Intro to Git

Scott Chacon

What is Git?

Git is an open source, distributed version control system designed for speed and efficiency

Git is an **open source**, distributed version control system designed for speed and efficiency

git-scm.com

Home | About Git | Documentation | Download | Tools & Hosting | Wiki

Git is...

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

Every Git clone is a full-fledged repository with complete history and full revision tracking capabilities, not dependent on network access or a central server. **Branching and merging are fast** and easy to do.

Git is used for version control of files, much like tools such as Mercurial, Bazaar, Subversion, CVS, Perforce, and Visual SourceSafe.

Projects using Git

- Git
- Linux Kernel
- Perl
- Ruby on Rails
- Android
- WINE
- Fedora
- X.org
- VLC
- Prototype

Download Git

The latest stable Git release is

v1.6.1.1

e notes (2009-01-25)

TAR tar.bz2 (sign)

TAR tar.gz (sign)

Download Options

Source and History

Git Quick Start

Git is an open source,
distributed version control
system designed for speed
and efficiency

Fully Distributed

(almost) everything is local

which means

which means

everything is fast

which means

everything is fast

every clone is a backup

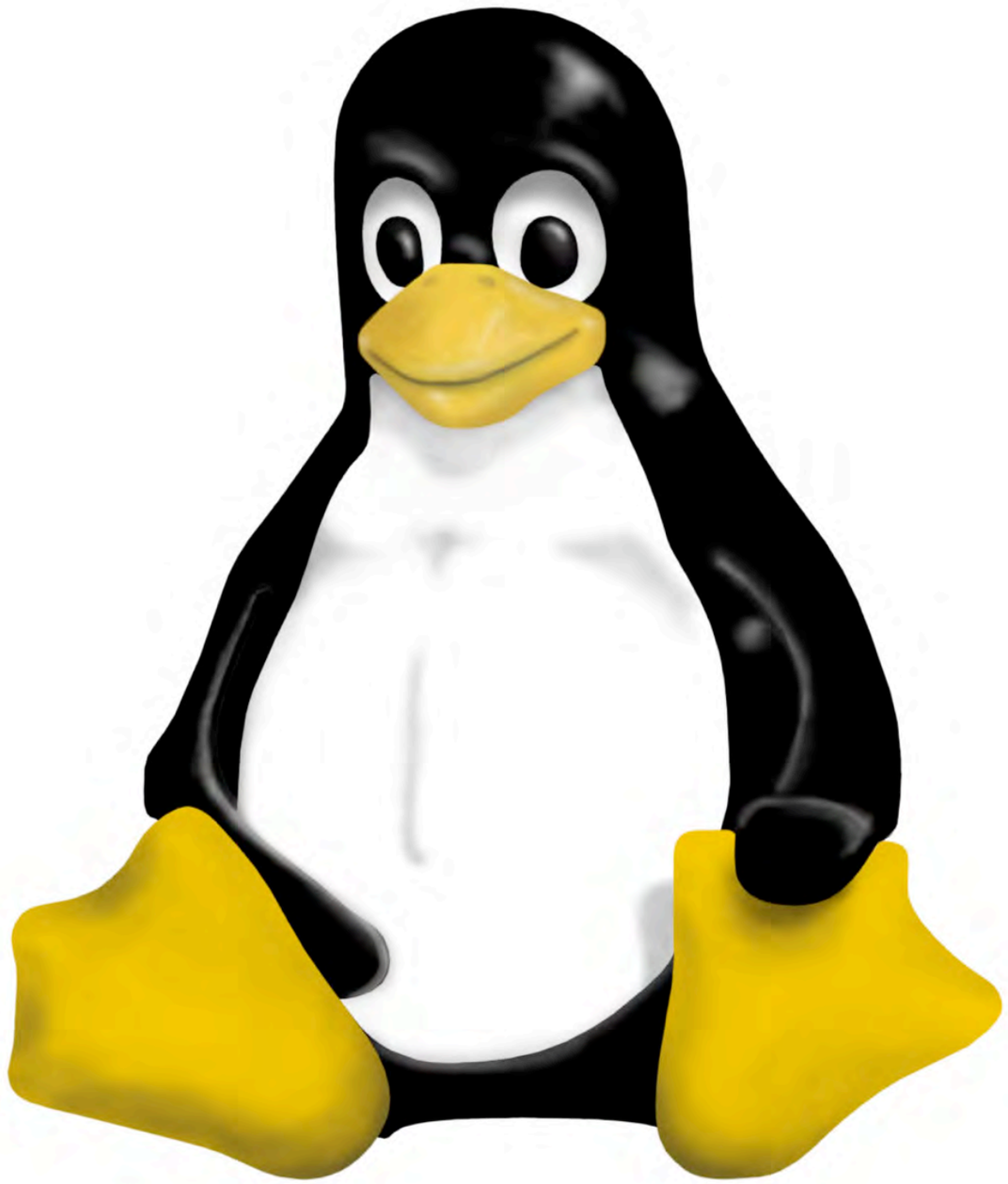
which means

everything is fast

every clone is a backup

work offline

Git is an open source, distributed version control system **designed for speed and efficiency**

