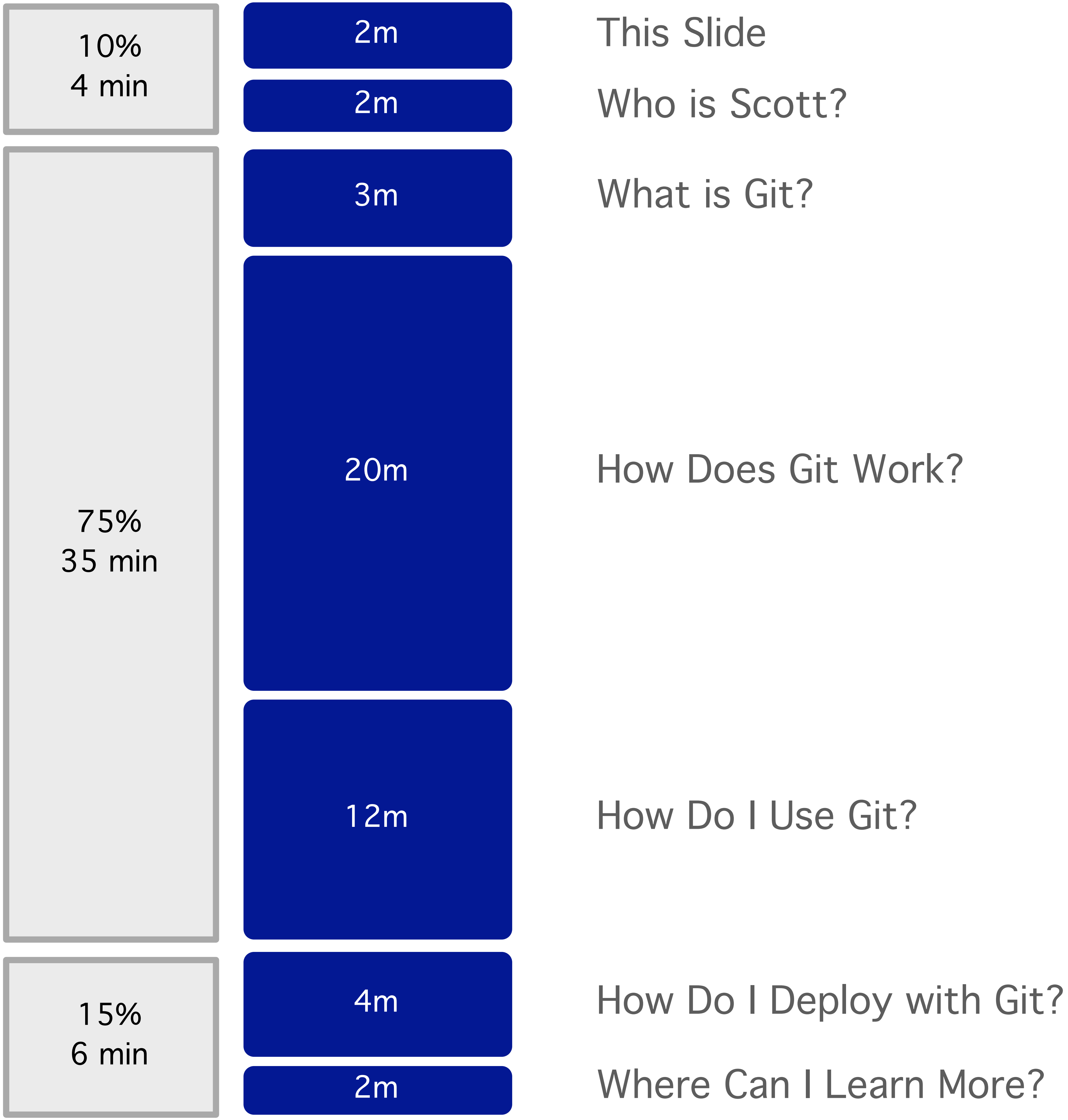
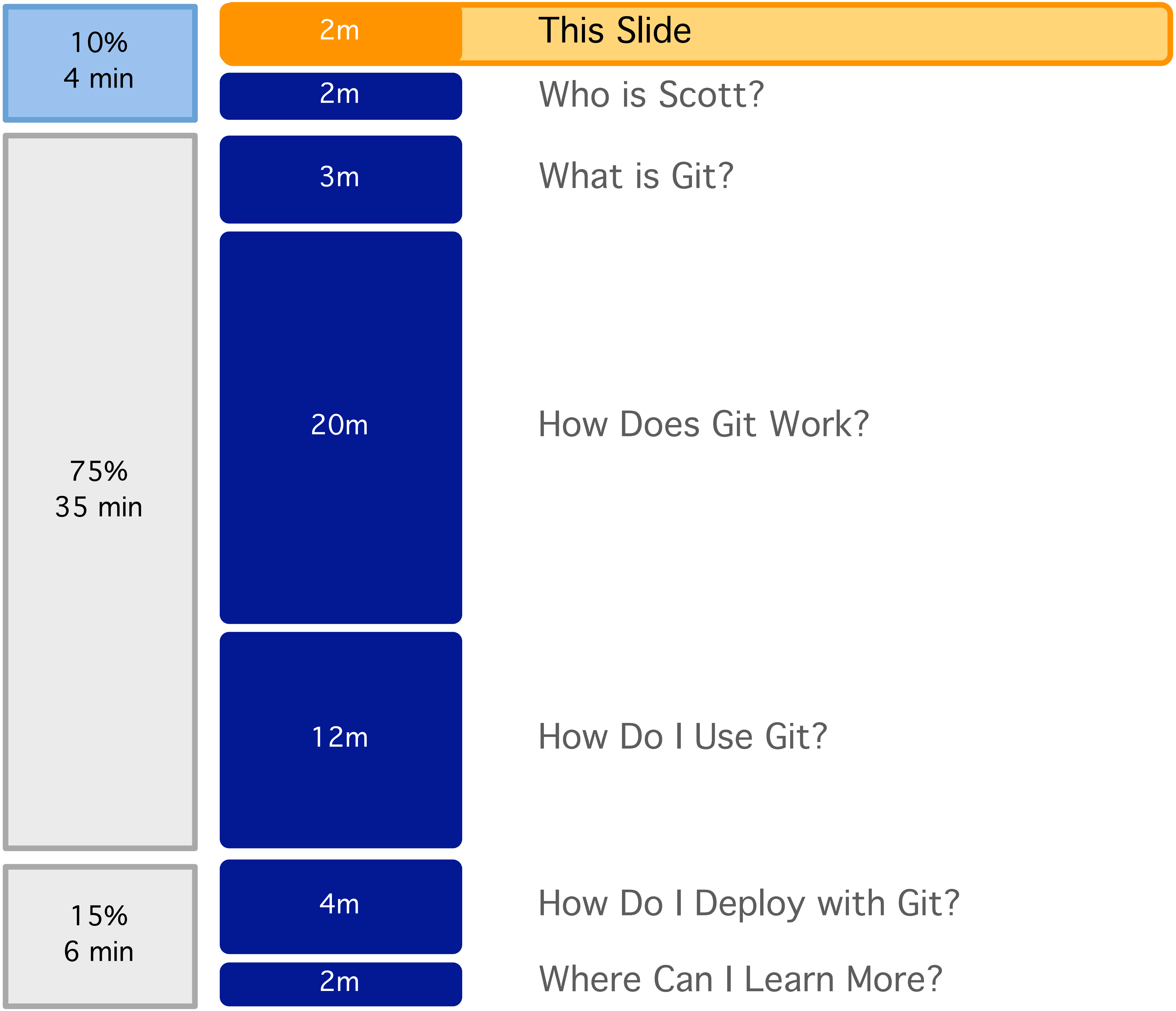
Getting Git

Scott Chacon



10% 4 min	2m	This Slide
	2m	Who is Scott?
75% 35 min	3m	What is Git?
	20m	How Does Git Work?
	12m	How Do I Use Git?
15% 6 min	4m	How Do I Deploy with Git?
	2m	Where Can I Learn More?



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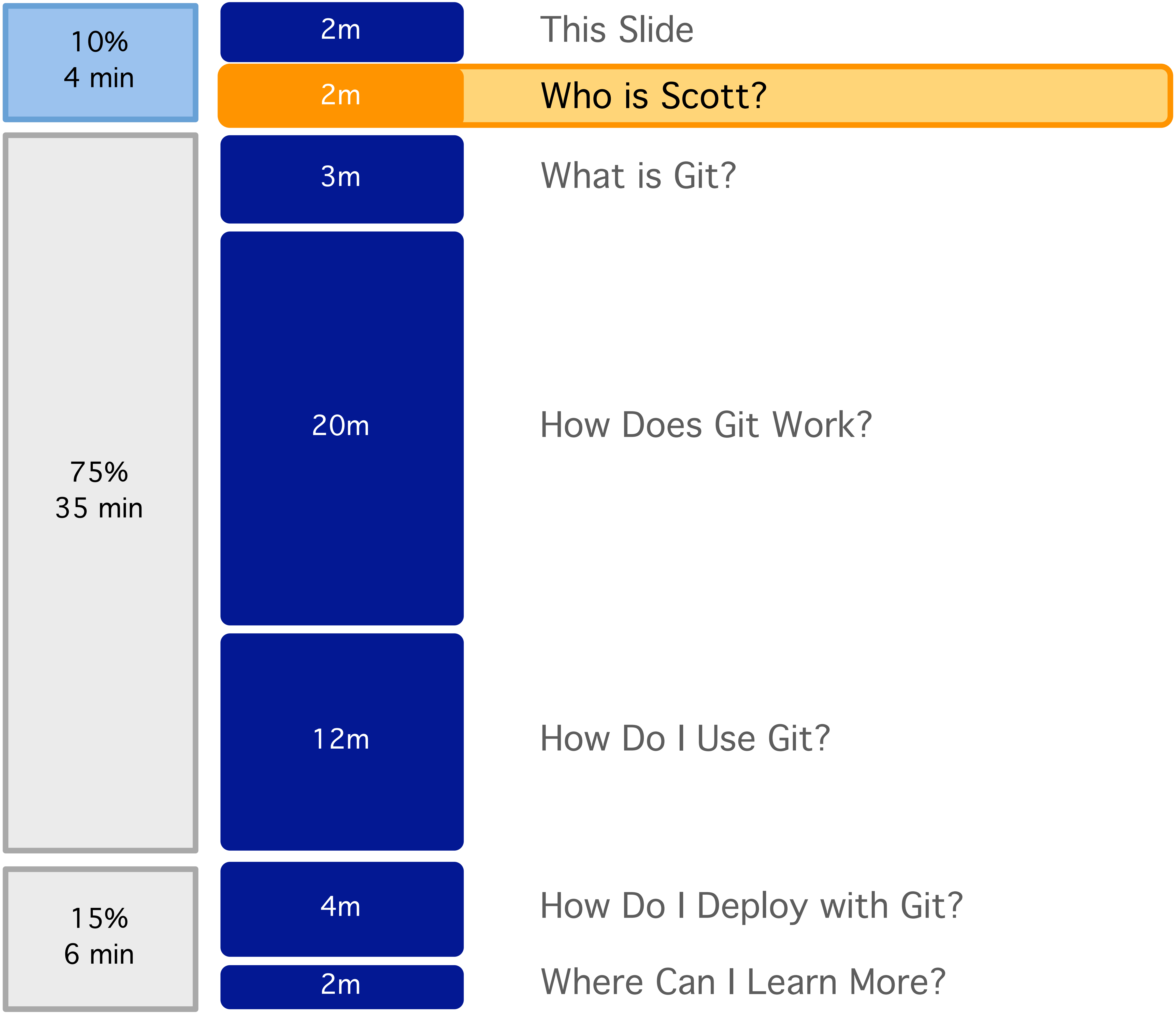

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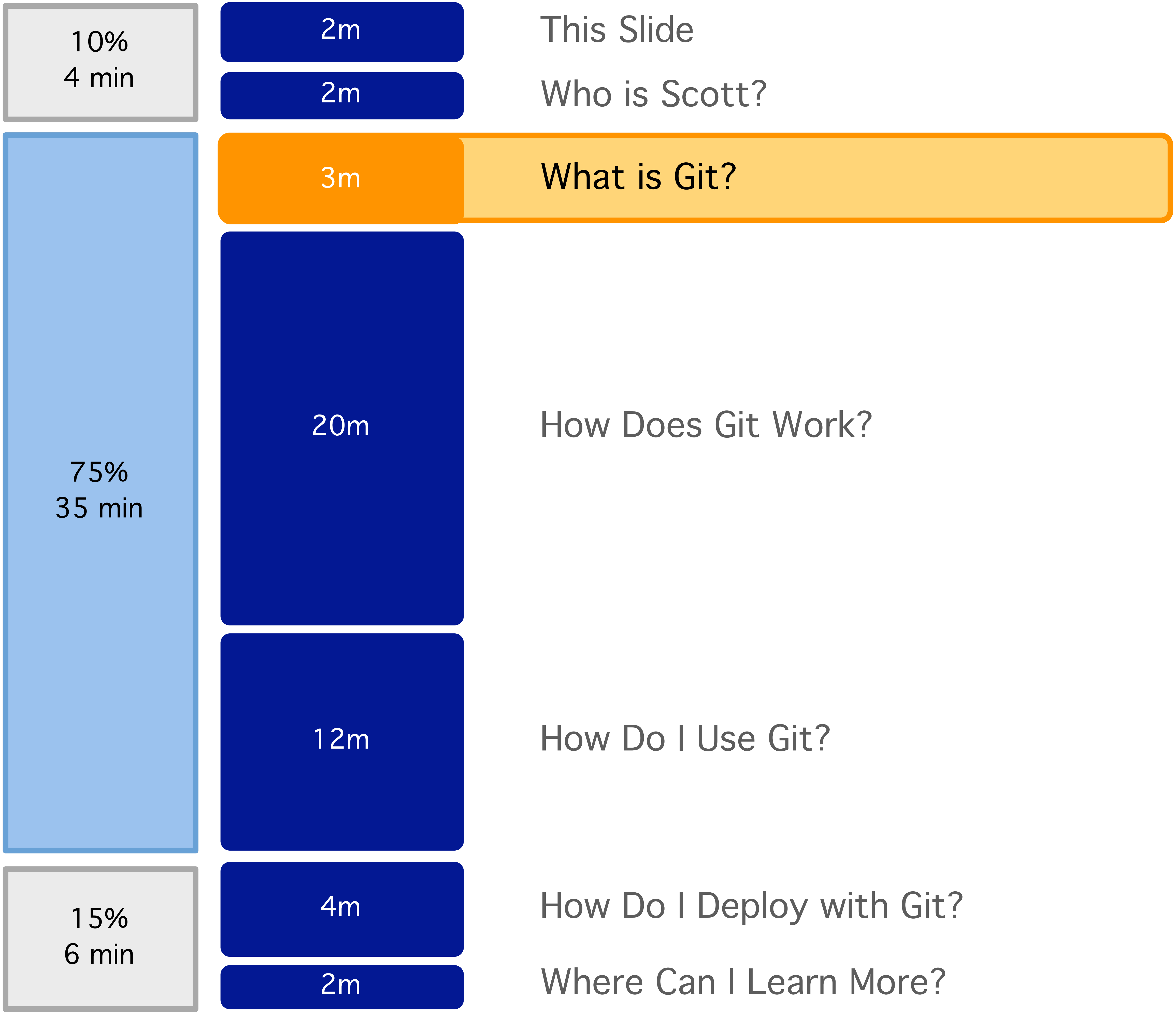

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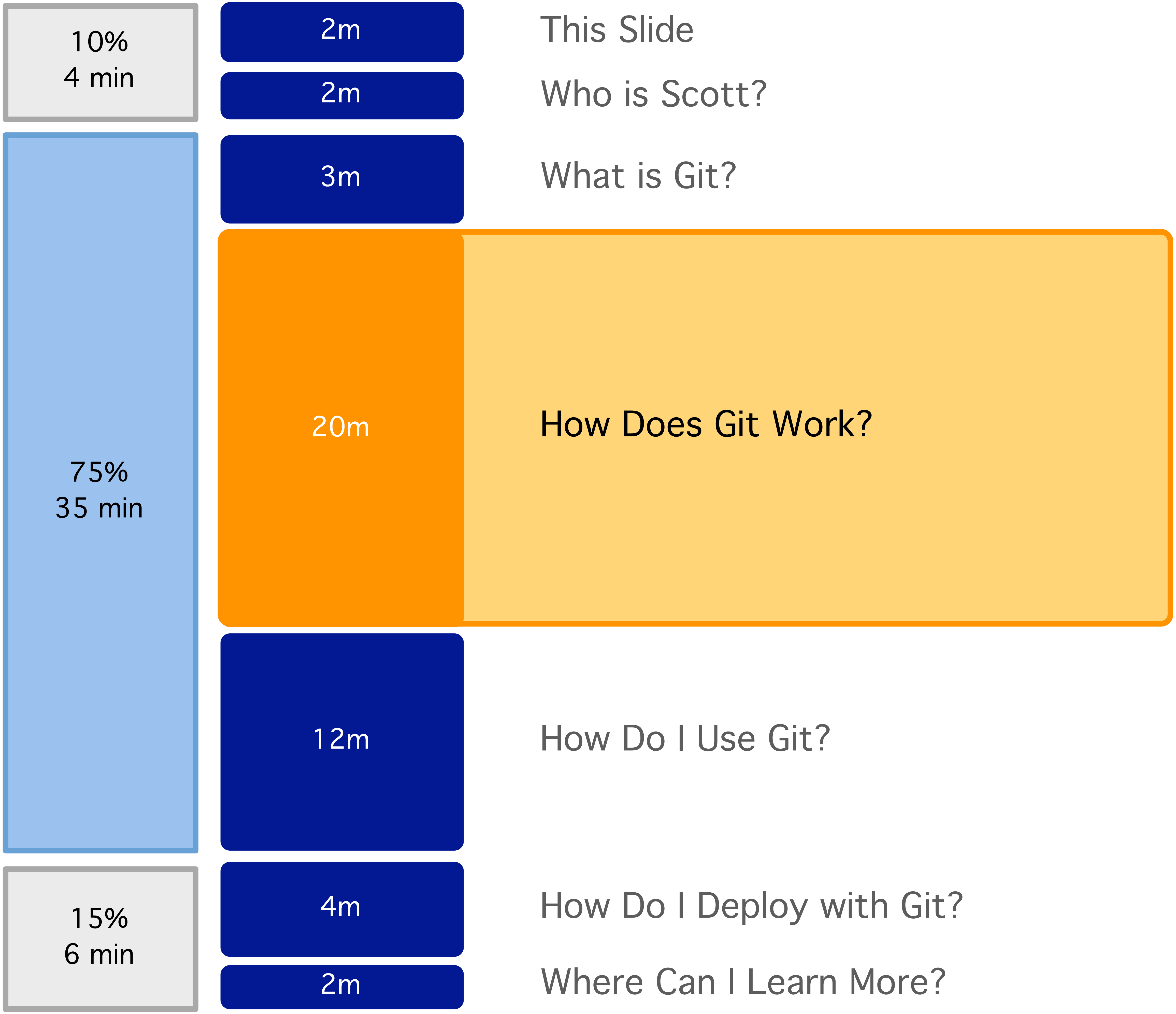

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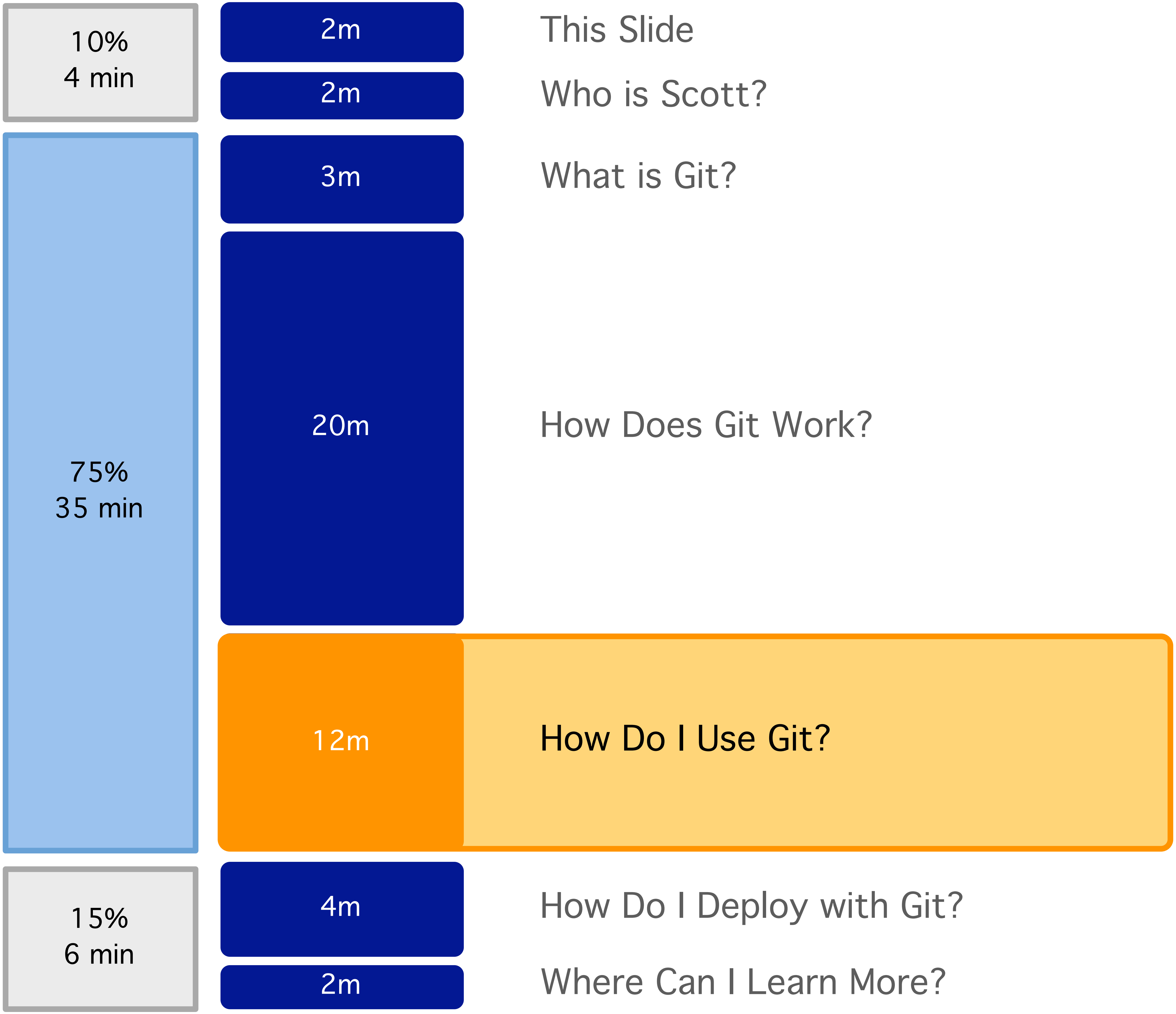

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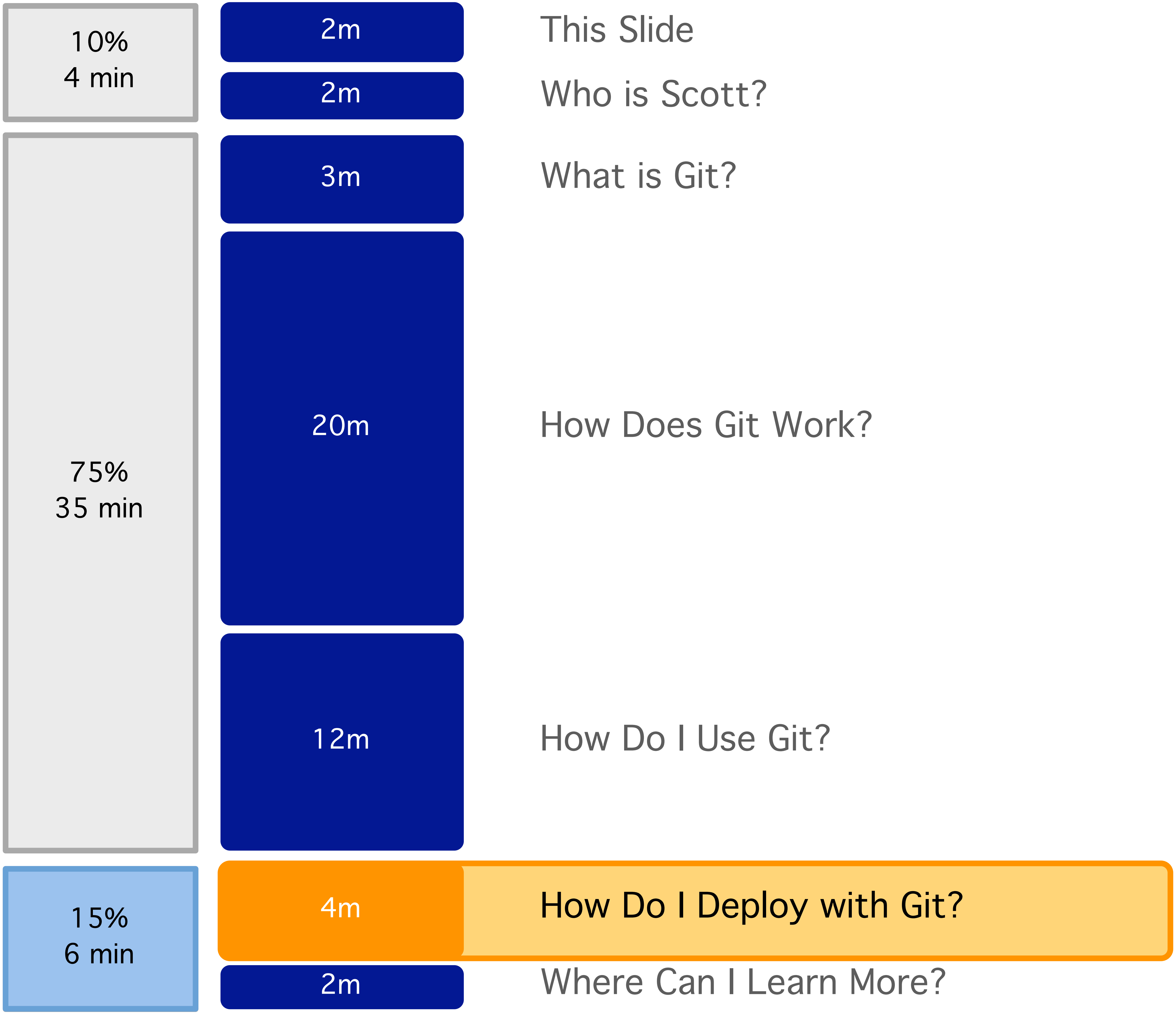

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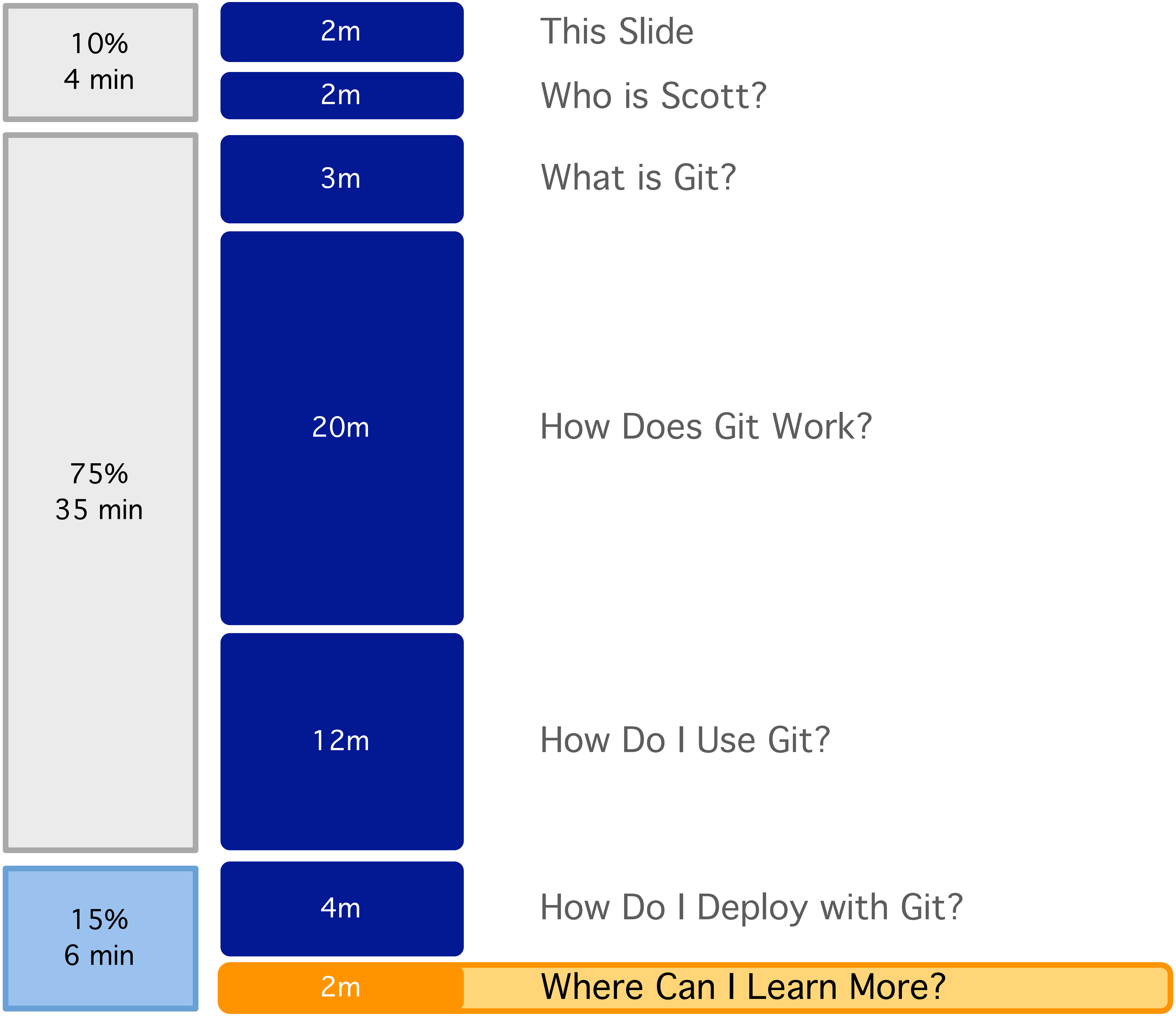

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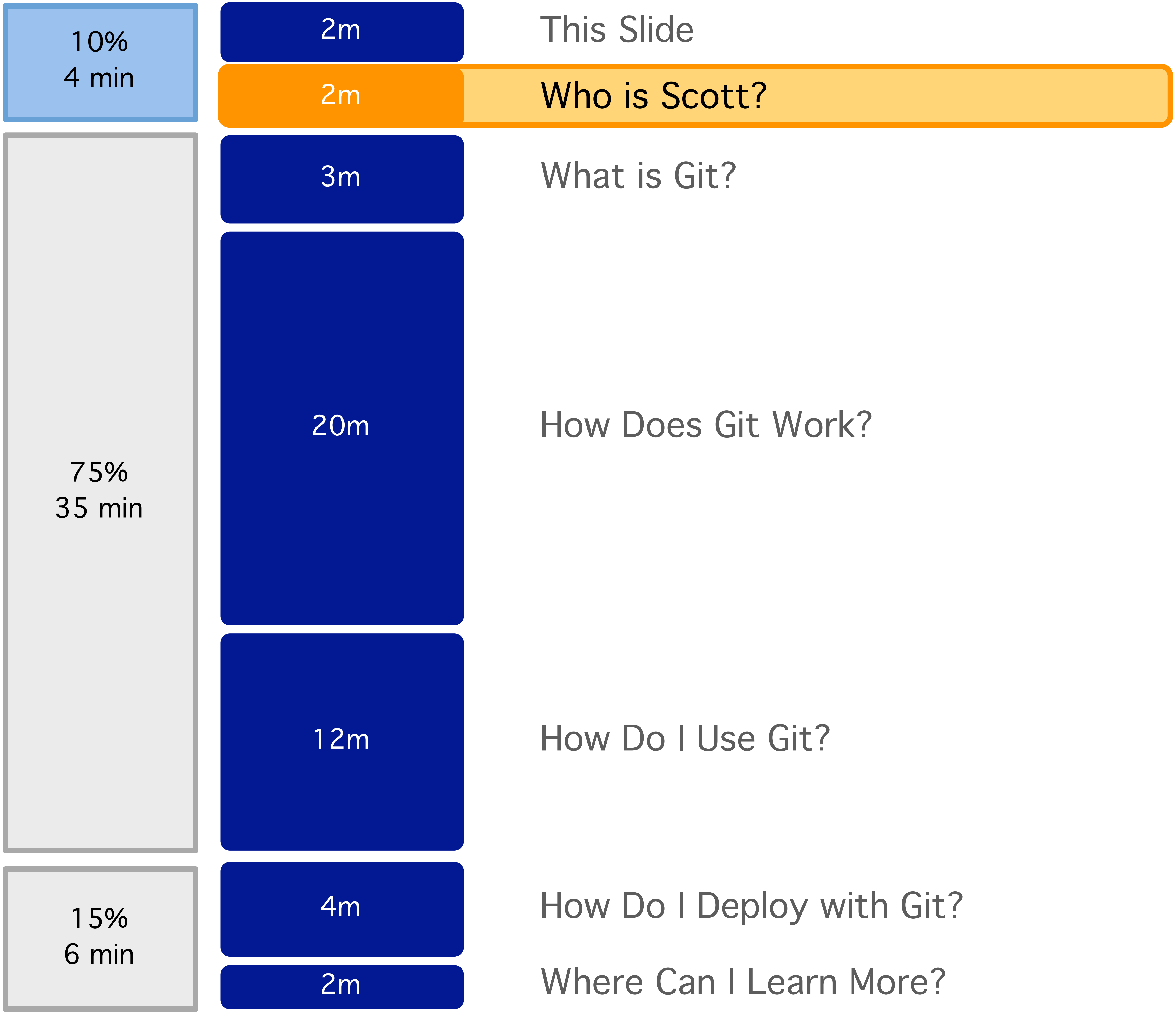
Who Is Scott?

Introducing myself…



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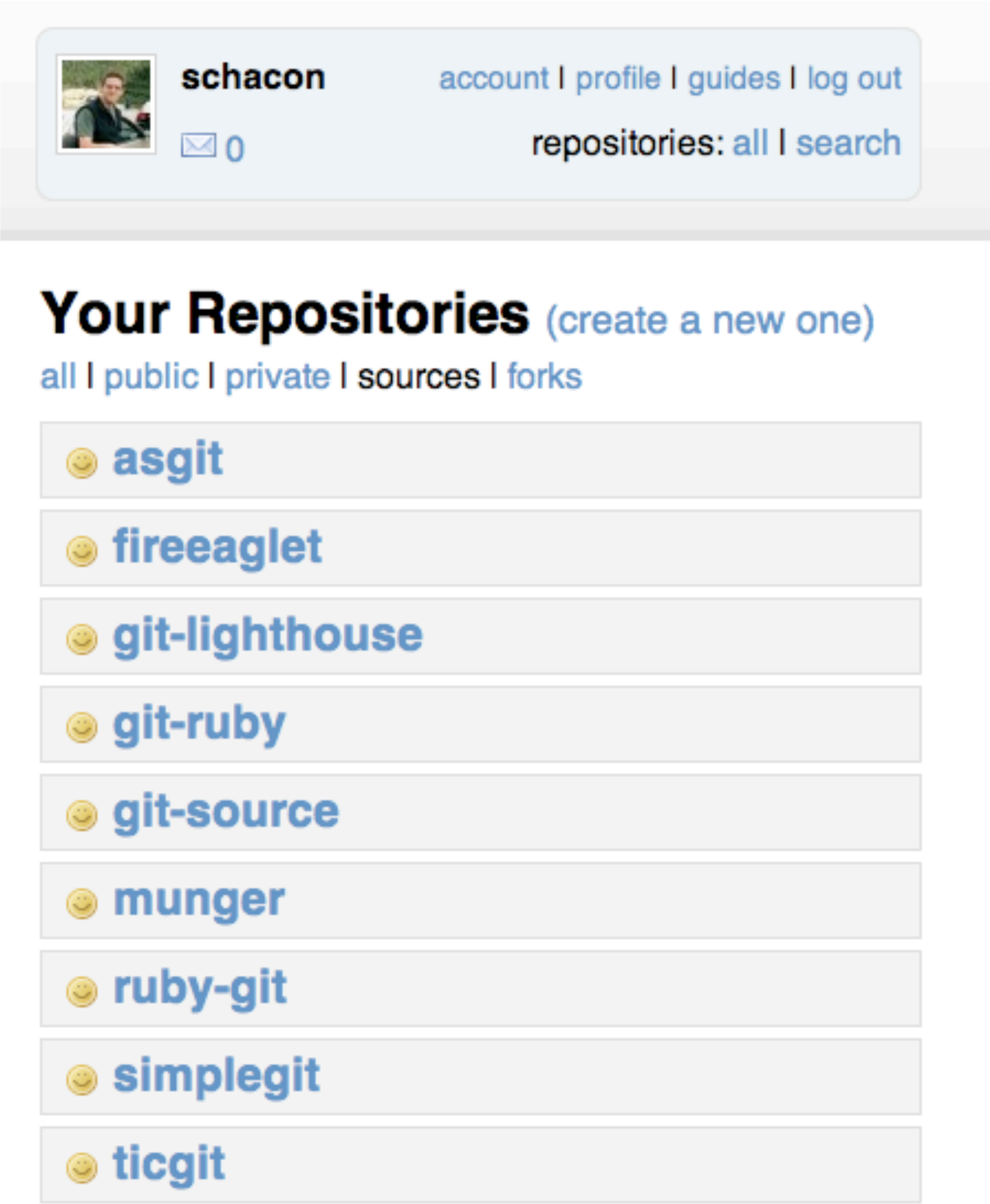
Scott Anthony Chacon

github.com/schacon



schacon

account | profile | guides | log out

✉ 0

repositories: all | search

Your Repositories (create a new one)

all | public | private | sources | forks

- asgit
- fireeaglet
- git-lighthouse
- git-ruby
- git-source
- munger
- ruby-git
- simplegit
- ticgit

PeepCode
press

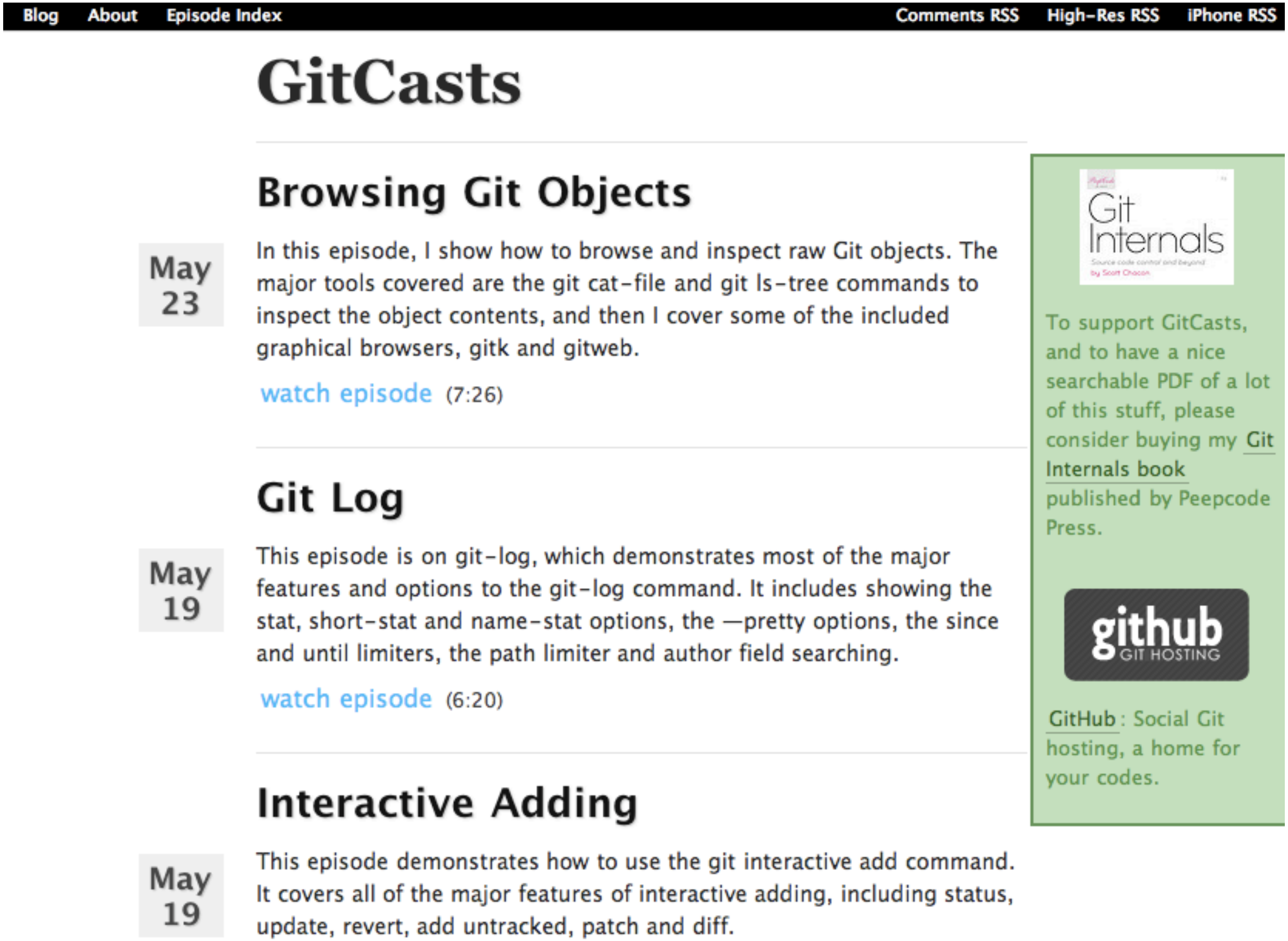
$9

Git Internals

Source code control and beyond

by Scott Chacon

www.gitcasts.com



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GitCasts

Browsing Git Objects

May 23

In this episode, I show how to browse and inspect raw Git objects. The major tools covered are the git cat-file and git ls-tree commands to inspect the object contents, and then I cover some of the included graphical browsers, gitk and gitweb.

watch episode (7:26)

Git Log

May 19

This episode is on git-log, which demonstrates most of the major features and options to the git-log command. It includes showing the stat, short-stat and name-stat options, the —pretty options, the since and until limiters, the path limiter and author field searching.

watch episode (6:20)

Interactive Adding

May 19

This episode demonstrates how to use the git interactive add command. It covers all of the major features of interactive adding, including status, update, revert, add untracked, patch and diff.

Git Internals

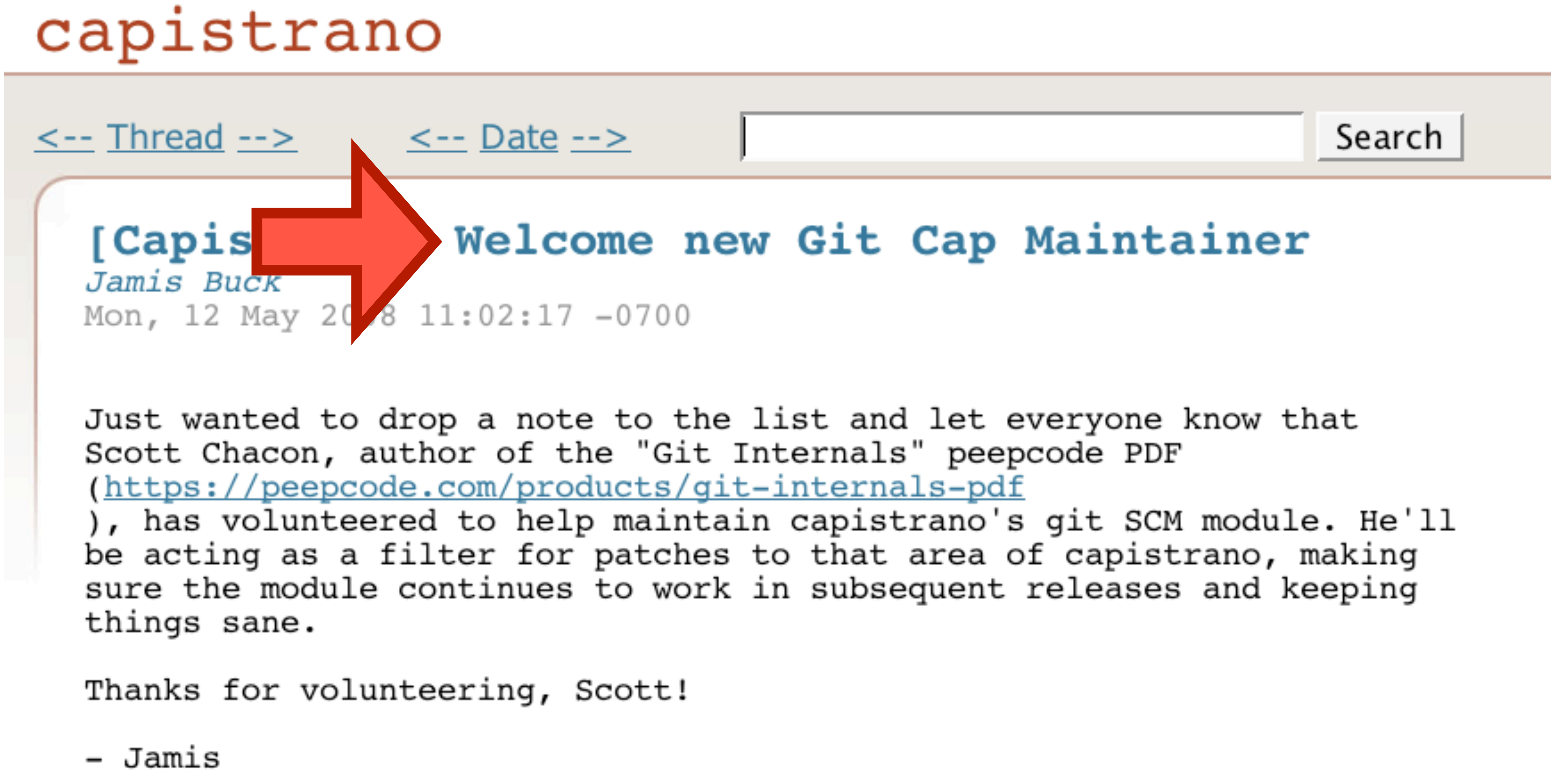
Source code control and beyond

by Scott Chacon

To support GitCasts, and to have a nice searchable PDF of a lot of this stuff, please consider buying my Git Internals book published by Peepcode Press.

github GIT HOSTING

GitHub: Social Git hosting, a home for your codes.



[Capis Welcome new Git Cap Maintainer

Jamis Buck

Mon, 12 May 20 8 11:02:17 -0700

```
Just wanted to drop a note to the list and let everyone know that
Scott Chacon, author of the "Git Internals" peepcode PDF
(https://peepcode.com/products/git-internals-pdf
), has volunteered to help maintain capistrano's git SCM module. He'll
be acting as a filter for patches to that area of capistrano, making
sure the module continues to work in subsequent releases and keeping
things sane.

Thanks for volunteering, Scott!

- Jamis
```

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Huge Flat Screens

jepoirrier@flickr

me

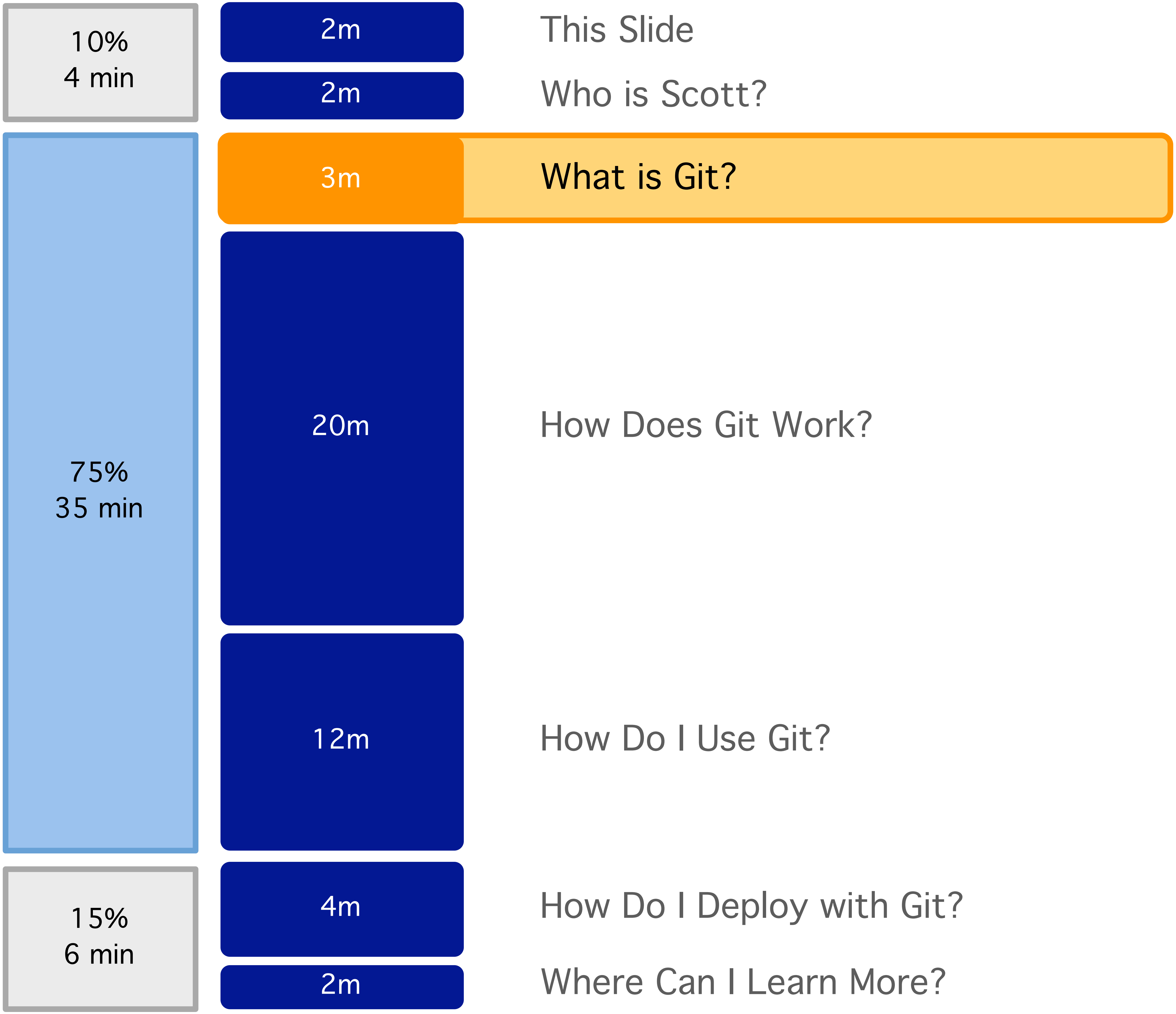
introduce yourself

introduce yourself

and your sweet projects...

why is scott here?

What is Git?



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2m Where Can I Learn More?

git is

git is

directory content management system

git is

tree history
storage system

git is

stupid content tracker

git is

a toolkit

```
git-add                  git-fast-export          git-merge-recur          git-revert
git-add--interactive     git-fast-import          git-merge-recursive      git-rm
git-am                   git-fetch                git-merge-recursive-old  git-runstatus
git-annotate             git-fetch--tool          git-merge-resolve        git-send-email
git-apply                git-fetch-pack           git-merge-stupid         git-send-pack
git-applymbox            git-filter-branch        git-merge-subtree        git-sh-setup
git-applypatch           git-fmt-merge-msg        git-merge-tree           git-shell
git-archimport           git-for-each-ref         git-mergetool            git-shortlog
git-archive              git-format-patch         git-mktag                git-show
git-bisect               git-fsck                 git-mktree               git-show-branch
git-blame                git-fsck-objects         git-mv                   git-show-index
git-branch               git-gc                   git-name-rev             git-show-ref
git-bundle               git-get-tar-commit-id    git-pack-objects         git-ssh-fetch
git-cat-file             git-grep                 git-pack-redundant       git-ssh-pull
git-check-attr           git-gui                  git-pack-refs            git-ssh-push
git-check-ref-format     git-hash-object          git-parse-remote         git-ssh-upload
git-checkout             git-http-fetch           git-patch-id             git-stash
git-checkout-index       git-http-push            git-peek-remote          git-status
git-cherry               git-imap-send            git-prune                git-stripspace
git-cherry-pick          git-index-pack           git-prune-packed         git-submodule
git-citool               git-init                 git-pull                 git-svn
git-clean                git-init-db              git-push                 git-svnimport
git-clone                git-instaweb             git-quiltimport          git-symbolic-ref
git-commit               git-local-fetch          git-read-tree            git-tag
git-commit-tree          git-log                  git-rebase               git-tar-tree
git-config               git-lost-found           git-rebase--interactive  git-unpack-file
git-convert-objects      git-ls-files             git-receive-pack         git-unpack-objects
git-count-objects        git-ls-remote            git-reflog               git-update-index
git-cvsexportcommit      git-ls-tree              git-relink               git-update-ref
git-cvsimport            git-mailinfo             git-remote               git-update-server-inf
git-cvsserver            git-mailsplit            git-repack               git-upload-archive
git-daemon               git-merge                git-repo-config          git-upload-pack
git-describe             git-merge-base           git-request-pull         git-var
git-diff                 git-merge-file           git-rerere               git-verify-pack
git-diff-files           git-merge-index          git-reset                git-verify-tag
git-diff-index           git-merge-octopus        git-resolve              git-web--browse
git-diff-stages          git-merge-one-file       git-rev-list             git-whatchanged
git-diff-tree            git-merge-ours           git-rev-parse            git-write-tree
```

```
git-applymbox
git-applypatch
git-archimport
git-bundle
git-cat-file
git-check-attr
git-check-ref-format
git-checkout-index
git-cherry
git-commit-tree
git-config
git-convert-objects
git-count-objects
git-cvsexportcommit
git-cvsimport
git-cvsserver
git-describe
git-diff-files
git-diff-index
git-diff-stages
git-diff-tree
git-fast-export
git-fast-import
git-fetch--tool
git-fetch-pack
git-filter-branch
git-fmt-merge-msg
git-for-each-ref
git-fsck
git-fsck-objects
git-get-tar-commit-id
git-hash-object
git-http-fetch
git-http-push
git-imap-send
git-index-pack
git-init-db
git-local-fetch
git-lost-found
git-ls-files
git-ls-remote
git-ls-tree
git-mailinfo
git-mailsplit
git-merge-base
git-merge-file
git-merge-index
git-merge-octopus
git-merge-one-file
git-merge-ours
git-merge-recur
git-merge-recursive
git-merge-recursive-old
git-merge-resolve
git-merge-stupid
git-merge-subtree
git-merge-tree
git-mergetool
git-mktag
git-mktree
git-name-rev
git-pack-objects
git-pack-redundant
git-pack-refs
git-parse-remote
git-patch-id
git-peek-remote
git-prune
git-prune-packed
git-quiltimport
git-read-tree
git-receive-pack
git-reflog
git-relink
git-remote
git-repack
git-repo-config
git-request-pull
git-rerere
git-resolve
git-rev-list
git-rev-parse
git-runstatus
git-send-pack
git-sh-setup
git-shell
git-shortlog
git-show-branch
git-show-index
git-show-ref
git-ssh-fetch
git-ssh-pull
git-ssh-push
git-ssh-upload
git-stripspace
git-svn
git-svnimport
git-symbolic-ref
git-tar-tree
git-unpack-file
git-unpack-objects
git-update-index
git-update-ref
git-update-server-inf
git-upload-archive
git-upload-pack
git-var
git-verify-pack
git-verify-tag
git-web--browse
git-whatchanged
git-write-tree
```

the “plumbing”

```
git-applymbox
git-applypatch
git-archimport

git-bundle
git-cat-file
git-check-attr
git-check-ref-format

git-checkout-index
git-cherry

git-commit-tree
git-config
git-convert-objects
git-count-objects
git-cvsexportcommit
git-cvsimport
git-cvsserver

git-describe

git-diff-files
git-diff-index
git-diff-stages
git-diff-tree
```

```
git-fast-export
git-fast-import

git-fetch--tool
git-fetch-pack
git-filter-branch
git-fmt-merge-msg
git-for-each-ref

git-fsck
git-fsck-objects

git-get-tar-commit-id

git-hash-objects
git-http-fetch
git-http-push
git-imap-send
git-index-pack

git-init-db

git-local-fetch

git-lost-found
git-ls-files
git-ls-remote
git-ls-tree
git-mailinfo
git-mailsplit

git-merge-base
git-merge-file
git-merge-index
git-merge-octopus
git-merge-one-file
git-merge-ours
```

```
git-merge-recur
git-merge-recursive
git-merge-recursive-old
git-merge-resolve
git-merge-stupid
git-merge-subtree
git-merge-tree
git-mergetool
git-mktag
git-mktree

git-name-rev
git-pack-objects
git-pack-redundant
git-pack-refs
git-parse-remote
git-patch-id
git-peek-remote
git-prune
git-prune-packed

git-quiltimport
git-read-tree

git-receive-pack
git-reflog
git-relink
git-remote
git-repack
git-repo-config
git-request-pull
git-rerere

git-resolve
git-rev-list
git-rev-parse
```

```
git-runstatus

git-send-pack
git-sh-setup
git-shell
git-shortlog

git-show-branch
git-show-index
git-show-ref
git-ssh-fetch
git-ssh-pull
git-ssh-push
git-ssh-upload

git-stripspace

git-svn
git-svnimport
git-symbolic-ref

git-tar-tree
git-unpack-file
git-unpack-objects
git-update-index
git-update-ref
git-update-server-inf
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git-upload-pack
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git-verify-tag
git-web--browse
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git-write-tree
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```
git-add                  git-fast-export          git-merge-recur          git-revert
git-add--interactive     git-fast-import          git-merge-recursive      git-rm
git-am                   git-fetch                git-merge-recursive-old  git-runstatus
git-annotate             git-fetch--tool          git-merge-resolve        git-send-email
git-apply                git-fetch-pack           git-merge-stupid         git-send-pack
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git-archive              git-format-patch         git-mktag                git-show
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git-blame                git-fsck-objects         git-mv                   git-show-index
git-branch               git-gc                   git-name-rev             git-show-ref
git-bundle               git-get-tar-commit-id    git-pack-objects         git-ssh-fetch
git-cat-file             git-grep                 git-pack-redundant       git-ssh-pull
git-check-attr           git-gui                  git-pack-refs            git-ssh-push
git-check-ref-format     git-hash-object          git-parse-remote         git-ssh-upload
git-checkout             git-http-fetch           git-patch-id             git-stash
git-checkout-index       git-http-push            git-peek-remote          git-status
git-cherry               git-imap-send            git-prune                git-stripspace
git-cherry-pick          git-index-pack           git-prune-packed         git-submodule
git-citool               git-init                 git-pull                 git-svn
git-clean                git-init-db              git-push                 git-svnimport
git-clone                git-instaweb             git-quiltimport          git-symbolic-ref
git-commit               git-local-fetch          git-read-tree            git-tag
git-commit-tree          git-log                  git-rebase               git-tar-tree
git-config               git-lost-found           git-rebase--interactive  git-unpack-file
git-convert-objects      git-ls-files             git-receive-pack         git-unpack-objects
git-count-objects        git-ls-remote            git-reflog               git-update-index
git-cvsexportcommit      git-ls-tree              git-relink               git-update-ref
git-cvsimport            git-mailinfo             git-remote               git-update-server-inf
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git-diff                 git-merge-file           git-rerere               git-verify-pack
git-diff-files           git-merge-index          git-reset                git-verify-tag
git-diff-index           git-merge-octopus        git-resolve              git-web--browse
git-diff-stages          git-merge-one-file       git-rev-list             git-whatchanged
git-diff-tree            git-merge-ours           git-rev-parse            git-write-tree
```

```
git-add
git-add--interactive
git-am
git-annotate
git-apply
git-archive
git-bisect
git-blame
git-branch
git-checkout
git-cherry-pick
git-citool
git-clean
git-clone
git-commit
git-daemon
git-diff
```

```
git-fetch
git-format-patch
git-gc
git-grep
git-gui
git-init
git-instaweb
git-log
git-merge
```

```
git-mv
git-pull
git-push
git-rebase
git-rebase--interactive
git-reset
```

```
git-revert
git-rm
git-send-email
git-shortlog
git-show
git-stash
git-status
git-submodule
git-tag
```

the "porcelain"

git-add
git-add--interactive
git-am
git-annotate
git-apply
git-archive
git-bisect
git-blame
git-branch
git-checkout
git-cherry-pick
git-citool
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git-grep
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git-instaweb
git-log
git-merge

git-mv
git-pull
git-push
git-rebase
git-rebase--interactive
git-reset

git-revert
git-rm
git-send-email
git-shortlog
git-show
git-stash
git-status
git-submodule
git-tag

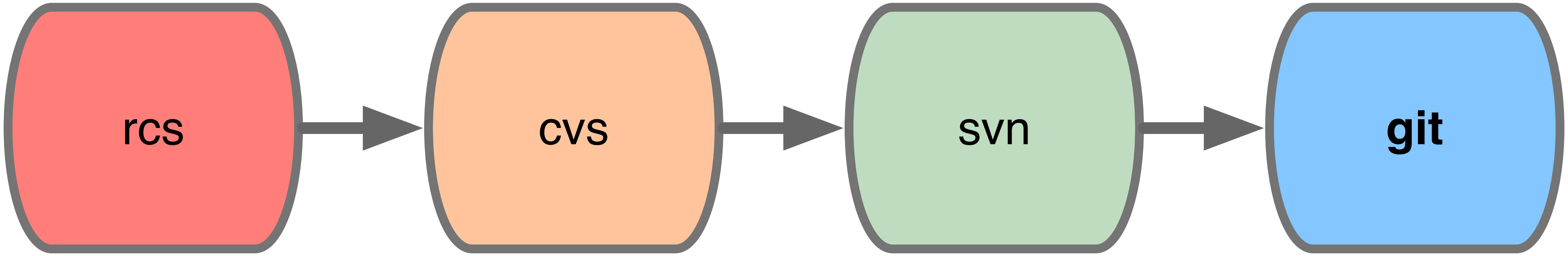
git is

not subversion!

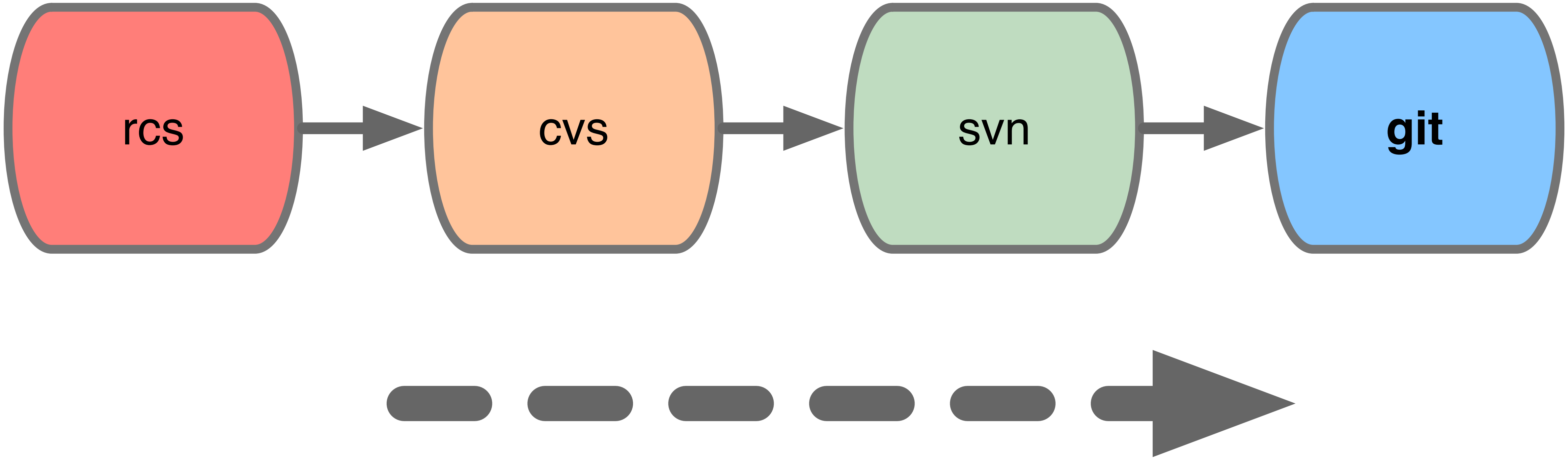
forget subversion!

not an evolution

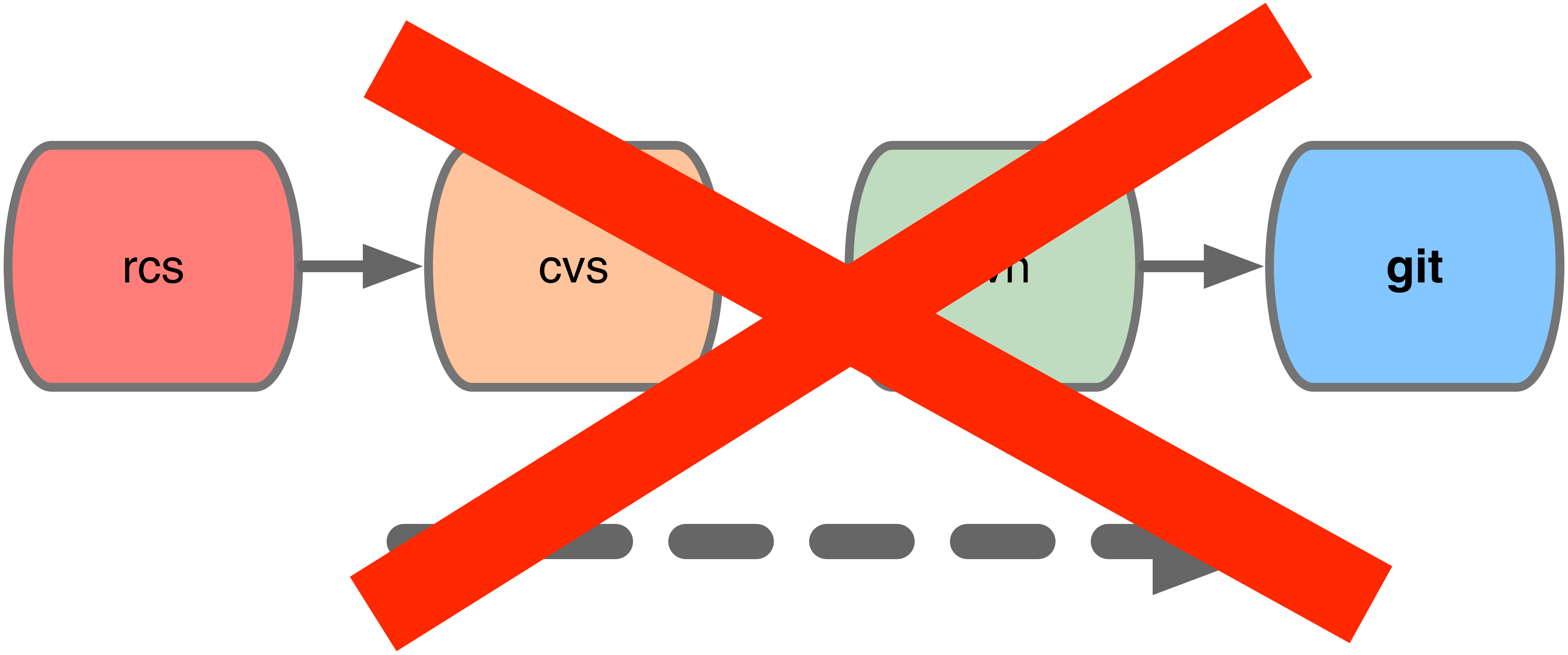
not an evolution



not an evolution

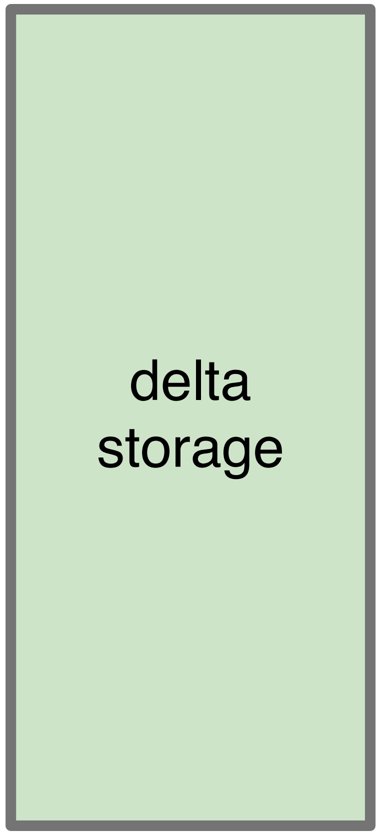


not an evolution



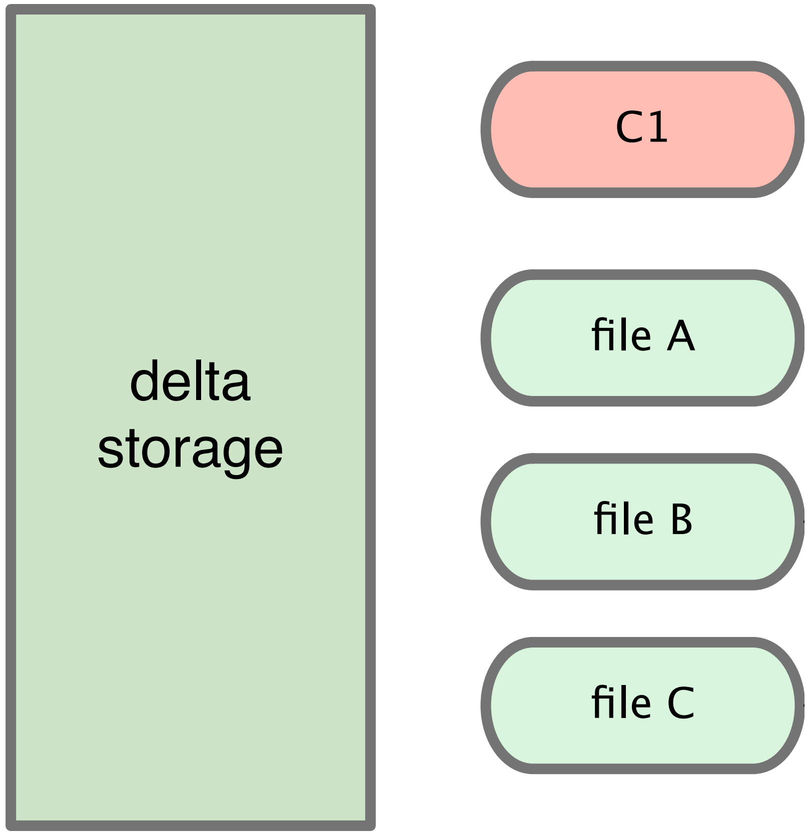
source control taxonomy

source control taxonomy

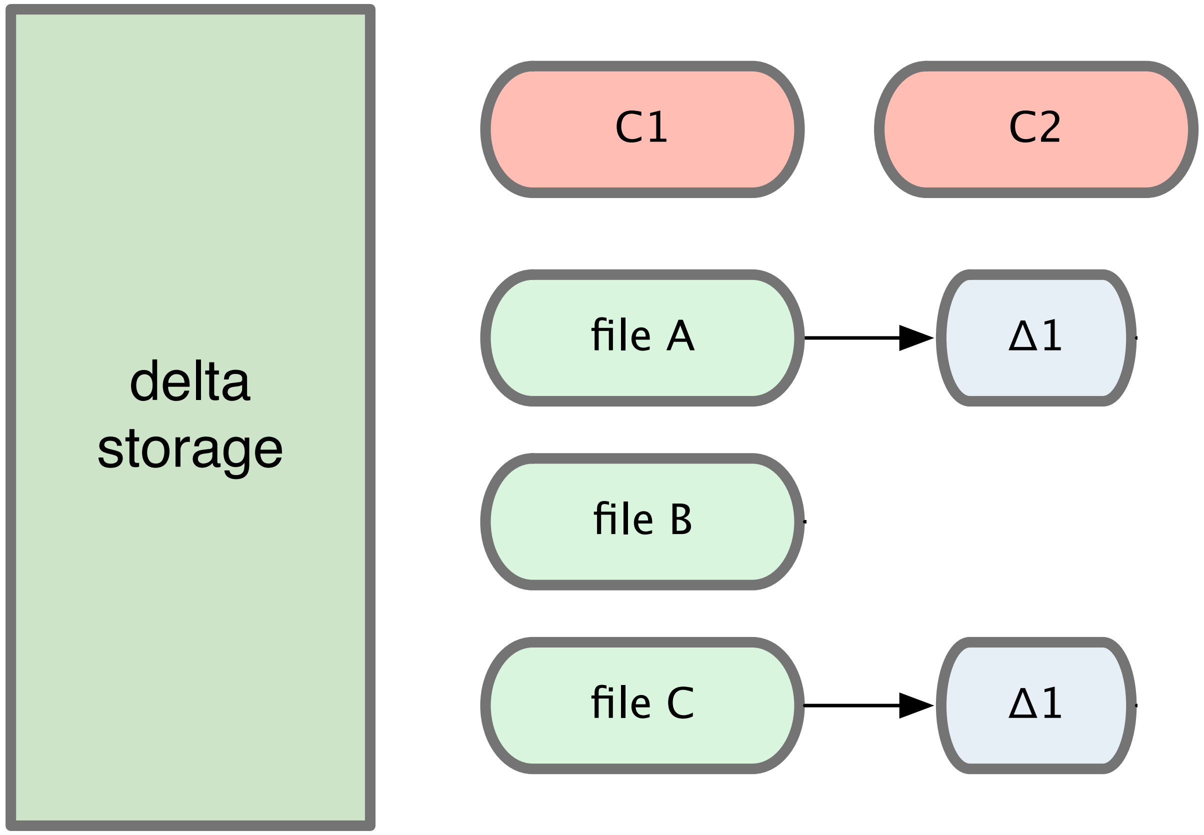


delta storage

source control taxonomy



source control taxonomy



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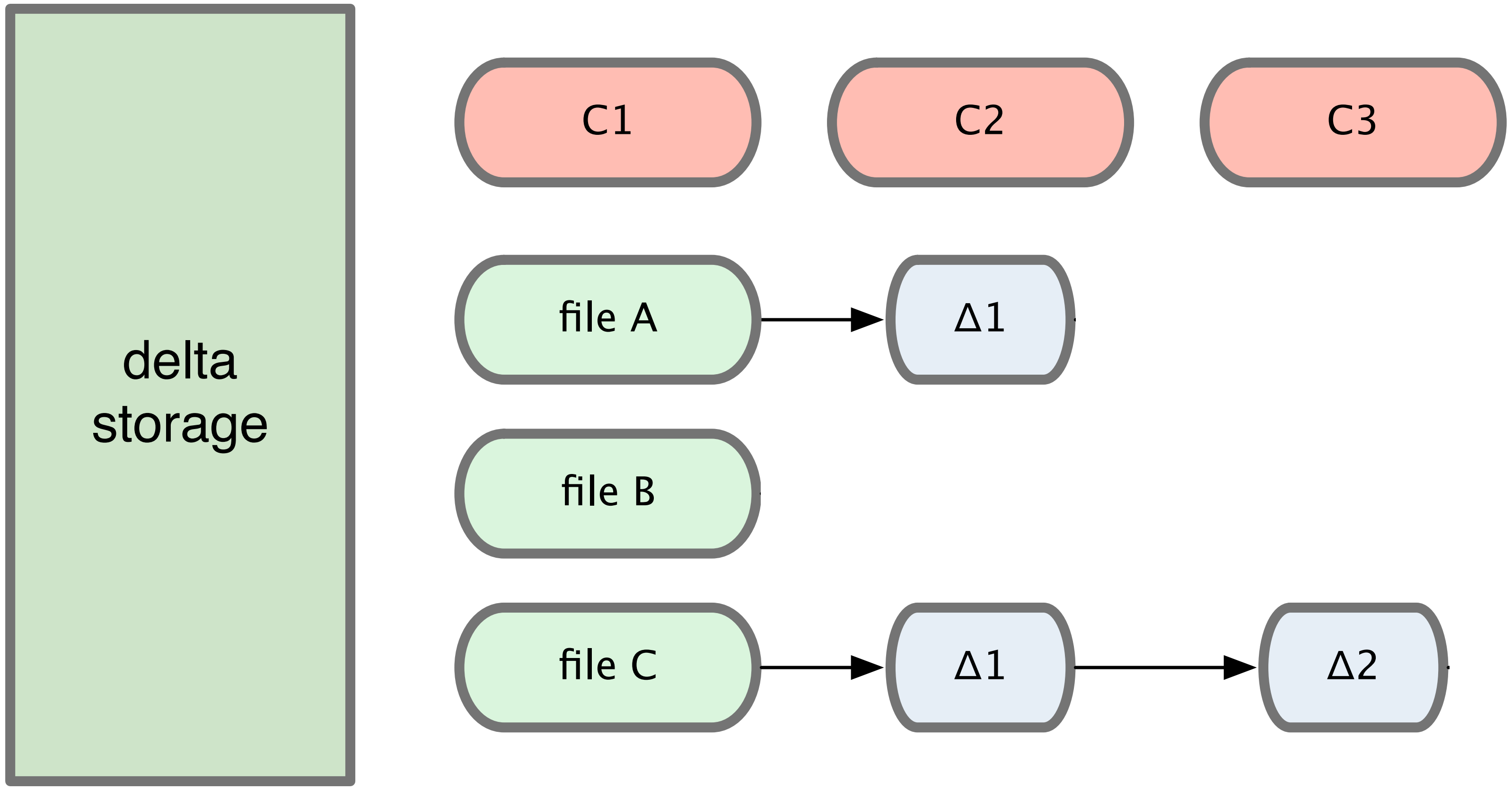
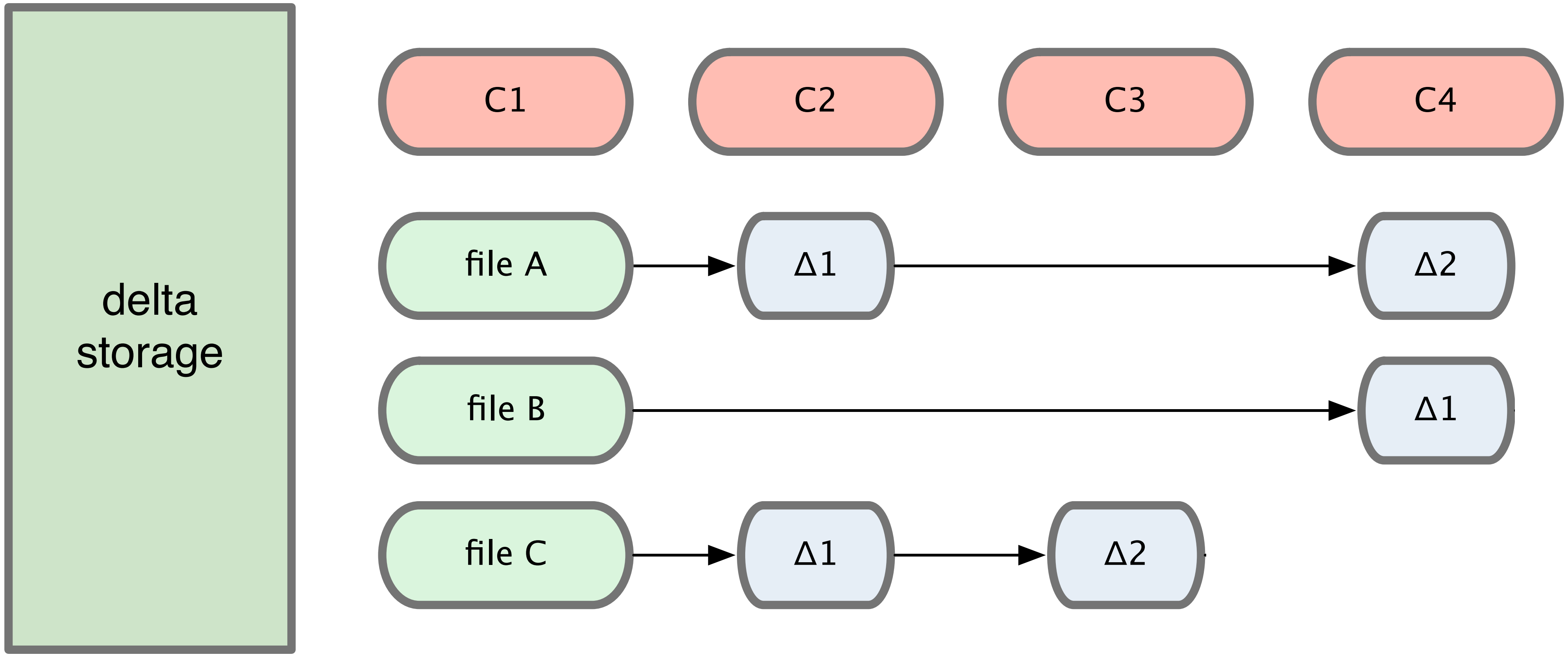
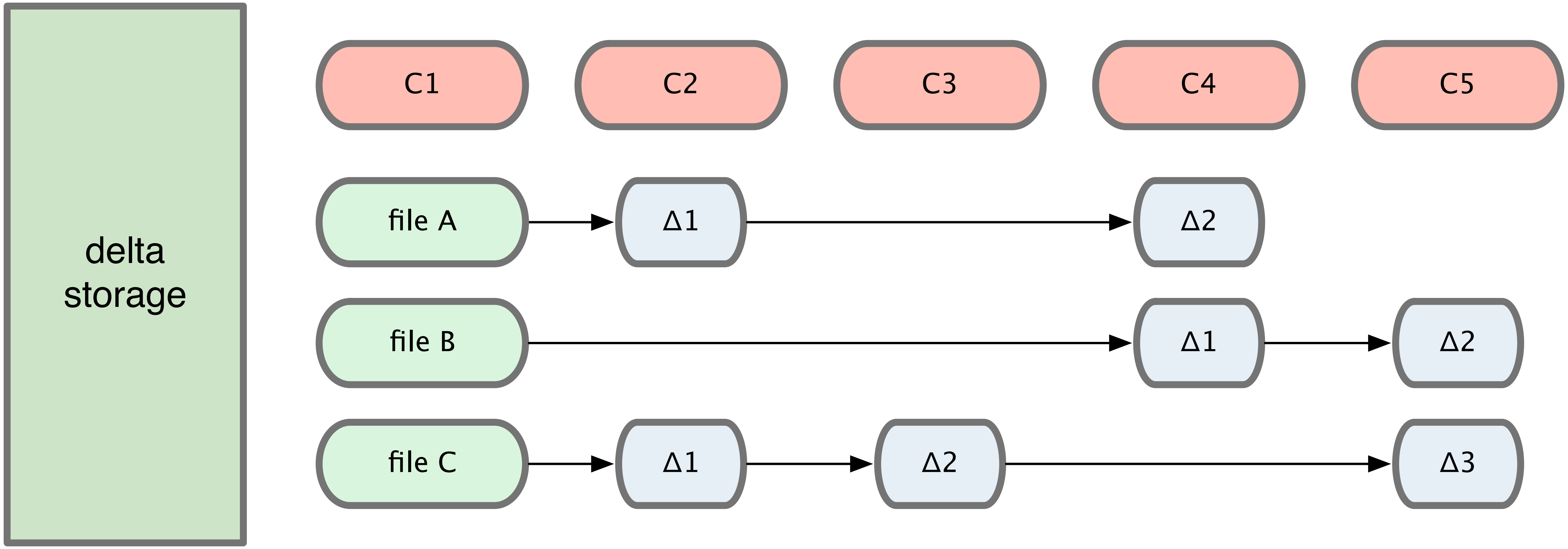


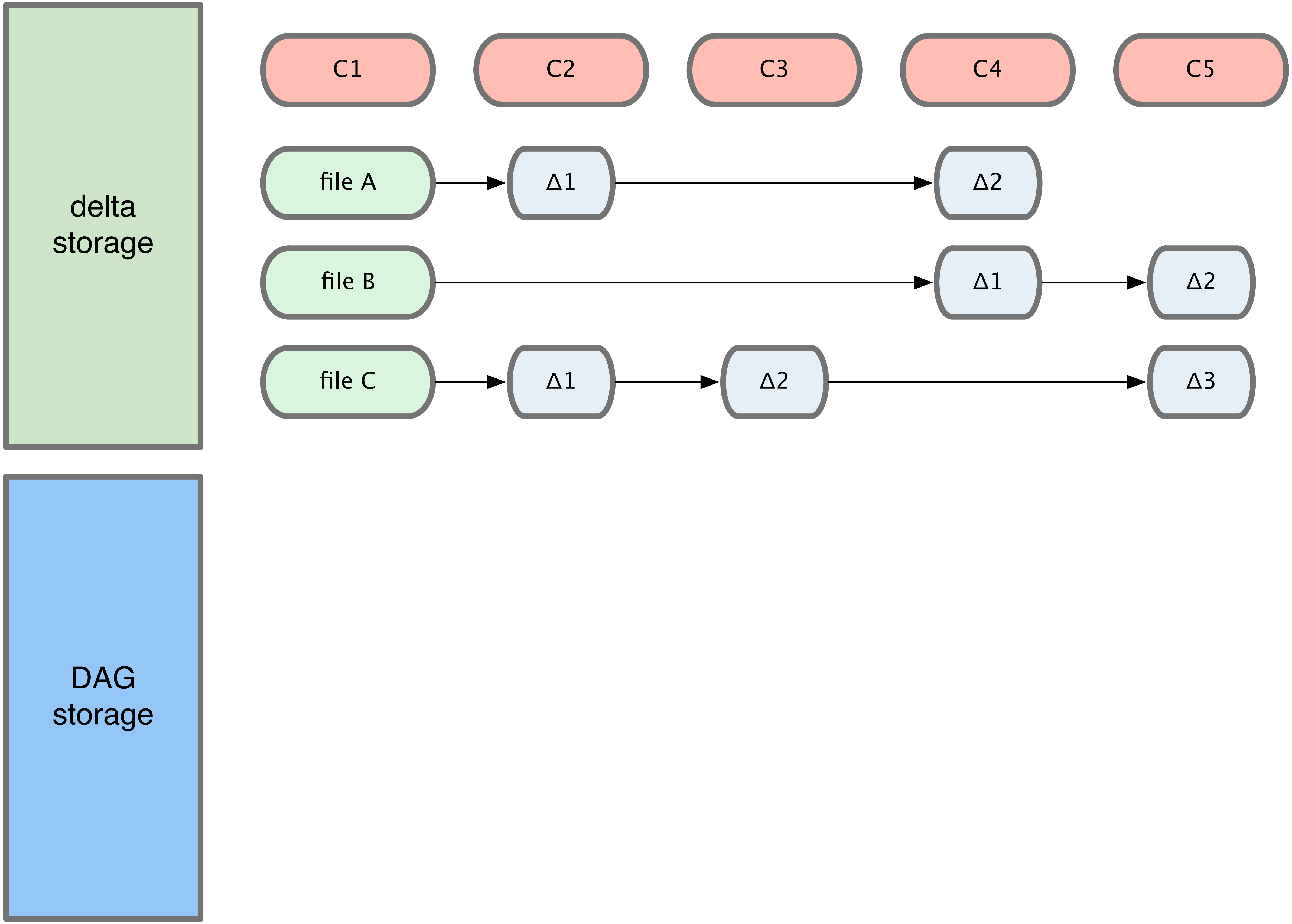
source control taxonomy



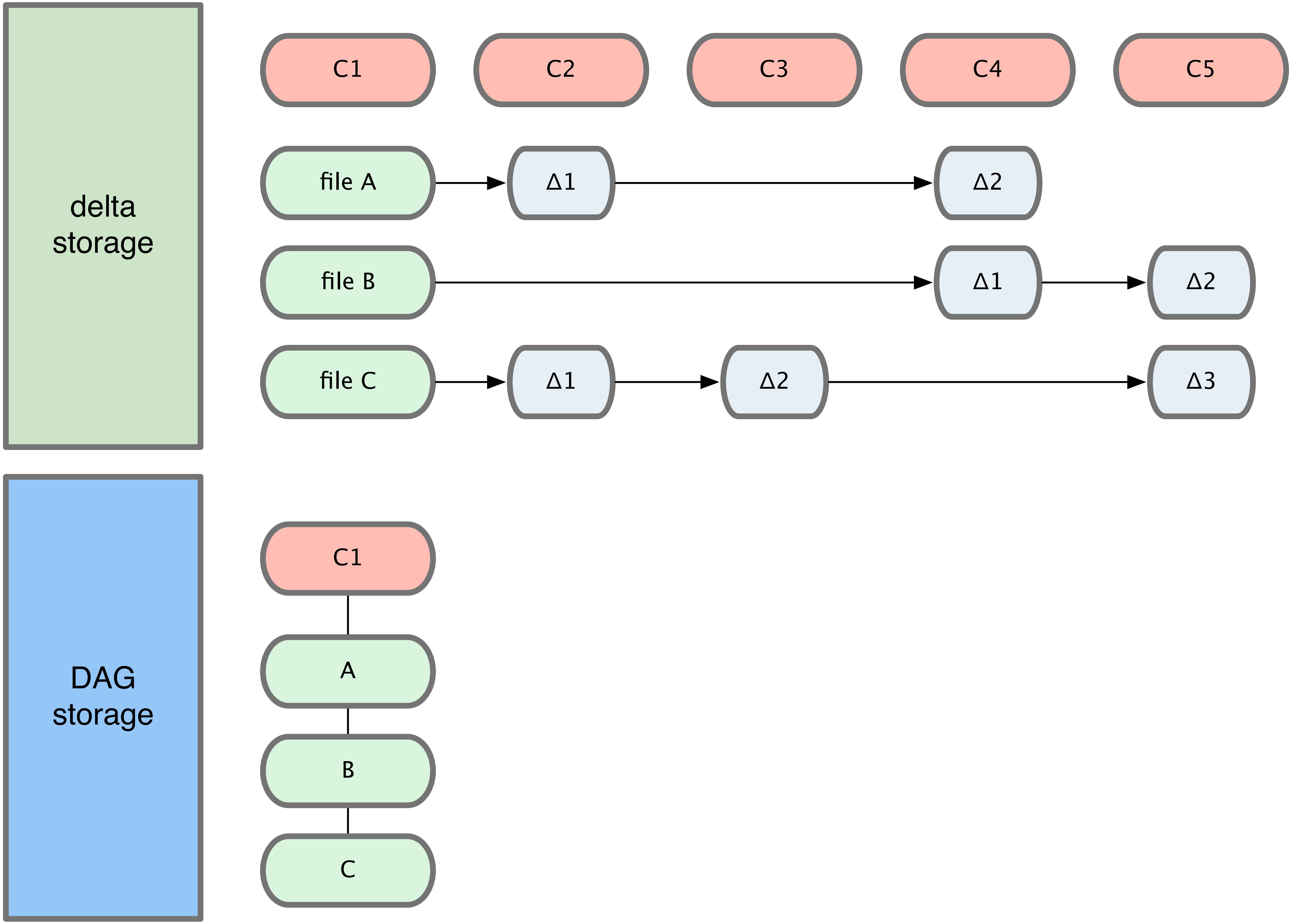
source control taxonomy



source control taxonomy



source control taxonomy



delta storage

C1 C2 C3 C4 C5

file A → Δ1 → Δ2

file B → Δ1 → Δ2

file C → Δ1 → Δ2 → Δ3

DAG storage

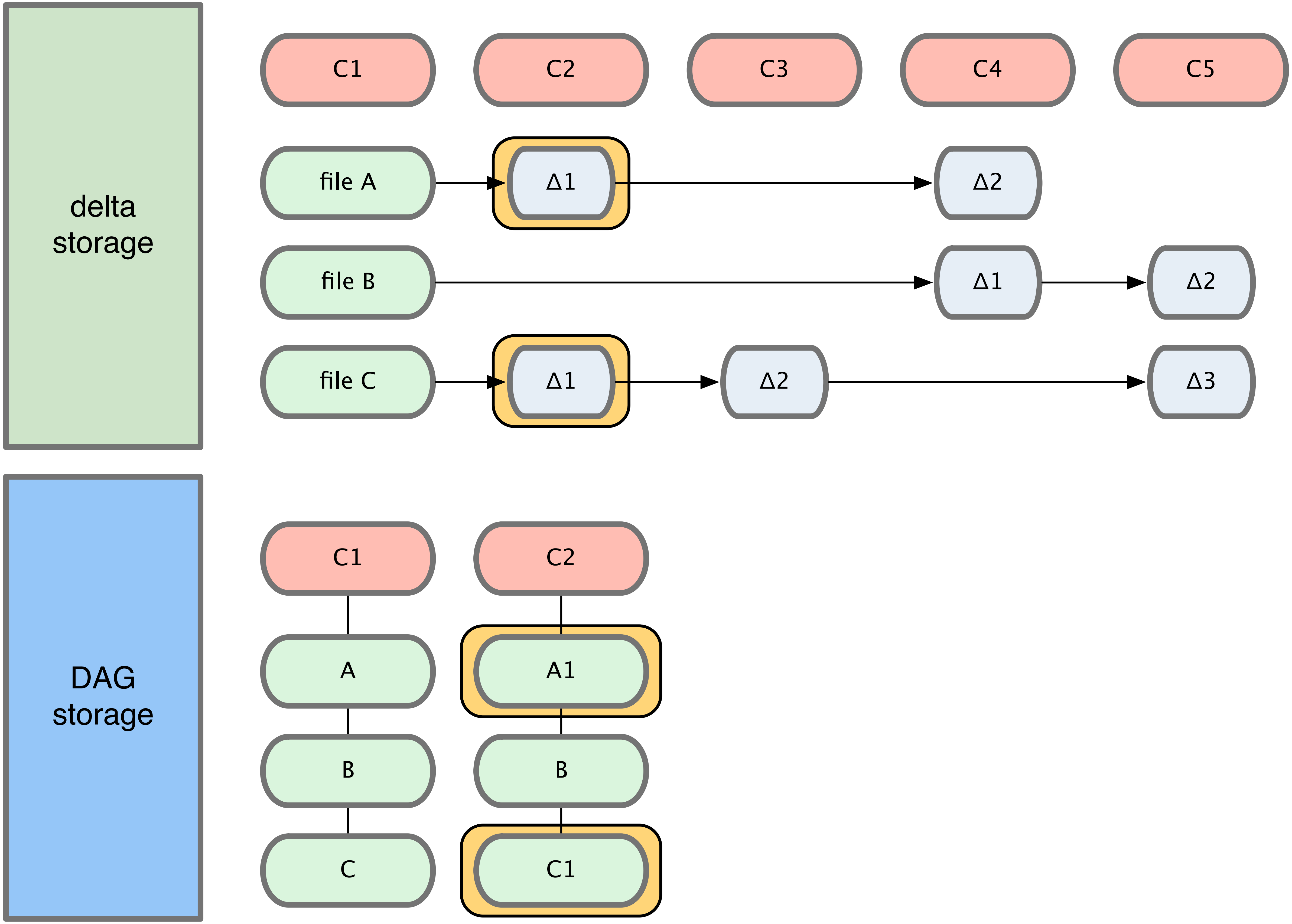
C1

A

B

C

source control taxonomy



delta storage

C1 C2 C3 C4 C5

file A → Δ1 → Δ2

file B → Δ1 → Δ2

file C → Δ1 → Δ2 → Δ3

DAG storage

C1

A

B

C

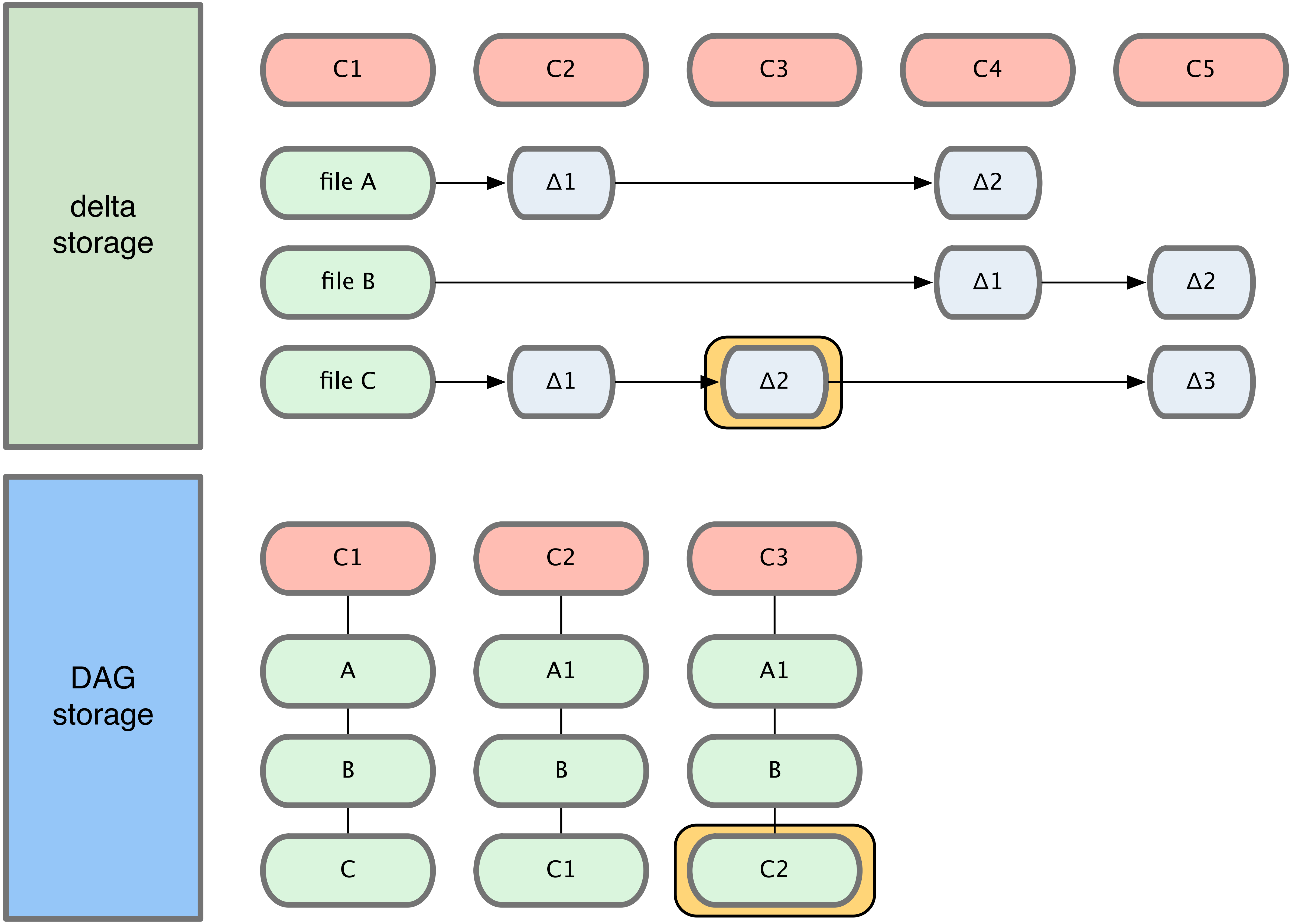
C2

A1

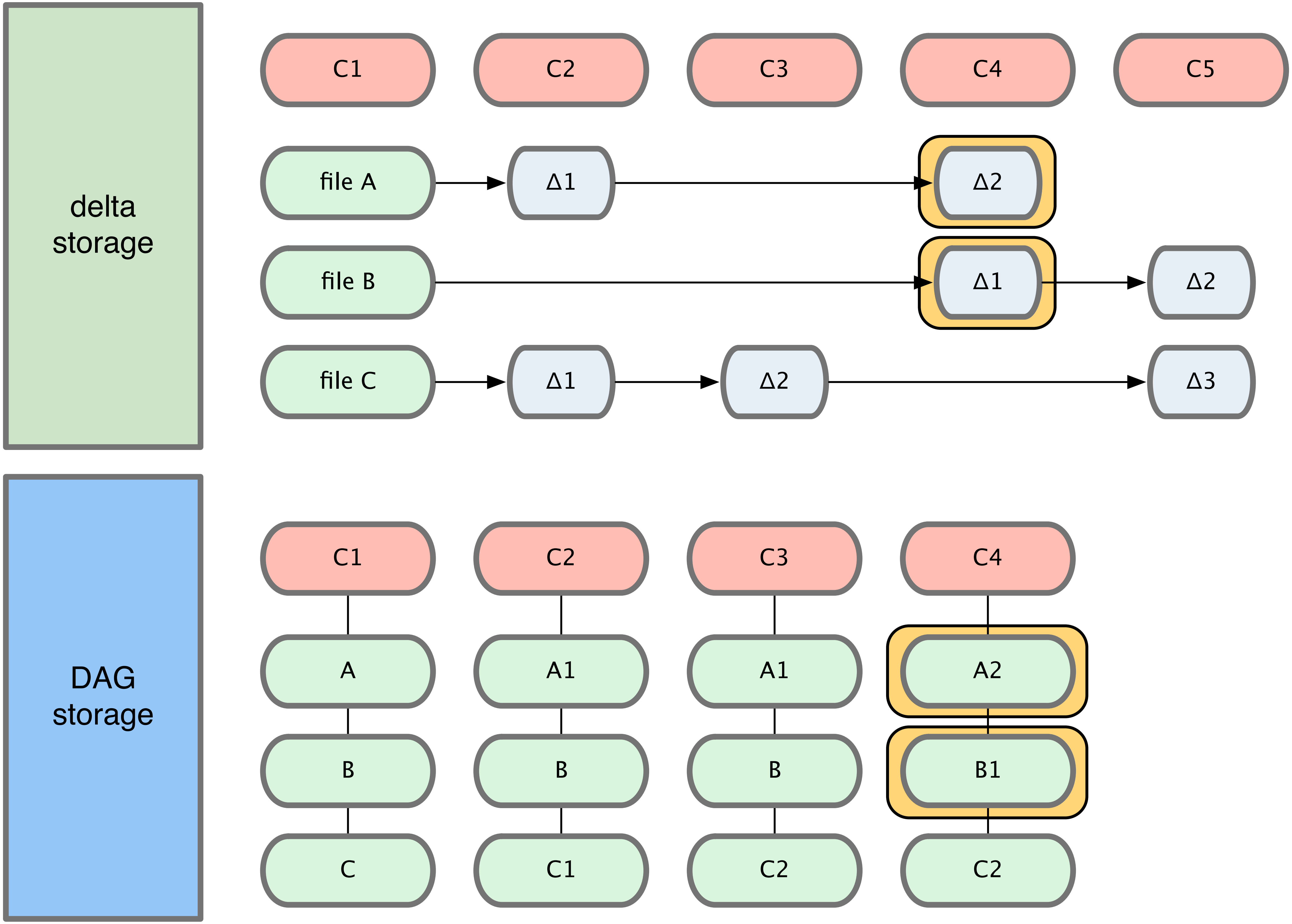
B

C1

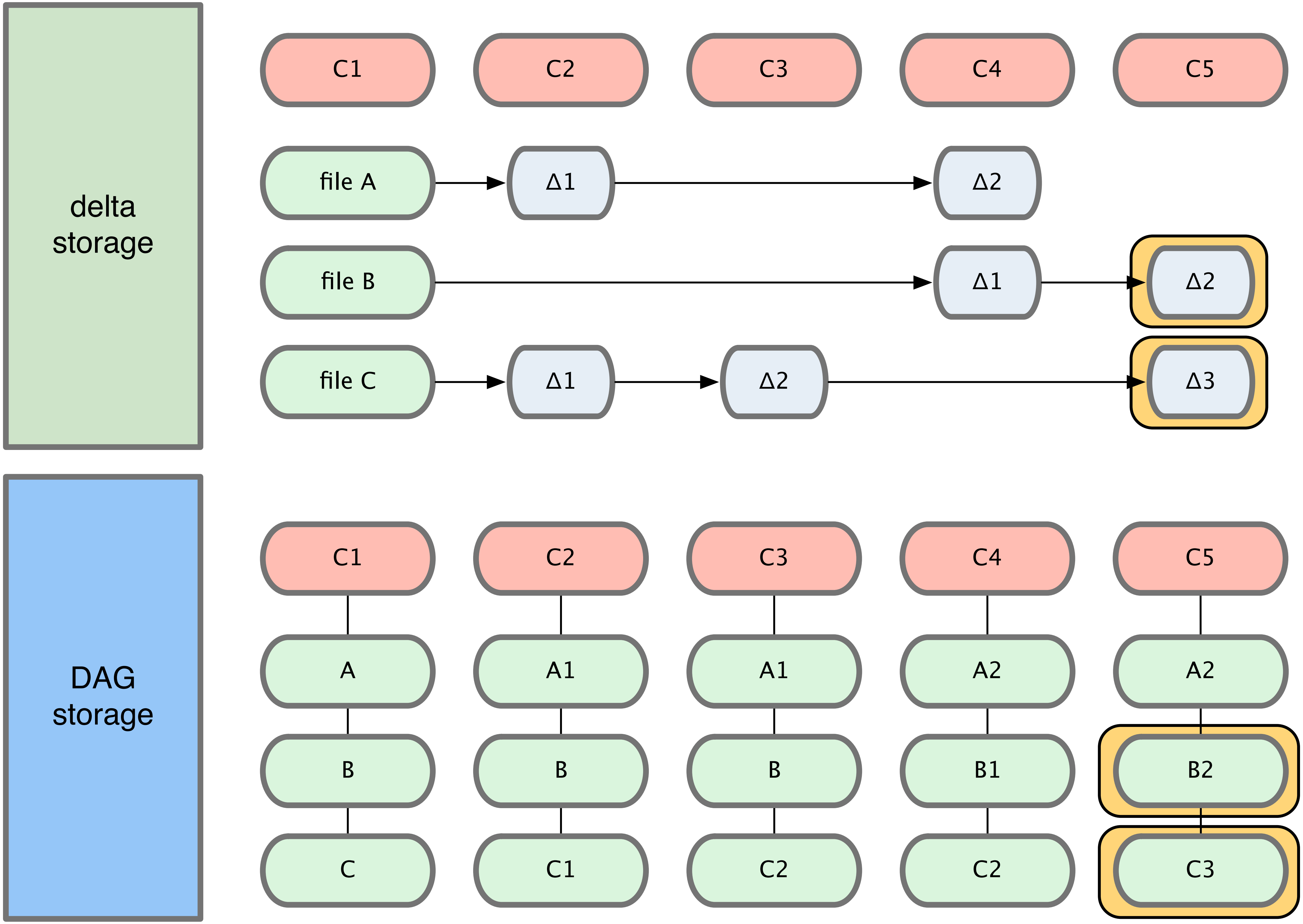
source control taxonomy



source control taxonomy



source control taxonomy



delta storage

C1 C2 C3 C4 C5

file A → Δ1 → Δ2

file B → Δ1 → Δ2

file C → Δ1 → Δ2 → Δ3

DAG storage

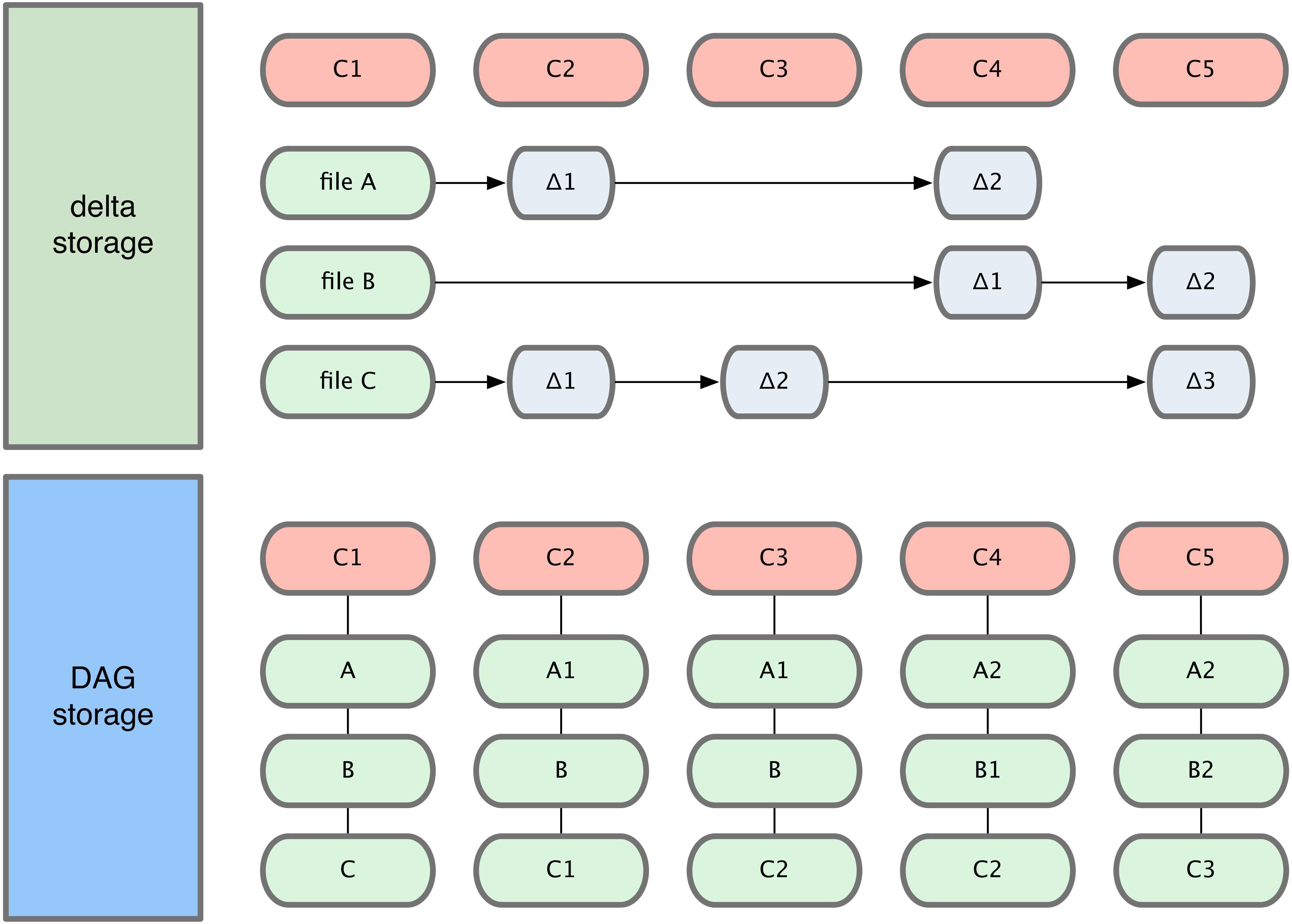
C1 C2 C3 C4 C5

A A1 A1 A2 A2

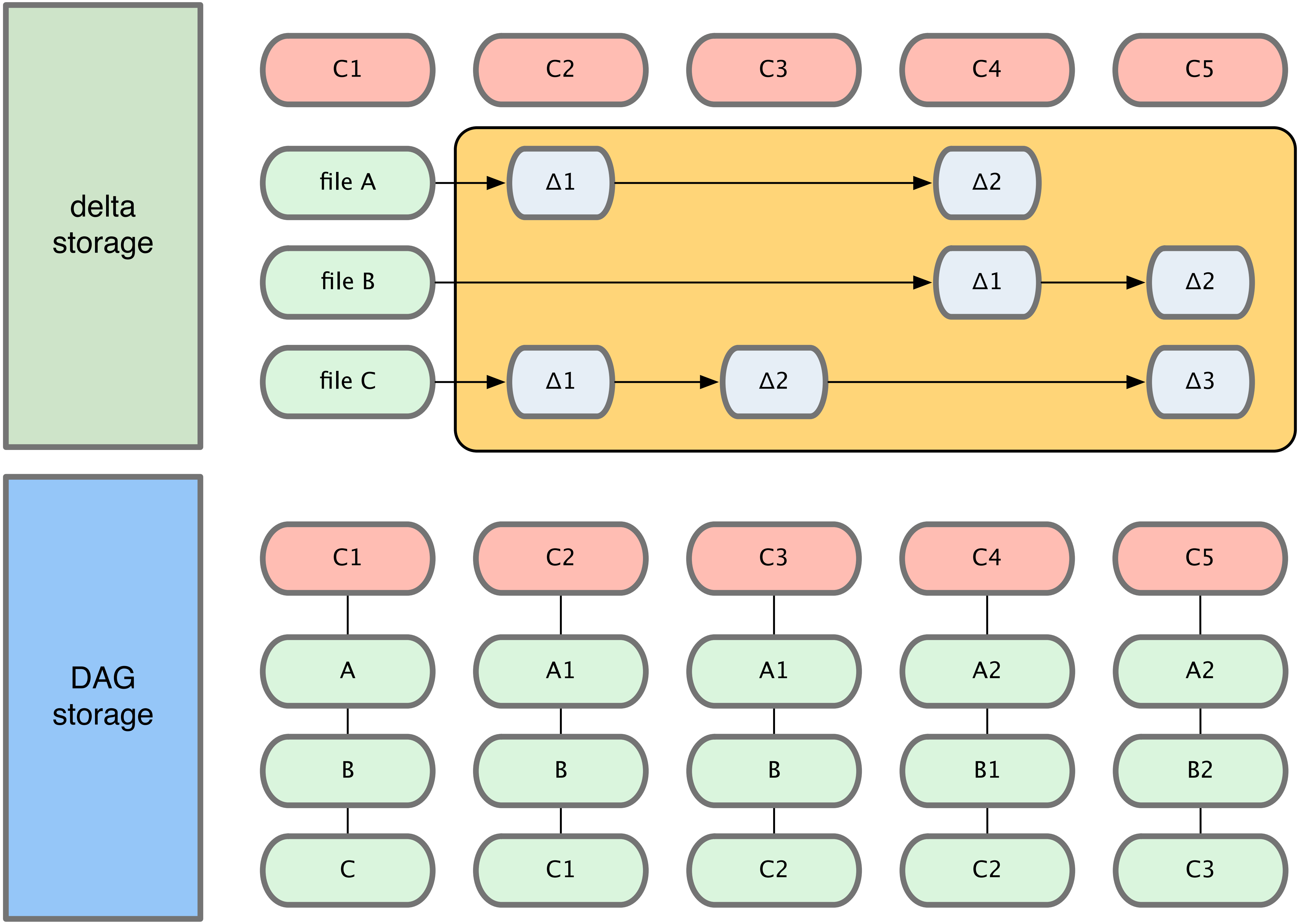
B B B B1 B2

C C1 C2 C2 C3

source control taxonomy



source control taxonomy



delta storage

C1 C2 C3 C4 C5

file A → Δ1 → Δ2

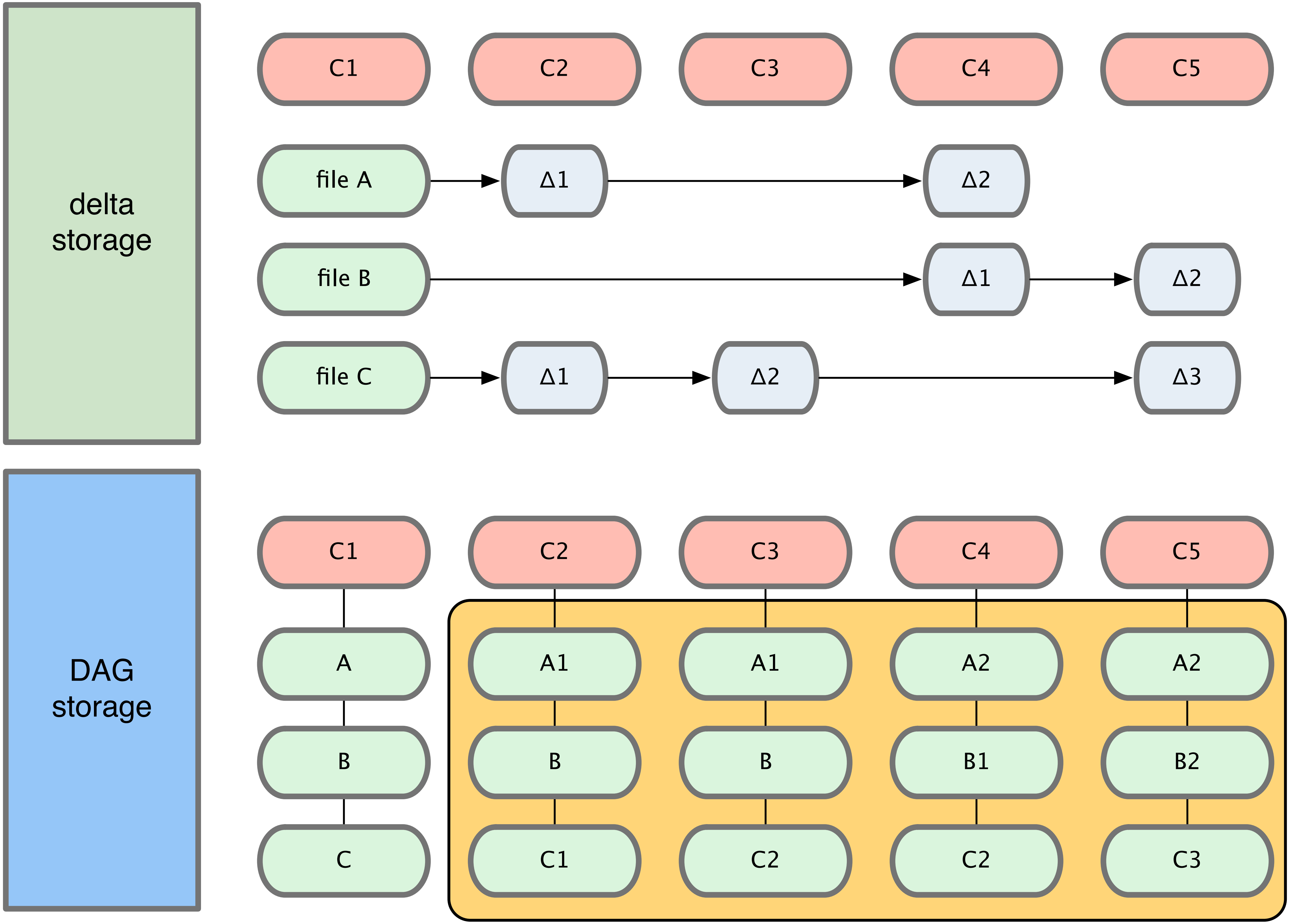
file B → Δ1 → Δ2

file C → Δ1 → Δ2 → Δ3

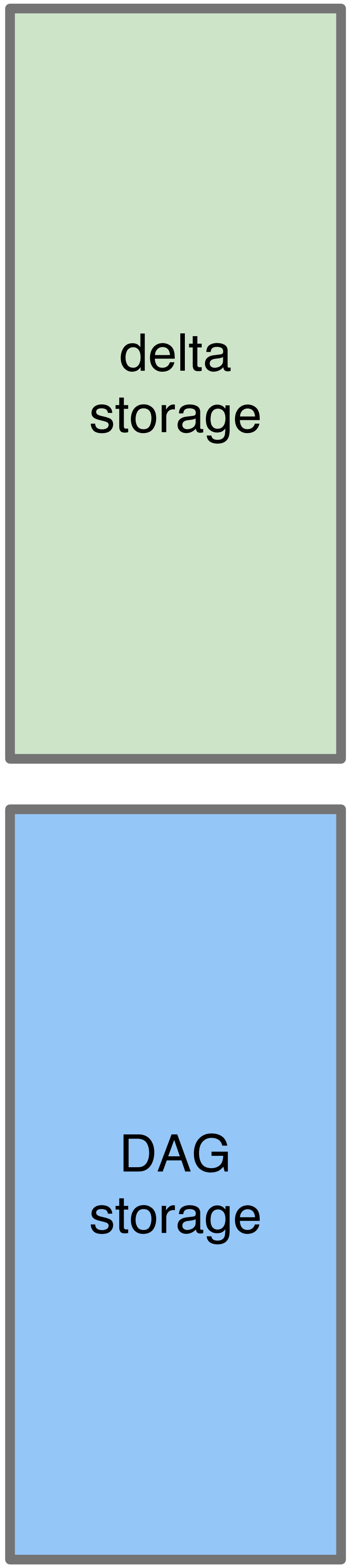
DAG storage

C1	C2	C3	C4	C5
A	A1	A1	A2	A2
B	B	B	B1	B2
C	C1	C2	C2	C3

source control taxonomy



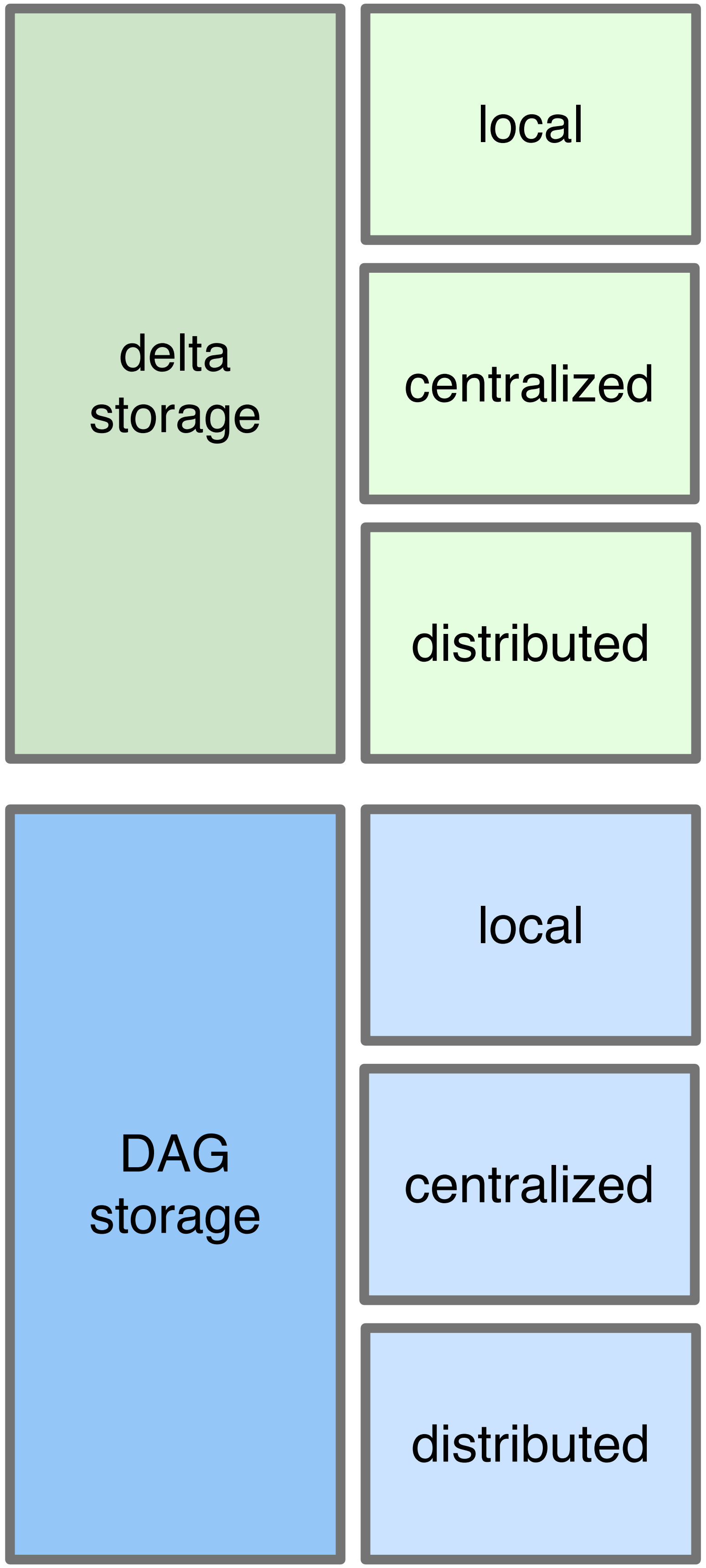
source control taxonomy



delta storage

DAG storage

source control taxonomy



delta storage

local

centralized

distributed

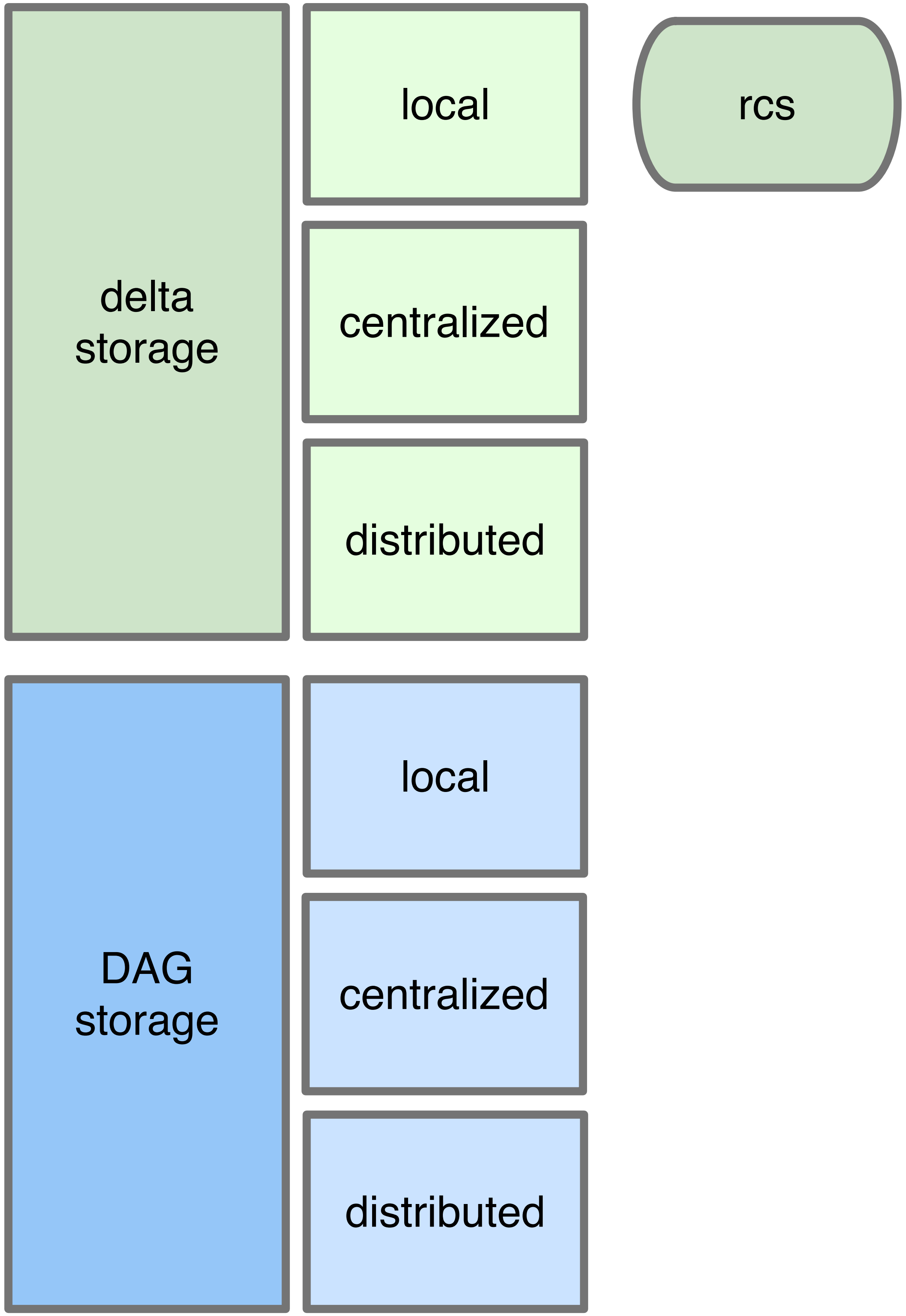
DAG storage

local

centralized

distributed

source control taxonomy



delta storage

local

rcs

centralized

distributed

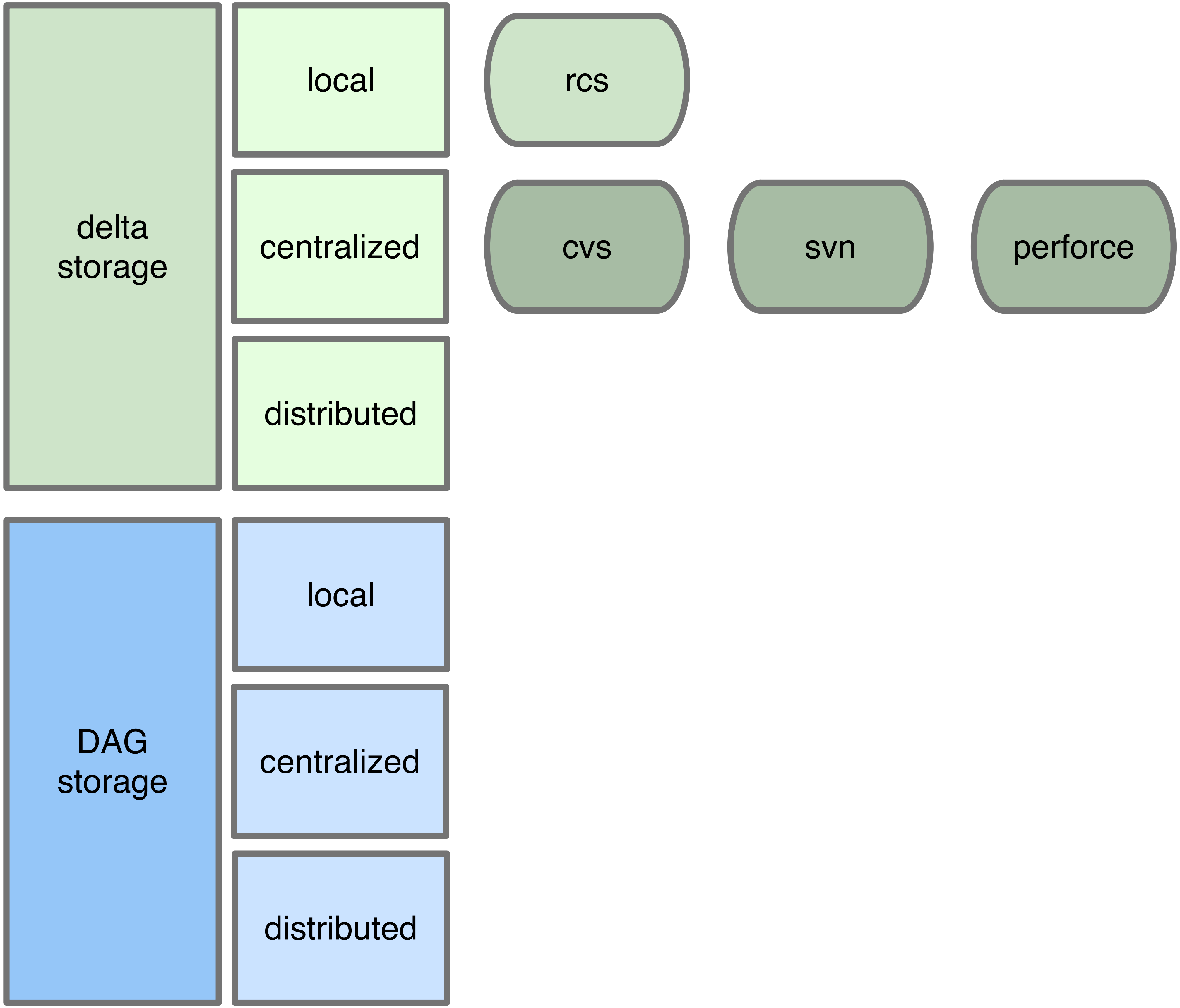
DAG storage

local

centralized

distributed

source control taxonomy



delta storage

local

rcs

centralized

cvs

svn

perforce

distributed

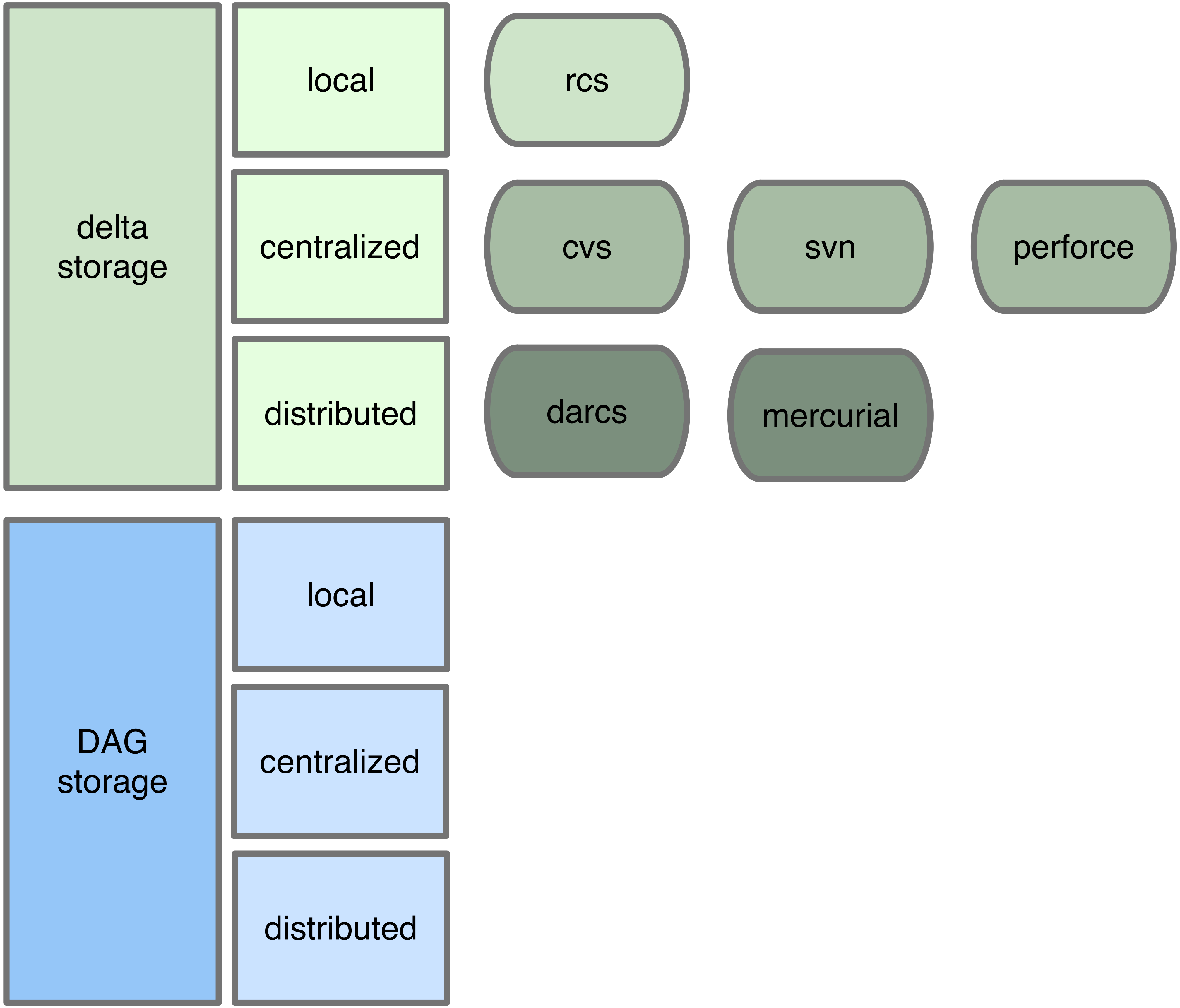
DAG storage

local

centralized

distributed

source control taxonomy



delta storage

local

rcs

centralized

cvs

svn

perforce

distributed

darcs

mercurial

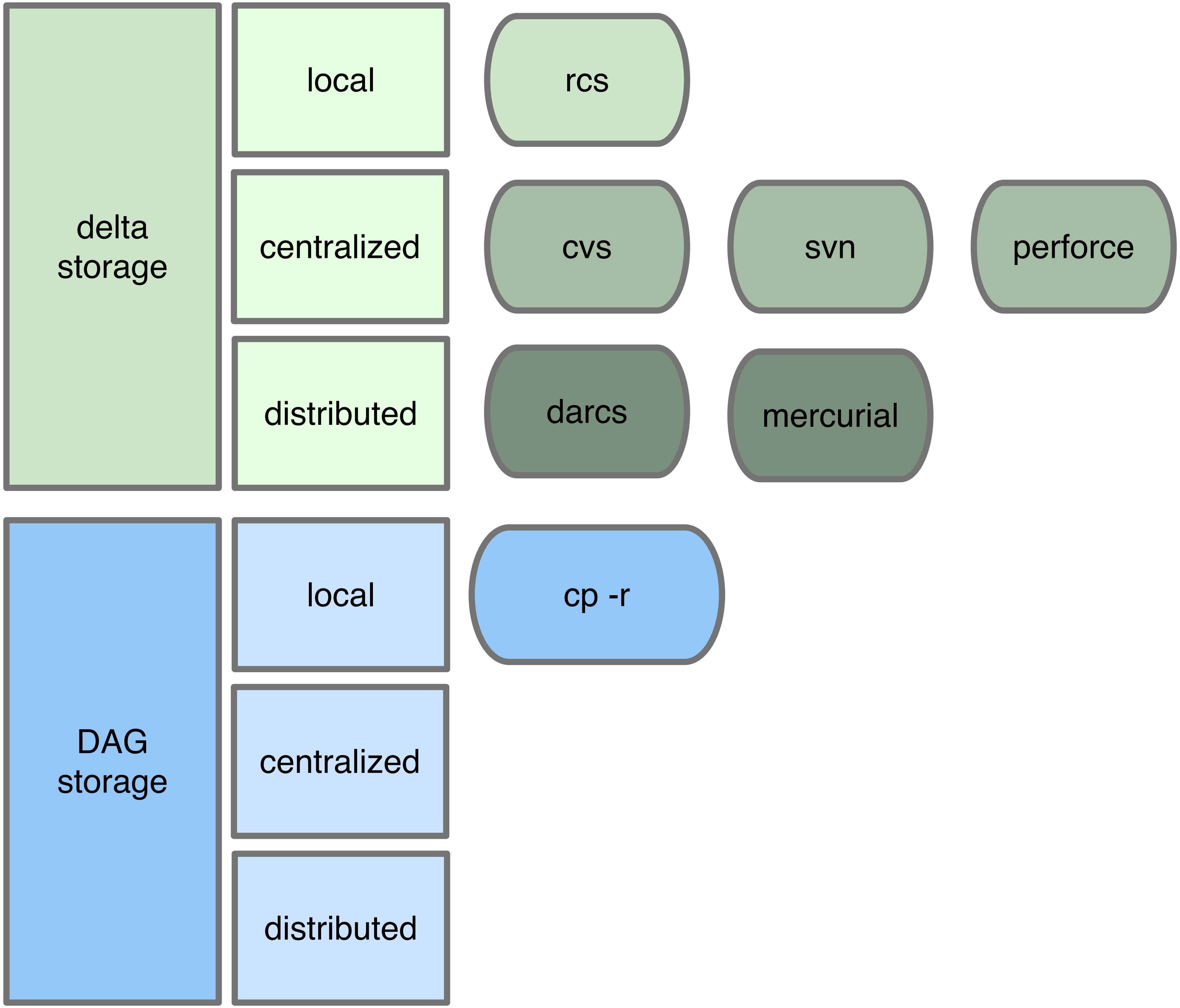
DAG storage

local

centralized

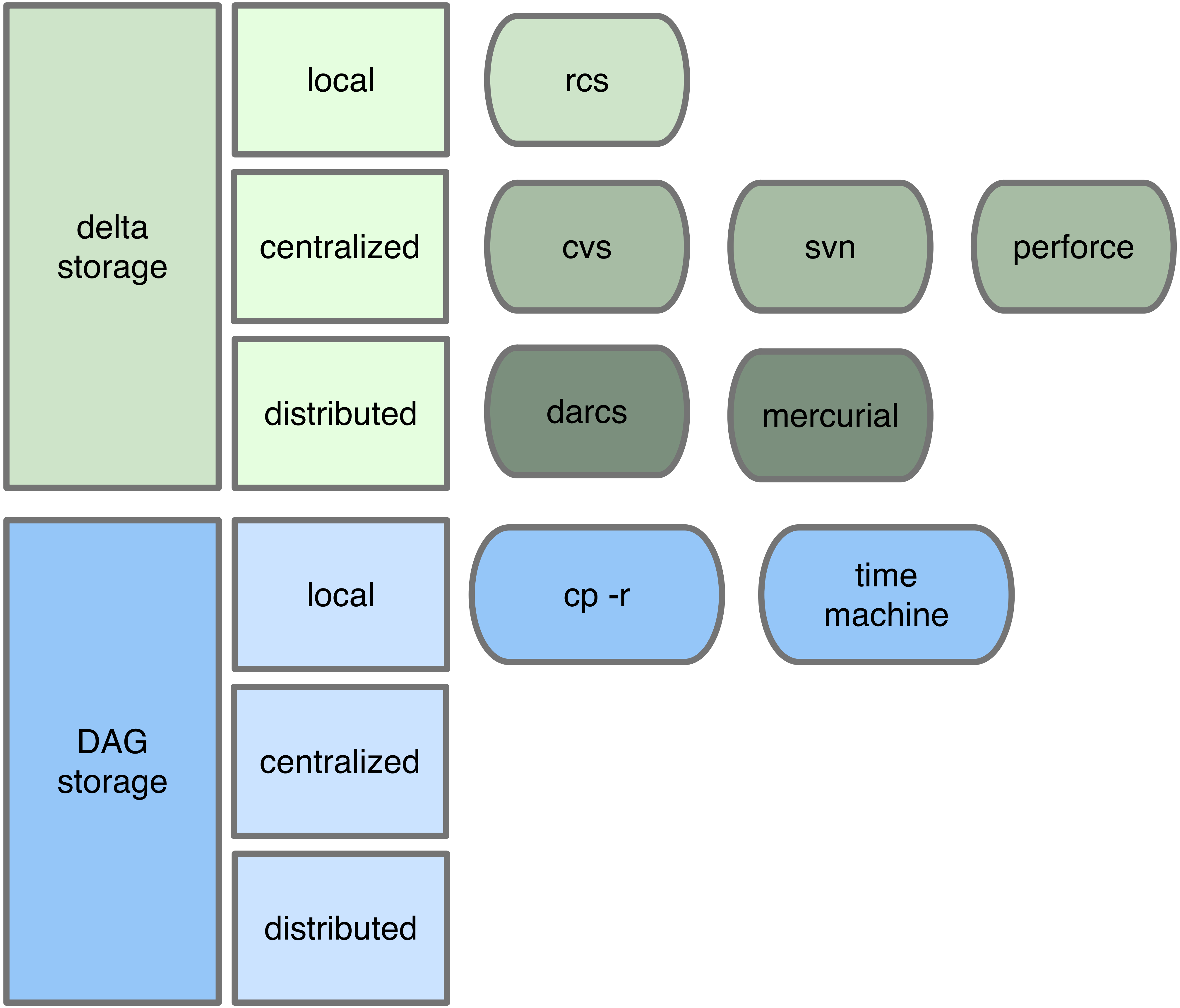
distributed

source control taxonomy



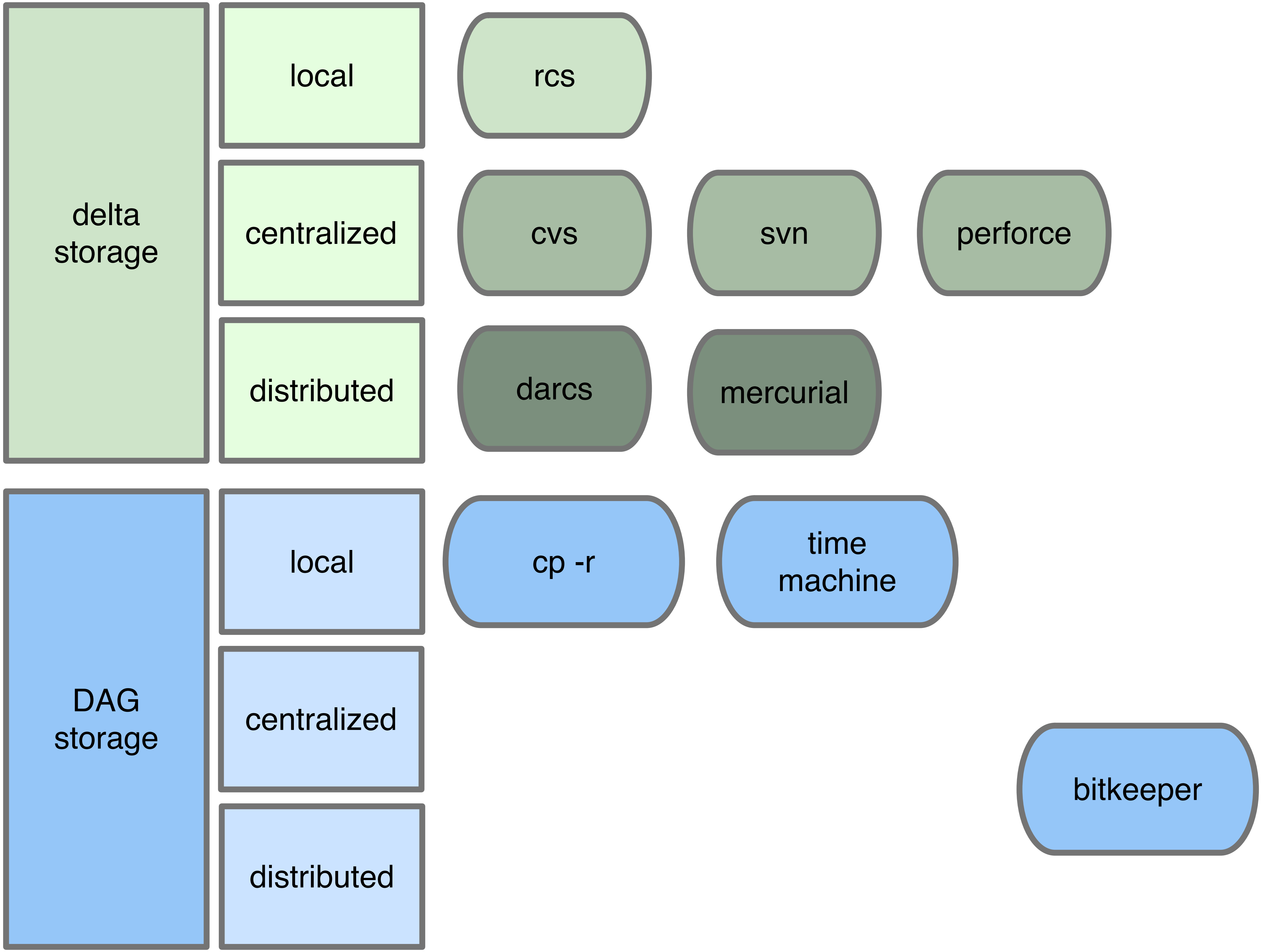
delta storage	local	rcs		
	centralized	cvs	svn	perforce
	distributed	darcs	mercurial	
DAG storage	local	cp -r		
	centralized			
	distributed			

source control taxonomy



delta storage	local	rcs		
	centralized	cvs	svn	perforce
	distributed	darcs	mercurial	
DAG storage	local	cp -r	time machine	
	centralized			
	distributed			

source control taxonomy



delta storage

local

rcs

centralized

cvs

svn

perforce

distributed

darcs

mercurial

DAG storage

local

cp -r

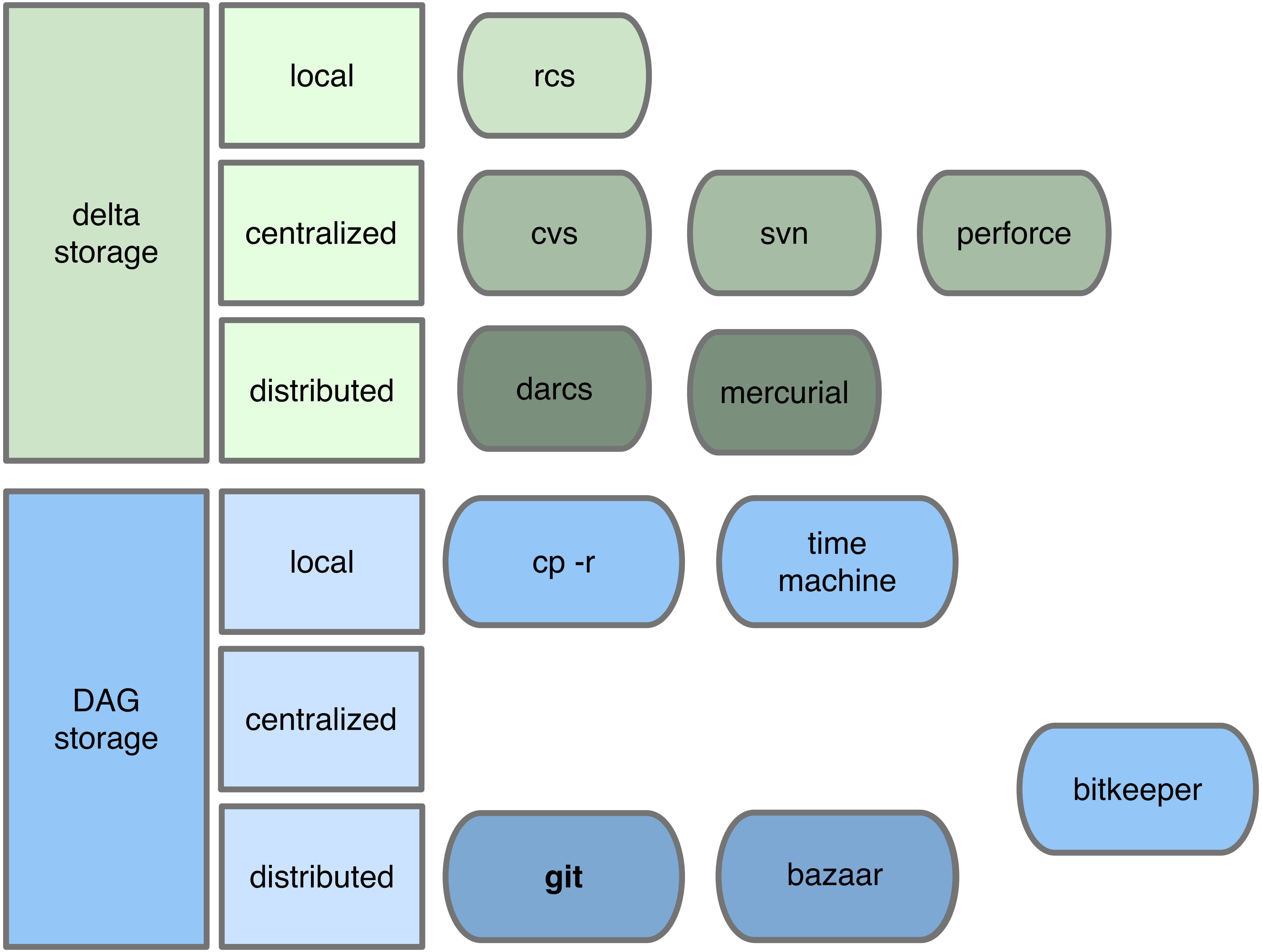
time machine

centralized

distributed

bitkeeper

source control taxonomy



delta storage

local

rcs

centralized

cvs

svn

perforce

distributed

darcs

mercurial

DAG storage

local

cp -r

time machine

centralized

bitkeeper

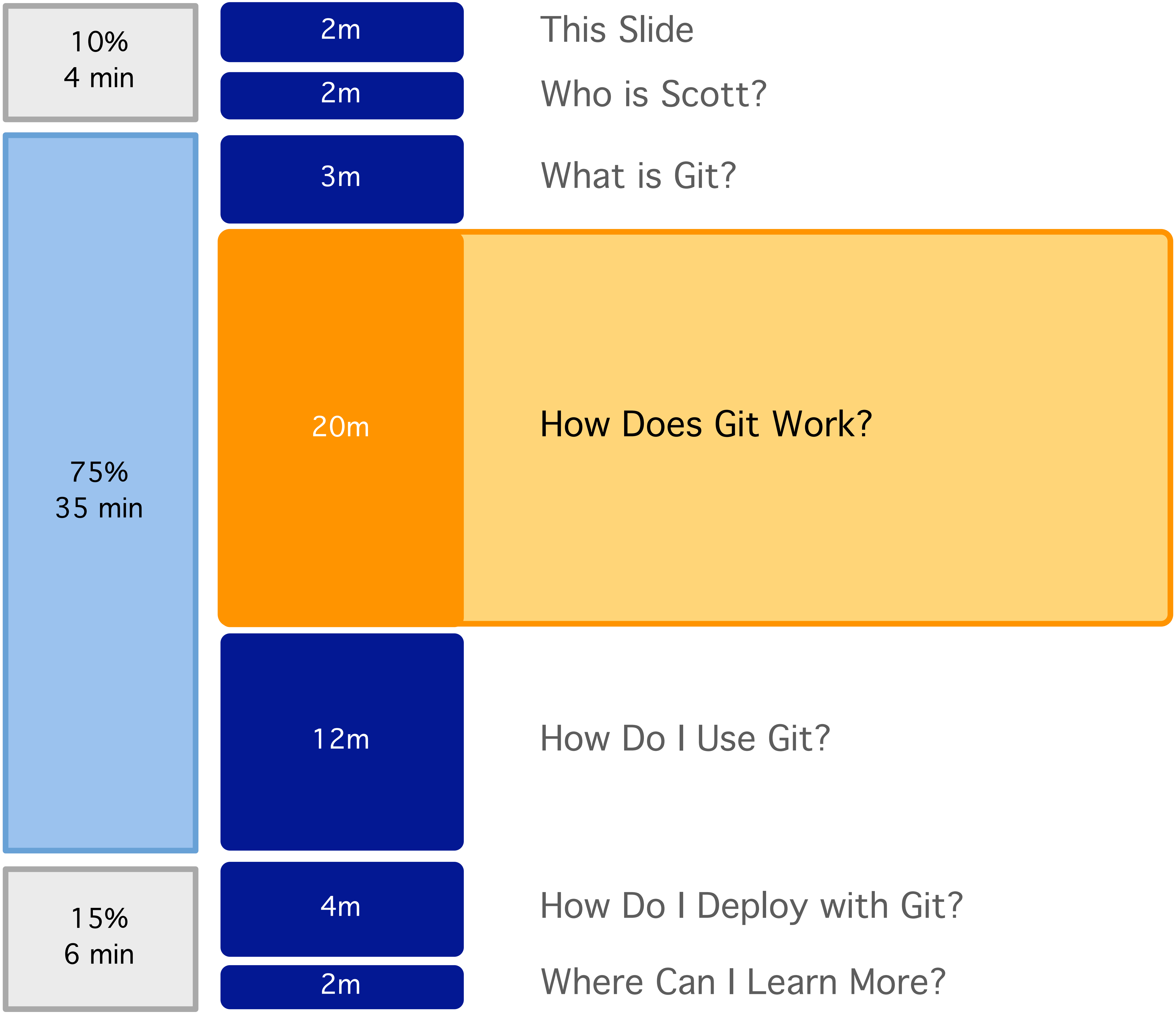
distributed

git

bazaar

How Does Git Work?

