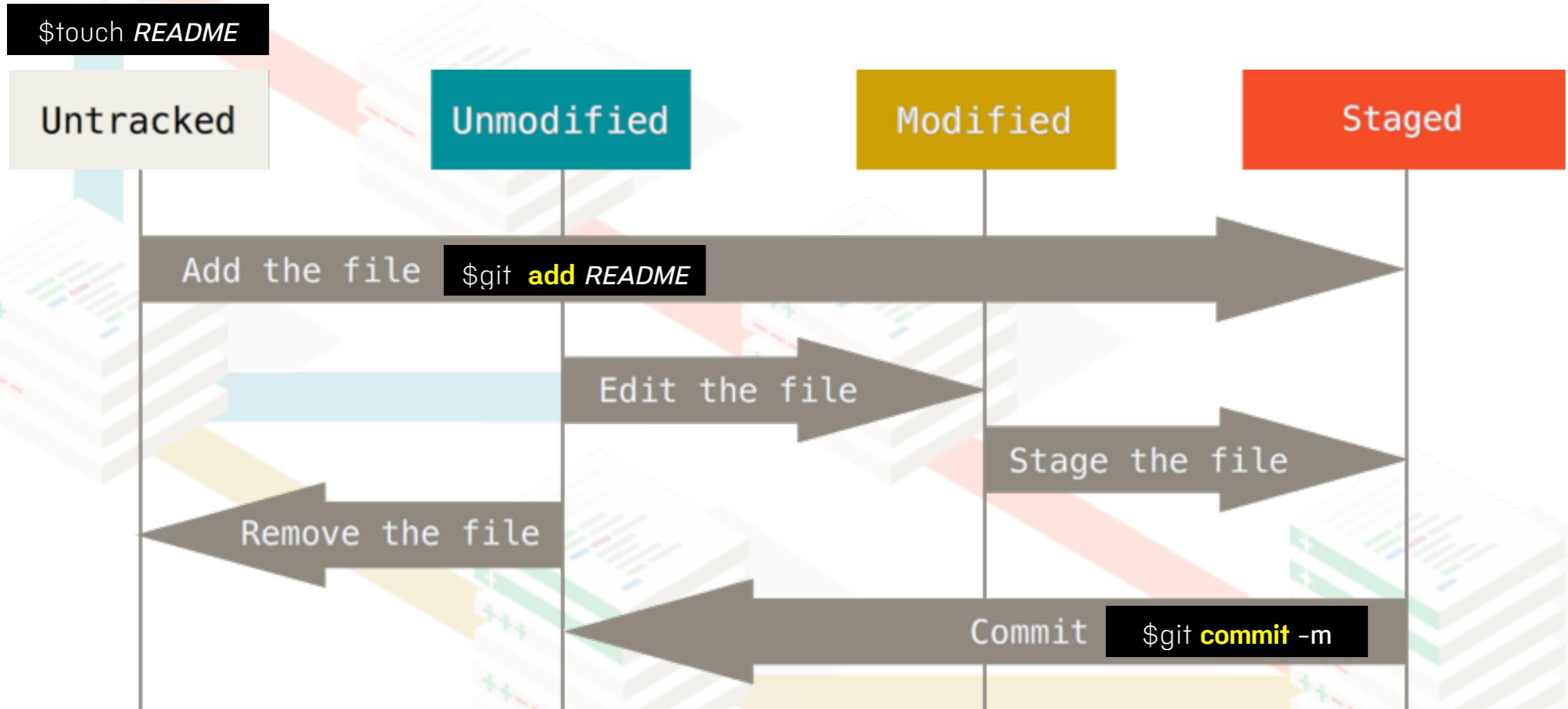
\$git **commit** -m “*Message for this change*”

```
[master (root-commit) aed0048] Your message  
2 files changed, 1 insertion(+)  
create mode 100644 .gitignore  
create mode 100644 README
```

tips

\$git **commit** -a -m “*Message for this change*”

# Lift Cycle of File Status



# Remove your files

\$rm *README*

\$git **status**

```
On branch master
Changes not staged for commit:
  (use "git add/rm <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

    deleted:    README

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

# Remove your files

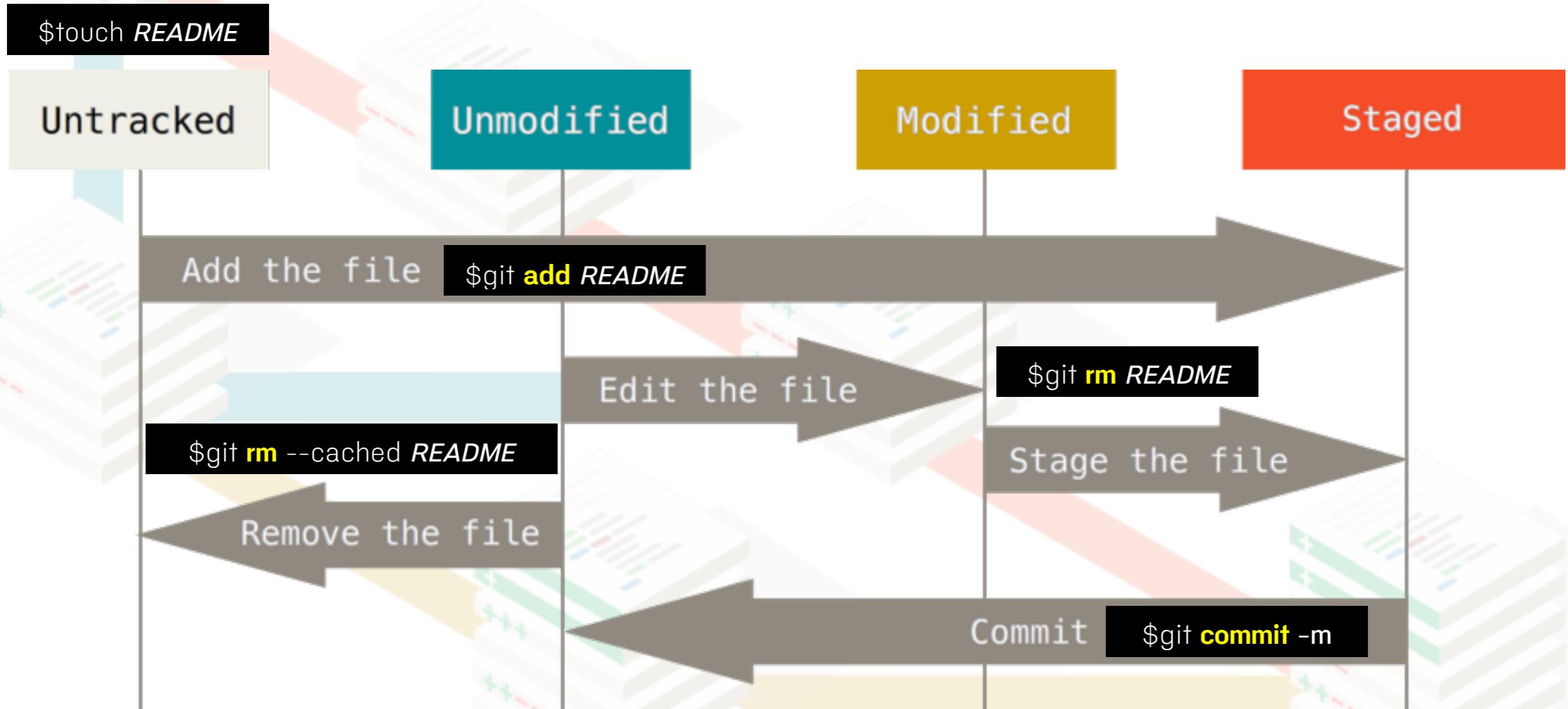
```
$git rm README
```

```
$git status
```

```
On branch master
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

    deleted:    README
```

# Lift Cycle of File Status



# Try to reset README file

\$git **WHAT COMMAND?**

\$git **help**

\$git [

\$git **status**

On branch master  
nothing to commit, working directory clean

# Move your files