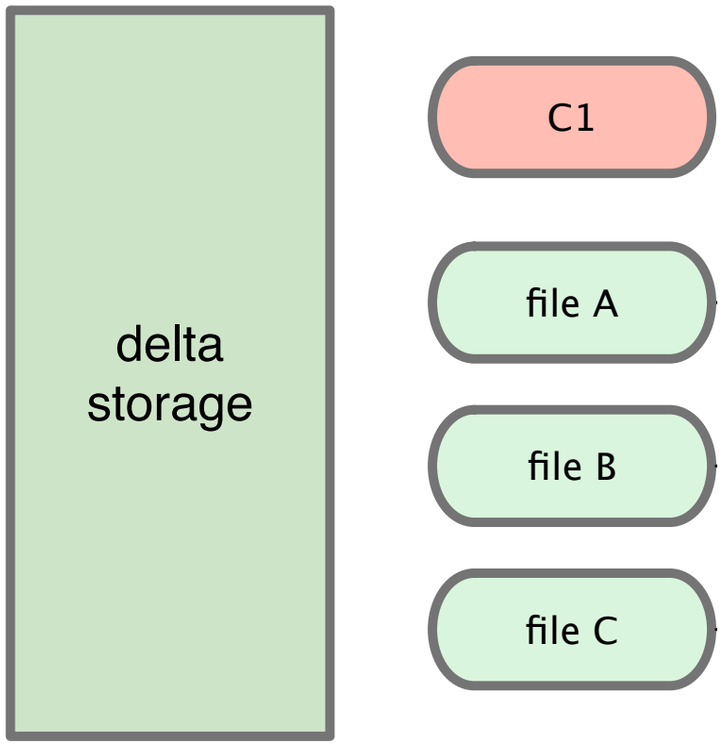


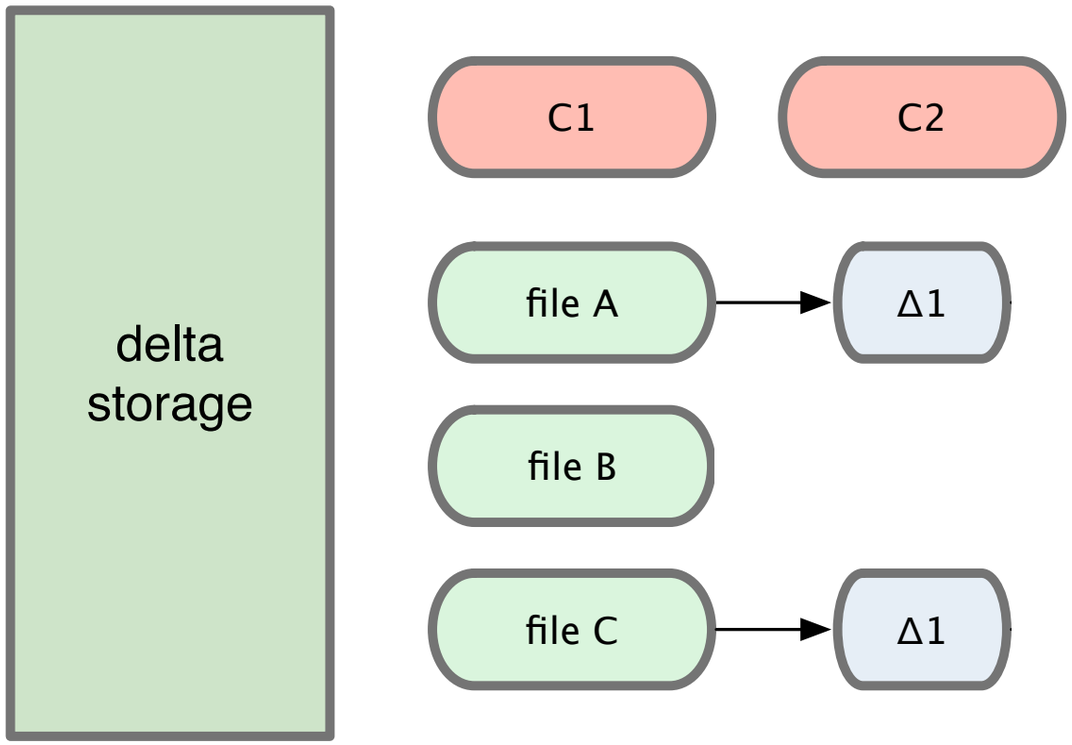
Immutable

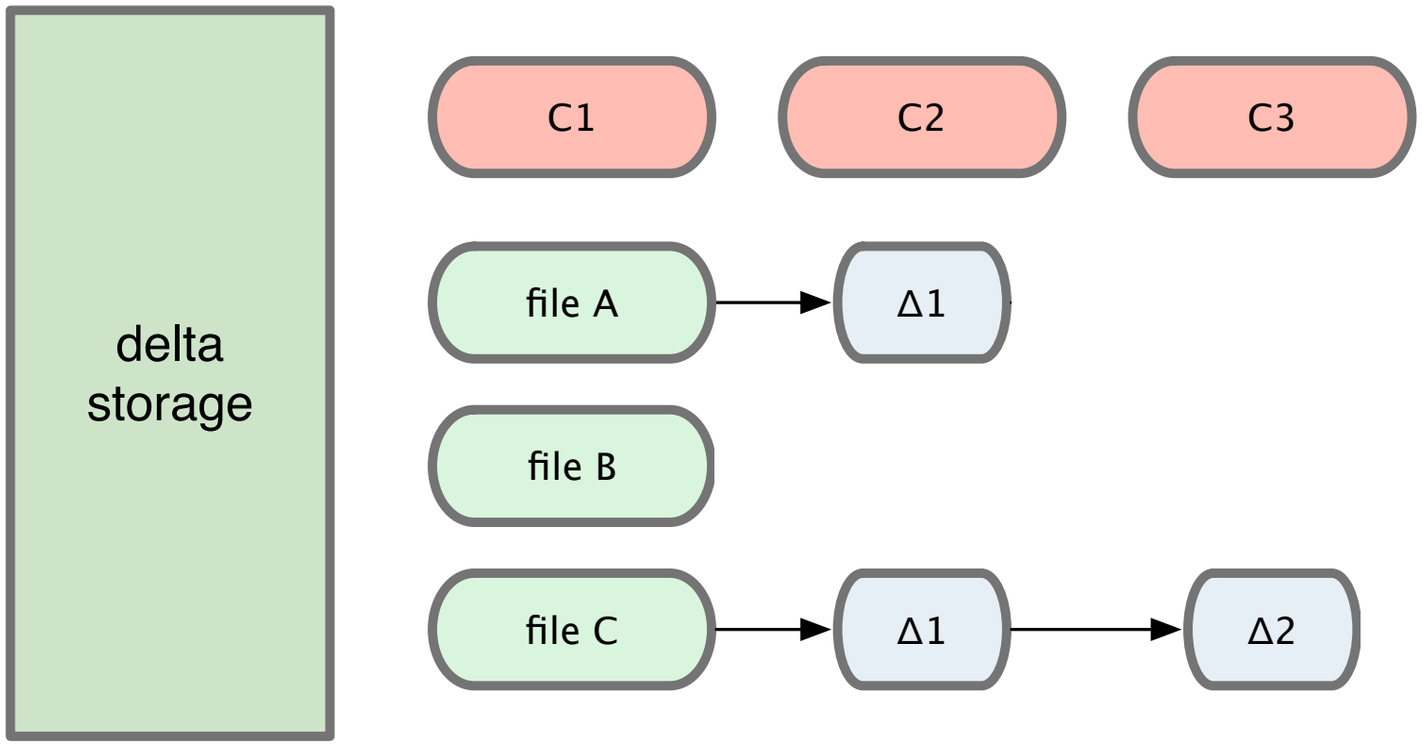
(almost) never removes data

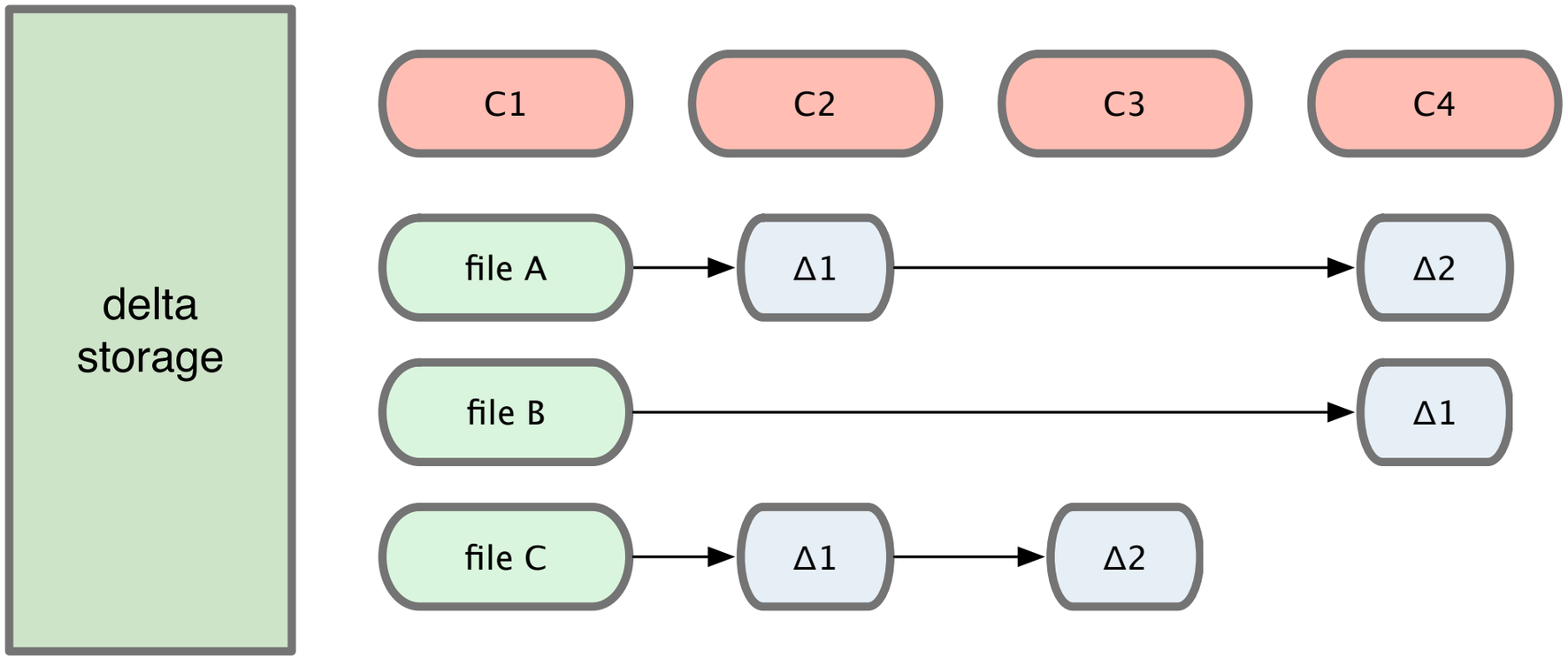
Snapshots, not Patches

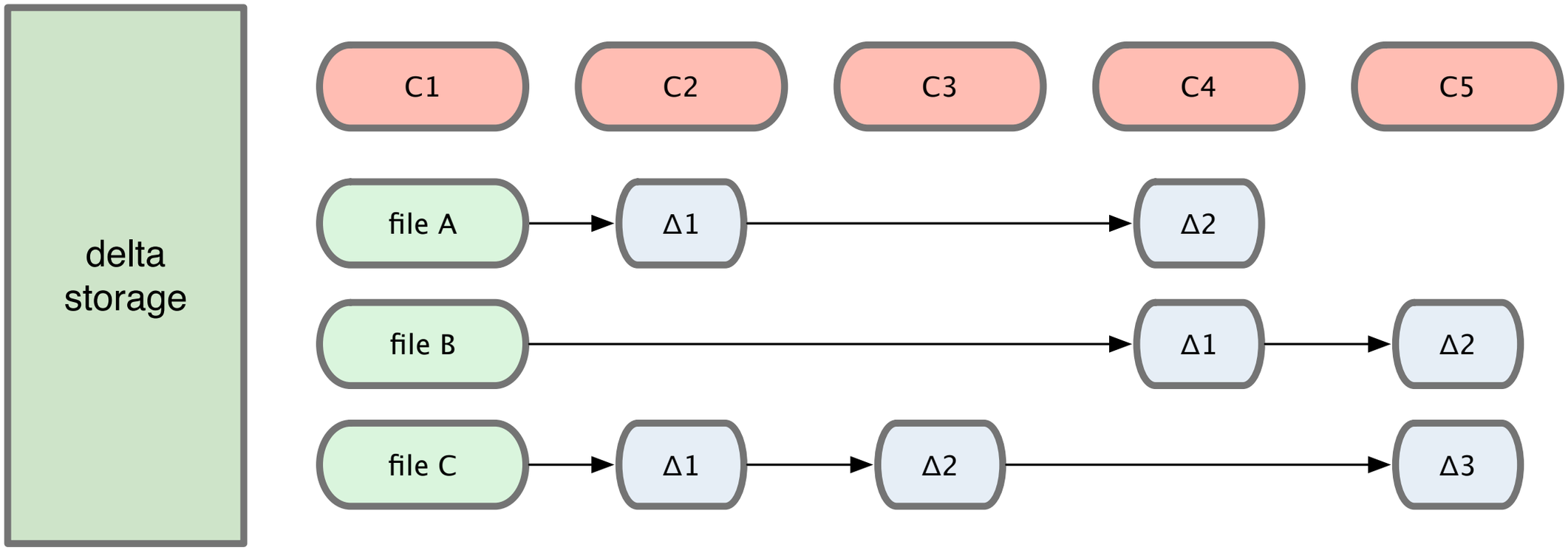
delta
storage


delta
storage
C1
file A
file B
file C


delta
storage
C1
C2
file A
Δ1
file B
file C
Δ1


delta
storage
C1
C2
C3
file A
Δ1
file B
file C
Δ1
Δ2


delta
storage
C1
C2
C3
C4
file A
Δ1
Δ2
file B
Δ1
file C
Δ1
Δ2


delta
storage
C1
C2
C3
C4
C5
file A
Δ1
Δ2
file B
Δ1
Δ2
file C
Δ1
Δ2
Δ3

delta storage

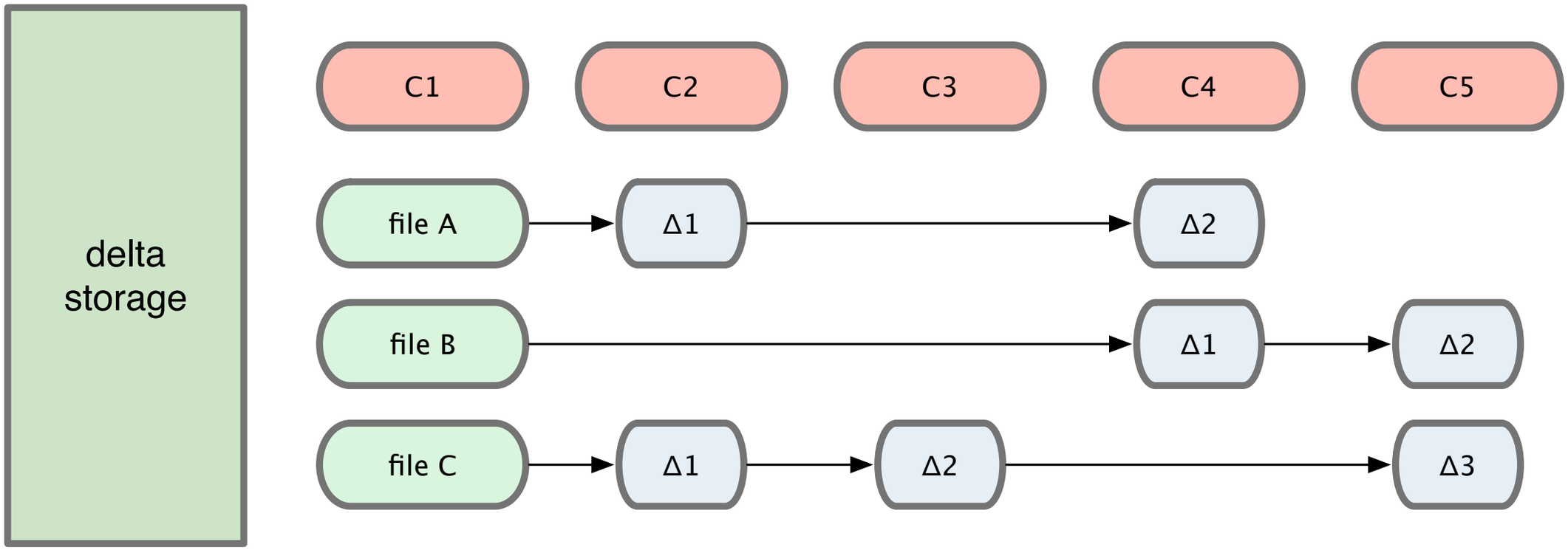
C1 C2 C3 C4 C5

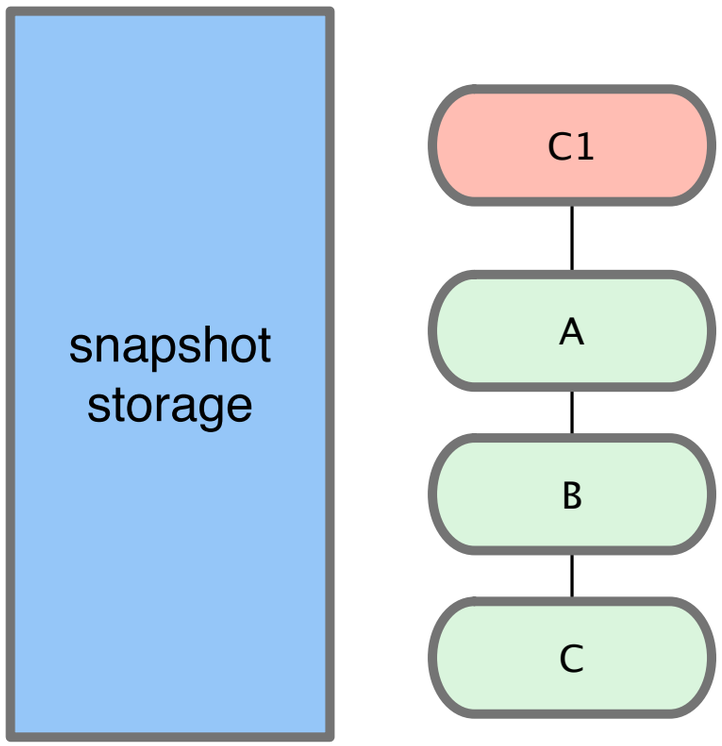
file A → Δ1 → Δ2

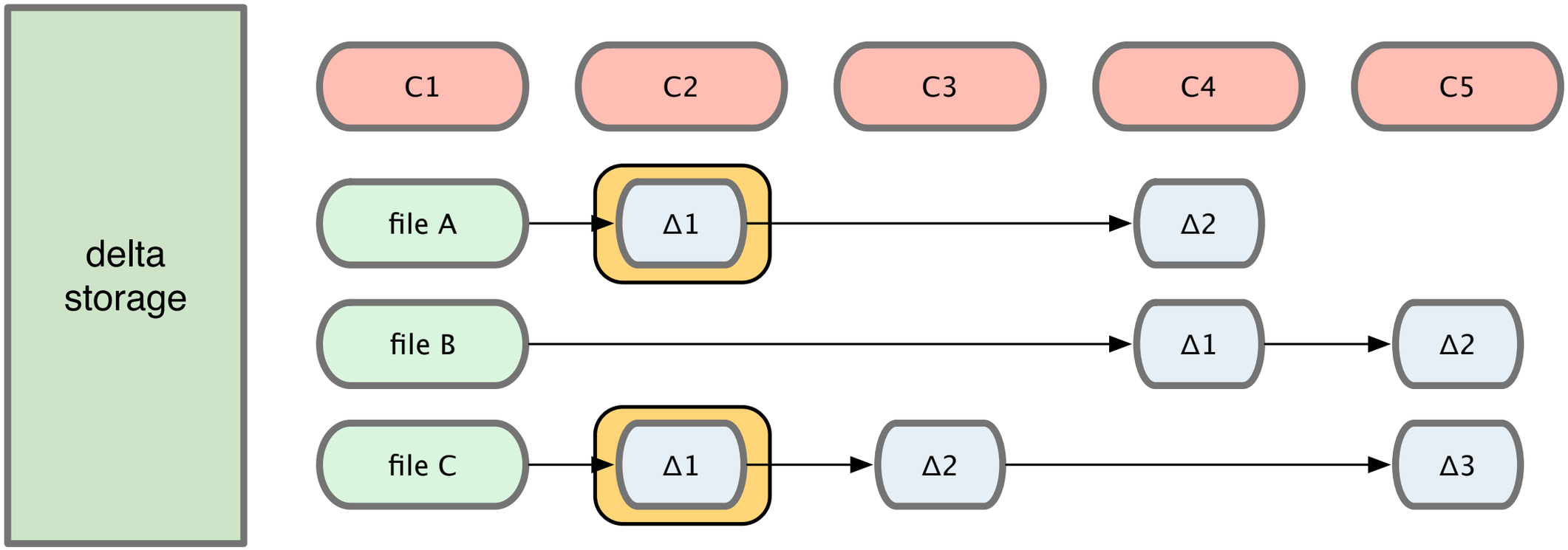
file B → Δ1 → Δ2

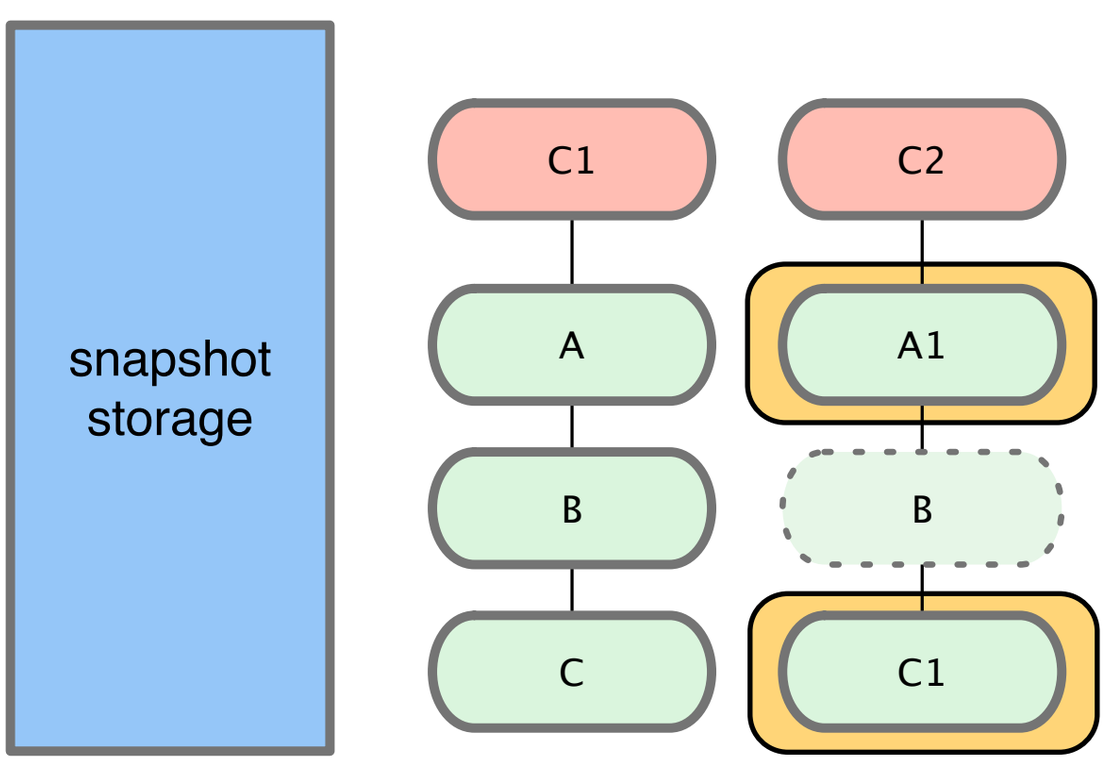
file C → Δ1 → Δ2 → Δ3

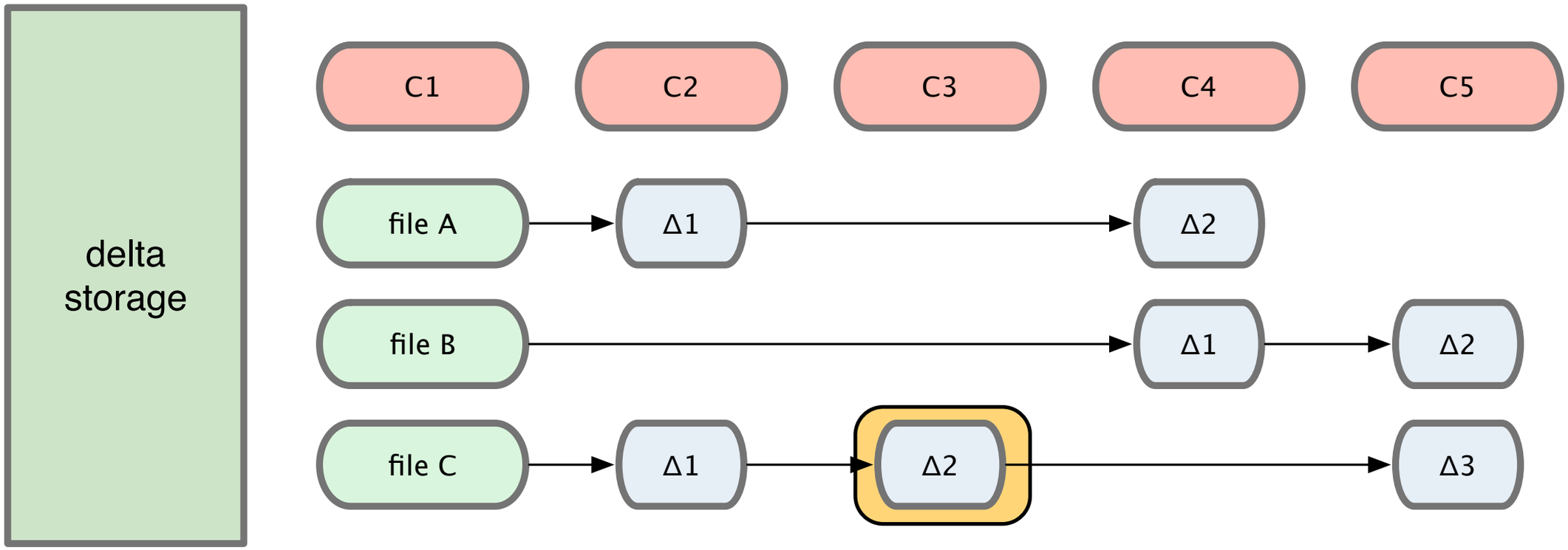
snapshot storage

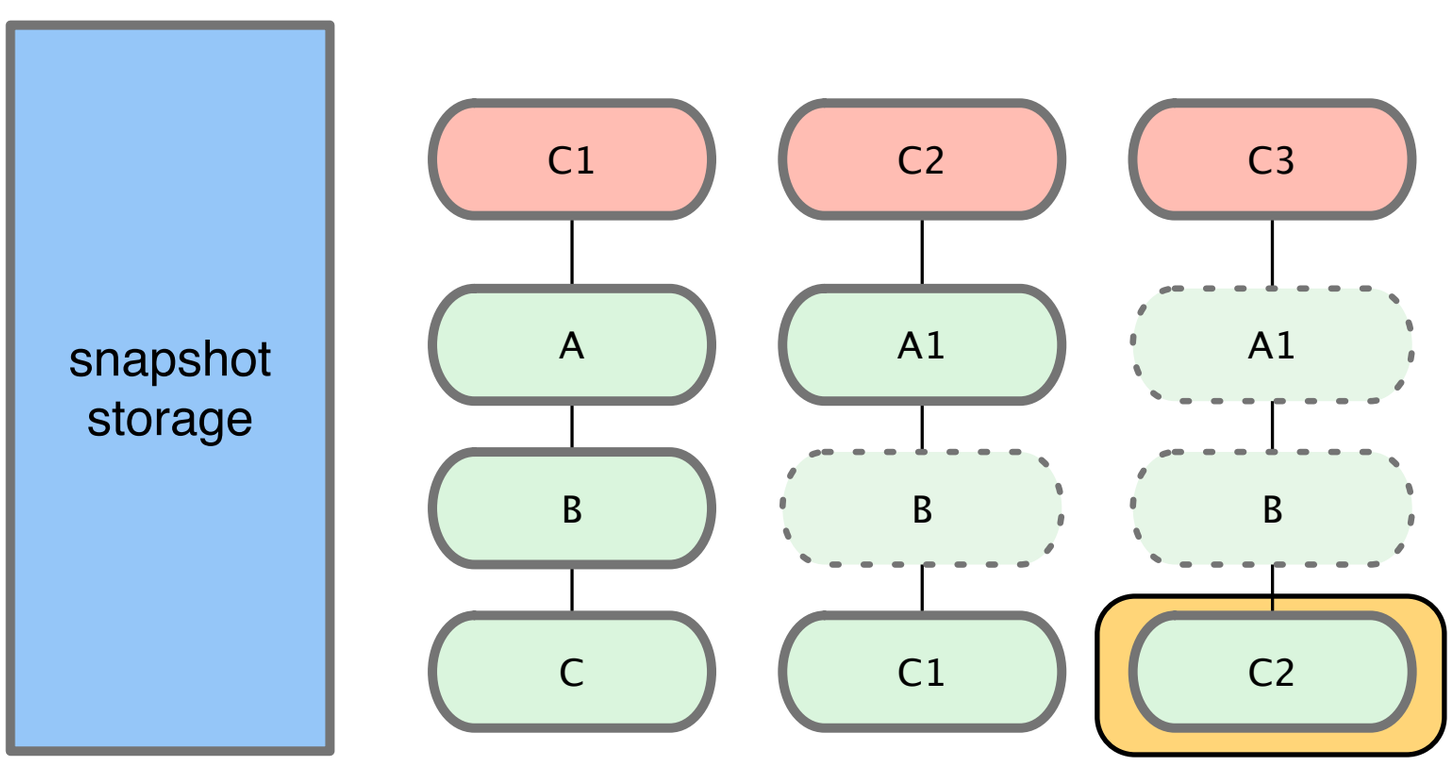

delta
storage
C1
C2
C3
C4
C5
file A
Δ1
Δ2
file B
Δ1
Δ2
file C
Δ1
Δ2
Δ3


snapshot
storage
C1
A
B
C

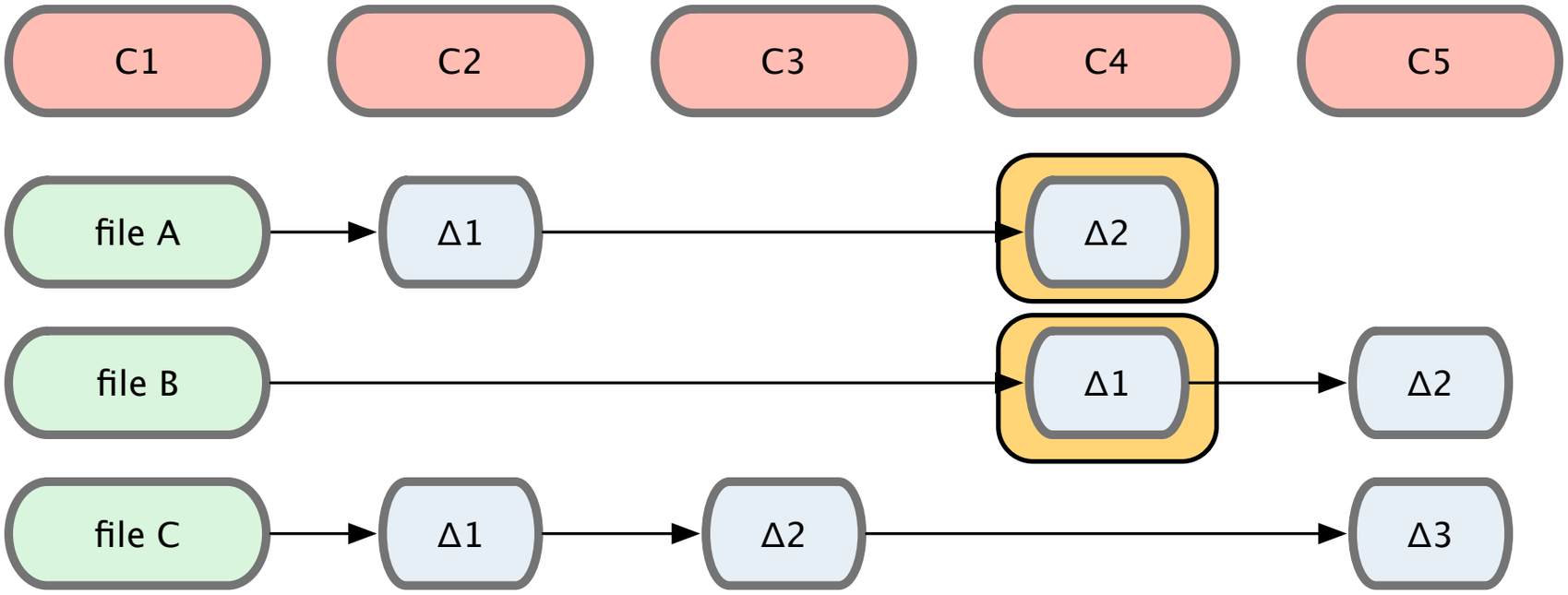

delta
storage
C1
C2
C3
C4
C5
file A
Δ1
Δ2
file B
Δ1
Δ2
file C
Δ1
Δ2
Δ3


snapshot
storage
C1
C2
A
A1
B
B
C
C1

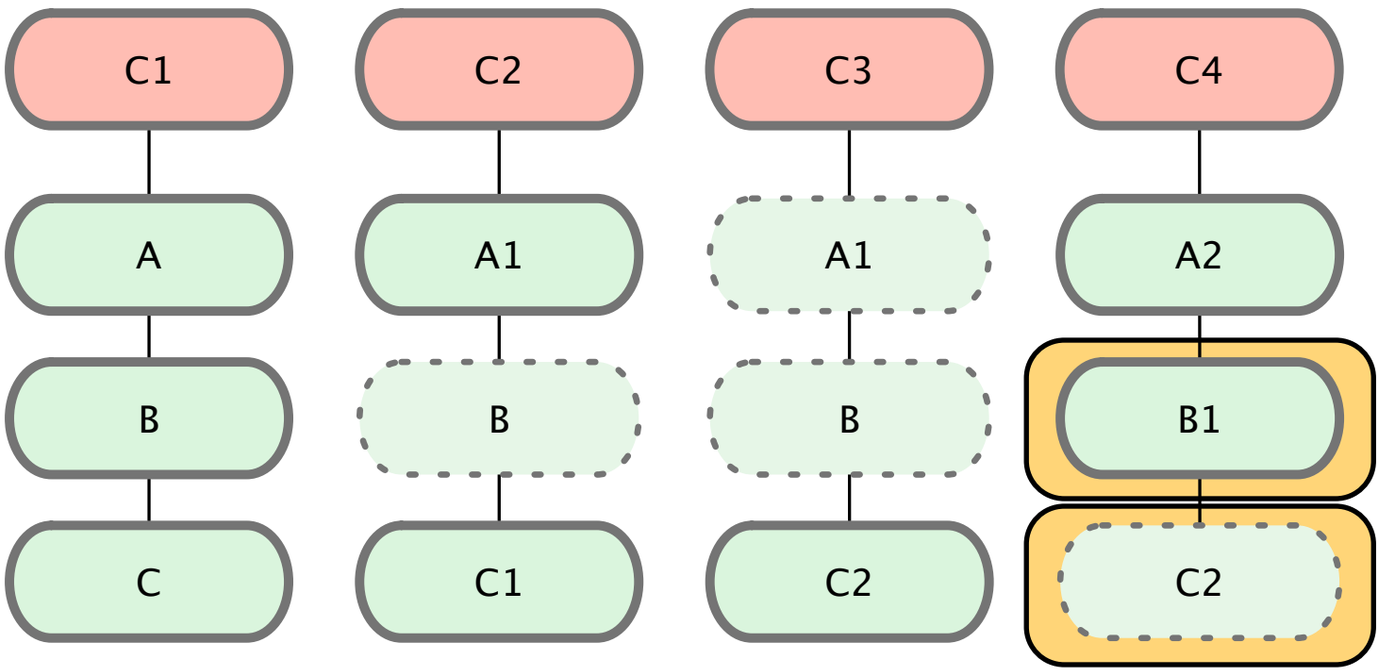

delta
storage
C1
C2
C3
C4
C5
file A
Δ1
Δ2
file B
Δ1
Δ2
file C
Δ1
Δ2
Δ3

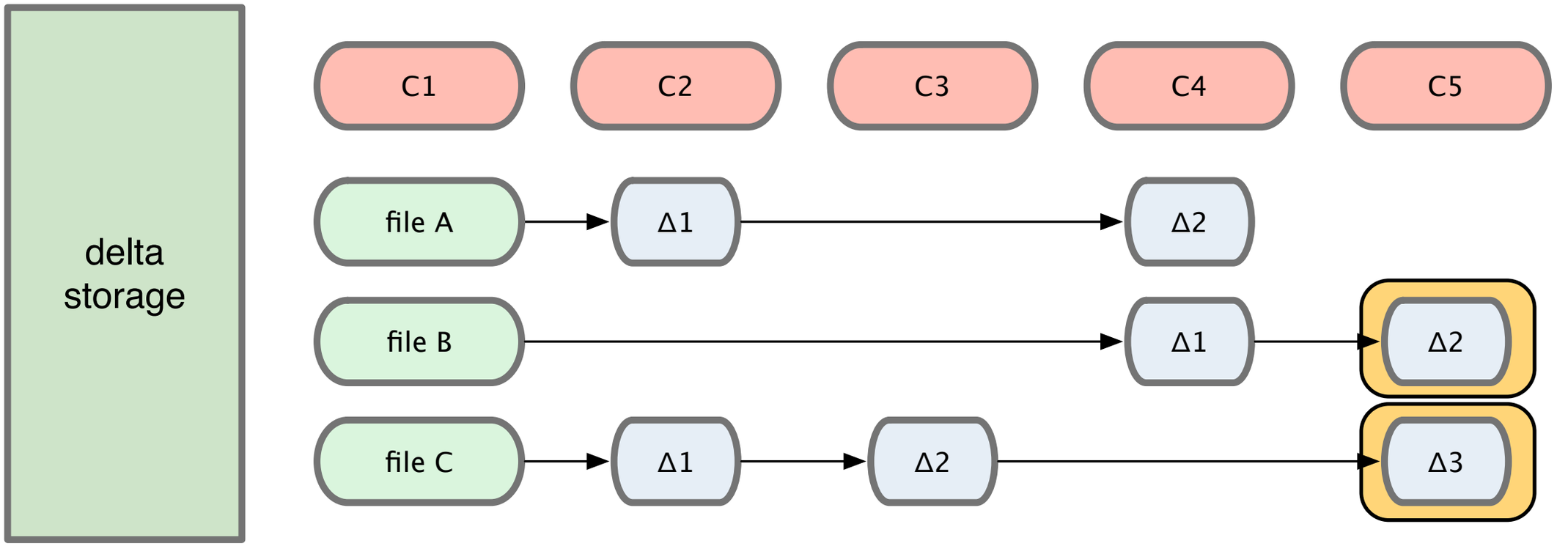

snapshot
storage
C1
A
B
C
C2
A1
B
C1
C3
A1
B
C2

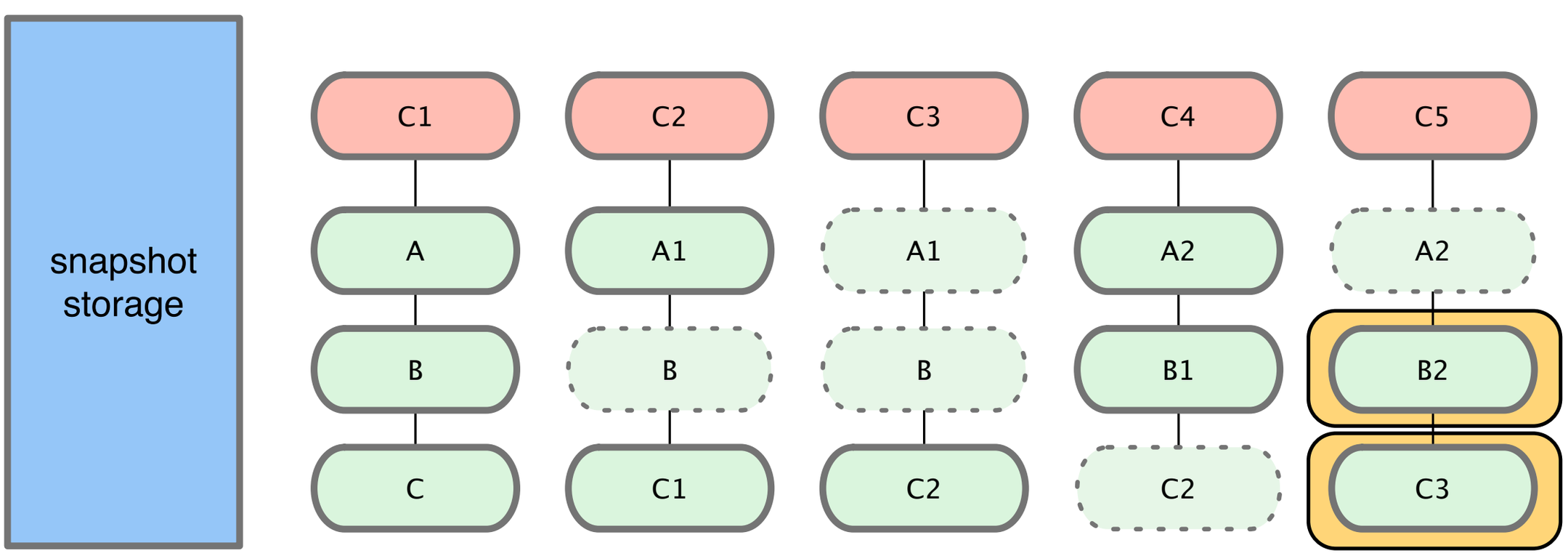
delta storage



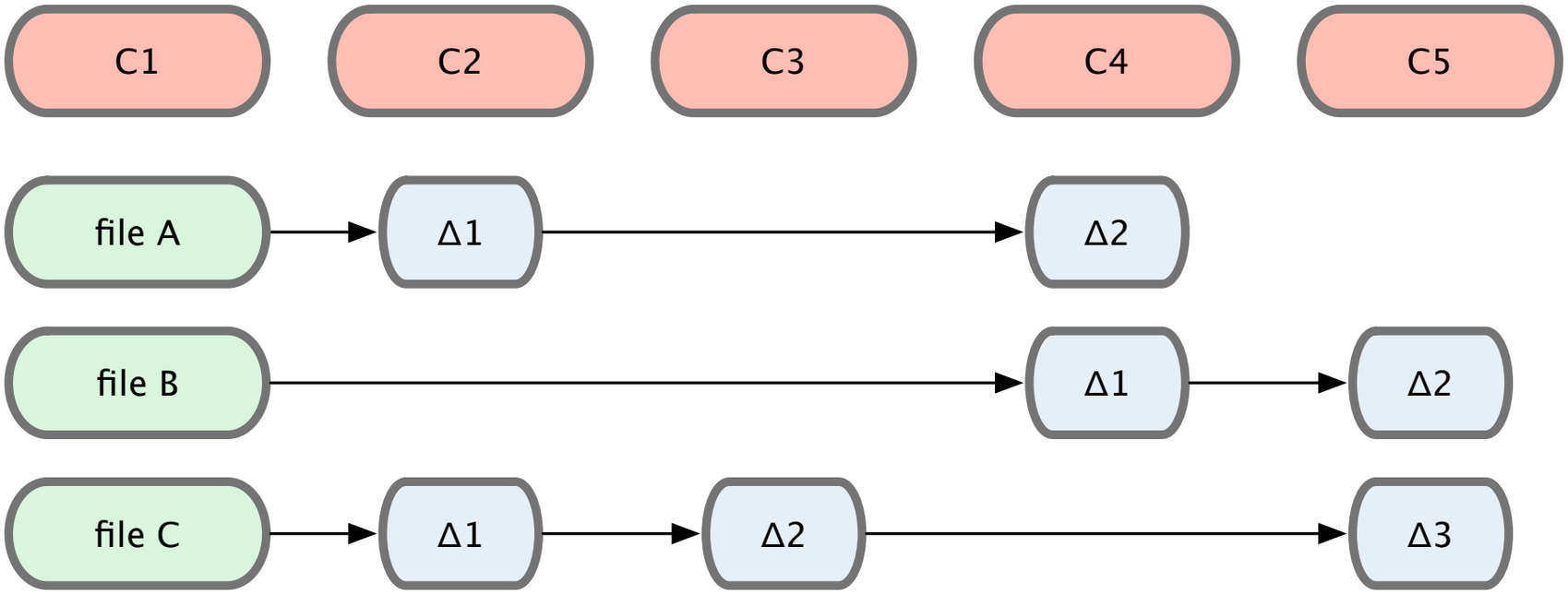
snapshot storage



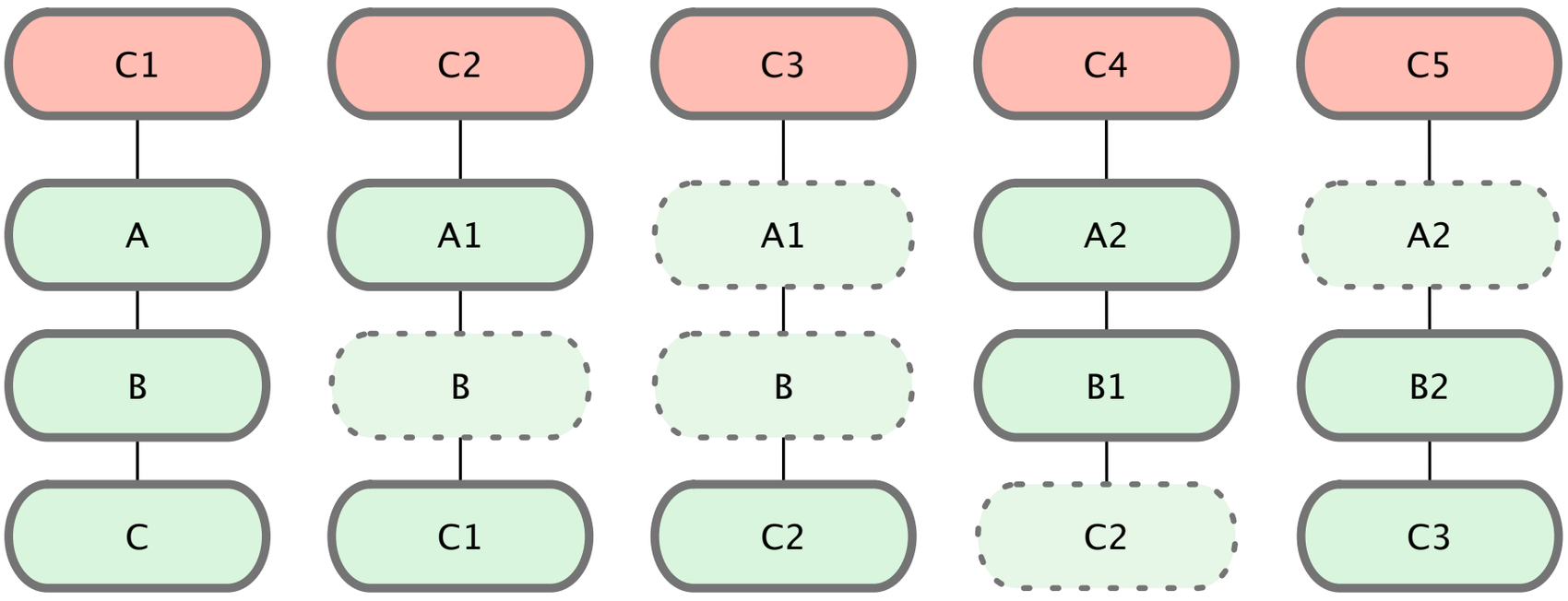

delta
storage
C1
C2
C3
C4
C5
file A
Δ1
Δ2
file B
Δ1
Δ2
file C
Δ1
Δ2
Δ3


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

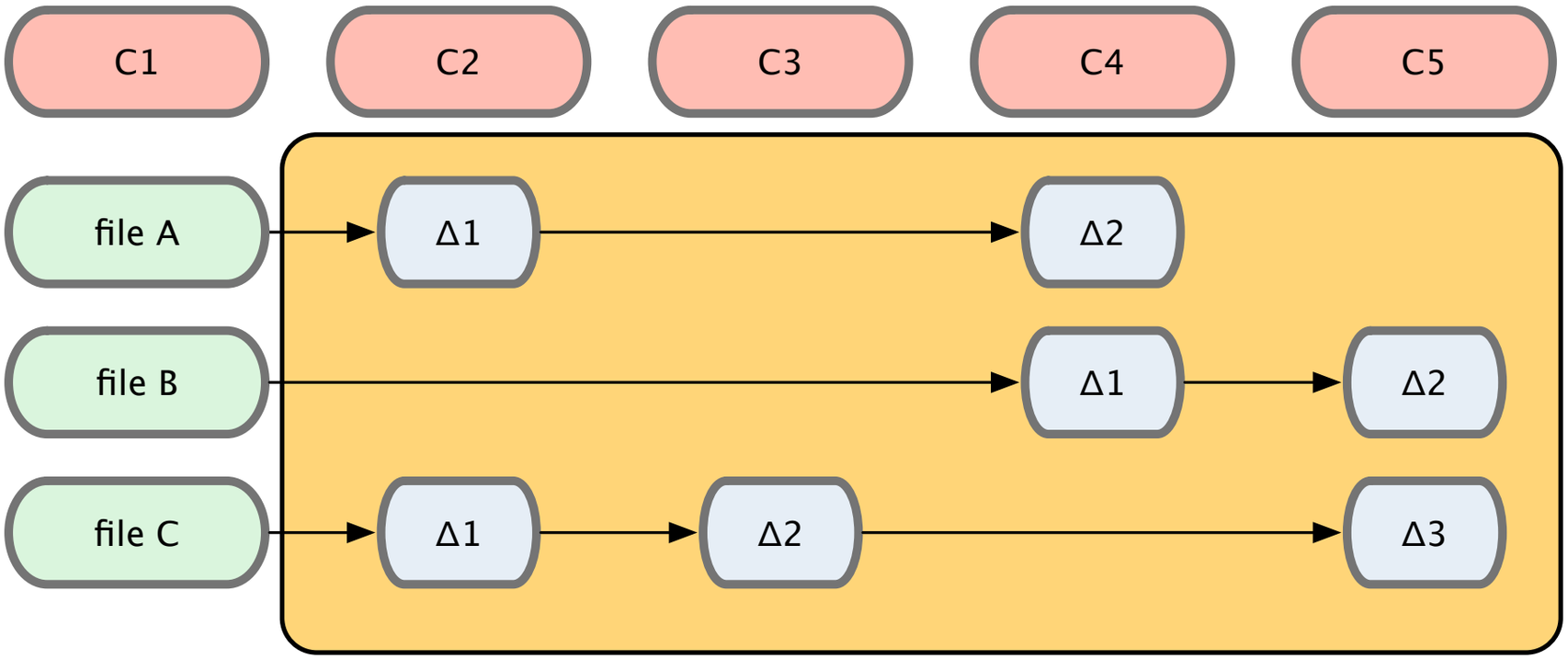
delta storage



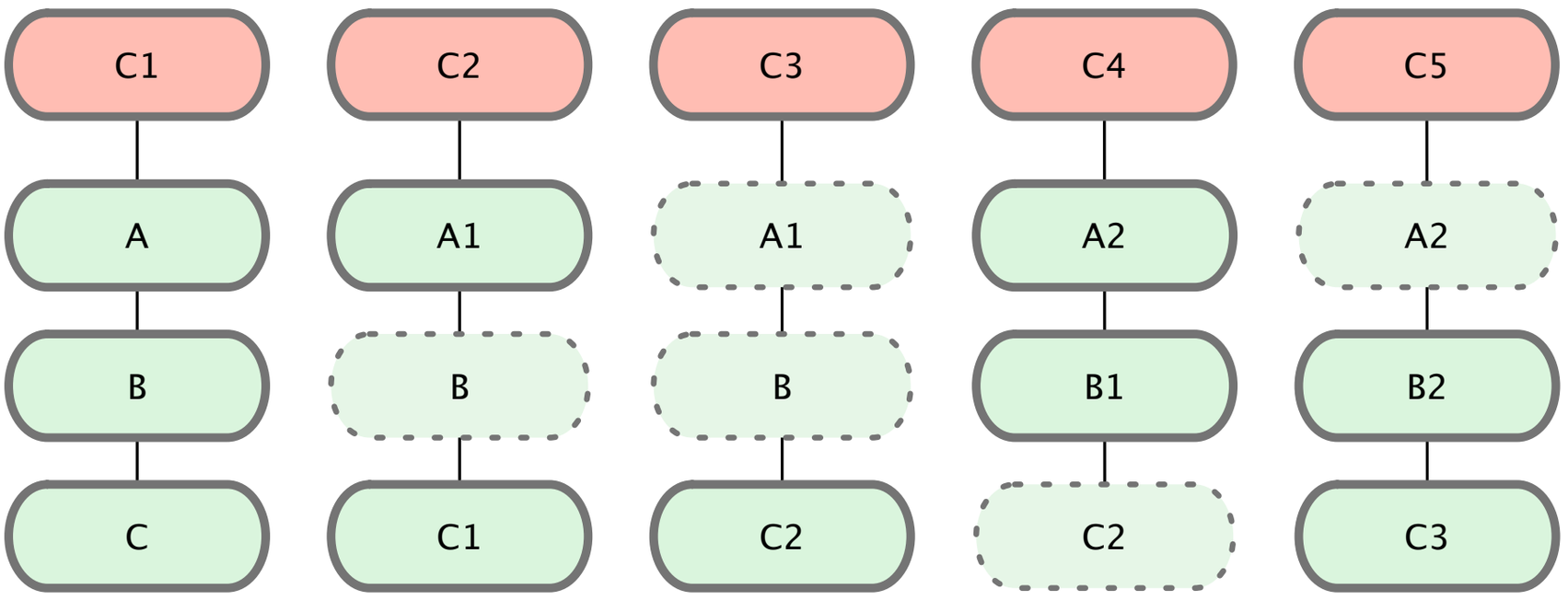
snapshot storage



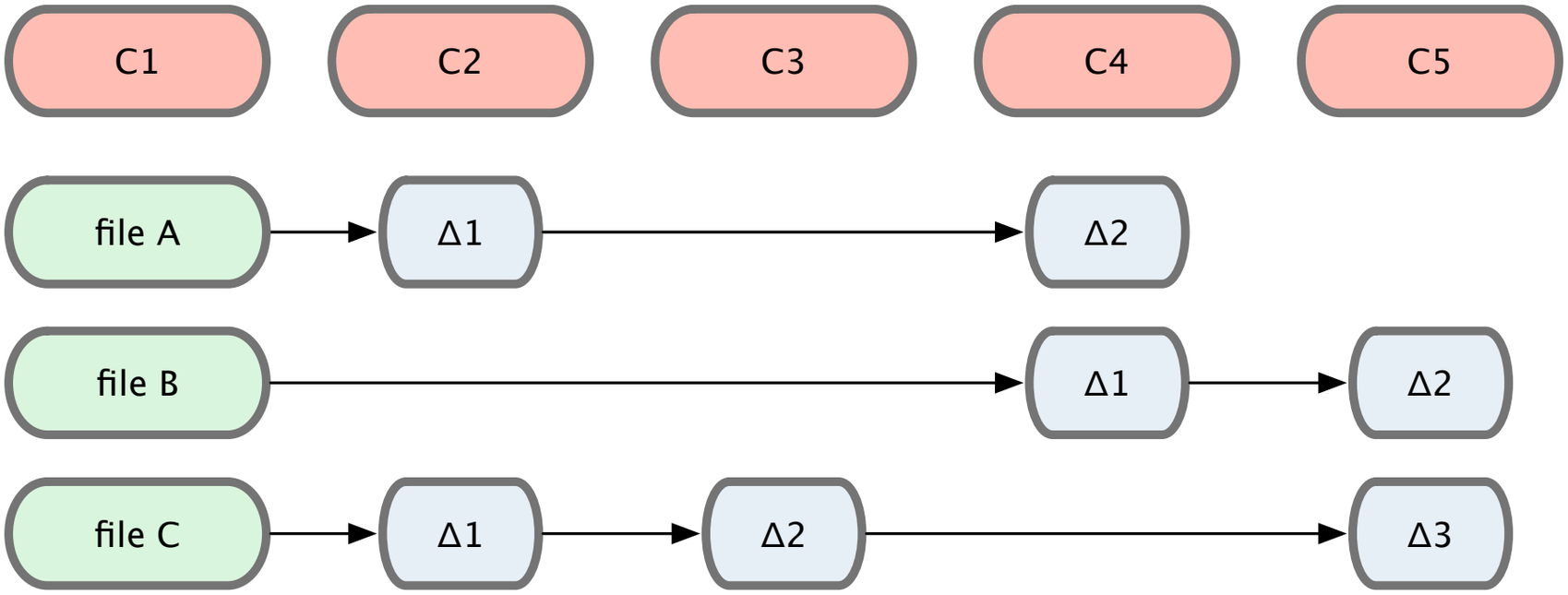
delta storage



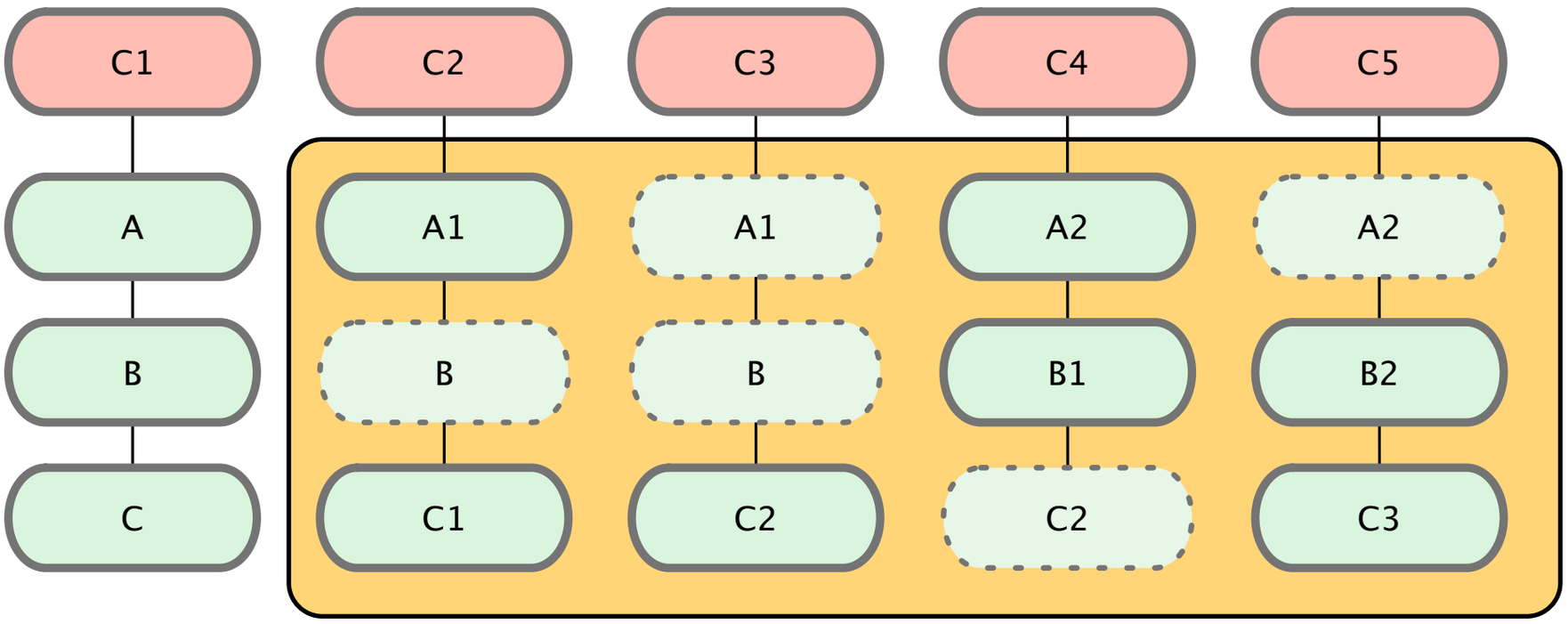
snapshot storage



delta storage



snapshot storage



How is this Different Than {cvs|svn|p4}?

Git Ist Schnell!

No Network Needed

No Network Needed

Performing a diff

No Network Needed

Performing a diff

Viewing file history

No Network Needed

Performing a diff

Viewing file history

Committing changes

No Network Needed

Performing a diff

Viewing file history

Committing changes

Merging branches

No Network Needed

Performing a diff

Viewing file history

Committing changes

Merging branches

Obtaining any other revision of a file

No Network Needed

Performing a diff

Viewing file history

Committing changes

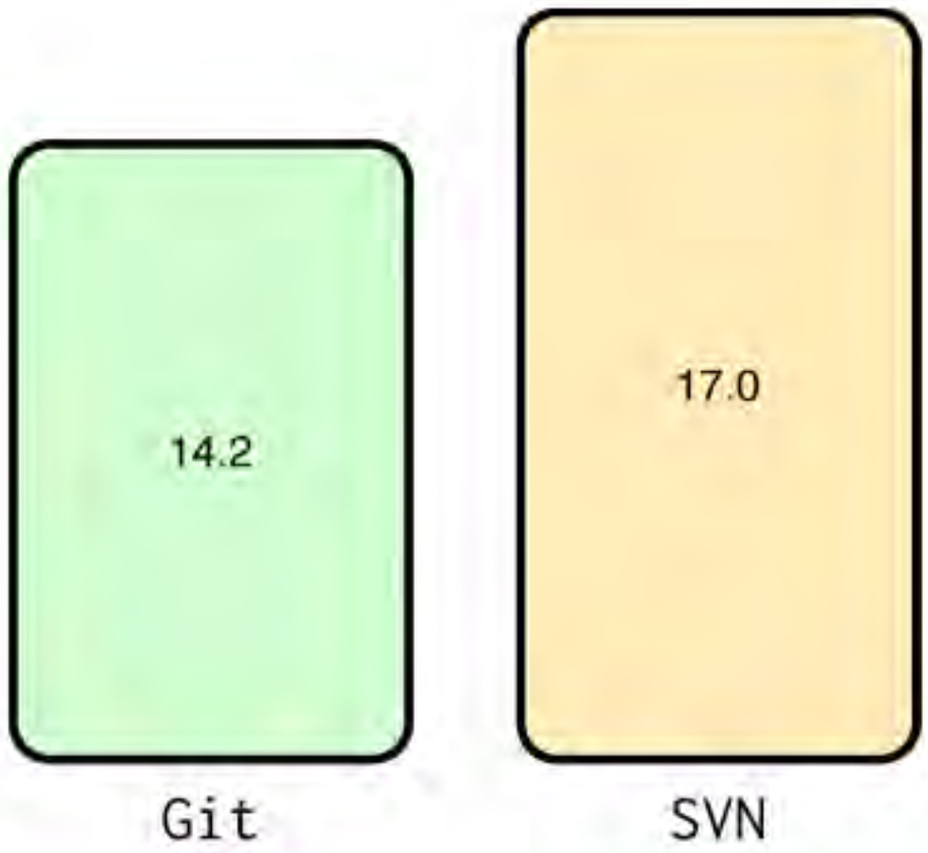
Merging branches

Obtaining any other revision of a file

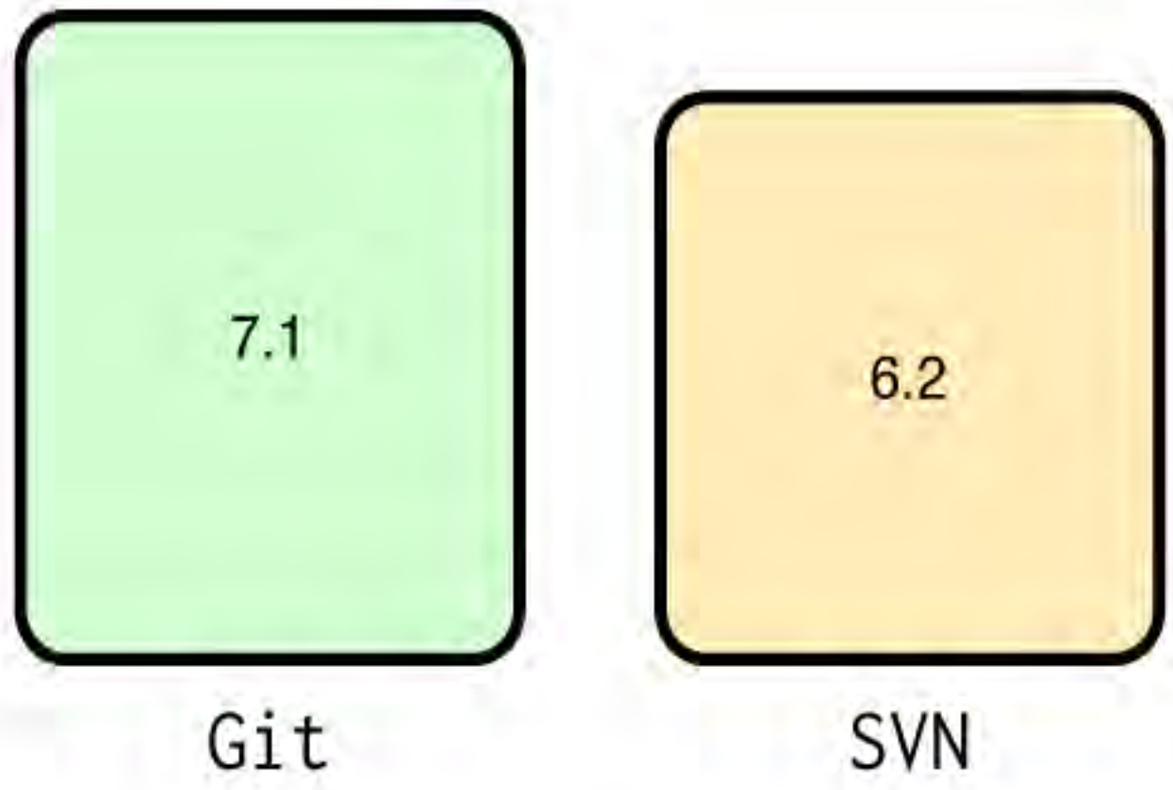
Switching branches

jQuery tests

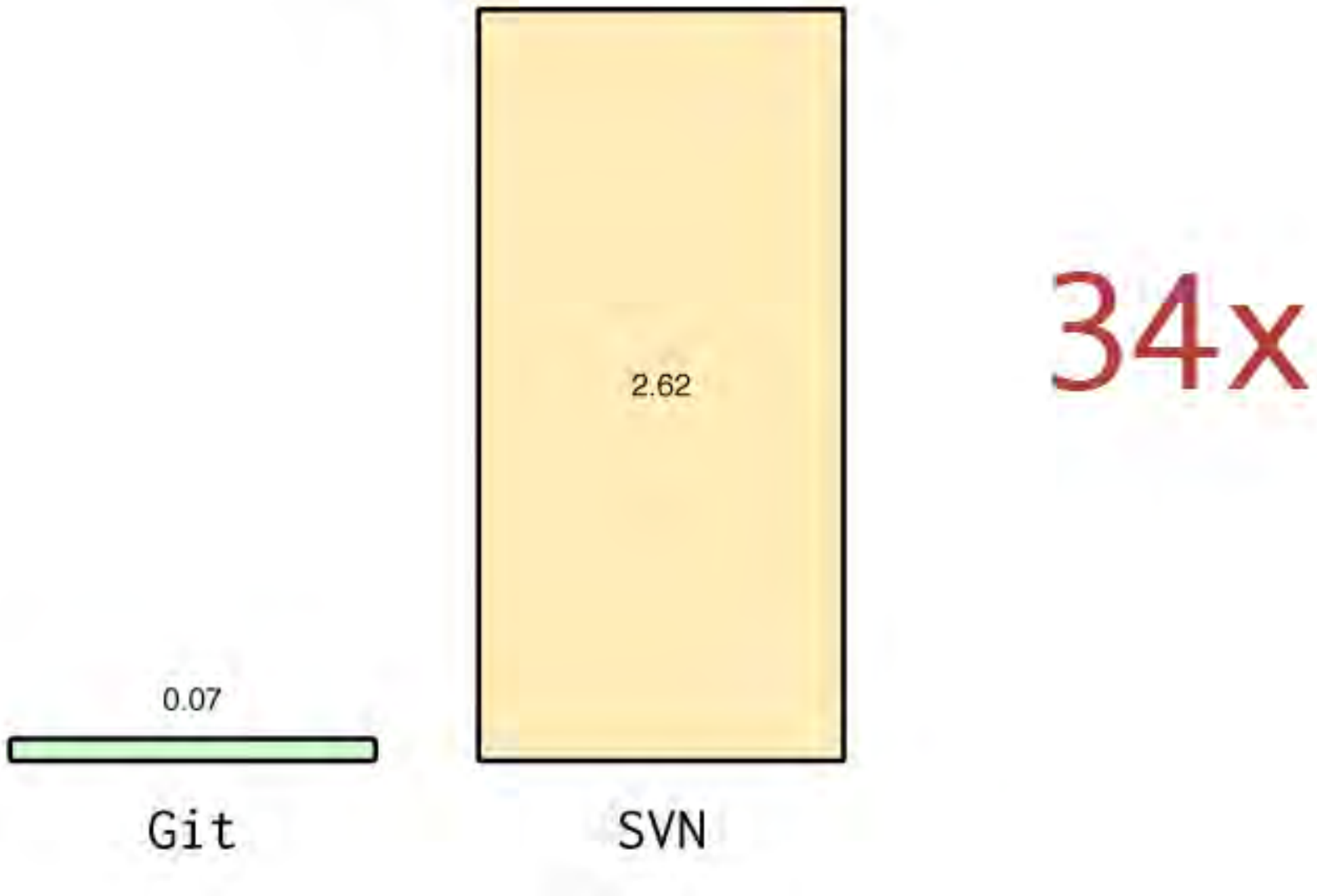
Clone/Checkout

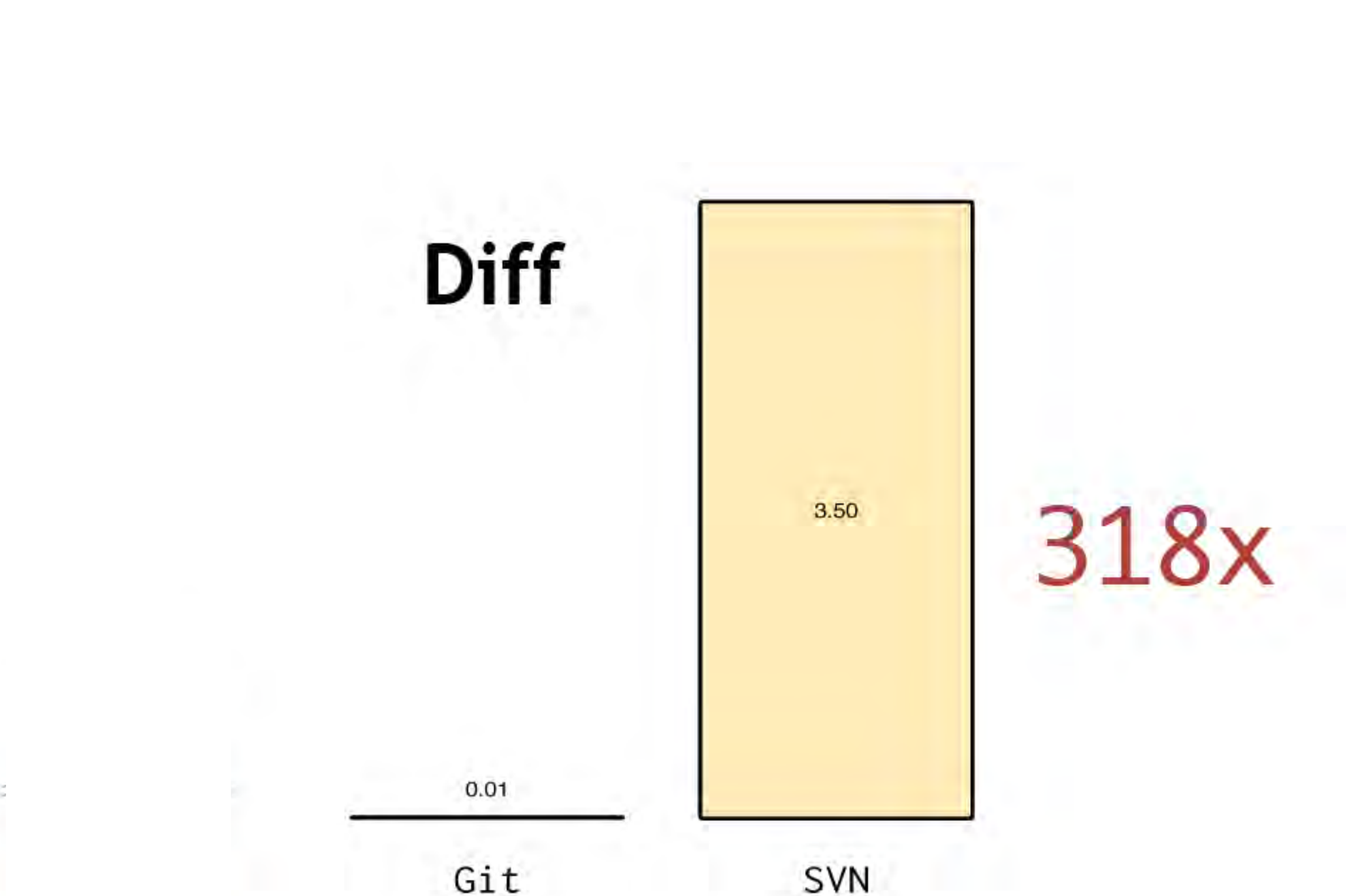


Size

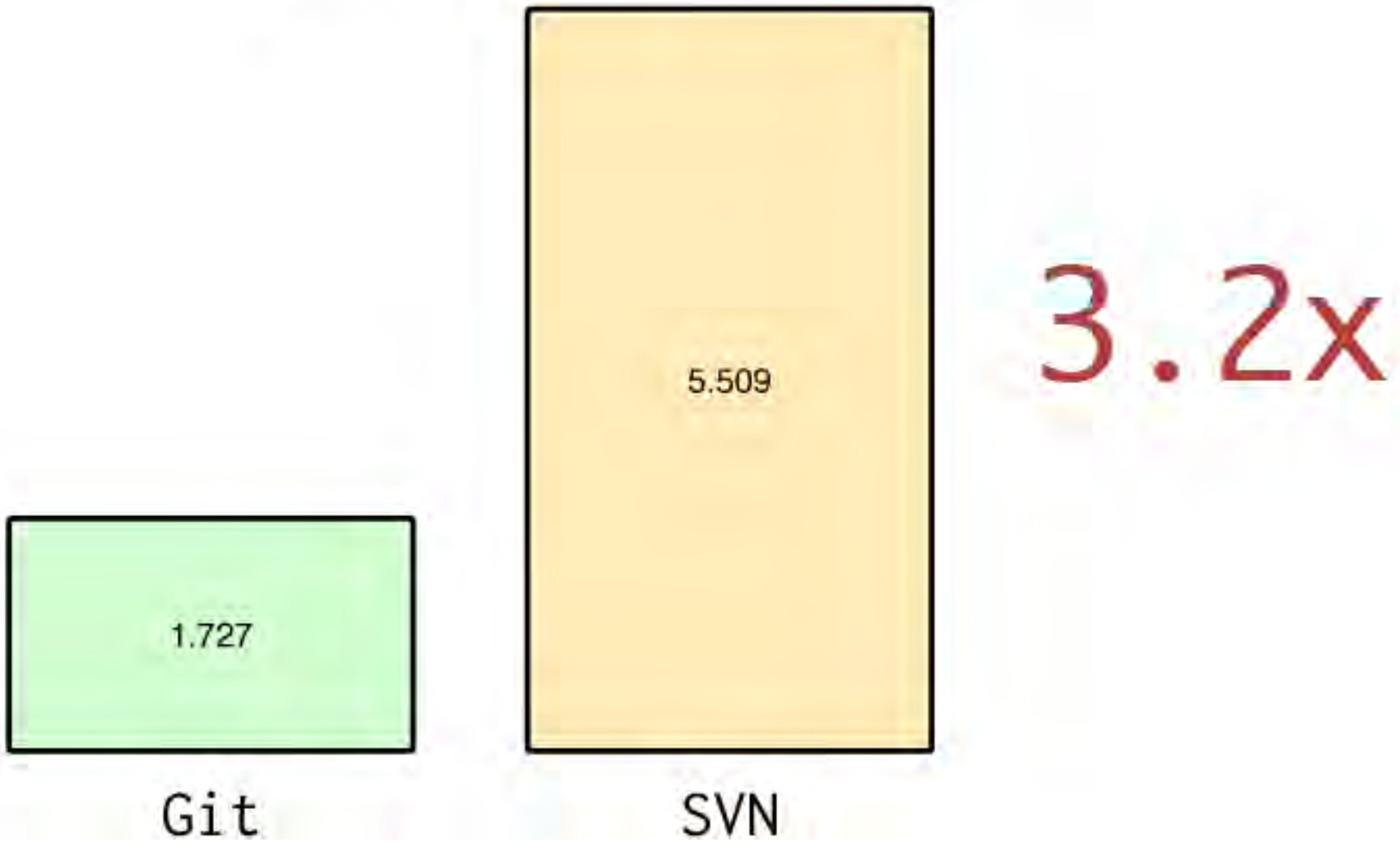


Log



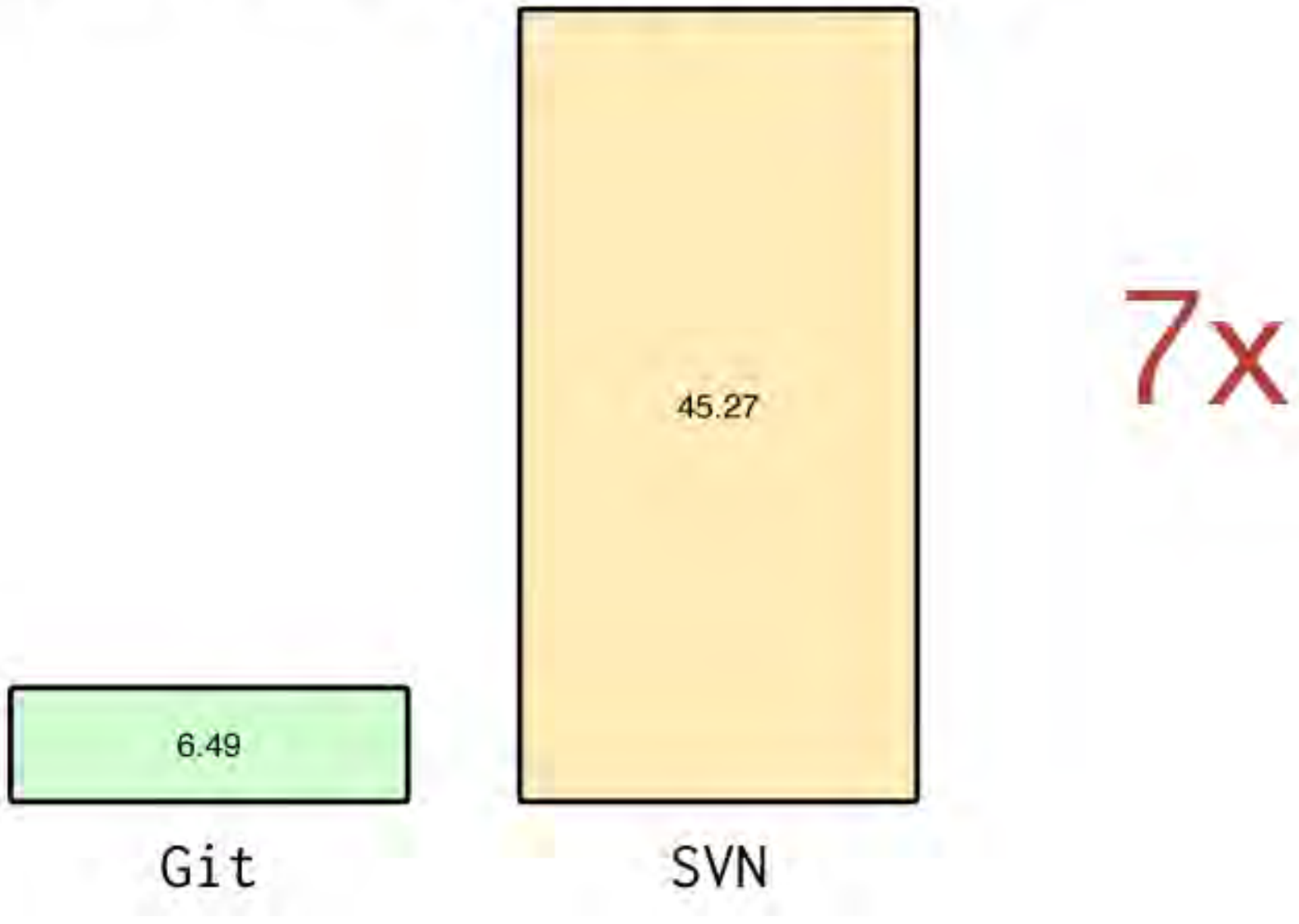

Diff
3.50
318x
0.01
Git
SVN

Commit



3.2x

Substantial Commit



Work Offline

No .svn Directories

Cheap Branching

```
$ du -h testrepo/
 78M testrepo/
```

```
$ du -h testrepo/
 78M testrepo/
$ cd testrepo/
```

```
$ du -h testrepo/
 78M testrepo/
$ cd testrepo/
$ time git checkout -b newbranch
```

```
$ du -h testrepo/
 78M testrepo/
$ cd testrepo/
$ time git checkout -b newbranch
Switched to a new branch "newbranch"

real 0m0.091s
user 0m0.016s
sys  0m0.023s
```

```
$ du -h testrepo/
 78M testrepo/
$ cd testrepo/
$ time git checkout -b newbranch
Switched to a new branch "newbranch"

real 0m0.091s
user 0m0.016s
sys  0m0.023s
```

```
$ time cp -Rf testrepo r2

real	0m13.684s
user	0m0.085s
sys	0m1.215s
```

Easy Merging

How Do I Use Git?

First Steps

```
$ git config --global user.name “Scott Chacon”
$ git config --global user.email “schacon@gmail.com”
```

Getting A Repo

```
git init
```

```
$ touch hello_world.rb
```

```
$ touch hello_world.rb
$ git init
```

```
$ tree -a
.
|-- .git
|   |-- HEAD
|   |-- branches
|   |-- config
|   |-- description
|   |-- hooks
|   |   |-- post-commit.sample
|   |   |-- post-receive.sample
|   |   |-- ...
|   |   |-- pre-rebase.sample
|   |   `-- update.sample
|   |-- info
|   |   `-- exclude
|   |-- objects
|   |   |-- info
|   |   `-- pack
|   |-- refs
|   |   |-- heads
|   |   `-- tags
|   `-- remotes
`-- hello_world.rb

11 directories, 25 files
```

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$ tree -a
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|   |-- config
|   |-- description
|   |-- hooks
|   |   |-- post-commit.sample
|   |   |-- post-receive.sample
|   |   |-- ...
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|   |   |-- info
|   |   `-- pack
|   |-- refs
|   |   |-- heads
|   |   `-- tags
|   `-- remotes
`-- hello_world.rb

11 directories, 25 files
```

git clone

```
$ git clone
```

```
$ git clone git://github.com/schacon/grit.git
```

```
$ git clone git://github.com/schacon/grit.git mygrit
```

```
$ git clone git://github.com/schacon/grit.git mygrit
Initialized empty Git repository in /home/schacon/mygrit/.git/
remote: Counting objects: 3220, done.
remote: Compressing objects: 100% (2093/2093), done.
remote: Total 3220 (delta 1134), reused 3149 (delta 1081)
Receiving objects: 100% (3220/3220), 1.79 MiB | 357 KiB/s, done.
Resolving deltas: 100% (1134/1134), done.
```

```
$ git clone git://github.com/schacon/grit.git mygrit
Initialized empty Git repository in /home/schacon/mygrit/.git/
remote: Counting objects: 3220, done.
remote: Compressing objects: 100% (2093/2093), done.
remote: Total 3220 (delta 1134), reused 3149 (delta 1081)
Receiving objects: 100% (3220/3220), 1.79 MiB | 357 KiB/s, done.
Resolving deltas: 100% (1134/1134), done.

$ cd mygrit
$
```

```
$ git clone git://github.com/schacon/grit.git mygrit
Initialized empty Git repository in /home/schacon/mygrit/.git/
remote: Counting objects: 3220, done.
remote: Compressing objects: 100% (2093/2093), done.
remote: Total 3220 (delta 1134), reused 3149 (delta 1081)
Receiving objects: 100% (3220/3220), 1.79 MiB | 357 KiB/s, done.
Resolving deltas: 100% (1134/1134), done.

$ cd mygrit
$ ls
API.txt      Manifest.txt README.txt   benchmarks.rb   examples  lib
History.txt  PURE_TODO Rakefile  benchmarks.txt  grit.gemspec test
$
```

The Git Directory

```
git init
```

```
$ tree -a
.
|-- .git
|   |-- HEAD
|   |-- branches
|   |-- config
|   |-- description
|   |-- hooks
|   |   |-- post-commit.sample
|   |   |-- post-receive.sample
|   |   |-- ...
|   |   |-- pre-rebase.sample
|   |   `-- update.sample
|   |-- info
|   |   `-- exclude
|   |-- objects
|   |   |-- info
|   |   `-- pack
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|   `-- remotes
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11 directories, 25 files
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|   |-- HEAD
|   |-- branches
|   |-- config
|   |-- description
|   |-- hooks
|   |   |-- post-commit.sample
|   |   |-- post-receive.sample
|   |   |-- ...
|   |   |-- pre-rebase.sample
|   |   `-- update.sample
|   |-- info
|   |   `-- exclude
|   |-- objects
|   |   |-- info
|   |   `-- pack
|   |-- refs
|   |   |-- heads
|   |   `-- tags
|   `-- remotes
`-- hello_world.rb

11 directories, 25 files
```

Areas of Interest

```
$ tree -a
.
|-- .git
|   |-- HEAD
|   |-- branches
|   |-- config
|   |-- description
|   |-- hooks
|   |   |-- post-commit.sample
|   |   |-- post-receive.sample
|   |   |-- ...
|   |   |-- pre-rebase.sample
|   |   `-- update.sample
|   |-- info
|   |   `-- exclude
|   |-- objects
|   |   |-- info
|   |   `-- pack
|   |-- refs
|   |   |-- heads
|   |   `-- tags
|   `-- remotes
`-- hello_world.rb

11 directories, 25 files
```

/etc/gitconfig

/etc/gitconfig

~/.gitconfig

/etc/gitconfig

~/.gitconfig

.git/config

```
$ tree -a
.
|-- .git
|   |-- HEAD
|   |-- branches
|   |-- config
|   |-- description
|   |-- hooks
|   |   |-- post-commit.sample
|   |   |-- post-receive.sample
|   |   |-- ...
|   |   |-- pre-rebase.sample
|   |   `-- update.sample
|   |-- info
|   |   `-- exclude
|   |-- objects
|   |   |-- info
|   |   `-- pack
|   |-- refs
|   |   |-- heads
|   |   `-- tags
|   `-- remotes
`-- hello_world.rb

11 directories, 25 files
```

```
$ tree -a
.
|-- .git
|   |-- HEAD
|   |-- branches
|   |-- config
|   |-- description
|   |-- hooks
|   |   |-- post-commit.sample
|   |   |-- post-receive.sample
|   |   |-- ...
|   |   |-- pre-rebase.sample
|   |   `-- update.sample
|   |-- info
|   |   `-- exclude
|   |-- objects
|   |   |-- info
|   |   `-- pack
|   |-- refs
|   |   |-- heads
|   |   `-- tags
|   `-- remotes
`-- hello_world.rb

11 directories, 25 files
```

```
$ tree -a
.
|-- .git
|   |-- HEAD
|   |-- branches
|   |-- config
|   |-- description
|   |-- hooks
|   |   |-- post-commit.sample
|   |   |-- post-receive.sample
|   |   |-- ...
|   |   |-- pre-rebase.sample
|   |   `-- update.sample
|   |-- info
|   |   `-- exclude
|   |-- objects
|   |   |-- info
|   |   `-- pack
|   |-- refs
|   |   |-- heads
|   |   `-- tags
|   `-- remotes
`-- hello_world.rb

11 directories, 25 files
```

```
$ touch hello_world.rb
$ git init
$ git add .
```

```
$ touch hello_world.rb
$ git init
$ git add .
$ git commit -m ‘first commit’
```

```
$ tree -a
.
|-- .git
|   |-- COMMIT_EDITMSG
|   |-- HEAD
|   |-- branches
|   |-- config
|   |-- description
|   |-- hooks
|   |   |-- applypatch-msg.sample
|   |   `-- update.sample
|   |-- index
|   |-- info
|   |   `-- exclude
|   |-- logs
|   |   |-- HEAD
|   |   `-- refs
|   |       `-- heads
|   |           `-- master
|   |-- objects
|   |   |-- 32/09658ac8d80bc9726d3a33d77e3dfc5fe6035e
|   |   |-- 53/9cd7886a627841d525a78d45cbc6396be20b41
|   |   |-- e6/9de29bb2d1d6434b8b29ae775ad8c2e48c5391
|   |   |-- info
|   |   `-- pack
|   |-- refs
|   |   |-- heads
|   |   |   `-- master
|   |   `-- tags
|   `-- remotes
`-- hello_world.rb

17 directories, 33 files
```

```
$ tree -a
.
|-- .git
|   |-- COMMIT_EDITMSG
|   |-- HEAD
|   |-- branches
|   |-- config
|   |-- description
|   |-- hooks
|   |   |-- applypatch-msg.sample
|   |   `-- update.sample
|   |-- index
|   |-- info
|   |   `-- exclude
|   |-- logs
|   |   |-- HEAD
|   |   `-- refs
|   |       `-- heads
|   |           `-- master
|   |-- objects
|   |   |-- 32/09658ac8d80bc9726d3a33d77e3dfc5fe6035e
|   |   |-- 53/9cd7886a627841d525a78d45cbc6396be20b41
|   |   |-- e6/9de29bb2d1d6434b8b29ae775ad8c2e48c5391
|   |   |-- info
|   |   `-- pack
|   |-- refs
|   |   |-- heads
|   |   |   `-- master
|   |   `-- tags
|   `-- remotes
`-- hello_world.rb

17 directories, 33 files
```

```
$ tree -a
.
|-- .git
|   |-- COMMIT_EDITMSG
|   |-- HEAD
|   |-- branches
|   |-- config
|   |-- description
|   |-- hooks
|   |   |-- applypatch-msg.sample
|   |   `-- update.sample
|   |-- index
|   |-- info
|   |   `-- exclude
|   |-- logs
|   |   |-- HEAD
|   |   `-- refs
|   |       `-- heads
|   |           `-- master
|   |-- objects
|   |   |-- 32/09658ac8d80bc9726d3a33d77e3dfc5fe6035e
|   |   |-- 53/9cd7886a627841d525a78d45cbc6396be20b41
|   |   |-- e6/9de29bb2d1d6434b8b29ae775ad8c2e48c5391
|   |   |-- info
|   |   `-- pack
|   |-- refs
|   |   |-- heads
|   |   |   `-- master
|   |   `-- tags
|   `-- remotes
`-- hello_world.rb

17 directories, 33 files
```

A Basic Workflow

A Basic Workflow

Edit files

Stage the changes

Review your changes

Commit the changes

working directory

index

repository

working directory

a working copy
of your project

index

repository

working directory

index

object database

repository

working directory

index

“staging”

repository

A Basic Workflow

Edit files

Stage the changes

Review your changes

Commit the changes

$

```
$ find .
```

```
$ find .
./app.yaml
./index.yaml
./main.py
```

$

```
$ vim main.py
```

$ vim main.py

```
#!/usr/bin/env python
import wsgiref.handlers
from google.appengine.ext import webapp

class MainHandler(webapp.RequestHandler):

  def get(self):
    self.response.out.write('Hello world!')

def main():
  application = webapp.WSGIApplication([('/', MainHandler)],
                                       debug=True)
  wsgiref.handlers.CGIHandler().run(application)

if __name__ == '__main__':
  main()
~
~
"main.py" 16L, 402C
```

$ vim main.py

```
#!/usr/bin/env python
import wsgiref.handlers
from google.appengine.ext import webapp

# this program prints out ‘hello world’

class MainHandler(webapp.RequestHandler):
  def get(self):
    self.response.out.write('Hello world!')

def main():
  application = webapp.WSGIApplication([('/', MainHandler)],
                                       debug=True)
  wsgiref.handlers.CGIHandler().run(application)

if __name__ == '__main__':
  main()
~
~
"main.py" 16L, 402C
```

```
$ git status
```

```
$ git status

# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what
#
#       modified:   main.py
#
no changes added to commit (use "git add" ar
```

```
$ git status

# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what
#
#       modified:   main.py
#
no changes added to commit (use "git add" ar
```

```
$ git status

# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what
#
#       modified:   main.py
#
no changes added to commit (use "git add" ar
```

```
$ git status

# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what
#
#       modified:   main.py
#
no changes added to commit (use "git add" ar
```

```
$ git status

# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what
#
# modified:   main.py
#
no changes added to commit (use "git add" ar
```

```
$ git status

# On branch master
# Changed but not updated:
#   (use "git add <file>..." to update what
#
# modified:   main.py
#
no changes added to commit (use "git add" ar
```

```
$ git status

# On branch master
# Changed but not STAGED:
#   (use "git add <file>..." to update what
#
#	modified:   main.py
#
no changes added to commit (use "git add" ar
```

```
$ git status

# On branch master
# Changed but not STAGED:
#   (use "git add <file>..." to update what
#
#	modified:   main.py
#
no changes added to commit (use "git add" ar
```

A Basic Workflow

Edit files

Stage the changes

Review your changes

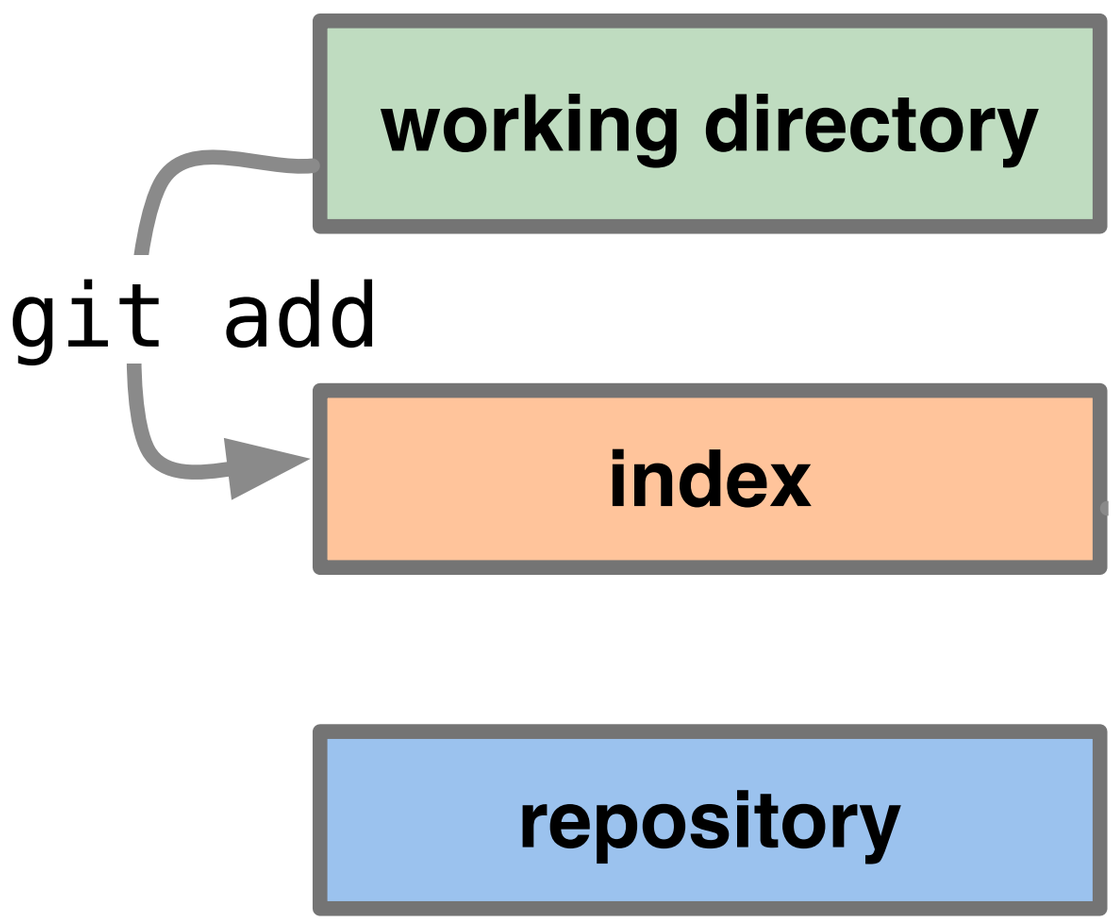
Commit the changes

git add

working directory

index

repository


working directory
git add
index
repository

$

```
$ git add main.py
```

```
$ git add main.py
$ git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>
#
#modified:   main.py
#
```

```
$ git add main.py
$ git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>
#
#modified:   main.py
#
```

```
$ git add main.py
$ git status
# On branch master
# Changes THAT ARE STAGED :
#   (use "git reset HEAD <file>
#
#modified:   main.py
#
```

$

```
$ vim app.yaml
```

```
$ vim app.yaml

application: chacon
version: 1
runtime: python
api_version: 1

handlers:
- url: .*
  script: main.py
~
~
~
"app.yaml" 8L, 101C
```

```
$ vim app.yaml

application: chacon
version: 
runtime: python
api_version: 1

handlers:
- url: .*
  script: main.py
~
~
~
"app.yaml" 8L, 101C
```

```
$ vim app.yaml

application: chacon
version: 2
runtime: python
api_version: 1

handlers:
- url: .*
  script: main.py
~
~
~
"app.yaml" 8L, 101C
```

$

```
$ git status
```

$ git status

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

$

```
$ vim main.py
```

$ vim main.py

```
#!/usr/bin/env python
import wsgiref.handlers
from google.appengine.ext import webapp

# this program prints out ‘hello world’

class MainHandler(webapp.RequestHandler):

  def get(self):
    self.response.out.write('Hello world!')

def main():
  application = webapp.WSGIApplication([('/', MainHandler)],
                                       debug=True)
  wsgiref.handlers.CGIHandler().run(application)

if __name__ == '__main__':
  main()
~
```

$ vim main.py

```
#!/usr/bin/env python
import wsgiref.handlers
from google.appengine.ext import webapp

# this program prints out ‘hello world’

class MainHandler(webapp.RequestHandler):

  def get(self):
    self.response.out.write('Hola  orld!')

def main():
  application = webapp.WSGIApplication([('/', MainHandler)],
                                       debug=True)
  wsgiref.handlers.CGIHandler().run(application)

if __name__ == '__main__':
  main()
~
~
"main.py" 16L, 402C
```

$ vim main.py

```
#!/usr/bin/env python
import wsgiref.handlers
from google.appengine.ext import webapp

# this program prints out ‘hello world’

class MainHandler(webapp.RequestHandler):

  def get(self):
    self.response.out.write('Hola Mundo')

def main():
  application = webapp.WSGIApplication([('/', MainHandler)],
                                       debug=True)
  wsgiref.handlers.CGIHandler().run(application)

if __name__ == '__main__':
  main()
~
~
"main.py" 16L, 402C
```

$

```
$ git status
```

$ git status

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

Staged

```
$ git status
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#  modified:   main.py
#
# Changed but not updated:
#   (use "git add <file>..." to update what will be com
#
#  modified:   app.yaml
#  modified:   main.py
#
```

$ git status

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

Unstaged

$ git status

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

Staged

```
#!/usr/bin/env python
import wsgiref.handlers
from google.appengine.ext import webapp

# this program prints out ‘hello world’

class MainHandler(webapp.RequestHandler):

  def get(self):
    self.response.out.write('Hello World!')

def main():
  application =
webapp.WSGIApplication([('/'
debug=True)

wsgiref.handlers.CGIHandler().run(applicat

if __name__ == '__main__':
  main()
```

In Working Directory

```
#!/usr/bin/env python
import wsgiref.handlers
from google.appengine.ext import webapp

# this program prints out ‘hello world’

class MainHandler(webapp.RequestHandler):

  def get(self):
    self.response.out.write('Hola Mundo!')

def main():
  application =
webapp.WSGIApplication([('/'
debug=True)

wsgiref.handlers.CGIHandler().run(applicat

if __name__ == '__main__':
  main()
```

Staged

```
#!/usr/bin/env python
import wsgiref.handlers
from google.appengine.ext import webapp

# this program prints out ‘hello world’

class MainHandler(webapp.RequestHandler):

  def get(self):
    self.response.out.write('Hello World!')


def main():
  application =
webapp.WSGIApplication([('/'
debug=True)

wsgiref.handlers.CGIHandler().run(applicat

if __name__ == '__main__':
  main()
```

In Working Directory

```
#!/usr/bin/env python
import wsgiref.handlers
from google.appengine.ext import webapp

# this program prints out ‘hello world’

class MainHandler(webapp.RequestHandler):

  def get(self):
    self.response.out.write('Hola Mundo!')


def main():
  application =
webapp.WSGIApplication([('/'
debug=True)

wsgiref.handlers.CGIHandler().run(applicat

if __name__ == '__main__':
  main()
```

You have to stage a file after you edit it

You have to stage a file **after** you edit it

You have to stage a file **after** you edit it

$

```
$ git add app.yaml main.py
```

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

A Basic Workflow

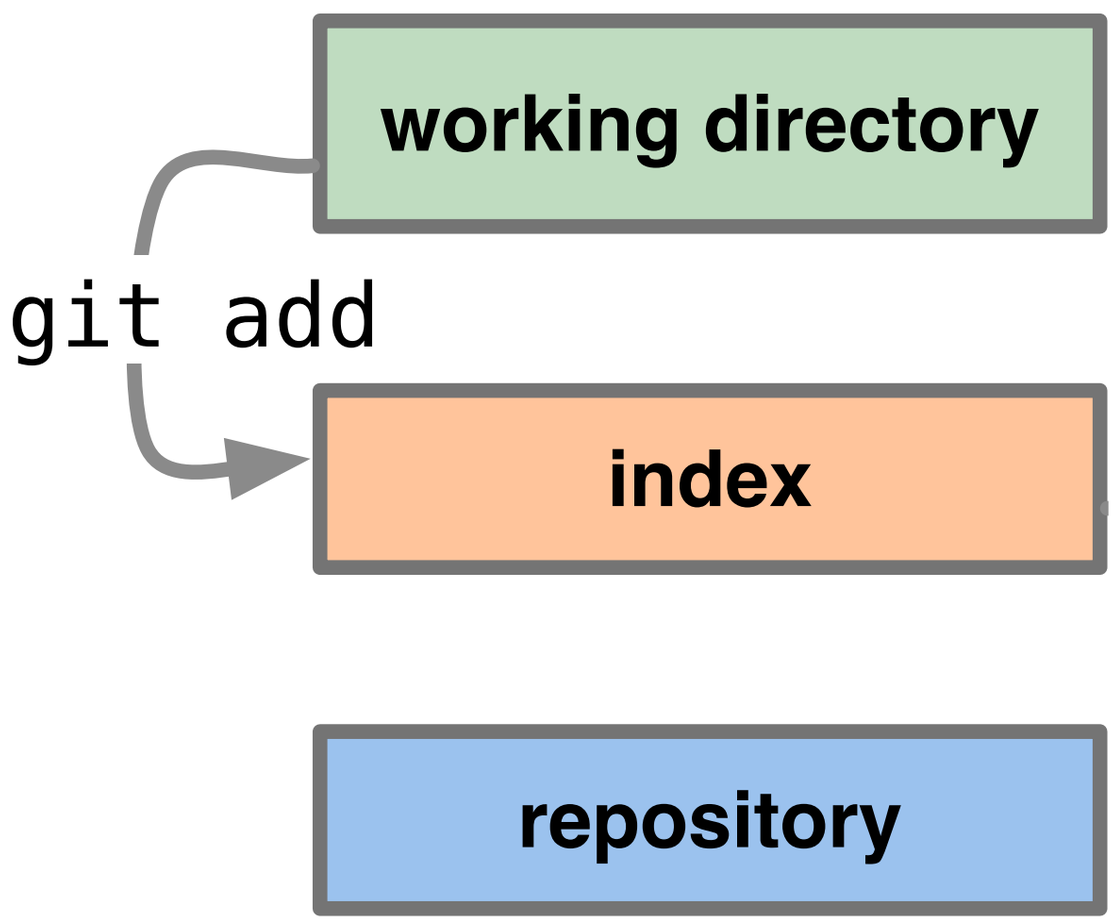
Edit files

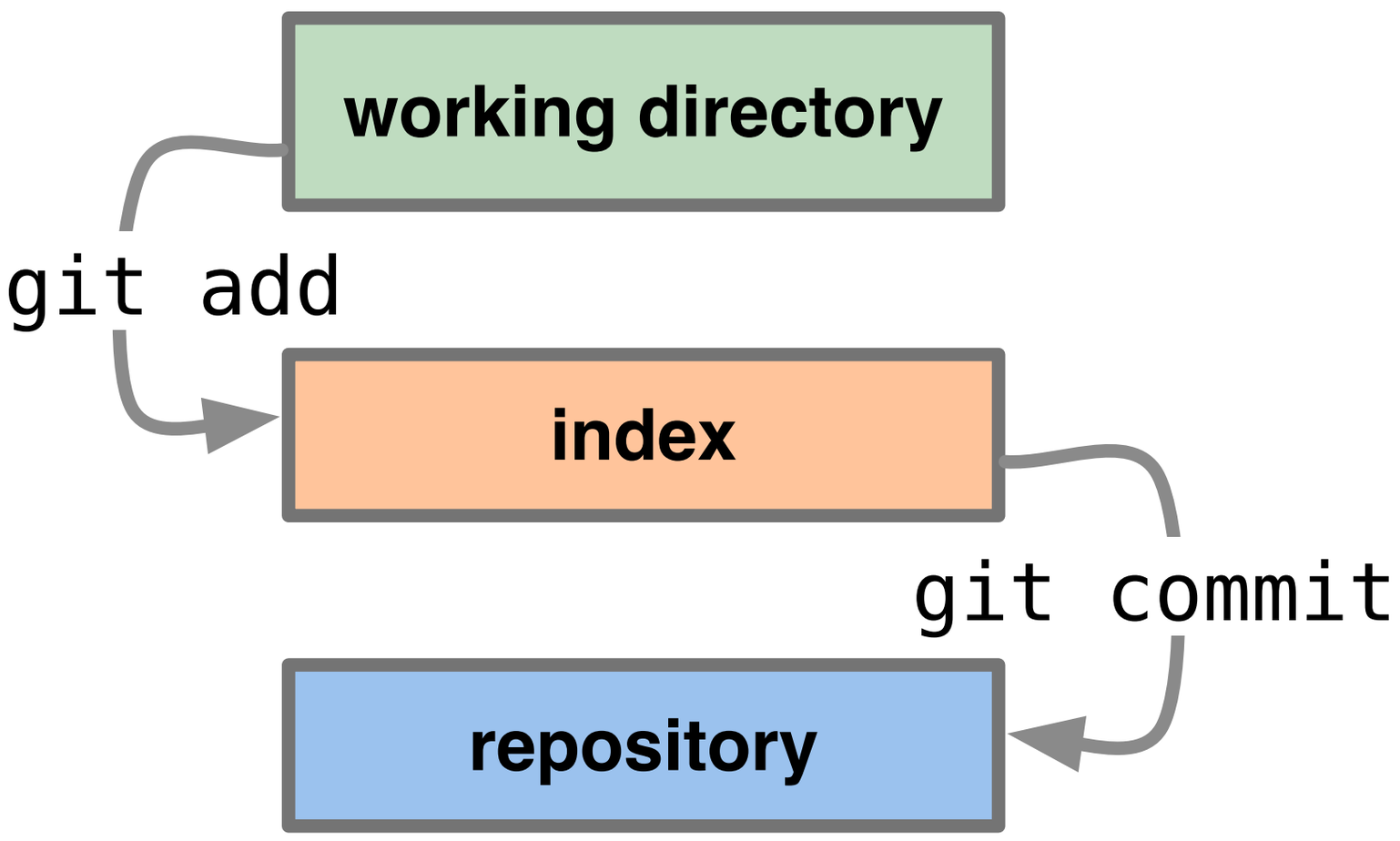
Stage the changes

Review your changes

Commit the changes

```
git commit
```


working directory
git add
index
repository


working directory
git add
index
git commit
repository

$

```
$ git commit
```

$ git commit

```
# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   app.yaml
#       modified:   main.py
#
~
~
~
~
".git/COMMIT_EDITMSG" 10L, 279C
```

$ git commit

```
descriptive commit message
# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   app.yaml
#       modified:   main.py
#
~
~
~
~
".git/COMMIT_EDITMSG" 10L, 279C
```

$ git commit

```
descriptive commit message
# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
# On branch master
# Changes to be committed:
#   (use "git reset HEAD <file>..." to unstage)
#
#       modified:   app.yaml
#       modified:   main.py
#
~
~
~
~
".git/COMMIT_EDITMSG" 10L, 279C
```

```
$ git commit

Created commit 77d3001: descriptive commit message
 2 files changed, 4 insertions(+), 2 deletions(-)
```

A Basic Workflow

A Basic Workflow

Edit files vim / emacs / etc

A Basic Workflow

Edit files — vim / emacs / etc

Stage the changes — git add (file)

A Basic Workflow

Edit files — vim / emacs / etc

Stage the changes — git add (file)

Review your changes — git status

A Basic Workflow

Edit files	vim / emacs / etc
Stage the changes	git add (file)
Review your changes	git status
Commit the changes	git commit

cheating...

A Basicerer Workflow

A Basicerer Workflow

Edit files — vim / emacs / etc

A Basicerer Workflow

Edit files — vim / emacs / etc

Stage & commit the changes — git commit -a

What's going on here?