How Does Git Work?



10%
4 min

2m This Slide

2m Who is Scott?

75%
35 min

3m What is Git?

20m **How Does Git Work?**

12m How Do I Use Git?

15%
6 min

4m How Do I Deploy with Git?

2m Where Can I Learn More?

git

git directory

git directory

.git

git directory

.git

`GIT_DIR`

Git Directory

config file

hooks

index

object database

references

object database

object database

`content`

object database

content

```
new_content = type + ’ ‘ + content.size + \0
+ content
```

object database

content

“header”

```
new_content = type + ' ' + content.size + \0
        + content
```

object database

```
content

new_content = type + ’ ‘ + content.size + \0
+ content

sha = Digest::SHA1.hexdigest(new_content)
```

object database

```
content

new_content = type + ' ' + content.size + \0
+ content

sha = Digest::SHA1.hexdigest(new_content)
"824aed035c0aa75d64c..."
```

object database

content

```
new_content = type + ' ' + content.size + \0
    + content

sha = Digest::SHA1.hexdigest(new_content)

"824aed035c0aa75d64c..."

compressed = zlib::deflate(new_content)
```

object database

```
content

new_content = type + ' ' + content.size + \0
+ content

sha = Digest::SHA1.hexdigest(new_content)

"824aed035c0aa75d64c..."

compressed = zlib::deflate(new_content)

path = ".git/objects/82/4aed035c0aa75d64c..."
```

object database

```
content

new_content = type + ’ ‘ + content.size + \0
+ content

sha = Digest::SHA1.hexdigest(new_content)

“824aed035c0aa75d64c...”

compressed = zlib::deflate(new_content)

path = “.git/objects/82/4aed035c0aa75d64c...”

File.open(path, ‘w’) {|f| f.write(compressed)}
```

object database

“loose” format

```
content

new_content = type + ‘ ‘ + content.size + \0
+ content

sha = Digest::SHA1.hexdigest(new_content)

“824aed035c0aa75d64c...”

compressed = zlib::deflate(new_content)

path = “.git/objects/82/4aed035c0aa75d64c...”

File.open(path, ‘w’) {|f| f.write(compressed)}
```

object database

```
git gc
```

object database

```
git gc
```

same file with minor differences

object database

`git gc`

same file with minor differences

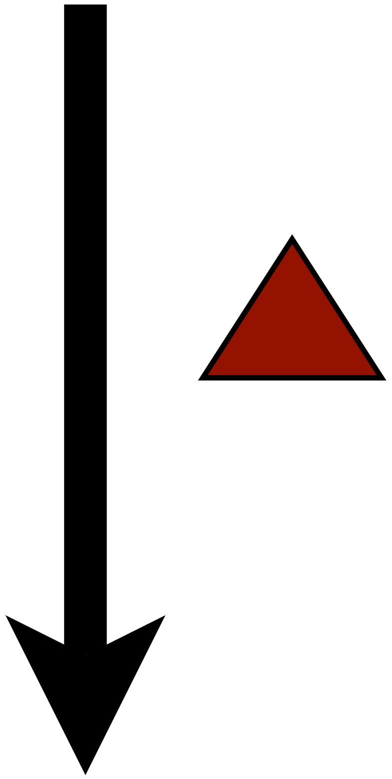
```
.git/objects/82/4aed035c0aa75d64c...
.git/objects/1d/c9cbcb76cbb80fce1...
.git/objects/63/874f37013c1740acd...
.git/objects/04/fb8aee105e6e445e8...
.git/objects/45/b983be36b73c0788d...
.git/objects/f1/032eed02413a1145c...
```

object database

```
git gc
```

same file with minor differences

```
.git/objects/82/4aed035c0aa75d64c...
.git/objects/1d/c9cbcb76cbb80fce1...
.git/objects/63/874f37013c1740acd...
.git/objects/04/fb8aee105e6e445e8...
.git/objects/45/b983be36b73c0788d...
.git/objects/f1/032eed02413a1145c...
```



```
.git/objects/pack/pack-999727..9f600.pack
.git/objects/pack/pack-999727..9f600.idx
```

object database

```
git gc
```

same file with minor differences

```
.git/objects/82/4aed035c0aa75d64c...
.git/objects/1d/c9cbcb76cbb80fce1...
.git/objects/63/874f37013c1740acd...
.git/objects/04/fb8aee105e6e445e8...
.git/objects/45/b983be36b73c0788d...
.git/objects/f1/032eed02413a1145c...
```

```
.git/objects/pack/pack-999727..9f600.pack
.git/objects/pack/pack-999727..9f600.idx
```

object database

`git gc`

same file with minor differences

“packed” format

```
.git/objects/82/4aed0[illegible]c0a[illegible]a75d64c...
.git/objects/1d/[illegible]76c[illegible]80fce1...
.git/objects/63/874f37013c1740acd...
.git/objects/04/fb8aee105e6e445e8...
.git/objects/45/b983be36b73c0788d...
.git/objects/f1/032eed02413a1145c...
```

```
.git/objects/pack/pack-999727..9f600.pack
.git/objects/pack/pack-999727..9f600.idx
```

object database

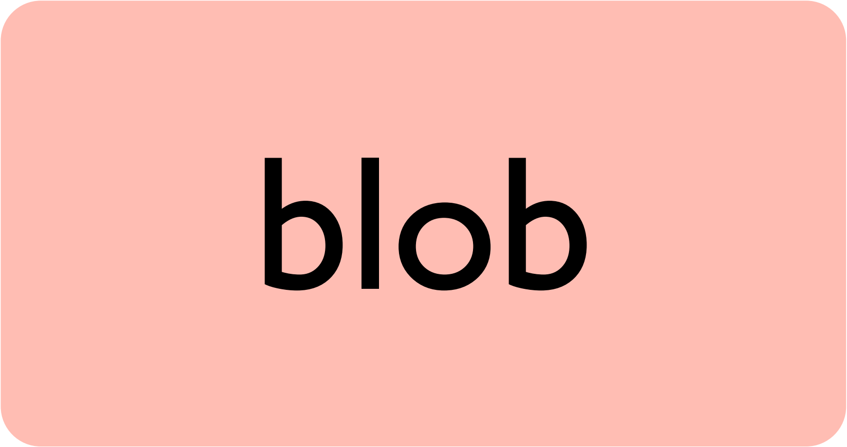
all git objects are stored this way

object database

```
new_content = type + ' ' + content.size + \0
              + content
```

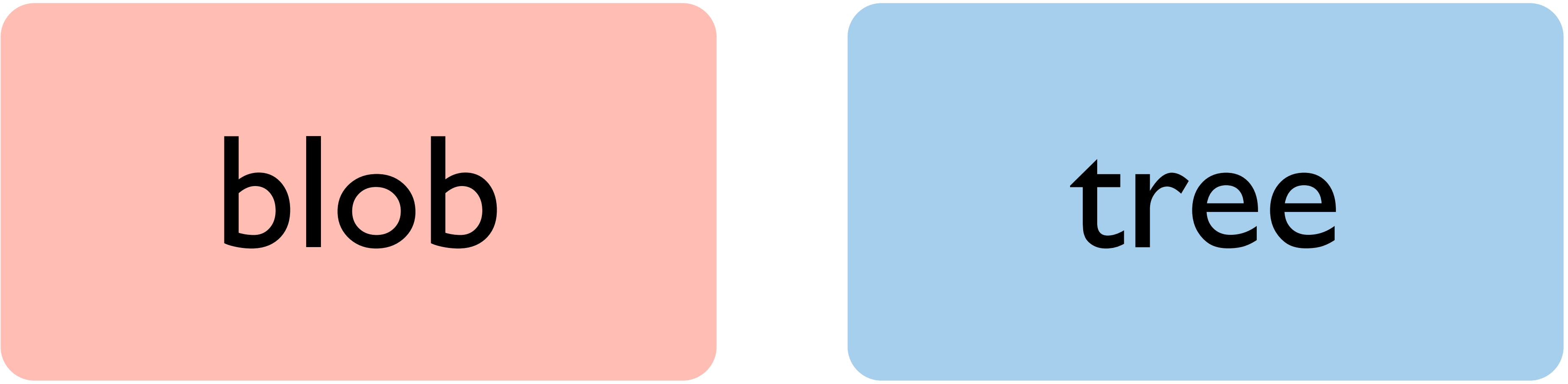
4 types of git objects

object database



blob

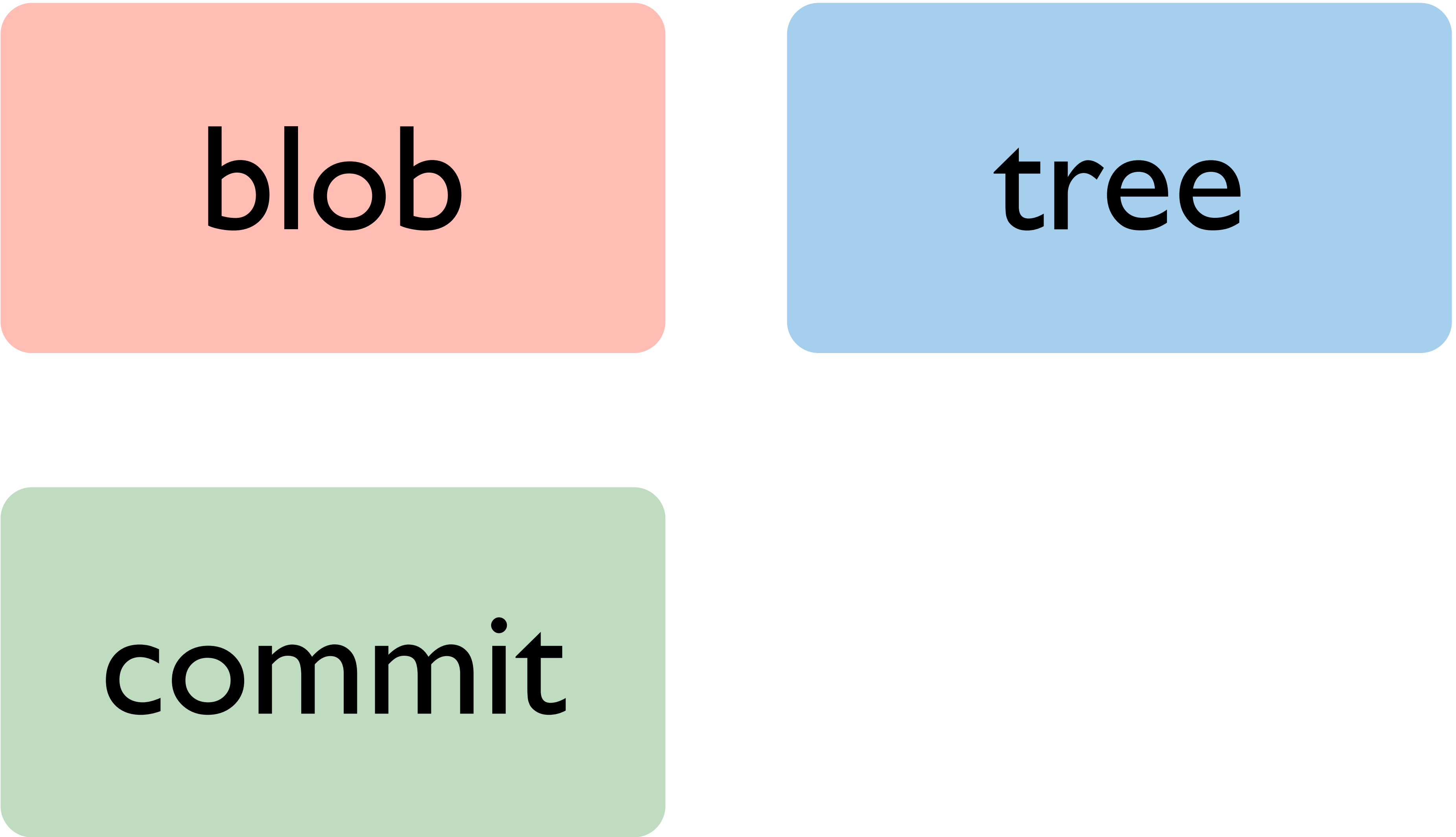
object database



blob

tree

object database

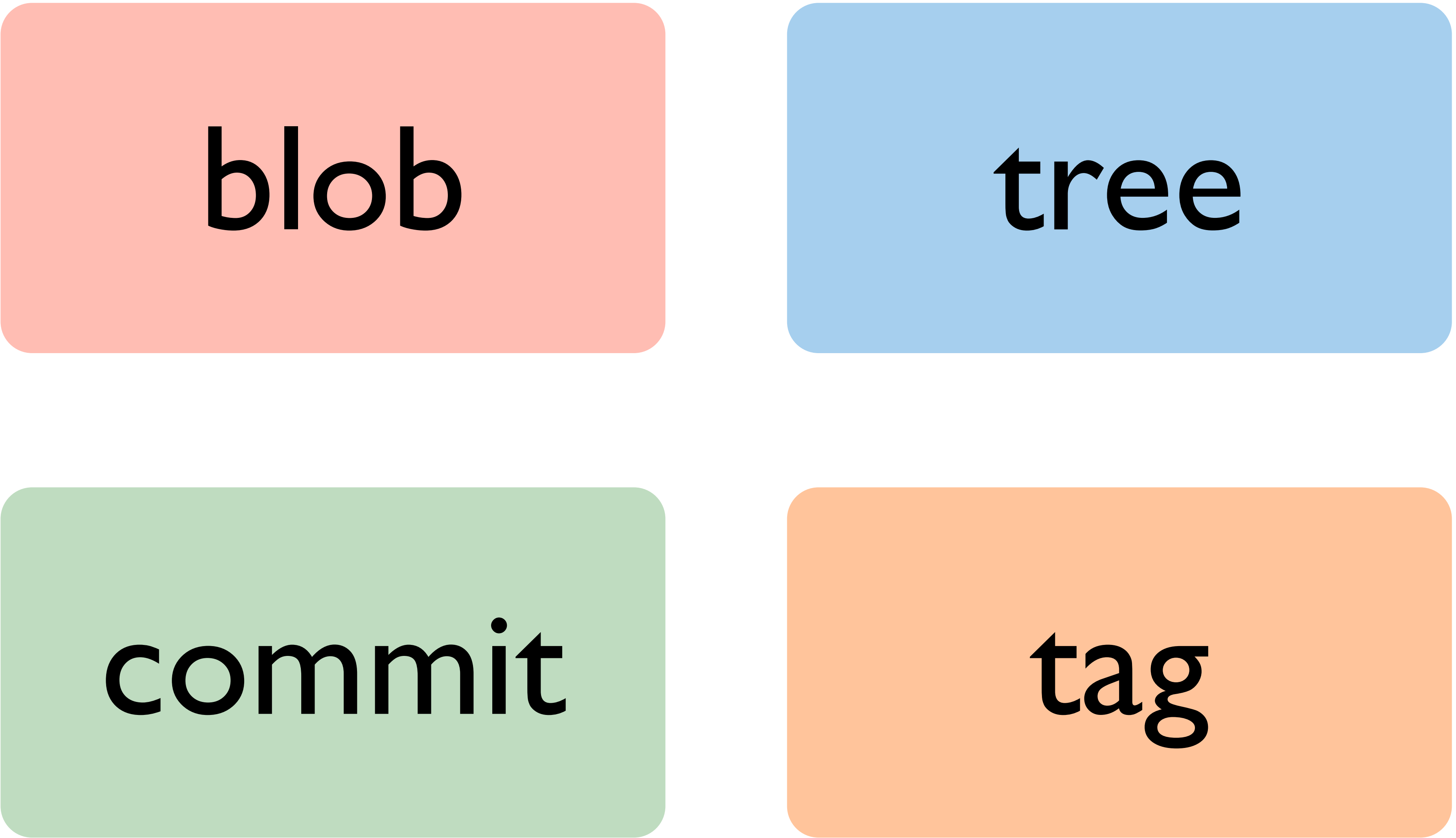


blob

tree

commit

object database



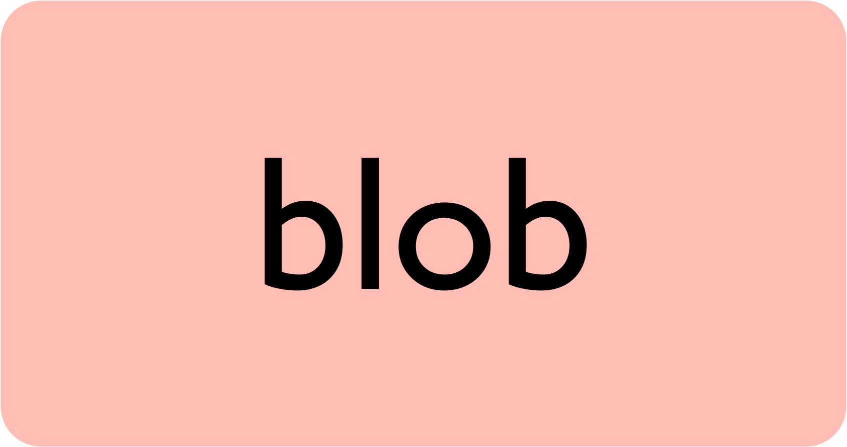
blob

tree

commit

tag

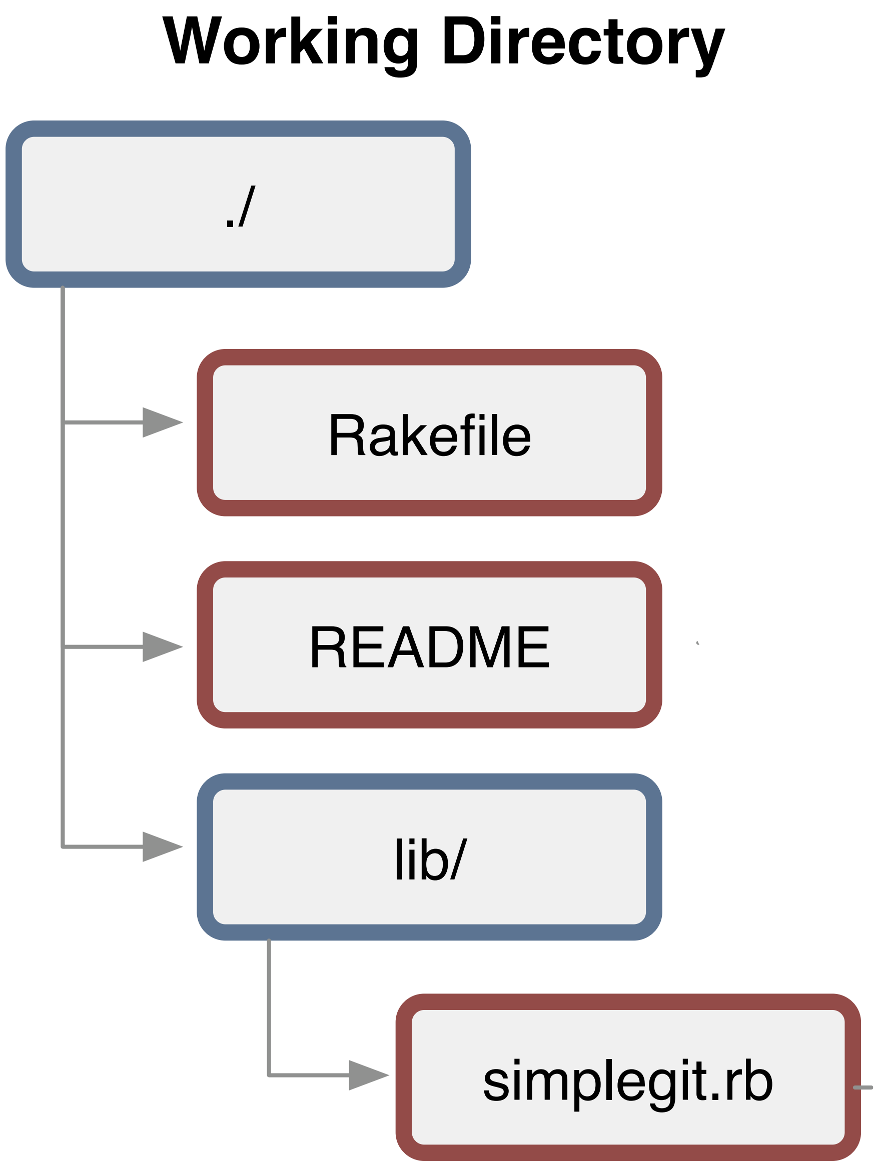
object database



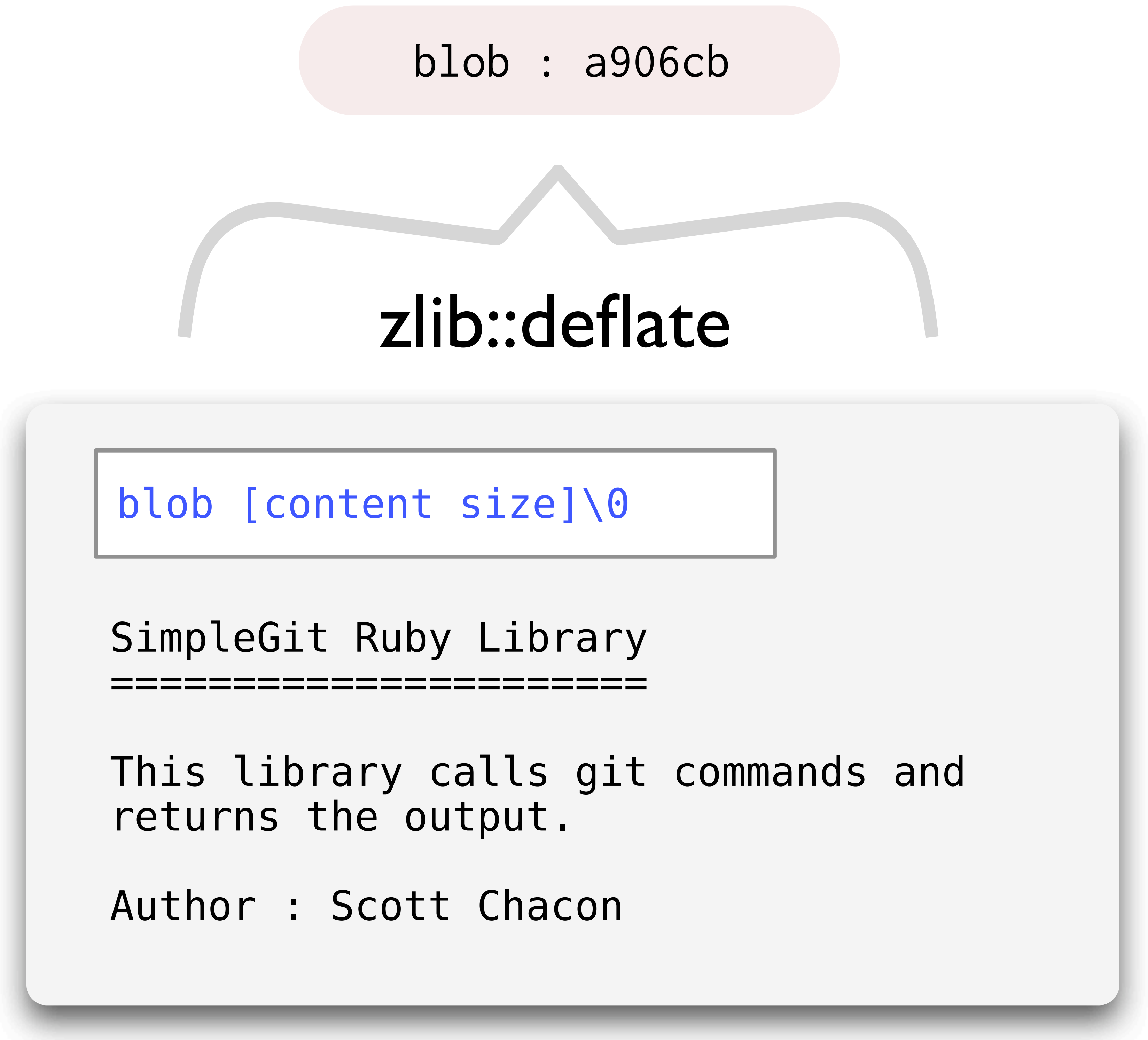
blob

object database

blob



object database



blob : a906cb

zlib::deflate

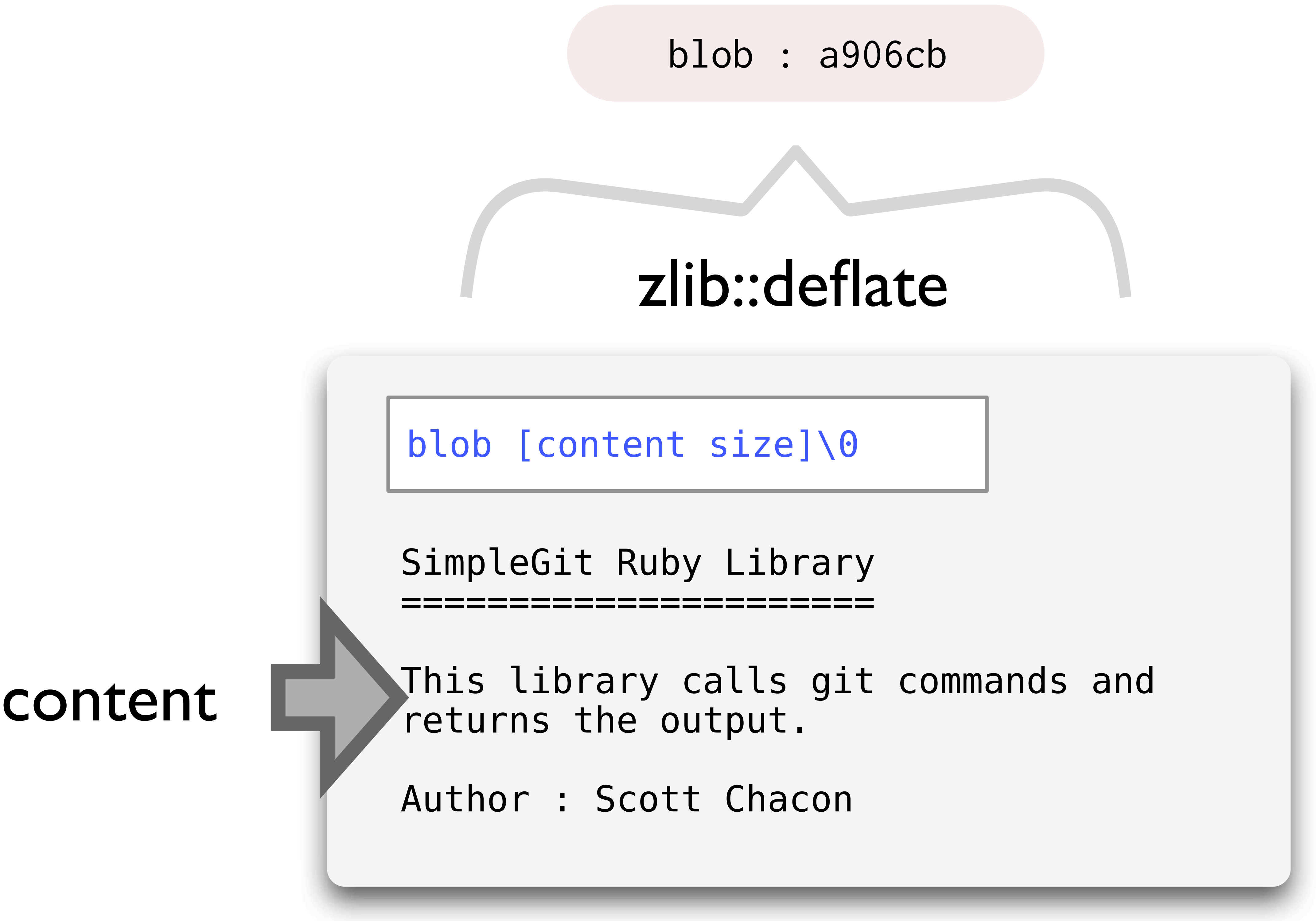
```
blob [content size]\0

SimpleGit Ruby Library
======================

This library calls git commands and
returns the output.

Author : Scott Chacon
```

object database



blob : a906cb

zlib::deflate

```
blob [content size]\0
```

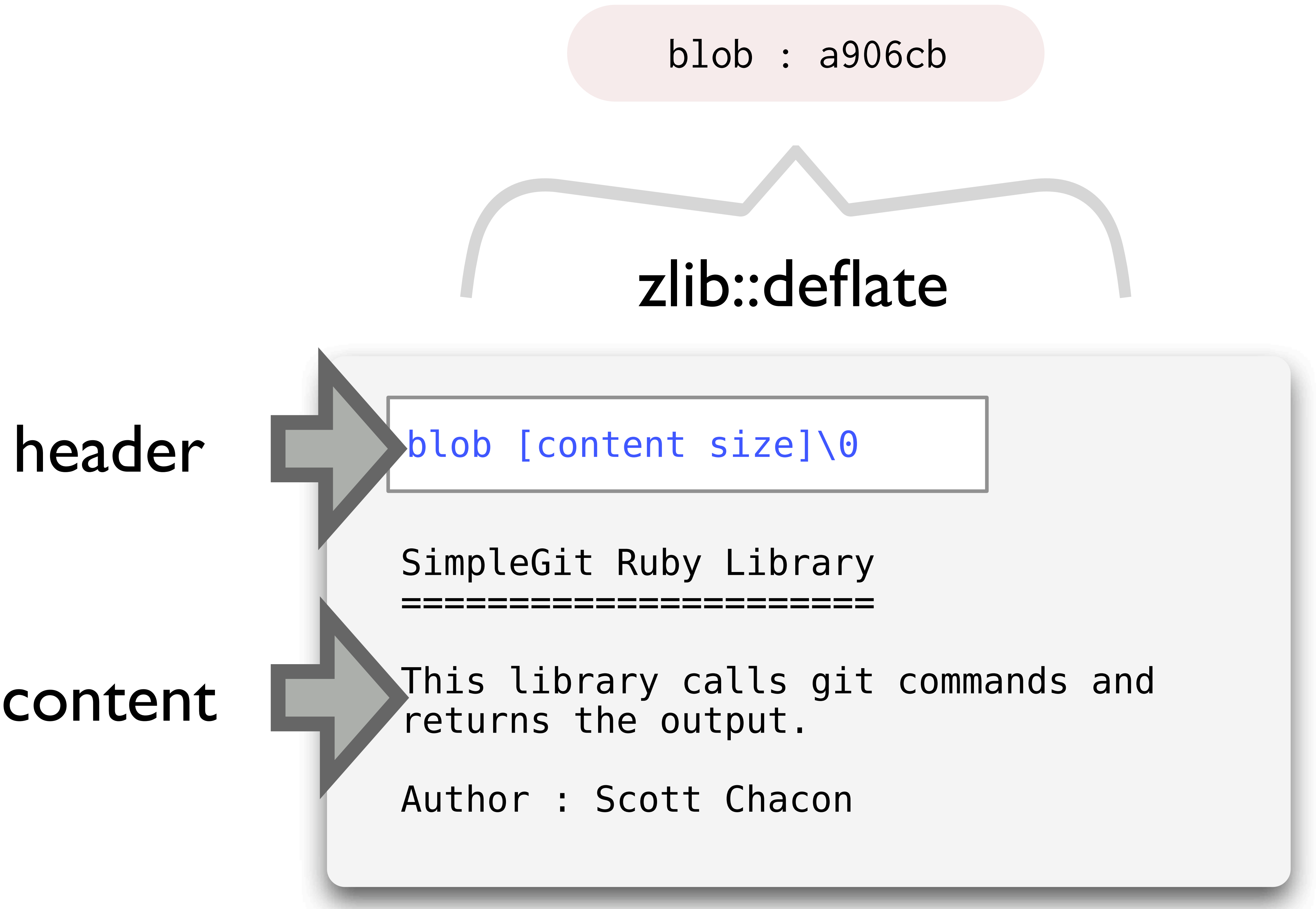
```
SimpleGit Ruby Library
======================

This library calls git commands and
returns the output.

Author : Scott Chacon
```

content

object database



```
blob : a906cb
```

zlib::deflate

header

```
blob [content size]\0
```

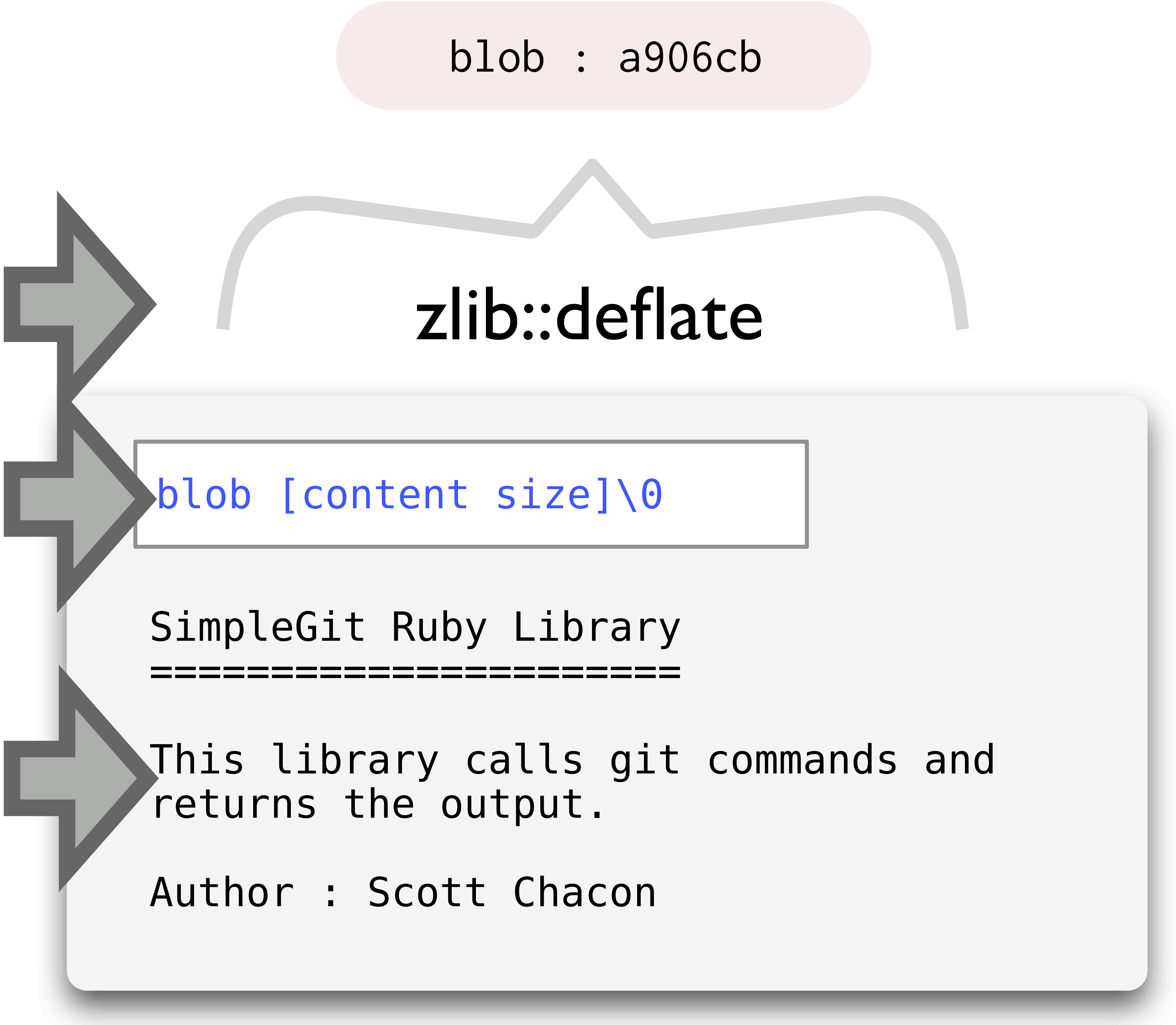
content

```
SimpleGit Ruby Library
======================

This library calls git commands and
returns the output.

Author : Scott Chacon
```

object database



blob : a906cb

zlib::deflate

compress

header

content

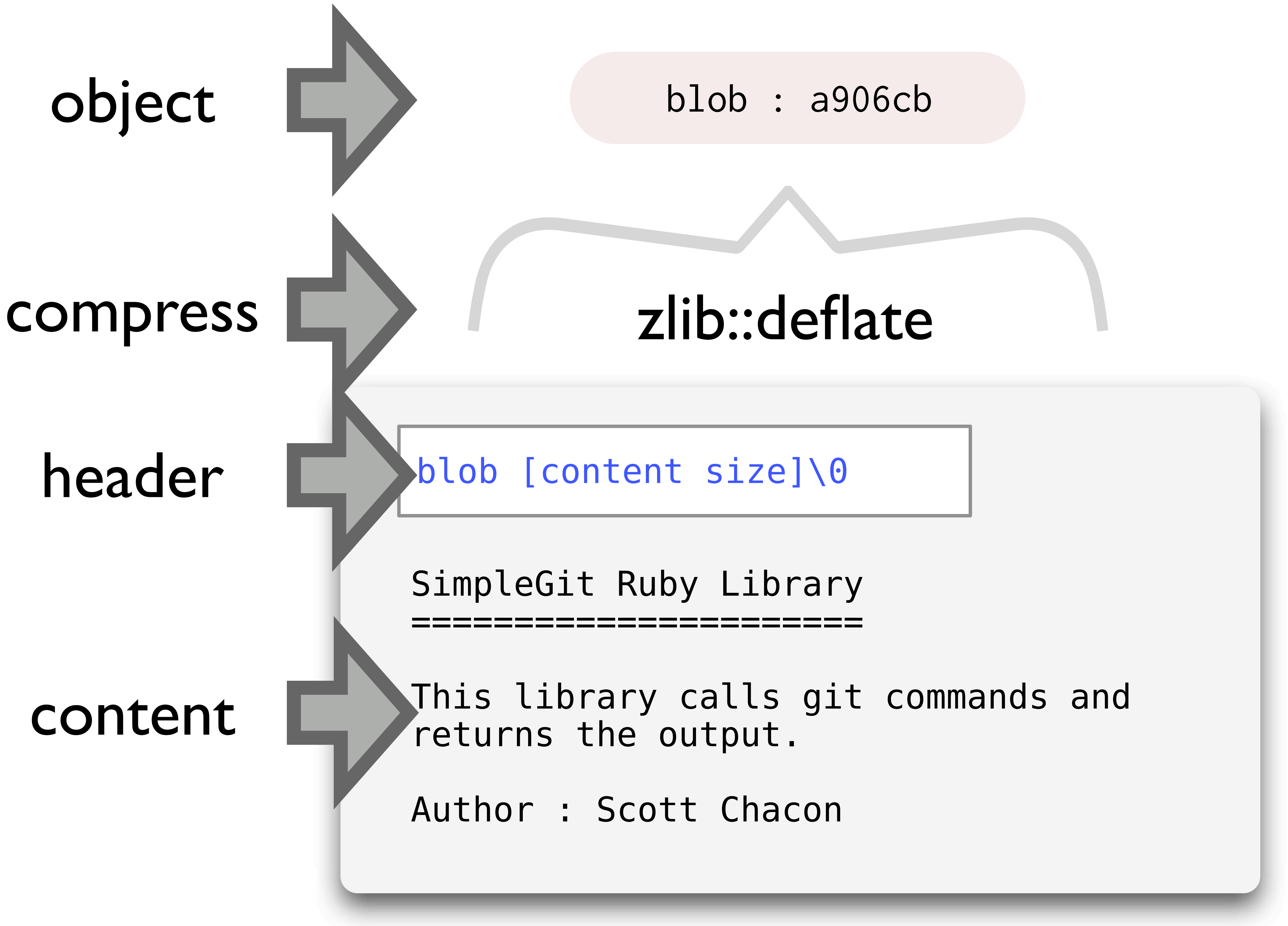
```
blob [content size]\0

SimpleGit Ruby Library
======================

This library calls git commands and
returns the output.

Author : Scott Chacon
```

object database



object

blob : a906cb

compress

zlib::deflate

header

```
blob [content size]\0
```

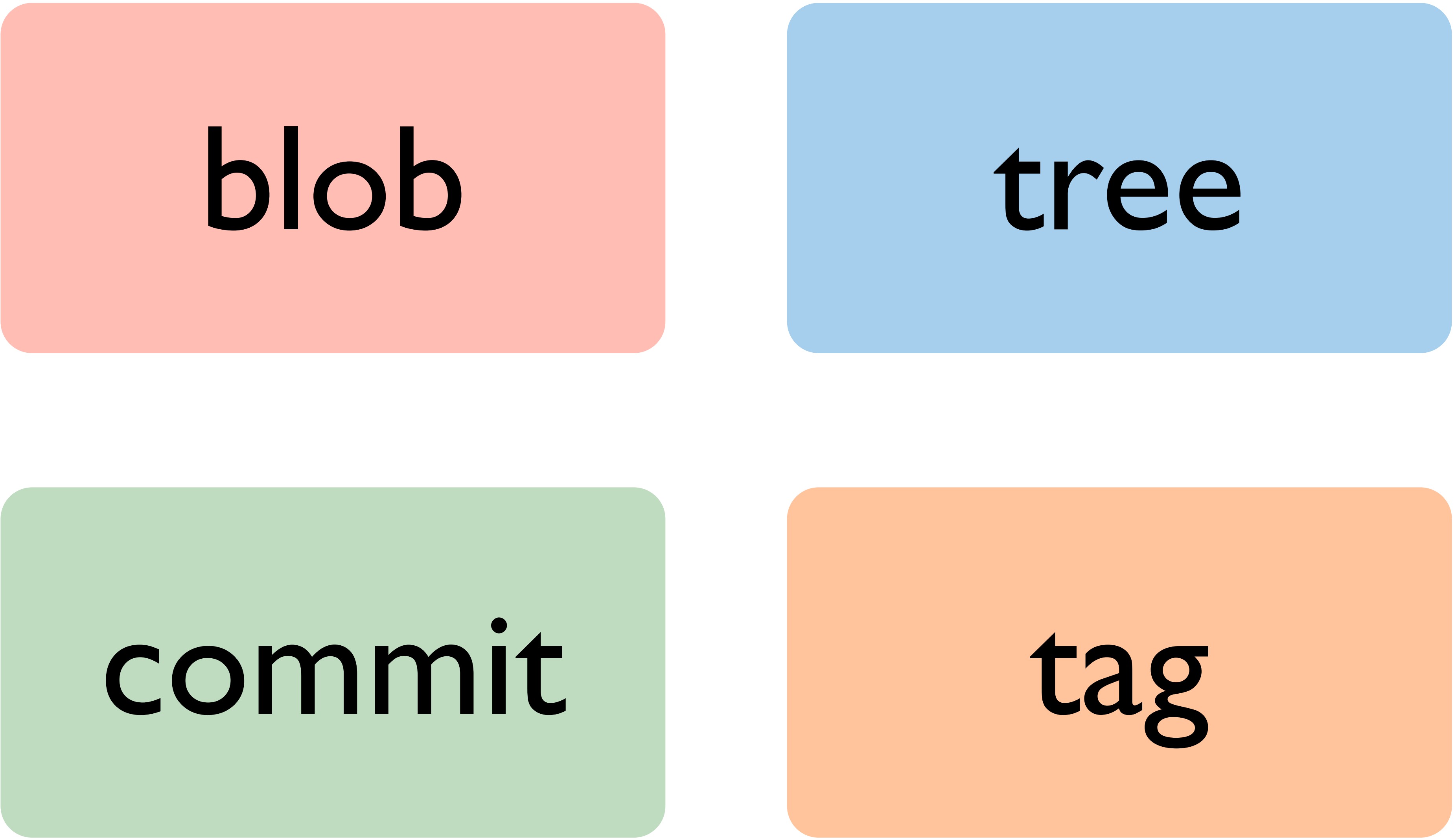
content

```
SimpleGit Ruby Library
======================

This library calls git commands and
returns the output.

Author : Scott Chacon
```

object database



blob

tree

commit

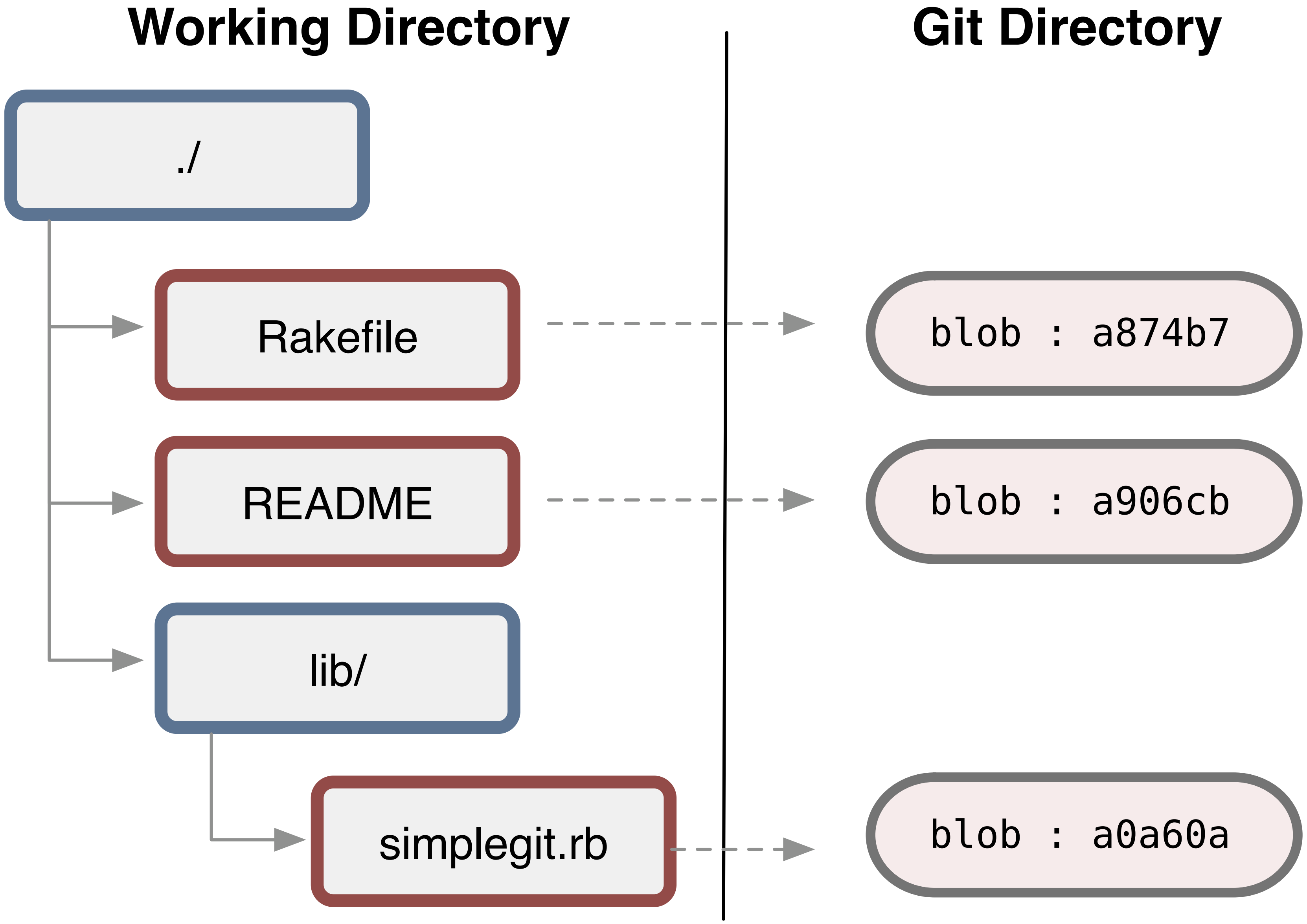
tag

object database

tree

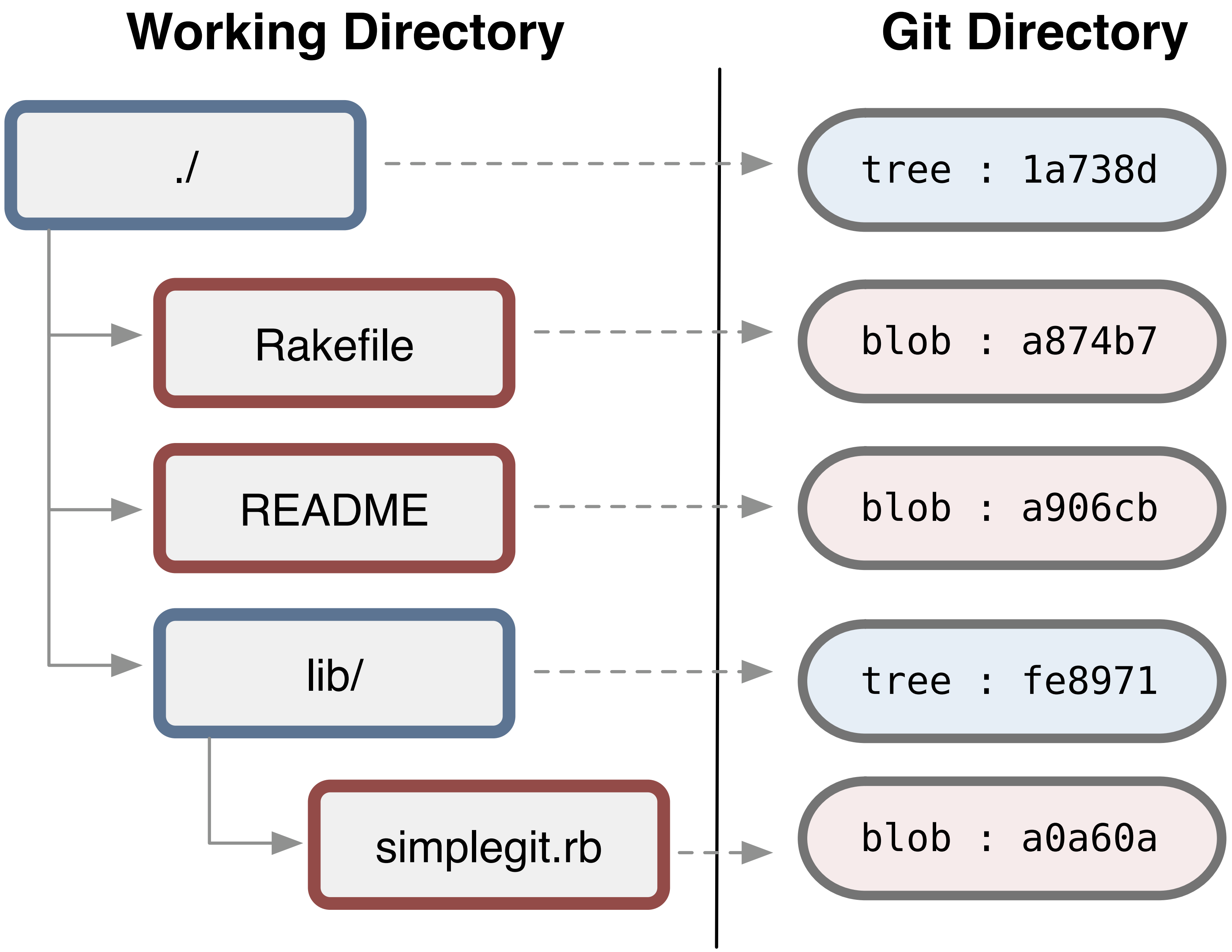
object database

tree

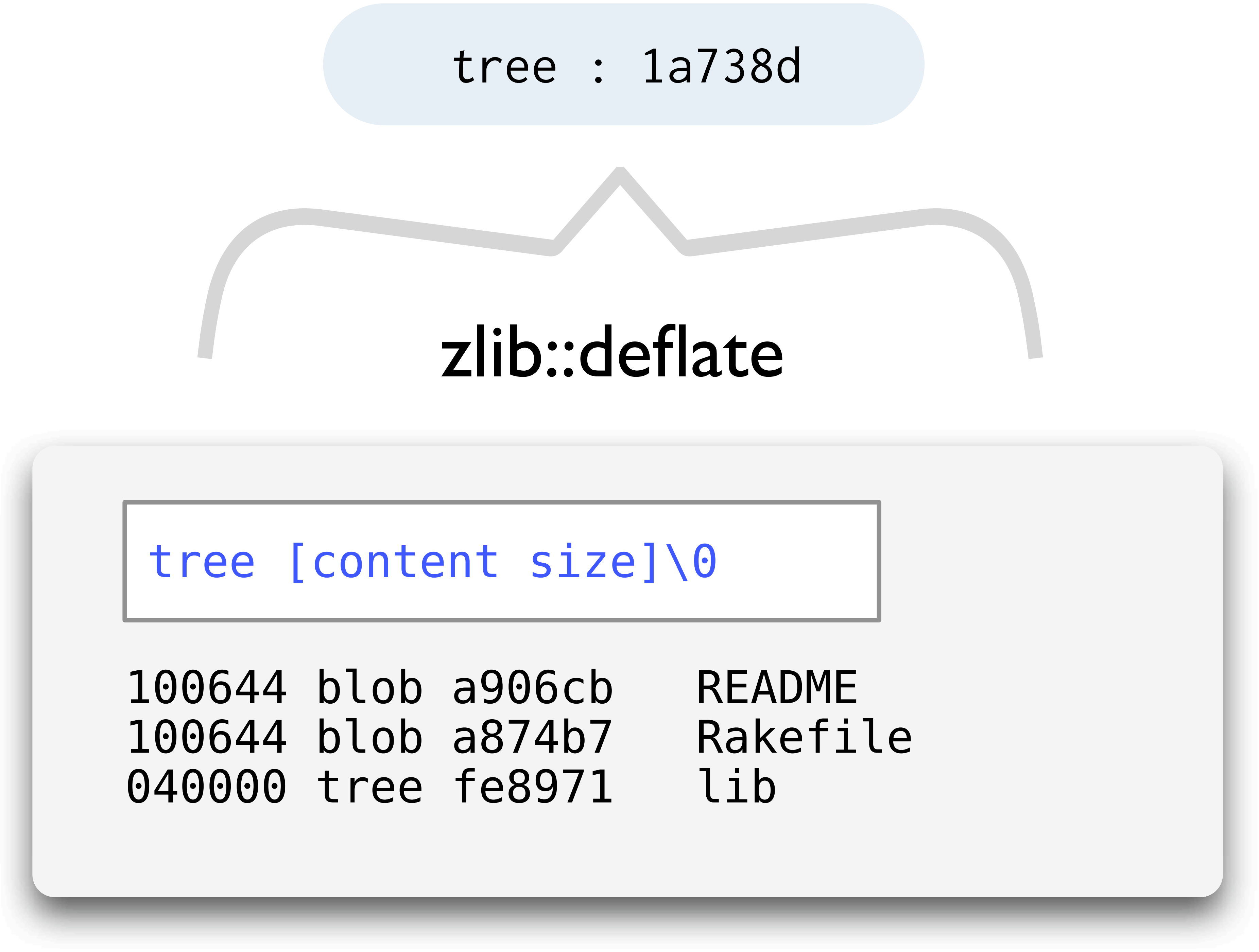


object database

tree



object database



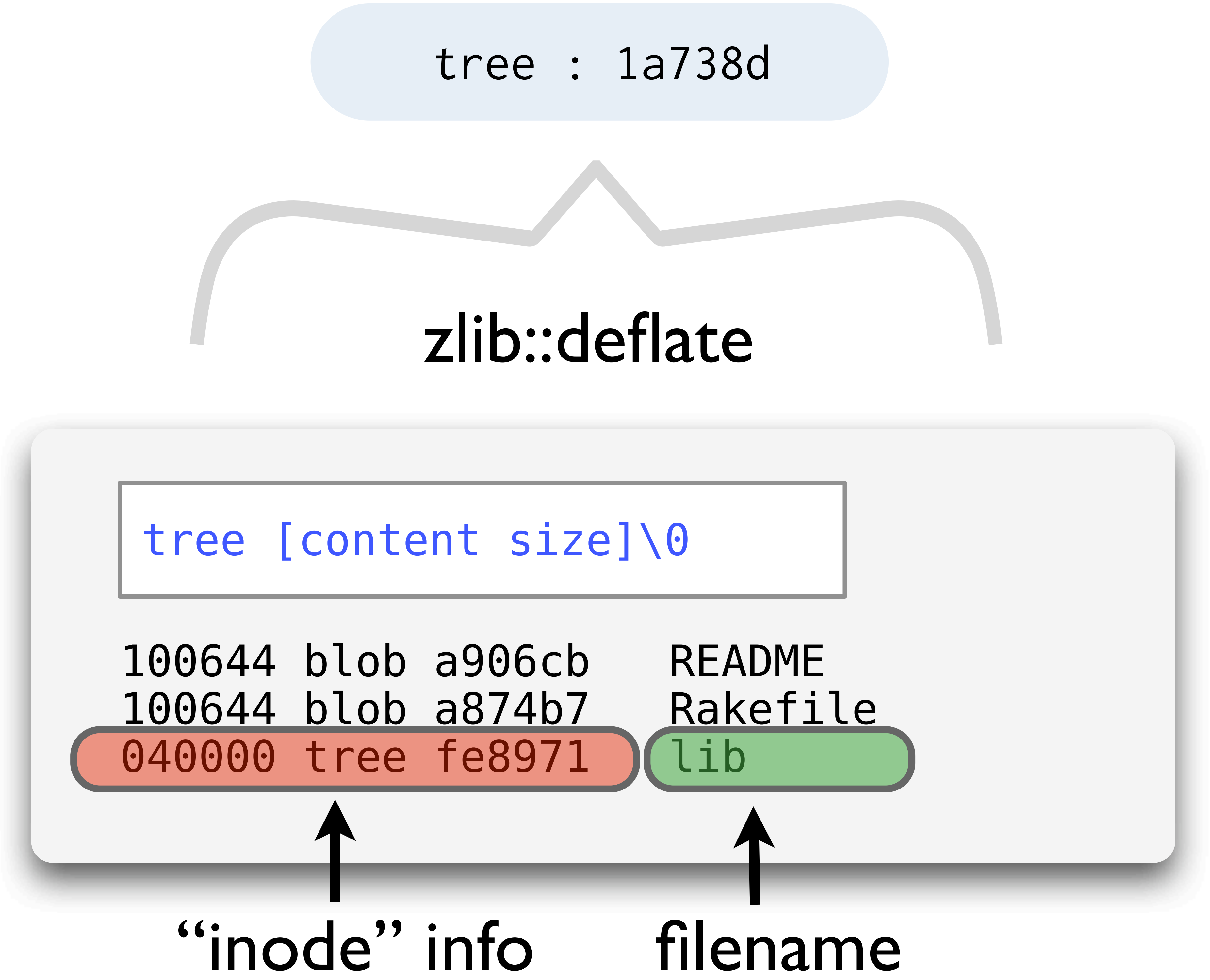
tree : 1a738d

zlib::deflate

```
tree [content size]\0

100644 blob a906cb   README
100644 blob a874b7   Rakefile
040000 tree fe8971   lib
```

object database



```
tree : 1a738d
```

zlib::deflate

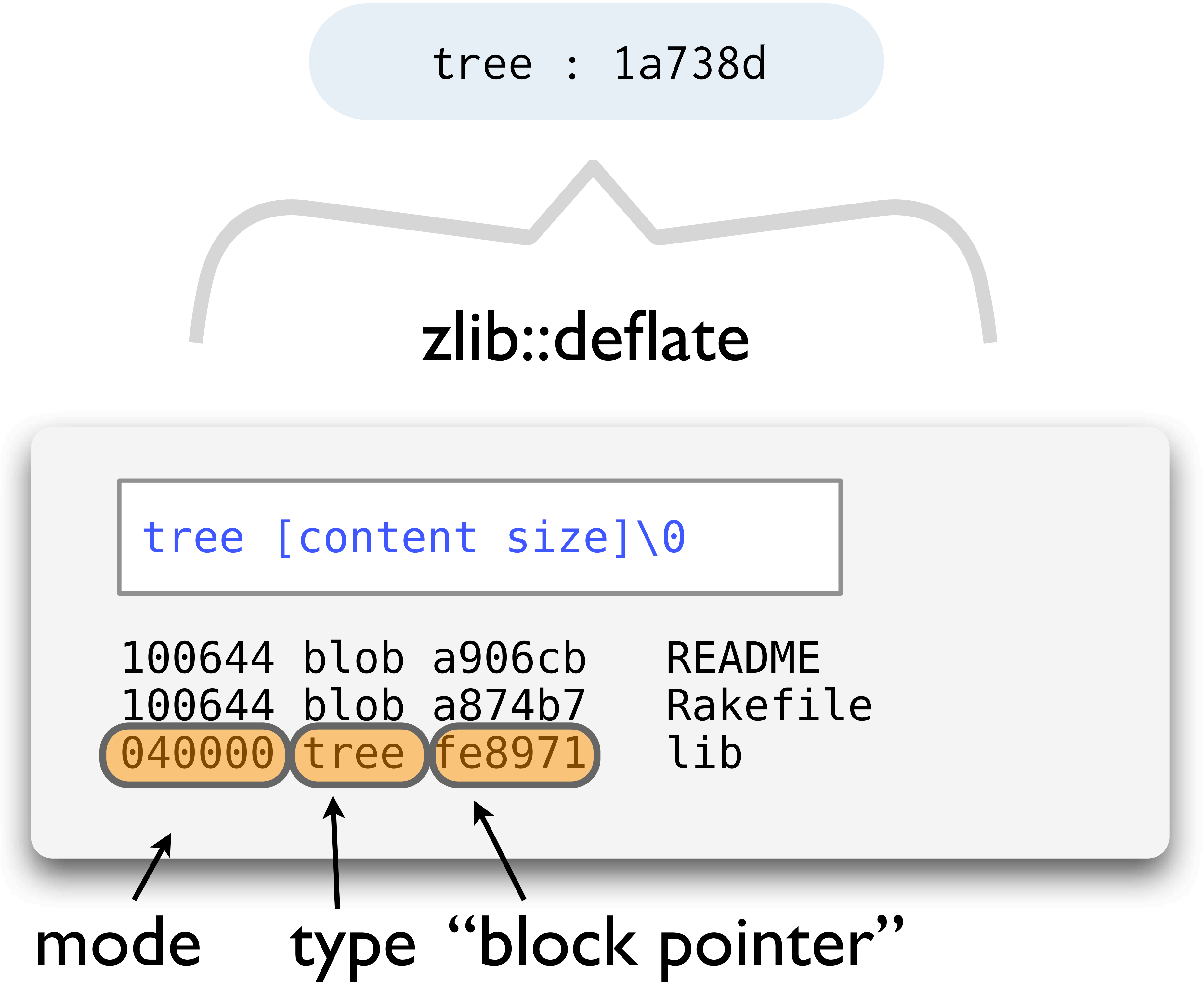
```
tree [content size]\0

100644 blob a906cb    README
100644 blob a874b7    Rakefile
040000 tree fe8971    lib
```

“inode” info

filename

object database



tree : 1a738d

zlib::deflate

```
tree [content size]\0

100644 blob a906cb   README
100644 blob a874b7   Rakefile
040000 tree fe8971   lib
```

mode

type

“block pointer”

object database

blob

tree

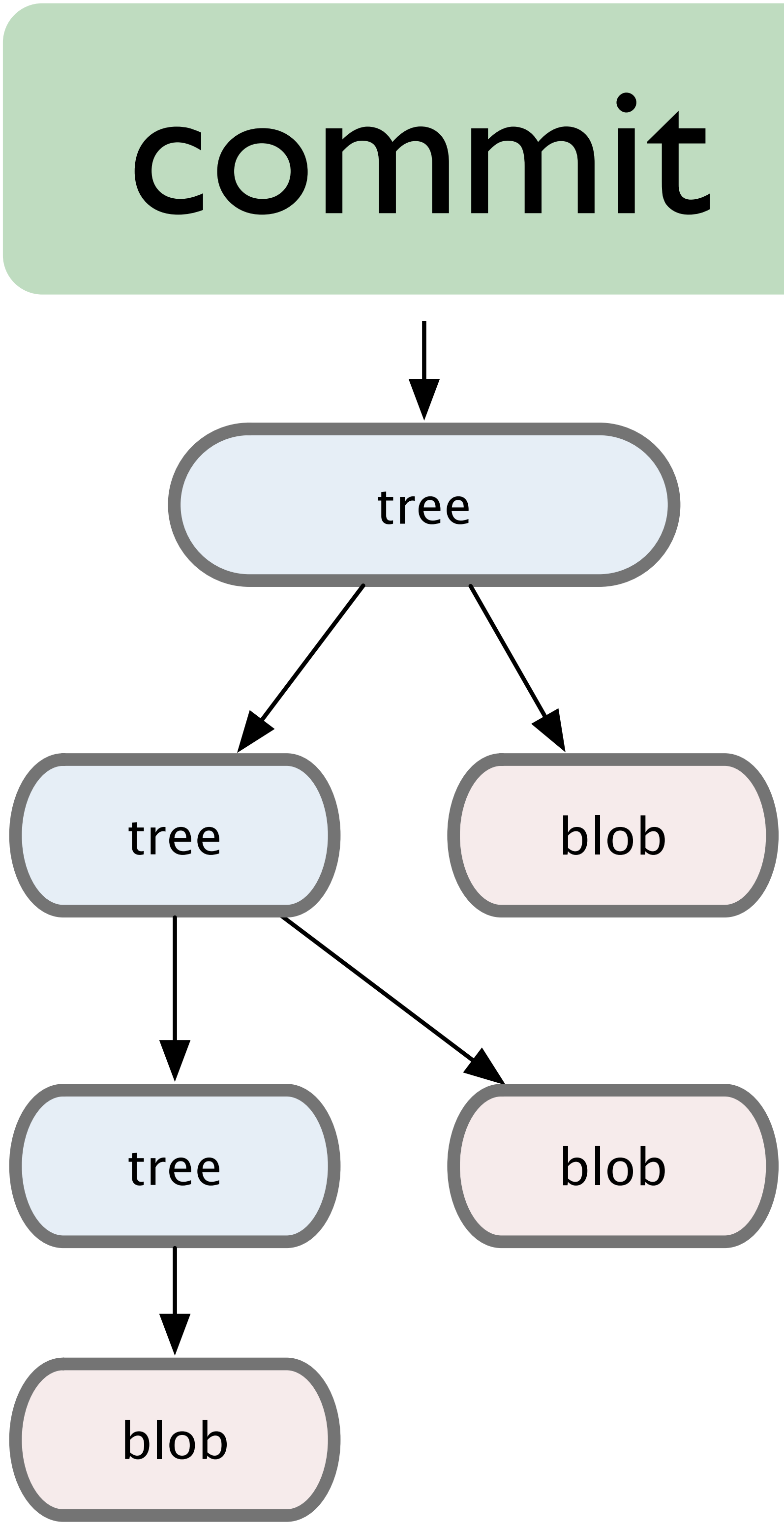
commit

tag

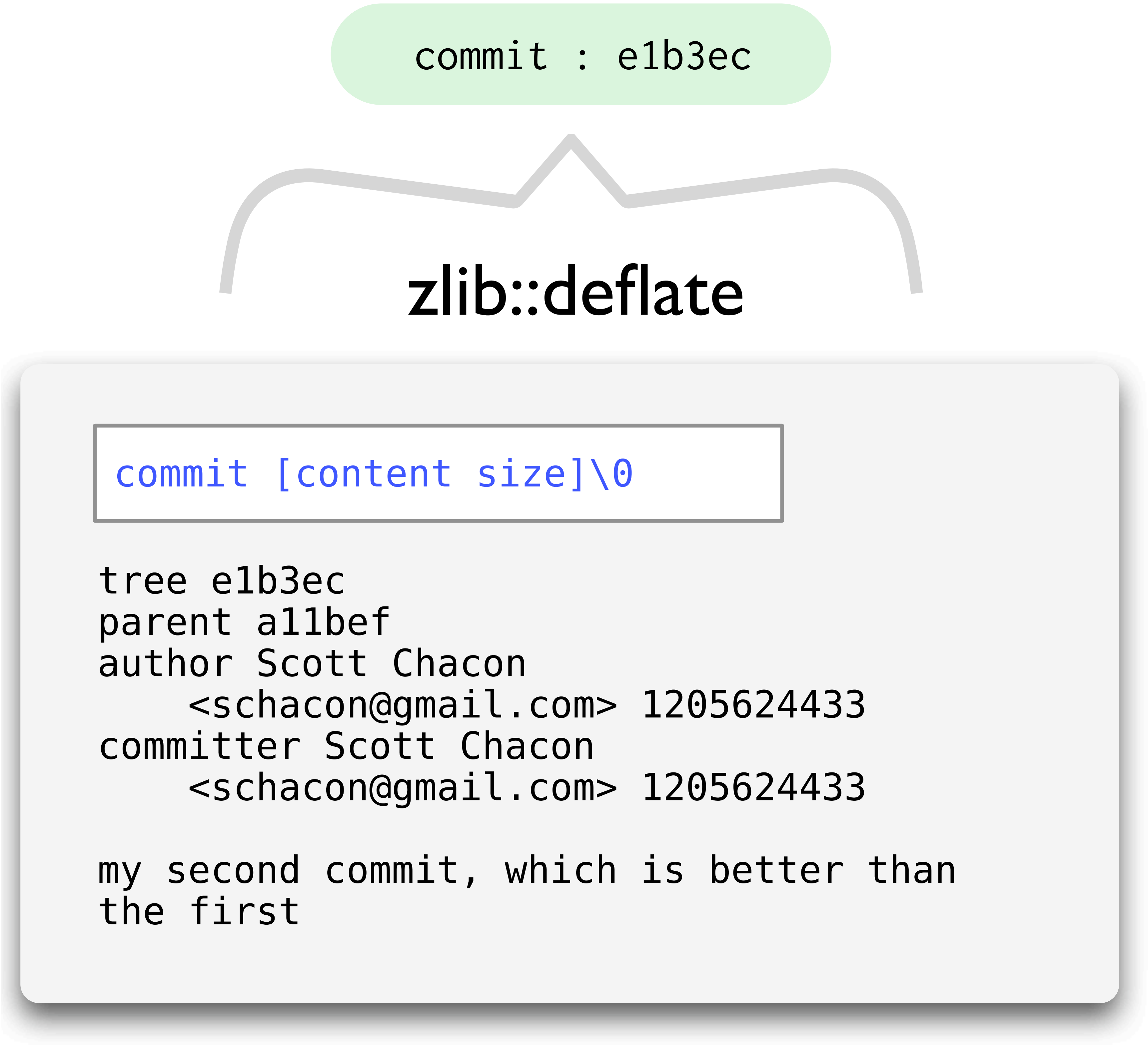
object database

commit

object database



object database



commit : e1b3ec

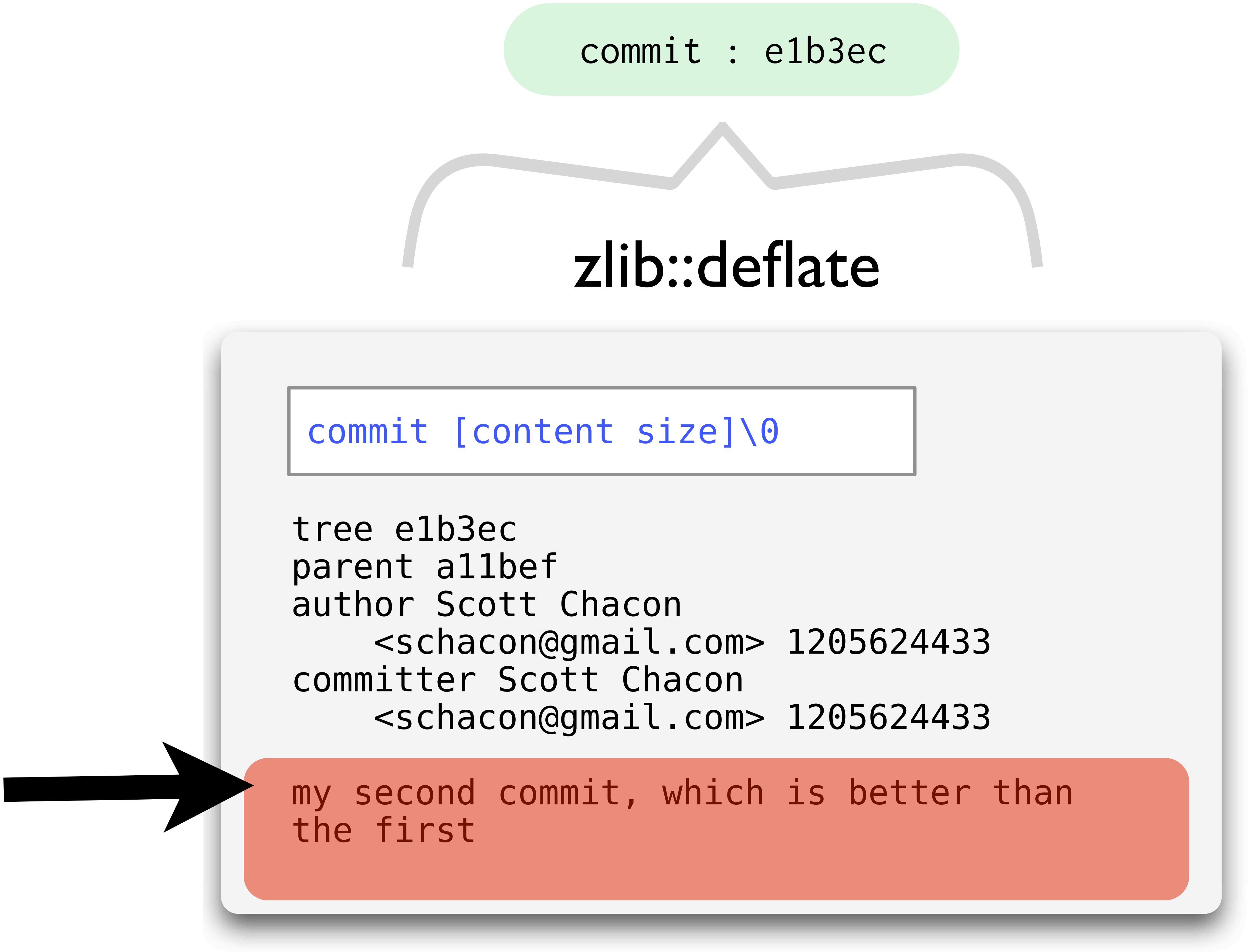
zlib::deflate

```
commit [content size]\0

tree e1b3ec
parent a11bef
author Scott Chacon
    <schacon@gmail.com> 1205624433
committer Scott Chacon
    <schacon@gmail.com> 1205624433

my second commit, which is better than
the first
```

object database



commit : e1b3ec

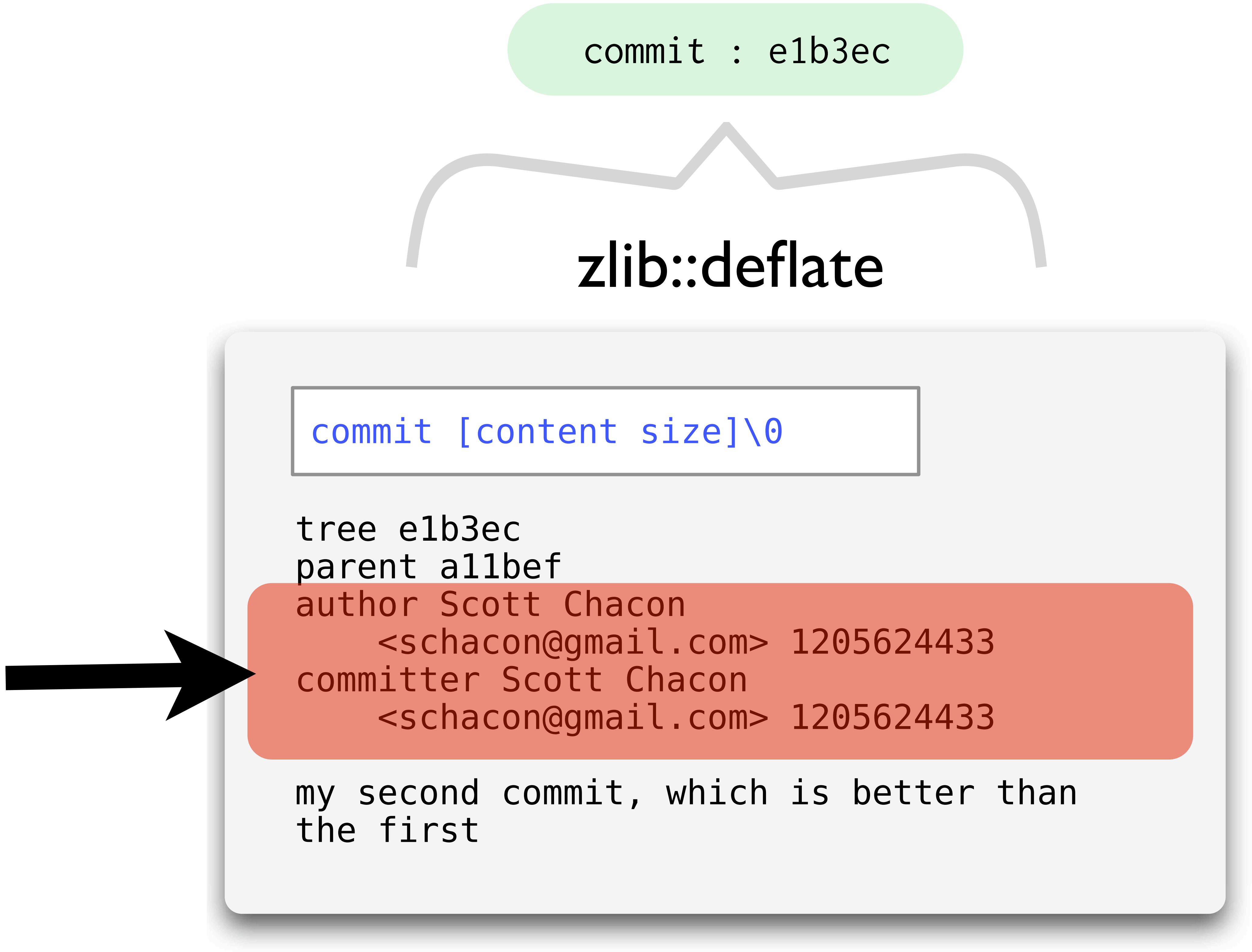
zlib::deflate

```
commit [content size]\0
```

```
tree e1b3ec
parent a11bef
author Scott Chacon
    <schacon@gmail.com> 1205624433
committer Scott Chacon
    <schacon@gmail.com> 1205624433
```

```
my second commit, which is better than
the first
```

object database



commit : e1b3ec

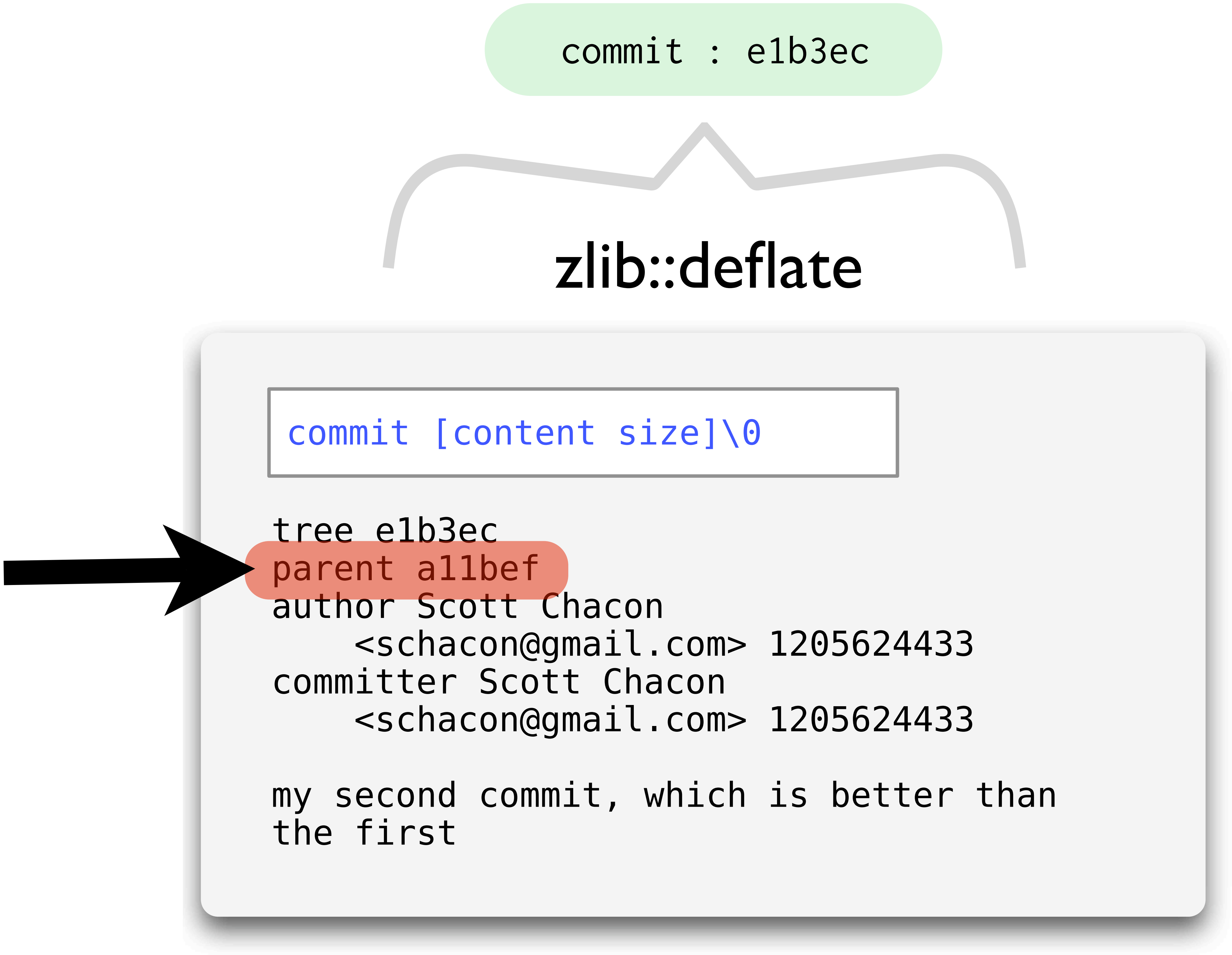
zlib::deflate

```
commit [content size]\0

tree e1b3ec
parent a11bef
author Scott Chacon
    <schacon@gmail.com> 1205624433
committer Scott Chacon
    <schacon@gmail.com> 1205624433

my second commit, which is better than
the first
```

object database



commit : e1b3ec

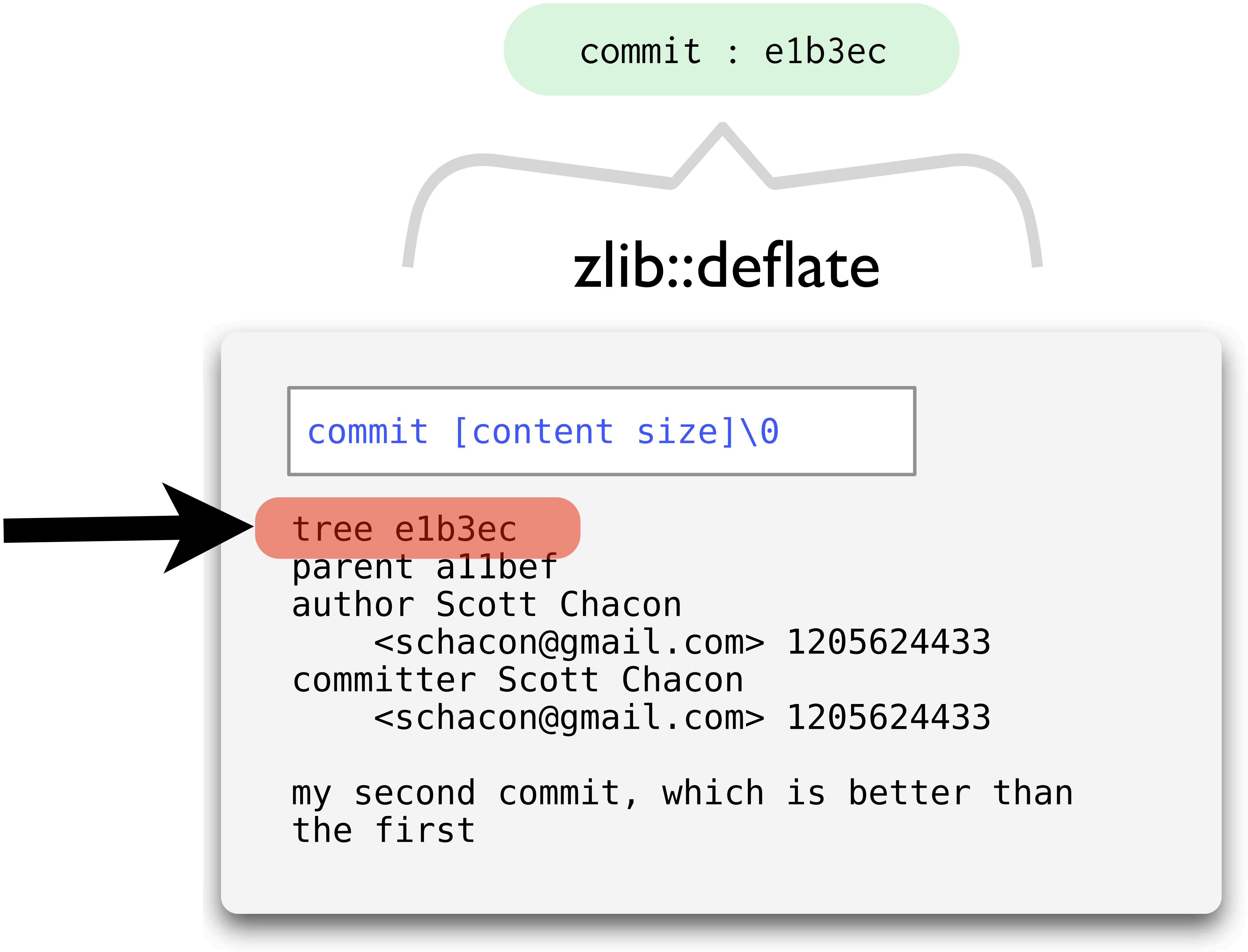
zlib::deflate

```
commit [content size]\0

tree e1b3ec
parent a11bef
author Scott Chacon
    <schacon@gmail.com> 1205624433
committer Scott Chacon
    <schacon@gmail.com> 1205624433

my second commit, which is better than
the first
```

object database



commit : e1b3ec

zlib::deflate

```
commit [content size]\0

tree e1b3ec
parent a11bef
author Scott Chacon
    <schacon@gmail.com> 1205624433
committer Scott Chacon
    <schacon@gmail.com> 1205624433

my second commit, which is better than
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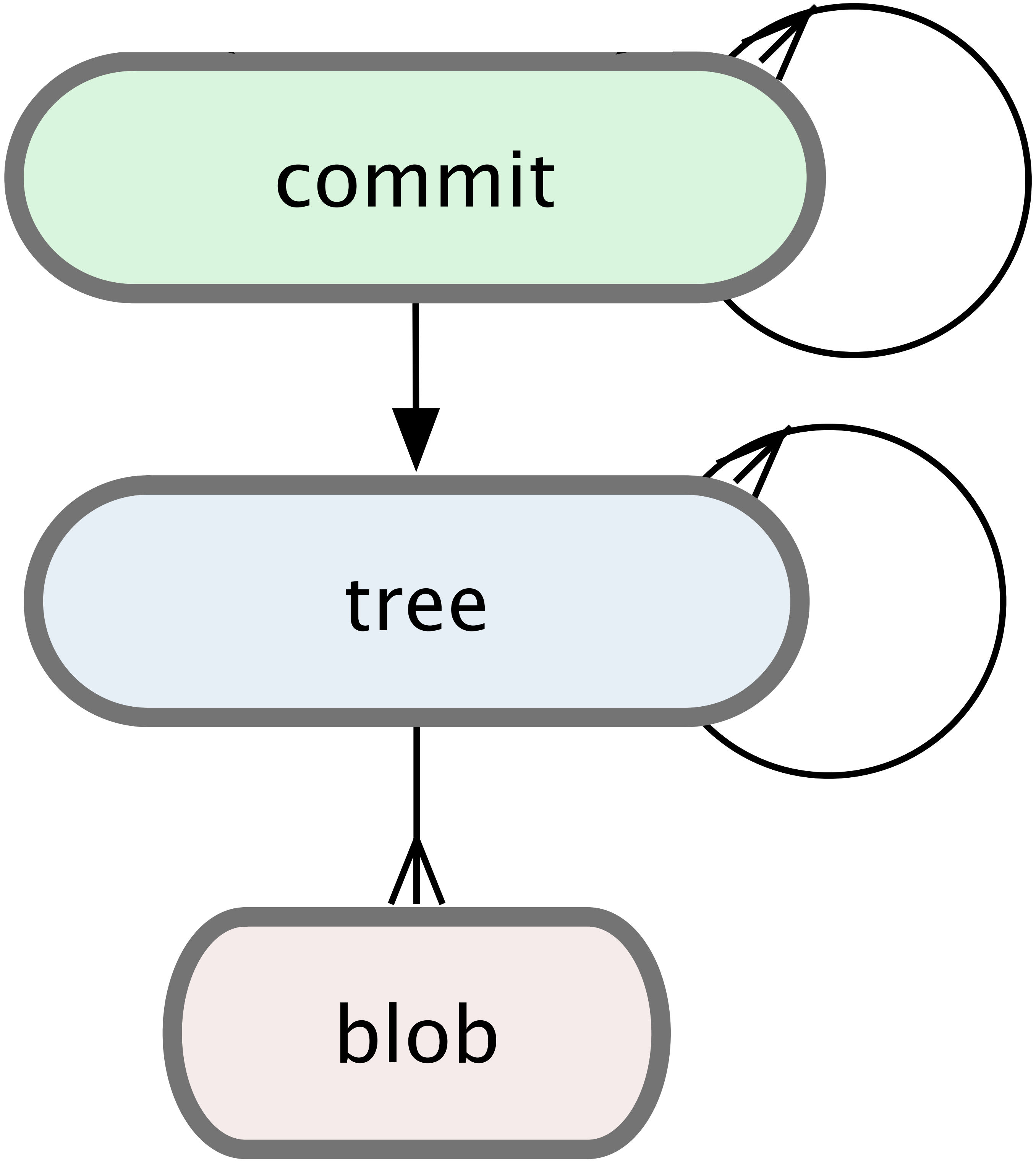
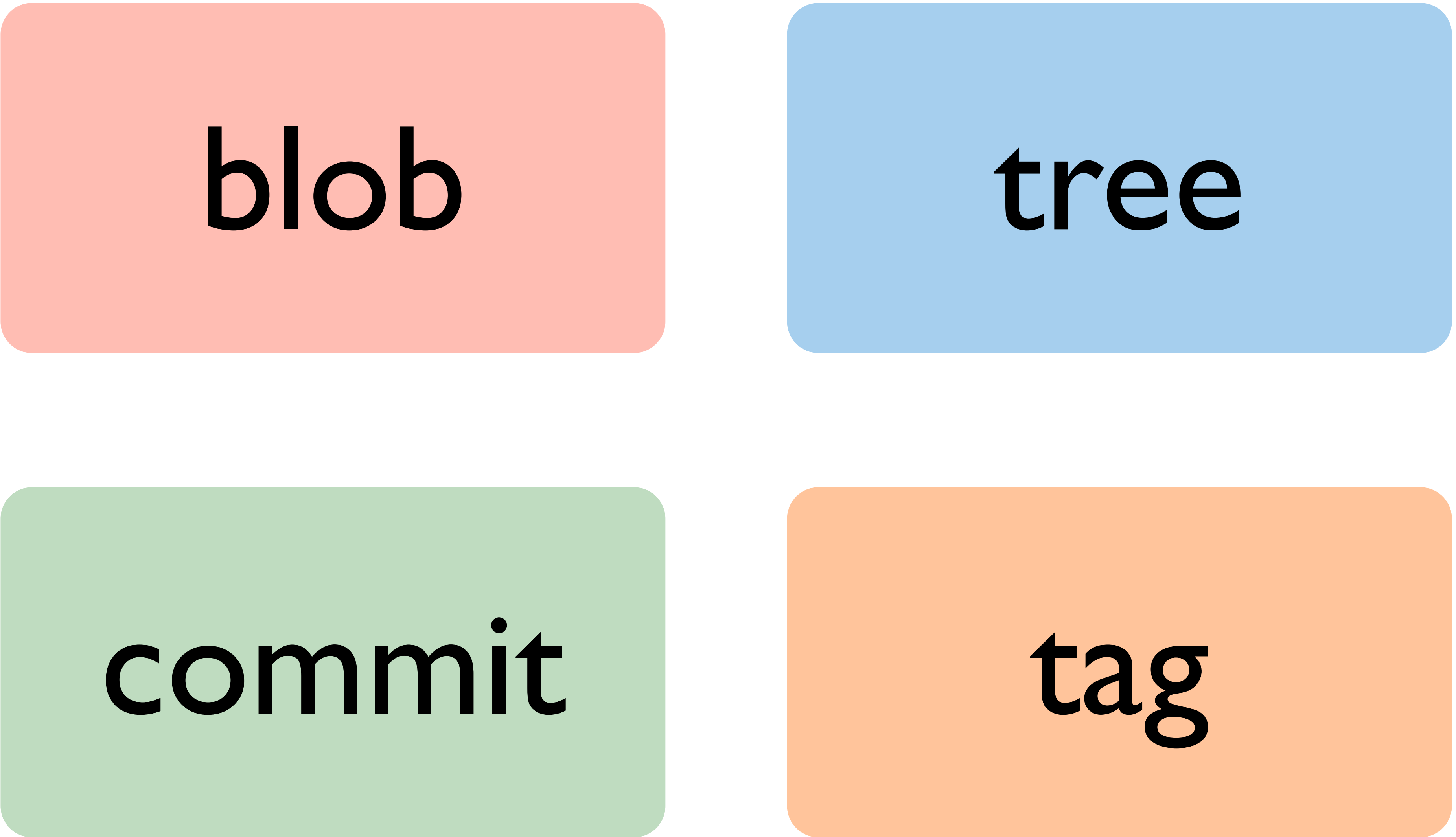
```

object database



object database



blob

tree

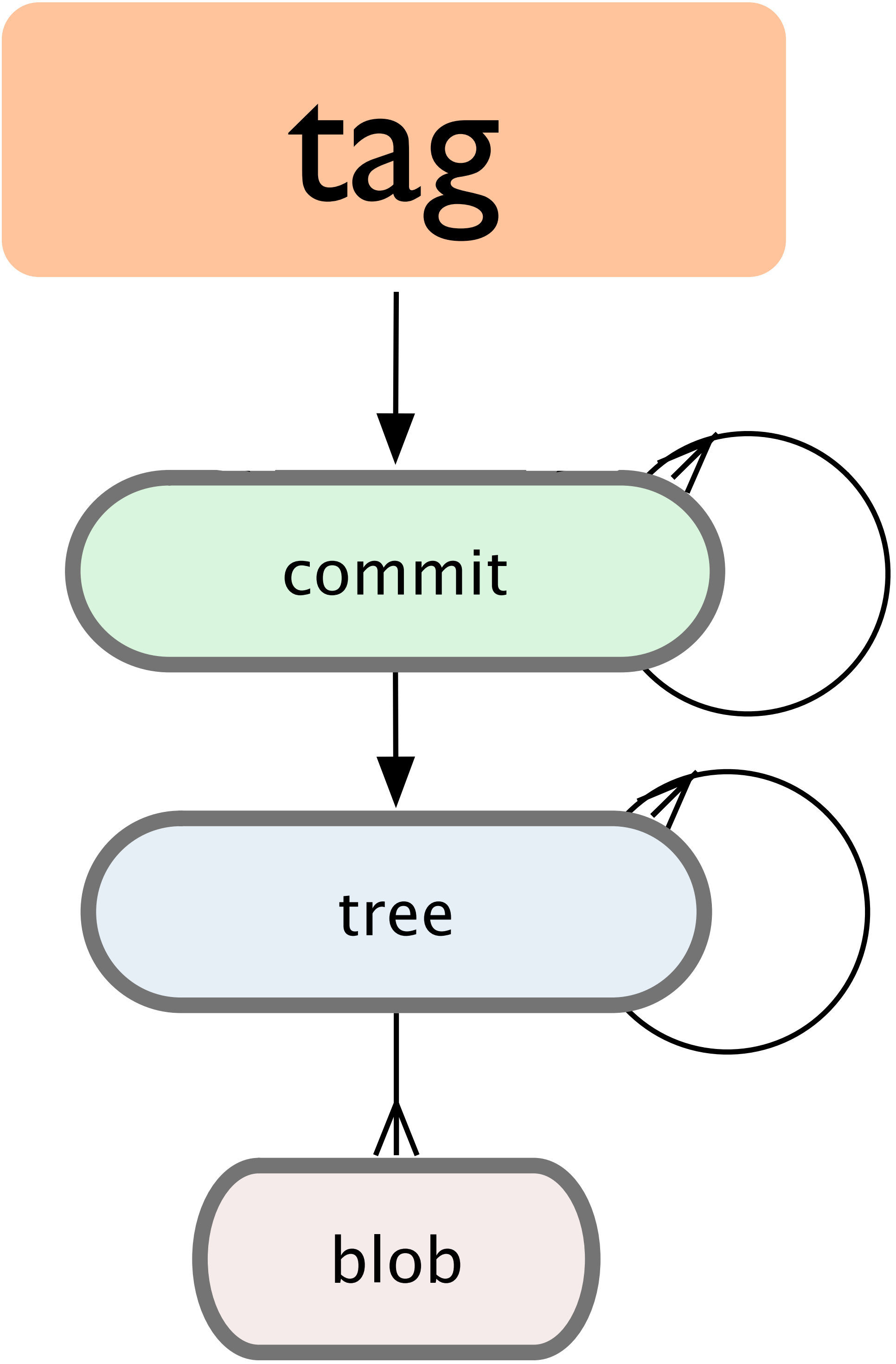
commit

tag

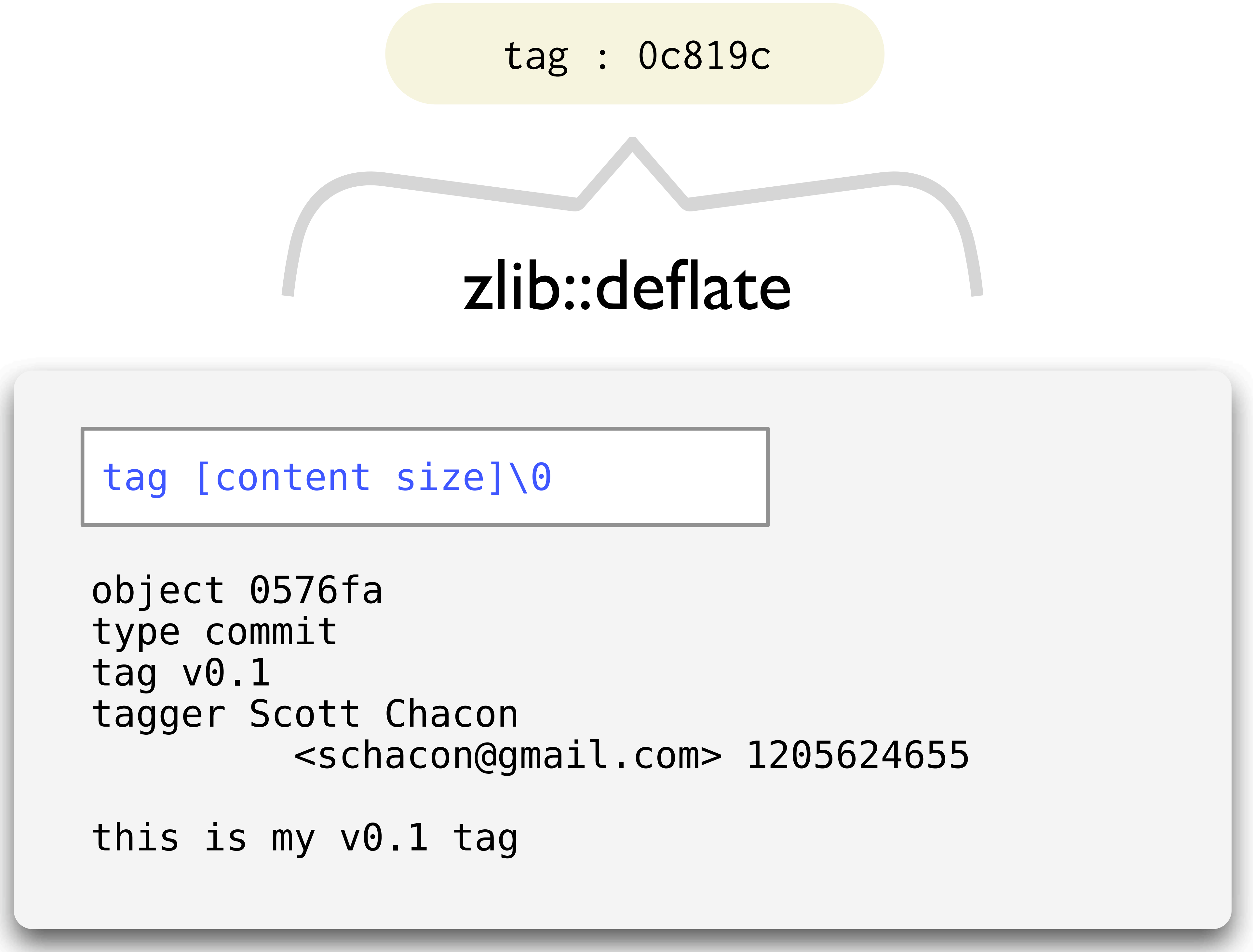
object database

tag

object database



object database



```
tag : 0c819c
```

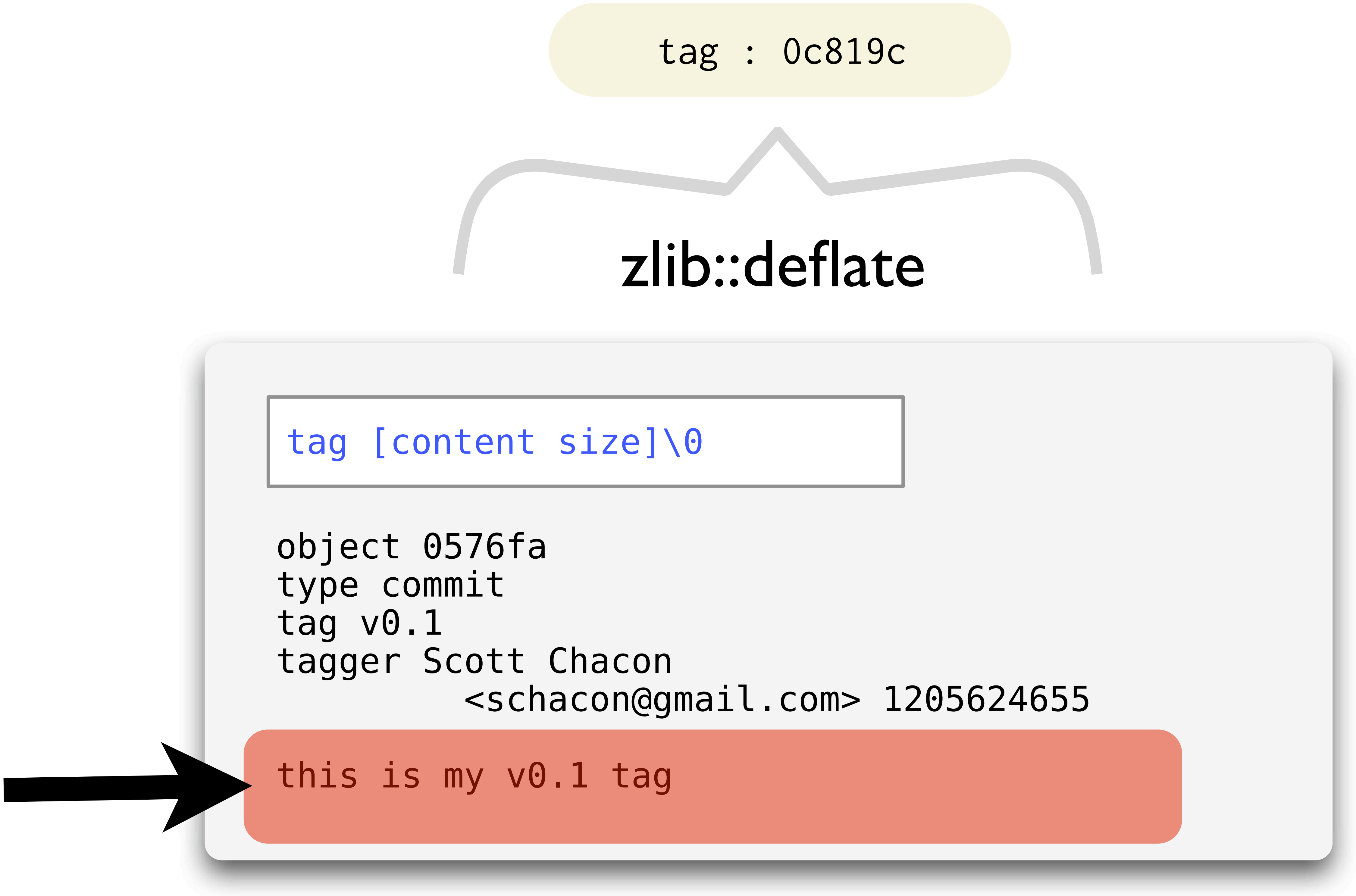
zlib::deflate

```
tag [content size]\0

object 0576fa
type commit
tag v0.1
tagger Scott Chacon
         <schacon@gmail.com> 1205624655

this is my v0.1 tag
```

object database



tag : 0c819c

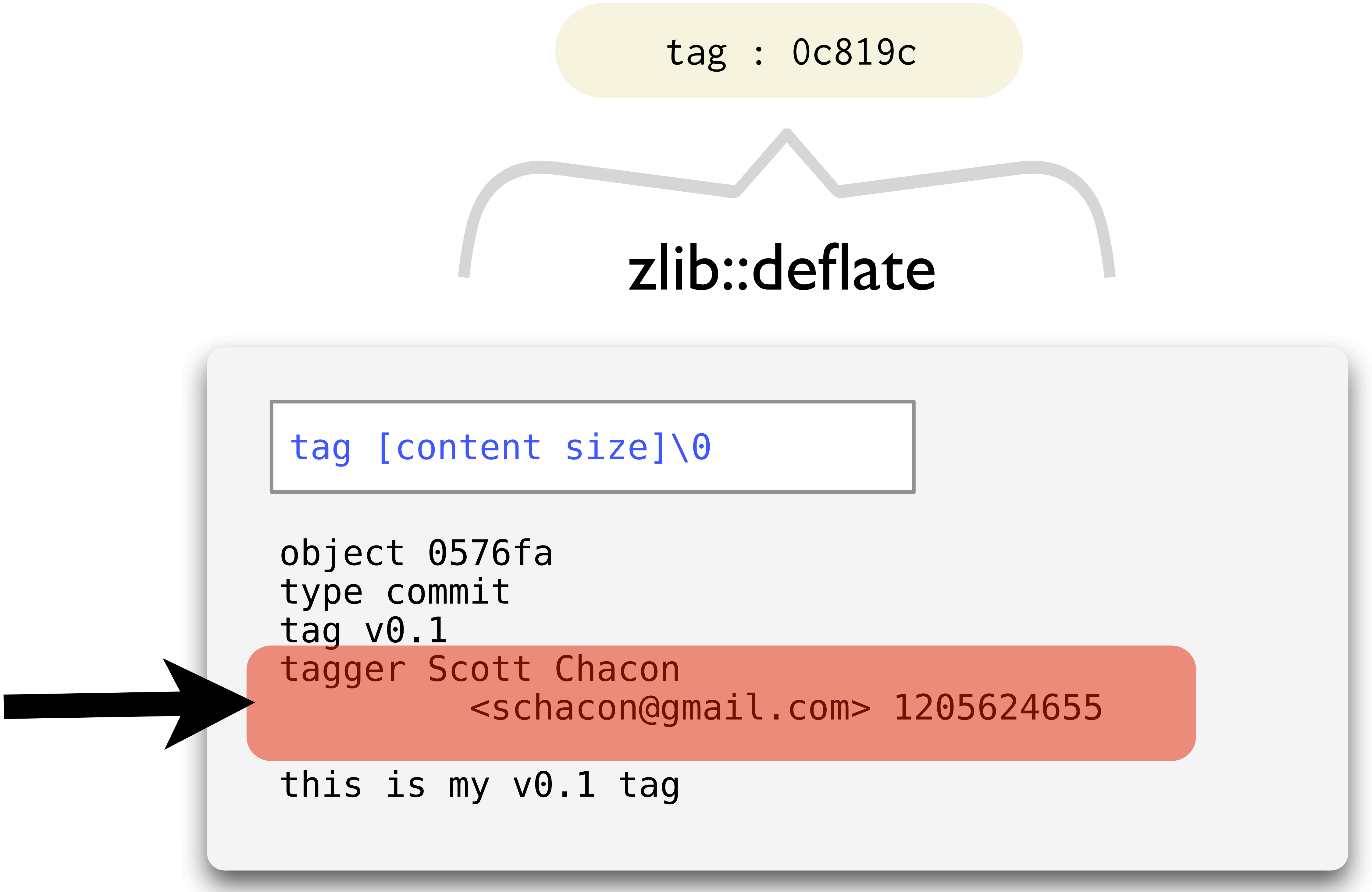
zlib::deflate

```
tag [content size]\0

object 0576fa
type commit
tag v0.1
tagger Scott Chacon
         <schacon@gmail.com> 1205624655

this is my v0.1 tag
```

object database



tag : 0c819c

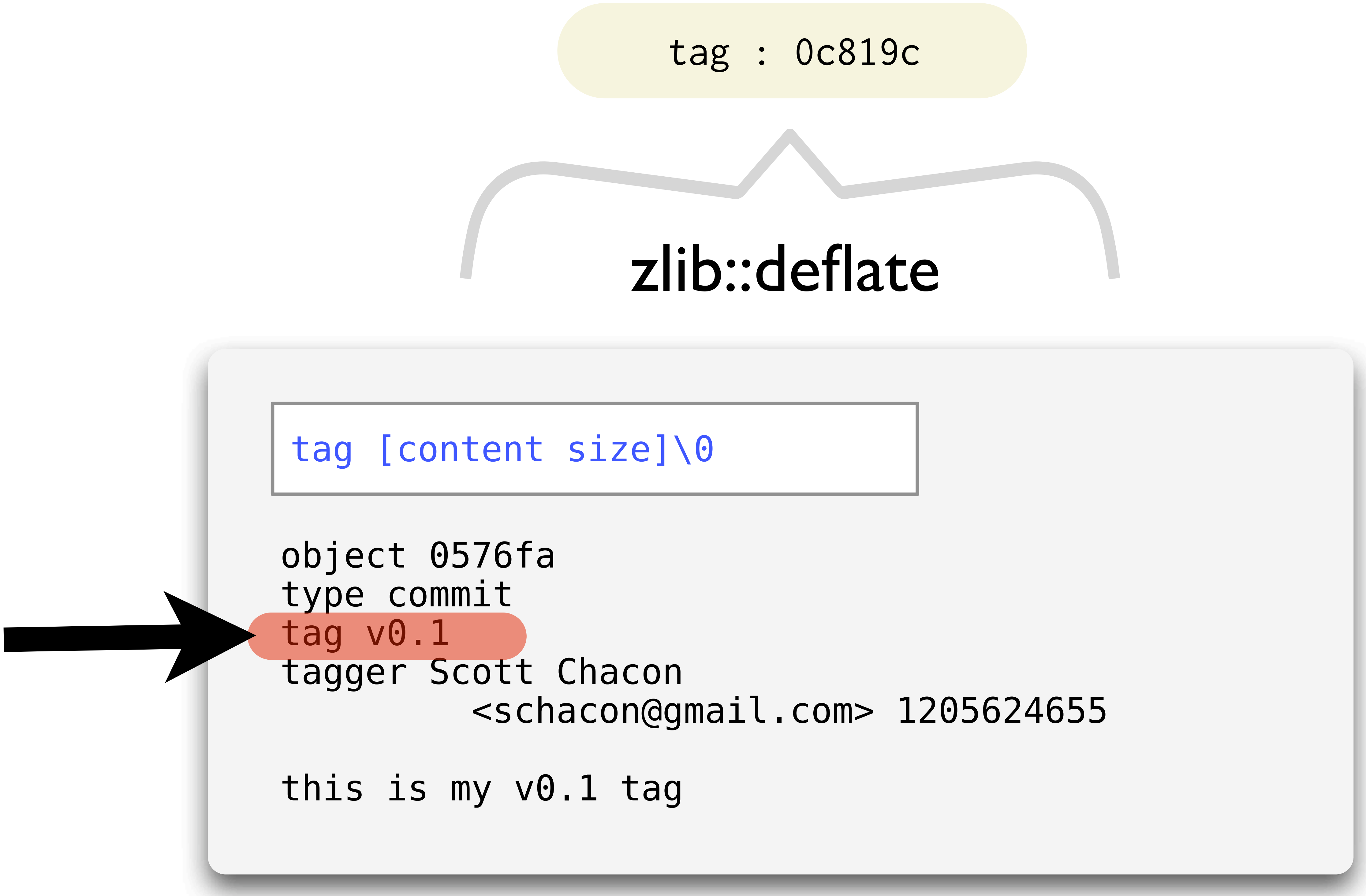
zlib::deflate

```
tag [content size]\0

object 0576fa
type commit
tag v0.1
tagger Scott Chacon
         <schacon@gmail.com> 1205624655

this is my v0.1 tag
```

object database



tag : 0c819c

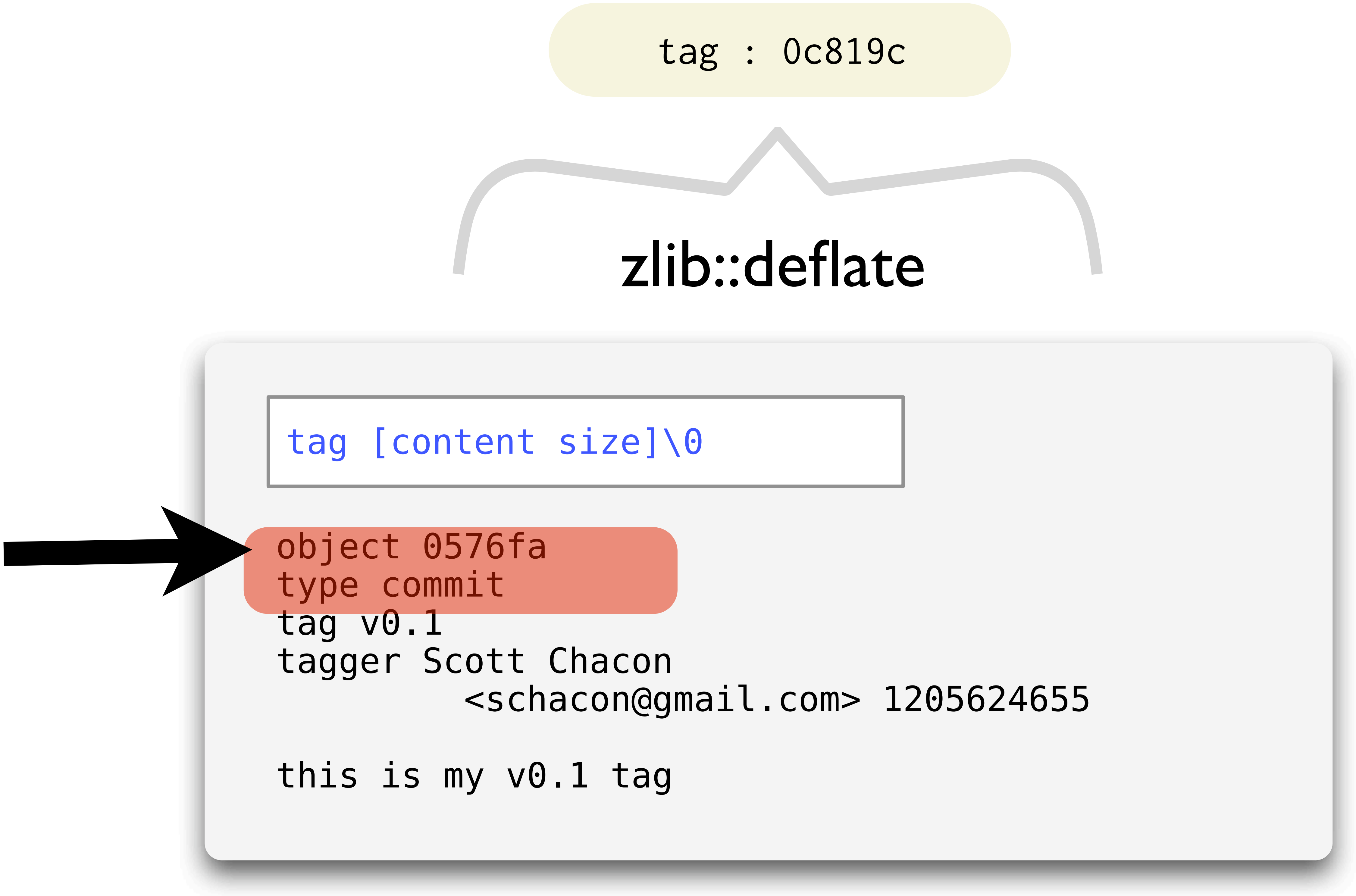
zlib::deflate

```
tag [content size]\0

object 0576fa
type commit
tag v0.1
tagger Scott Chacon
        <schacon@gmail.com> 1205624655

this is my v0.1 tag
```

object database



tag : 0c819c

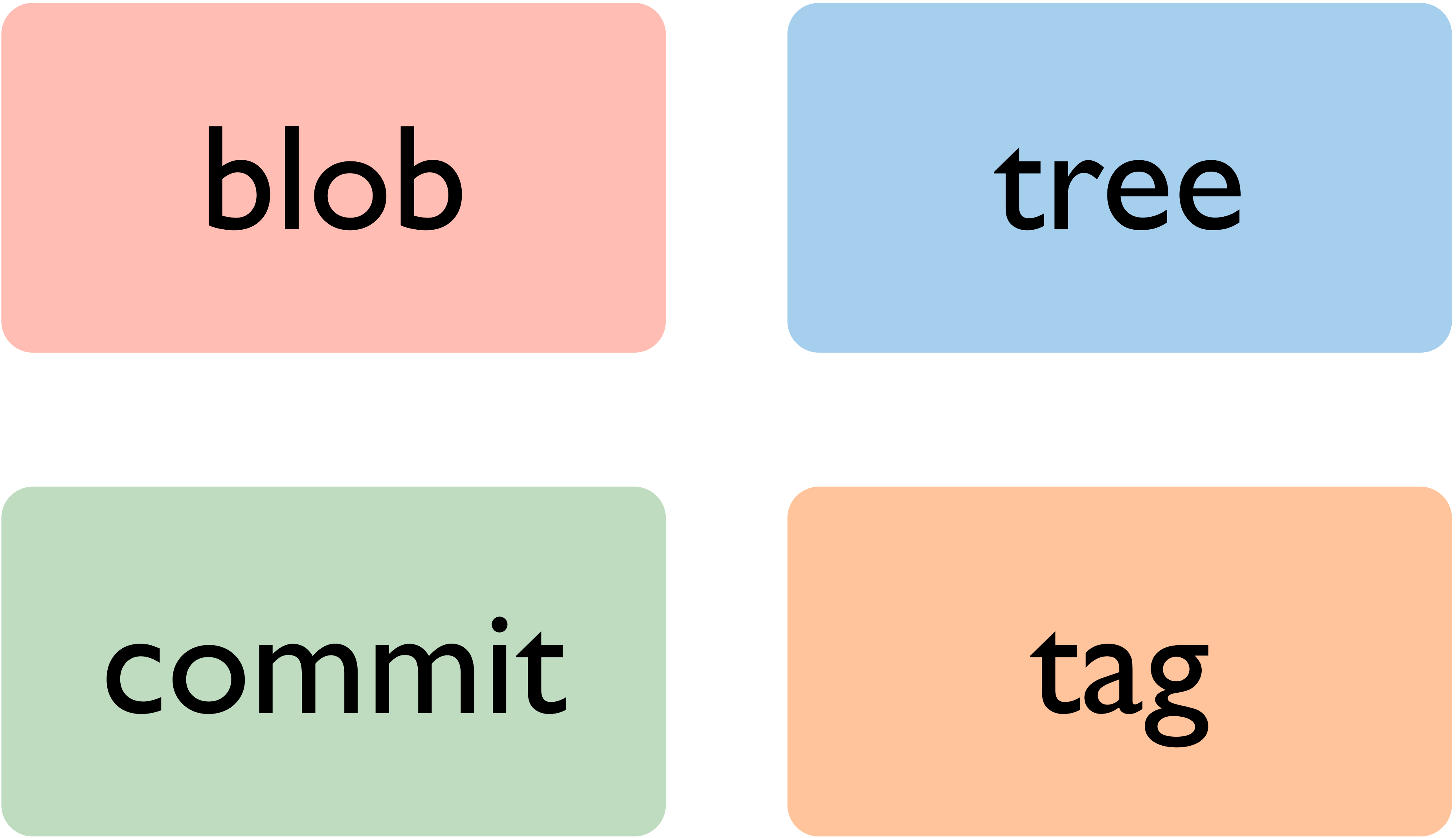
zlib::deflate

```
tag [content size]\0

object 0576fa
type commit
tag v0.1
tagger Scott Chacon
         <schacon@gmail.com> 1205624655

this is my v0.1 tag
```

object database



blob

tree

commit

tag

object database

blob

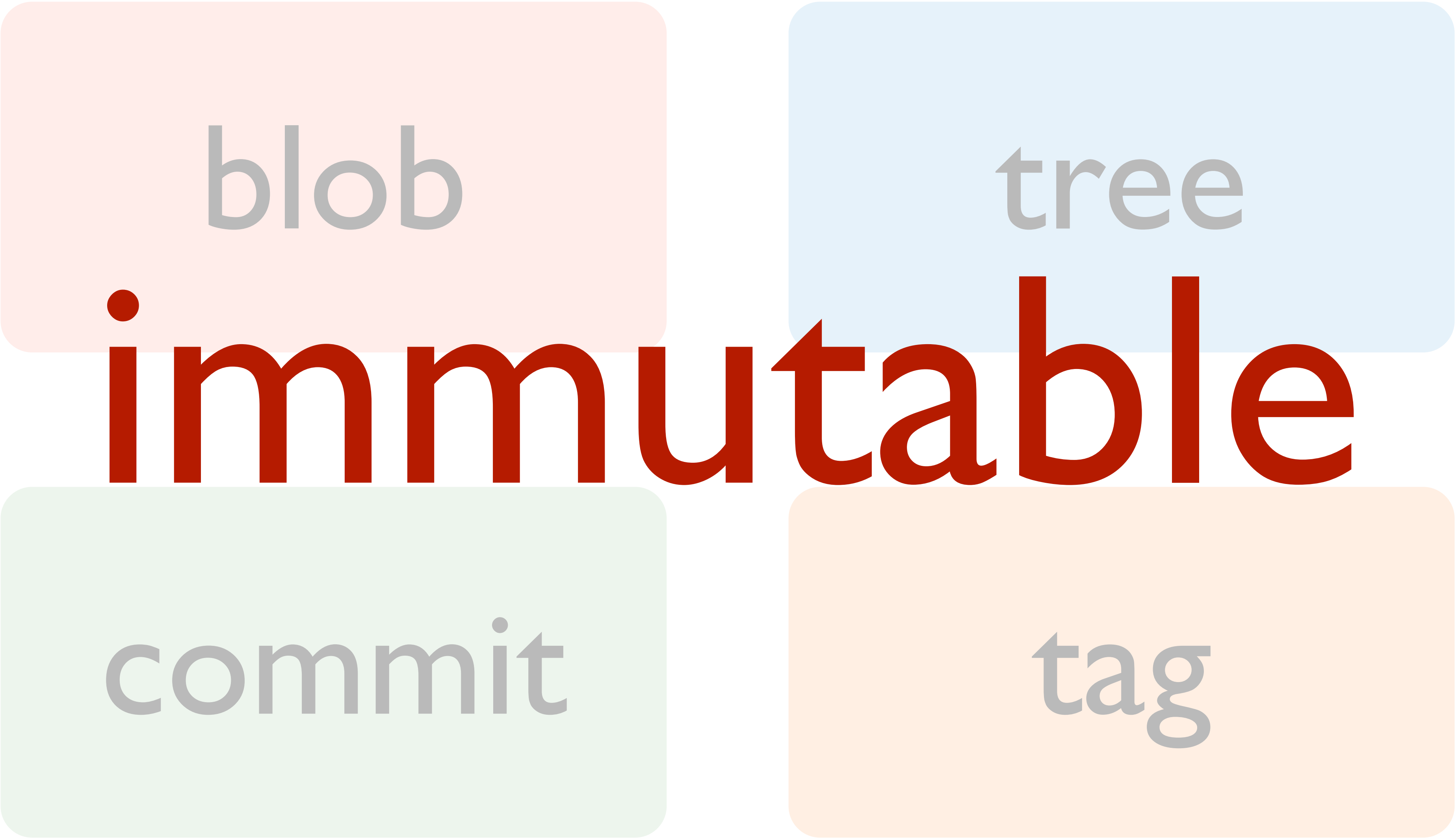
tree

immutable

commit

tag

object database



blob

tree

immutable

commit

tag

can’t be muted

Git Directory

config file

hooks

index

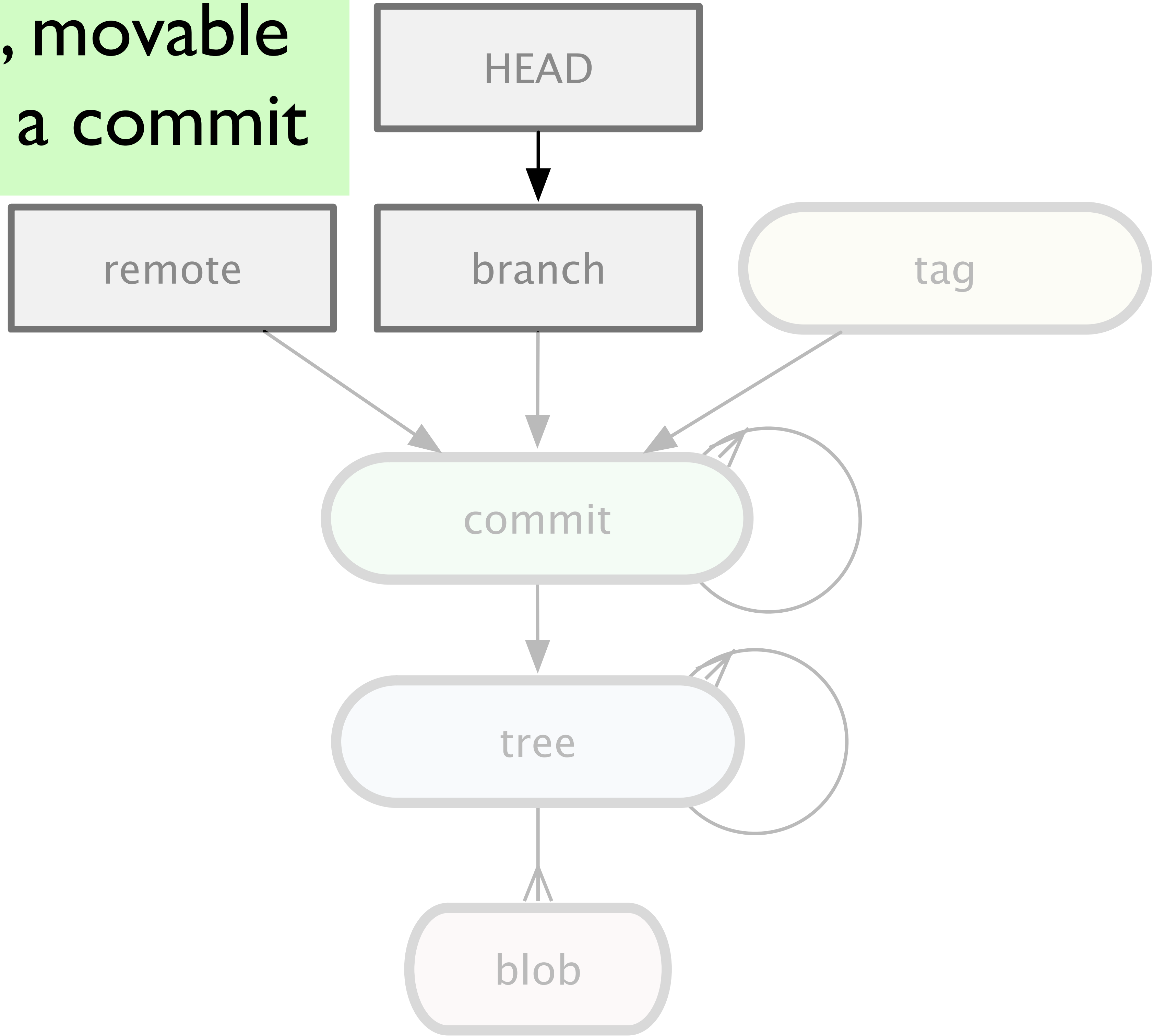
object database

references

references

references

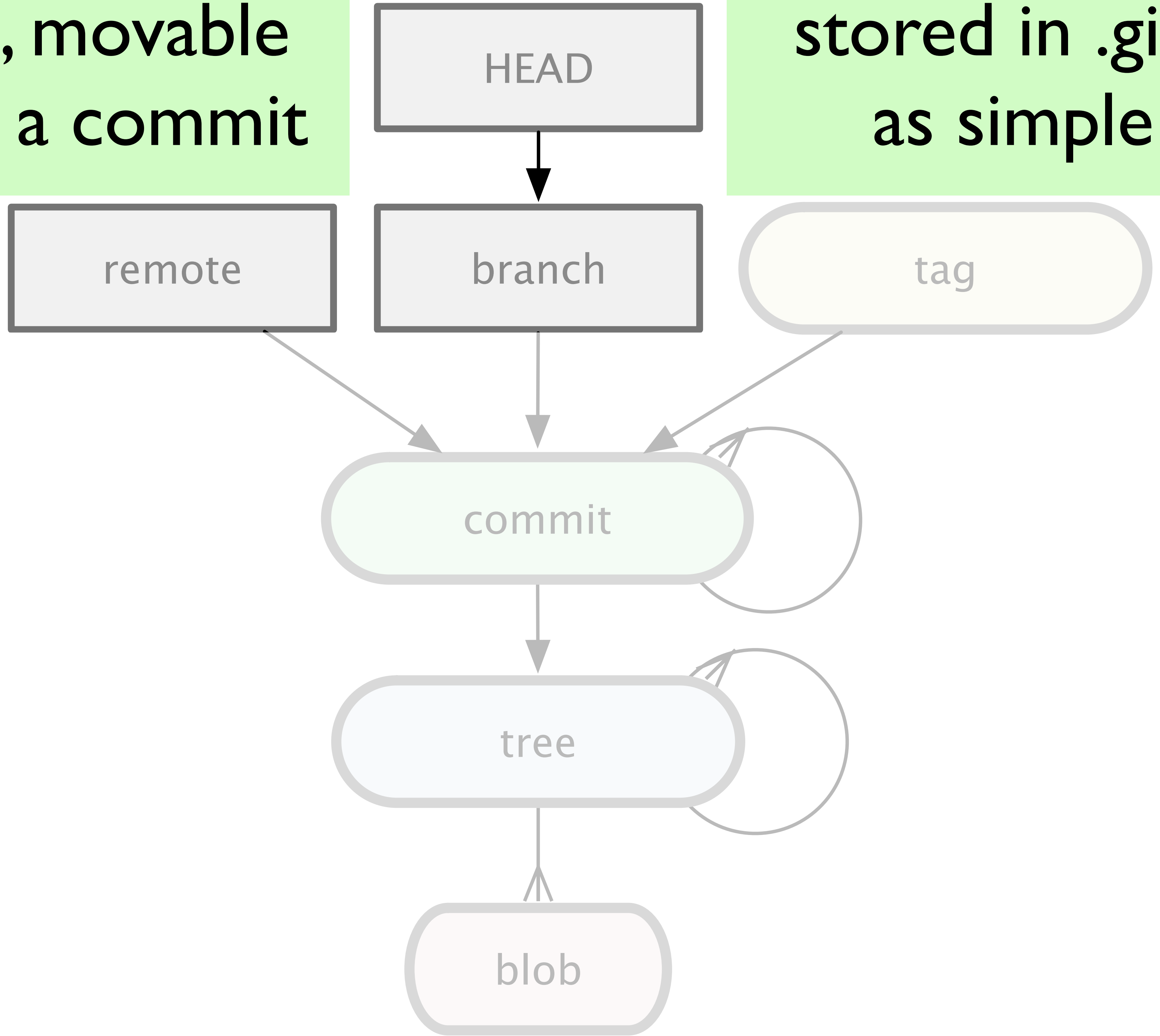
lightweight, movable pointers to a commit