```
$git mv README README.MD
```

```
$git status
```

```
On branch master
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

    renamed:    README -> README.md
```

# Move your files

\$git **mv** *README README.MD*

**\$mv README README.MD**

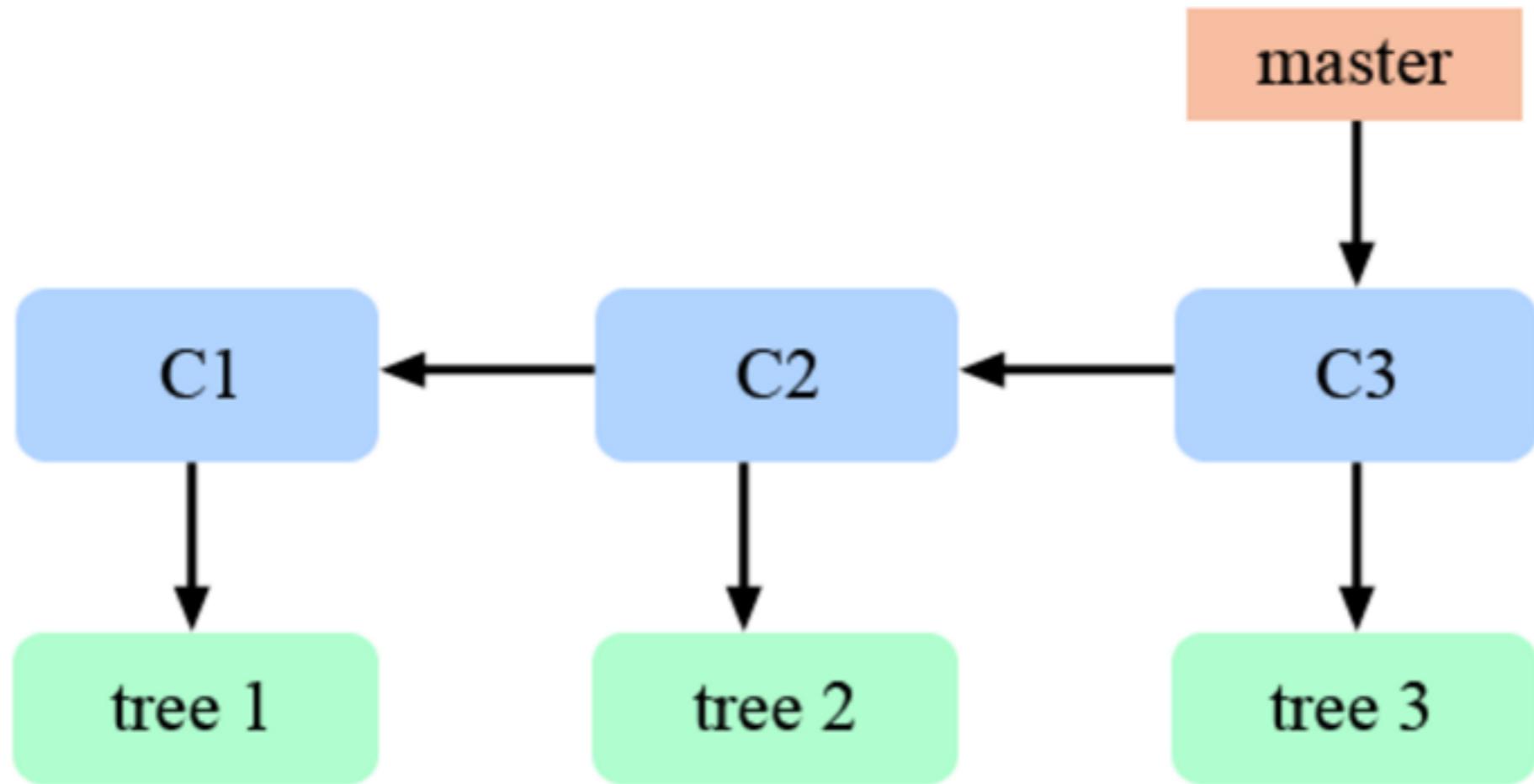
**\$git rm README**

**\$git add README.md**



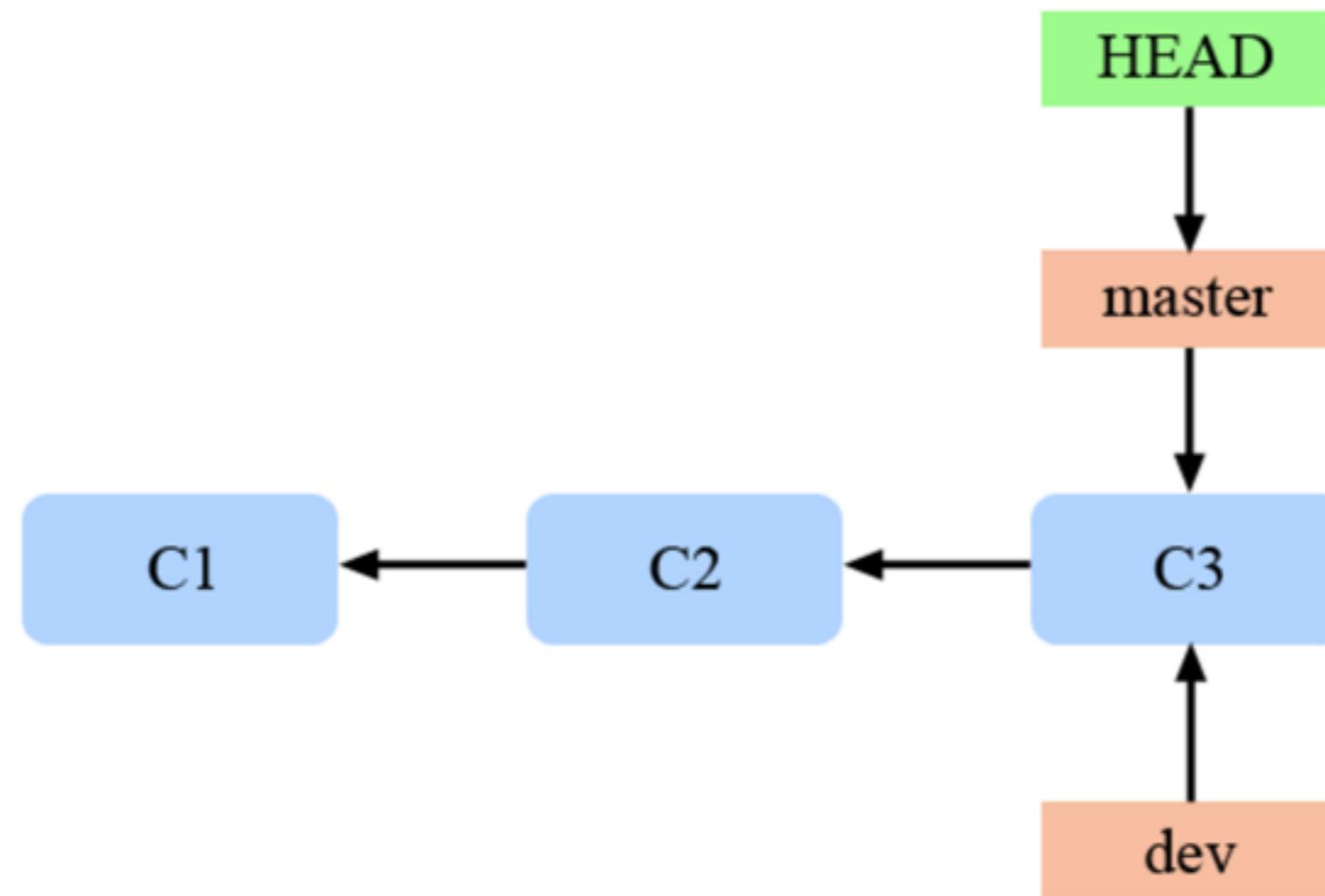
# Working with Branch

# Each branch points to a commit



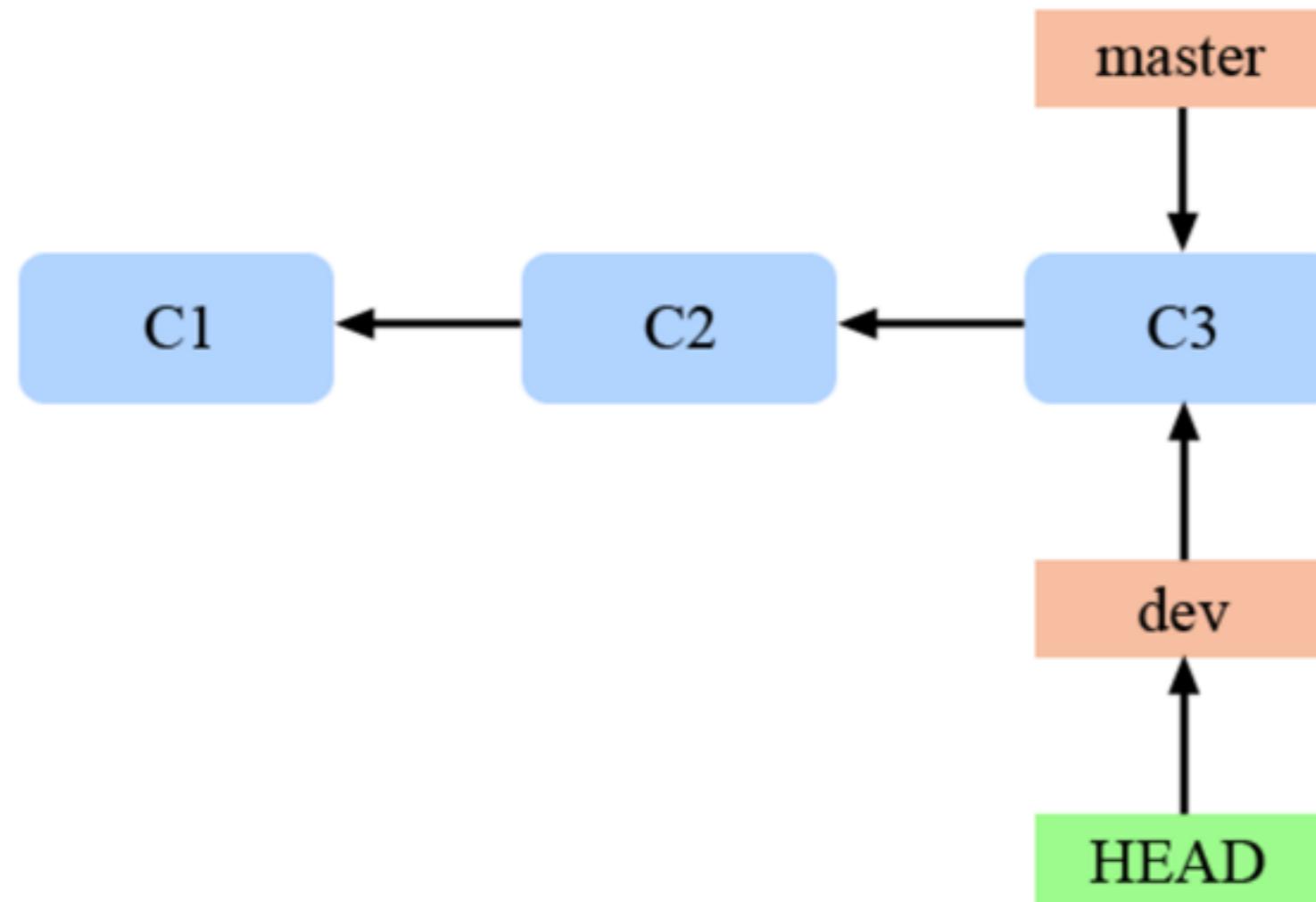
# Create new branch

\$git **branch** *BRANCH NAME*



# Switch branch

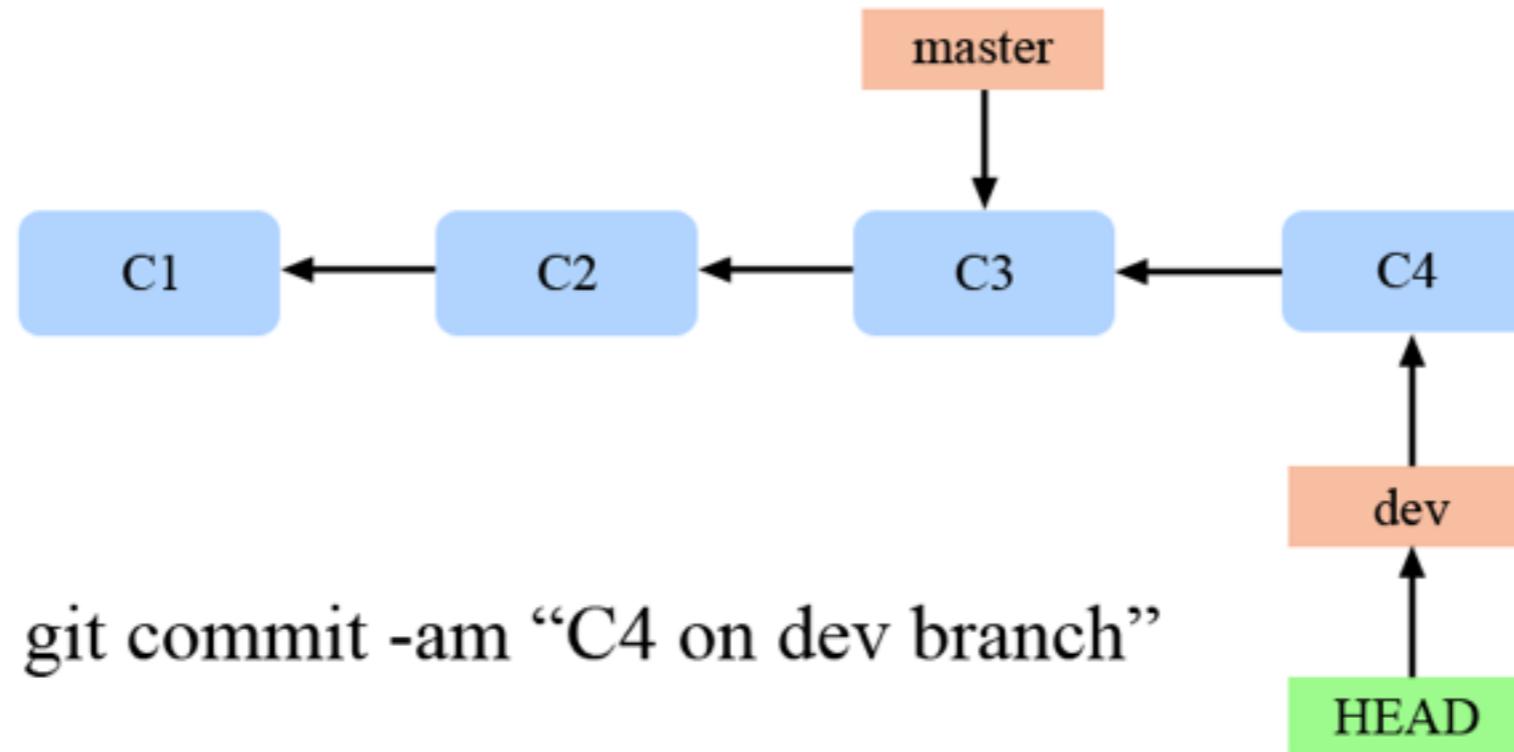
\$git **checkout** *BRANCH NAME*



# Modified and commit on branch

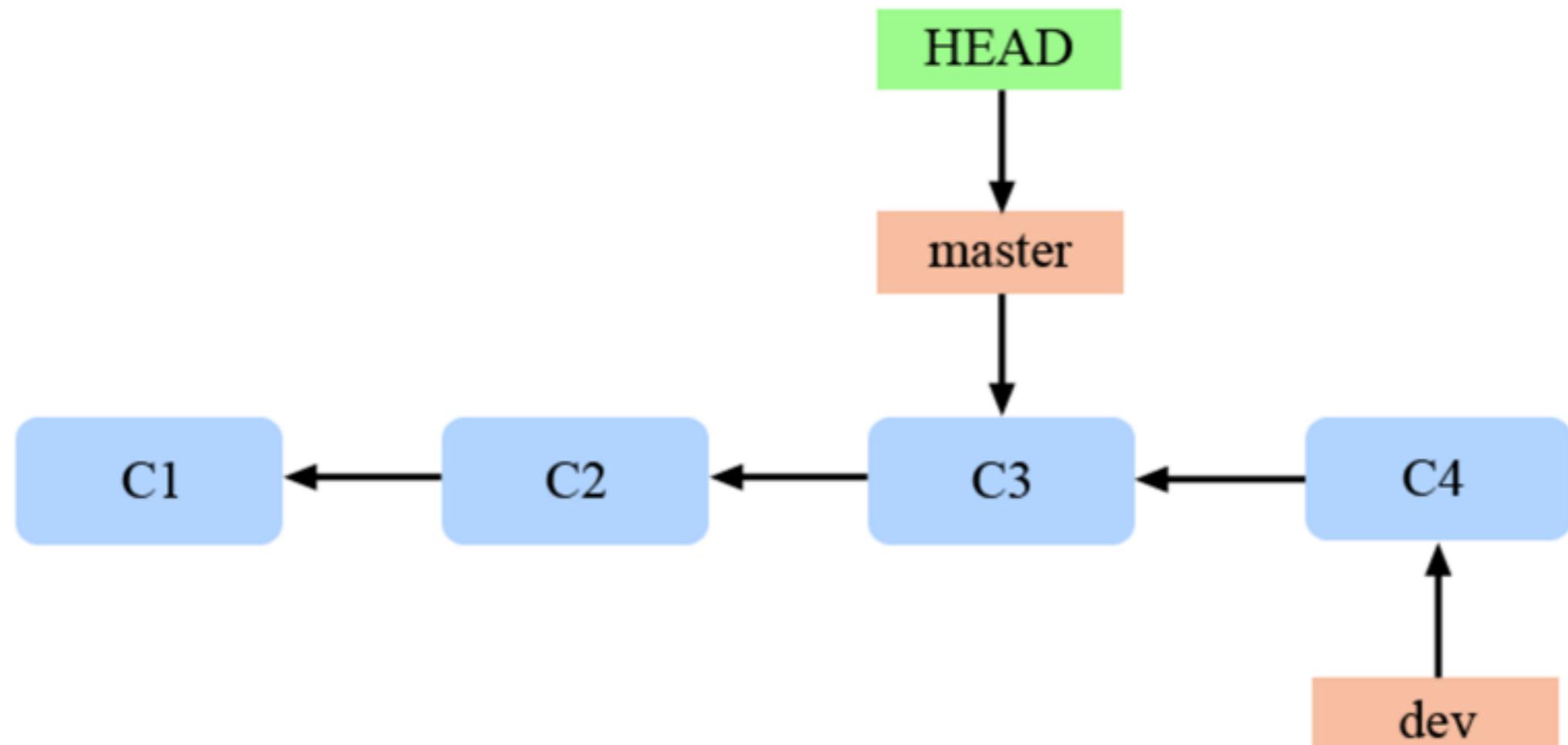
\$echo “On Branch” > *README*

\$git **commit** -am “C4 on dev”



# Switch to master branch

\$git **checkout master**



# Create and Switch branch

`$git checkout -b BRANCH NAME`

`$git branch BRANCH NAME`

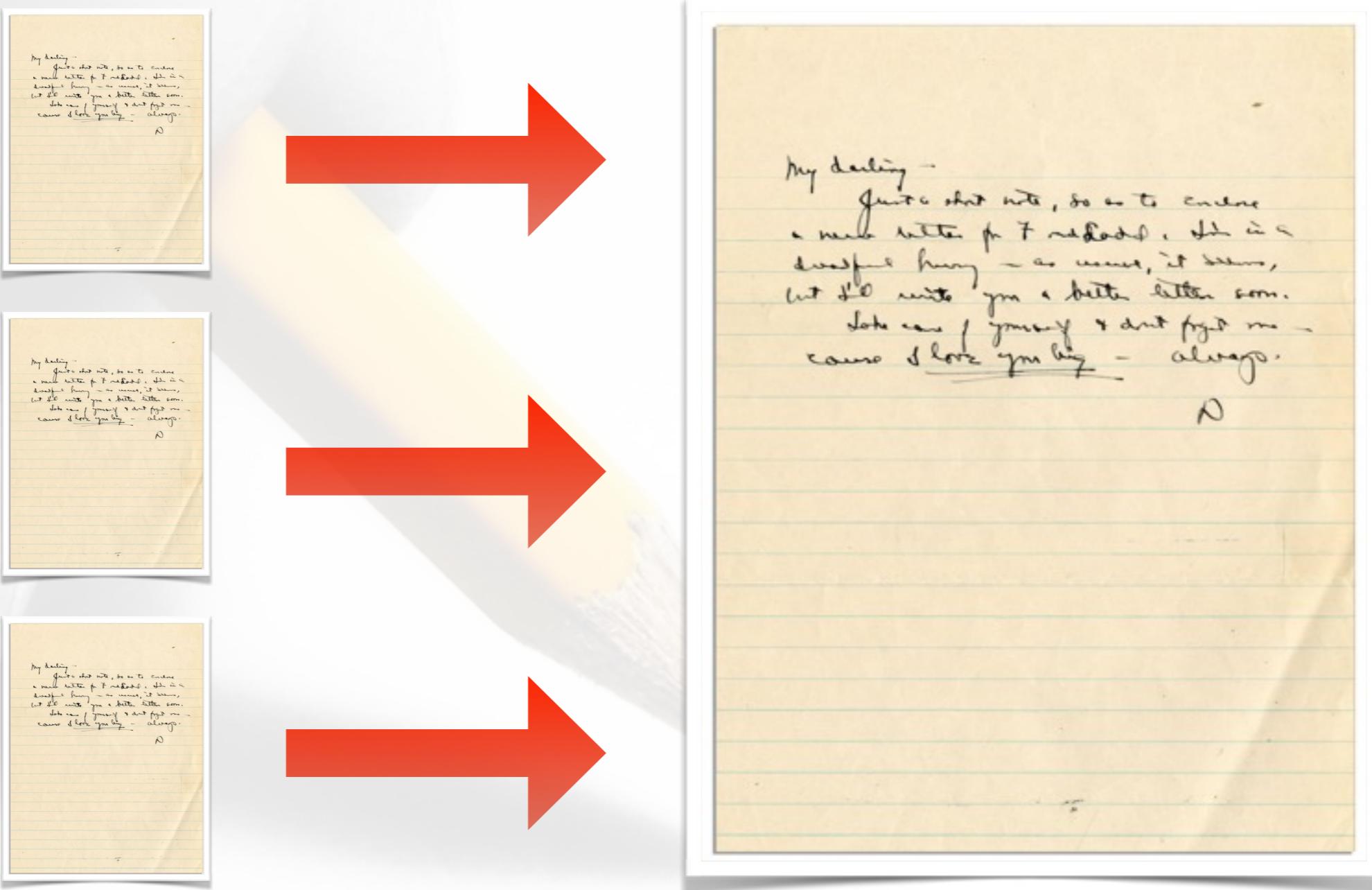
`$git checkout BRANCH NAME`

# Delete and Show all branch

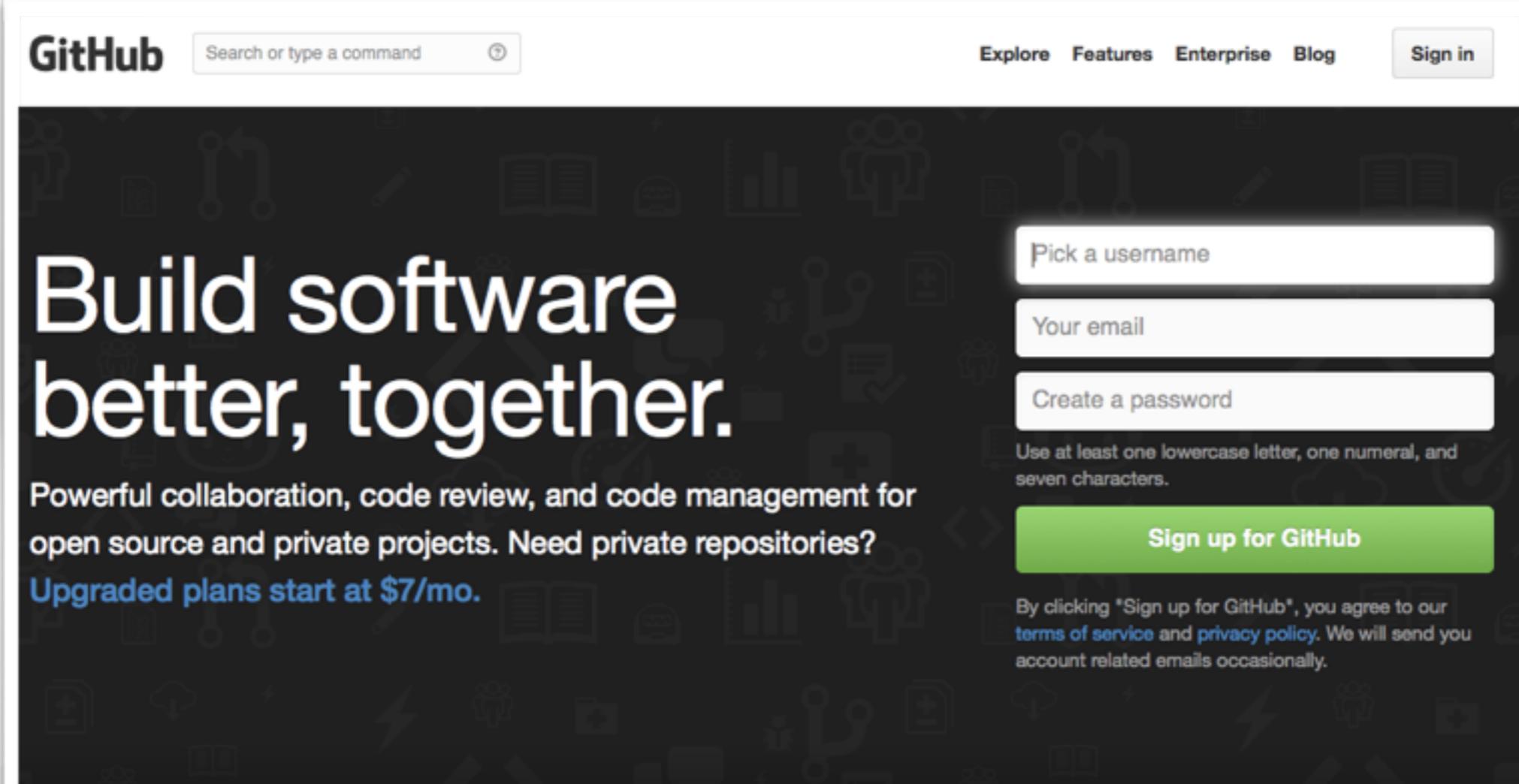
```
$git branch -d BRANCH NAME
```

```
$git branch
```

# All become One



# Working on GitHub



The screenshot shows the GitHub sign-up page. At the top, there's a navigation bar with the GitHub logo, a search bar, and links for Explore, Features, Enterprise, Blog, and Sign in. Below the navigation is a large, bold headline: "Build software better, together." A sub-headline below it reads: "Powerful collaboration, code review, and code management for open source and private projects. Need private repositories? Upgraded