```
$ git commit
Created commit 77d3001: descriptive commit message
 2 files changed, 4 insertions(+), 2 deletions(-)
```

```
$ git commit
Created commit 77d3001: descriptive commit message
 2 files changed, 4 insertions(+), 2 deletions(-)
```

77d3001

77d3001

77d3001a1de6bf8f5e431972fe4d25b01e595c0b

77d3001a1de6bf8f5e431972fe4d25b01e595c0b

77d3001a1de6bf8f5e431972fe4d25b01e595c0b

77d3001a1de6bf8f5e431972fe4d25b01e595c0b

commit	size
tree	c4ec5
parent	a149e
author	Scott
committer	Scott
my commit message goes here and it is really, really cool	

77d3001a1de6bf8f5e431972fe4d25b01e595c0b

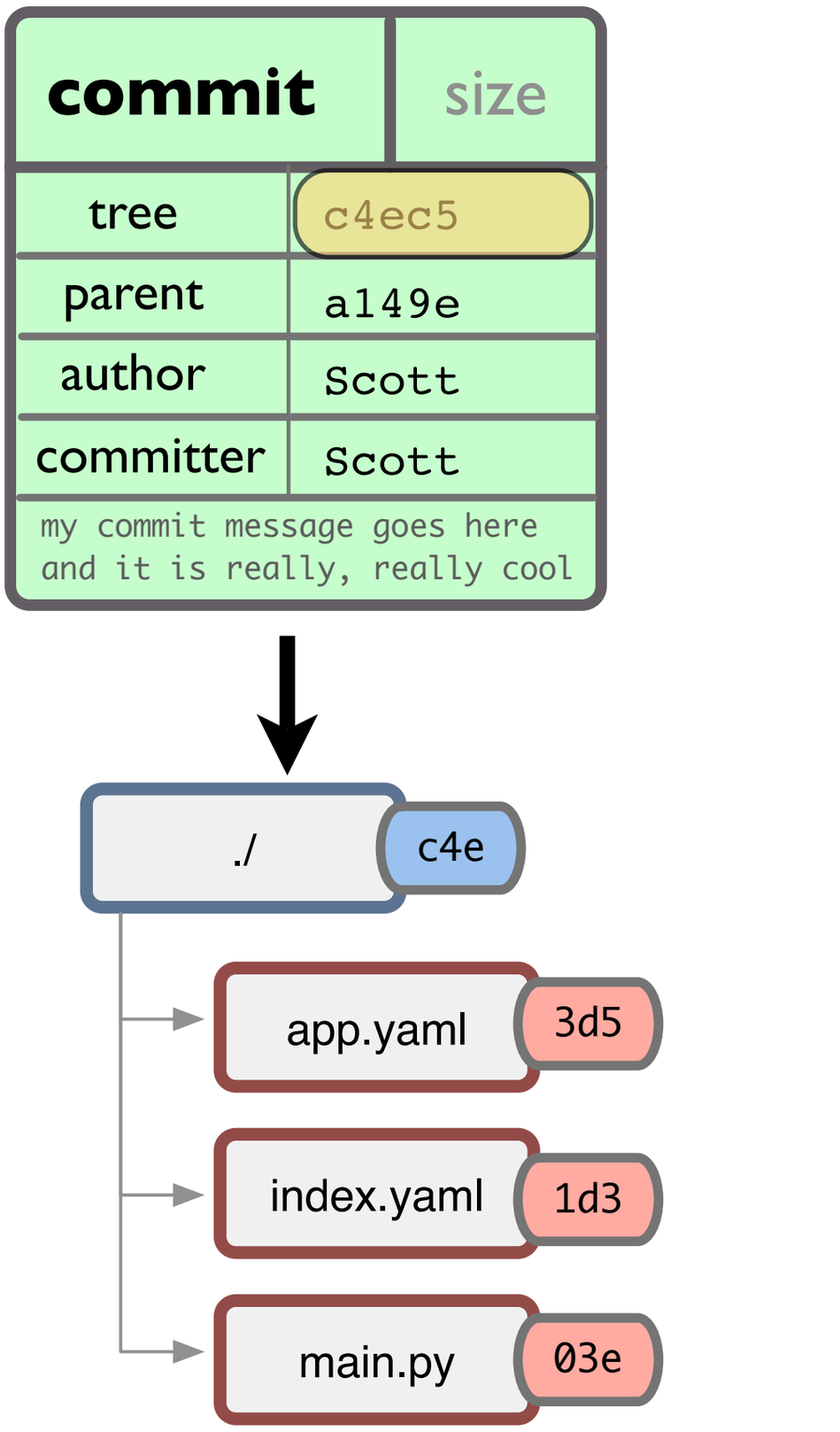
```
tree c4ec543b0322744e55c5efc9b6c4e449d398dbff
parent a149e2160b3f7573768cdc2fce24d0881f3577e1
author Scott Chacon <schacon@gmail.com> 1223402504 -0700
committer Scott Chacon <schacon@gmail.com> 1223402504 -0700

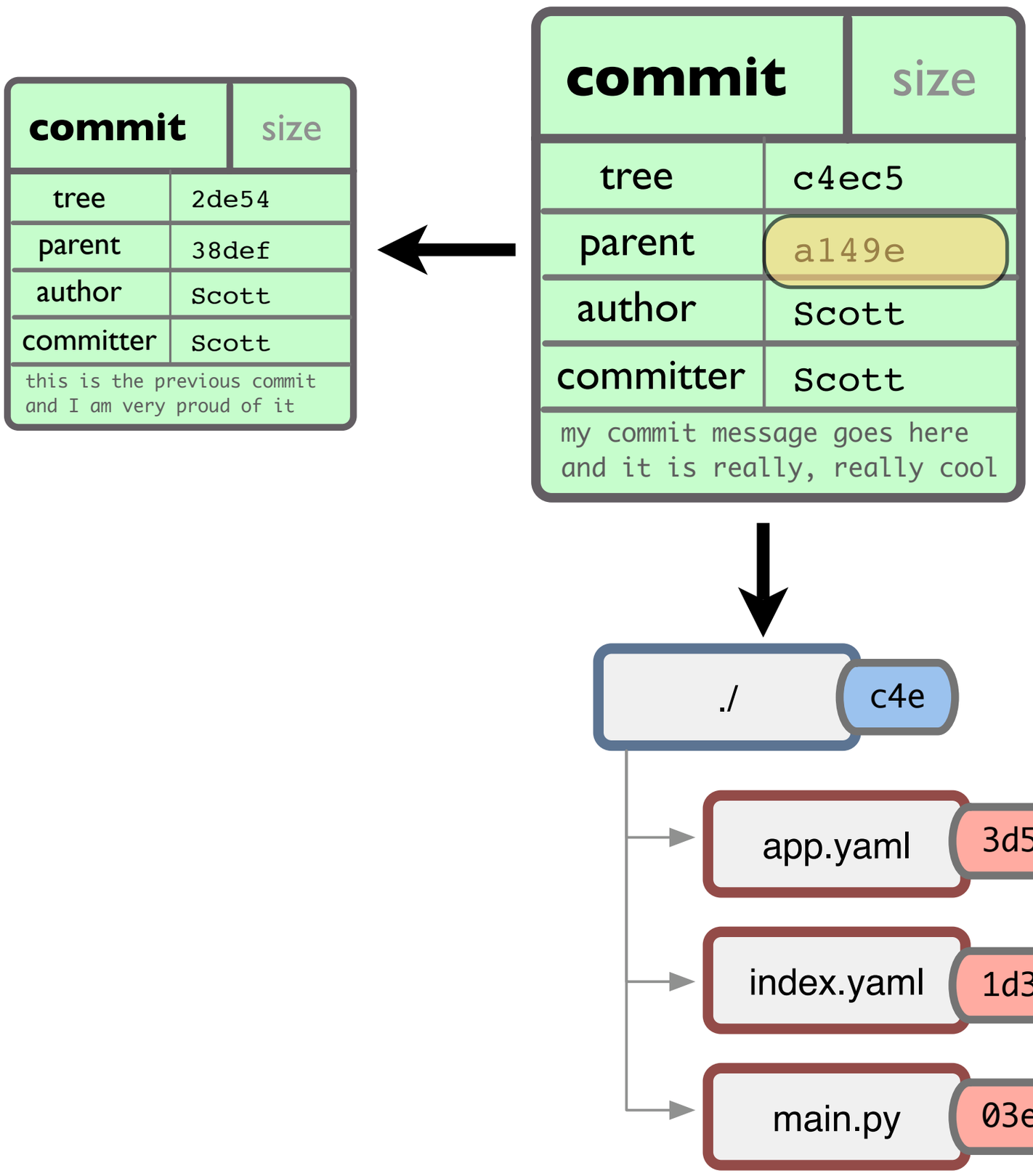
descriptive commit message
```

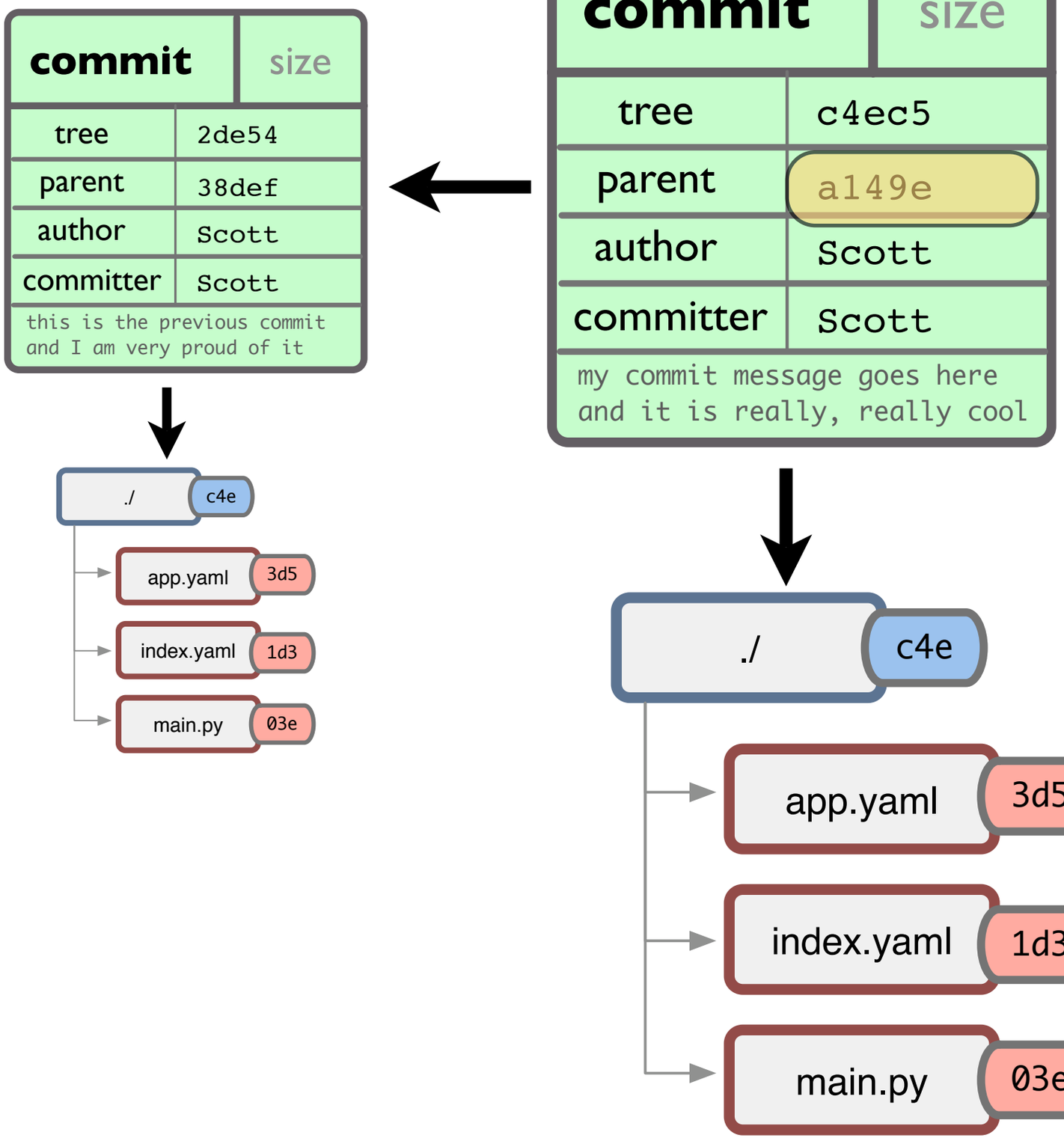
77d3001a1de6bf8f5e431972fe4d25b01e595c0b

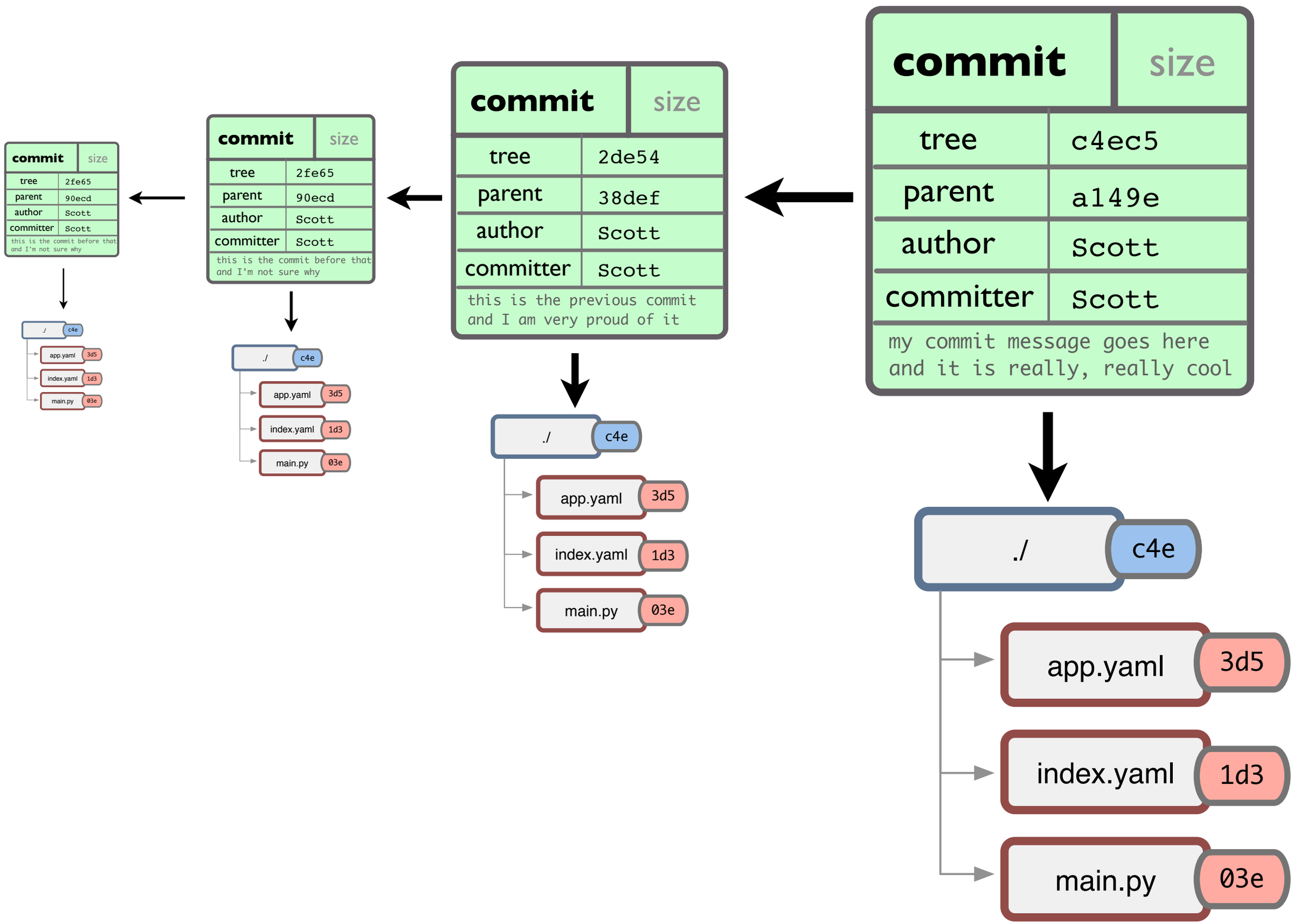
commit	size
tree	c4ec5
parent	a149e
author	Scott
committer	Scott
my commit message goes here and it is really, really cool	

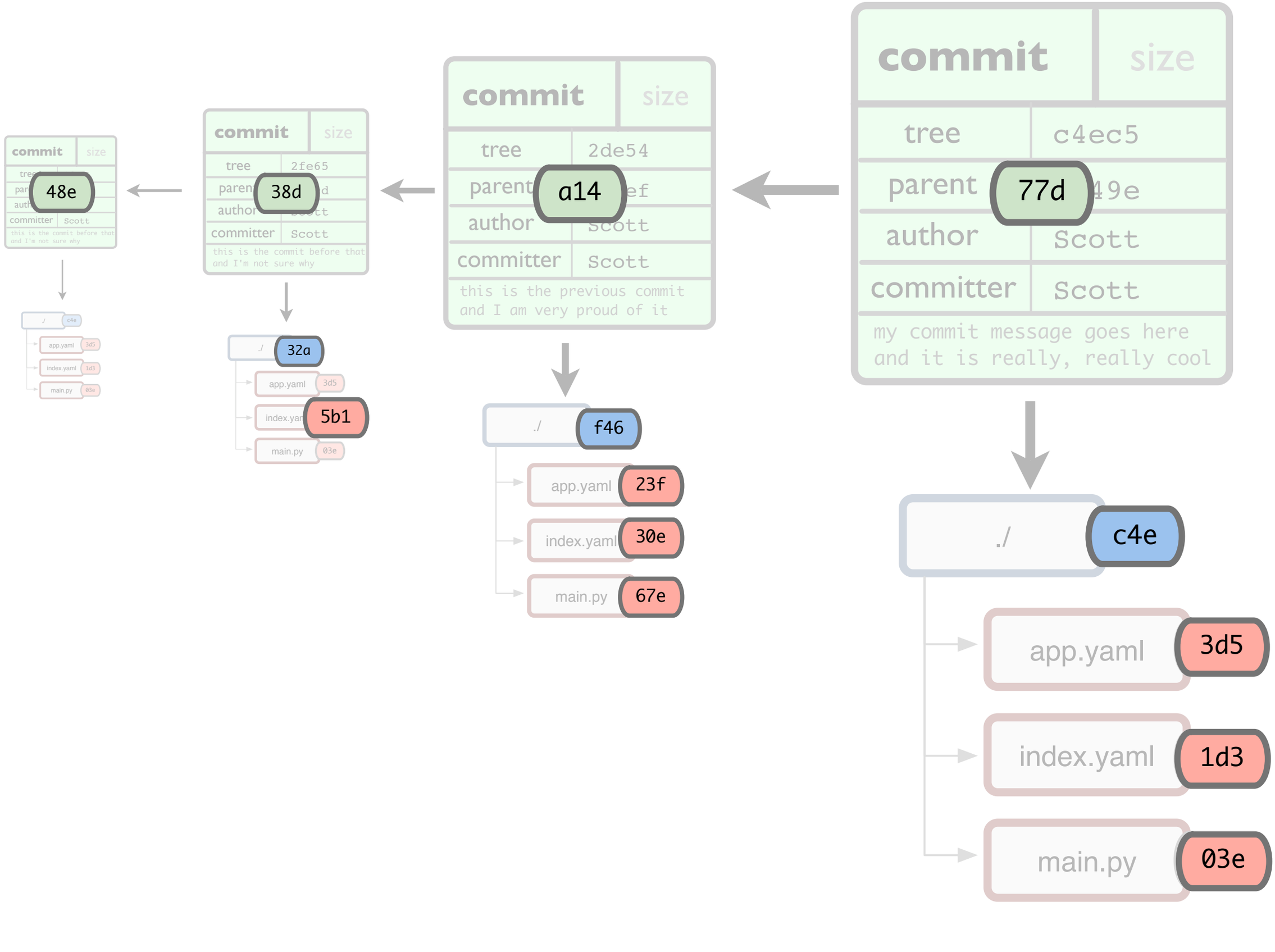
77d3001a1de6bf8f5e431972fe4d25b01e595c0b




commit
size
tree
2de54
parent
38def
author
Scott
committer
Scott
this is the previous commit
and I am very proud of it
commit
size
tree
c4ec5
parent
a149e
author
Scott
committer
Scott
my commit message goes here
and it is really, really cool
./
c4e
app.yaml
3d5
index.yaml
1d3
main.py
03e


commit
size
tree
2de54
parent
38def
author
Scott
committer
Scott
this is the previous commit
and I am very proud of it
commit
size
tree
c4ec5
parent
a149e
author
Scott
committer
Scott
my commit message goes here
and it is really, really cool
./
c4e
app.yaml
3d5
index.yaml
1d3
main.py
03e
./
c4e
app.yaml
3d5
index.yaml
1d3
main.py
03e


commit
size
tree
2fe65
parent
90ecd
author
Scott
committer
Scott
this is the commit before that and I'm not sure why
./
c4e
app.yaml
3d5
index.yaml
1d3
main.py
03e
commit
size
tree
2de54
parent
38def
author
Scott
committer
Scott
this is the previous commit and I am very proud of it
./
c4e
app.yaml
3d5
index.yaml
1d3
main.py
03e
commit
size
tree
c4ec5
parent
a149e
author
Scott
committer
Scott
my commit message goes here and it is really, really cool
./
c4e
app.yaml
3d5
index.yaml
1d3
main.py
03e


commit
size
tree
c4ec5
parent
77d
49e
author
Scott
committer
Scott
my commit message goes here
and it is really, really cool
./
c4e
app.yaml
3d5
index.yaml
1d3
main.py
03e
commit
size
tree
2de54
parent
a14
ef
author
Scott
committer
Scott
this is the previous commit
and I am very proud of it
./
f46
app.yaml
23f
index.yaml
30e
main.py
67e
commit
size
tree
2fe65
parent
38d
d
author
committer
Scott
this is the commit before that
and I'm not sure why
./
32a
app.yaml
3d5
index.yaml
5b1
main.py
03e
commit
size
tree
48e
committer
Scott
this is the commit before that
and I'm not sure why
./
c4e
app.yaml
3d5
index.yaml
1d3
main.py
03e

48e

32a

f46

23f

30e

67e

c4e

3d5

1d3

03e

a14

38d

5b1

77d

commit	size
tree	2fe65
parent	90ecd
author	Scott
committer	Scott
this is the commit before that and I'm not sure why	

./ c4e

app.yaml 3d5

index.yaml 1d3

main.py 03e

commit	size
tree	2de54
parent	38def
author	Scott
committer	Scott
this is the previous commit and I am very proud of it	

./ c4e

app.yaml 3d5

index.yaml 1d3

main.py 03e

commit	size
tree	c4ec5
parent	a149e
author	Scott
committer	Scott
my commit message goes here and it is really, really cool	

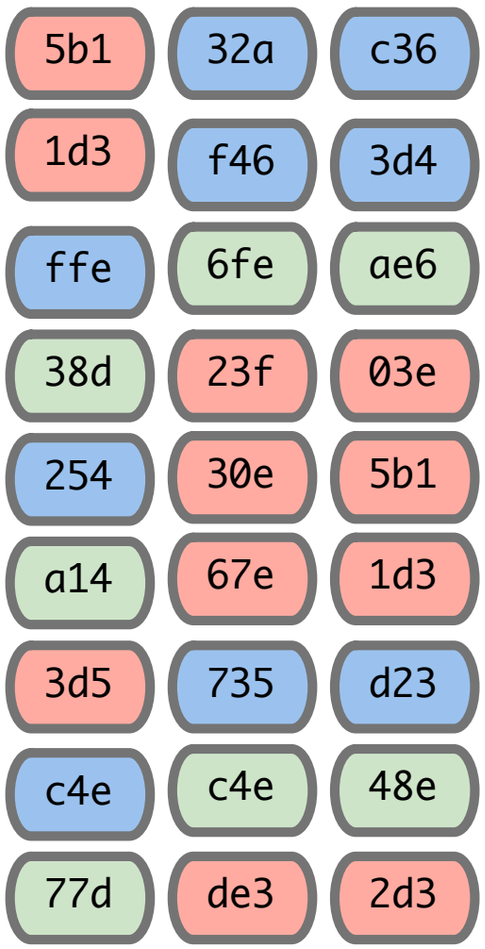
./ c4e

app.yaml 3d5

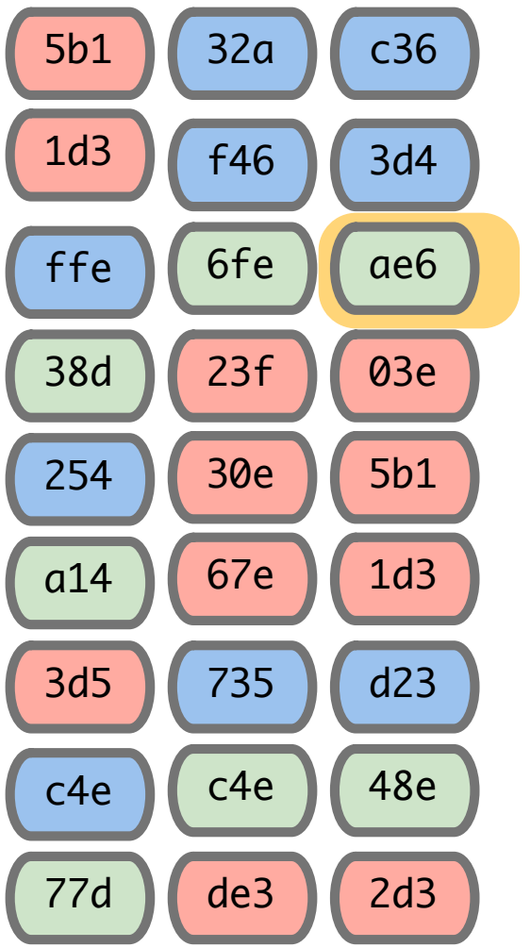
index.yaml 1d3

main.py 03e

Repository

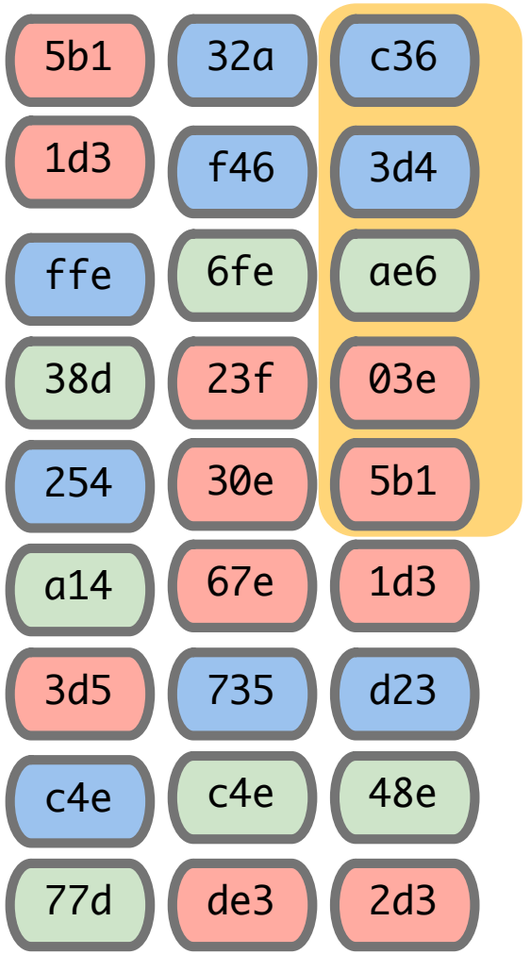

5b1
32a
c36
1d3
f46
3d4
ffe
6fe
ae6
38d
23f
03e
254
30e
5b1
a14
67e
1d3
3d5
735
d23
c4e
c4e
48e
77d
de3
2d3

Repository

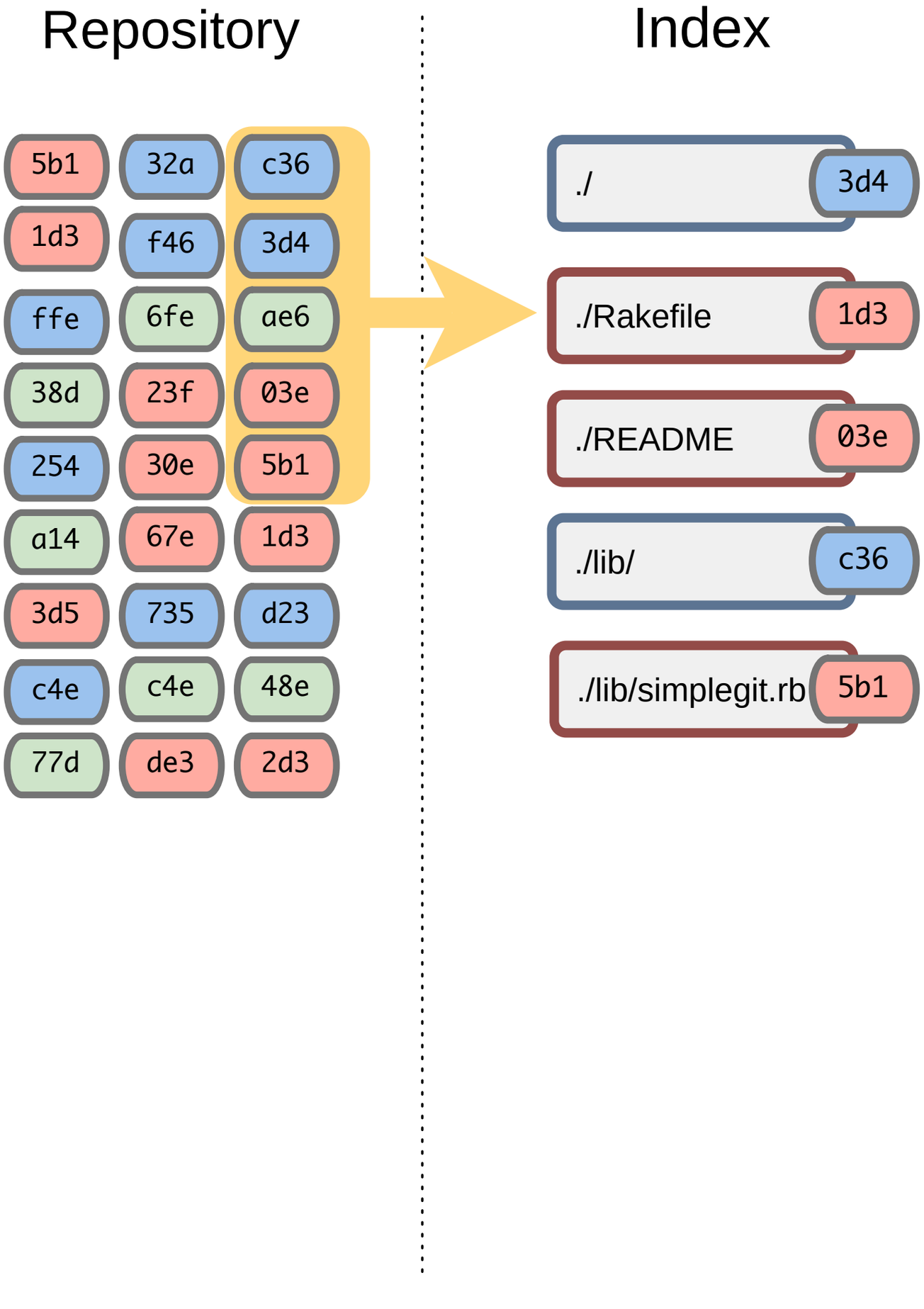


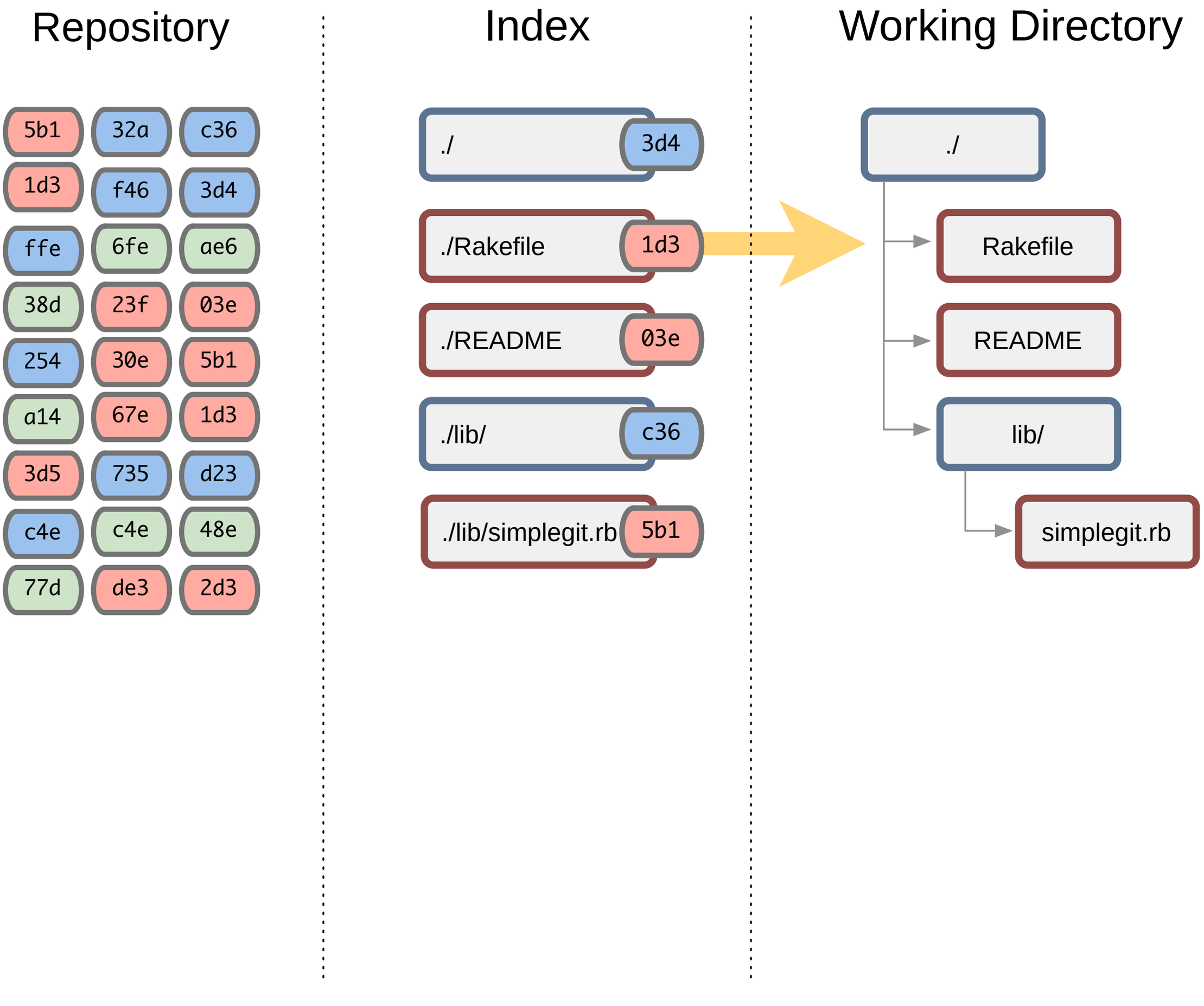