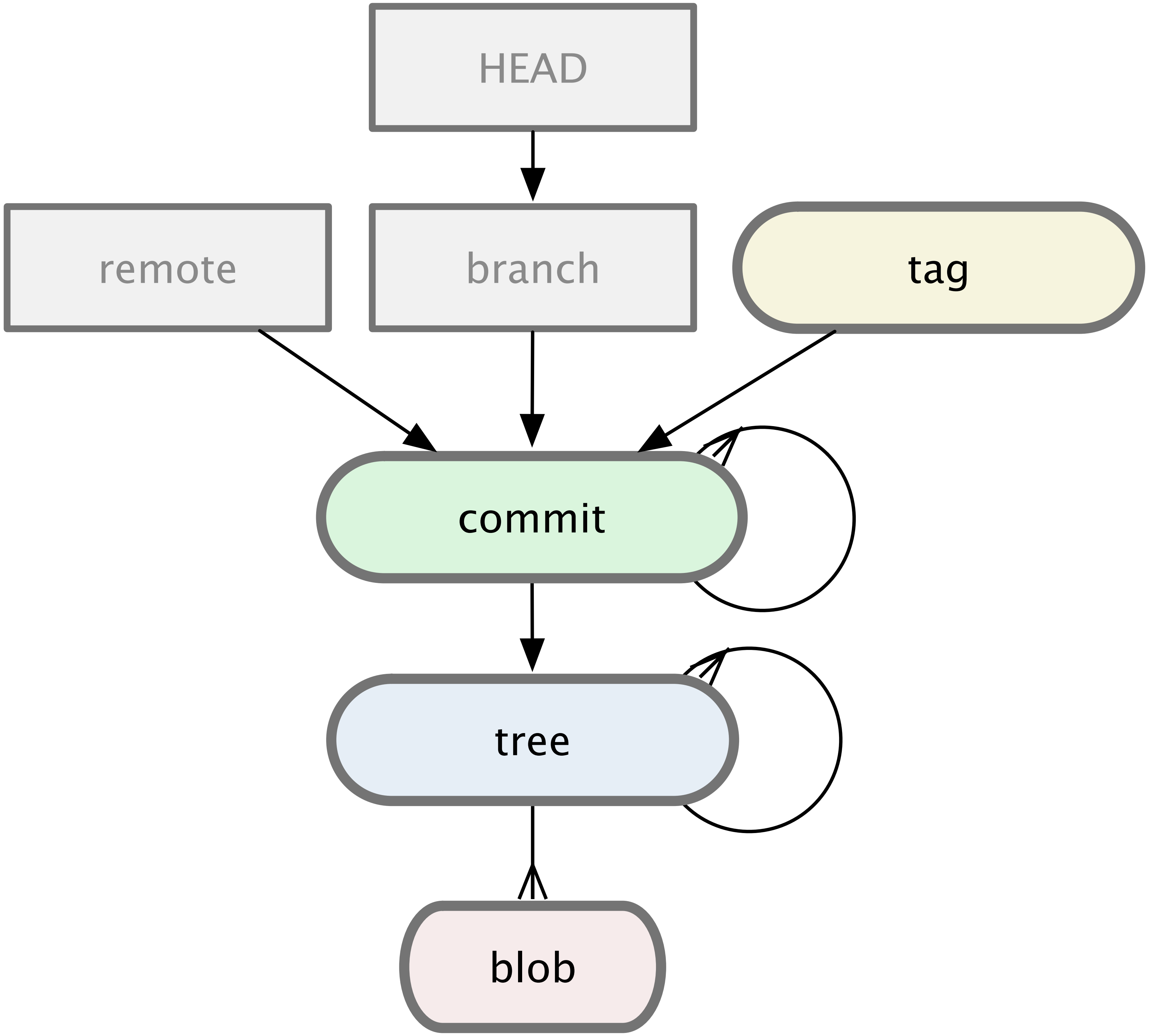
references

lightweight, movable pointers to a commit

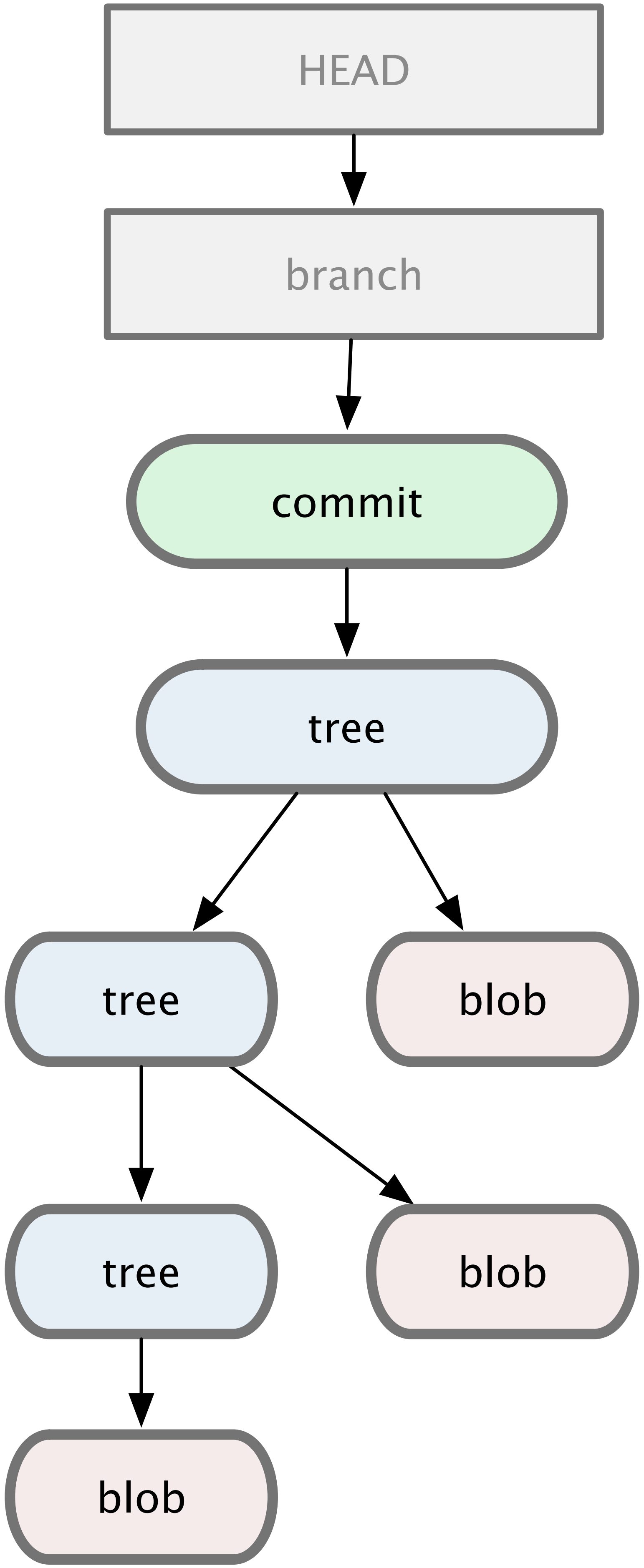
stored in .git/refs/* as simple files

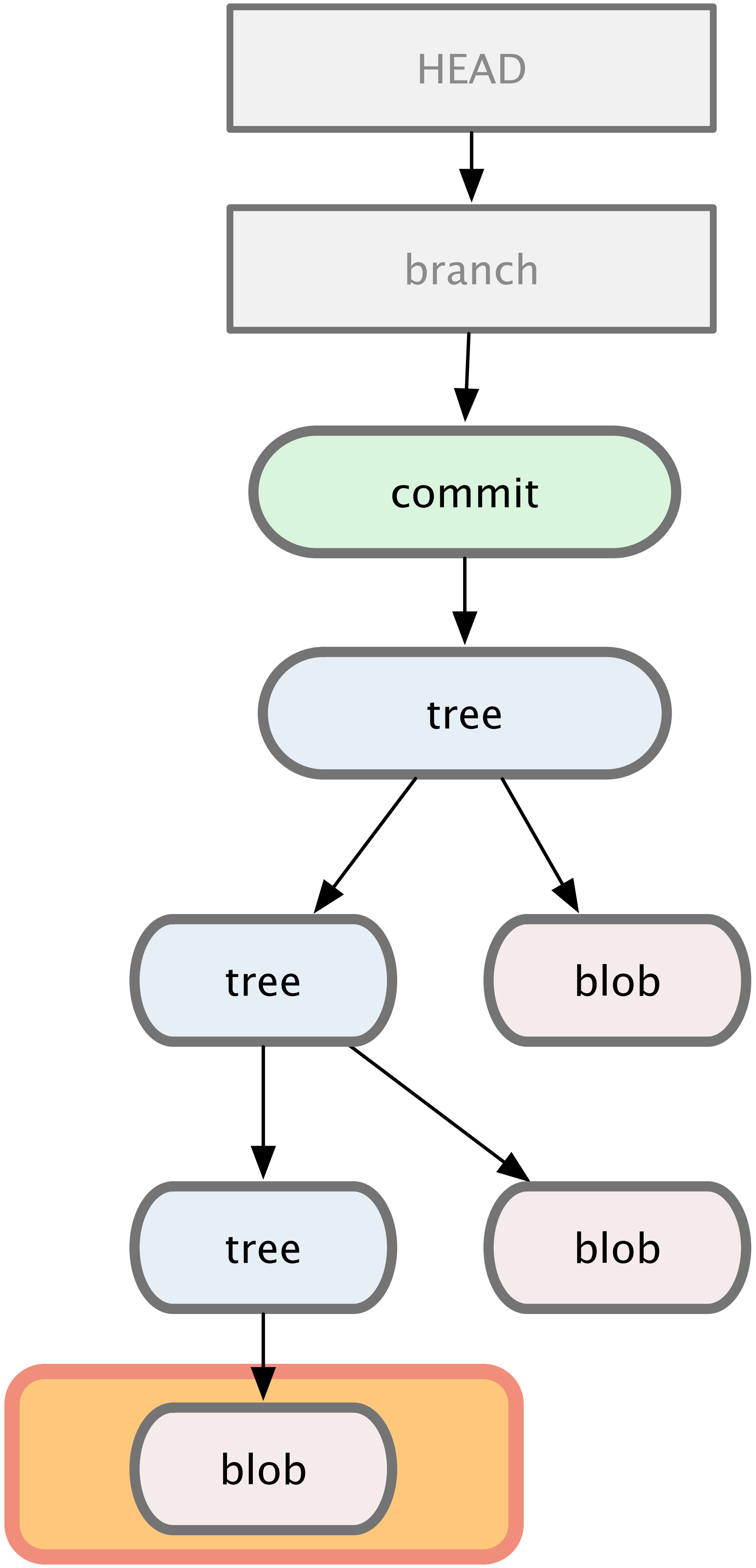


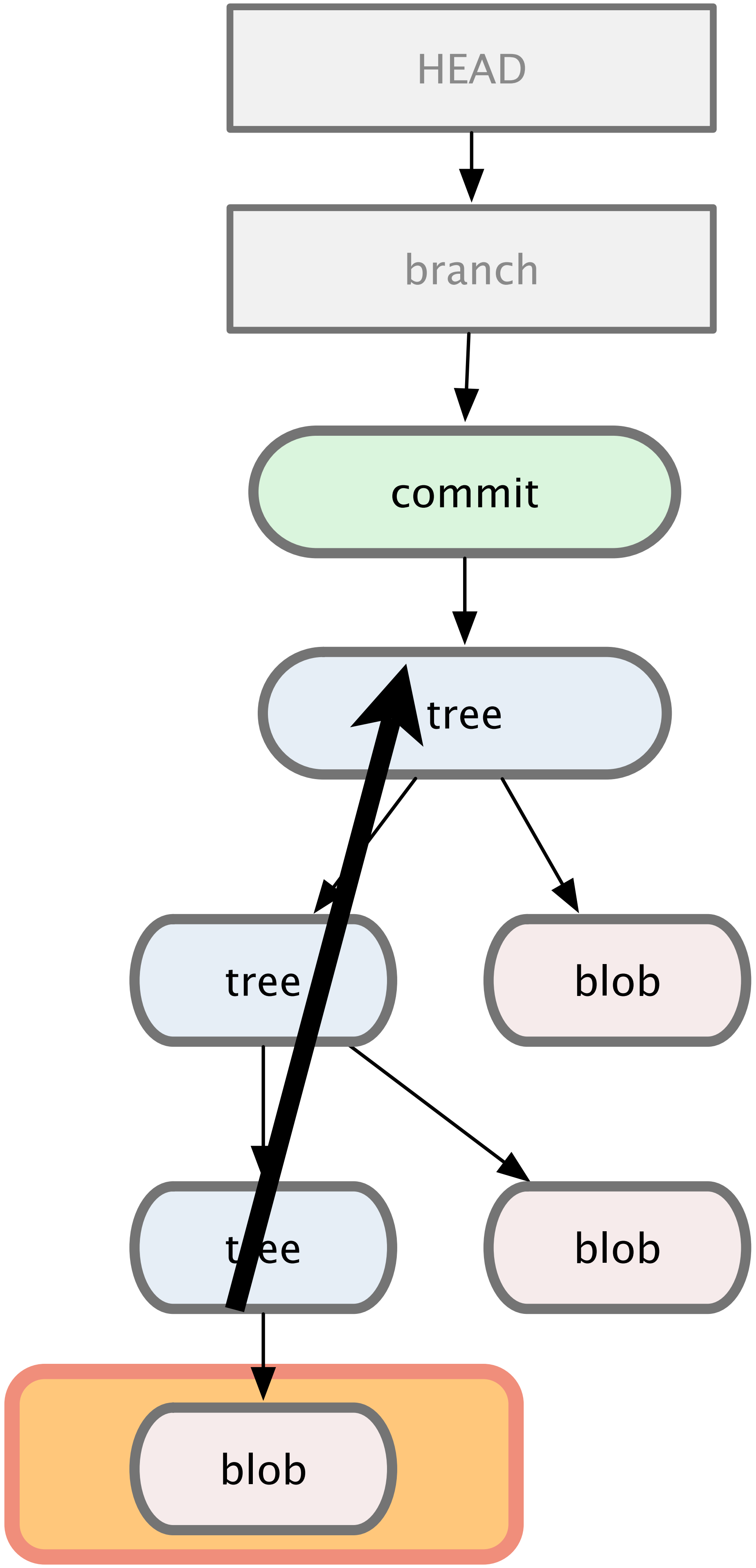
references

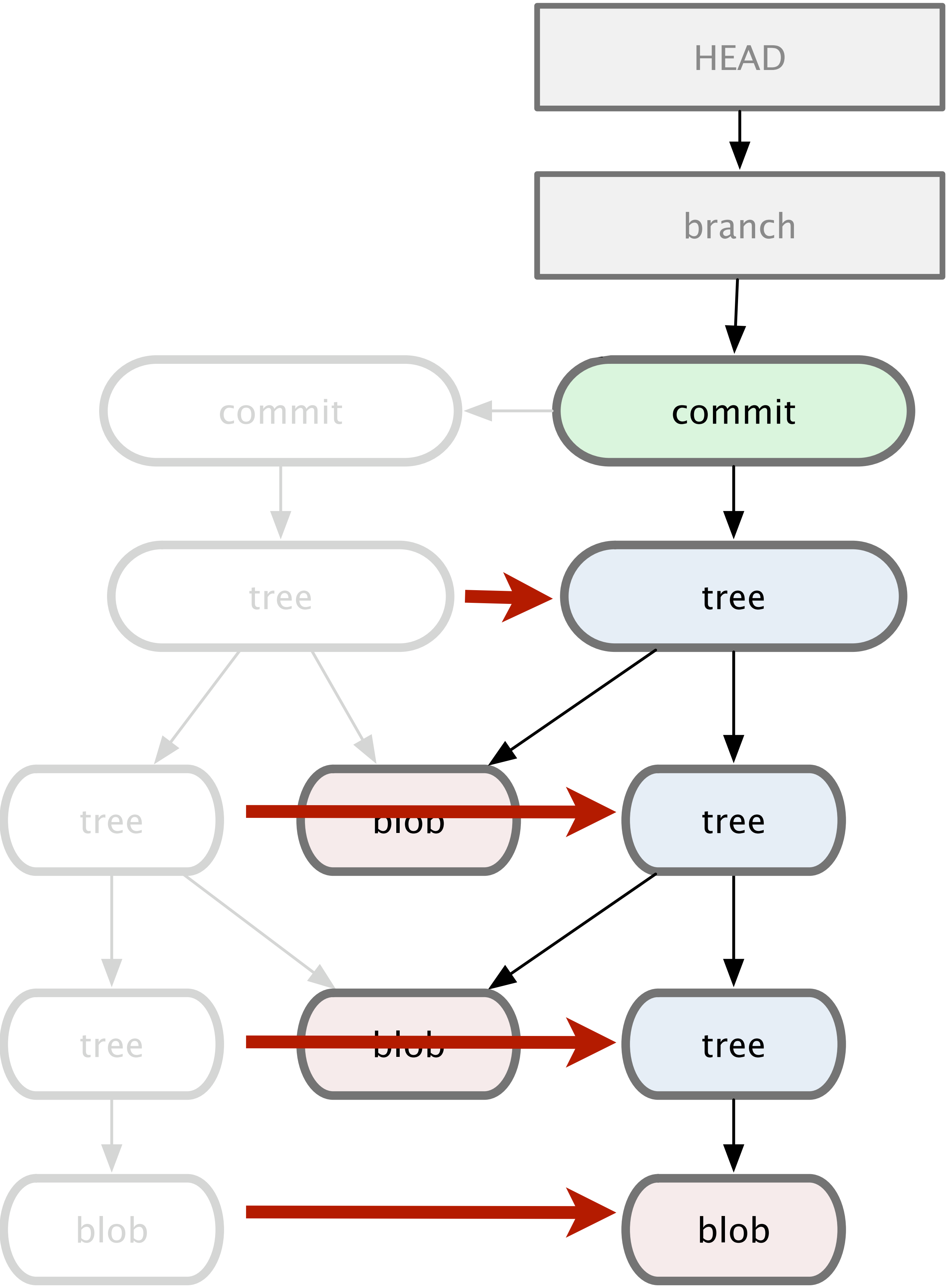


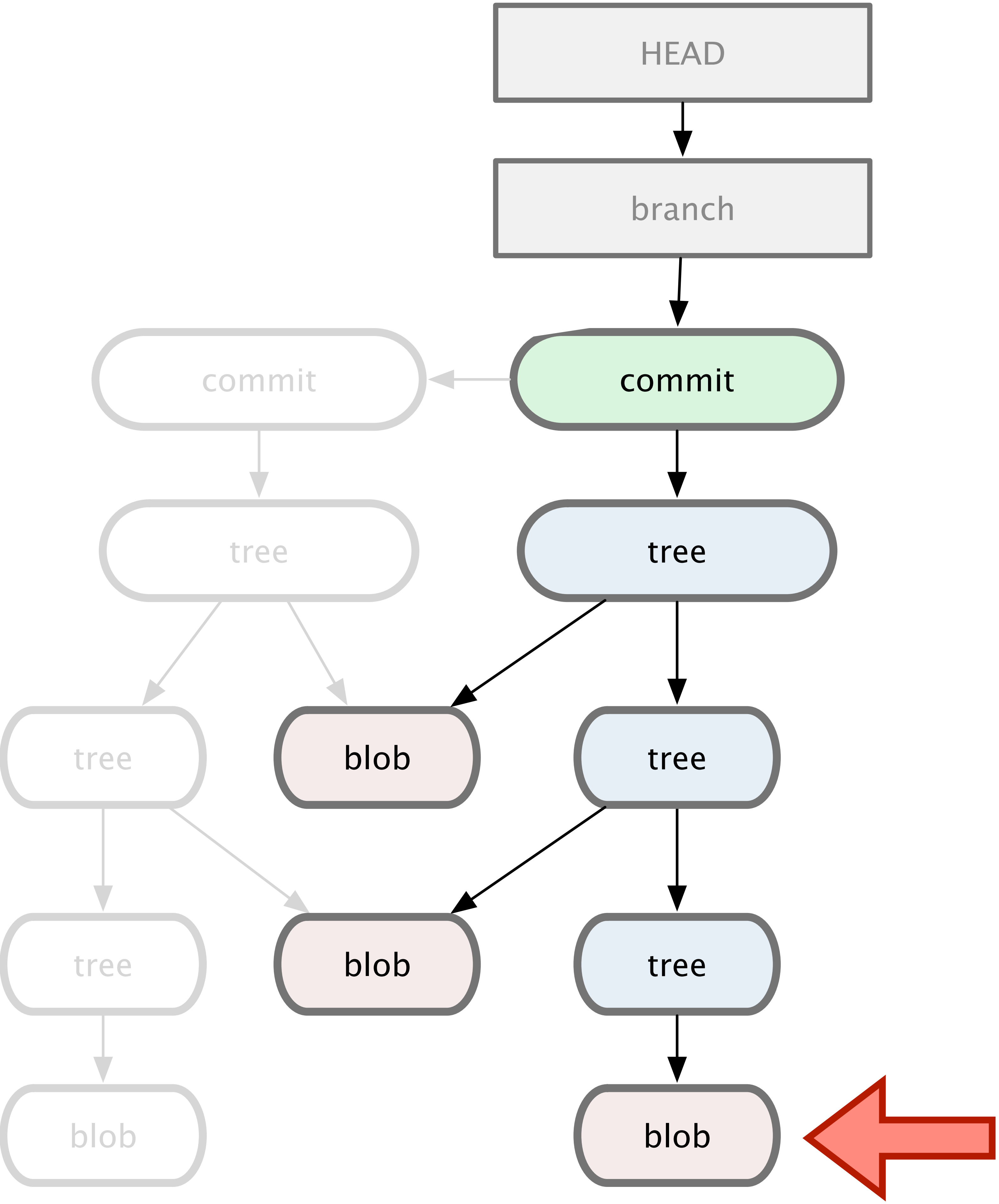
the object model


HEAD
branch
commit
tree
tree
blob
tree
blob
blob


HEAD
branch
commit
tree
tree
blob
tree
blob
blob


HEAD
branch
commit
tree
tree
blob
tree
blob
blob


HEAD
branch
commit
commit
tree
tree
tree
blob
tree
tree
blob
tree
blob
blob


HEAD
branch
commit
commit
tree
tree
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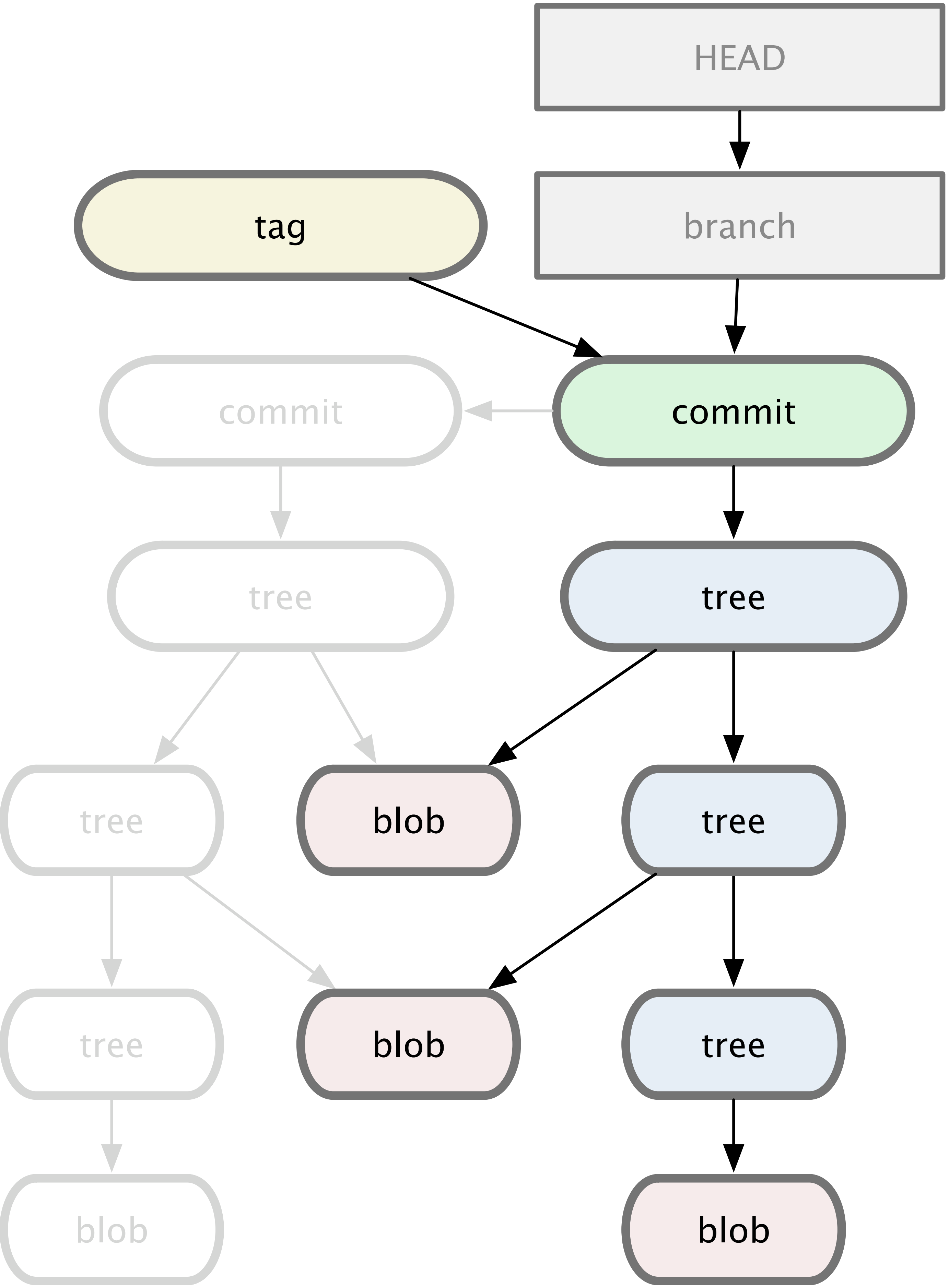
HEAD
tag
branch
commit
commit
tree
tree
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blob
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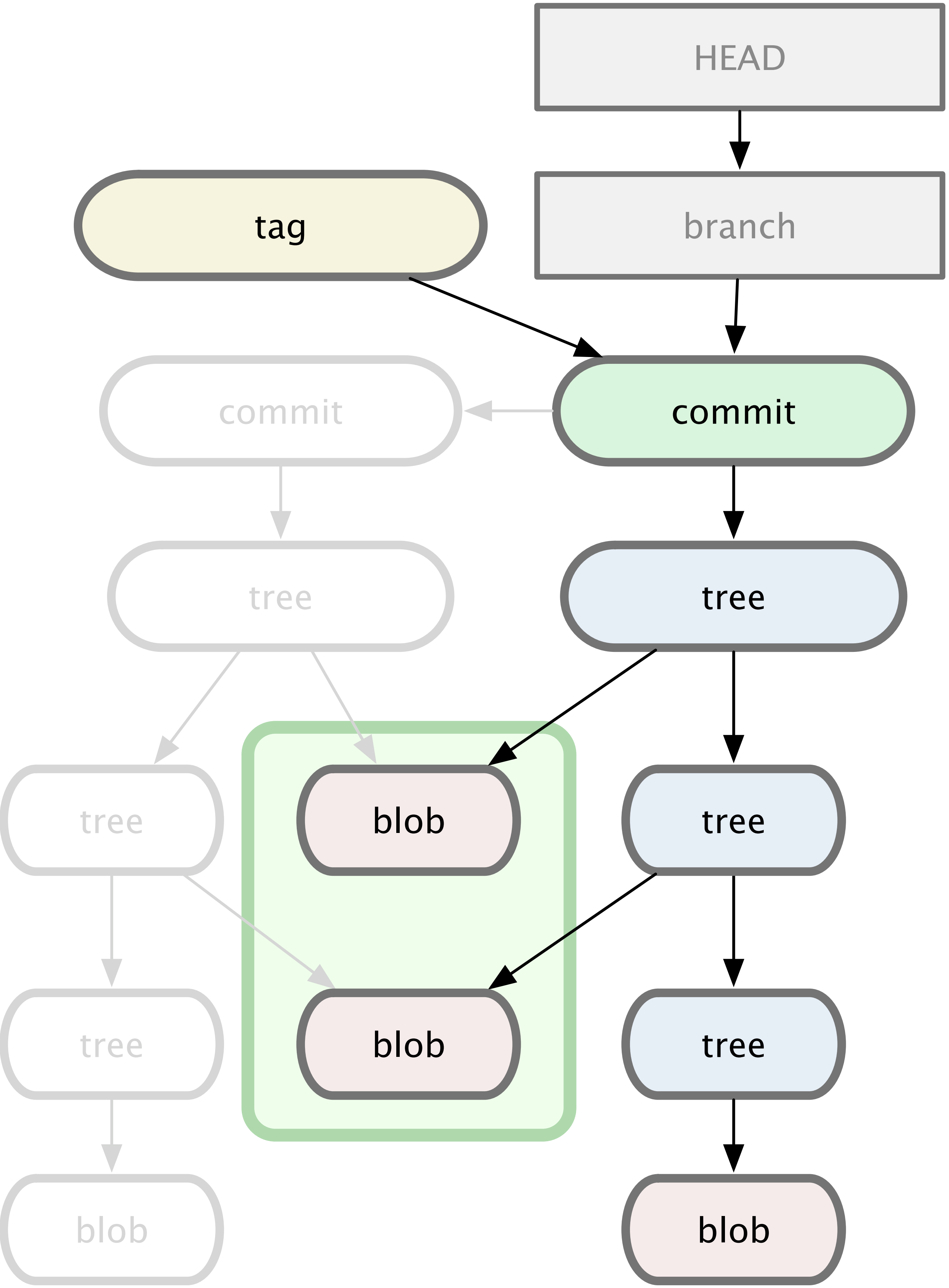
blob


HEAD
tag
branch
commit
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tree
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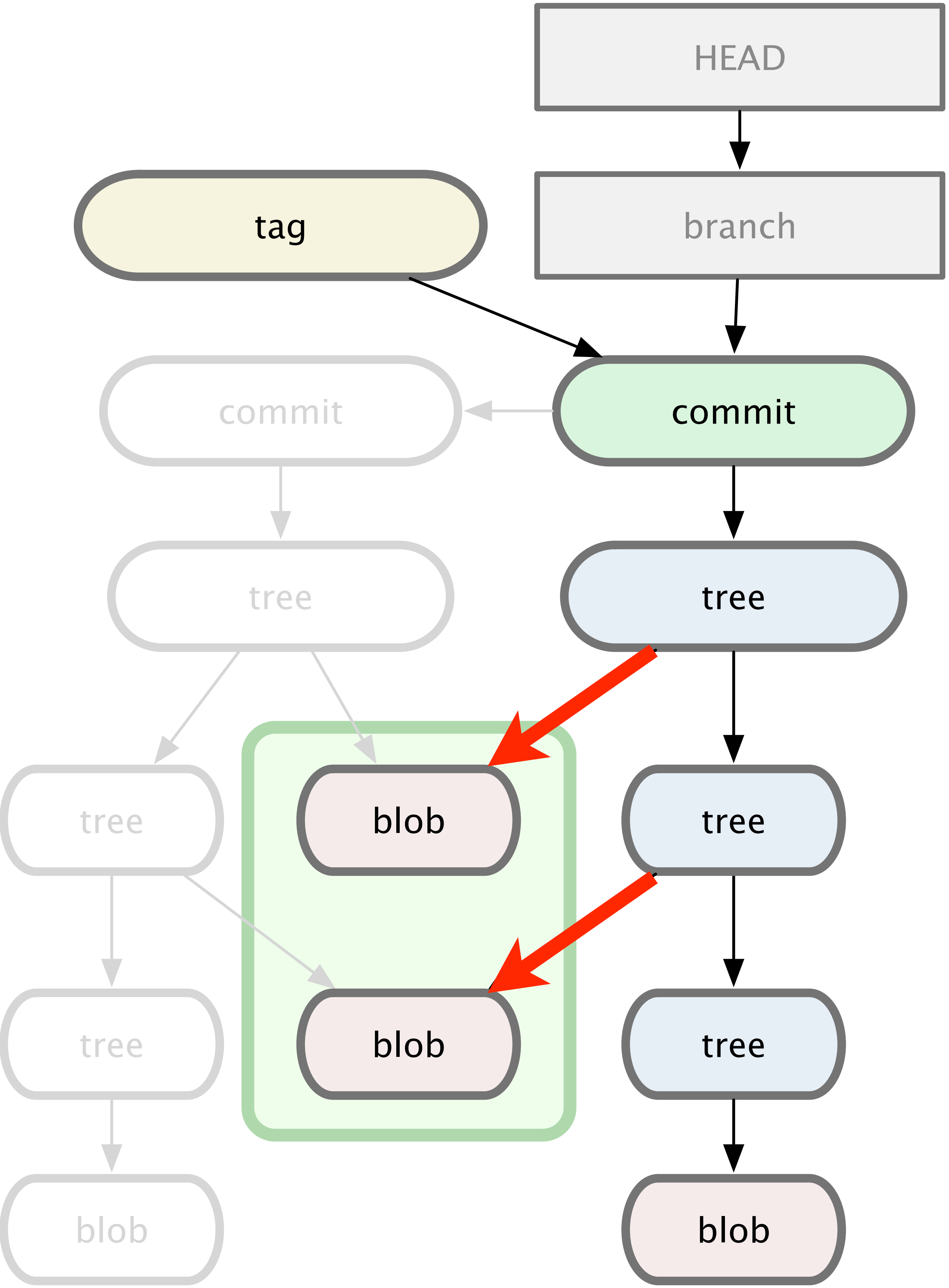
HEAD
tag
branch
commit
commit
tree
tree
tree
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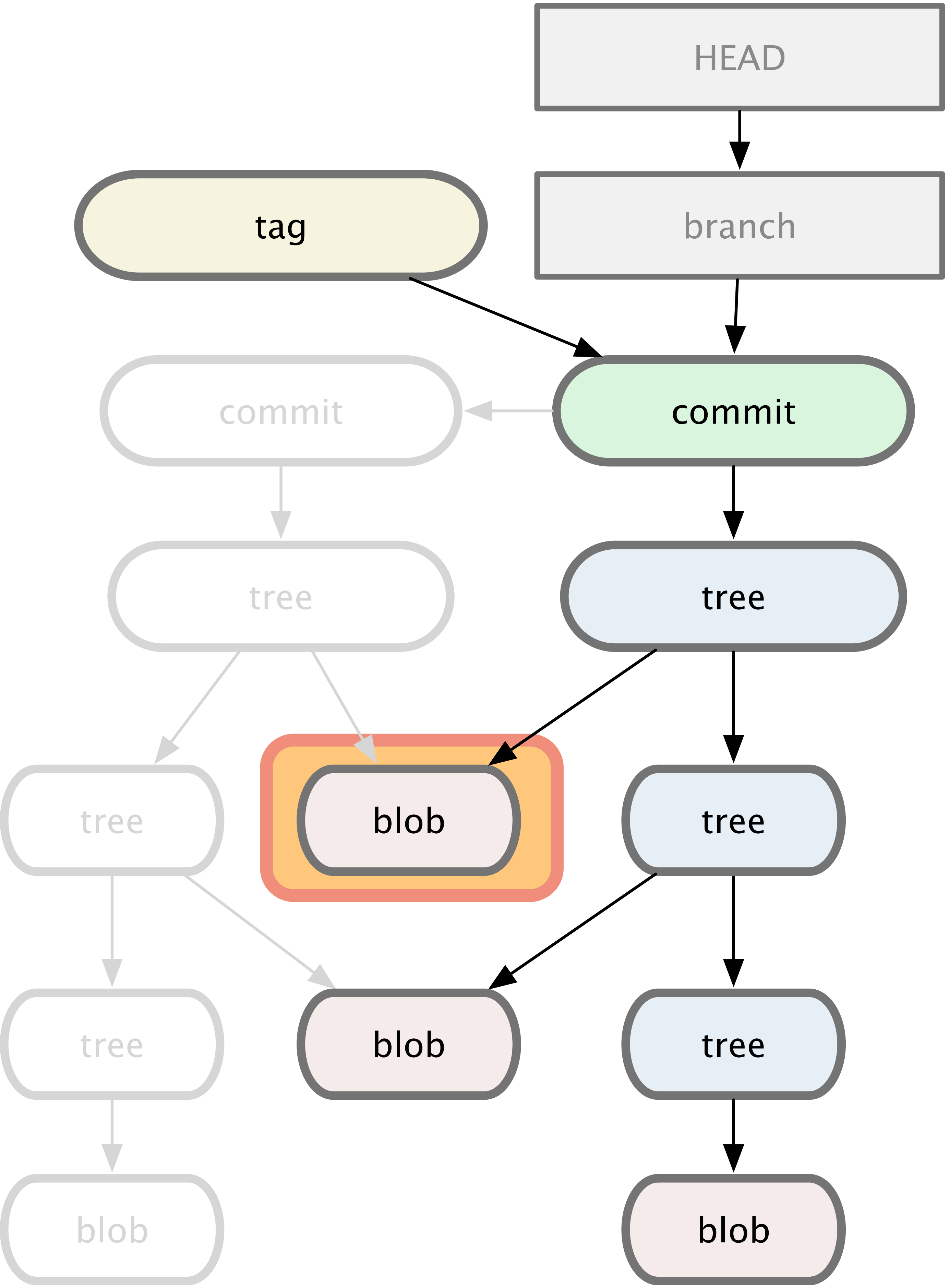
blob


HEAD
tag
branch
commit
commit
tree
tree
tree
blob
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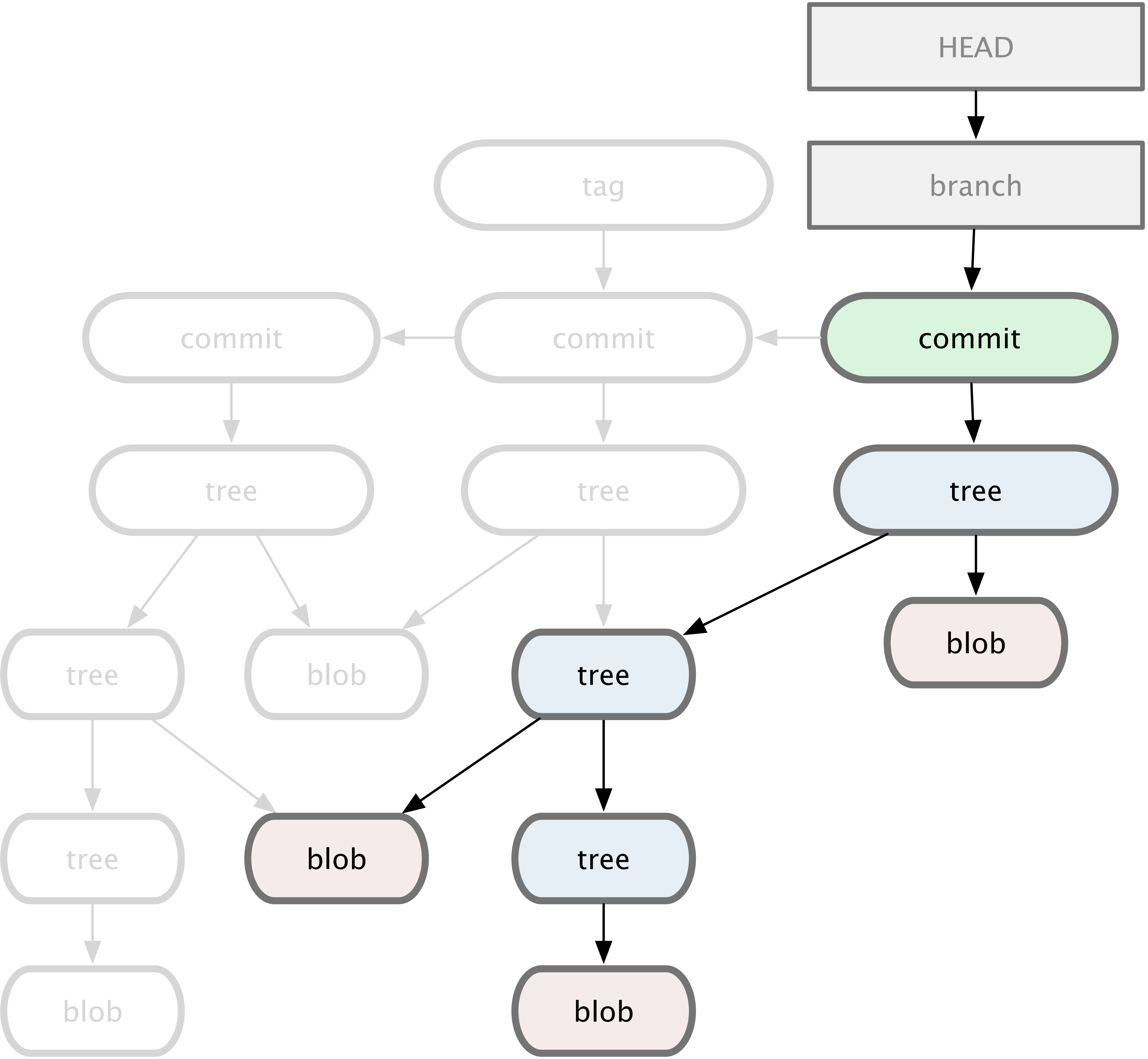
blob


HEAD
branch
tag
commit
commit
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tree
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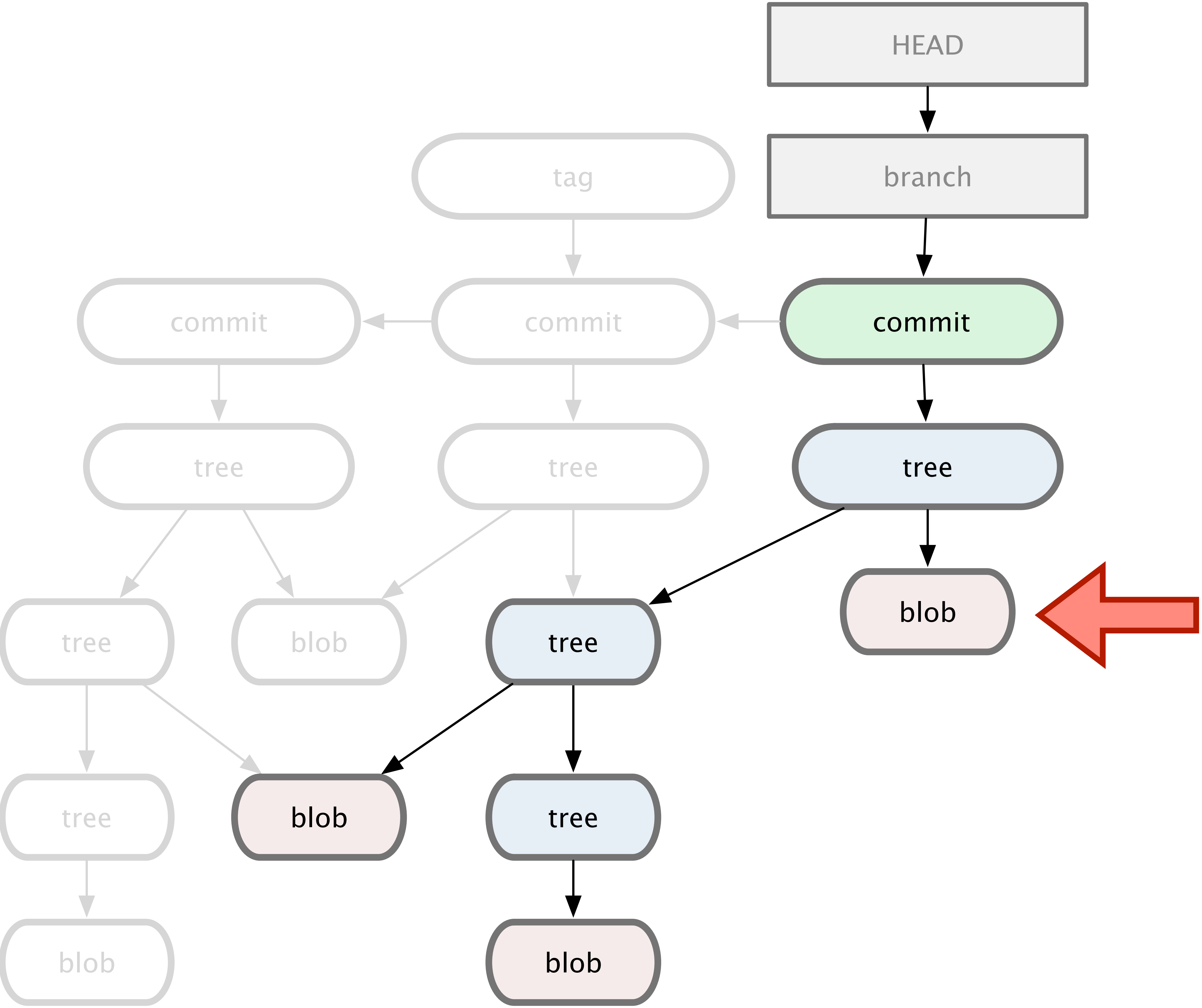
blob


HEAD
branch
tag
commit
commit
commit
tree
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blob
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tree
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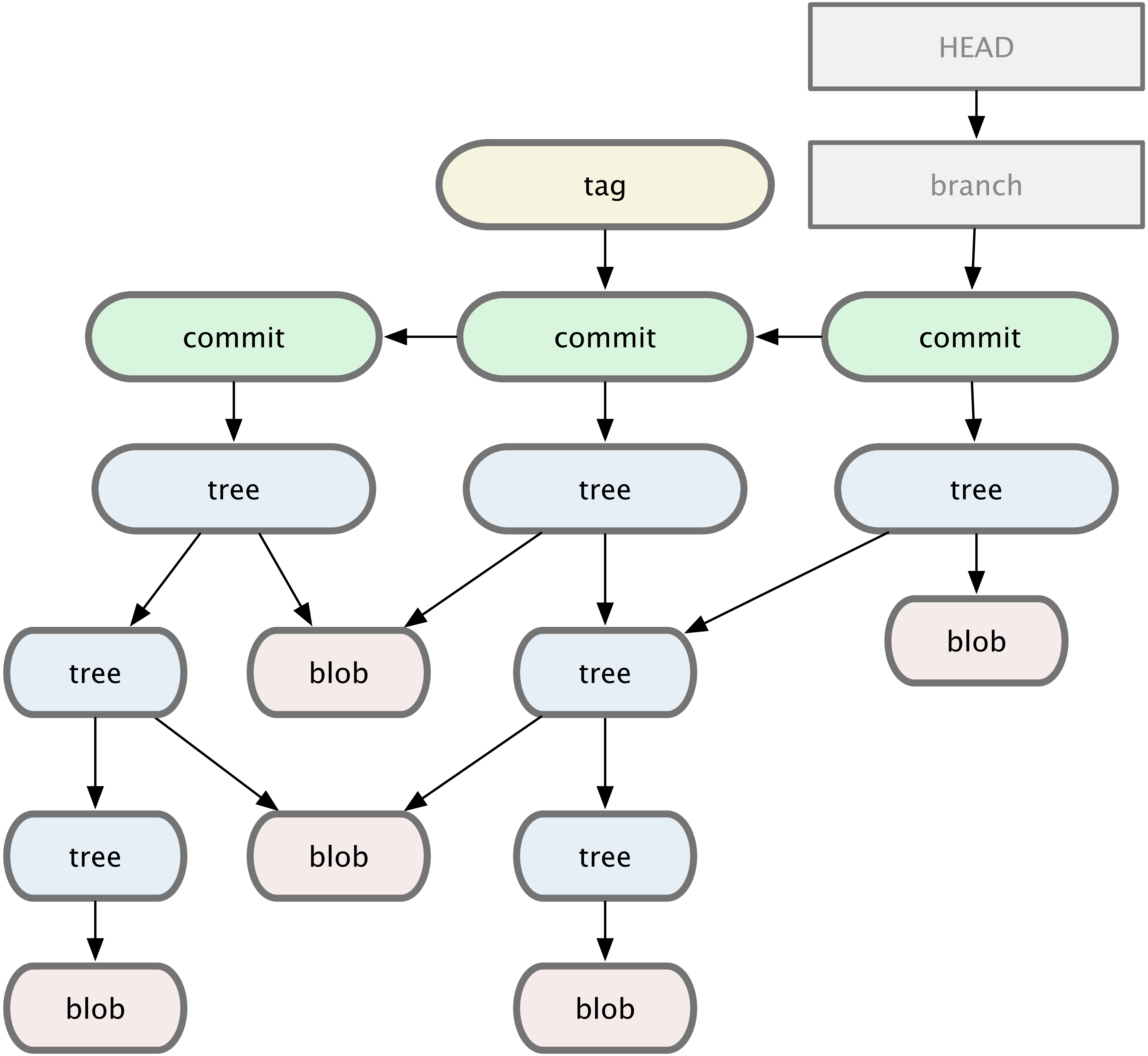
blob
blob


HEAD
branch
tag
commit
commit
commit
tree
tree
tree
tree
blob
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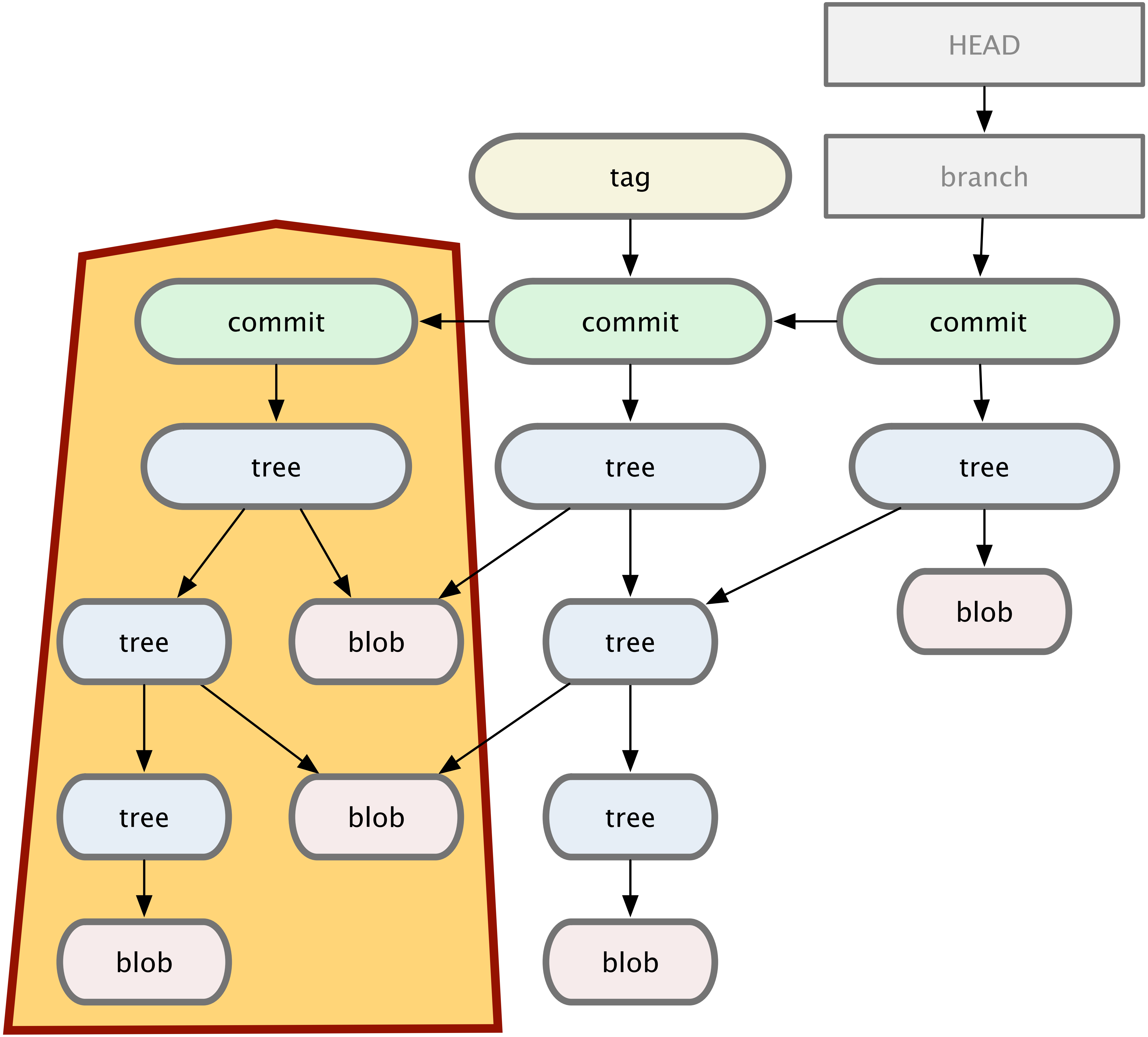
blob
tree
blob
blob


HEAD
tag
branch
commit
commit
commit
tree
tree
tree
tree
blob
tree
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blob
tree
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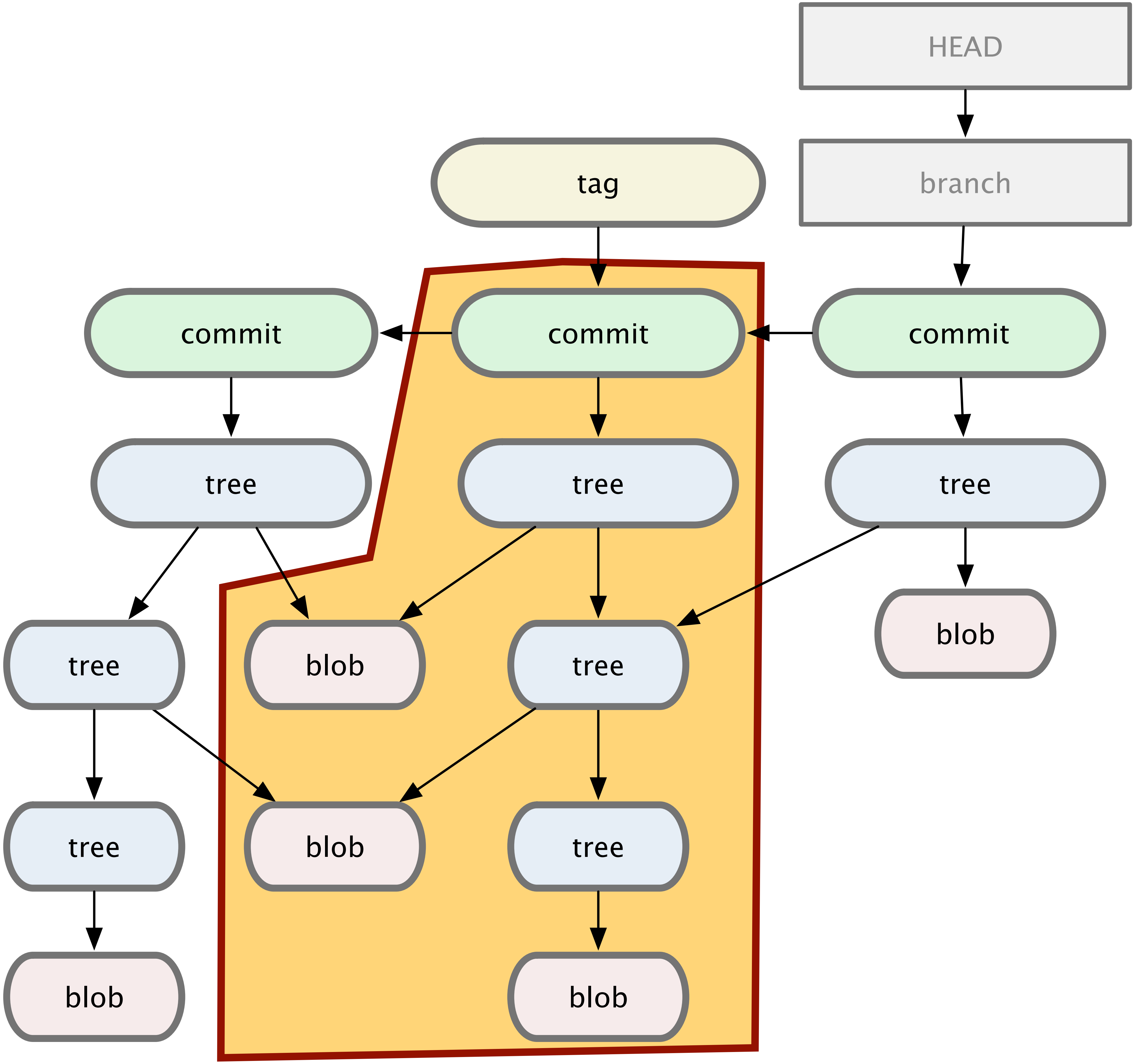
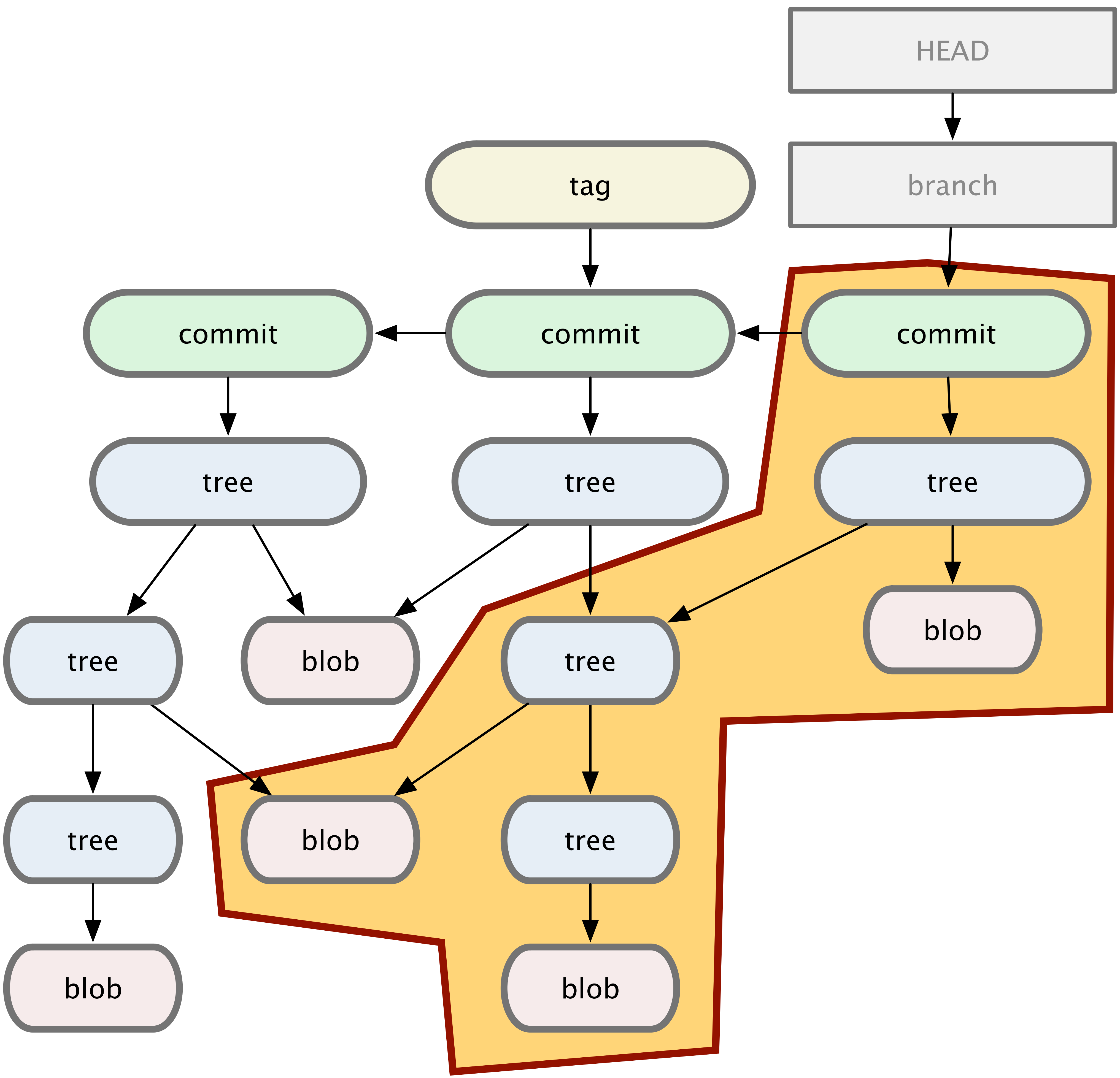
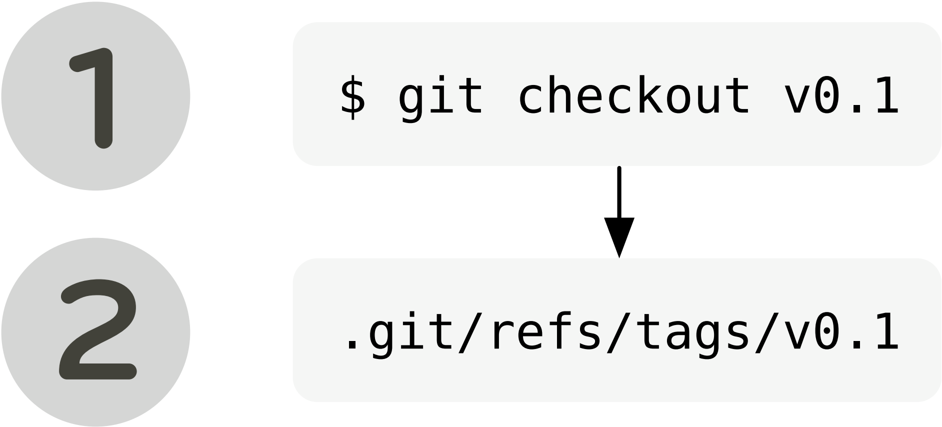
tree
blob
blob


HEAD
branch
tag
commit
commit
commit
tree
tree
tree
tree
blob
tree
blob
tree
blob
tree
blob
blob


HEAD
branch
tag
commit
commit
commit
tree
tree
tree
tree
blob
tree
blob
tree
blob
tree
blob
blob

1

```
$ git checkout v0.1
```

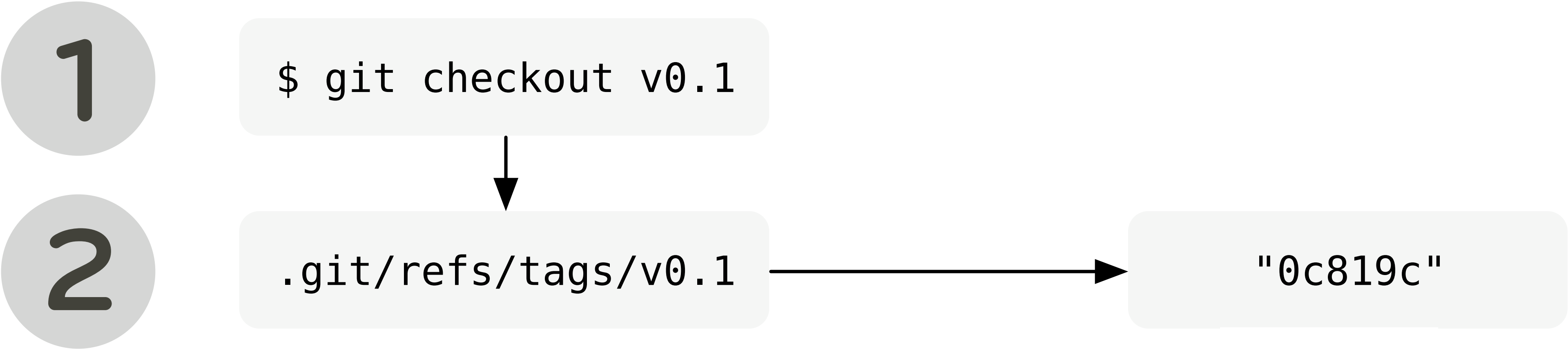


1

```
$ git checkout v0.1
```

2

```
.git/refs/tags/v0.1
```



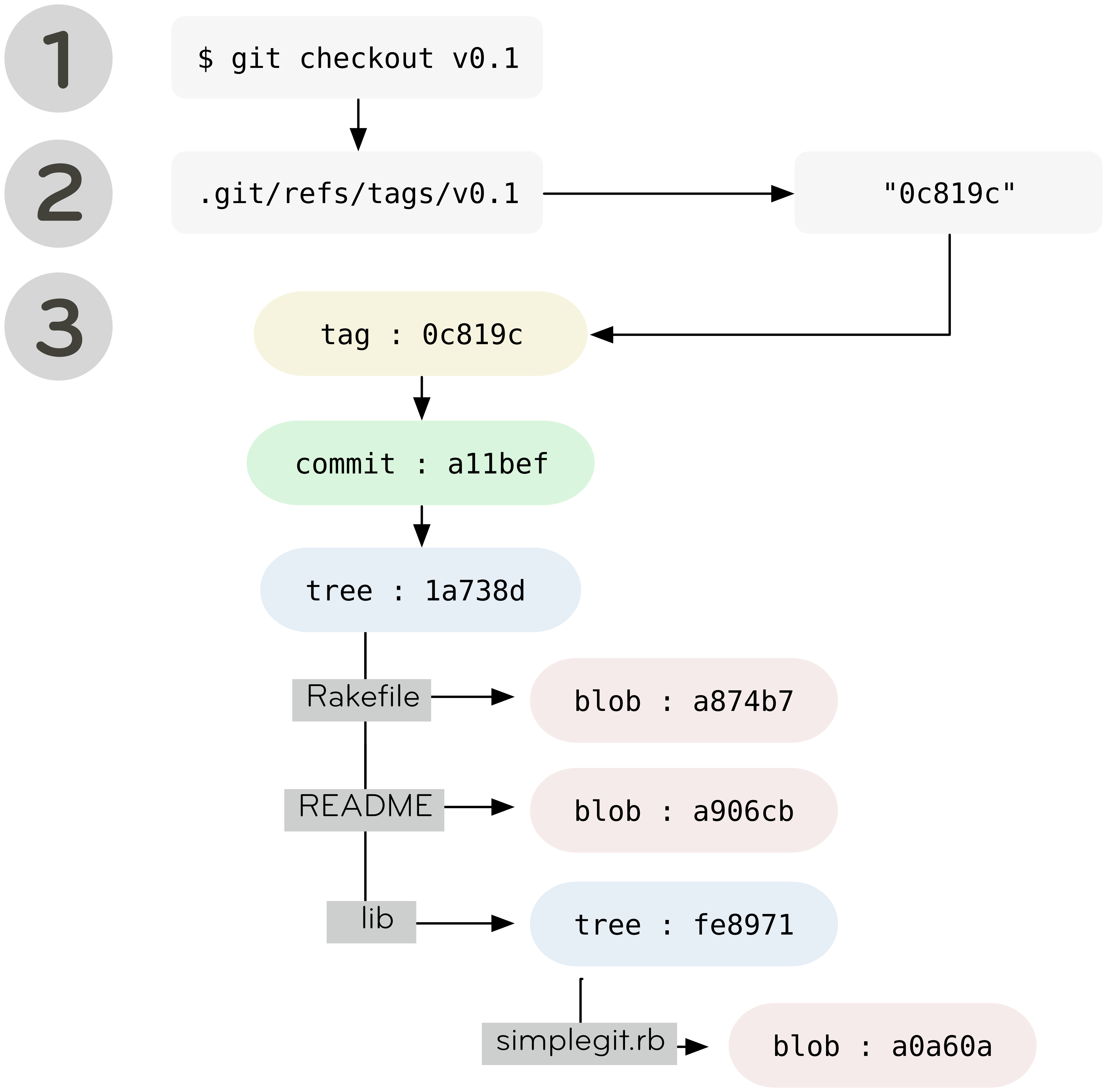
1

```
$ git checkout v0.1
```

2

.git/refs/tags/v0.1

"0c819c"



```
$ git checkout v0.1
```

1

```
$ git checkout v0.1
```

2

.git/refs/tags/v0.1

"0c819c"

3

tag : 0c819c

commit : a11bef

tree : 1a738d

Rakefile

blob : a874b7

README

blob : a906cb

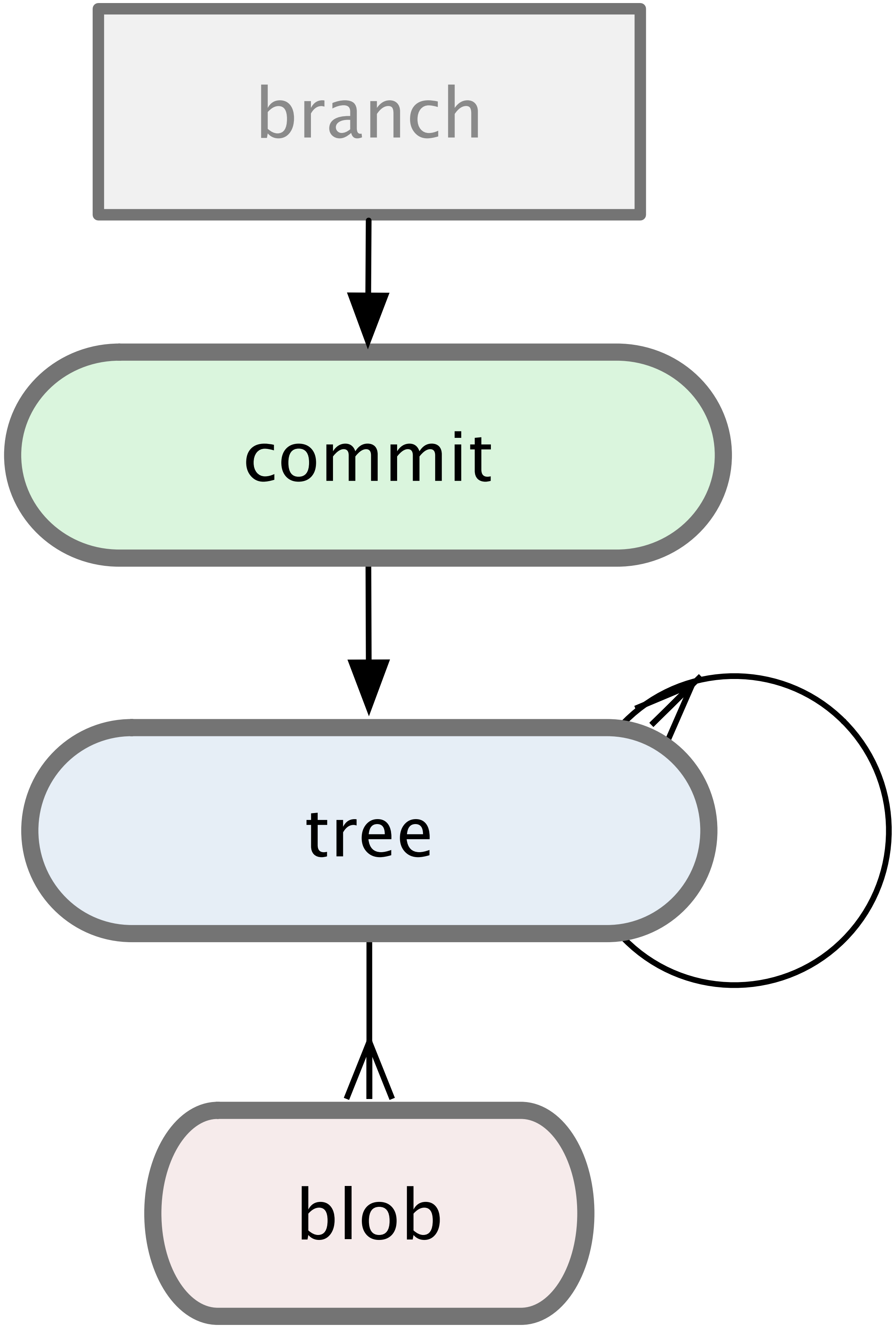
lib

tree : fe8971

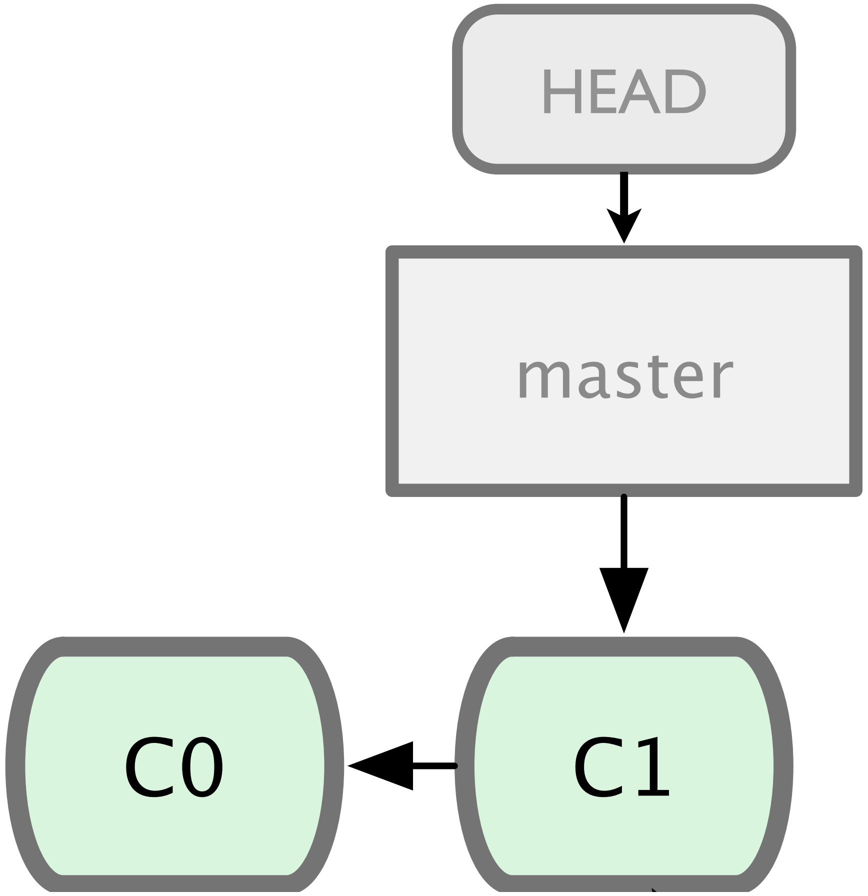
simplegit.rb

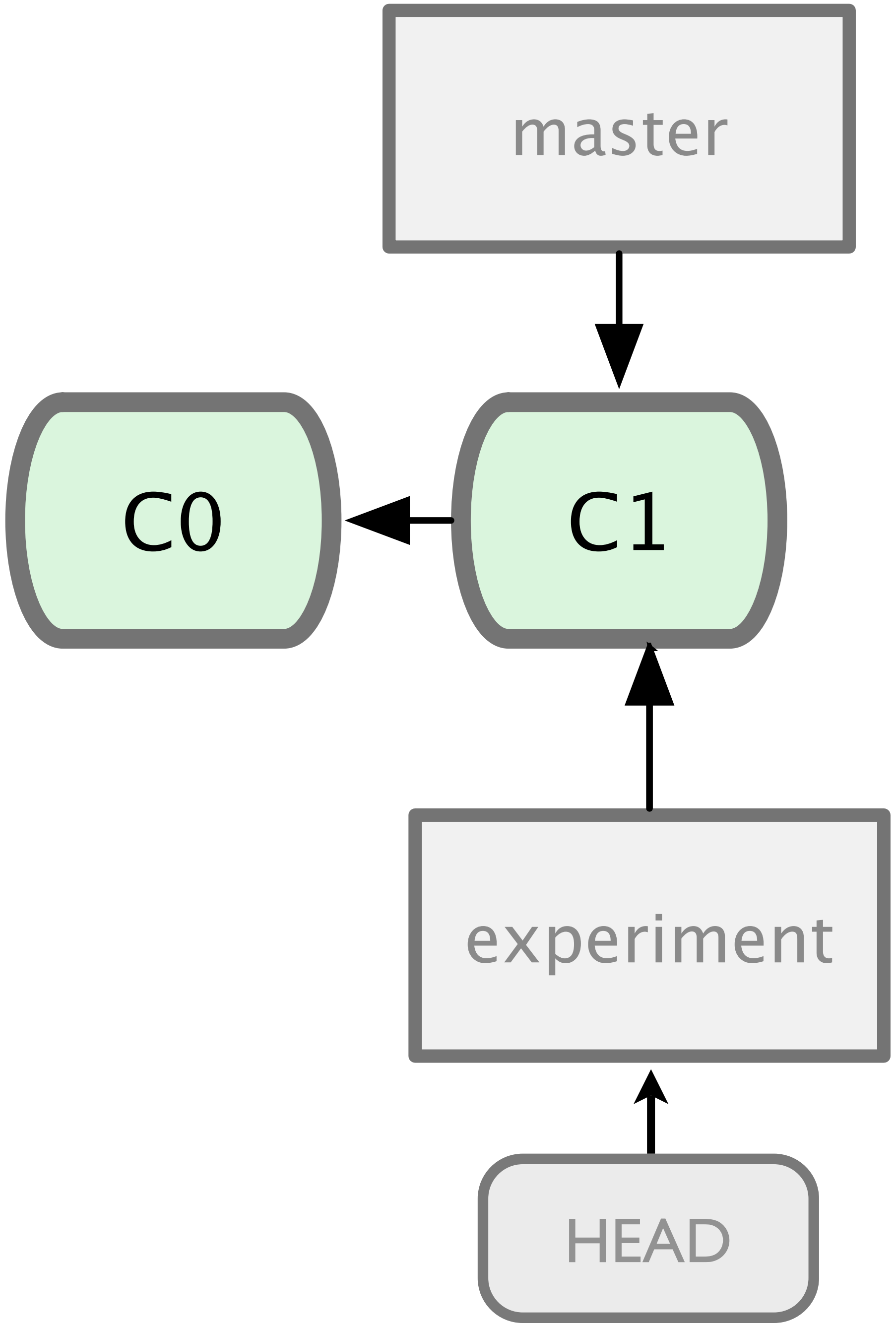
blob : a0a60a

the commit history

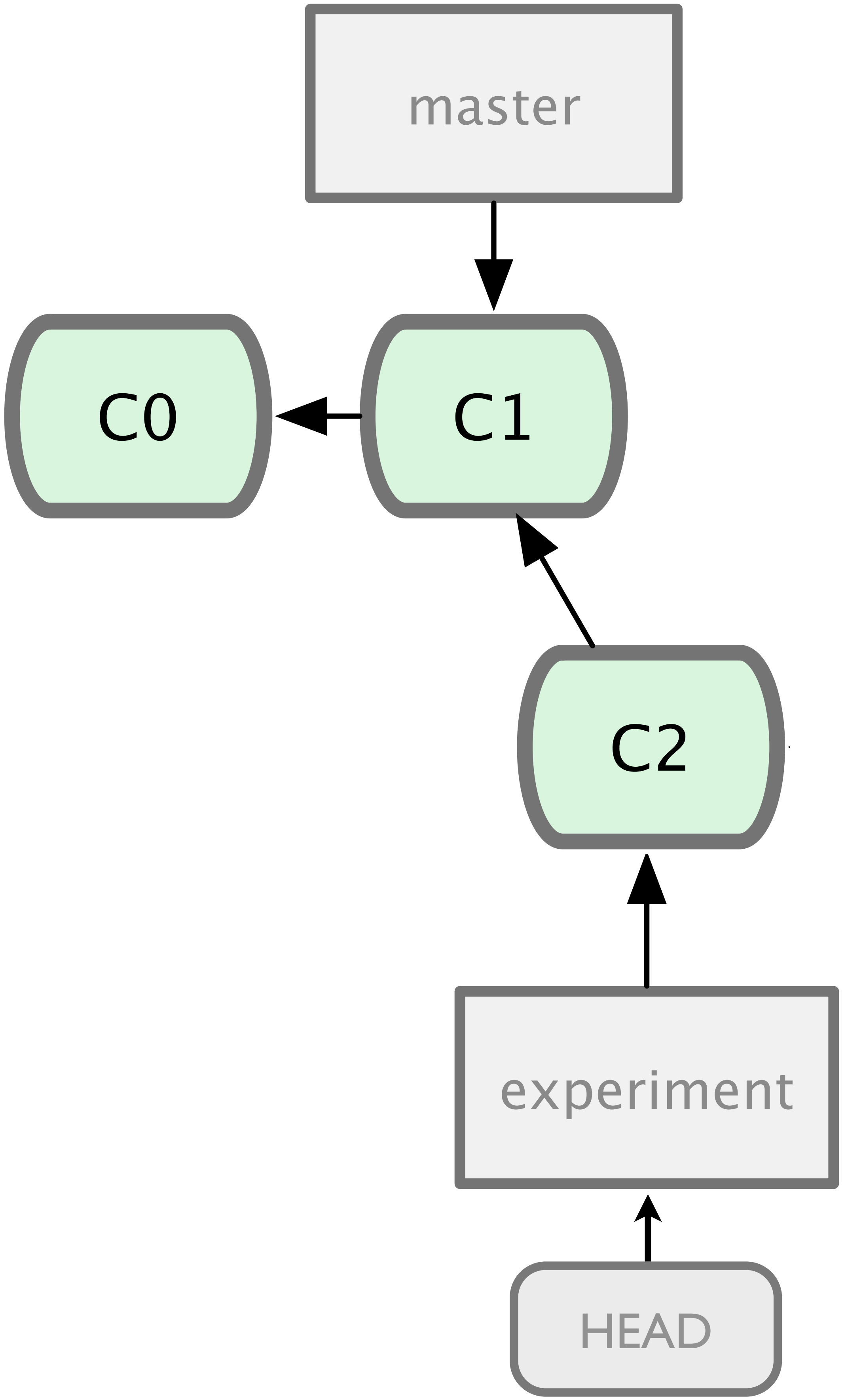

branch
commit
tree
blob

branching and merging

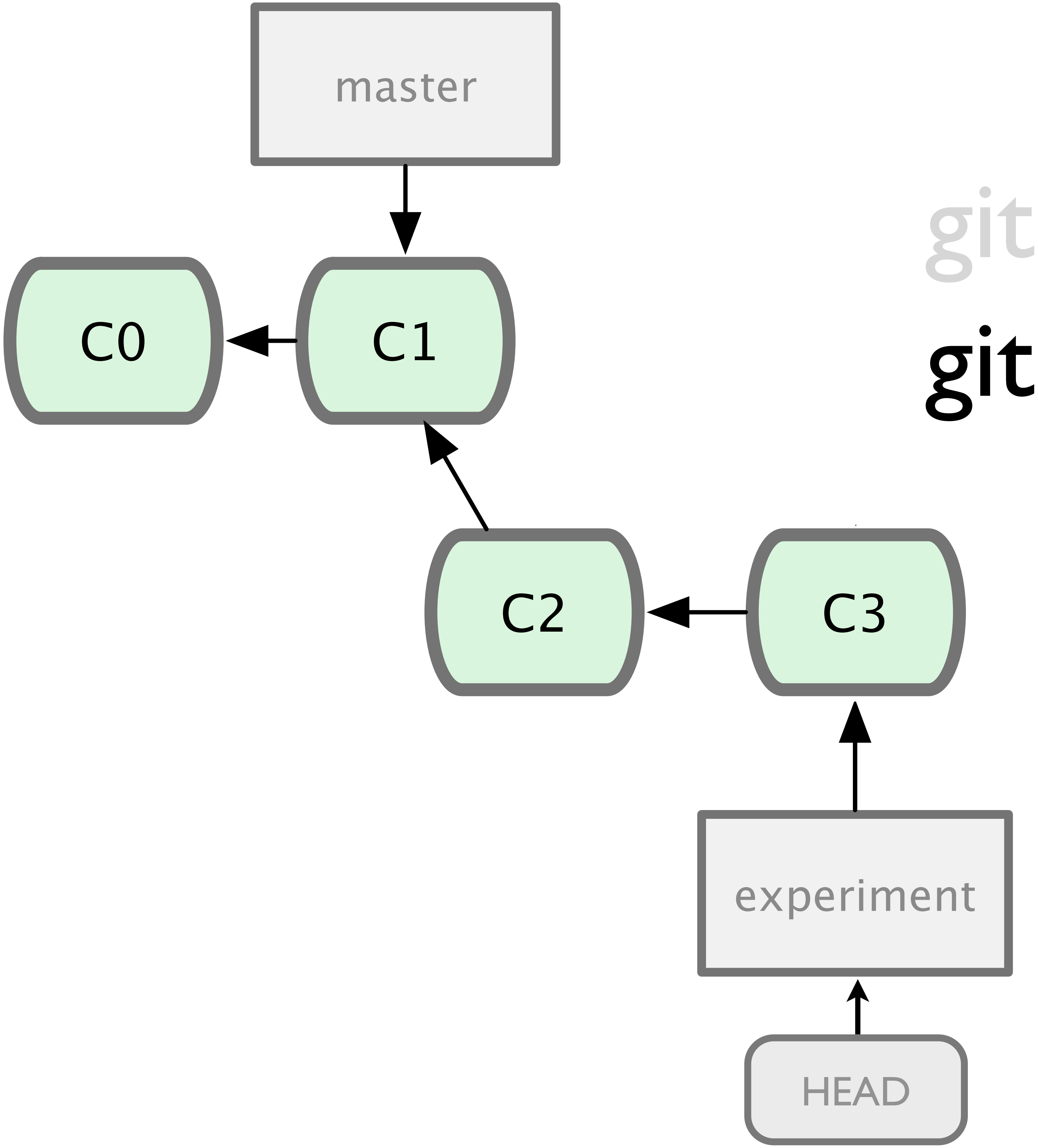

HEAD
master
C0
C1



git checkout -b experiment



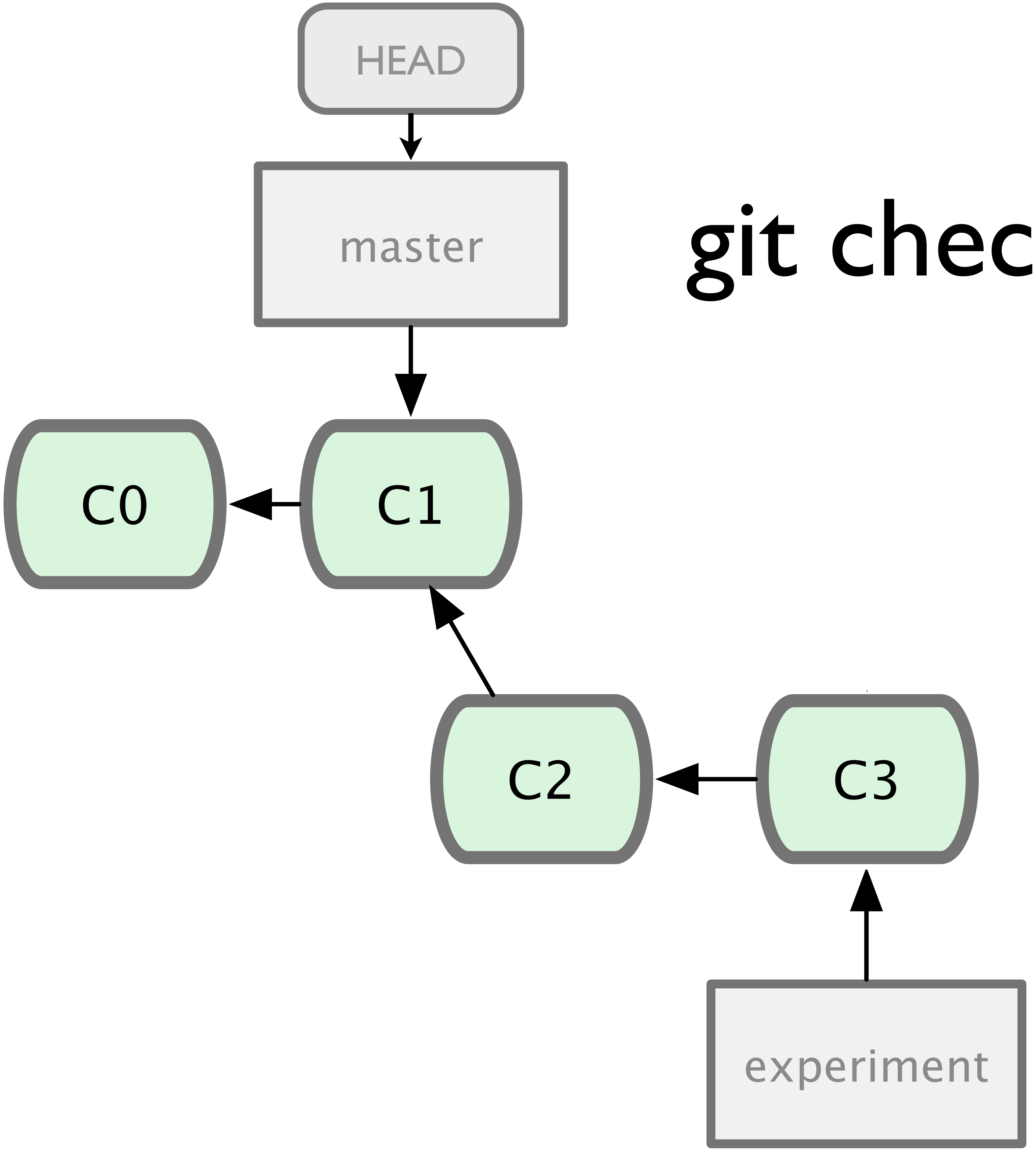
git commit



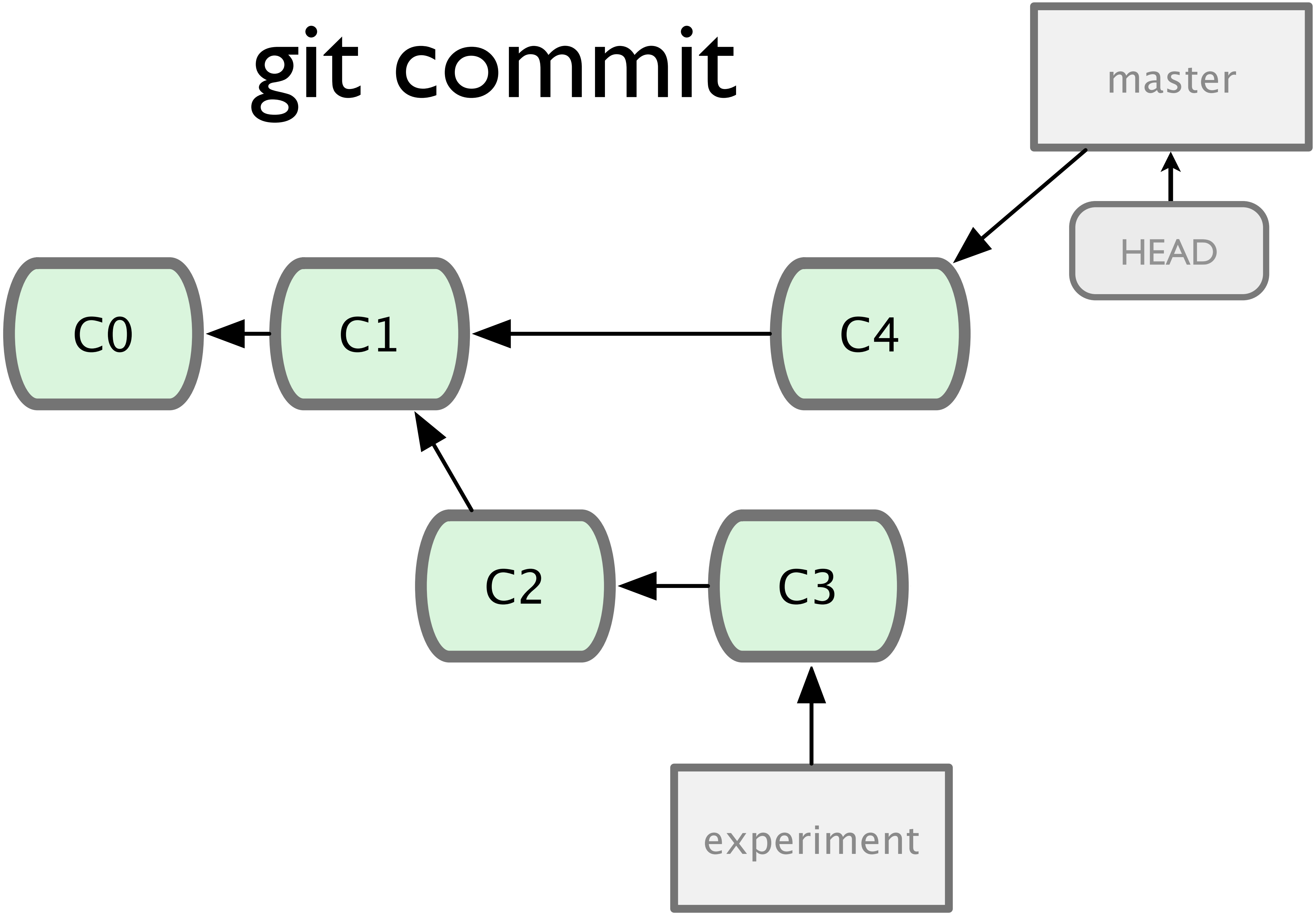
git commit

git commit

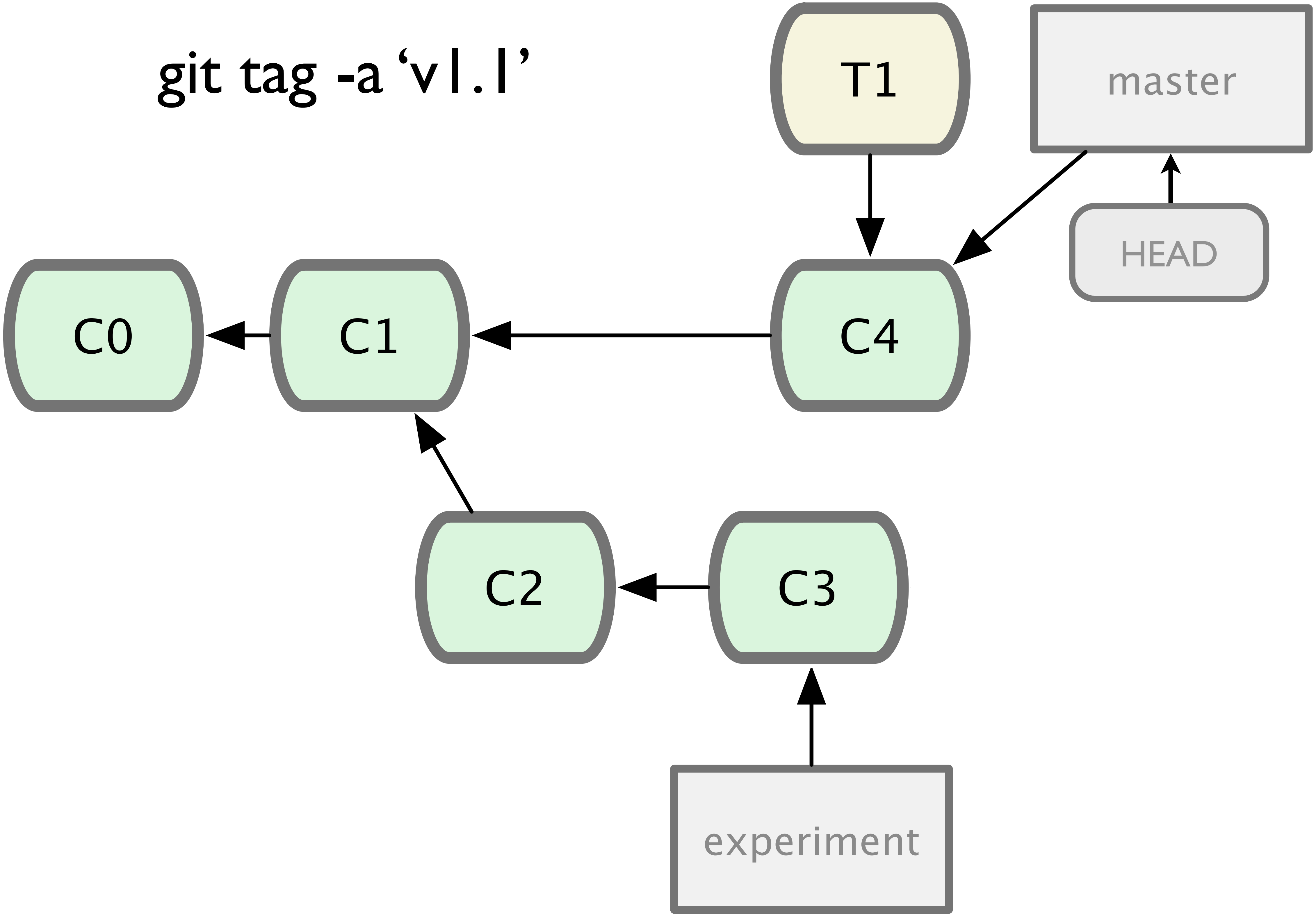
git checkout master

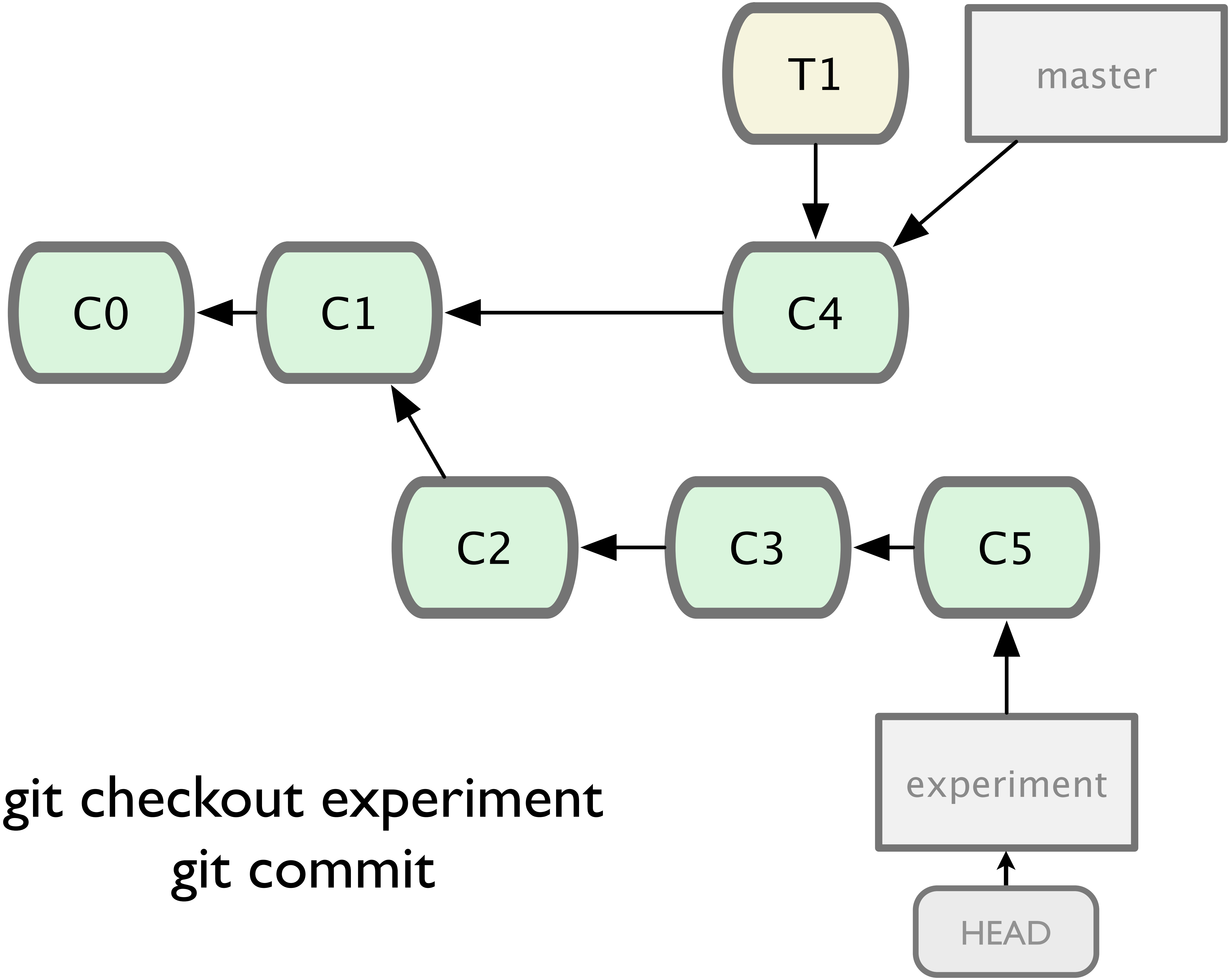


git commit

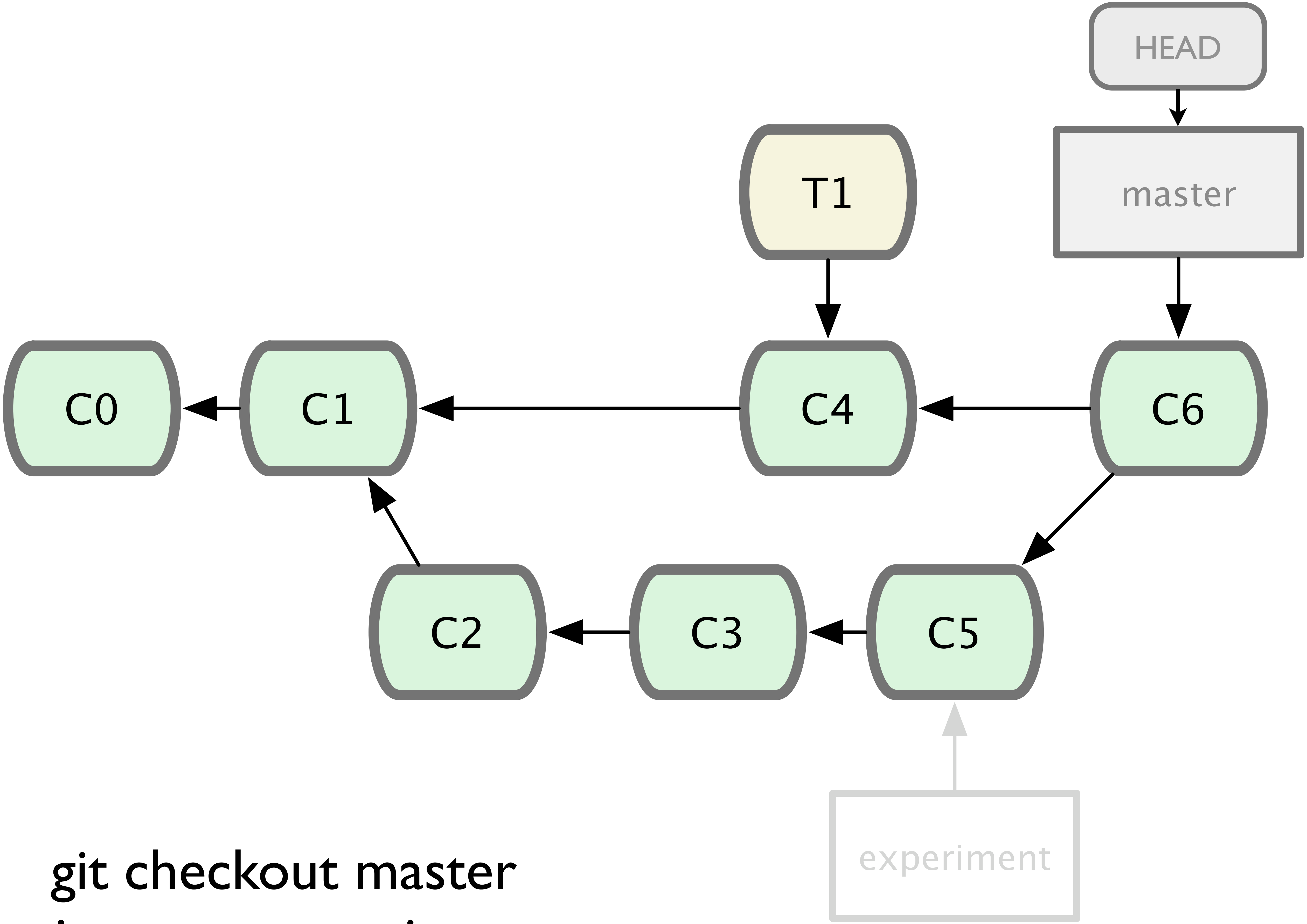


git tag -a ‘v1.1’



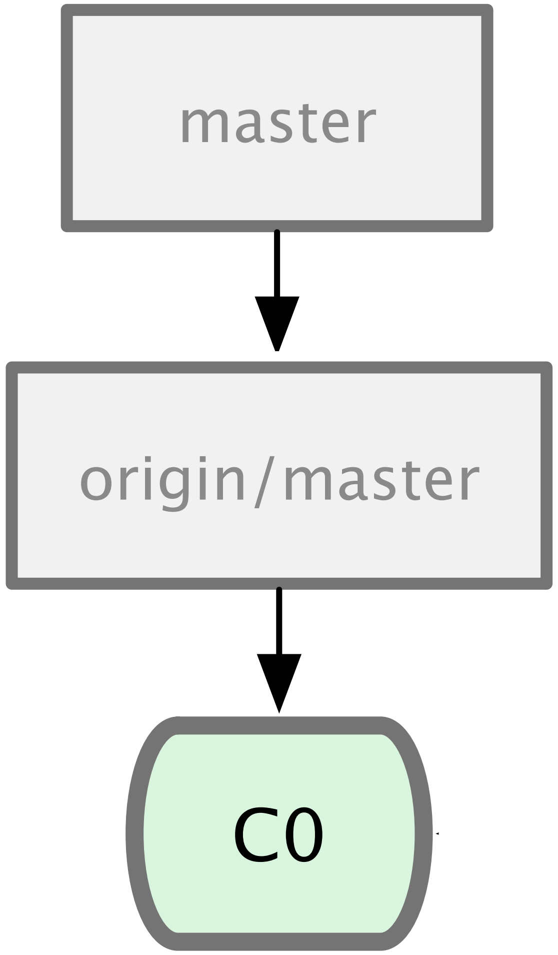


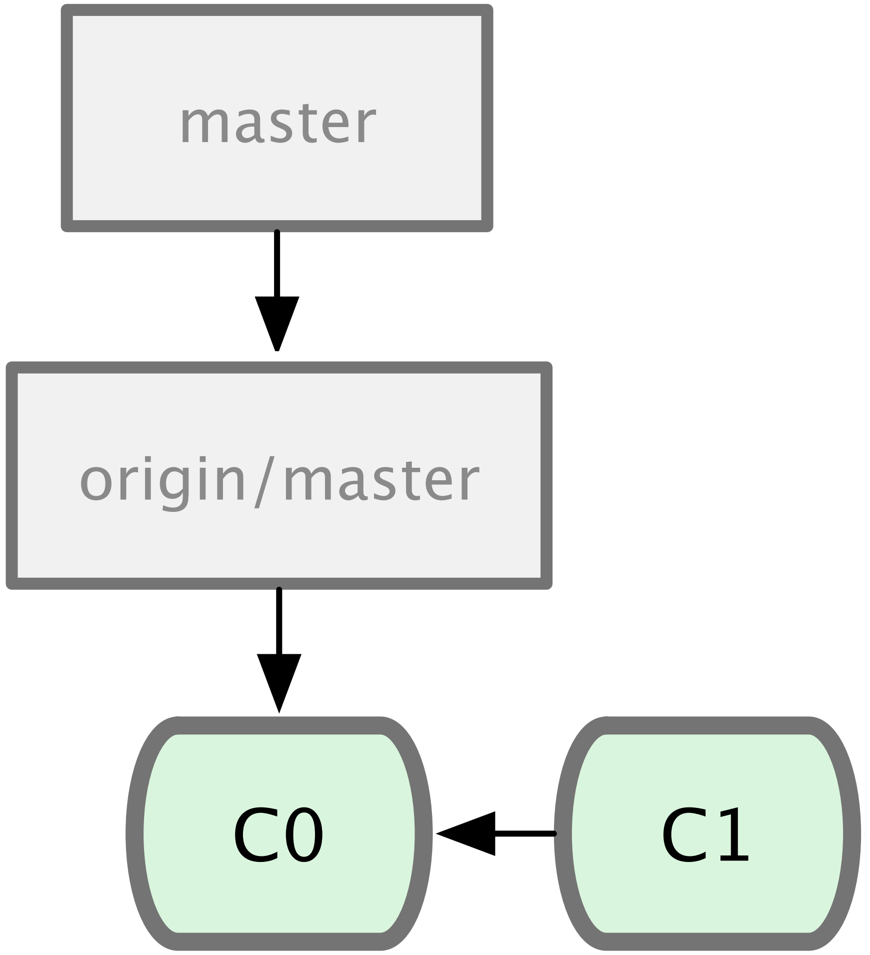
```
git checkout experiment
git commit
```

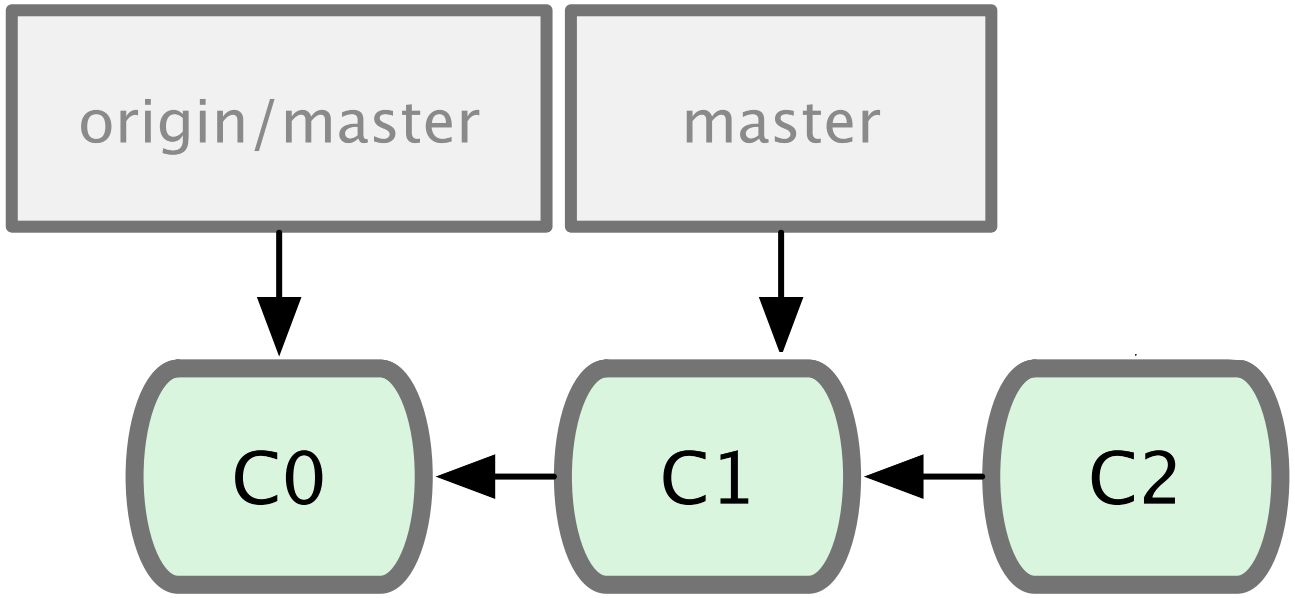


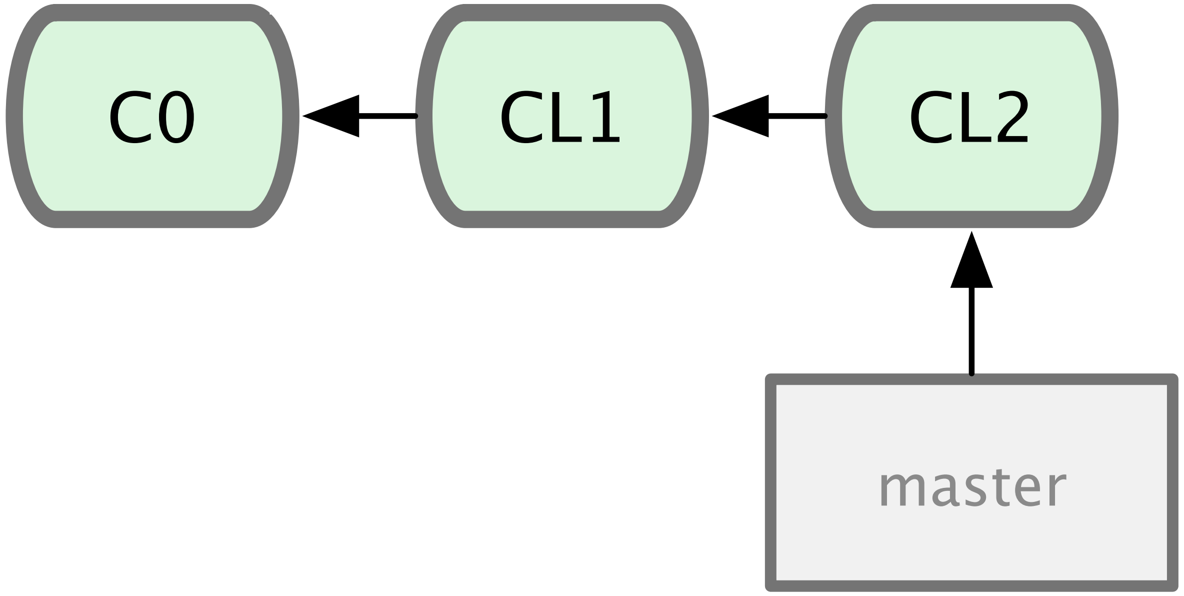
```
git checkout master
git merge experiment
```

remotes

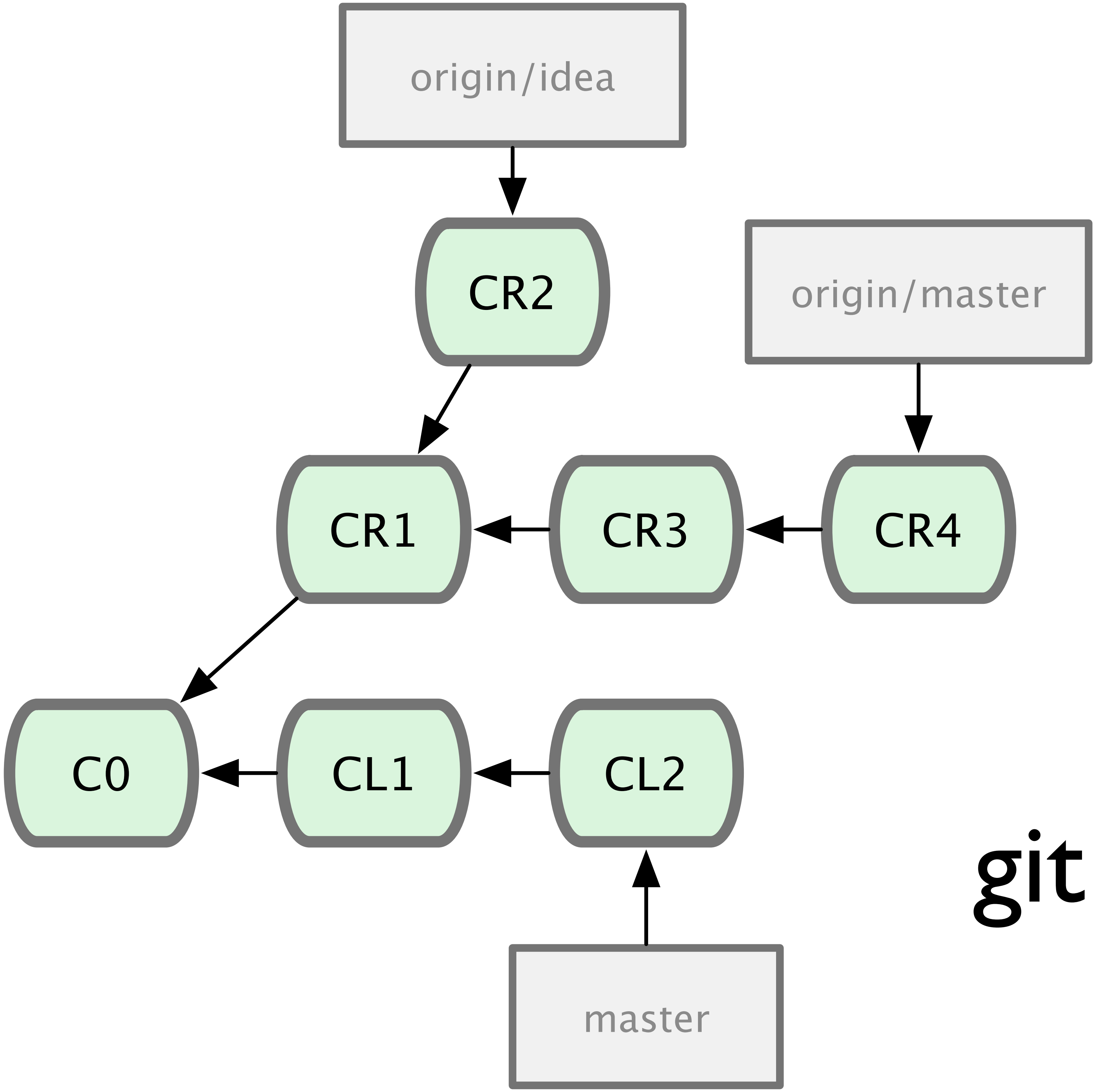

master
origin/master
C0


master
origin/master
C0
C1

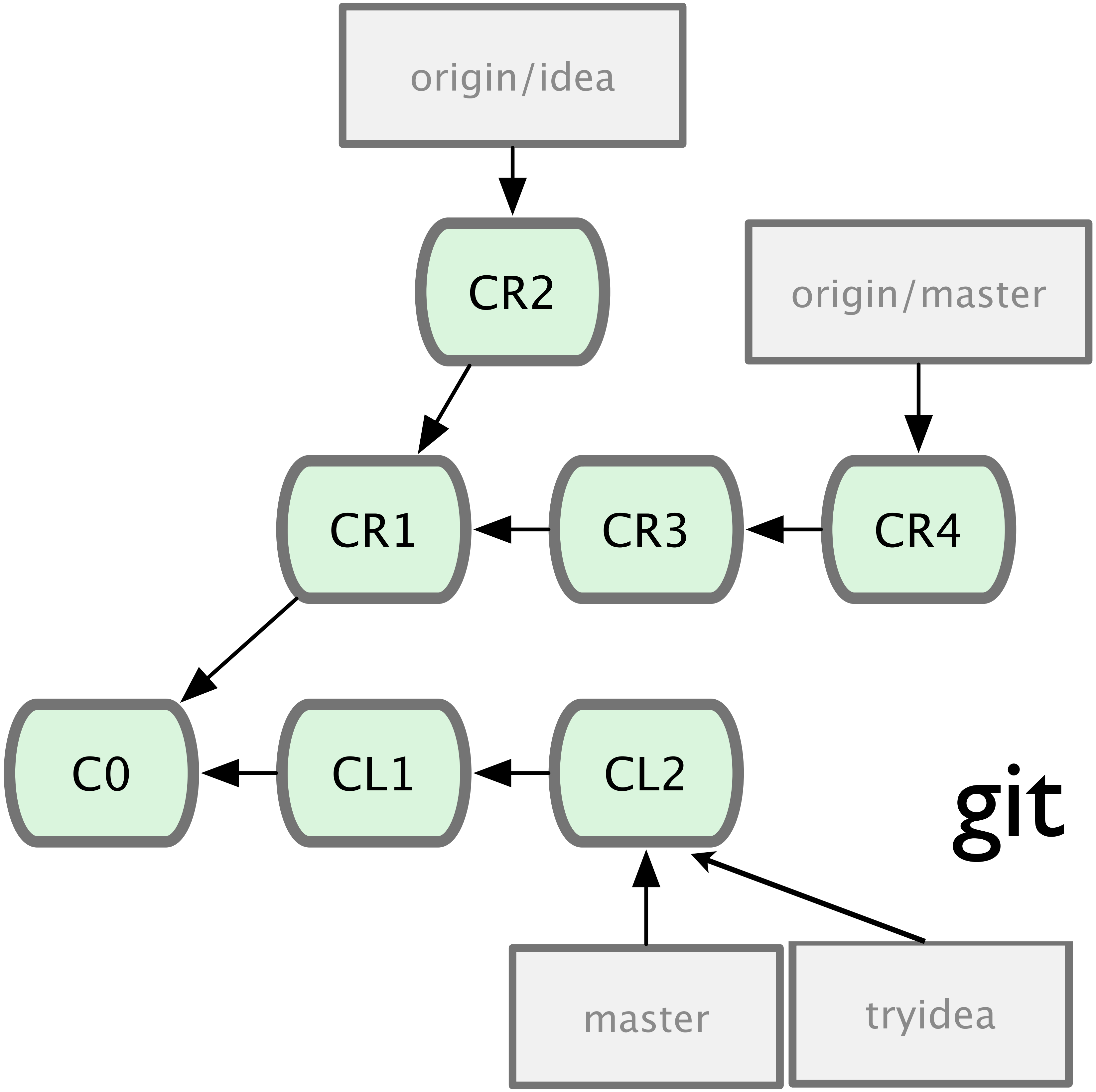

origin/master
master
C0
C1
C2



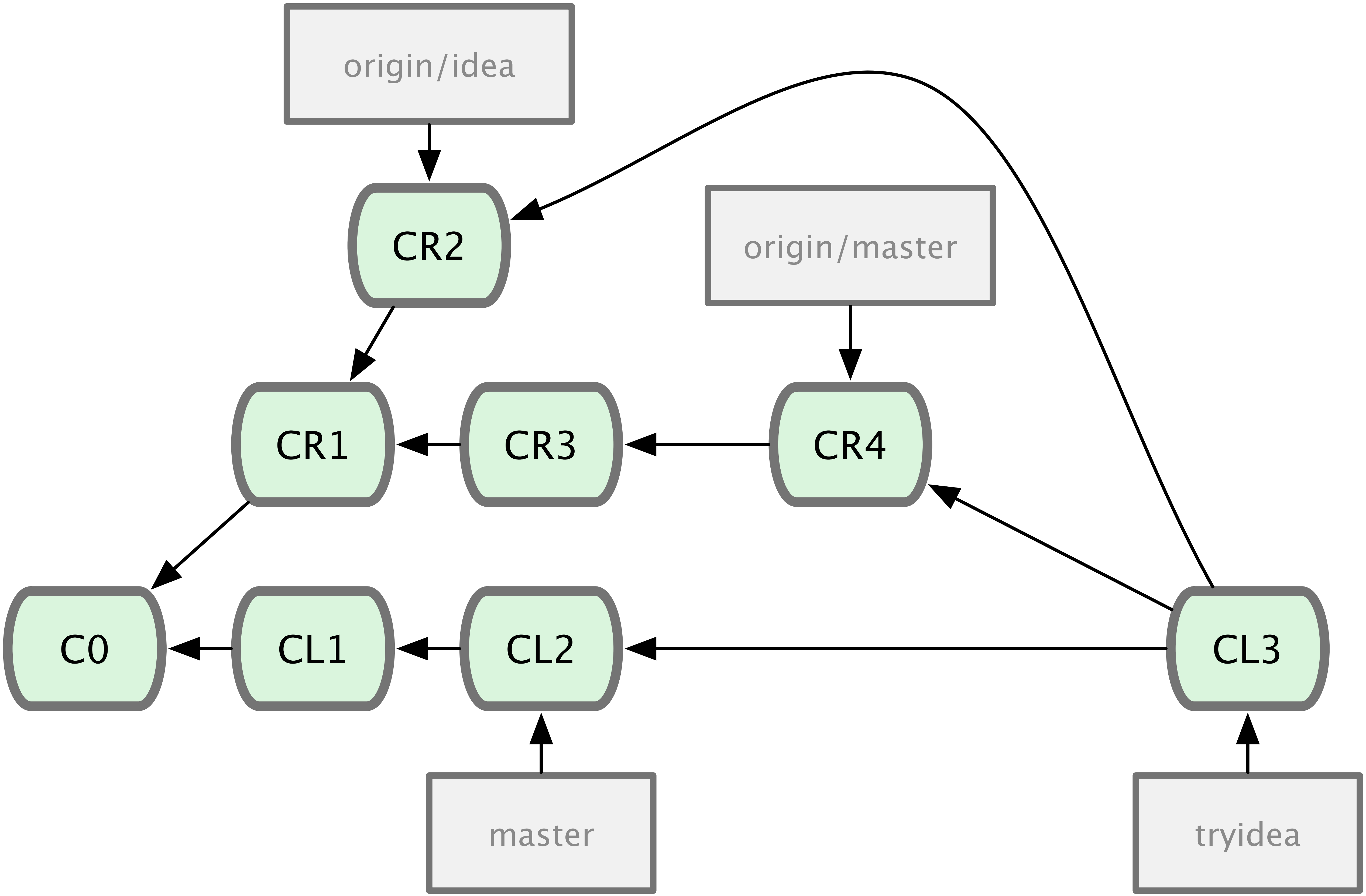
git fetch origin



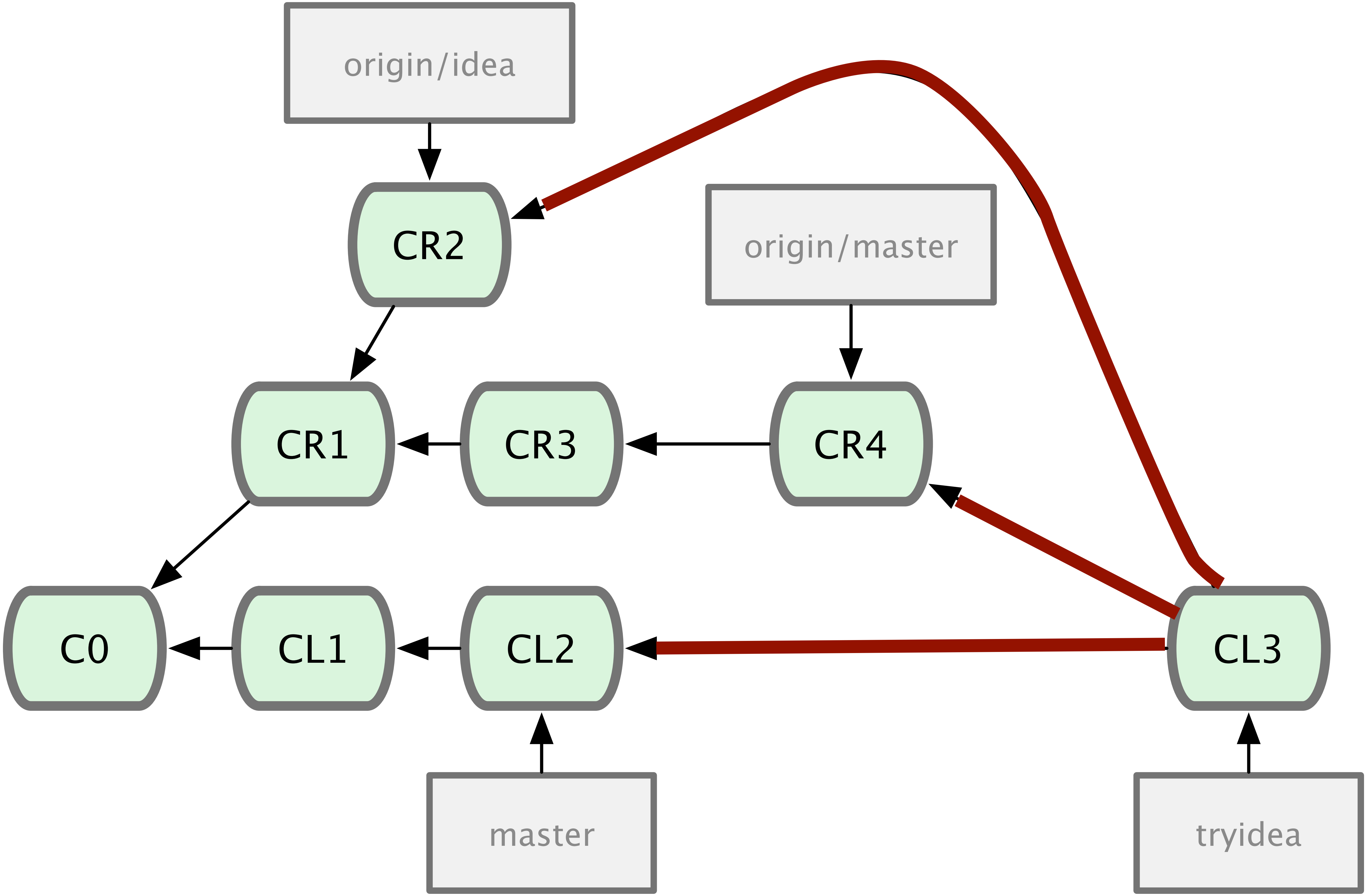
git fetch origin

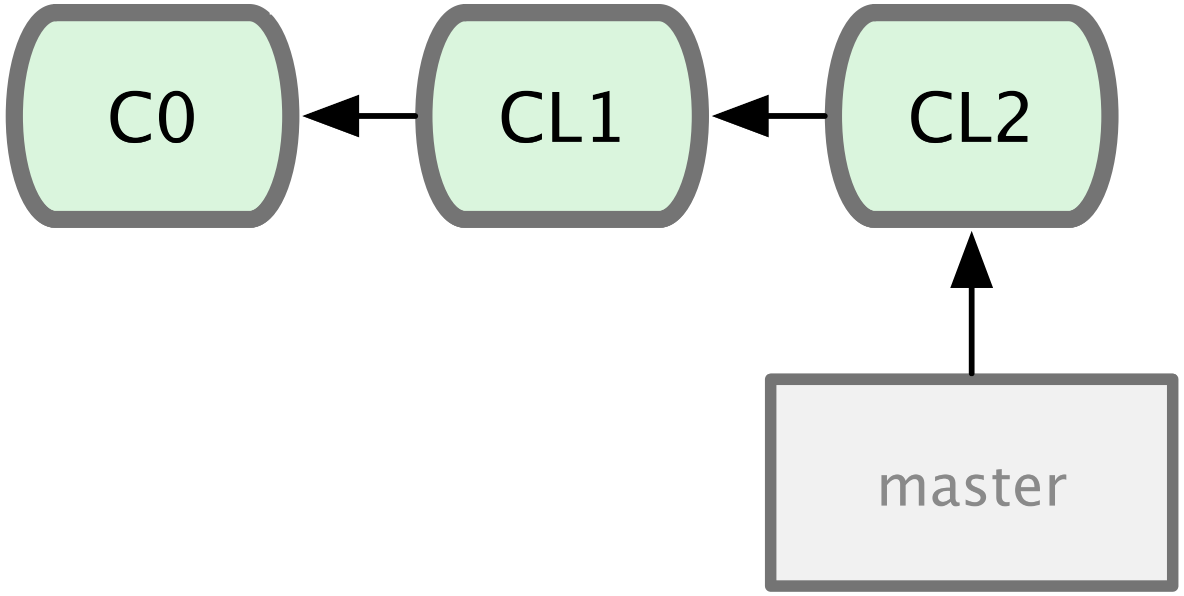


git checkout -b tryidea

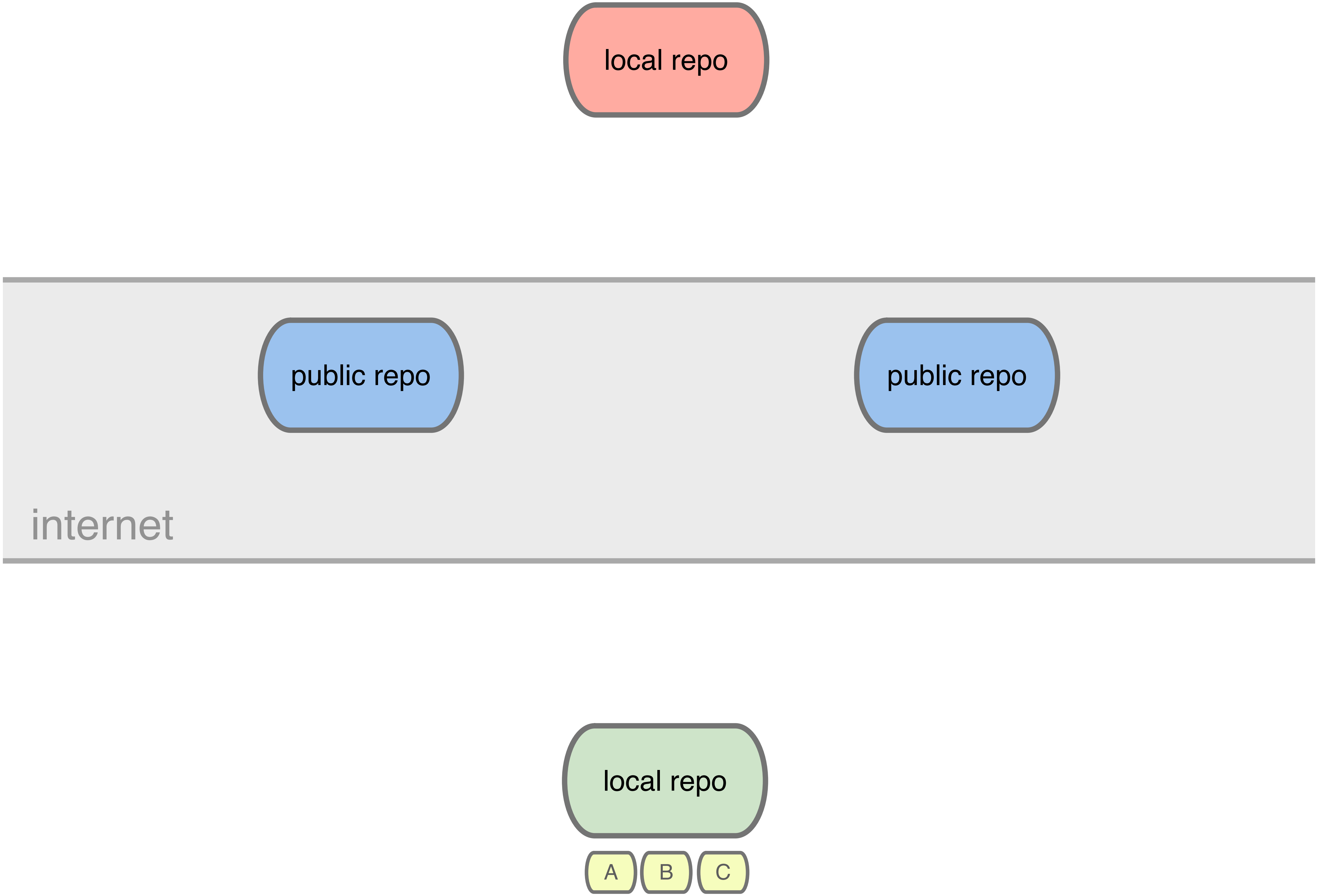


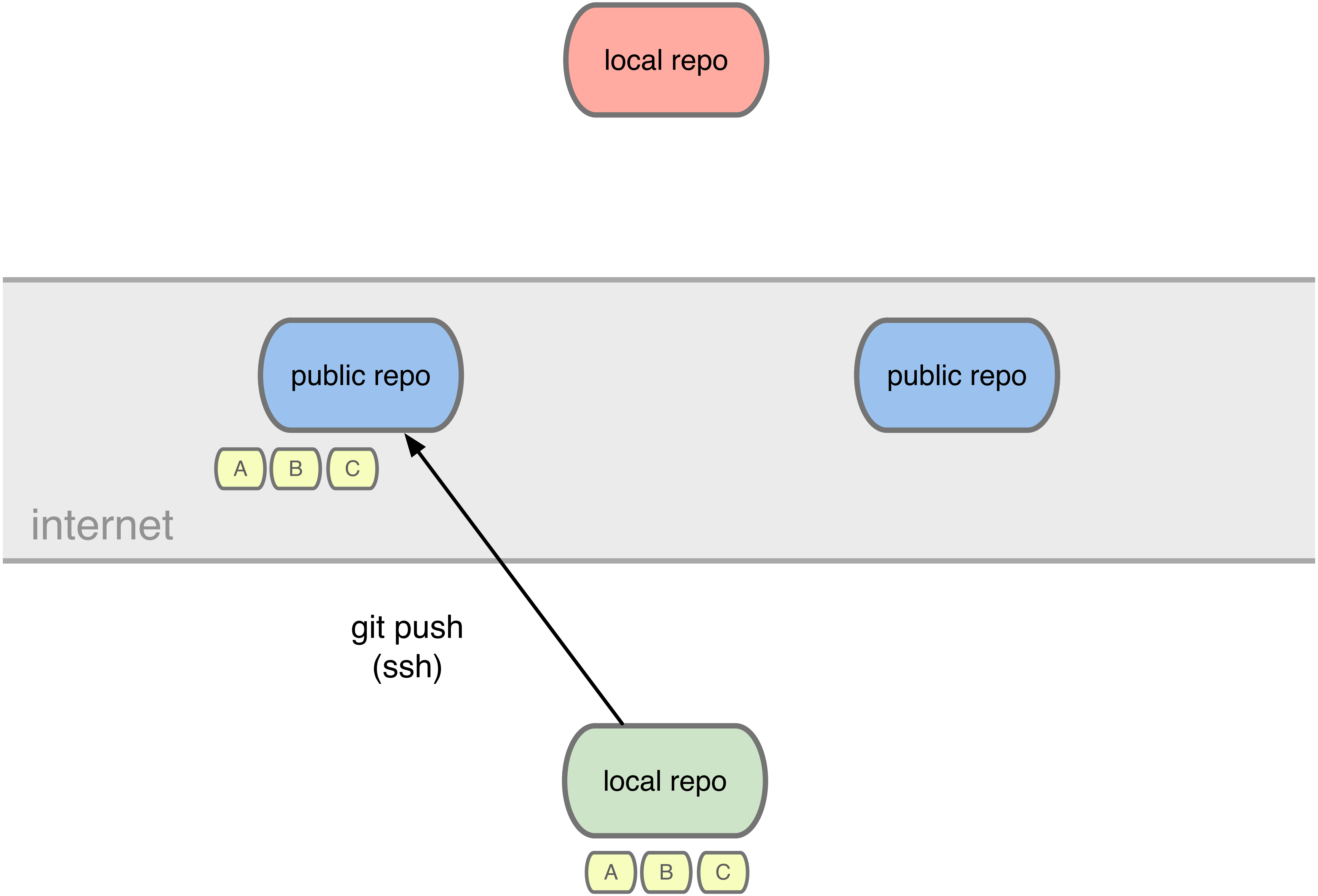
git merge origin/master origin/idea

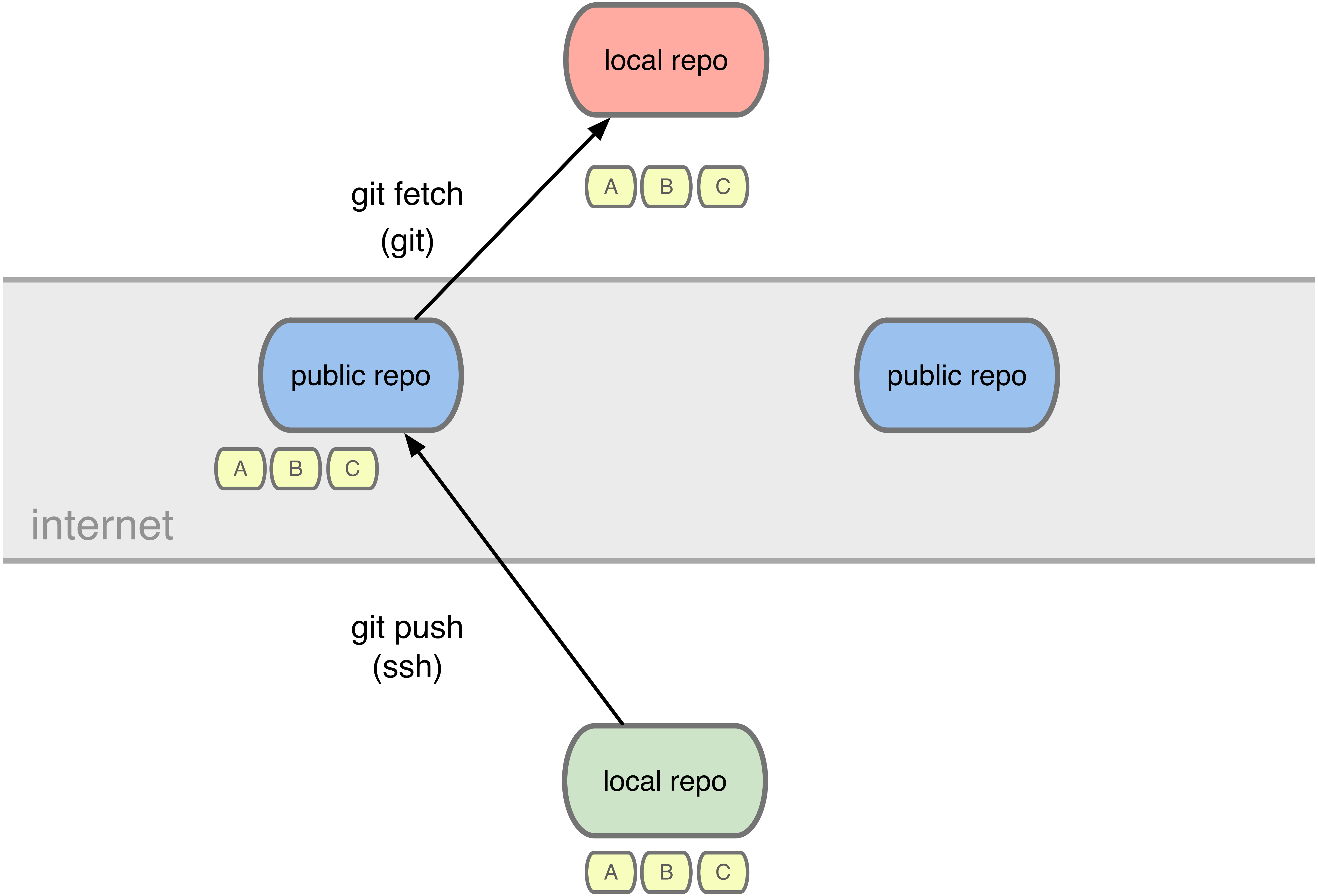

origin/idea
CR2
origin/master
CR1
CR3
CR4
C0
CL1
CL2
CL3
master
tryidea

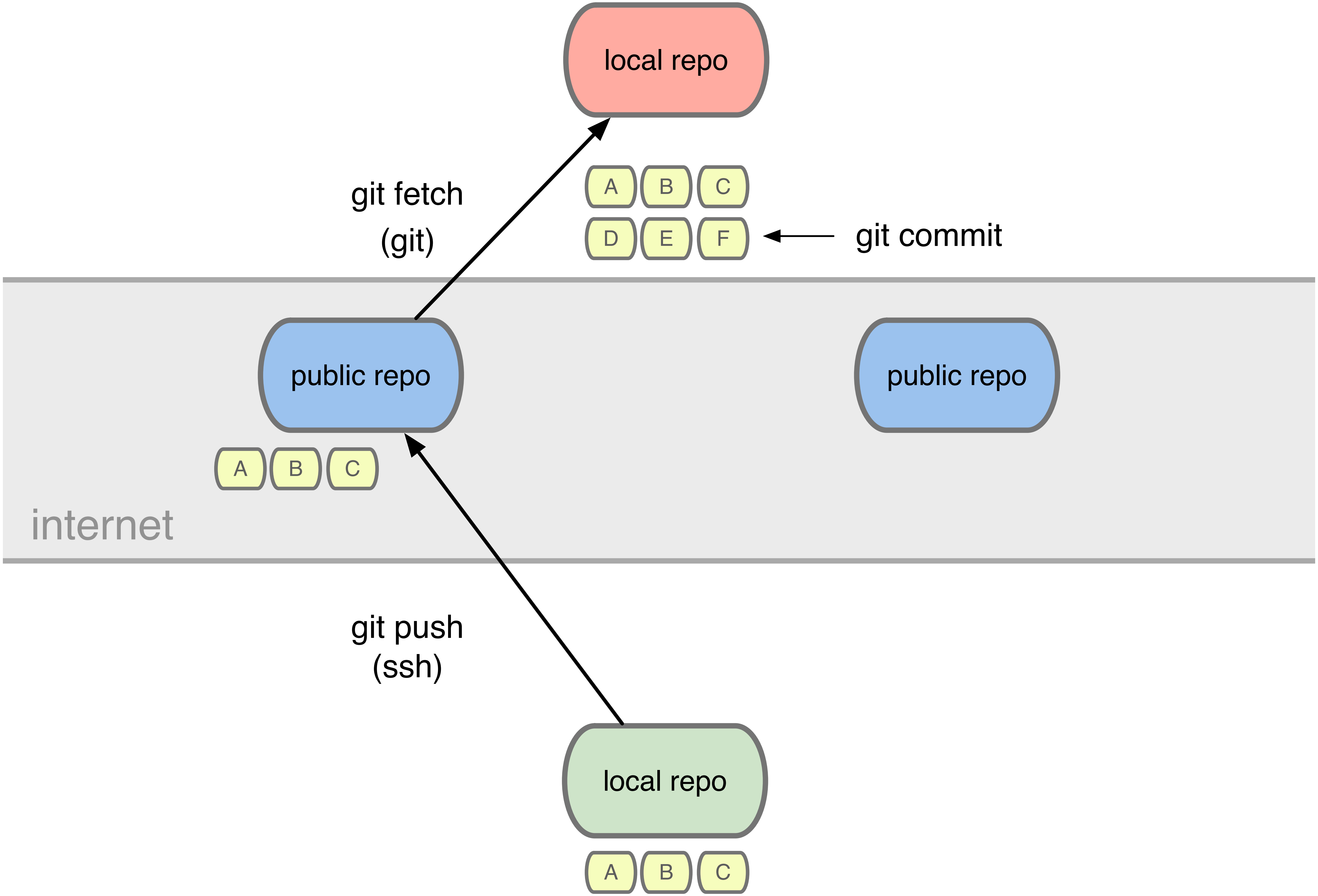

C0
CL1
CL2
master

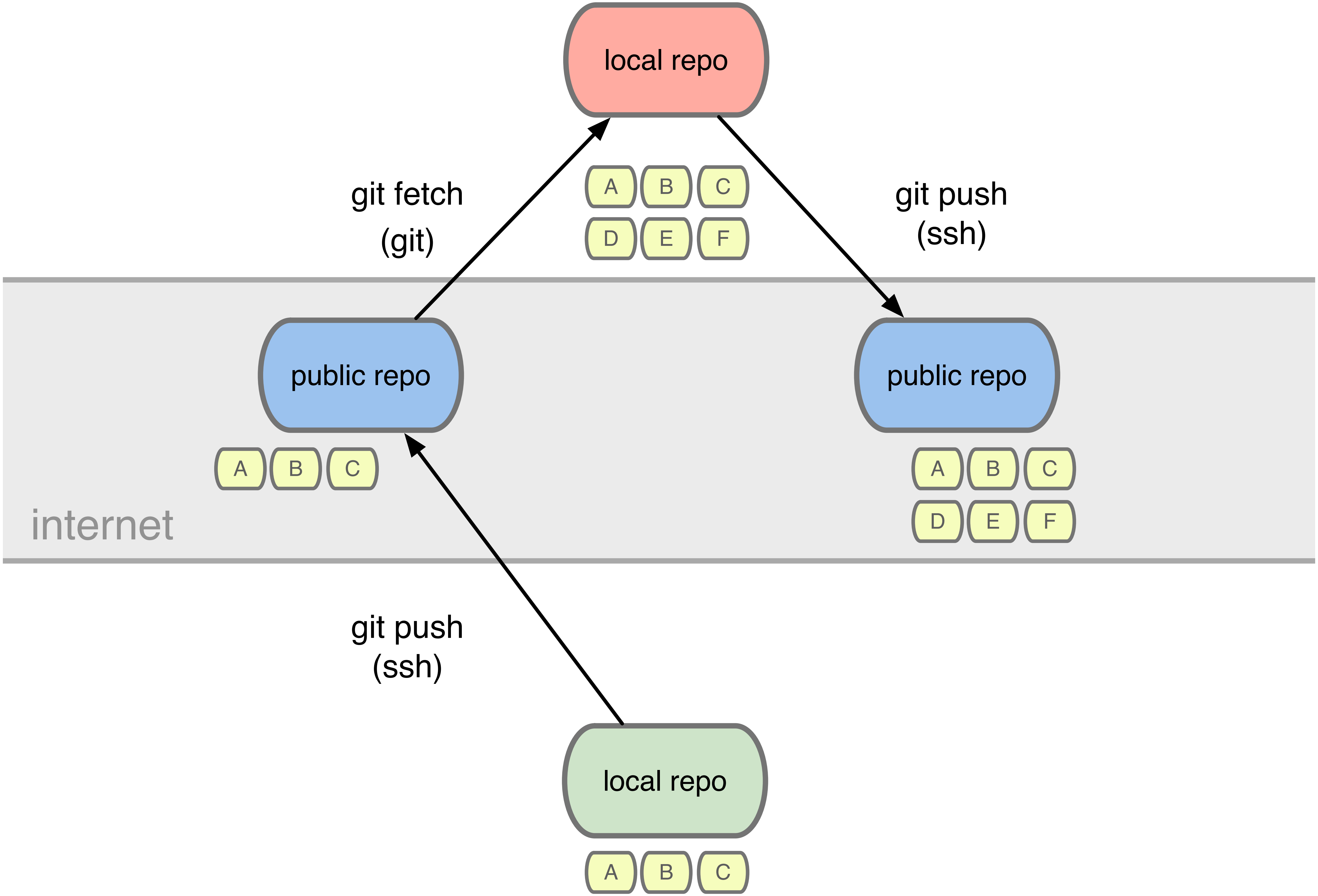
remote workflow

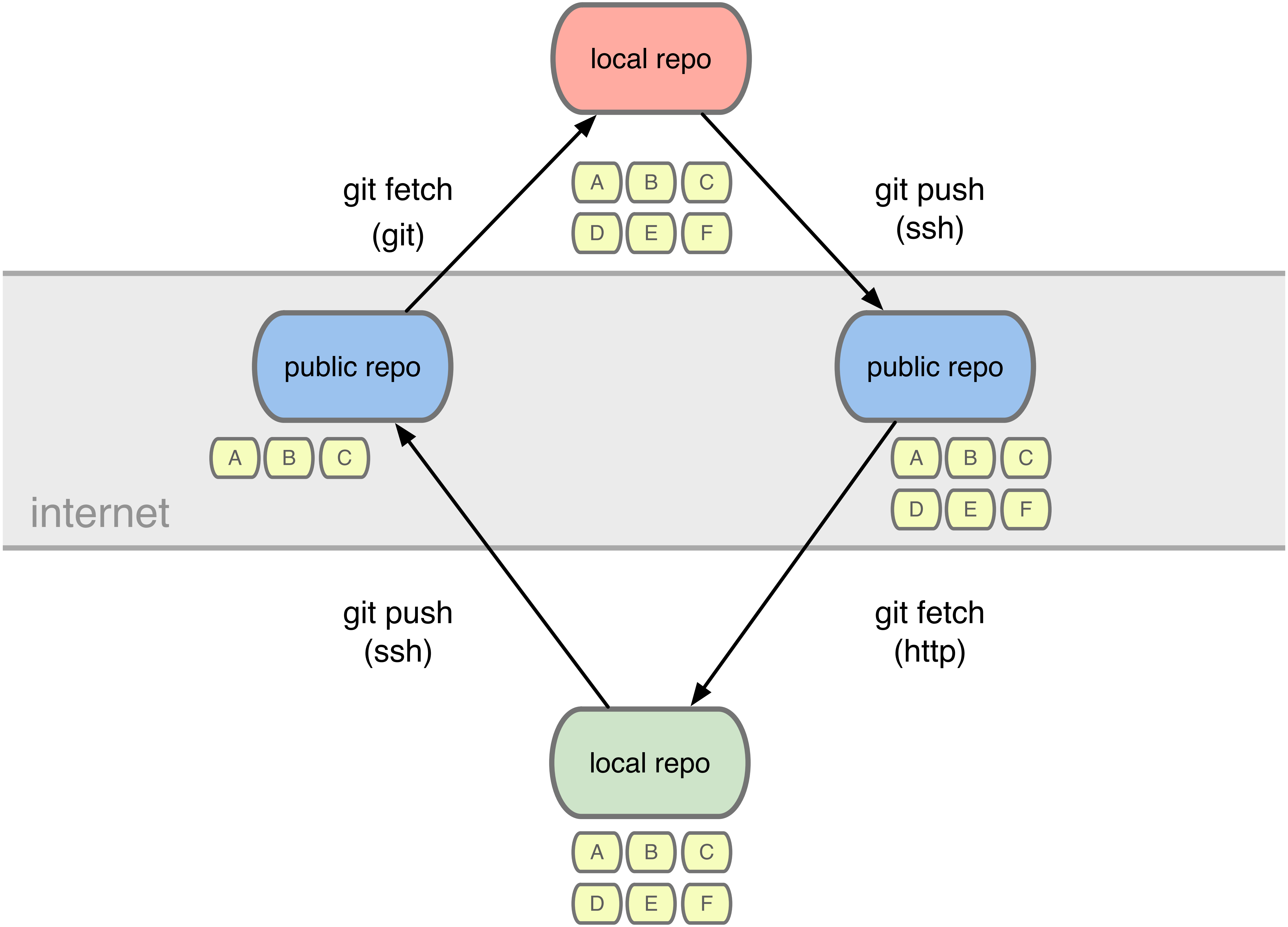

local repo
public repo
public repo
internet
local repo
A
B
C

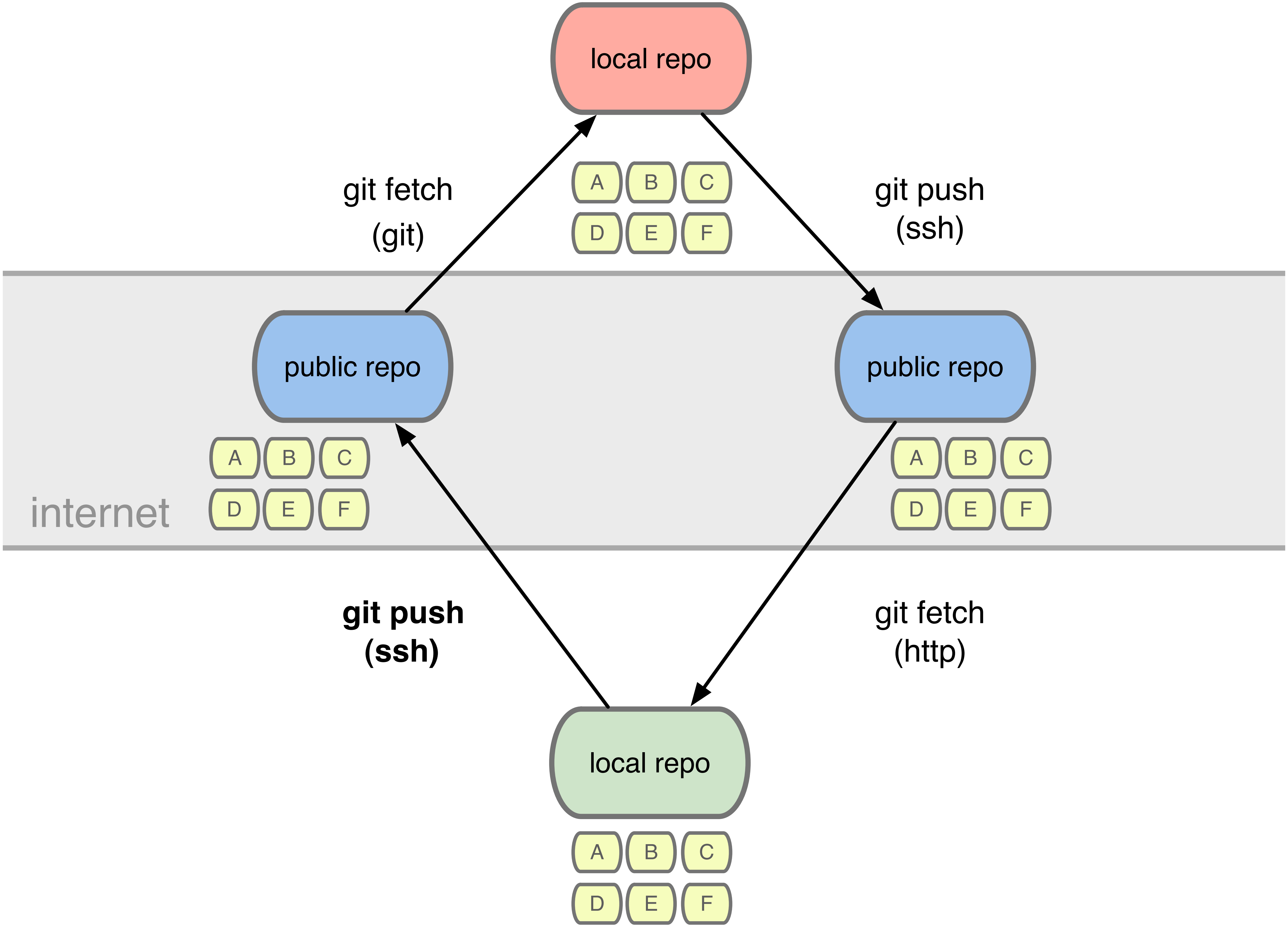

local repo
public repo
public repo
A
B
C
internet
git push
(ssh)
local repo
A
B
C


local repo
A
B
C
git fetch
(git)
public repo
public repo
A
B
C
internet
git push
(ssh)
local repo
A
B
C