plans start at \$7/mo." To the right of the headline is a form for creating a new account, consisting of three input fields: "Pick a username", "Your email", and "Create a password". Below these fields is a note: "Use at least one lowercase letter, one numeral, and seven characters." A prominent green "Sign up for GitHub" button is centered below the password field. At the bottom of the sign-up form, there's a small note: "By clicking 'Sign up for GitHub', you agree to our [terms of service](#) and [privacy policy](#). We will send you account related emails occasionally." Below the sign-up form, there's a section titled "Why you'll love GitHub." with the subtext: "Powerful features to make software development more collaborative."

**GitHub** Search or type a command

Explore Features Enterprise Blog Sign in

# Build software better, together.

Powerful collaboration, code review, and code management for open source and private projects. Need private repositories? Upgraded plans start at \$7/mo.

Pick a username

Your email

Create a password

Use at least one lowercase letter, one numeral, and seven characters.

**Sign up for GitHub**

By clicking "Sign up for GitHub", you agree to our [terms of service](#) and [privacy policy](#). We will send you account related emails occasionally.

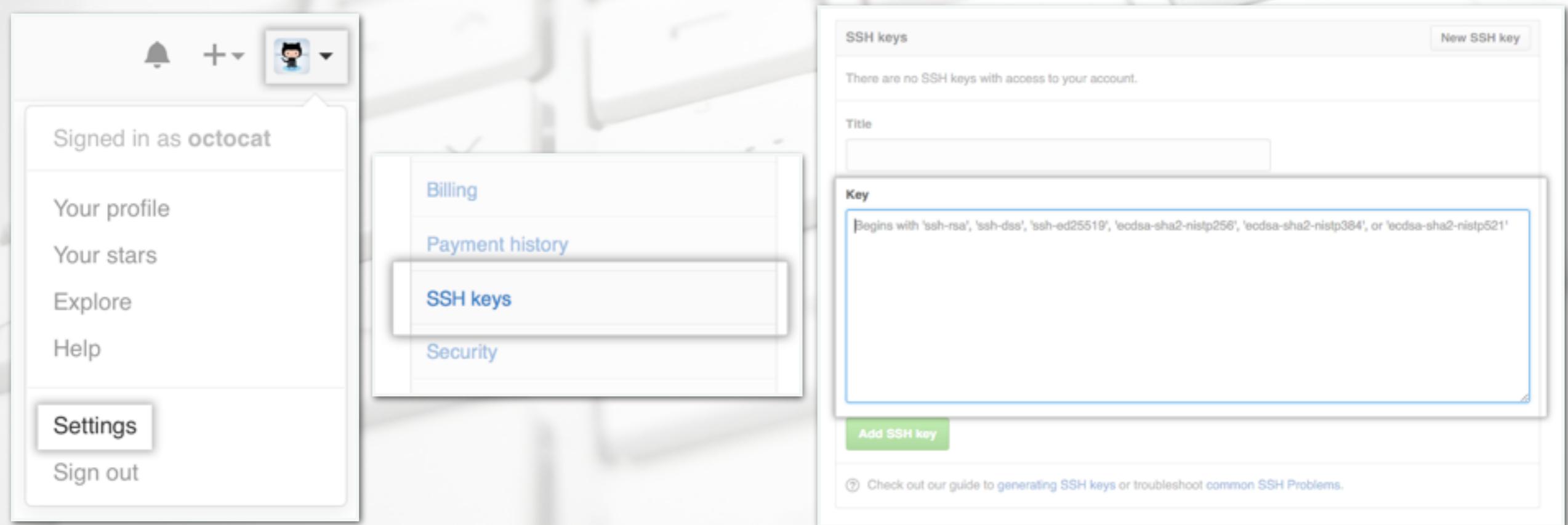
## Why you'll love GitHub.

Powerful features to make software development more collaborative.

# Generate ssh key and add to Github

\$ssh-keygen

\$pbcopy < ~/.ssh/id\_rsa.pub



# Testing your SSH connection