```
git checkout ae635
```

Repository




```
git checkout ae635
```


Repository
Index
5b1
32a
c36
1d3
f46
3d4
ffe
6fe
ae6
38d
23f
03e
254
30e
5b1
a14
67e
1d3
3d5
735
d23
c4e
c4e
48e
77d
de3
2d3
./
3d4
./Rakefile
1d3
./README
03e
./lib/
c36
./lib/simplegit.rb
5b1


Repository
Index
Working Directory
5b1
32a
c36
1d3
f46
3d4
ffe
6fe
ae6
38d
23f
03e
254
30e
5b1
a14
67e
1d3
3d5
735
d23
c4e
c4e
48e
77d
de3
2d3
./
3d4
./Rakefile
1d3
./README
03e
./lib/
c36
./lib/simplegit.rb
5b1
./
Rakefile
README
lib/
simplegit.rb

Repository

Index

Working Directory

5b1 32a c36
1d3 f46 3d4
ffe 6fe ae6
38d 23f 03e
254 30e 5b1
a14 67e 1d3
3d5 735 d23
c4e c4e 48e
77d de3 2d3

./ 3d4

./Rakefile 1d3

./README 03e

./lib/ c36

./lib/simplegit.rb 5b1

./

Rakefile

README

lib/

simplegit.rb

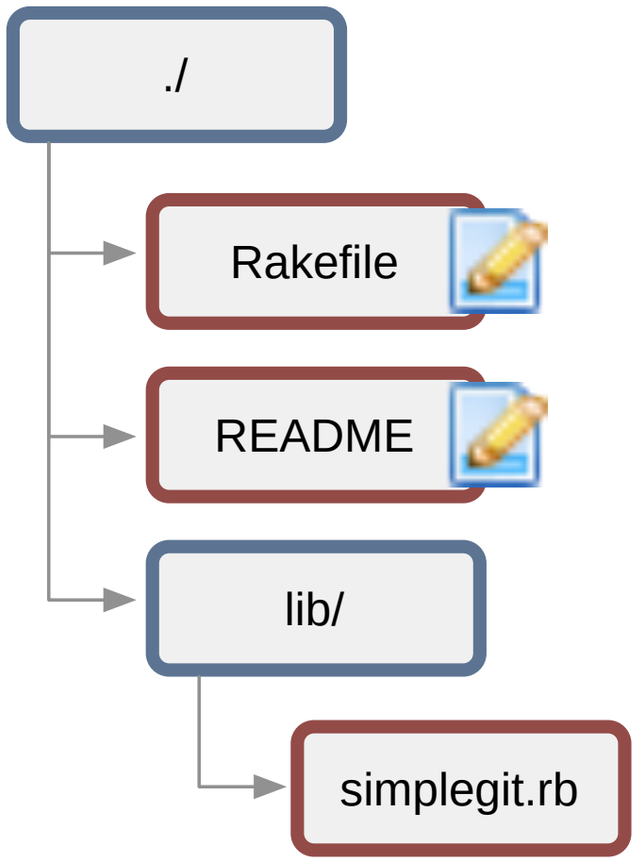
Repository

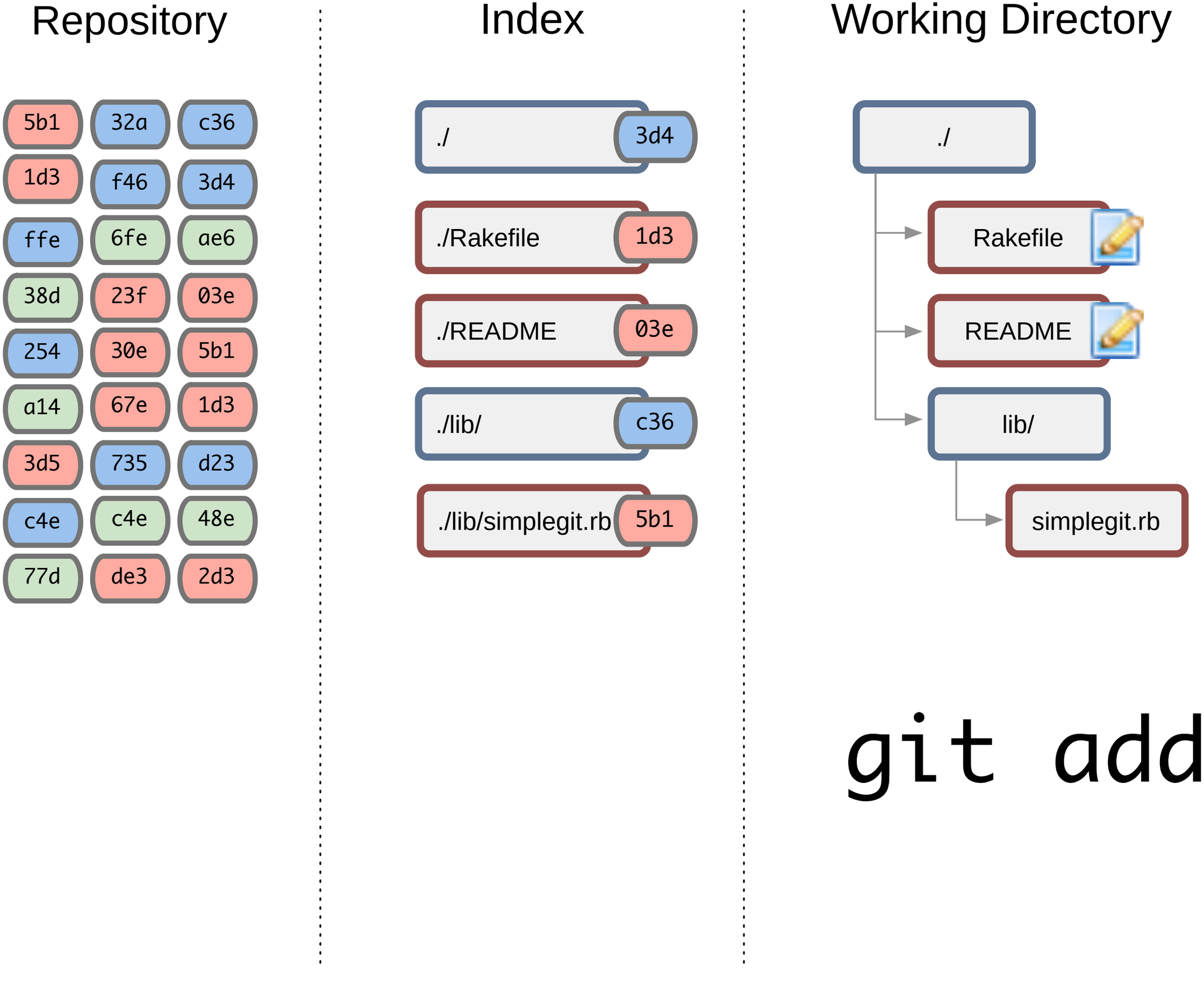
5b1 32a c36
1d3 f46 3d4
ffe 6fe ae6
38d 23f 03e
254 30e 5b1
a14 67e 1d3
3d5 735 d23
c4e c4e 48e
77d de3 2d3

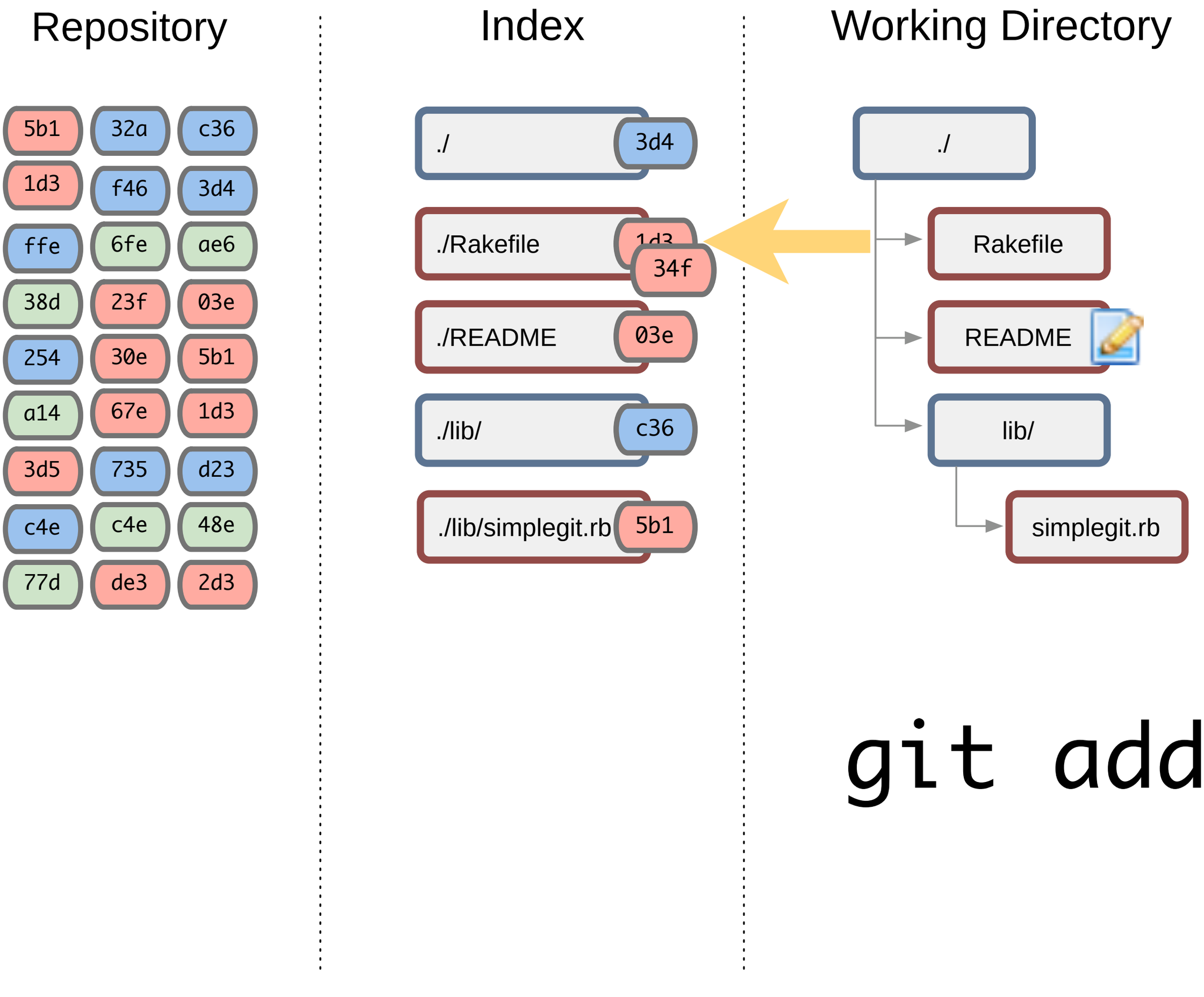
Index

./ 3d4
./Rakefile 1d3
./README 03e
./lib/ c36
./lib/simplegit.rb 5b1

Working Directory




Repository
5b1
32a
c36
1d3
f46
3d4
ffe
6fe
ae6
38d
23f
03e
254
30e
5b1
a14
67e
1d3
3d5
735
d23
c4e
c4e
48e
77d
de3
2d3
Index
./
3d4
./Rakefile
1d3
./README
03e
./lib/
c36
./lib/simplegit.rb
5b1
Working Directory
./
Rakefile
README
lib/
simplegit.rb
git add


Repository
Index
Working Directory
5b1 32a c36
1d3 f46 3d4
ffe 6fe ae6
38d 23f 03e
254 30e 5b1
a14 67e 1d3
3d5 735 d23
c4e c4e 48e
77d de3 2d3
./ 3d4
./Rakefile 1d3 34f
./README 03e
./lib/ c36
./lib/simplegit.rb 5b1
./
Rakefile
README
lib/
simplegit.rb
git add

Repository

Index

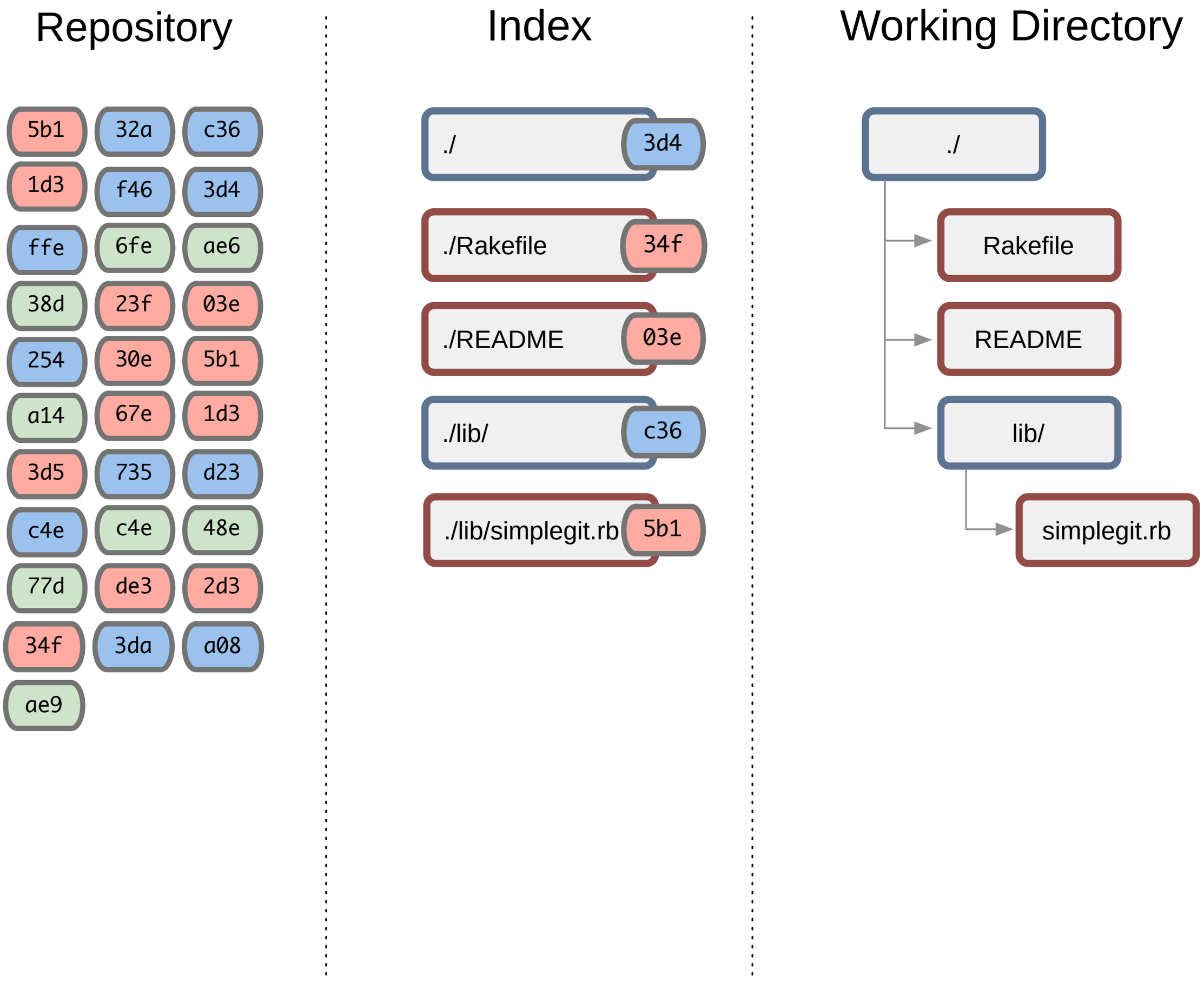
Working Directory

5b1 32a c36
1d3 f46 3d4
ffe 6fe ae6
38d 23f 03e
254 30e 5b1
a14 67e 1d3
3d5 735 d23
c4e c4e 48e
77d de3 2d3
34f 3da a08
ae9

./ 3d4
./Rakefile 34f
./README 03e
./lib/ c36
./lib/simplegit.rb 5b1

./
Rakefile
README
lib/
simplegit.rb

git commit


Repository
Index
Working Directory
5b1
32a
c36
1d3
f46
3d4
ffe
6fe
ae6
38d
23f
03e
254
30e
5b1
a14
67e
1d3
3d5
735
d23
c4e
c4e
48e
77d
de3
2d3
34f
3da
a08
ae9
./
3d4
./Rakefile
34f
./README
03e
./lib/
c36
./lib/simplegit.rb
5b1
./
Rakefile
README
lib/
simplegit.rb

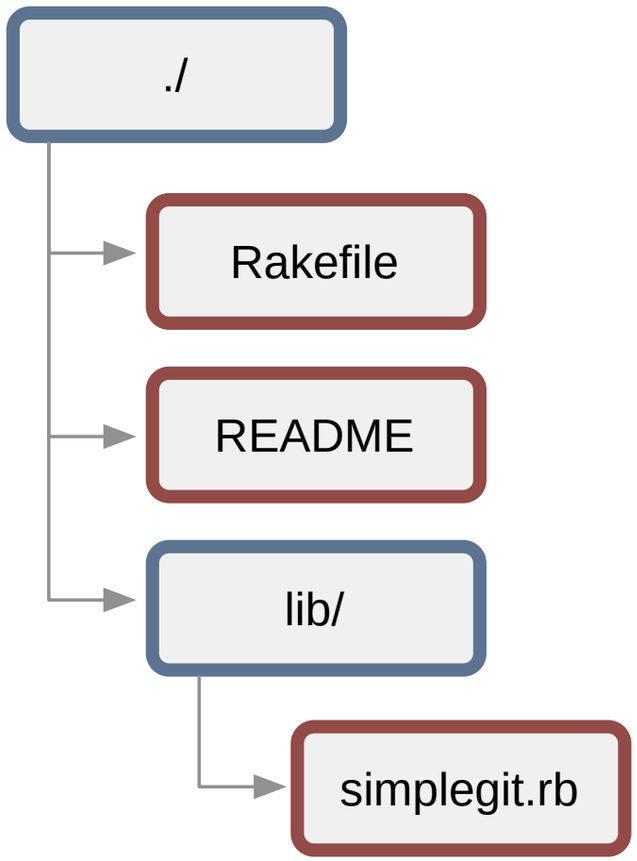
Repository

5b1 32a c36
1d3 f46 3d4
ffe 6fe ae6
38d 23f 03e
254 30e 5b1
a14 67e 1d3
3d5 735 d23
c4e c4e 48e
77d de3 2d3
34f 3da a08
ae9

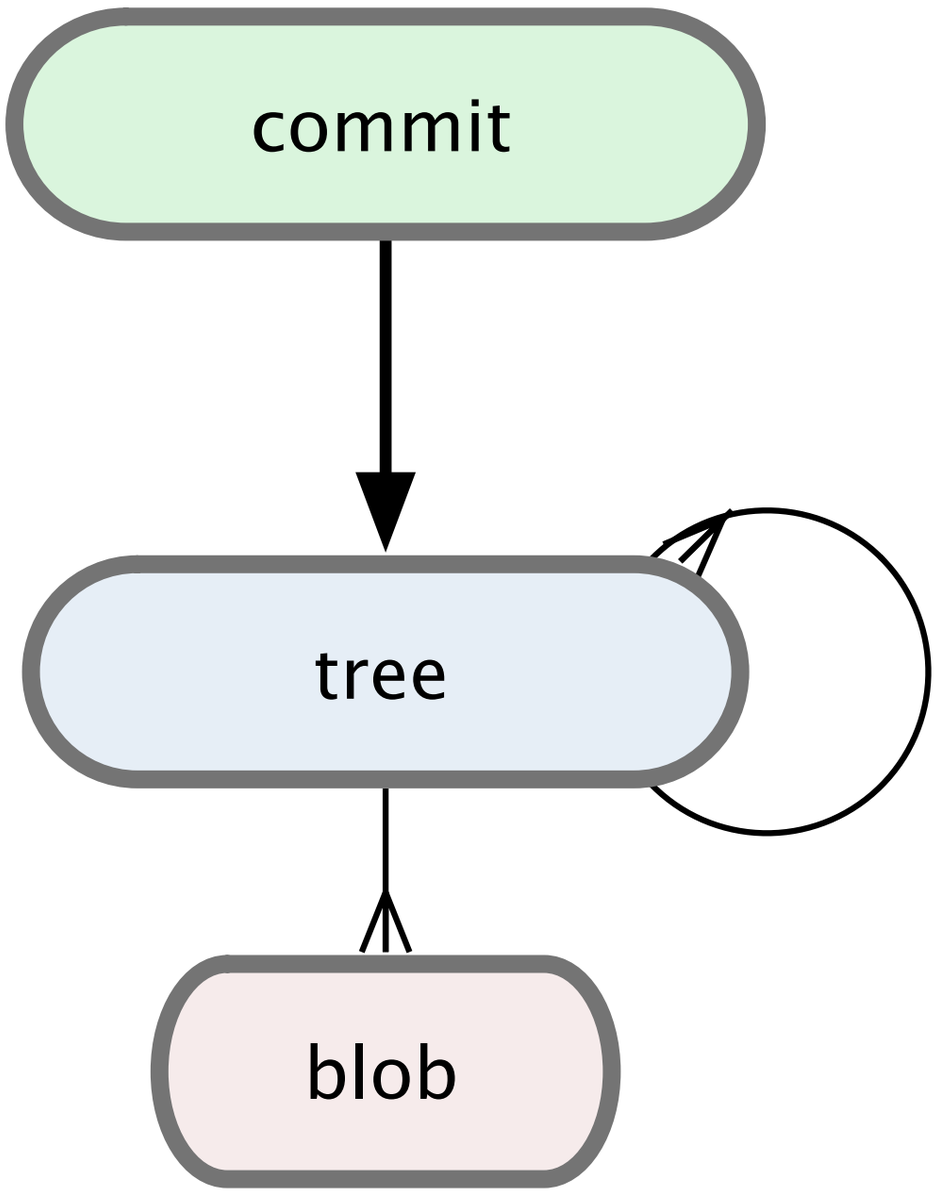
Index

./ 3d4
./Rakefile 34f
./README 03e
./lib/ c36
./lib/simplegit.rb 5b1

Working Directory

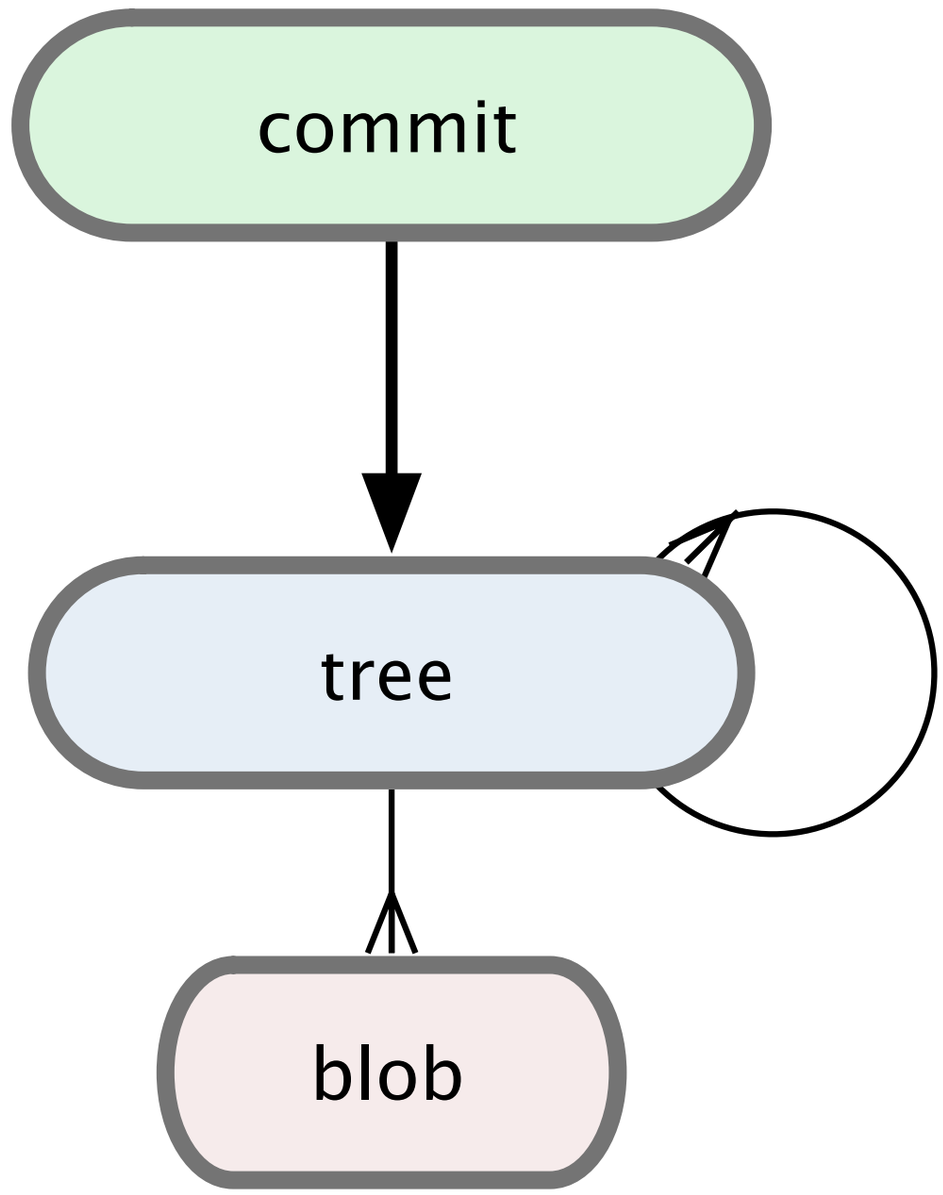


object model



object model

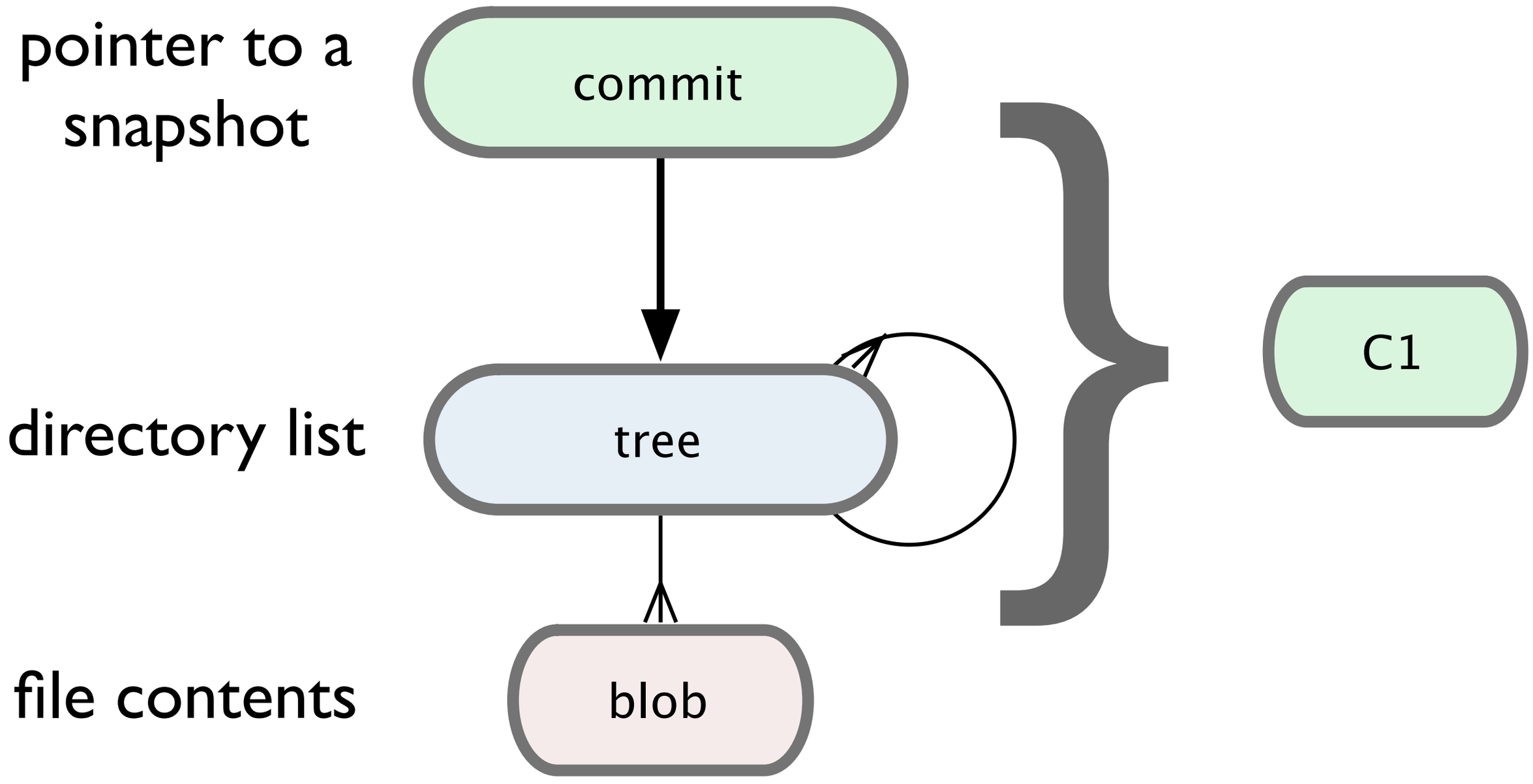
pointer to a snapshot



directory list

file contents

object model

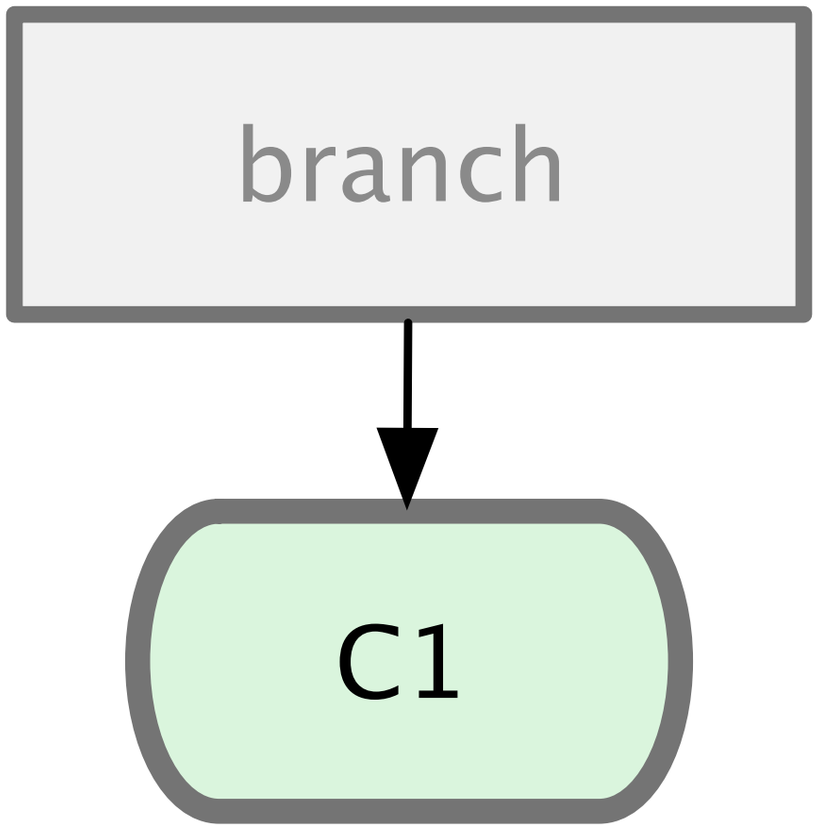


Branching and Merging

branches

branches

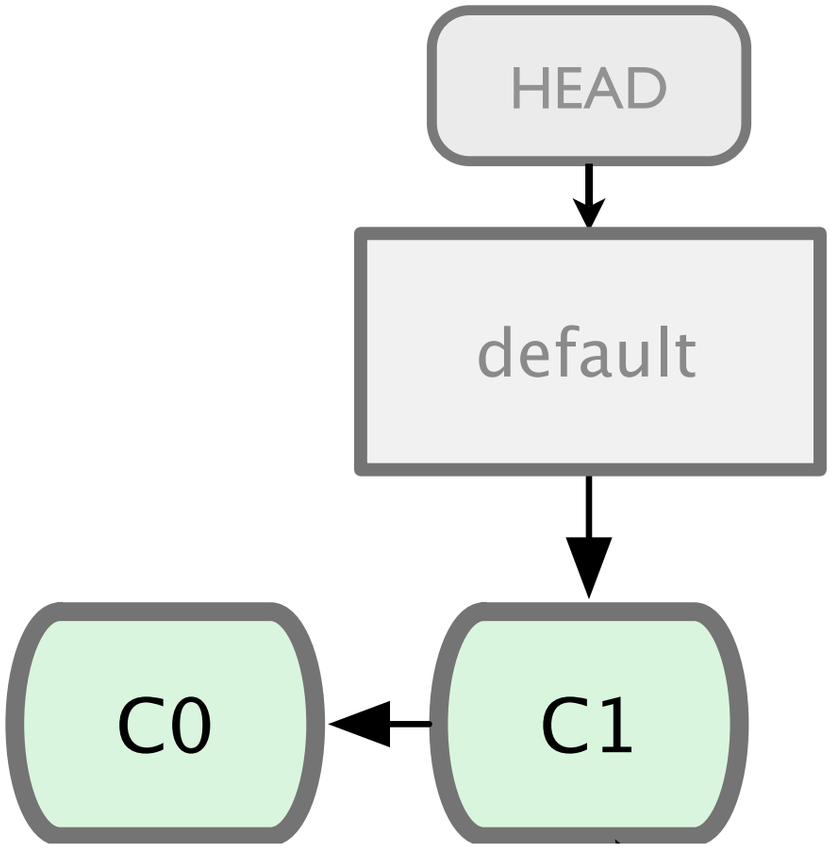
lightweight, movable pointers to a commit

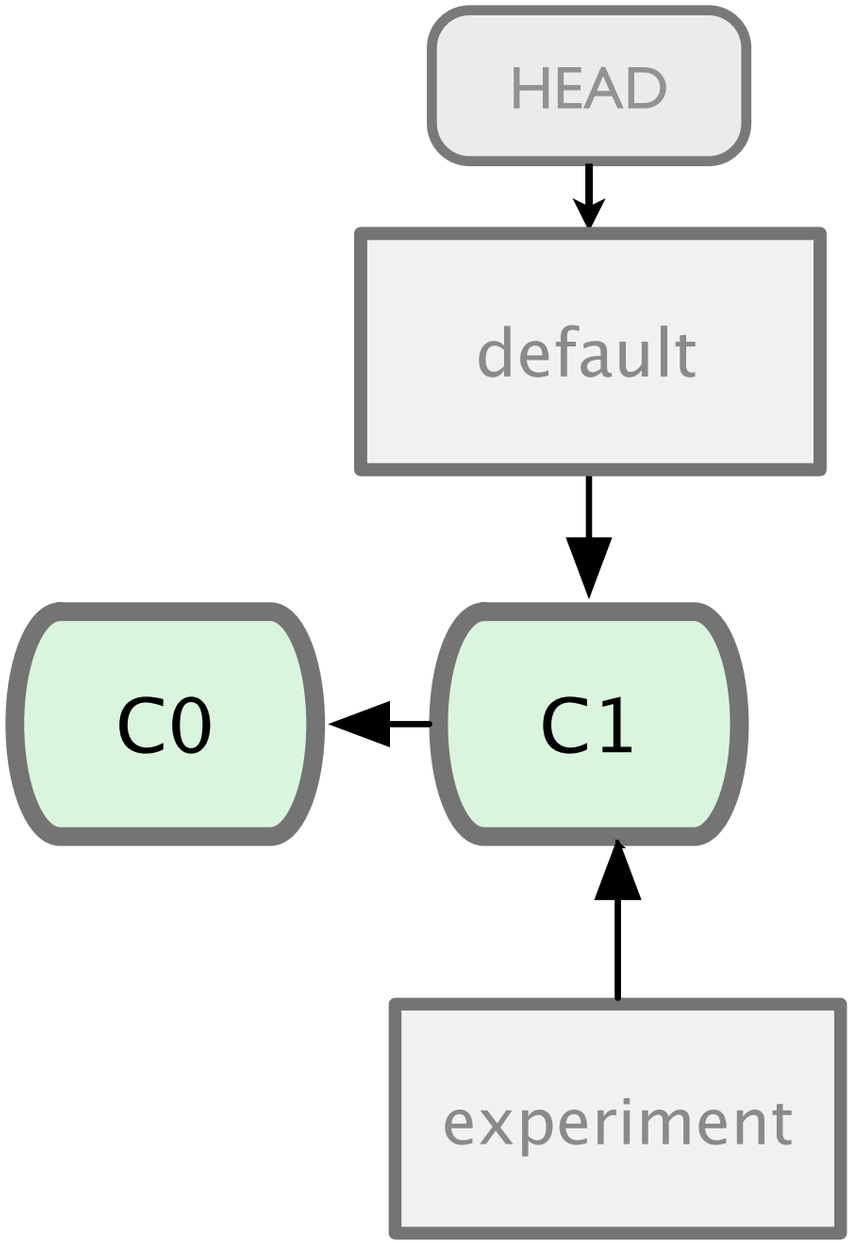


branching

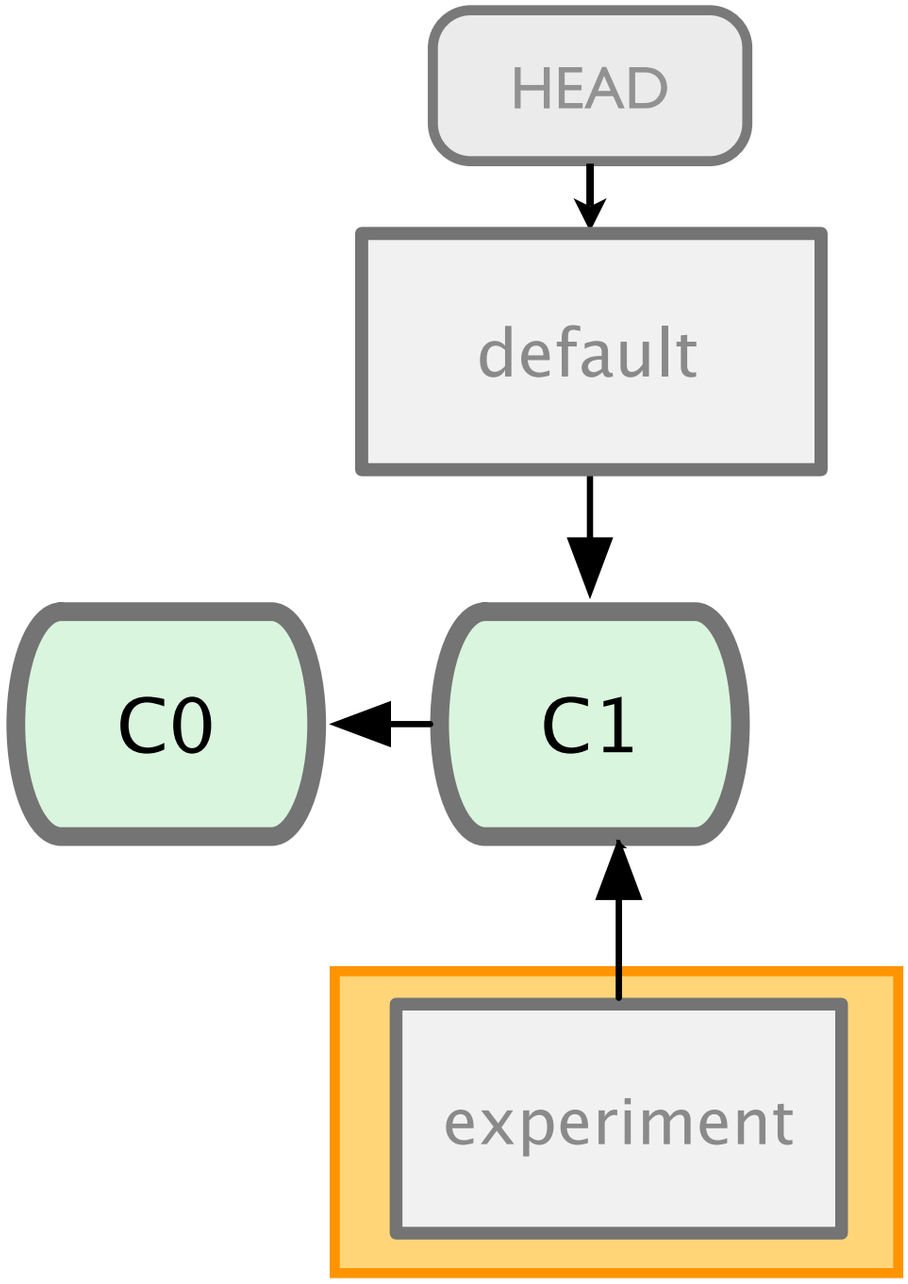
`git branch`

`git checkout`

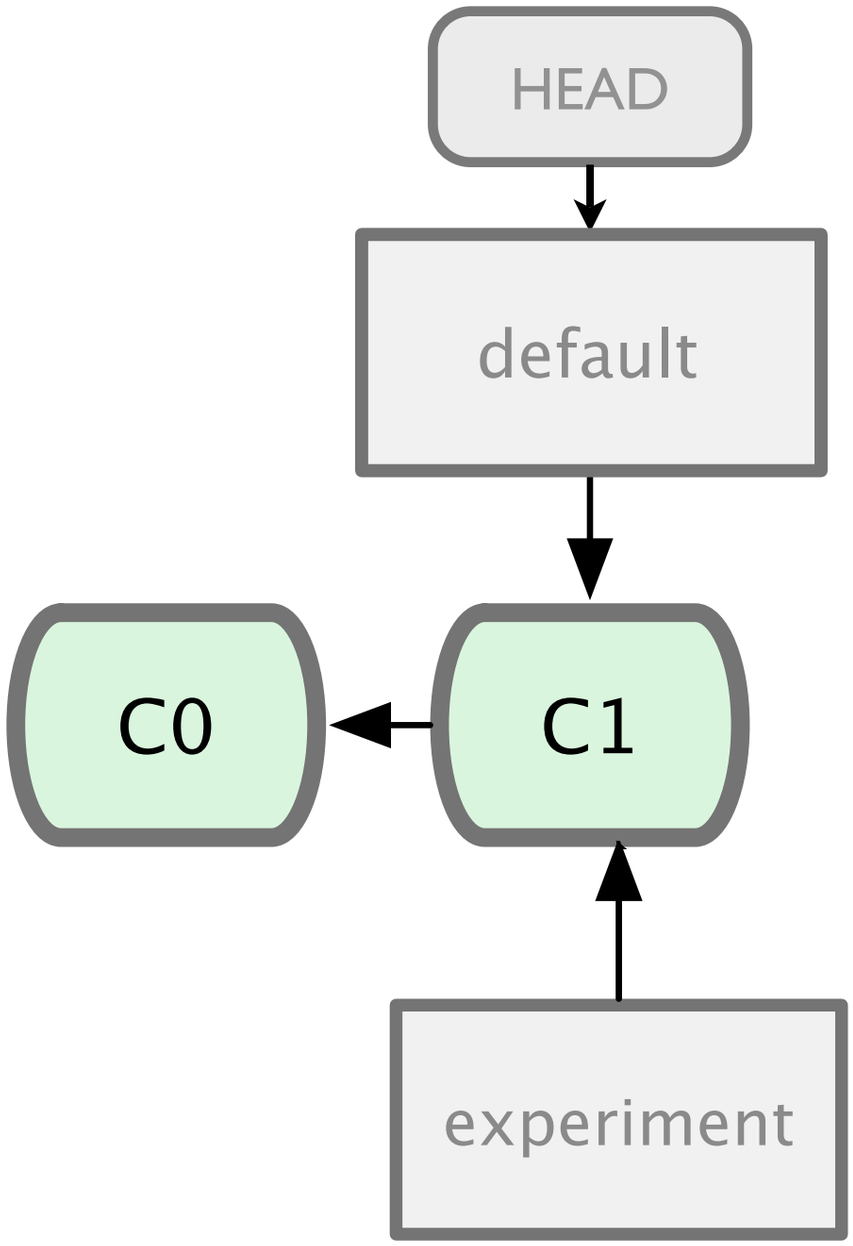

HEAD
default
C0
C1



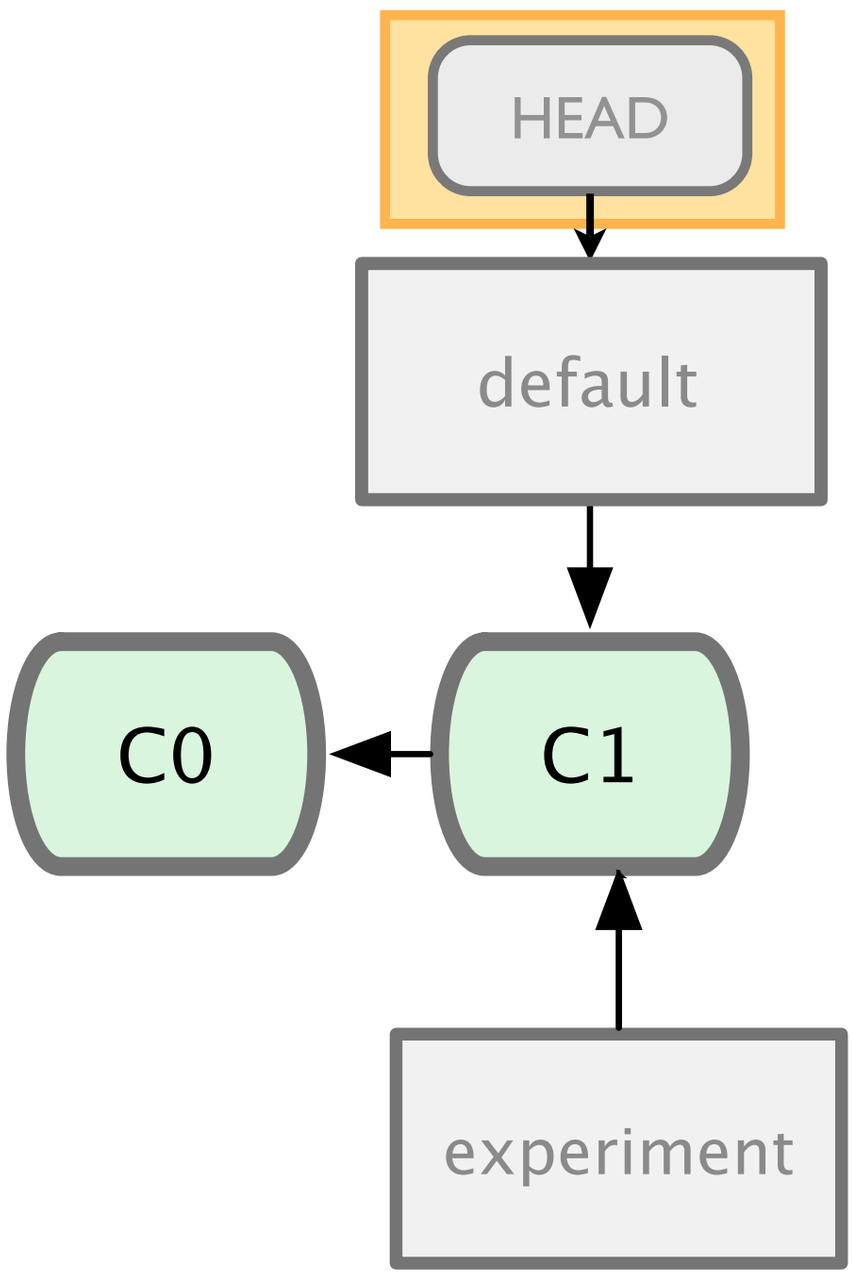
git branch experiment



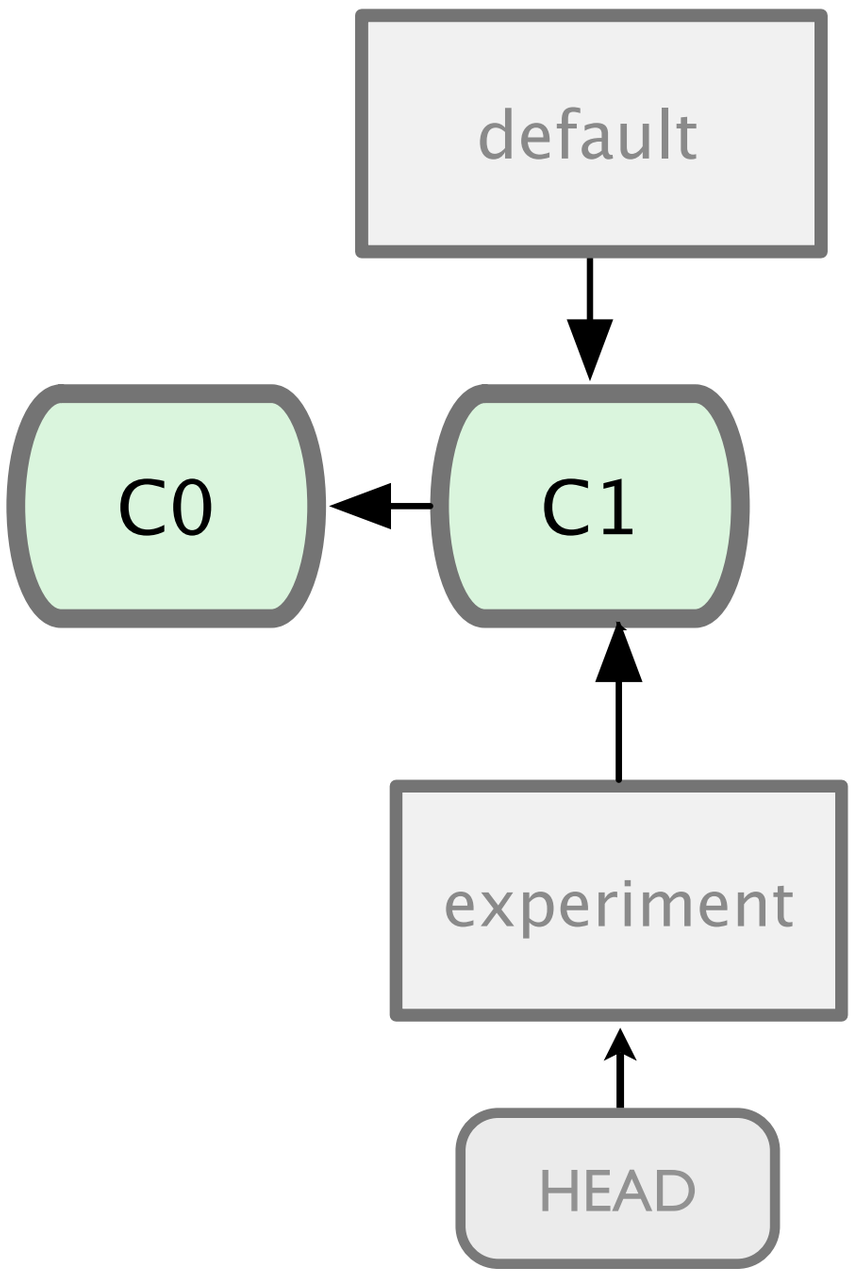
git branch experiment



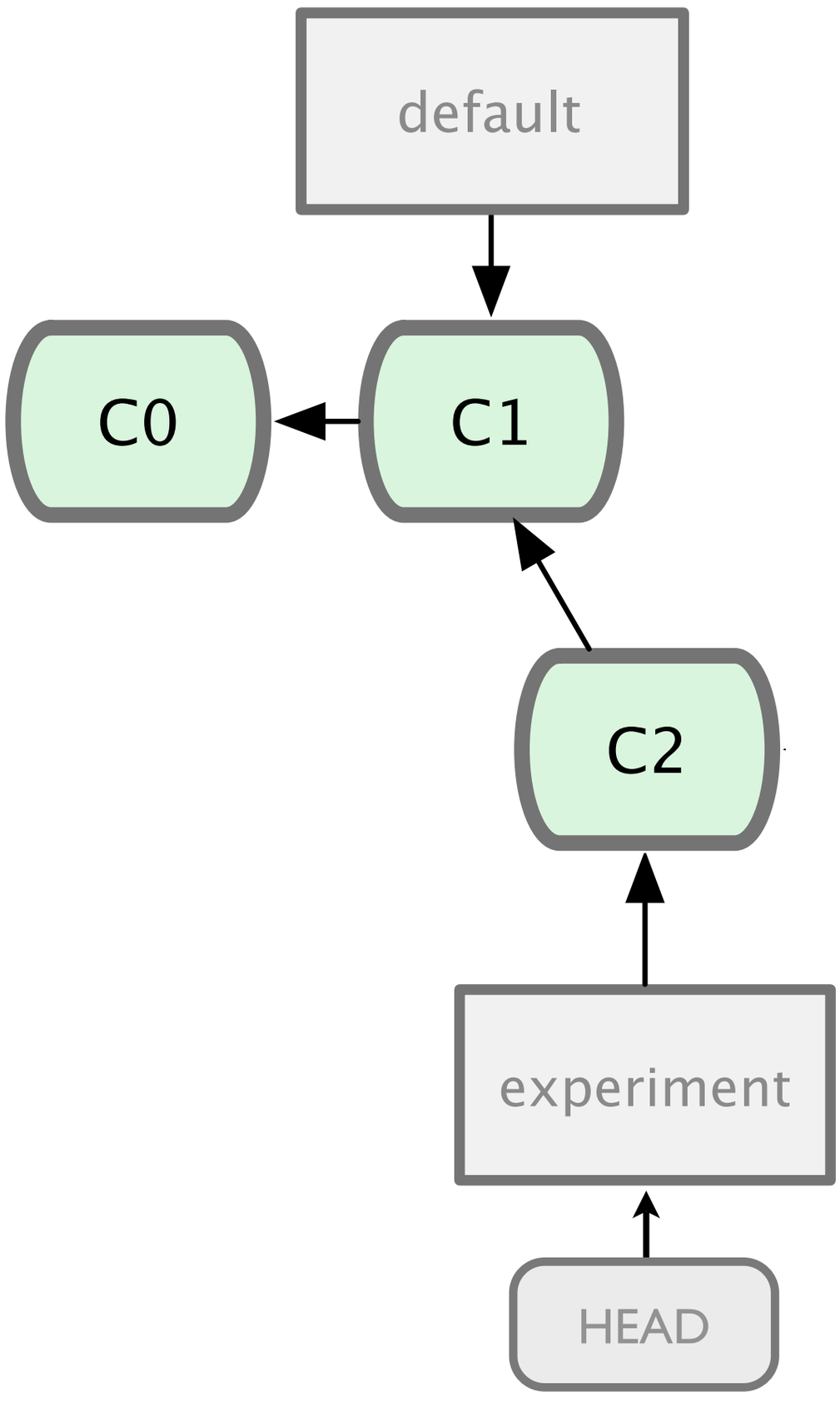

```
$ git branch
* default
  experiment
```



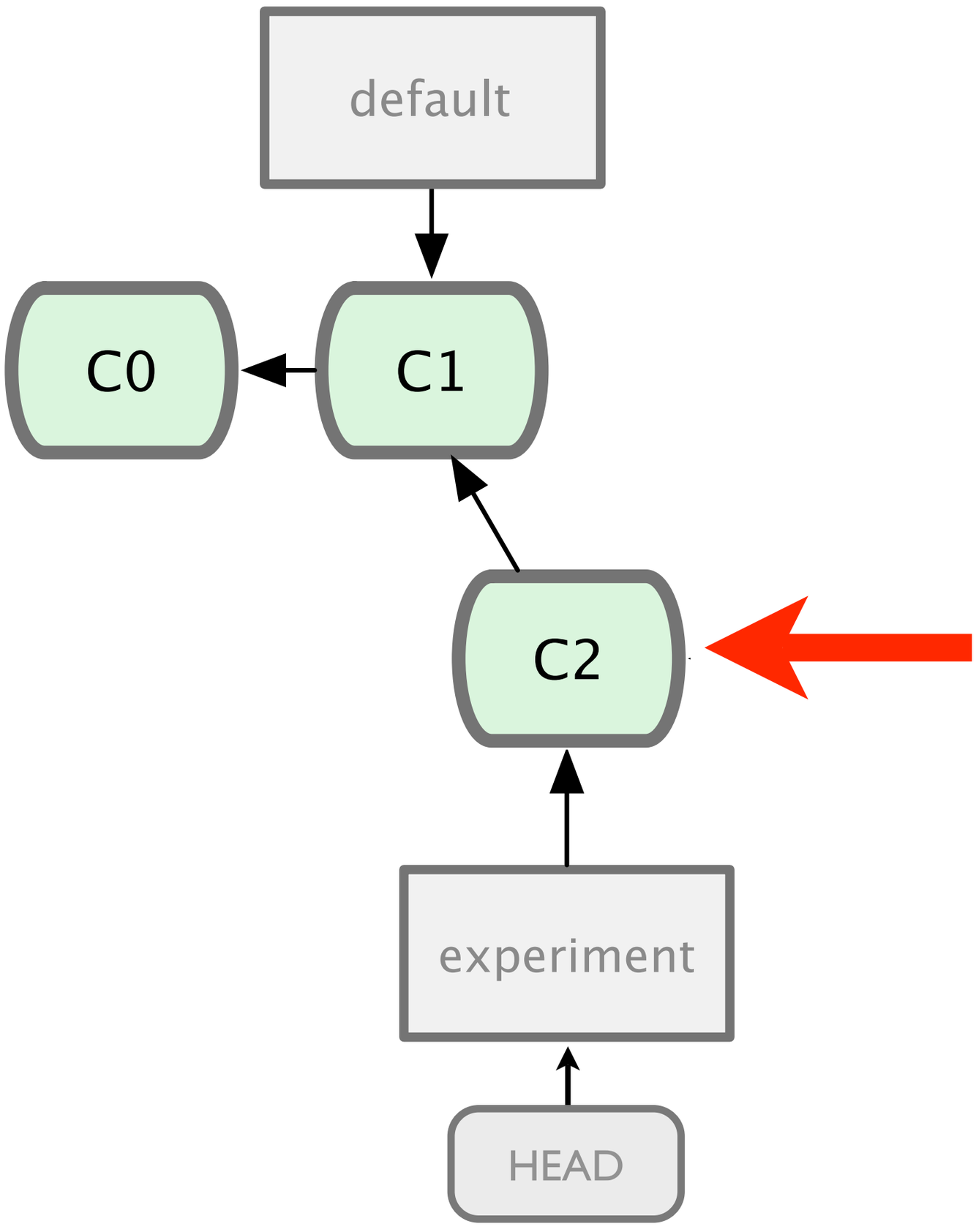