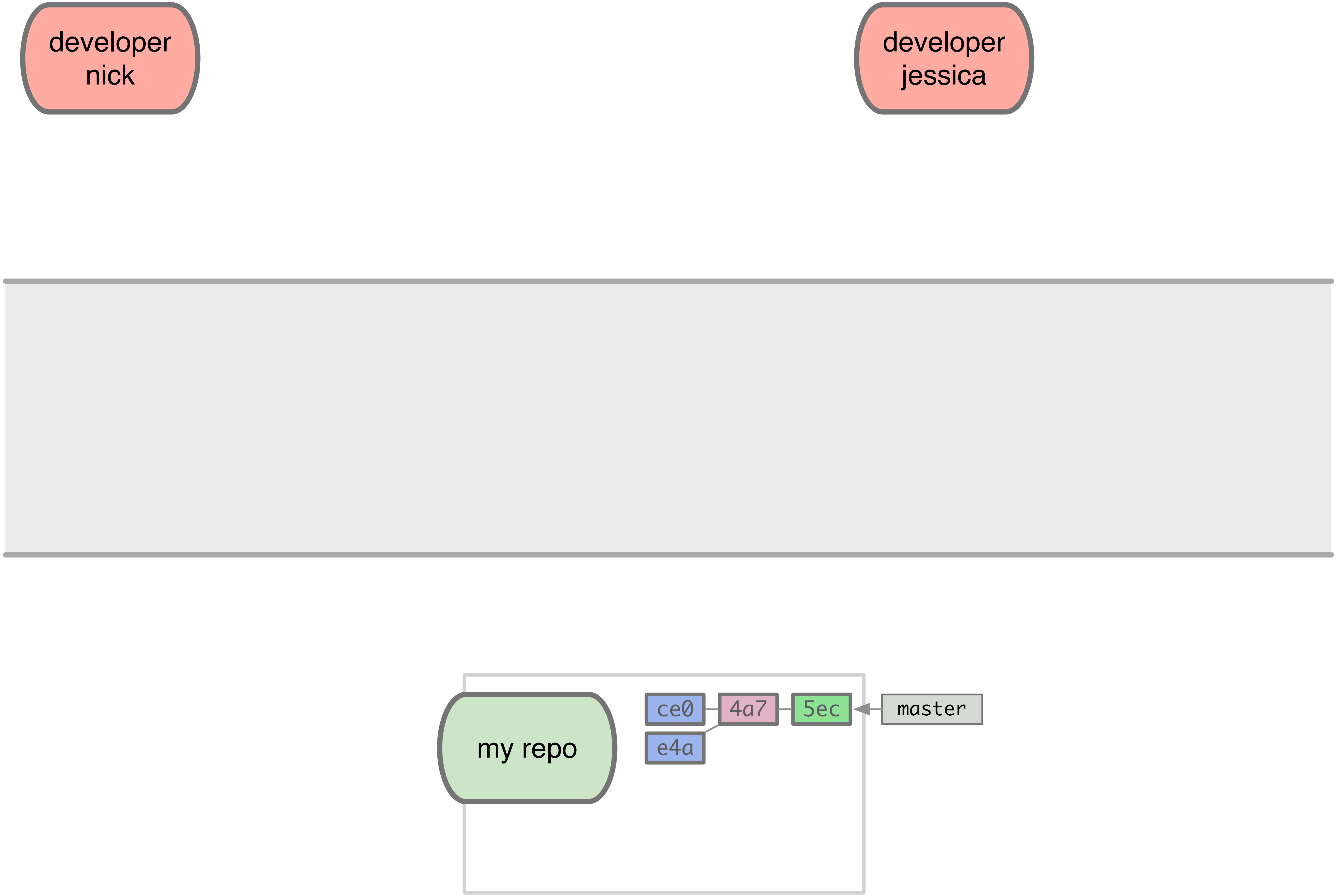

local repo
A
B
C
D
E
F
git commit
git fetch
(git)
public repo
public repo
A
B
C
internet
git push
(ssh)
local repo
A
B
C

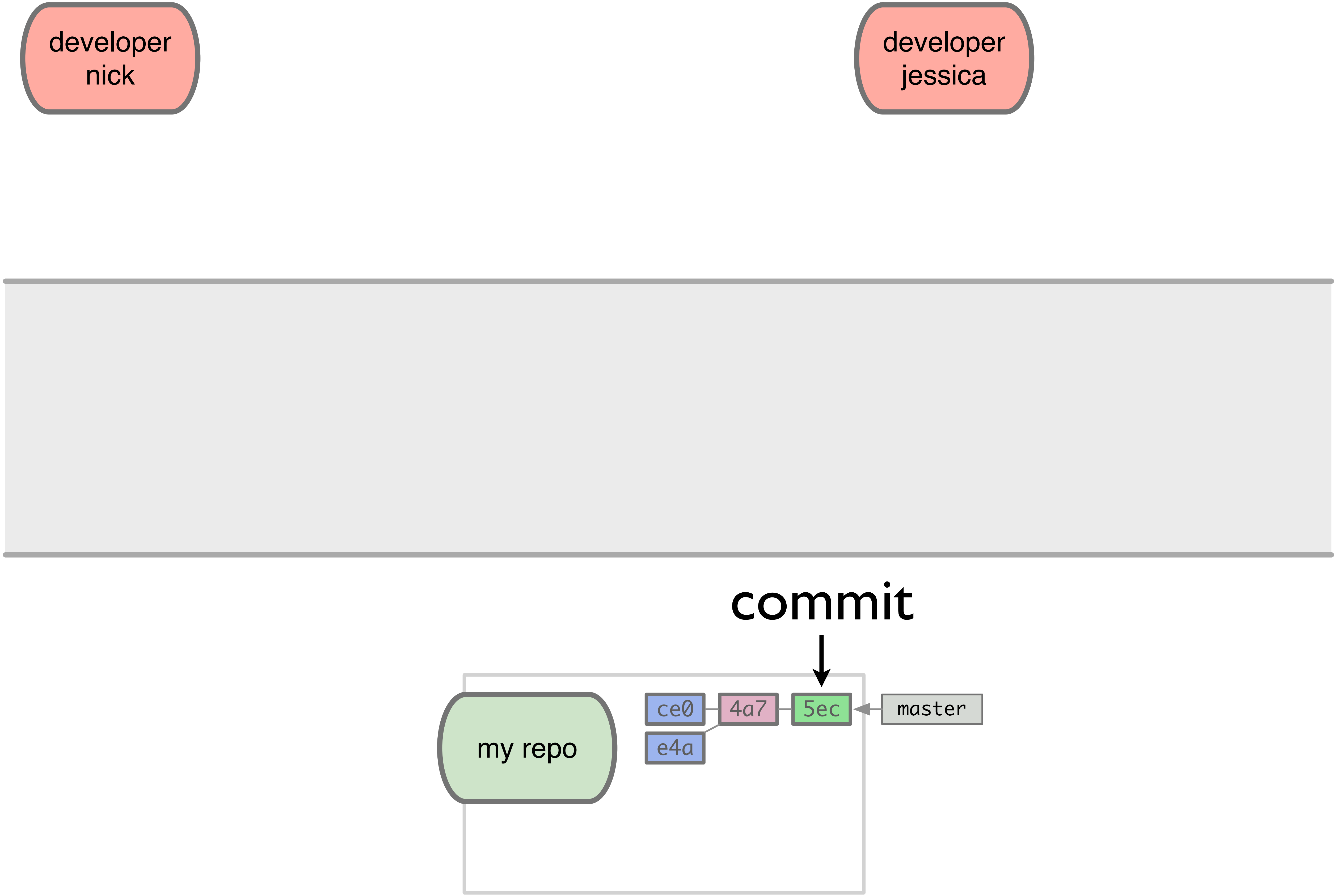

local repo
A
B
C
D
E
F
git fetch
(git)
git push
(ssh)
public repo
A
B
C
internet
public repo
A
B
C
D
E
F
git push
(ssh)
local repo
A
B
C


local repo
git fetch
(git)
A
B
C
D
E
F
git push
(ssh)
public repo
A
B
C
public repo
A
B
C
D
E
F
internet
git push
(ssh)
git fetch
(http)
local repo
A
B
C
D
E
F


local repo
git fetch
(git)
A
B
C
D
E
F
git push
(ssh)
public repo
public repo
A
B
C
D
E
F
A
B
C
D
E
F
internet
git push
(ssh)
git fetch
(http)
local repo
A
B
C
D
E
F

multiple remotes


developer nick
developer jessica
my repo
ce0
4a7
5ec
master
e4a



developer
nick

developer
jessica

commit

my repo

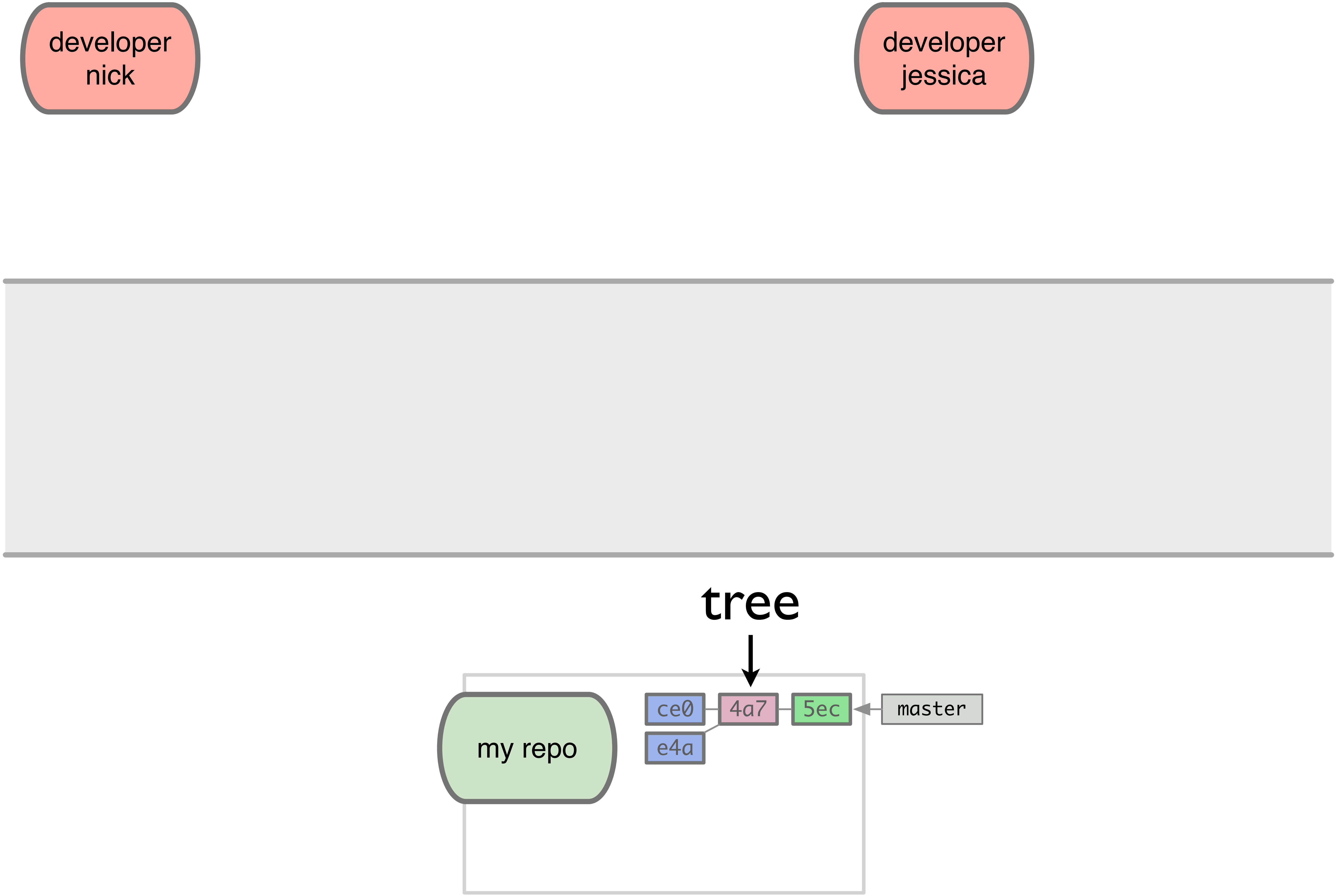
ce0

4a7

5ec

master

e4a



developer nick

developer jessica

tree

my repo

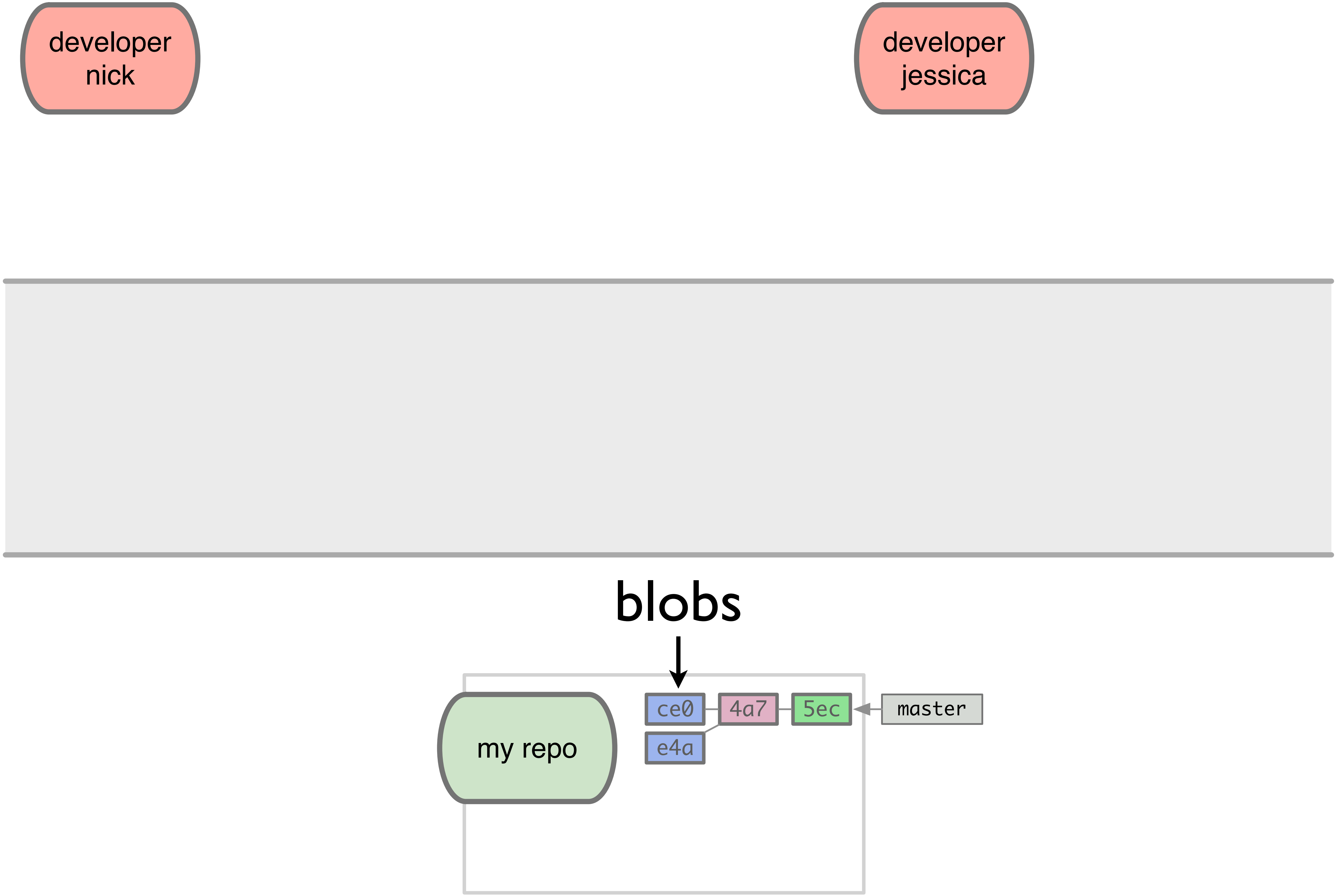
ce0

4a7

5ec

master

e4a



developer nick

developer jessica

blobs

my repo

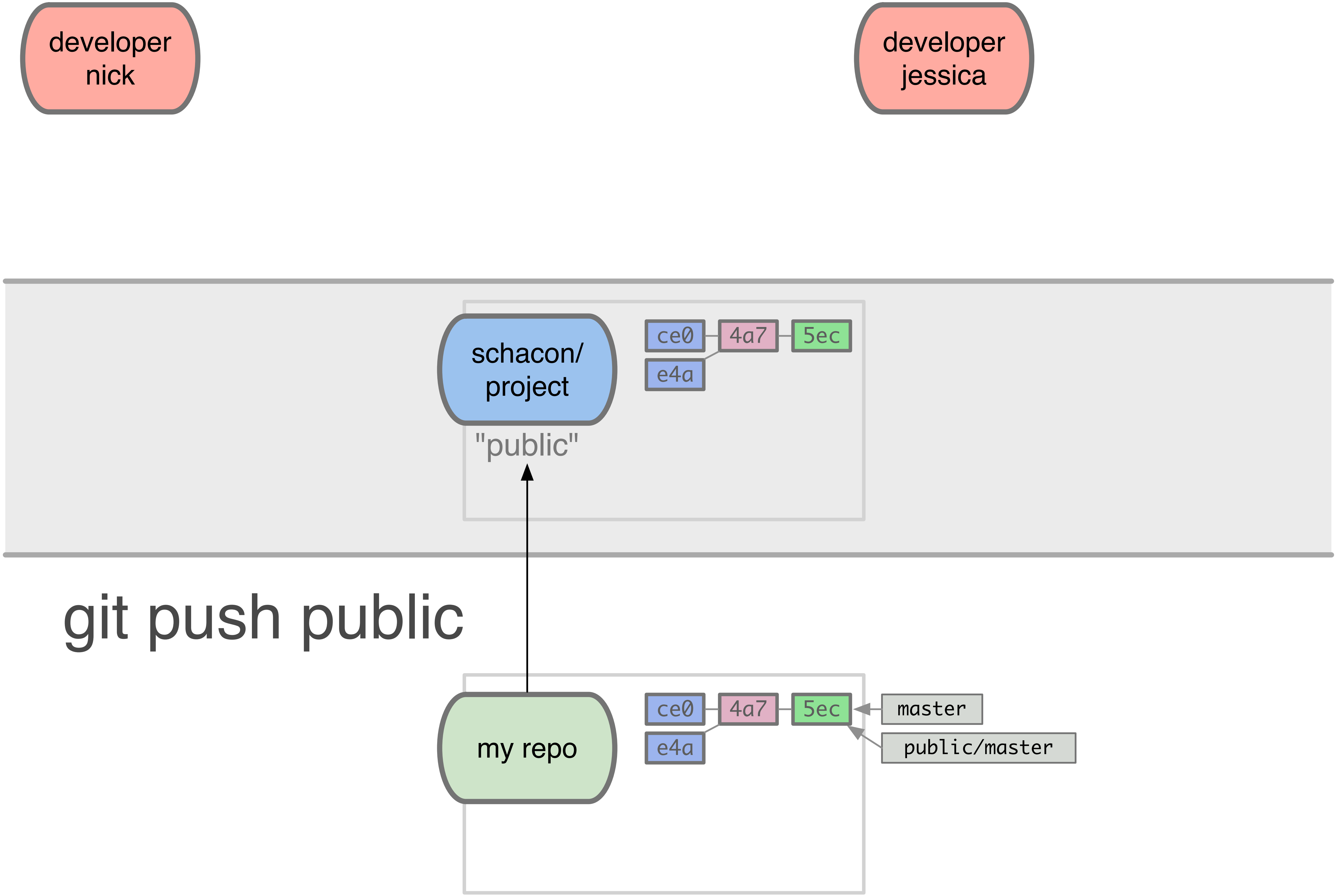
ce0

4a7

5ec

master

e4a



developer nick

developer jessica

schacon/ project

"public"

ce0 4a7 5ec

e4a

git push public

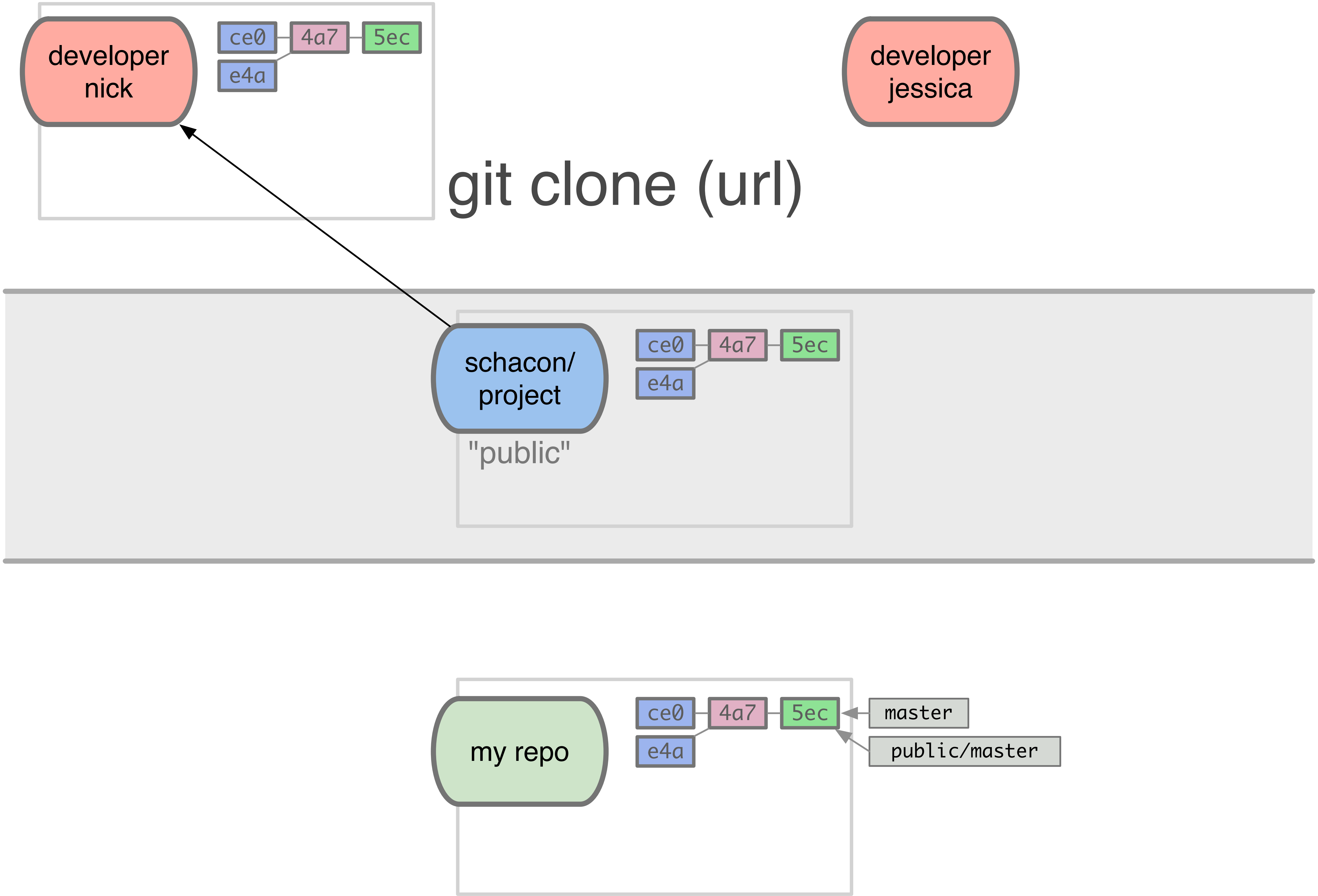
my repo

ce0 4a7 5ec

e4a

master

public/master



git clone (url)

developer nick

ce0 4a7 5ec

e4a

developer jessica

schacon/ project

"public"

ce0 4a7 5ec

e4a

my repo

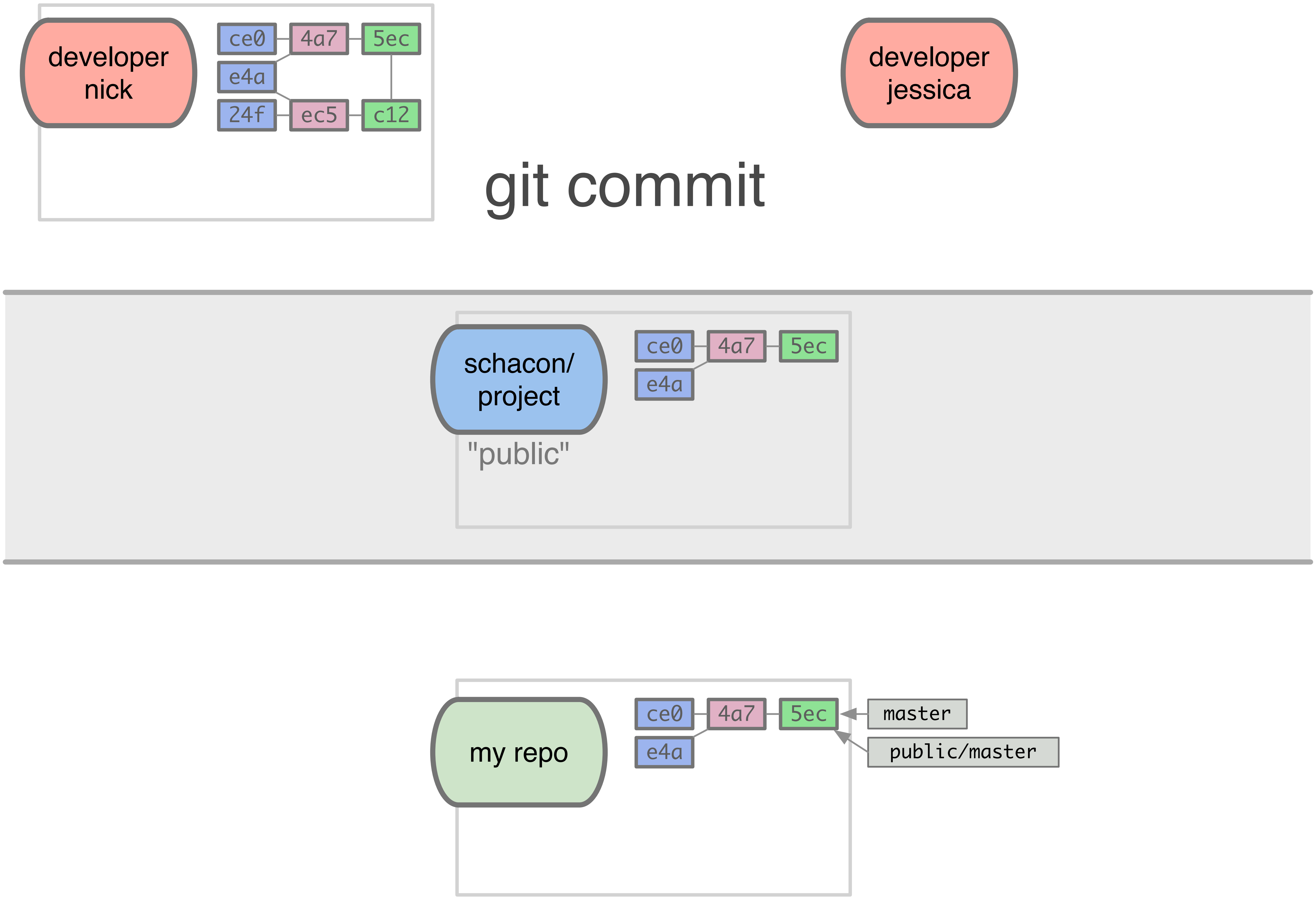
ce0 4a7 5ec

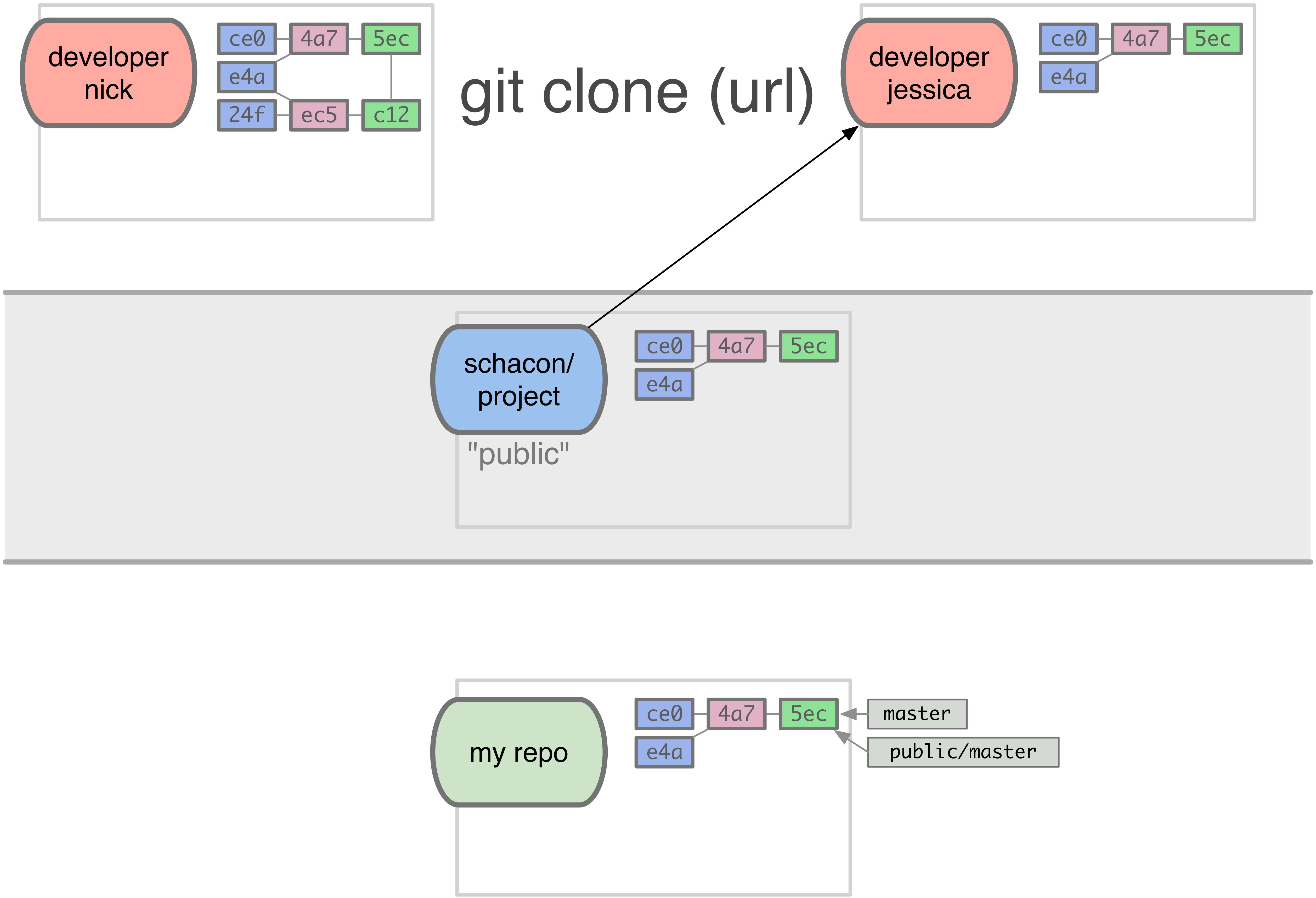
e4a

master

public/master

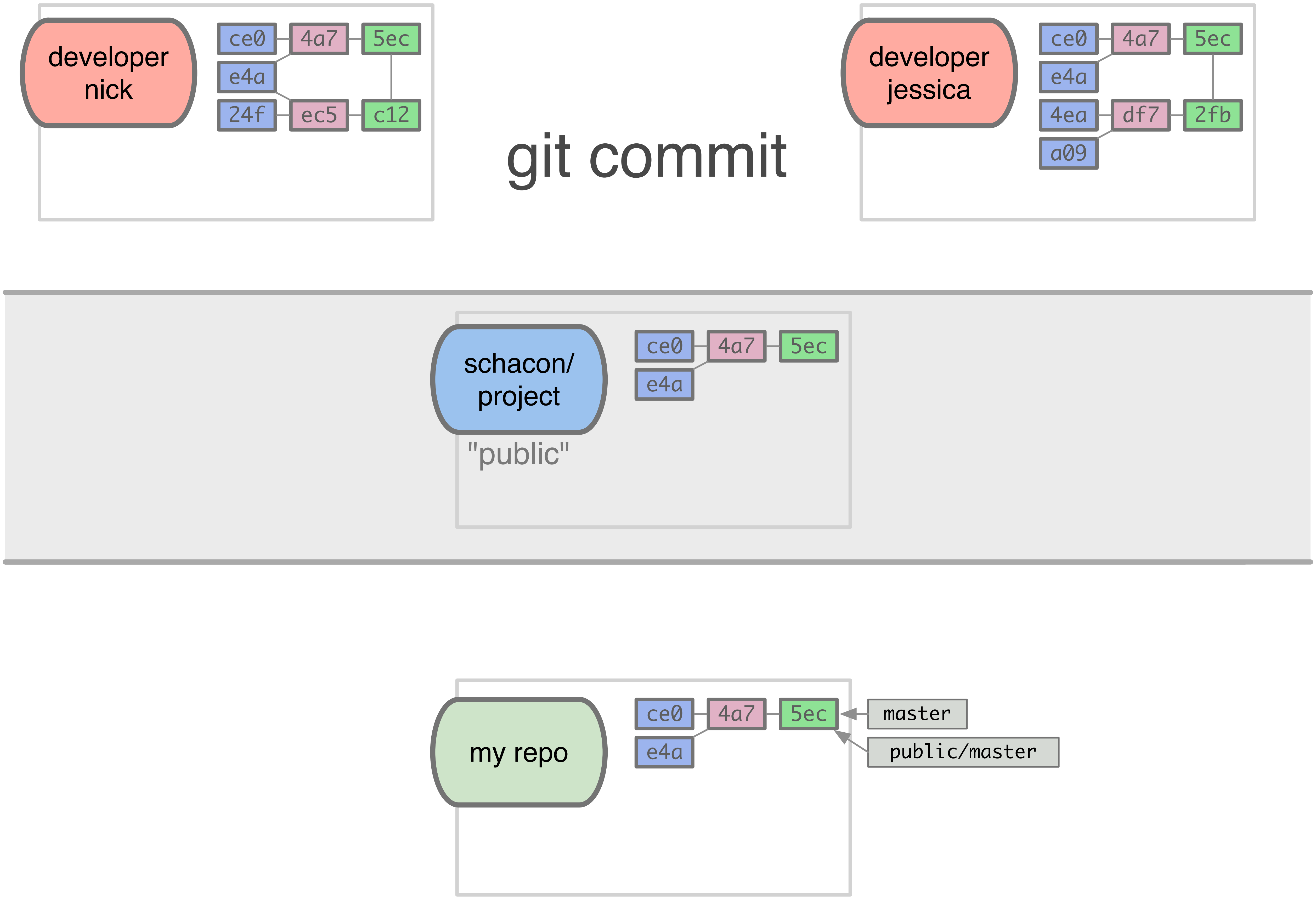
git commit


developer nick
ce0
4a7
5ec
e4a
24f
ec5
c12
developer jessica
schacon/ project
"public"
ce0
4a7
5ec
e4a
my repo
ce0
4a7
5ec
e4a
master
public/master

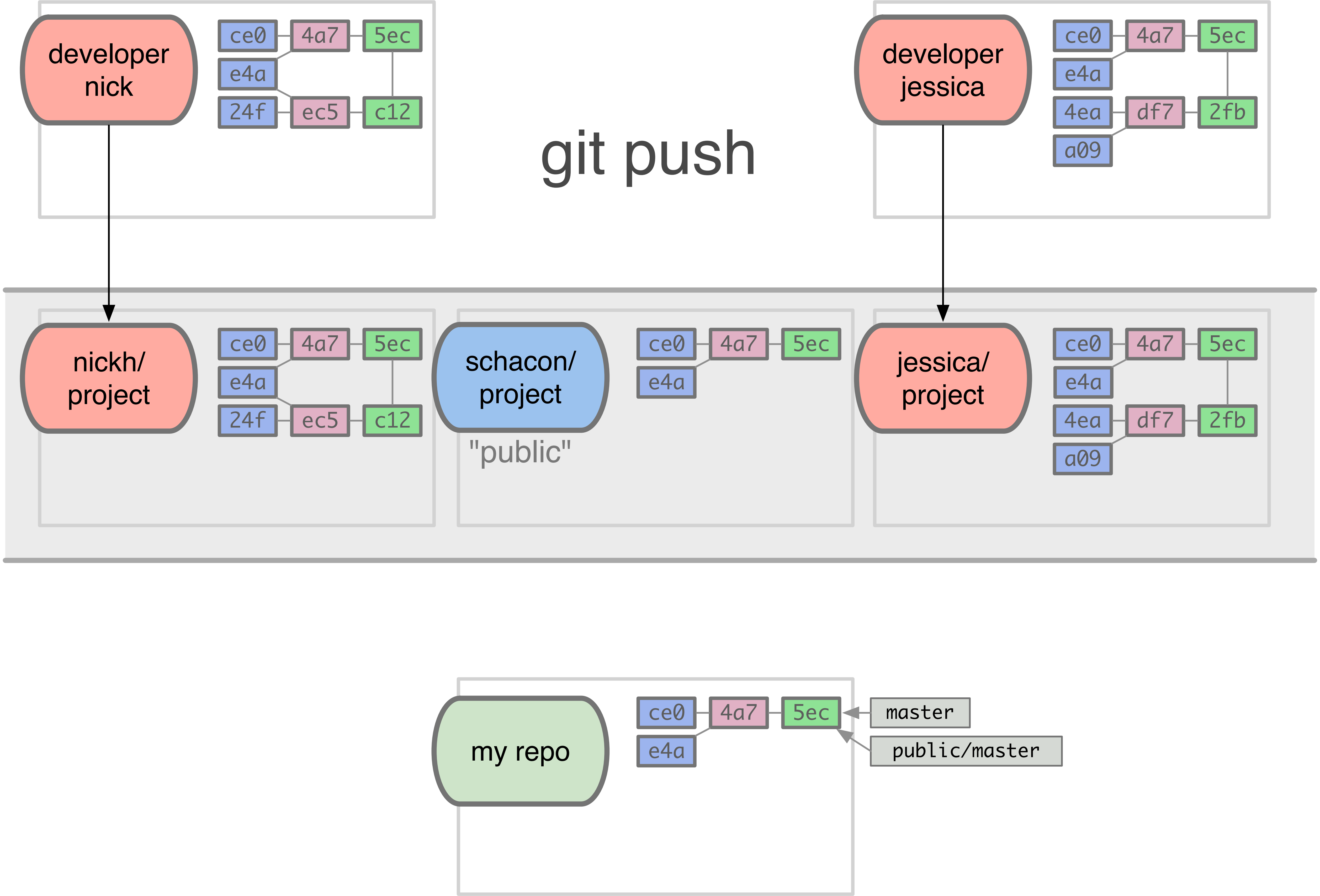


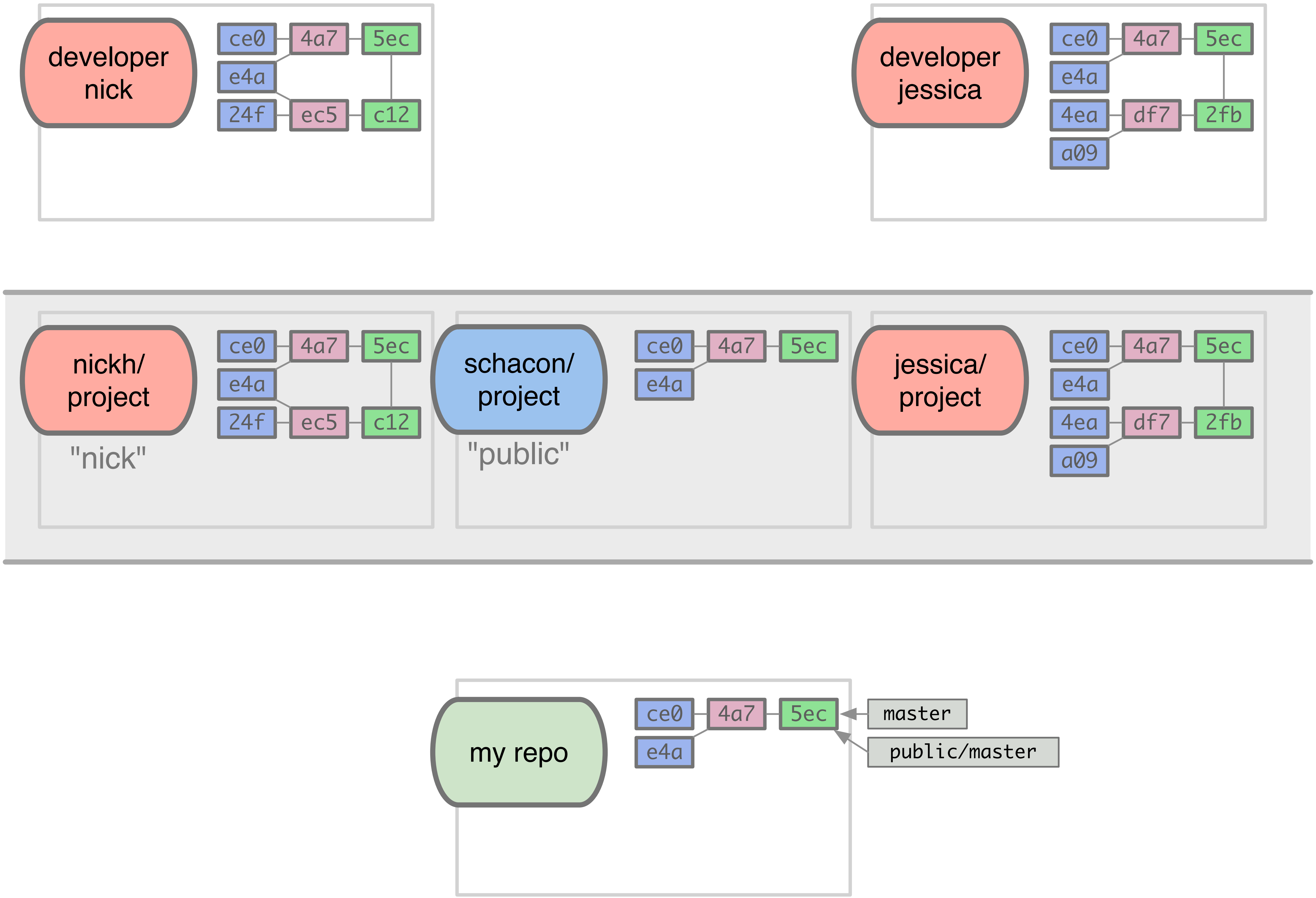
git clone (url)

git commit

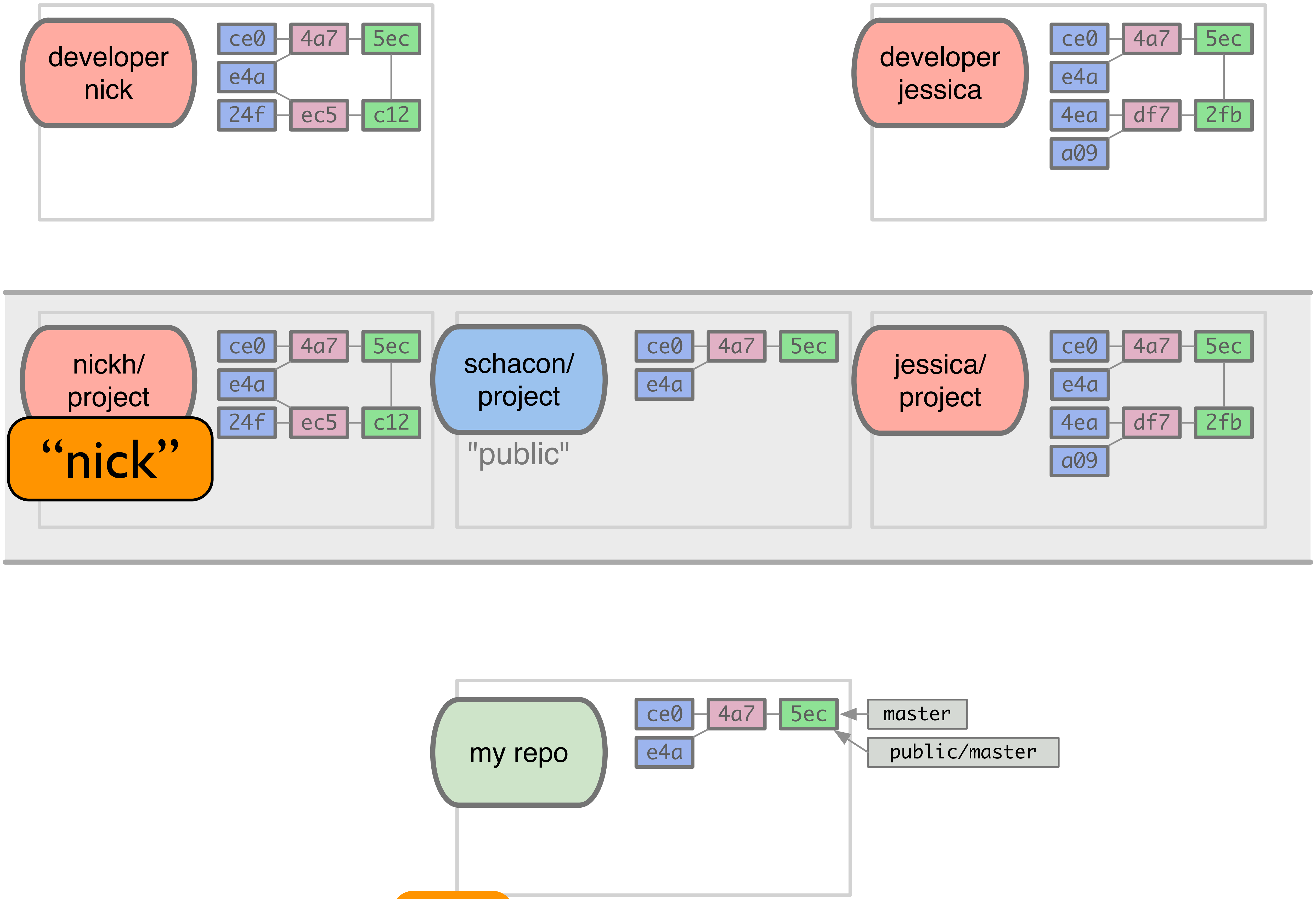

developer nick
ce0
4a7
5ec
e4a
24f
ec5
c12
developer jessica
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
schacon/ project
"public"
ce0
4a7
5ec
e4a
my repo
ce0
4a7
5ec
e4a
master
public/master

git push

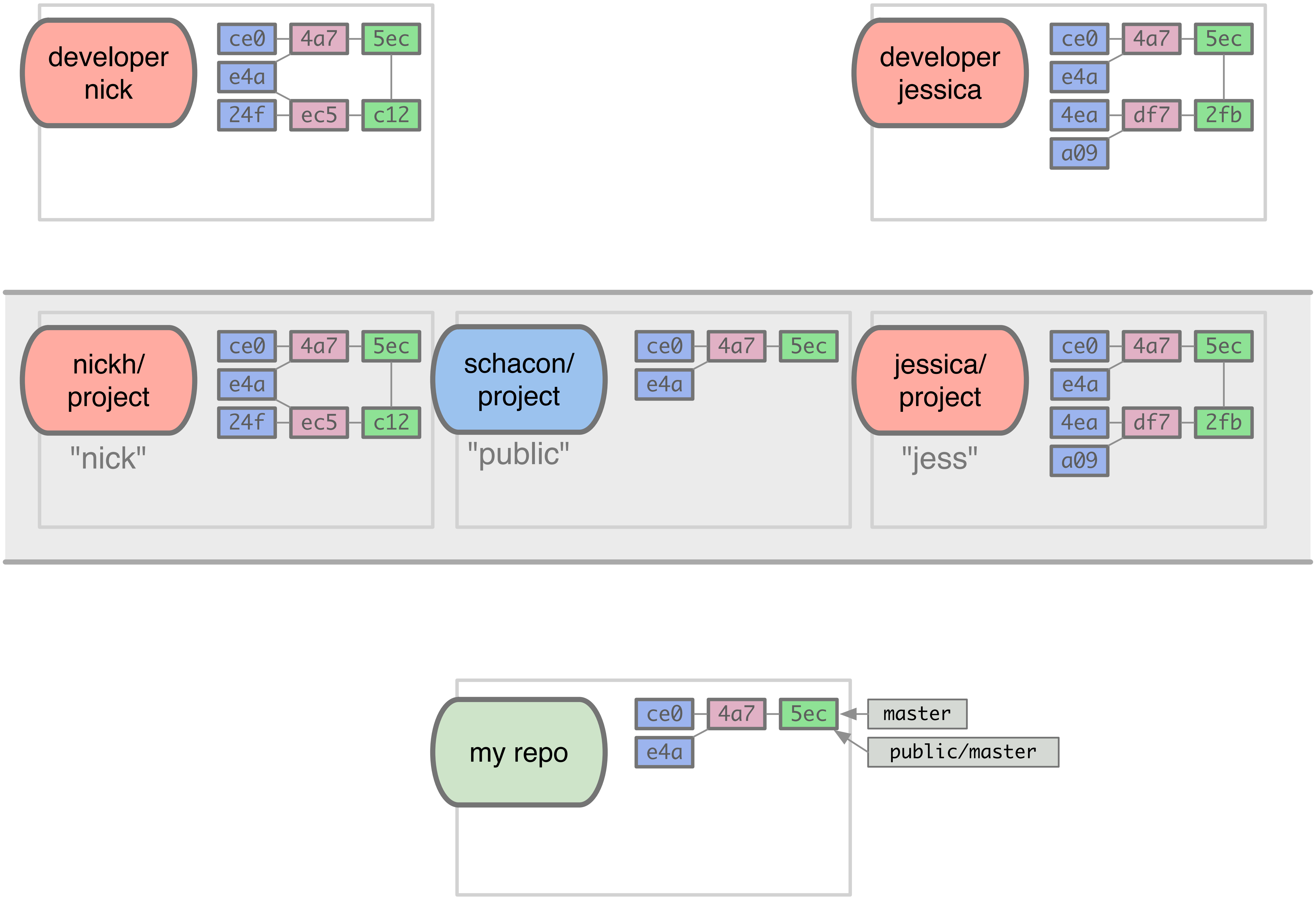

developer nick
ce0
4a7
5ec
e4a
24f
ec5
c12
developer jessica
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
nickh/ project
ce0
4a7
5ec
e4a
24f
ec5
c12
schacon/ project
"public"
ce0
4a7
5ec
e4a
jessica/ project
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
my repo
ce0
4a7
5ec
e4a
master
public/master



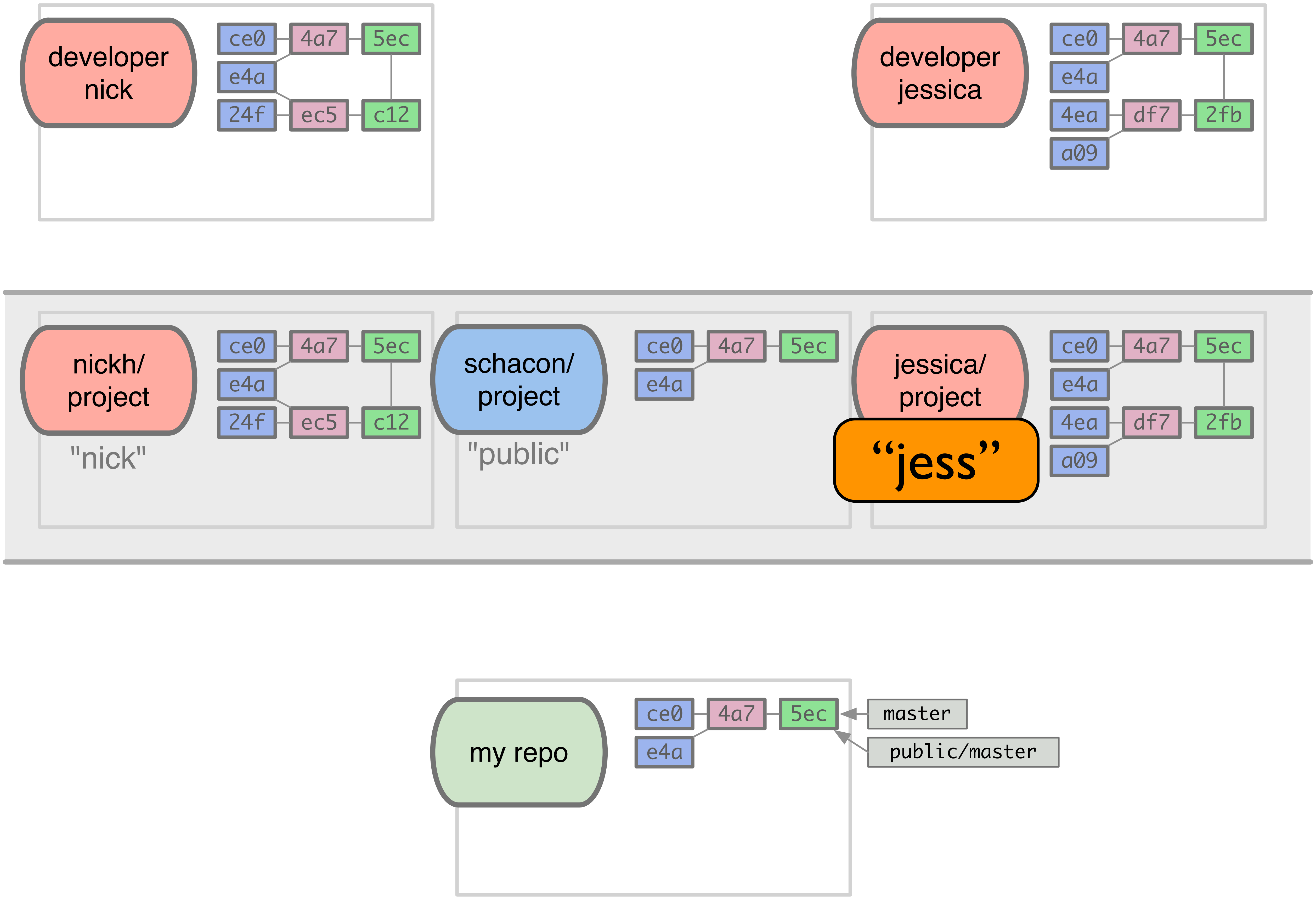
```
git remote add nick git://github.com/nickh/project.git
```



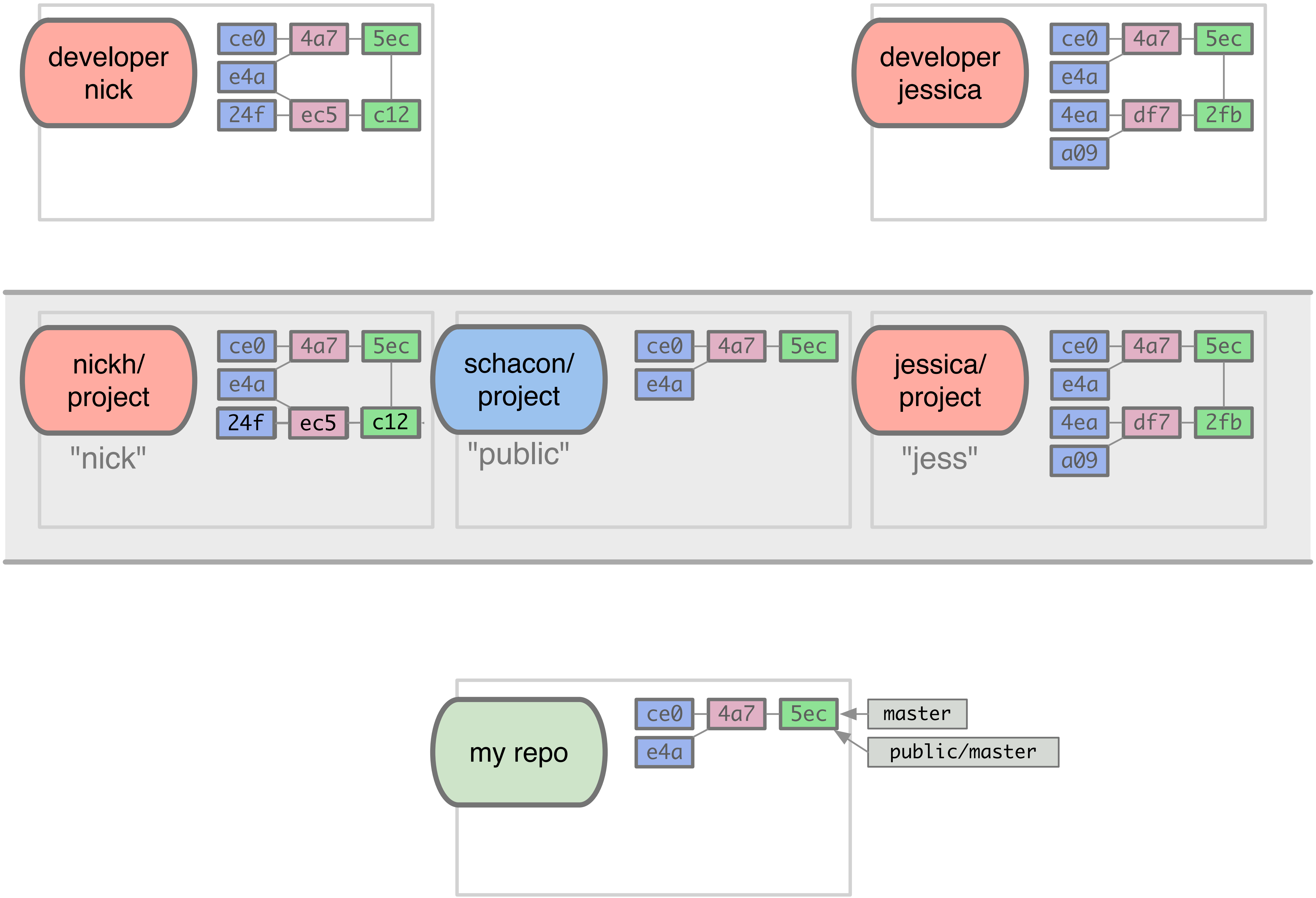
```
git remote add nick git://github.com/nickh/project.git
```



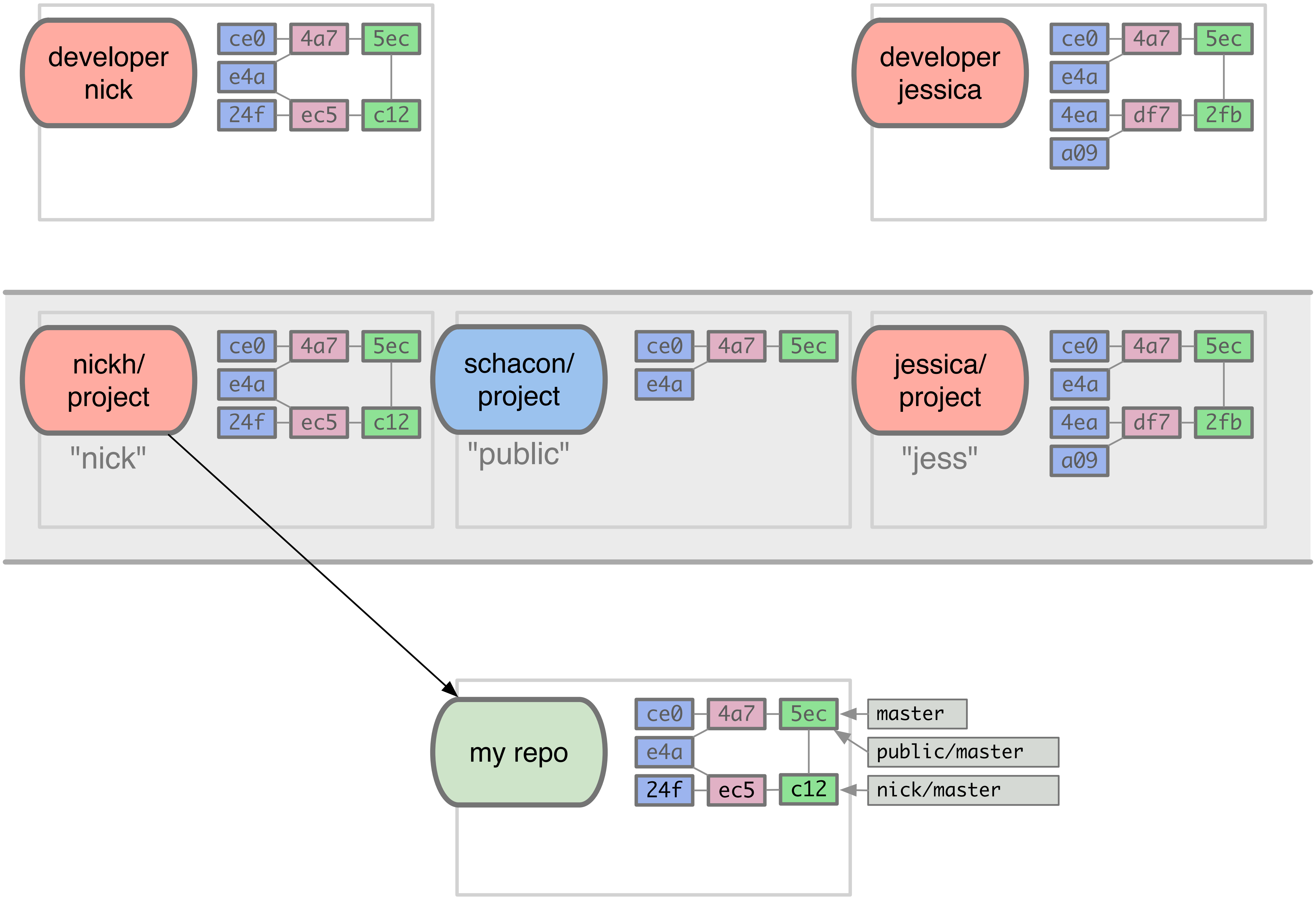
git remote add jess git://github.com/jessica/project.git

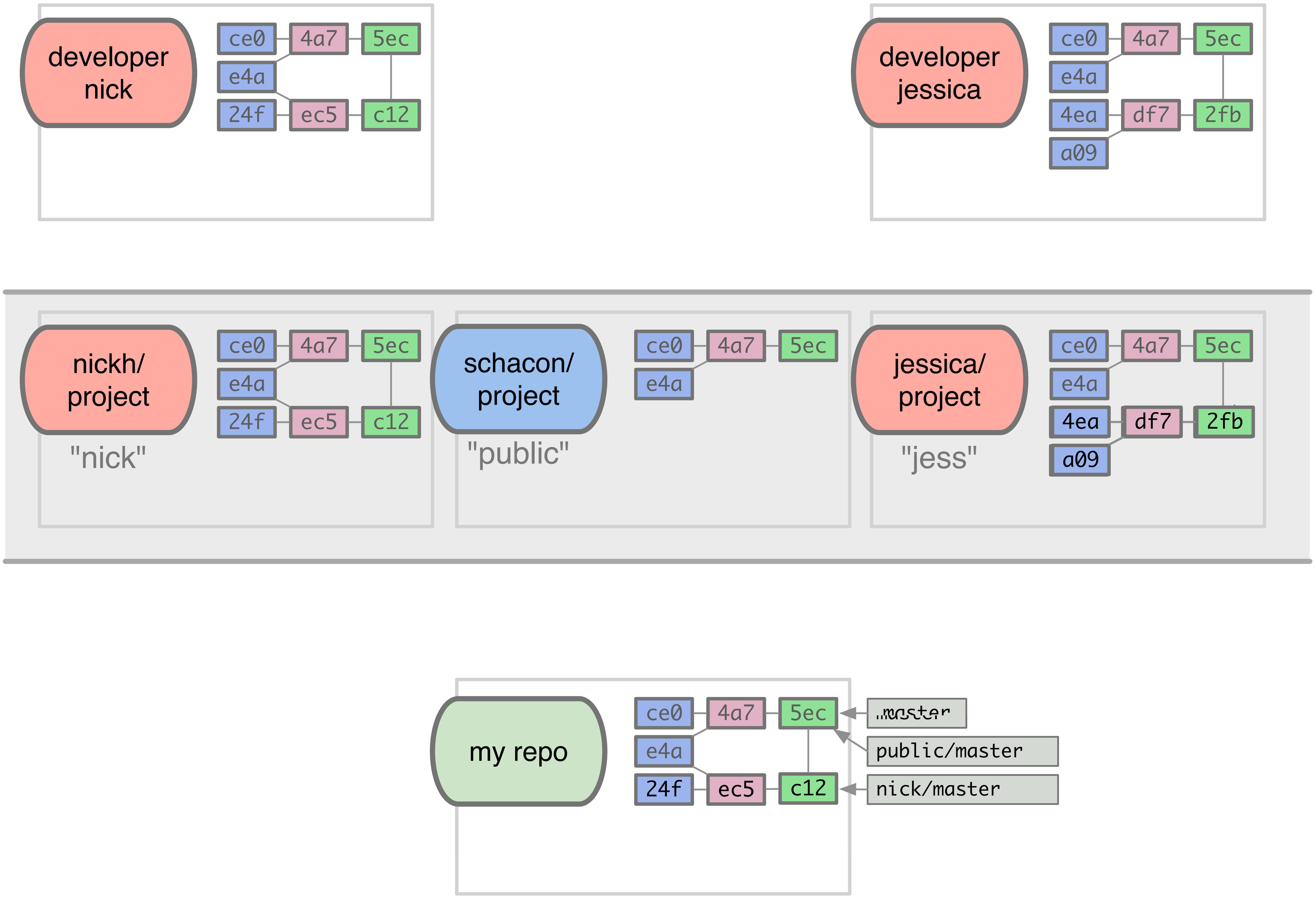


git remote add jess git://github.com/jessica/project.git

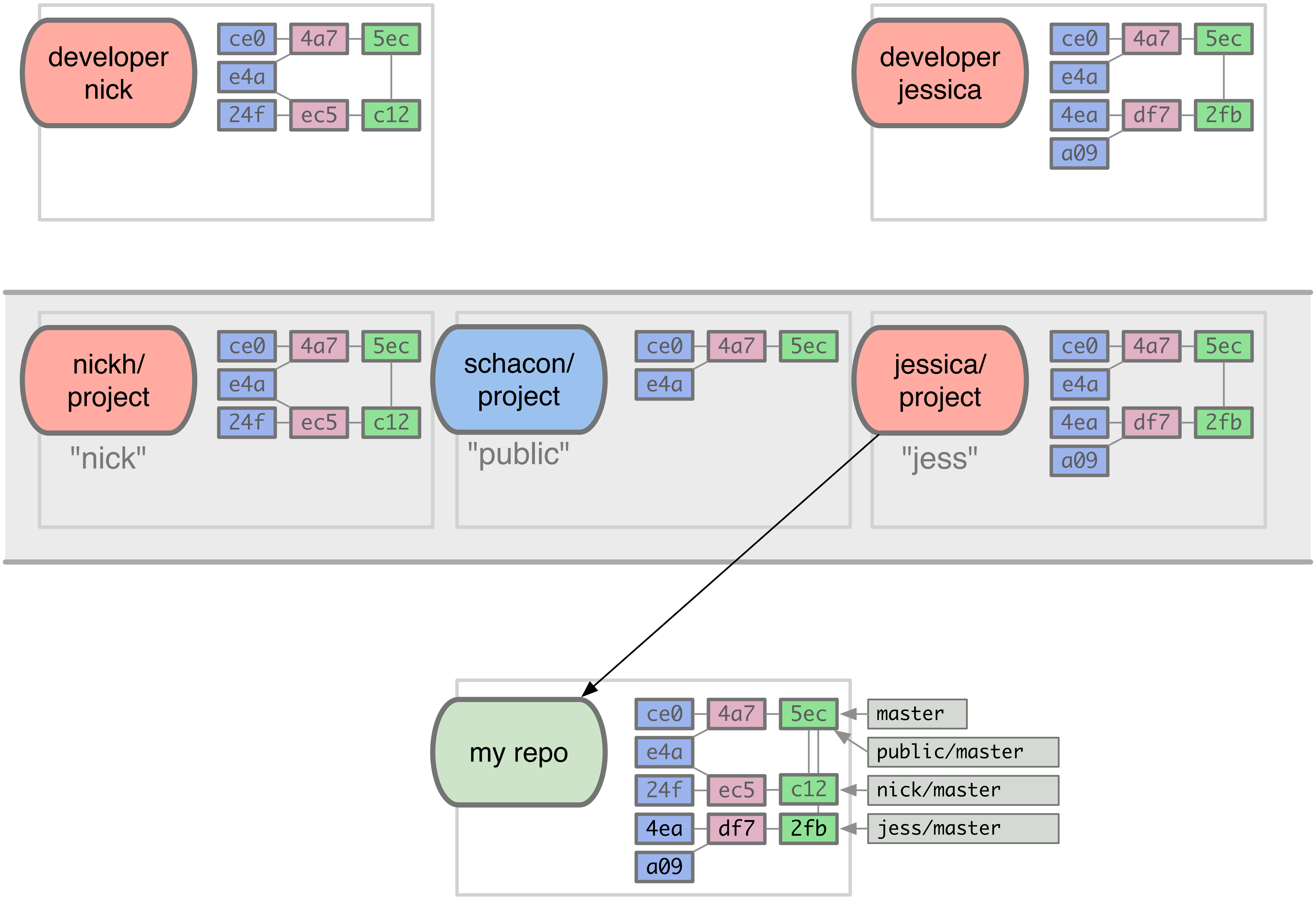


git fetch nick


developer nick
ce0
4a7
5ec
e4a
24f
ec5
c12
developer jessica
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
nickh/ project
"nick"
ce0
4a7
5ec
e4a
24f
ec5
c12
schacon/ project
"public"
ce0
4a7
5ec
e4a
jessica/ project
"jess"
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
my repo
ce0
4a7
5ec
e4a
24f
ec5
c12
master
public/master
nick/master



git fetch jess


developer nick
ce0
4a7
5ec
e4a
24f
ec5
c12
developer jessica
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
nickh/ project
"nick"
ce0
4a7
5ec
e4a
24f
ec5
c12
schacon/ project
"public"
ce0
4a7
5ec
e4a
jessica/ project
"jess"
ce0
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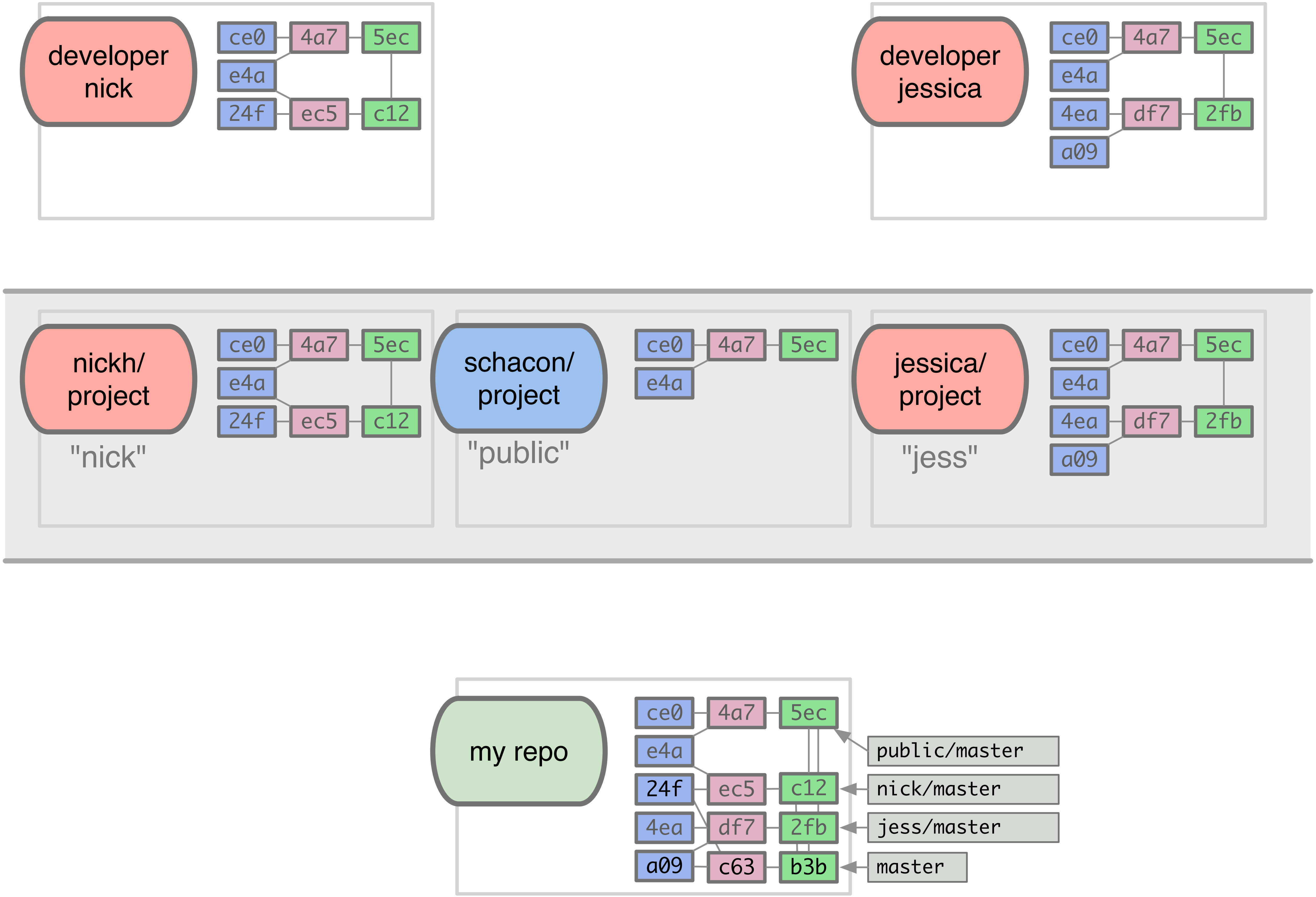
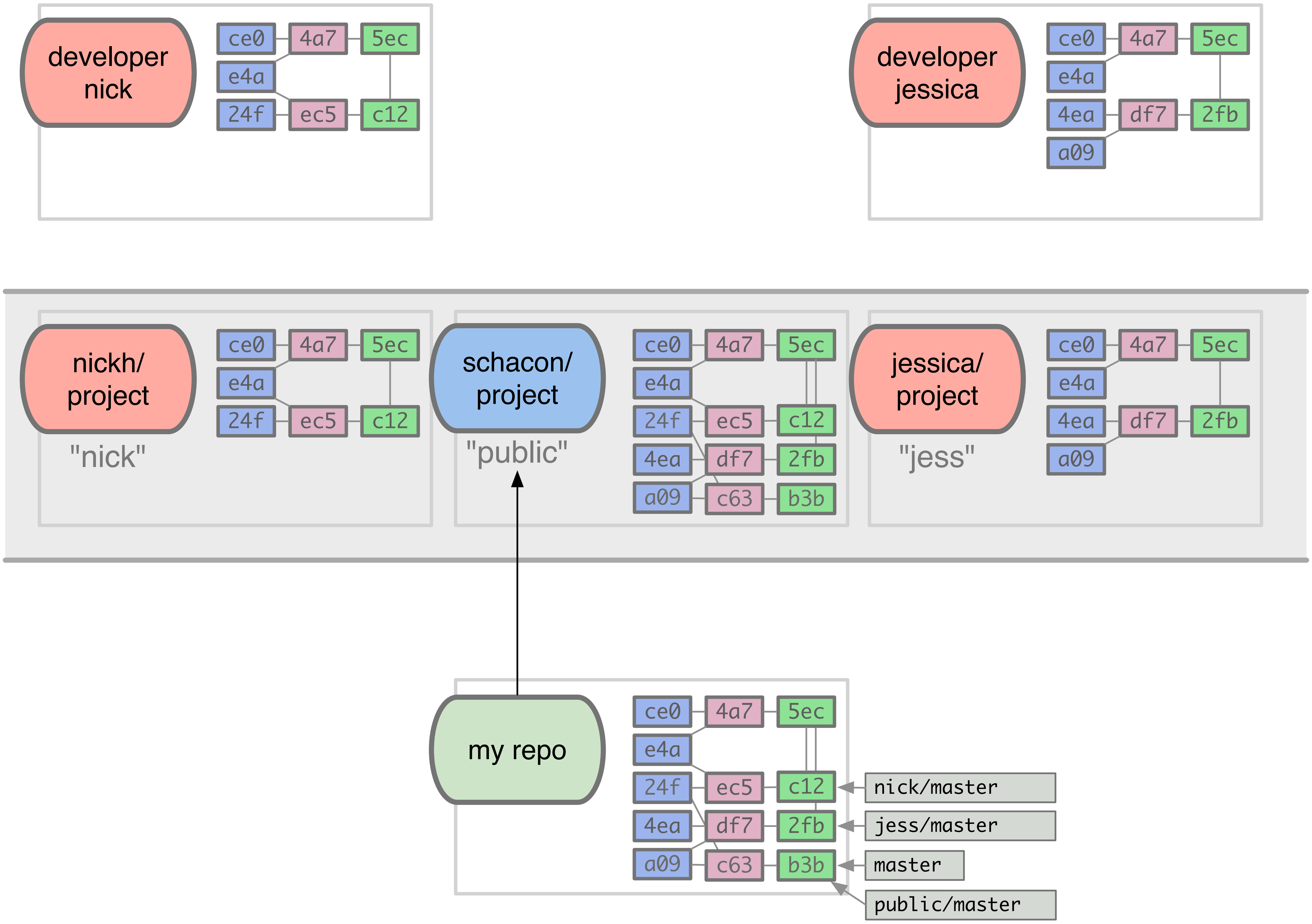
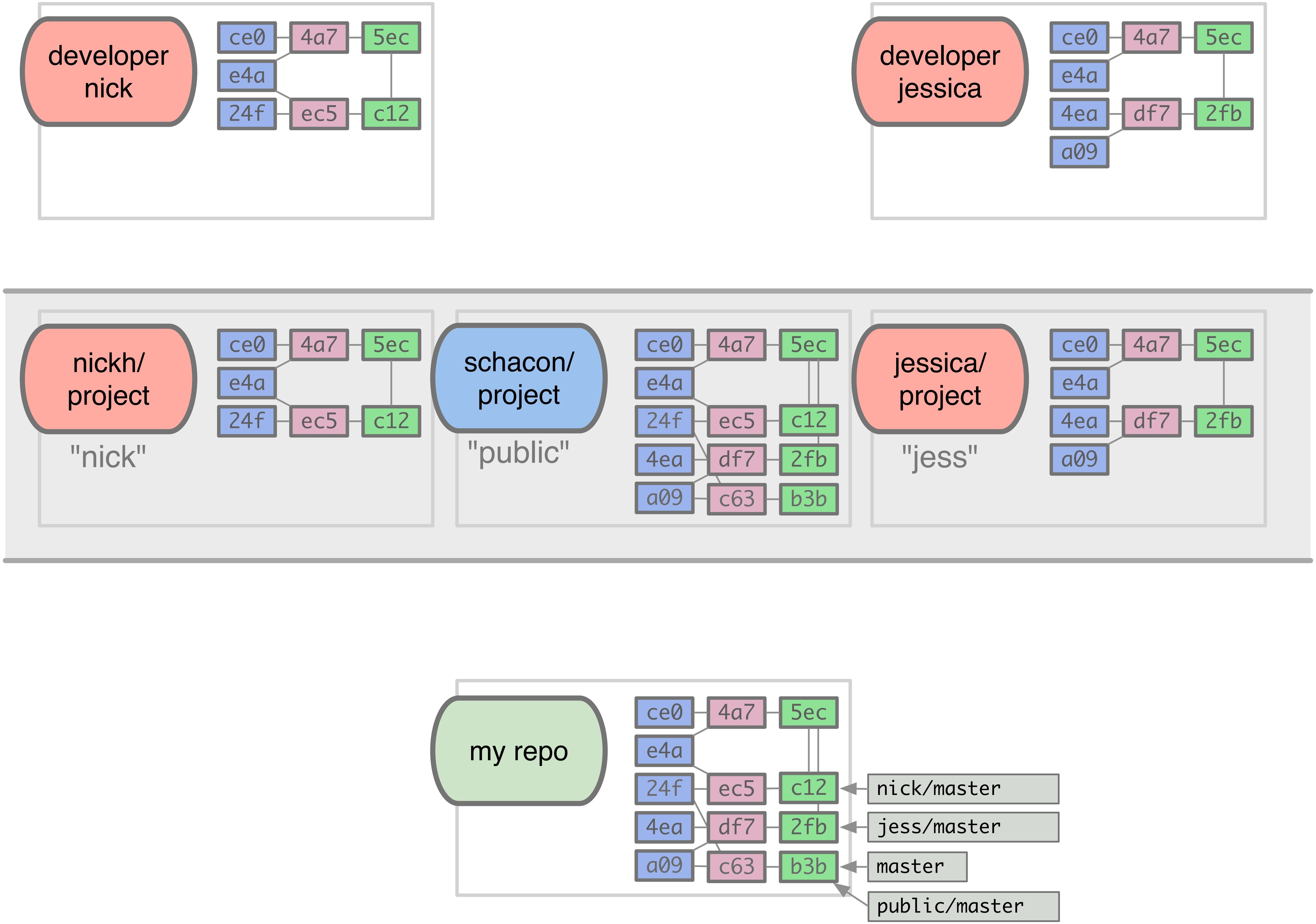
5ec
e4a
4ea
df7
2fb
a09
my repo
ce0
4a7
5ec
e4a
24f
ec5
c12
4ea
df7
2fb
a09
master
public/master
nick/master
jess/master

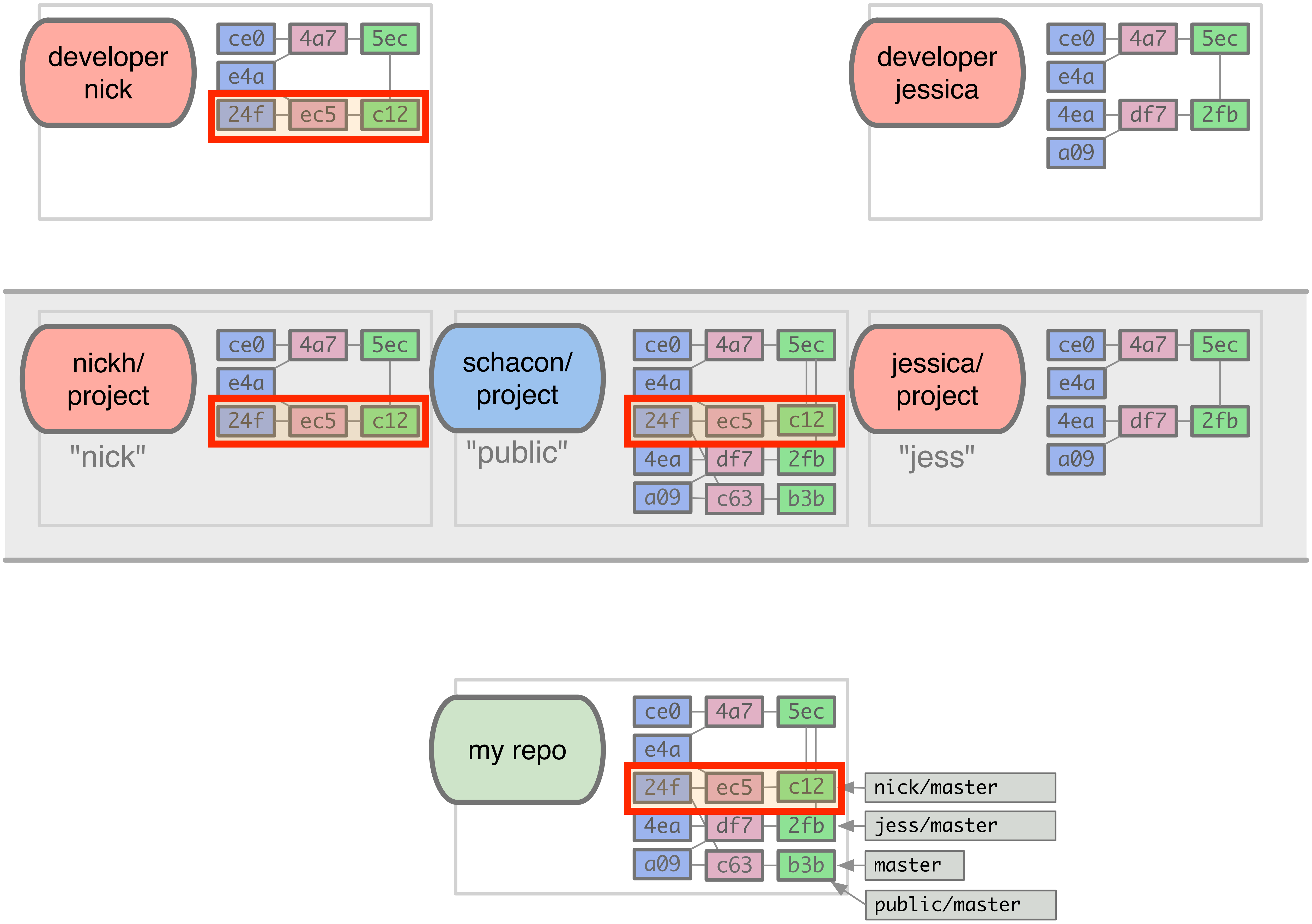


git merge nick jess



git push public


developer nick
ce0
4a7
5ec
e4a
24f
ec5
c12
developer jessica
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
nickh/ project
"nick"
ce0
4a7
5ec
e4a
24f
ec5
c12
schacon/ project
"public"
ce0
4a7
5ec
e4a
24f
ec5
c12
4ea
df7
2fb
a09
c63
b3b
jessica/ project
"jess"
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
my repo
ce0
4a7
5ec
e4a
24f
ec5
c12
4ea
df7
2fb
a09
c63
b3b
nick/master
jess/master
master
public/master


developer nick
ce0
4a7
5ec
e4a
24f
ec5
c12
developer jessica
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
nickh/ project
"nick"
ce0
4a7
5ec
e4a
24f
ec5
c12
schacon/ project
"public"
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4a7
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df7
2fb
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c63
b3b
jessica/ project
"jess"
ce0
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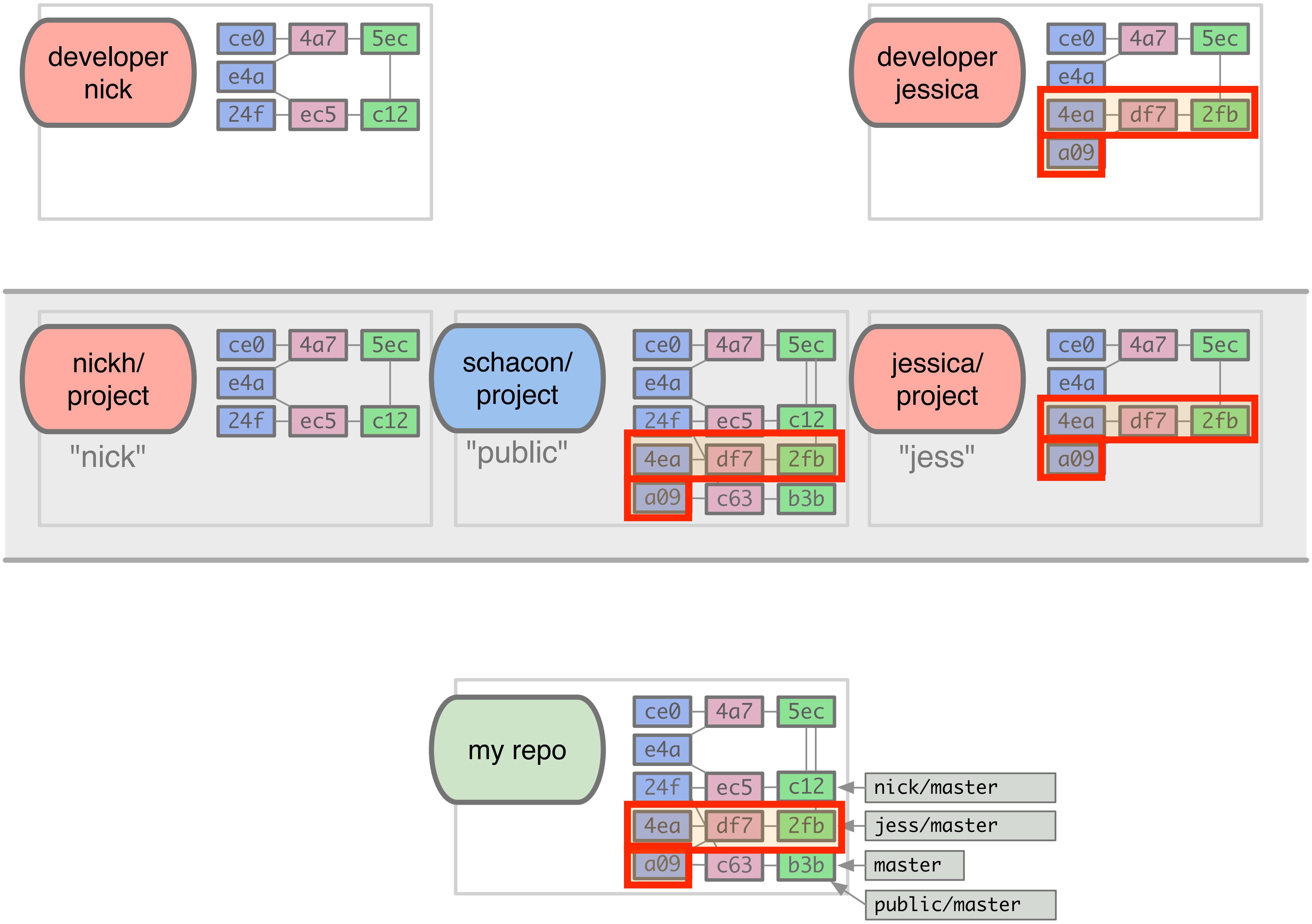
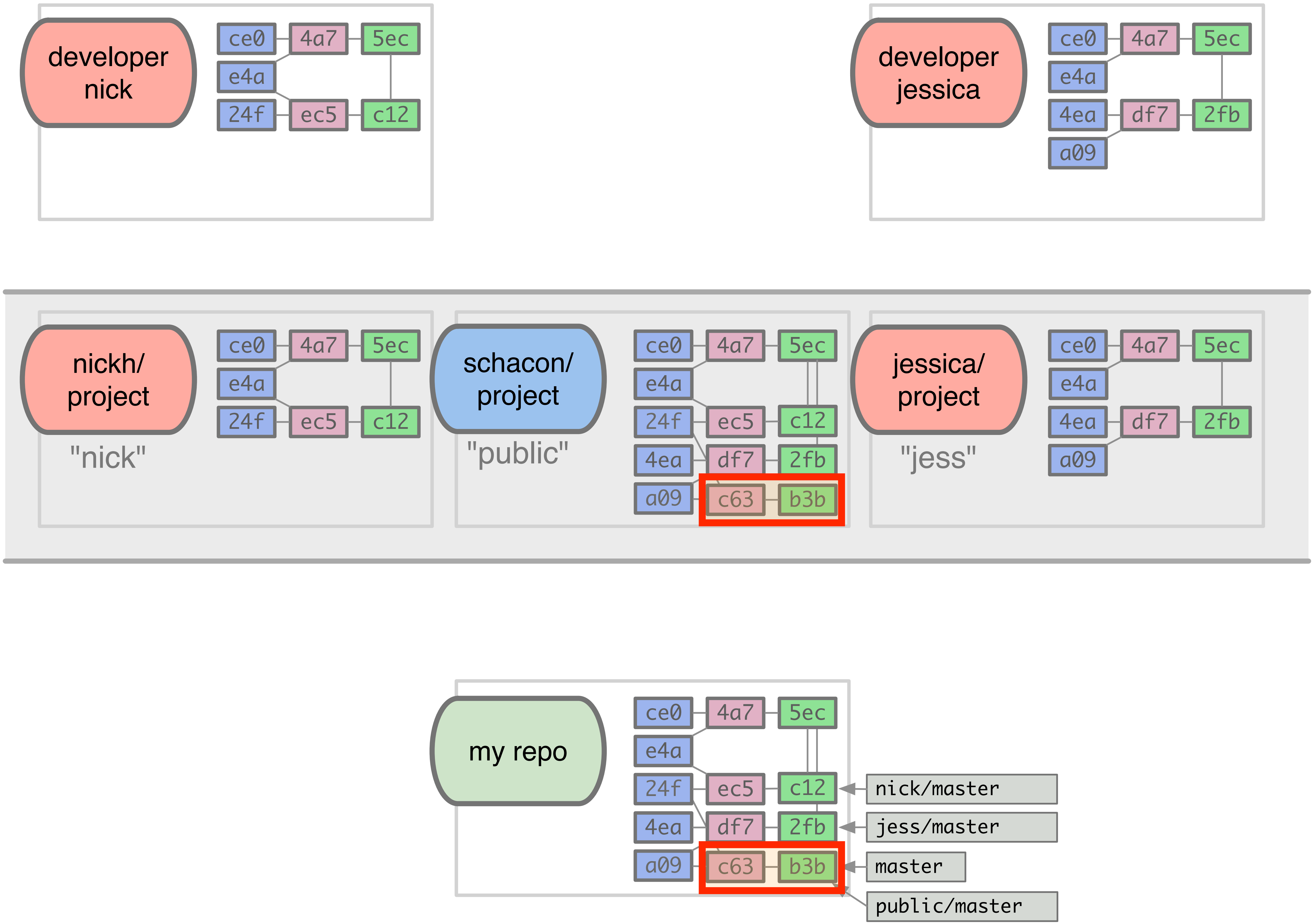
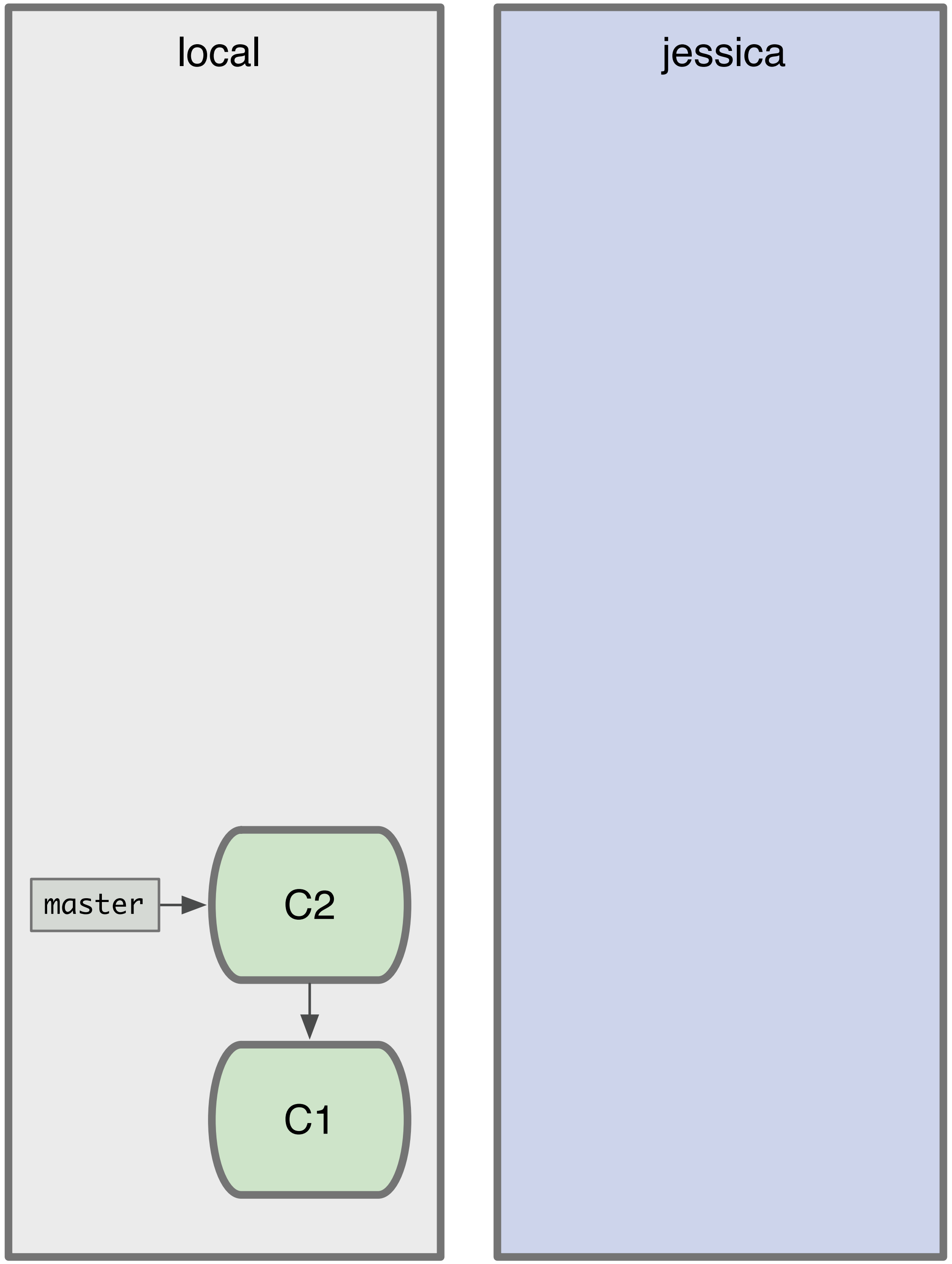
4ea
df7
2fb
a09
my repo
ce0
4a7
5ec
e4a
24f
ec5
c12
4ea
df7
2fb
a09
c63
b3b
nick/master
jess/master
master
public/master

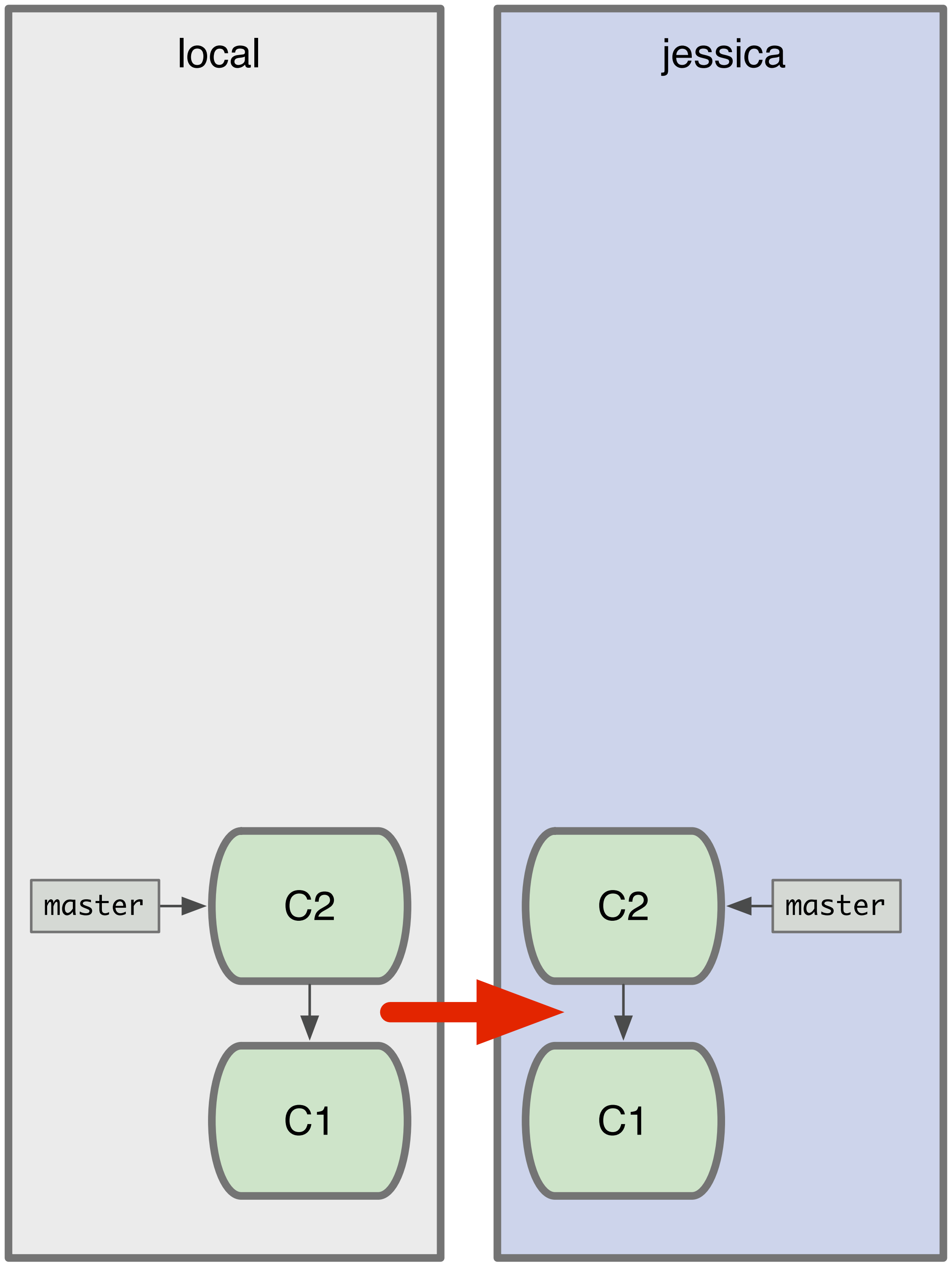

developer nick
ce0
4a7
5ec
e4a
24f
ec5
c12
developer jessica
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
nickh/ project
"nick"
ce0
4a7
5ec
e4a
24f
ec5
c12
schacon/ project
"public"
ce0
4a7
5ec
e4a
24f
ec5
c12
4ea
df7
2fb
a09
c63
b3b
jessica/ project
"jess"
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
my repo
ce0
4a7
5ec
e4a
24f
ec5
c12
4ea
df7
2fb
a09
c63
b3b
nick/master
jess/master
master
public/master



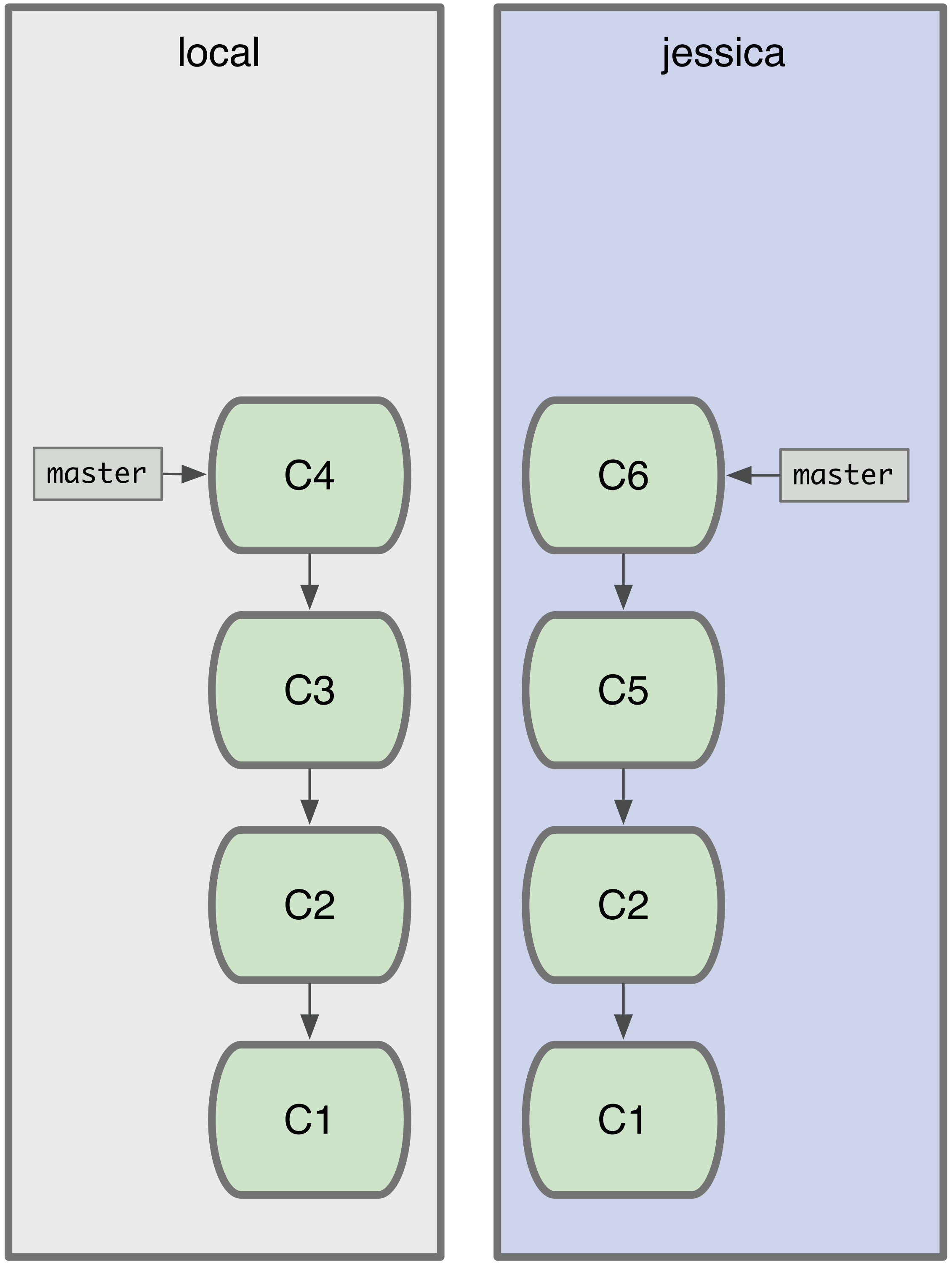
developer nick
ce0
4a7
5ec
e4a
24f
ec5
c12
developer jessica
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
nickh/ project
"nick"
ce0
4a7
5ec
e4a
24f
ec5
c12
schacon/ project
"public"
ce0
4a7
5ec
e4a
24f
ec5
c12
4ea
df7
2fb
a09
c63
b3b
jessica/ project
"jess"
ce0
4a7
5ec
e4a
4ea
df7
2fb
a09
my repo
ce0
4a7
5ec
e4a
24f
ec5
c12
4ea
df7
2fb
a09
c63
b3b
nick/master
jess/master
master
public/master

rebasing


local
jessica
master
C2
C1

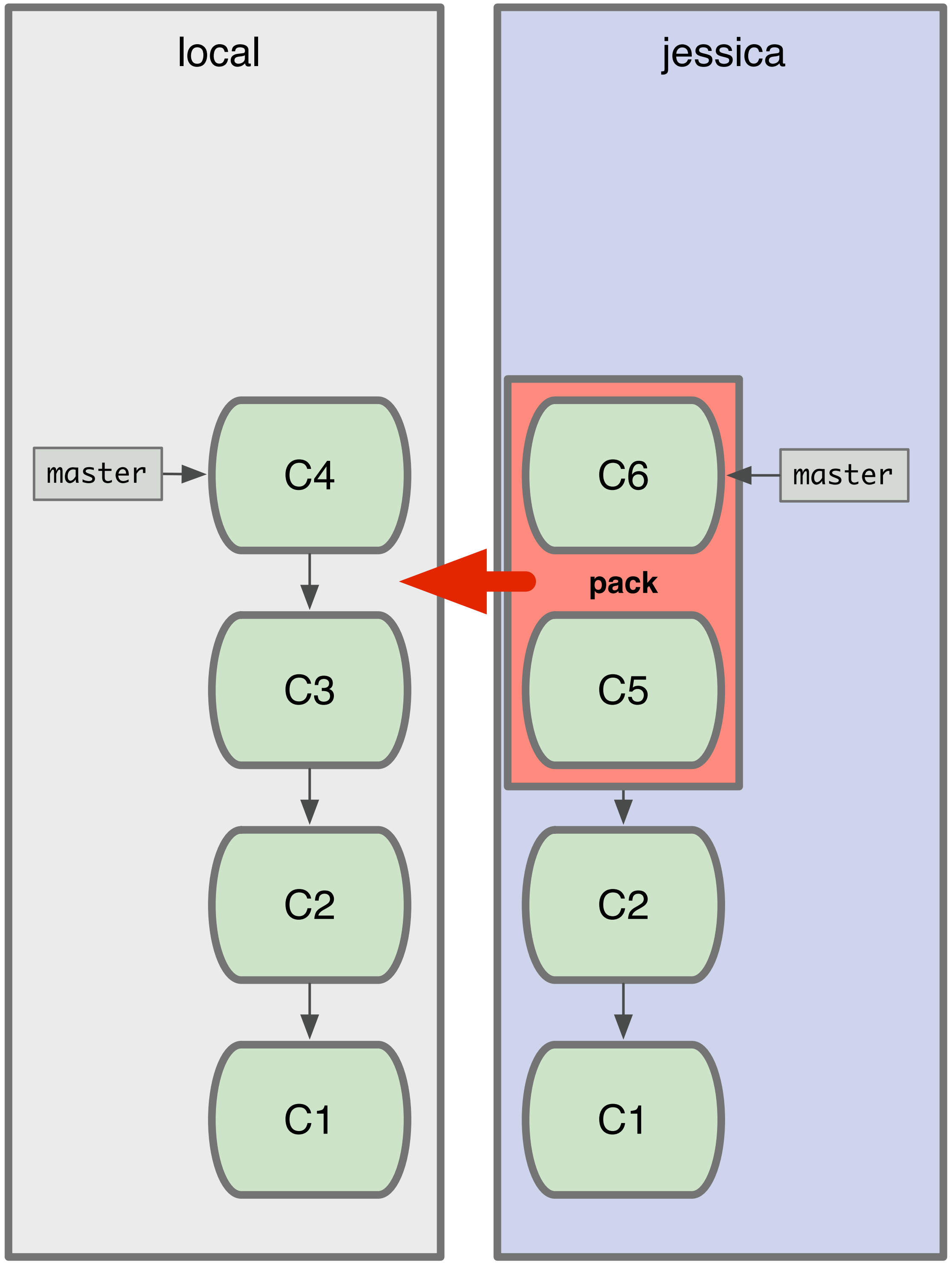


git clone

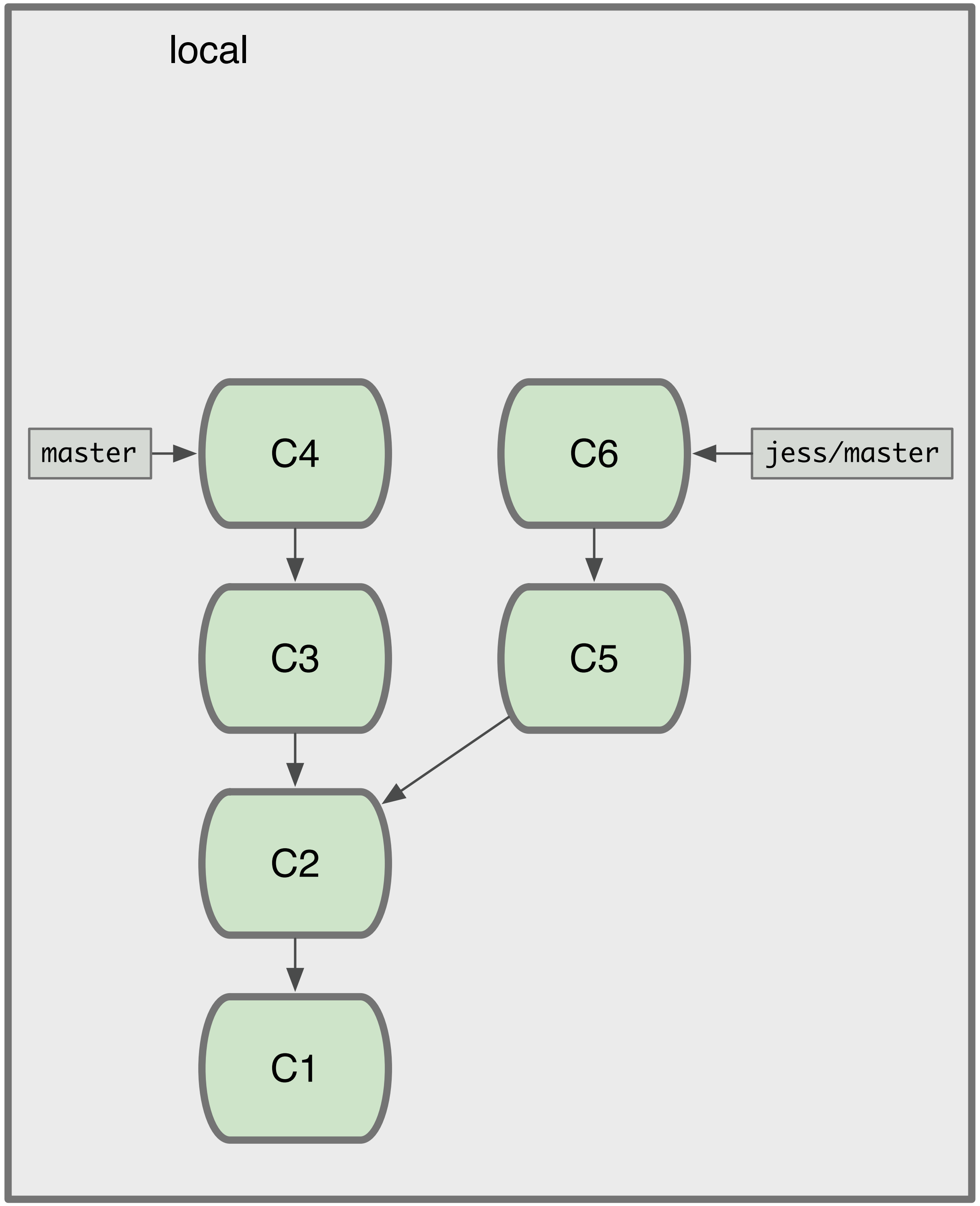


```
git commit

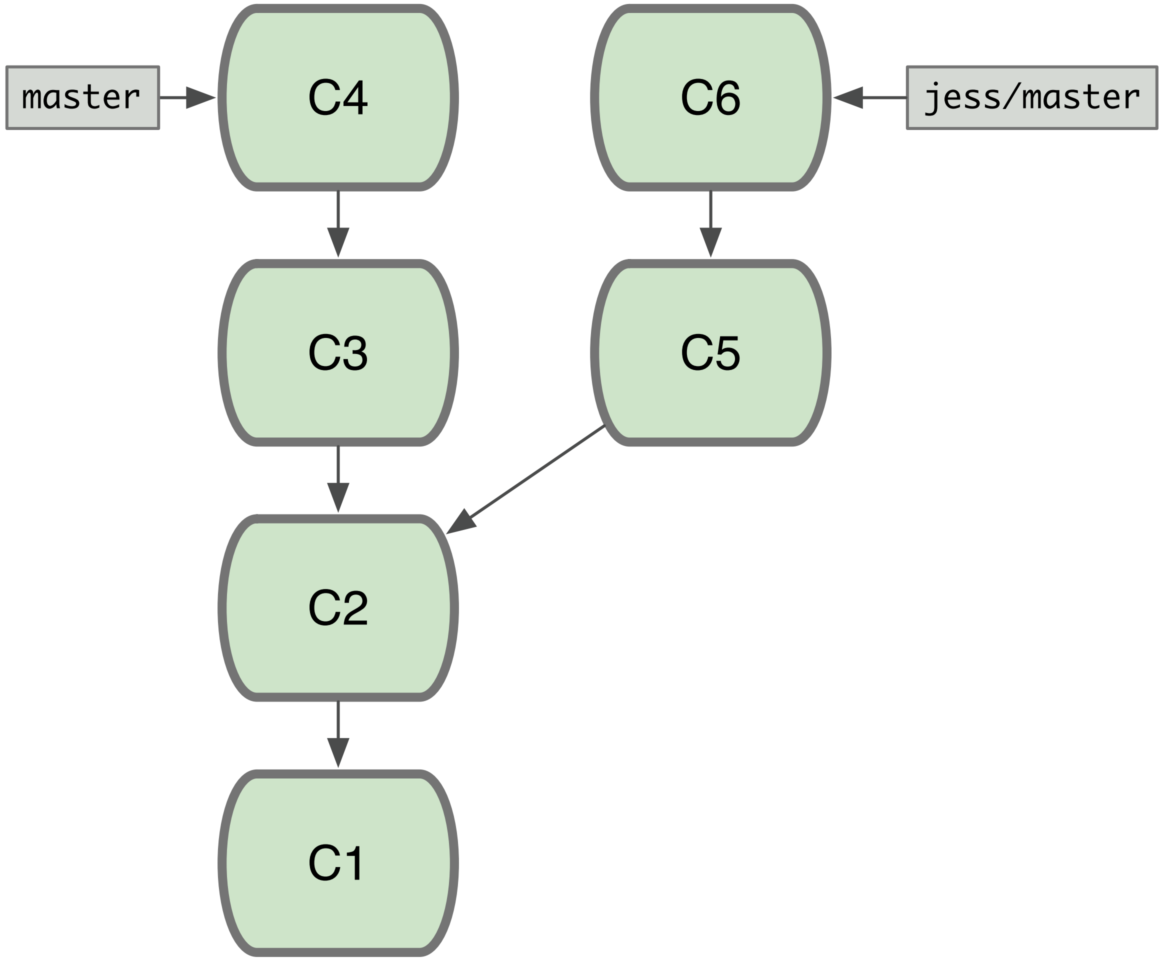
git commit
```