```
$ ssh -T git@github.com
```

```
The authenticity of host 'github.com (192.30.252.1)' can't be established.  
RSA key fingerprint is 16:27:ac:a5:76:28:2d:36:63:1b:56:4d:eb:df:a6:48.  
Are you sure you want to continue connecting (yes/no)?
```

```
The authenticity of host 'github.com (192.30.252.1)' can't be established.  
RSA key fingerprint is nThbg6kXUpJWGl7E1IGOCspRomTxoCARLviKw6E5SY8.  
Are you sure you want to continue connecting (yes/no)?
```

```
Hi username! You've successfully authenticated, but GitHub does not  
provide shell access.
```

# Add and Rename remote

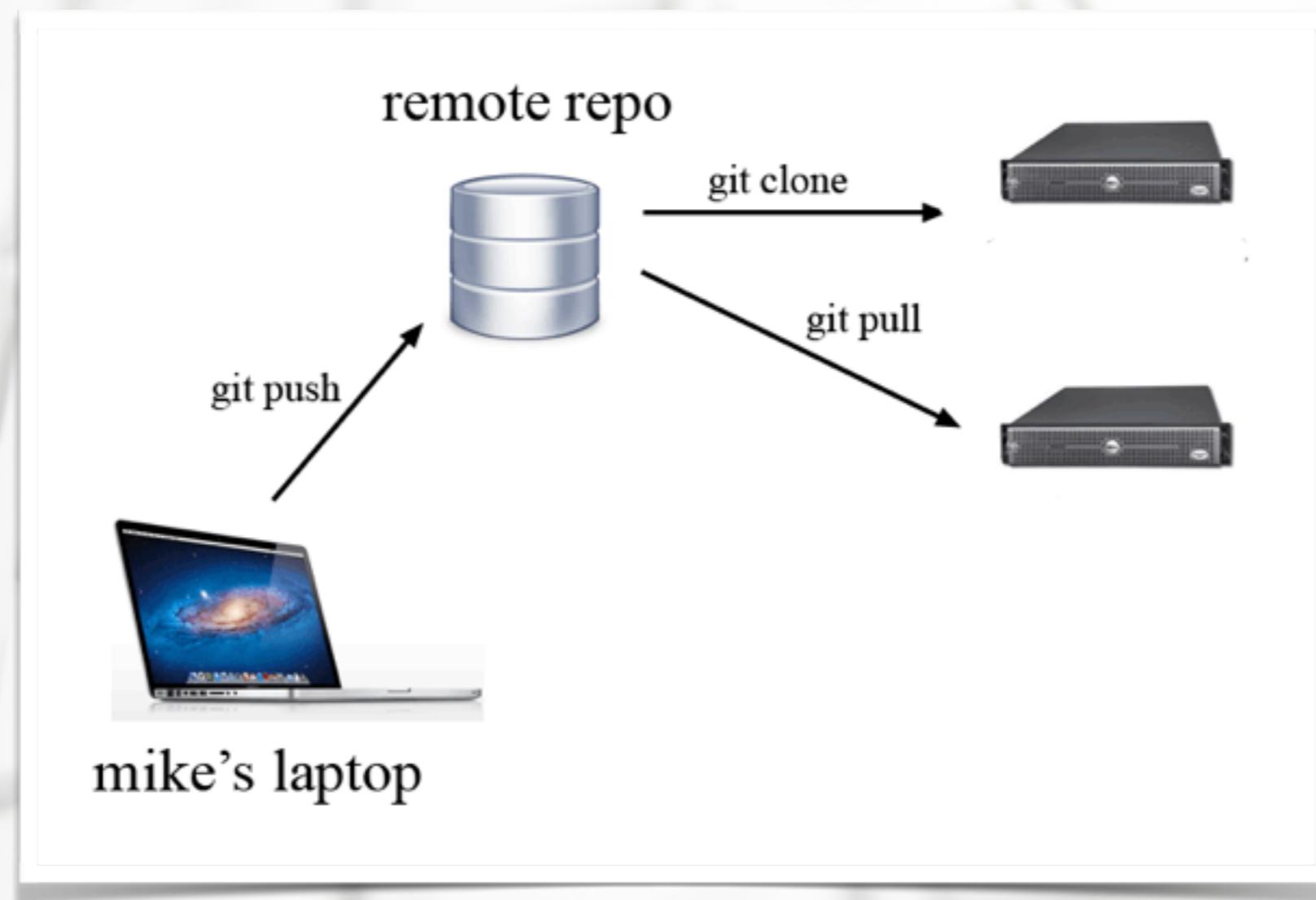
\$git **remote add** [*NICKNAME*] [*REMOTE URL*]

\$git **remote rm** [*NICKNAME*]

\$git **remote rm** [*OLD NICKNAME*] [*NEW NICKNAME*]

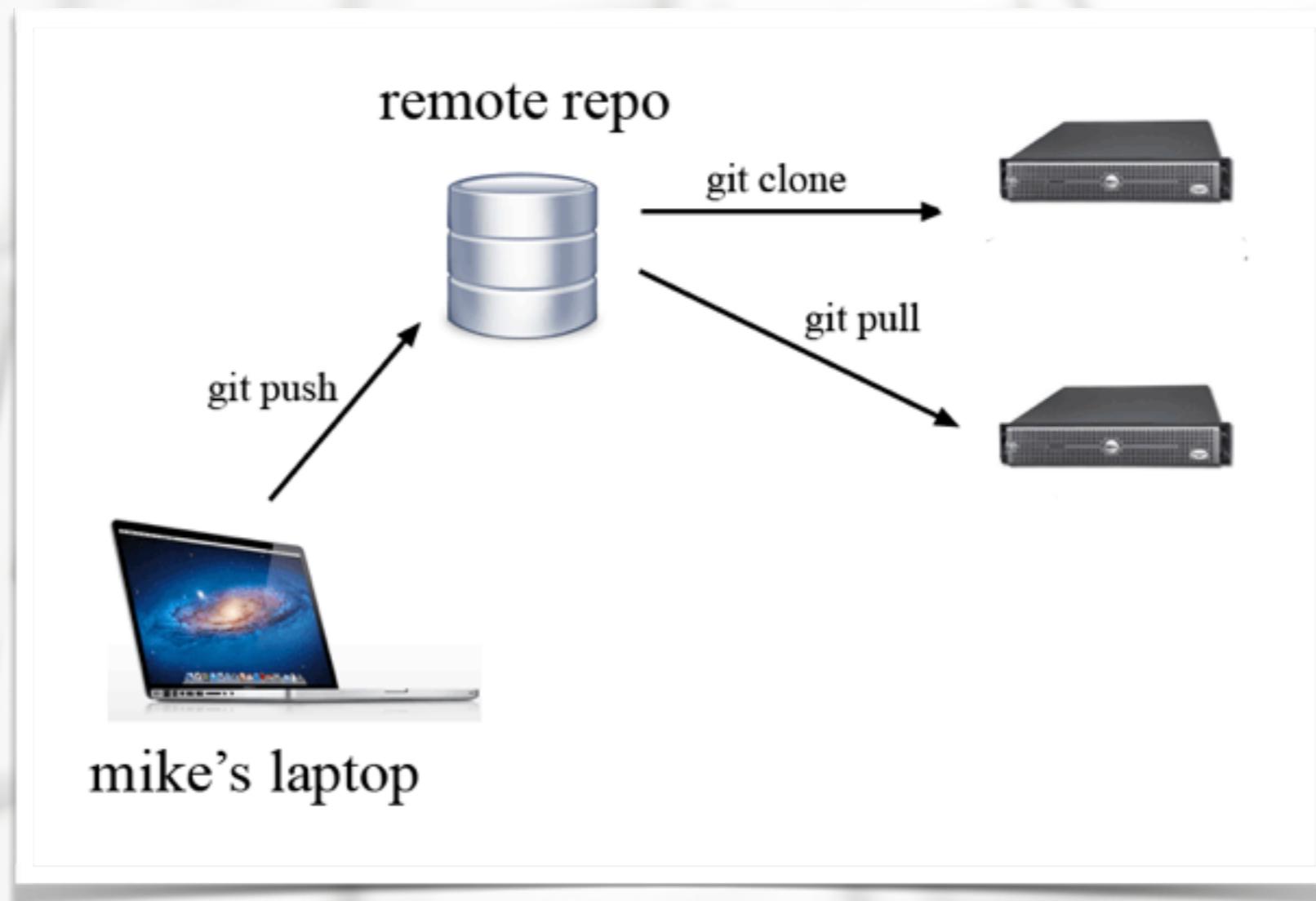
# Push to remote

\$git **push** [NICKNAME] [BRANCH]



# Fetch and Merge

\$git **pull** [NICKNAME] [BRANCH]



# Fetch and Merge

\$git **pull** [NICKNAME] [BRANCH]

\$git fetch [NICKNAME]

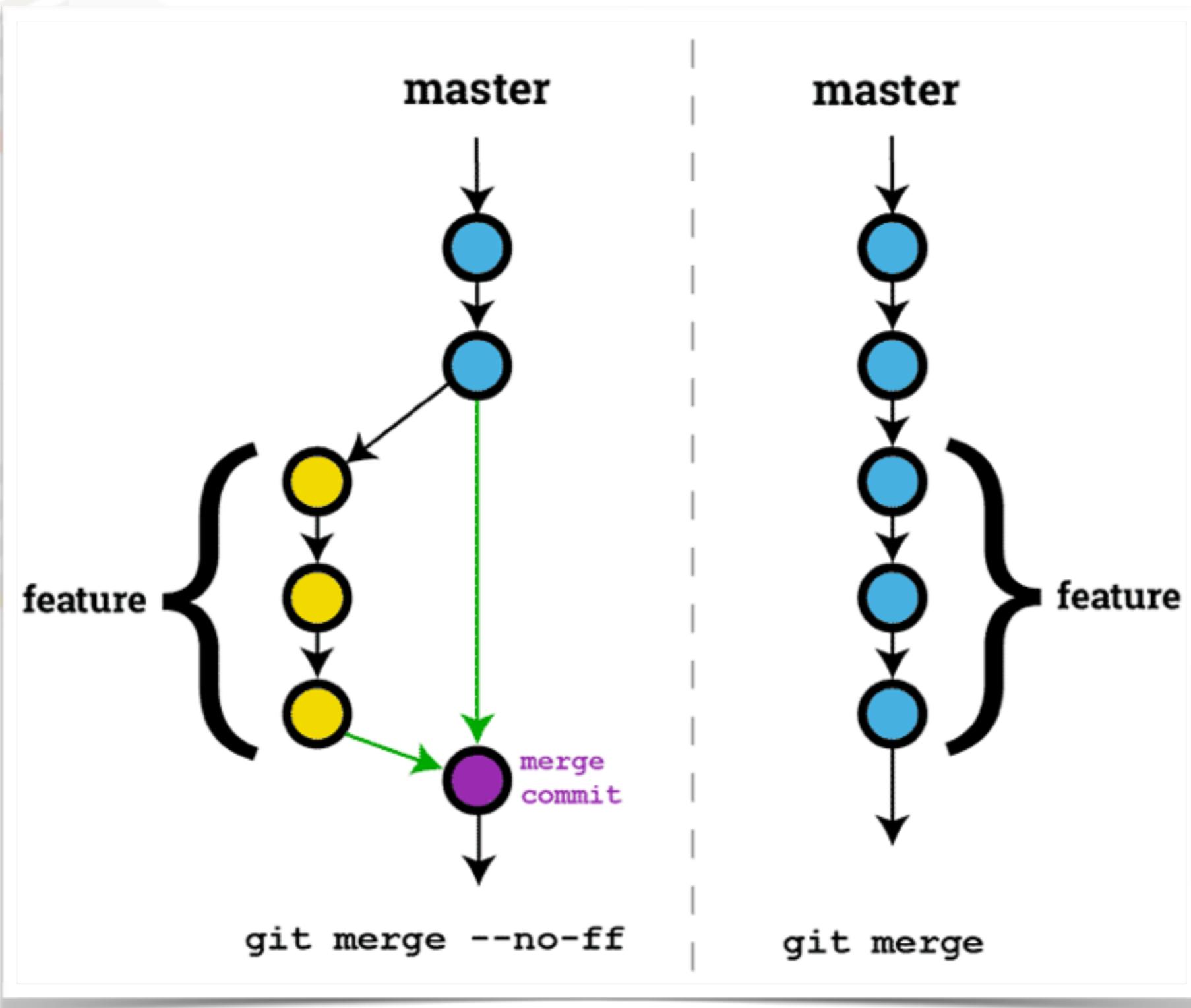
\$git merge [BRANCH]

**BRANCHED FROM MASTER 3  
WEEKS AGO**

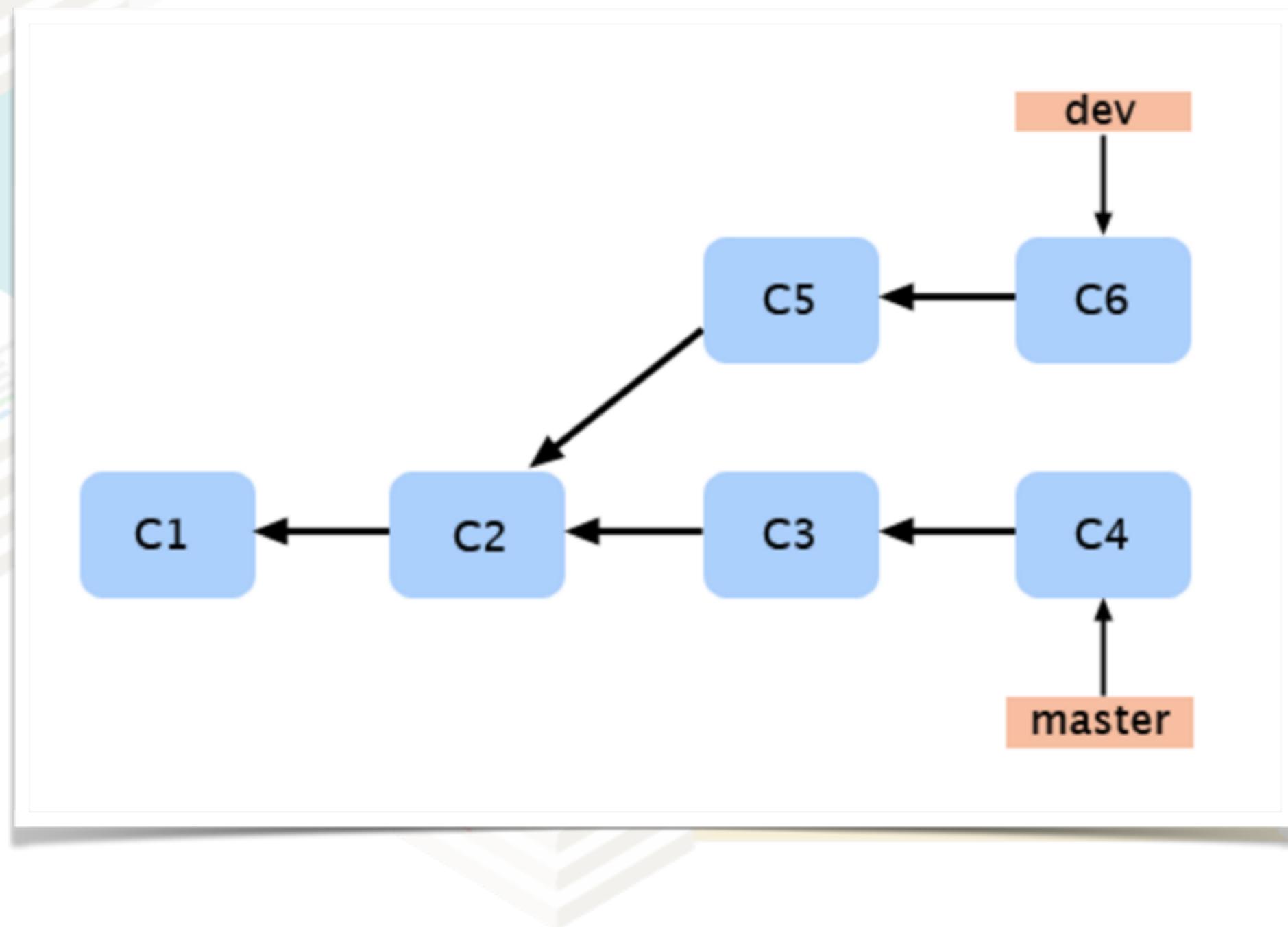


**MERGED BACK WITHOUT  
ANY CONFLICTS**

# Merge and Rebase

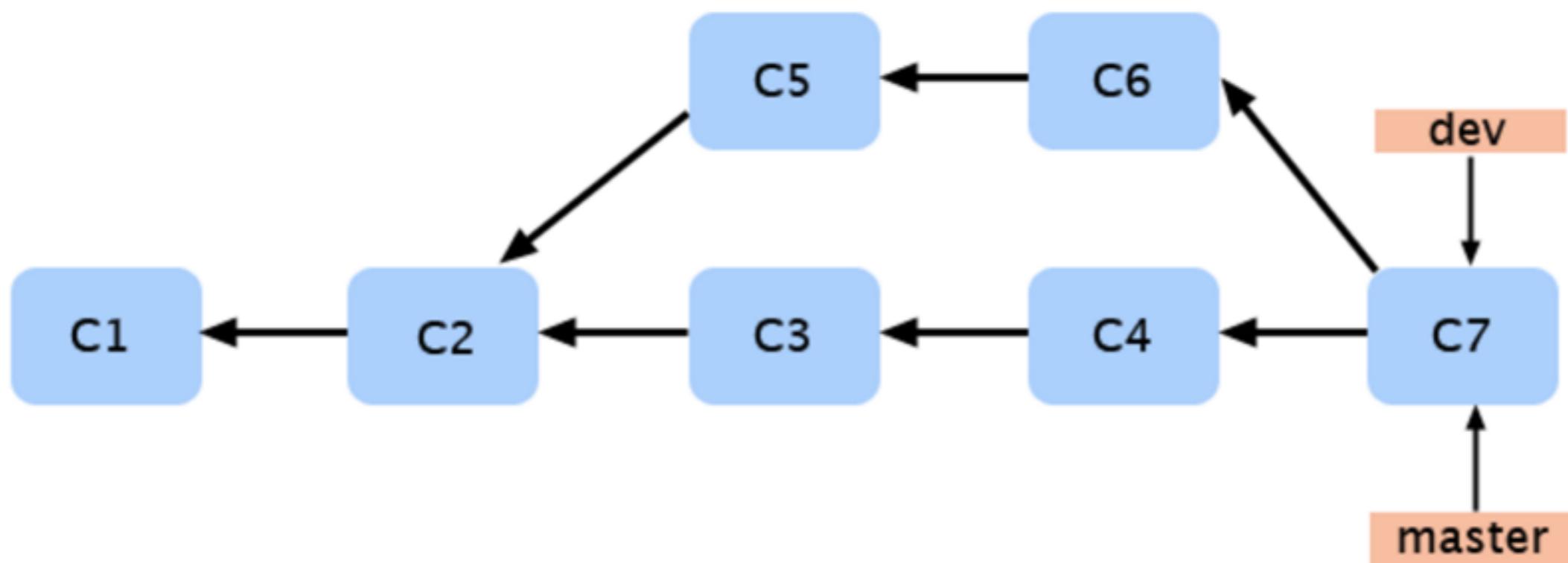


# Start before Merge



# After Merge

\$git **merge**



# Avoid Merge Conflict

**Small change and commit**

**Early merge**

**Single Responsibility Principle**

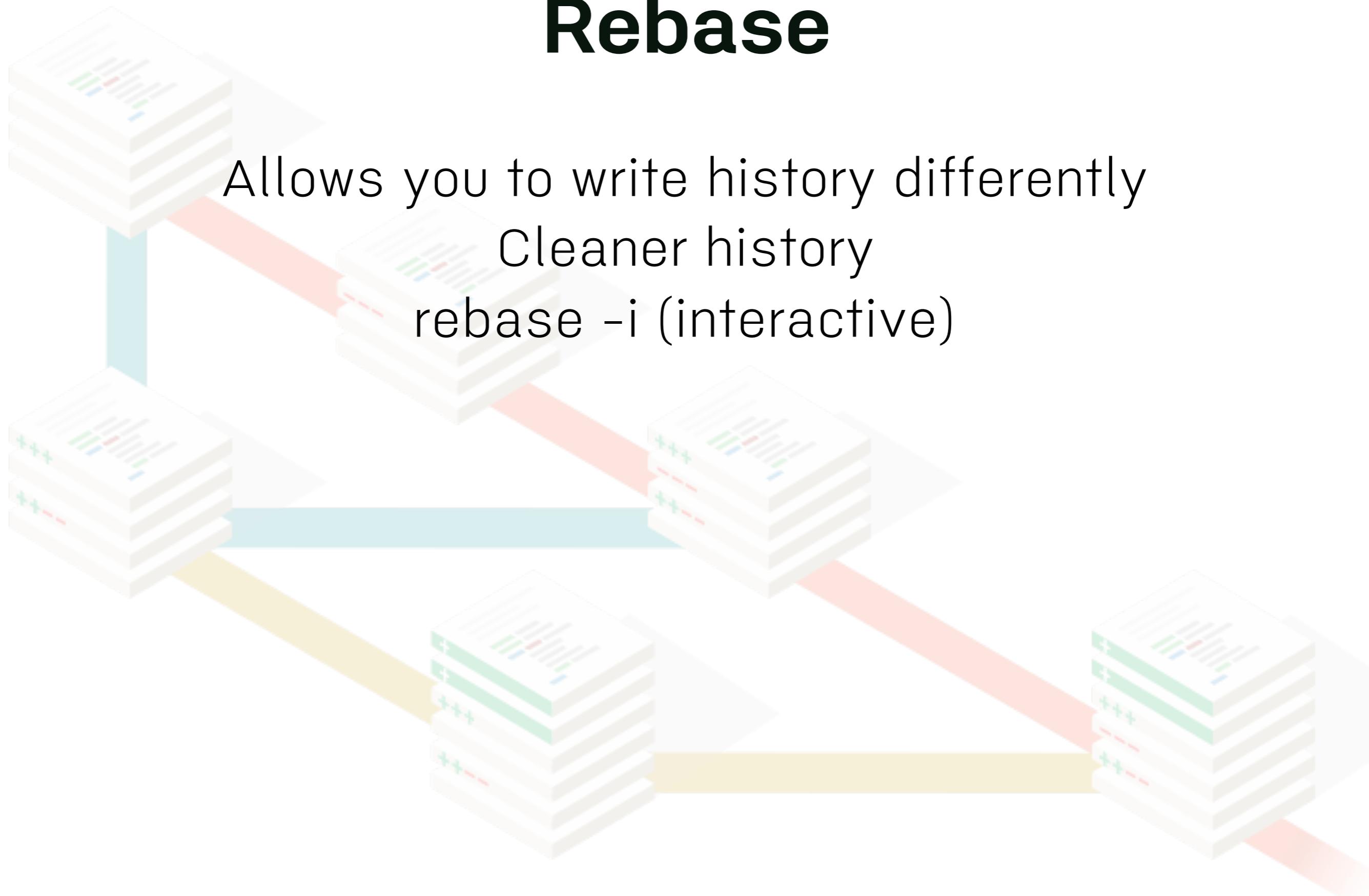
**Communication is a Key**

**Mob programming**

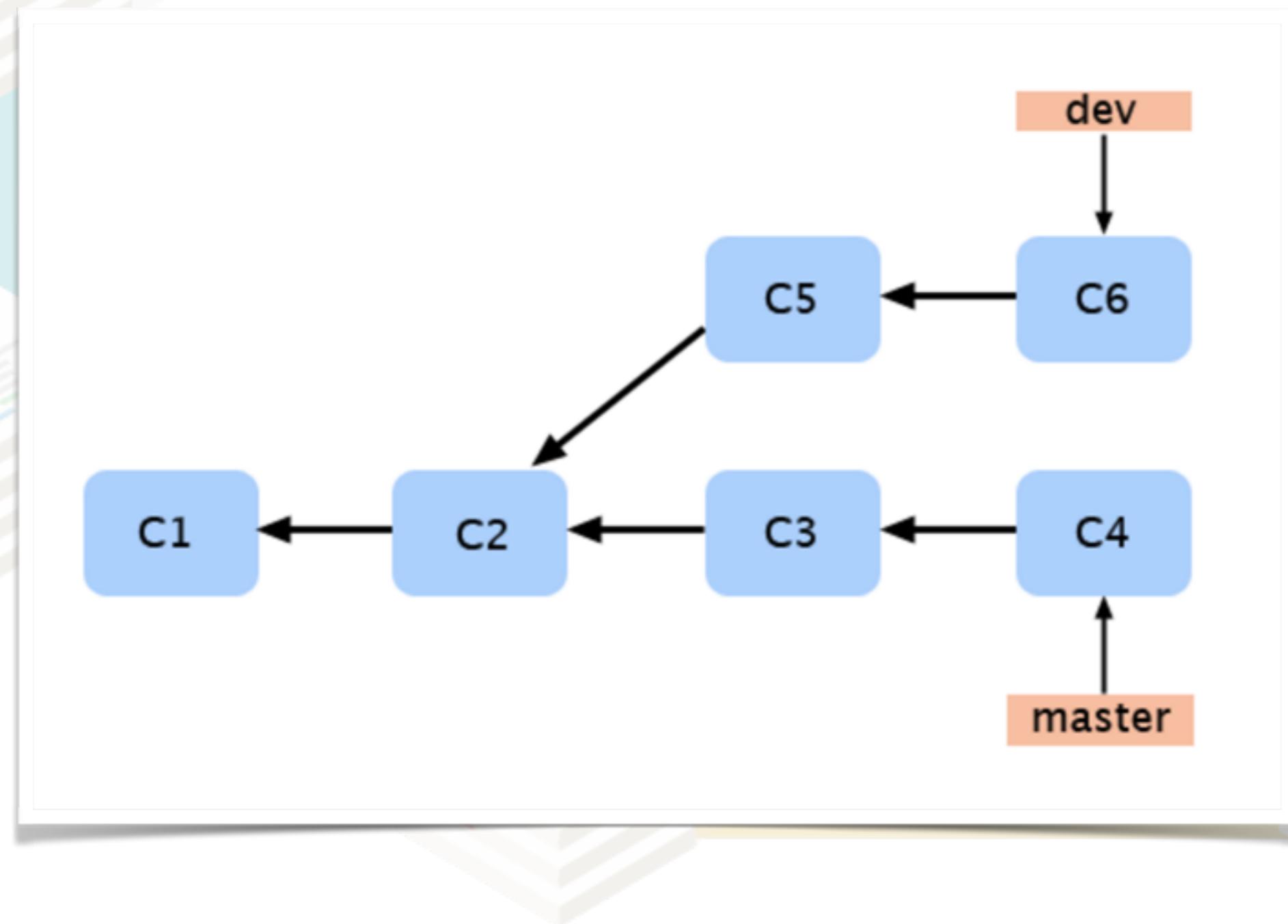


# Rebase

Allows you to write history differently  
Cleaner history  
`rebase -i (interactive)`

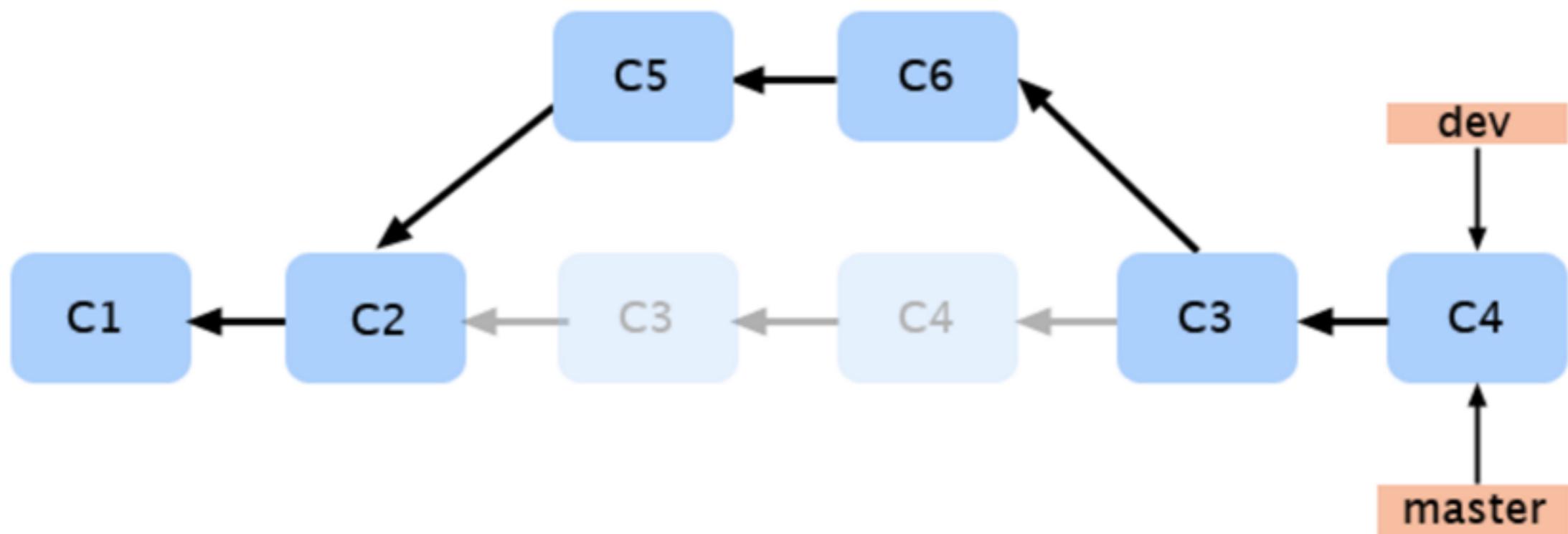


# Start before Rebase



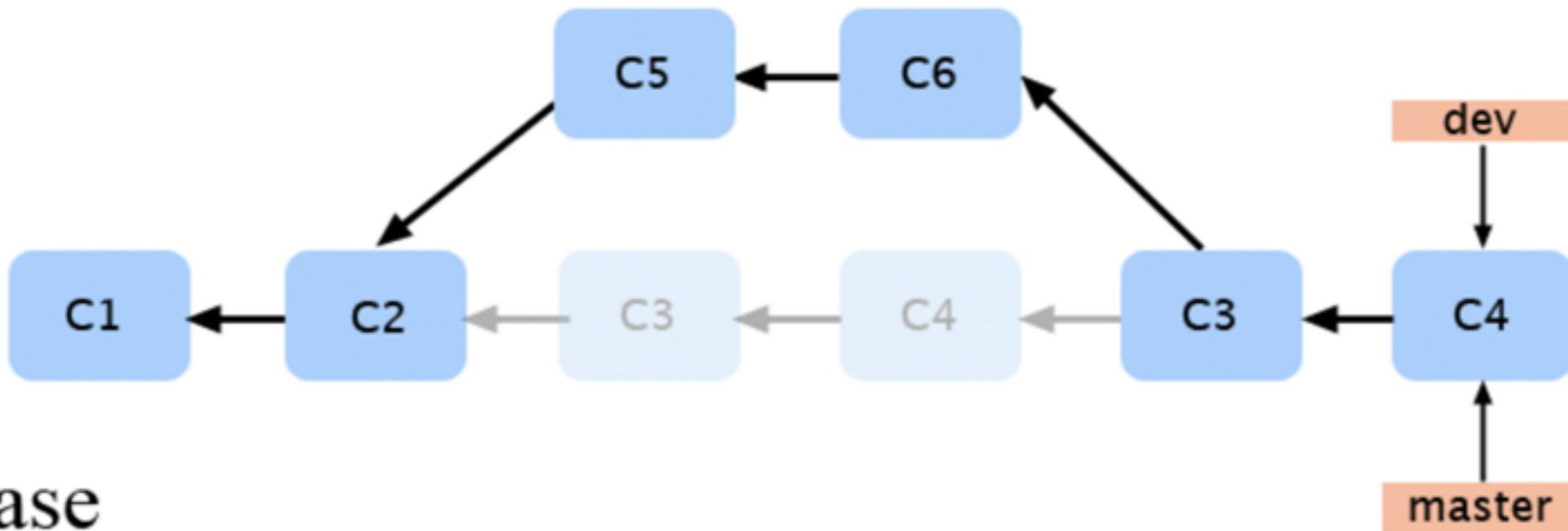
# After Rebase

\$git **rebase** [BRANCH NAME]

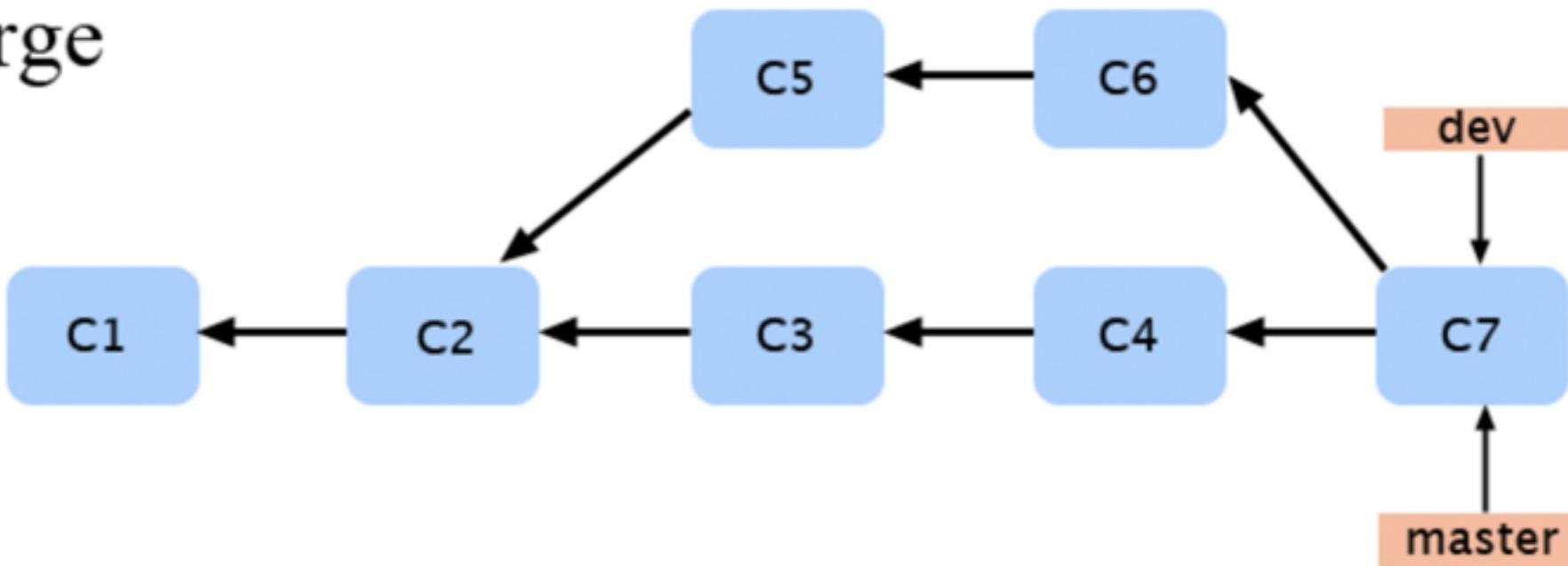


# Merge vs Rebase

rebase



merge





# Tips Working on Branch

1. Create your branch
2. Checkout branch
2. Make changes and save file
3. Use diff to see all changes
4. Add and commit on your branch
5. Merge and rebase or discard !!

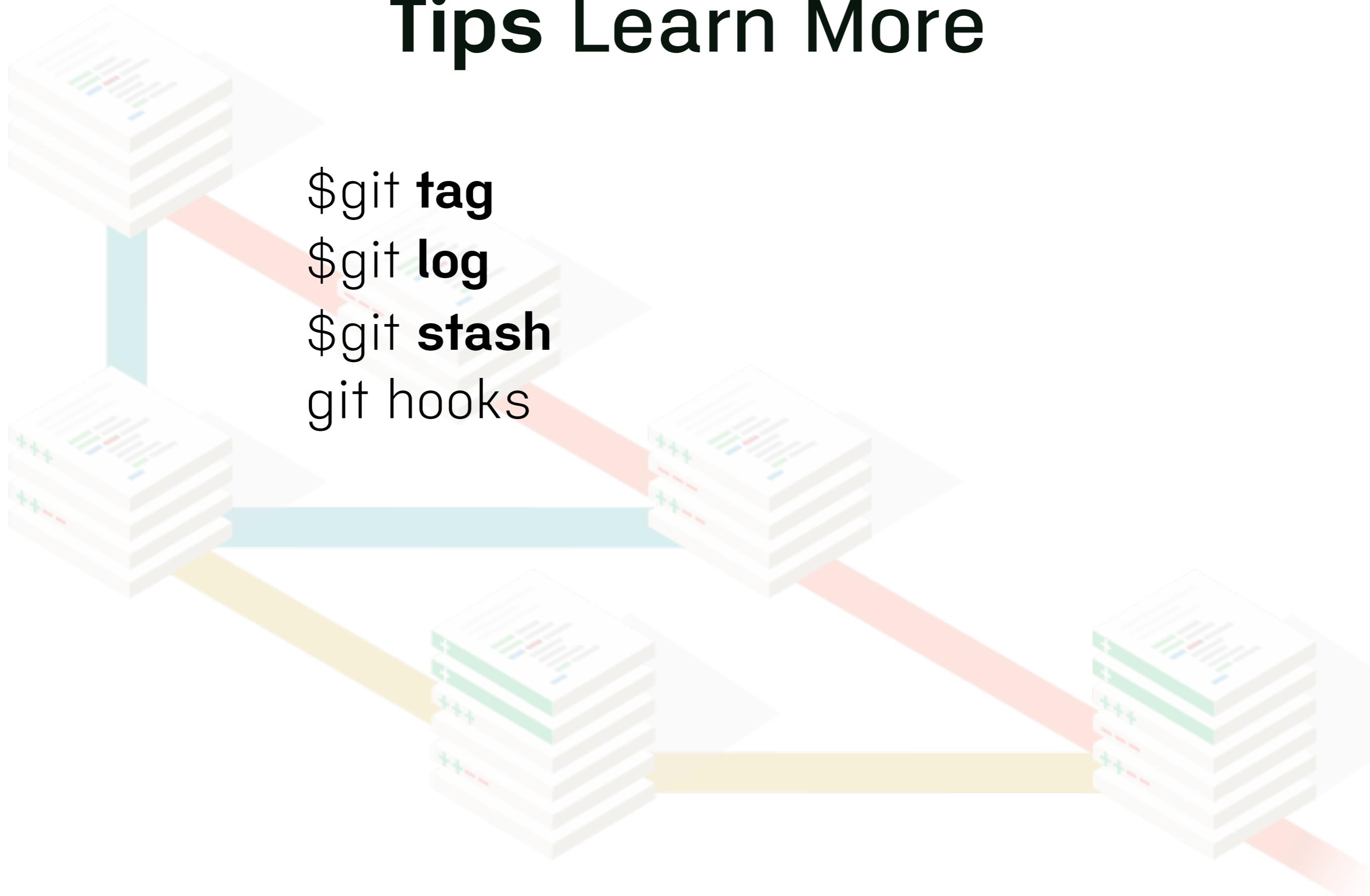
# Tips Learn More

\$git **tag**

\$git **log**

\$git **stash**

git hooks



# Tips Workflow

1. initial repository
2. Pull (fetch and merge)
3. Branching in your local repository (optional)
4. Modify and improve your code
5. Commit to local repository
6. push to your branch on remote repository
- 7. Diff file => Review code**

# Tips Learn More

**Professional** review code to find out **ERRORS**

## List of tools for code review

From Wikipedia, the free encyclopedia

This is a list of [software](#) that helps [software developers](#) conduct and manage [code reviews](#).