```
$ git branch
* default
  experiment
```



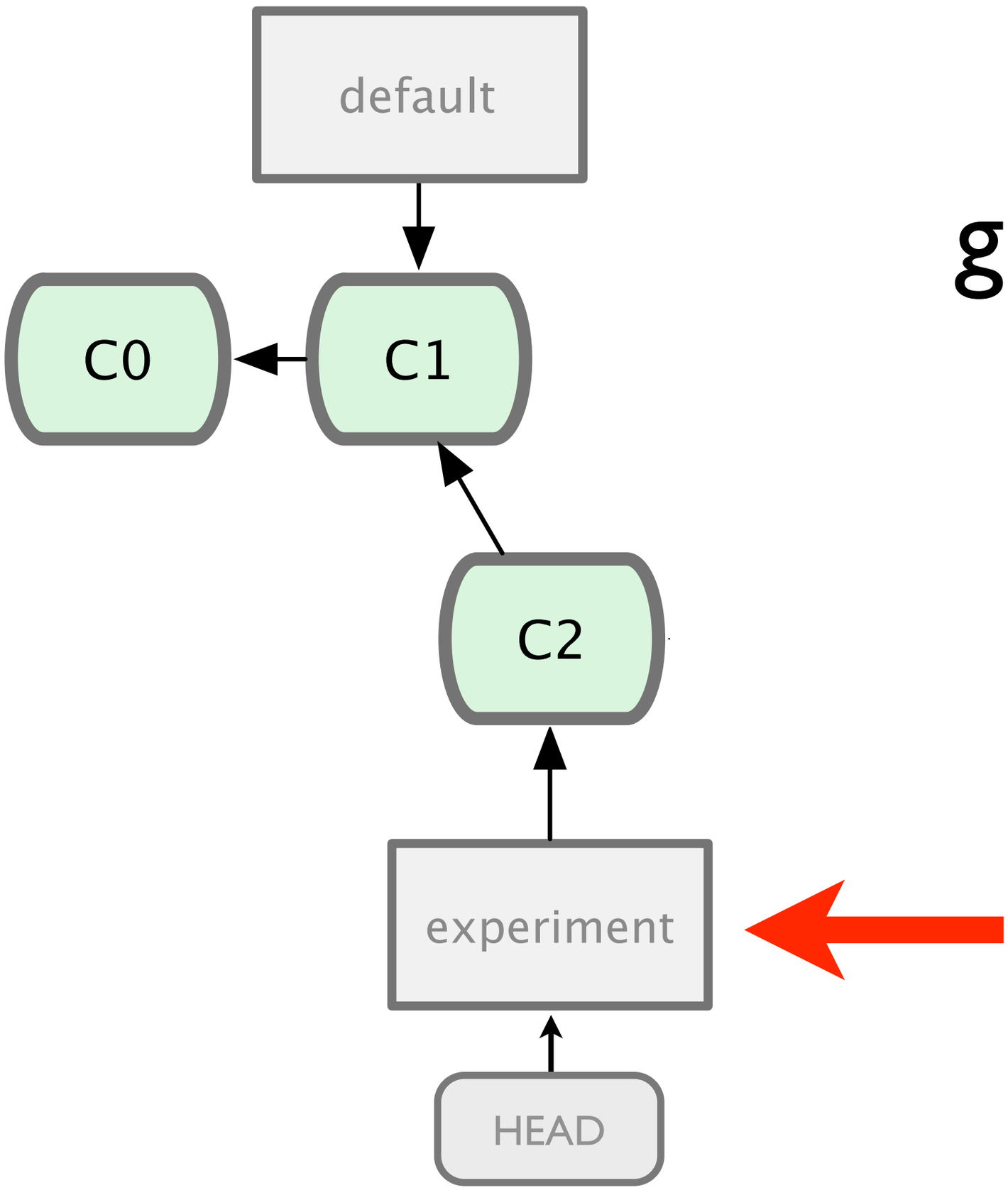
git checkout experiment



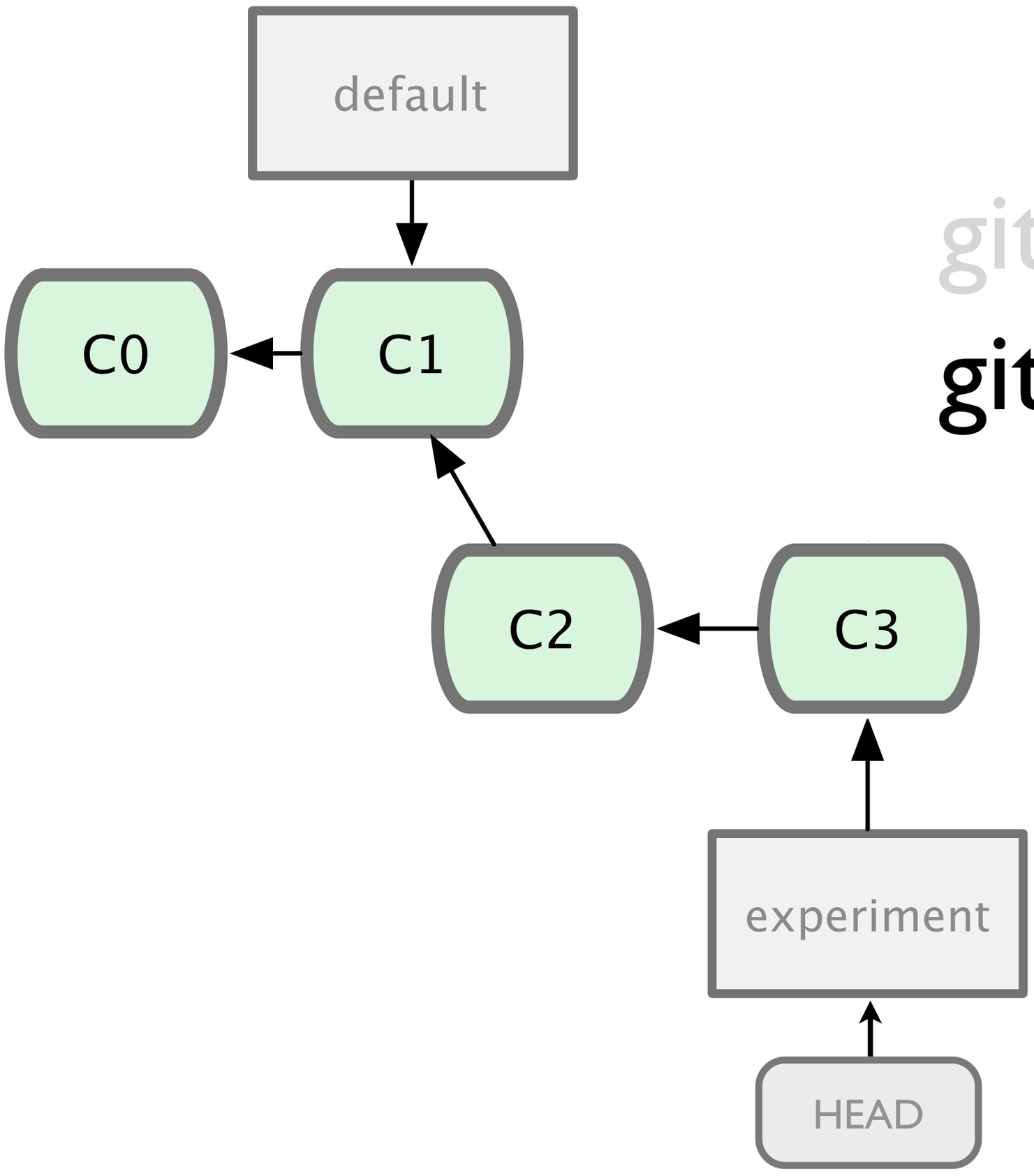
git commit



git commit

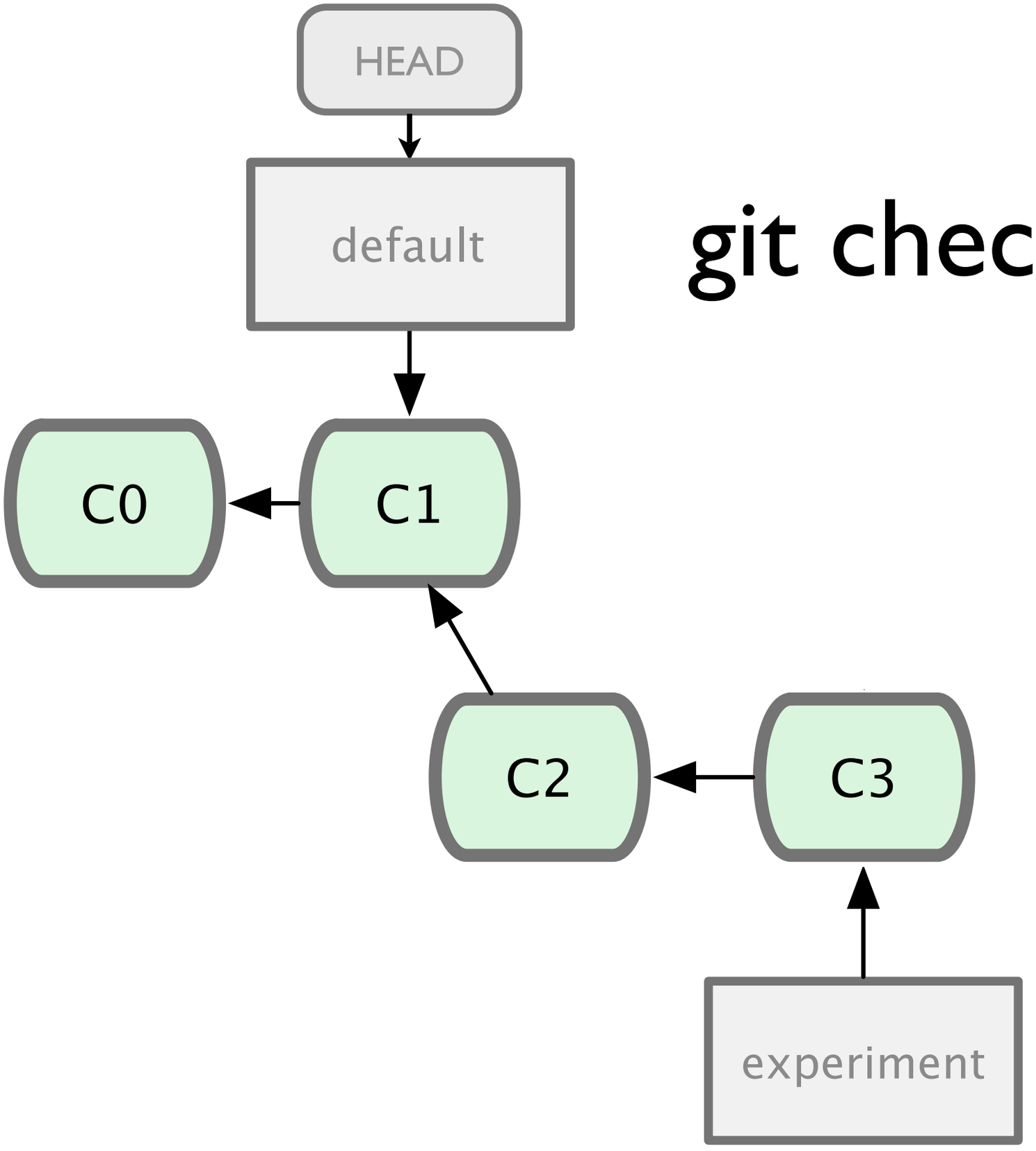


git commit

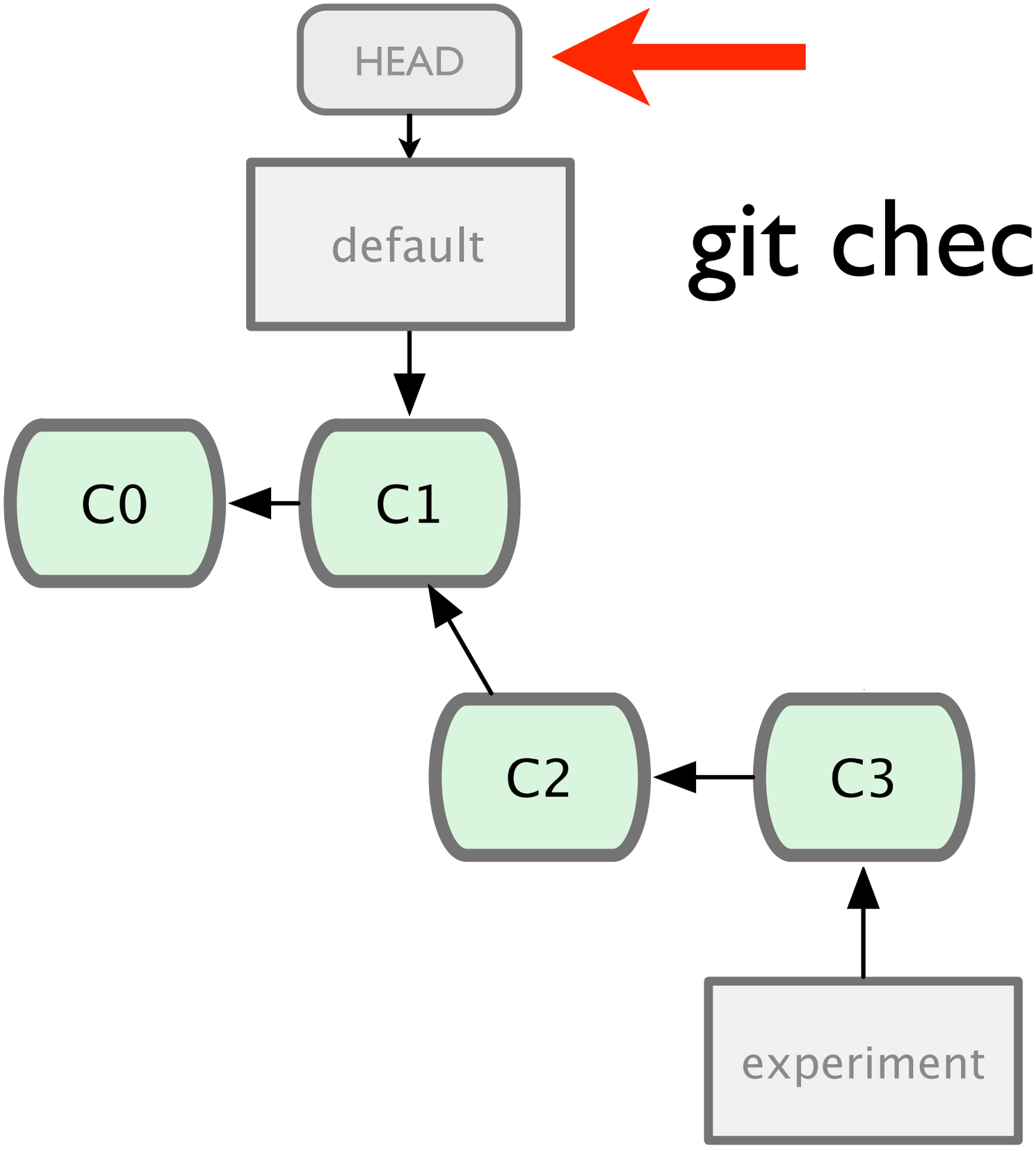


git commit

git commit

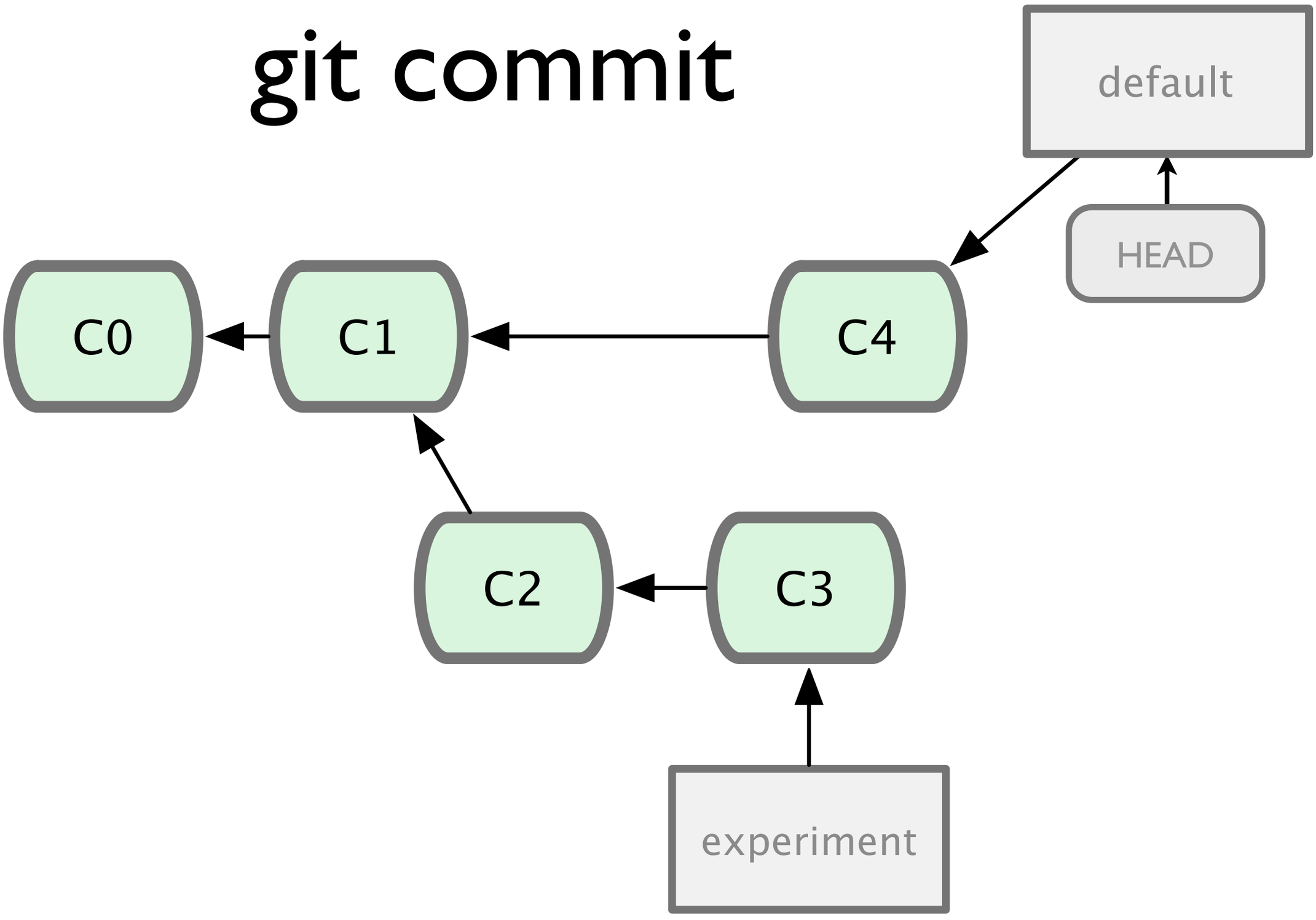


git checkout default

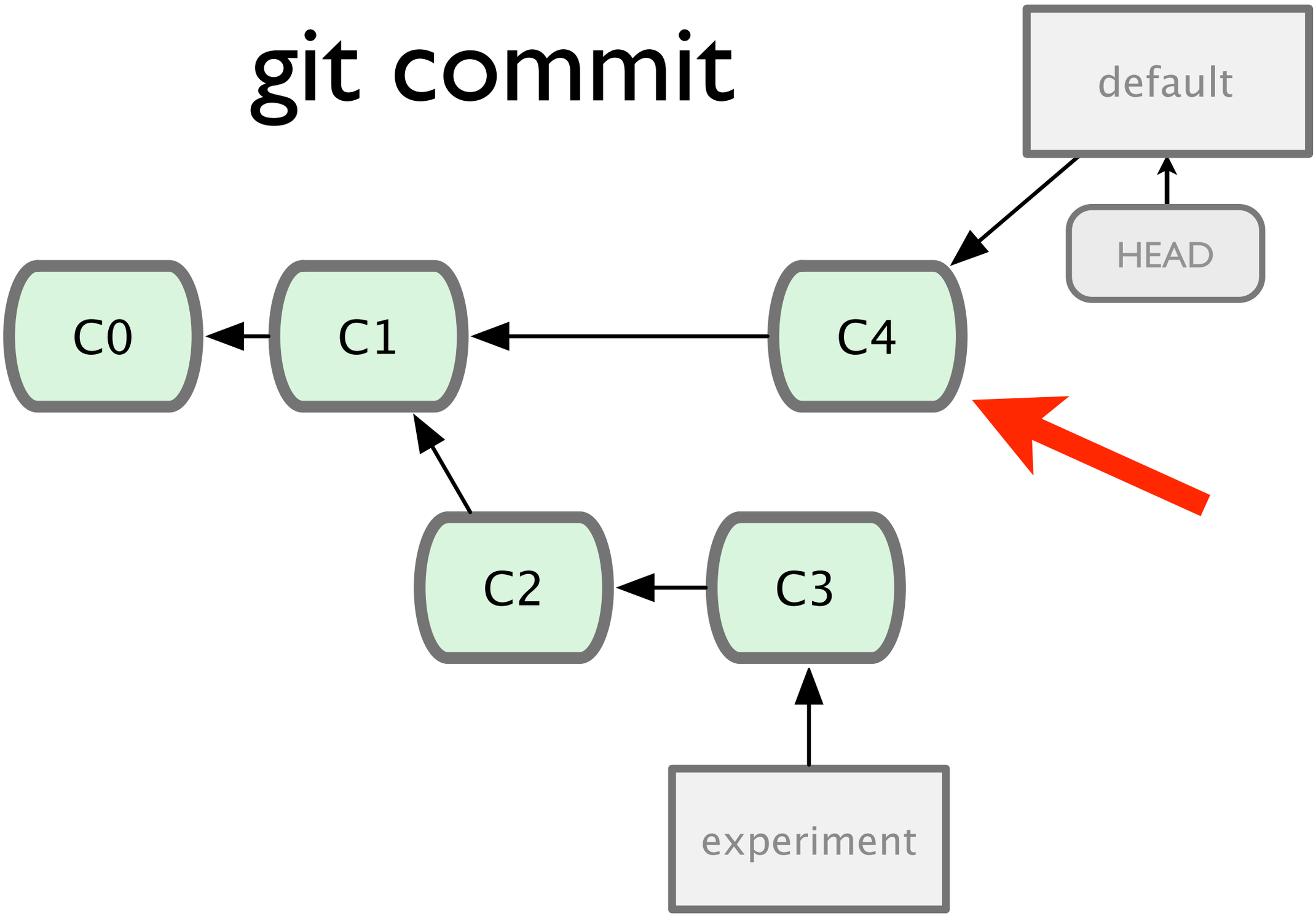


git checkout default

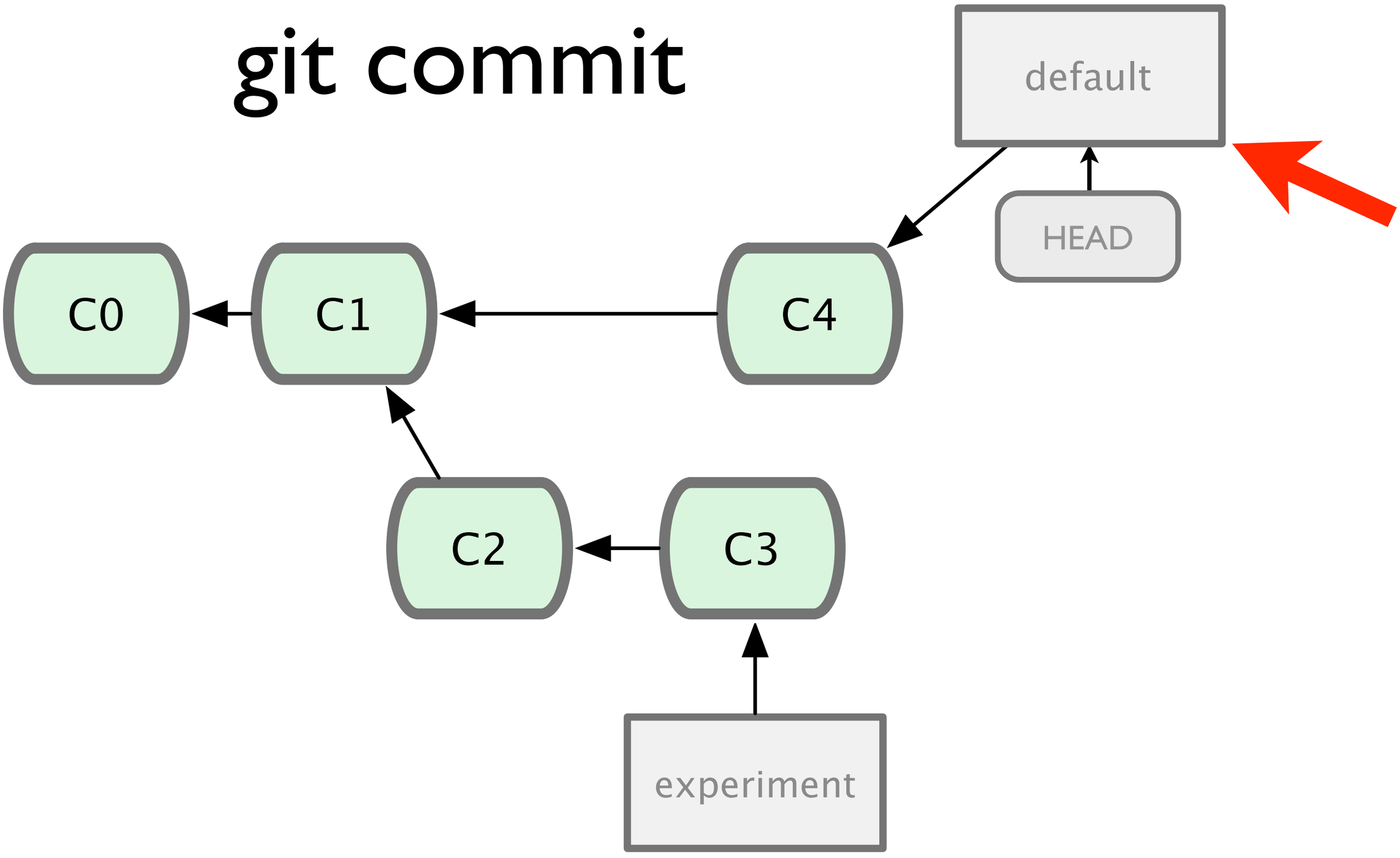
git commit

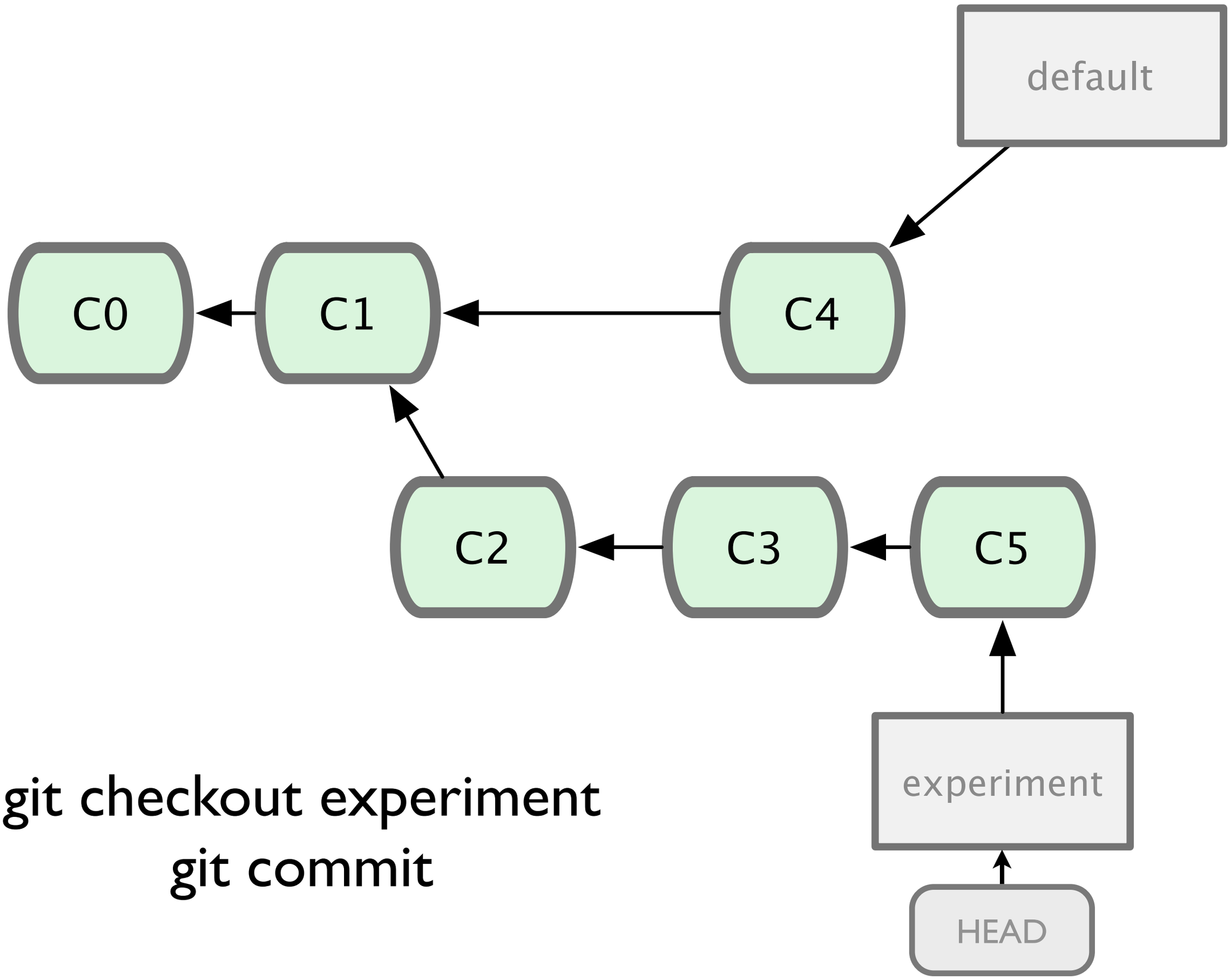


git commit



git commit

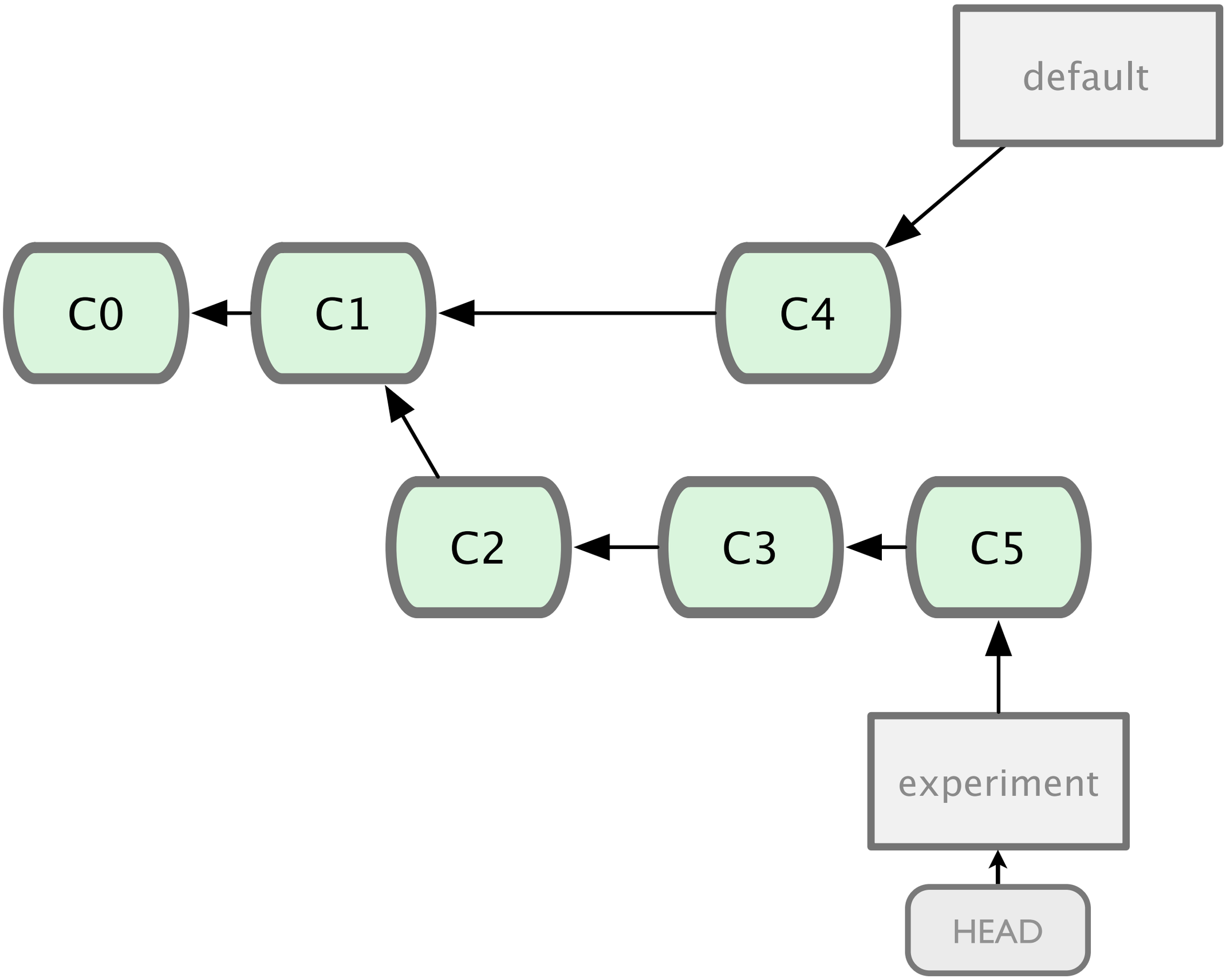


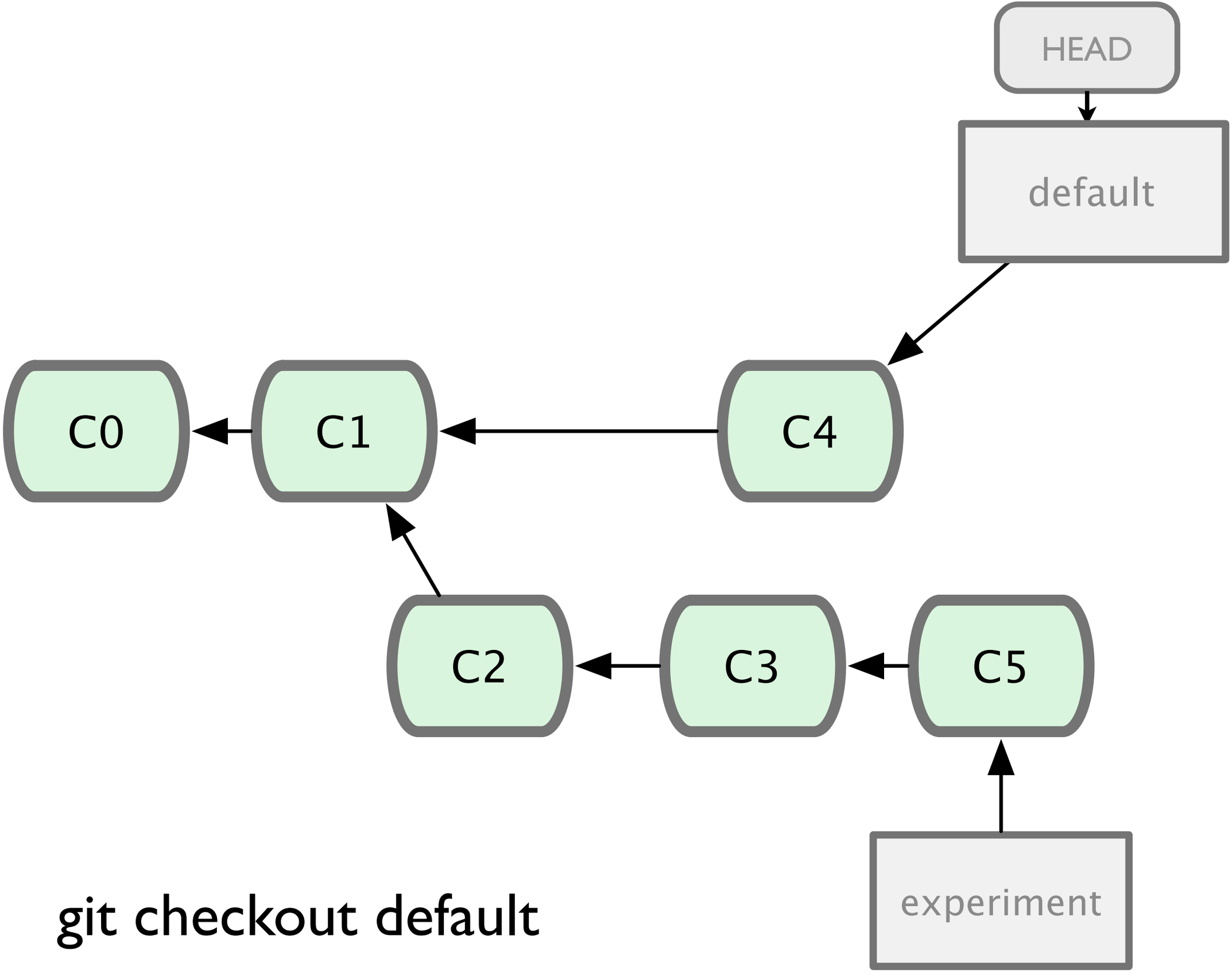


git checkout experiment
git commit

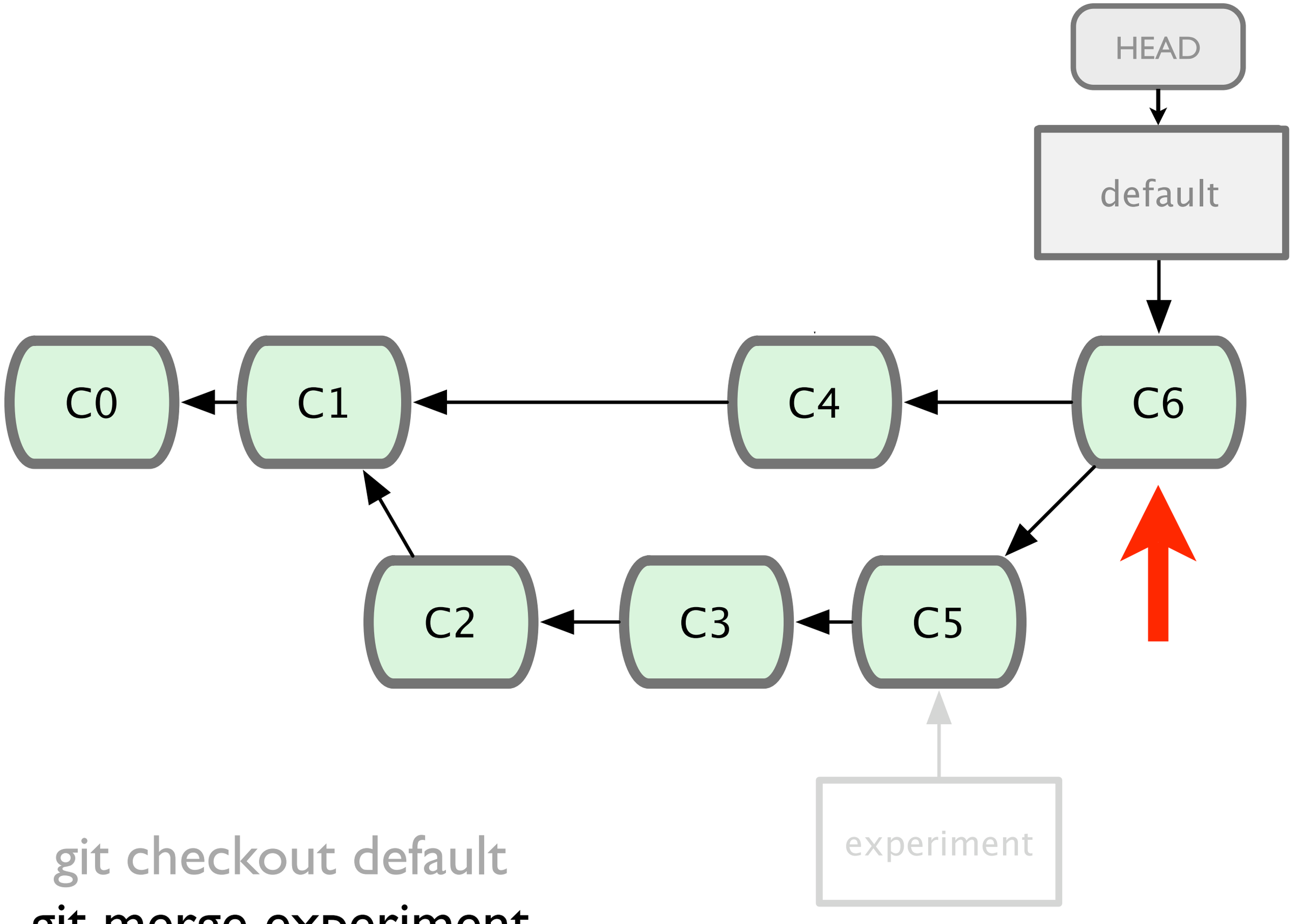
merging

git merge


default
C0
C1
C4
C2
C3
C5
experiment
HEAD

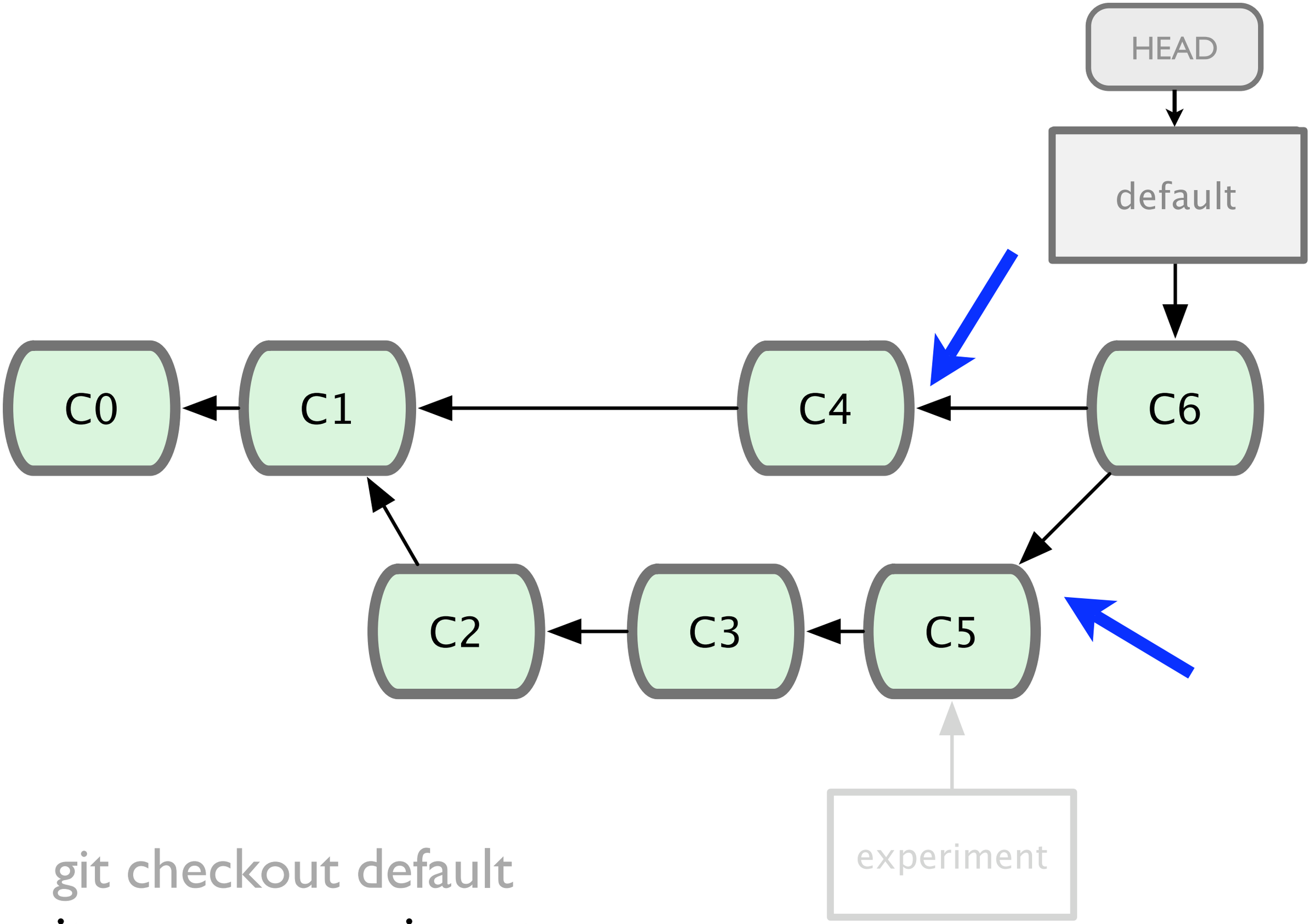


git checkout default



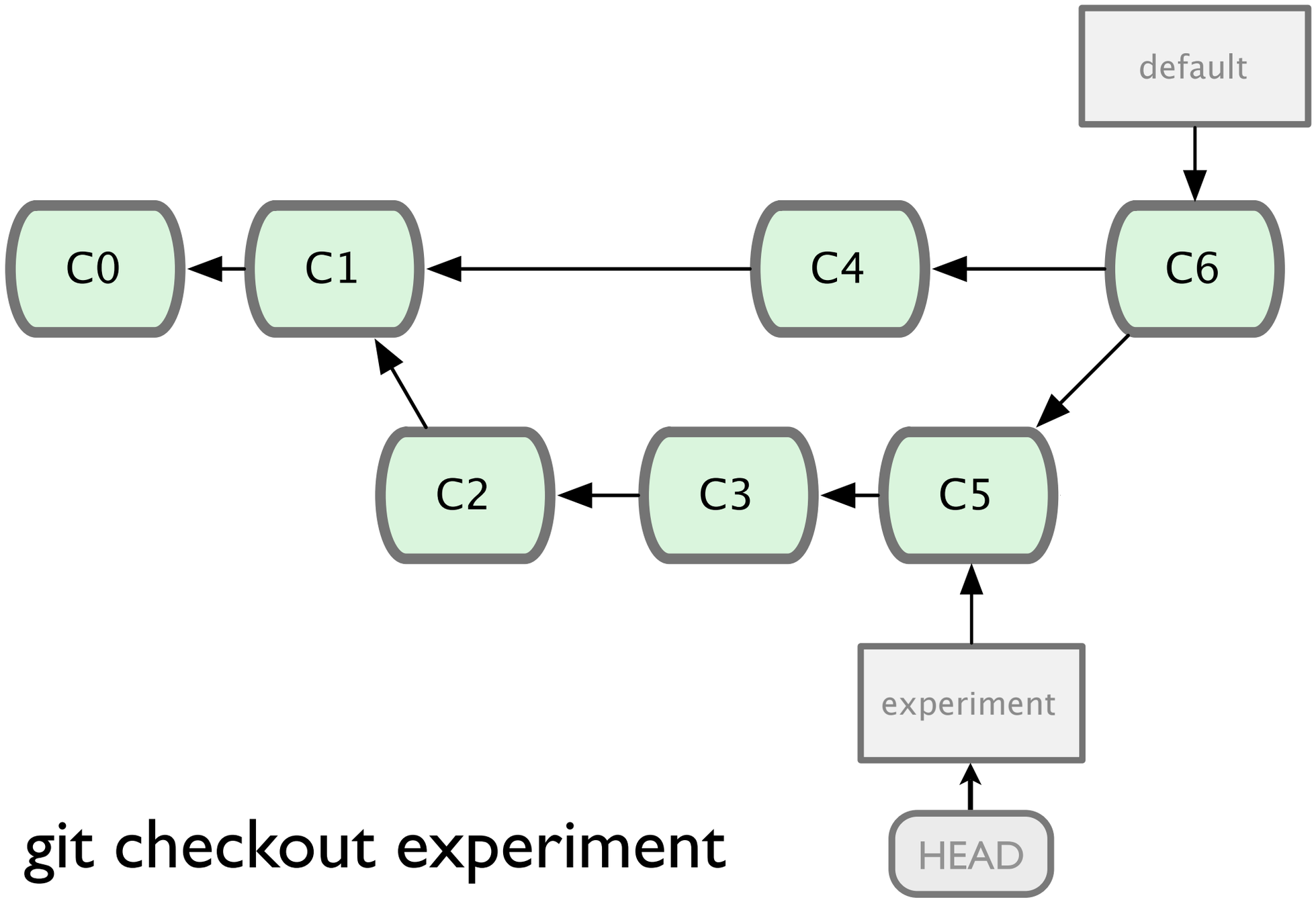
git checkout default

git merge experiment

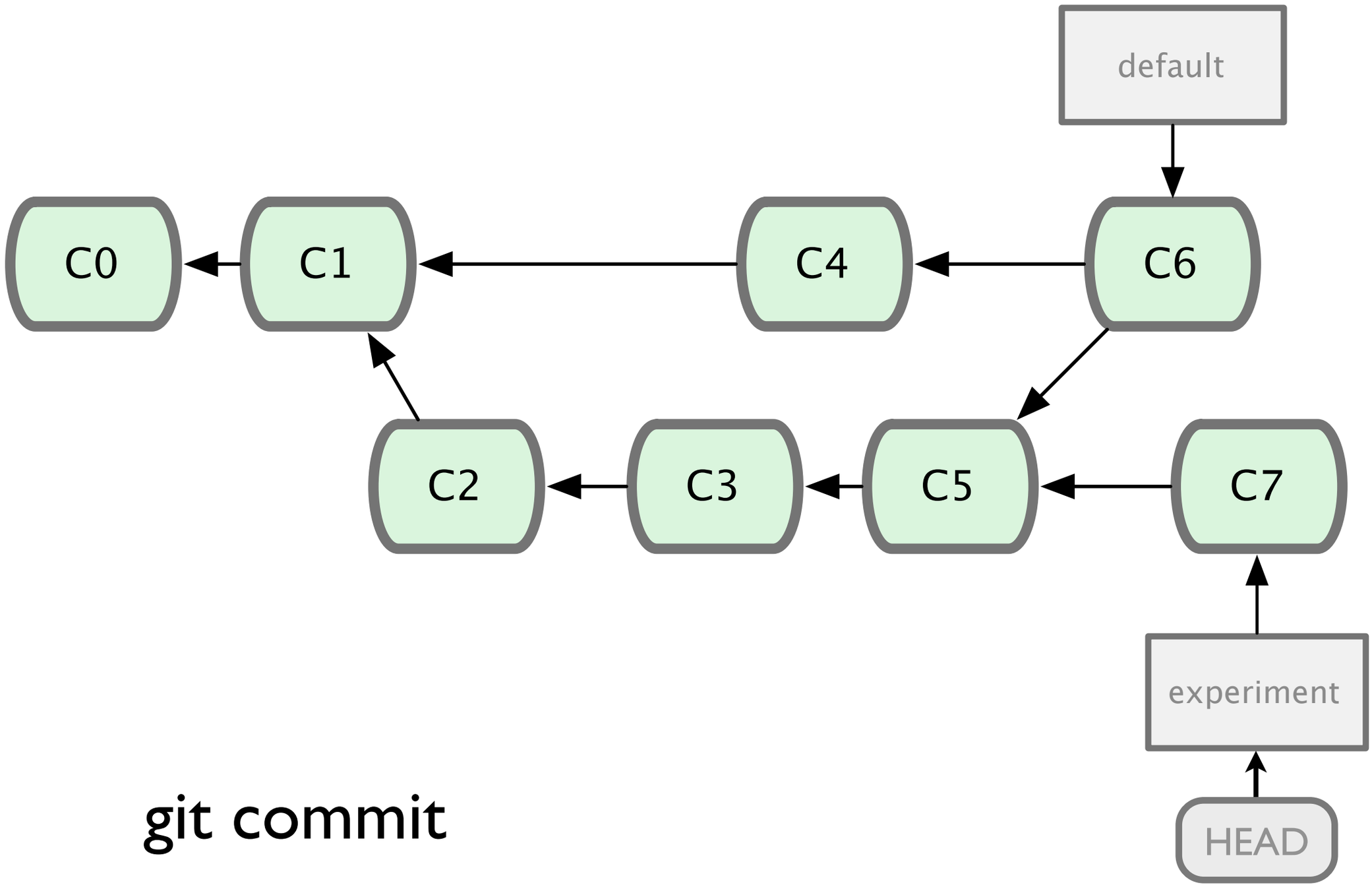


git checkout default

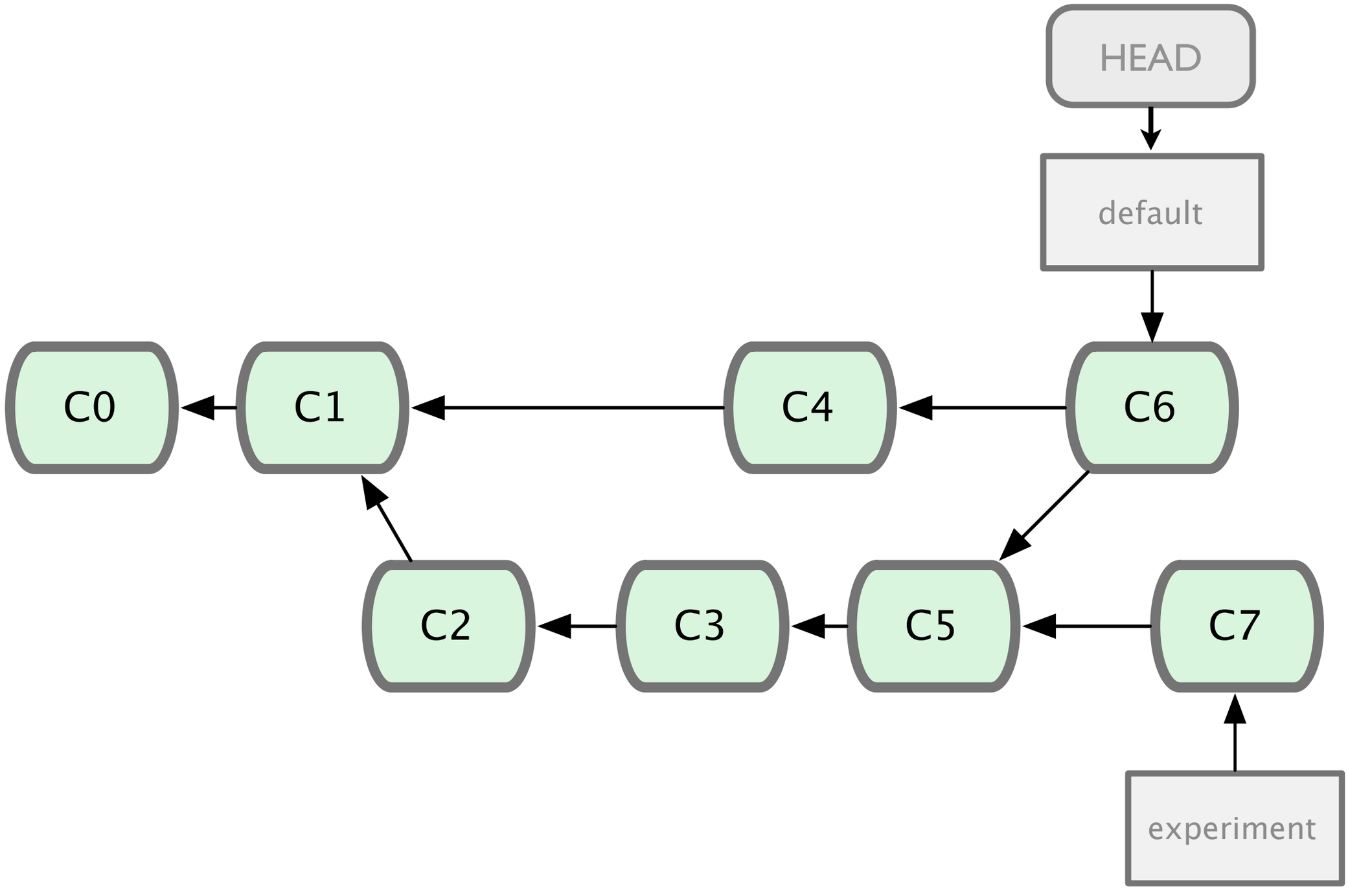
git merge experiment



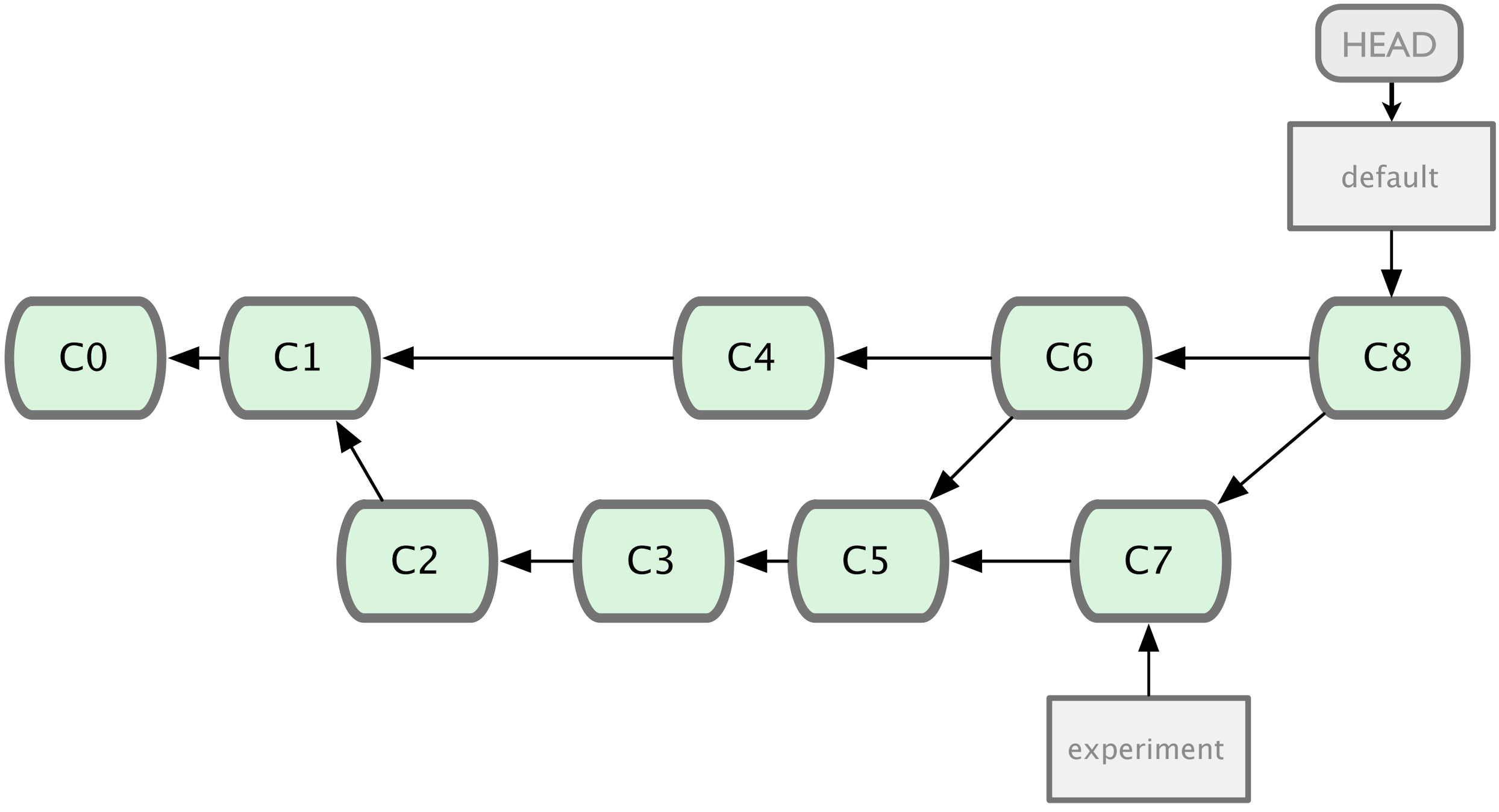
git checkout experiment



git commit



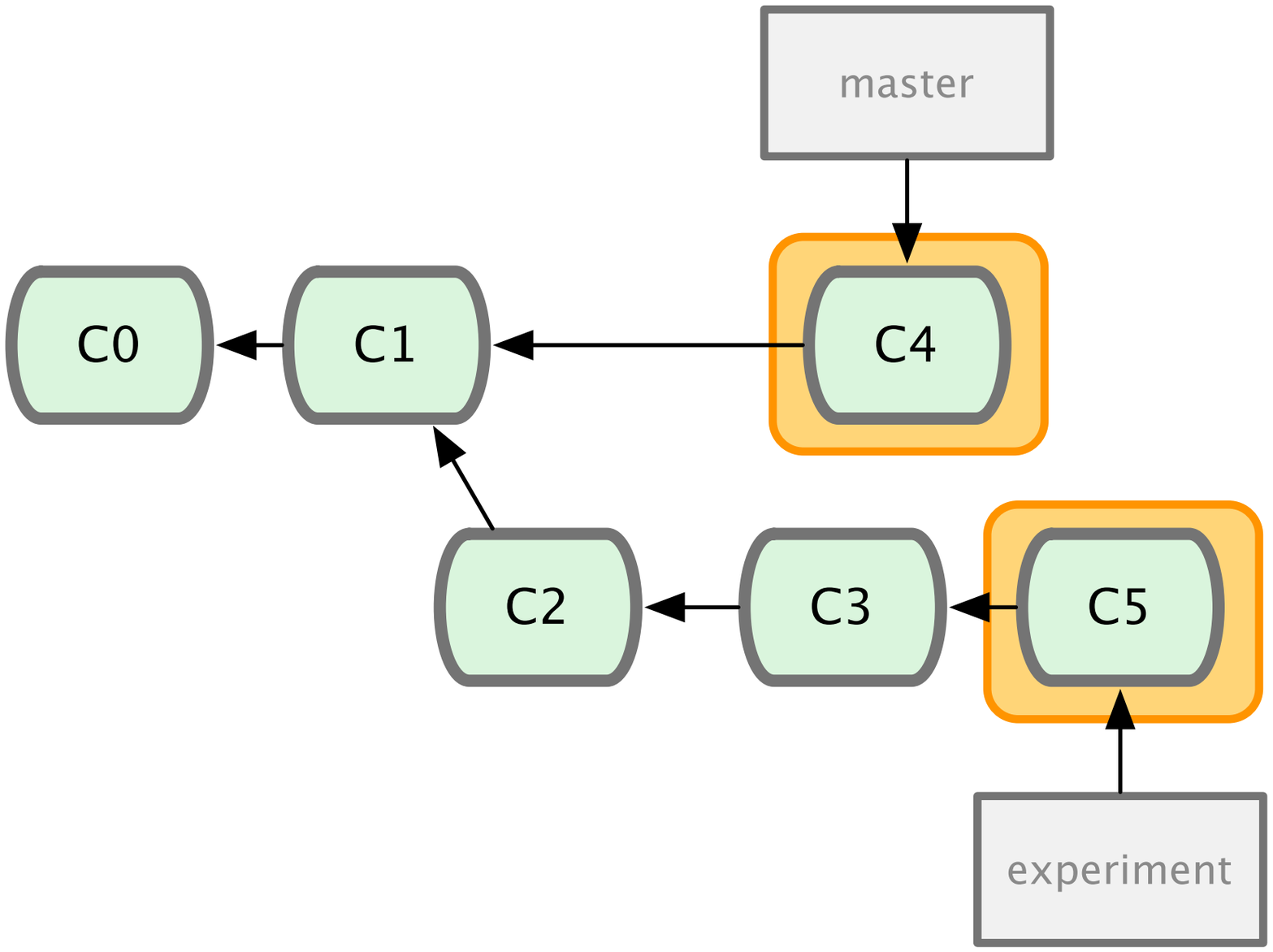
git checkout default

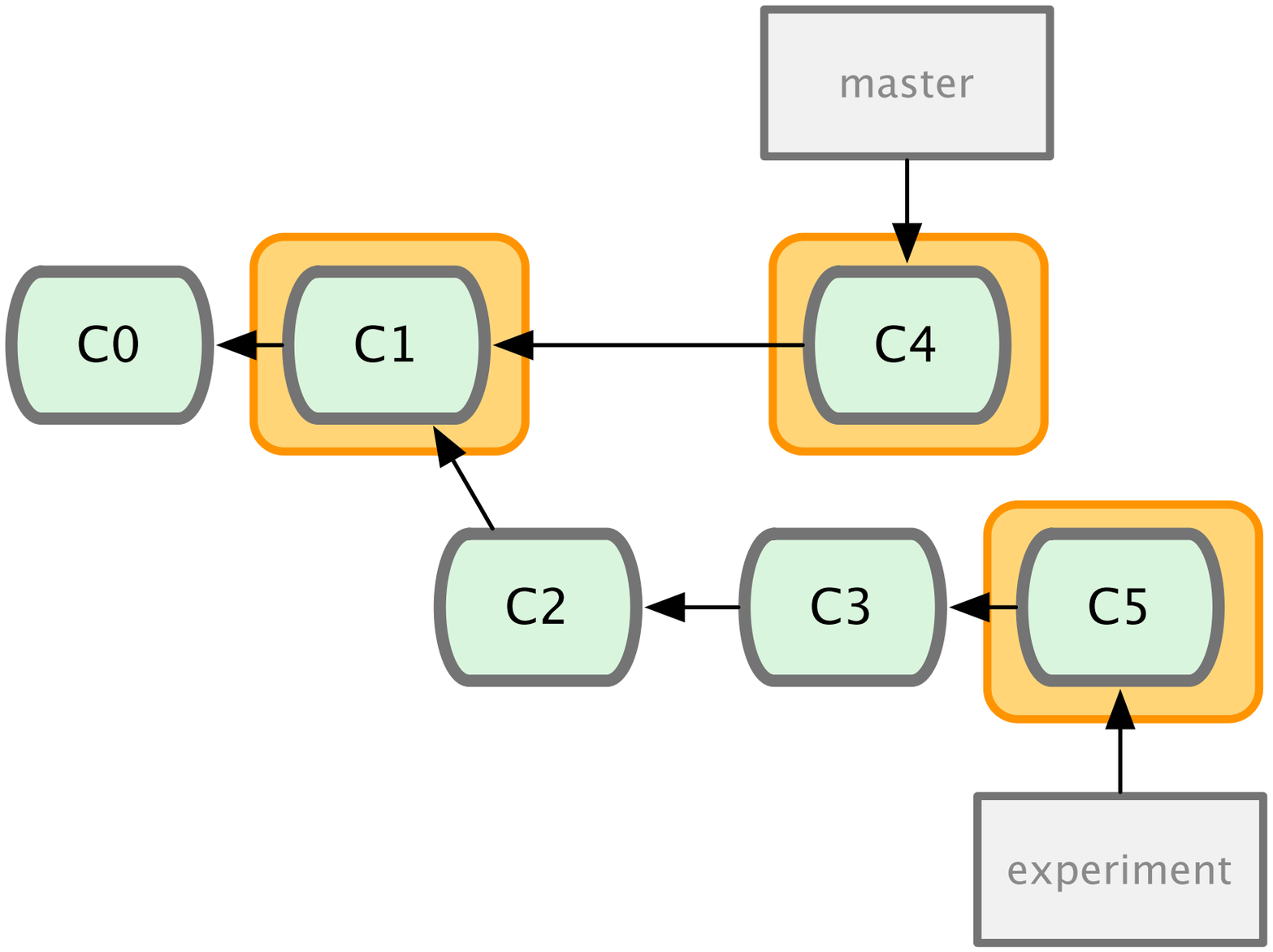


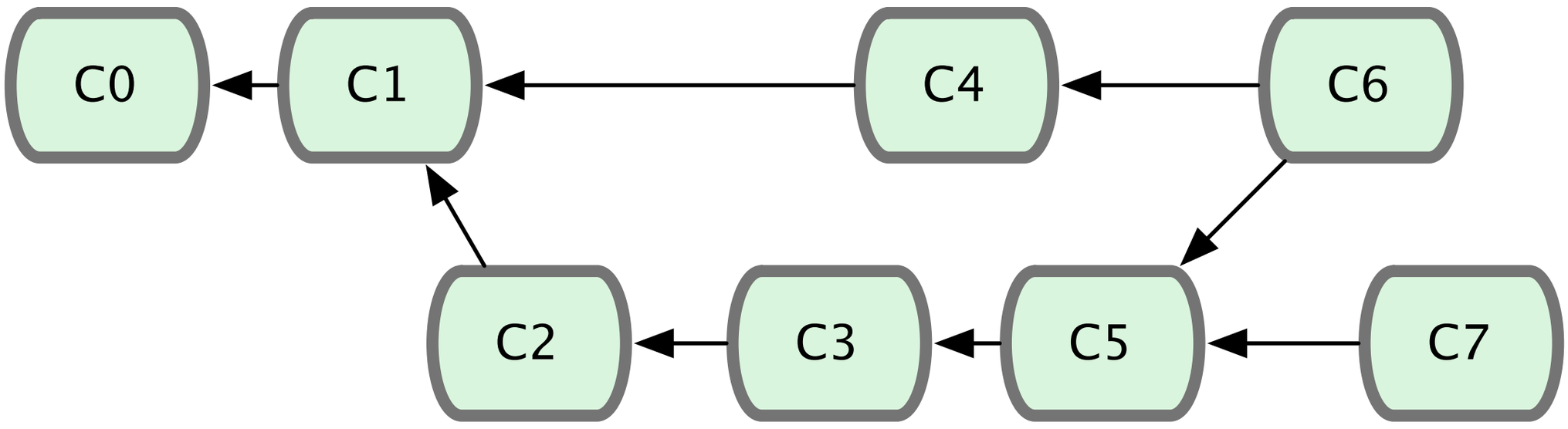
git merge experiment

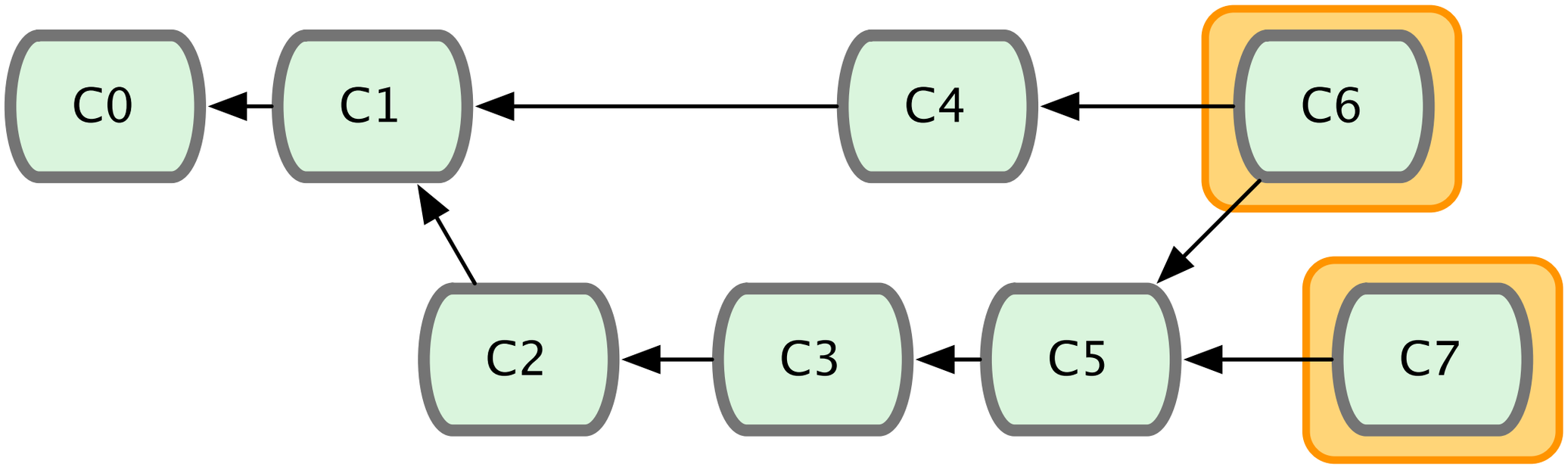
Hot

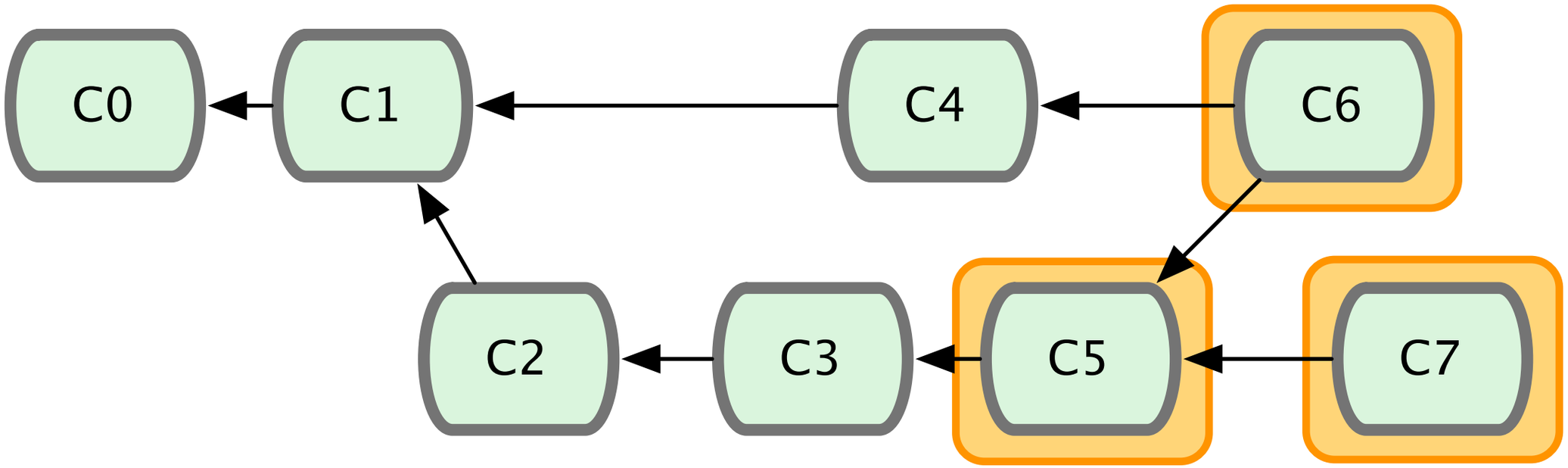
3 Way Merge Action


master
C0
C1
C4
C2
C3
C5
experiment


master
C0
C1
C4
C2
C3
C5
experiment


C0
C1
C4
C6
C2
C3
C5
C7


C0
C1
C4
C6
C2
C3
C5
C7


C0
C1
C4
C6
C2
C3
C5
C7

Remotes

Distributed Workflow

local repo

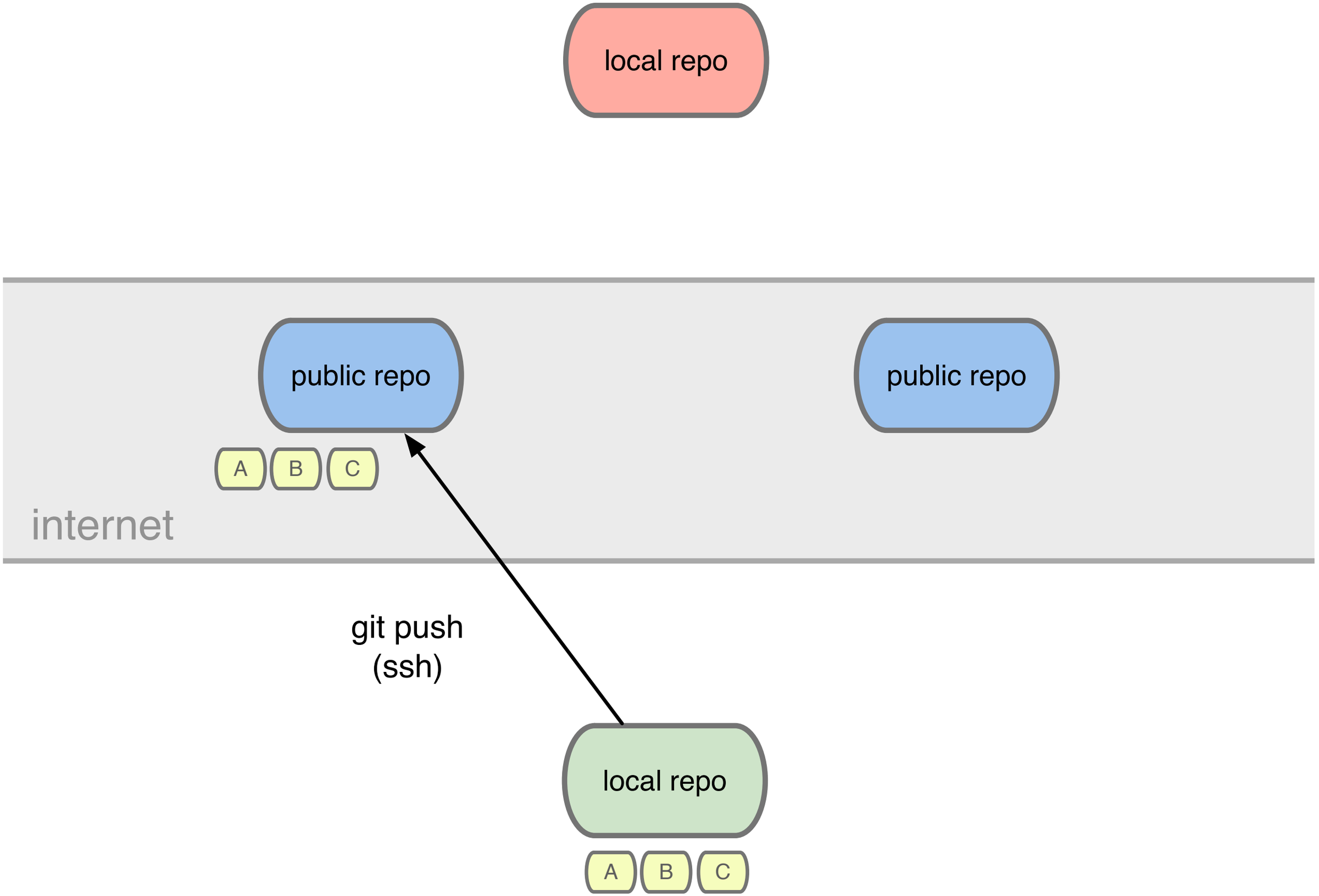
public repo

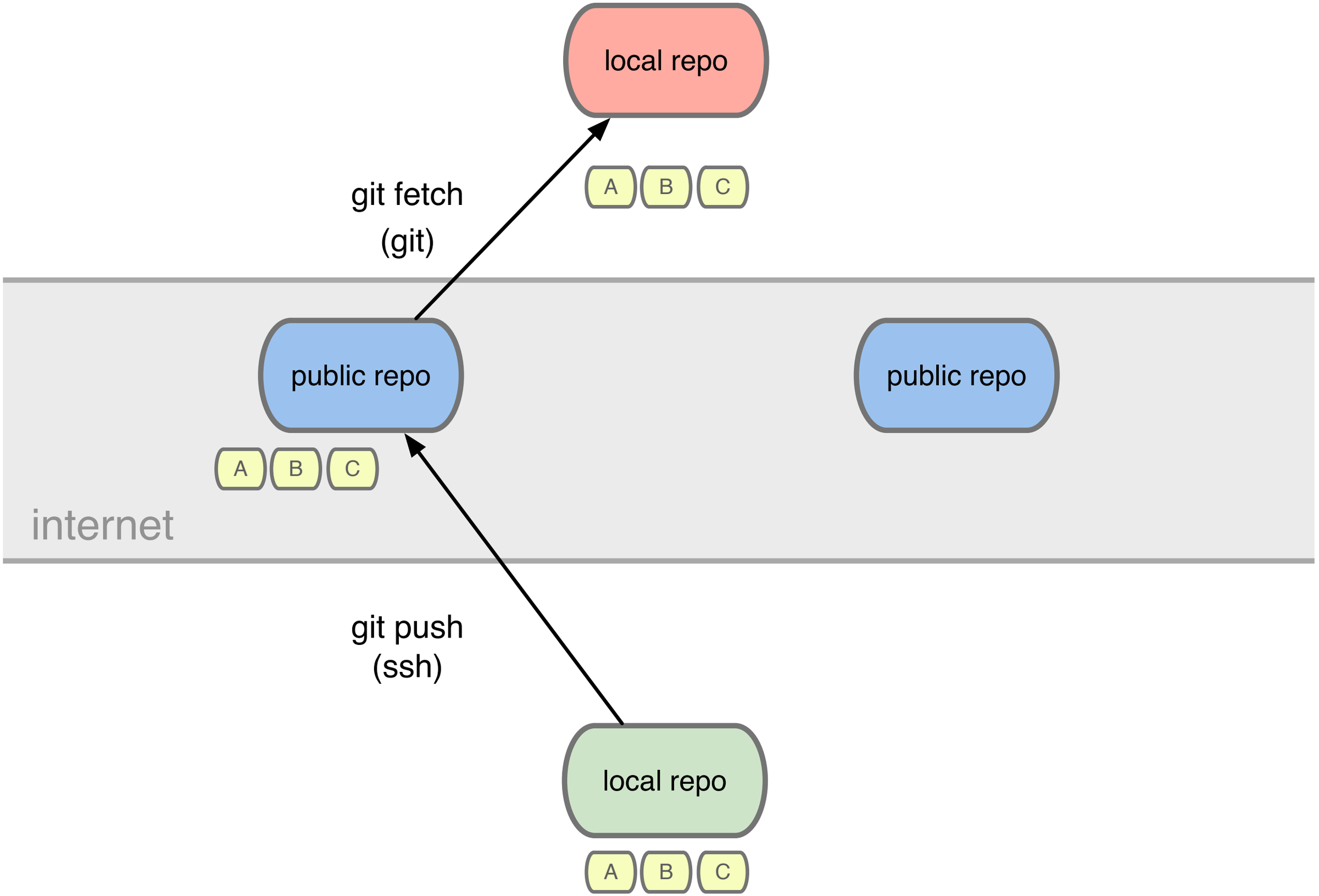
public repo

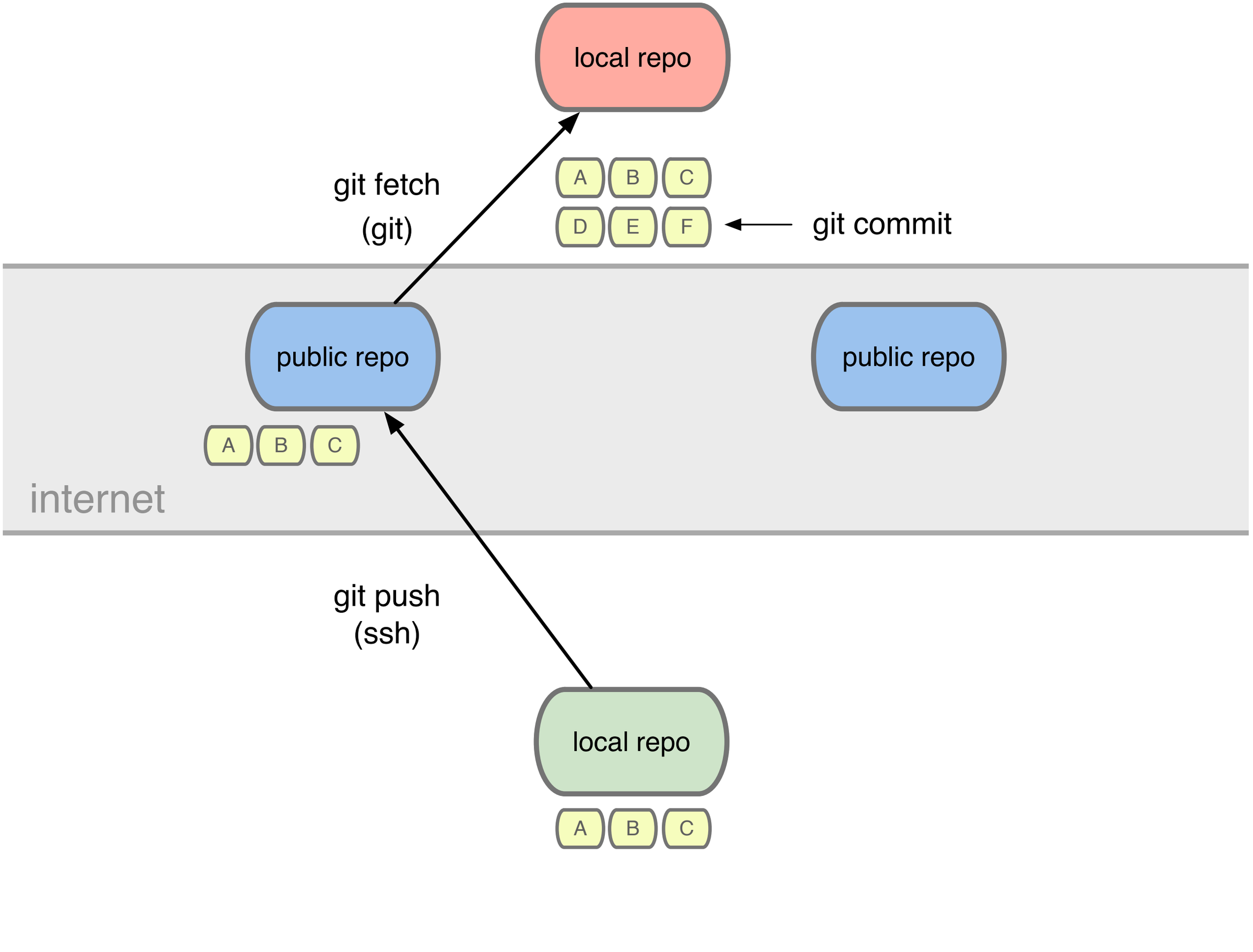
internet

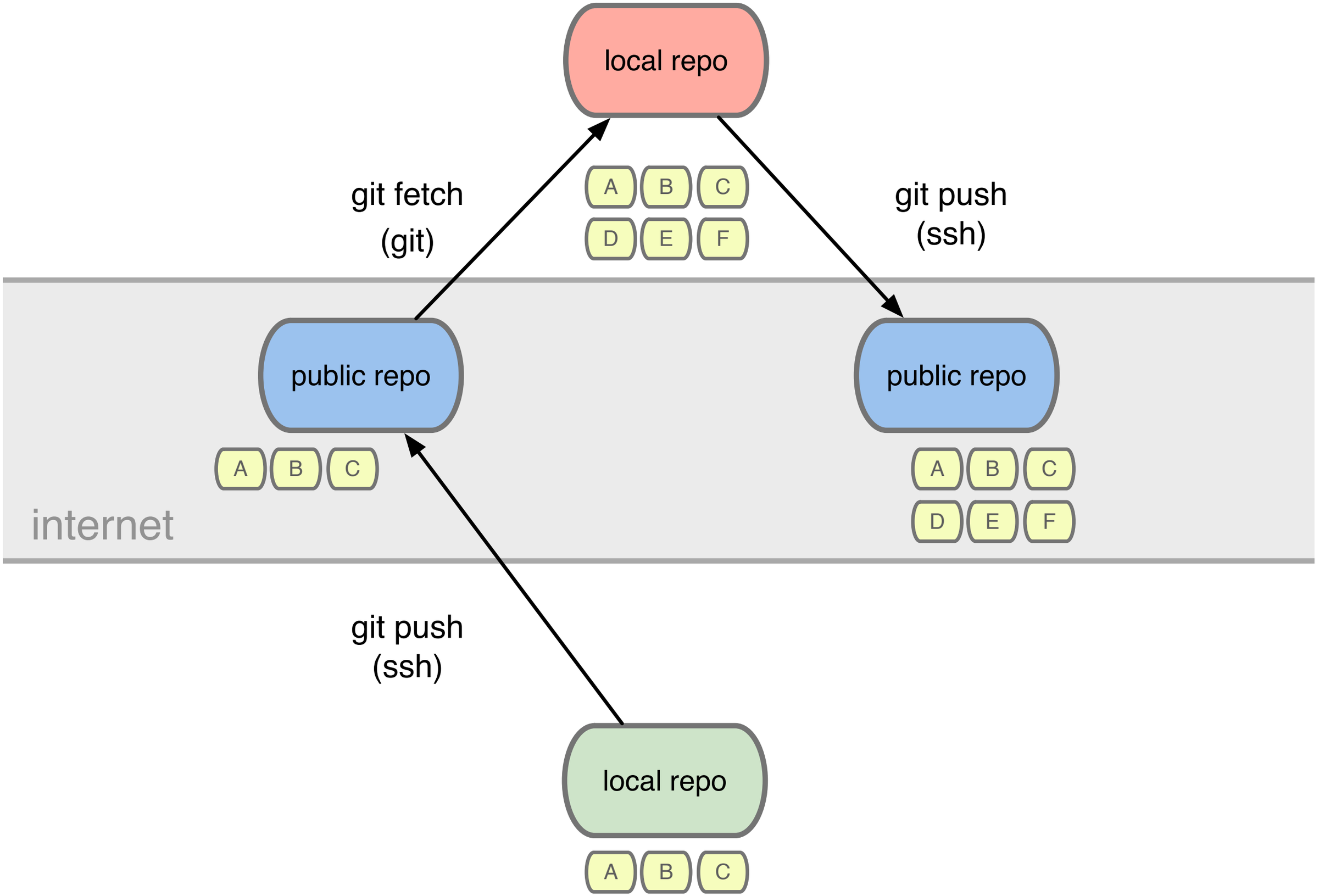
local repo

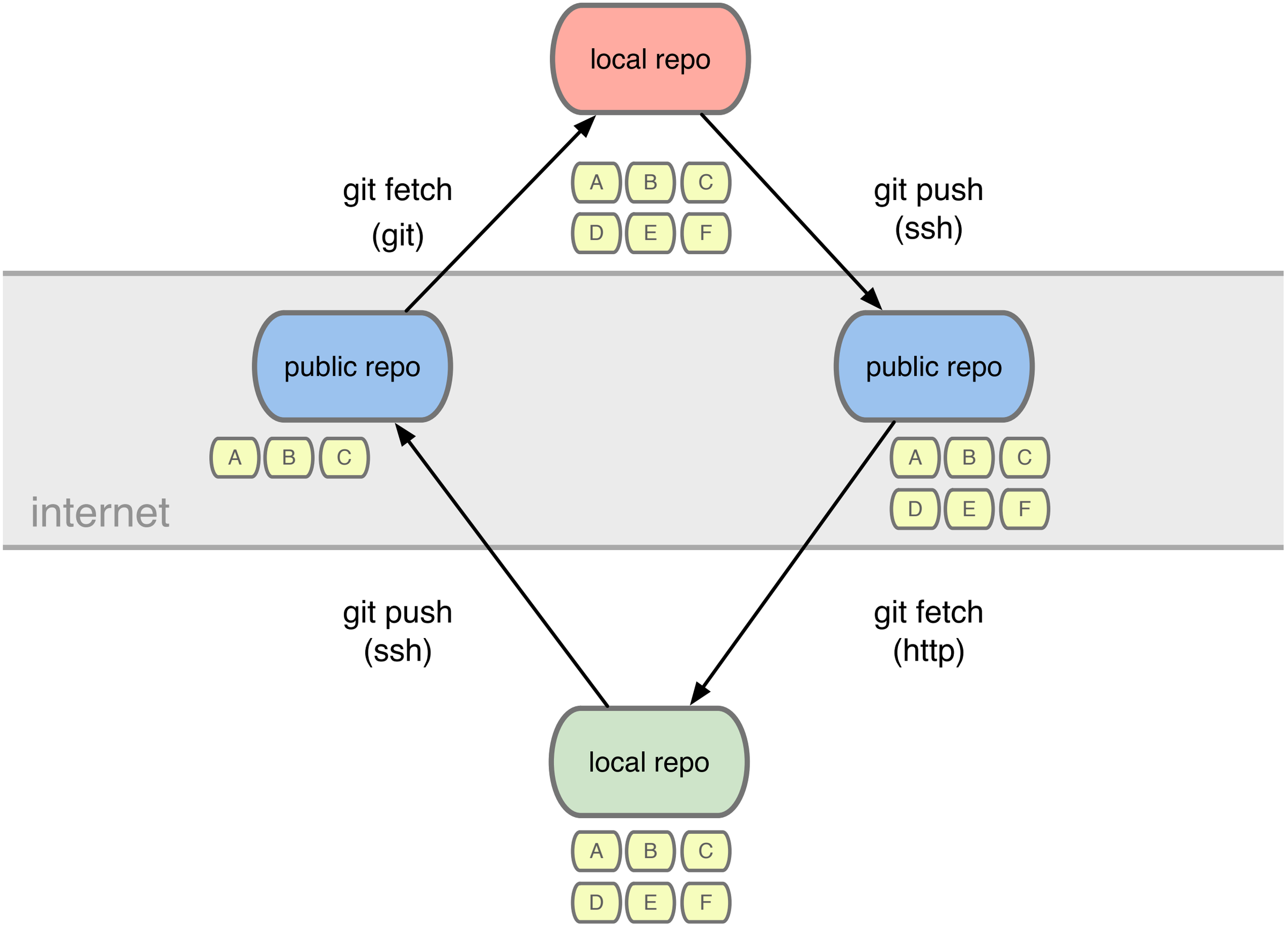
A B C

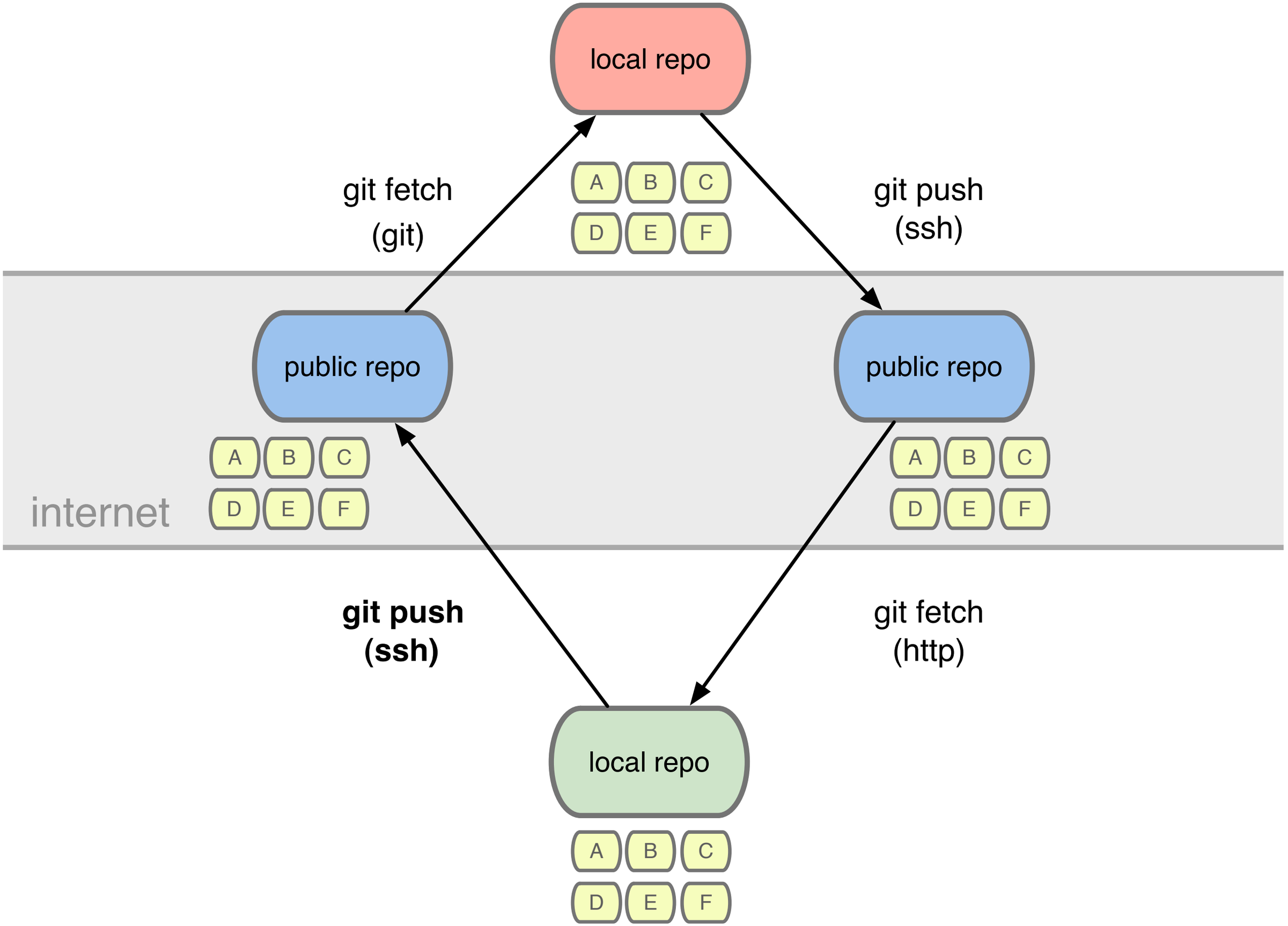

local repo
public repo
public repo
A
B
C
internet
git push
(ssh)
local repo
A
B
C


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