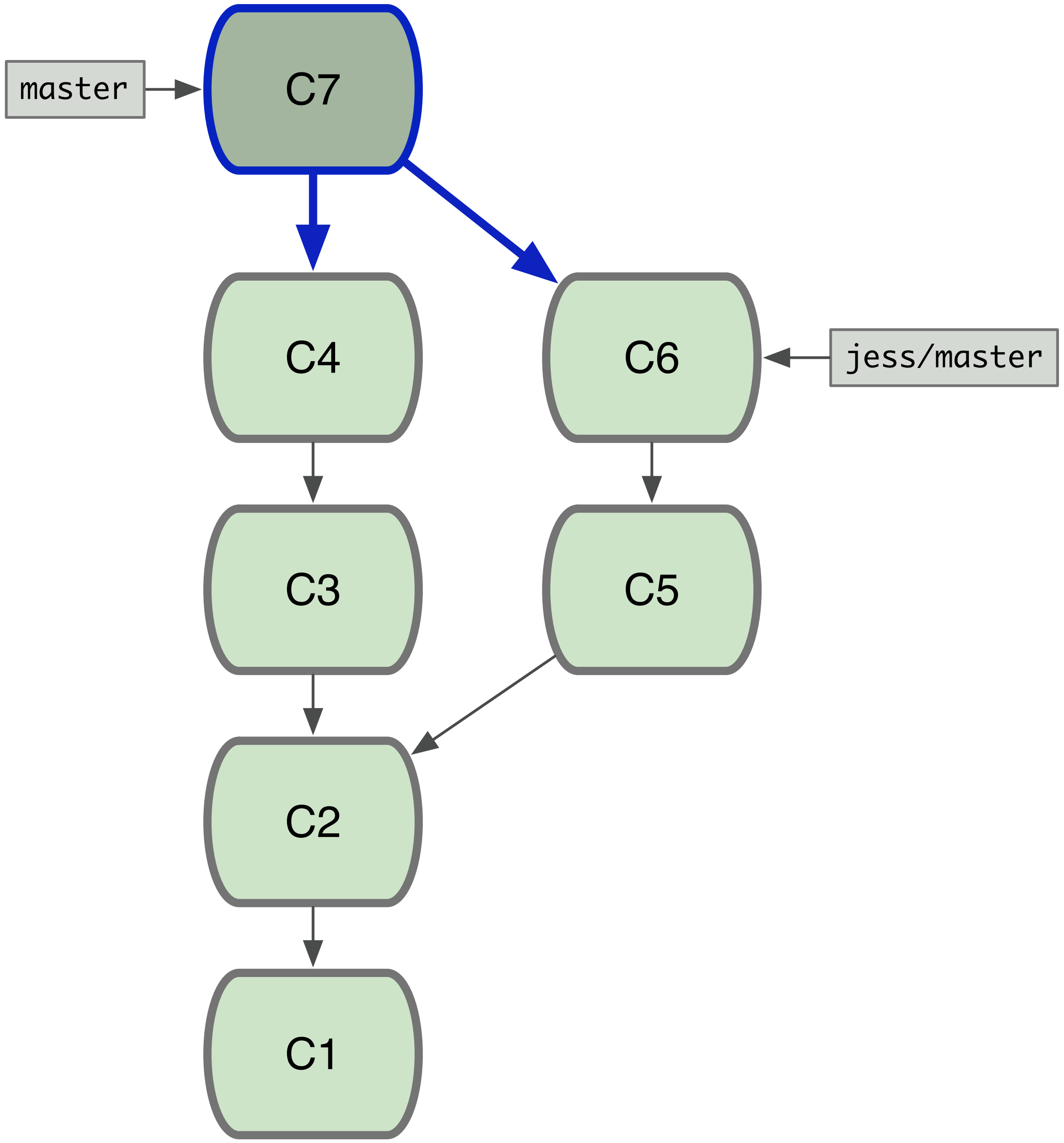
git fetch jess


local
master
C4
C6
jess/master
C3
C5
C2
C1

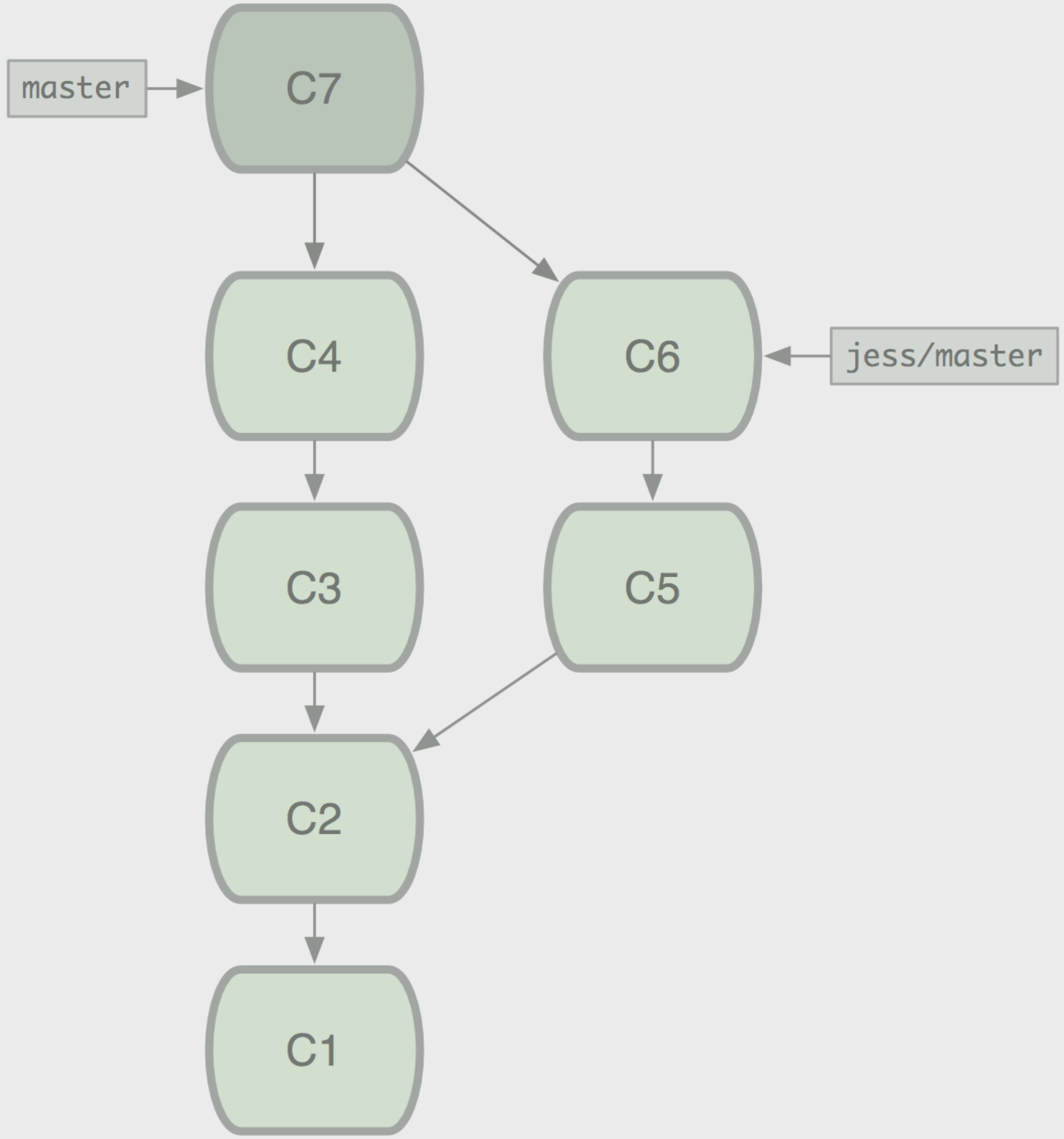
git merge



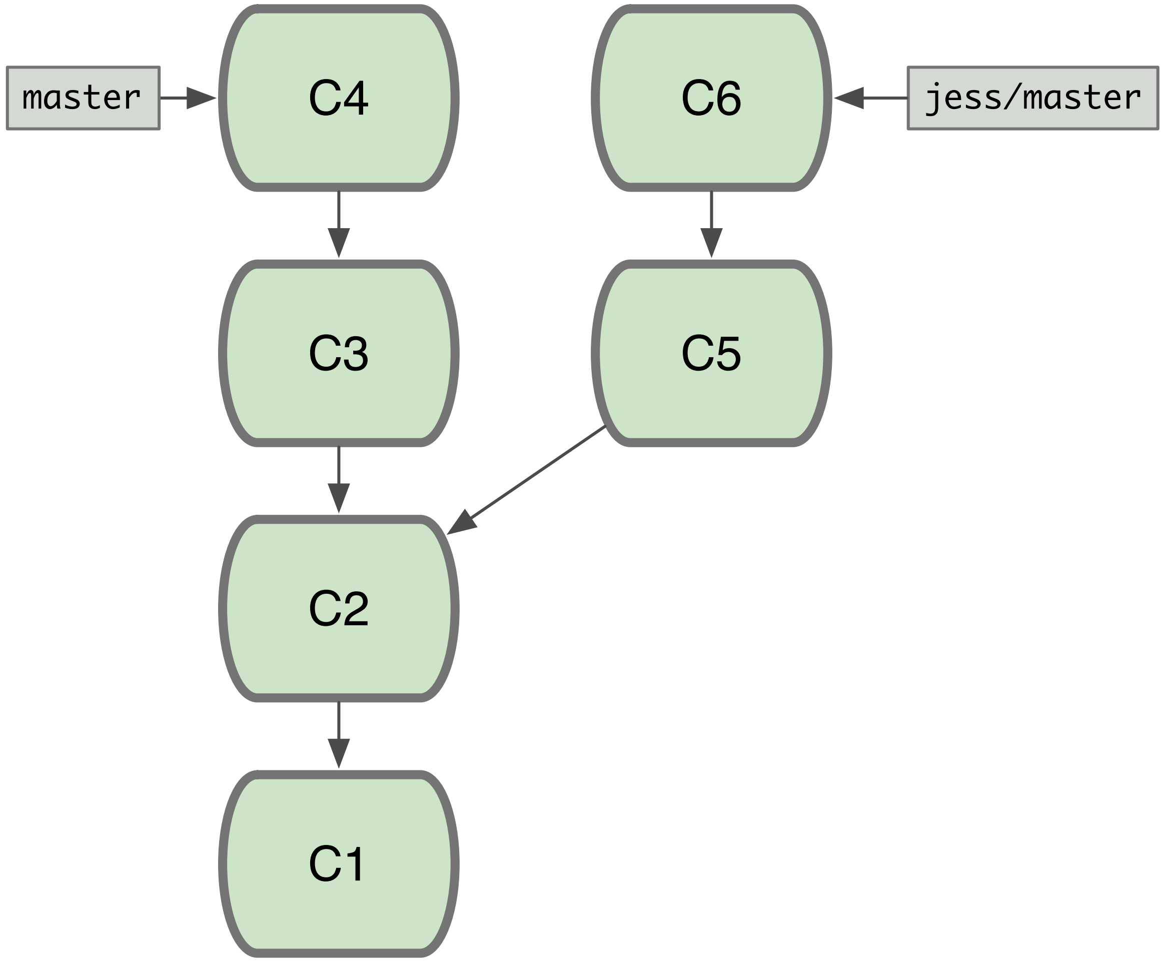
git merge



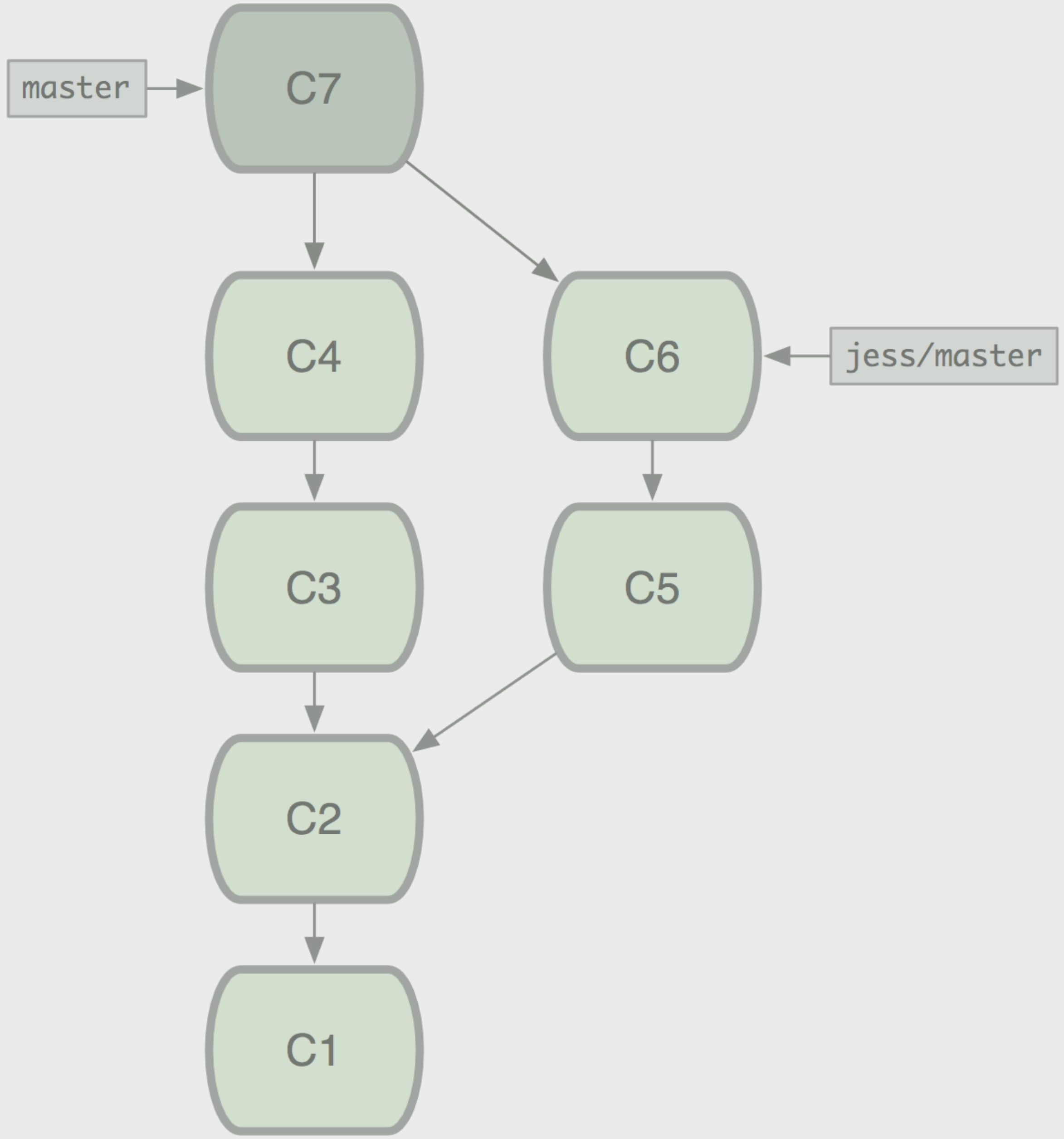
git merge



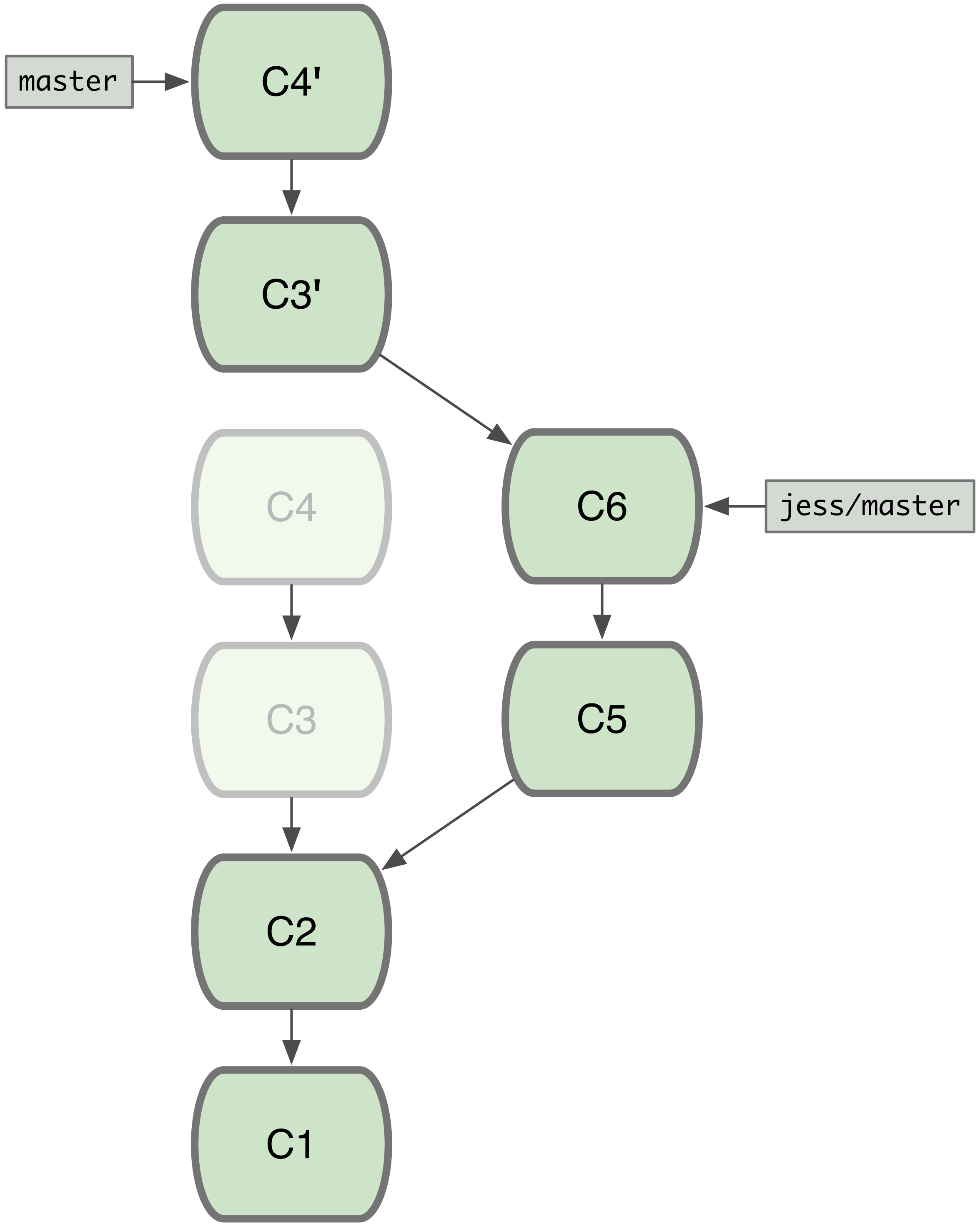
git rebase



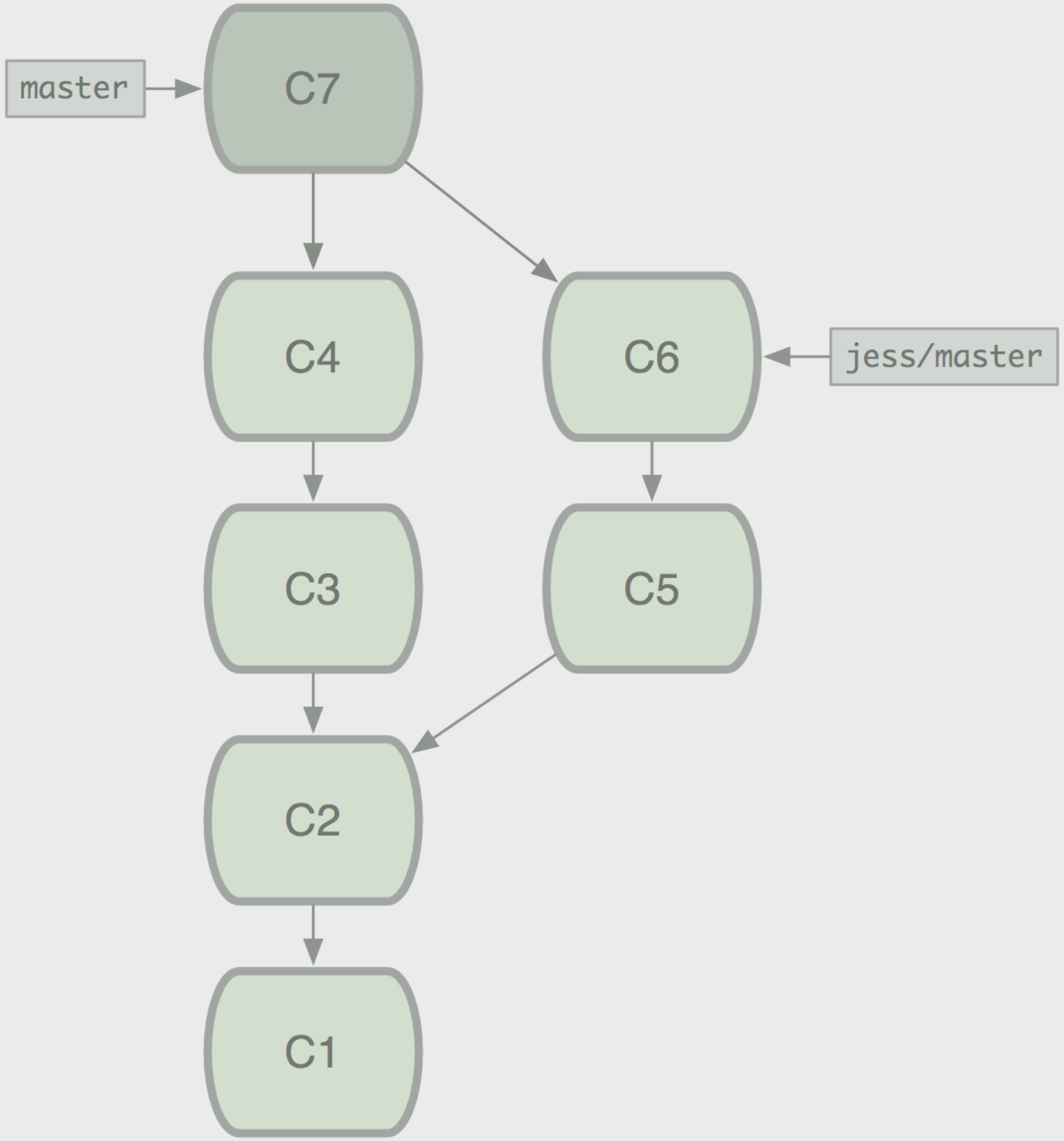
git merge



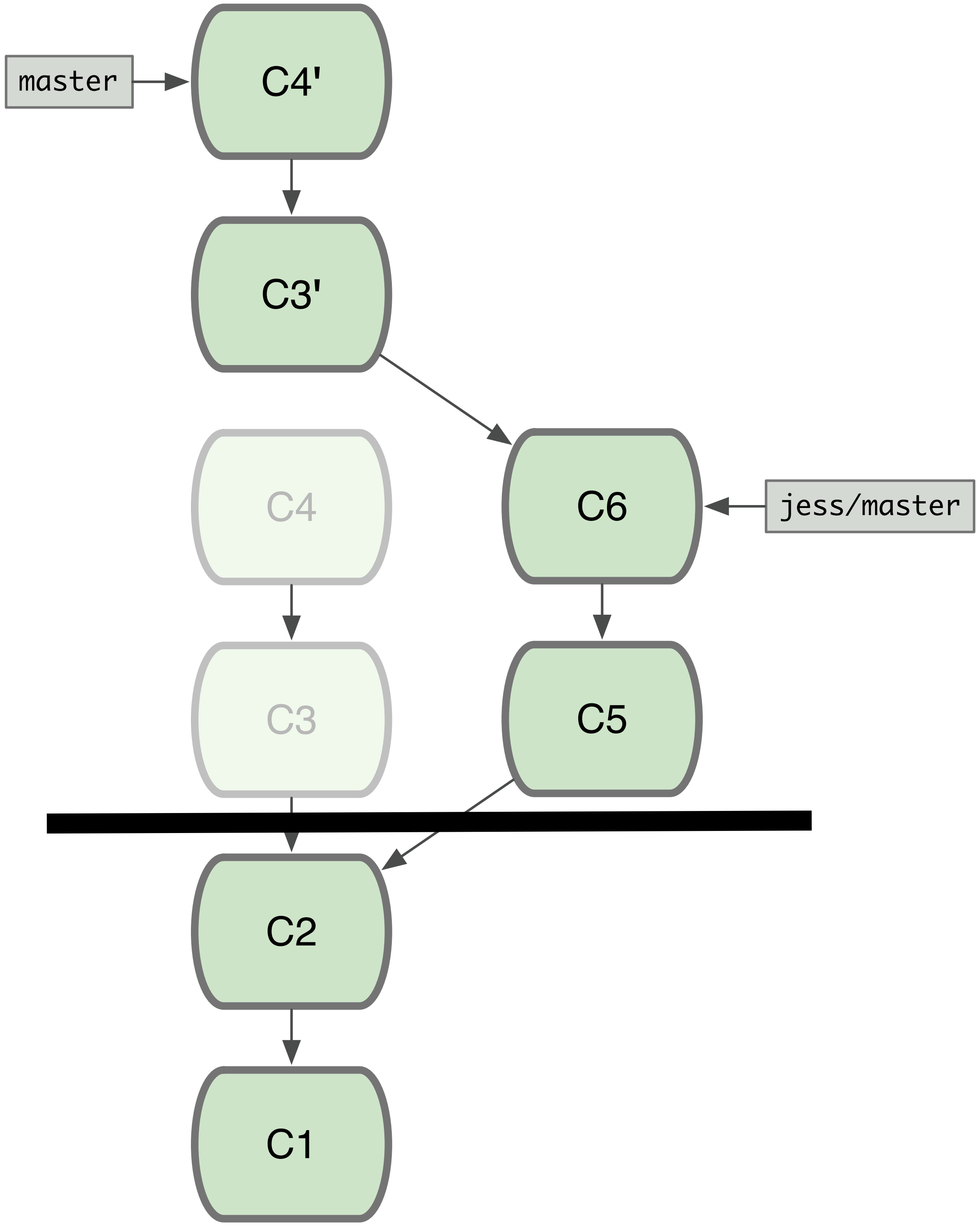
git rebase



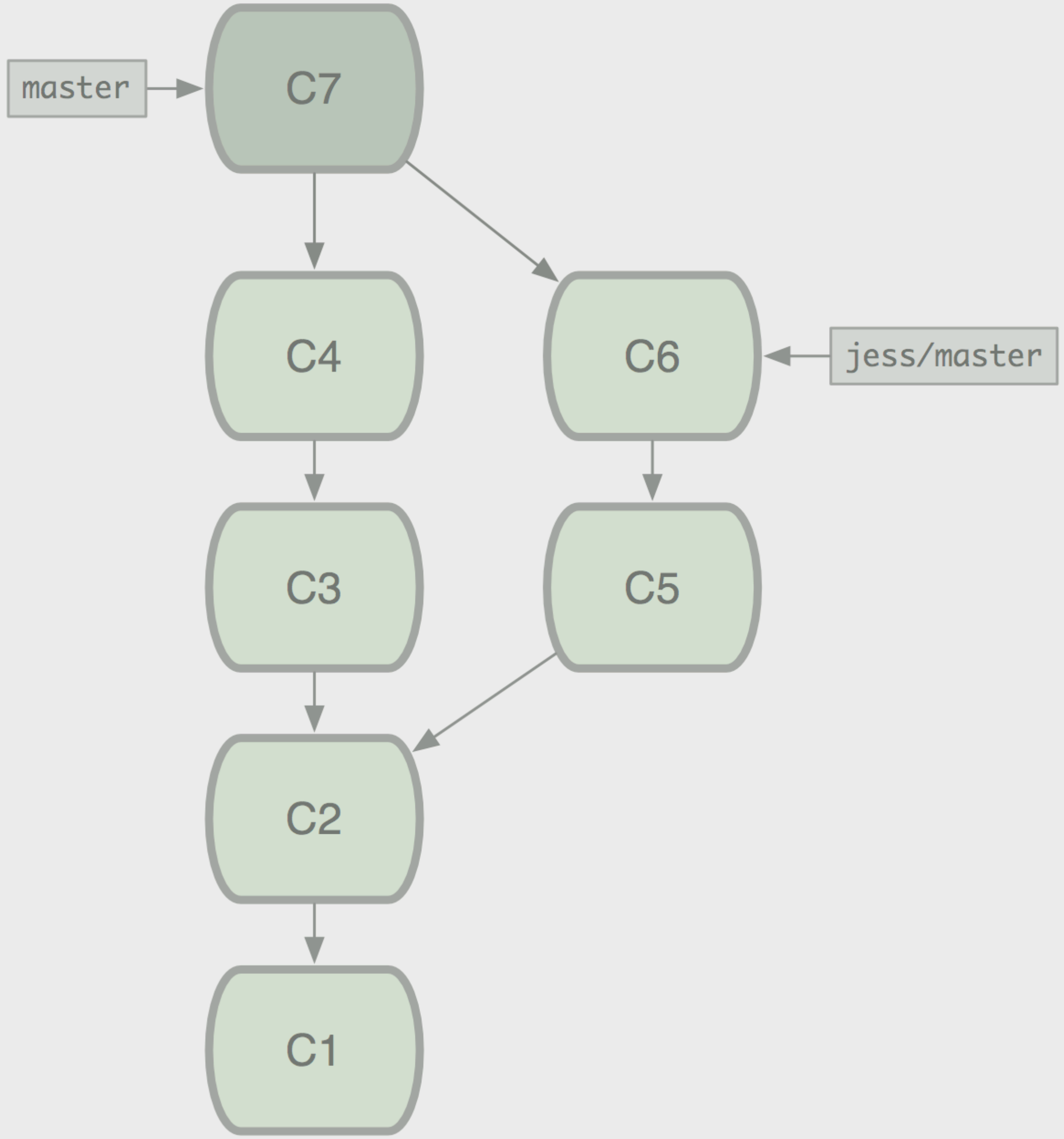
git merge



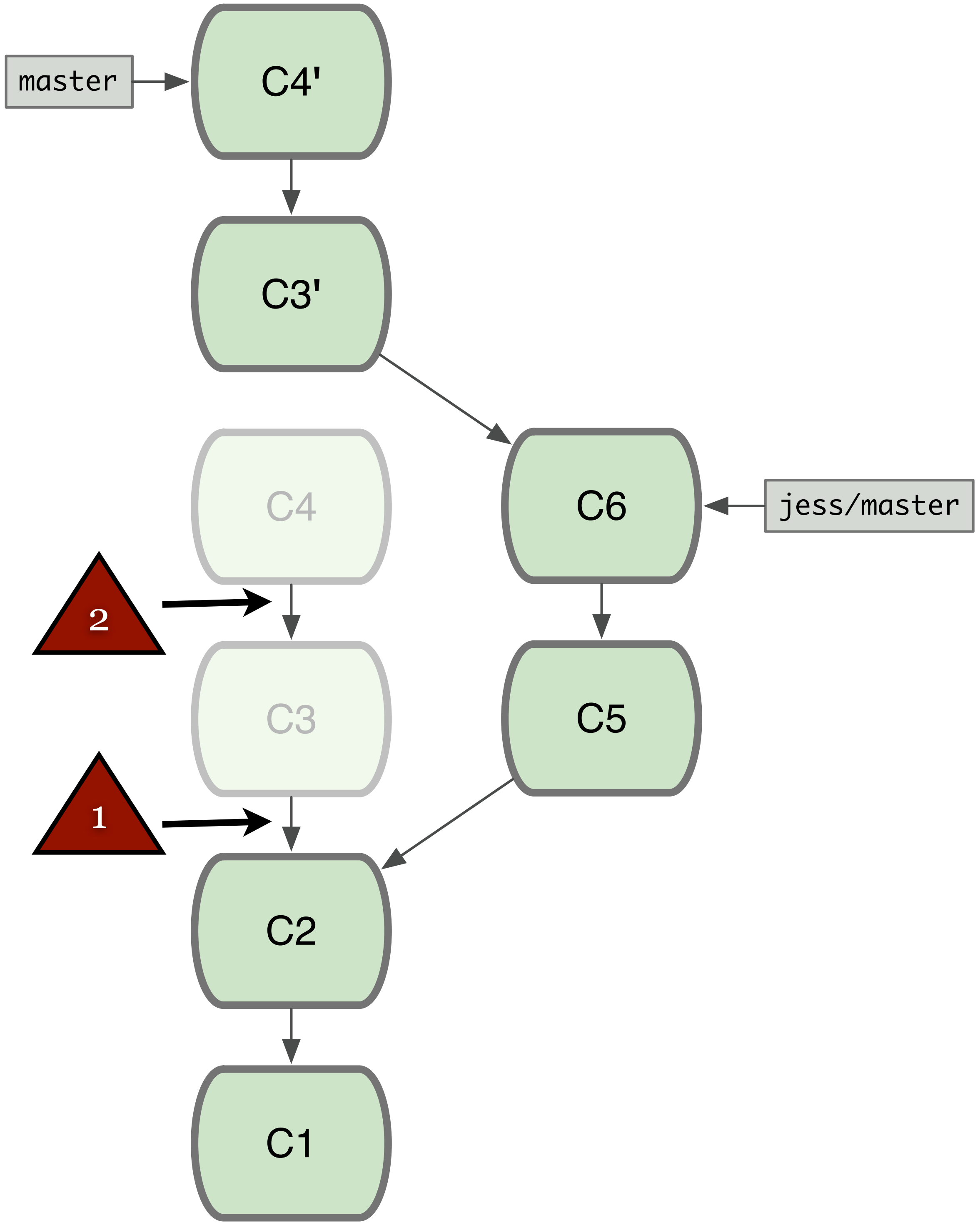
git rebase



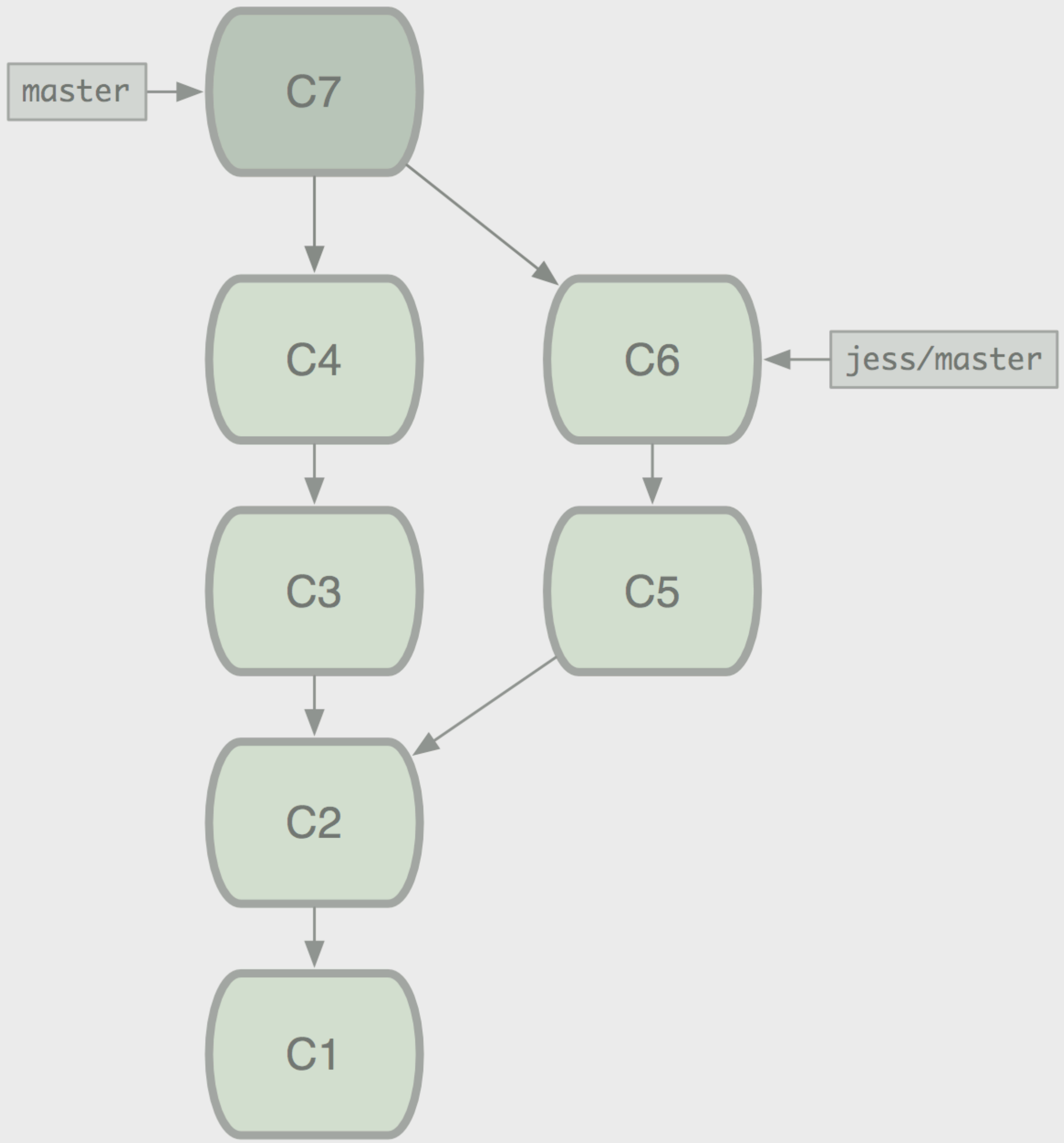
git merge



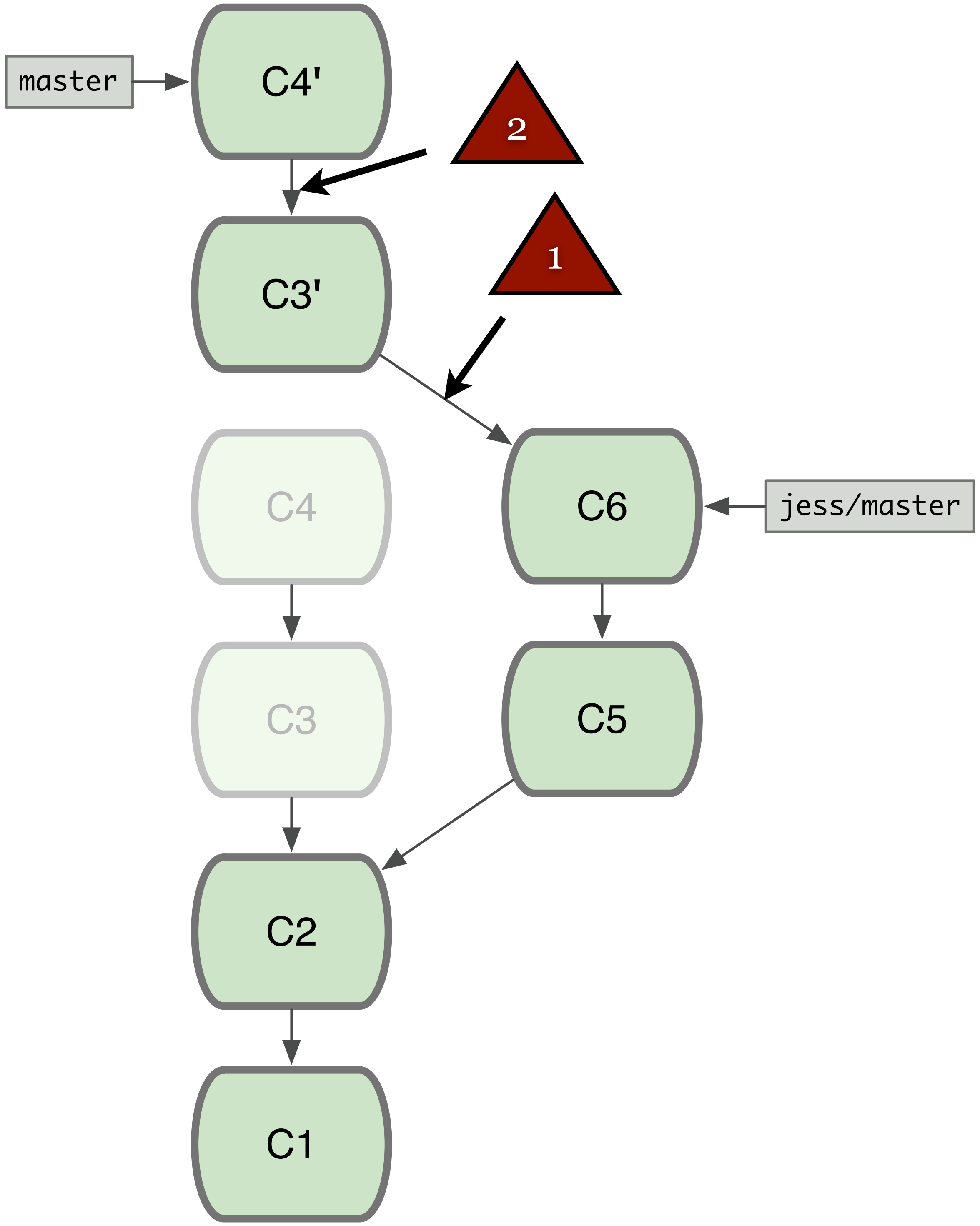
git rebase



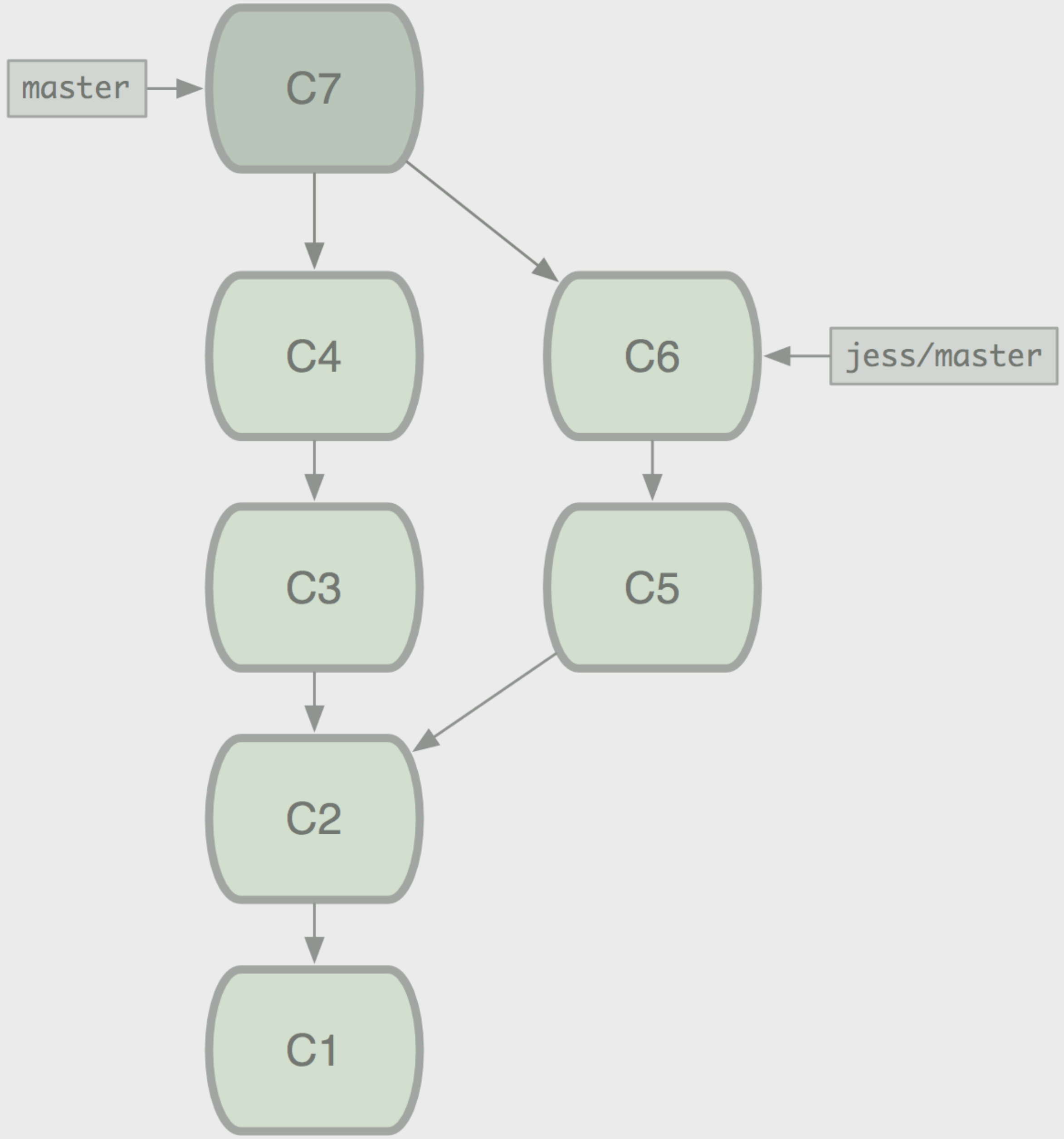
git merge



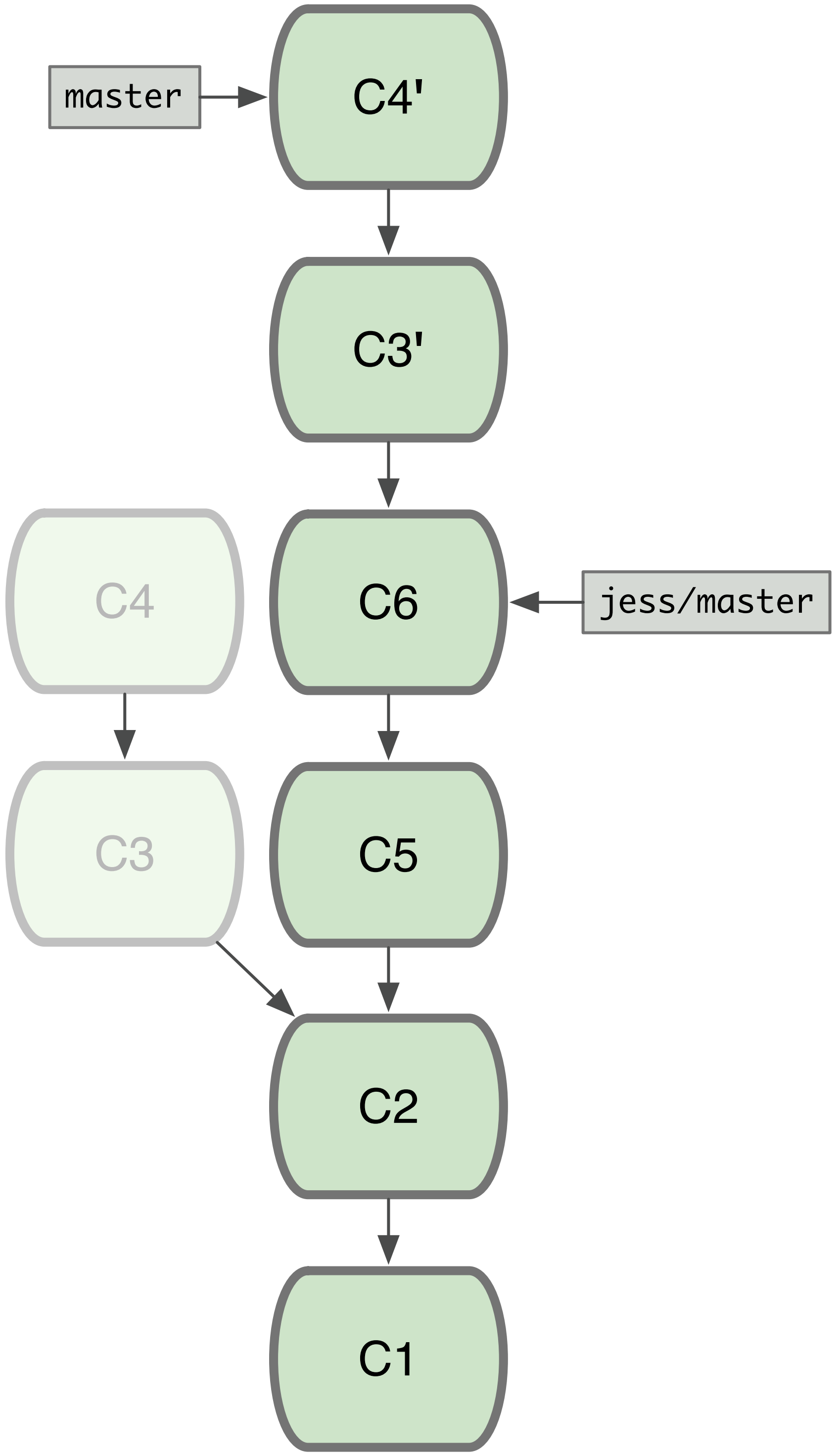
git rebase



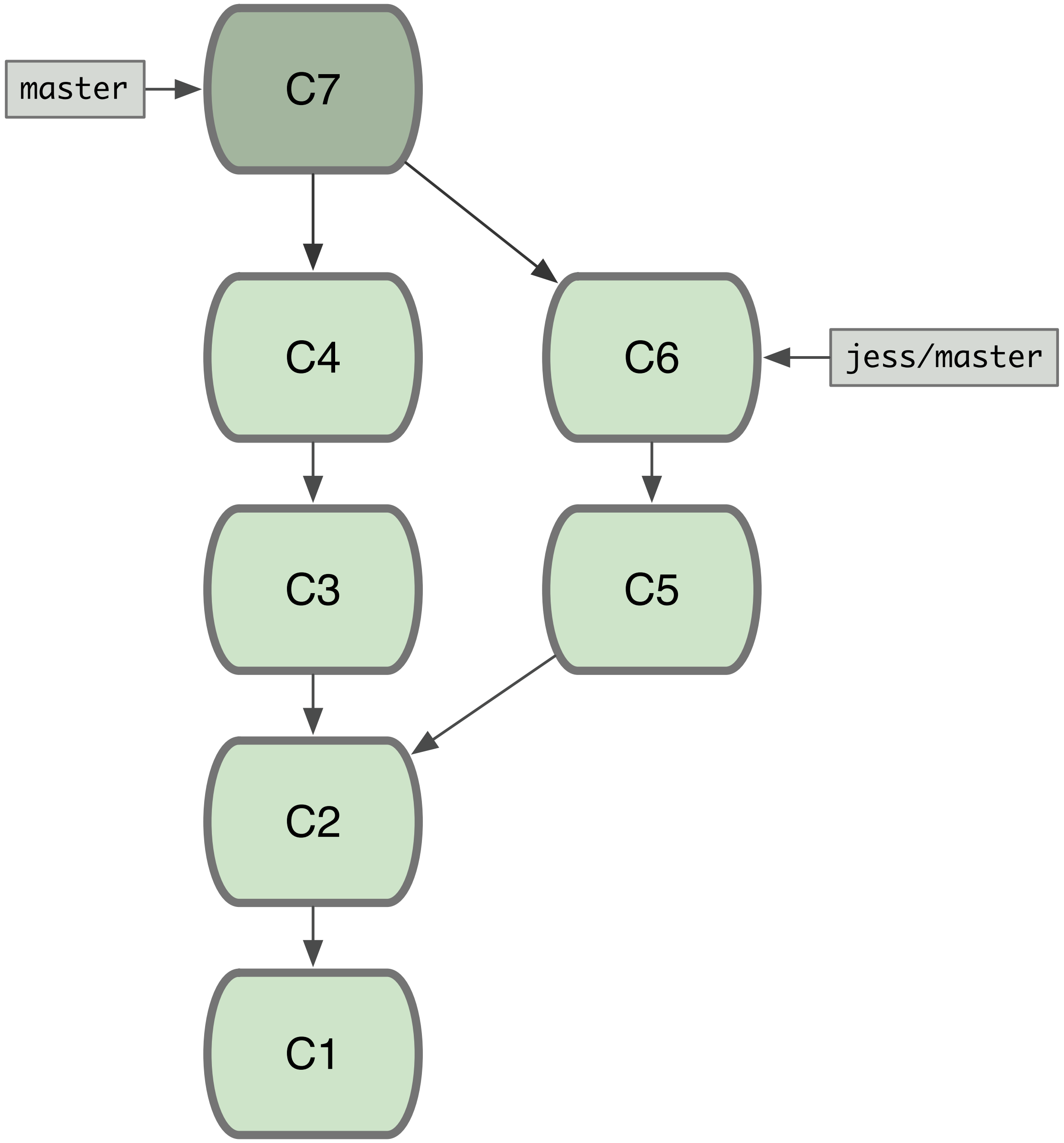
git merge



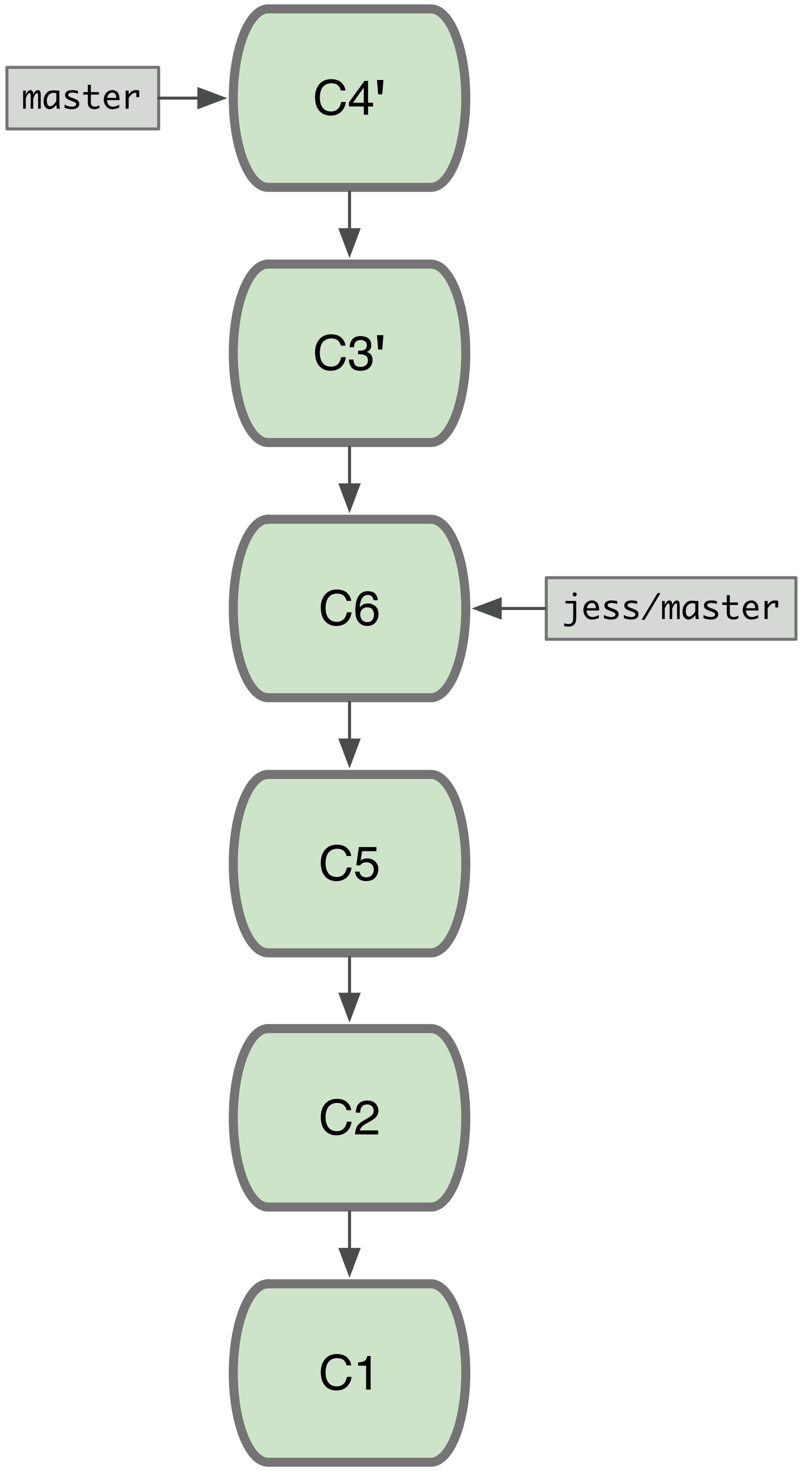
git rebase



git merge



git rebase



the treeish

the treeish

alternate ways to refer to objects or ranges of objects

Treeish

- full sha-1
- partial sha-1
- branch or tag name
- date spec
- ordinal spec
- carrot parent
- tilde spec
- tree pointer
- blob spec
- ranges

Full SHA1

```
6e453f523fa1da50ecb04431101112b3611c6a4d
```

Partial SHA1

```
6e453f523fa1da50ecb04431101112b3611c6a4d

6e453f523fa1da50

6e453
```

Branch, Remote or Tag Name

```
v1.0
master
origin/testing
```

Date Spec

```
master@{yesterday}

master@{1 month ago}
```

Ordinal Spec

```
master@{5}
```

5th prior value of ‘master’

Carrot Parent

```
master^2
```

2nd parent of ‘master’

Tilde Spec

```
master~2
```

2nd generation grandparent of ‘master’

Tree Pointer

```
master^{tree}
```

tree that ‘master’ points to

Blob Spec

```
master:/path/to/file
```

blob of that file in ‘master’ commit

Ranges

```
ce0e4..e4272
```

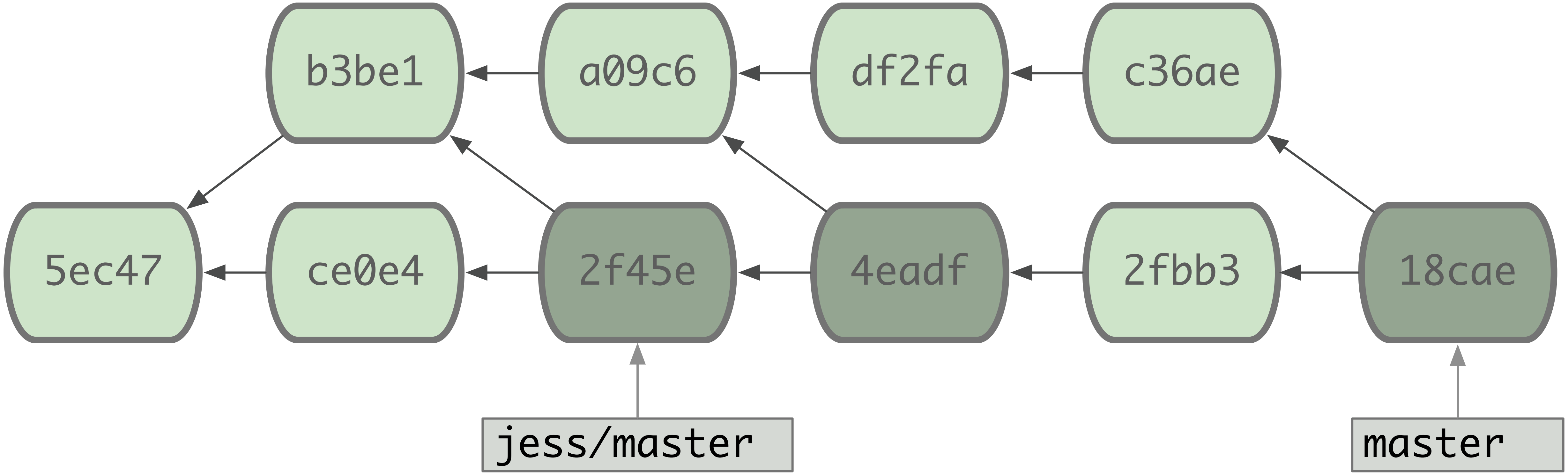
everything between two commits

Ranges

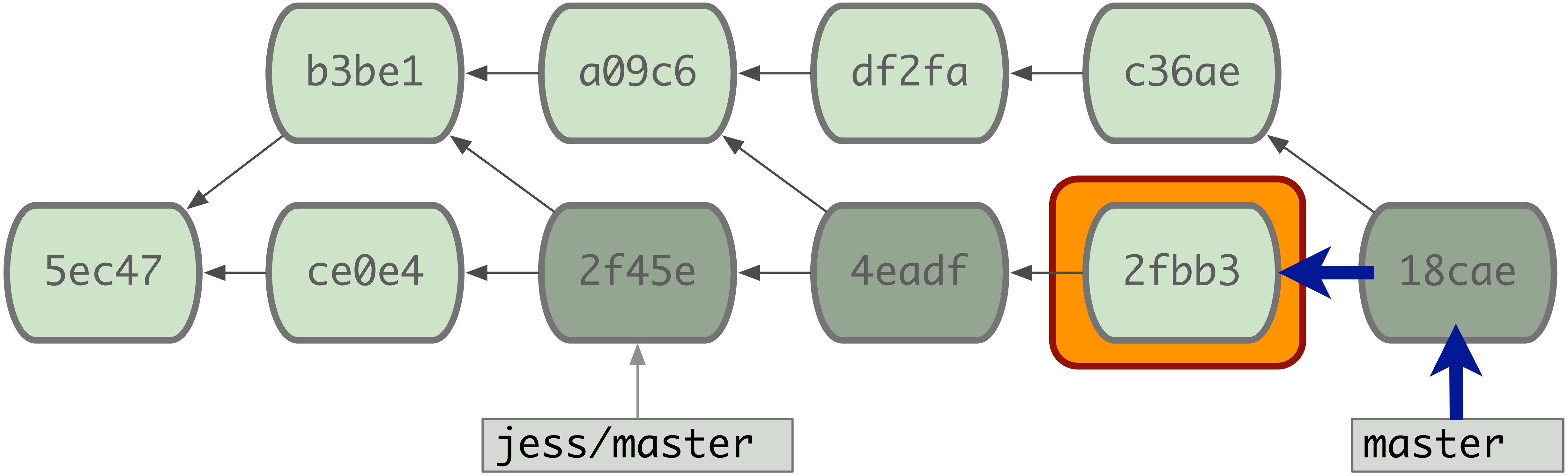
`ce0e4..`

everything since a commit

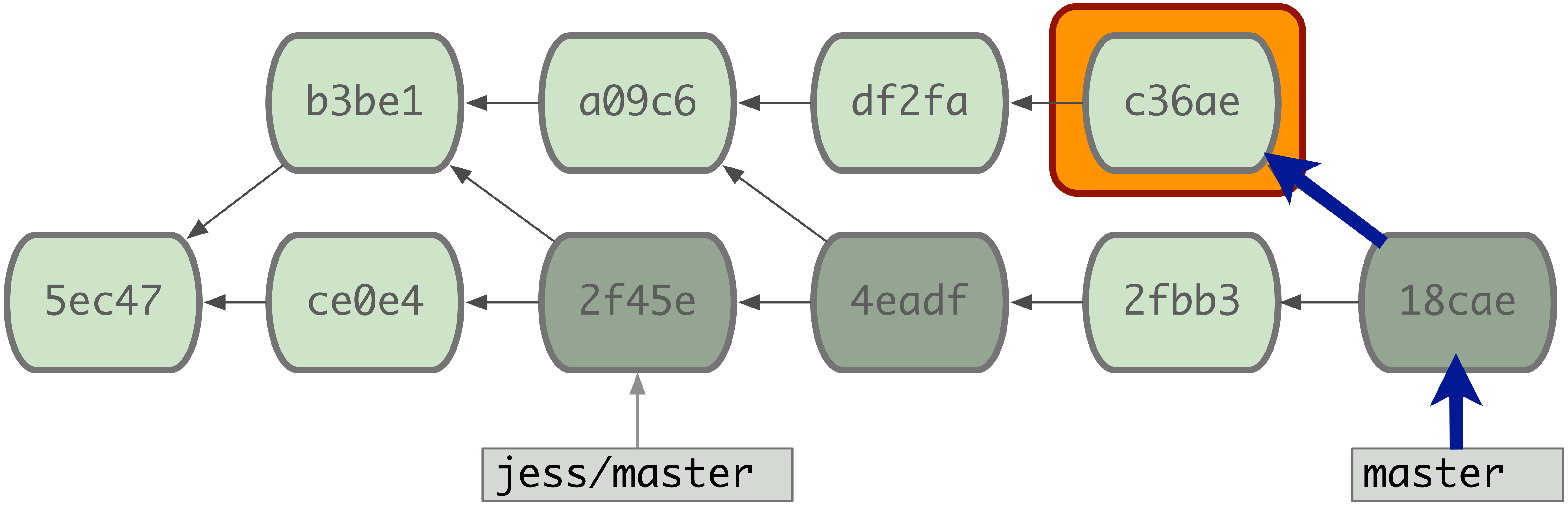
examples


b3be1
a09c6
df2fa
c36ae
5ec47
ce0e4
2f45e
4eadf
2fbb3
18cae
jess/master
master

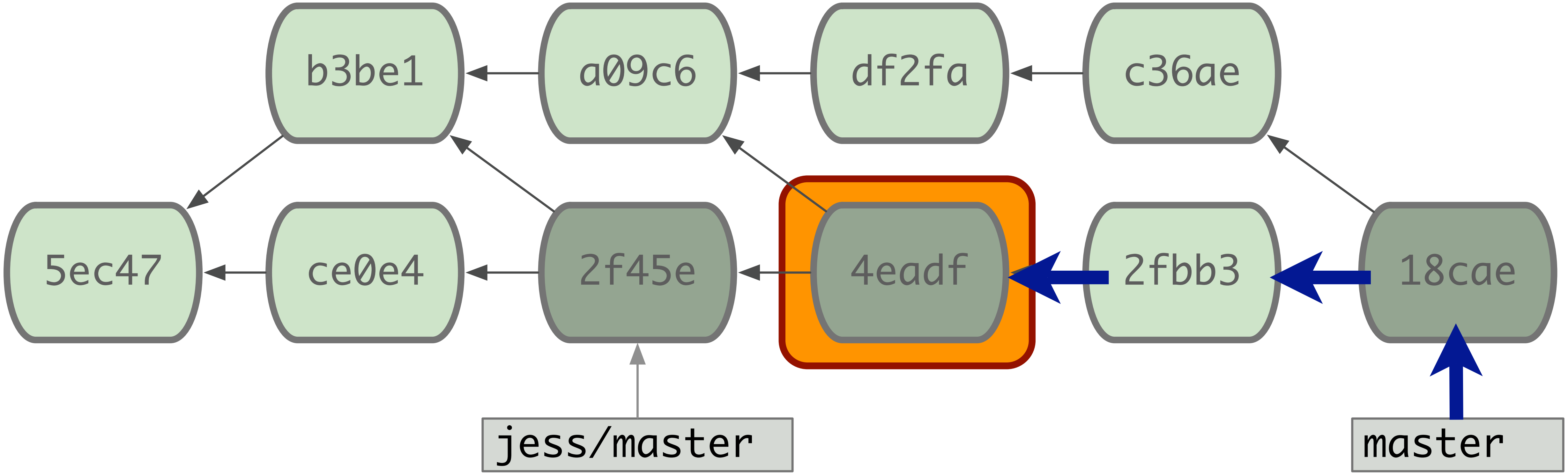
master^


b3be1
a09c6
df2fa
c36ae
5ec47
ce0e4
2f45e
4eadf
2fbb3
18cae
jess/master
master

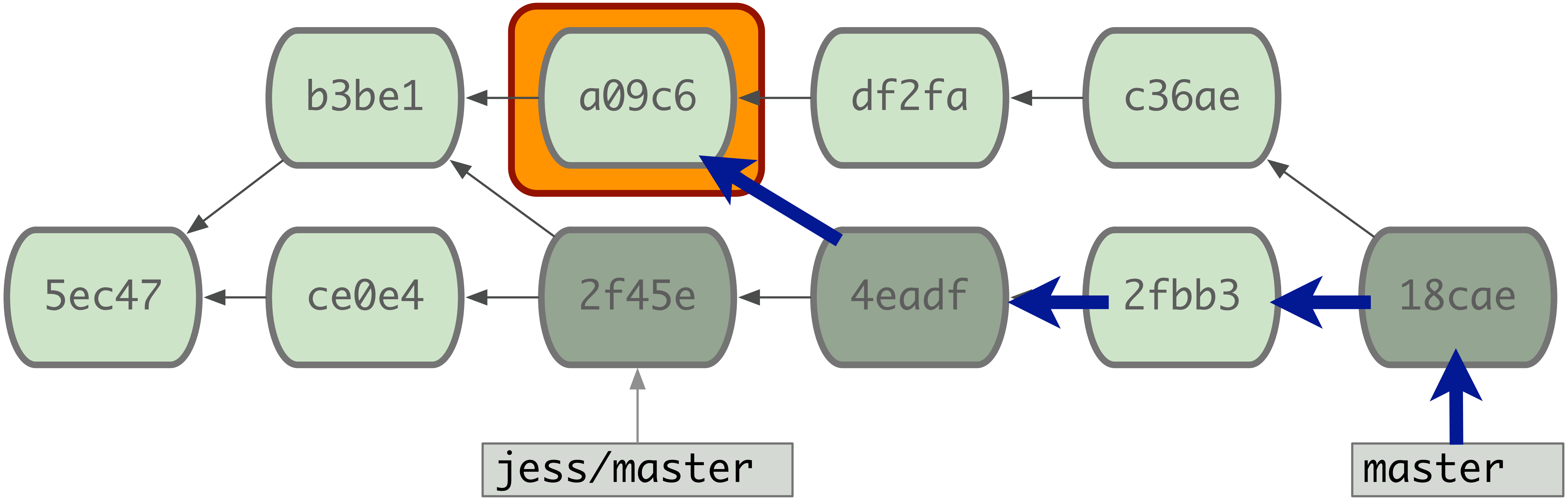
master^2


b3be1
a09c6
df2fa
c36ae
5ec47
ce0e4
2f45e
4eadf
2fbb3
18cae
jess/master
master

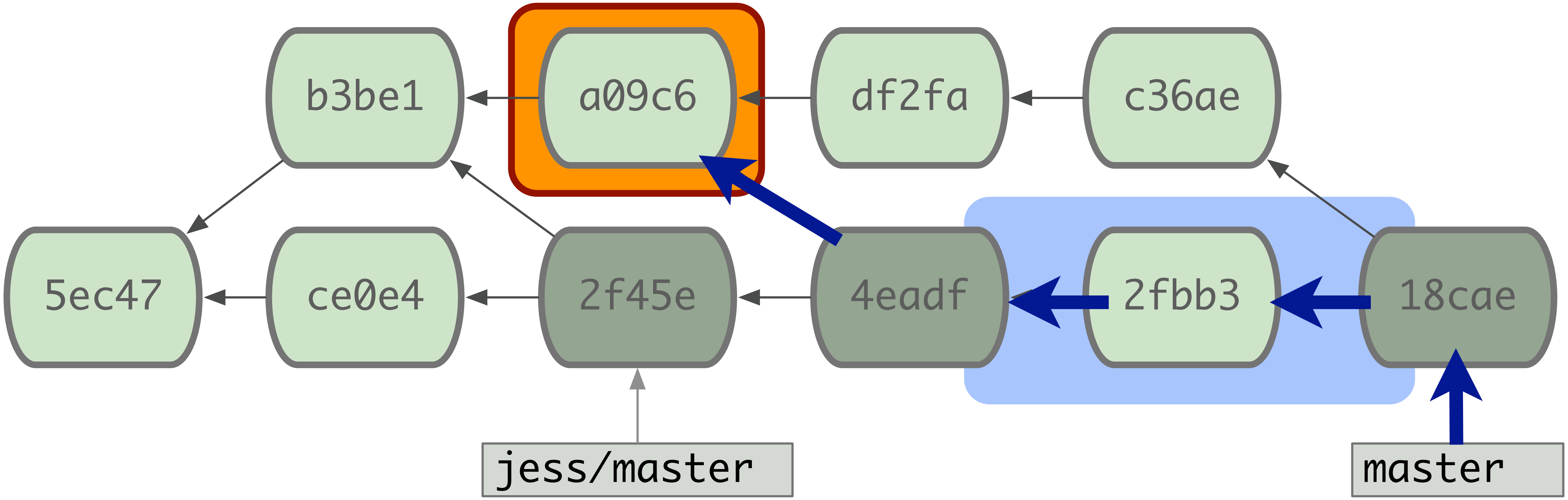
master~2


b3be1
a09c6
df2fa
c36ae
5ec47
ce0e4
2f45e
4eadf
2fbb3
18cae
jess/master
master

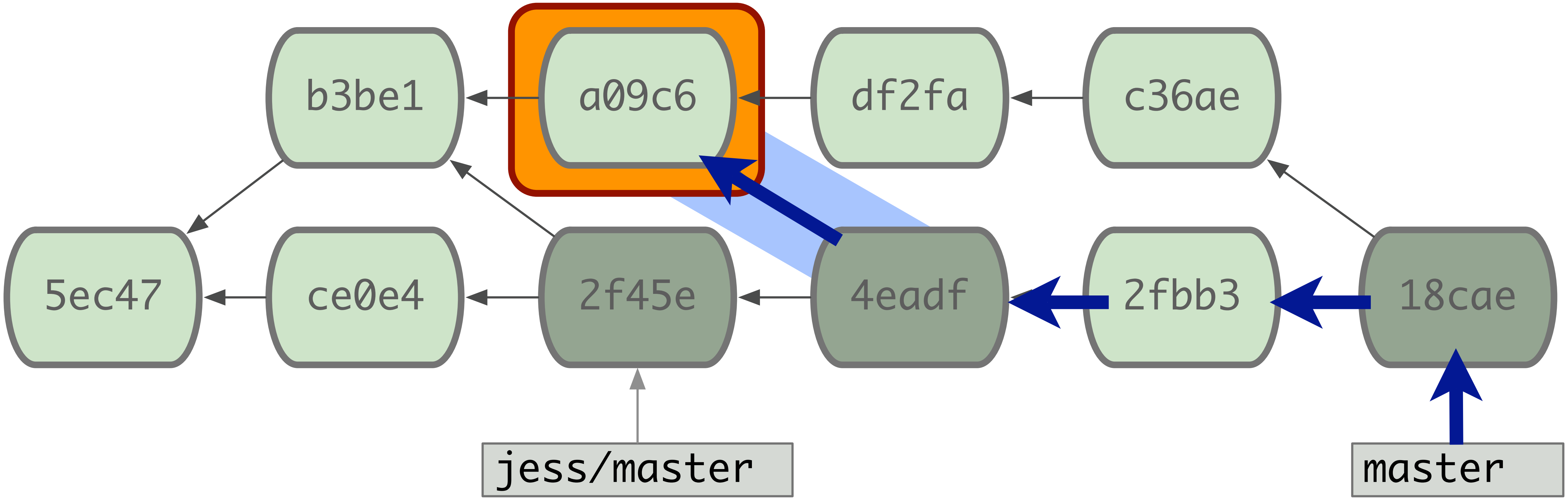
master^^^2
master~2^2



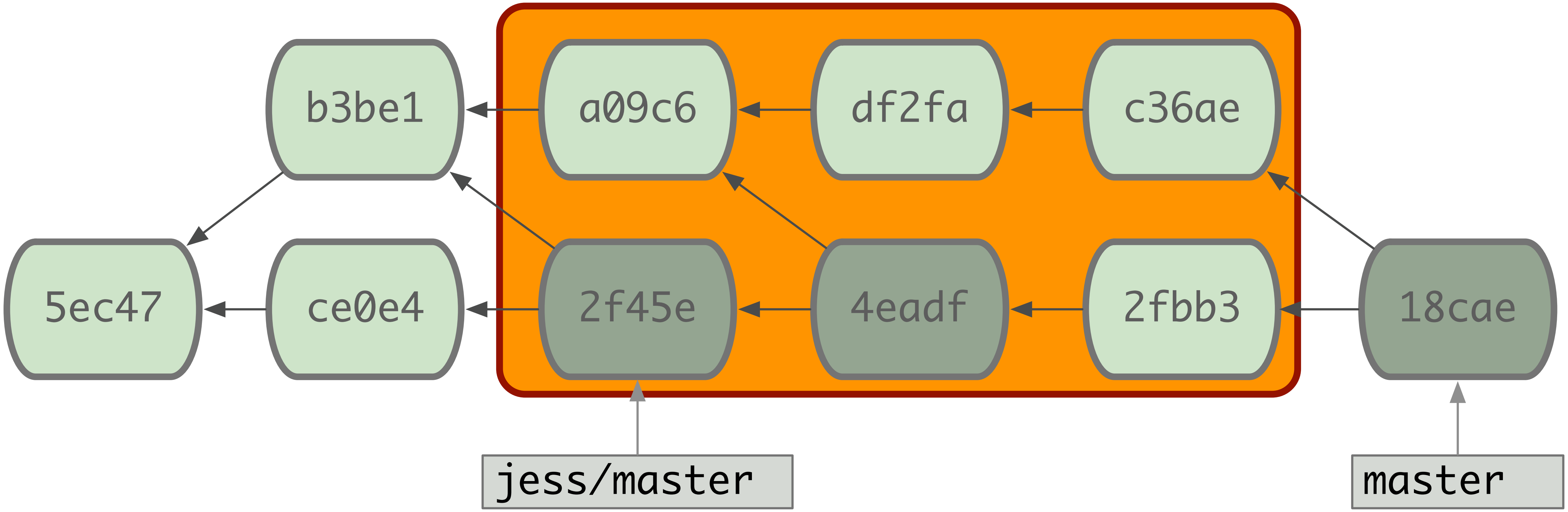
master^^^2
master~2^2



master^^^2
master~2^2



master~3..master^



local stuff

the index

Git Directory

config file

hooks

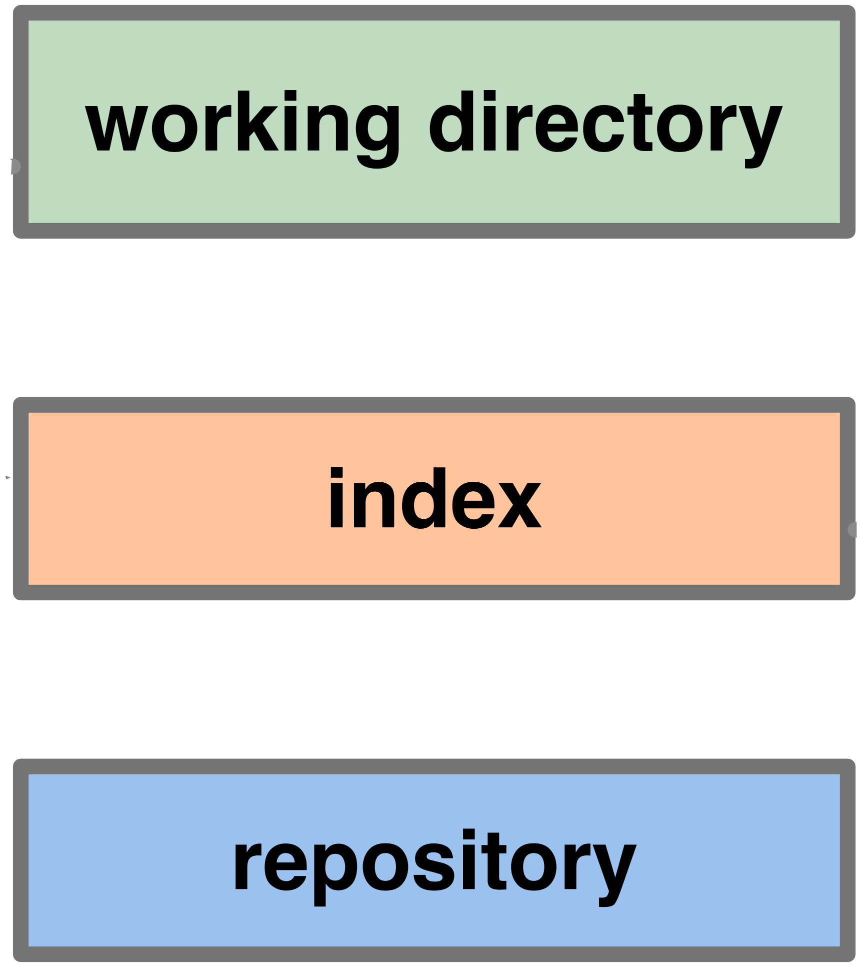
index

object database

references

index

index

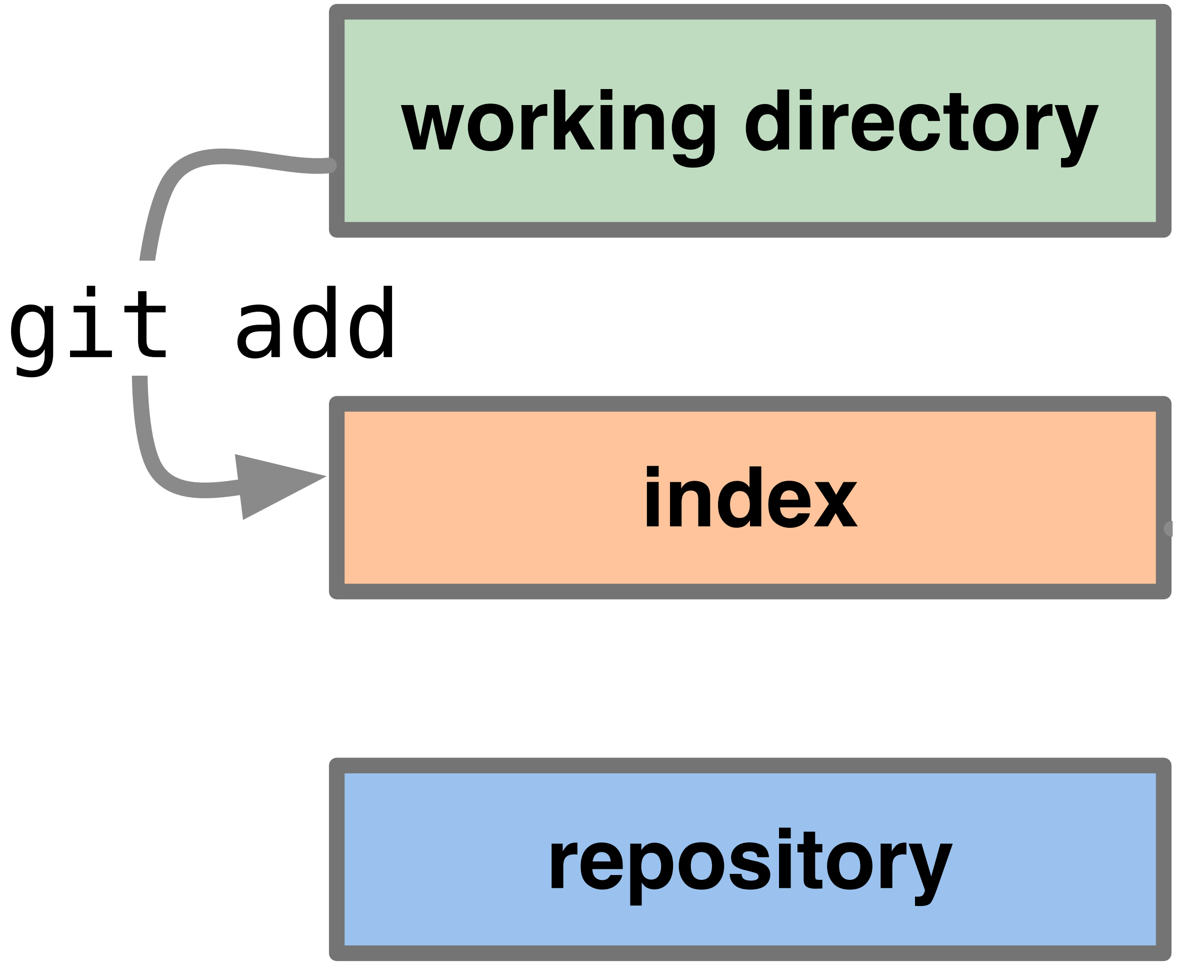


working directory

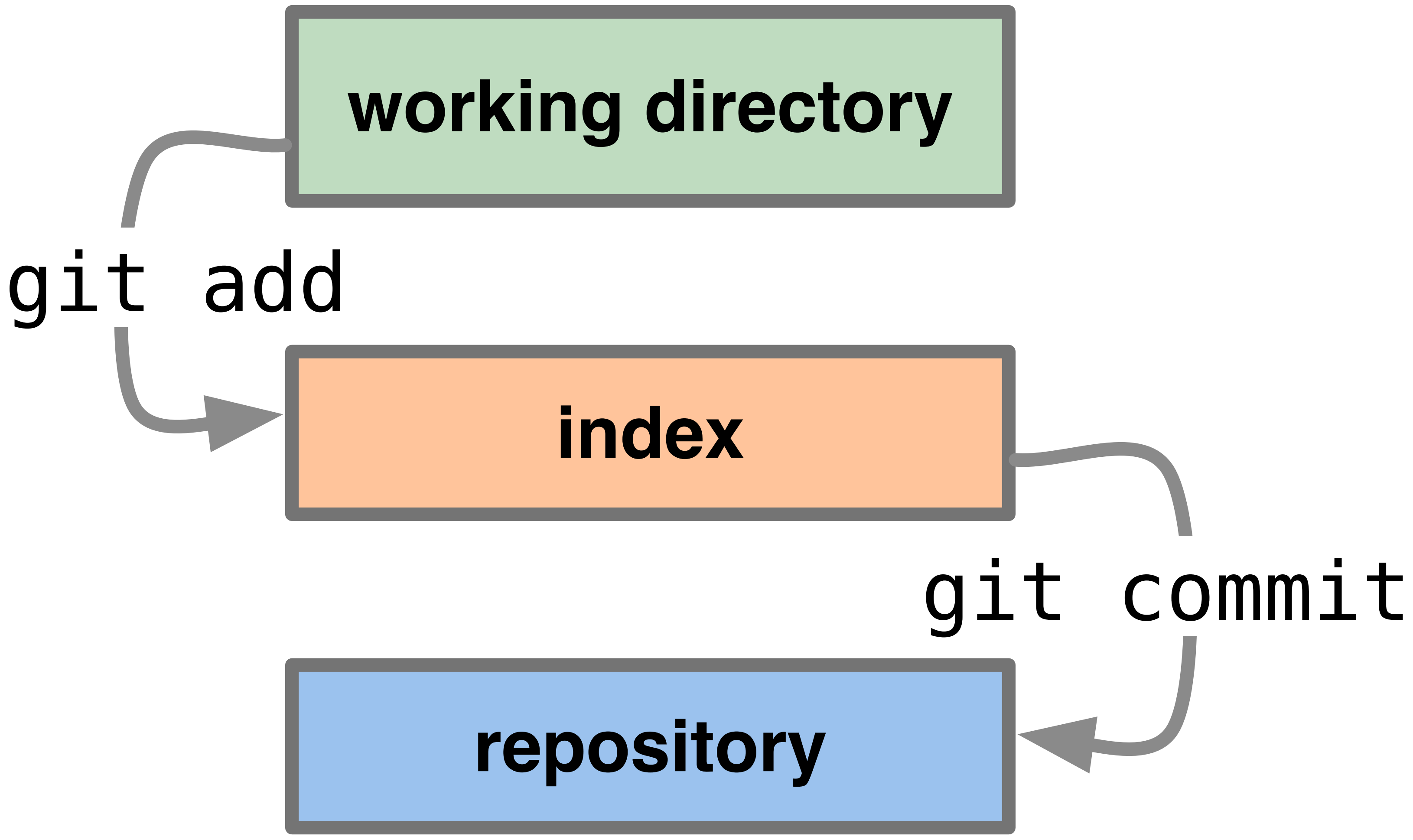
index

repository

index



index



working directory

git add

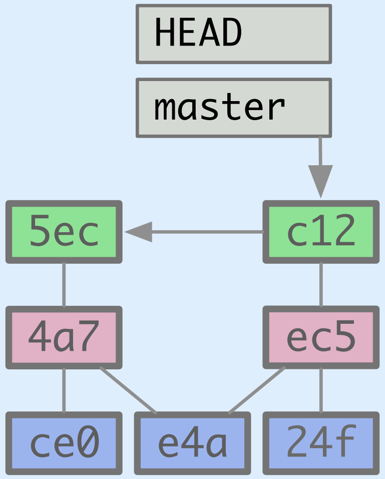
index

git commit

repository

what?

Object Directory



project/.git/objects

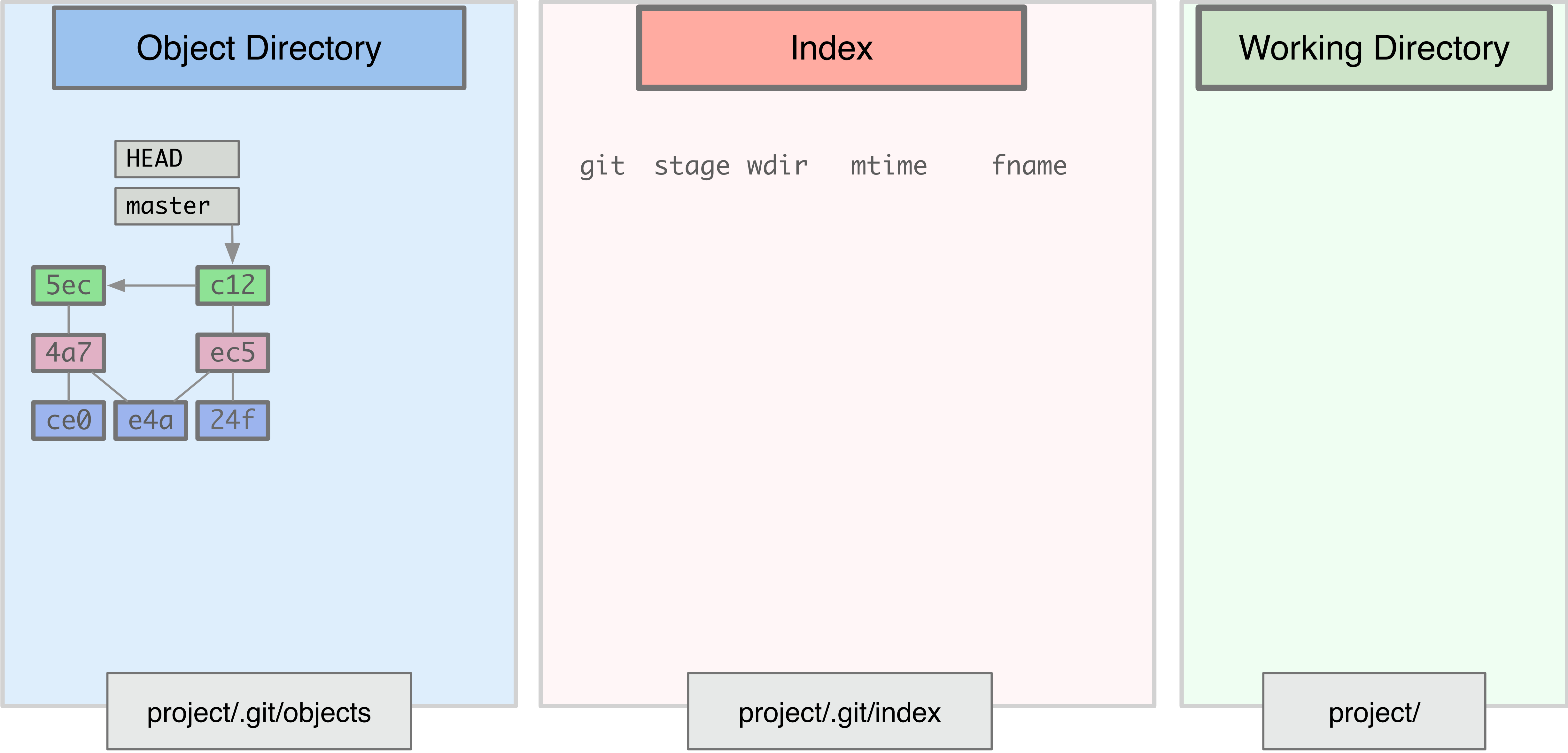
Index

```
git  stage wdir  mtime   fname
```

project/.git/index

Working Directory

project/



Object Directory

HEAD

master

5ec c12

4a7 ec5

ce0 e4a 24f

project/.git/objects

Index

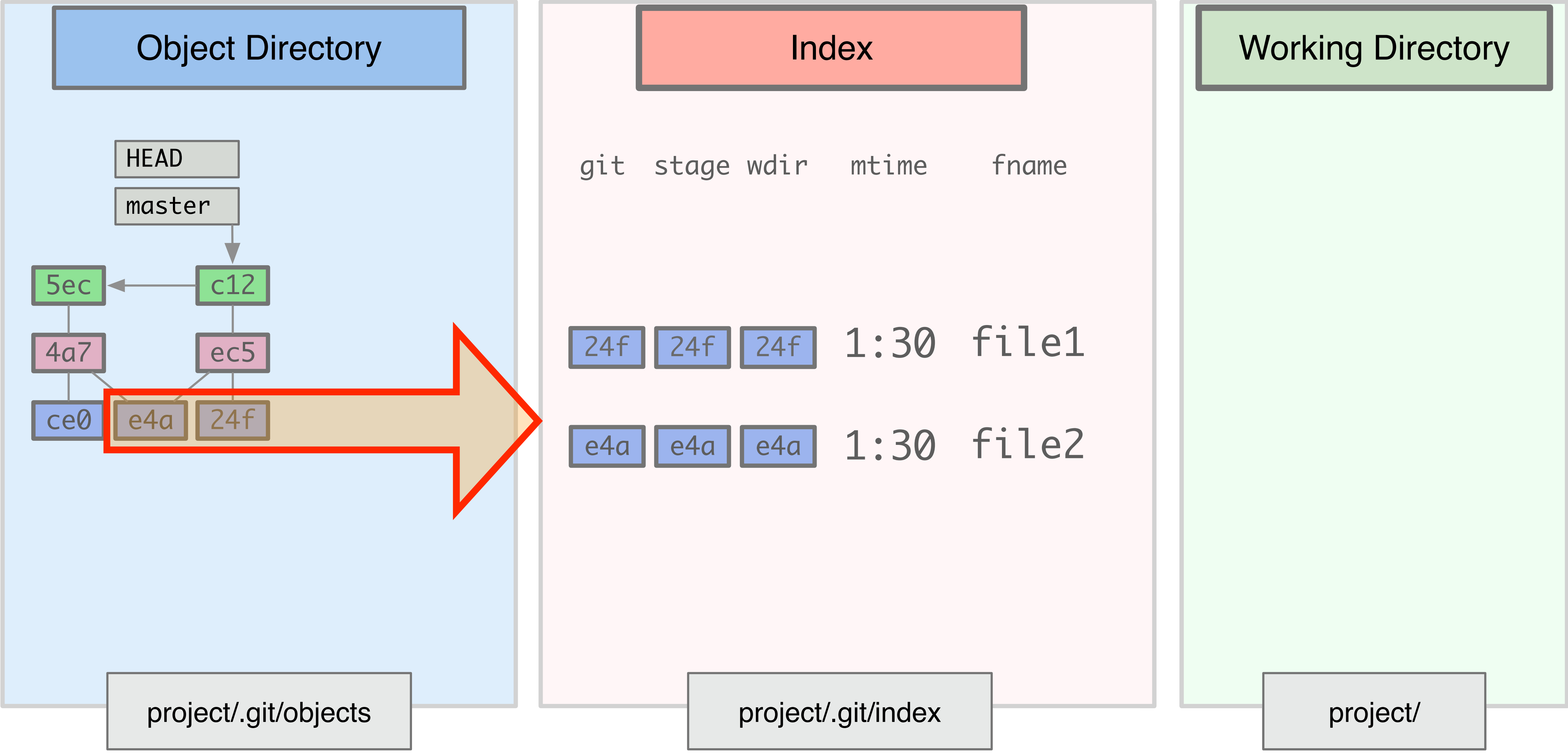
git stage wdir mtime fname

project/.git/index

Working Directory

project/

git checkout



Object Directory

HEAD

master

5ec

c12

4a7

ec5

ce0

e4a

24f

project/.git/objects

Index

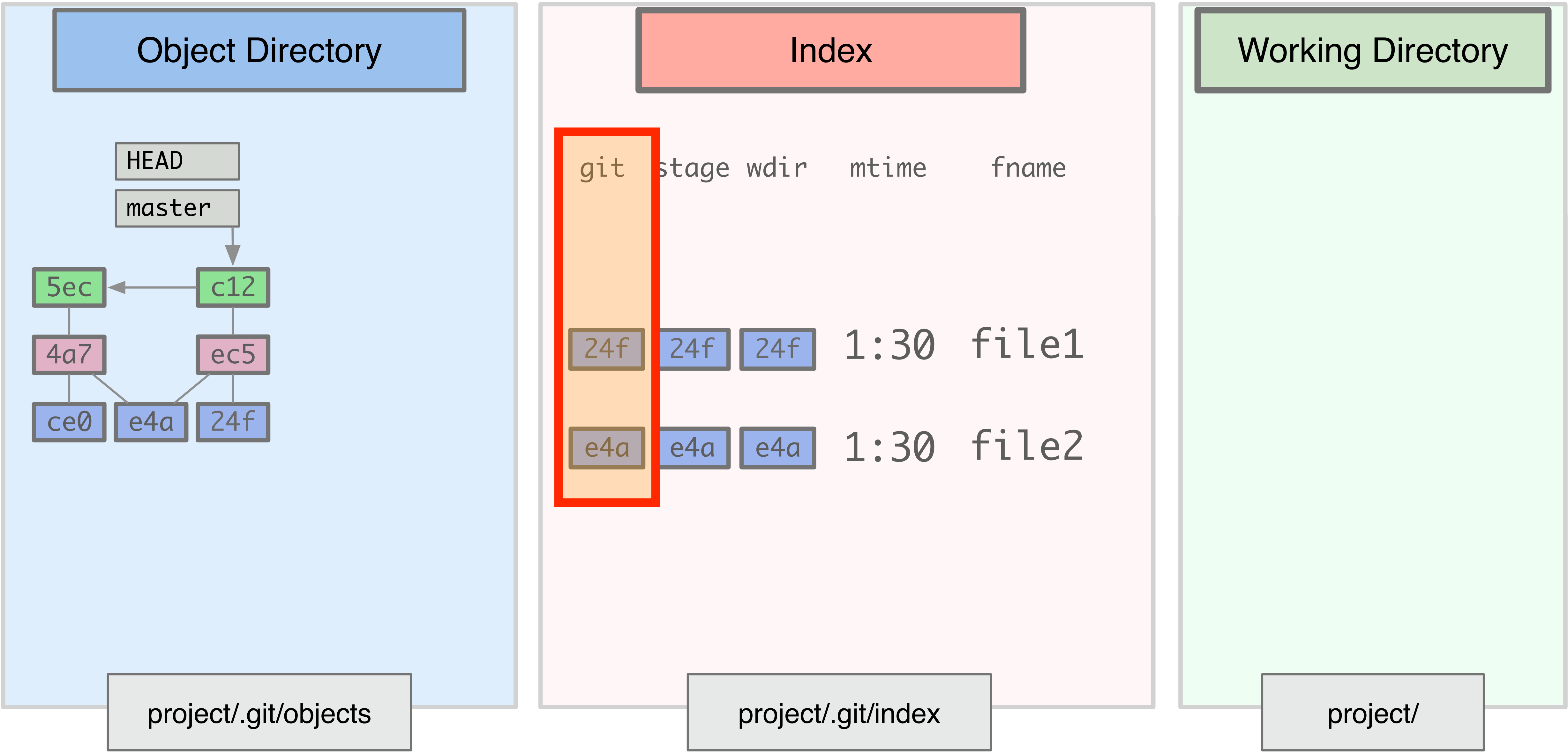
git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	e4a	e4a	1:30	file2

project/.git/index

Working Directory

project/

git checkout



Object Directory

project/.git/objects

Index

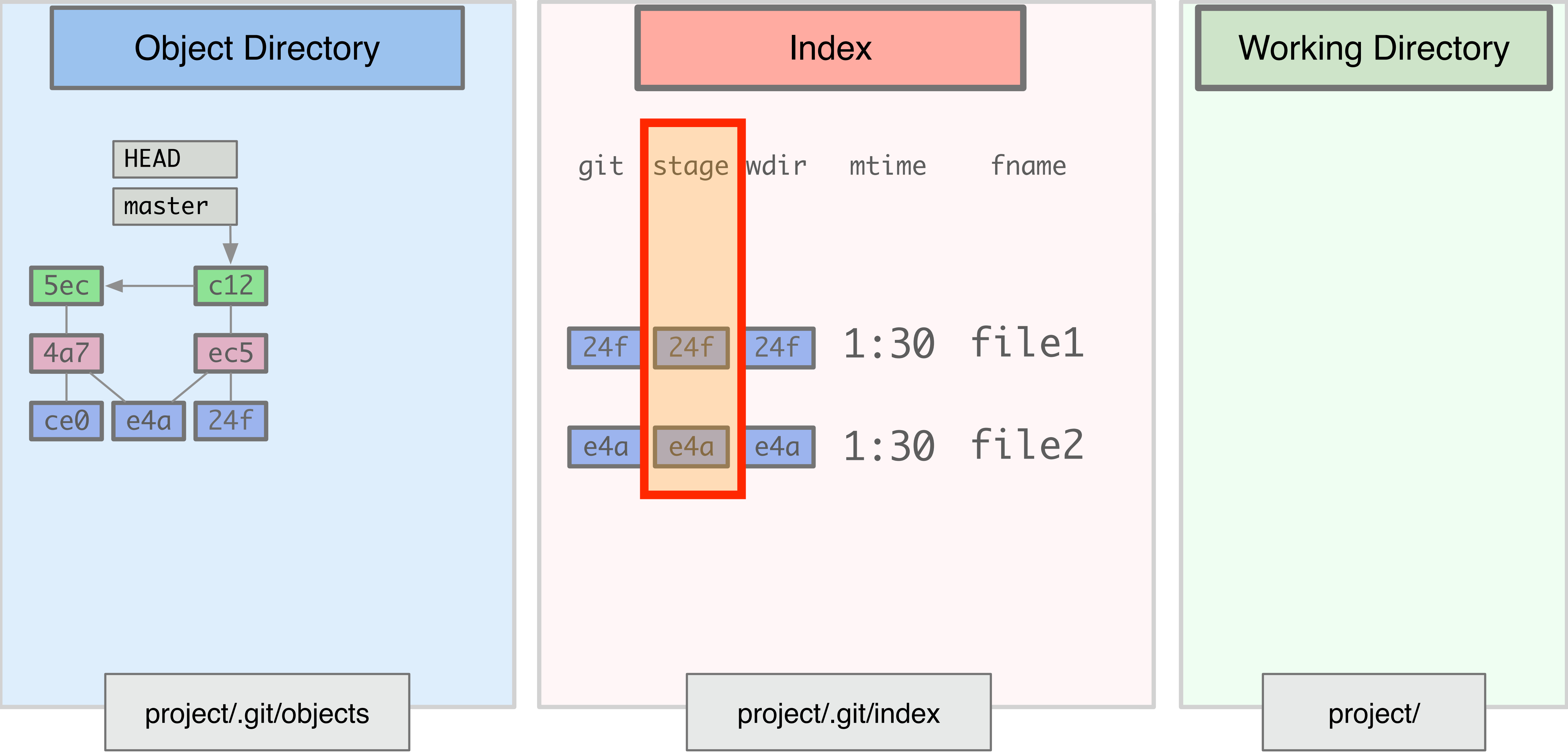
git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	e4a	e4a	1:30	file2

project/.git/index

Working Directory

project/

git checkout



Object Directory

project/.git/objects

Index

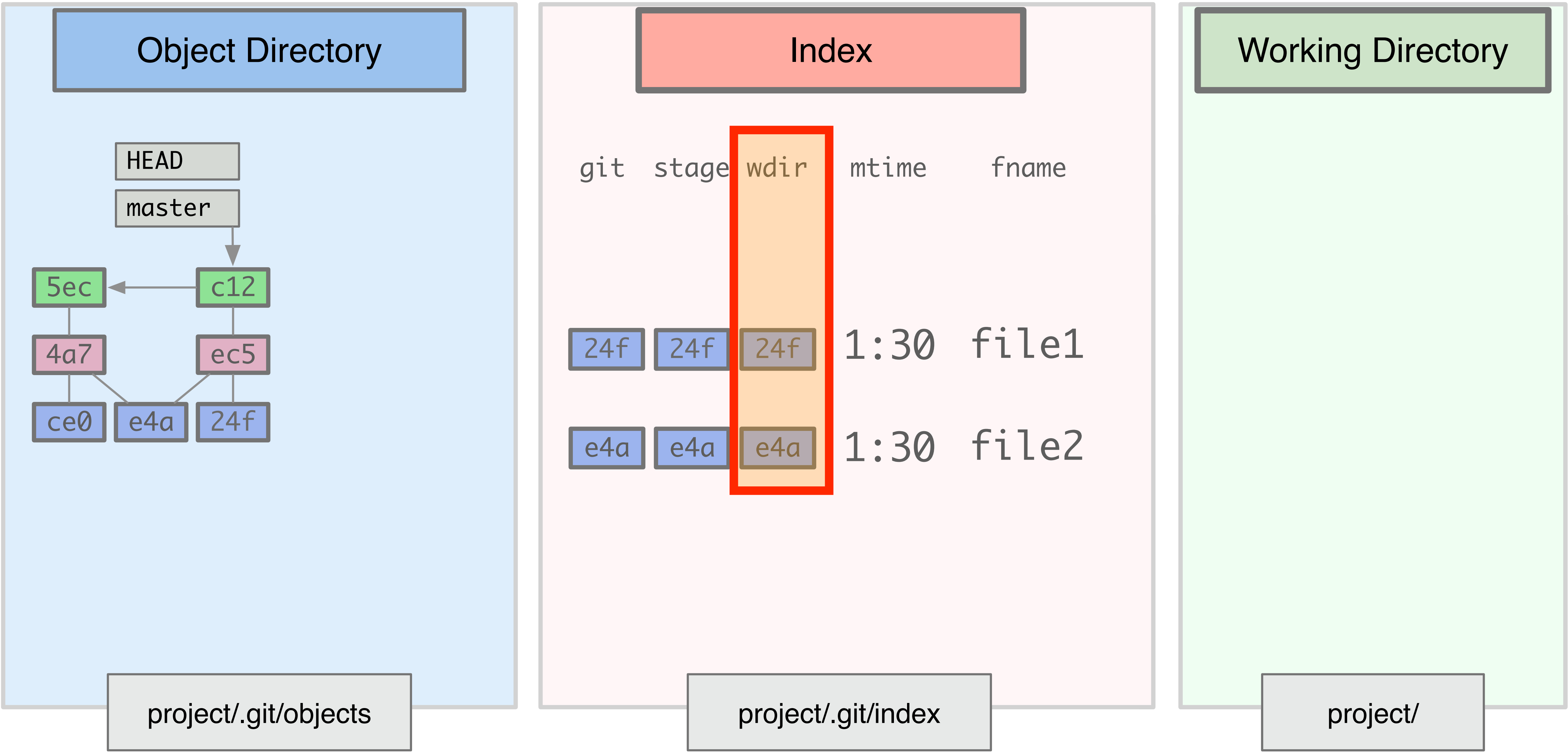
git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	e4a	e4a	1:30	file2

project/.git/index

Working Directory

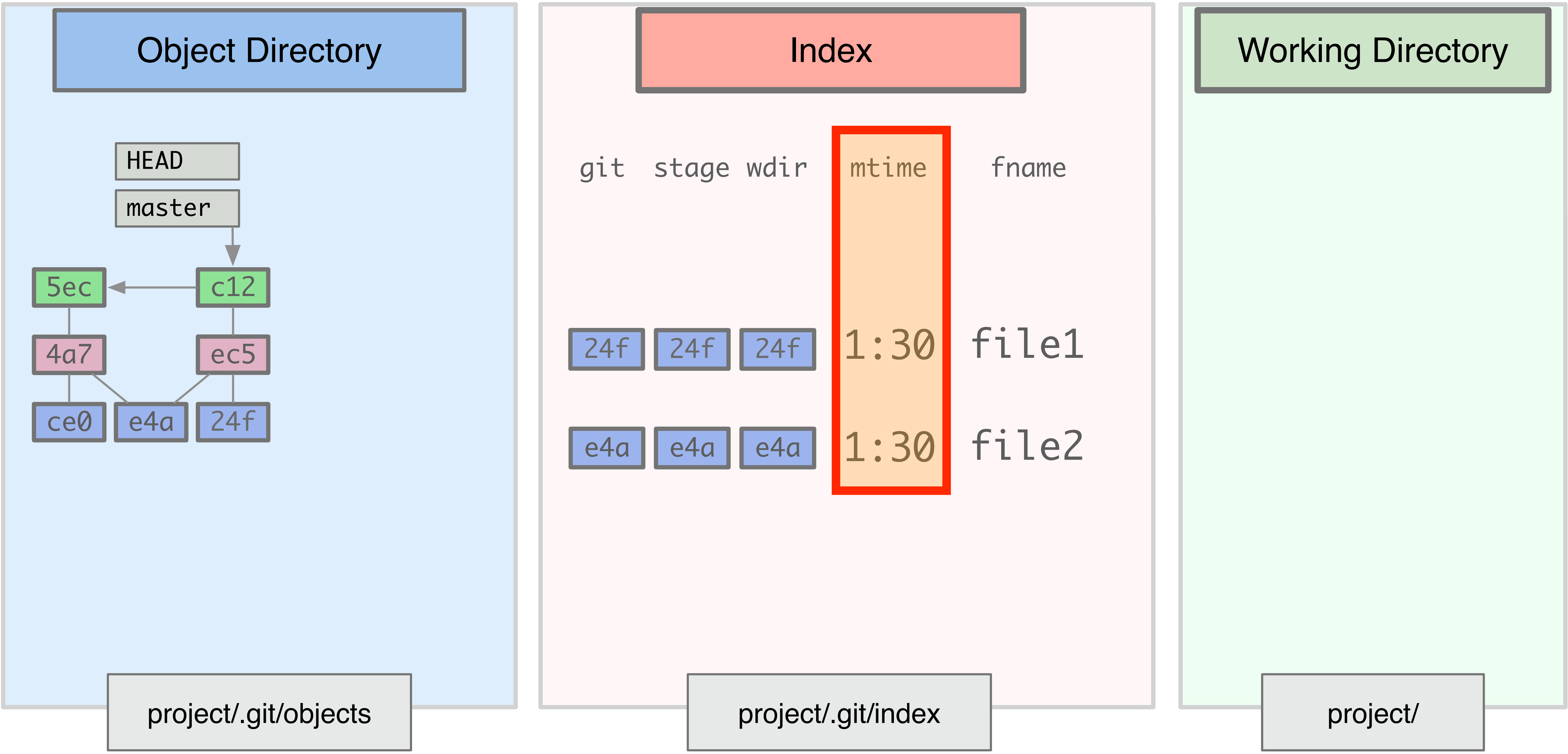
project/

git checkout



git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	e4a	e4a	1:30	file2

git checkout



Object Directory

HEAD

master

5ec c12

4a7 ec5

ce0 e4a 24f

project/.git/objects

Index

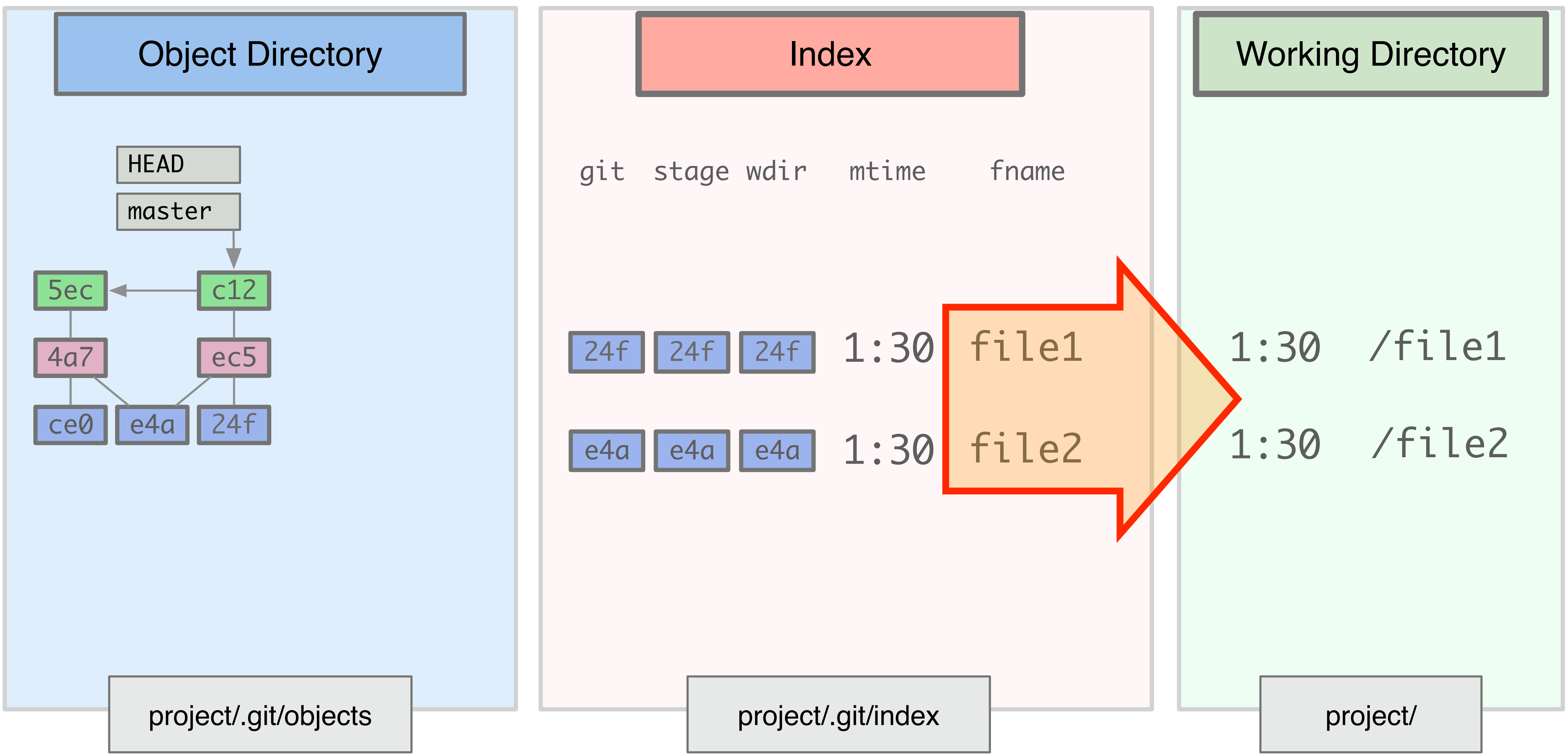
git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	e4a	e4a	1:30	file2

project/.git/index

Working Directory

project/

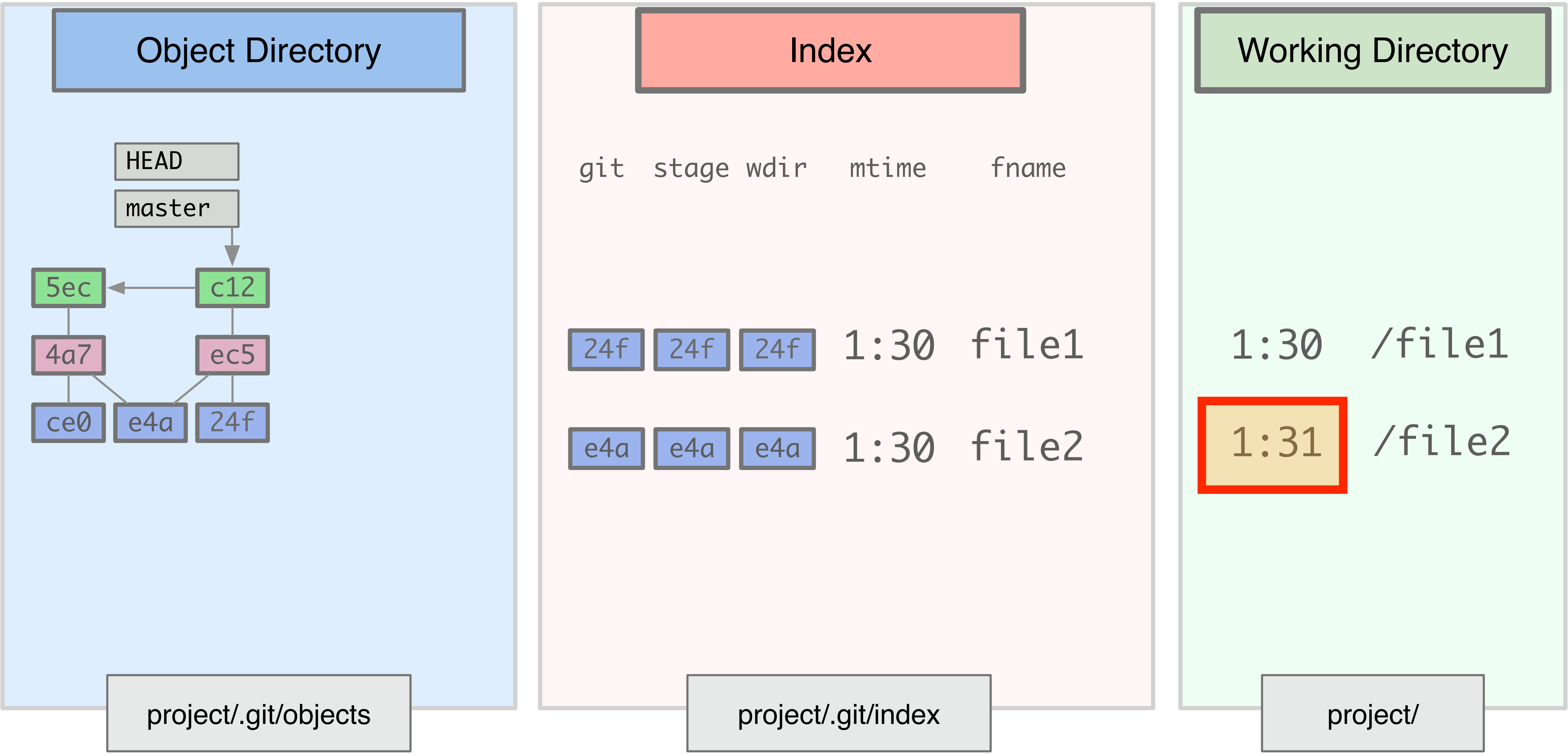
git checkout



git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	e4a	e4a	1:30	file2

1:30	/file1
1:30	/file2

git checkout



Object Directory

project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	e4a	e4a	1:30	file2

project/.git/index

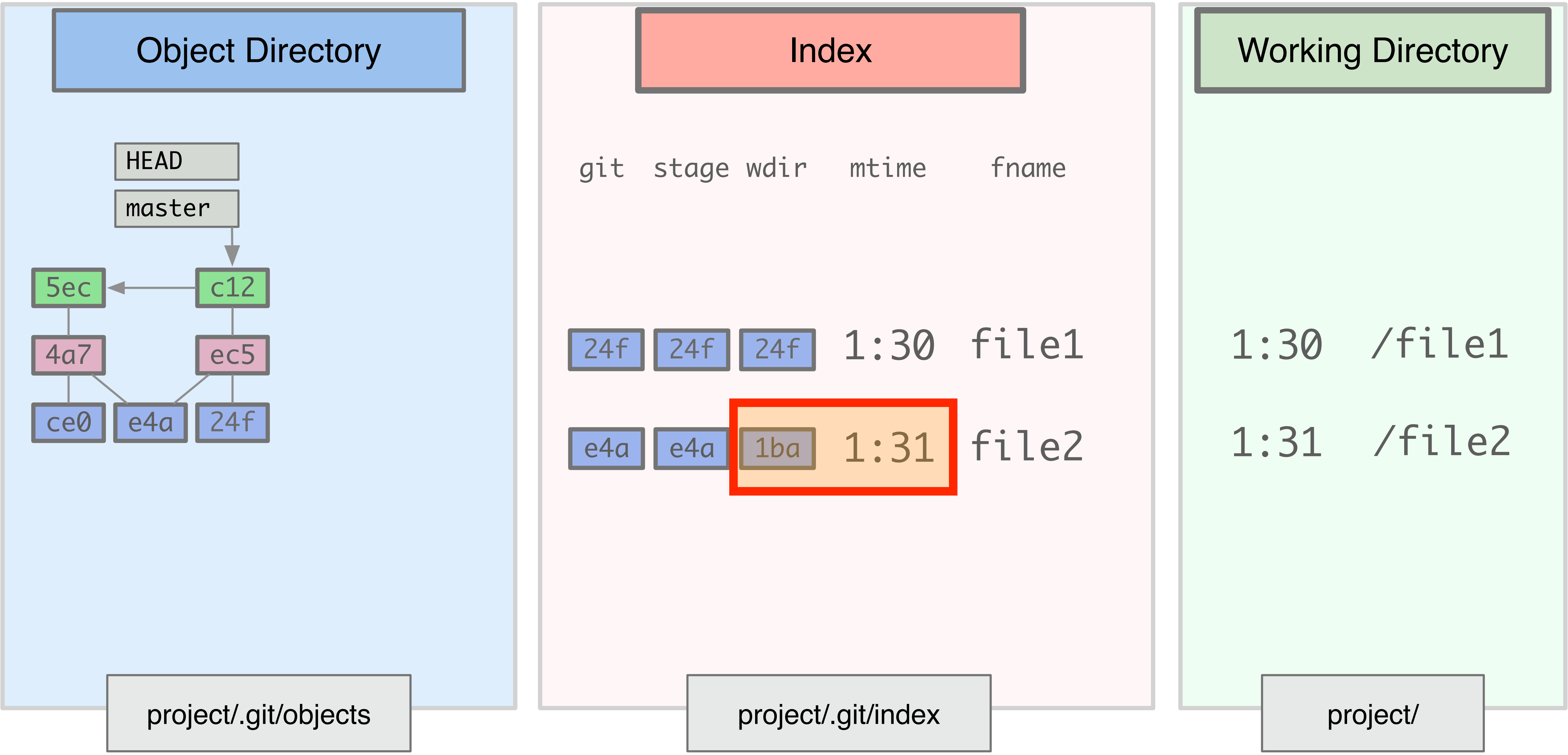
Working Directory

1:30 /file1

1:31 /file2

project/

vim file2



project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	e4a	1ba	1:31	file2

project/.git/index

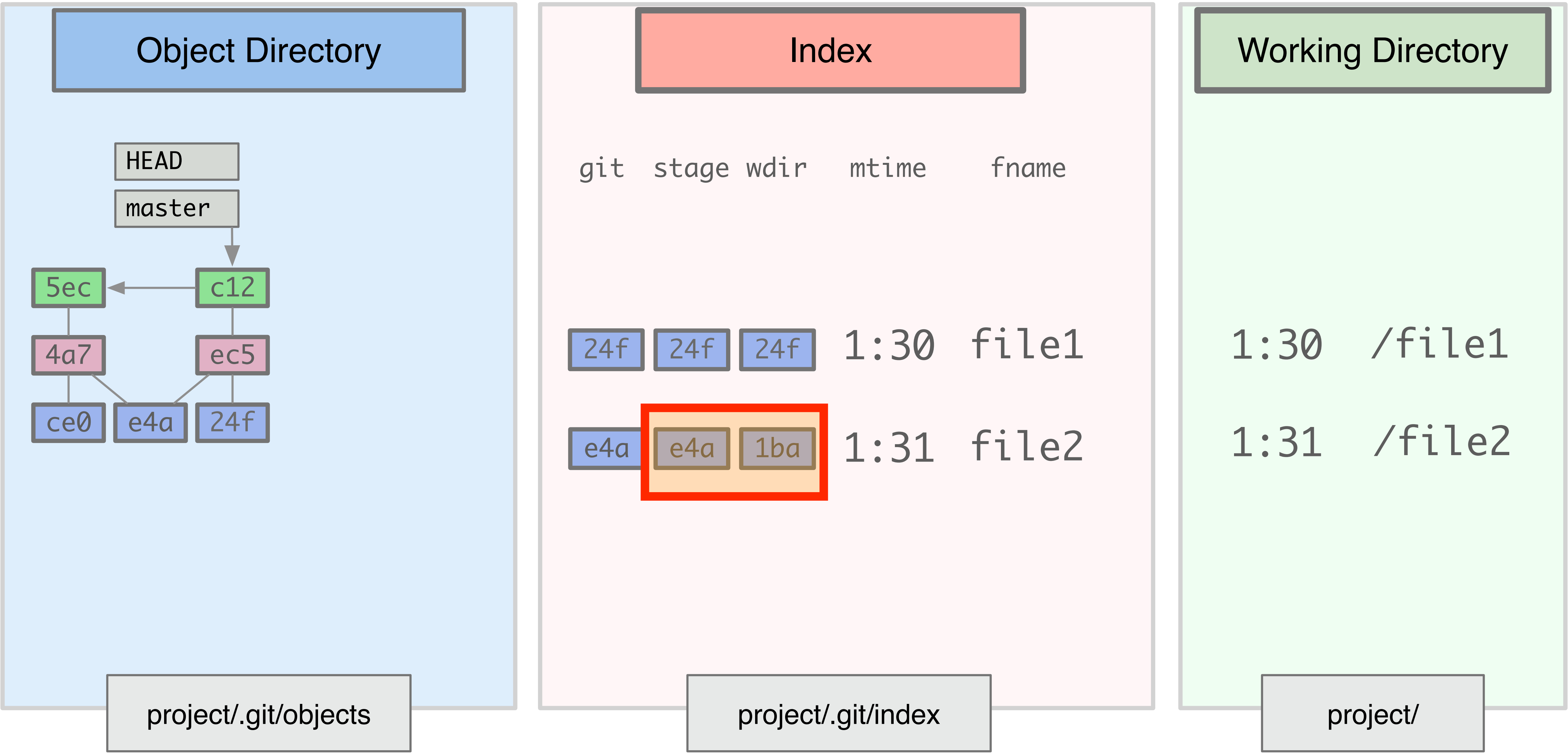
Working Directory

1:30 /file1

1:31 /file2

project/

git status



Object Directory

project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	e4a	1ba	1:31	file2

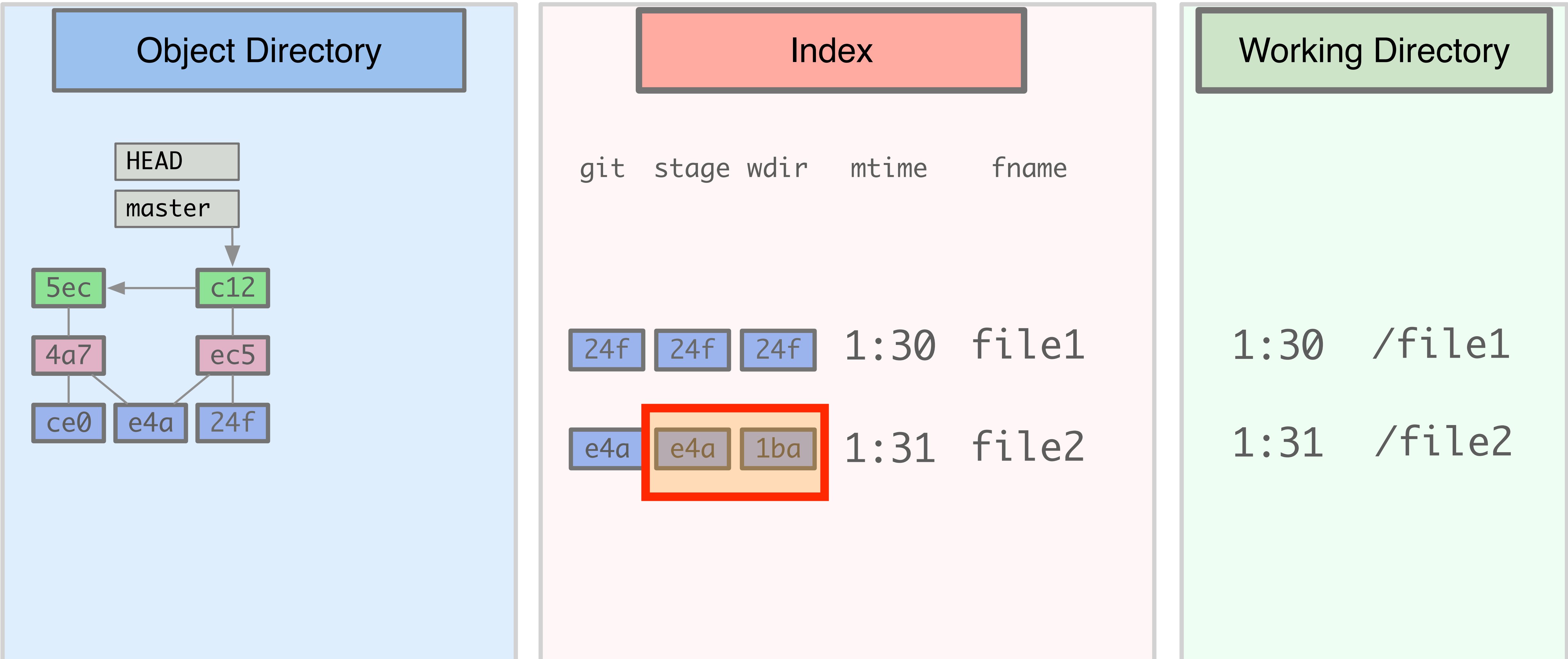
project/.git/index

Working Directory

1:30	/file1
1:31	/file2

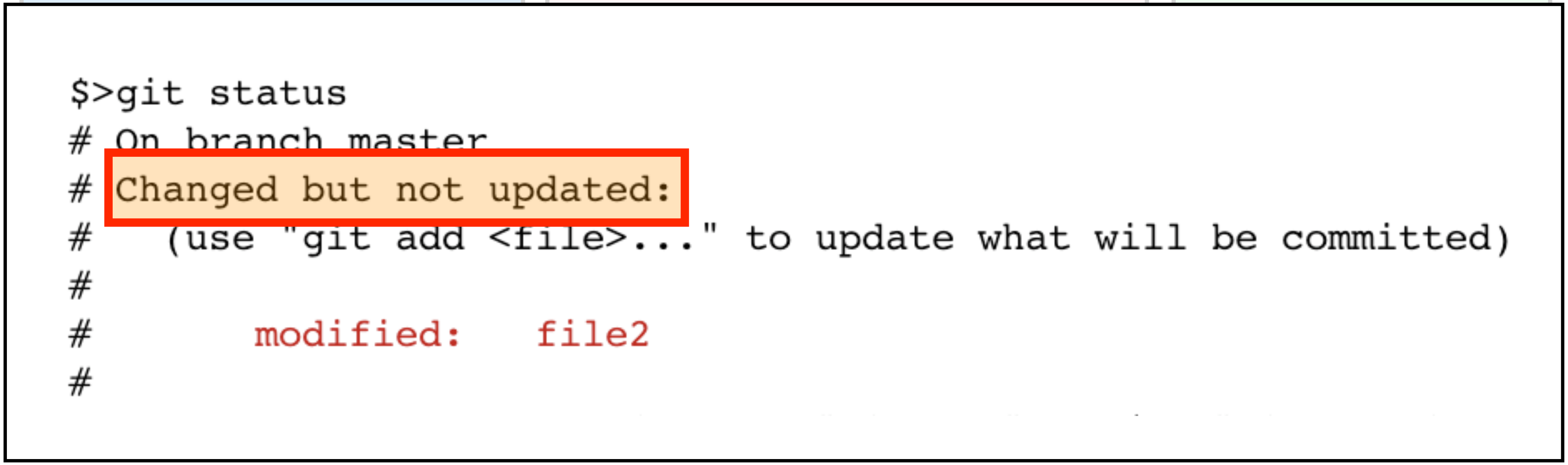
project/

git status

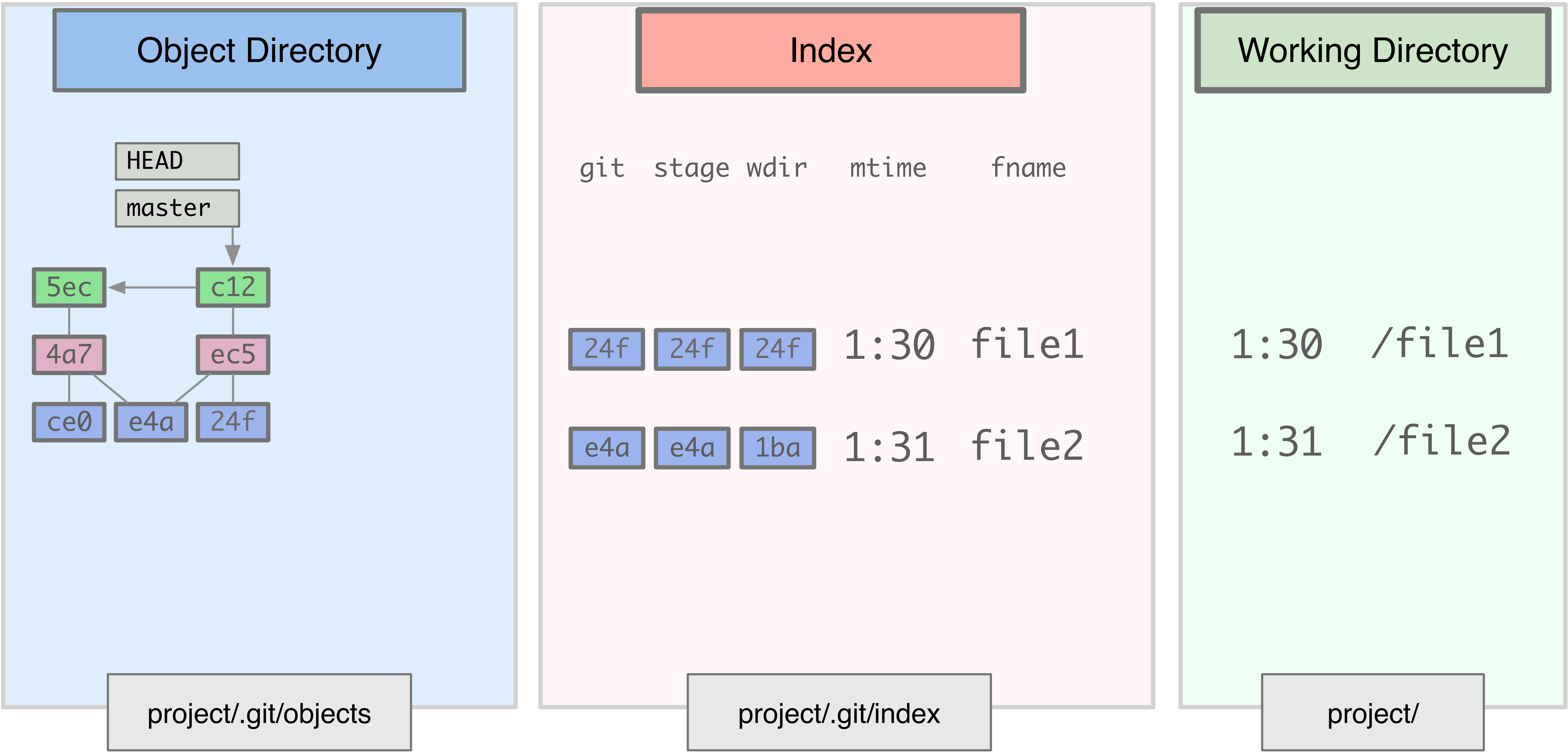


git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	e4a	1ba	1:31	file2

1:30	/file1
1:31	/file2



```
$>git status
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   file2
#
```



Object Directory

project/.git/objects

Index

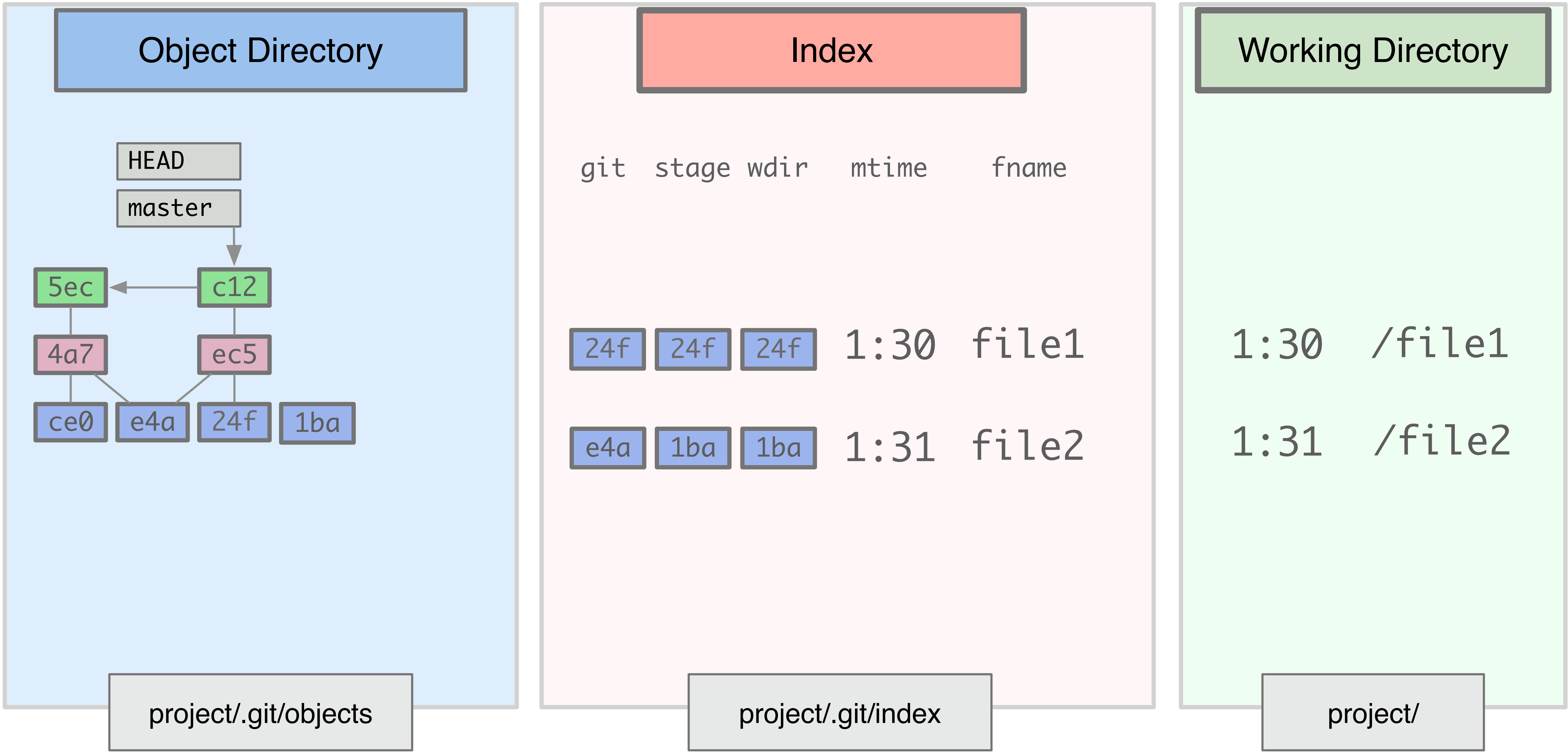
git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	e4a	1ba	1:31	file2

project/.git/index

Working Directory

1:30	/file1
1:31	/file2

project/



Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	1ba	1ba	1:31	file2

project/.git/index

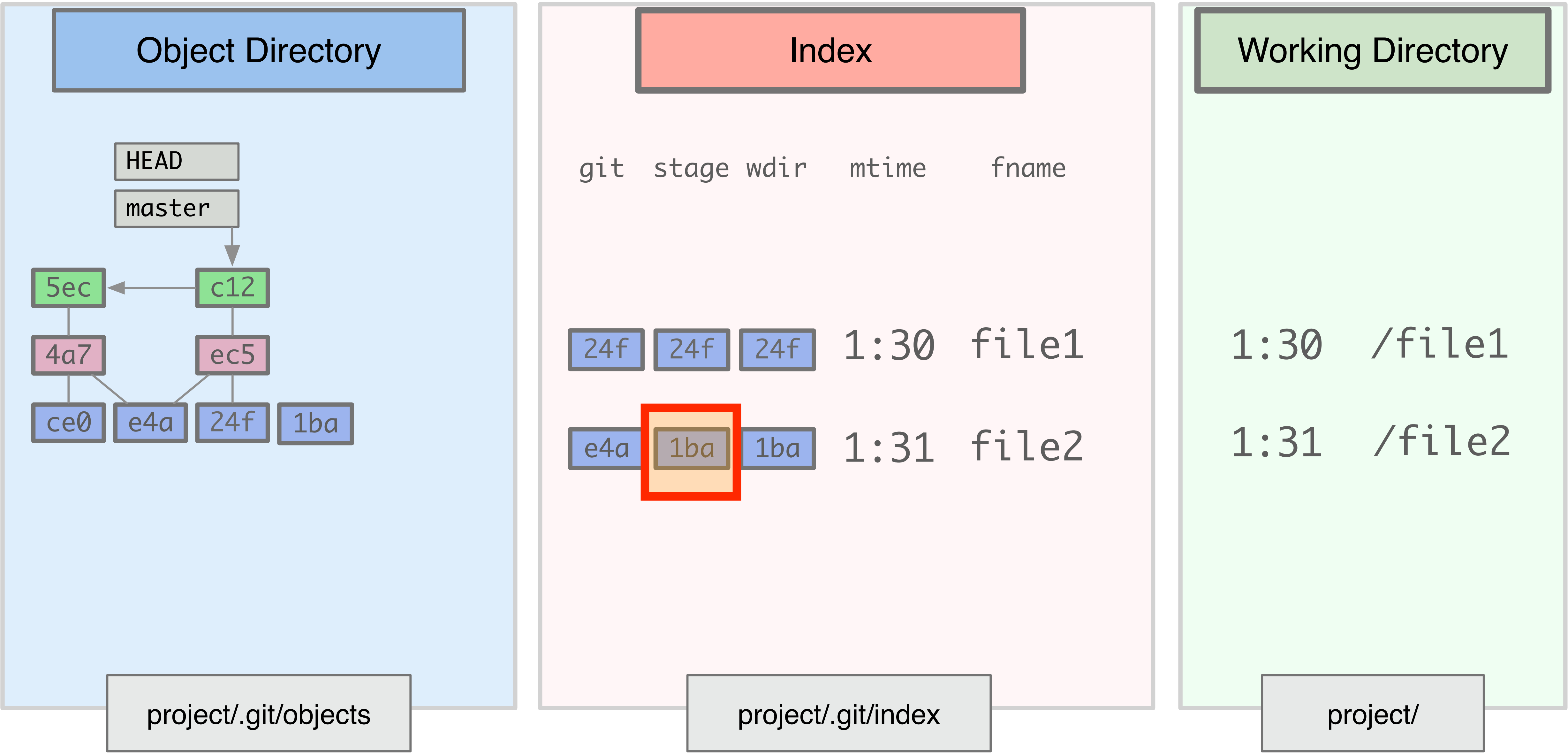
Working Directory

1:30 /file1

1:31 /file2

project/

git add file2



Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	1ba	1ba	1:31	file2

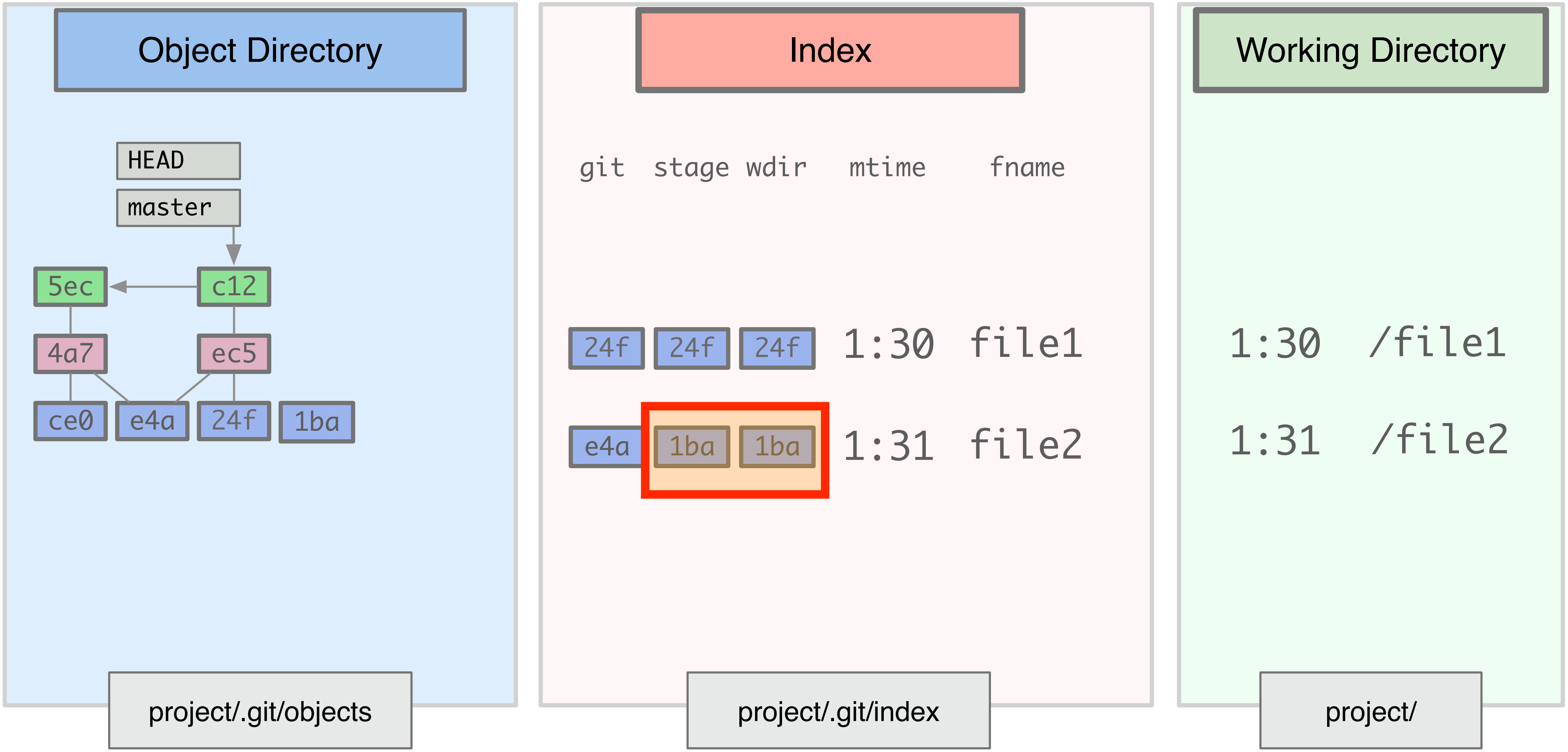
project/.git/index

Working Directory

1:30	/file1
1:31	/file2

project/

git add file2



Object Directory

project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	1ba	1ba	1:31	file2

project/.git/index

Working Directory

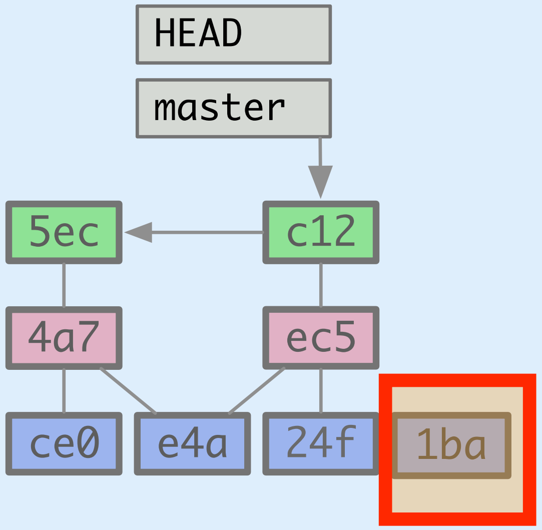
1:30 /file1

1:31 /file2

project/

git add file2

Object Directory



project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	1ba	1ba	1:31	file2

project/.git/index

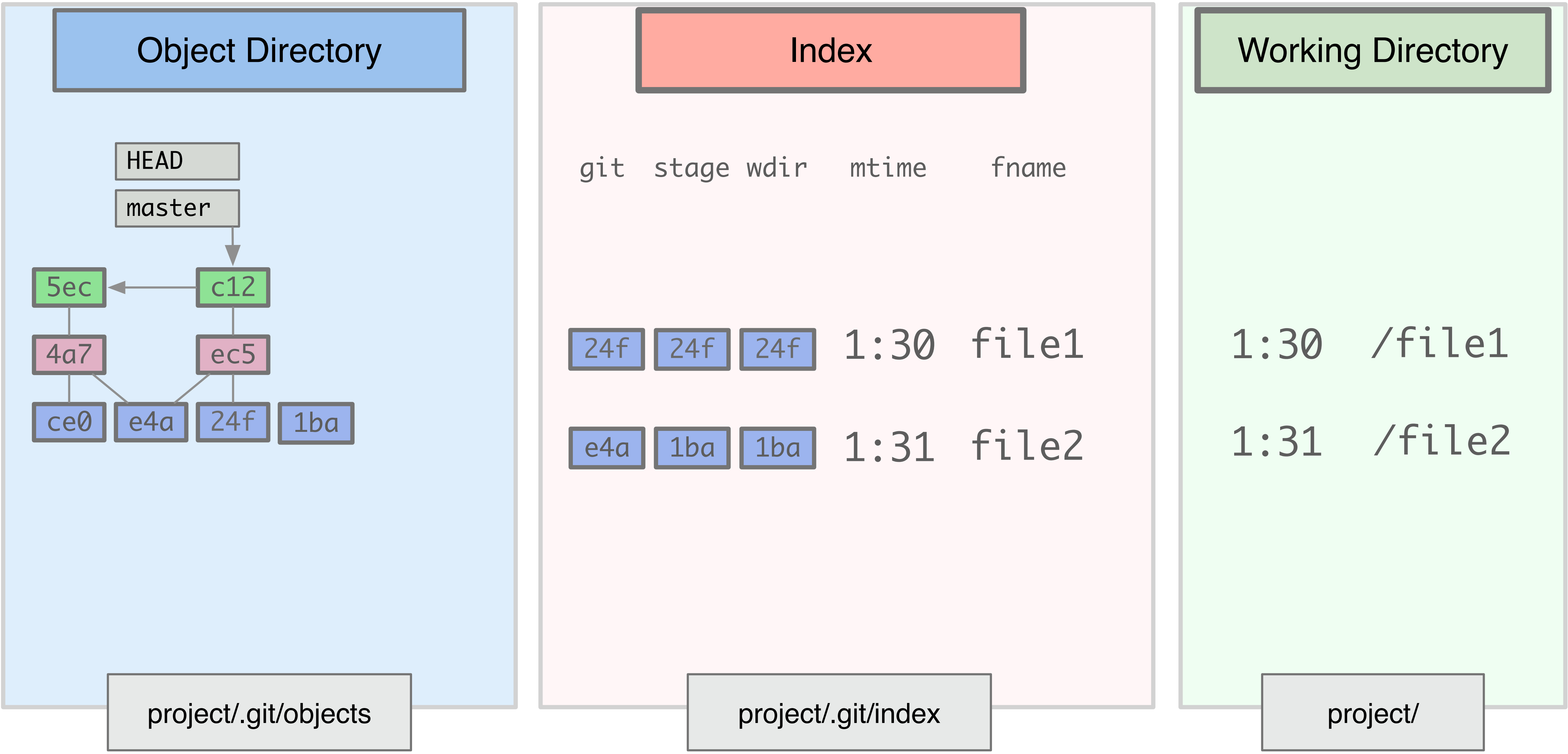
Working Directory

1:30 /file1

1:31 /file2

project/

git add file2



Object Directory

project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	1ba	1ba	1:31	file2

project/.git/index

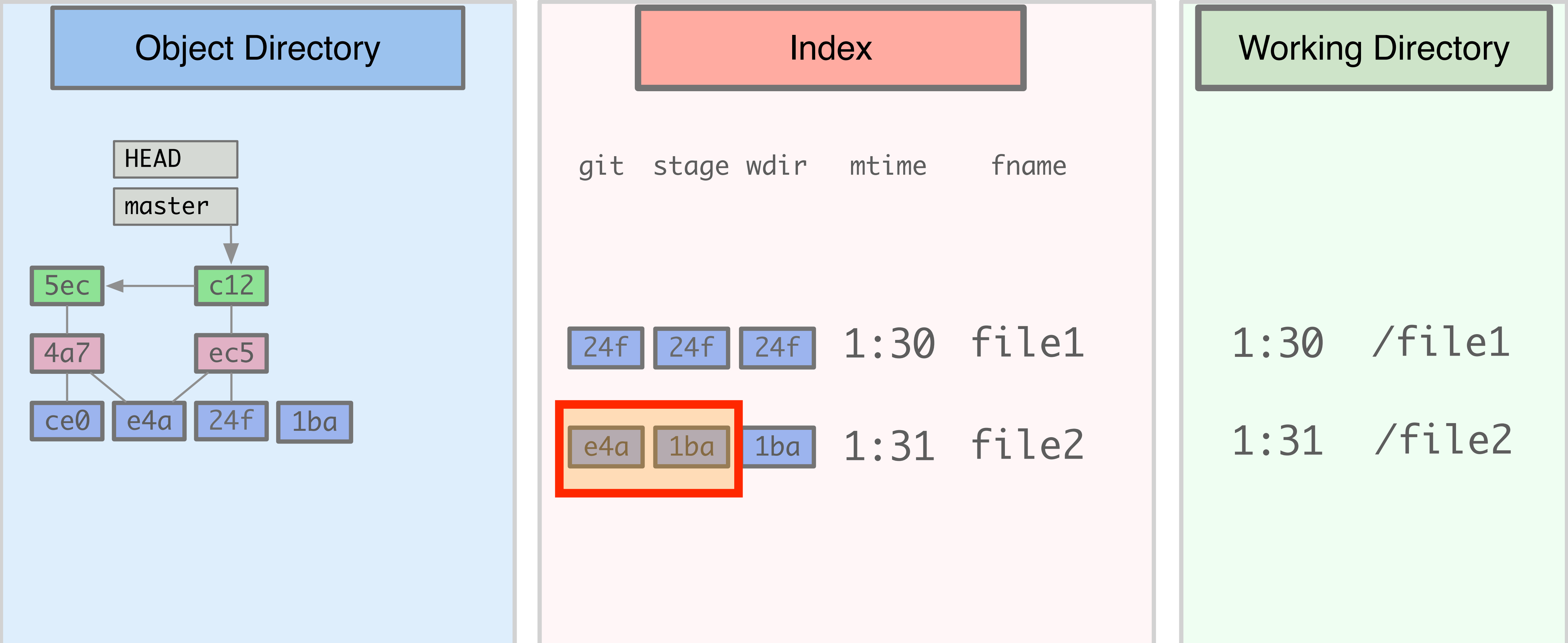
Working Directory

1:30 /file1

1:31 /file2

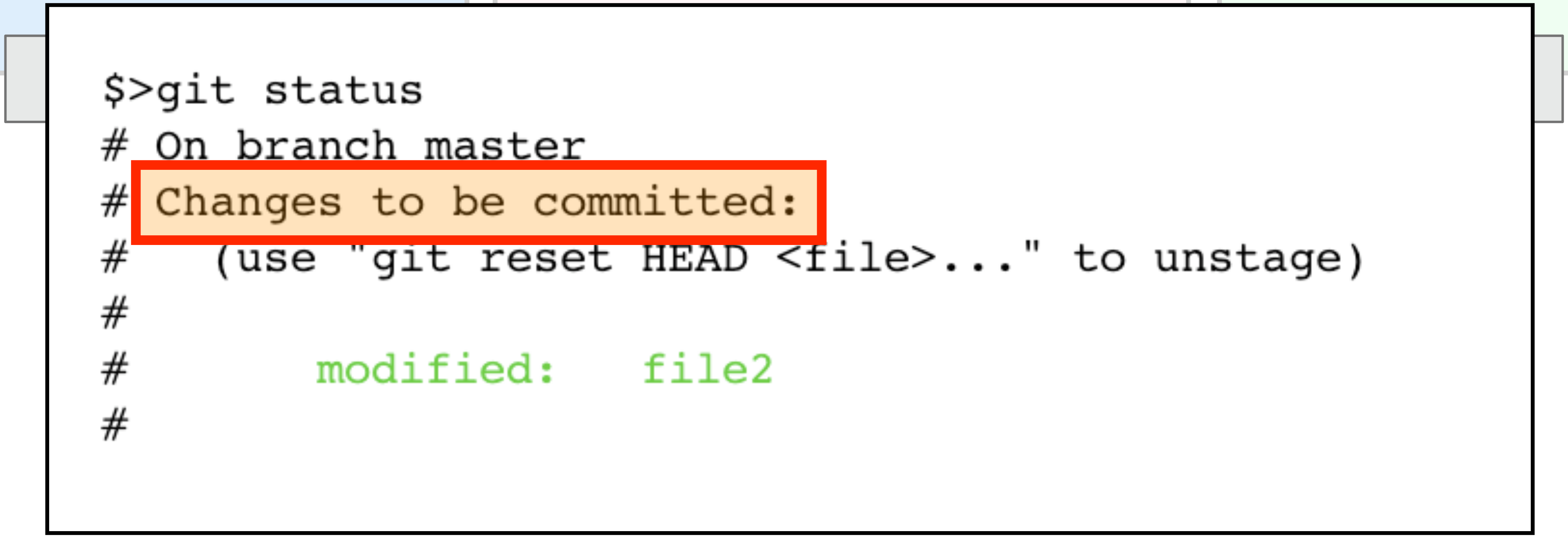
project/

git status

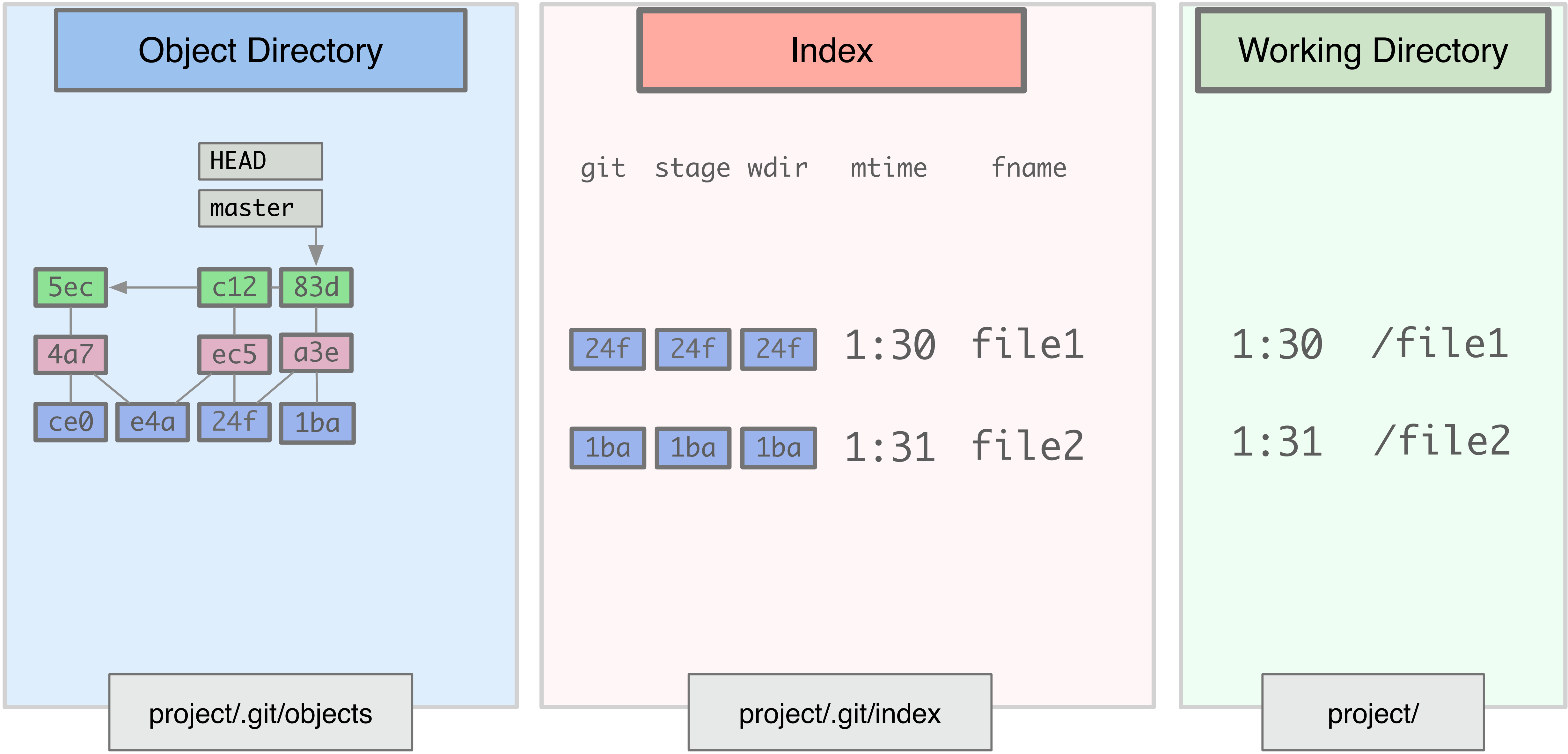


git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
e4a	1ba	1ba	1:31	file2

1:30	/file1
1:31	/file2



```
$>git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   file2
#
```