Software	Maintainer	Development status	License	VCS supported	Platforms supported	Workflow
<a href="#">Swascan</a>	<a href="#">Swascan</a>	actively developed	Proprietary	Any	<a href="#">Java</a> , <a href="#">PHP</a> , <a href="#">csharp</a> , <a href="#">css</a> , <a href="#">erlang</a> , <a href="#">flex</a> , <a href="#">groovy</a> , <a href="#">javascript</a> , <a href="#">python</a> , <a href="#">scmgit</a> , <a href="#">scmsvn</a> , <a href="#">web</a> , <a href="#">xml</a>	pre- and post-commit
<a href="#">Crucible</a>	<a href="#">Atlassian</a>	actively developed	Proprietary	<a href="#">CVS</a> , <a href="#">Subversion</a> , <a href="#">Git</a> , <a href="#">Mercurial</a> , <a href="#">Perforce</a>	<a href="#">Java</a>	pre- and post-commit
<a href="#">Gerrit</a>	Shawn Pearce	actively developed	Apache v2	<a href="#">Git</a>	<a href="#">Java EE</a>	pre-commit
<a href="#">Upsource</a>	<a href="#">JetBrains</a>	actively developed	Proprietary	<a href="#">Git</a> , <a href="#">Subversion</a> , <a href="#">Mercurial</a> , <a href="#">Perforce</a>	<a href="#">Java</a>	post-commit
<a href="#">GitLab</a>	GitLab Inc.	actively developed	MIT	<a href="#">Git</a>	<a href="#">Ruby on Rails</a>	pre- and post-commit
<a href="#">Kallithea</a>	kallithea-scm.org	actively developed	GPL v3	<a href="#">Git</a> , <a href="#">Mercurial</a>	<a href="#">Python</a>	post-commit
<a href="#">Phabricator</a>	Phacility	actively developed	Apache	<a href="#">Git</a> , <a href="#">Subversion</a> , <a href="#">Mercurial</a>	<a href="#">PHP</a>	pre- and post-commit
<a href="#">Review Board</a>	reviewboard.org	actively developed	MIT	<a href="#">CVS</a> , <a href="#">Subversion</a> , <a href="#">Git</a> , <a href="#">Mercurial</a> , <a href="#">Bazaar</a> , <a href="#">Perforce</a> , <a href="#">ClearCase</a> , <a href="#">Plastic SCM</a>	<a href="#">Python</a> , <a href="#">Java</a>	mainly pre-commit
<a href="#">Rietveld</a>	Guido van Rossum	actively developed	Apache v2	<a href="#">Git</a> , <a href="#">Subversion</a> , <a href="#">Mercurial</a> , <a href="#">Perforce</a> , <a href="#">CVS</a>	<a href="#">Python</a>	pre-commit
<a href="#">Understand</a>	SciTools	actively developed	Proprietary	Any	<a href="#">Windows</a> , <a href="#">Mac OSX</a> , <a href="#">Linux</a>	pre- and post-commit

[https://en.wikipedia.org/wiki/List\\_of\\_tools\\_for\\_code\\_review](https://en.wikipedia.org/wiki/List_of_tools_for_code_review)