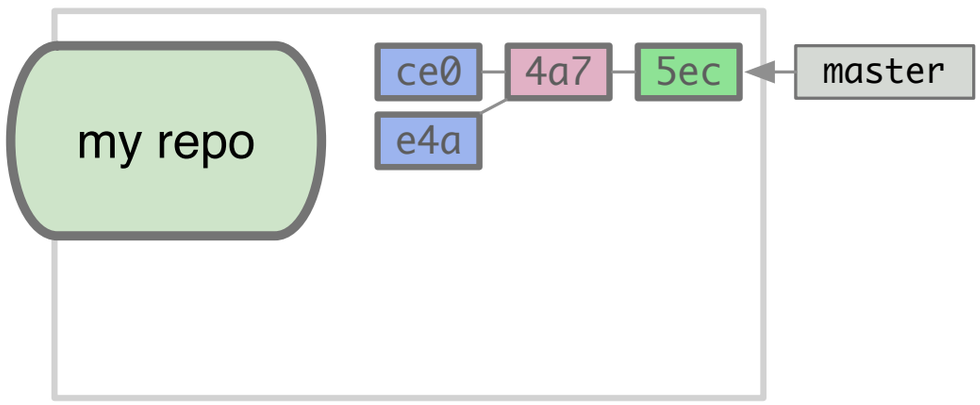

local repo
A B C
D E F
git fetch
(git)
git push
(ssh)
public repo
A B C
public repo
A B C
D E F
internet
git push
(ssh)
git fetch
(http)
local repo
A B C
D E F


local repo
A B C
D E F
git fetch
(git)
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

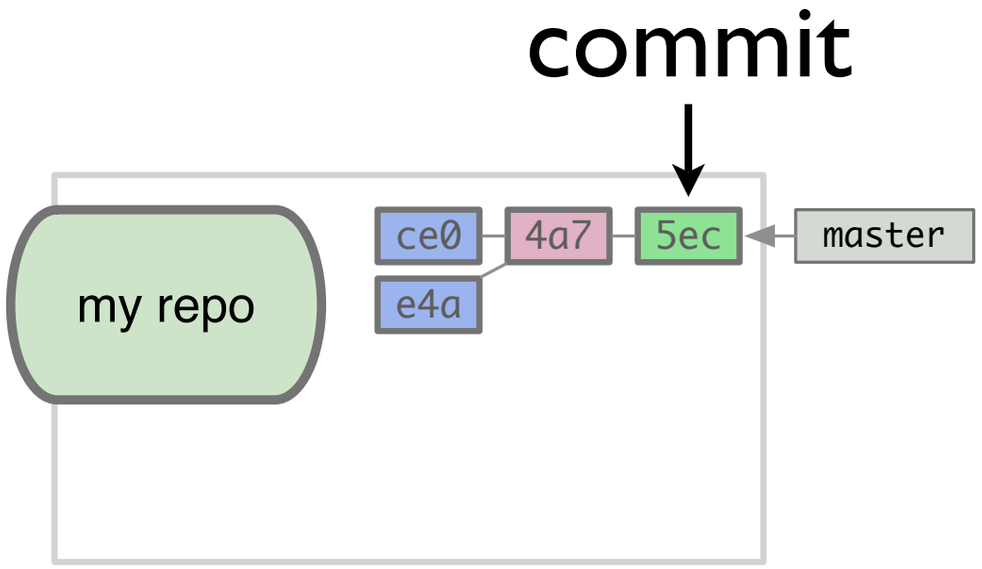
developer
nick

developer
jessica



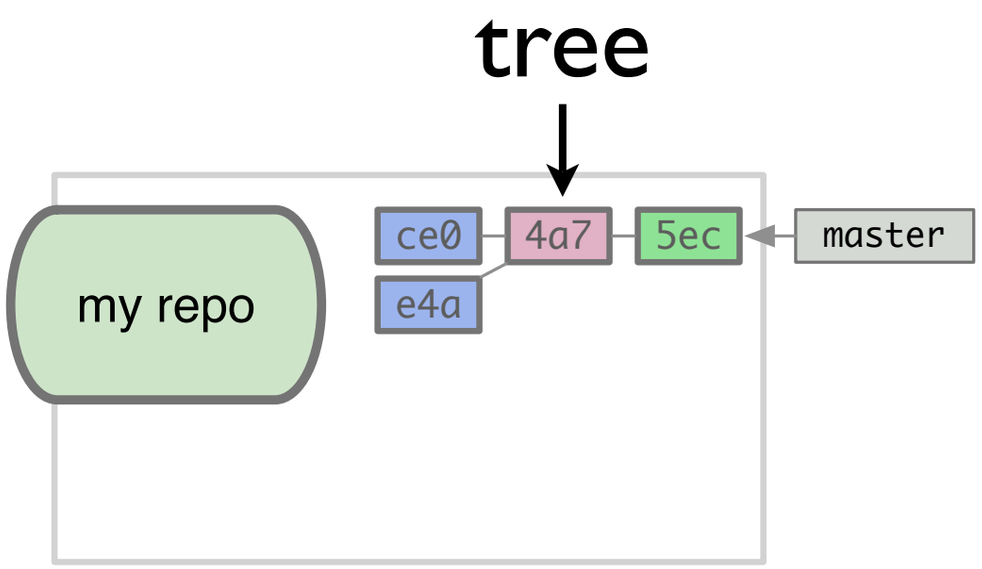
developer
nick

developer
jessica



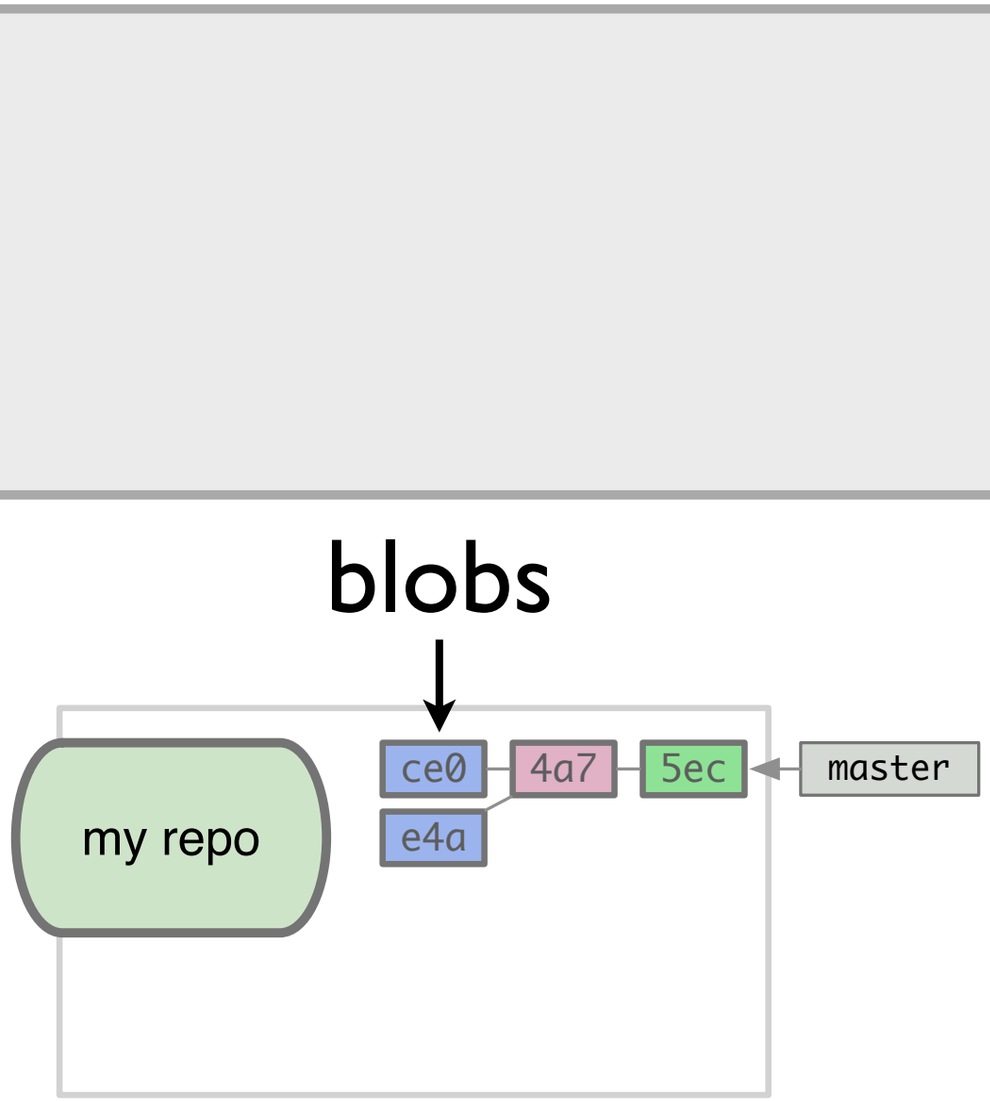
developer
nick

developer
jessica



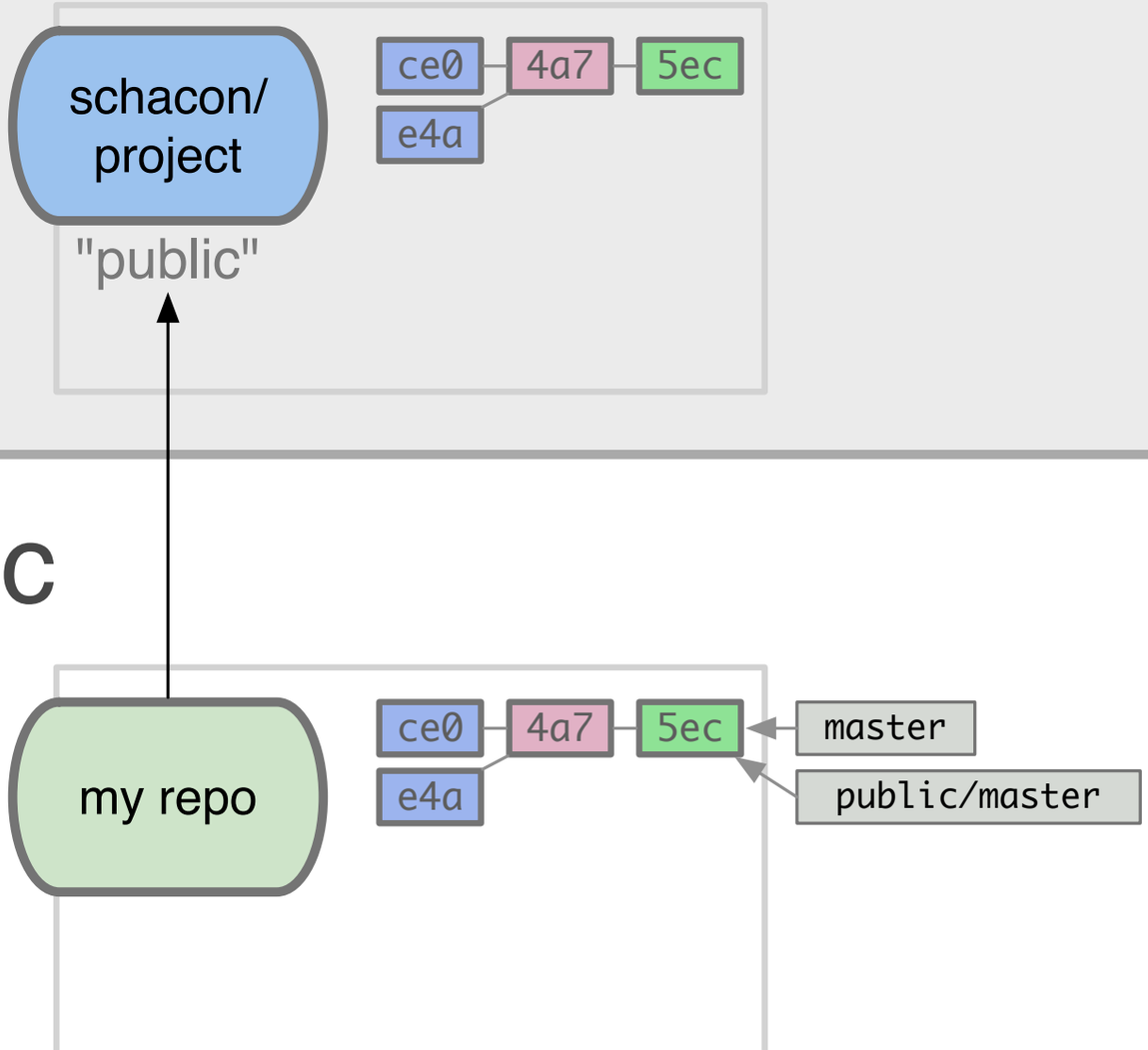
developer
nick

developer
jessica

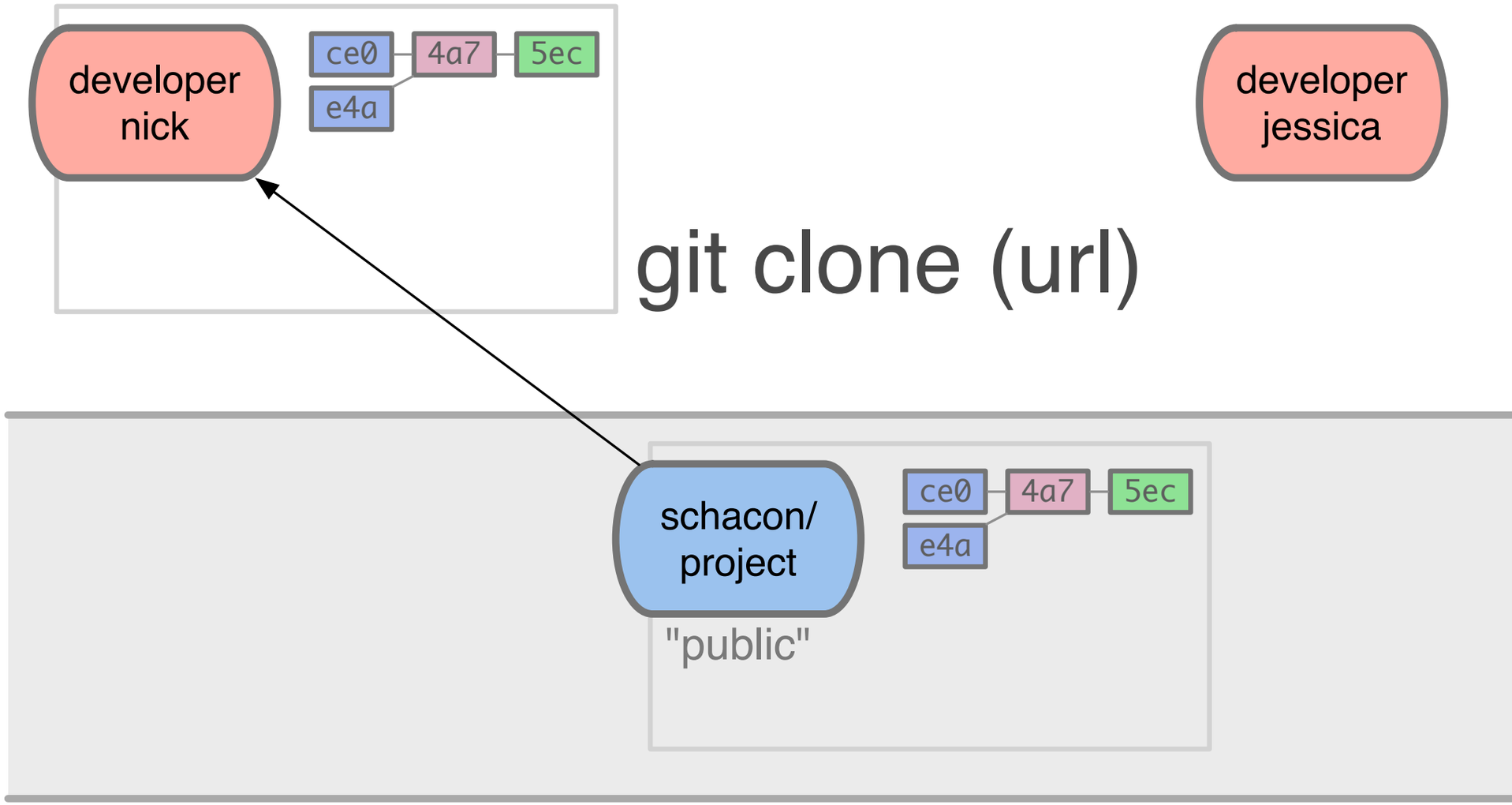


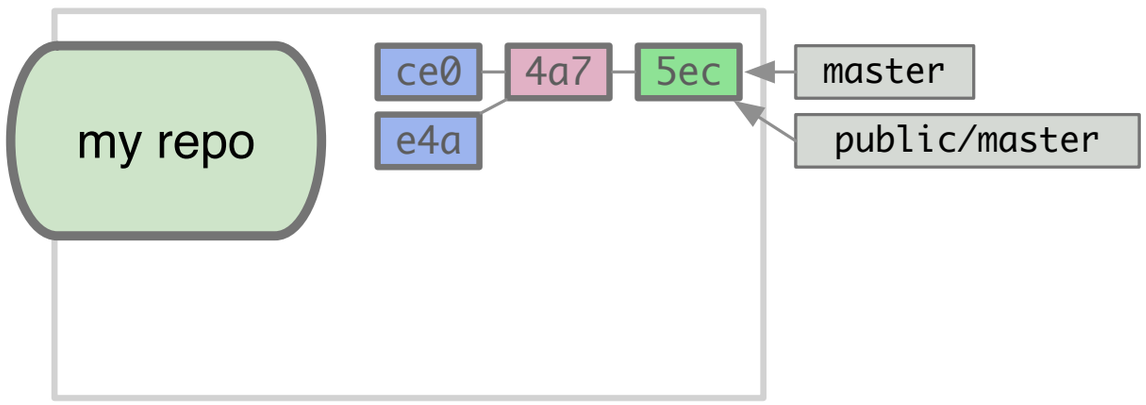
developer
nick

developer
jessica



git push public

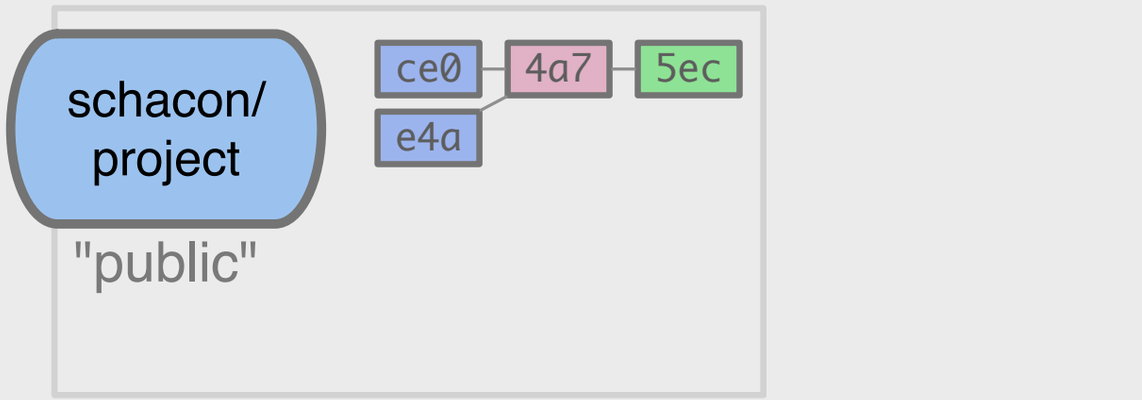

developer
nick
ce0
4a7
5ec
e4a
developer
jessica
git clone (url)
schacon/
project
ce0
4a7
5ec
e4a
"public"

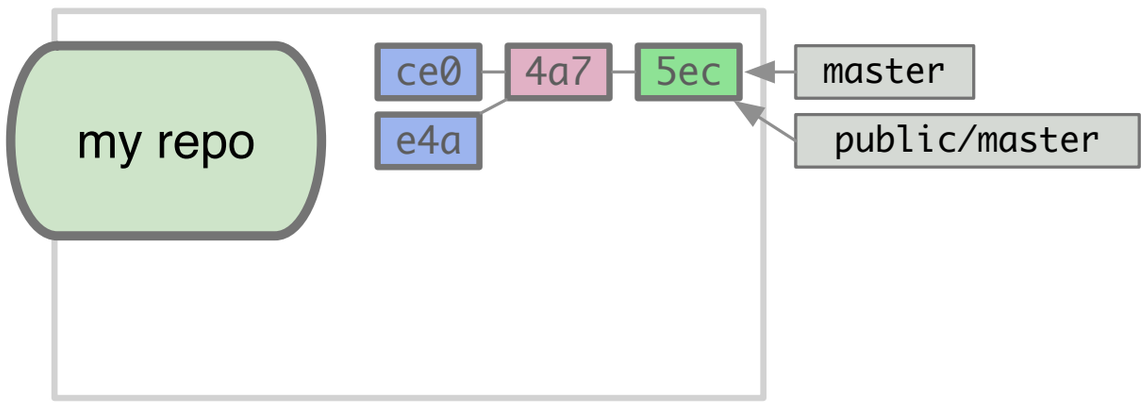

my repo
ce0
4a7
5ec
e4a
master
public/master

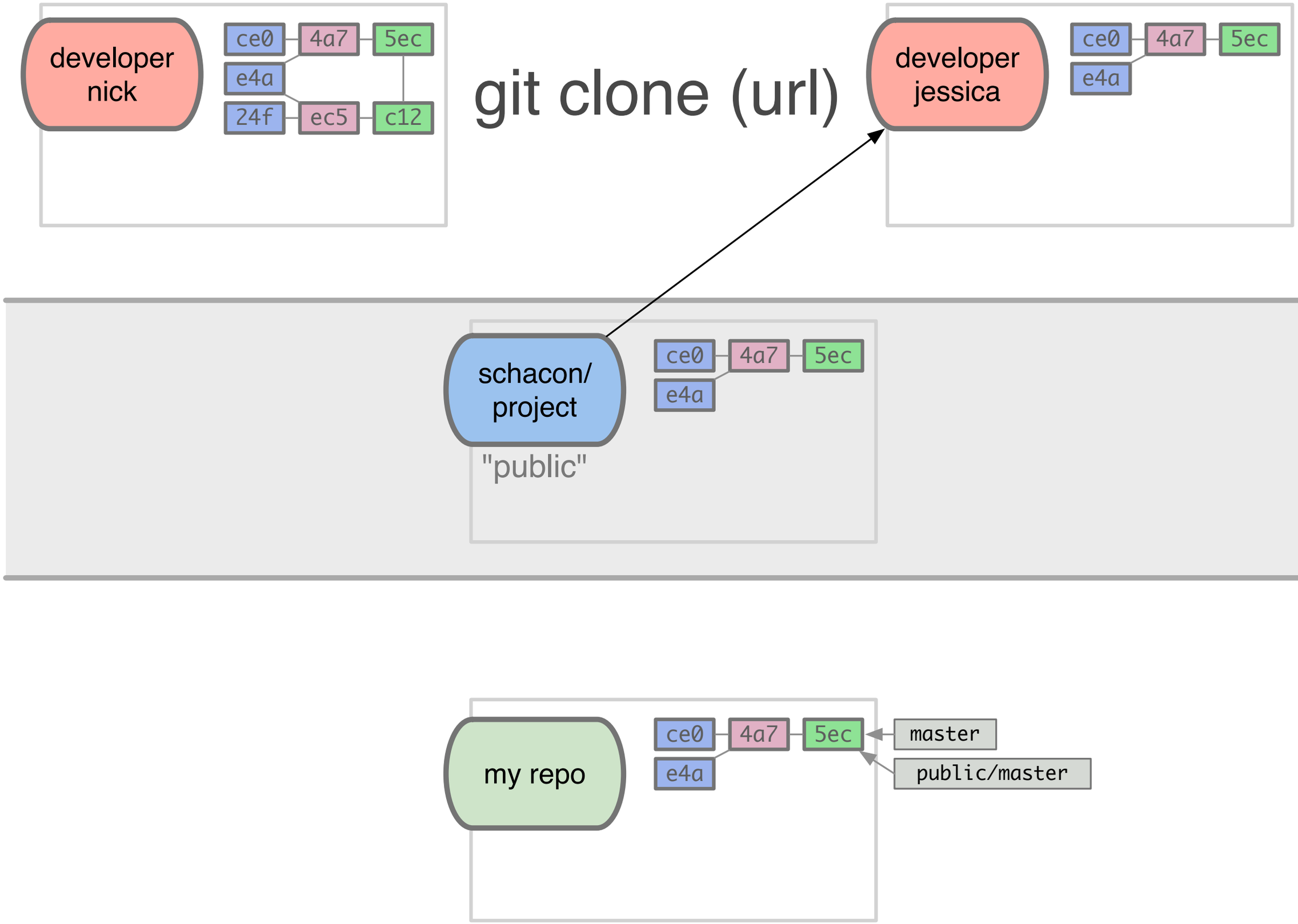

developer
nick
ce0
4a7
5ec
e4a
24f
ec5
c12

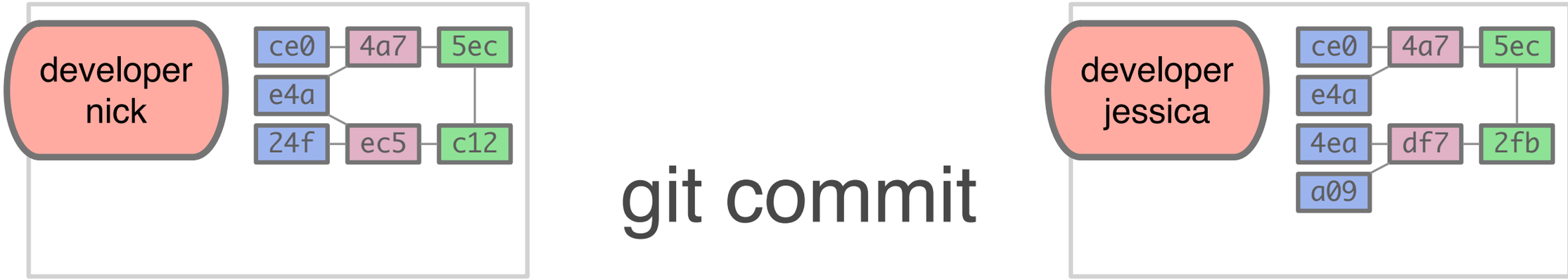
developer
jessica

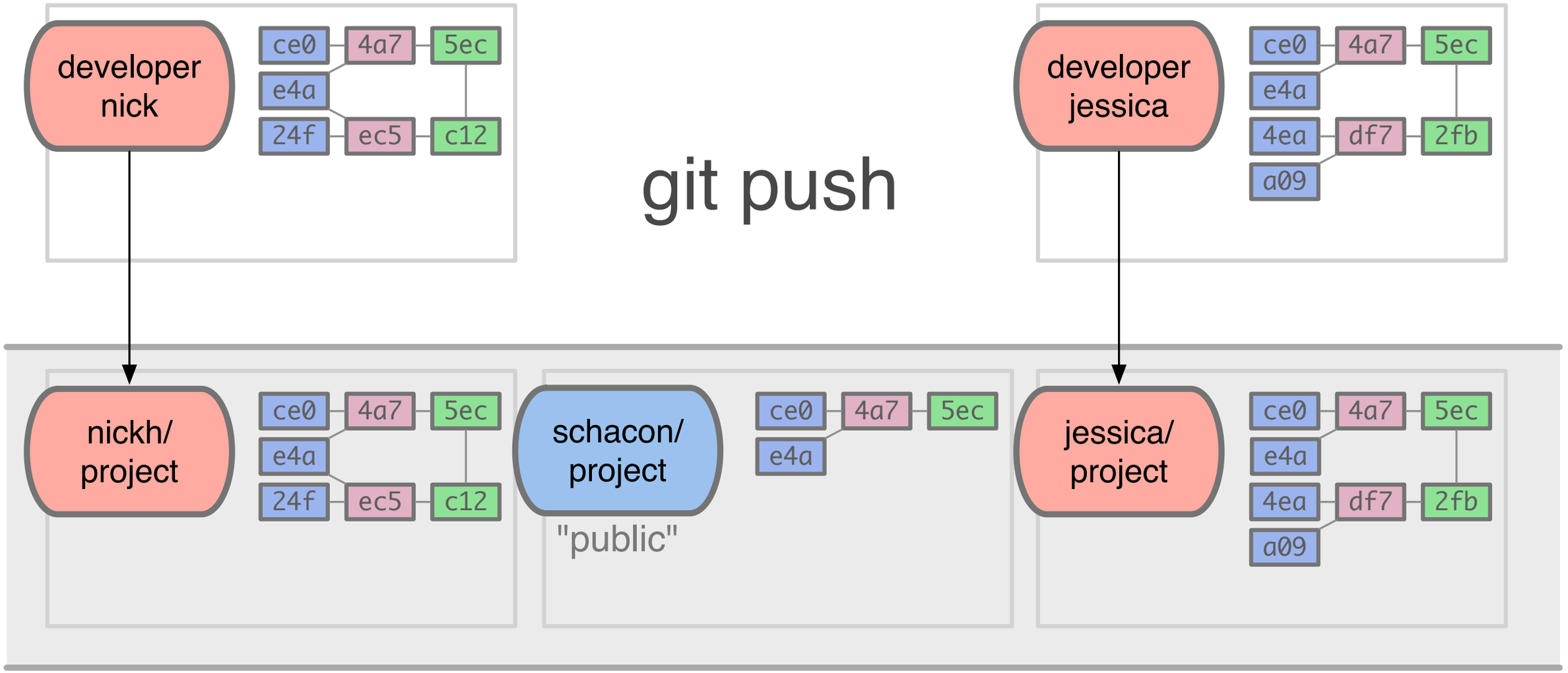
git commit


schacon/
project
"public"
ce0
4a7
5ec
e4a


my repo
ce0
4a7
5ec
e4a
master
public/master


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


developer
nick
ce0
4a7
5ec
e4a
24f
ec5
c12
git commit
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


developer
nick
ce0
4a7
5ec
e4a
24f
ec5
c12
git push
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
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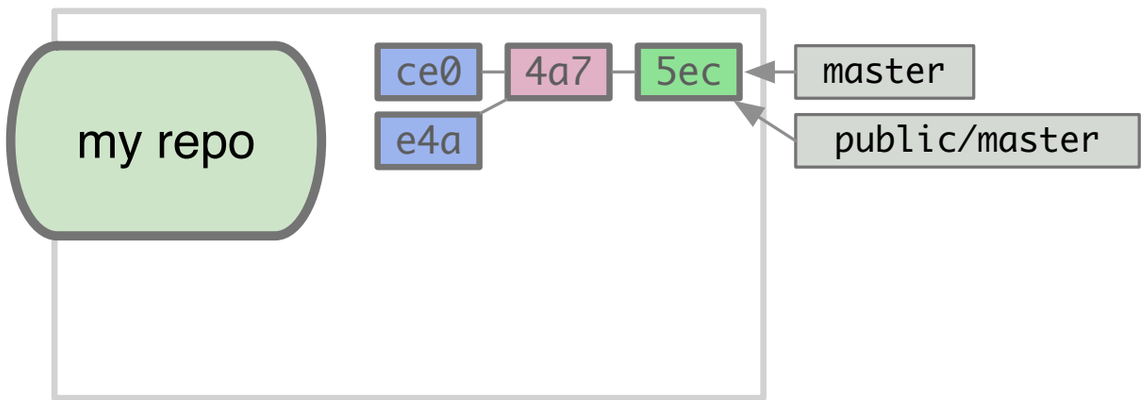
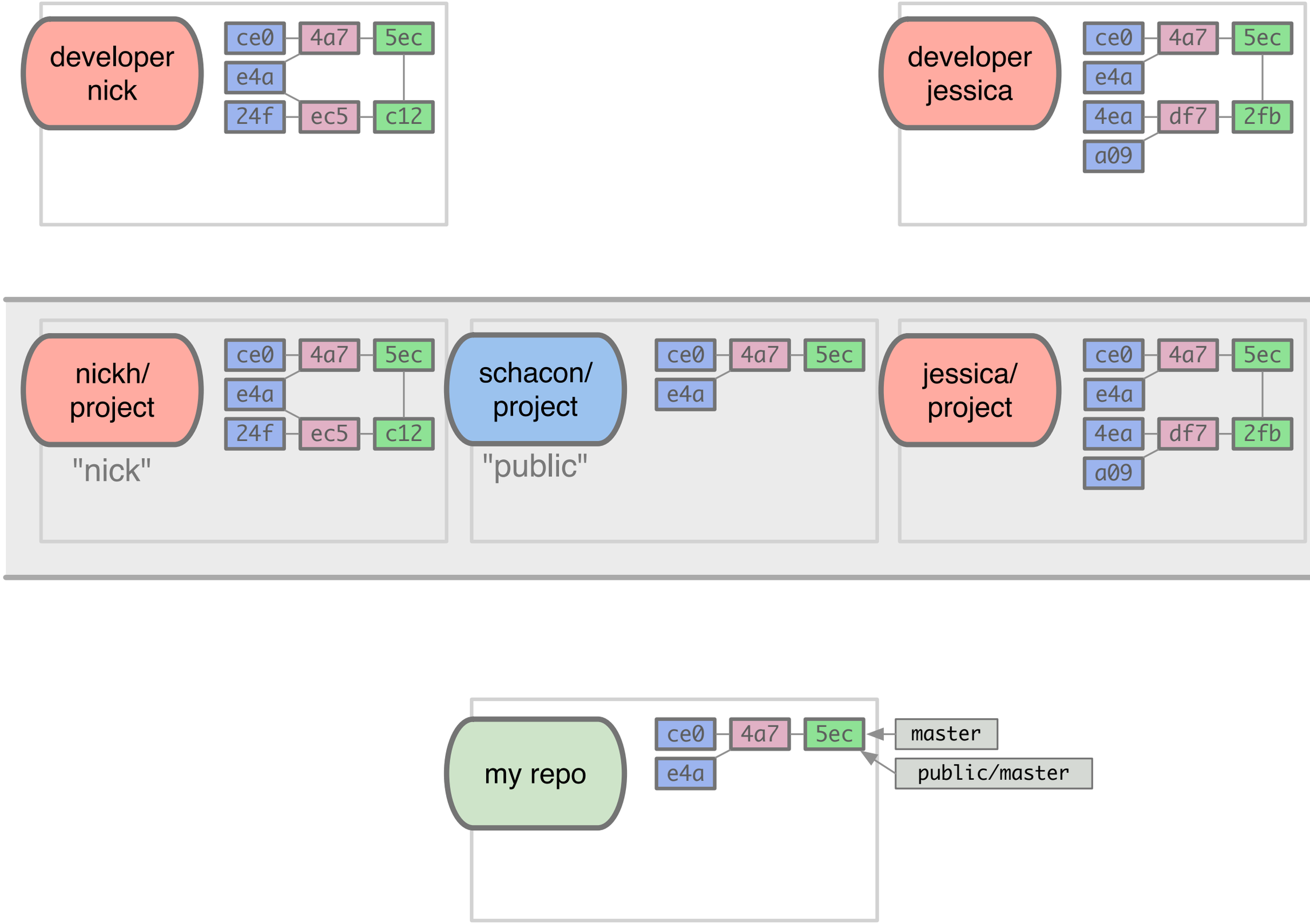
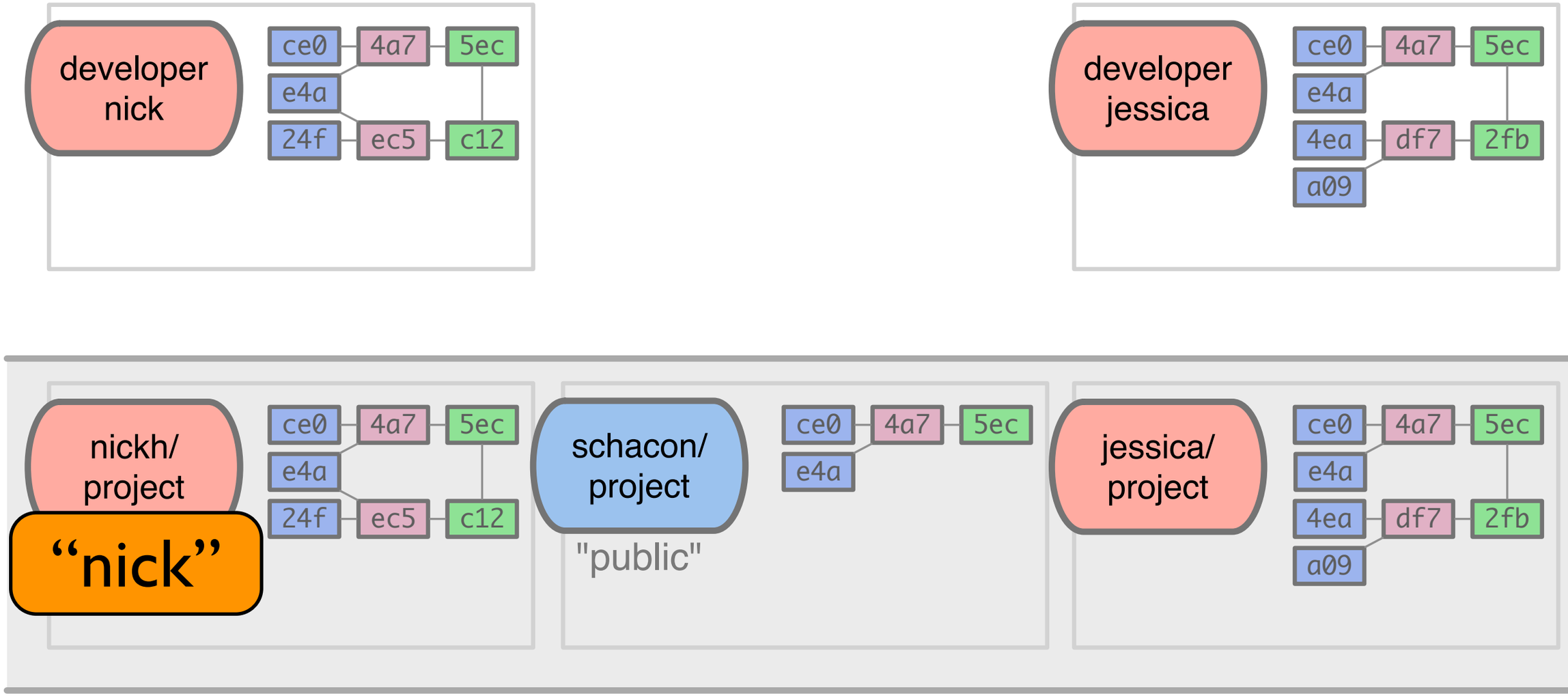
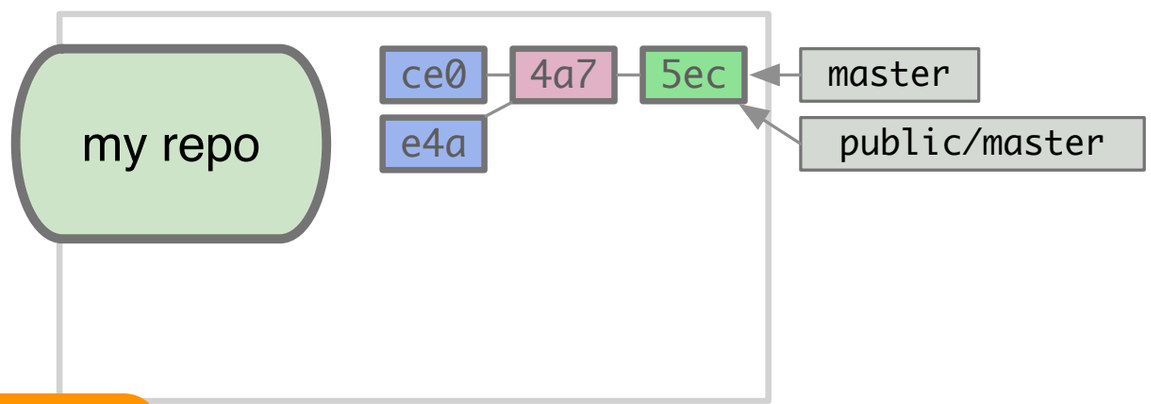
4a7
5ec
e4a
4ea
df7
2fb
a09


my repo
ce0
4a7
5ec
e4a
master
public/master

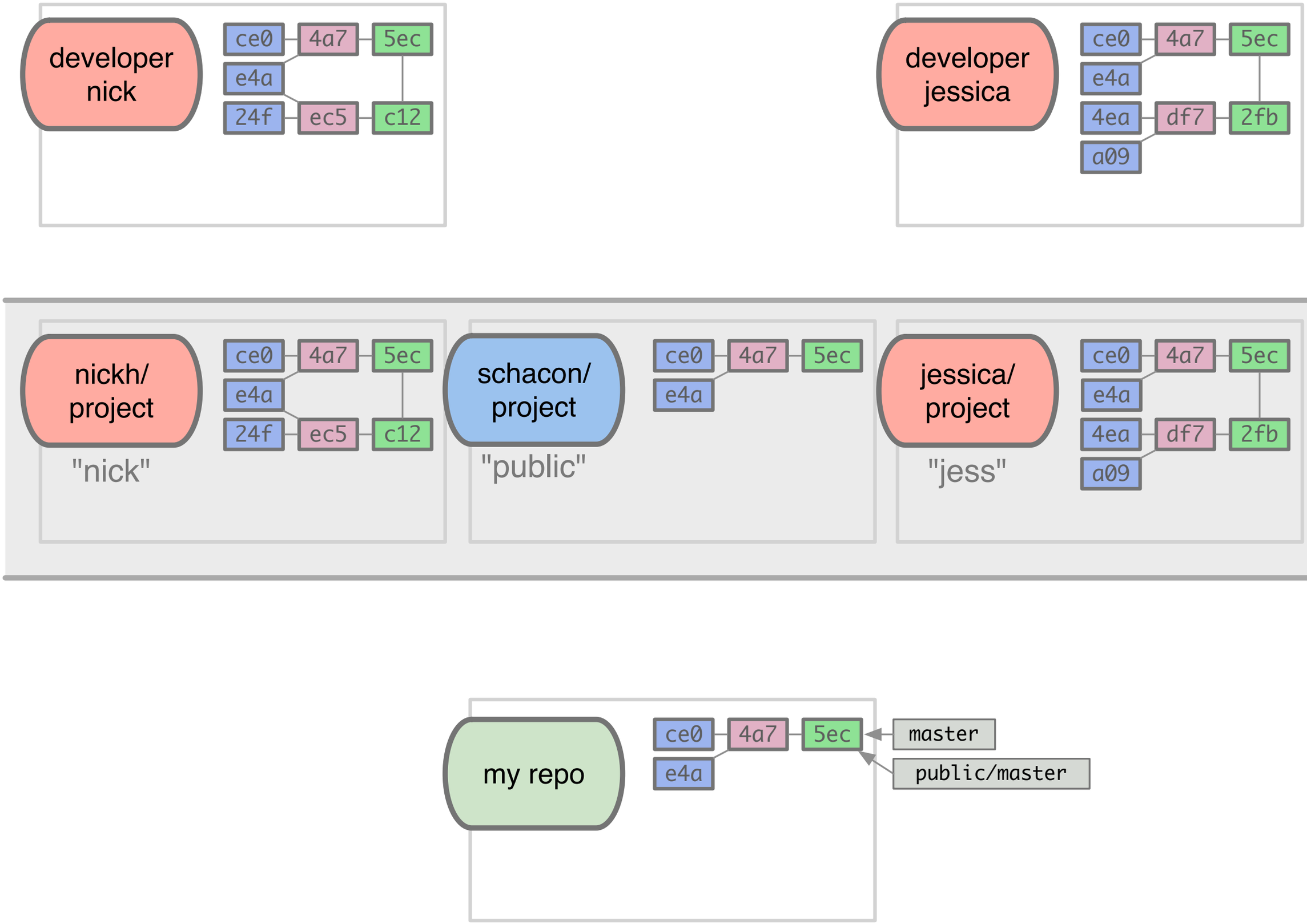


git remote add nick git://github.com/nickh/project.git

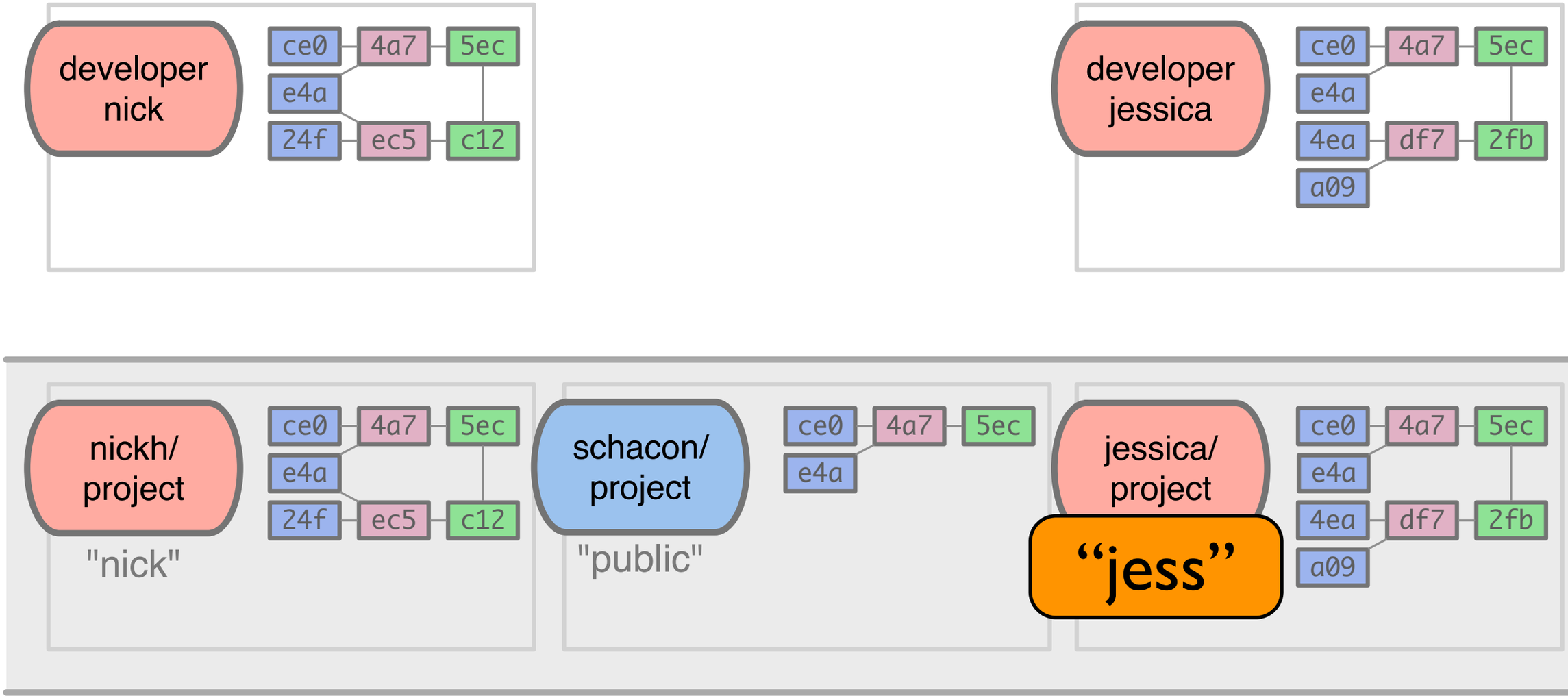


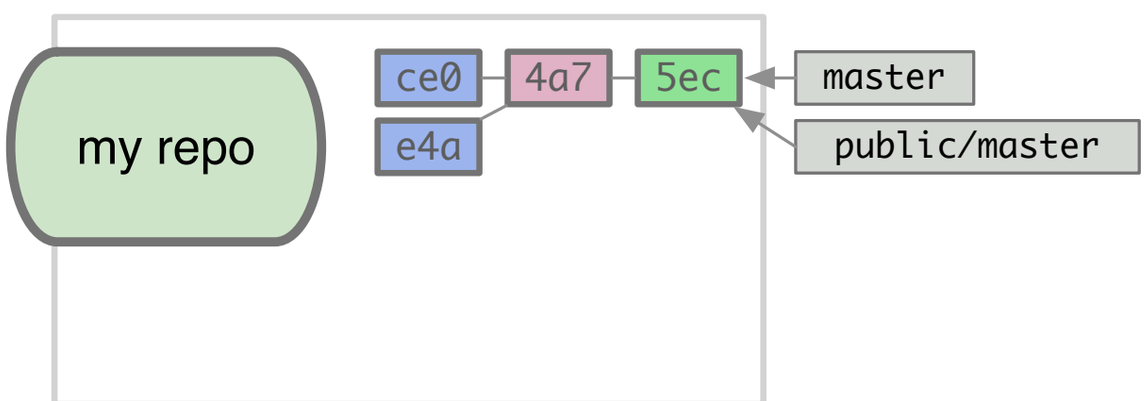