Object Directory

HEAD

master

5ec c12 83d

4a7 ec5 a3e

ce0 e4a 24f 1ba

project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
1ba	1ba	1ba	1:31	file2

project/.git/index

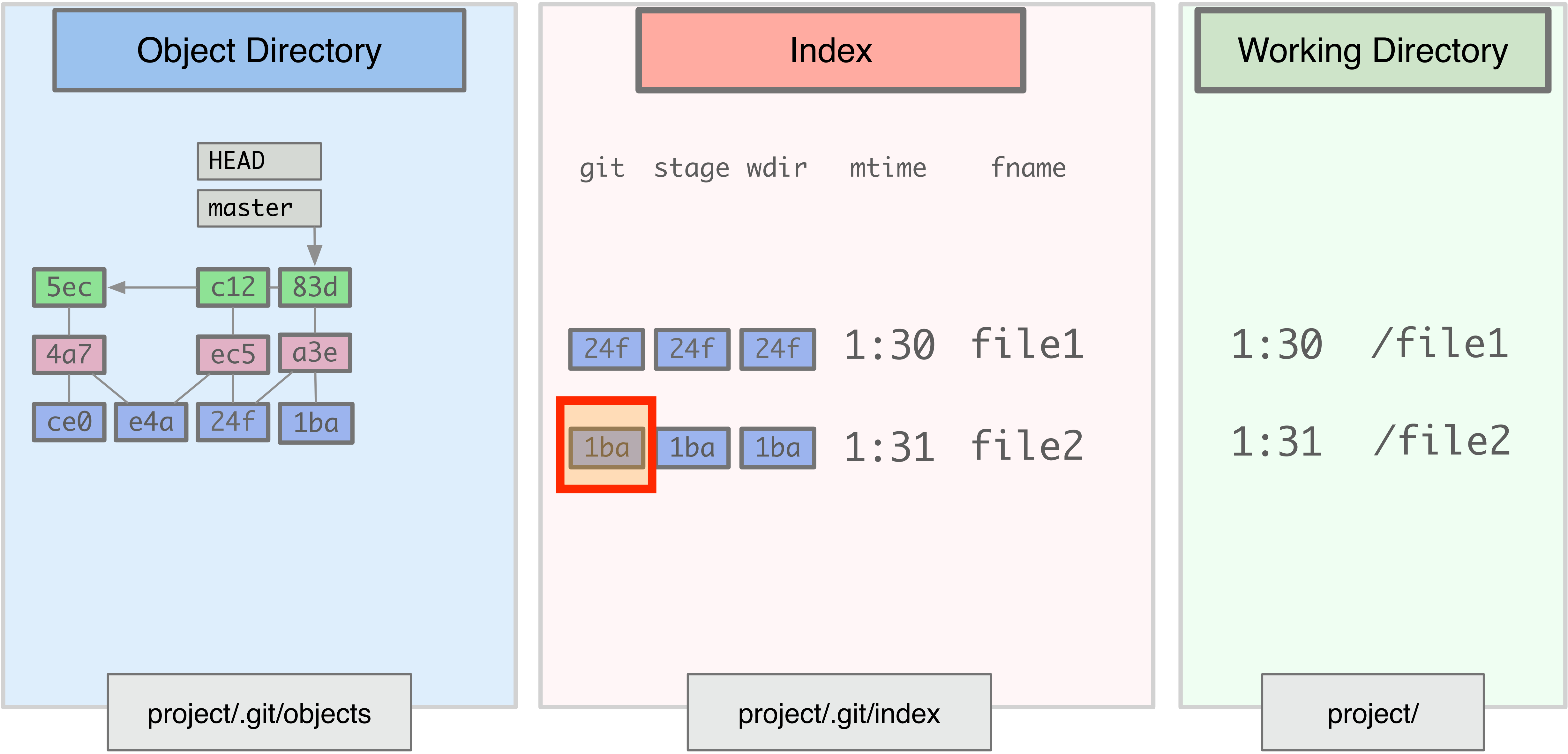
Working Directory

1:30 /file1

1:31 /file2

project/

git commit



Object Directory

HEAD

master

5ec c12 83d

4a7 ec5 a3e

ce0 e4a 24f 1ba

project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
1ba	1ba	1ba	1:31	file2

project/.git/index

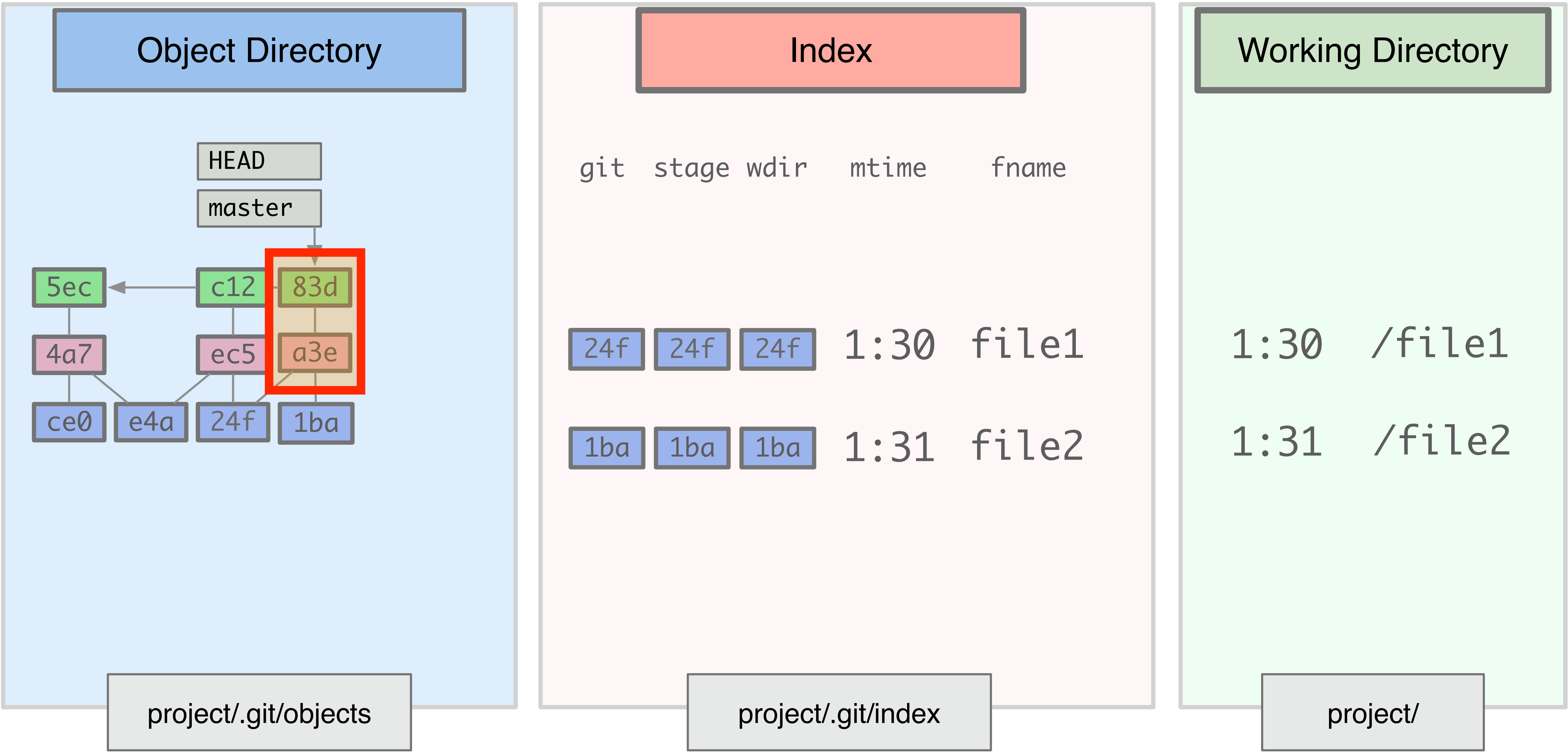
Working Directory

1:30 /file1

1:31 /file2

project/

git commit



Object Directory

HEAD

master

5ec c12 83d

4a7 ec5 a3e

ce0 e4a 24f 1ba

project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
1ba	1ba	1ba	1:31	file2

project/.git/index

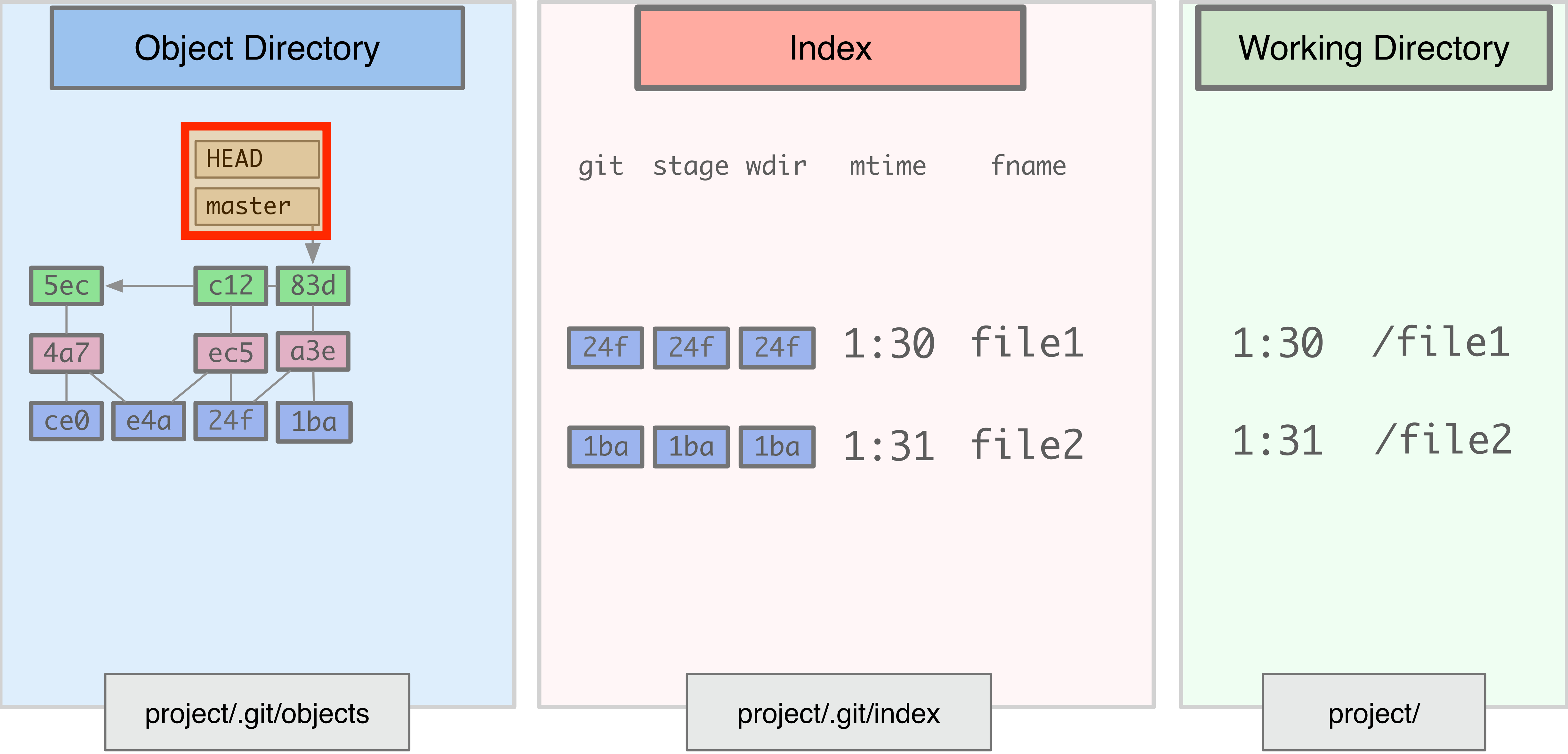
Working Directory

1:30 /file1

1:31 /file2

project/

git commit



Index

git	stage	wdir	mtime	fname
24f	24f	24f	1:30	file1
1ba	1ba	1ba	1:31	file2

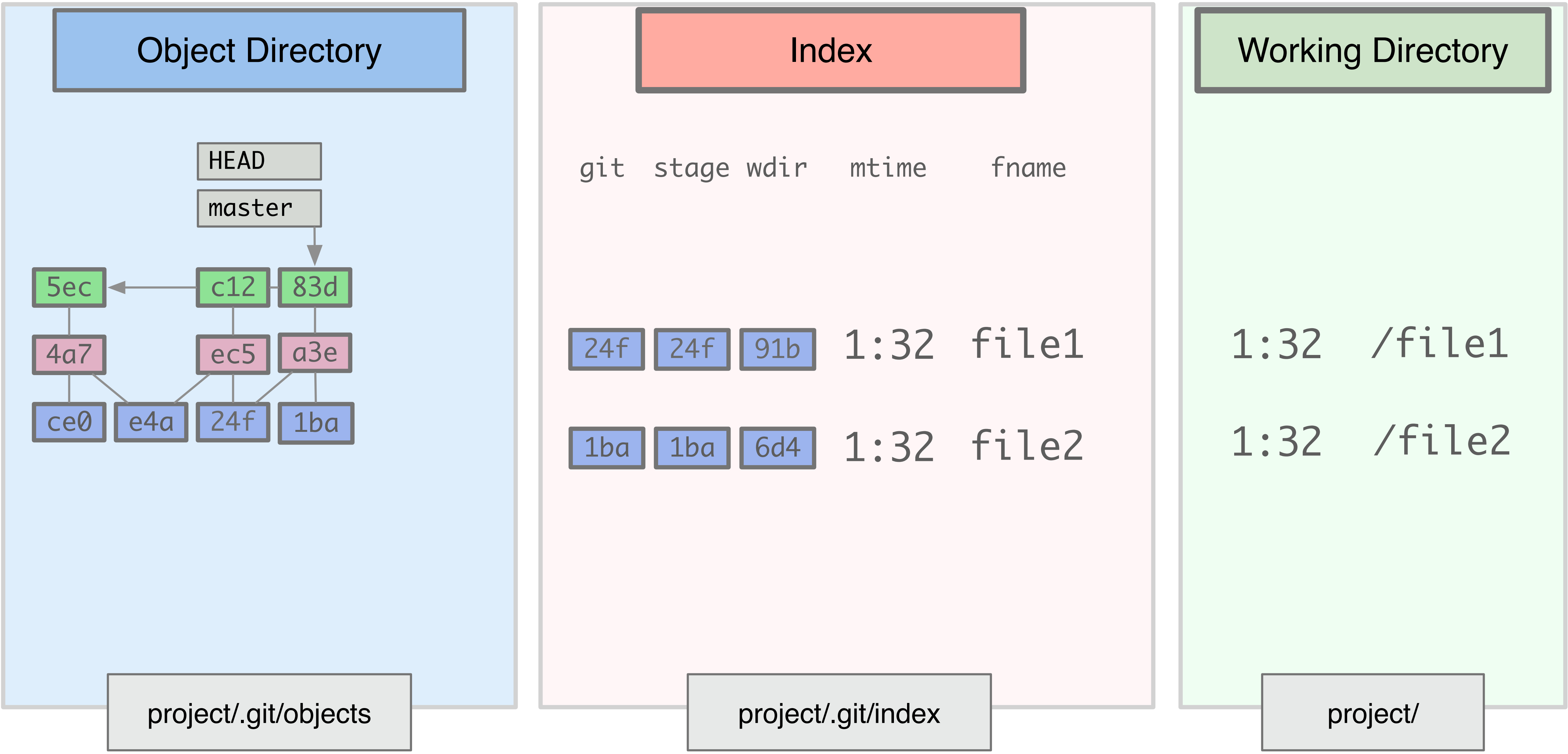
project/.git/index

Working Directory

1:30	/file1
1:31	/file2

project/

git commit



Index

git	stage	wdir	mtime	fname
24f	24f	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

project/.git/index

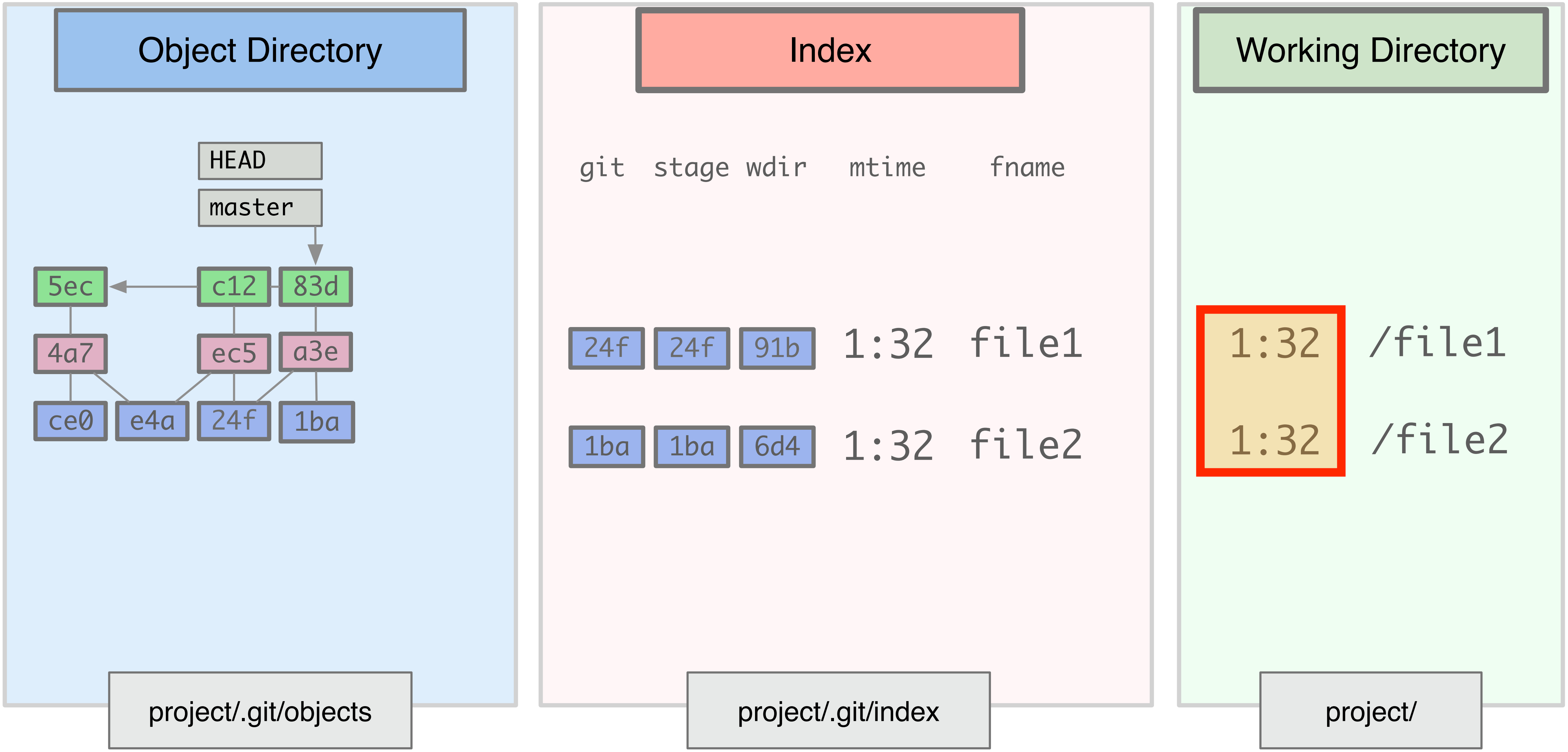
Working Directory

1:32 /file1
1:32 /file2

project/

vim file1 file2

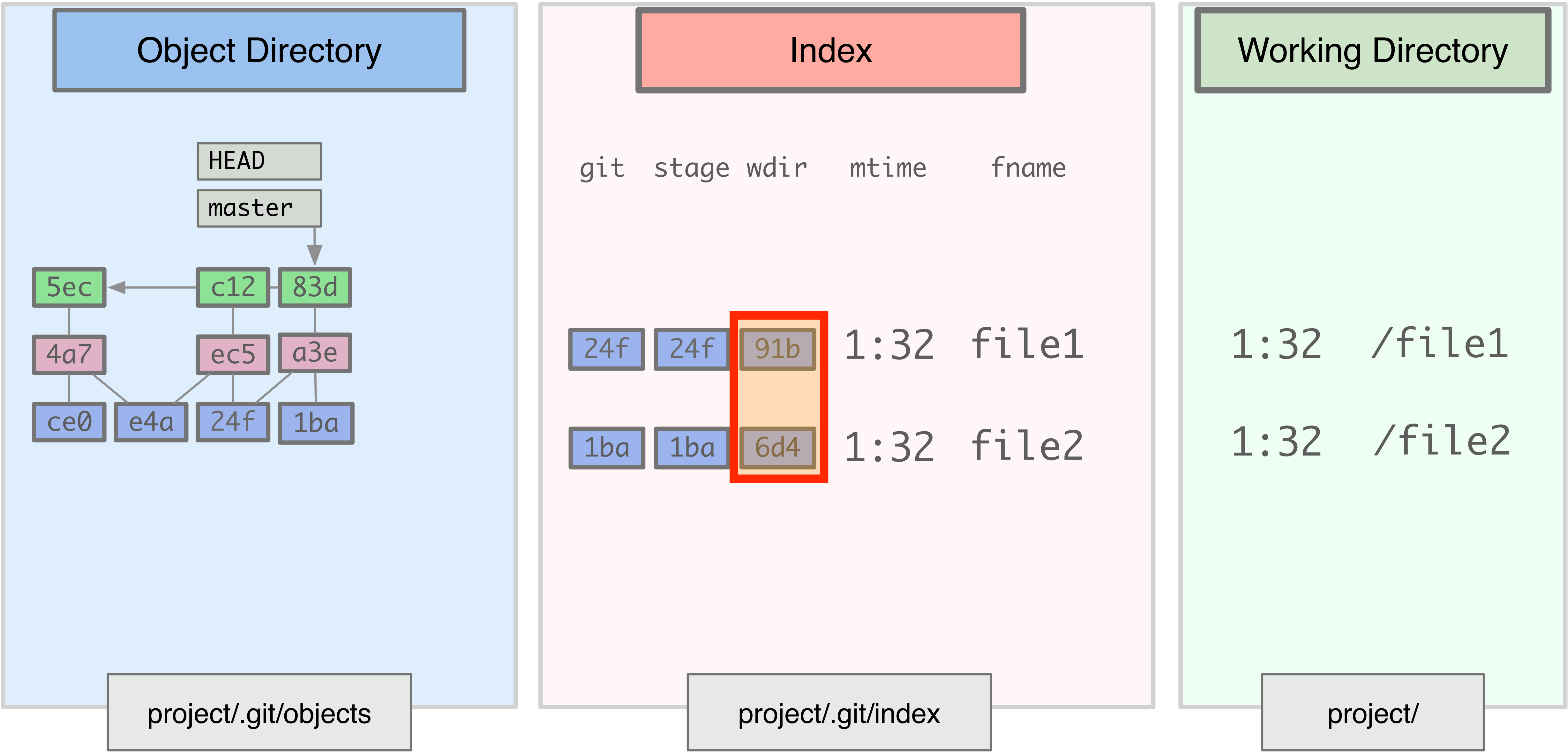
git status



git	stage	wdir	mtime	fname
24f	24f	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

vim file1 file2

git status



Object Directory

HEAD

master

5ec c12 83d

4a7 ec5 a3e

ce0 e4a 24f 1ba

project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	24f	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

project/.git/index

Working Directory

1:32 /file1

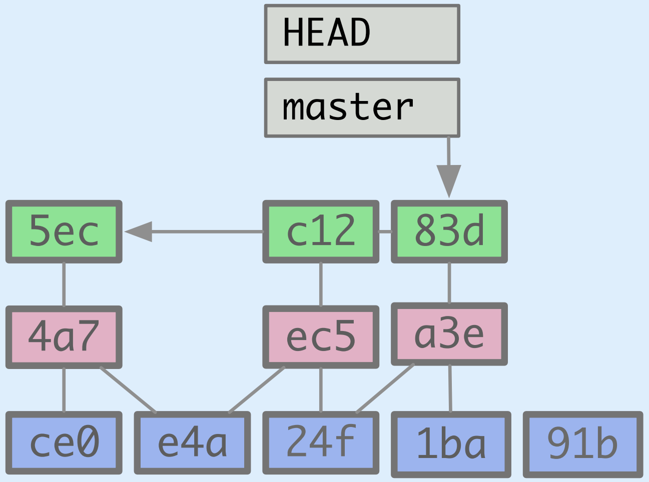
1:32 /file2

project/

vim file1 file2

git status

Object Directory



HEAD

master

5ec c12 83d

4a7 ec5 a3e

ce0 e4a 24f 1ba 91b

project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	91b	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

project/.git/index

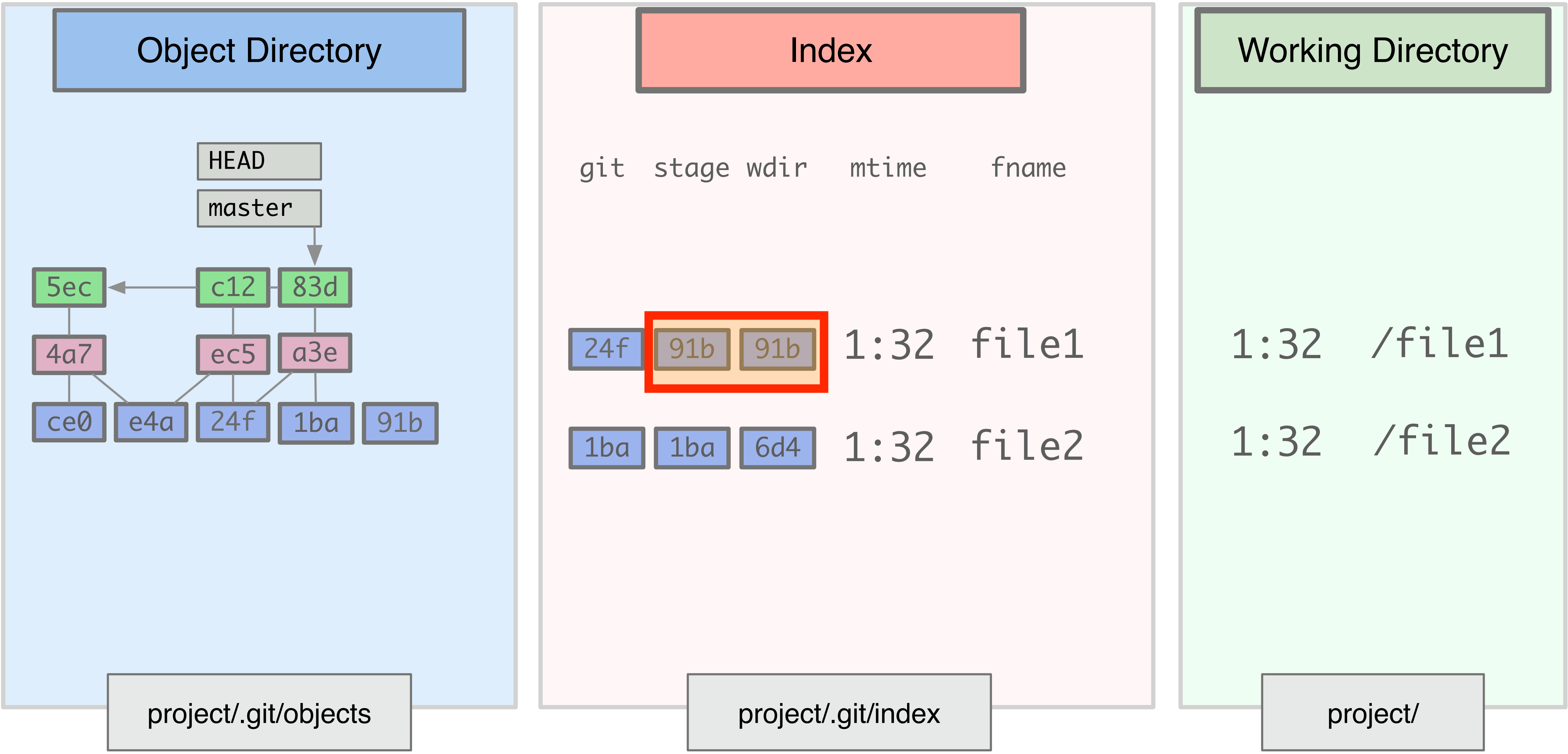
Working Directory

1:32 /file1

1:32 /file2

project/

git add file1



Object Directory

HEAD

master

5ec c12 83d

4a7 ec5 a3e

ce0 e4a 24f 1ba 91b

project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	91b	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

project/.git/index

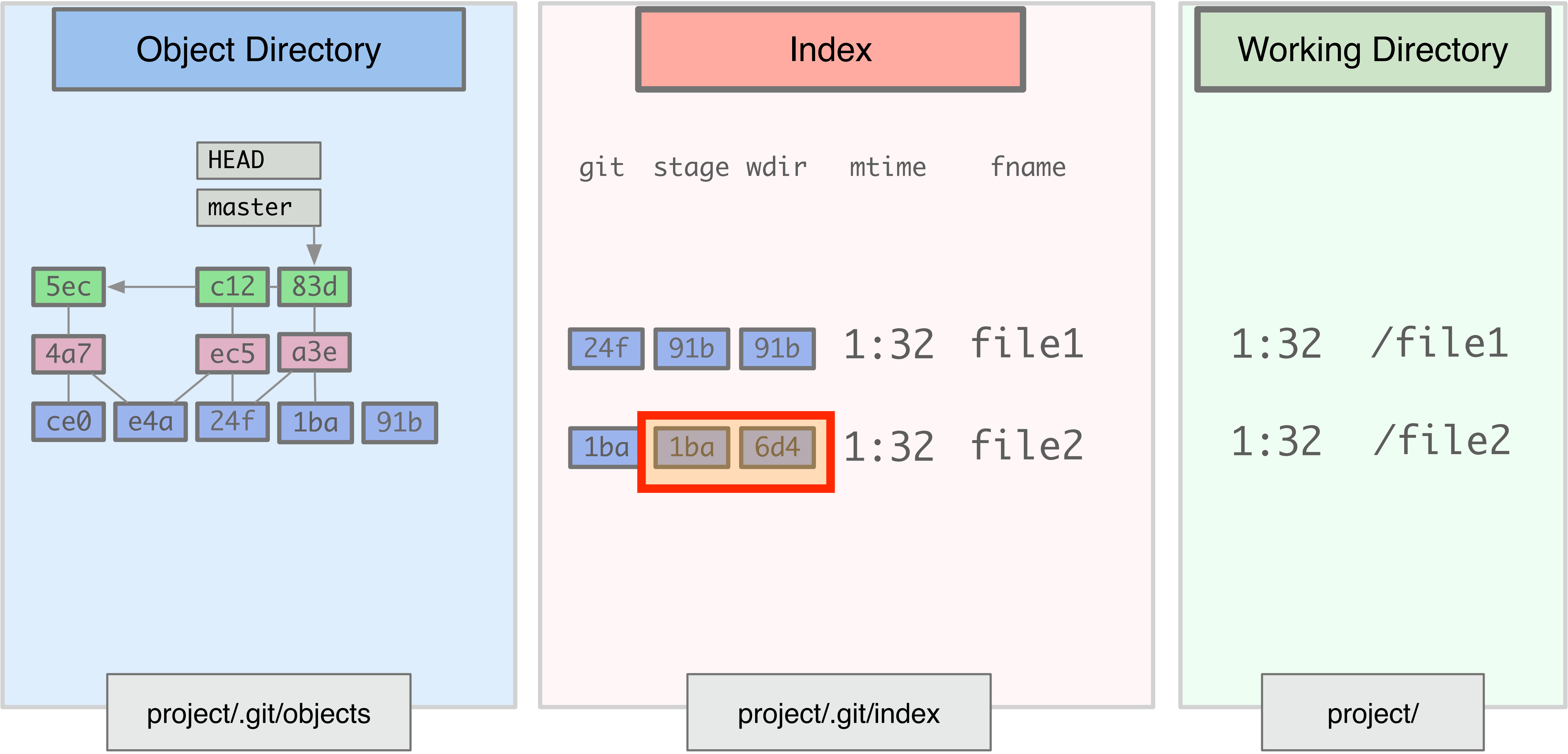
Working Directory

1:32 /file1

1:32 /file2

project/

git add file1

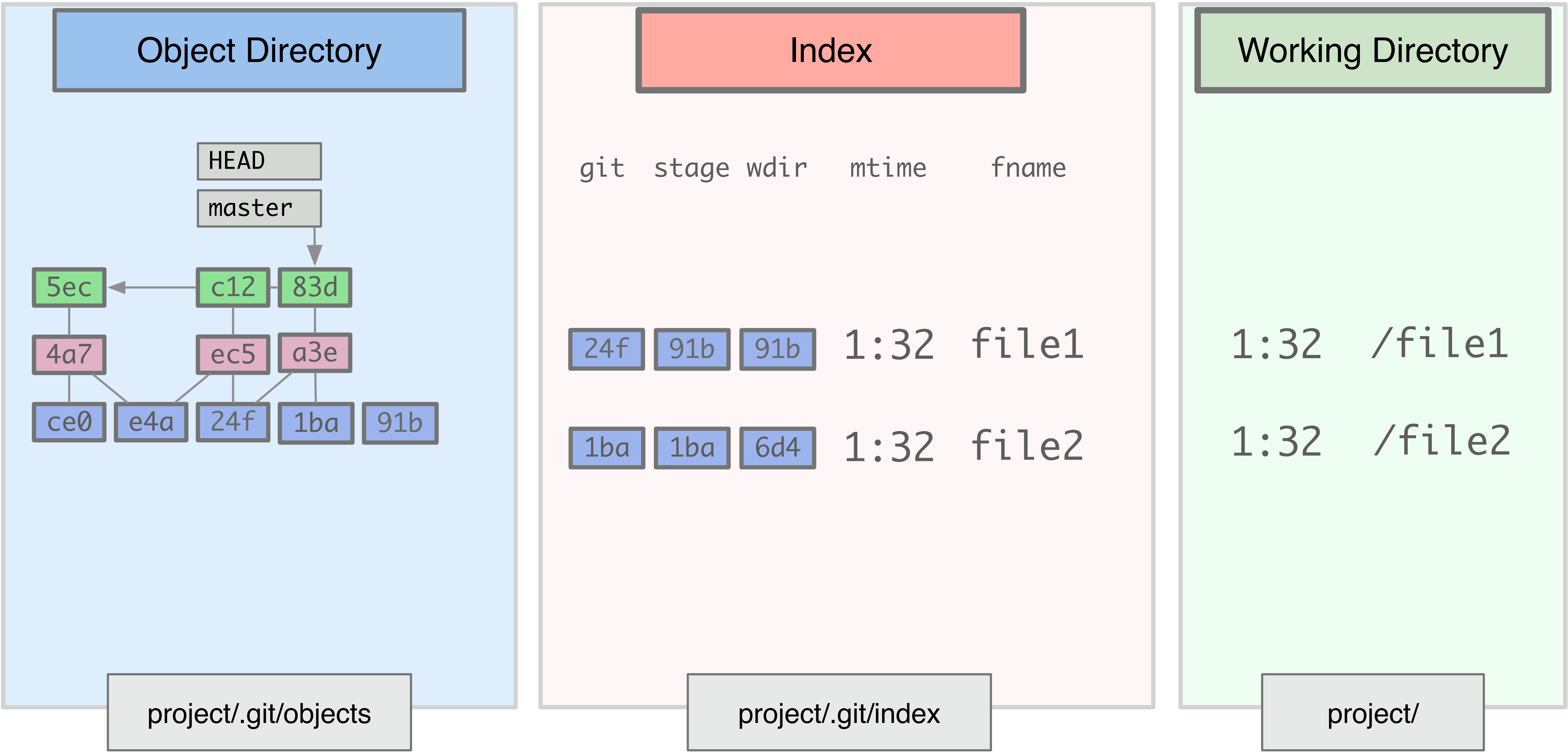


git	stage	wdir	mtime	fname
24f	91b	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

1:32 /file1

1:32 /file2

git add file1



Object Directory

HEAD

master

5ec c12 83d

4a7 ec5 a3e

ce0 e4a 24f 1ba 91b

project/.git/objects

Index

git	stage	wdir	mtime	fname
24f	91b	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

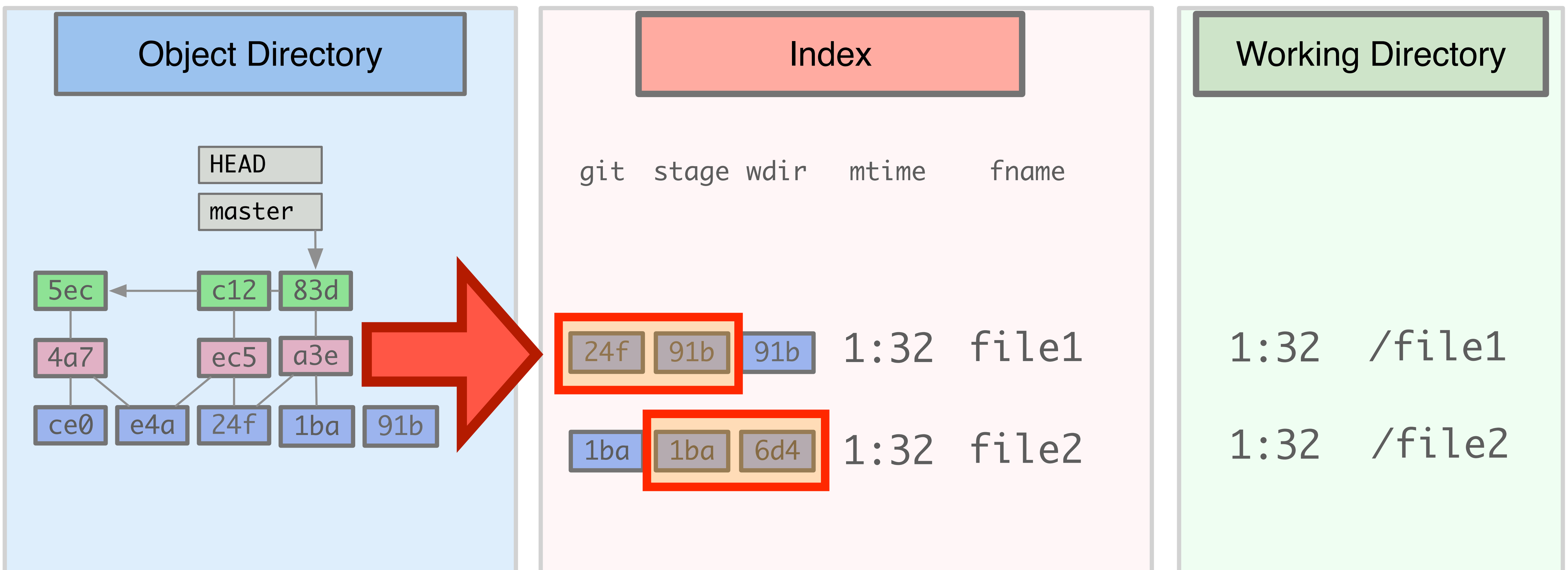
project/.git/index

Working Directory

1:32	/file1
1:32	/file2

project/

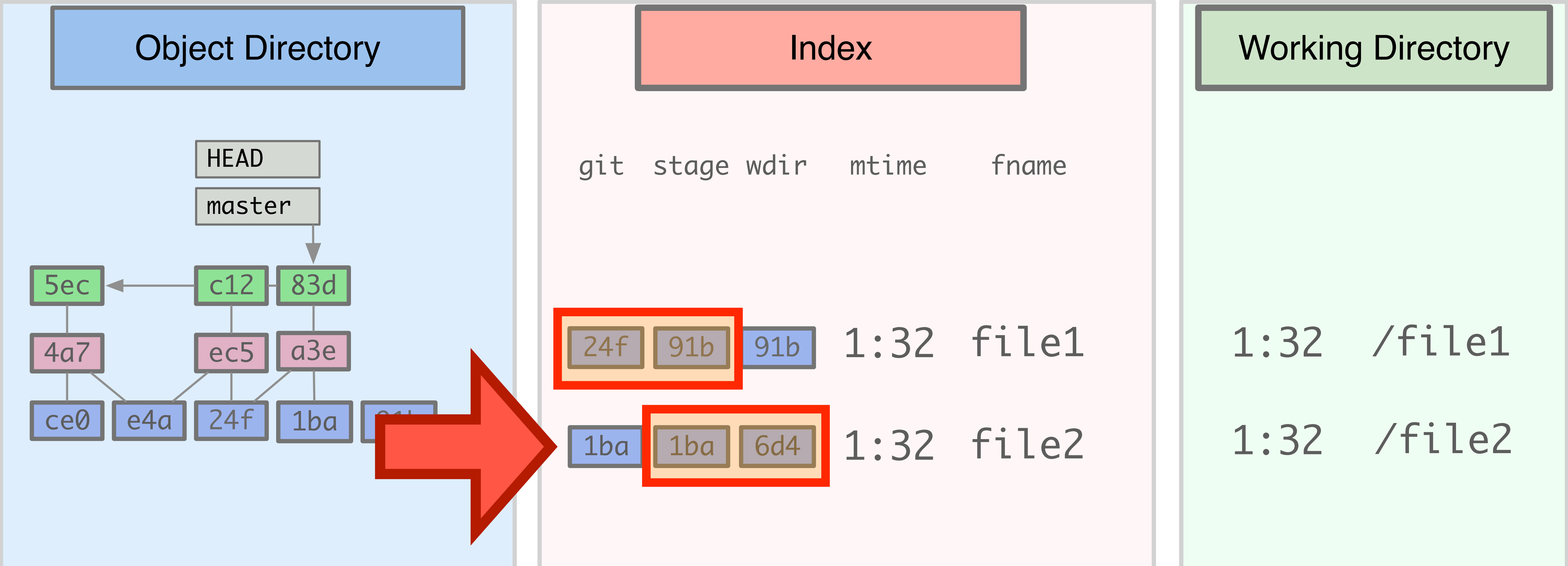
git status



git	stage	wdir	mtime	fname
24f	91b	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

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

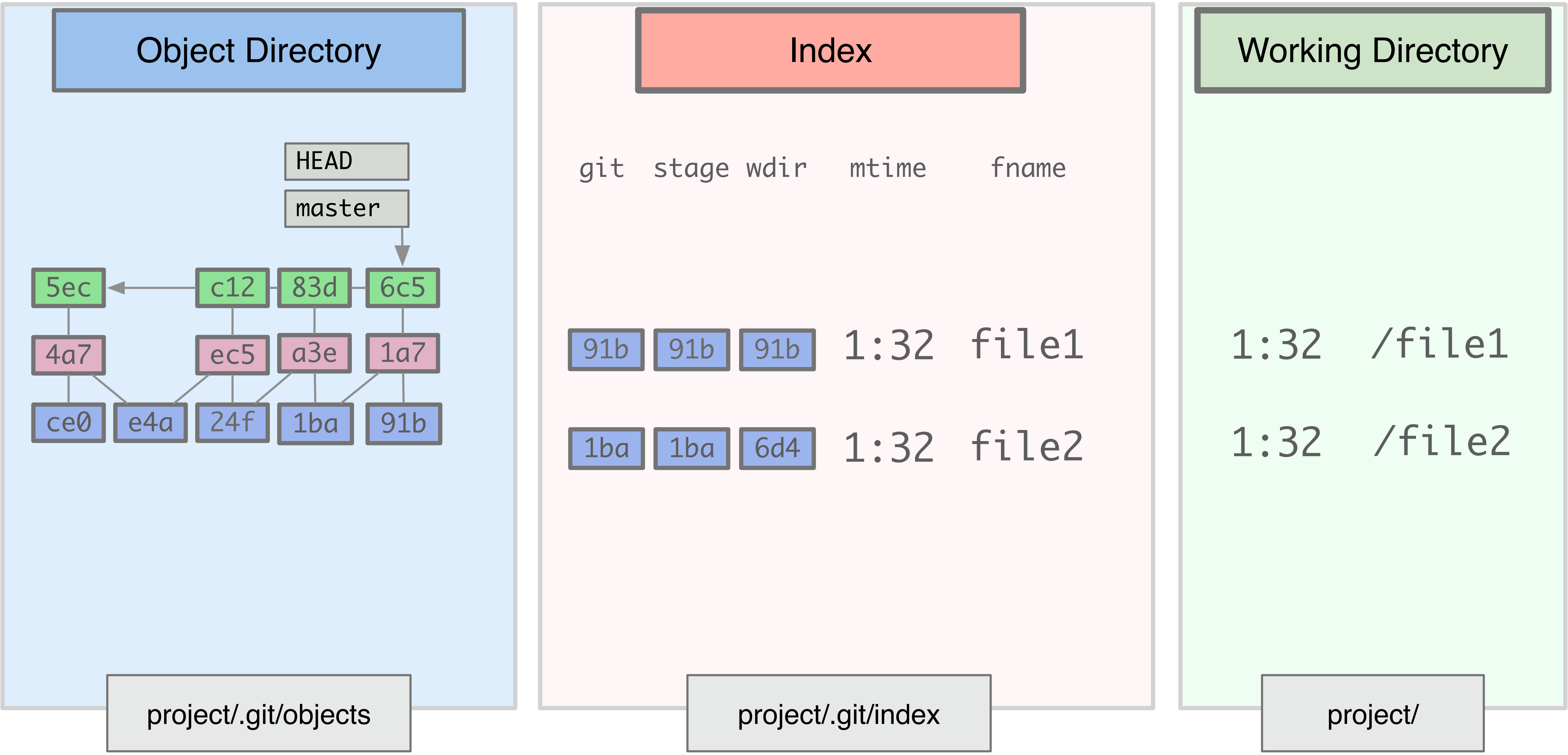
#       modified:   file1
#
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   file2
#
```



git	stage	wdir	mtime	fname
24f	91b	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

```
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   file1
#
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)

#       modified:   file2
#
```



Index

git	stage	wdir	mtime	fname
91b	91b	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

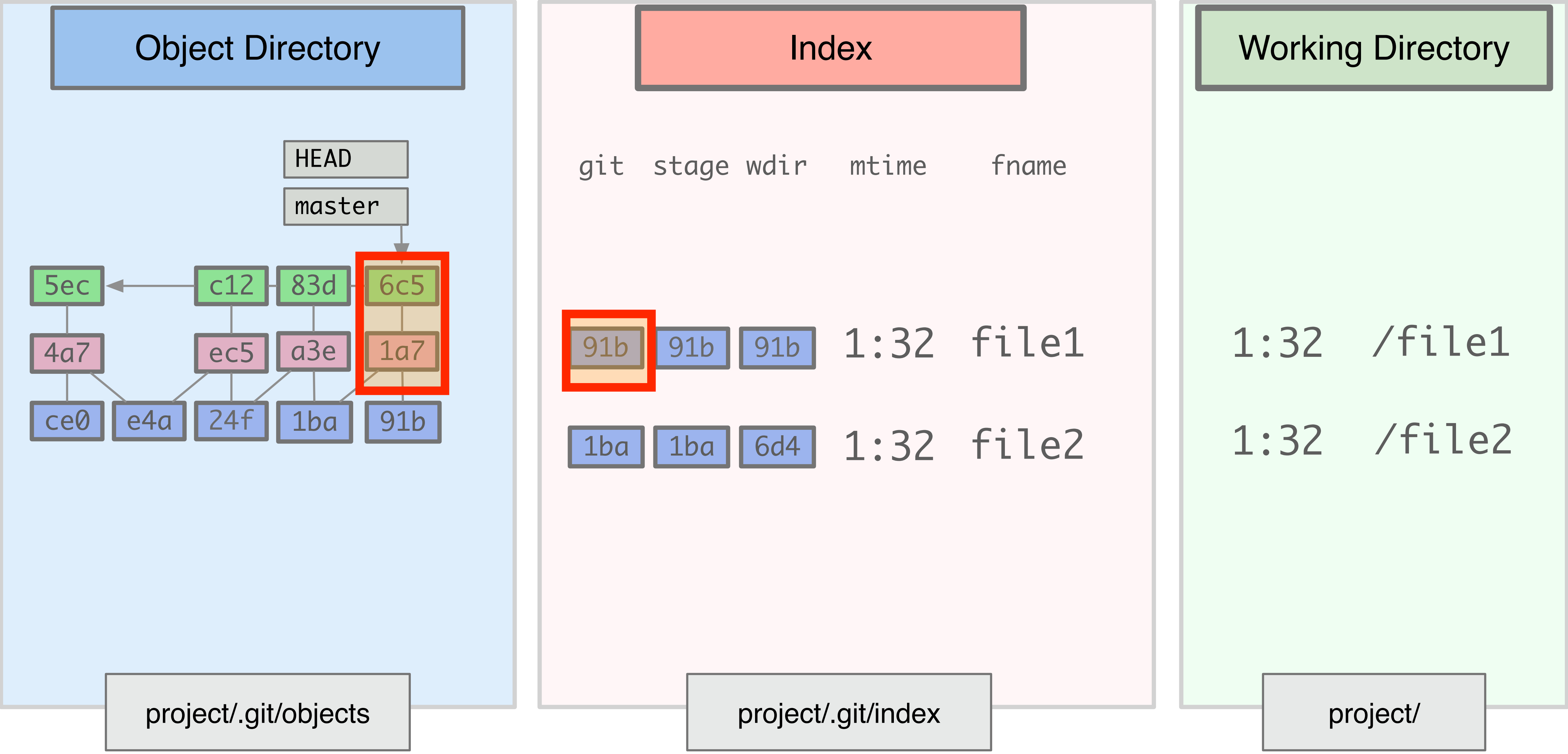
project/.git/index

Working Directory

1:32	/file1
1:32	/file2

project/

git commit



Index

git	stage	wdir	mtime	fname
91b	91b	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

project/.git/index

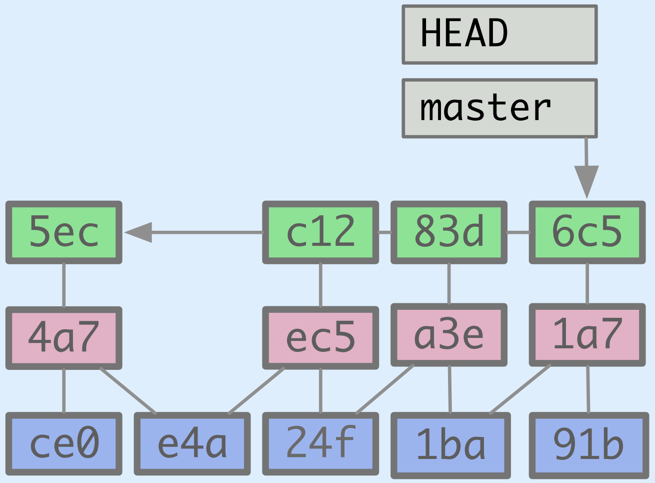
Working Directory

1:32	/file1
1:32	/file2

project/

git commit

Object Directory



project/.git/objects

Index

git	stage	wdir	mtime	fname
91b	91b	91b	1:32	file1
1ba	1ba	6d4	1:32	file2

project/.git/index

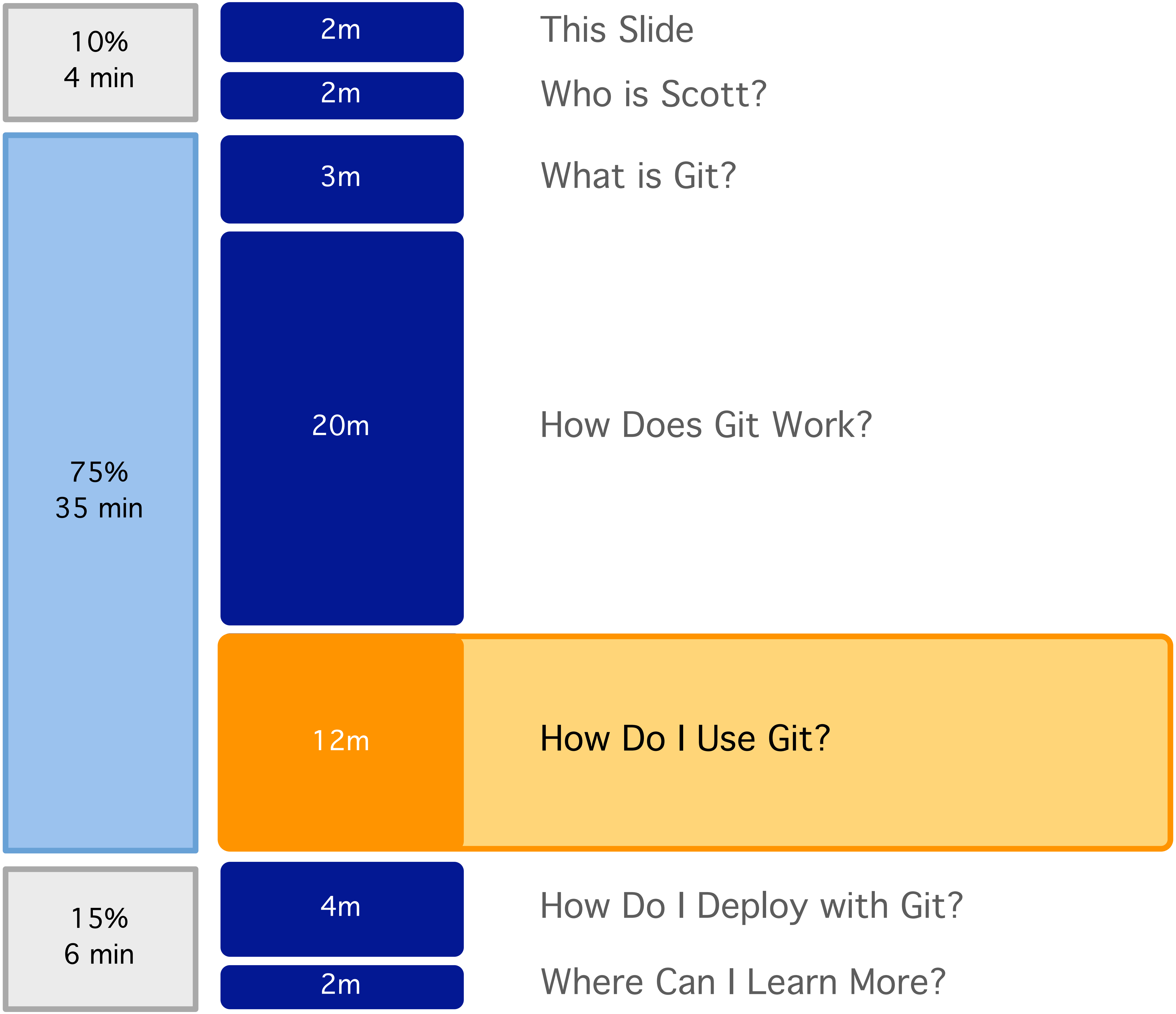
Working Directory

1:32 /file1

1:32 /file2

project/

How Do I Use Git?



10%
4 min

2m This Slide

2m Who is Scott?

75%
35 min

3m What is Git?

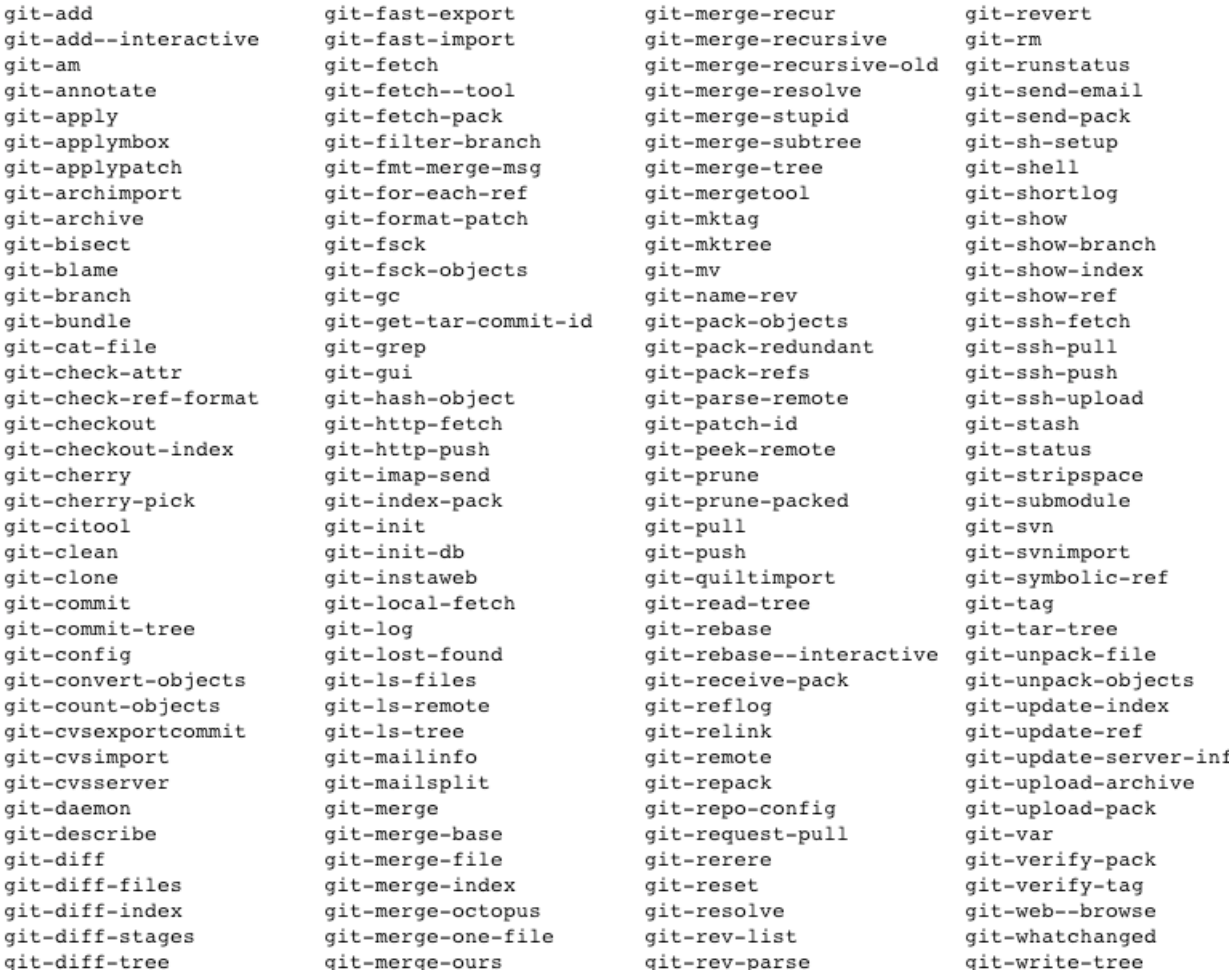
20m How Does Git Work?

12m How Do I Use Git?

15%
6 min

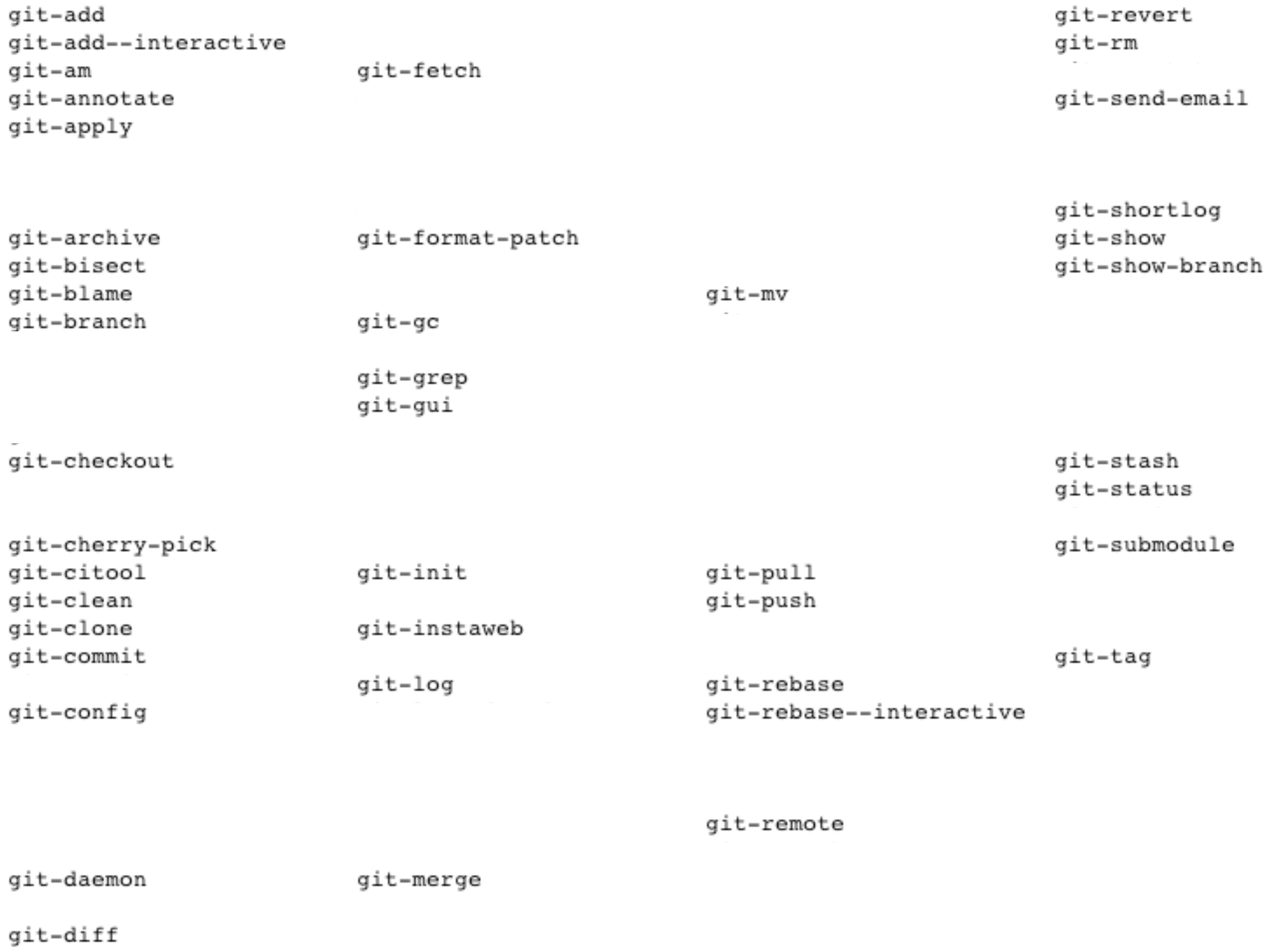
4m How Do I Deploy with Git?

2m Where Can I Learn More?



```
git-add                  git-fast-export          git-merge-recur          git-revert
git-add--interactive     git-fast-import          git-merge-recursive      git-rm
git-am                   git-fetch                git-merge-recursive-old  git-runstatus
git-annotate             git-fetch--tool          git-merge-resolve        git-send-email
git-apply                git-fetch-pack           git-merge-stupid         git-send-pack
git-applymbox            git-filter-branch        git-merge-subtree        git-sh-setup
git-applypatch           git-fmt-merge-msg        git-merge-tree           git-shell
git-archimport           git-for-each-ref         git-mergetool            git-shortlog
git-archive              git-format-patch         git-mktag                git-show
git-bisect               git-fsck                 git-mktree               git-show-branch
git-blame                git-fsck-objects         git-mv                   git-show-index
git-branch               git-gc                   git-name-rev             git-show-ref
git-bundle               git-get-tar-commit-id    git-pack-objects         git-ssh-fetch
git-cat-file             git-grep                 git-pack-redundant       git-ssh-pull
git-check-attr           git-gui                  git-pack-refs            git-ssh-push
git-check-ref-format     git-hash-object          git-parse-remote         git-ssh-upload
git-checkout             git-http-fetch           git-patch-id             git-stash
git-checkout-index       git-http-push            git-peek-remote          git-status
git-cherry               git-imap-send            git-prune                git-stripspace
git-cherry-pick          git-index-pack           git-prune-packed         git-submodule
git-citool               git-init                 git-pull                 git-svn
git-clean                git-init-db              git-push                 git-svnimport
git-clone                git-instaweb             git-quiltimport          git-symbolic-ref
git-commit               git-local-fetch          git-read-tree            git-tag
git-commit-tree          git-log                  git-rebase               git-tar-tree
git-config               git-lost-found           git-rebase--interactive  git-unpack-file
git-convert-objects      git-ls-files             git-receive-pack         git-unpack-objects
git-count-objects        git-ls-remote            git-reflog               git-update-index
git-cvsexportcommit      git-ls-tree              git-relink               git-update-ref
git-cvsimport            git-mailinfo             git-remote               git-update-server-inf
git-cvsserver            git-mailsplit            git-repack               git-upload-archive
git-daemon               git-merge                git-repo-config          git-upload-pack
git-describe             git-merge-base           git-request-pull         git-var
git-diff                 git-merge-file           git-rerere               git-verify-pack
git-diff-files           git-merge-index          git-reset                git-verify-tag
git-diff-index           git-merge-octopus        git-resolve              git-web--browse
git-diff-stages          git-merge-one-file       git-rev-list             git-whatchanged
git-diff-tree            git-merge-ours           git-rev-parse            git-write-tree
```

152 Total Commands



```
git-add                                                                     git-revert
git-add--interactive                                                        git-rm
git-am                   git-fetch
git-annotate                                                                git-send-email
git-apply


                                                                            git-shortlog
git-archive              git-format-patch                                   git-show
git-bisect                                                                  git-show-branch
git-blame                                          git-mv
git-branch               git-gc

                         git-grep
                         git-gui

git-checkout                                                                git-stash
                                                                            git-status

git-cherry-pick                                                             git-submodule
git-citool               git-init                  git-pull
git-clean                                          git-push
git-clone                git-instaweb
git-commit                                                                  git-tag
                         git-log                   git-rebase
git-config                                         git-rebase--interactive

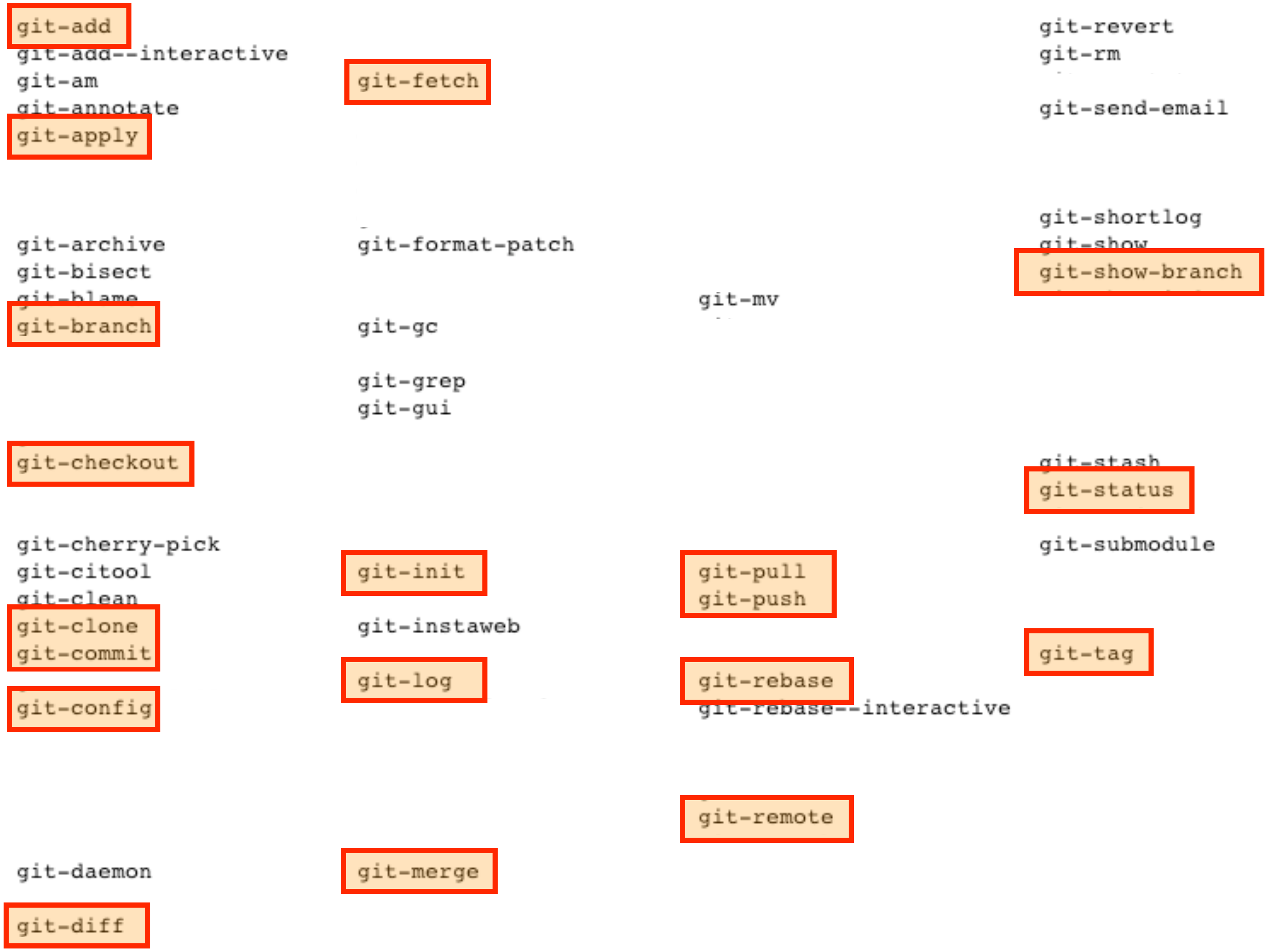


                                                   git-remote

git-daemon               git-merge

git-diff
```

43 Porcelain Commands



```
git-add
git-add--interactive
git-am
git-annotate
git-apply

git-archive
git-bisect
git-blame
git-branch

git-checkout

git-cherry-pick
git-citool
git-clean
git-clone
git-commit
git-config

git-daemon
git-diff

git-fetch

git-format-patch

git-gc

git-grep
git-gui

git-init

git-instaweb

git-log

git-merge

git-mv

git-pull
git-push

git-rebase
git-rebase--interactive

git-remote

git-revert
git-rm

git-send-email

git-shortlog
git-show
git-show-branch

git-stash
git-status

git-submodule

git-tag
```

We’ll Cover Half

getting git

git.or.cz

git.or.cz

wget
make
make install

```
yum install git-core

apt-get install git-core

port install git-core +svn
```

setup

```
git config --global user.name
“Scott Chacon”
```

```
git config --global user.email
“schacon@gmail.com”
```

```
$>cat ~/.gitconfig
[user]
        name = Scott Chacon
        email = schacon@gmail.com
[color]
        status = auto
        branch = auto
        interactive = auto
        diff = auto
```

```
$>cat ~/.gitconfig
[user]
        name = Scott Chacon
        email = schacon@gmail.com
[color]
        status = auto
        branch = auto
        interactive = auto
        diff = auto
```

git-add
git-add--interactive
git-am
git-annotate
git-apply
git-archive
git-bisect
git-blame
git-branch
git-checkout
git-cherry-pick
git-citool
git-clean
git-clone
git-commit
~~git-config~~
git-daemon
git-diff

git-fetch
git-format-patch
git-gc
git-grep
git-gui
git-init
git-instaweb
git-log
git-merge

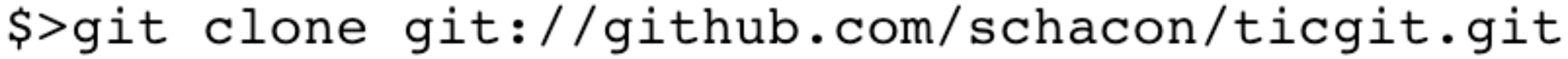
git-mv
git-pull
git-push
git-rebase
git-rebase--interactive
git-remote

git-revert
git-rm
git-send-email
git-shortlog
git-show
git-show-branch
git-stash
git-status
git-submodule
git-tag

I Down

getting a repo

git clone



```
$>git clone git://github.com/schacon/ticgit.git
```

Git Protocols

ssh://

http[s]://

git://

file:///

rsync://

Git Protocols

ssh://

http[s]://

git://

file:///

~~rsync://~~

Git Protocols

ssh:// push

http[s]://

git://

file:///

~~rsync://~~

Git Protocols

pull

ssh://

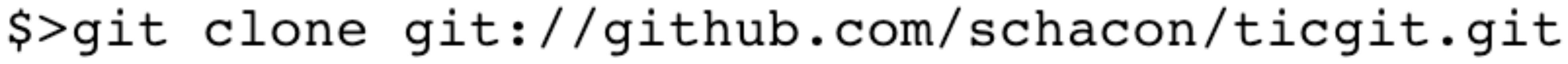
http[s]://

git://

file:///

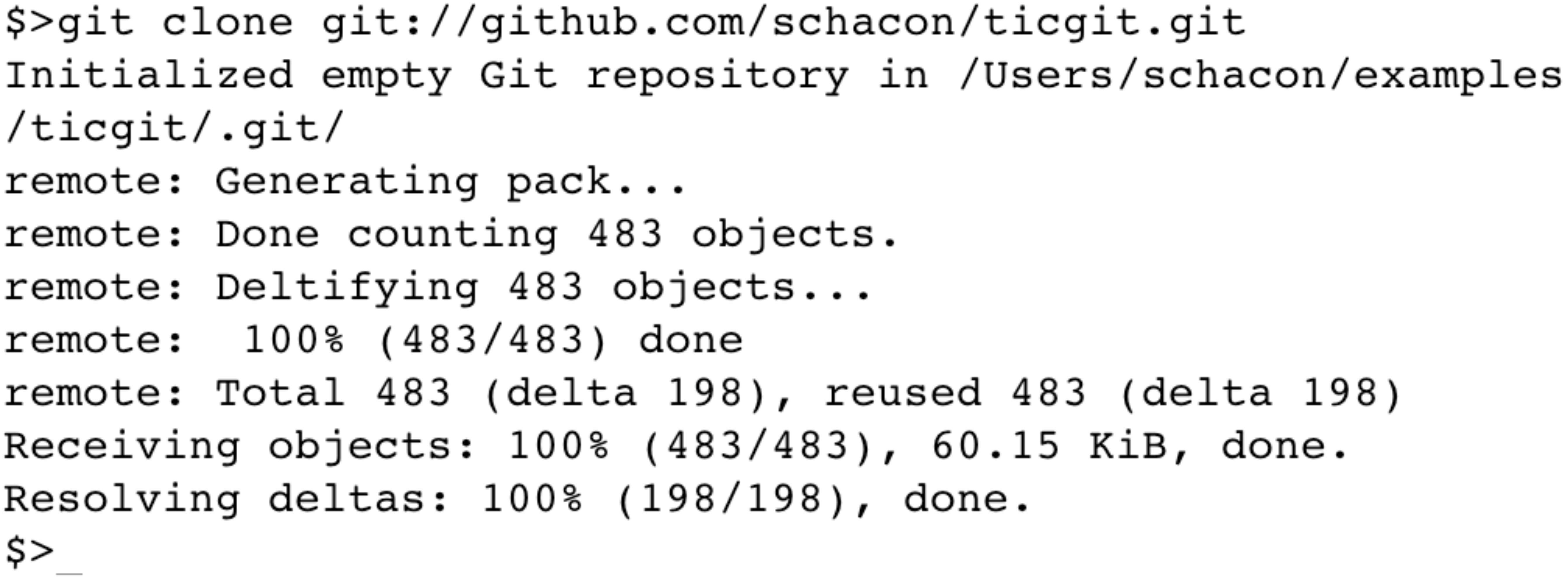
~~rsync://~~

git clone



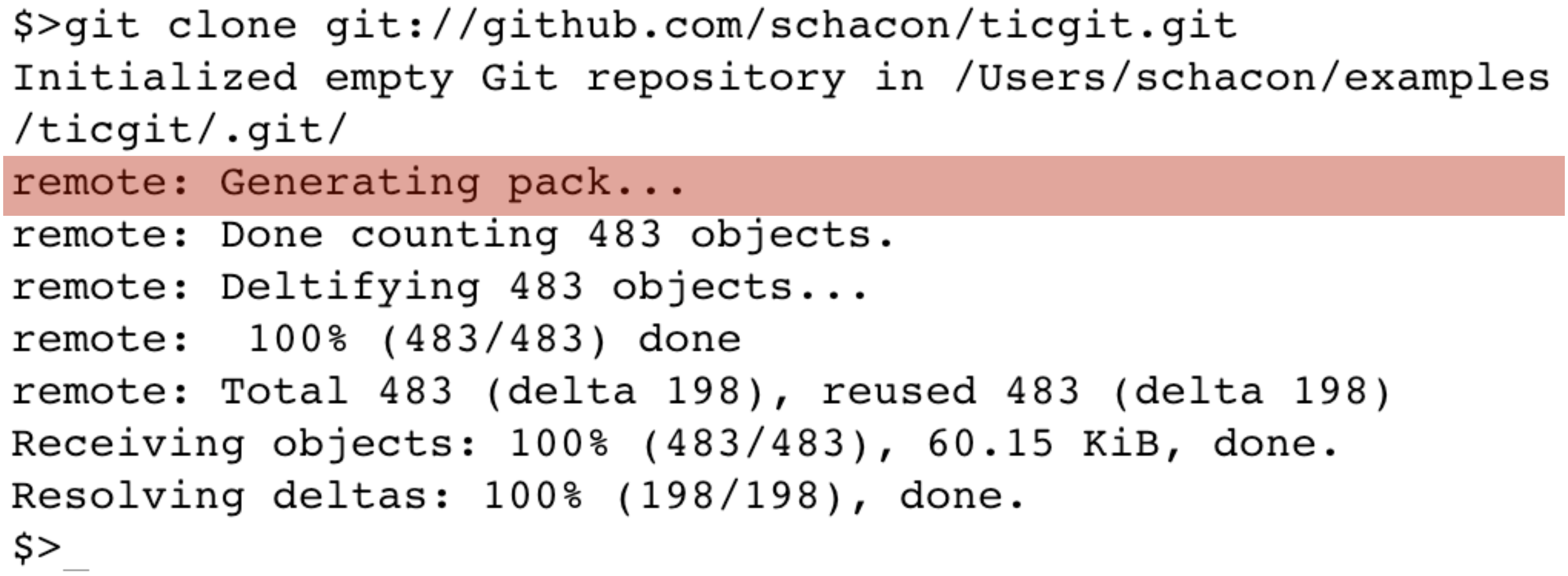
```
$>git clone git://github.com/schacon/ticgit.git
```

git clone



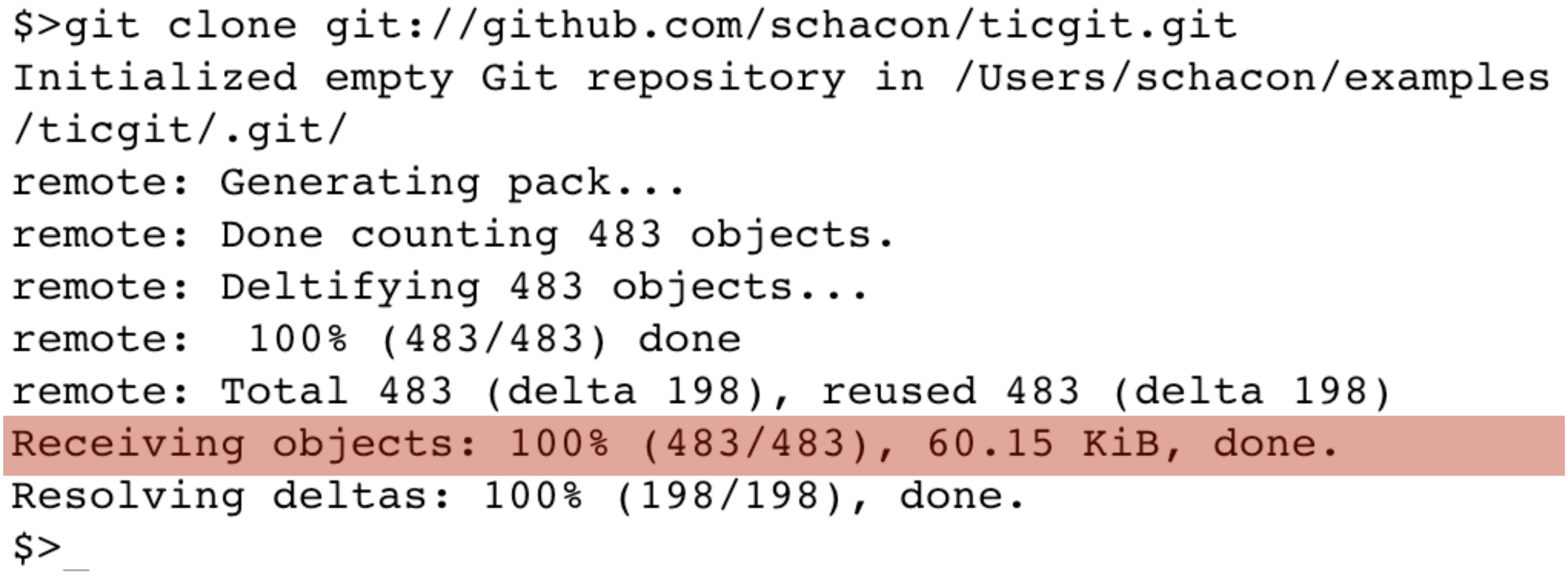
```
$>git clone git://github.com/schacon/ticgit.git
Initialized empty Git repository in /Users/schacon/examples
/ticgit/.git/
remote: Generating pack...
remote: Done counting 483 objects.
remote: Deltifying 483 objects...
remote:  100% (483/483) done
remote: Total 483 (delta 198), reused 483 (delta 198)
Receiving objects: 100% (483/483), 60.15 KiB, done.
Resolving deltas: 100% (198/198), done.
$>_
```

git clone



```
$>git clone git://github.com/schacon/ticgit.git
Initialized empty Git repository in /Users/schacon/examples
/ticgit/.git/
remote: Generating pack...
remote: Done counting 483 objects.
remote: Deltifying 483 objects...
remote:  100% (483/483) done
remote: Total 483 (delta 198), reused 483 (delta 198)
Receiving objects: 100% (483/483), 60.15 KiB, done.
Resolving deltas: 100% (198/198), done.
$>_
```

git clone



```
$>git clone git://github.com/schacon/ticgit.git
Initialized empty Git repository in /Users/schacon/examples
/ticgit/.git/
remote: Generating pack...
remote: Done counting 483 objects.
remote: Deltifying 483 objects...
remote:  100% (483/483) done
remote: Total 483 (delta 198), reused 483 (delta 198)
Receiving objects: 100% (483/483), 60.15 KiB, done.
Resolving deltas: 100% (198/198), done.
$>_
```

initializing a repo

```
cd myproject
git init
git add .
git commit
```

```
$>git init
```

```
$>git init
Initialized empty Git repository in .git/
```

```
$>git init
Initialized empty Git repository in .git/
$>git add .
```

```
$>git init
Initialized empty Git repository in .git/
$>git add .
$>git commit -m 'my first commit'
```

```
$>git init
Initialized empty Git repository in .git/
$>git add .
$>git commit -m 'my first commit'
Created initial commit bfe09f9: my first commit
 3 files changed, 3 insertions(+), 0 deletions(-)
 create mode 100644 README
 create mode 100644 Rakefile
 create mode 100644 lib/mylib.rb
$>_
```

```
$>git init
Initialized empty Git repository in .git/
$>git add .
$>git commit -m 'my first commit'
Created initial commit bfe09f9: my first commit
 3 files changed, 3 insertions(+), 0 deletions(-)
 create mode 100644 README
 create mode 100644 Rakefile
 create mode 100644 lib/mylib.rb
$>_
```

~~git-add~~
git-add--interactive
git-am
git-annotate
git-apply

git-archive
git-bisect
git-blame
git-branch

git-checkout

git-cherry-pick
git-citool
git-clean
~~git-clone~~
~~git-commit~~

~~git-config~~

git-daemon

git-diff

git-fetch

git-format-patch

git-gc

git-grep
git-gui

~~git-init~~

git-instaweb

git-log

git-merge

git-mv

git-pull
git-push

git-rebase
git-rebase--interactive

git-remote

git-revert
git-rm

git-send-email

git-shortlog
git-show
git-show-branch

git-stash
git-status

git-submodule

git-tag

5 Down

normal workflow

.gitignore

```
$>cat .gitignore
tmp/**/*
log/*
config/database.yml
config/environments/production.rb
.DS_Store
```

```
$>cat .gitignore
tmp/**/*
log/*
config/database.yml
config/environments/production.rb
.DS_Store
```

adding and committing

```
$>git status
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   README
#       modified:   TODO
#
no changes added to commit (use "git add" and/or "git commit -a")
$>_
```

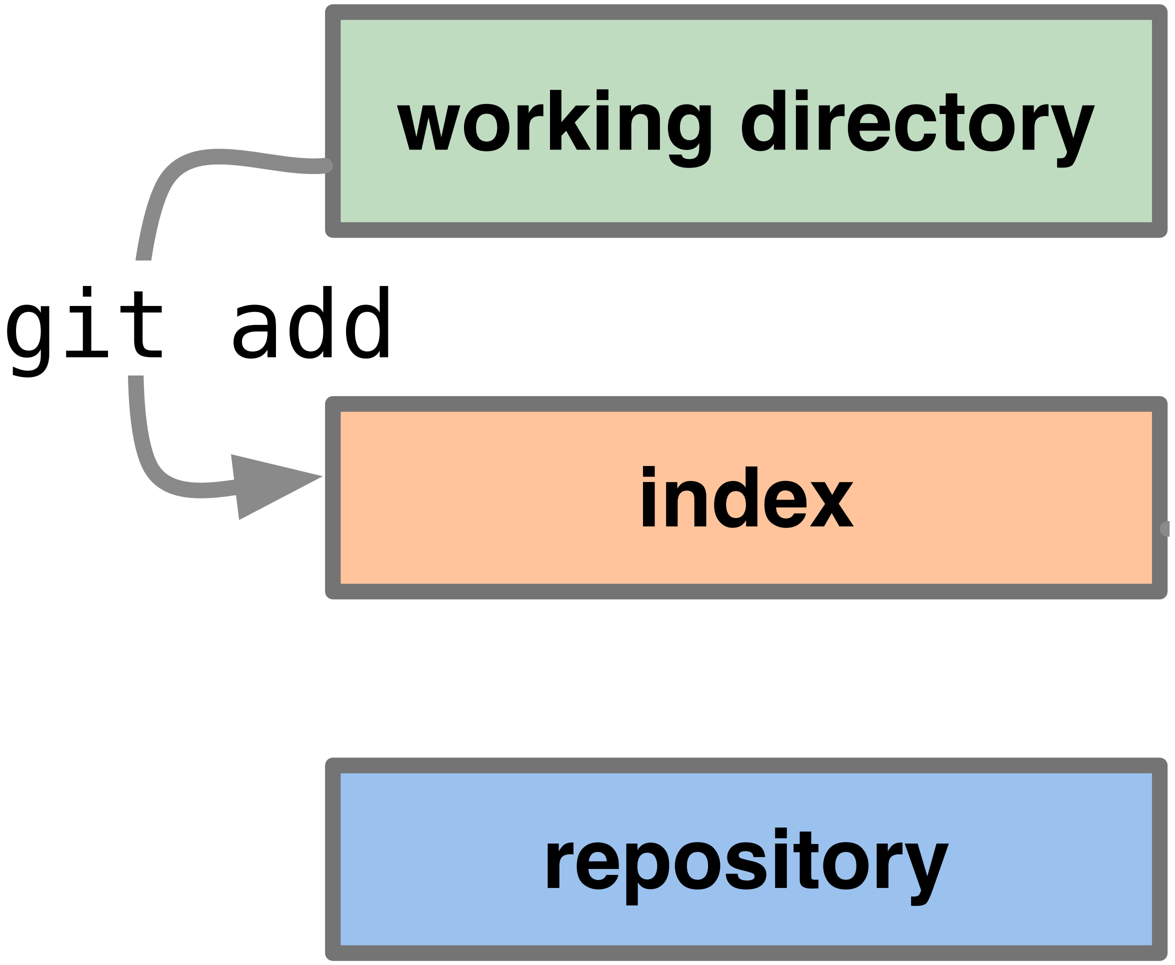
```
$>git status
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   README
#       modified:   TODO
#
no changes added to commit (use "git add" and/or "git commit -a")
$>_
```

```
$>git status
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   README
#       modified:   TODO
#
no changes added to commit (use "git add" and/or "git commit -a")
$>git add README
```

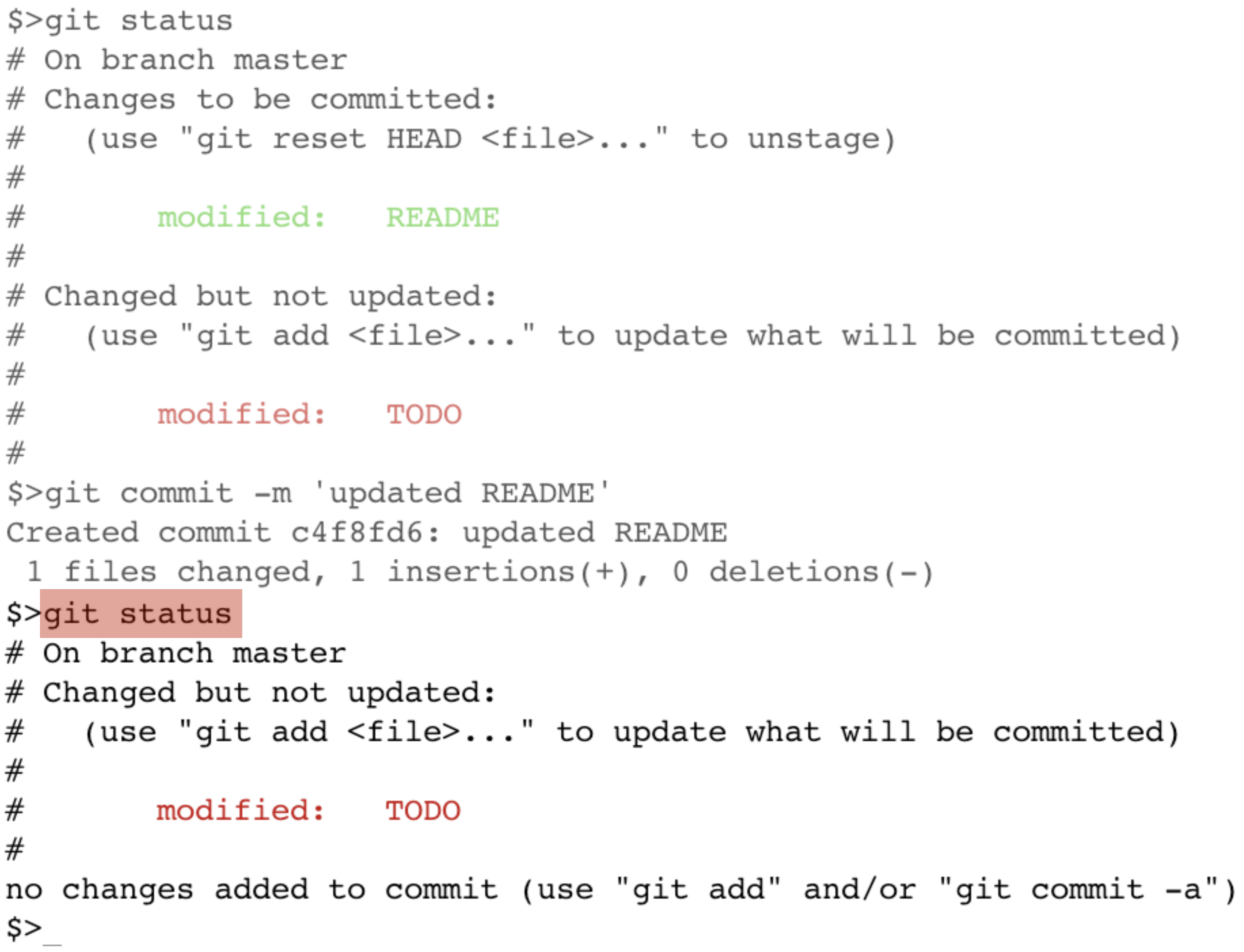
```
$>git status
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   README
#       modified:   TODO
#
no changes added to commit (use "git add" and/or "git commit -a")
$>git add README
$>git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   README
#
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   TODO
#
$>_
```

```
$>git status
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   README
#       modified:   TODO
#
no changes added to commit (use "git add" and/or "git commit -a")
$>git add README
$>git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   README
#
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   TODO
#
$>_
```

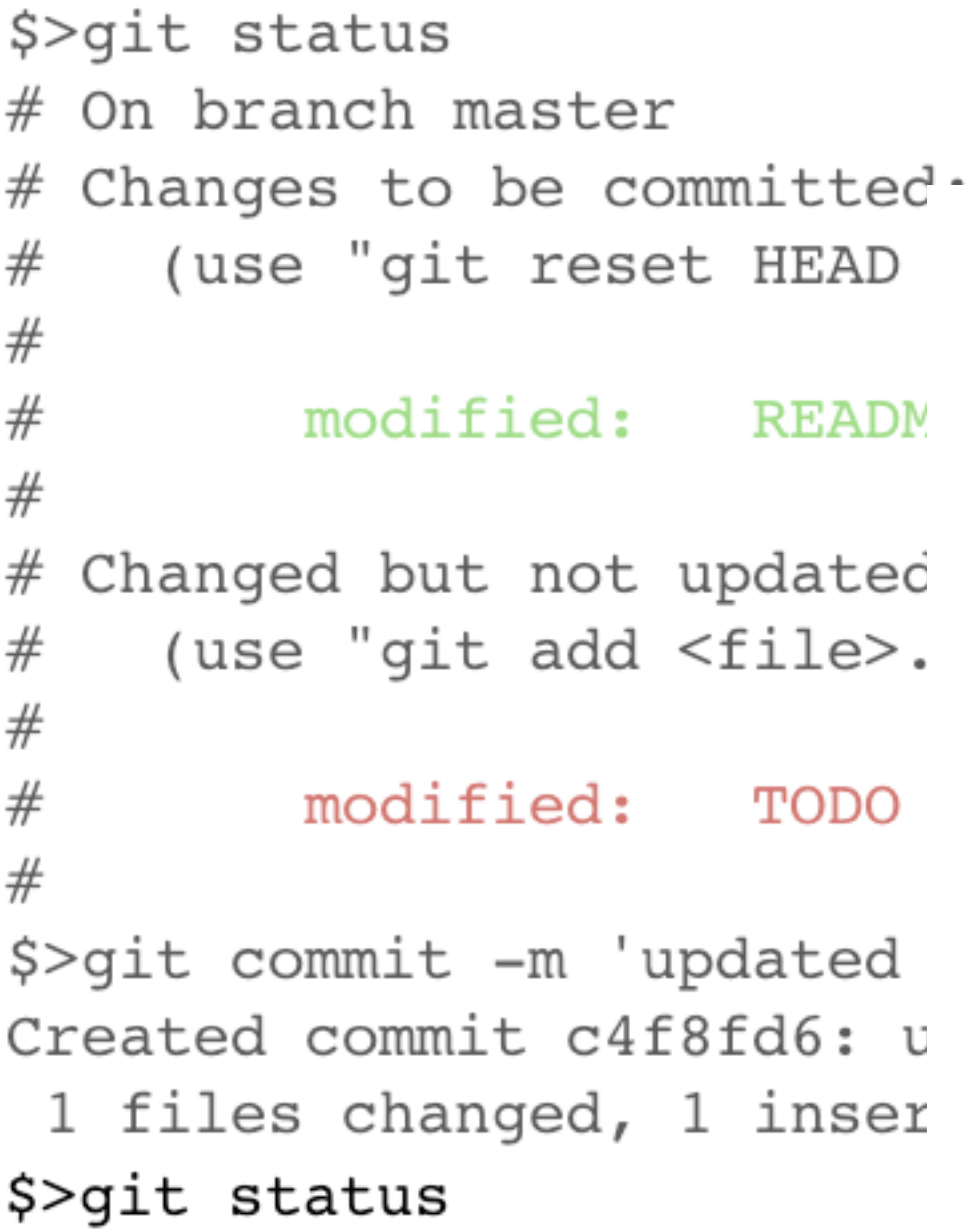
```
$>git status
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   README
#       modified:   TODO
#
no changes added to commit (use "
$>git add README
$>git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..
#
#       modified:   README
#
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   TODO
#
$>_
```



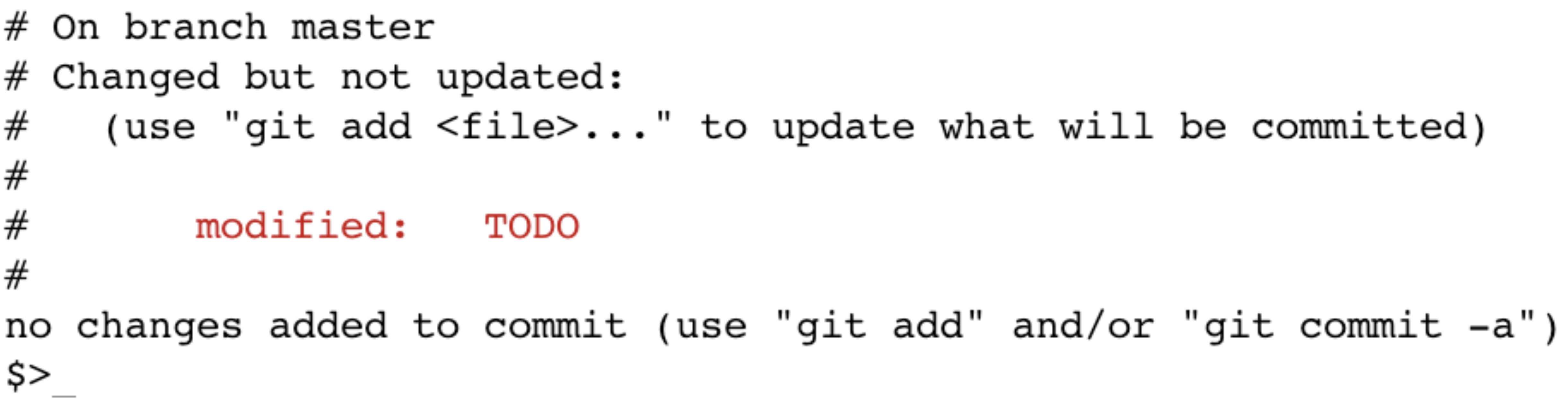
```
$>git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   README
#
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   TODO
#
$>git commit -m 'updated README'
Created commit c4f8fd6: updated README
 1 files changed, 1 insertions(+), 0 deletions(-)
$>_
```



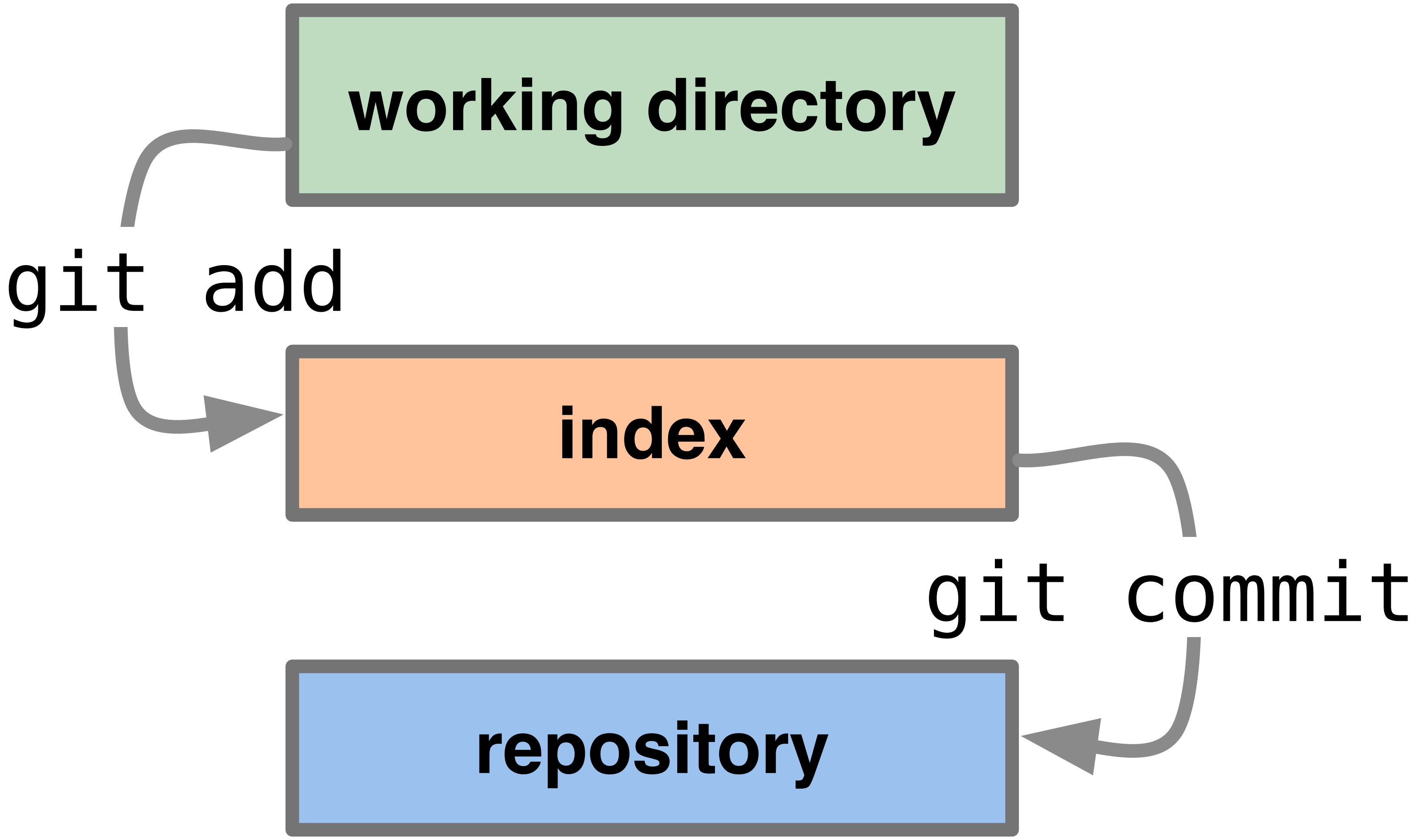
```
$>git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   README
#
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   TODO
#
$>git commit -m 'updated README'
Created commit c4f8fd6: updated README
 1 files changed, 1 insertions(+), 0 deletions(-)
$>git status
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   TODO
#
no changes added to commit (use "git add" and/or "git commit -a")
$>_
```



```
$>git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD
#
#       modified:   READM
#
# Changed but not updated
#   (use "git add <file>.
#
#       modified:   TODO
#
$>git commit -m 'updated
Created commit c4f8fd6: u
 1 files changed, 1 inser
$>git status
```



```
# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what will be committed)
#
#       modified:   TODO
#
no changes added to commit (use "git add" and/or "git commit -a")
$>_
```



git log

```
$>git log_
```

```
$>git log
commit 310154e3c7db47d8bac935c2c43aee6afac11aae
Author: Scott Chacon <schacon@gmail.com>
Date:   Sun Apr 13 10:49:15 2008 -0700

    updated README formatting and added blame

commit f7f3f6dd8fd3fa40f052427c32785a0fa01aaa5f
Author: Magnus Chacon <mchacon@gmail.com>
Date:   Sun Apr 13 10:45:01 2008 -0700

    changed my name a bit

commit 710f0f8d2cdf5af87033b9ec08859a505f9a6af5
Author: Magnus Chacon <mchacon@gmail.com>
Date:   Sun Apr 13 10:34:16 2008 -0700

    added ls-files

commit c110d7ff8cfb86fd5cce9a8aee462678dbb4ef9b
Author: Scott Chacon <schacon@gmail.com>
Date:   Sun Apr 6 12:13:36 2008 -0700

    made the ls-tree function recursive and list trees
```

```
$>git log
commit 310154e3c7db47d8bac935c2c43aee6afac11aae
Author: Scott Chacon <schacon@gmail.com>
Date:   Sun Apr 13 10:49:15 2008 -0700

    updated README formatting and added blame

commit f7f3f6dd8fd3fa40f052427c32785a0fa01aaa5f
Author: Magnus Chacon <mchacon@gmail.com>
Date:   Sun Apr 13 10:45:01 2008 -0700

    changed my name a bit

commit 710f0f8d2cdf5af87033b9ec08859a505f9a6af5
Author: Magnus Chacon <mchacon@gmail.com>
Date:   Sun Apr 13 10:34:16 2008 -0700

    added ls-files

commit c110d7ff8cfb86fd5cce9a8aee462678dbb4ef9b
Author: Scott Chacon <schacon@gmail.com>
Date:   Sun Apr 6 12:13:36 2008 -0700

    made the ls-tree function recursive and list trees
```

```
$>git log
commit 310154e3c7db47d8bac935c2c43aee6afac11aae
Author: Scott Chacon <schacon@gmail.com>
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    updated README formatting and added blame

commit f7f3f6dd8fd3fa40f052427c32785a0fa01aaa5f
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```
$>git log
commit 310154e3c7db47d8bac935c2c43aee6afac11aae
Author: Scott Chacon <schacon@gmail.com>
Date:   Sun Apr 13 10:49:15 2008 -0700

    updated README formatting and added blame

commit f7f3f6dd8fd3fa40f052427c32785a0fa01aaa5f
Author: Magnus Chacon <mchacon@gmail.com>
Date:   Sun Apr 13 10:45:01 2008 -0700

    changed my name a bit

commit 710f0f8d2cdf5af87033b9ec08859a505f9a6af5
Author: Magnus Chacon <mchacon@gmail.com>
Date:   Sun Apr 13 10:34:16 2008 -0700

    added ls-files

commit c110d7ff8cfb86fd5cce9a8aee462678dbb4ef9b
Author: Scott Chacon <schacon@gmail.com>
Date:   Sun Apr 6 12:13:36 2008 -0700

    made the ls-tree function recursive and list trees
```

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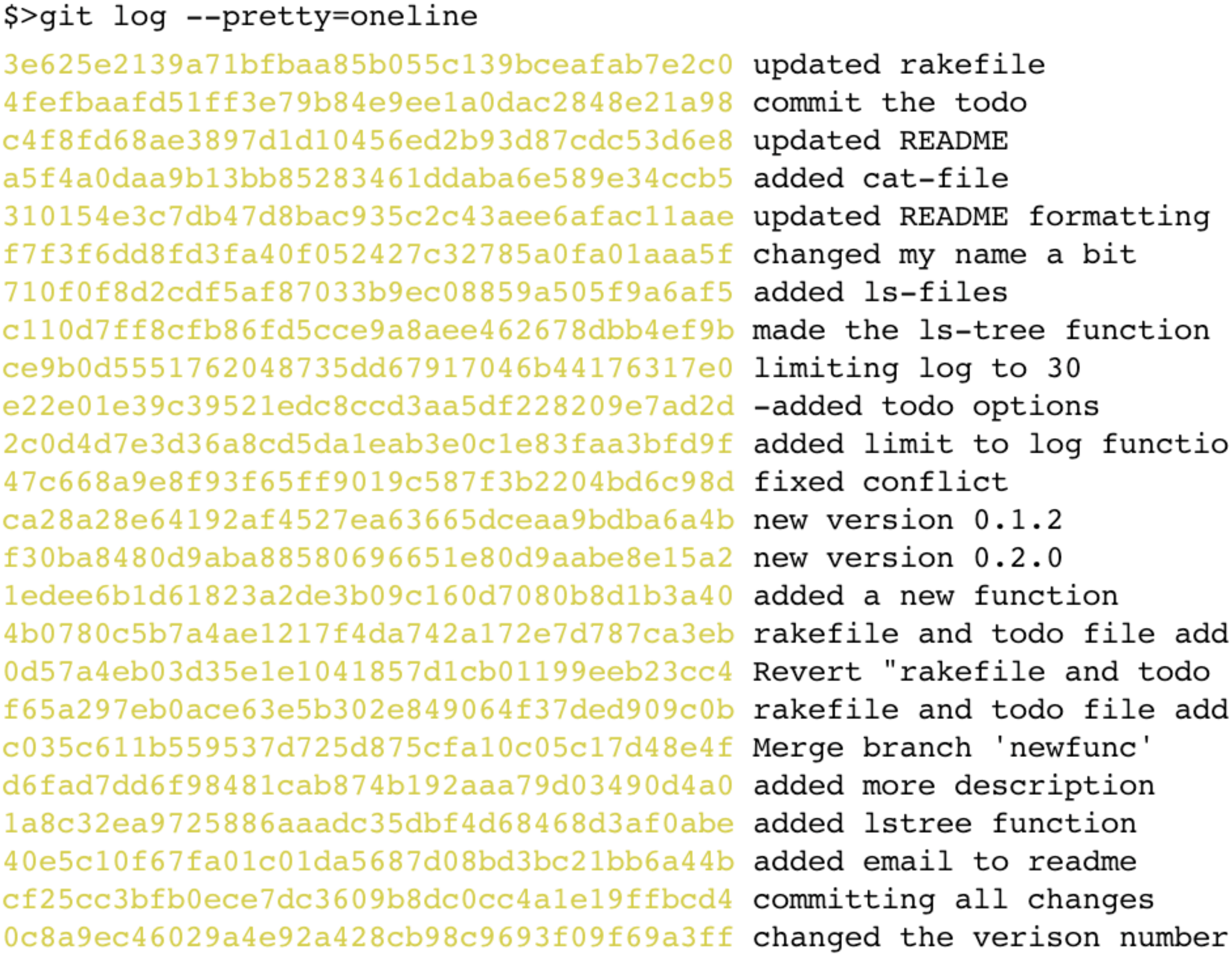
Author: Scott Chacon <schacon@gmail.com>
Date:   Sun Apr 6 12:13:36 2008 -0700

    made the ls-tree function recursive and list trees
```

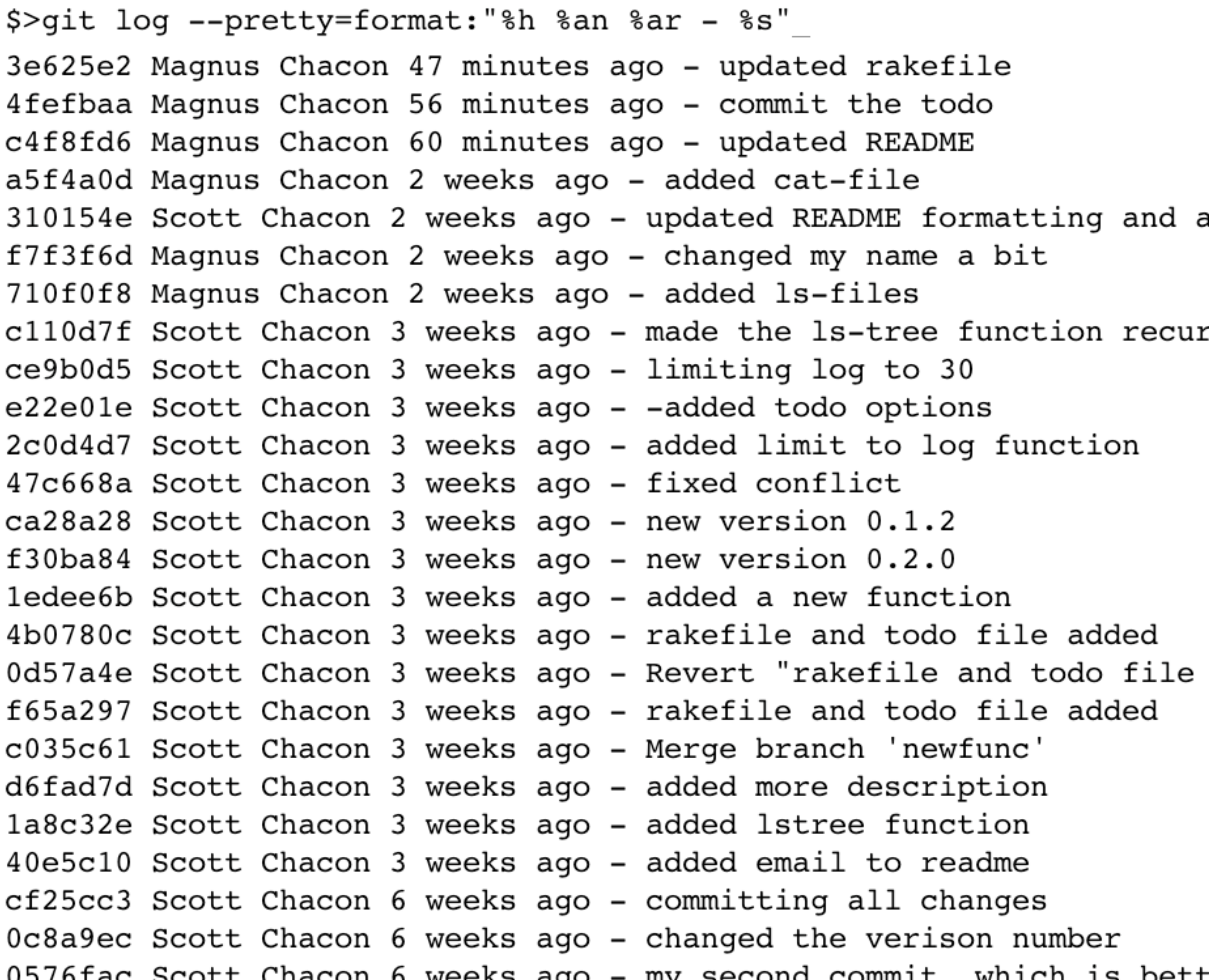
git log --pretty

```
$>git log --pretty=oneline
```

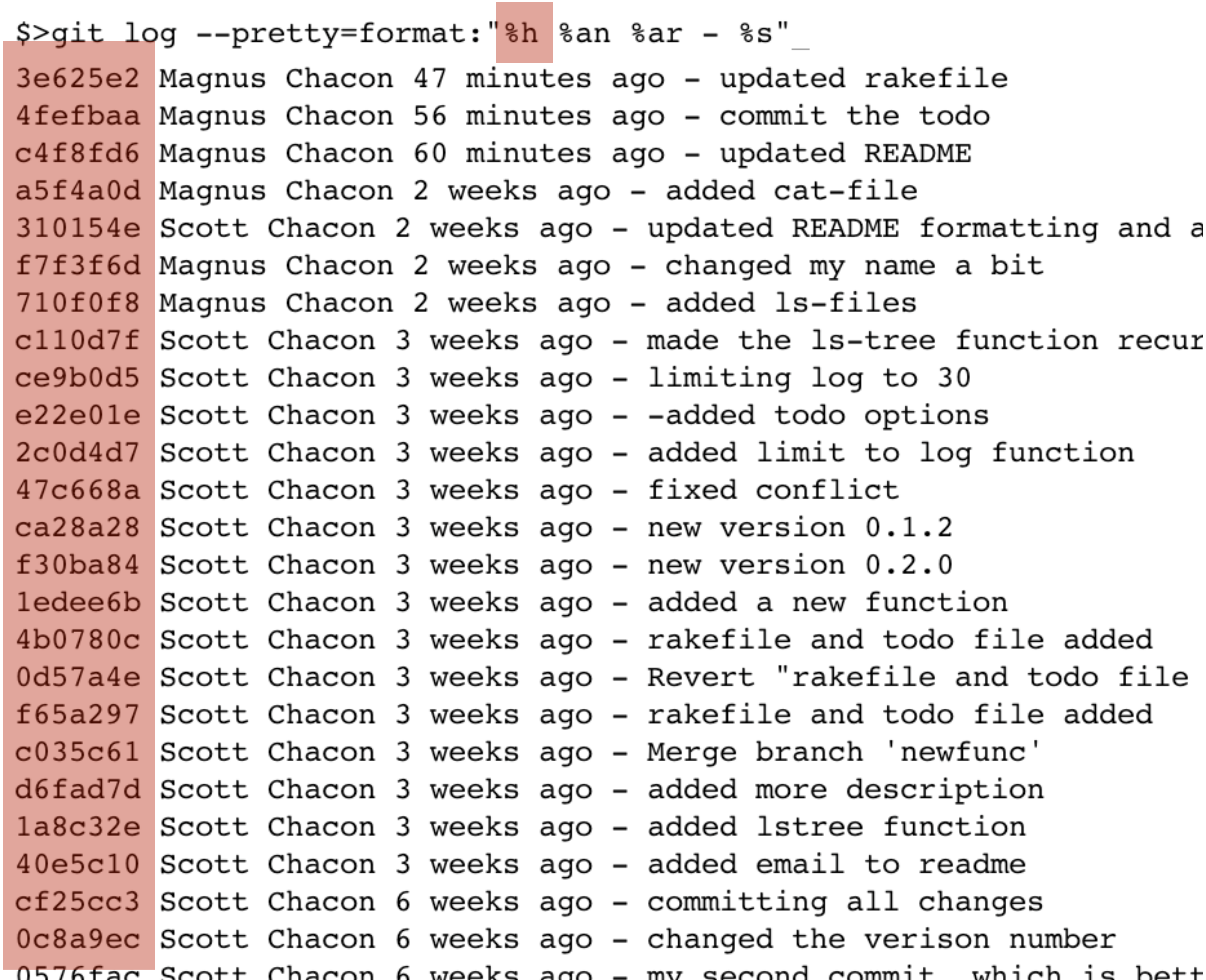


```
$>git log --pretty=oneline
3e625e2139a71bfbaa85b055c139bceafab7e2c0 updated rakefile
4fefbaafd51ff3e79b84e9ee1a0dac2848e21a98 commit the todo
c4f8fd68ae3897d1d10456ed2b93d87cdc53d6e8 updated README
a5f4a0daa9b13bb85283461ddaba6e589e34ccb5 added cat-file
310154e3c7db47d8bac935c2c43aee6afac11aae updated README formatting
f7f3f6dd8fd3fa40f052427c32785a0fa01aaa5f changed my name a bit
710f0f8d2cdf5af87033b9ec08859a505f9a6af5 added ls-files
c110d7ff8cfb86fd5cce9a8aee462678dbb4ef9b made the ls-tree function
ce9b0d5551762048735dd67917046b44176317e0 limiting log to 30
e22e01e39c39521edc8ccd3aa5df228209e7ad2d -added todo options
2c0d4d7e3d36a8cd5da1eab3e0c1e83faa3bfd9f added limit to log functio
47c668a9e8f93f65ff9019c587f3b2204bd6c98d fixed conflict
ca28a28e64192af4527ea63665dceaa9bdba6a4b new version 0.1.2
f30ba8480d9aba88580696651e80d9aabe8e15a2 new version 0.2.0
1edee6b1d61823a2de3b09c160d7080b8d1b3a40 added a new function
4b0780c5b7a4ae1217f4da742a172e7d787ca3eb rakefile and todo file add
0d57a4eb03d35e1e1041857d1cb01199eeb23cc4 Revert "rakefile and todo
f65a297eb0ace63e5b302e849064f37ded909c0b rakefile and todo file add
c035c611b559537d725d875cfa10c05c17d48e4f Merge branch 'newfunc'
d6fad7dd6f98481cab874b192aaa79d03490d4a0 added more description
1a8c32ea9725886aaadc35dbf4d68468d3af0abe added lstree function
40e5c10f67fa01c01da5687d08bd3bc21bb6a44b added email to readme
cf25cc3bfb0ece7dc3609b8dc0cc4a1e19ffbcd4 committing all changes
0c8a9ec46029a4e92a428cb98c9693f09f69a3ff changed the verison number
```

```
$>git log --pretty=format:"%h %an %ar - %s"_
```



```
$>git log --pretty=format:"%h %an %ar - %s"_
3e625e2 Magnus Chacon 47 minutes ago - updated rakefile
4fefbaa Magnus Chacon 56 minutes ago - commit the todo
c4f8fd6 Magnus Chacon 60 minutes ago - updated README
a5f4a0d Magnus Chacon 2 weeks ago - added cat-file
310154e Scott Chacon 2 weeks ago - updated README formatting and a
f7f3f6d Magnus Chacon 2 weeks ago - changed my name a bit
710f0f8 Magnus Chacon 2 weeks ago - added ls-files
c110d7f Scott Chacon 3 weeks ago - made the ls-tree function recur
ce9b0d5 Scott Chacon 3 weeks ago - limiting log to 30
e22e01e Scott Chacon 3 weeks ago - -added todo options
2c0d4d7 Scott Chacon 3 weeks ago - added limit to log function
47c668a Scott Chacon 3 weeks ago - fixed conflict
ca28a28 Scott Chacon 3 weeks ago - new version 0.1.2
f30ba84 Scott Chacon 3 weeks ago - new version 0.2.0
1edee6b Scott Chacon 3 weeks ago - added a new function
4b0780c Scott Chacon 3 weeks ago - rakefile and todo file added
0d57a4e Scott Chacon 3 weeks ago - Revert "rakefile and todo file
f65a297 Scott Chacon 3 weeks ago - rakefile and todo file added
c035c61 Scott Chacon 3 weeks ago - Merge branch 'newfunc'
d6fad7d Scott Chacon 3 weeks ago - added more description
1a8c32e Scott Chacon 3 weeks ago - added lstree function
40e5c10 Scott Chacon 3 weeks ago - added email to readme
cf25cc3 Scott Chacon 6 weeks ago - committing all changes
0c8a9ec Scott Chacon 6 weeks ago - changed the verison number
0576fac Scott Chacon 6 weeks ago - my second commit, which is bett
```



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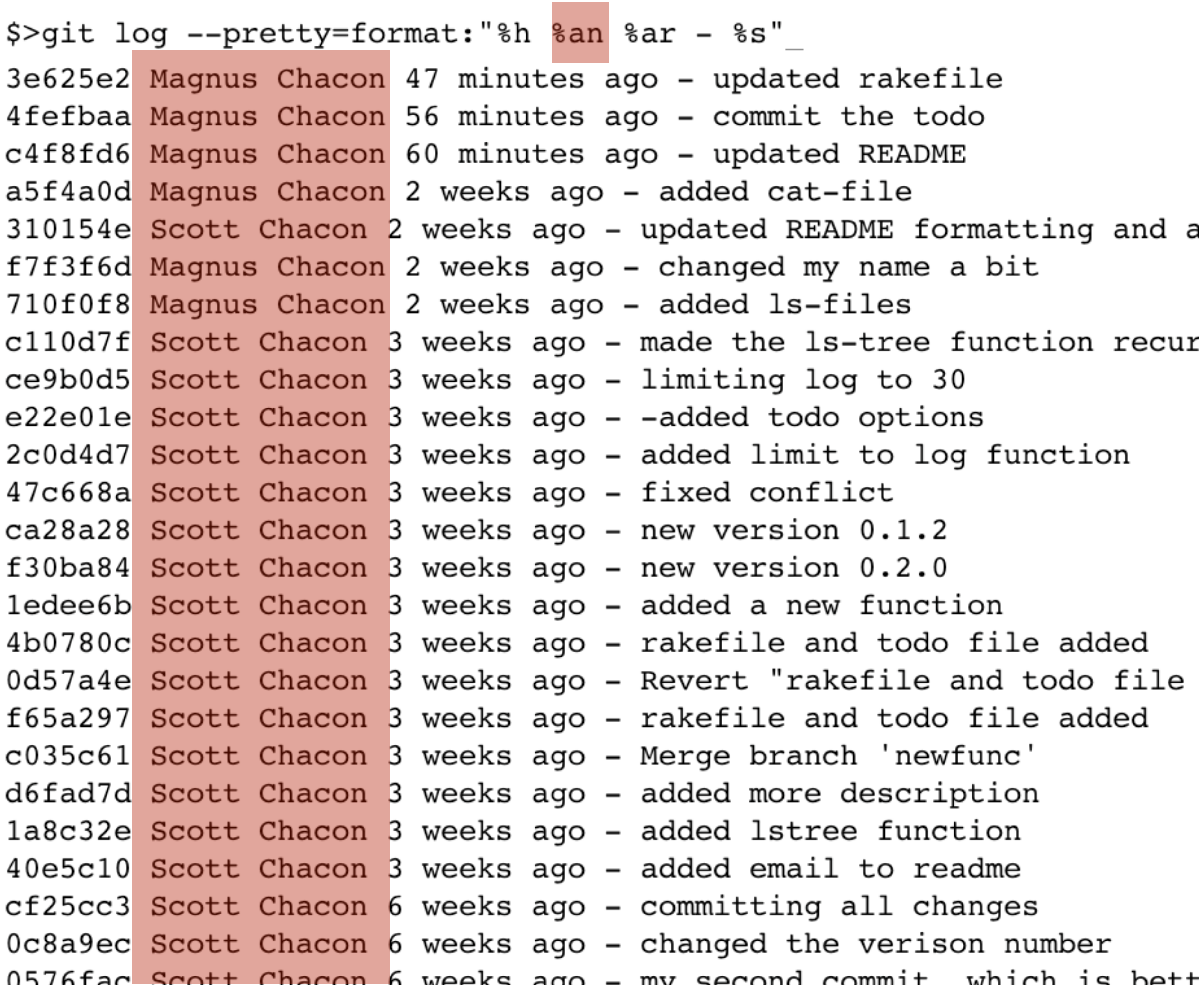

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```

~~git-add~~
git-add--interactive
git-am
git-annotate
git-apply

git-archive
git-bisect
git-blame
git-branch

git-checkout

git-cherry-pick
git-citool
git-clean
~~git-clone~~
~~git-commit~~
~~git-config~~

git-daemon

git-diff

git-fetch

git-format-patch

git-gc

git-grep
git-gui

~~git-init~~

git-instaweb

~~git-log~~

git-merge

git-mv

git-pull
git-push

git-rebase
git-rebase--interactive

git-remote

git-revert
git-rm

git-send-email

git-shortlog
git-show
git-show-branch

git-stash
git-status

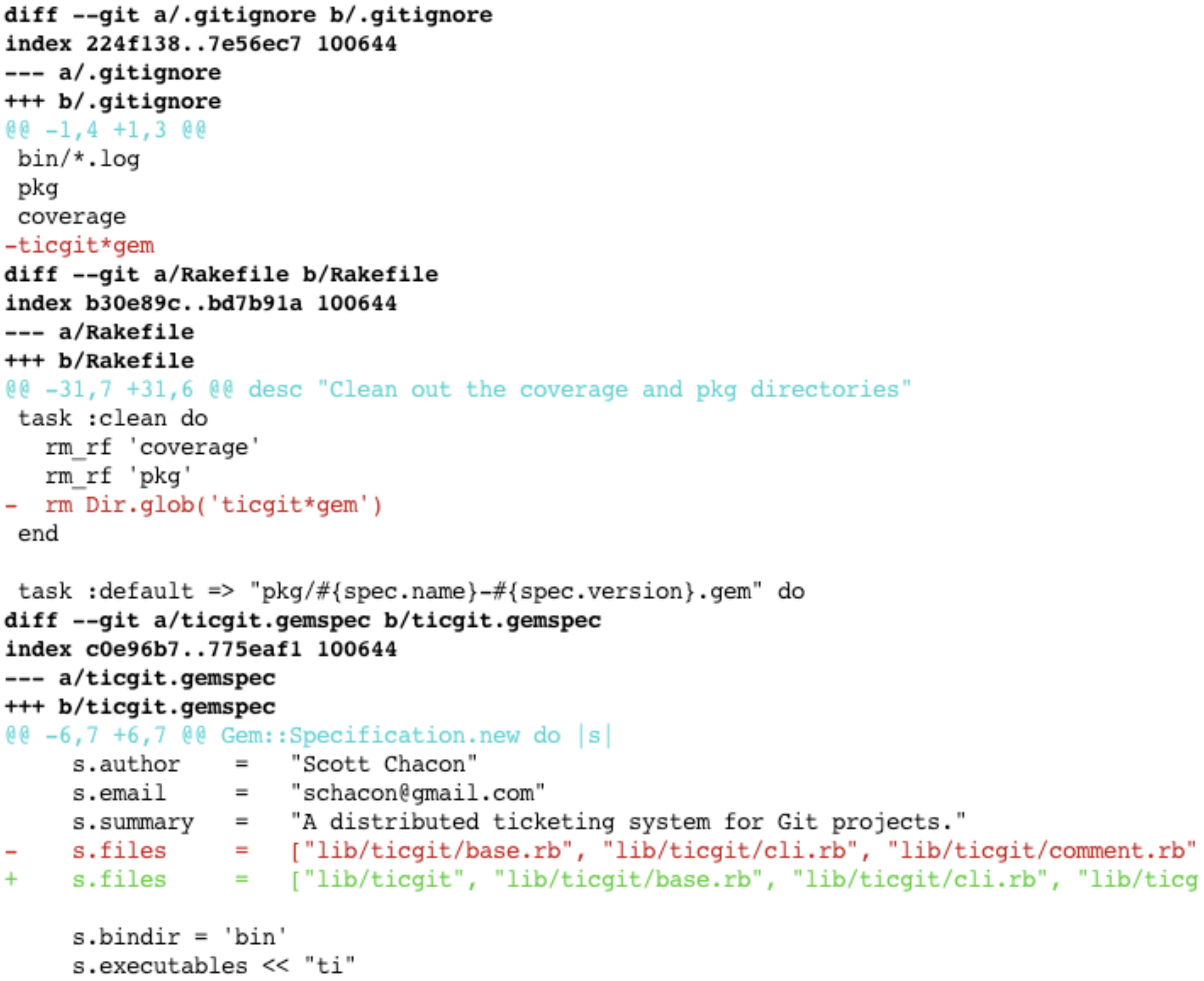
git-submodule

git-tag

6 Down

git diff

git diff (treeish1) (treeish2)



```
diff --git a/.gitignore b/.gitignore
index 224f138..7e56ec7 100644
--- a/.gitignore
+++ b/.gitignore
@@ -1,4 +1,3 @@
 bin/*.log
 pkg
 coverage
-ticgit*gem
diff --git a/Rakefile b/Rakefile
index b30e89c..bd7b91a 100644
--- a/Rakefile
+++ b/Rakefile
@@ -31,7 +31,6 @@ desc "Clean out the coverage and pkg directories"
 task :clean do
   rm_rf 'coverage'
   rm_rf 'pkg'
-  rm Dir.glob('ticgit*gem')
 end
 
 task :default => "pkg/#{spec.name}-#{spec.version}.gem" do
diff --git a/ticgit.gemspec b/ticgit.gemspec
index c0e96b7..775eaf1 100644
--- a/ticgit.gemspec
+++ b/ticgit.gemspec
@@ -6,7 +6,7 @@ Gem::Specification.new do |s|
     s.author     =   "Scott Chacon"
     s.email      =   "schacon@gmail.com"
     s.summary    =   "A distributed ticketing system for Git projects."
-    s.files      =   ["lib/ticgit/base.rb", "lib/ticgit/cli.rb", "lib/ticgit/comment.rb"
+    s.files      =   ["lib/ticgit", "lib/ticgit/base.rb", "lib/ticgit/cli.rb", "lib/ticg
 
     s.bindir = 'bin'
     s.executables << "ti"
```

```
git diff master^ > change.diff
git diff master^ > change.diff
```

```
patch -p1 < change.diff
```

```
git diff master^ > change.diff
```

```
patch -p1 < change.diff
```

or

```
git apply change.diff
```

git and patches

Single Commit

```
git format-patch origin/master --stdout >
story.patch
```

```
git am < story.patch
```

Multiple Commits

```
$ git format-patch -o patches origin
$ git send-email --to list@email.com patches

$ git am mbox
```

Multiple Commits

1 patch file per commit
in this directory

```
$ git format-patch -o patches origin
$ git send-email --to list@email.com patches

$ git am mbox
```

example: patching rails

Patching Rails

```
git clone git://github.com/rails/rails.git
```

```
cd rails; (vim/emacs etc)
```

```
git format-patch origin/master --stdout > story.patch
```

upload `story.patch` to rails.lighthouseapp.com

Applying a Rails Patch

download `story.patch` from
rails.lighthouseapp.com

```
git am < story.patch
```