# Tips Learn More

**Professional** review code to find out **ERRORS**

The screenshot shows the Review Board 2.5.3 alpha 0 (dev) interface. At the top, there's a navigation bar with links for 'Review Requests', 'Users', 'Groups', and 'Reports'. A note says 'The demo server is reset every night at midnight PST.' Below this is a section titled 'ALL REVIEW REQUESTS' with a 'Hide closed' link. The main area is a table with columns: 'Summary', 'Submitter', 'Posted', and 'Last Updated'. The table lists various review requests, each with a small profile icon and timestamp. The last row shows a request for 'Merge branch 'release-2.5.x'' with status 'Submitted'.

Summary	Submitter	Posted	Last Updated
Diff viewer demo	chipx86	March 31st, 2015, 4:28 a.m.	12 hours, 21 minutes ago
Change history demo	chipx86	March 31st, 2015, 4:28 a.m.	18 hours, 16 minutes ago
Test review	guest576	March 11th, 2016, 7:42 a.m.	1 day, 20 hours ago
Fix URL to web hook docs	guest4899	March 9th, 2016, 5:25 a.m.	3 days, 23 hours ago
Tesing	guest9247	March 8th, 2016, 7:18 a.m.	4 days, 21 hours ago
test1	guest8359	August 11th, 2015, 6:50 a.m.	5 days, 8 hours ago
Merge branch 'release-2.6.x'	guest8989	January 31st, 2016, 2:49 p.m.	5 days, 8 hours ago
Add a site setting for the static URL	guest6129	March 4th, 2016, 12:22 p.m.	6 days, 11 hours ago
Initial Review	guest7880	March 4th, 2016, 12:50 p.m.	1 week, 1 day ago
Merge branch 'release-2.6.x'	guest6129	March 4th, 2016, 10:54 a.m.	1 week, 1 day ago
PDF document review demo	chipx86	March 31st, 2015, 4:28 a.m.	1 week, 2 days ago
1111	guest4539	January 26th, 2016, 1:25 a.m.	1 week, 2 days ago
Submitted Merge branch 'release-2.5.x' into release-2.6.x	guest5371	March 3rd, 2016, 3:31 a.m.	1 week, 3 days ago
Test PDF review?	guest3369	March 3rd, 2016, 12:04 a.m.	1 week, 3 days ago

<https://www.reviewboard.org/>





# Git Good

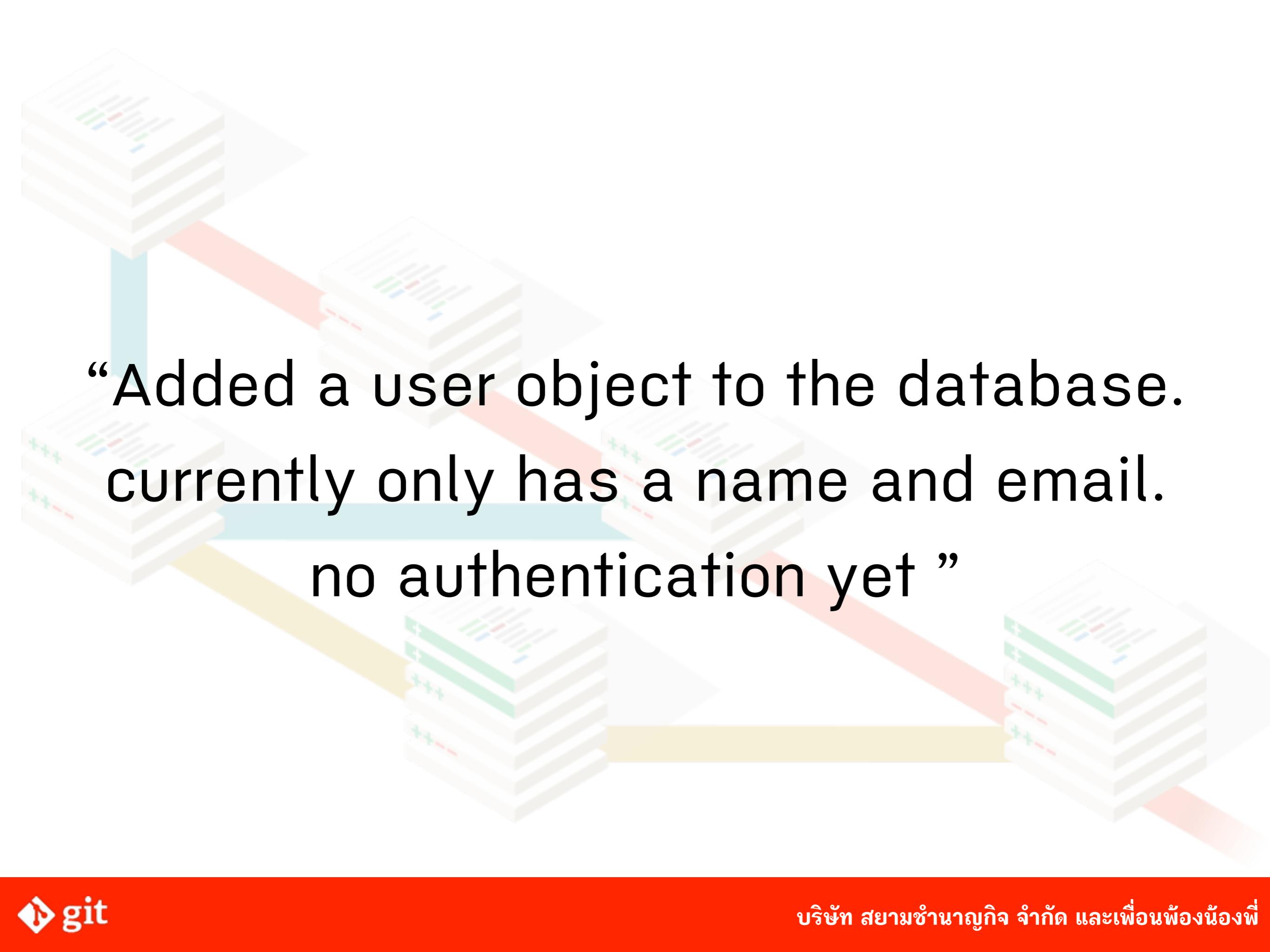
# Git Status

# Commit Message



...

TODO  
asdasfdgafg  
stuff  
fixed bug  
add feature



“Added a user object to the database.  
currently only has a name and email.  
no authentication yet ”



“Fixed the bug that would add something to everything. Turn to not add something to everything”

# GitHub issue tracker integration

<https://guides.github.com/features/issues/>

# bug 01 #1

 **Closed** up1 opened this issue 5 minutes ago · 0 comments



up1 commented 5 minutes ago

Owner



*No description provided.*



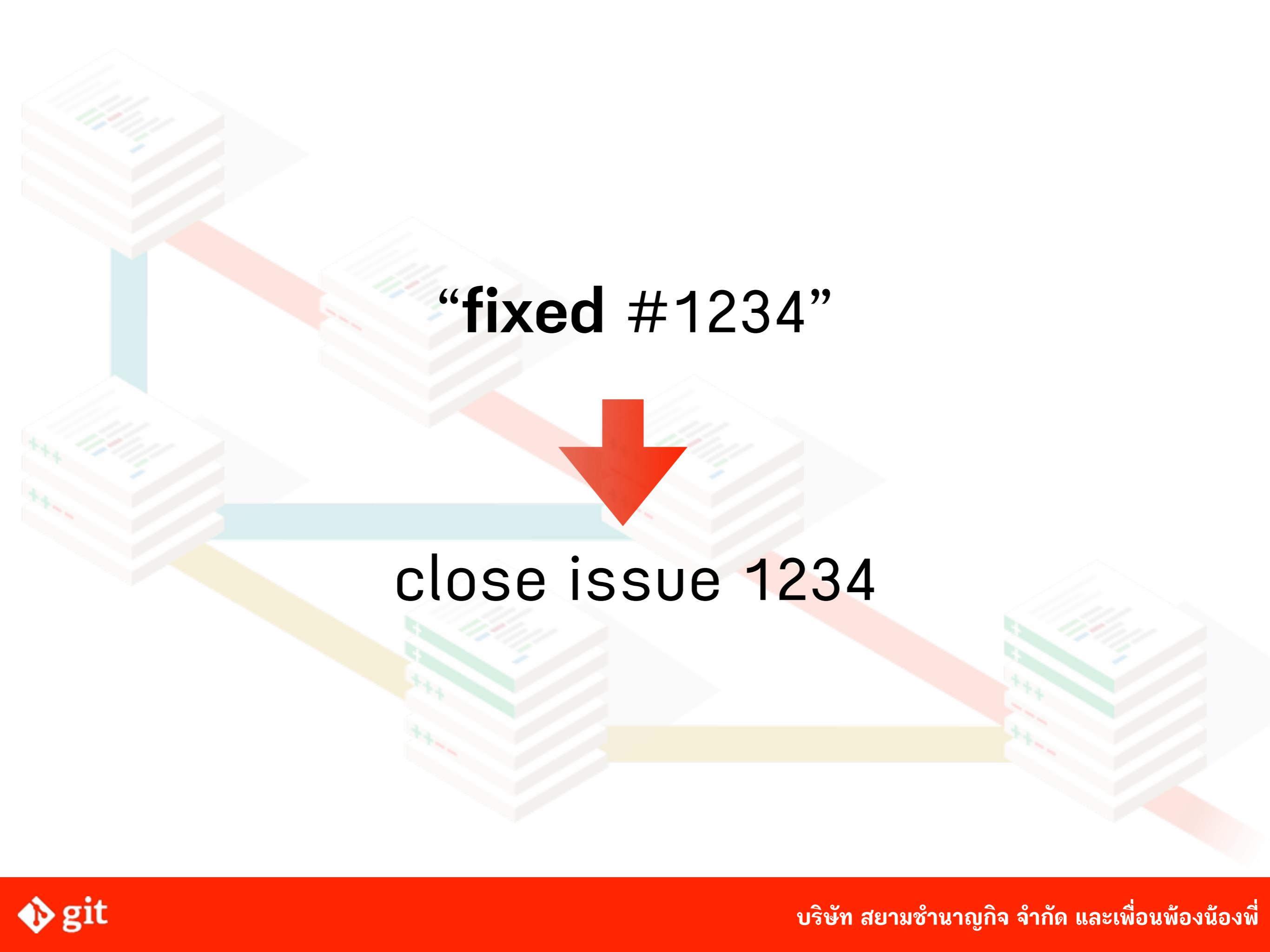
up1 closed this issue from a commit 4 minutes ago

↳ Fixed #1 to remove aomething

90db52f

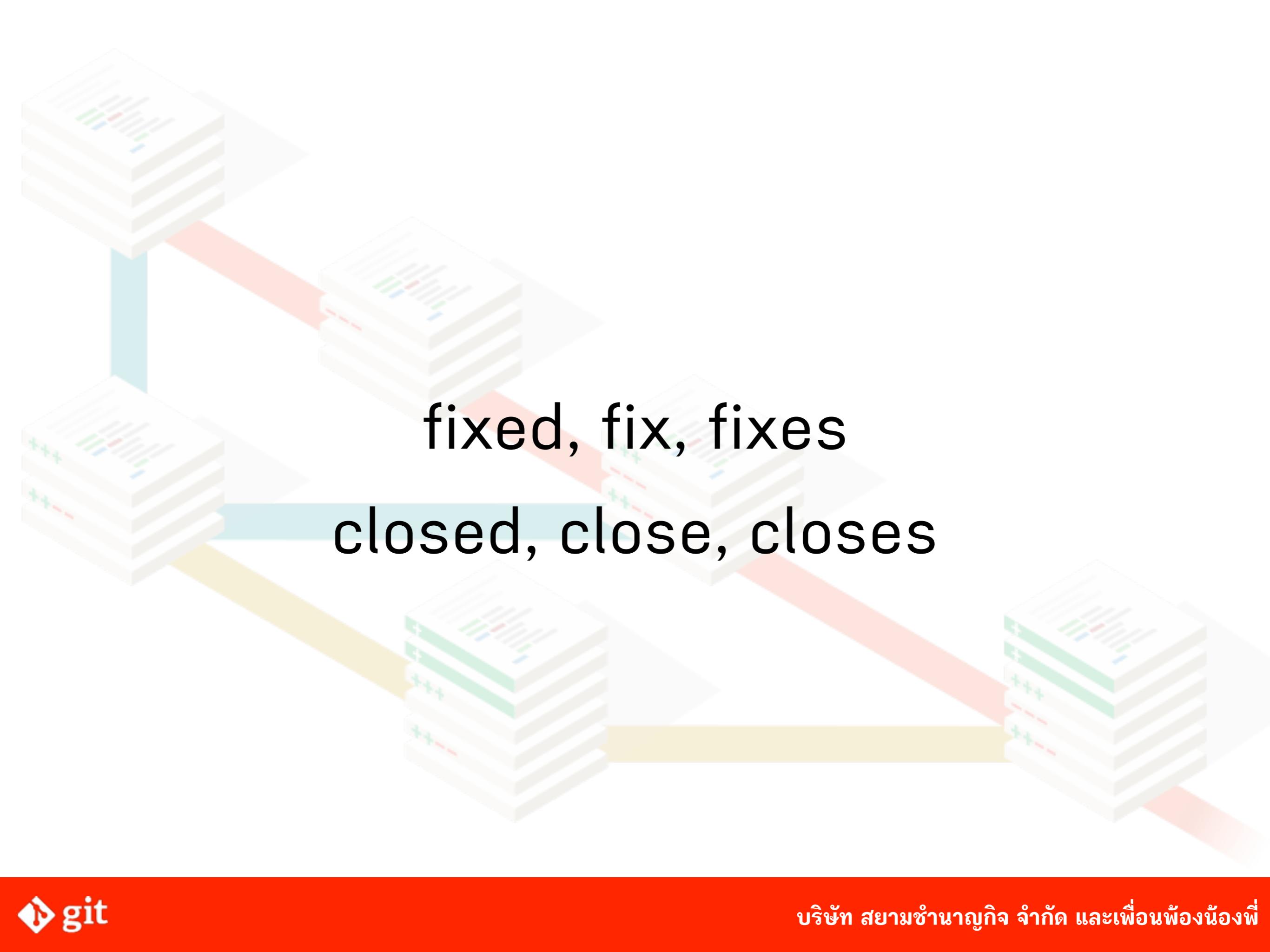


up1 closed this in [90db52f](#) 4 minutes ago

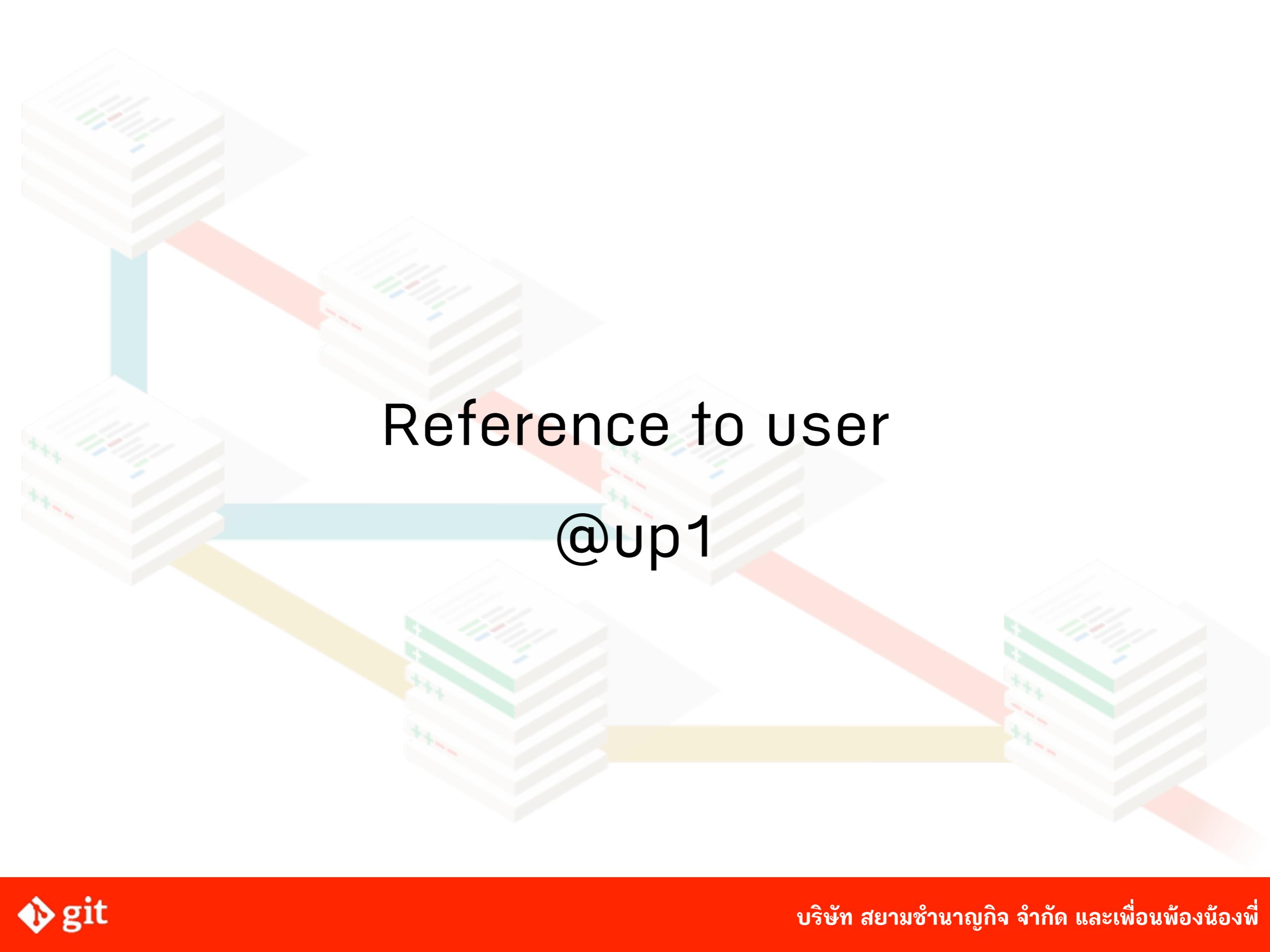


**“fixed #1234”**

**close issue 1234**



fixed, fix, fixes  
closed, close, closes



Reference to user  
@up1

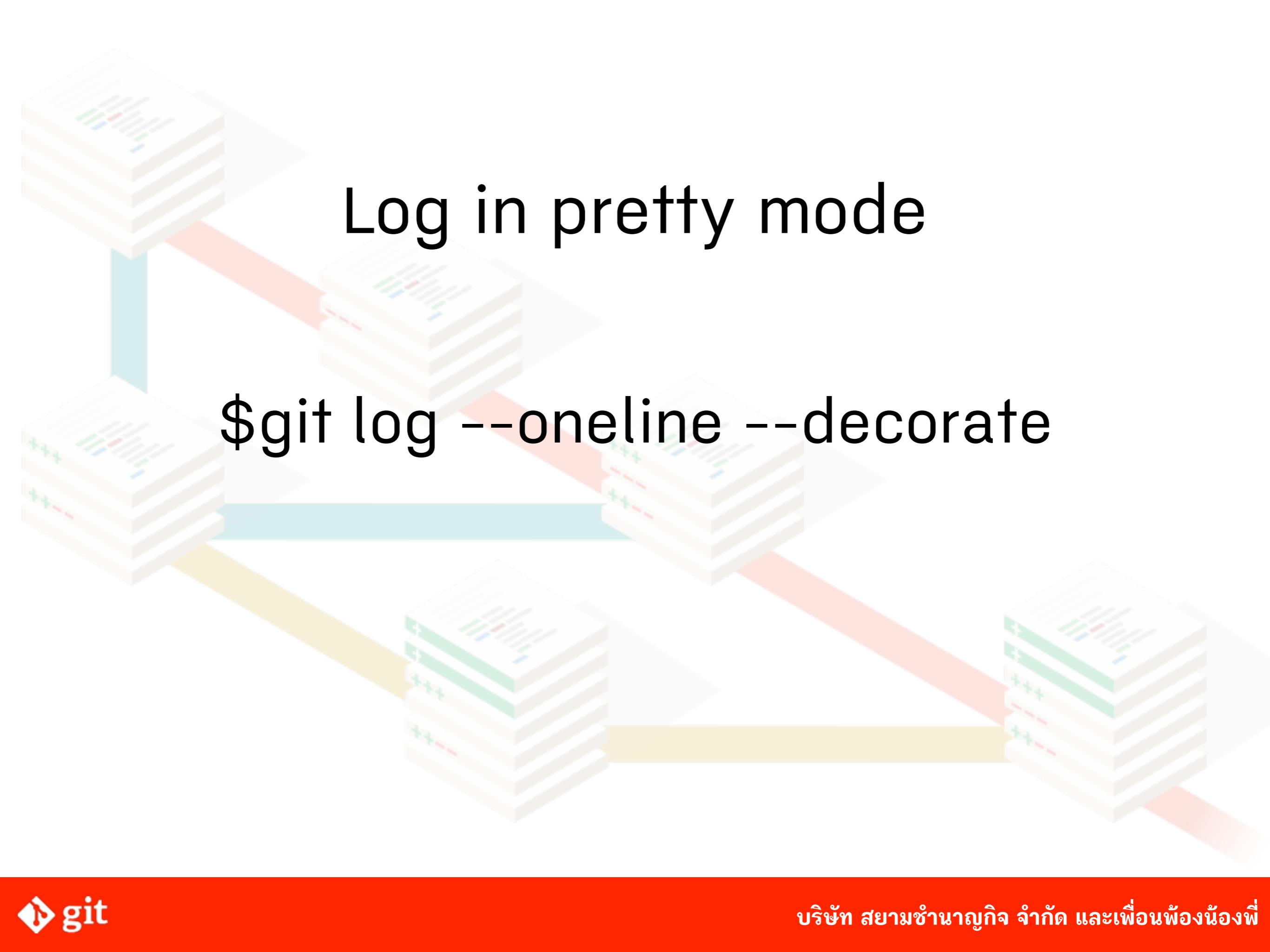
# Git Log





# Log in one line