git remote add nick git://github.com/nickh/project.git

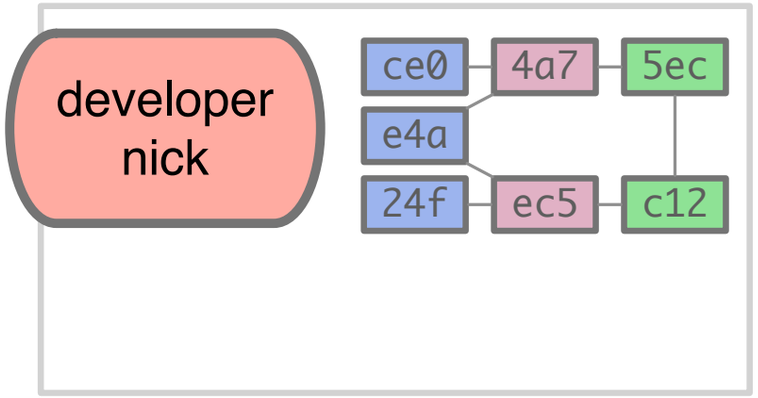


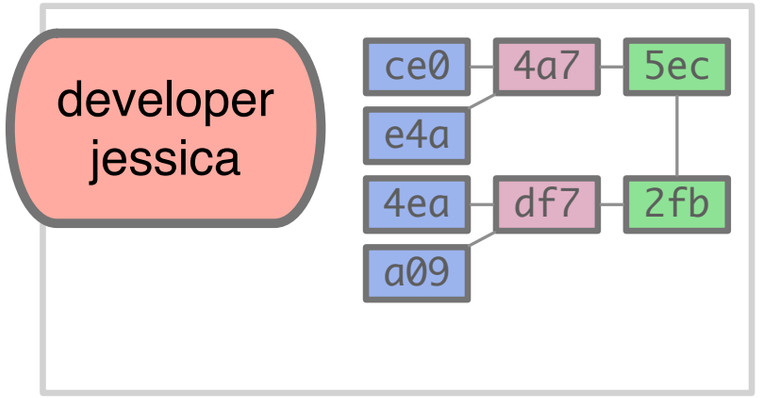
git remote add jess git://github.com/jessica/project.git

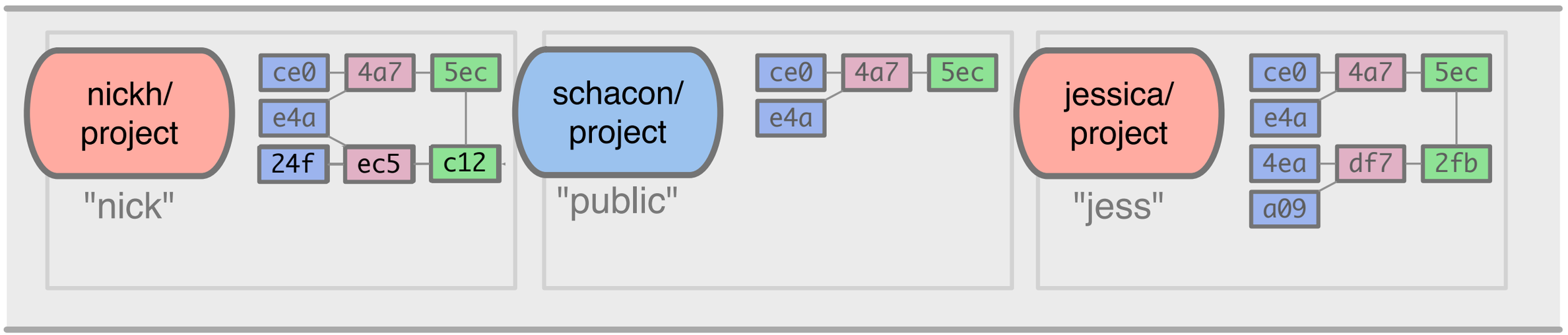


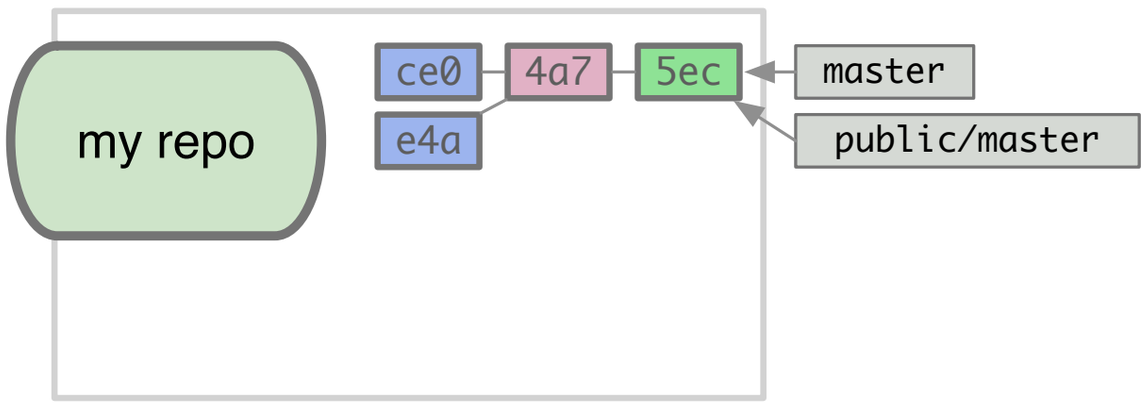


git remote add jess git://github.com/jessica/project.git

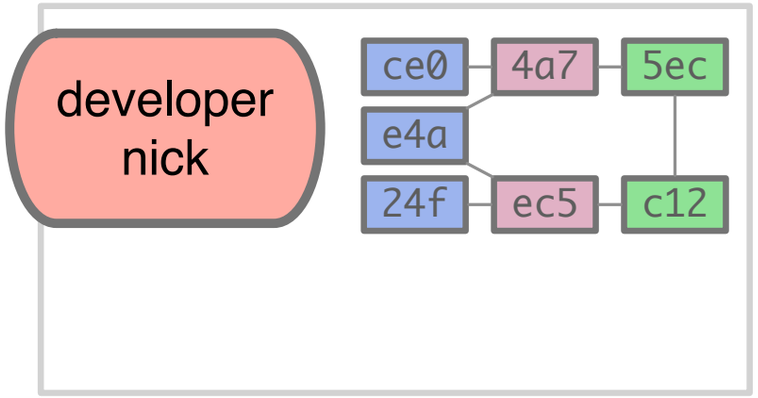


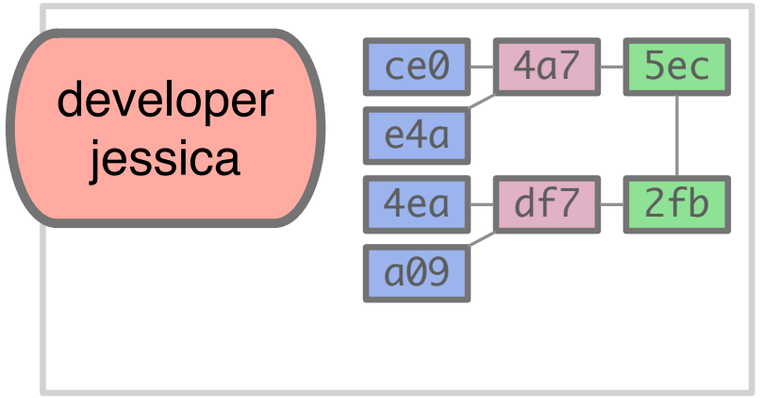


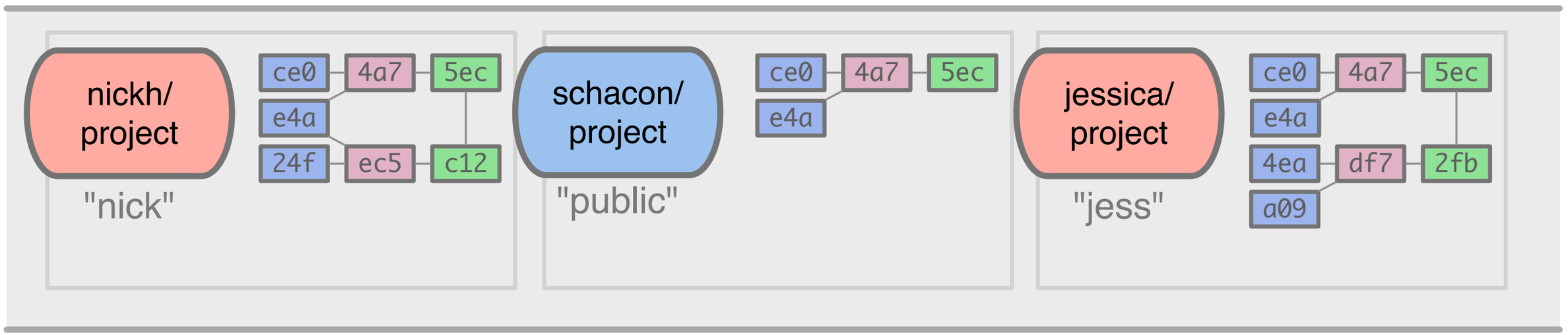


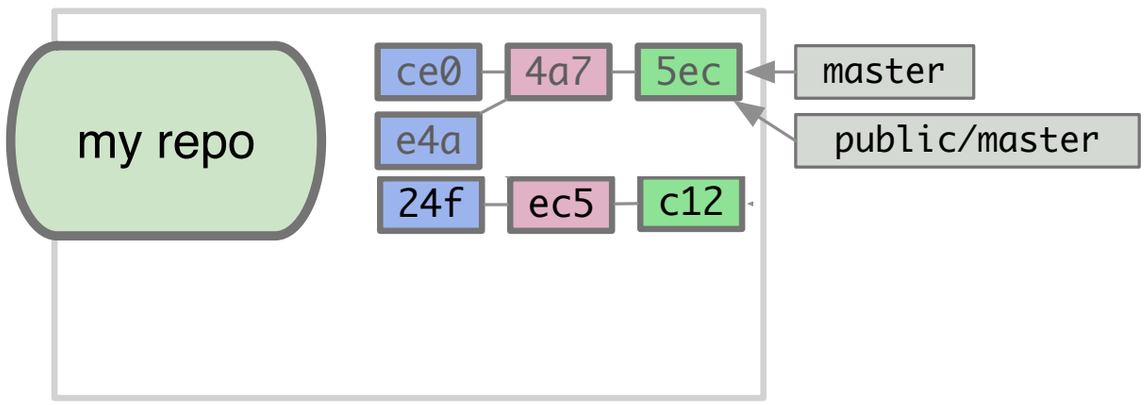


git fetch nick









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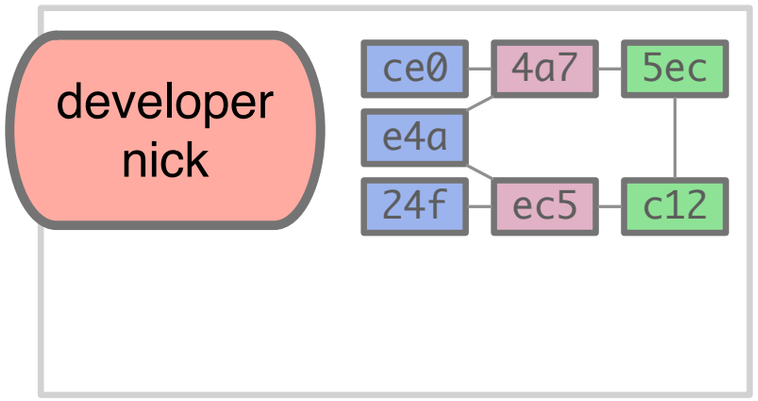
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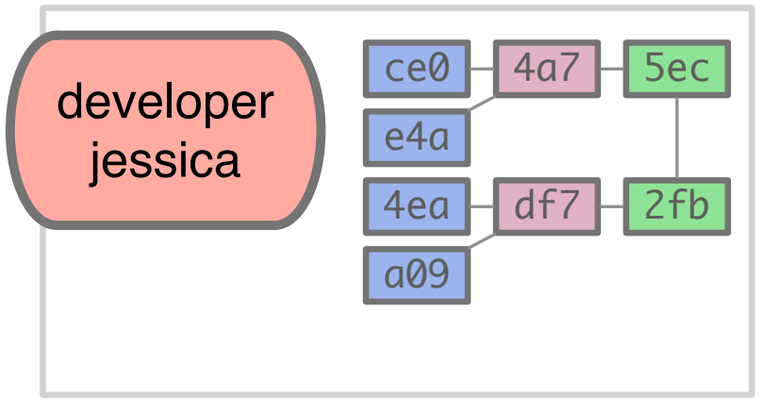
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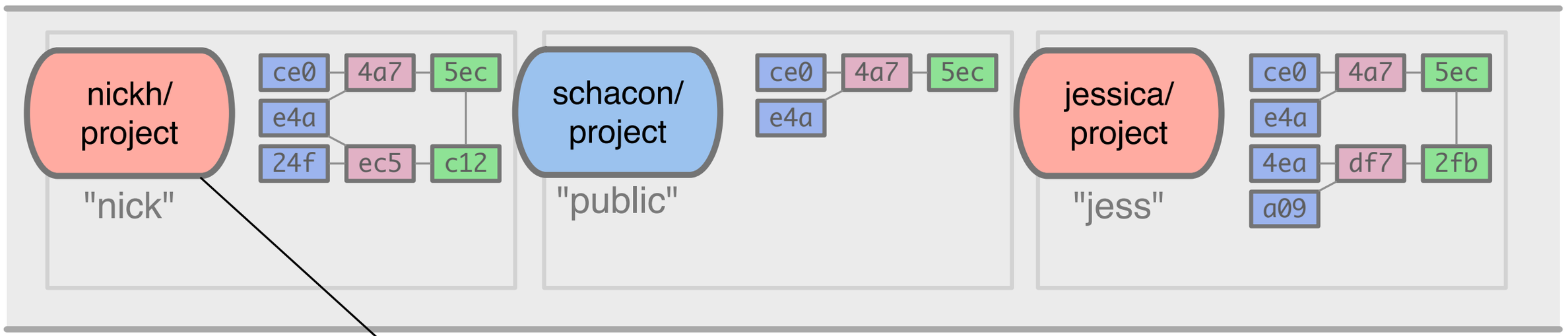
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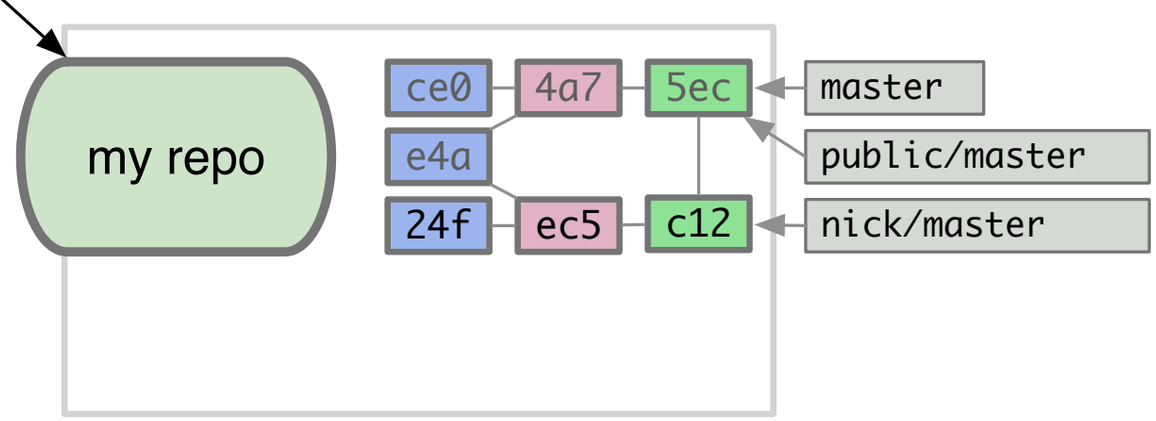
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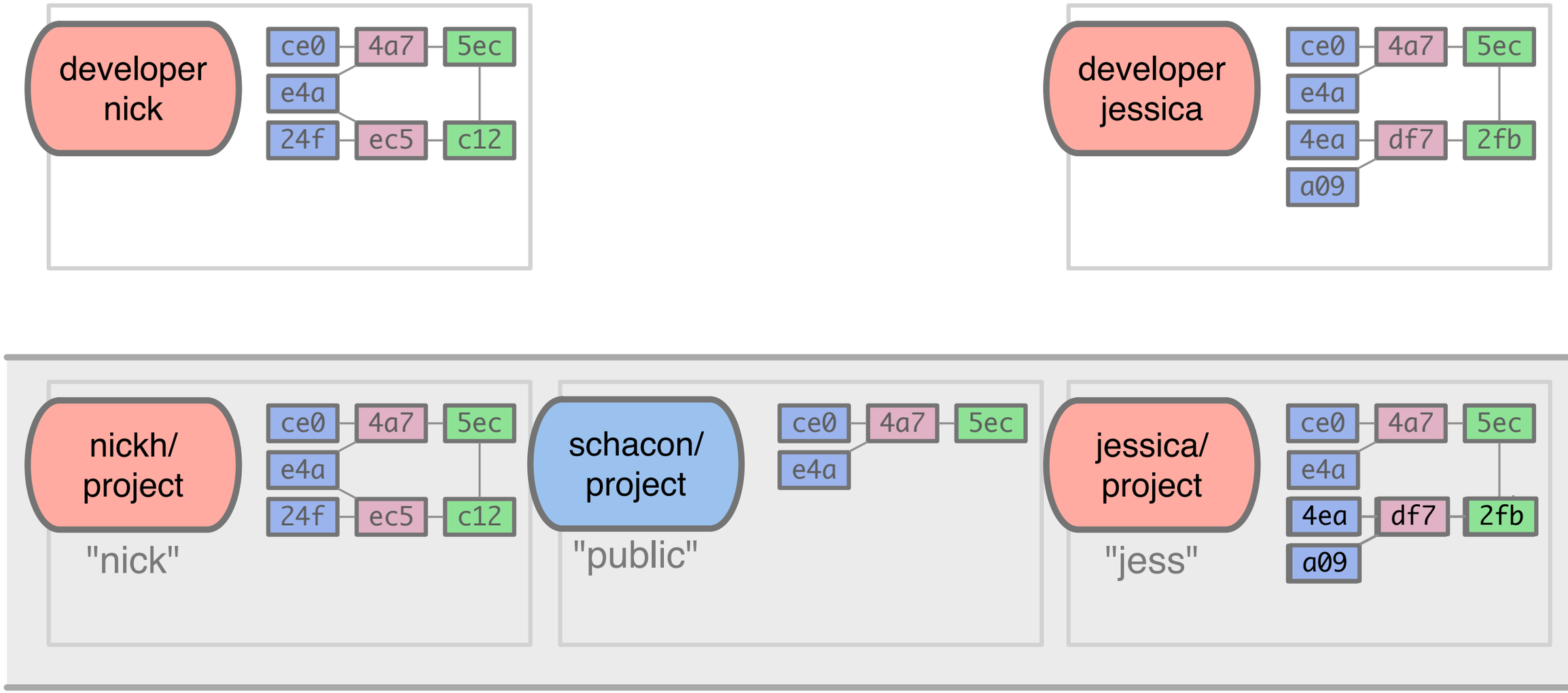

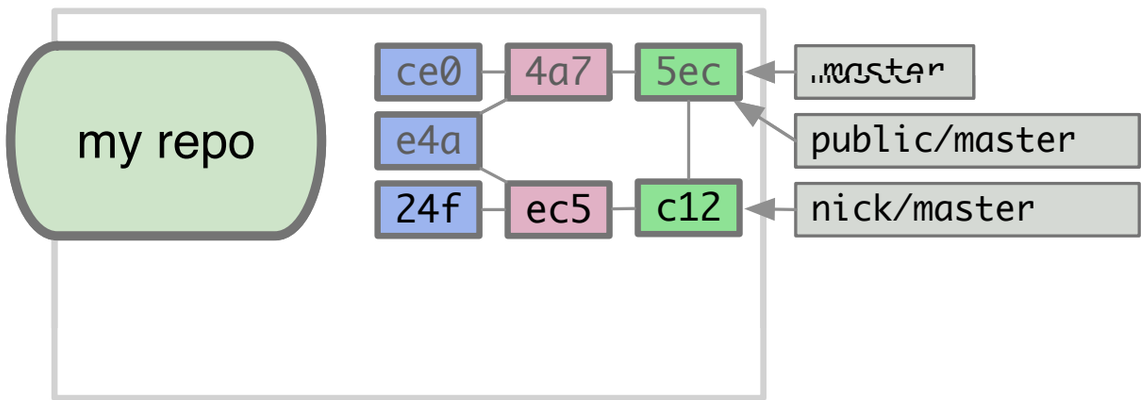

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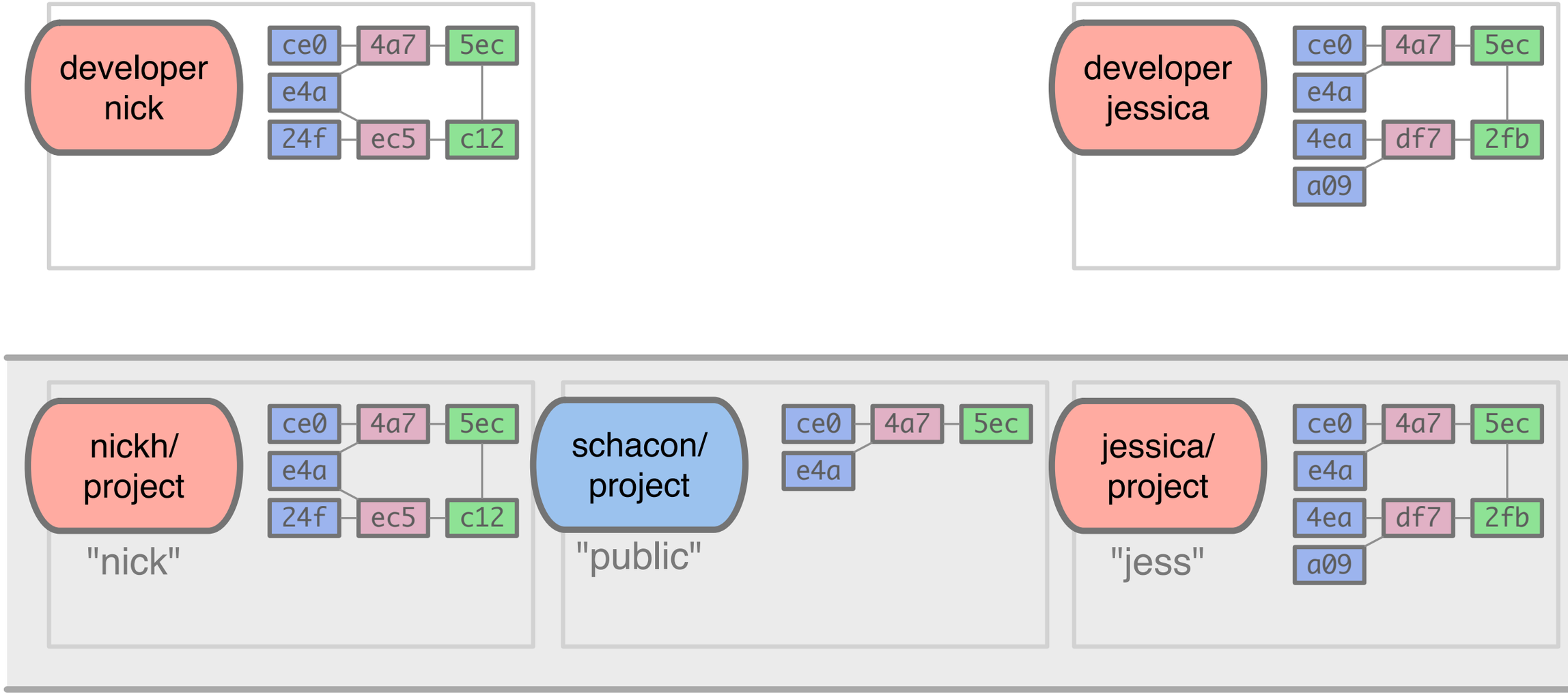

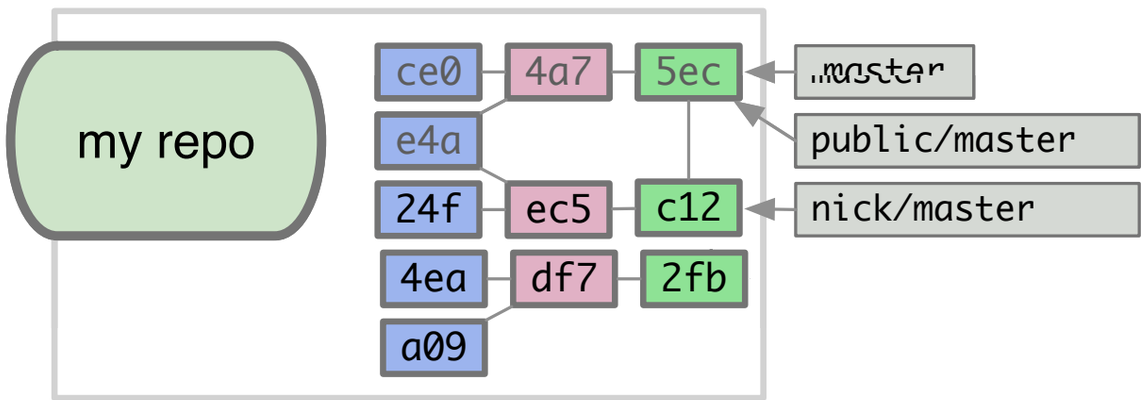

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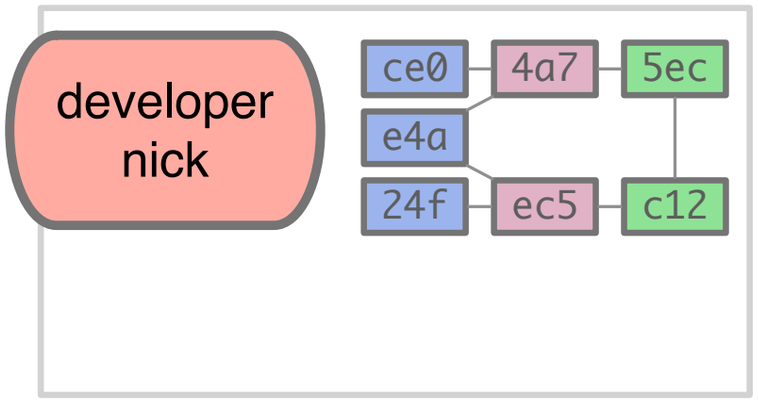
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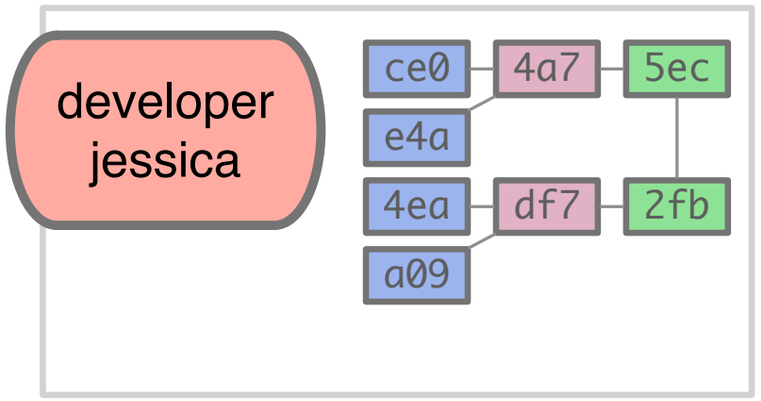
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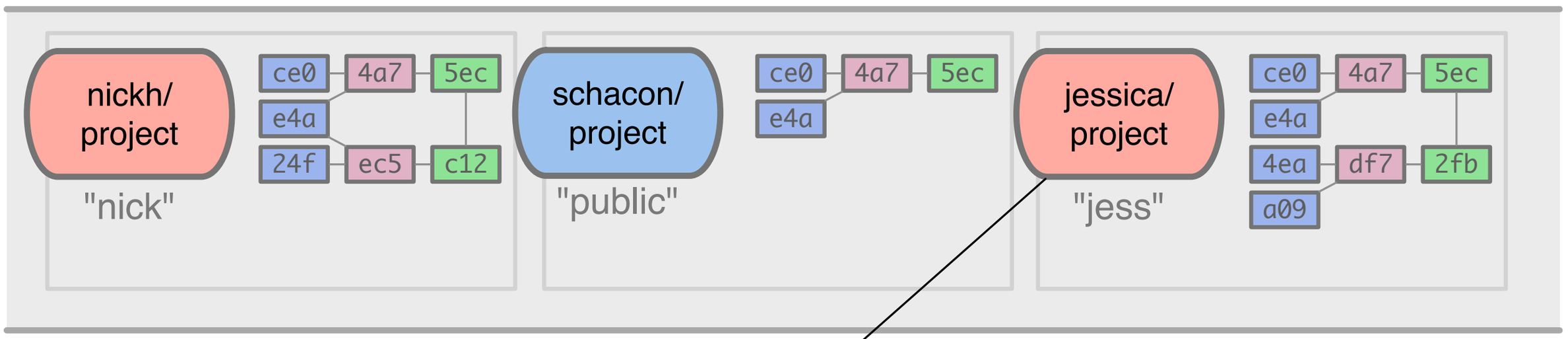
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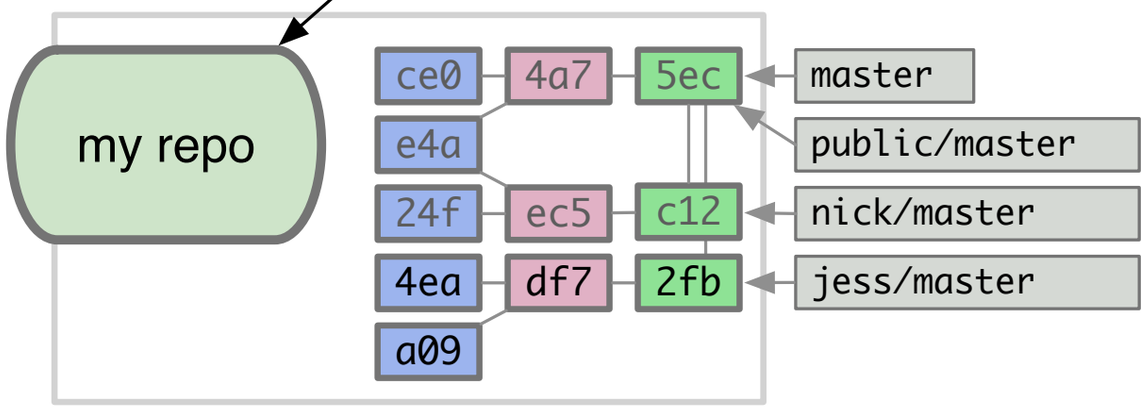
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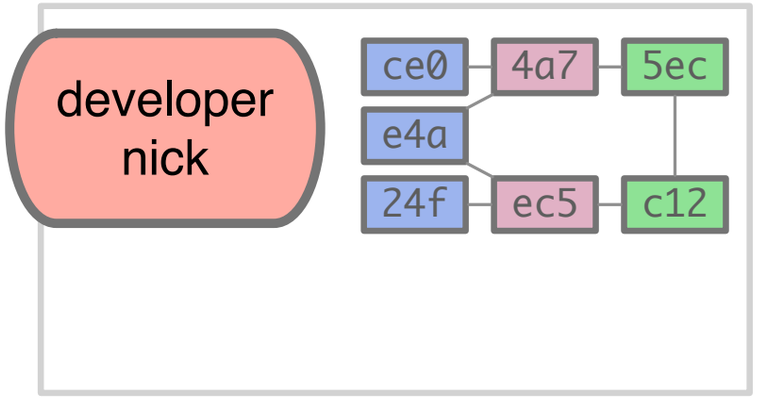

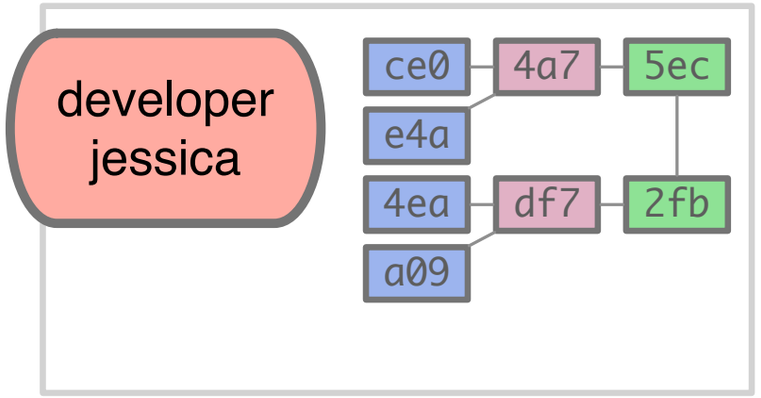

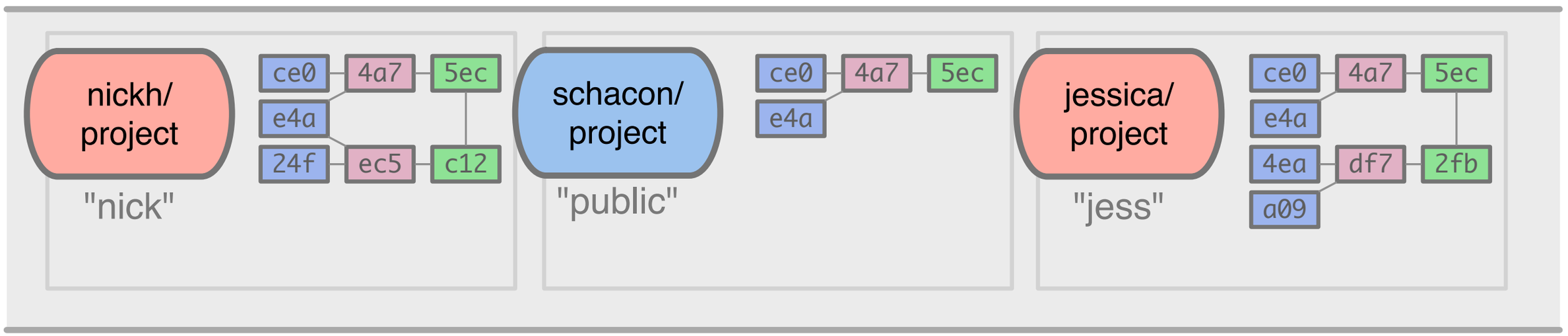

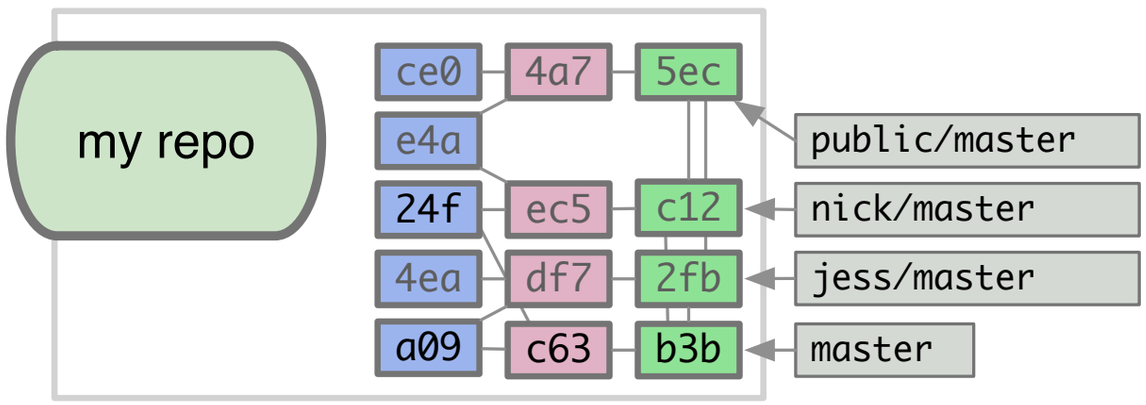

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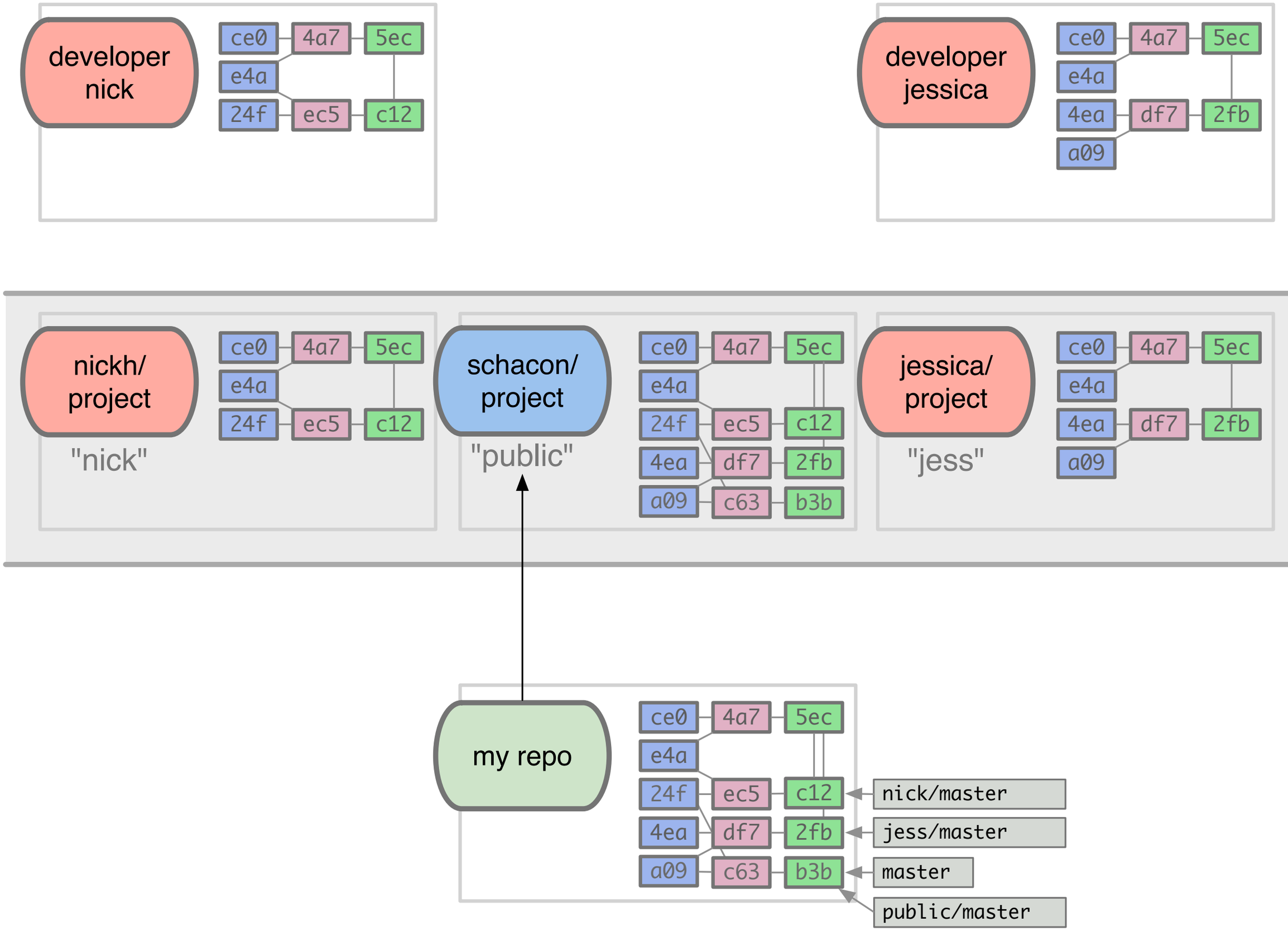

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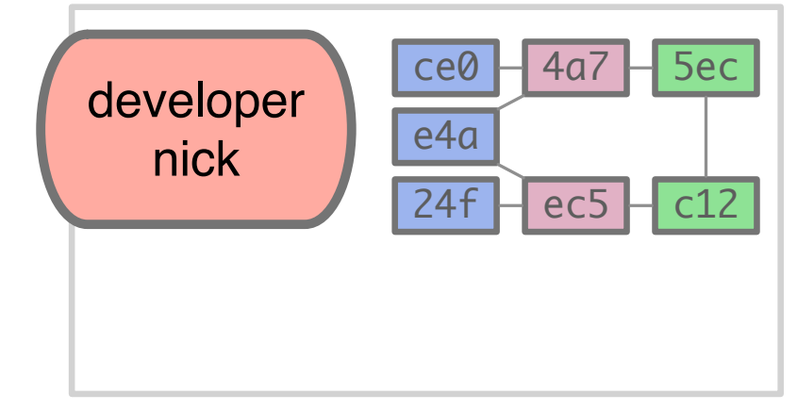
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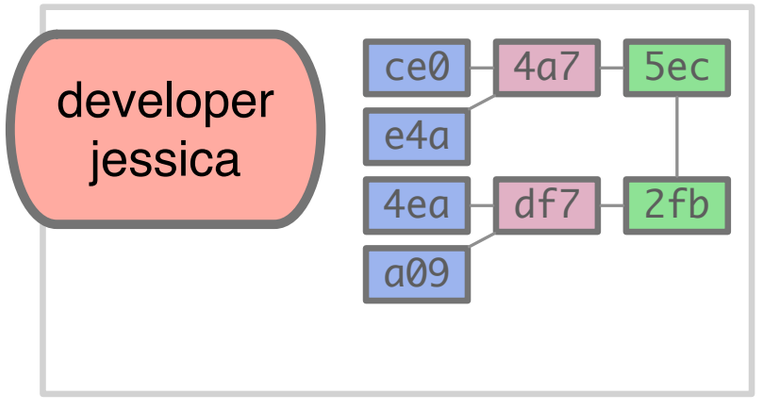