~~git-add~~
git-add--interactive
~~git-am~~
git-annotate
~~git-apply~~

git-archive
git-bisect
git-blame
git-branch

git-checkout

git-cherry-pick
git-citool
git-clean
~~git-clone~~
~~git-commit~~
~~git-config~~

git-daemon

~~git-diff~~

git-fetch

~~git-format-patch~~

git-gc

git-grep
git-gui

~~git-init~~

git-instaweb

~~git-log~~

git-merge

git-mv

git-pull
git-push

git-rebase
git-rebase--interactive

git-remote

git-revert
git-rm

git-send-email

git-shortlog
git-show
git-show-branch

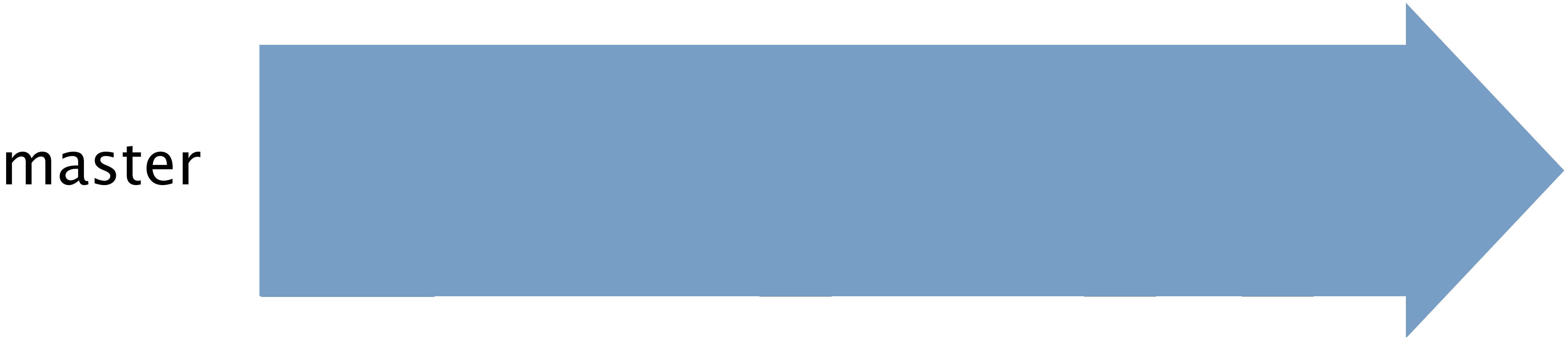
git-stash
~~git-status~~

git-submodule

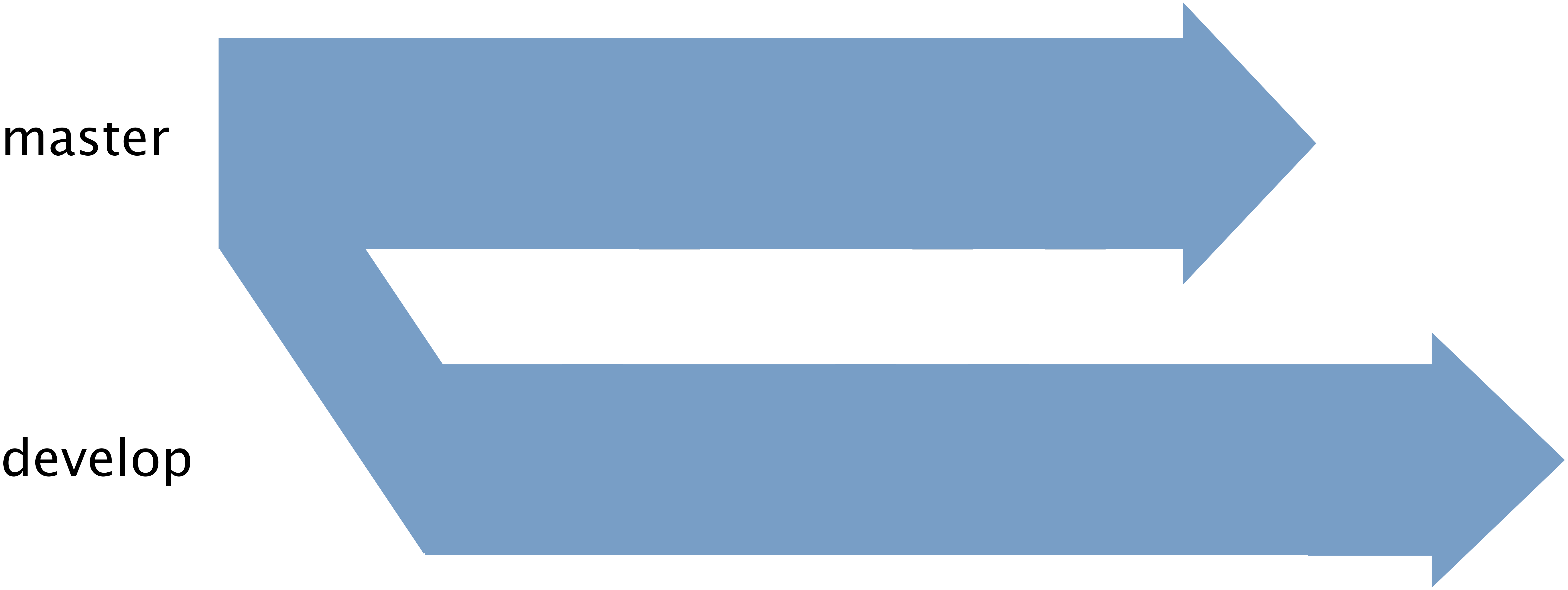
git-tag

11 Down

branch, merge, rebase

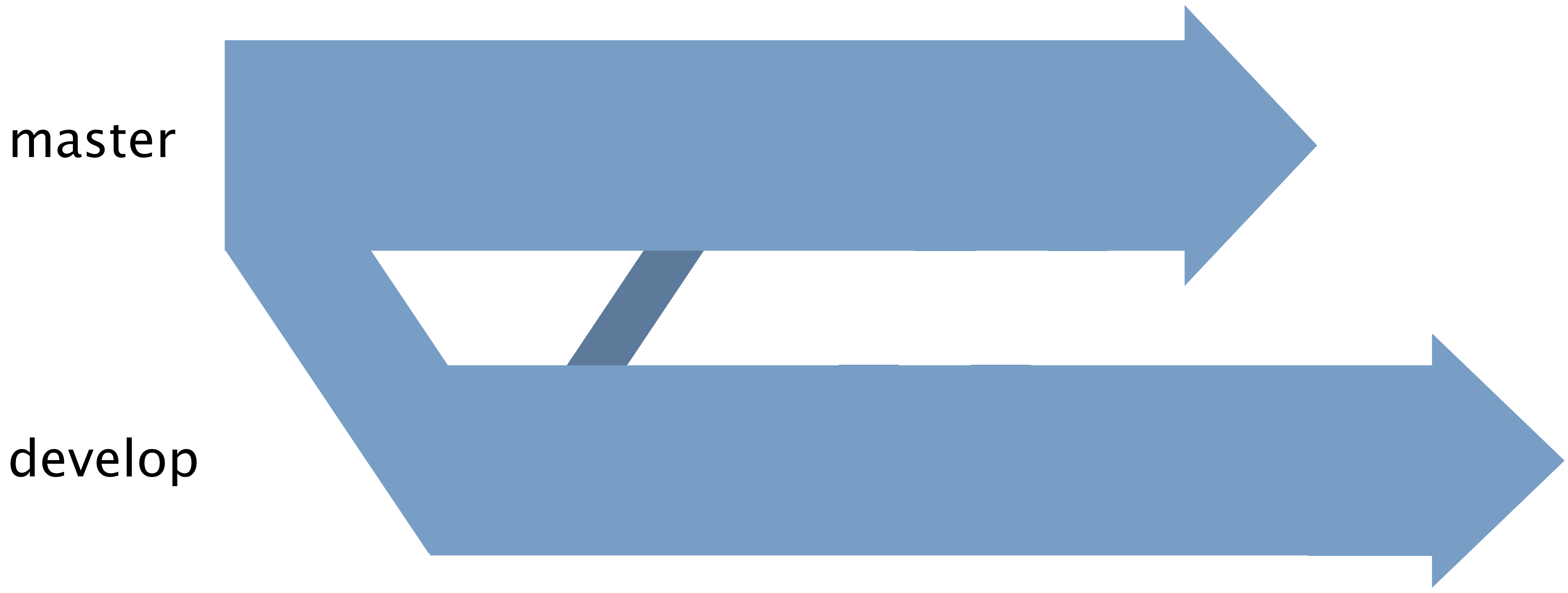


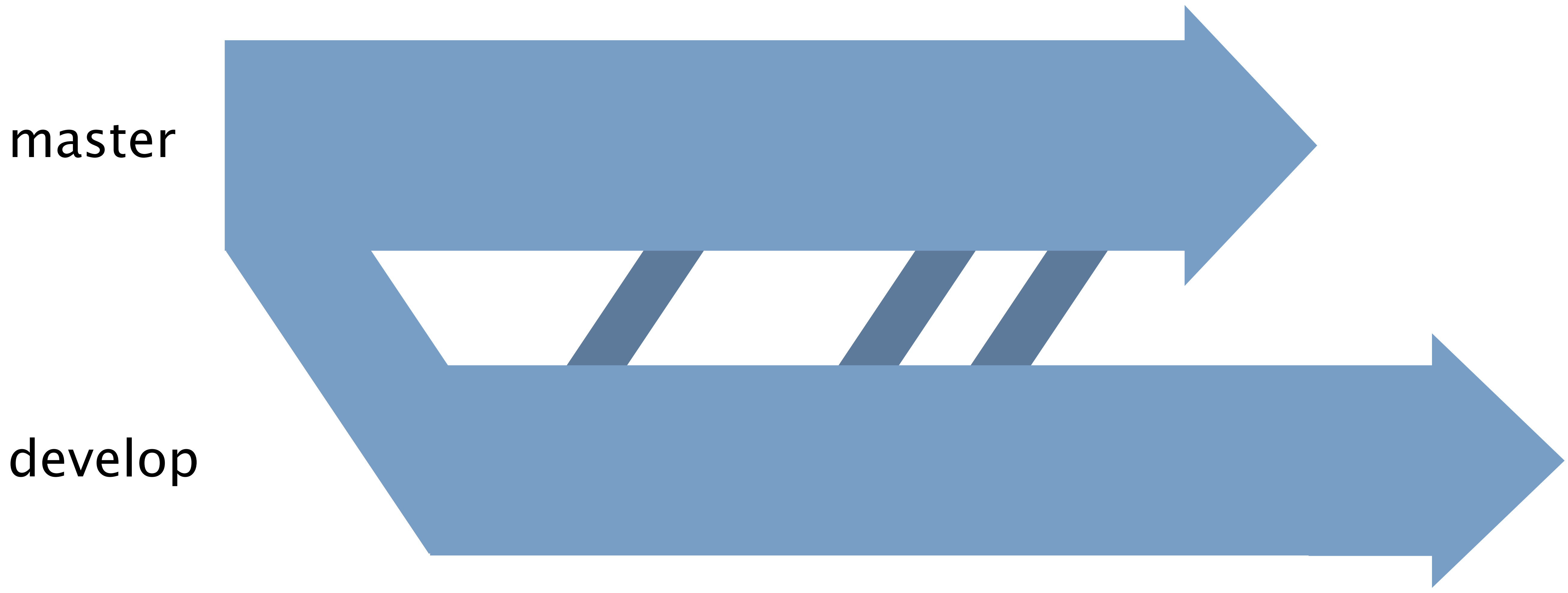
master

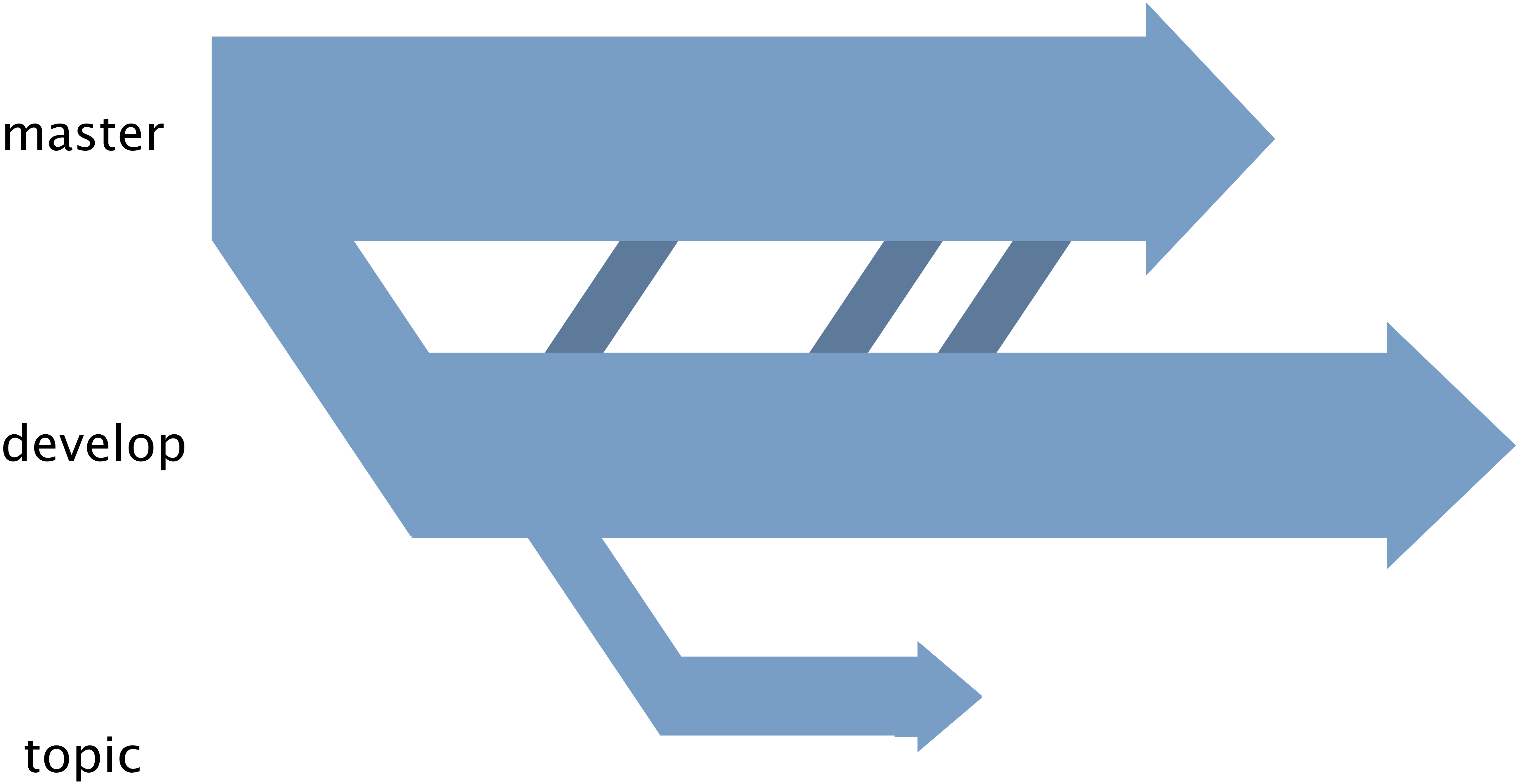


master

develop


master
develop

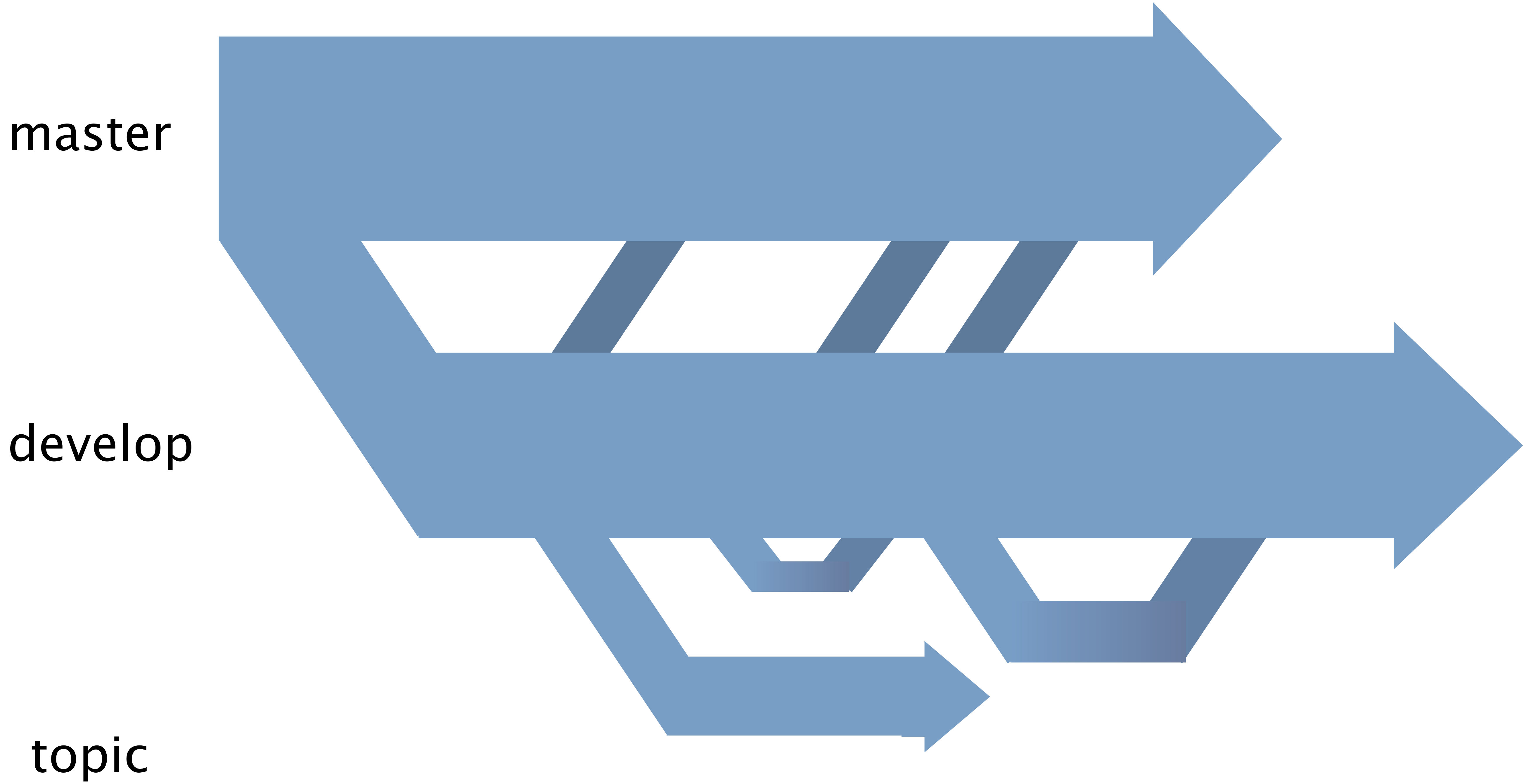

master
develop

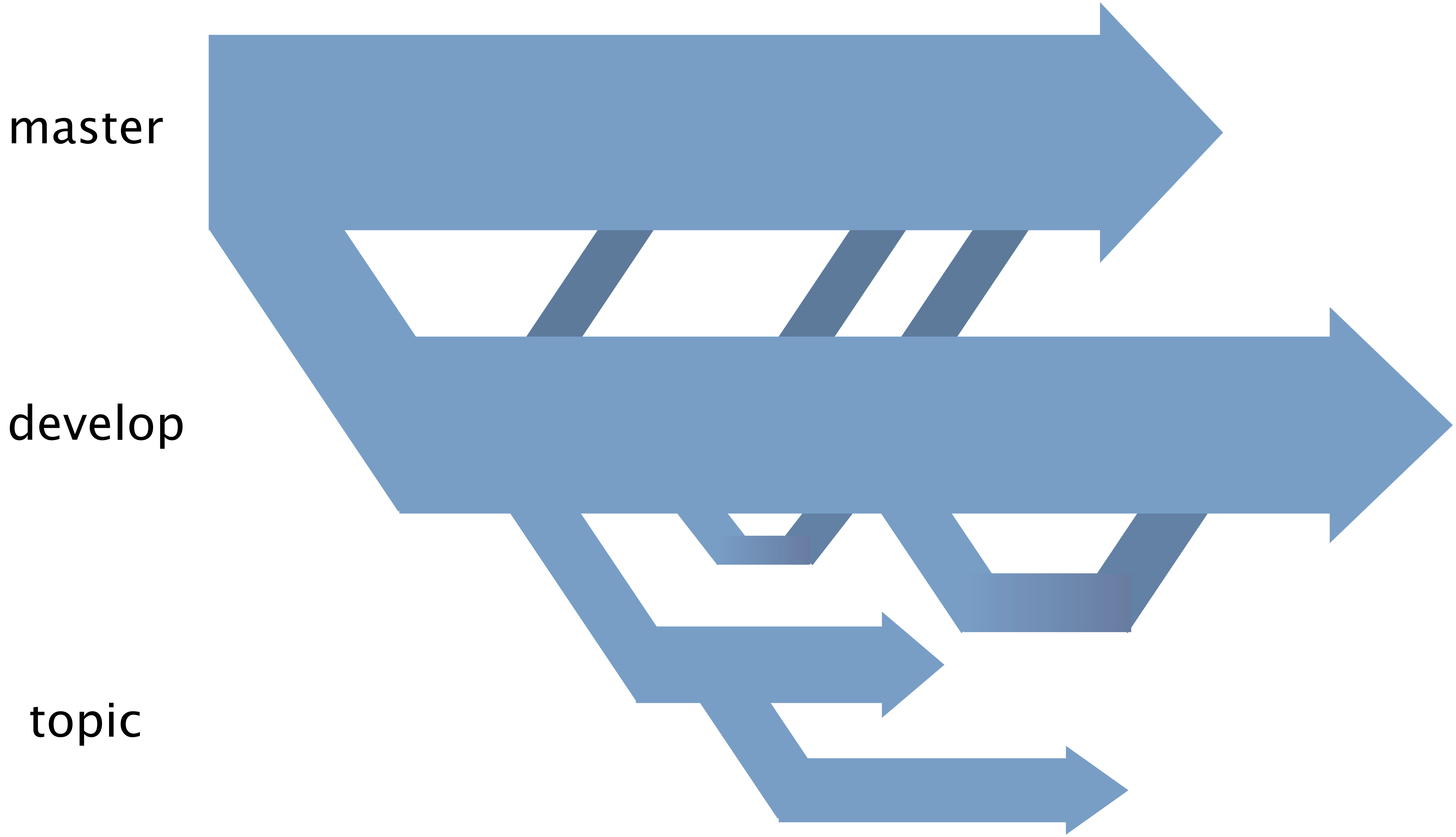


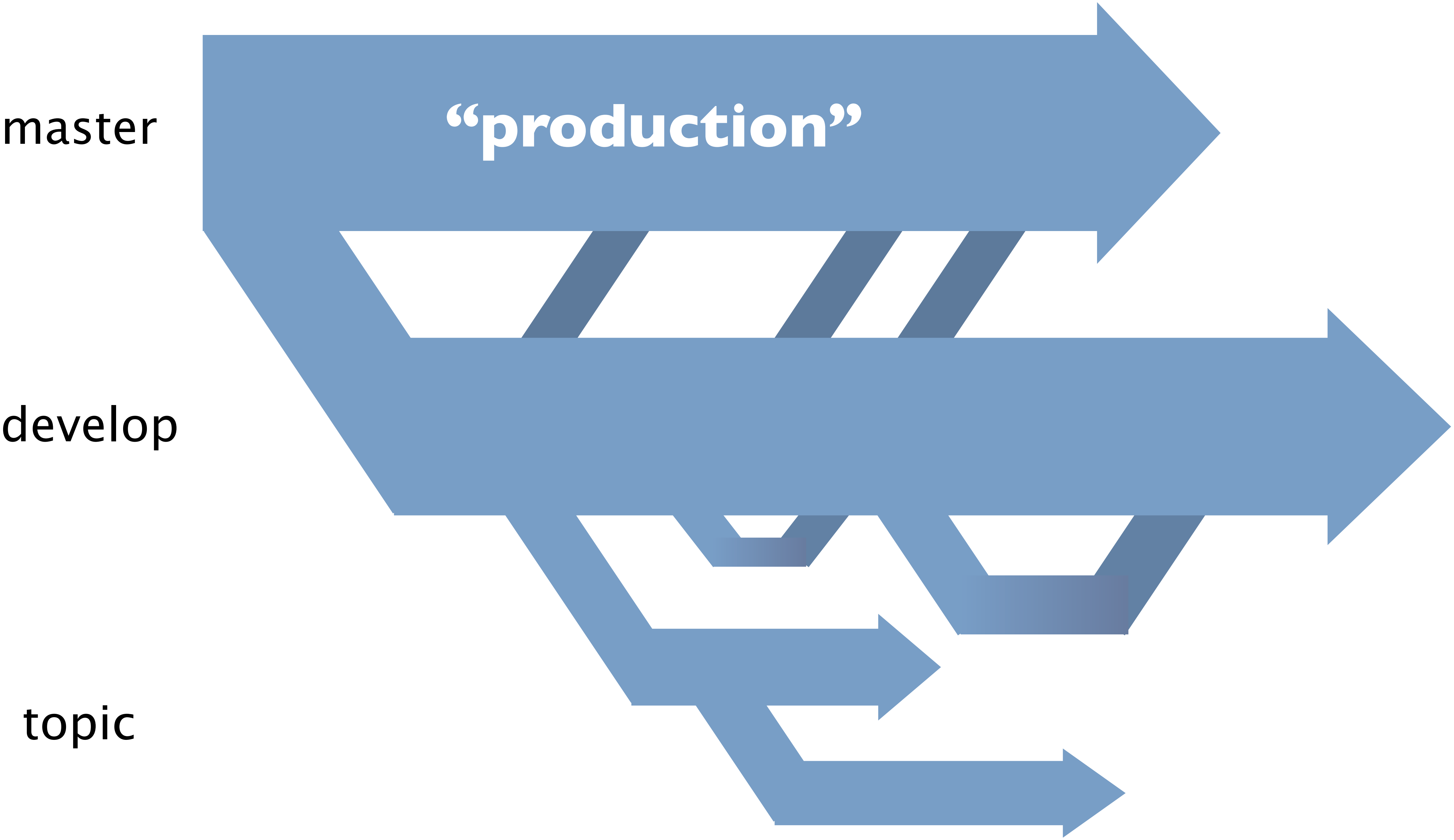
master

develop

topic


master
develop
topic


master
develop
topic

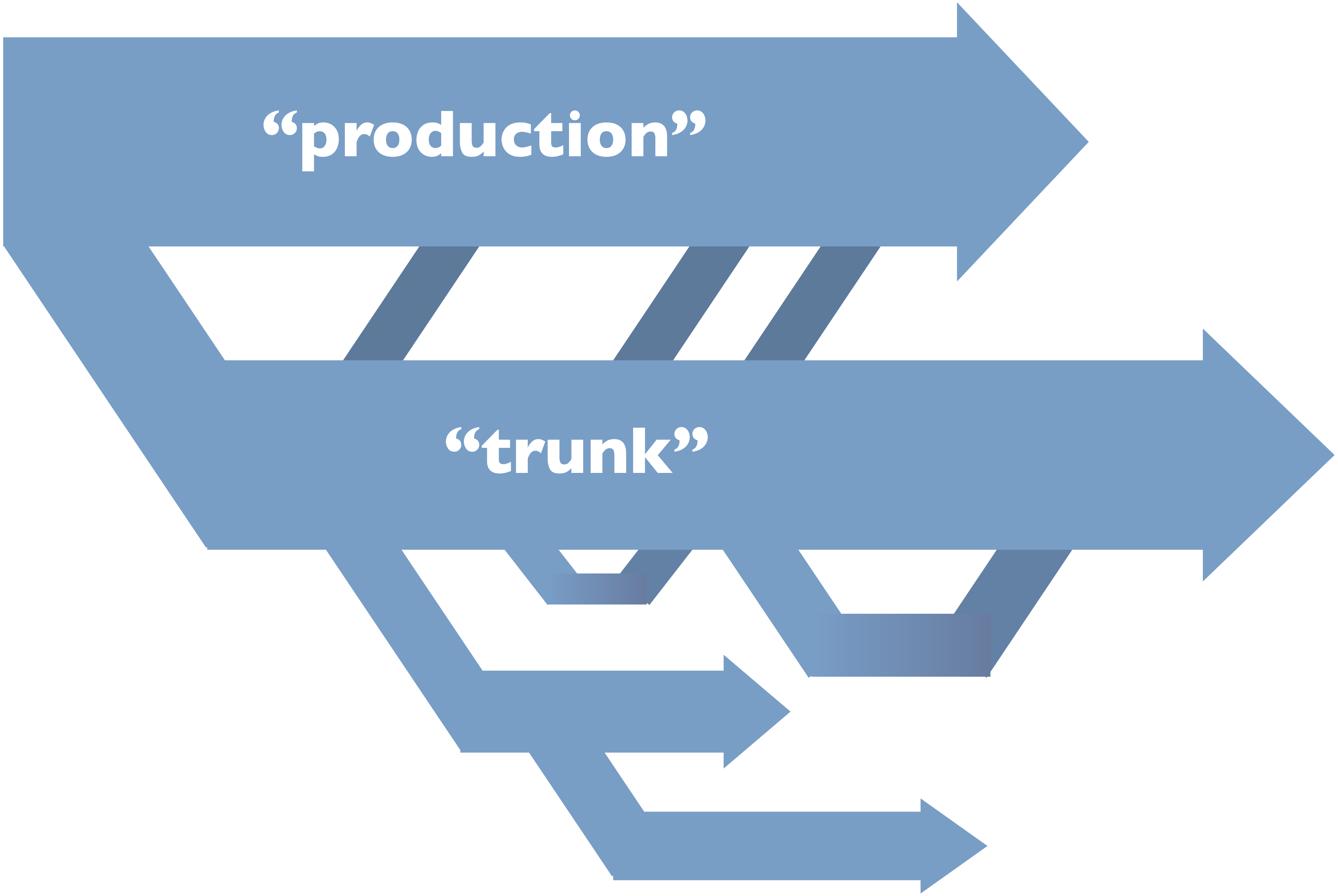


master

“production”

develop

topic



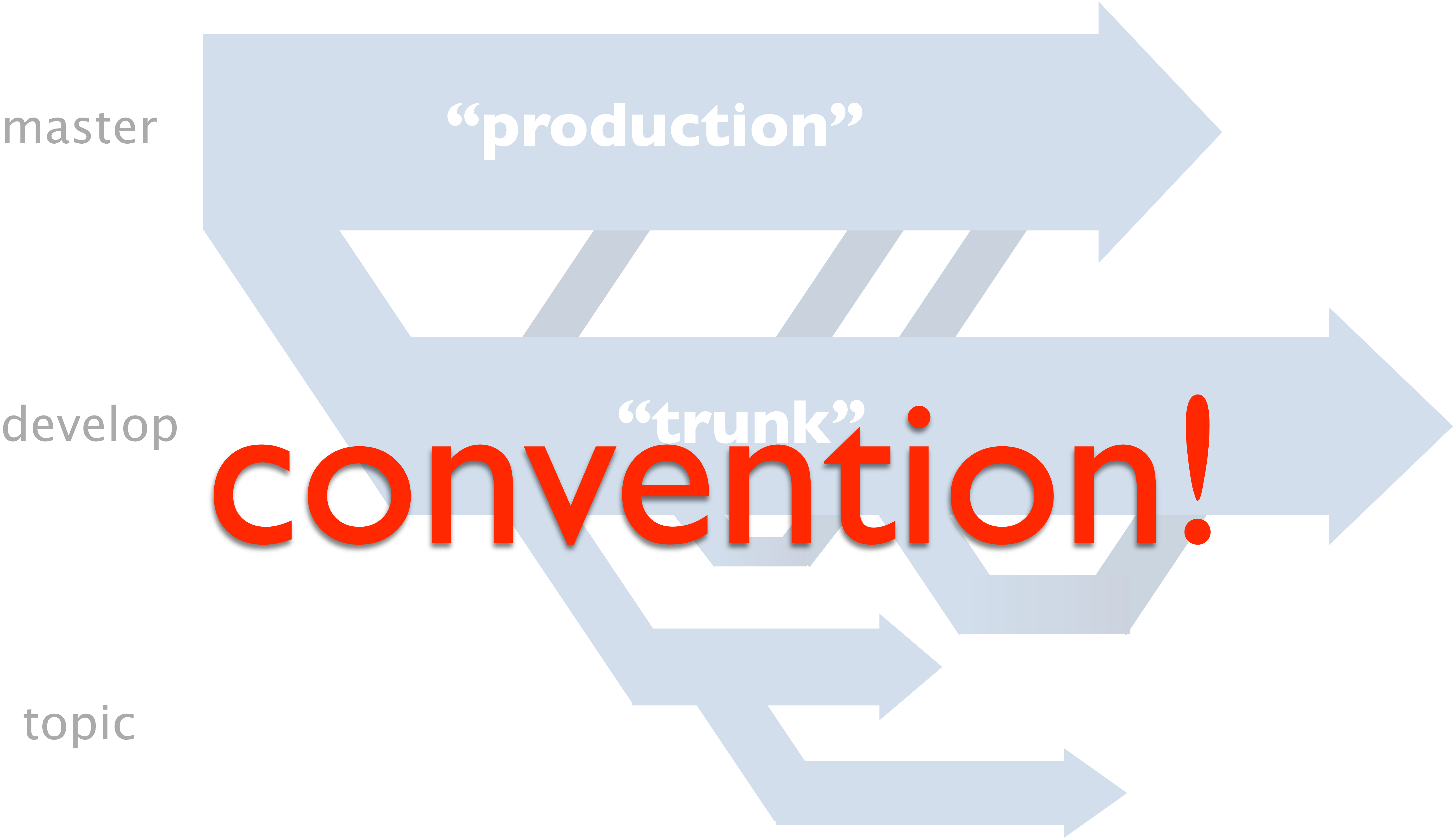
master

“production”

develop

“trunk”

topic



master

“production”

develop

“trunk”

topic

convention!

branching workflow

normal development

want to try an idea

have to do a hotfix

merge idea into development

push to production

branching workflow

normal development

want to try an idea

have to do a hotfix

merge idea into development

push to production

```
$>git branch
```

```
$>git branch
* develop
  master
  story95
$>_
```

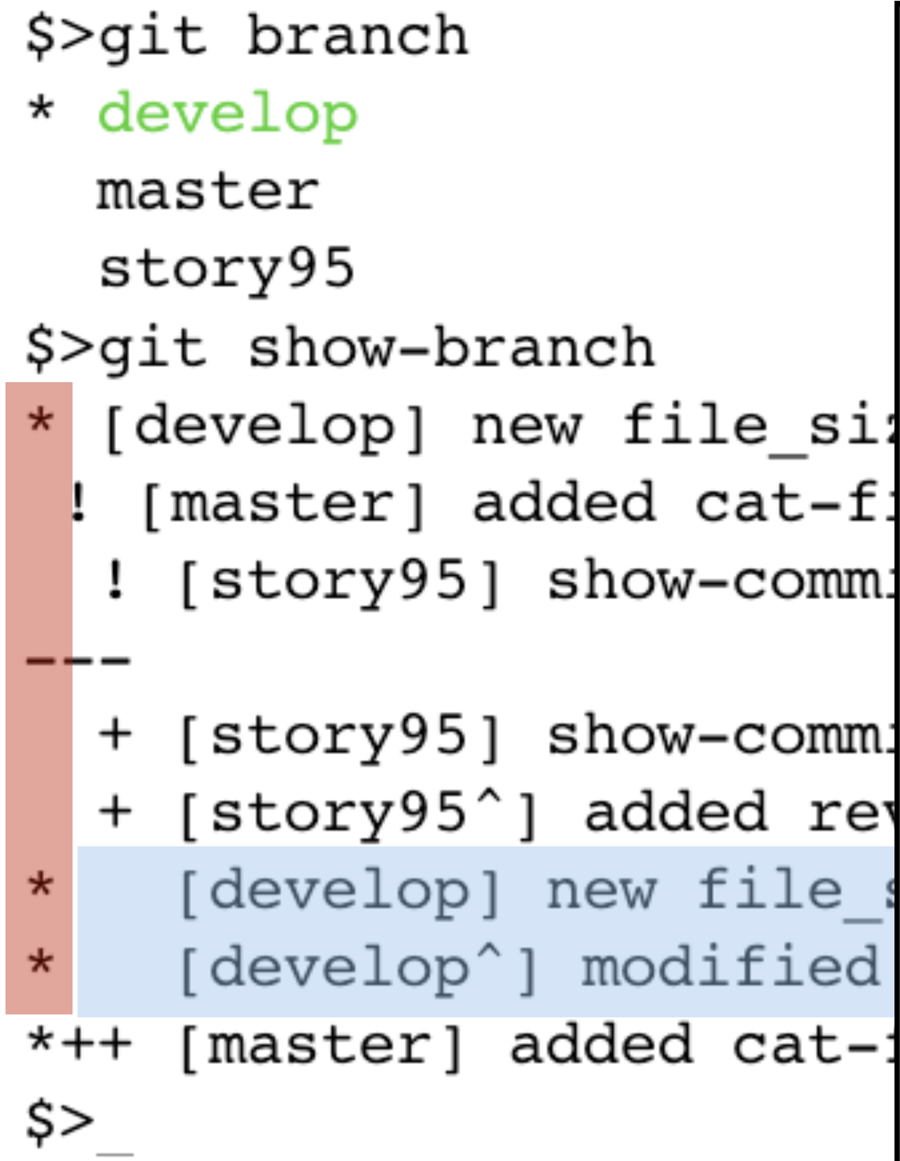
```
$>git branch
* develop
  master
  story95
$>git show-branch
```

```
$>git branch
* develop
  master
  story95
$>git show-branch
* [develop] new file_size function
 ! [master] added cat-file
  ! [story95] show-commit-tree added
---
  + [story95] show-commit-tree added
  + [story95^] added revparse
*   [develop] new file_size function
*   [develop^] modified show to raw
*++ [master] added cat-file
$>_
```

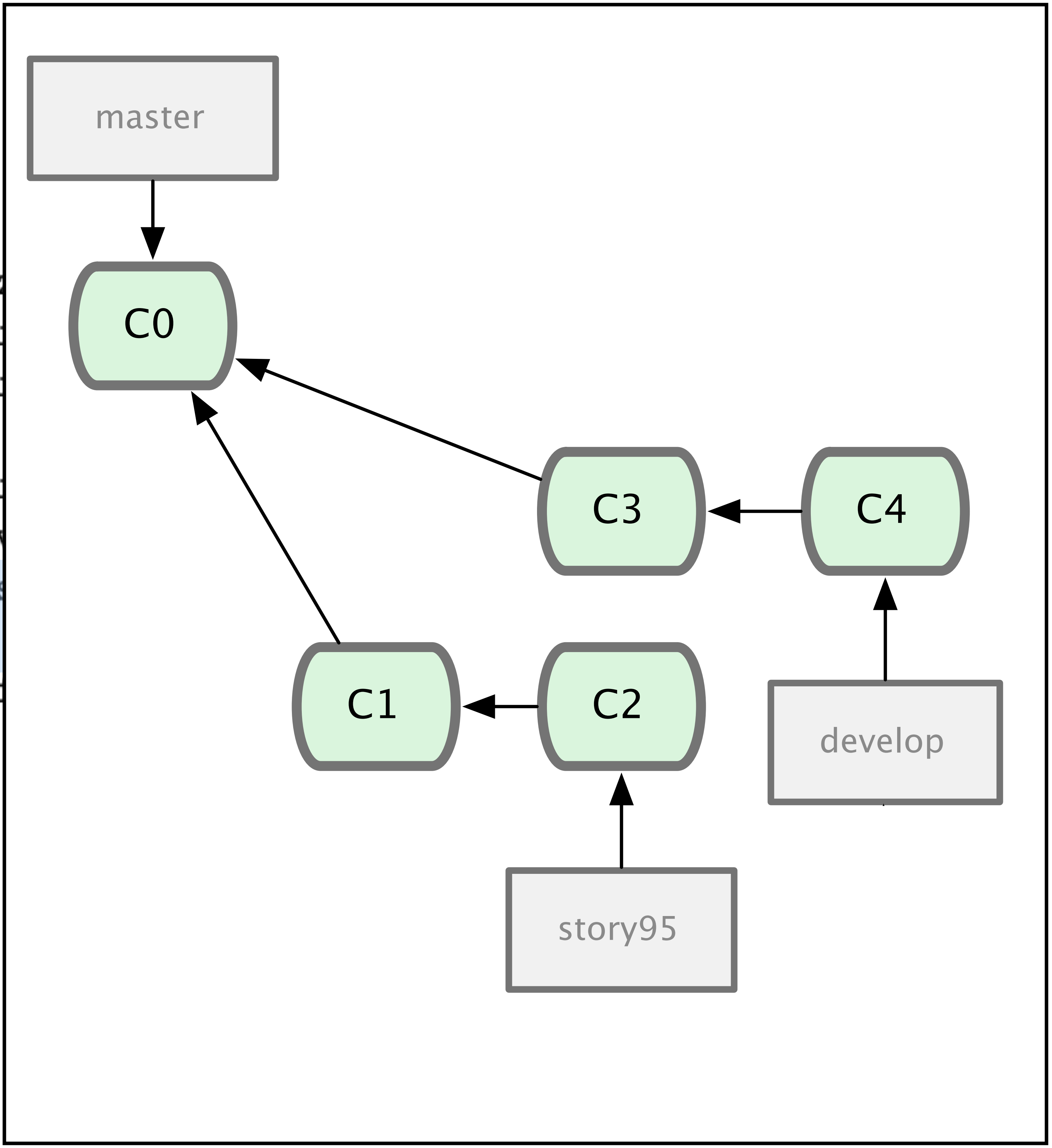
```
$>git branch
* develop
  master
  story95
$>git show-branch
* [develop] new file_size function
 ! [master] added cat-file
  ! [story95] show-commit-tree added
---
  + [story95] show-commit-tree added
  + [story95^] added revparse
*   [develop] new file_size function
*   [develop^] modified show to raw
*++ [master] added cat-file
$>_
```

```
$>git branch
* develop
  master
  story95
$>git show-branch
* [develop] new file_size function
 ! [master] added cat-file
  ! [story95] show-commit-tree added
---
  + [story95] show-commit-tree added
  + [story95^] added revparse
*   [develop] new file_size function
*   [develop^] modified show to raw
*++ [master] added cat-file
$>_
```

```
$>git branch
* develop
  master
  story95
$>git show-branch
* [develop] new file_size function
 ! [master] added cat-file
  ! [story95] show-commit-tree added
---
  + [story95] show-commit-tree added
  + [story95^] added revparse
*   [develop] new file_size function
*   [develop^] modified show to raw
*++ [master] added cat-file
$>_
```



```
$>git branch
* develop
  master
  story95
$>git show-branch
* [develop] new file_si
 ! [master] added cat-fi
  ! [story95] show-commi
---
  + [story95] show-commi
  + [story95^] added rev
*   [develop] new file_s
*   [develop^] modified
*++ [master] added cat-i
$>_
```



branching workflow

normal development

want to try an idea

have to do a hotfix

merge idea into development

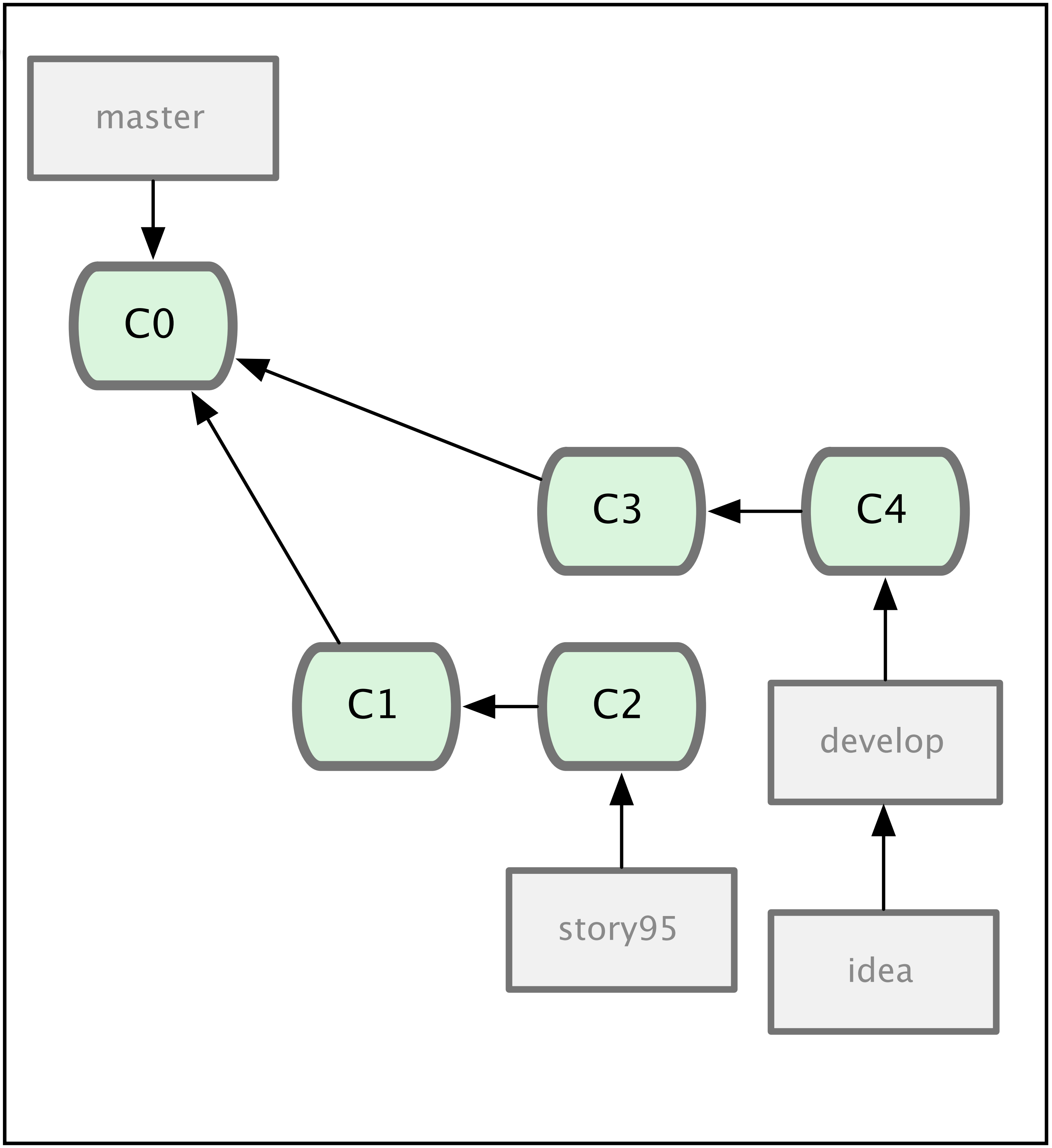
push to production

```
$>git checkout -b idea
```

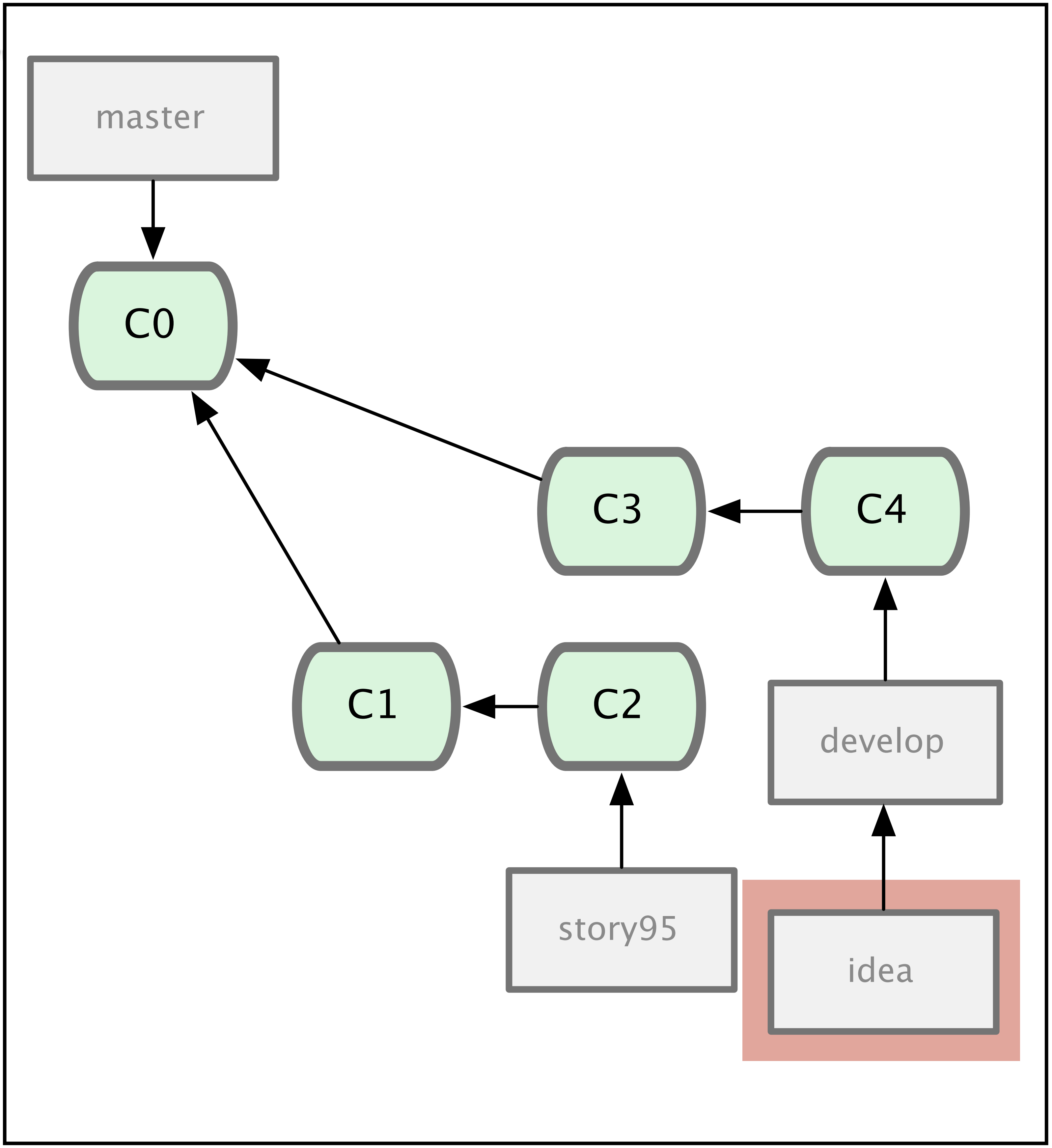
```
$>git checkout -b idea
Switched to a new branch "idea"
$>
```

```
$>git checkout -b idea
Switched to a new branch "idea"
$>git branch
  develop
* idea
  master
  story95
$>
```

```
$>git checkout -b idea
Switched to a new branch '
$>git branch
  develop
* idea
  master
  story95
$>
```



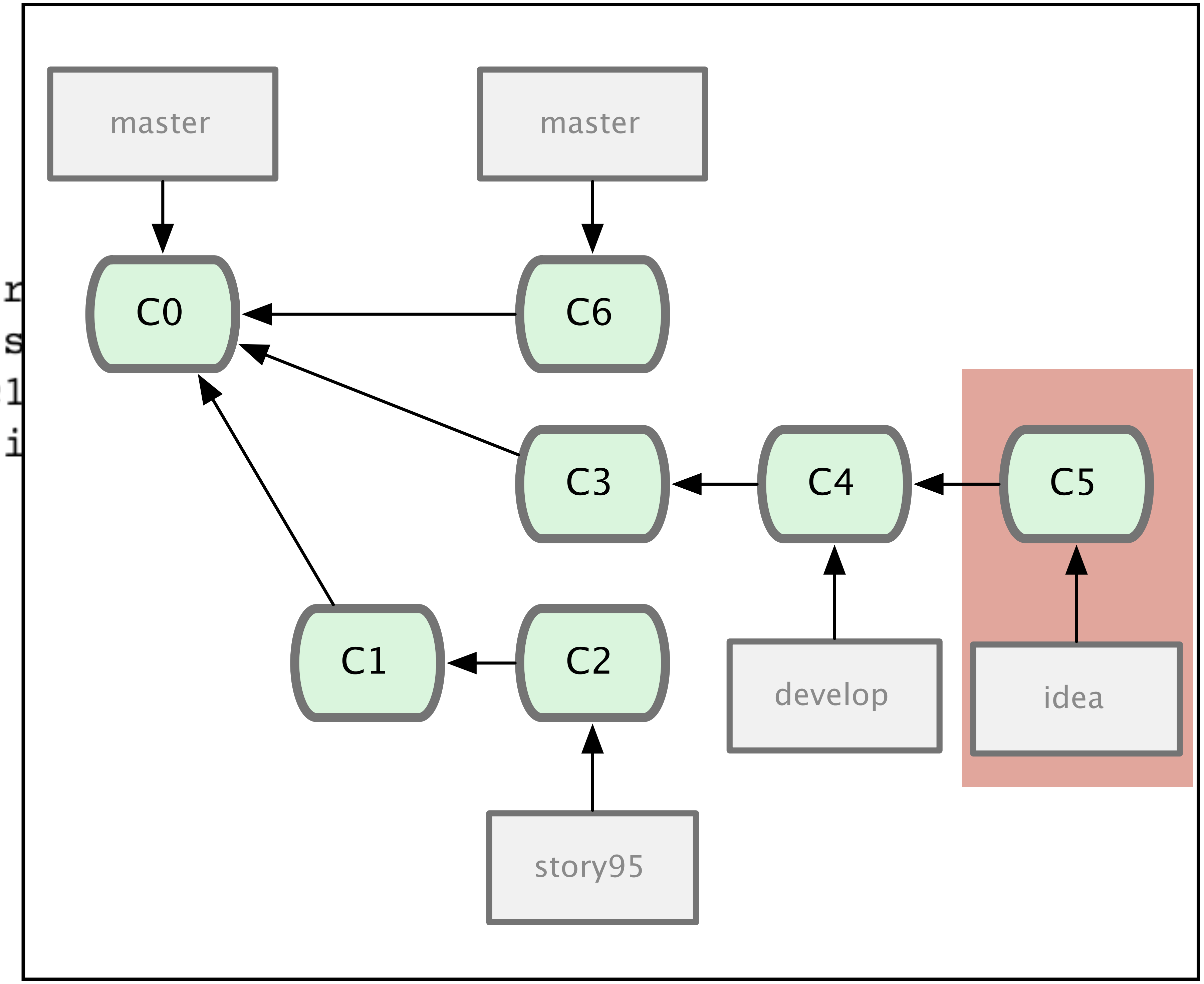
```
$>git checkout -b idea
Switched to a new branch '
$>git branch
  develop
* idea
  master
  story95
$>
```



```
$>git checkout -b idea
Switched to a new branch "idea"
$>git branch
  develop
* idea
  master
  story95
$>vim lib/simplegit.rb
$>
```

```
$>git checkout -b idea
Switched to a new branch "idea"
$>git branch
  develop
* idea
  master
  story95
$>vim lib/simplegit.rb
$>git commit -a -m 'split show command into raw and normal'
Created commit 8268c1a: split show command into raw and normal
 1 files changed, 4 insertions(+), 0 deletions(-)
$>
```

```
$>git checkout -b idea
Switched to a new branch "idea"
$>git branch
  develop
* idea
  master
  story95
$>vim lib/simplegit.r
$>git commit -a -m 's
Created commit 8268c1
 1 files changed, 4 i
```



branching workflow

normal development

want to try an idea

have to do a hotfix

merge idea into development

push to production

```
$>git checkout master
Switched to branch "master"
$>
```

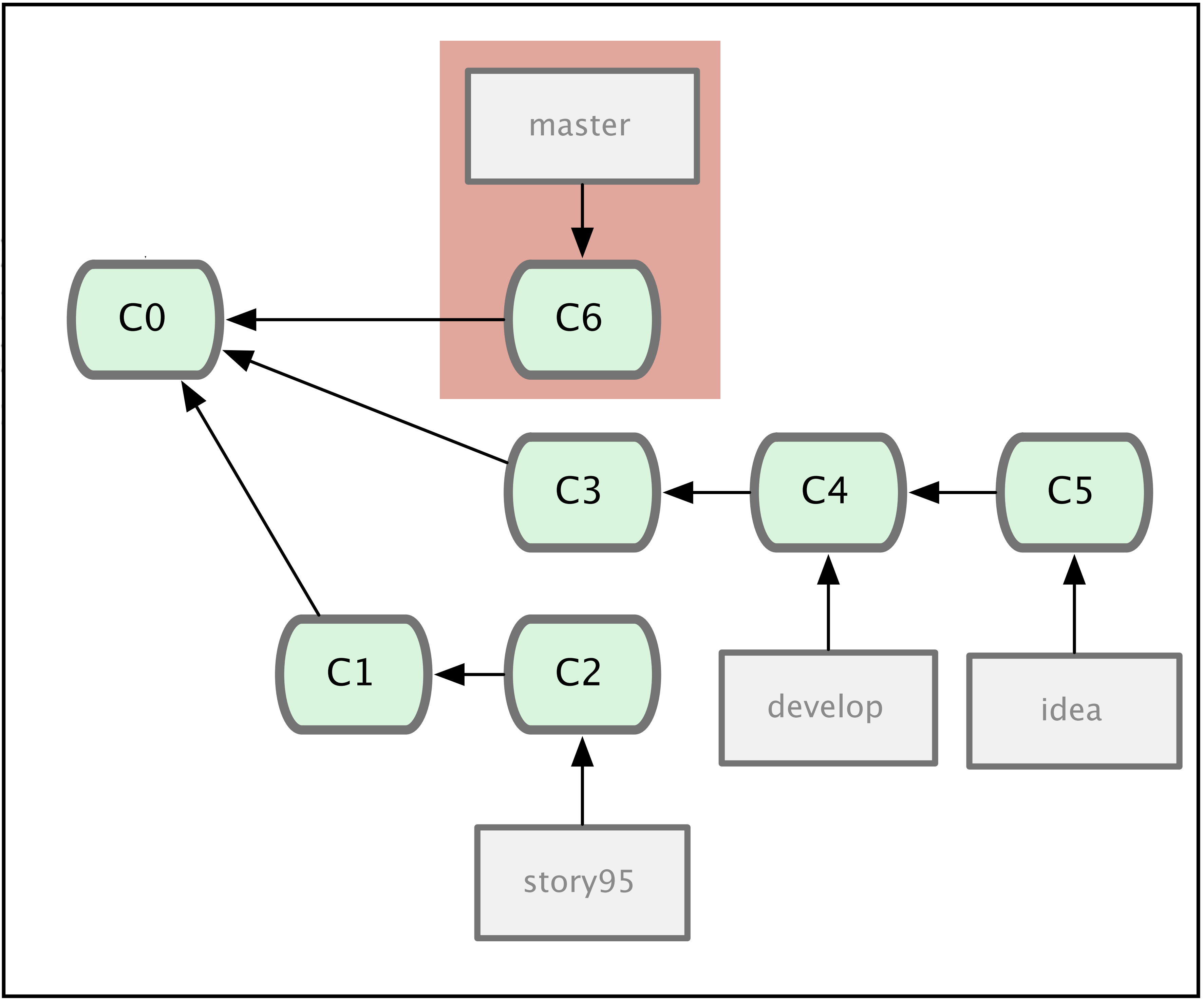
```
$>git checkout master
Switched to branch "master"
$>git branch
  develop
  idea
* master
  story95
$>
```

```
$>git checkout master
Switched to branch "master"
$>git branch
  develop
  idea
* master
  story95
$>vim lib/simplegit.rb
$>
```

```
$>git checkout master
Switched to branch "master"
$>git branch
  develop
  idea
* master
  story95
$>vim lib/simplegit.rb
$>git commit -a -m 'changed log output to 30 from 25'
Created commit 749bcbb: changed log output to 30 from 25
 1 files changed, 1 insertions(+), 1 deletions(-)
$>
```

```
$>git checkout master
Switched to branch "master"
$>git branch
  develop
  idea
* master
  story95
$>vim lib/simplegit.rb
$>git commit -a -m 'changed log output to 30 from 25'
Created commit 749bcbb: changed log output to 30 from 25
 1 files changed, 1 insertions(+), 1 deletions(-)
$>git tag -a 'v1.3'
$>
```

```
$>git checkout master
Switched to branch "master"
$>git branch
  develop
  idea
* master
  story95
$>vim lib/simplegit.r
$>git commit -a -m 'c
Created commit 749bcb
 1 files changed, 1 i
$>git tag -a 'v1.3'
```



branching workflow

normal development

want to try an idea

have to do a hotfix

merge idea into development

push to production

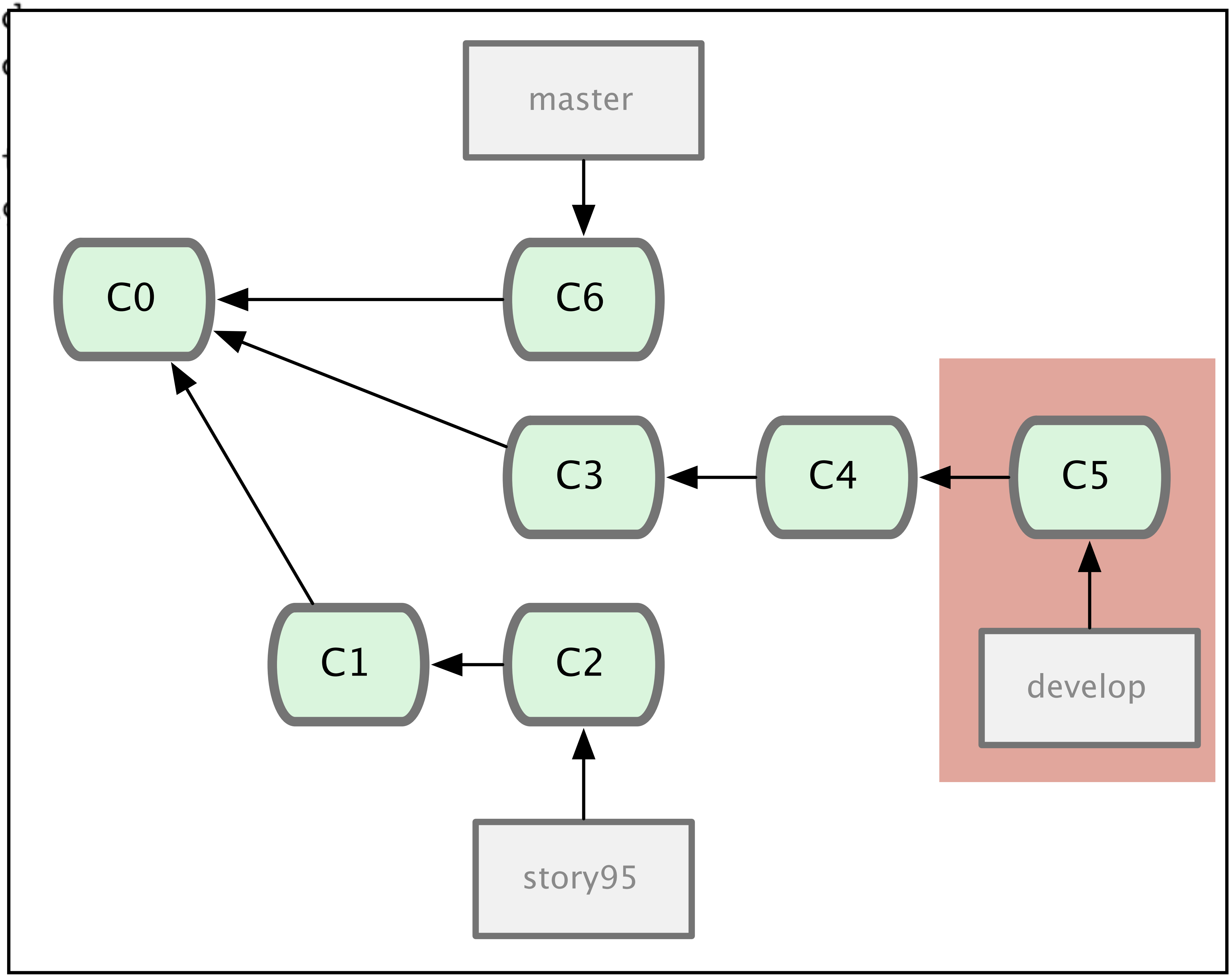
```
$>git checkout develop
```

```
$>git checkout develop
Switched to branch "develop"
$>
```

```
$>git checkout develop
Switched to branch "develop"
$>git merge idea
Updating 8f35c23..8268c1a
Fast forward
 lib/simplegit.rb |    4 ++++
 1 files changed, 4 insertions(+), 0 deletions(-)
$>
```

```
$>git checkout develop
Switched to branch "develop"
$>git merge idea
Updating 8f35c23..8268c1a
Fast forward
 lib/simplegit.rb |    4 ++++
 1 files changed, 4 insertions(+), 0 deletions(-)
$>
```

```
$>git checkout develop
Switched to branch "develop"
$>git merge id
Updating 8f35d
Fast forward
 lib/simplegit
 1 files chang
```



branching workflow

normal development

want to try an idea

have to do a hotfix

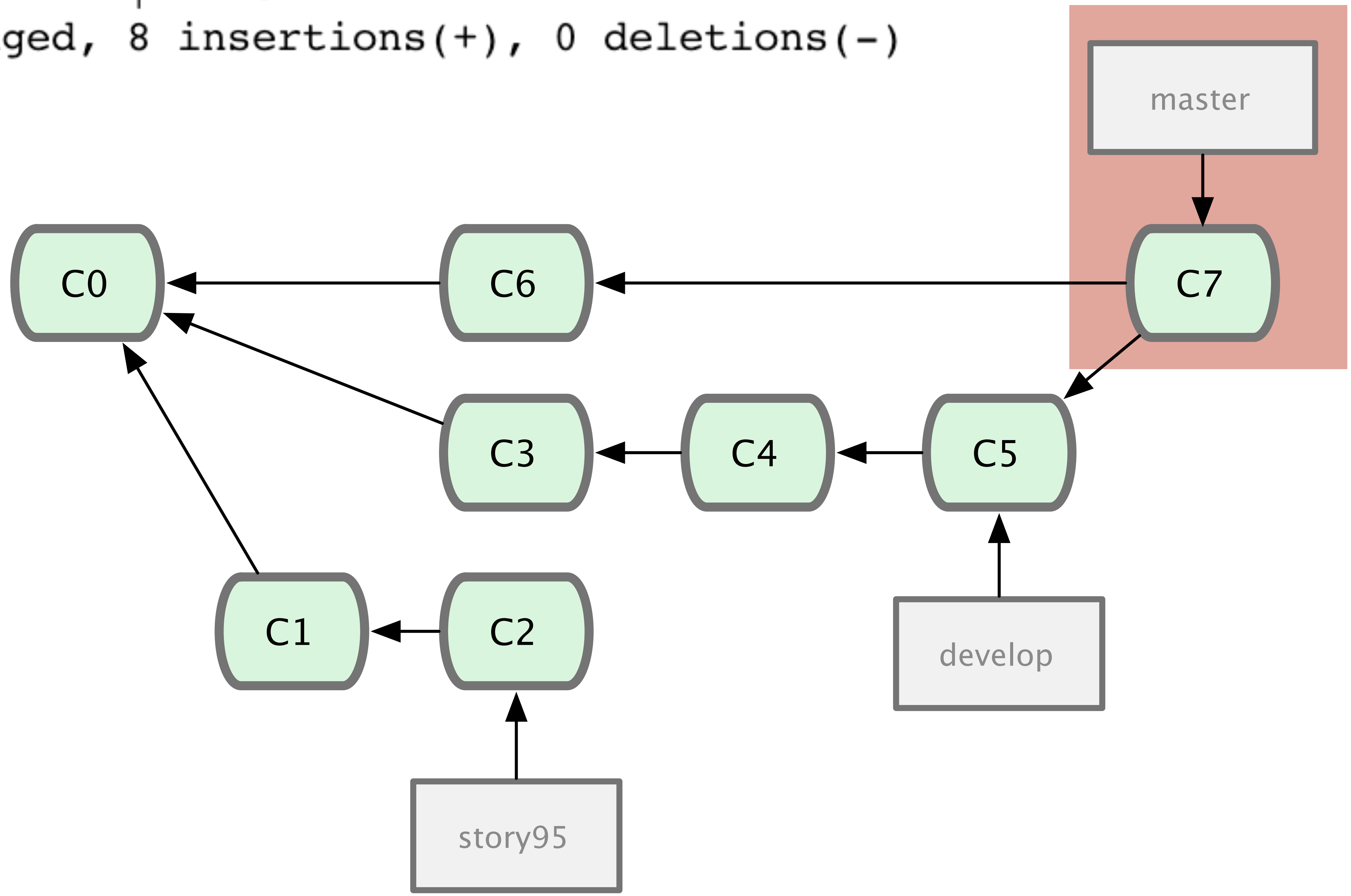
merge idea into development

push to production

```
$>git checkout master
Switched to branch "master"
$>
```

```
$>git checkout master
Switched to branch "master"
$>git merge develop
Auto-merged lib/simplegit.rb
Merge made by recursive.
 lib/simplegit.rb |    8 ++++++++
 1 files changed, 8 insertions(+), 0 deletions(-)
$>
```

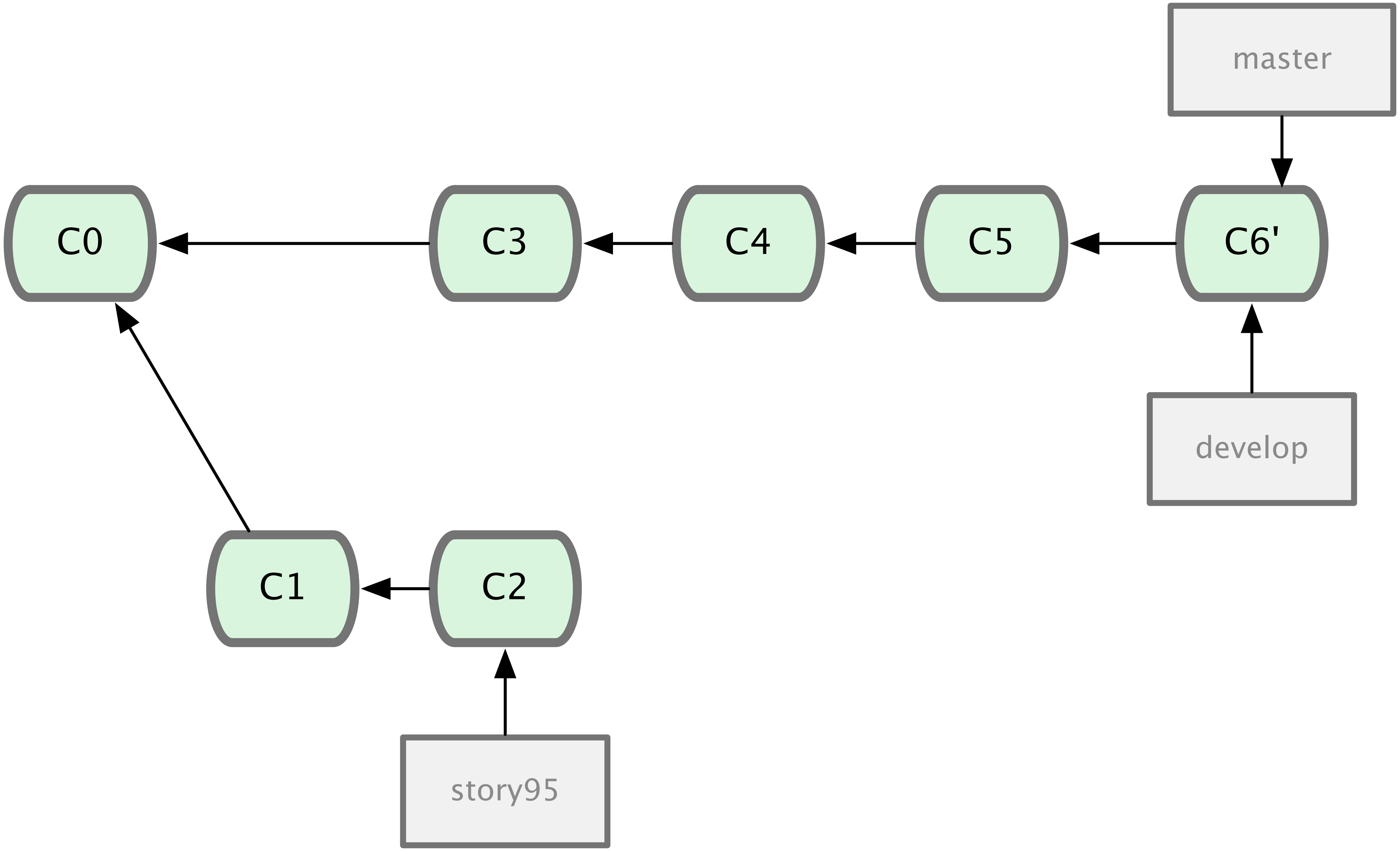
```
$>git checkout master
Switched to branch "master"
$>git merge develop
Auto-merged lib/simplegit.rb
Merge made by recursive.
 lib/simplegit.rb |     8 ++++++++
 1 files changed, 8 insertions(+), 0 deletions(-)
$>
```

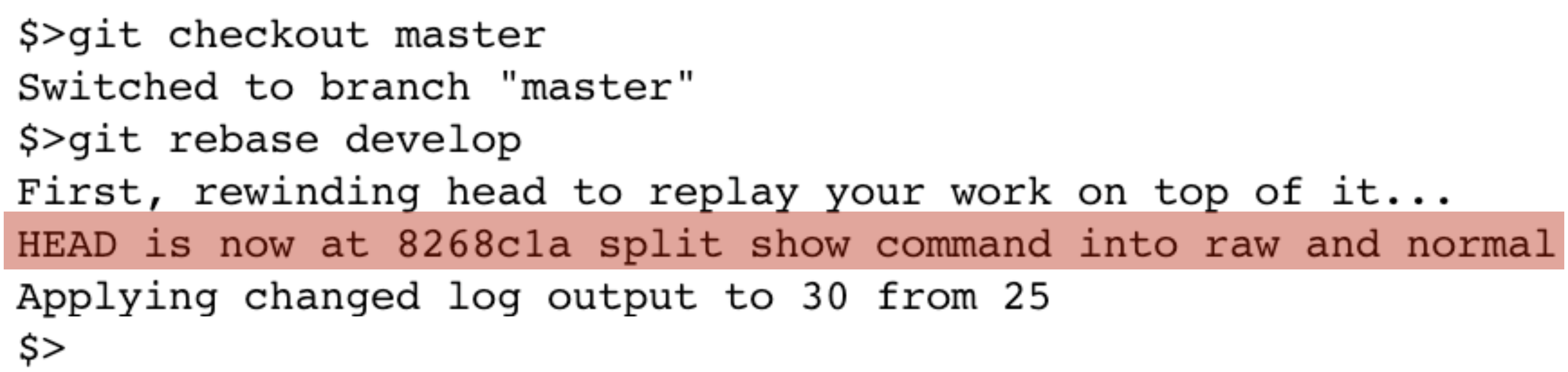


```
$>git checkout master
Switched to branch "master"
$>
```

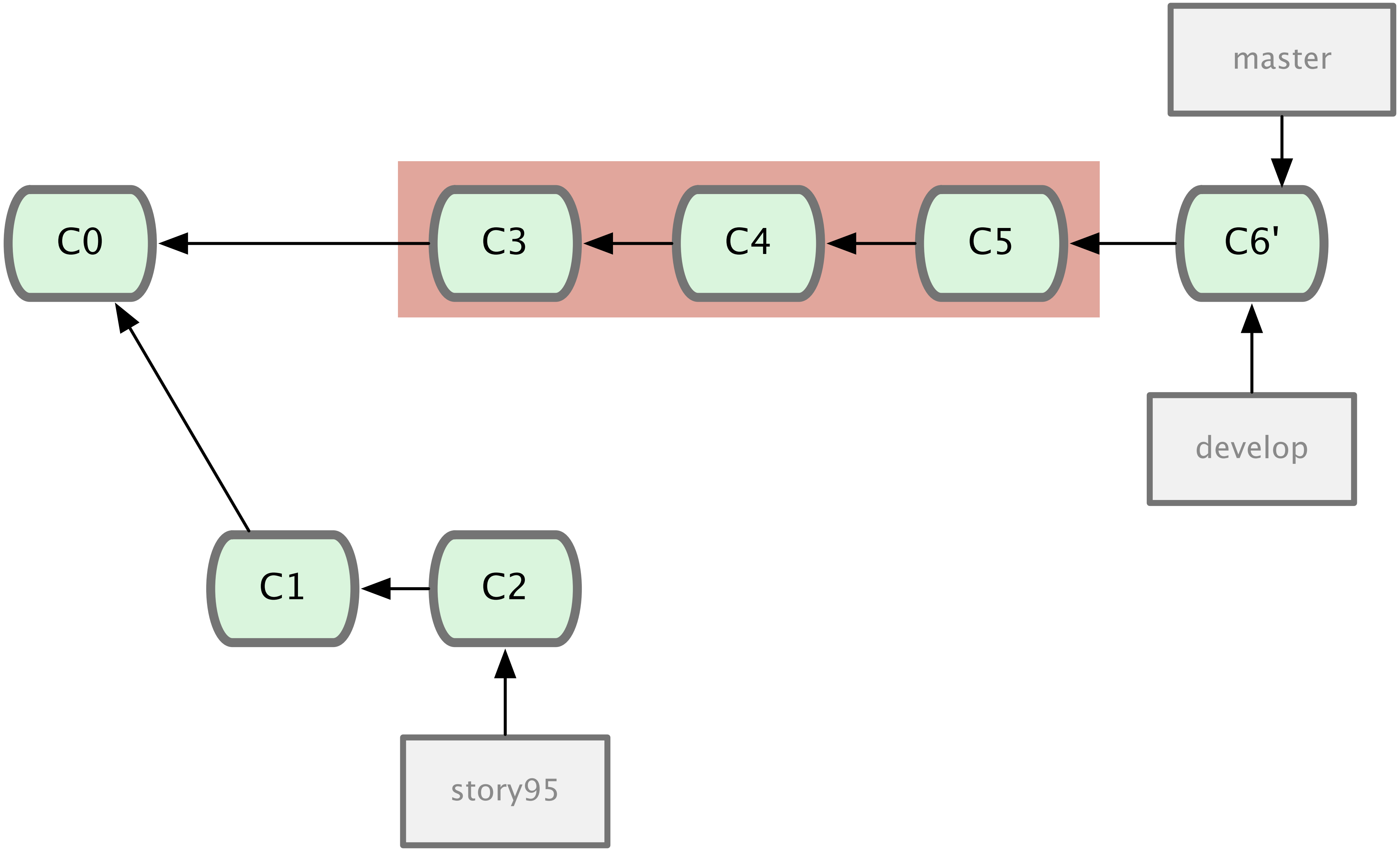
```
$>git checkout master
Switched to branch "master"
$>git rebase develop
First, rewinding head to replay your work on top of it...
HEAD is now at 8268c1a split show command into raw and normal
Applying changed log output to 30 from 25
$>
```

```
$>git checkout master
Switched to branch "master"
$>git rebase develop
First, rewinding head to replay your work on top of it...
HEAD is now at 8268c1a split show command into raw and normal
Applying changed log output to 30 from 25
$>
```

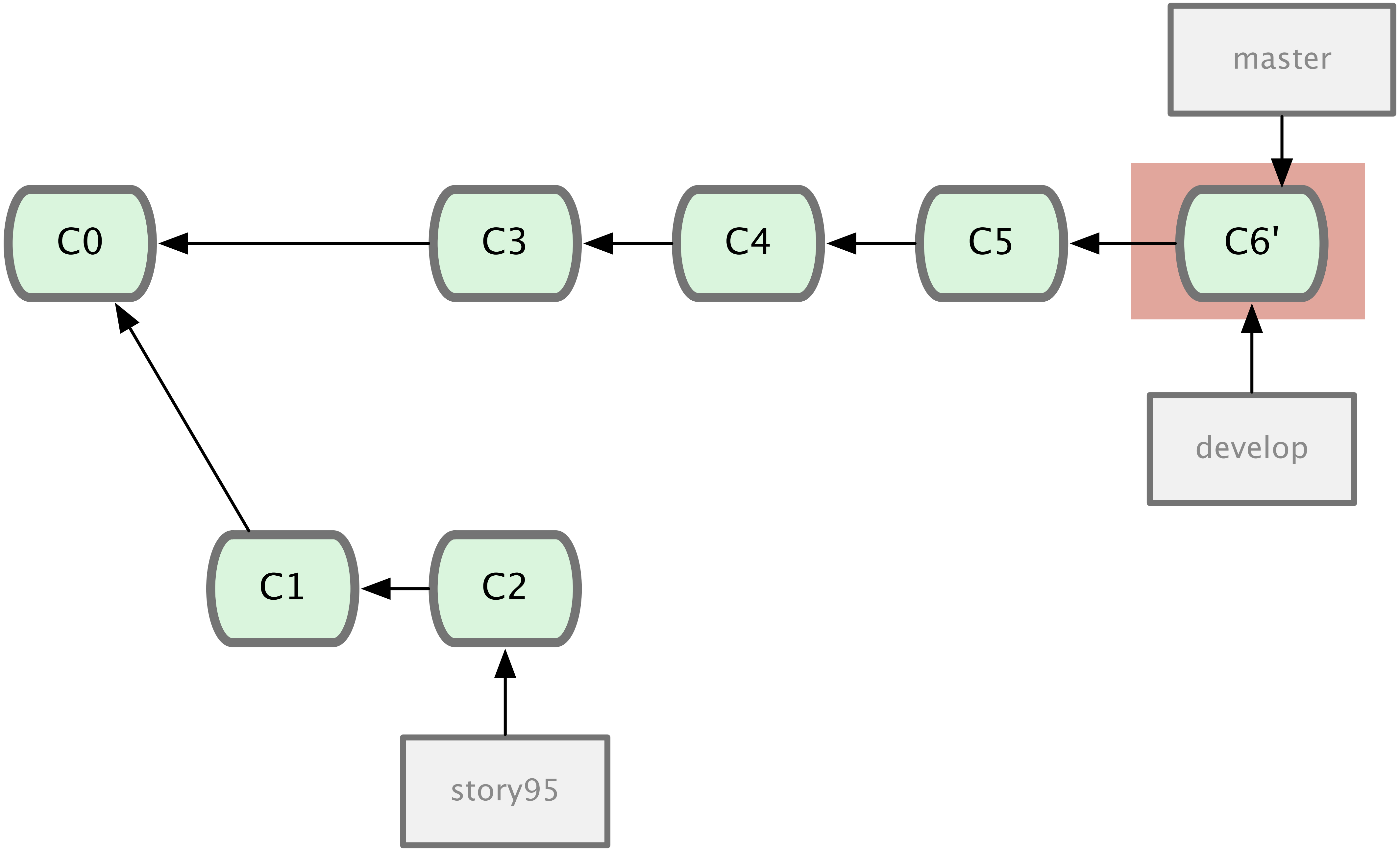




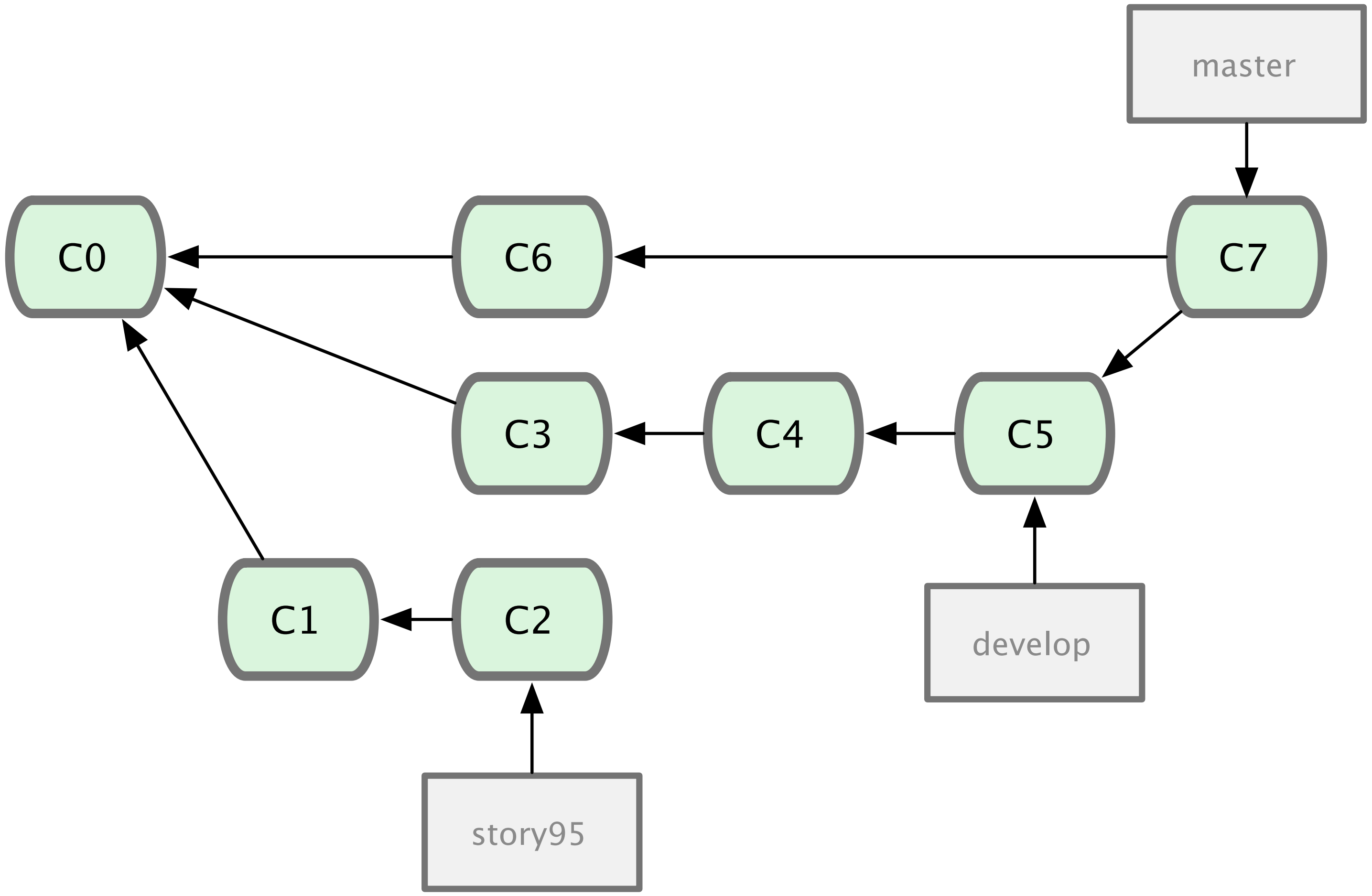
```
$>git checkout master
Switched to branch "master"
$>git rebase develop
First, rewinding head to replay your work on top of it...
HEAD is now at 8268c1a split show command into raw and normal
Applying changed log output to 30 from 25
$>
```



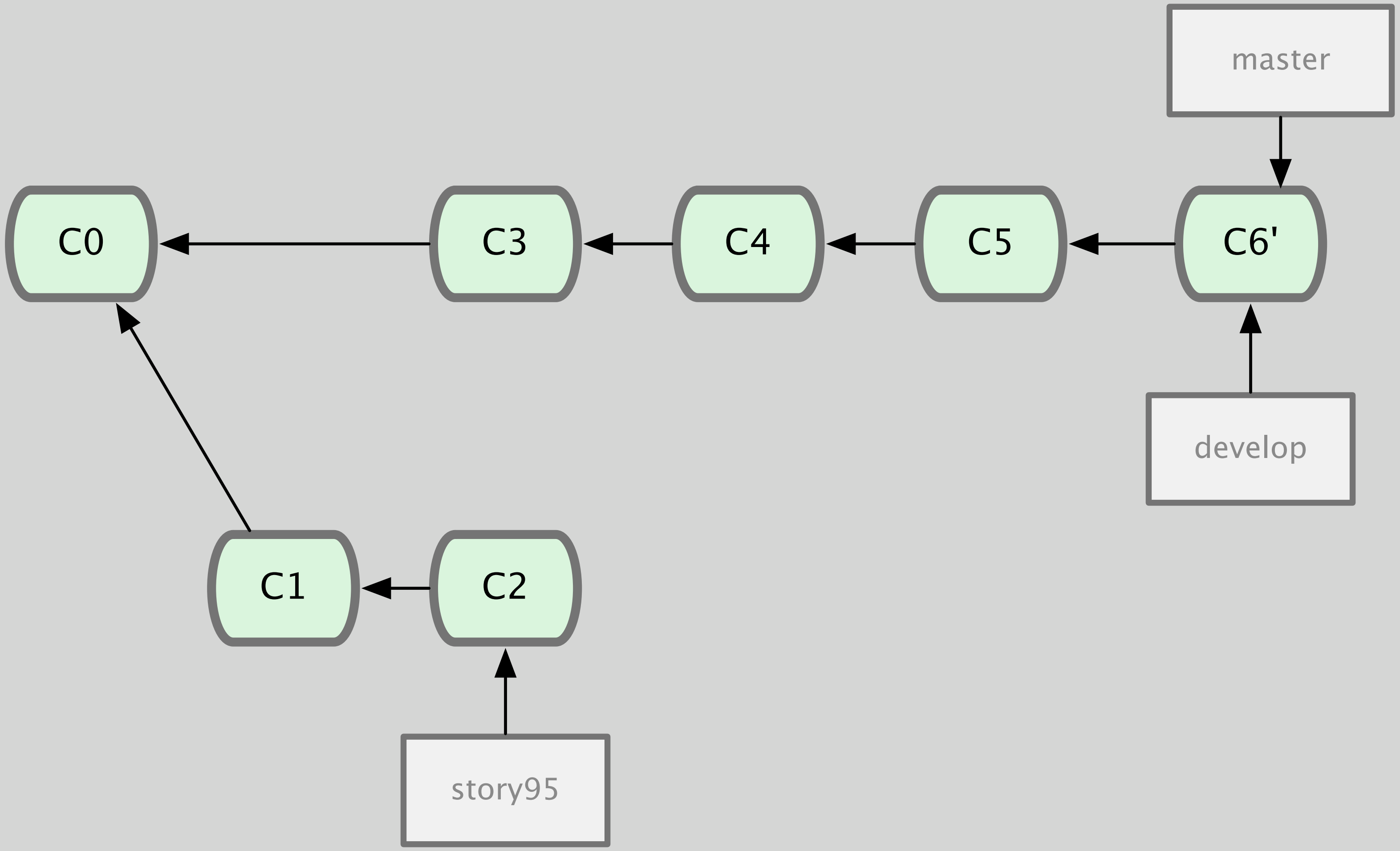
```
$>git checkout master
Switched to branch "master"
$>git rebase develop
First, rewinding head to replay your work on top of it...
HEAD is now at 8268c1a split show command into raw and normal
Applying changed log output to 30 from 25
$>
```



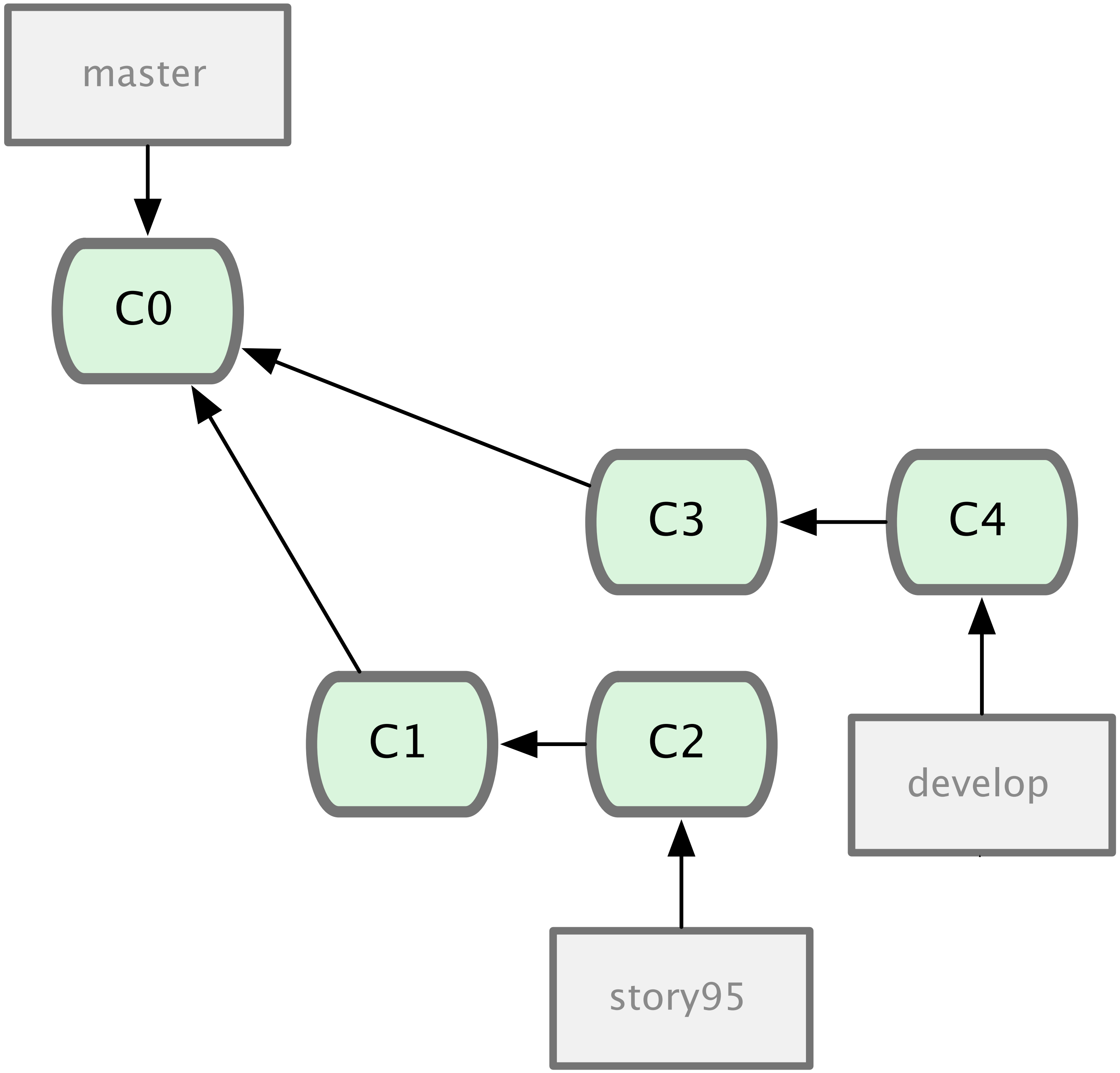
merge

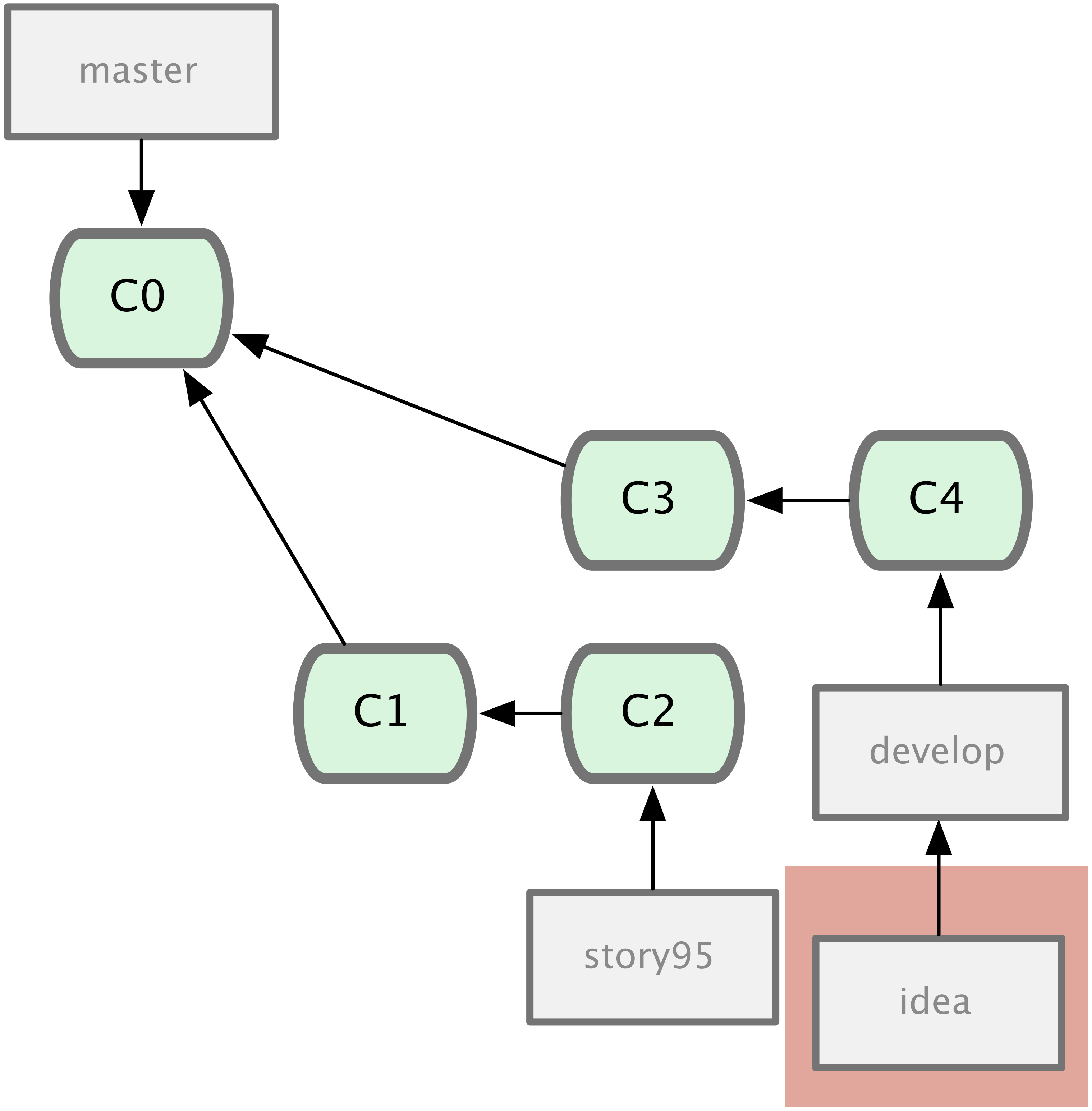


rebase

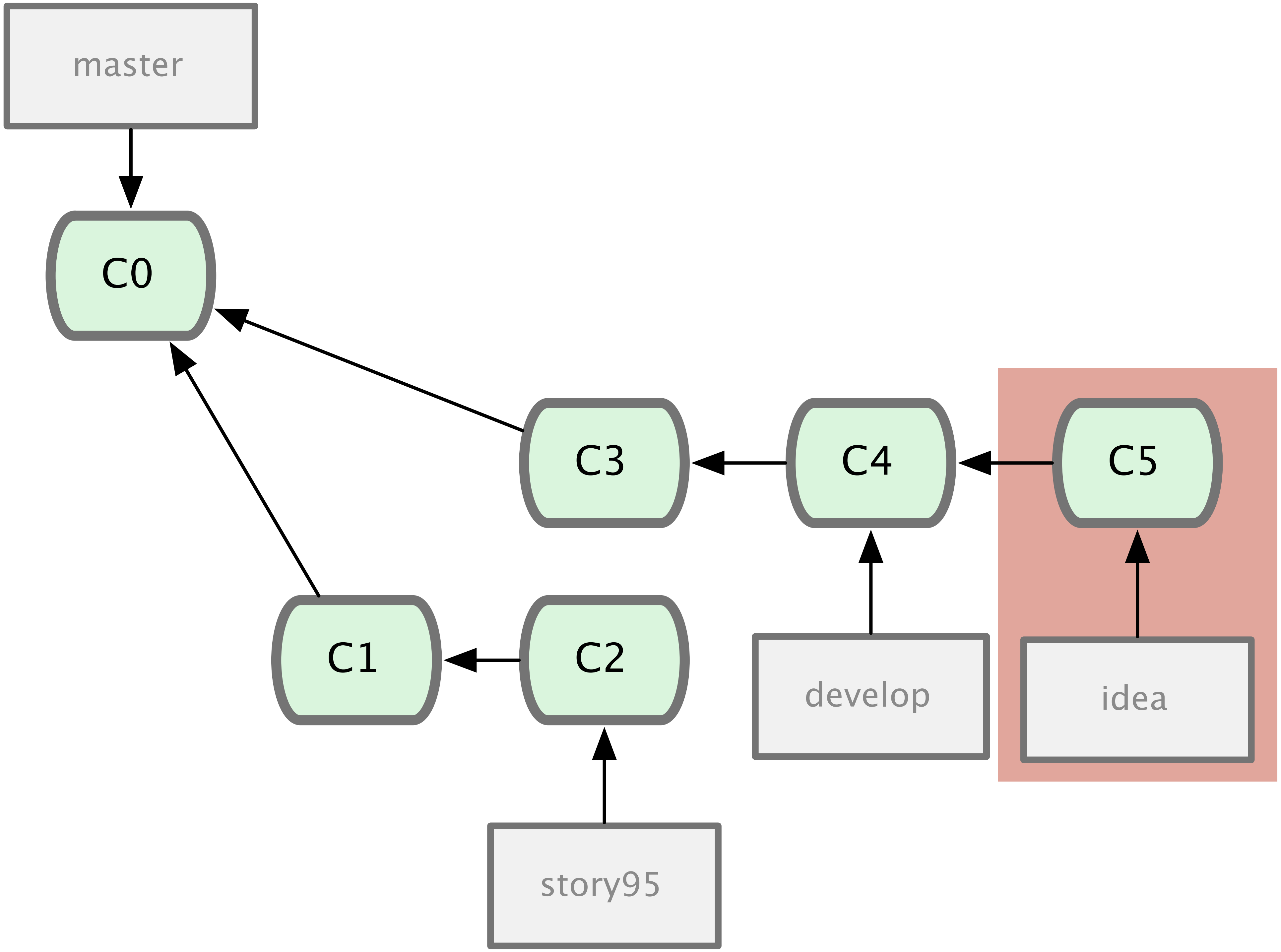


one more time now!

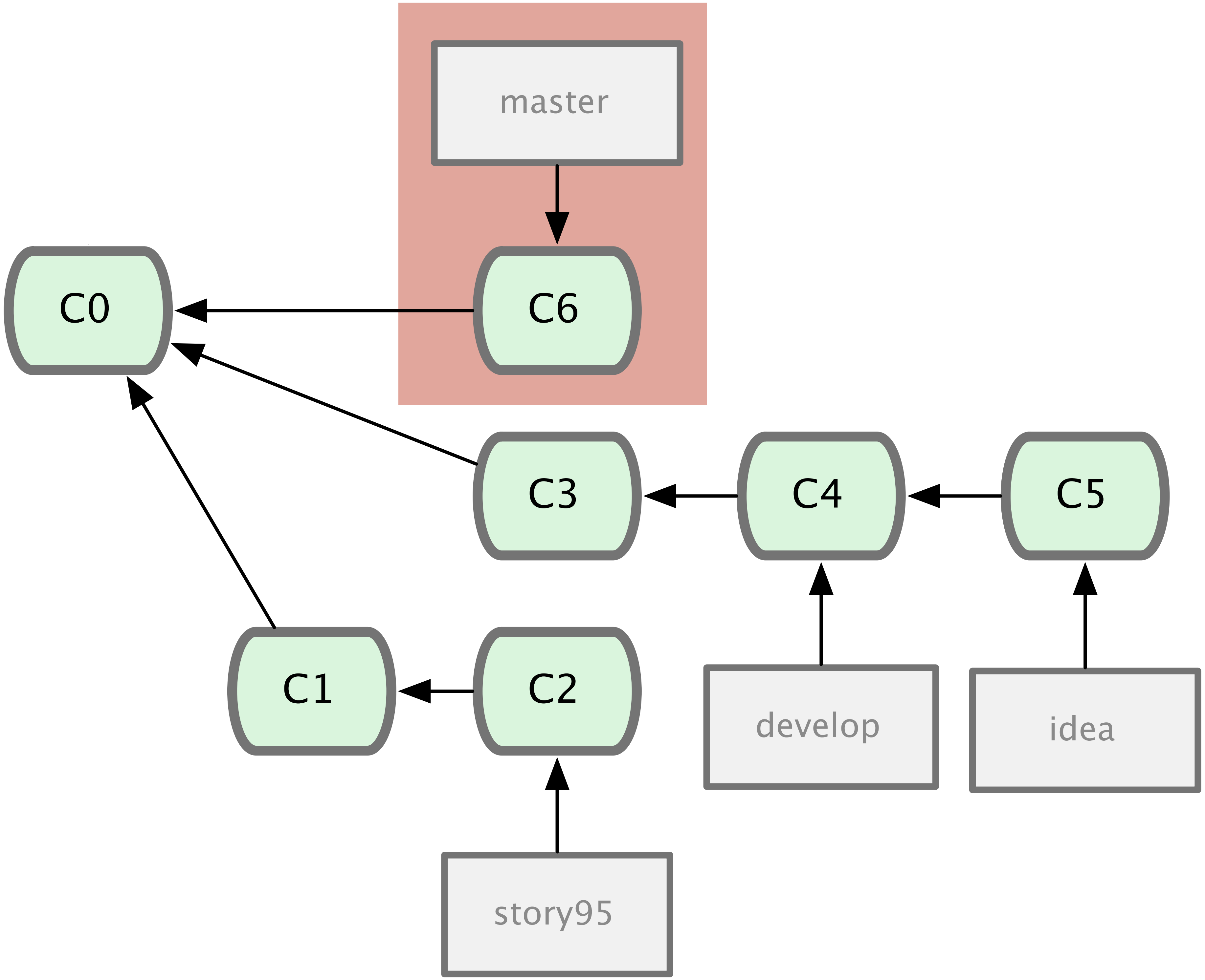

master
C0
C3
C4
C1
C2
develop
story95



git checkout -b idea

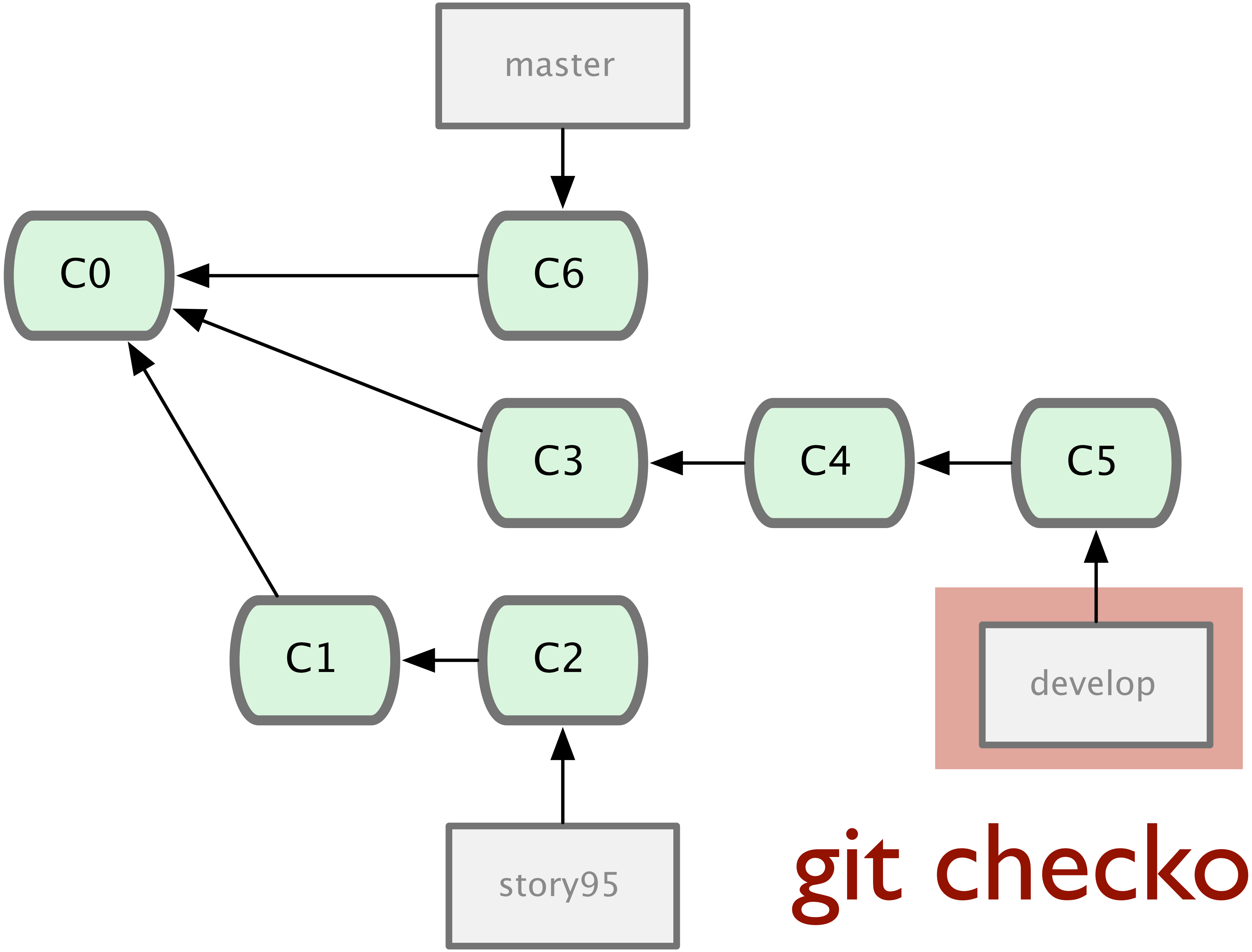


git commit

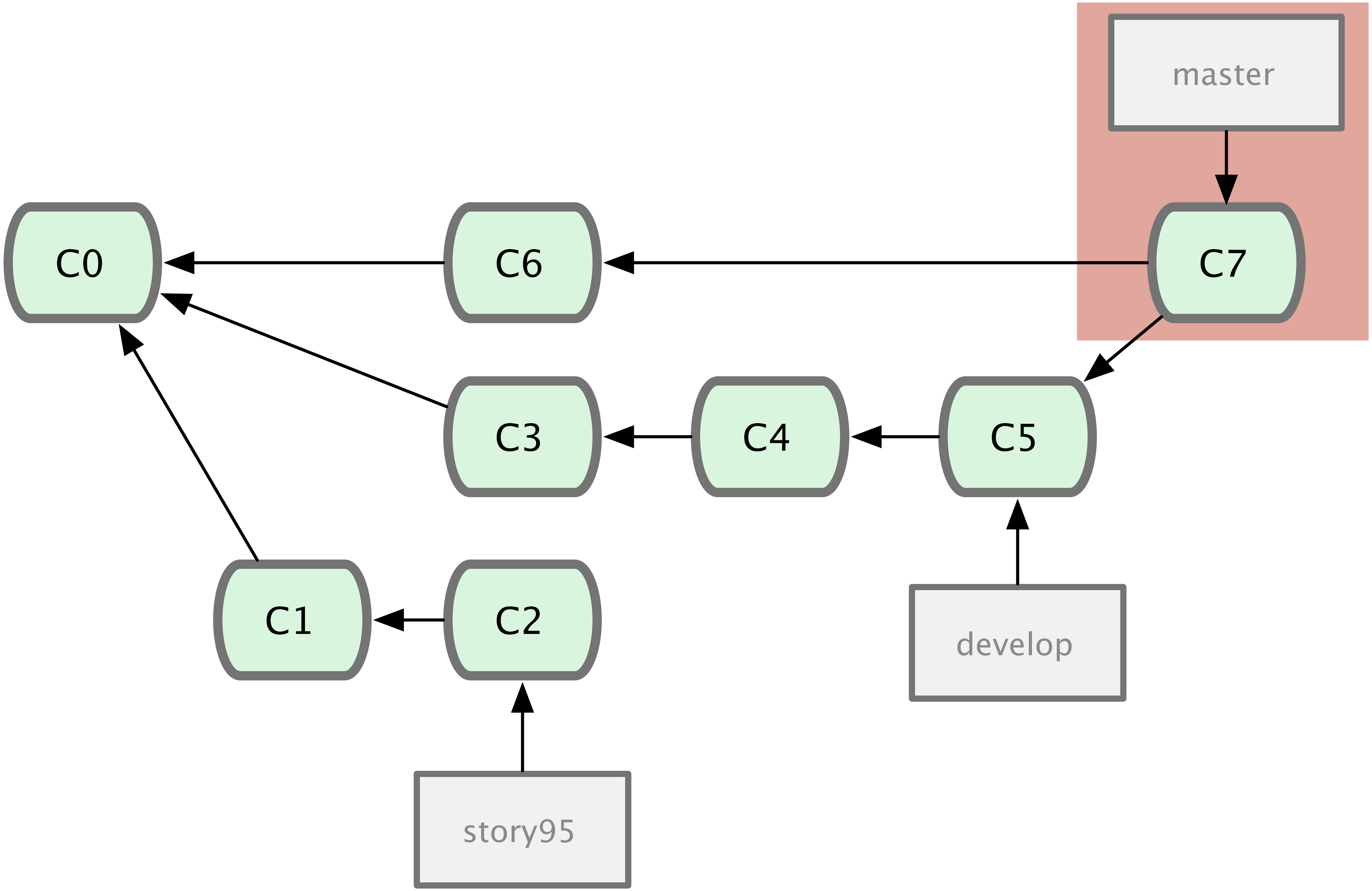


git checkout master

git commit



```
git checkout idea
git merge develop
git branch -d idea
```



git checkout master
git merge develop

~~git-add~~

git-add--interactive

~~git-am~~

git-annotate

~~git-apply~~

git-archive

git-bisect

git-blame

~~git-branch~~

~~git-checkout~~

git-cherry-pick

git-citool

git-clean

~~git-clone~~

~~git-commit~~

~~git-config~~

git-daemon

~~git-diff~~

git-fetch

~~git-format-patch~~

git-gc

git-grep

git-gui

~~git-init~~

git-instaweb

~~git-log~~

~~git-merge~~

git-mv

git-pull

git-push

~~git-rebase~~

git-rebase--interactive

git-remote

git-revert

git-rm

git-send-email

git-shortlog

git-show

~~git-show-branch~~

git-stash

~~git-status~~

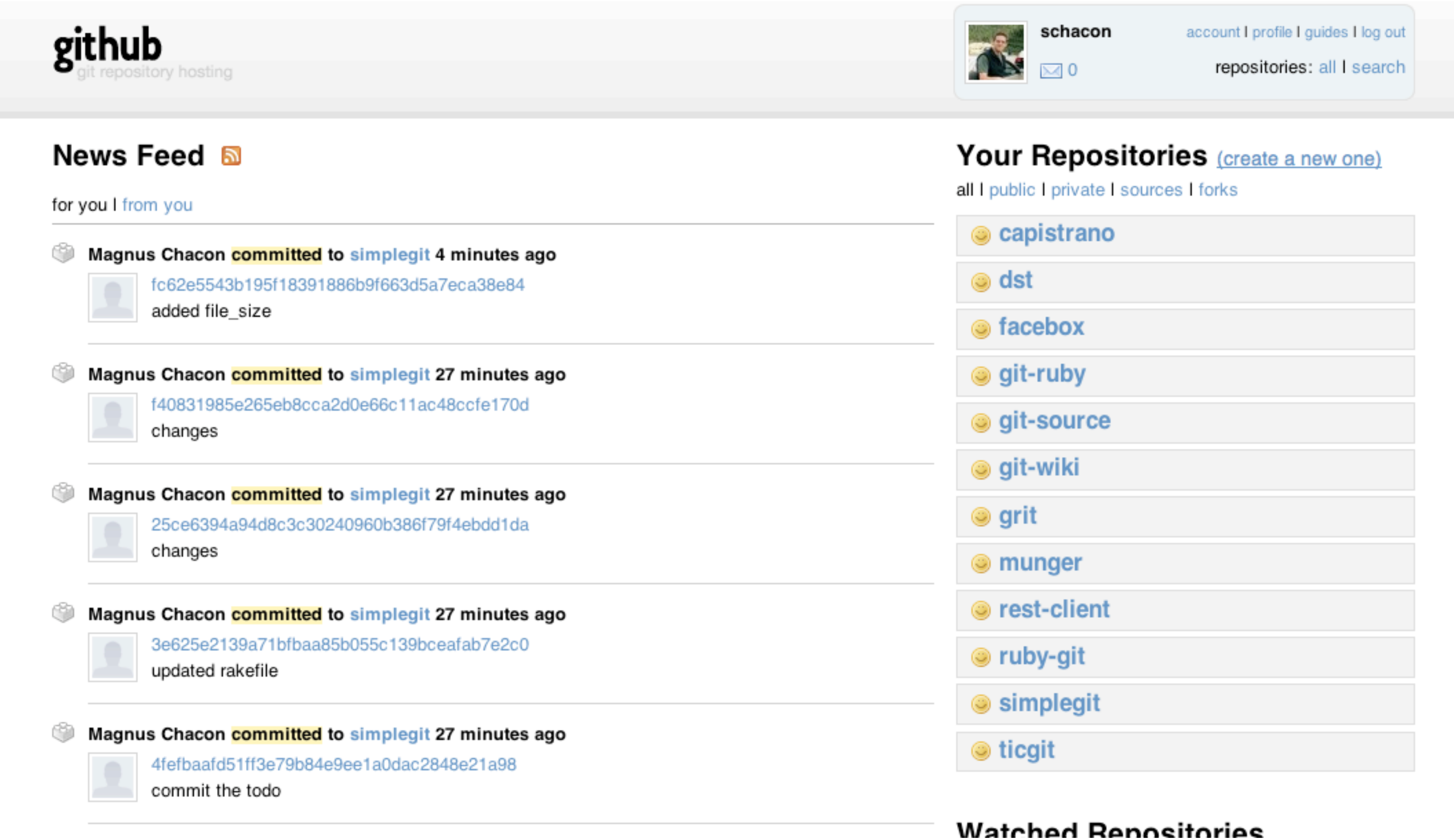
git-submodule

~~git-tag~~

17 Down

sharing git

```
$>git remote
$>
```



github
git repository hosting

schacon

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✉ 0

repositories: all | search

News Feed

for you | from you

Magnus Chacon committed to simplegit 4 minutes ago
fc62e5543b195f18391886b9f663d5a7eca38e84
added file_size

Magnus Chacon committed to simplegit 27 minutes ago
f40831985e265eb8cca2d0e66c11ac48ccfe170d
changes

Magnus Chacon committed to simplegit 27 minutes ago
25ce6394a94d8c3c30240960b386f79f4ebdd1da
changes

Magnus Chacon committed to simplegit 27 minutes ago
3e625e2139a71bfbaa85b055c139bceafab7e2c0
updated rakefile

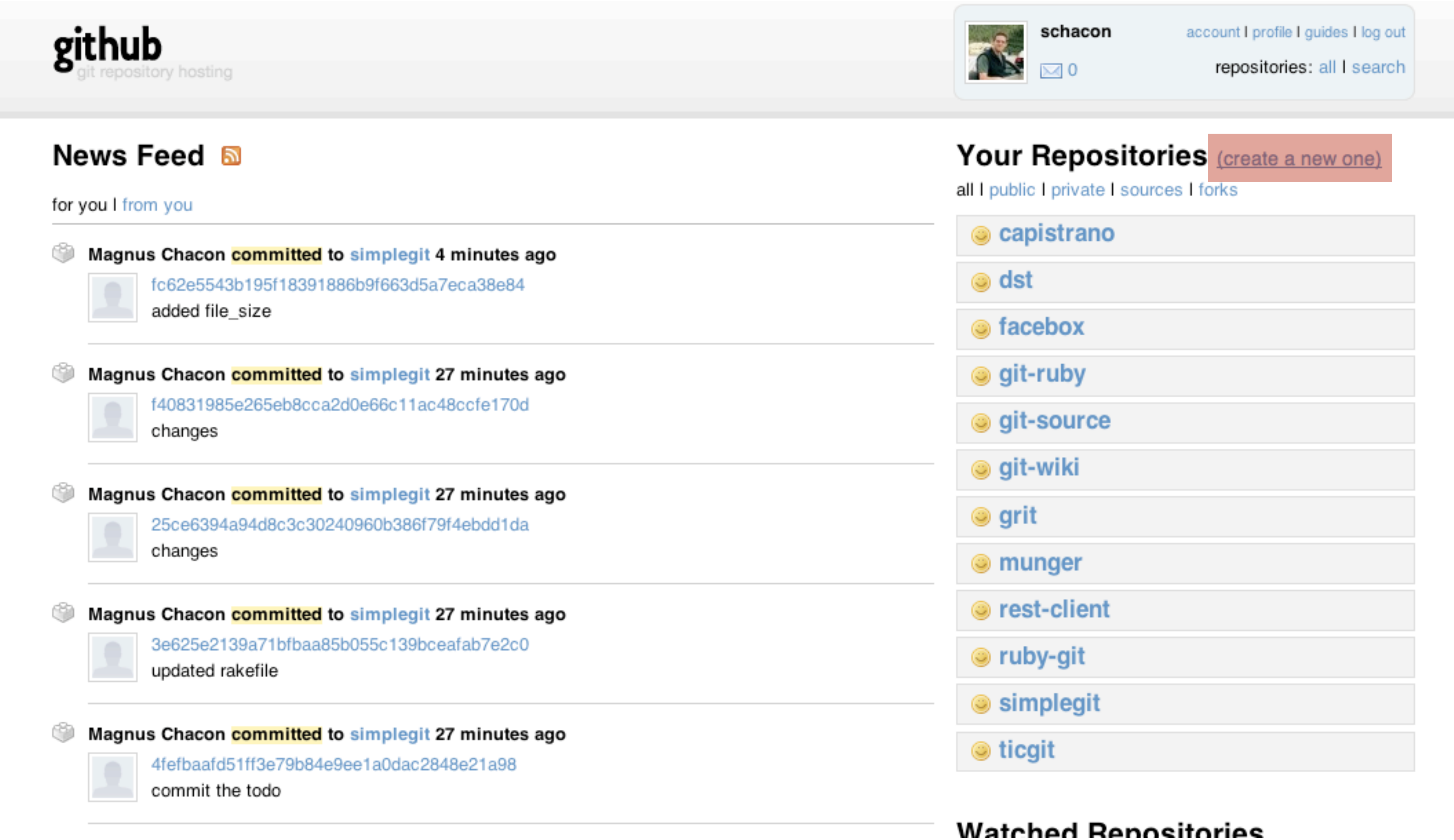
Magnus Chacon committed to simplegit 27 minutes ago
4fefbaafd51ff3e79b84e9ee1a0dac2848e21a98
commit the todo

Your Repositories (create a new one)

all | public | private | sources | forks

- capistrano
- dst
- facebox
- git-ruby
- git-source
- git-wiki
- grit
- munger
- rest-client
- ruby-git
- simplegit
- ticgit

Watched Repositories



github
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account | profile | guides | log out
0
repositories: all | search

News Feed

for you | from you

Magnus Chacon committed to simplegit 4 minutes ago
fc62e5543b195f18391886b9f663d5a7eca38e84
added file_size

Magnus Chacon committed to simplegit 27 minutes ago
f40831985e265eb8cca2d0e66c11ac48ccfe170d
changes

Magnus Chacon committed to simplegit 27 minutes ago
25ce6394a94d8c3c30240960b386f79f4ebdd1da
changes

Magnus Chacon committed to simplegit 27 minutes ago
3e625e2139a71bfbaa85b055c139bceafab7e2c0
updated rakefile

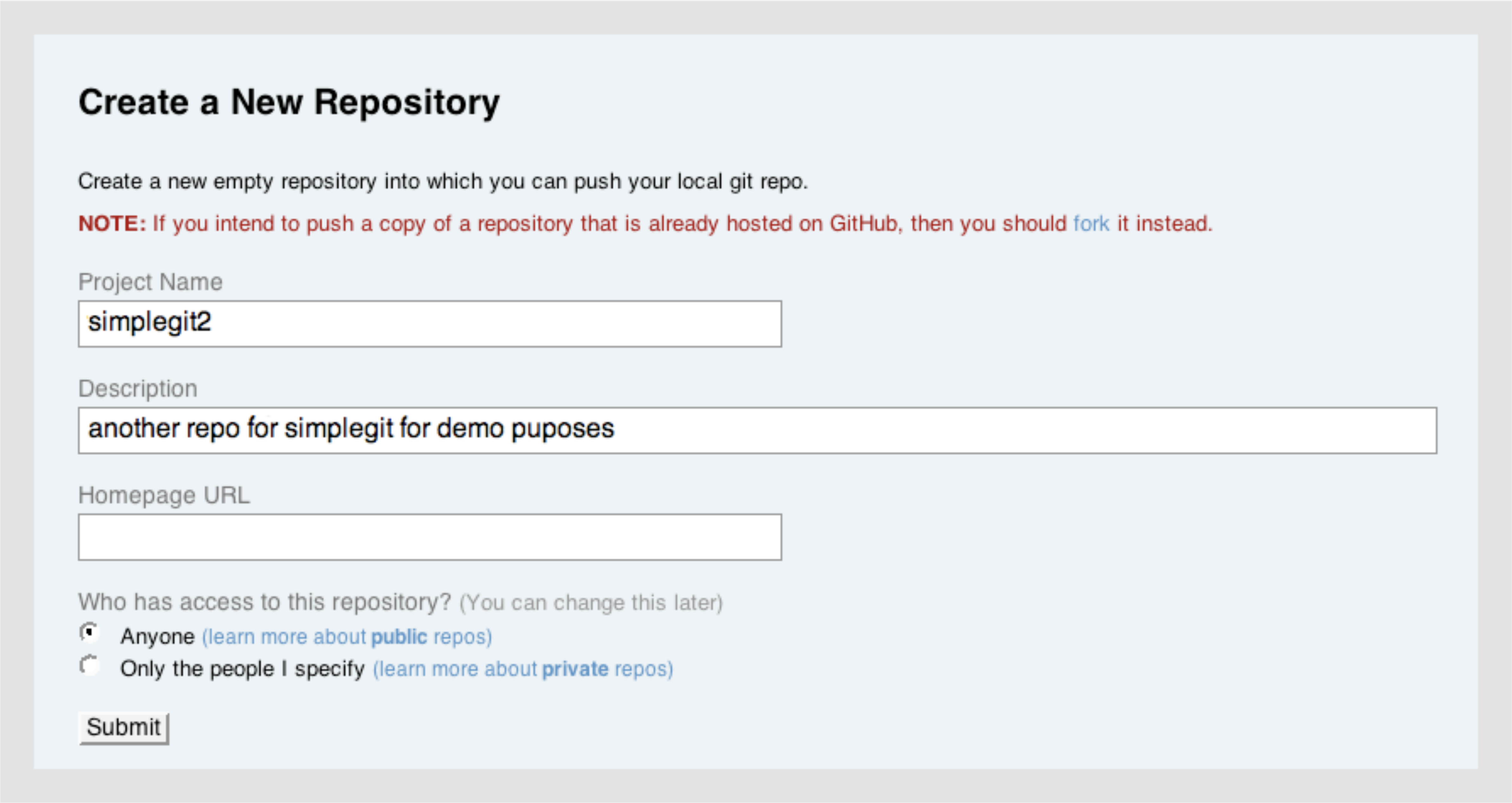
Magnus Chacon committed to simplegit 27 minutes ago
4fefbaafd51ff3e79b84e9ee1a0dac2848e21a98
commit the todo

Your Repositories (create a new one)

all | public | private | sources | forks

- capistrano
- dst
- facebox
- git-ruby
- git-source
- git-wiki
- grit
- munger
- rest-client
- ruby-git
- simplegit
- ticgit

Watched Repositories



Create a New Repository

Create a new empty repository into which you can push your local git repo.

NOTE: If you intend to push a copy of a repository that is already hosted on GitHub, then you should fork it instead.