```
$git log --oneline
```



# Log in pretty mode

```
$git log --oneline --decorate
```

# Log in graph mode

```
$git log --graph --oneline --decorate
```

# See diff from log

```
$git log --stat  
$git log -p
```

# Log by user

```
$git log --author=up1
```



# By message

```
$git log --grep="message"
```



# By content

\$git log -S“content”

# By content with regular expression

```
$git log -G“content”
```

# Log in date range

```
$git log --after="2015-9-1"  
      --before="2015-9-12"
```

# Log in date range

```
$git log --since=2.months.ago  
          --until=1.day.ago
```

# Filter merge commit

```
$git log --no-merges  
$git log --merges
```

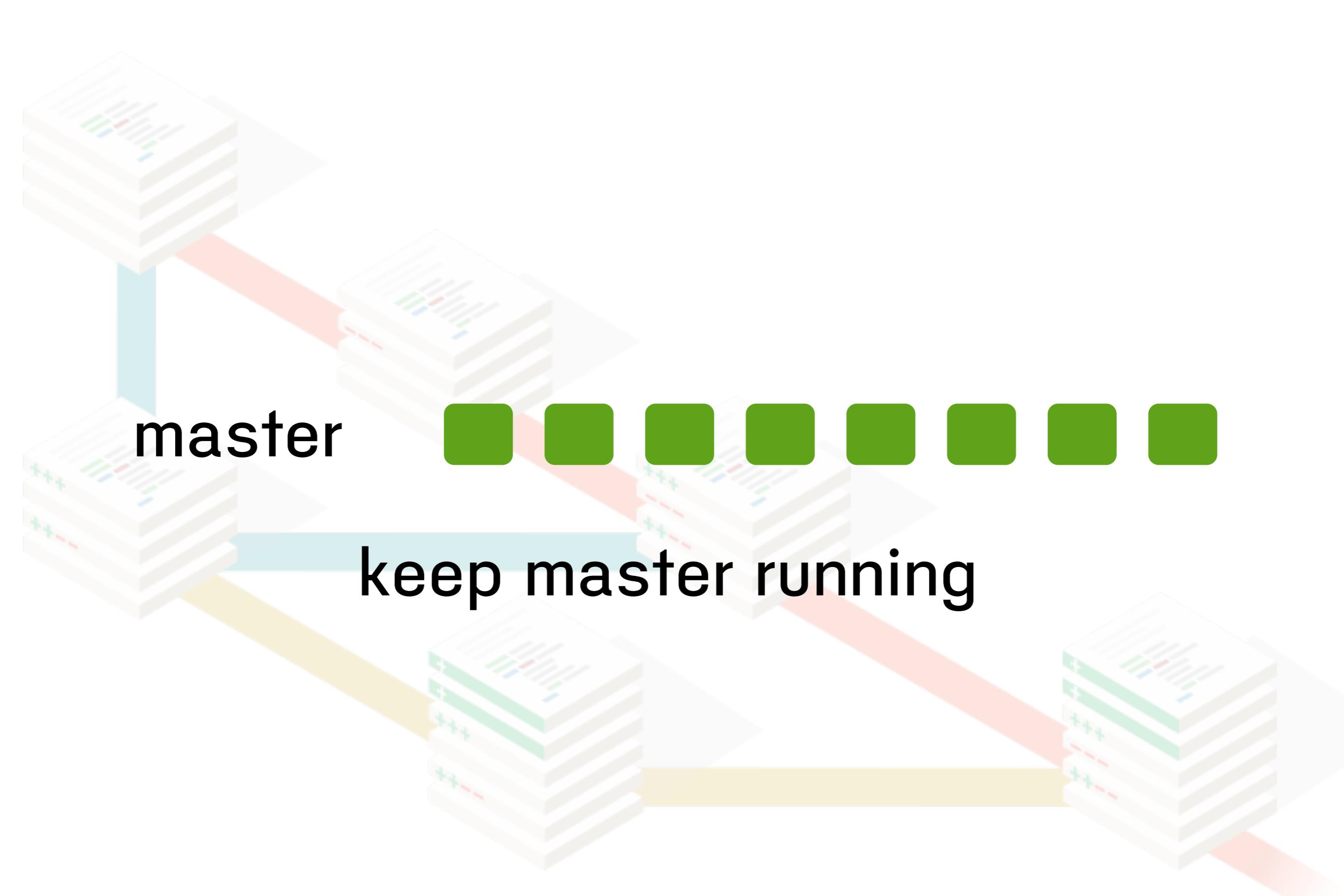


# Git shortlog

# Git help

# Git branch

<http://nvie.com/posts/a-successful-git-branching-model/>

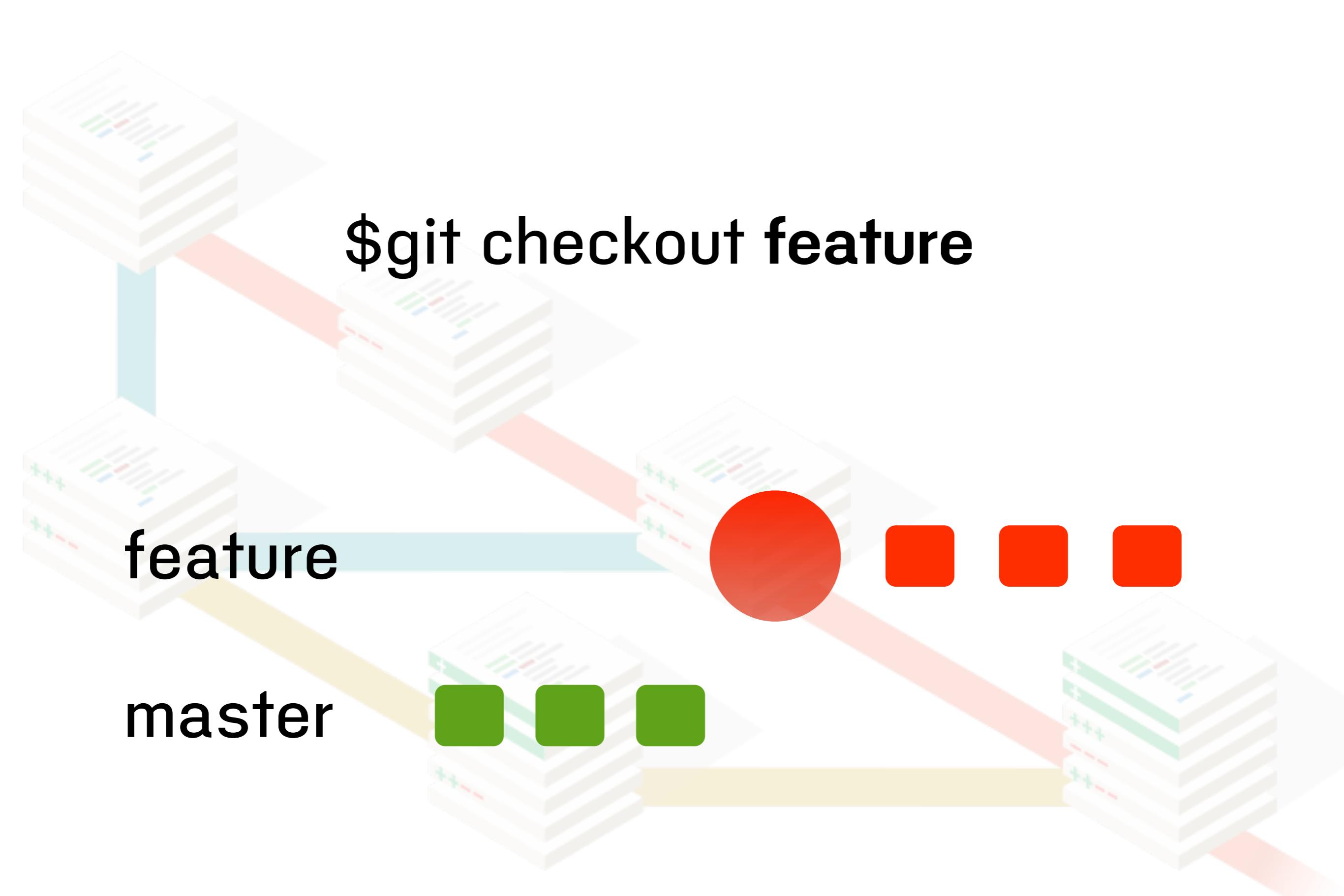


master

keep master running



Need to fix bug ?



**feature**

**master**

# \$git checkout feature

# Git checkout -b feature



**When ready to merge into master**

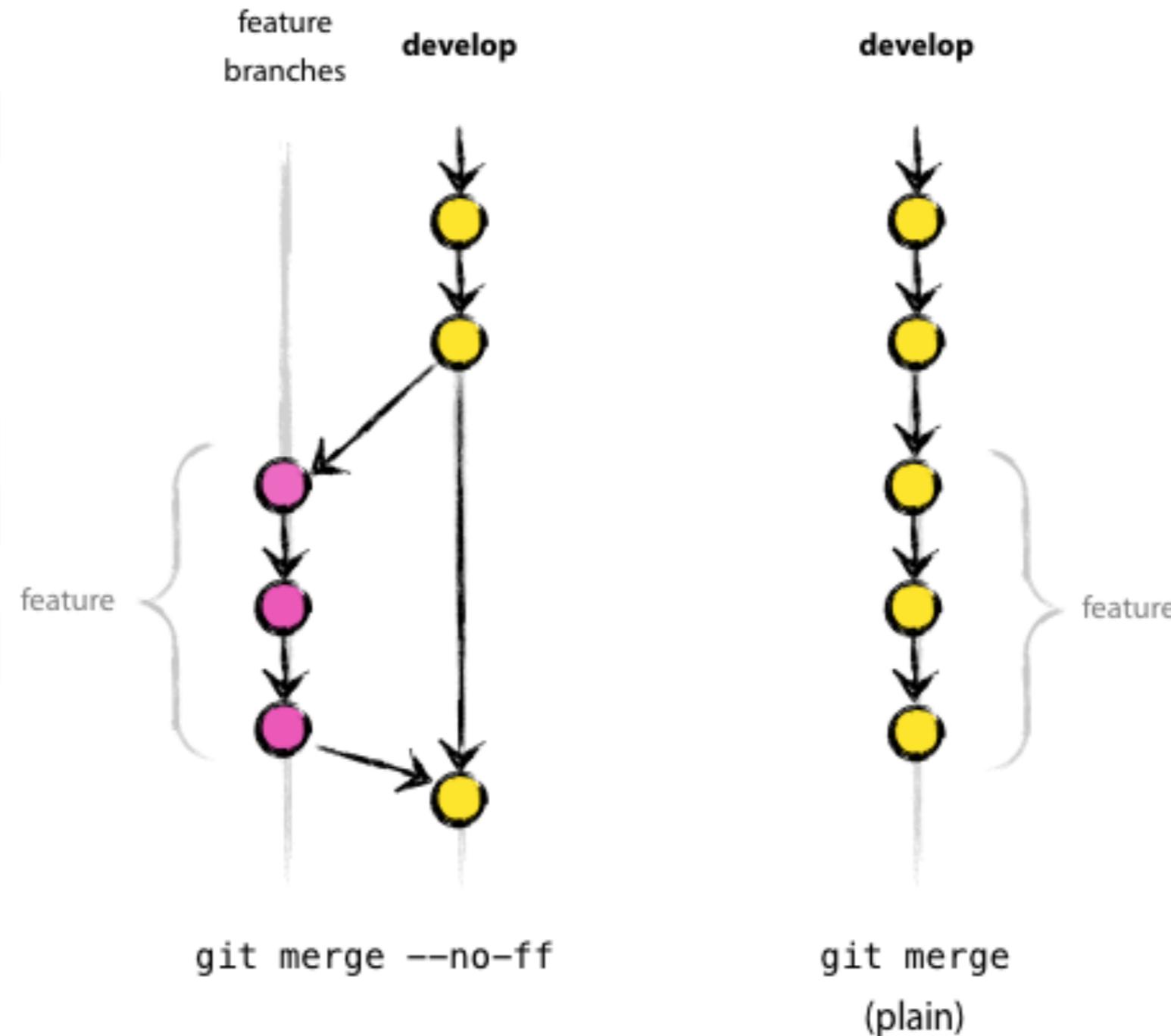
**How ?**

feature

master

\$git merge feature master

# \$git merge --no-ff





**branching is cheap  
painless development**

**delete branch if it's not work  
delete branch if it's not use**





# Branching Strategy

# Maintainable Git



**CODE is KING**

# Developer cost

\$\$\$\$\$\$\$\$\$\$

# Branching cost (~40 bytes)

\$

# Developer cost

\$\$\$\$\$\$\$\$\$

# Poor branching strategy

\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$

# Branching strategies

Last good state ?  
Mistake break everyone !!  
Lead to big commits !!

what is deployed ?  
Where do fixed ?



zipmeme

What is being worked on ?  
How do you switch tasks ?  
When do you integrated ?



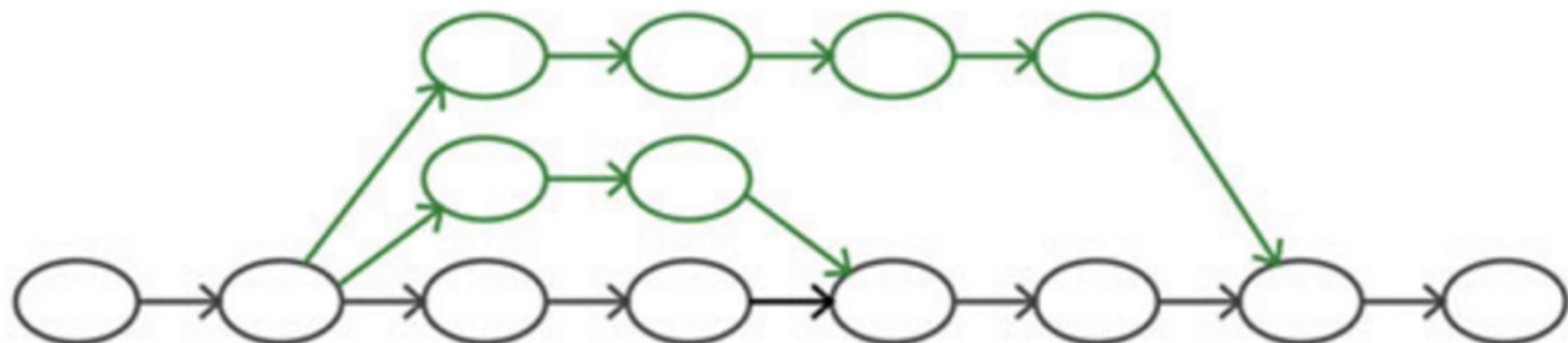
# ทำอย่างไรดี ?

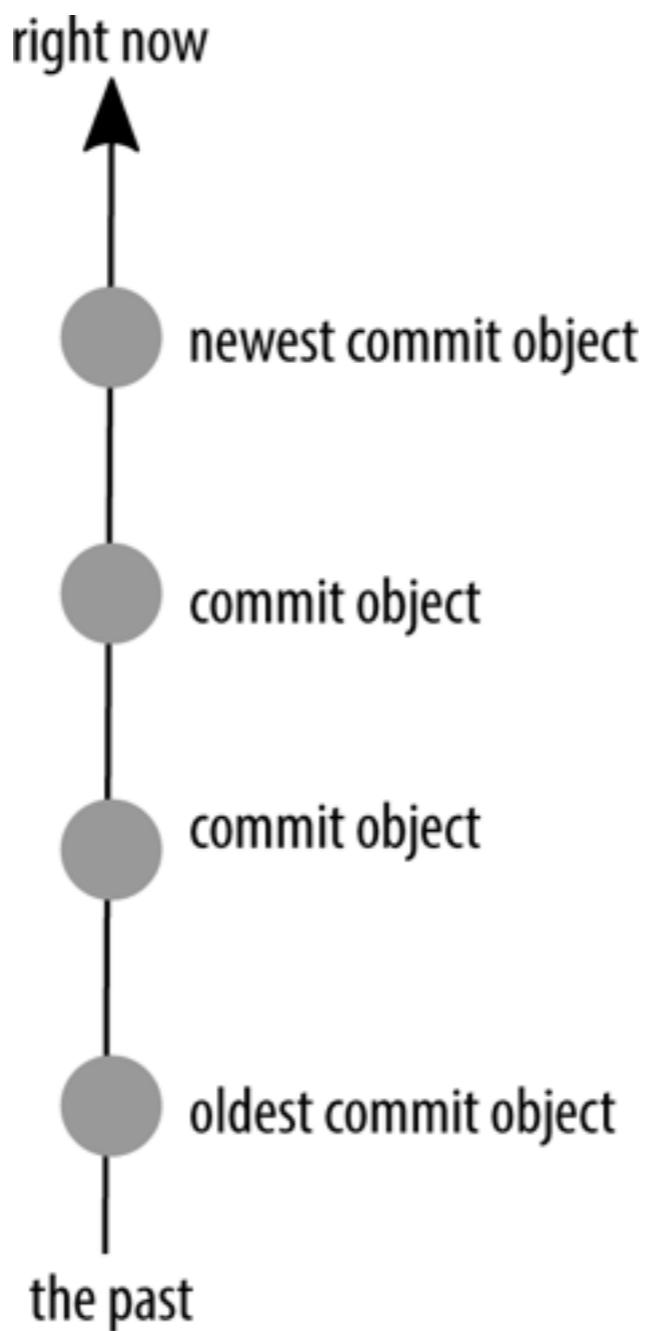
# Release Process ?

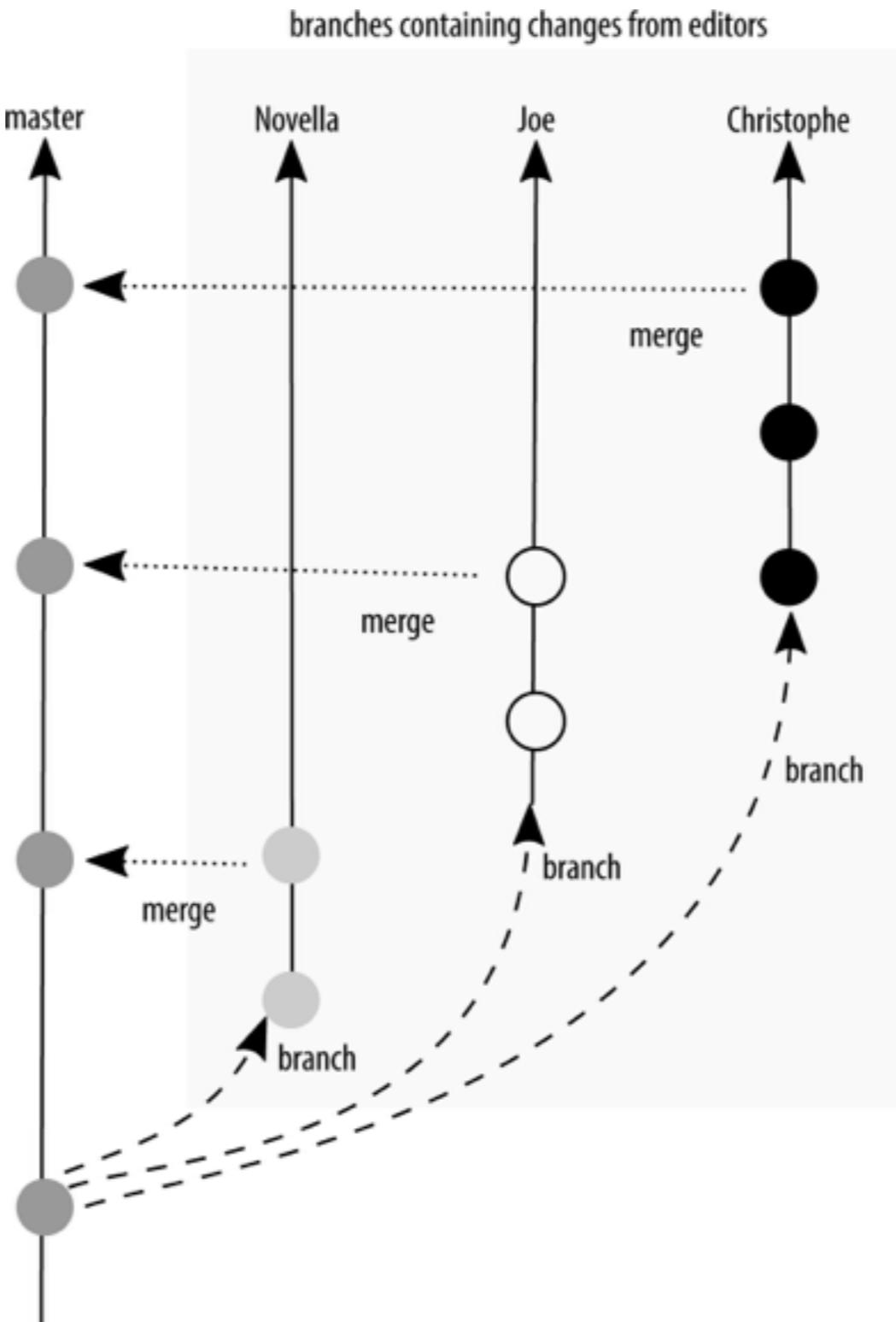
## Create a new branch

when working on any feature, issue or bug

**Merged** back when it is finished

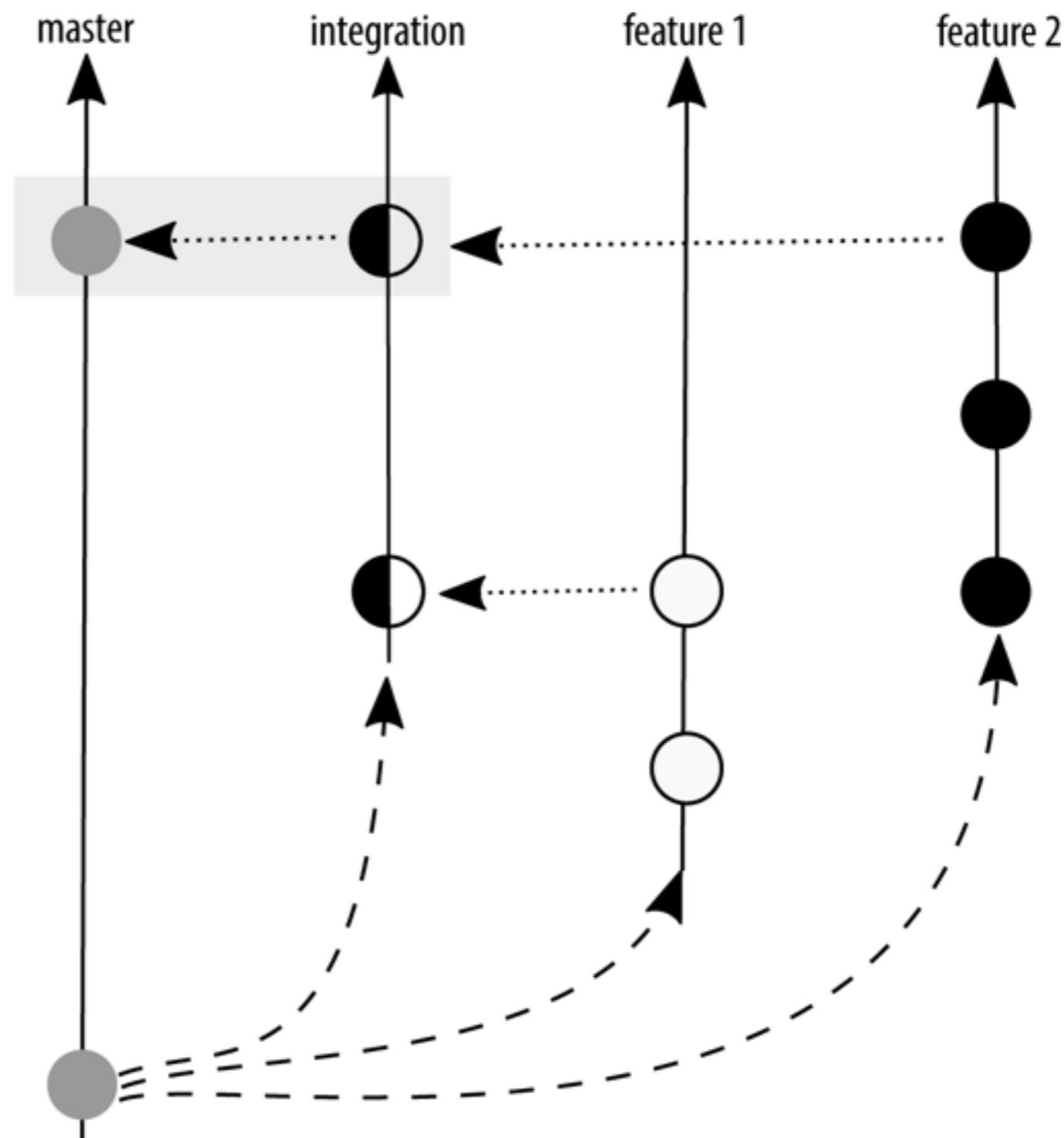


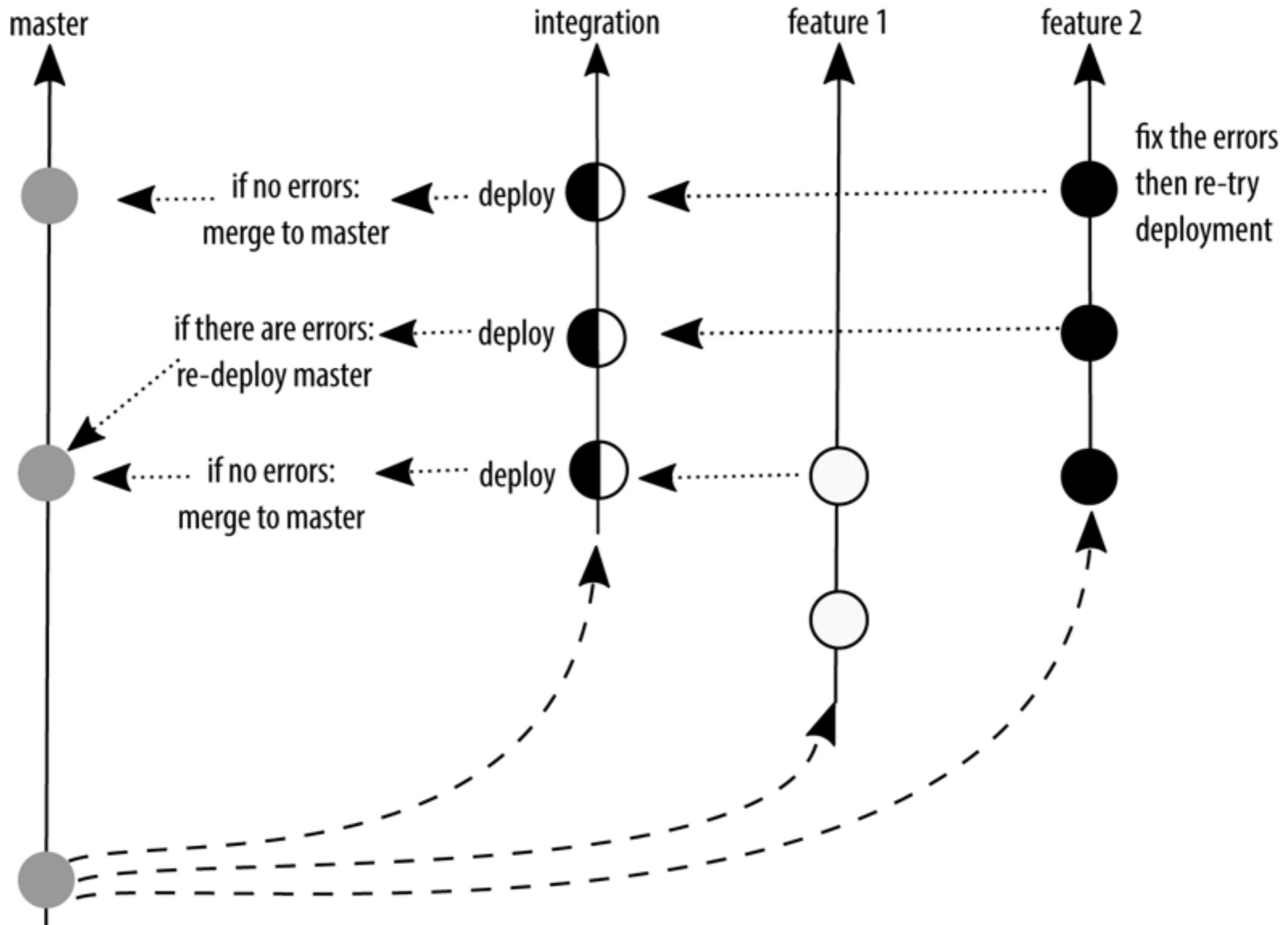




Let's discuss with Your team

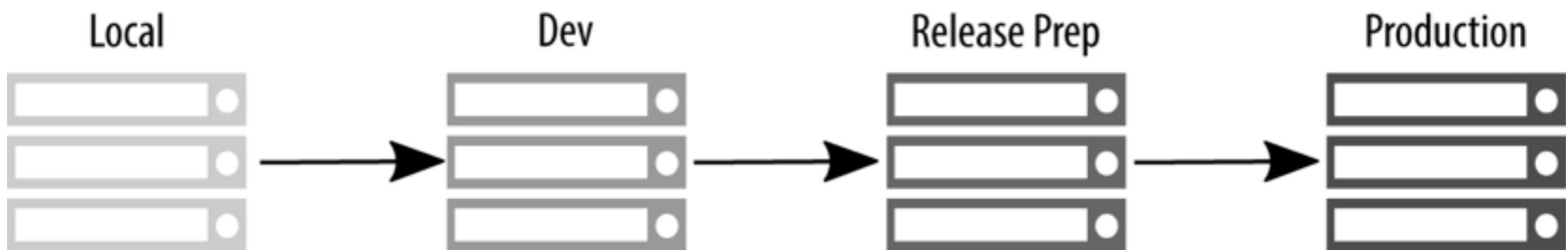
Assuming feature 1 and feature 2 integrate well: merge the combined changes in the integration branch into the master branch.

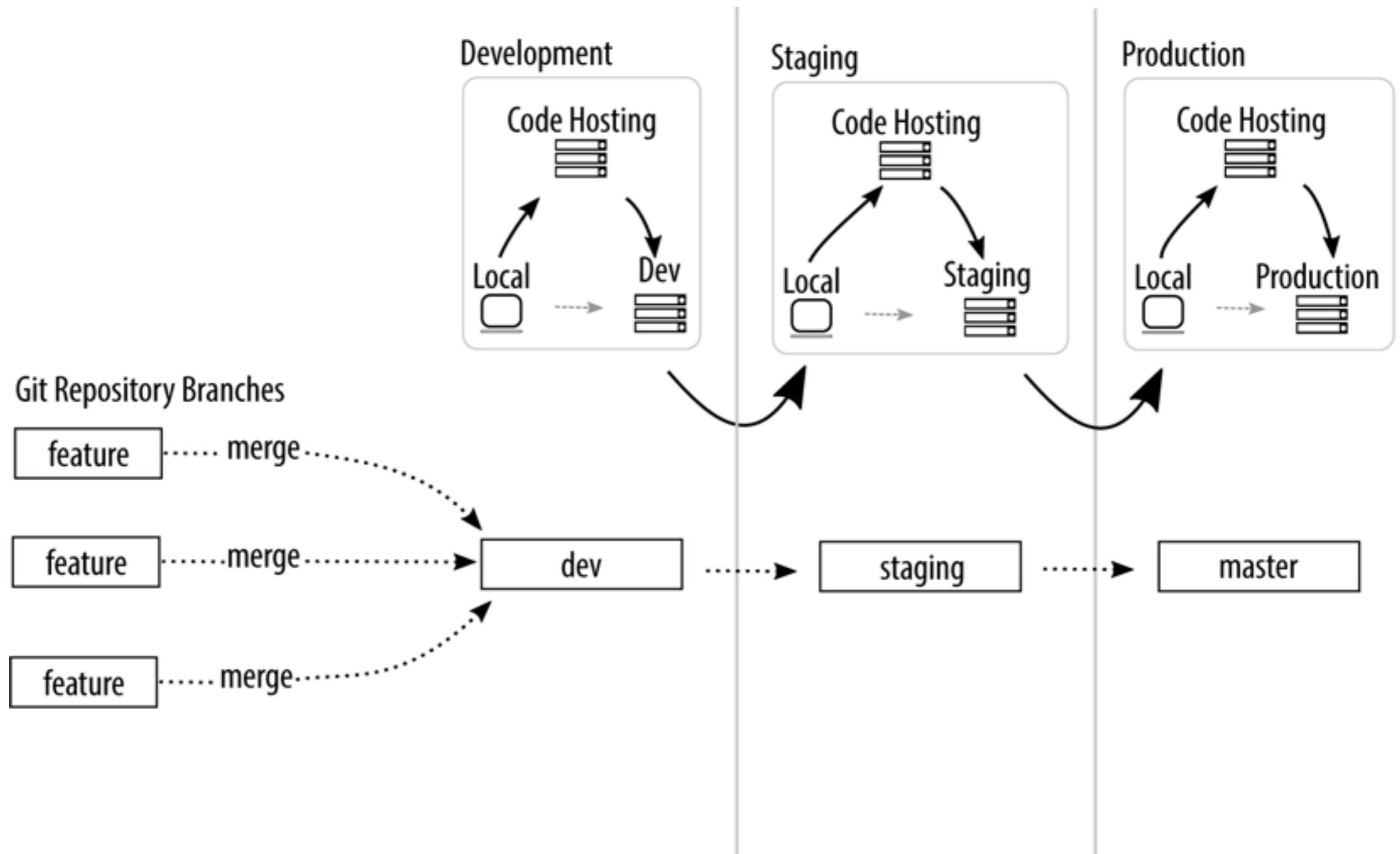




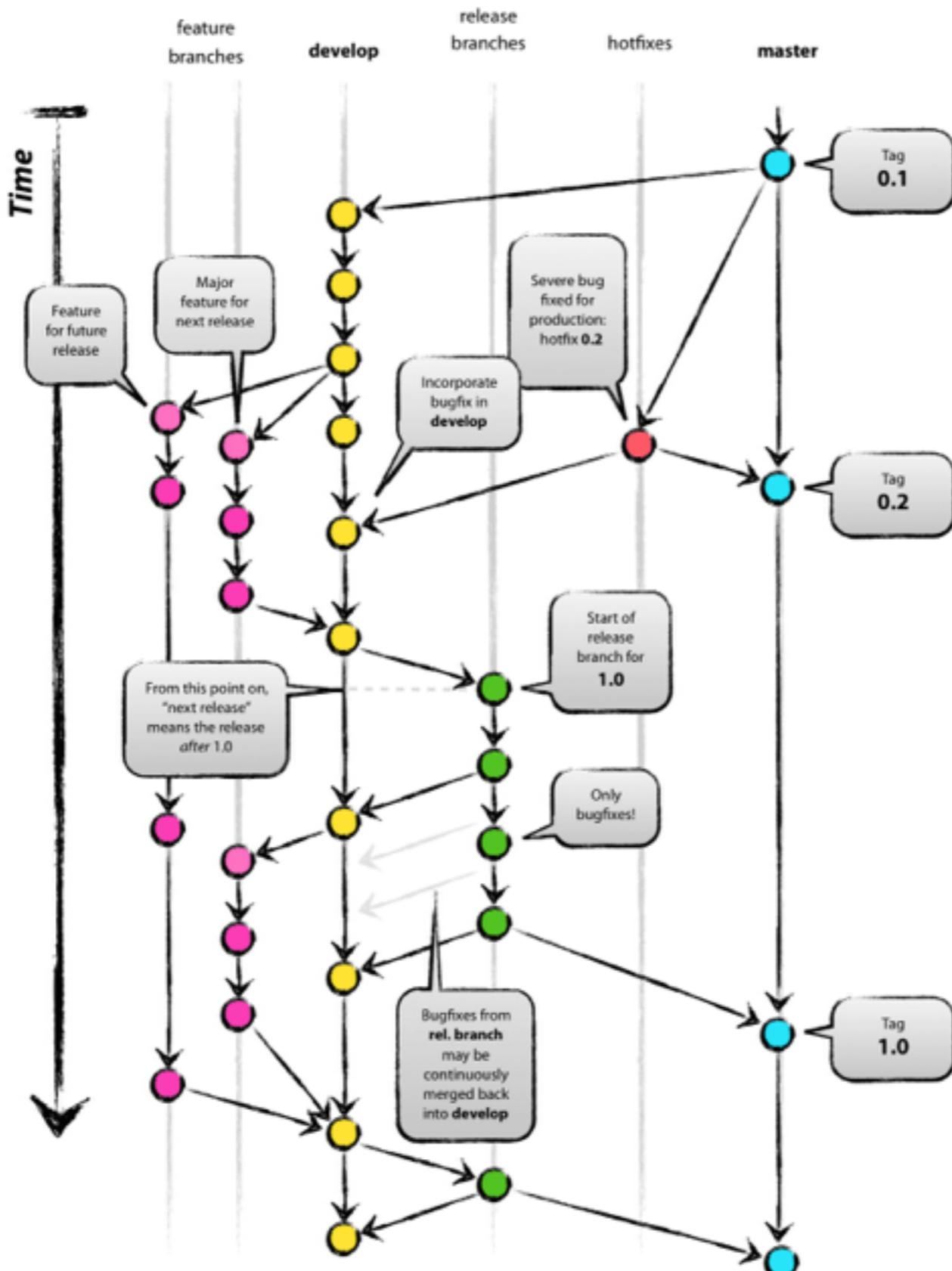
Let's discuss with Your team

# One branch per platform

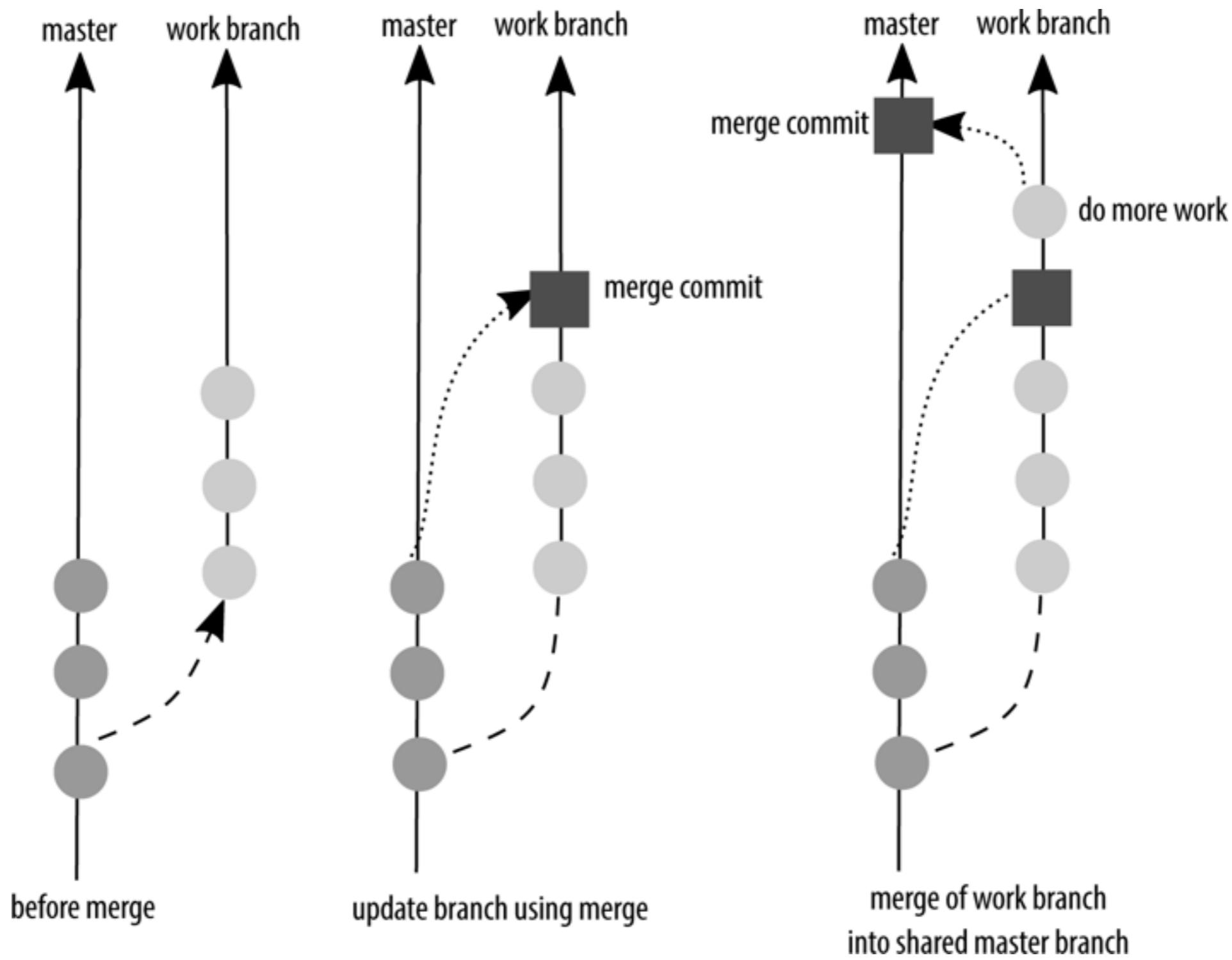




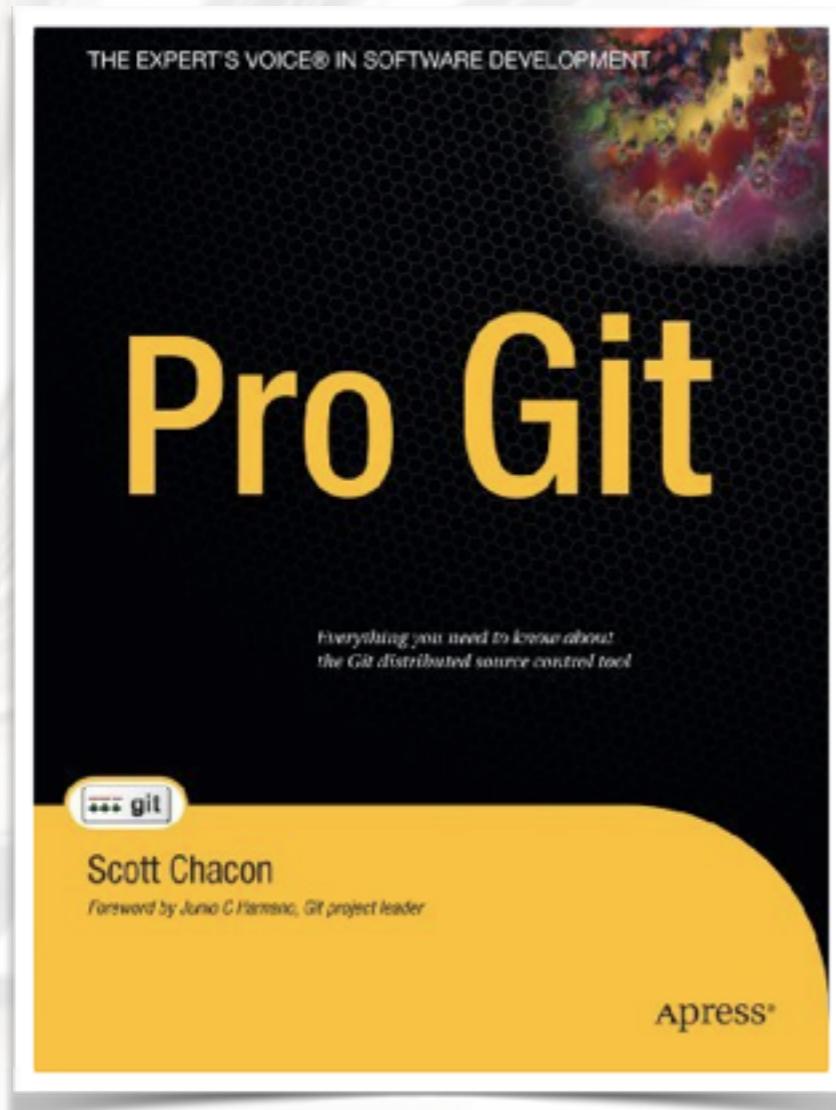
Let's discuss with Your team



Let's discuss with Your team



# Books to Read and Practice



<http://www.git-scm.com/book/en/v2>



<http://shop.oreilly.com/product/0636920034520.do>