Project Name: simplegit2

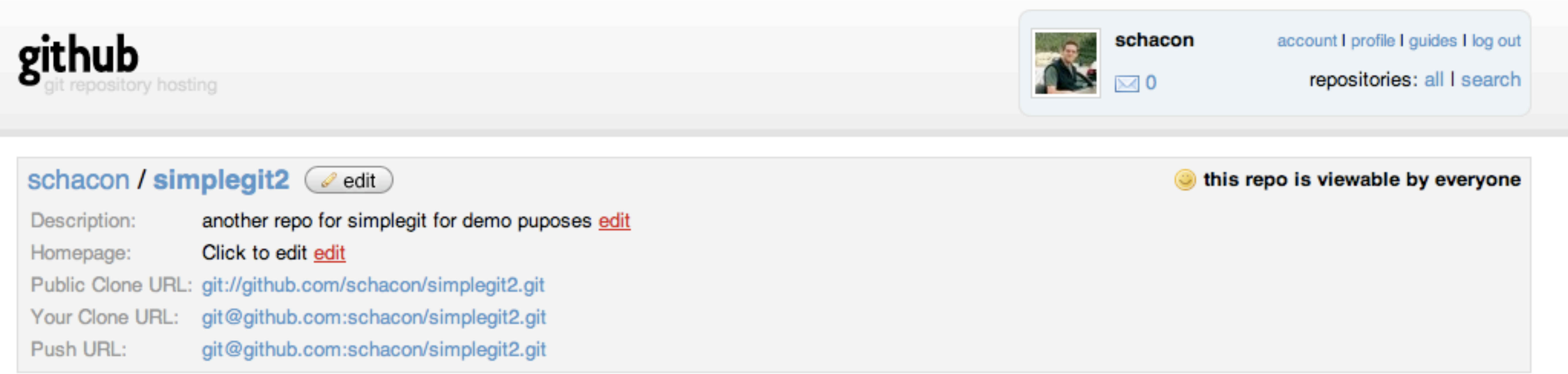
Description: another repo for simplegit for demo puposes

Homepage URL:

Who has access to this repository? (You can change this later)

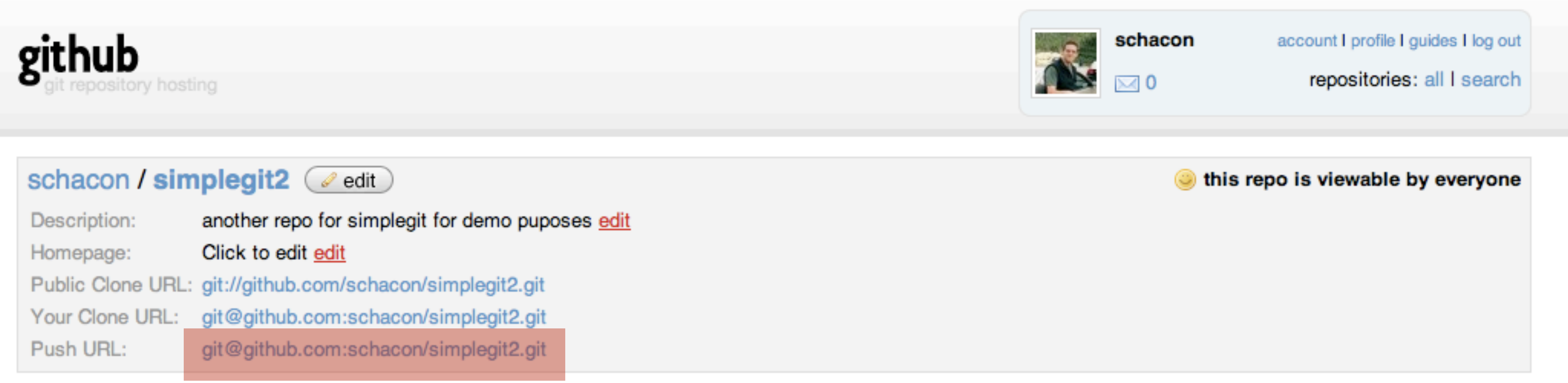
● Anyone (learn more about **public** repos)

○ Only the people I specify (learn more about **private** repos)


github
git repository hosting
schacon
account | profile | guides | log out
0
repositories: all | search
edit
this repo is viewable by everyone

schacon / simplegit2

Description: another repo for simplegit for demo puposes edit
Homepage: Click to edit edit
Public Clone URL: git://github.com/schacon/simplegit2.git
Your Clone URL: git@github.com:schacon/simplegit2.git
Push URL: git@github.com:schacon/simplegit2.git


github
git repository hosting
schacon
account | profile | guides | log out
0
repositories: all | search
edit
this repo is viewable by everyone

schacon / simplegit2

Description: another repo for simplegit for demo puposes edit

Homepage: Click to edit edit

Public Clone URL: git://github.com/schacon/simplegit2.git

Your Clone URL: git@github.com:schacon/simplegit2.git

Push URL: git@github.com:schacon/simplegit2.git

```
$>git remote
$>git remote add public git@github.com:schacon/simplegit2.git
$>
```

```
$>git remote
$>git remote add public git@github.com:schacon/simplegit2.git
$>
```

```
$>git remote
$>git remote add public git@github.com:schacon/simplegit2.git
$>
```

```
$>git remote
$>git remote add public git@github.com:schacon/simplegit2.git
$>git push public master
Counting objects: 115, done.
Compressing objects: 100% (73/73), done.
Writing objects: 100% (115/115), 11.20 KiB, done.
Total 115 (delta 42), reused 65 (delta 24)
refs/heads/master: 0000000000000000000000000000000000000000 -> fc6
5543b195f18391886b9f663d5a7eca38e84
To git@github.com:schacon/simplegit2.git
 * [new branch]      master -> master
$>
```

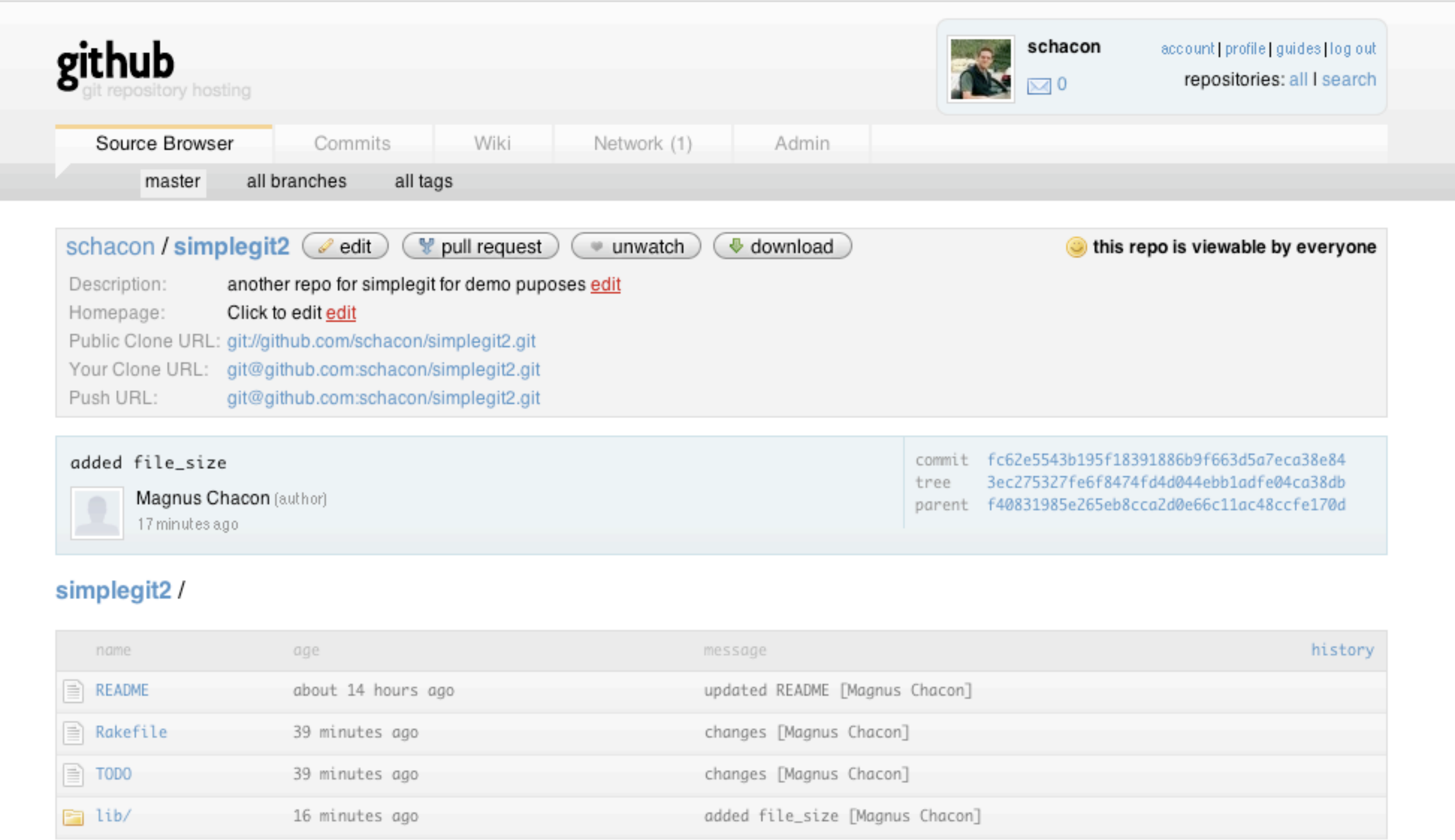
```
$>git remote
$>git remote add public git@github.com:schacon/simplegit2.git
$>git push public master
Counting objects: 115, done.
Compressing objects: 100% (73/73), done.
Writing objects: 100% (115/115), 11.20 KiB, done.
Total 115 (delta 42), reused 65 (delta 24)
refs/heads/master: 0000000000000000000000000000000000000000 -> fc6
5543b195f18391886b9f663d5a7eca38e84
To git@github.com:schacon/simplegit2.git
 * [new branch]      master -> master
$>
```

```
$>git remote
$>git remote add public git@github.com:schacon/simplegit2.git
$>git push public master
Counting objects: 115, done.
Compressing objects: 100% (73/73), done.
Writing objects: 100% (115/115), 11.20 KiB, done.
Total 115 (delta 42), reused 65 (delta 24)
refs/heads/master: 0000000000000000000000000000000000000000 -> fc6
5543b195f18391886b9f663d5a7eca38e84
To git@github.com:schacon/simplegit2.git
 * [new branch]      master -> master
$>
```

```
$>git remote
$>git remote add public git@github.com:schacon/simplegit2.git
$>git push public master
Counting objects: 115, done.
Compressing objects: 100% (73/73), done.
Writing objects: 100% (115/115), 11.20 KiB, done.
Total 115 (delta 42), reused 65 (delta 24)
refs/heads/master: 0000000000000000000000000000000000000000 -> fc6
5543b195f18391886b9f663d5a7eca38e84
To git@github.com:schacon/simplegit2.git
 * [new branch]      master -> master
$>
```

```
$>git remote
$>git remote add public git@github.com:schacon/simplegit2.git
$>git push public master
Counting objects: 115, done.
Compressing objects: 100% (73/73), done.
Writing objects: 100% (115/115), 11.20 KiB, done.
Total 115 (delta 42), reused 65 (delta 24)
refs/heads/master: 0000000000000000000000000000000000000000 -> fc6
5543b195f18391886b9f663d5a7eca38e84
To git@github.com:schacon/simplegit2.git
 * [new branch]      master -> master
$>git remote
public
$>
```

```
$>git remote
$>git remote add public git@github.com:schacon/simplegit2.git
$>git push public master
Counting objects: 115, done.
Compressing objects: 100% (73/73), done.
Writing objects: 100% (115/115), 11.20 KiB, done.
Total 115 (delta 42), reused 65 (delta 24)
refs/heads/master: 0000000000000000000000000000000000000000 -> fc6
5543b195f18391886b9f663d5a7eca38e84
To git@github.com:schacon/simplegit2.git
 * [new branch]      master -> master
$>git remote
public
$>git remote show public
* remote public
  URL: git@github.com:schacon/simplegit2.git
  Tracked remote branches
    master
$>_
```



schacon / simplegit2

this repo is viewable by everyone

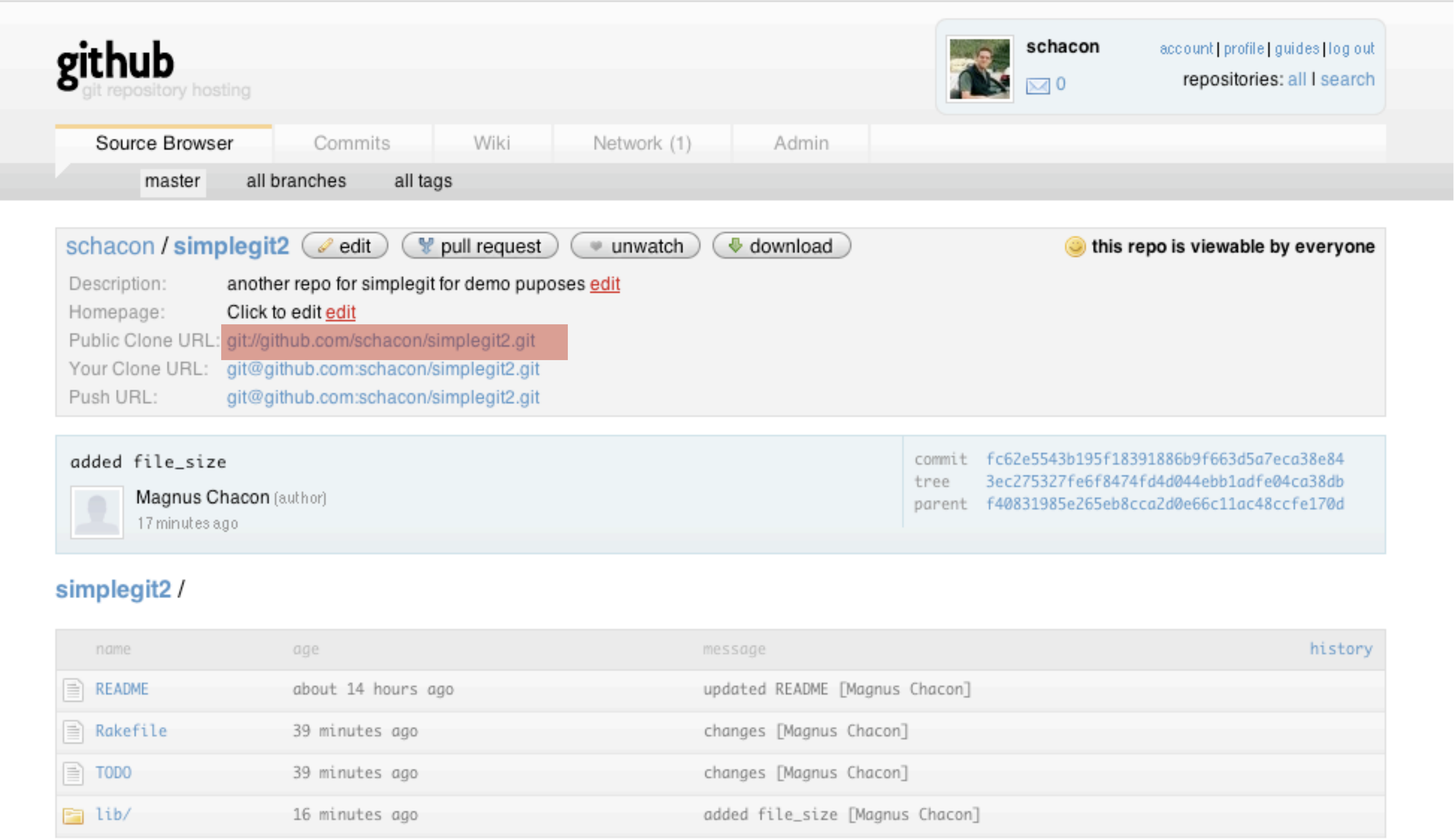
Description: another repo for simplegit for demo puposes edit
Homepage: Click to edit edit
Public Clone URL: git://github.com/schacon/simplegit2.git
Your Clone URL: git@github.com:schacon/simplegit2.git
Push URL: git@github.com:schacon/simplegit2.git

```
added file_size
Magnus Chacon (author)
17 minutes ago
```

```
commit  fc62e5543b195f18391886b9f663d5a7eca38e84
tree    3ec275327fe6f8474fd4d044ebb1adfe04ca38db
parent  f40831985e265eb8cca2d0e66c11ac48ccfe170d
```

simplegit2 /

name	age	message	history
README	about 14 hours ago	updated README [Magnus Chacon]	
Rakefile	39 minutes ago	changes [Magnus Chacon]	
TODO	39 minutes ago	changes [Magnus Chacon]	
lib/	16 minutes ago	added file_size [Magnus Chacon]	



schacon / simplegit2

this repo is viewable by everyone

Description: another repo for simplegit for demo puposes edit

Homepage: Click to edit edit

Public Clone URL: git://github.com/schacon/simplegit2.git

Your Clone URL: git@github.com:schacon/simplegit2.git

Push URL: git@github.com:schacon/simplegit2.git

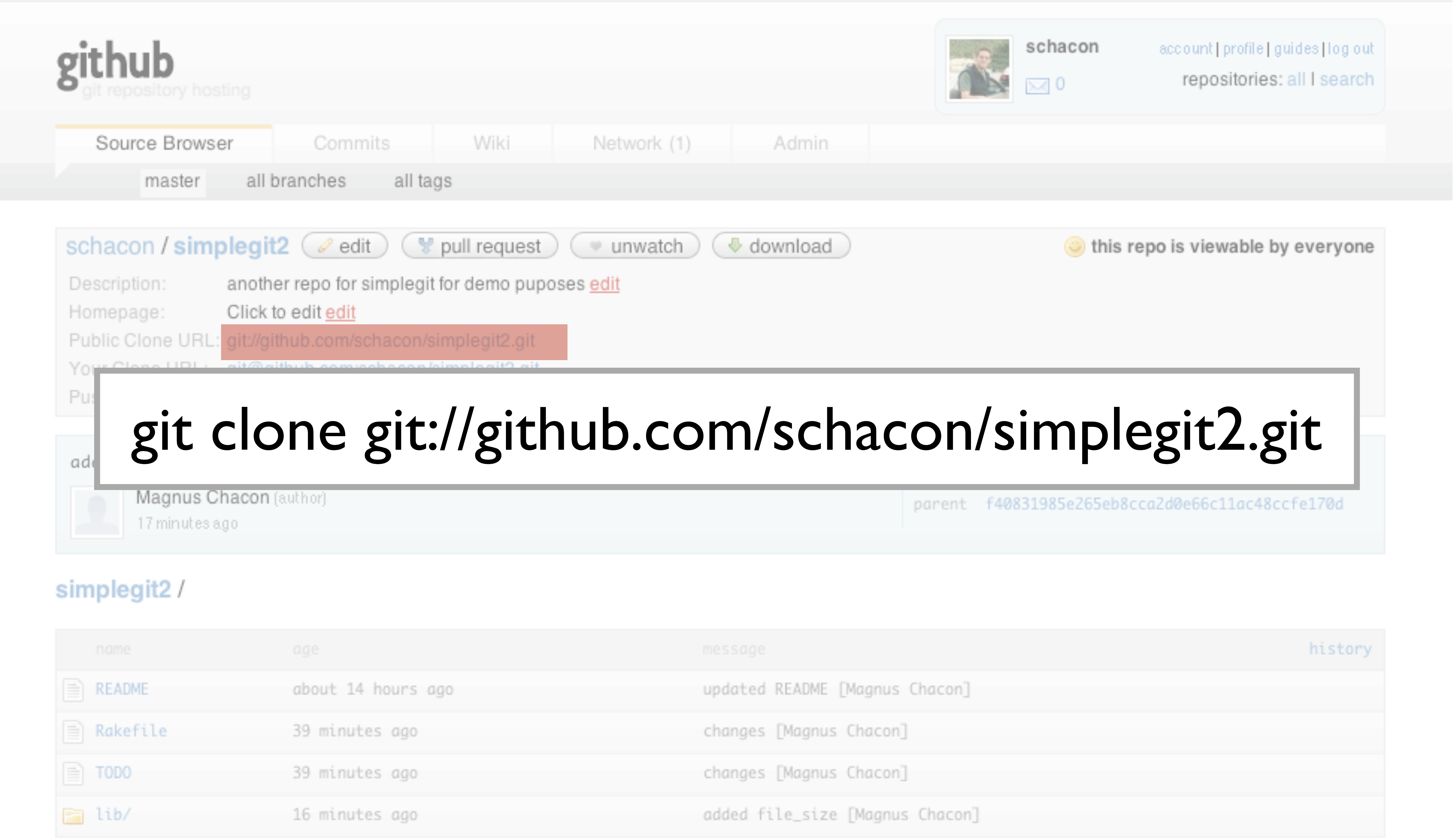
```
added file_size
```

Magnus Chacon (author)
17 minutes ago

```
commit  fc62e5543b195f18391886b9f663d5a7eca38e84
tree    3ec275327fe6f8474fd4d044ebb1adfe04ca38db
parent  f40831985e265eb8cca2d0e66c11ac48ccfe170d
```

simplegit2 /

name	age	message	history
README	about 14 hours ago	updated README [Magnus Chacon]	
Rakefile	39 minutes ago	changes [Magnus Chacon]	
TODO	39 minutes ago	changes [Magnus Chacon]	
lib/	16 minutes ago	added file_size [Magnus Chacon]	



github
git repository hosting

schacon
0
account | profile | guides | log out
repositories: all | search

Source Browser | Commits | Wiki | Network (1) | Admin

master | all branches | all tags

schacon / simplegit2 edit pull request unwatch download

this repo is viewable by everyone

Description: another repo for simplegit for demo puposes edit

Homepage: Click to edit edit

Public Clone URL: git://github.com/schacon/simplegit2.git

```
git clone git://github.com/schacon/simplegit2.git
```

Magnus Chacon (author)
17 minutes ago

parent f40831985e265eb8cca2d0e66c11ac48ccfe170d

simplegit2 /

name	age	message	history
README	about 14 hours ago	updated README [Magnus Chacon]	
Rakefile	39 minutes ago	changes [Magnus Chacon]	
TODO	39 minutes ago	changes [Magnus Chacon]	
lib/	16 minutes ago	added file_size [Magnus Chacon]	

distributed workflow

distributed workflow

fetch, pull and push

fetch

```
$>git remote
github
$>
```

```
$>git remote
github
$>git remote show github
* remote github
  URL: git://github.com/schacon/simplegit.git
  New remote branches (next fetch will store in remotes/github)
    master
$>
```

```
$>git remote
github
$>git remote show github
* remote github
  URL: git://github.com/schacon/simplegit.git
  New remote branches (next fetch will store in remotes/github)
    master
$>
```

```
$>git remote
github
$>git remote show github
* remote github
  URL: git://github.com/schacon/simplegit.git
  New remote branches (next fetch will store in remotes/github)
    master
$>git fetch github
remote: Generating pack...
remote: Done counting 106 objects.
remote: Result has 101 objects.
remote: Deltifying 101 objects...
remote:  100% (101/101) done
remote: Total 101 (delta 35), reused 101 (delta 35)
Receiving objects: 100% (101/101), 9.49 KiB, done.
Resolving deltas: 100% (35/35), done.
From git://github.com/schacon/simplegit
 * [new branch]      master     -> github/master
$>
```

```
$>git remote
github
$>git remote show github
* remote github
  URL: git://github.com/schacon/simplegit.git
  New remote branches (next fetch will store in remotes/github)
    master
$>git fetch github
remote: Generating pack...
remote: Done counting 106 objects.
remote: Result has 101 objects.
remote: Deltifying 101 objects...
remote:  100% (101/101) done
remote: Total 101 (delta 35), reused 101 (delta 35)
Receiving objects: 100% (101/101), 9.49 KiB, done.
Resolving deltas: 100% (35/35), done.
From git://github.com/schacon/simplegit
 * [new branch]      master     -> github/master
$>git branch -a
  develop
  master
* story95
  github/master
$>_
```

```
$>git remote
github
$>git remote show github
* remote github
  URL: git://github.com/schacon/simplegit.git
  New remote branches (next fetch will store in remotes/github)
    master
$>git fetch github
remote: Generating pack...
remote: Done counting 106 objects.
remote: Result has 101 objects.
remote: Deltifying 101 objects...
remote:  100% (101/101) done
remote: Total 101 (delta 35), reused 101 (delta 35)
Receiving objects: 100% (101/101), 9.49 KiB, done.
Resolving deltas: 100% (35/35), done.
From git://github.com/schacon/simplegit
 * [new branch]      master     -> github/master
$>git branch -a
  develop
  master
* story95
  github/master
$>_
```

pull

pull = fetch + merge

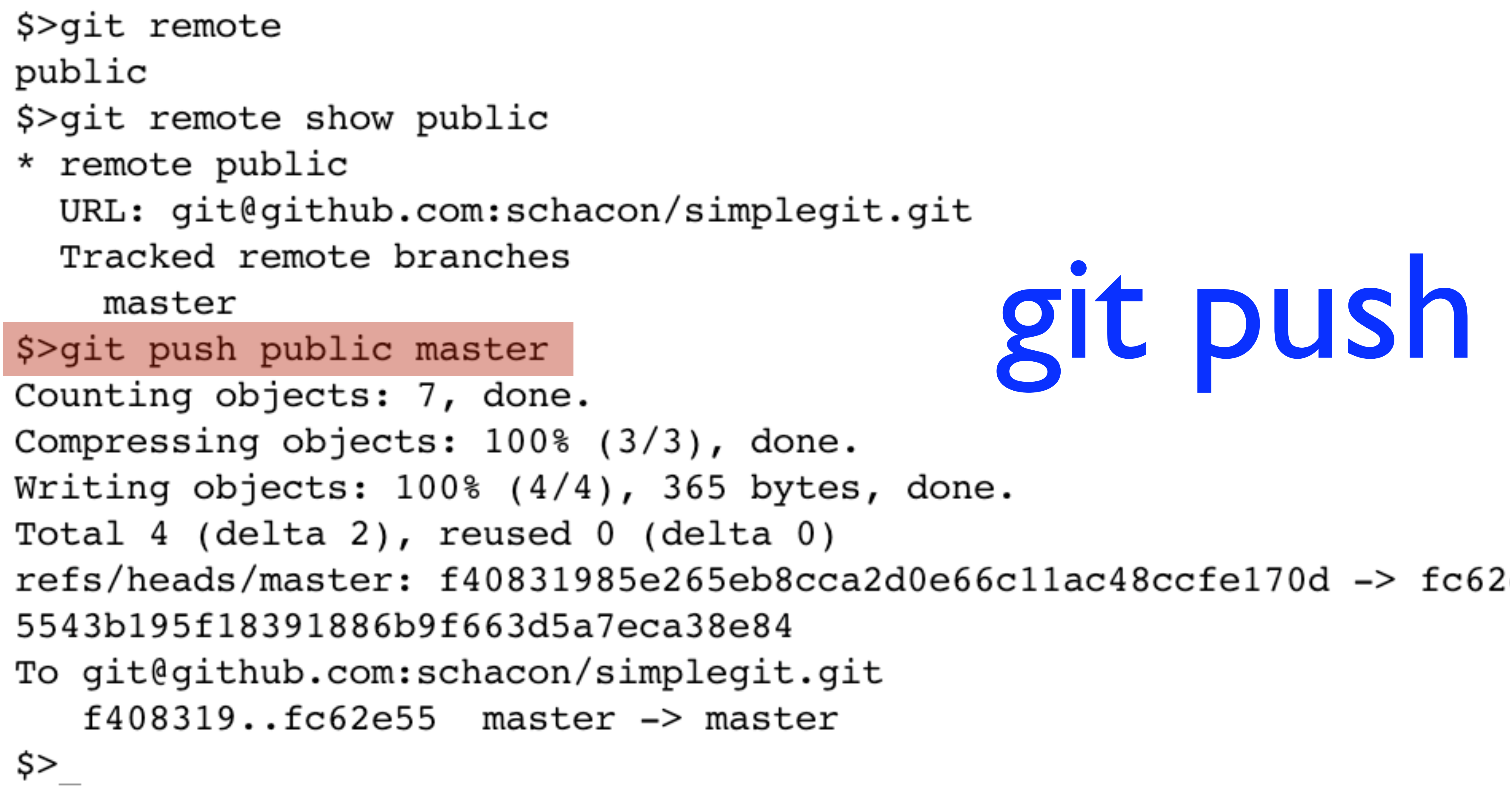
push

```
$>git remote
public
$>
```

```
$>git remote
public
$>git remote show public
* remote public
  URL: git@github.com:schacon/simplegit.git
  Tracked remote branches
    master
$>
```

```
$>git remote
public
$>git remote show public
* remote public
  URL: git@github.com:schacon/simplegit.git
  Tracked remote branches
    master
$>
```

git push



```
$>git remote
public
$>git remote show public
* remote public
  URL: git@github.com:schacon/simplegit.git
  Tracked remote branches
    master
$>git push public master
Counting objects: 7, done.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (4/4), 365 bytes, done.
Total 4 (delta 2), reused 0 (delta 0)
refs/heads/master: f40831985e265eb8cca2d0e66c11ac48ccfe170d -> fc62
5543b195f18391886b9f663d5a7eca38e84
To git@github.com:schacon/simplegit.git
   f408319..fc62e55  master -> master
$>_
```

```
$>git remote
public
$>git remote show public
* remote public
  URL: git@github.com:schacon/simplegit.git
  Tracked remote branches
    master
$>git push public master
Counting objects: 7, done.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (4/4), 365 bytes, done.
Total 4 (delta 2), reused 0 (delta 0)
refs/heads/master: f40831985e265eb8cca2d0e66c11ac48ccfe170d -> fc62
5543b195f18391886b9f663d5a7eca38e84
To git@github.com:schacon/simplegit.git
   f408319..fc62e55  master -> master
$>_
```

~~git-add~~
git-add--interactive
~~git-am~~
git-annotate
~~git-apply~~

git-archive
git-bisect
git-blame
~~git-branch~~

~~git-checkout~~

git-cherry-pick
git-citool
git-clean
~~git-clone~~
~~git-commit~~
~~git-config~~

git-daemon

~~git-diff~~

~~git-fetch~~

~~git-format-patch~~

git-gc

git-grep
git-gui

~~git-init~~

git-instaweb

~~git-log~~

~~git-merge~~

git-mv

~~git-pull~~
~~git-push~~

~~git-rebase~~
git-rebase--interactive

~~git-remote~~

git-revert
git-rm

git-send-email

git-shortlog
git-show
~~git-show-branch~~

git-stash
~~git-status~~

git-submodule

~~git-tag~~

We Know Em All!

review

- **Local Commands**
  - git config
  - git init
  - git add
  - git commit
  - git status
  - git tag
  - git log

- **Local Commands**
  - git config
  - git init
  - git add
  - git commit
  - git status
  - git tag
  - git log
- **Branchy Commands**
  - git checkout
  - git branch
  - git merge
  - git rebase

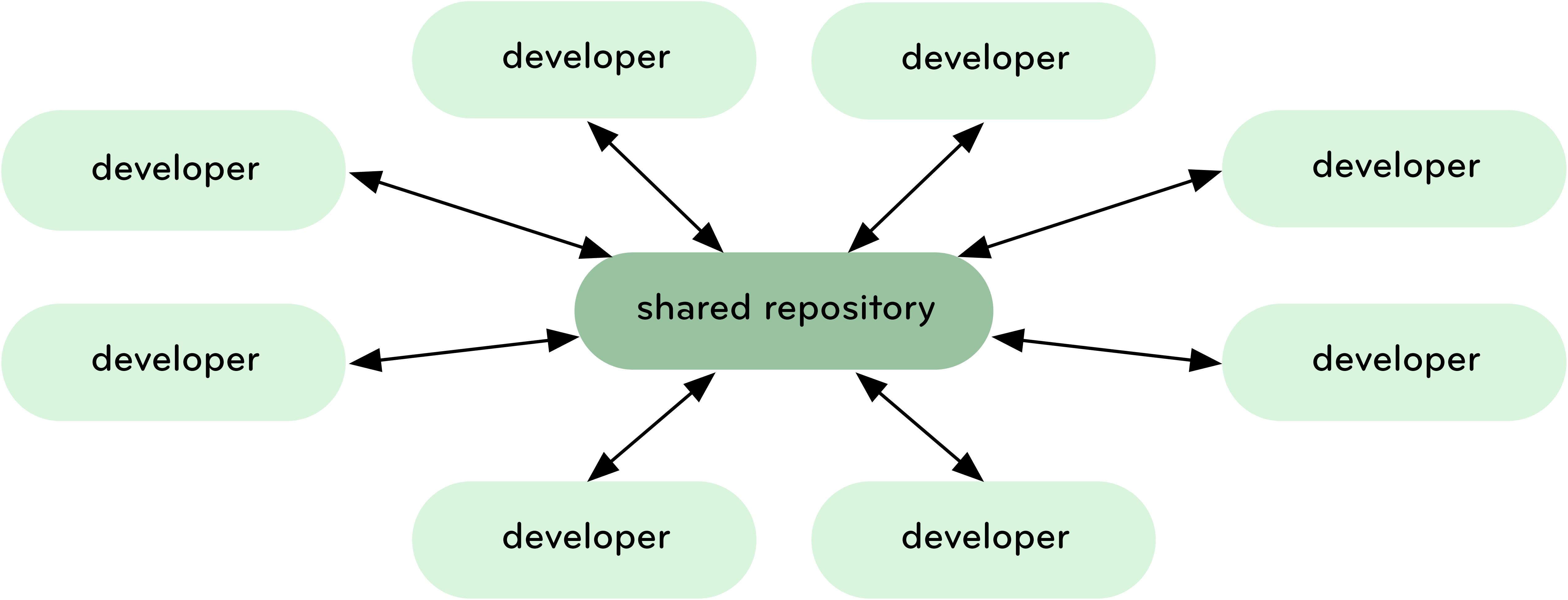
- **Local Commands**
  - git config
  - git init
  - git add
  - git commit
  - git status
  - git tag
  - git log
- **Branchy Commands**
  - git checkout
  - git branch
  - git merge
  - git rebase
- **Remotey Commands**
  - git remote
  - git fetch
  - git pull
  - git clone
  - git push

- **Local Commands**
  - git config
  - git init
  - git add
  - git commit
  - git status
  - git tag
  - git log
- **Branchy Commands**
  - git checkout
  - git branch
  - git merge
  - git rebase
- **Remotey Commands**
  - git remote
  - git fetch
  - git pull
  - git clone
  - git push
- **Patchy Commands**
  - git diff
  - git apply
  - git format-patch
  - git am

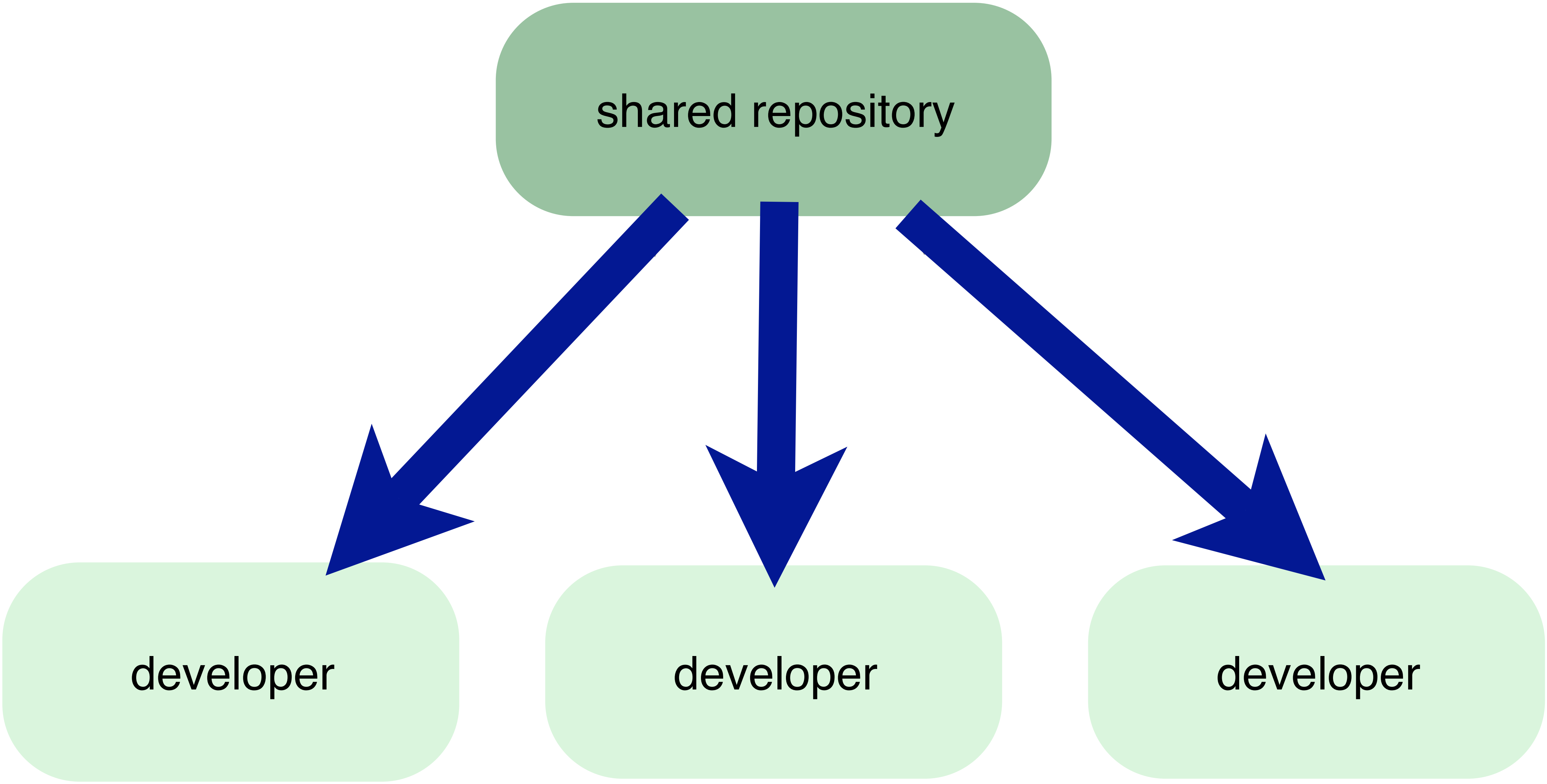
- **Local Commands**
    - git config
    - git init
    - git add
    - git commit
    - git status
    - git tag
    - git log
- **Branchy Commands**
    - git checkout
    - git branch
    - git merge
    - git rebase
- **Remotey Commands**
    - git remote
    - git fetch
    - git pull
    - git clone
    - git push
- **Patchy Commands**
    - git diff
    - git apply
    - git format-patch
    - git am

popular workflows

central repository model



developer
developer
developer
developer
shared repository
developer
developer
developer
developer



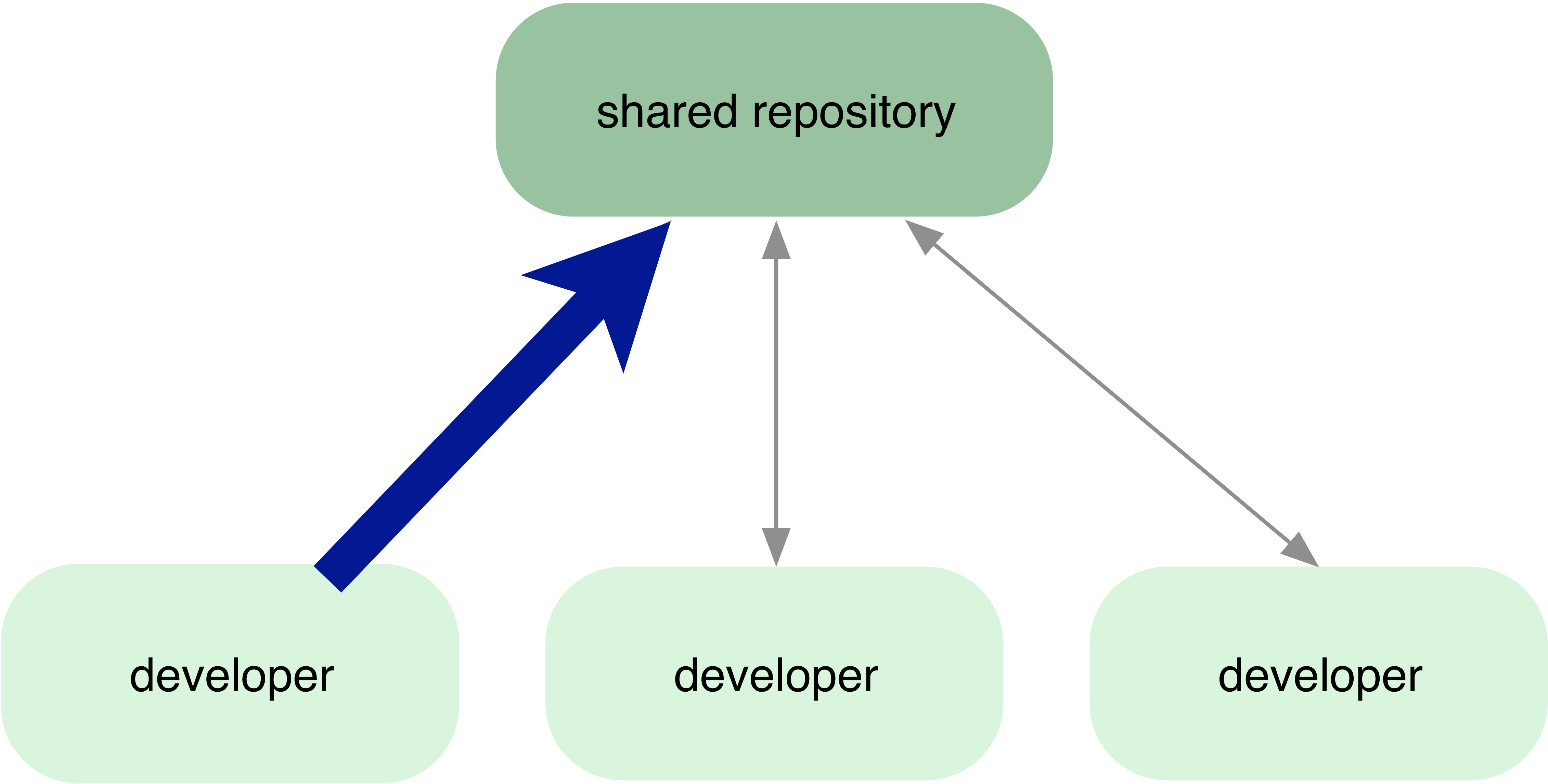
shared repository

developer

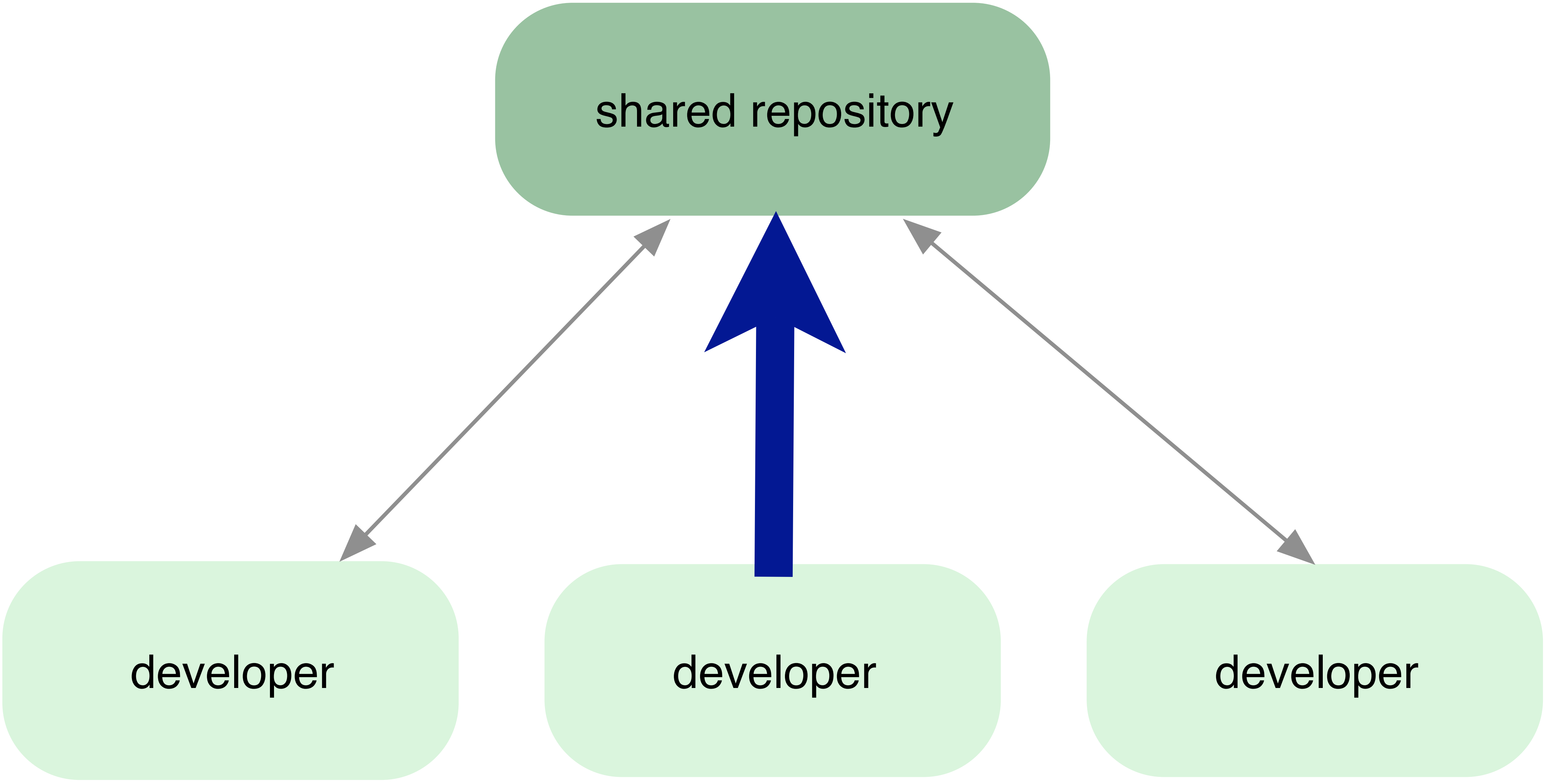
developer

developer

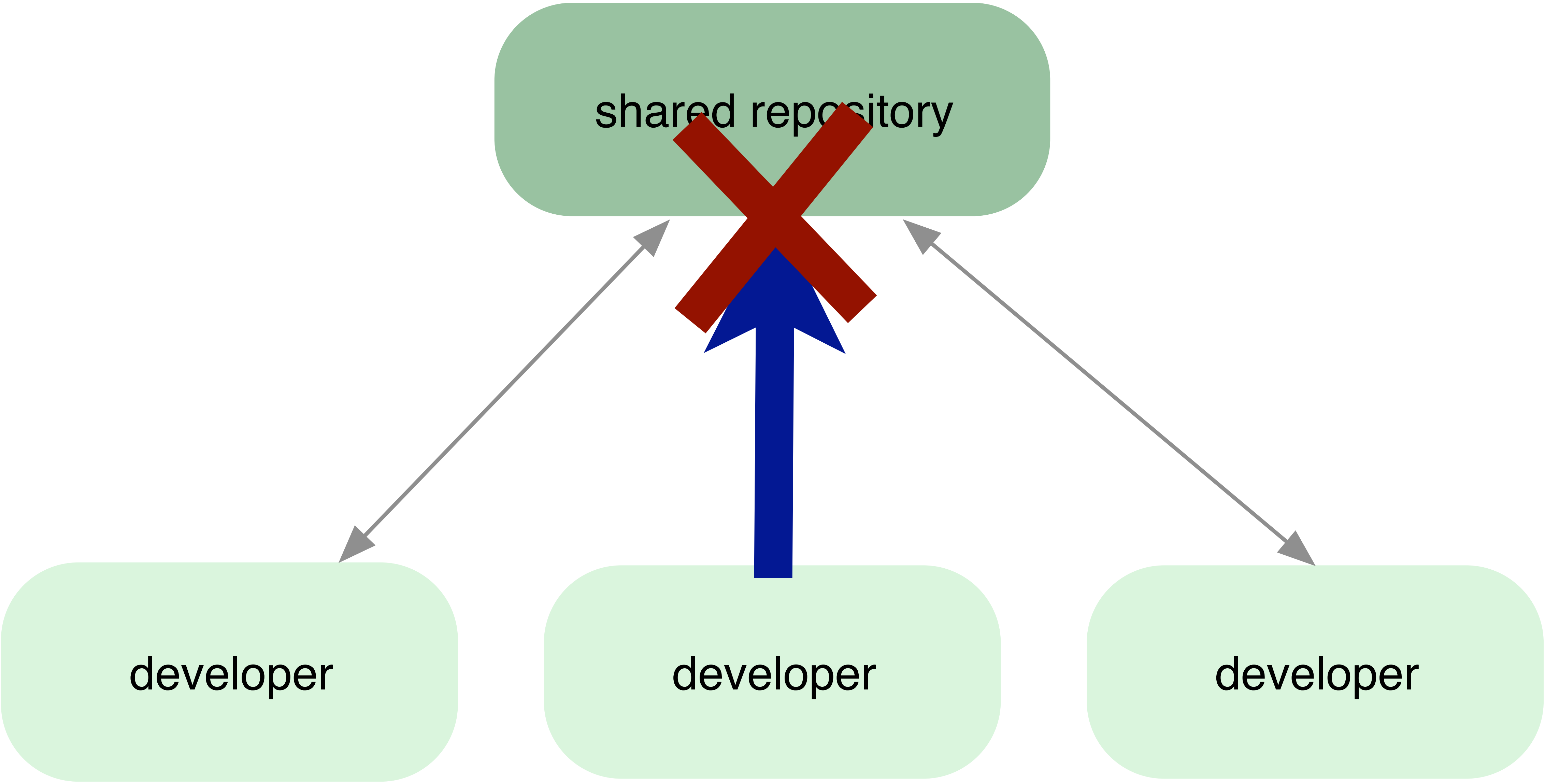
git clone

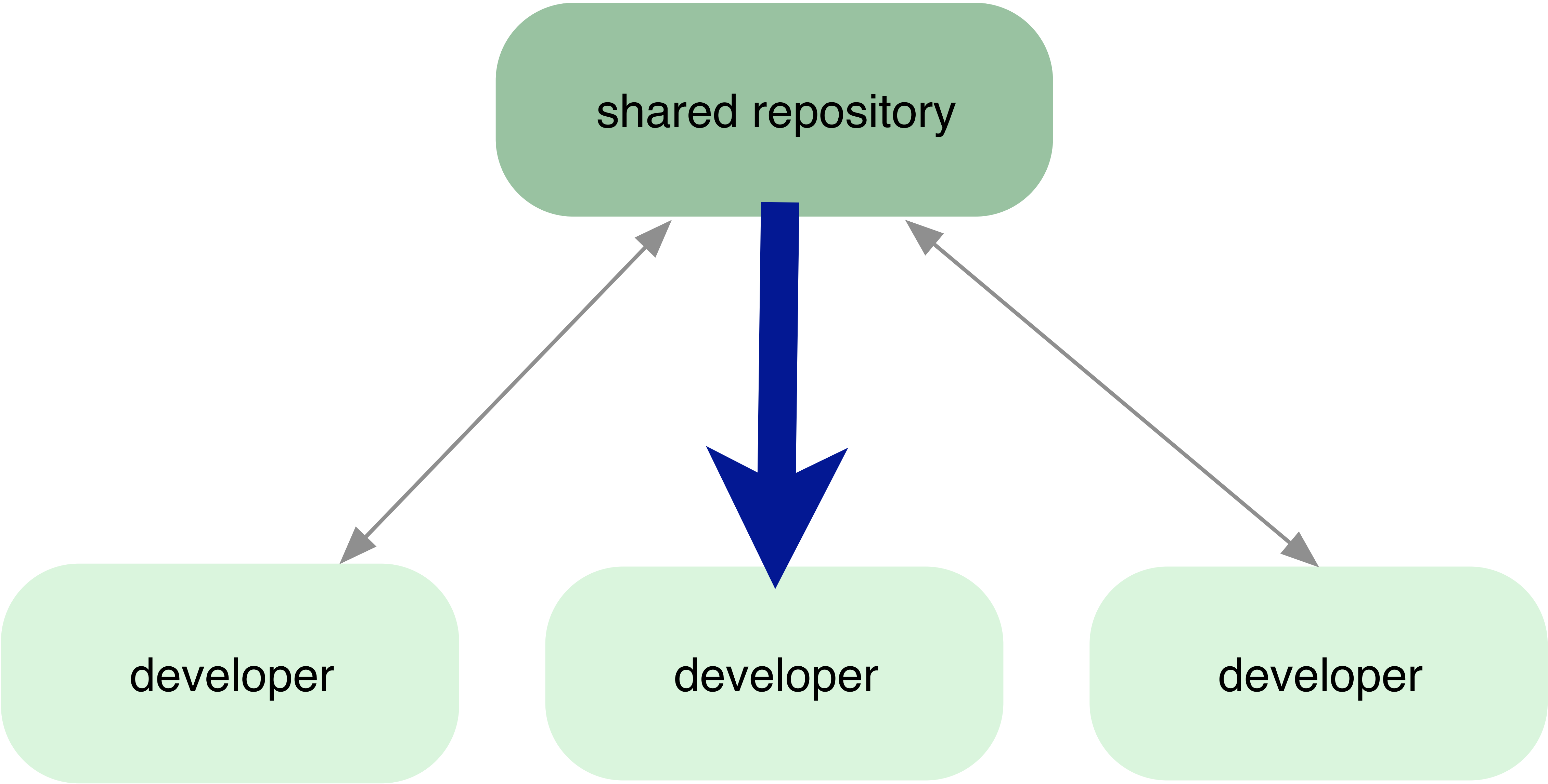


git push



git push


shared repository
developer
developer
developer



shared repository

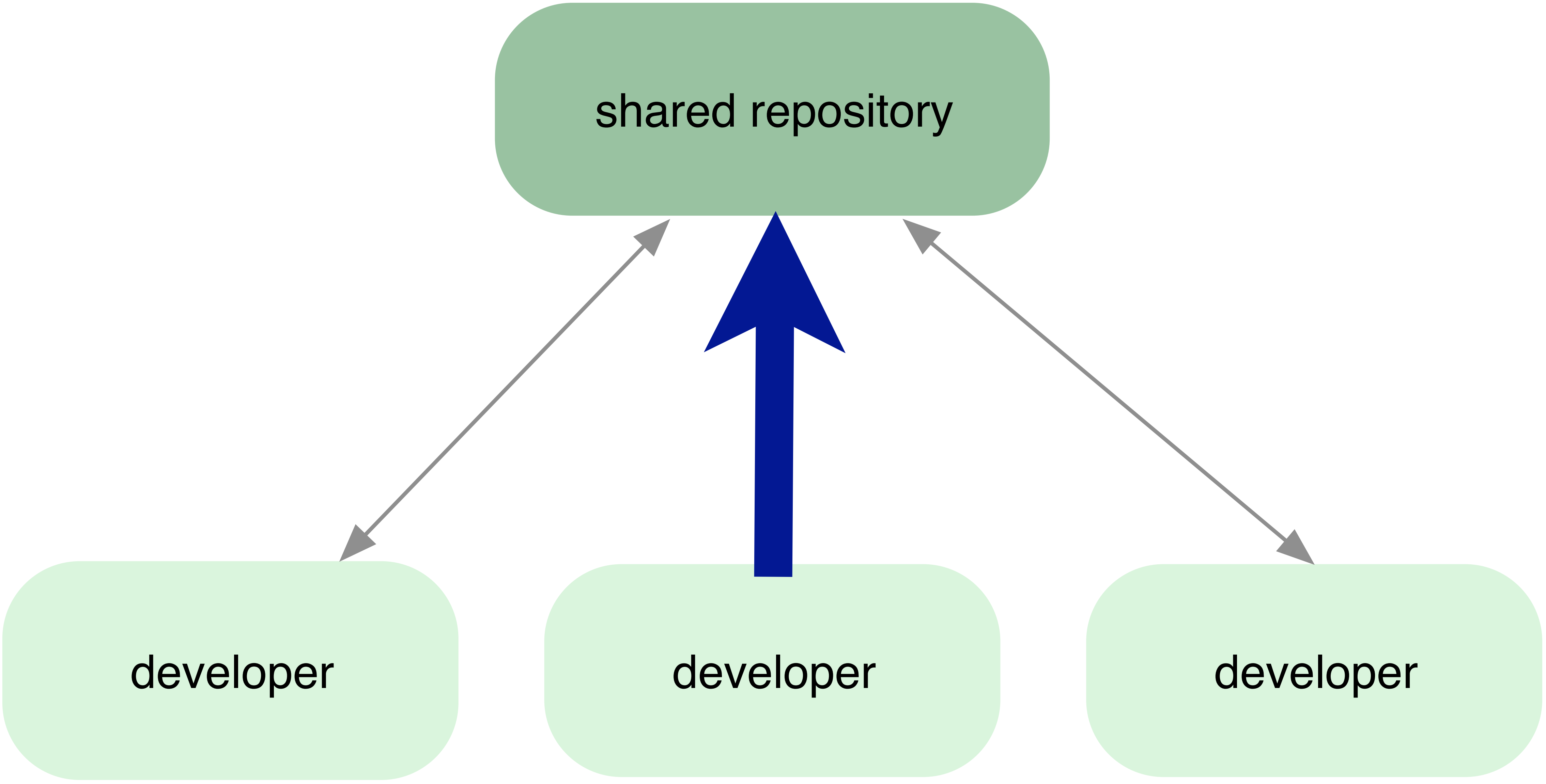
developer

developer

developer

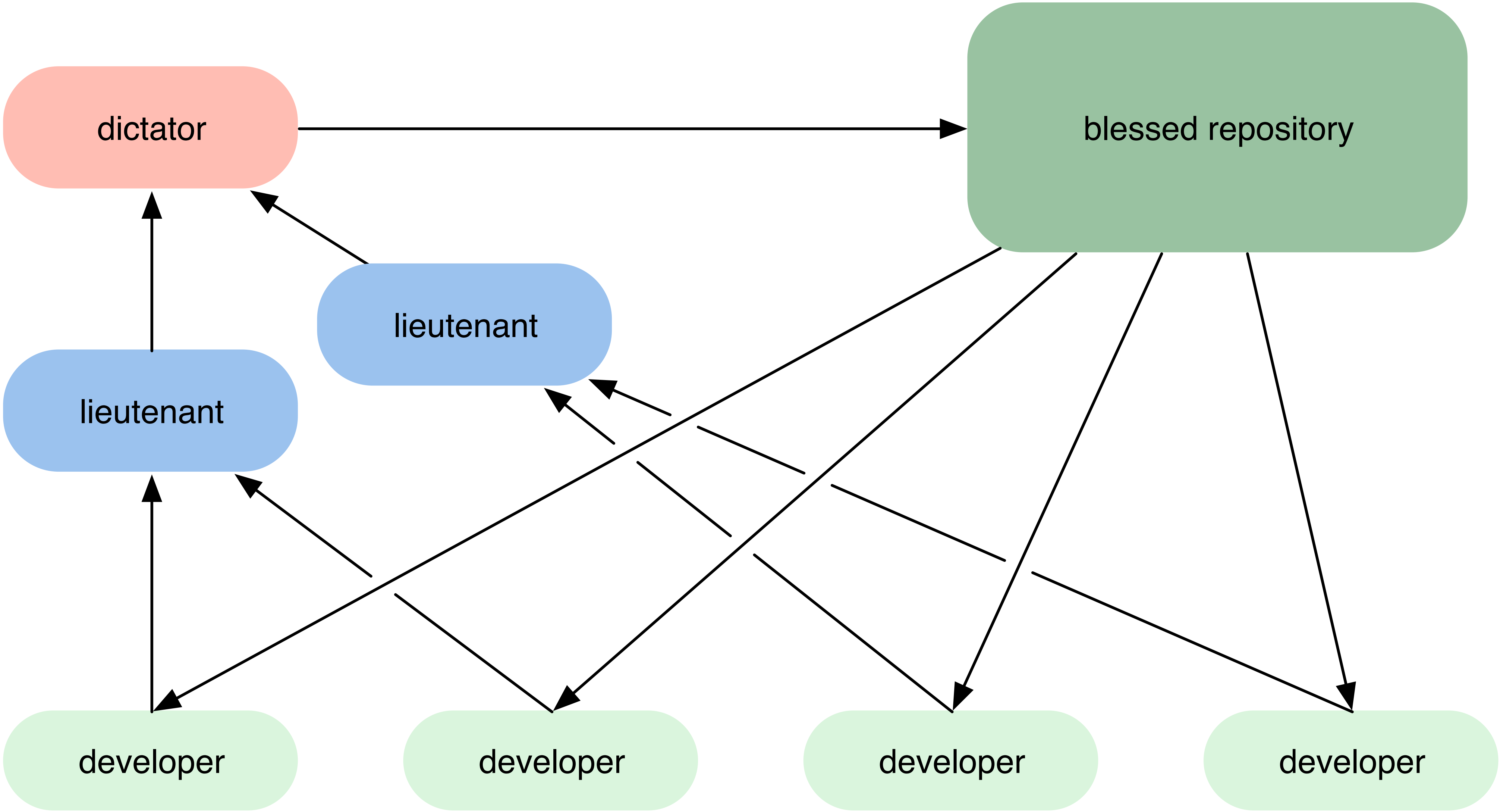
git fetch

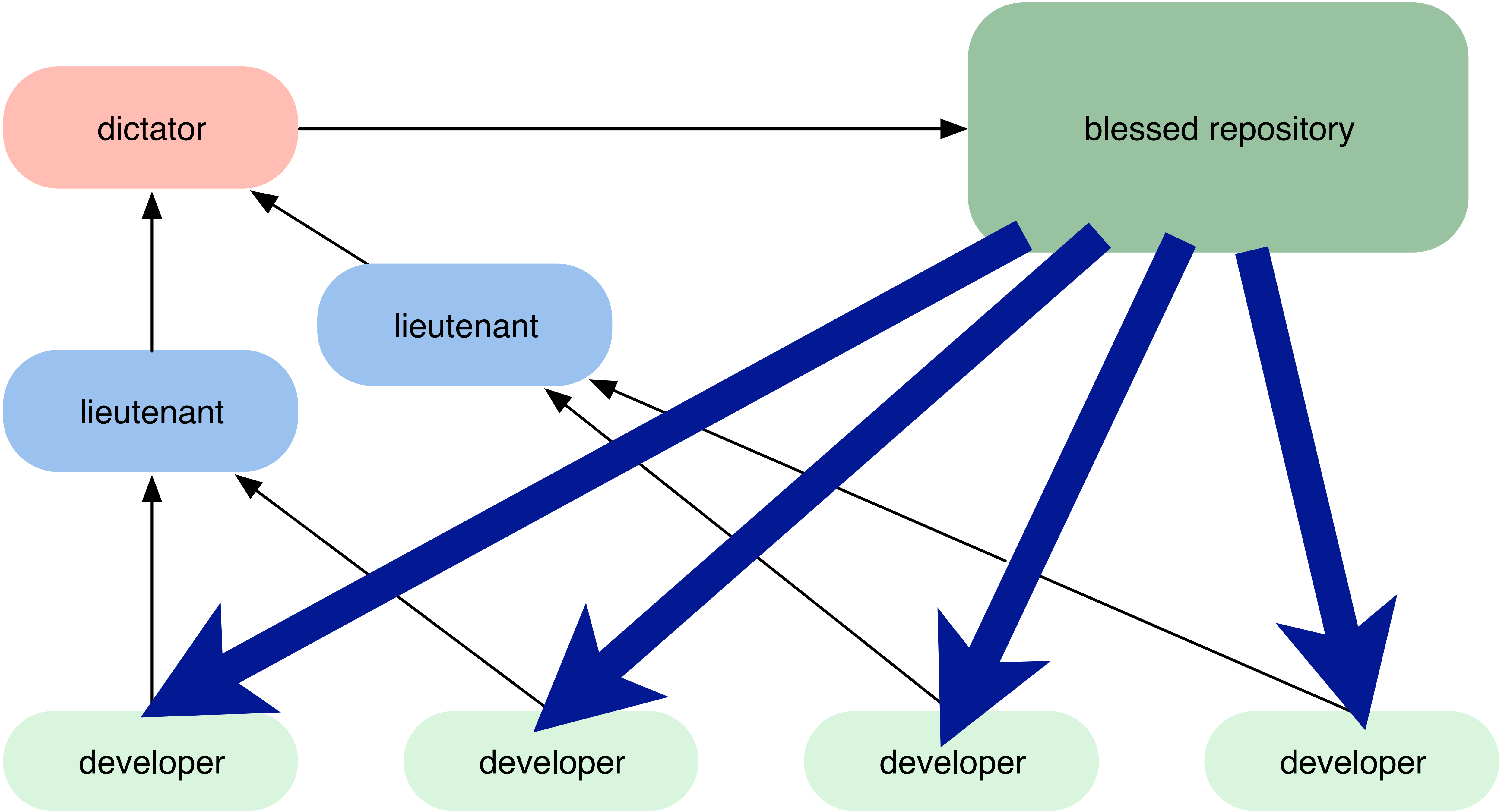
git merge



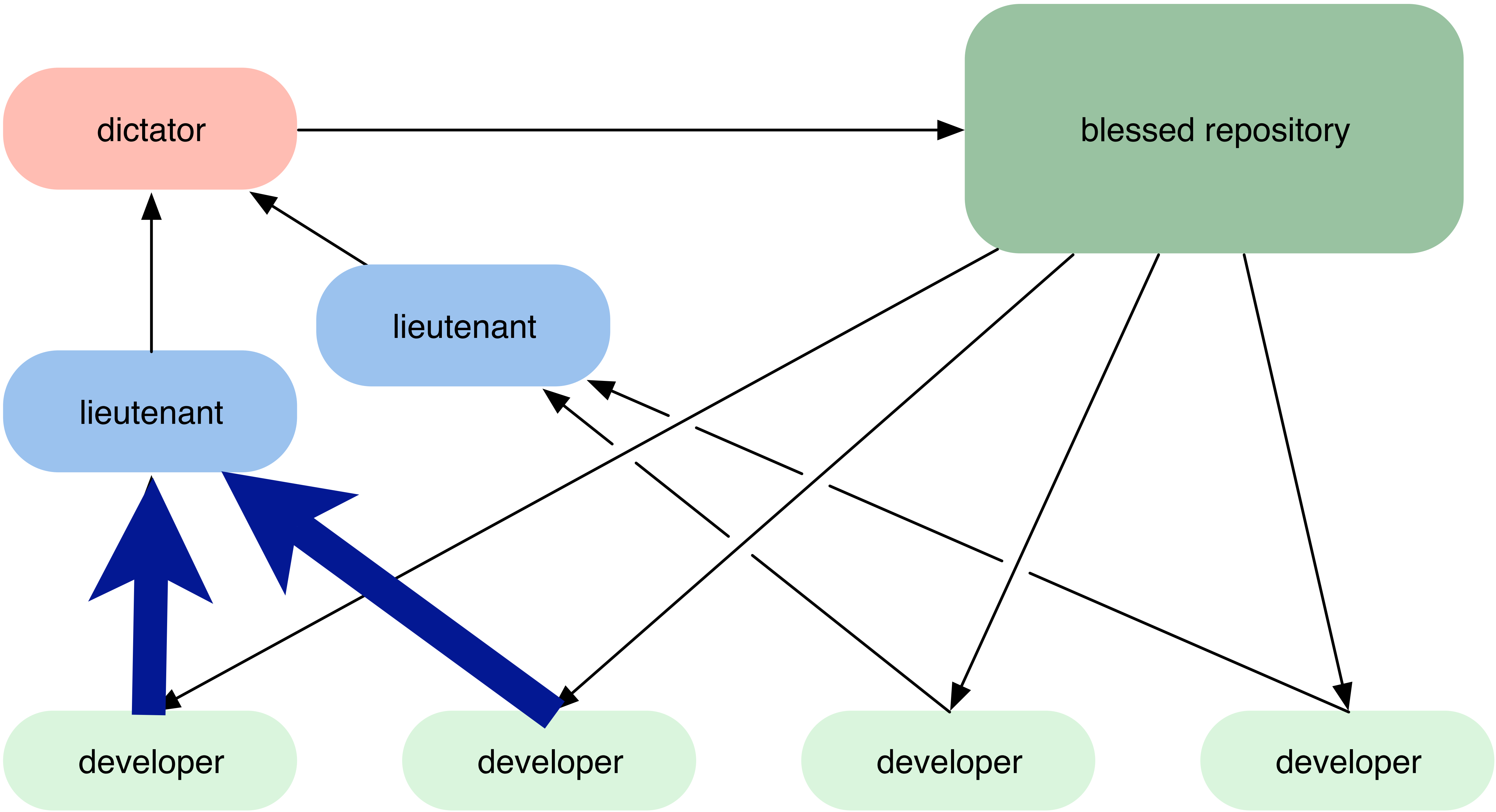
git push

dictator and lieutenants model


dictator
blessed repository
lieutenant
lieutenant
developer
developer
developer
developer

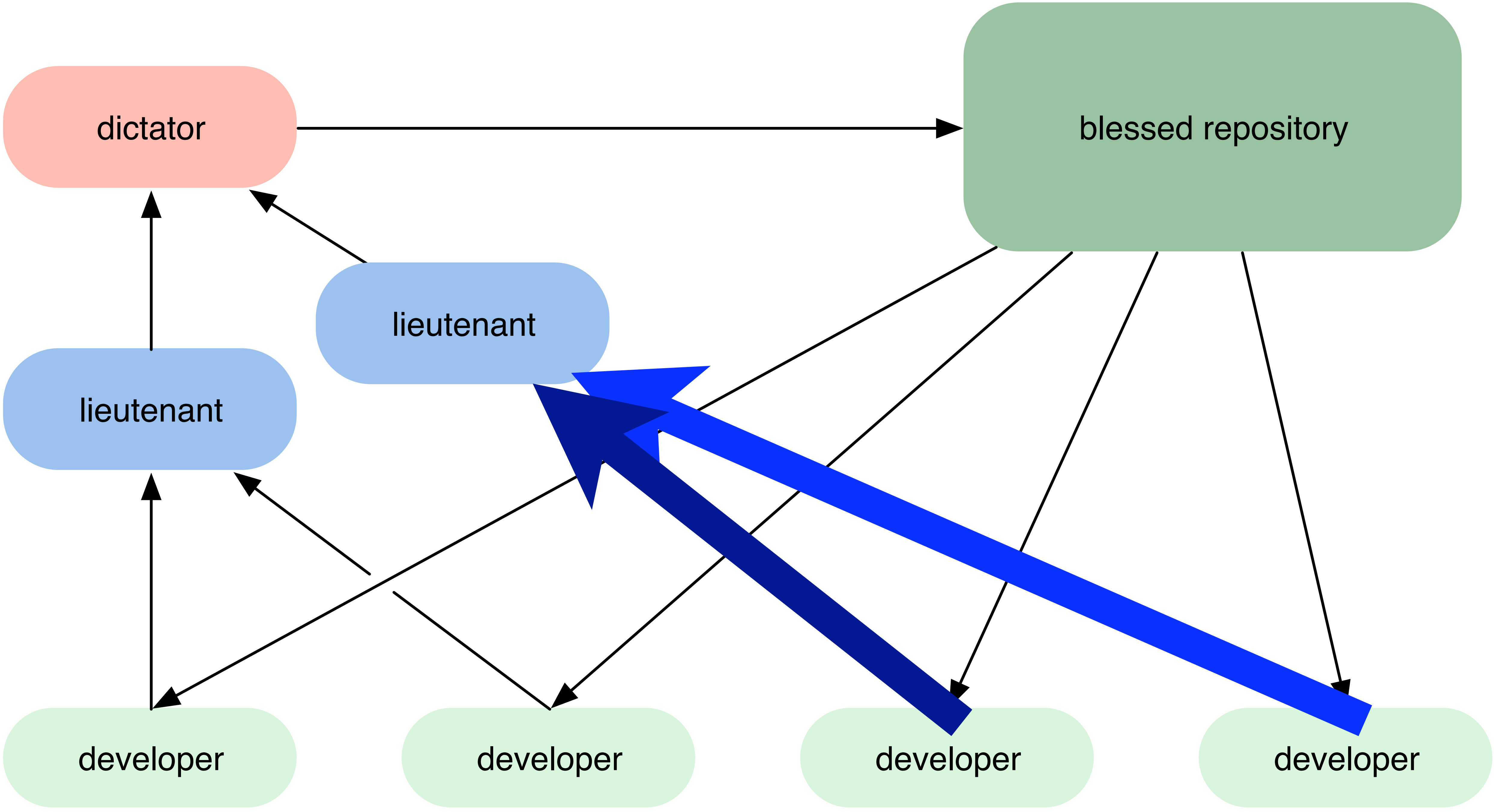

dictator
blessed repository
lieutenant
lieutenant
developer
developer
developer
developer

git clone



git fetch

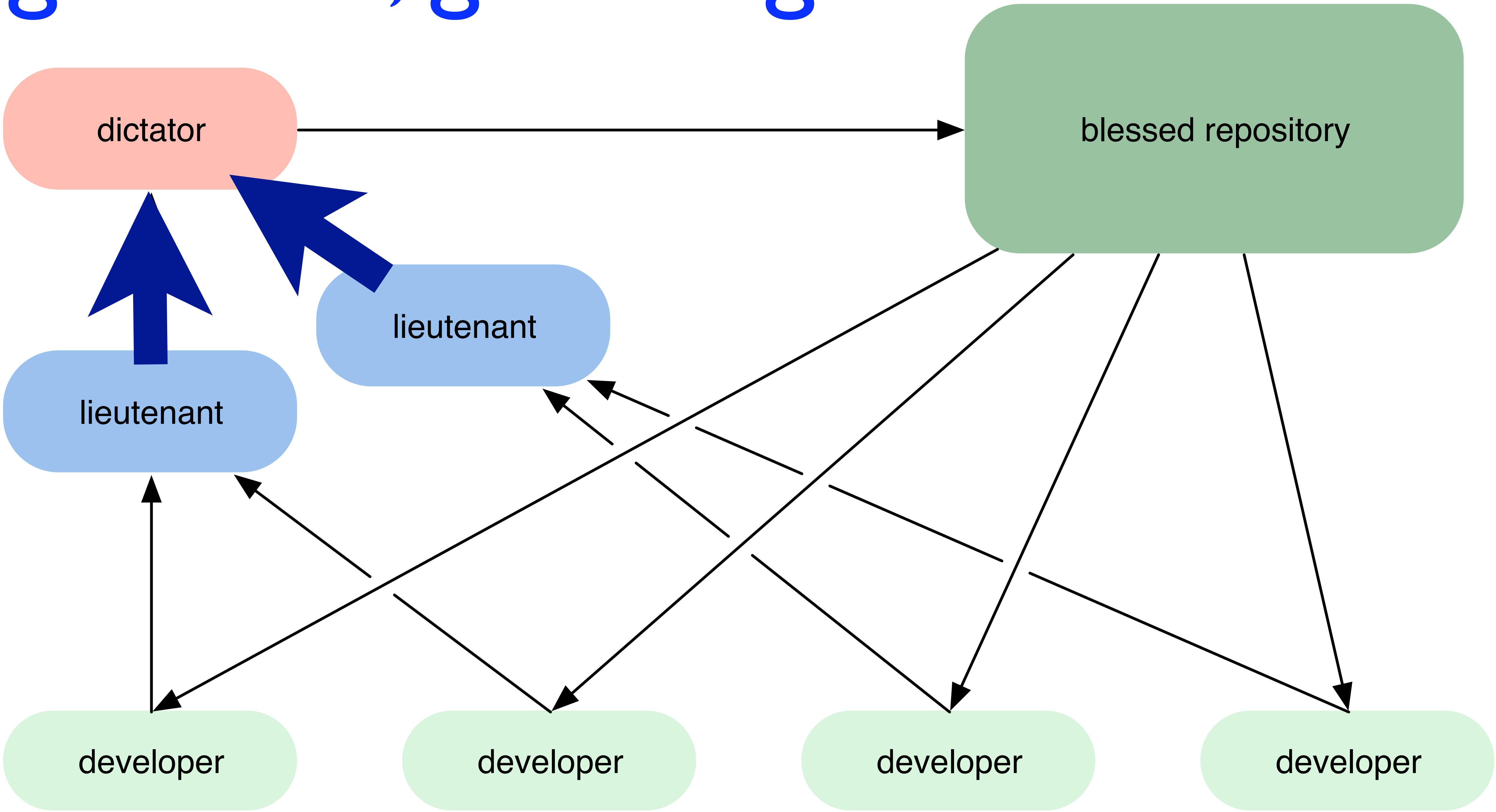
git merge



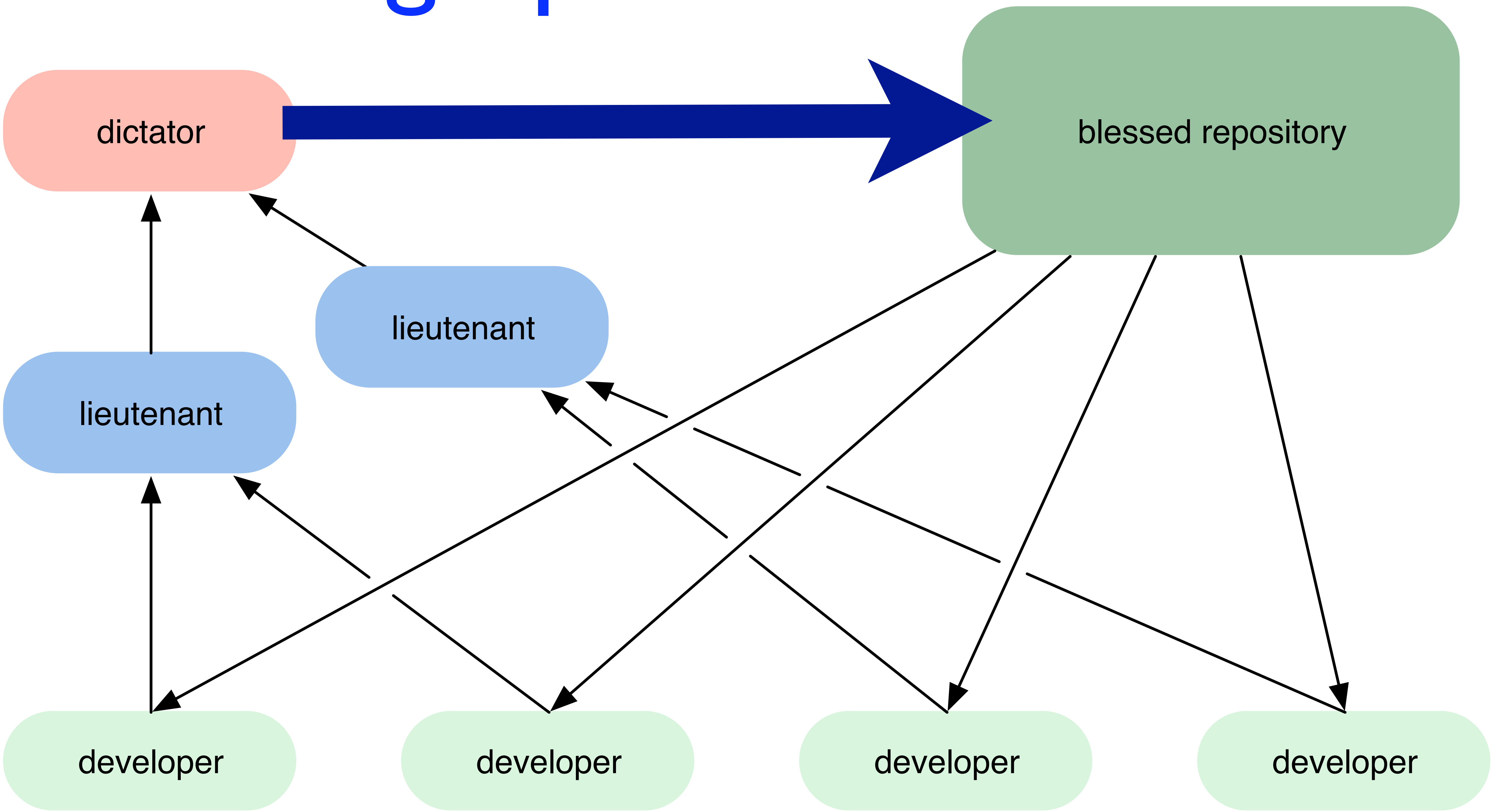
git fetch

git merge

git fetch; git merge



git push



dictator

blessed repository

lieutenant

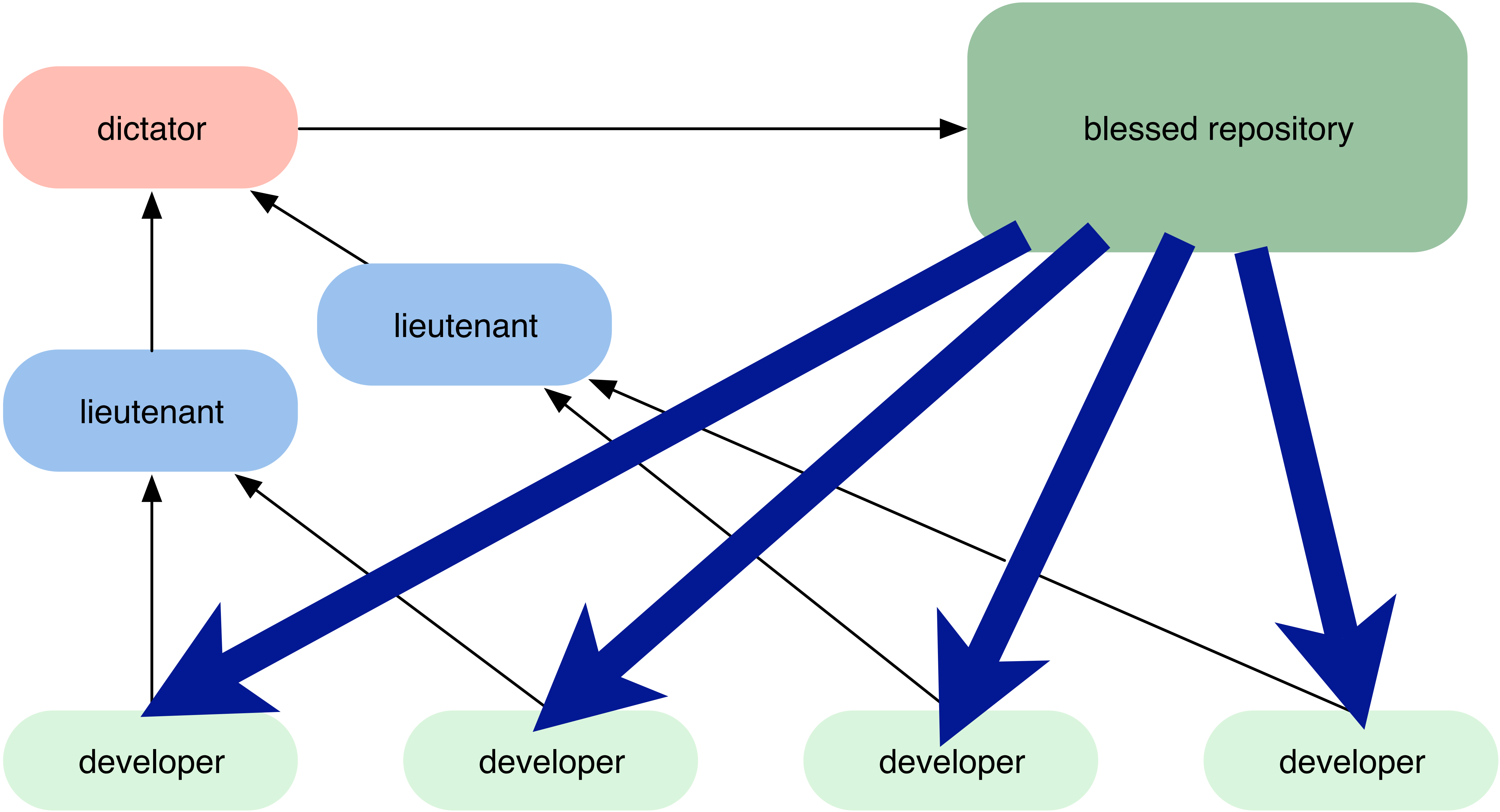
lieutenant

developer

developer

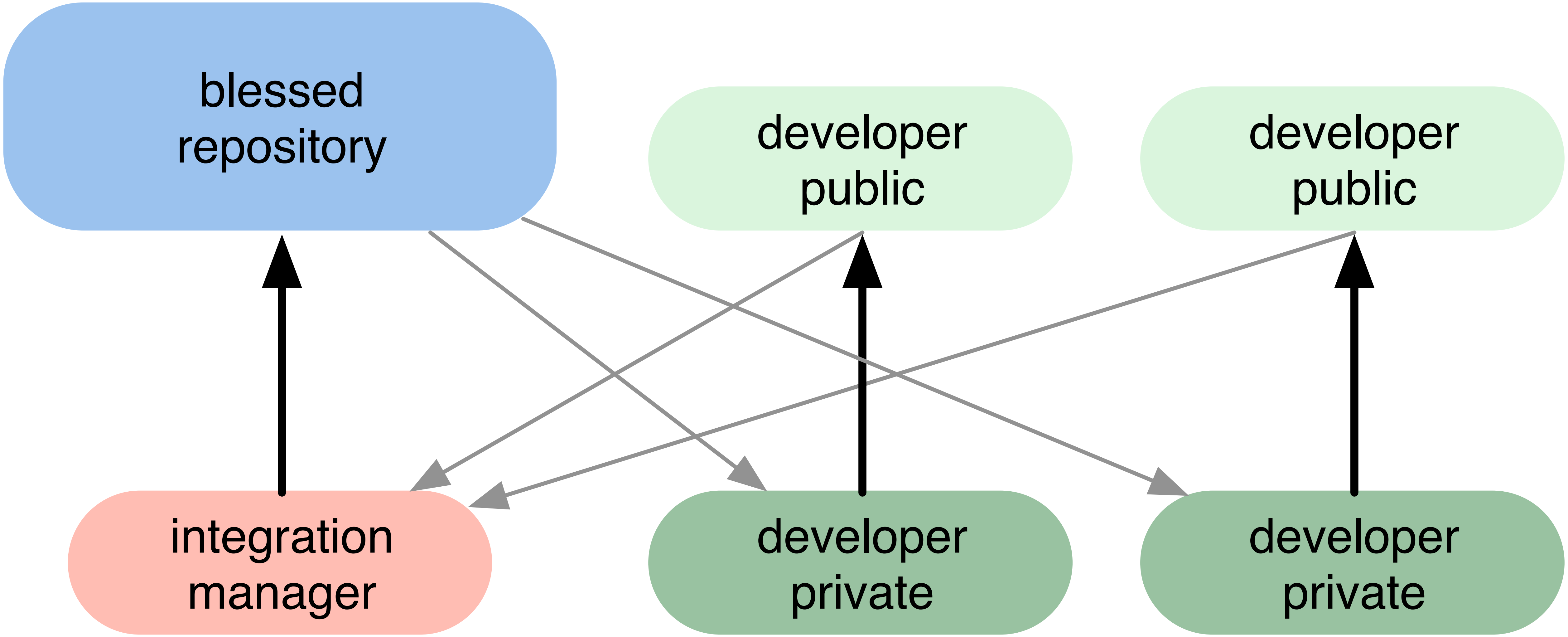
developer

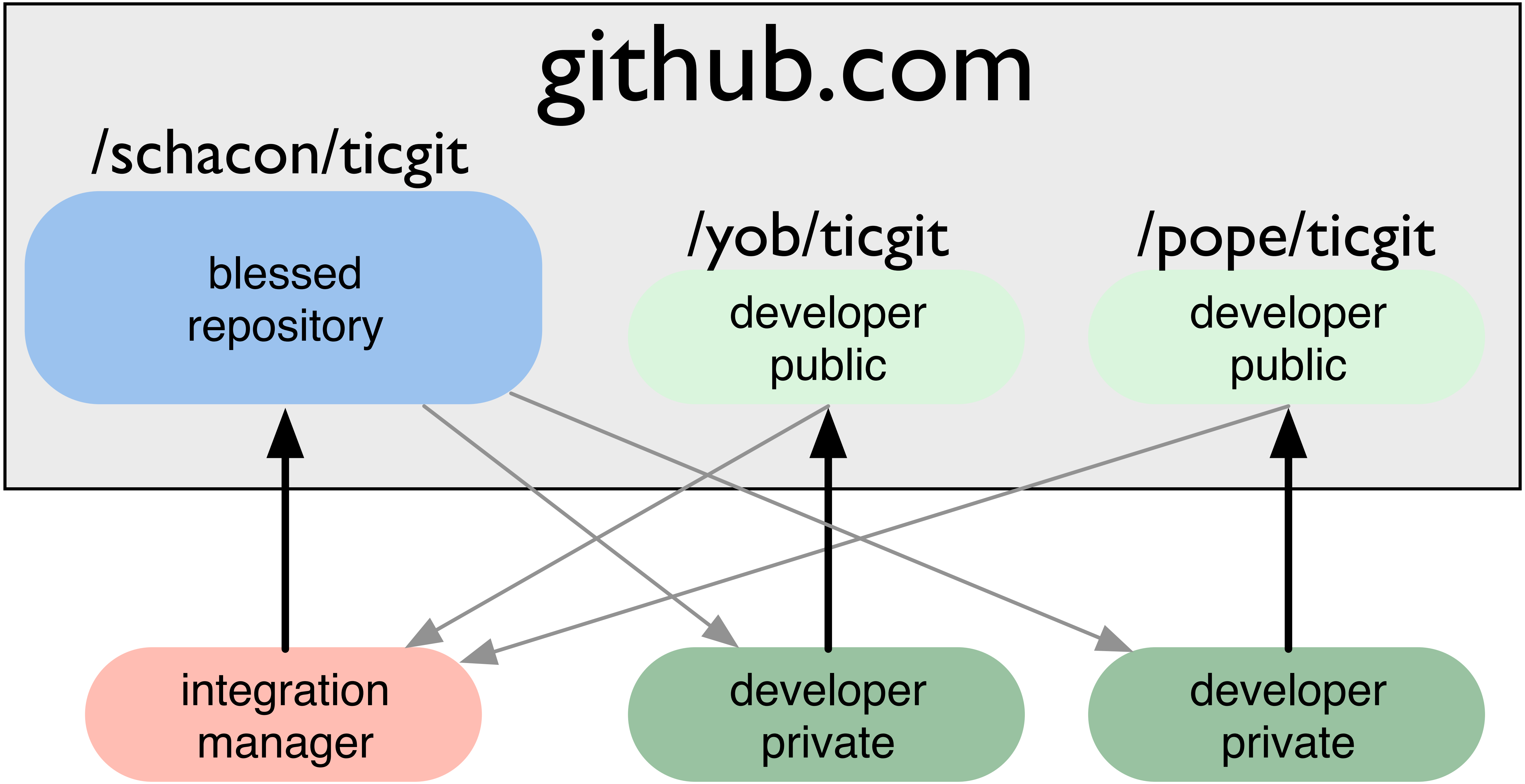
developer

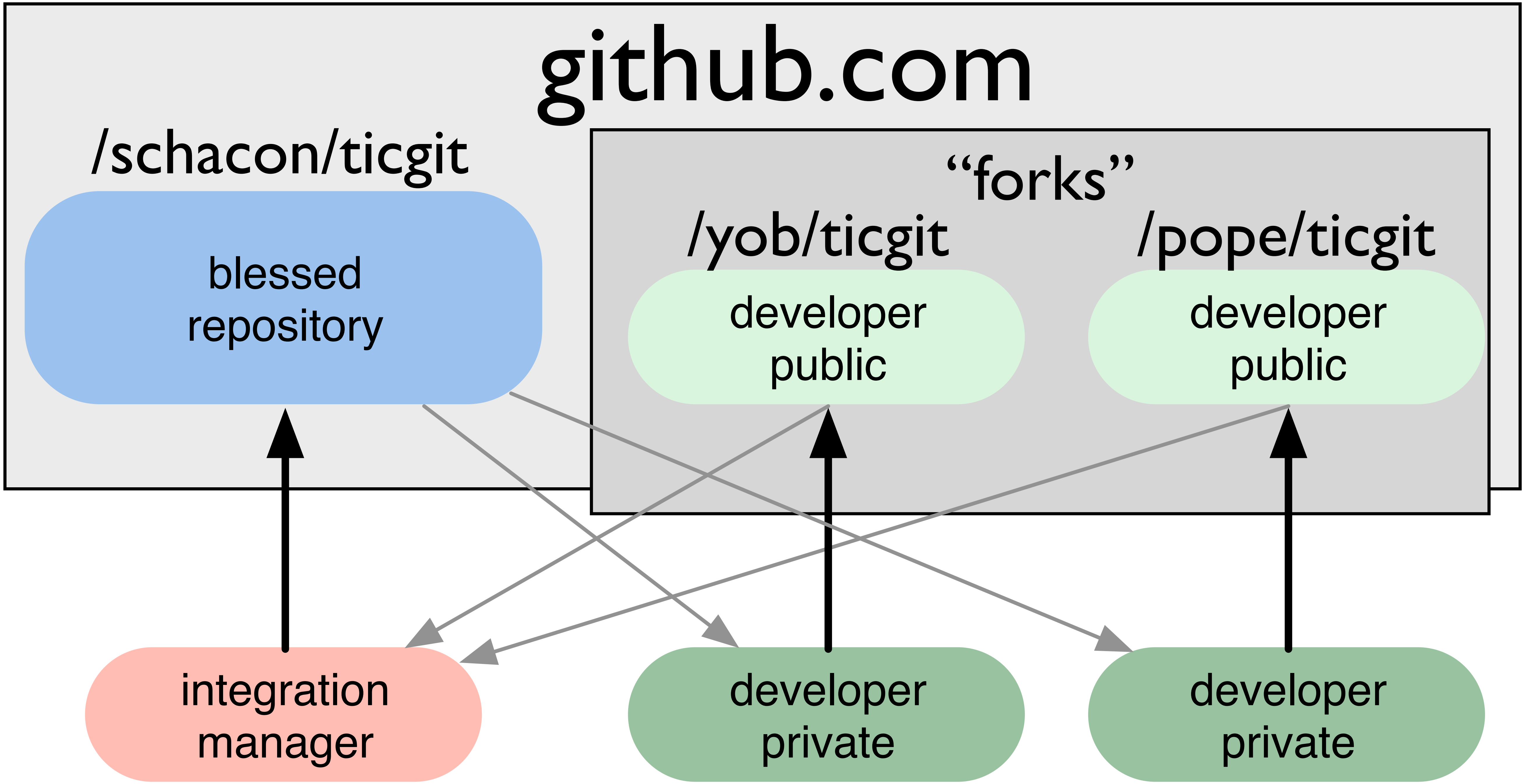

dictator
blessed repository
lieutenant
lieutenant
developer
developer
developer
developer

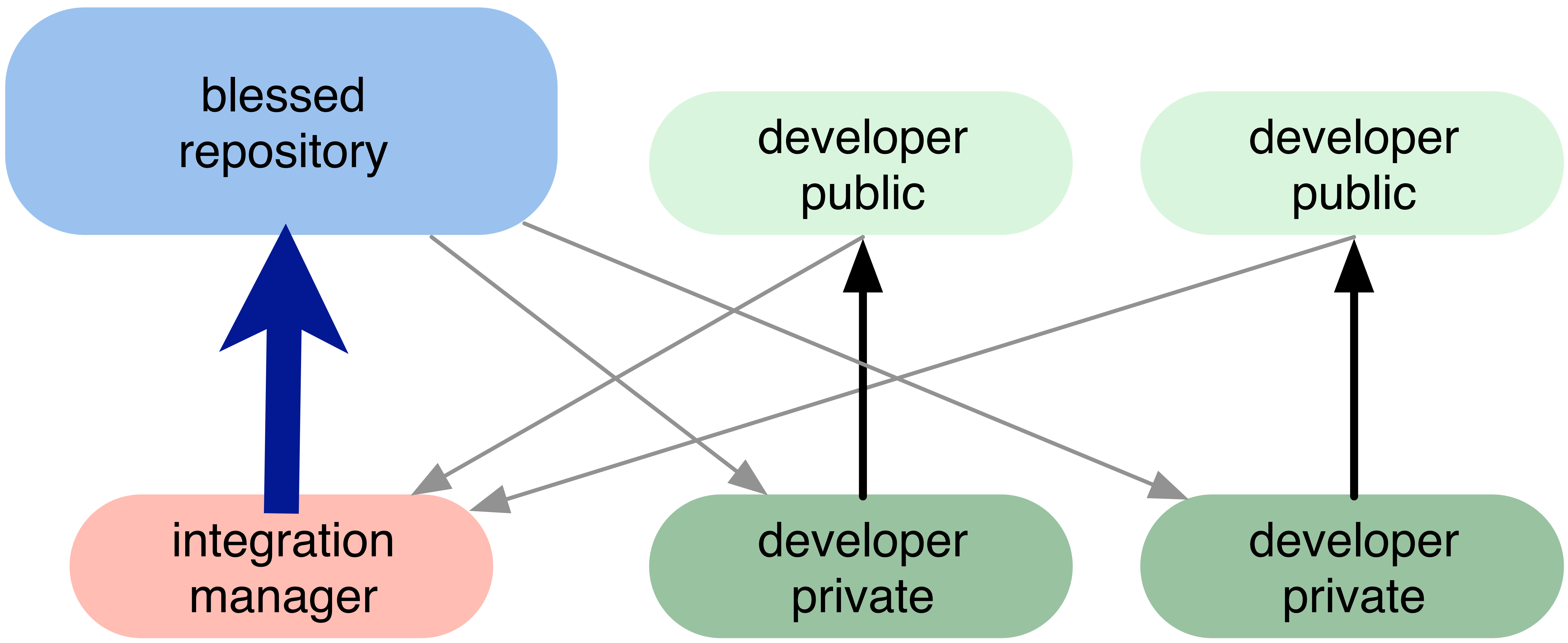
git fetch

integration manager model


blessed repository
developer public
developer public
integration manager
developer private
developer private


github.com
/schacon/ticgit
blessed repository
/yob/ticgit
developer public
/pope/ticgit
developer public
integration manager
developer private
developer private


github.com
/schacon/ticgit
blessed repository
"forks"
/yob/ticgit
developer public
/pope/ticgit
developer public
integration manager
developer private
developer private



blessed repository

developer public

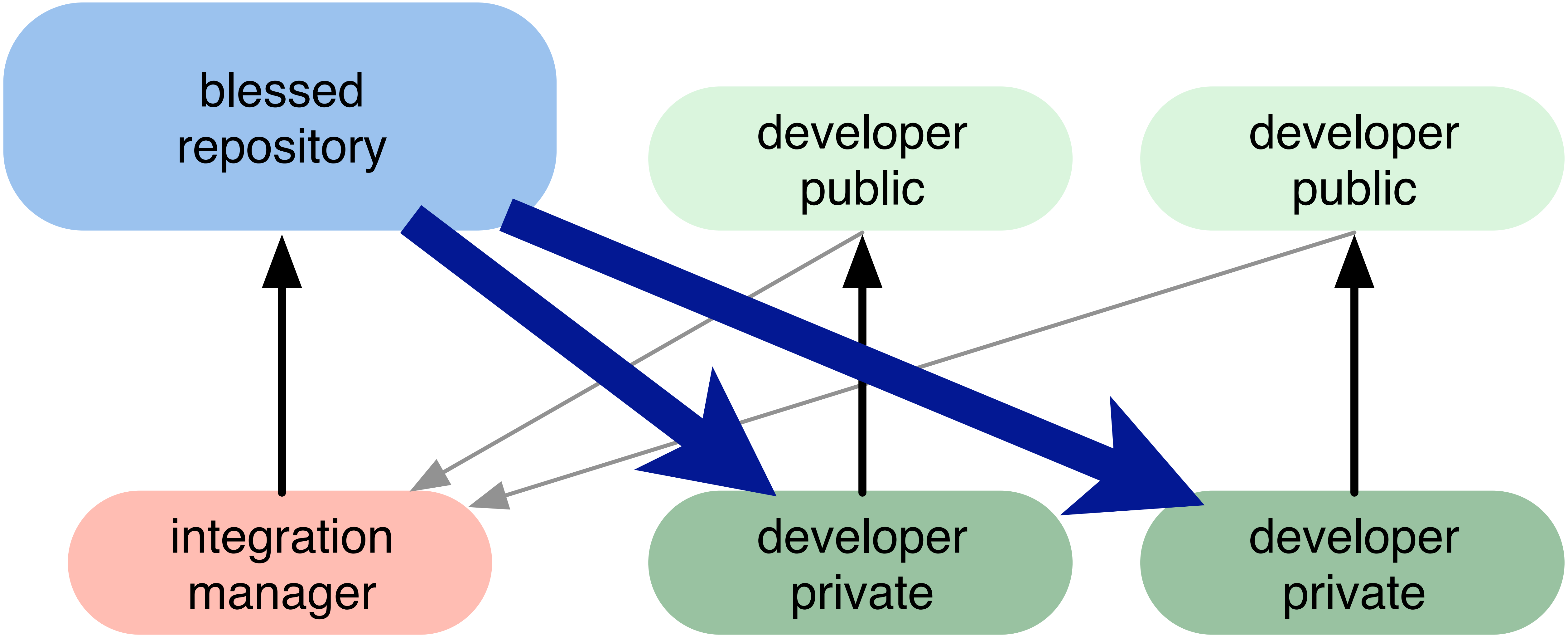
developer public

integration manager

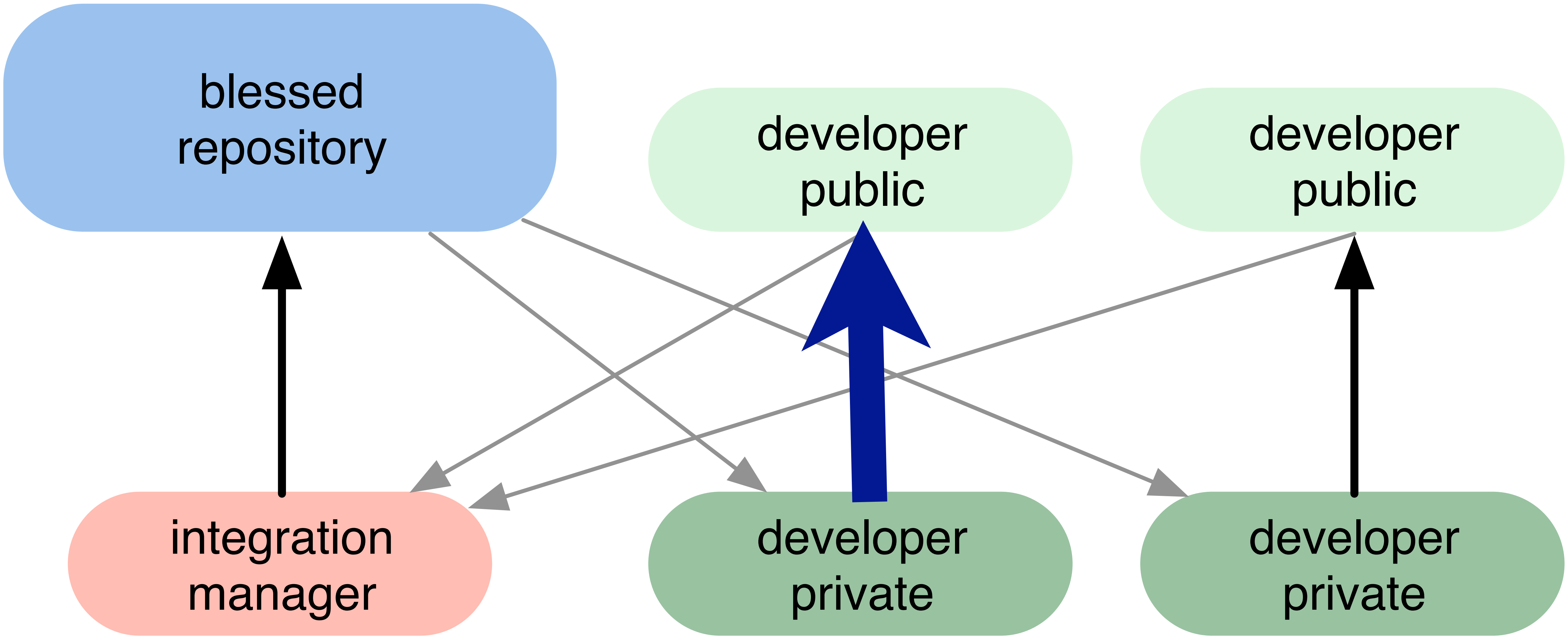
developer private

developer private

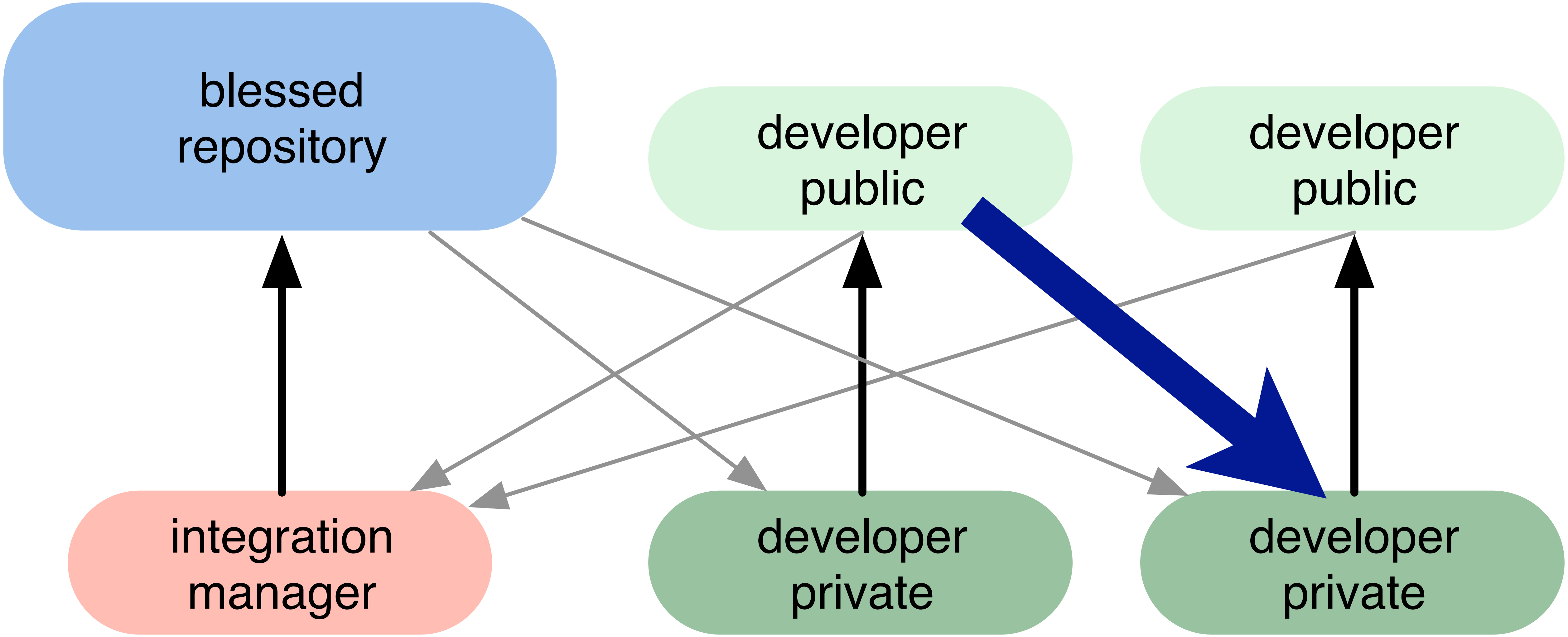
git push


blessed repository
developer public
developer public
integration manager
developer private
developer private

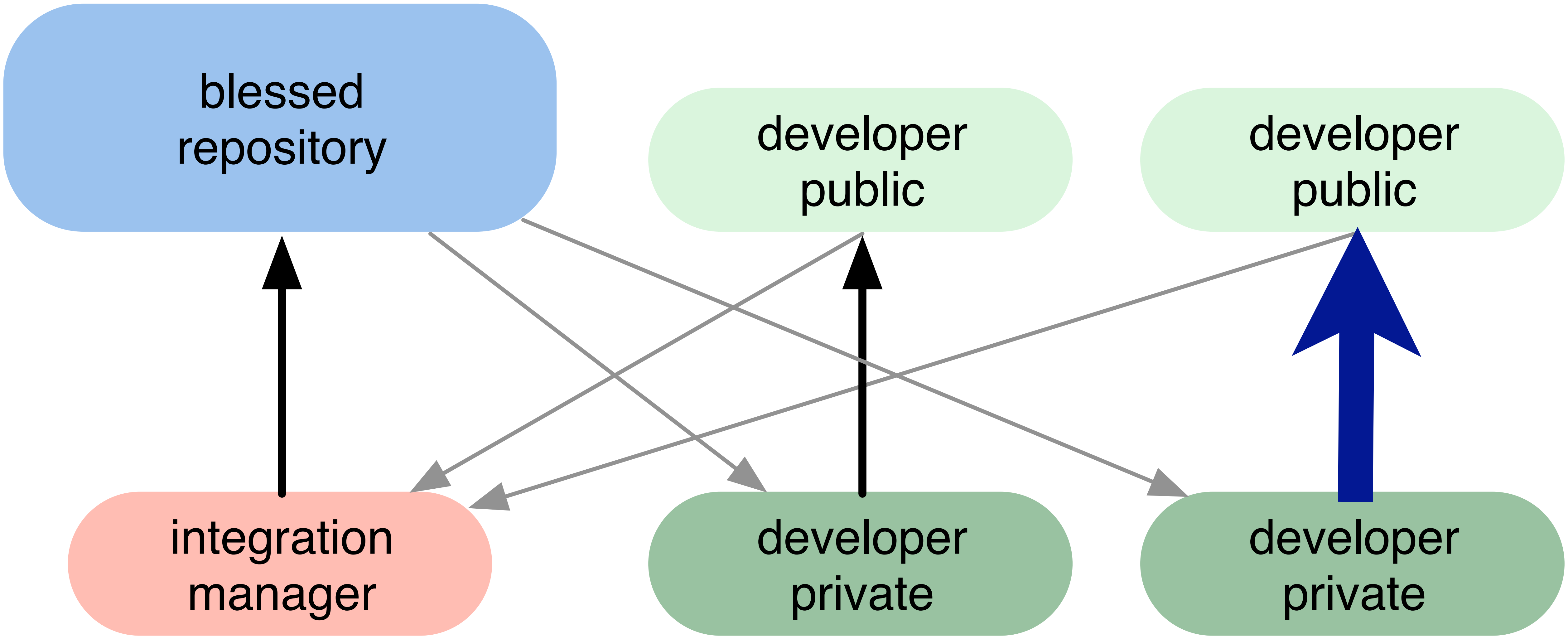
git clone


blessed repository
developer public
developer public
integration manager
developer private
developer private

git push



git fetch
git merge



blessed repository

developer public

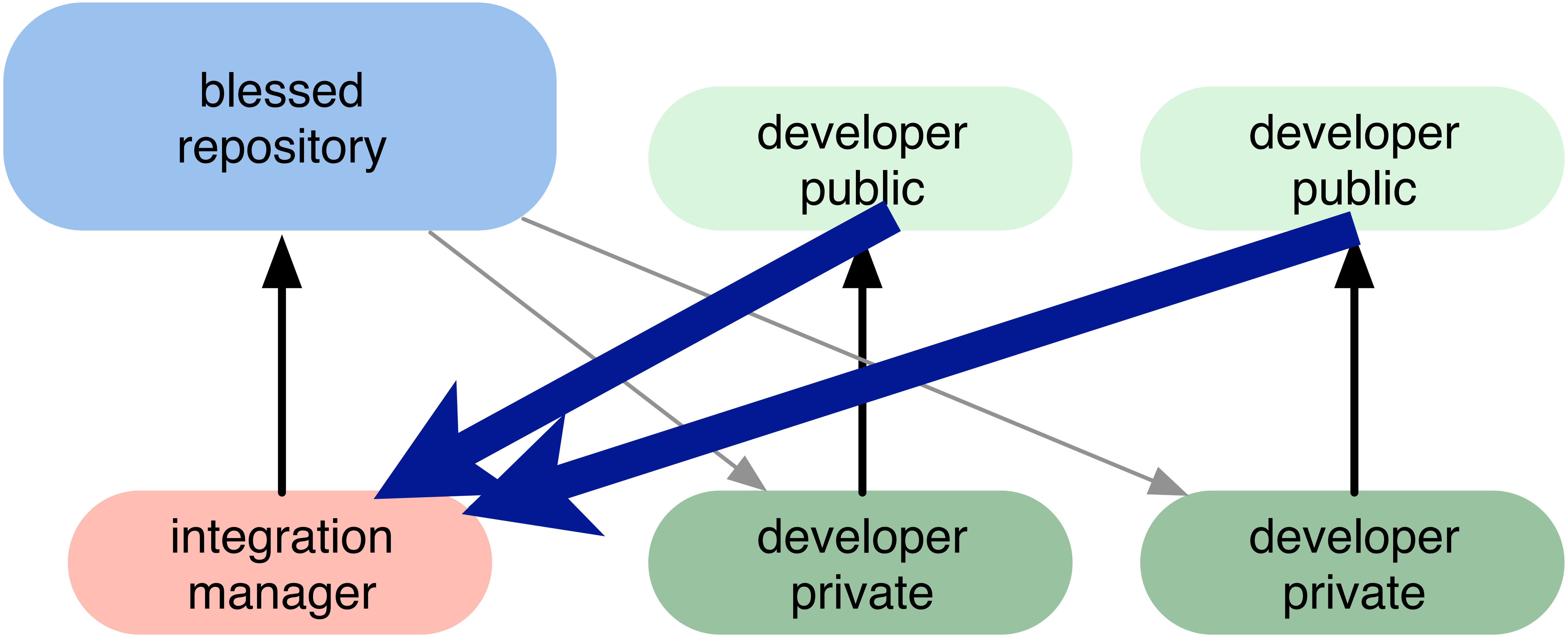
developer public

integration manager

developer private

developer private

git push



blessed repository

developer public

developer public

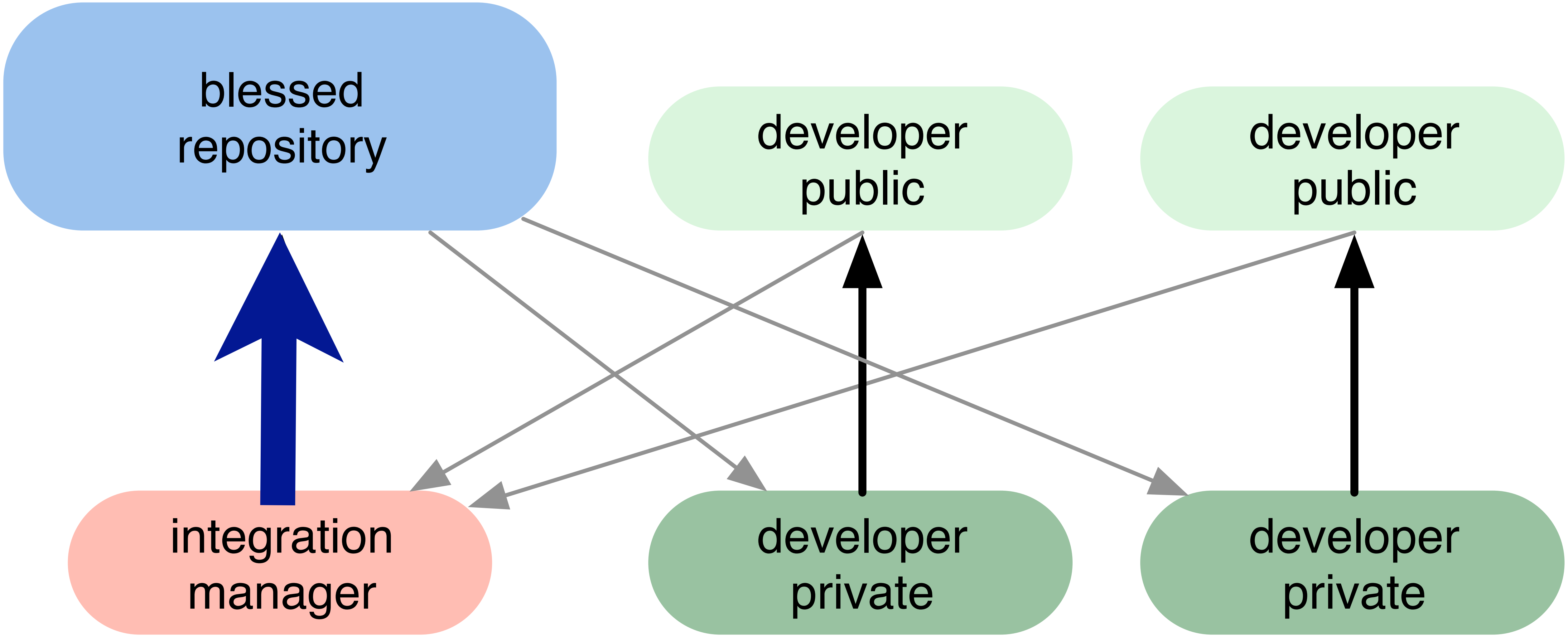
integration manager

developer private

developer private

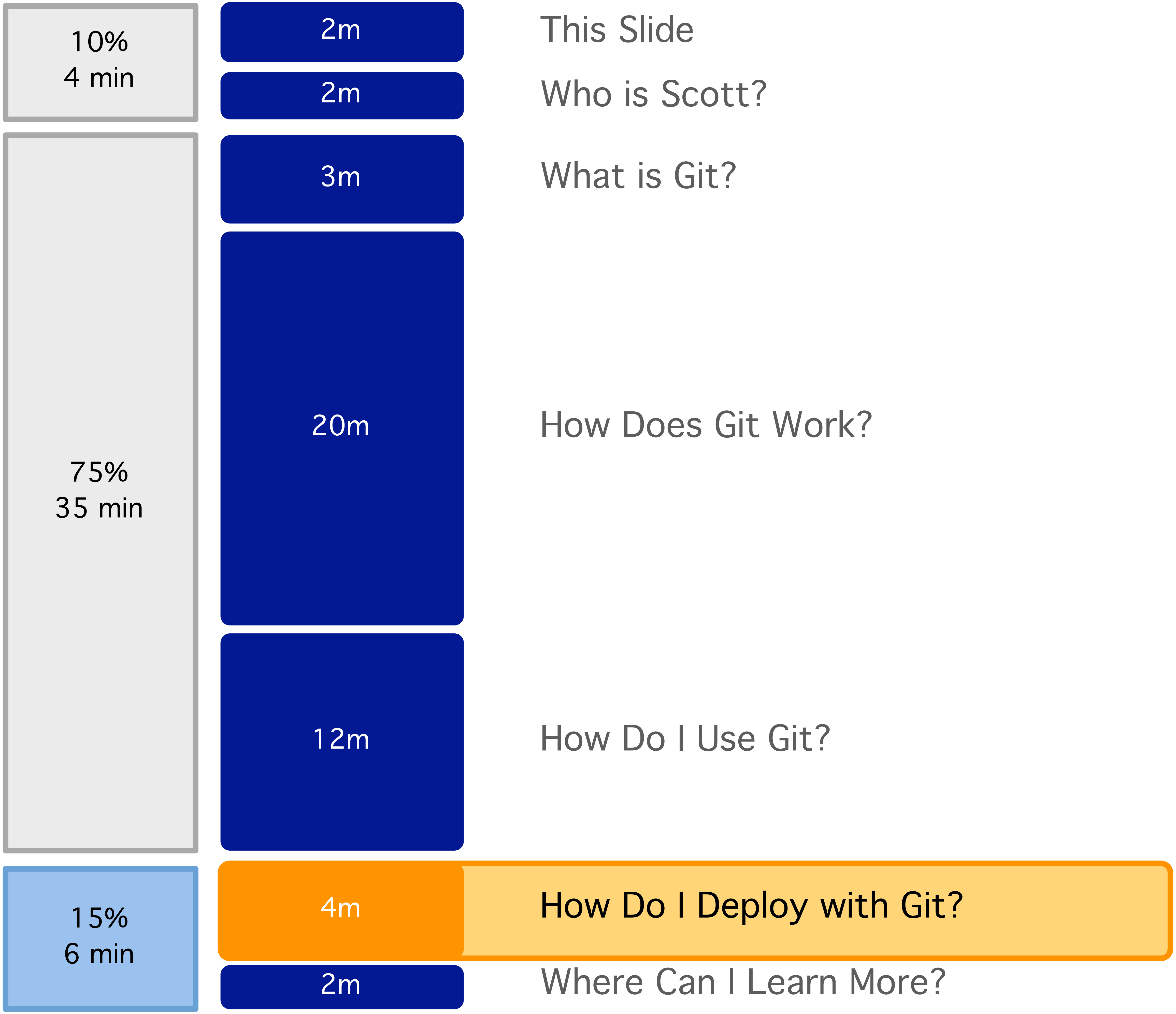
git fetch

git rebase / merge


blessed repository
developer public
developer public
integration manager
developer private
developer private

git push

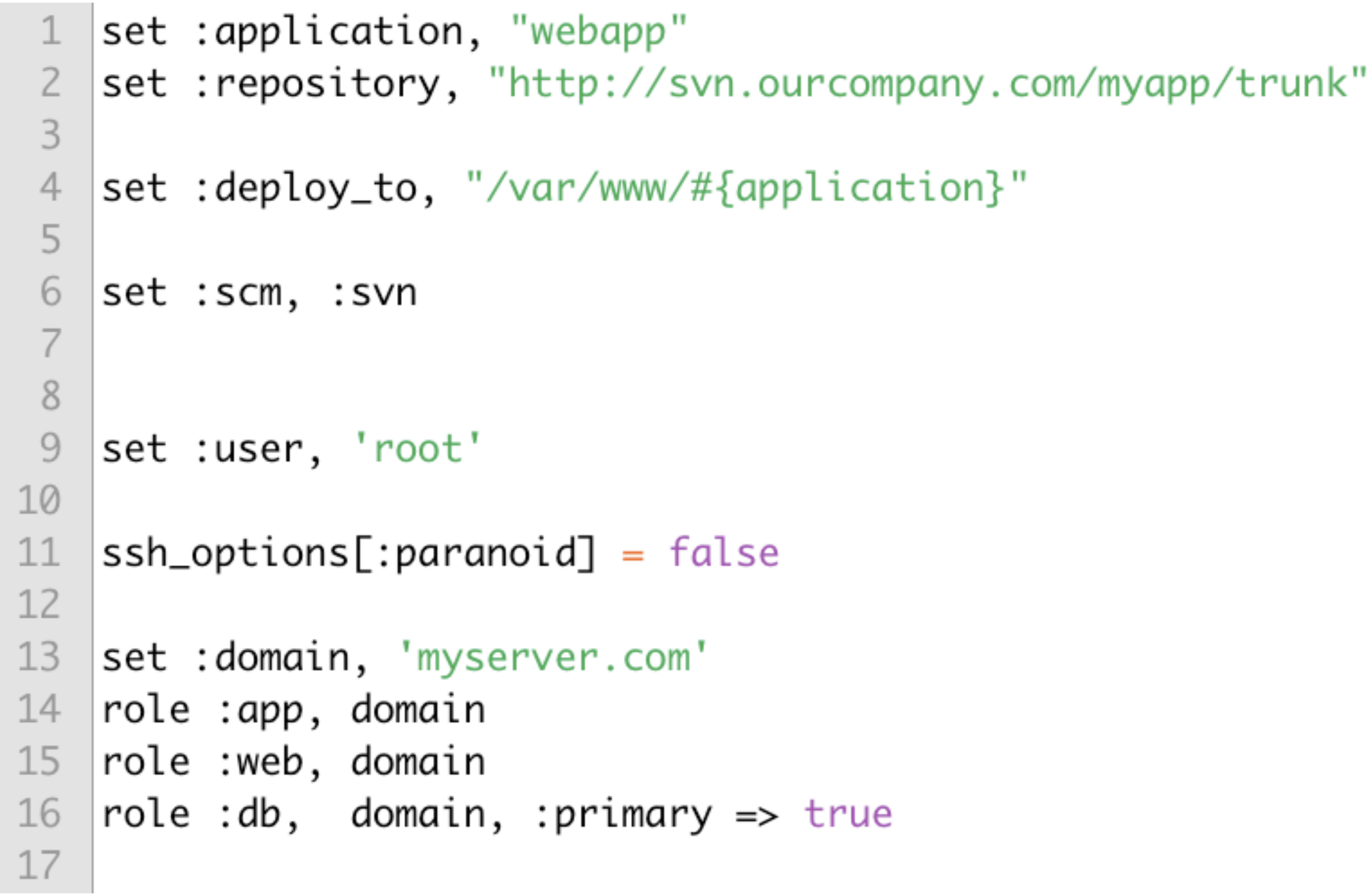
How Do I Deploy with Git?



10% 4 min	2m	This Slide
	2m	Who is Scott?
75% 35 min	3m	What is Git?
	20m	How Does Git Work?
	12m	How Do I Use Git?
15% 6 min	4m	**How Do I Deploy with Git?**
	2m	Where Can I Learn More?

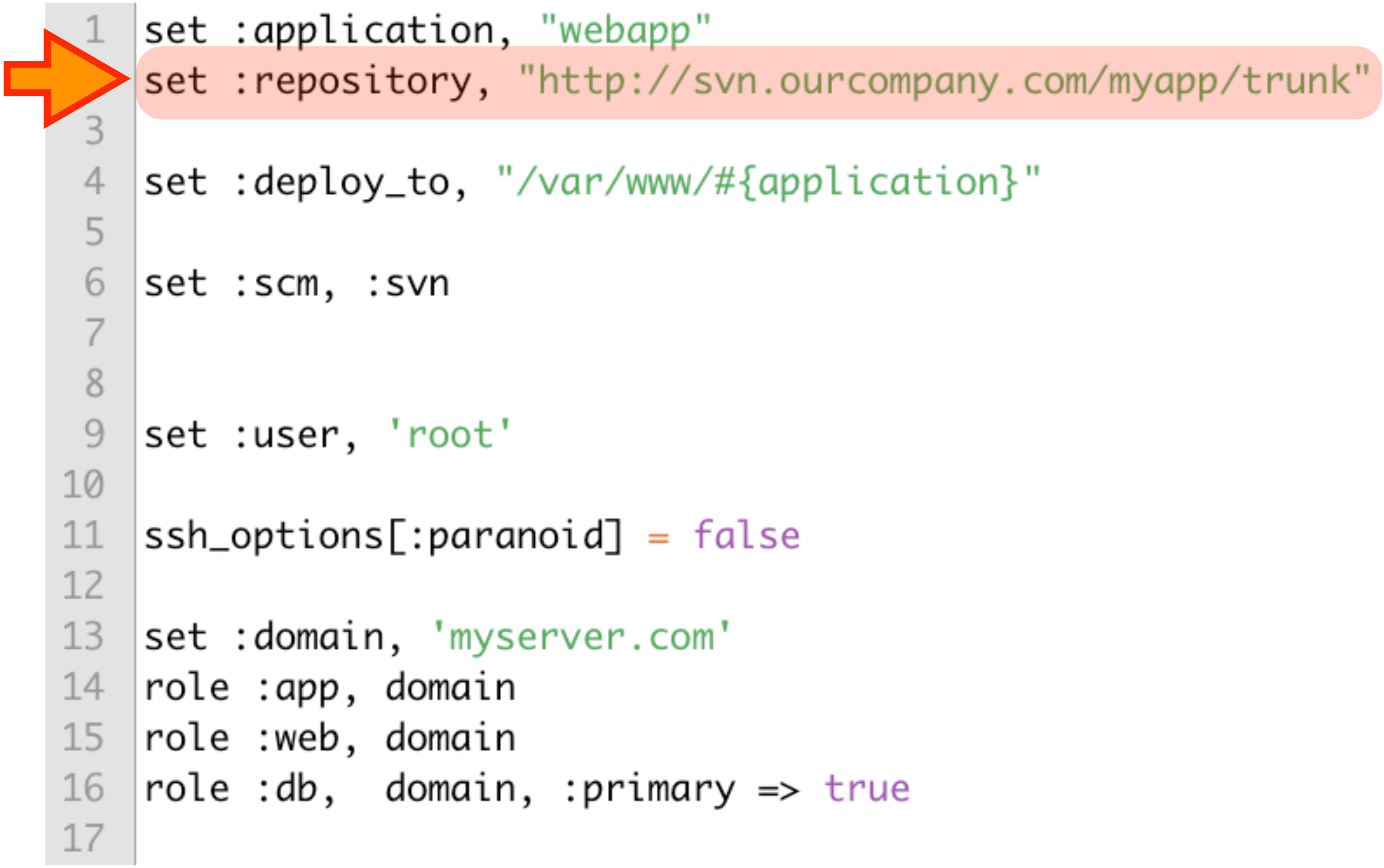
capistrano + git

deploy.rb



```ruby
set :application, "webapp"
set :repository, "http://svn.ourcompany.com/myapp/trunk"

set :deploy_to, "/var/www/#{application}"

set :scm, :svn


set :user, 'root'

ssh_options[:paranoid] = false

set :domain, 'myserver.com'
role :app, domain
role :web, domain
role :db,  domain, :primary => true

```

deploy.rb



```ruby
set :application, "webapp"
set :repository, "http://svn.ourcompany.com/myapp/trunk"

set :deploy_to, "/var/www/#{application}"

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```
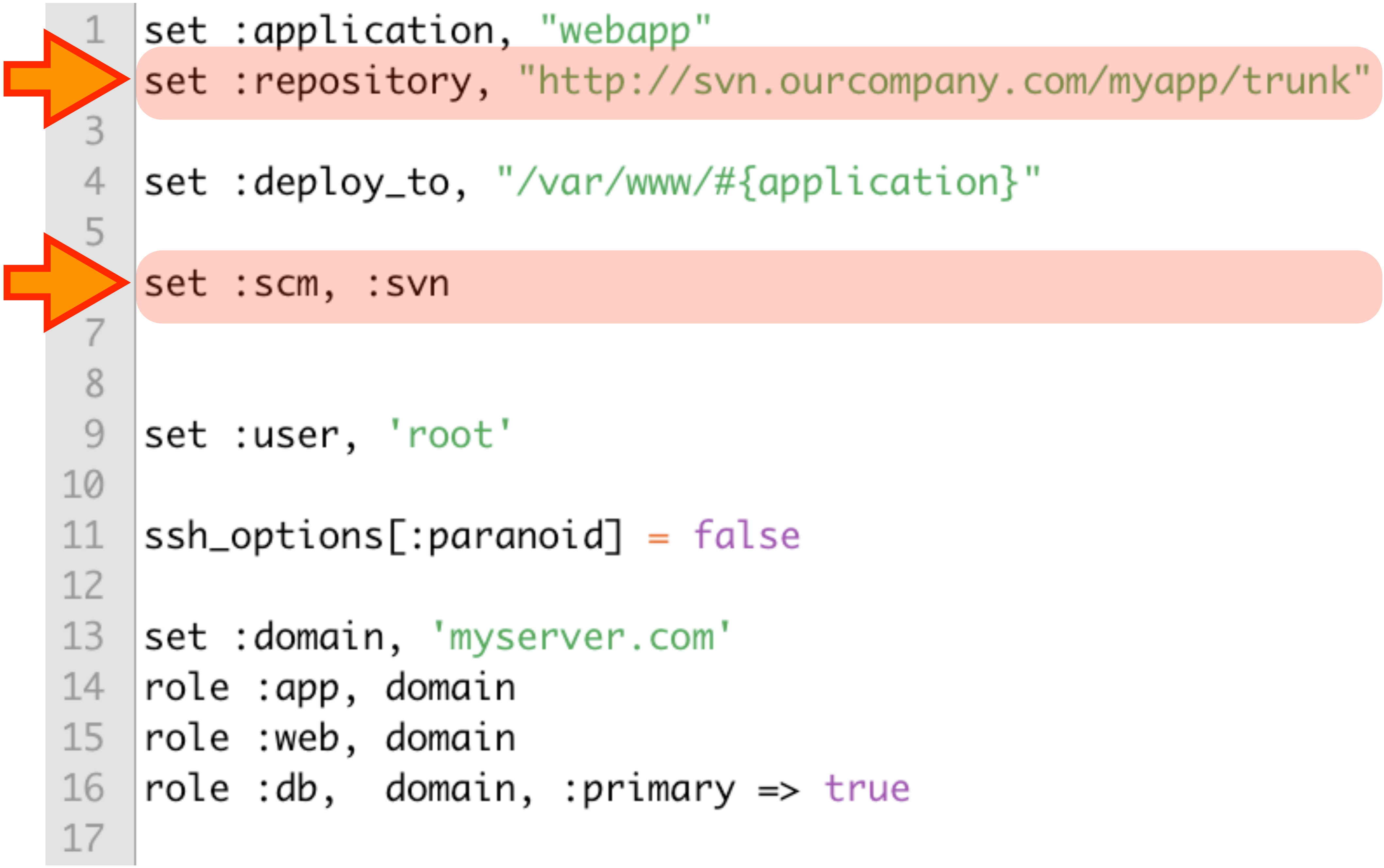
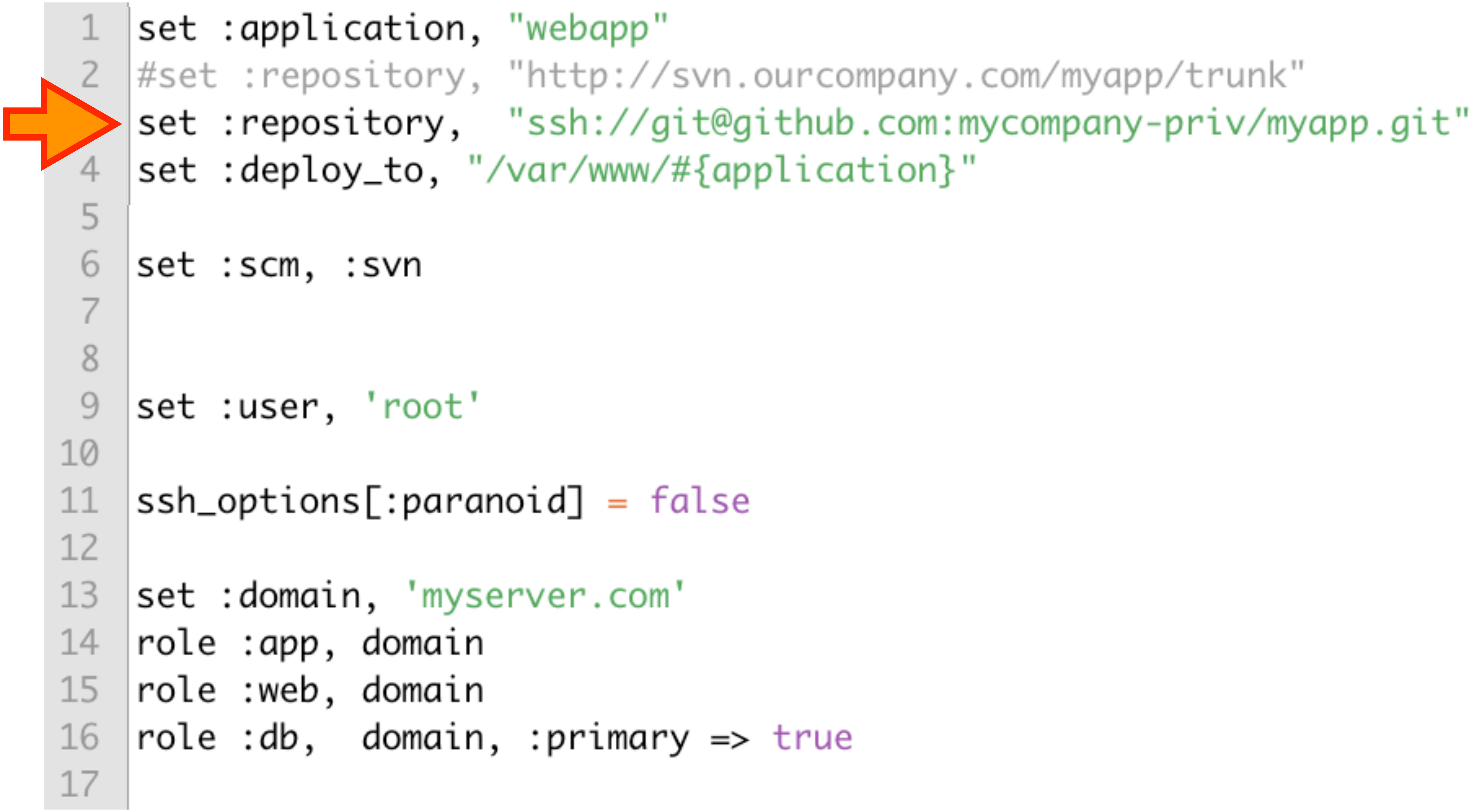
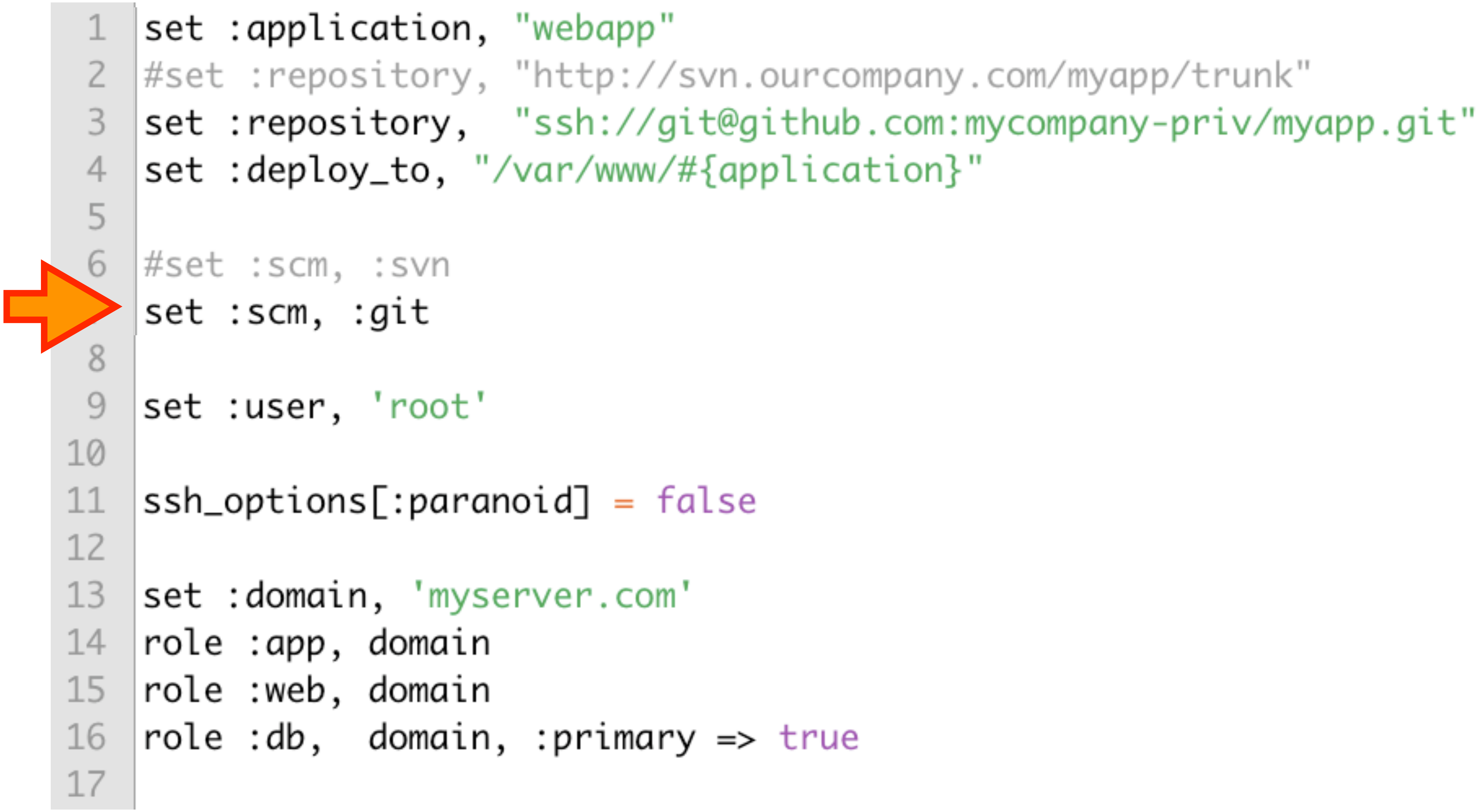

deploy.rb



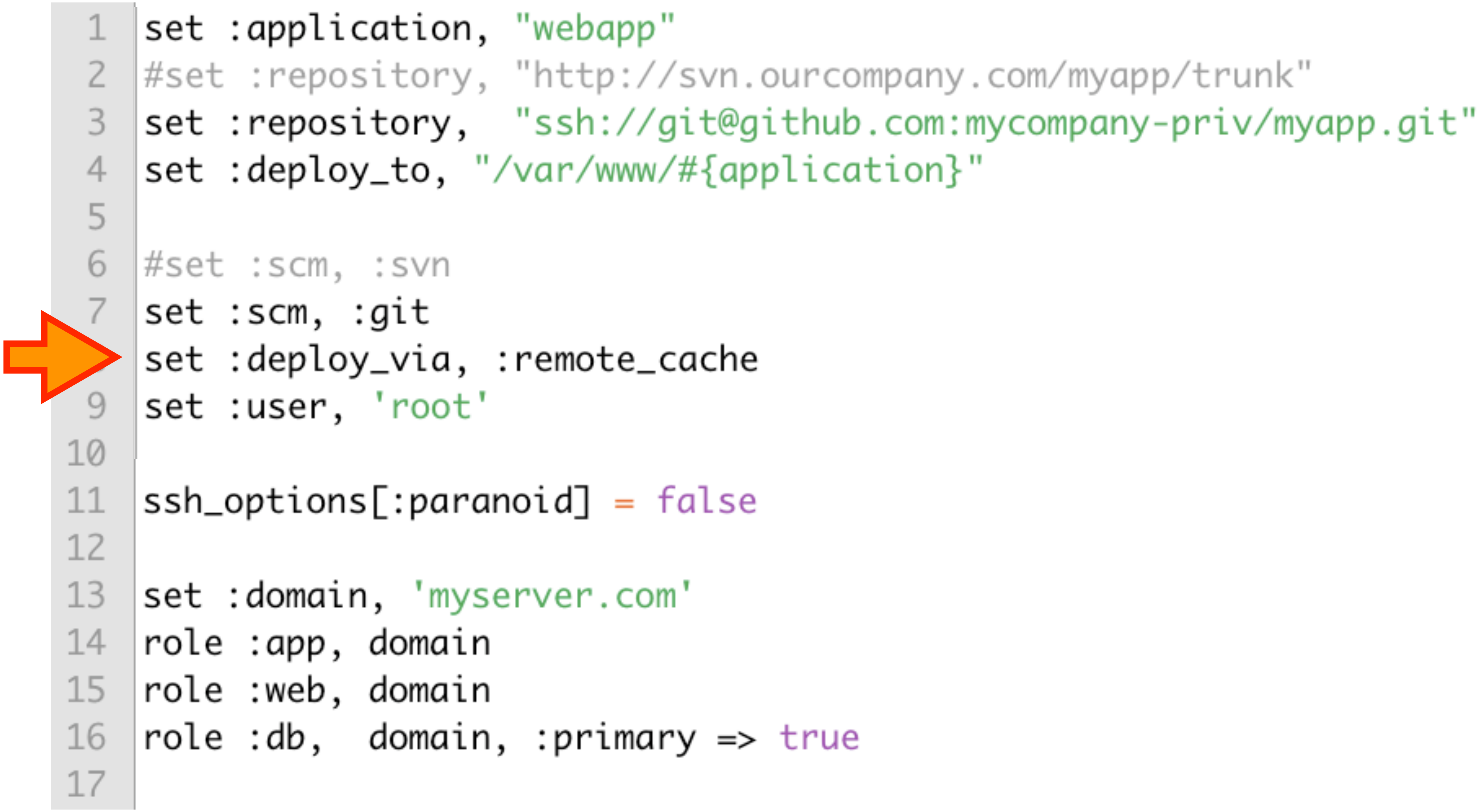
```ruby
set :application, "webapp"
set :repository, "http://svn.ourcompany.com/myapp/trunk"

set :deploy_to, "/var/www/#{application}"

set :scm, :svn


set :user, 'root'

ssh_options[:paranoid] = false

set :domain, 'myserver.com'
role :app, domain
role :web, domain
role :db,  domain, :primary => true

```



```
set :application, "webapp"
#set :repository, "http://svn.ourcompany.com/myapp/trunk"
set :repository,  "ssh://git@github.com:mycompany-priv/myapp.git"
set :deploy_to, "/var/www/#{application}"

set :scm, :svn


set :user, 'root'

ssh_options[:paranoid] = false

set :domain, 'myserver.com'
role :app, domain
role :web, domain
role :db,  domain, :primary => true

```



```
set :application, "webapp"
#set :repository, "http://svn.ourcompany.com/myapp/trunk"
set :repository,  "ssh://git@github.com:mycompany-priv/myapp.git"
set :deploy_to, "/var/www/#{application}"

#set :scm, :svn
set :scm, :git

set :user, 'root'

ssh_options[:paranoid] = false

set :domain, 'myserver.com'
role :app, domain
role :web, domain
role :db,  domain, :primary => true

```



```
set :application, "webapp"
#set :repository, "http://svn.ourcompany.com/myapp/trunk"
set :repository,  "ssh://git@github.com:mycompany-priv/myapp.git"
set :deploy_to, "/var/www/#{application}"

#set :scm, :svn
set :scm, :git
set :deploy_via, :remote_cache
set :user, 'root'

ssh_options[:paranoid] = false

set :domain, 'myserver.com'
role :app, domain
role :web, domain
role :db,  domain, :primary => true

```

other cap options

```
set :branch, "master"

set :git_shallow_clone, 1

set :git_enable_submodules, 1
```

ruby + git

ruby + git

grit

git gem

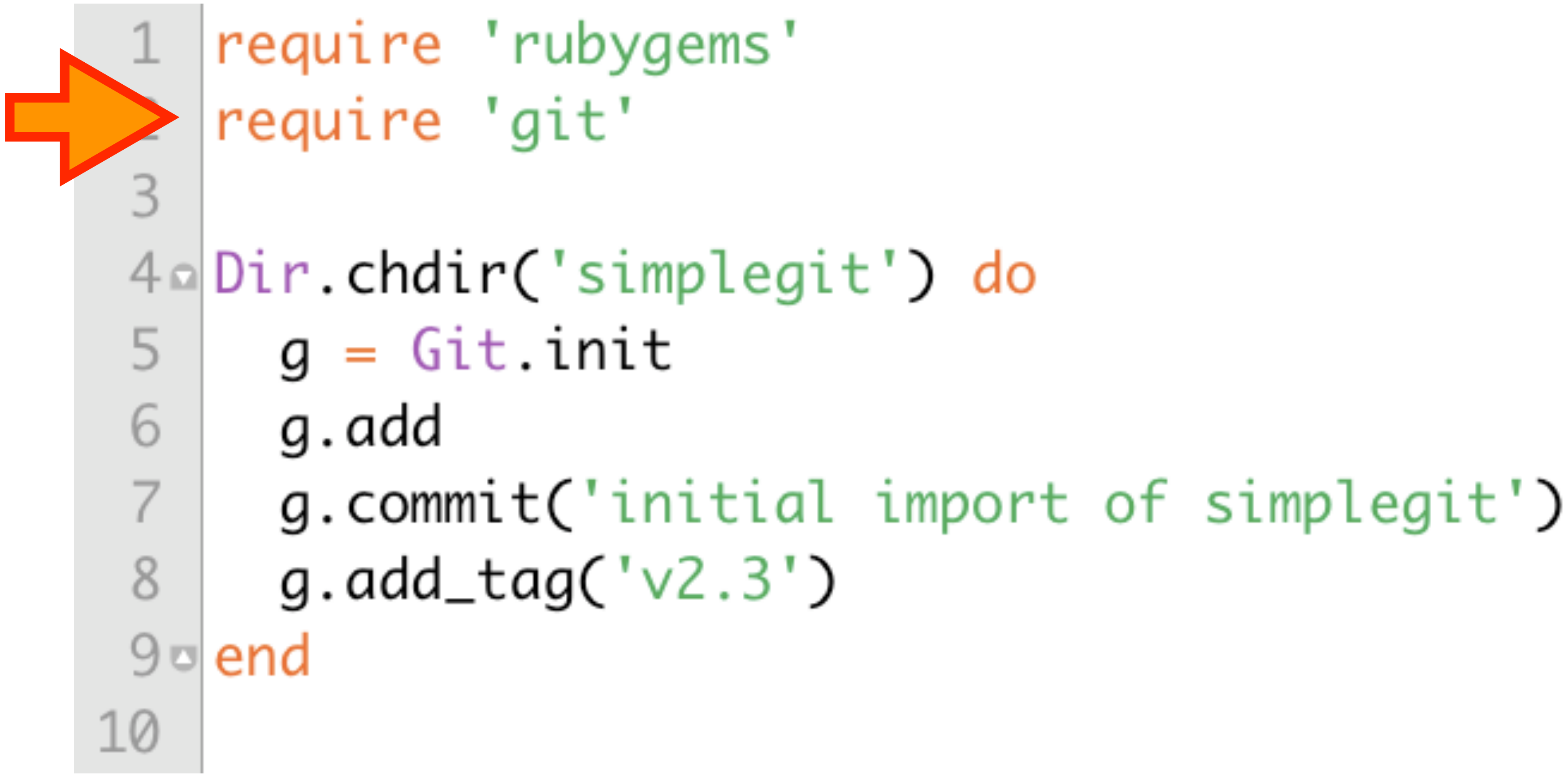
git-ruby

ruby + git

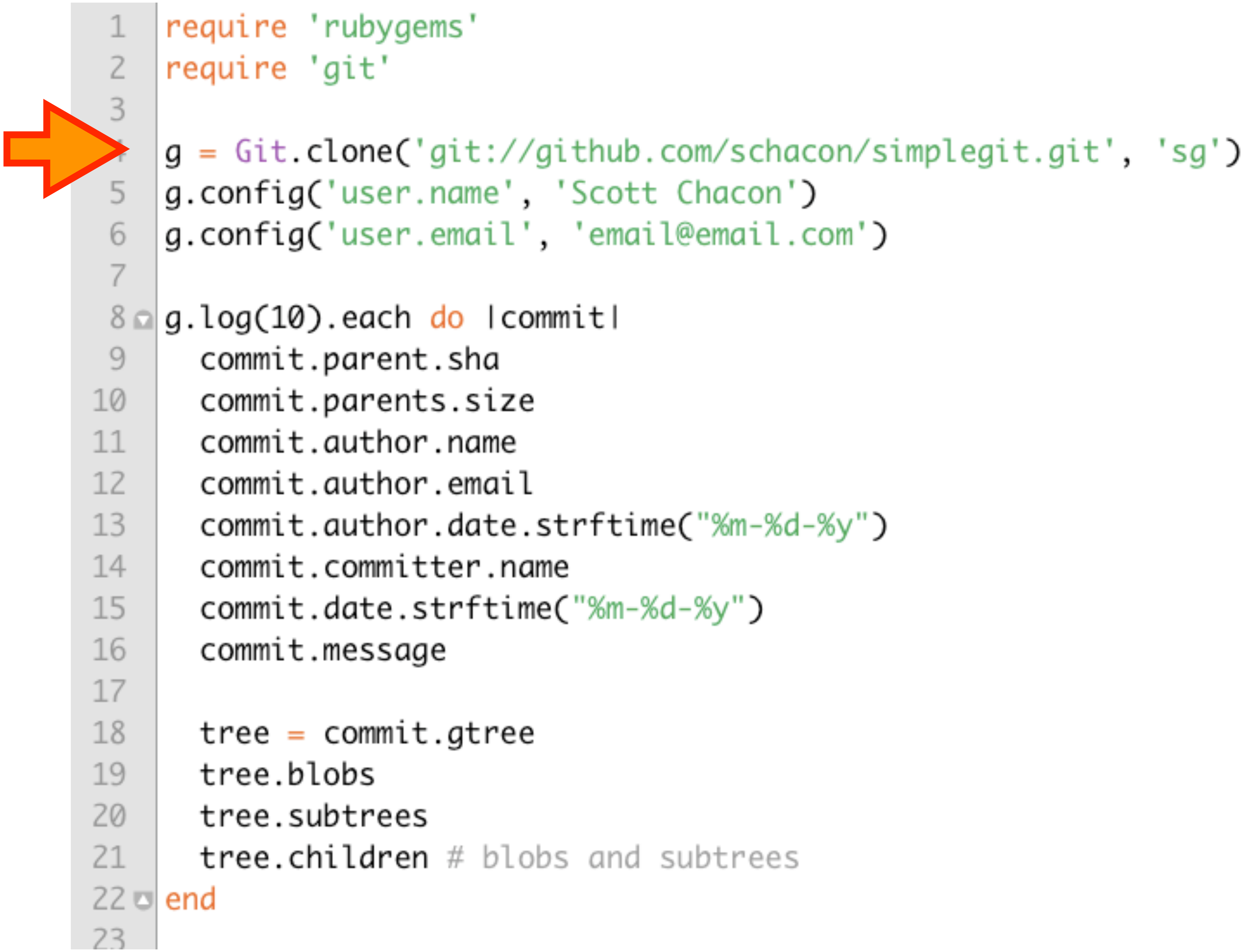
grit

git gem

git-ruby



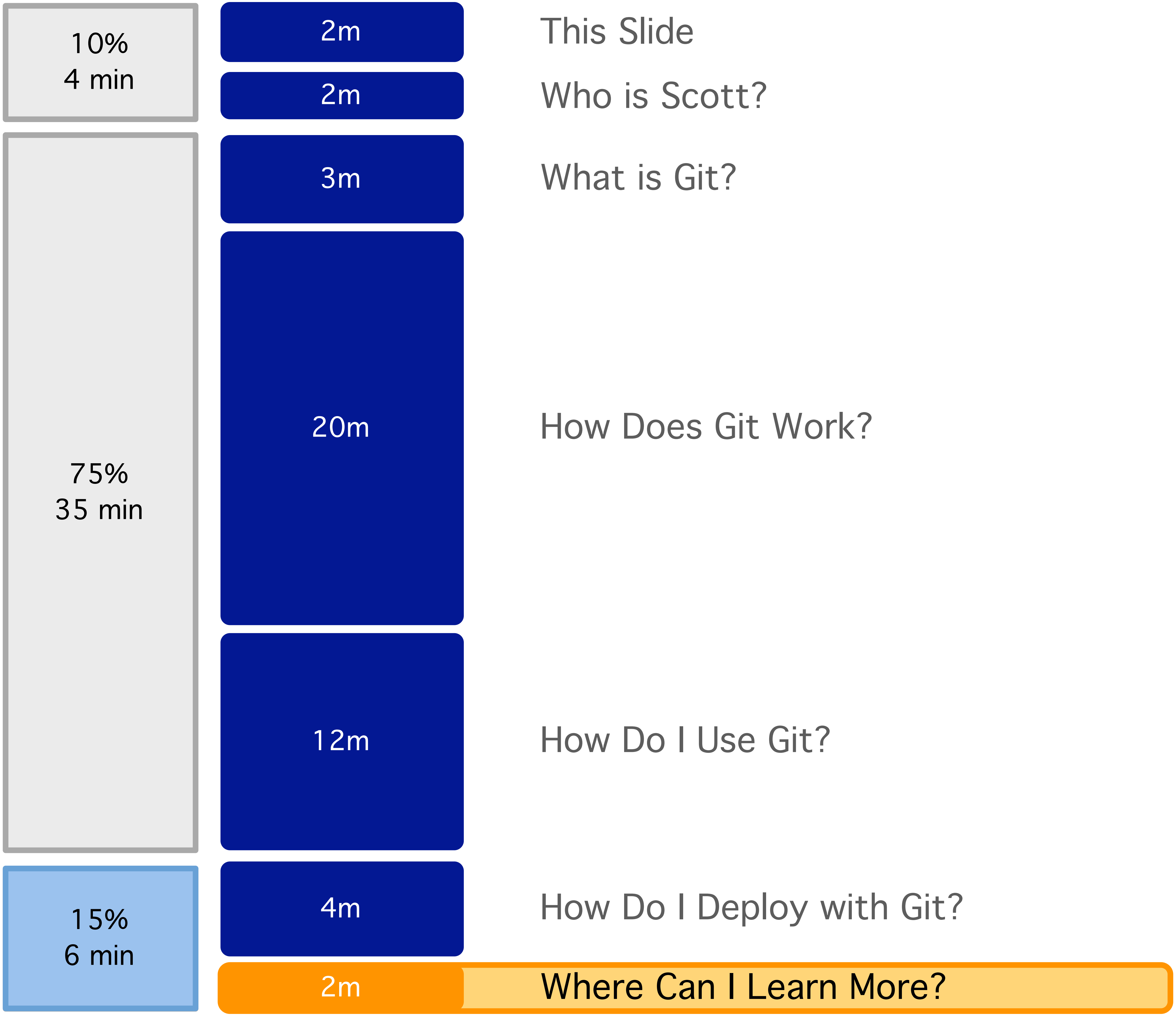
```ruby
require 'rubygems'
require 'git'

Dir.chdir('simplegit') do
  g = Git.init
  g.add
  g.commit('initial import of simplegit')
  g.add_tag('v2.3')
end

```



```ruby
require 'rubygems'
require 'git'

g = Git.clone('git://github.com/schacon/simplegit.git', 'sg')
g.config('user.name', 'Scott Chacon')
g.config('user.email', 'email@email.com')

g.log(10).each do |commit|
  commit.parent.sha
  commit.parents.size
  commit.author.name
  commit.author.email
  commit.author.date.strftime("%m-%d-%y")
  commit.committer.name
  commit.date.strftime("%m-%d-%y")
  commit.message

  tree = commit.gtree
  tree.blobs
  tree.subtrees
  tree.children # blobs and subtrees
end

```

github.com/schacon/
ruby-git

Where Can I Learn More?



10%
4 min

2m This Slide

2m Who is Scott?

75%
35 min

3m What is Git?

20m How Does Git Work?

12m How Do I Use Git?

15%
6 min

4m How Do I Deploy with Git?

2m **Where Can I Learn More?**

Resources

git.or.cz

gitcasts.com

del.icio.us/popular/git

#git / #github on IRC

peepcode - git book and screencast

schacon@gmail.com

me. here.

thats it!

thats it!

gitcasts.com/git-talk

notes, these slides, etc

thats it!

gitcasts.com/git-talk

notes, these slides, etc

git.or.cz

del.icio.us/popular/git

peepcode

gitcasts.com

#git / #github on IRC

schacon@gmail.com