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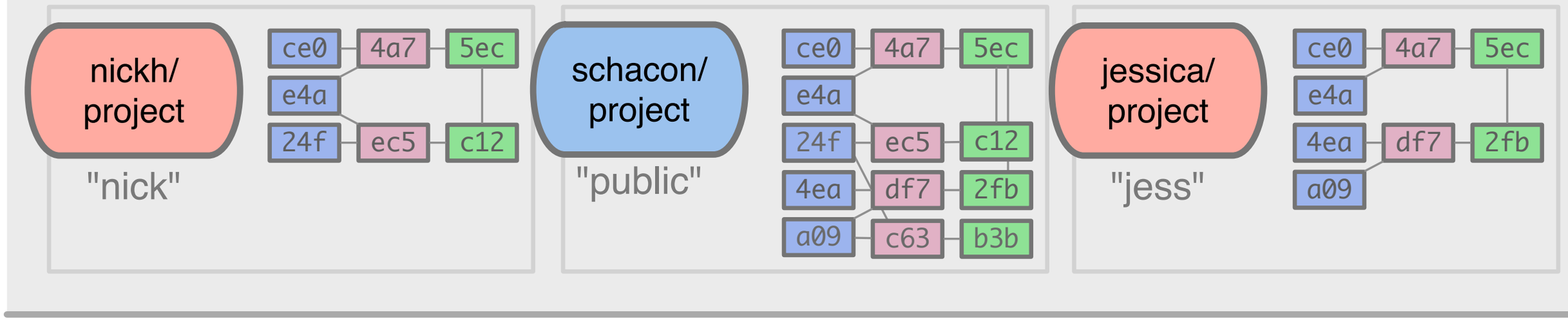
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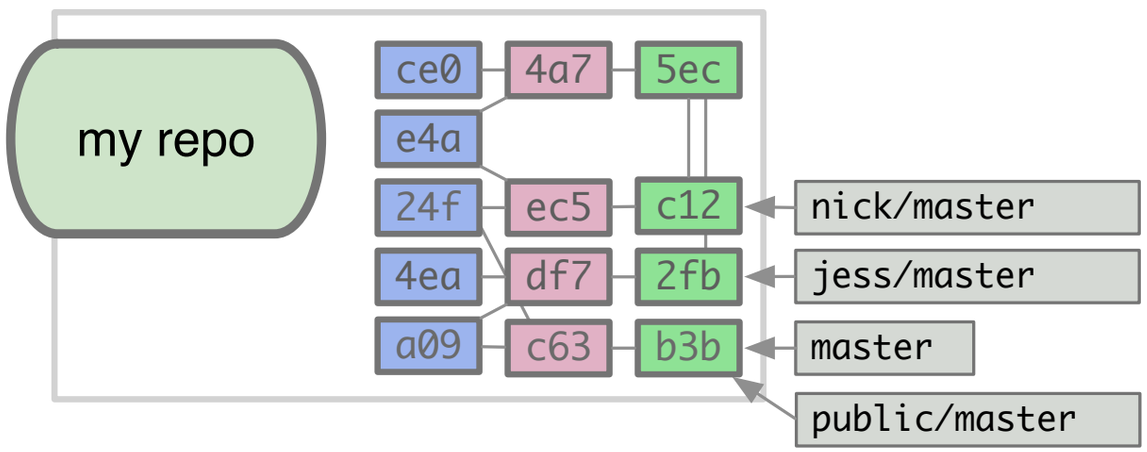
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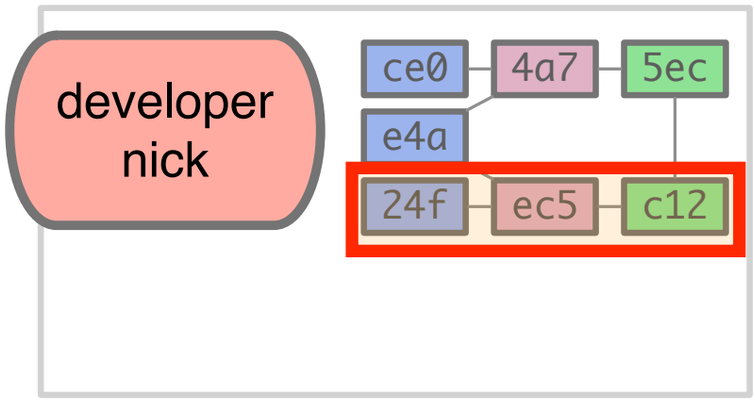
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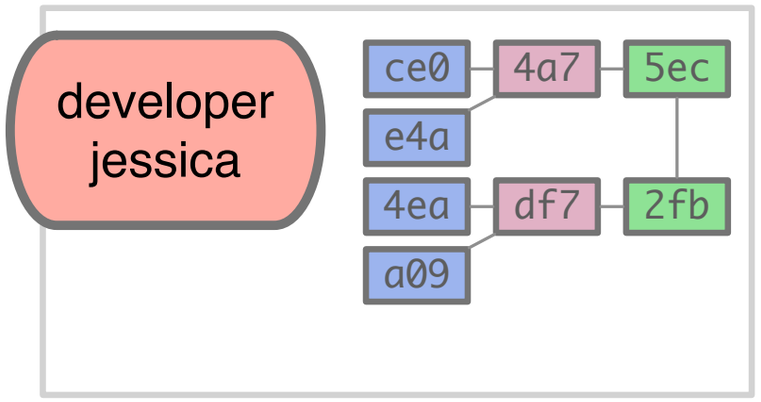
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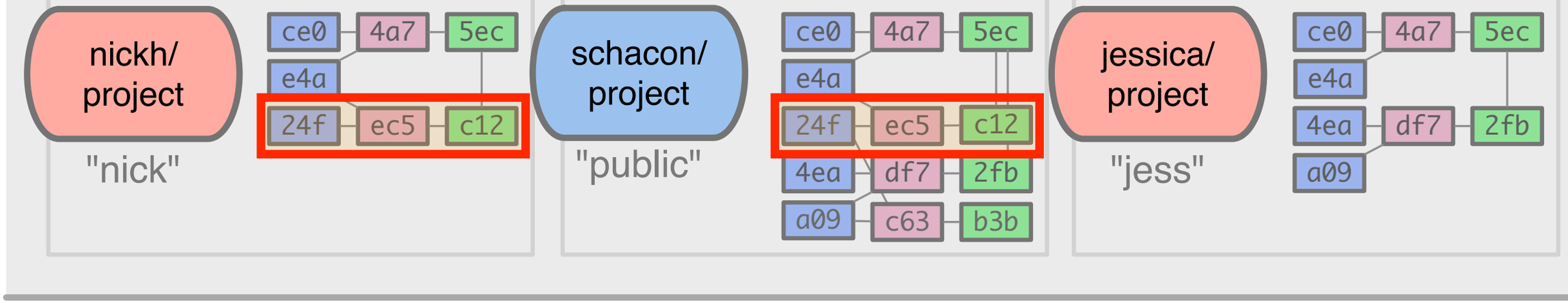
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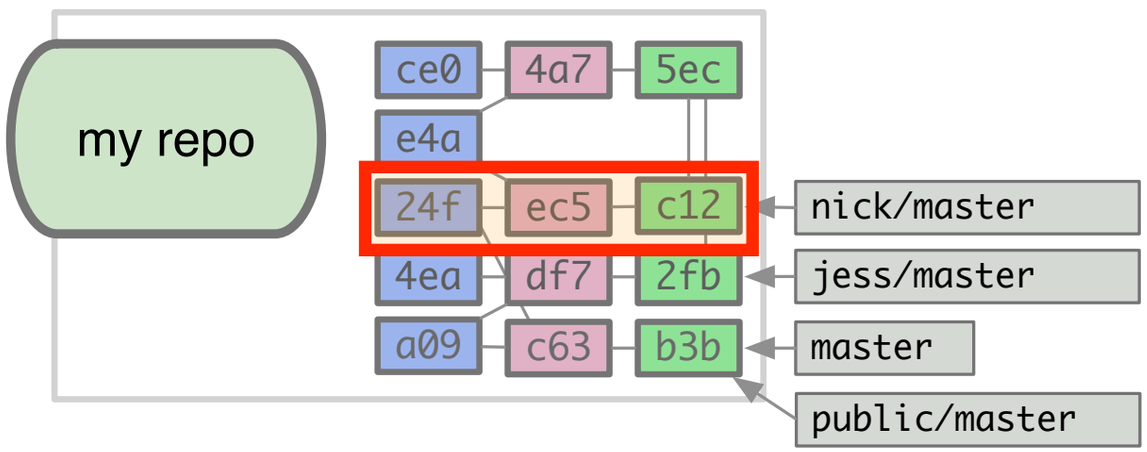
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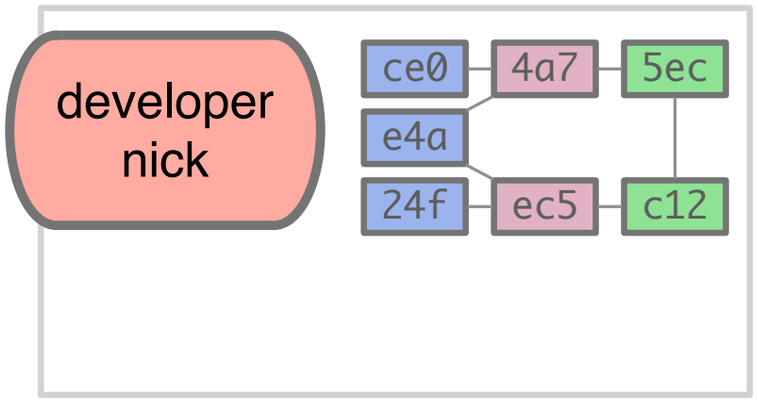
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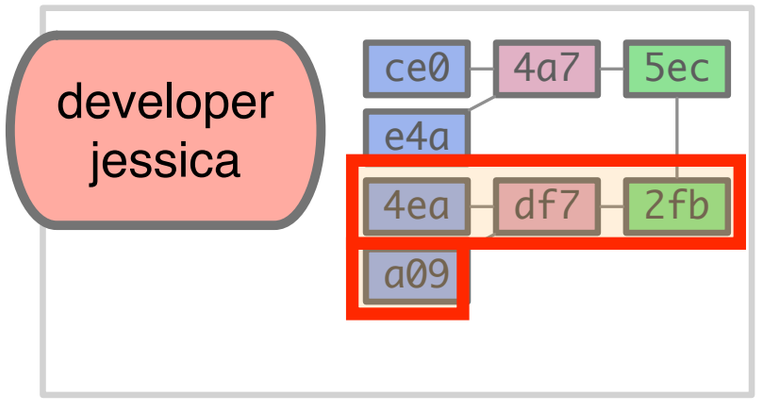
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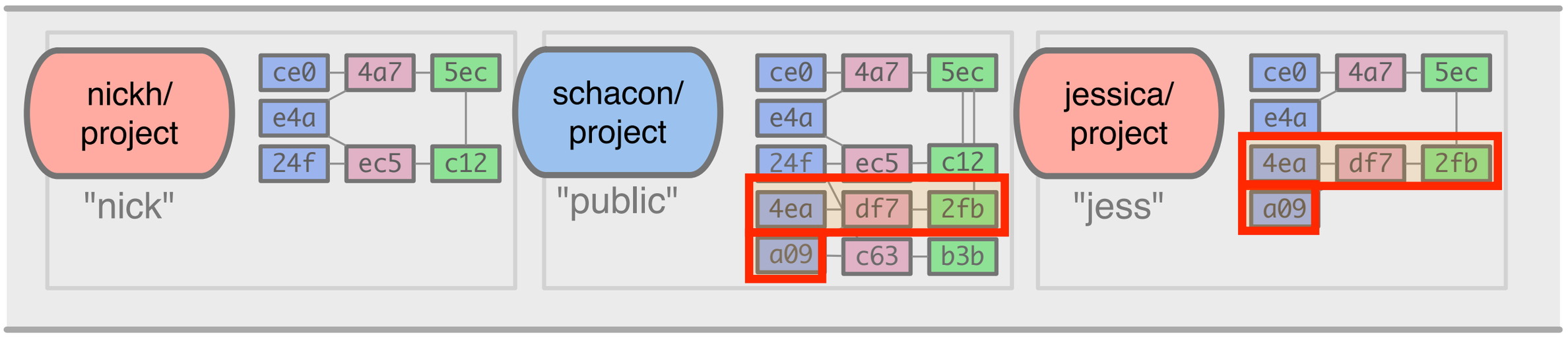
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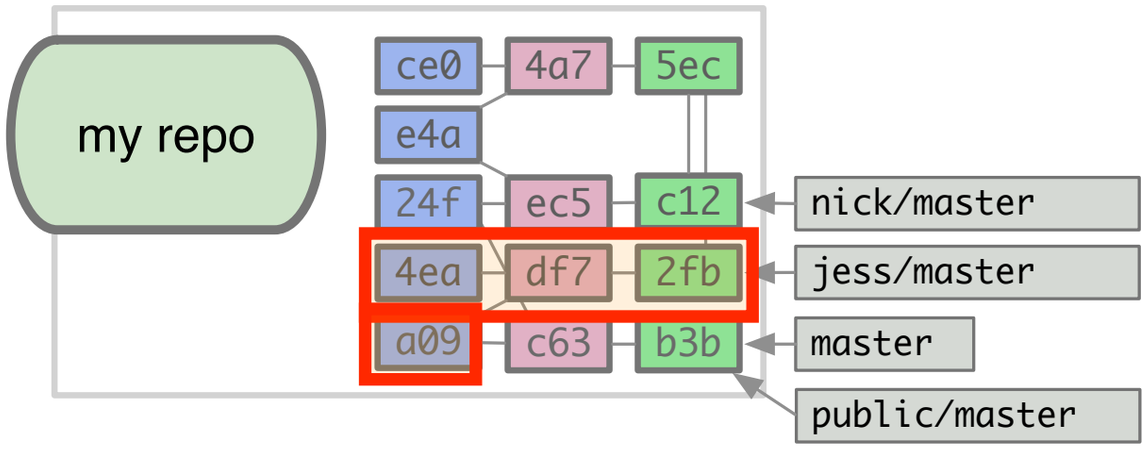
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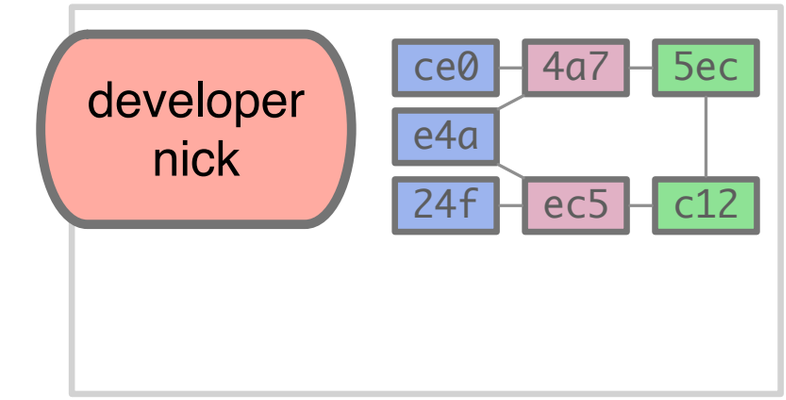
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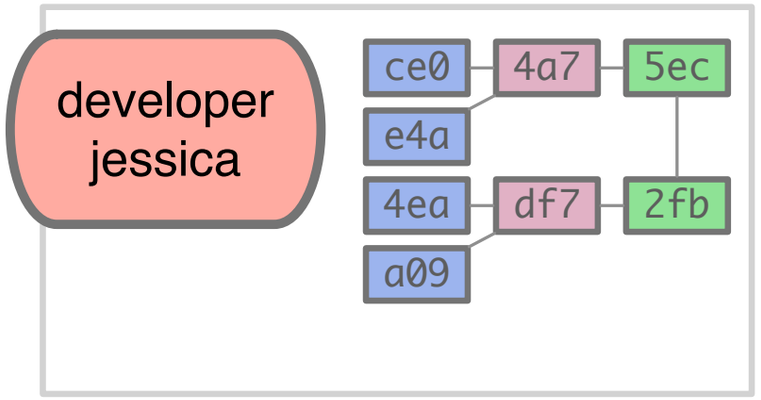
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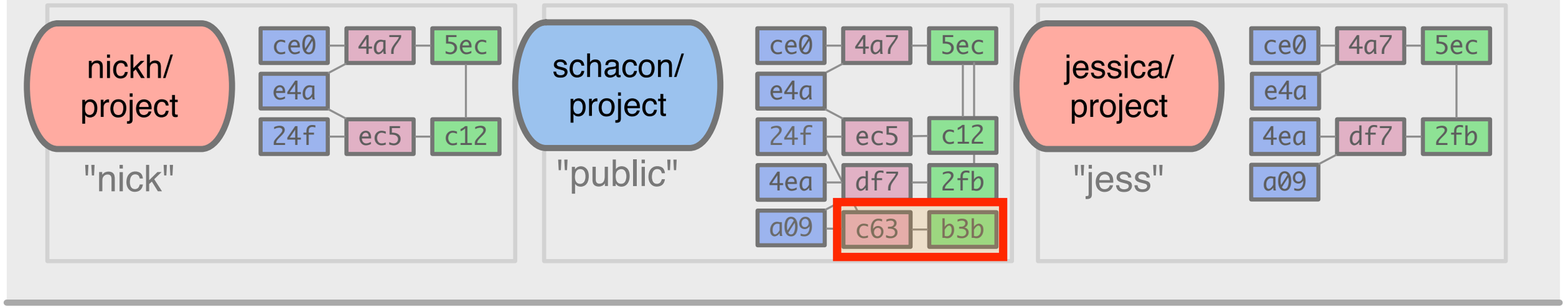
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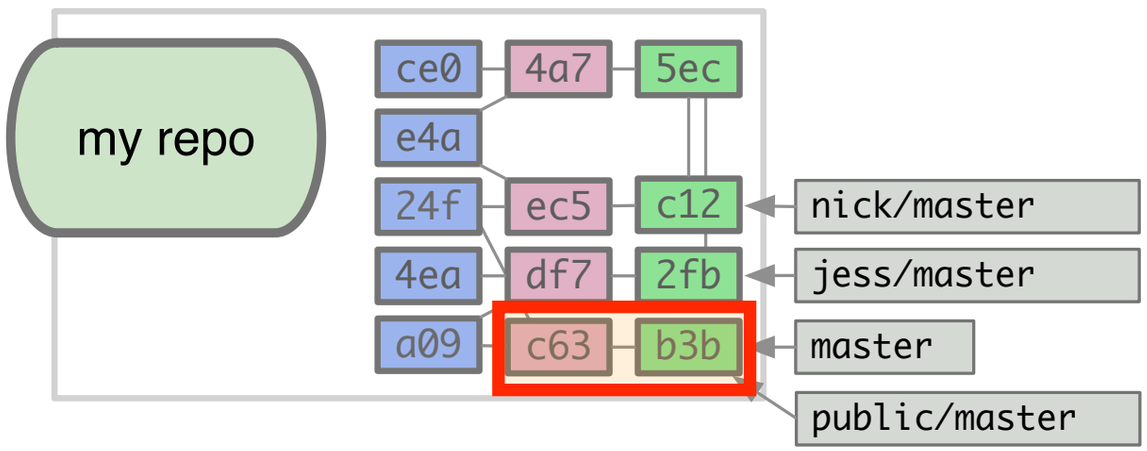
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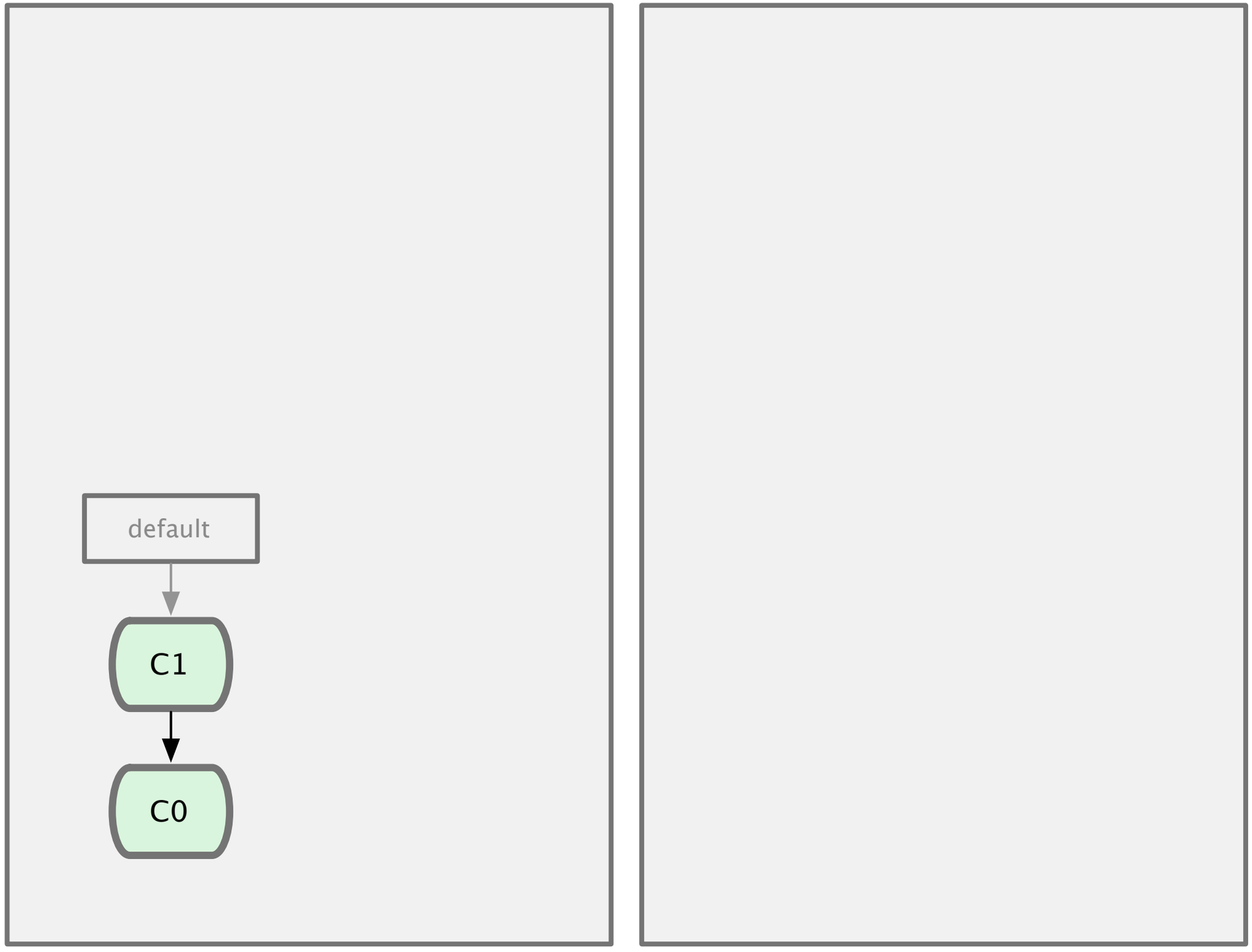
Remotes Are Branches

scott

jessica



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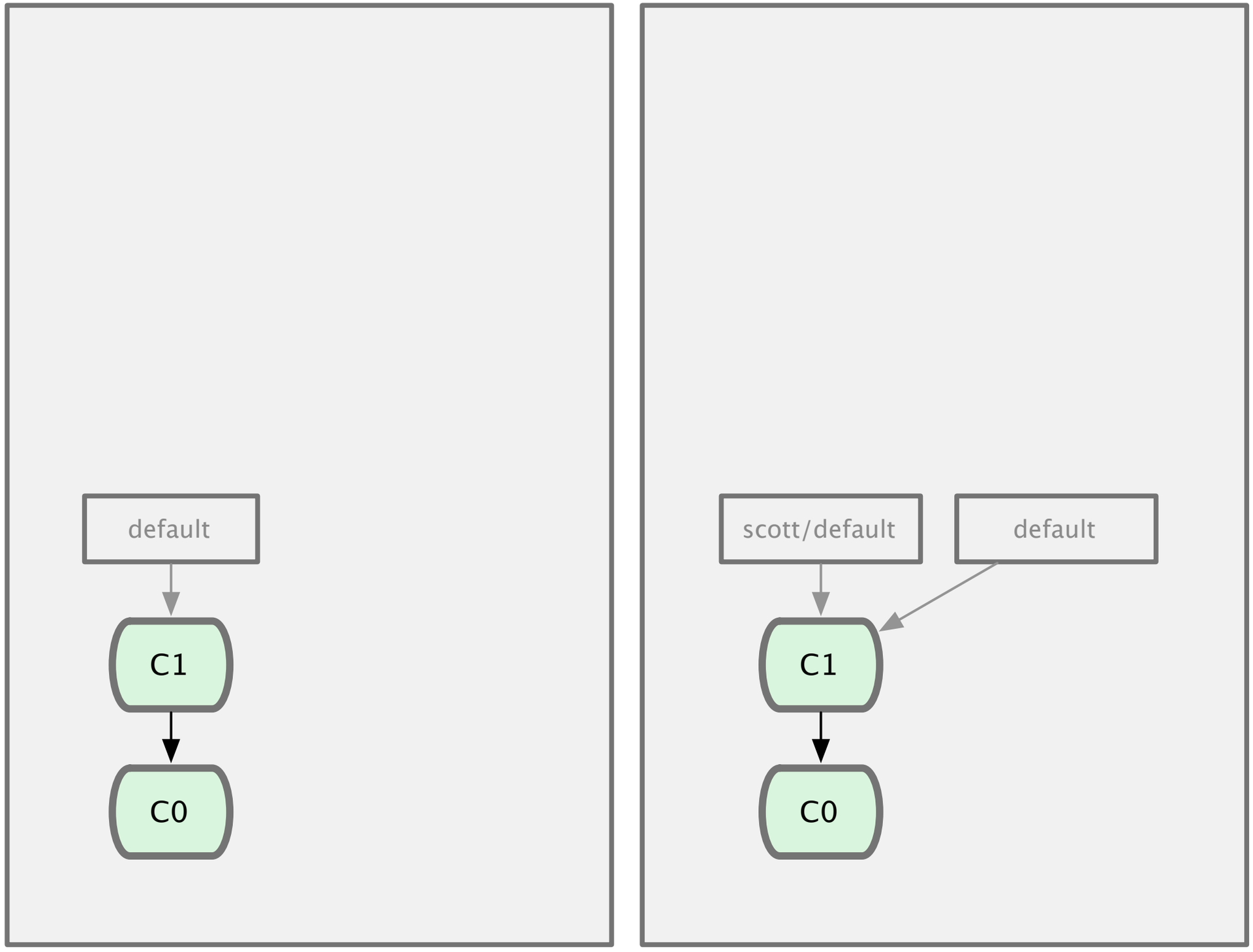
jessica



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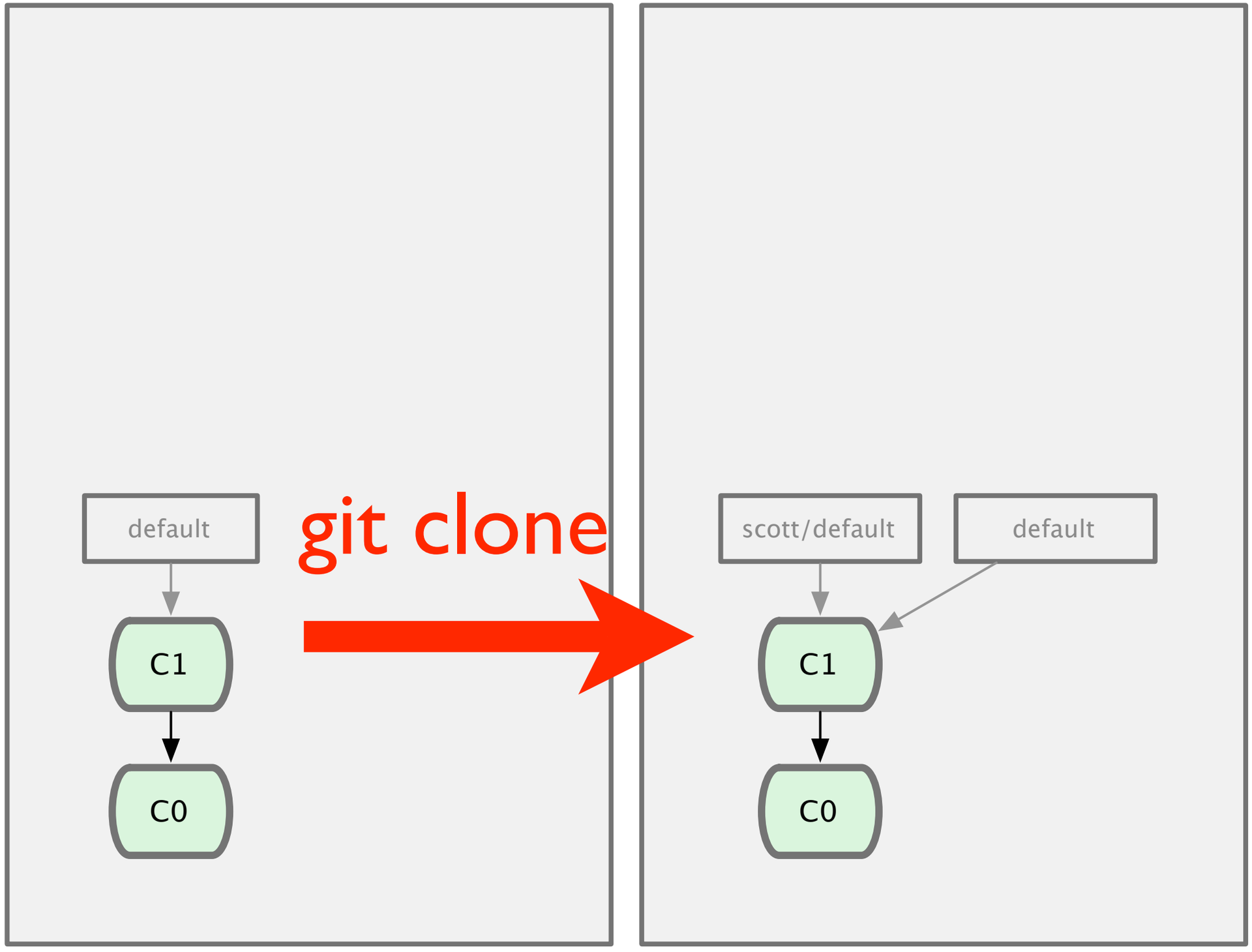
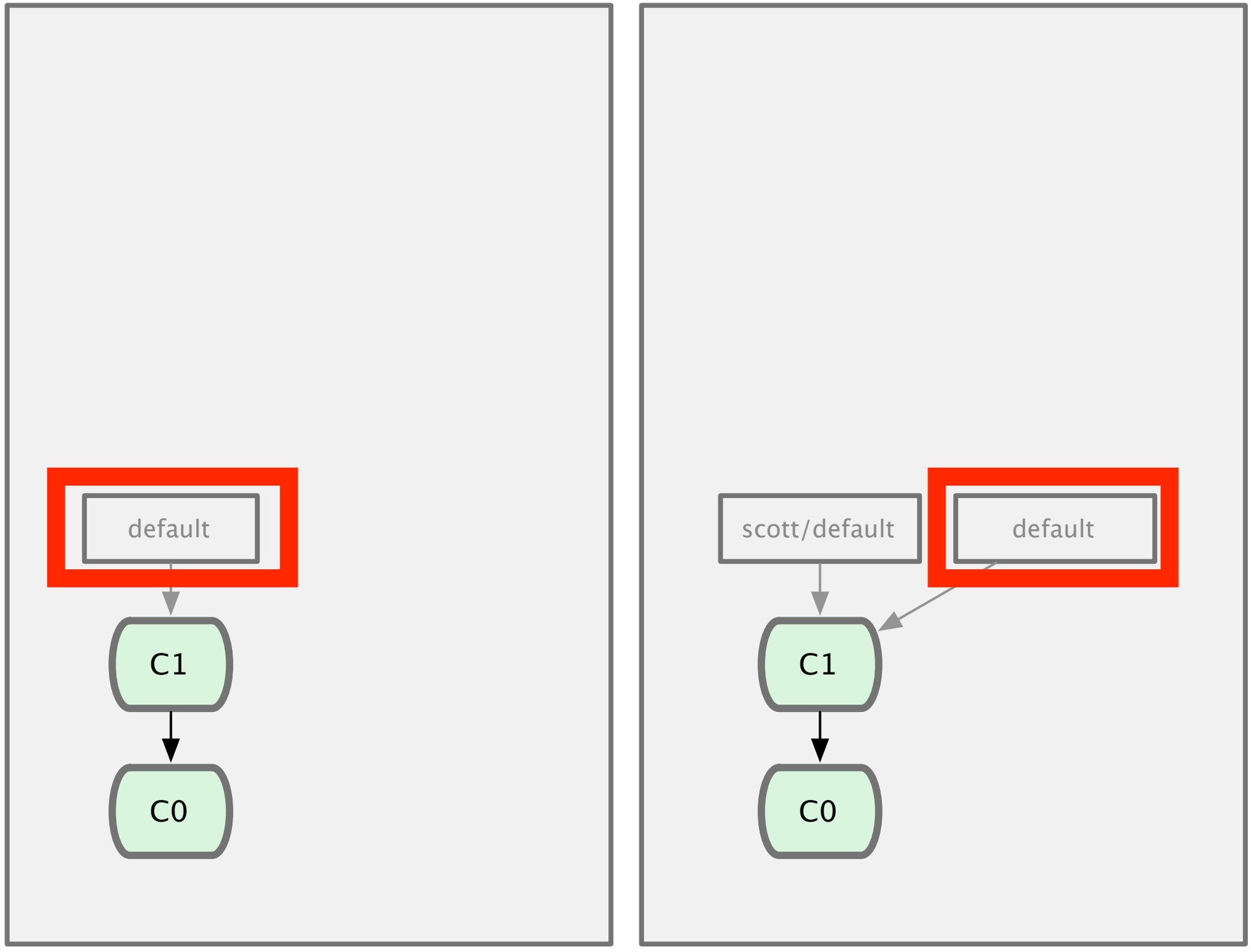


scott

jessica



scott

jessica

default

C1

C0

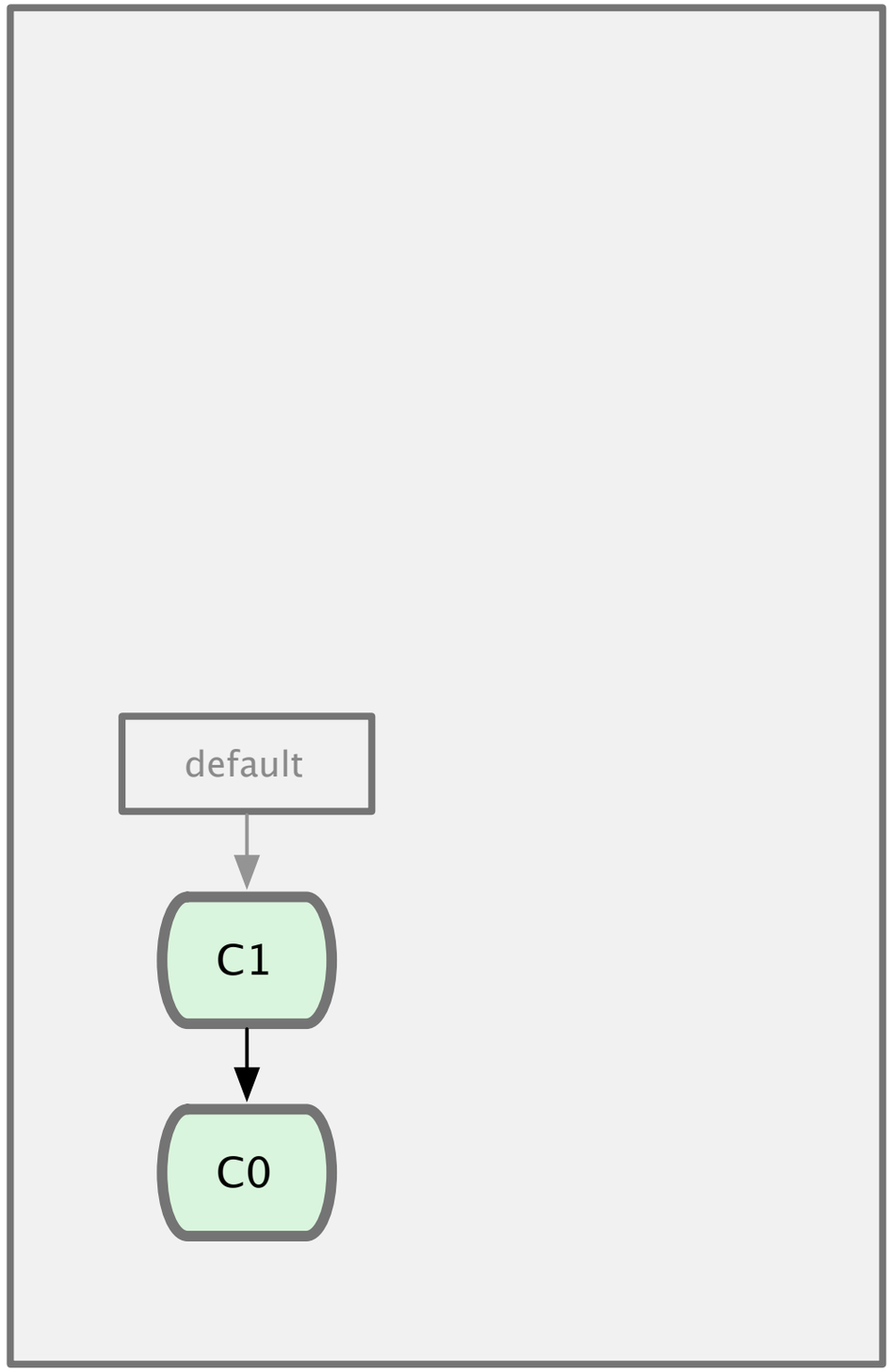
scott/default

default

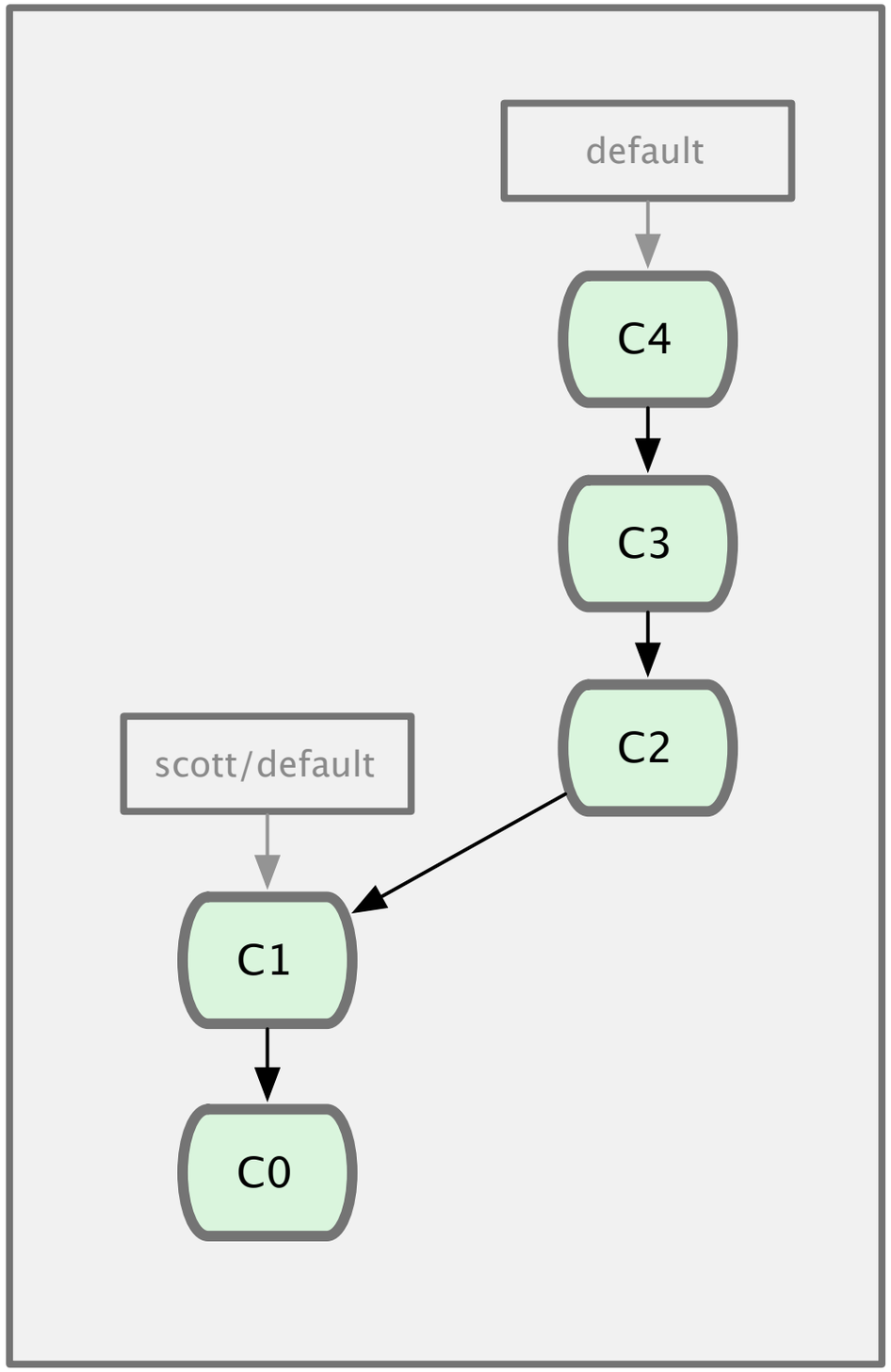
C1

C0

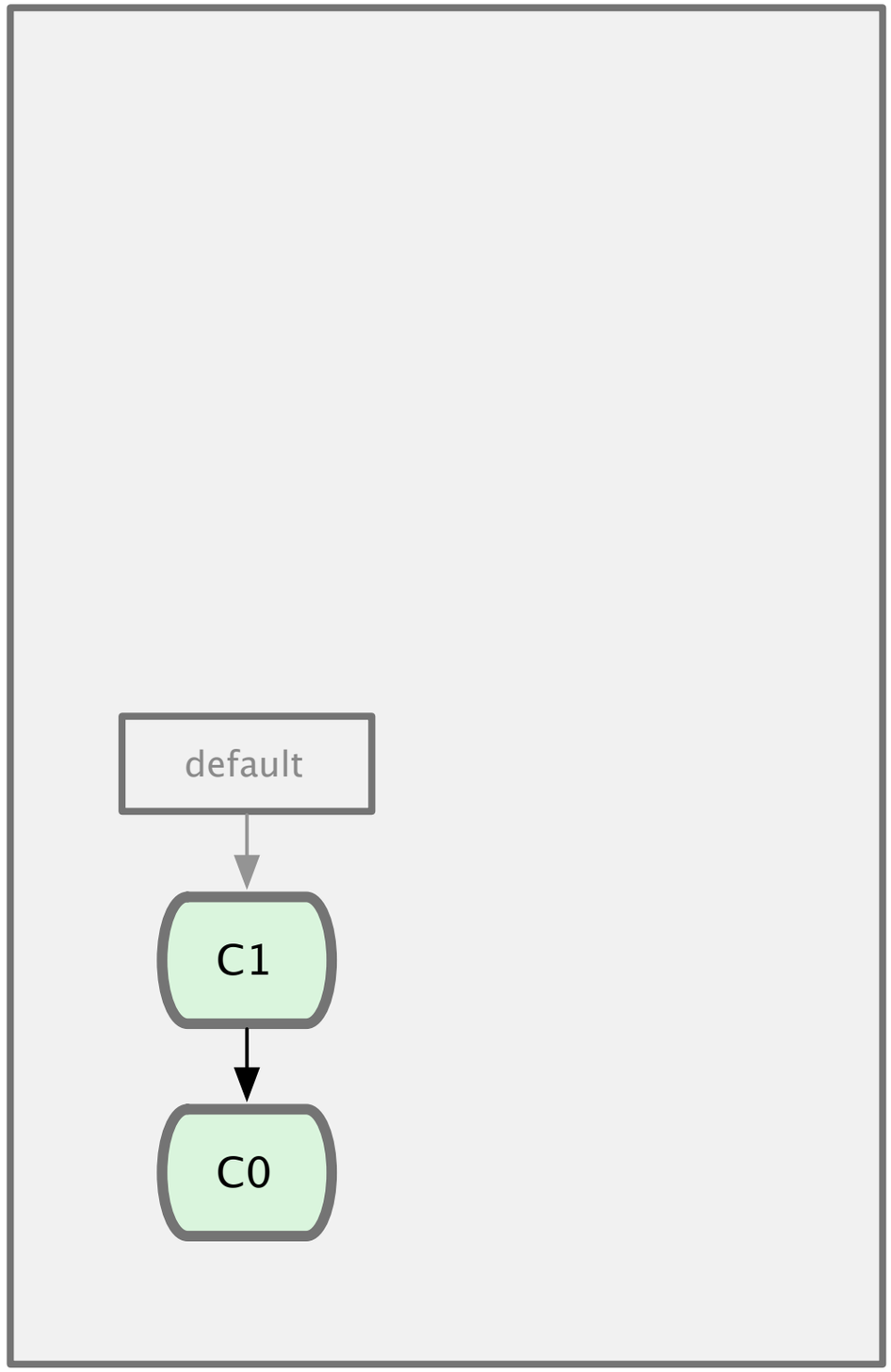
scott



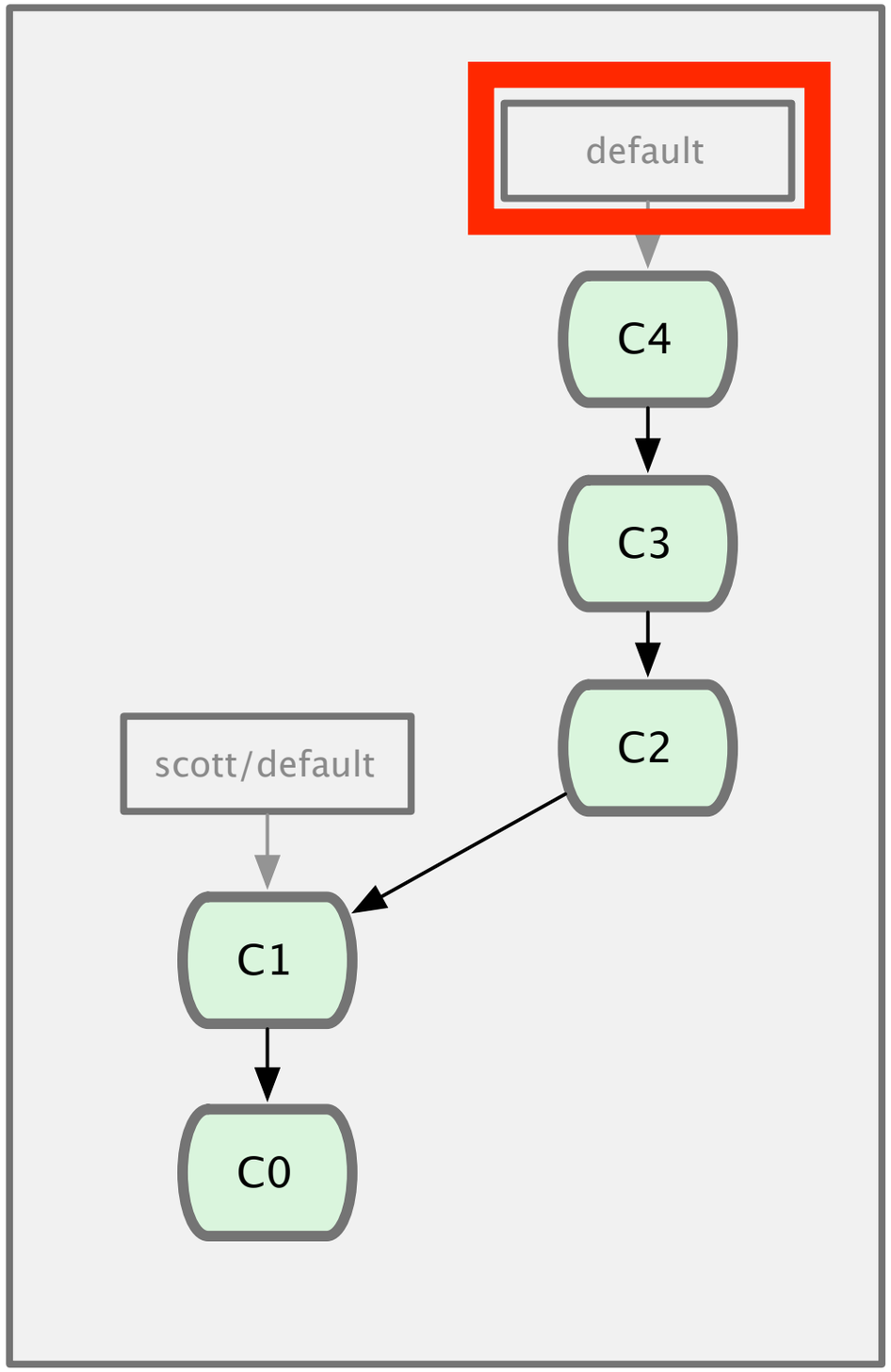
jessica



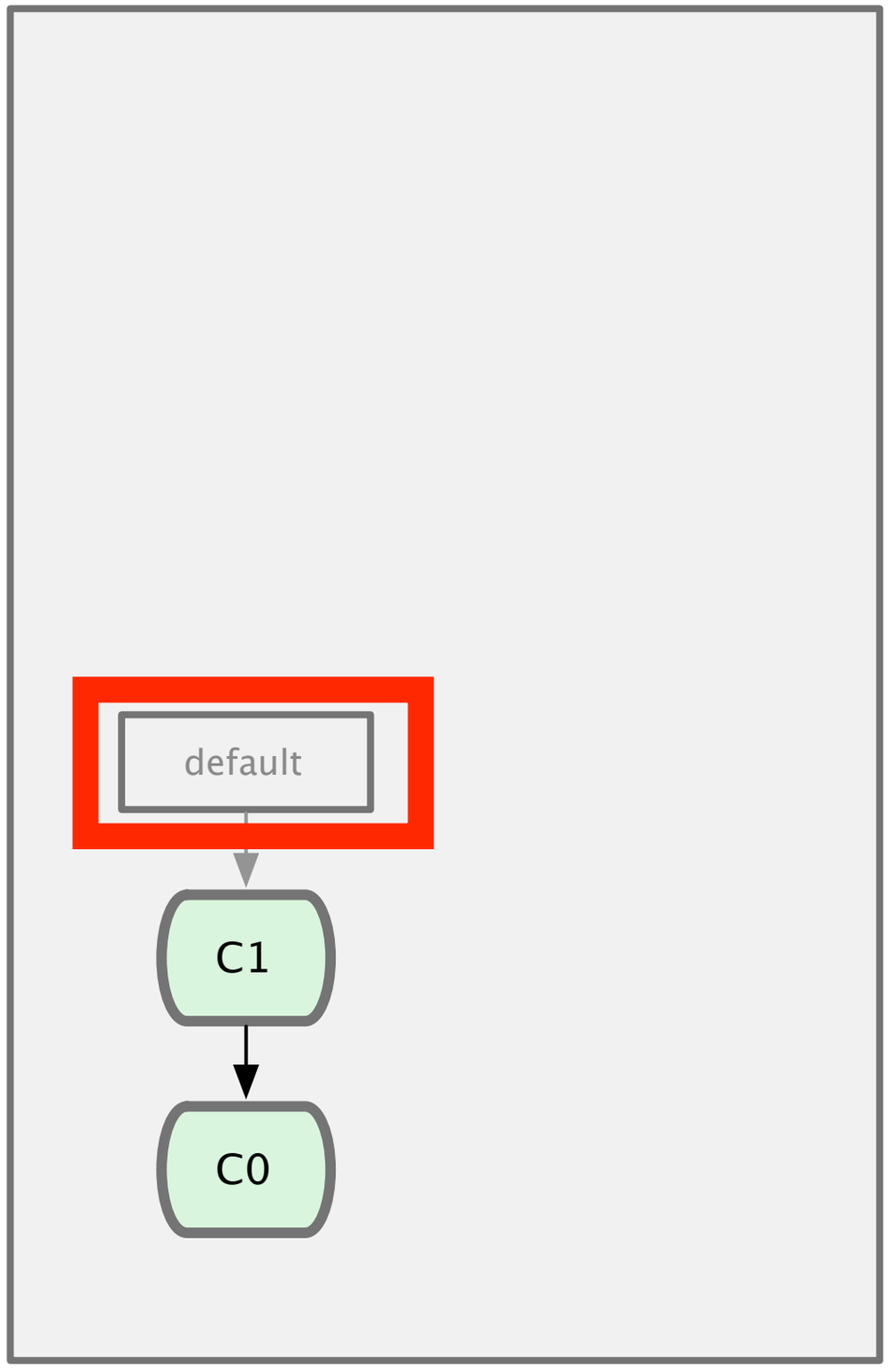
scott



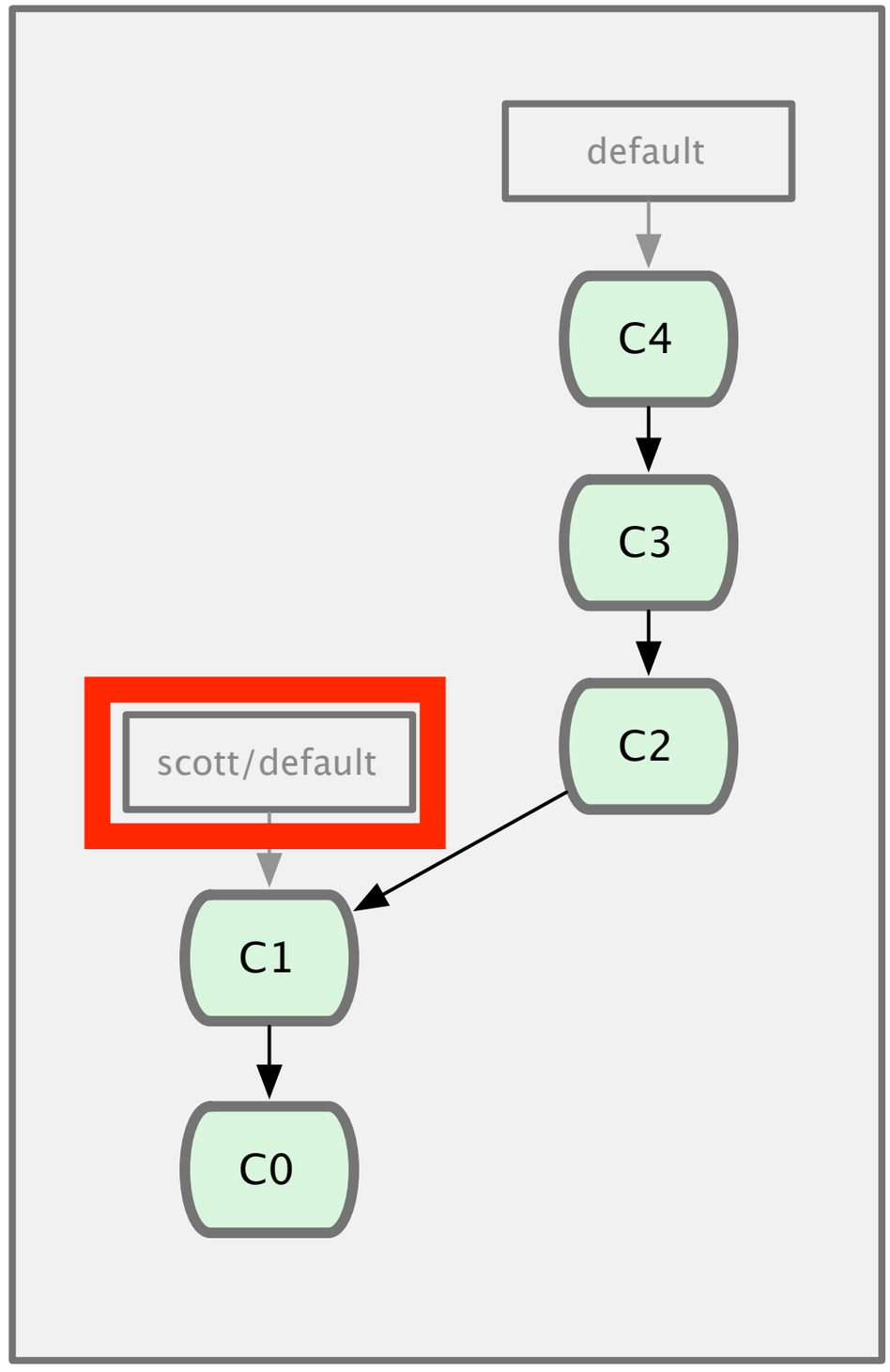
jessica



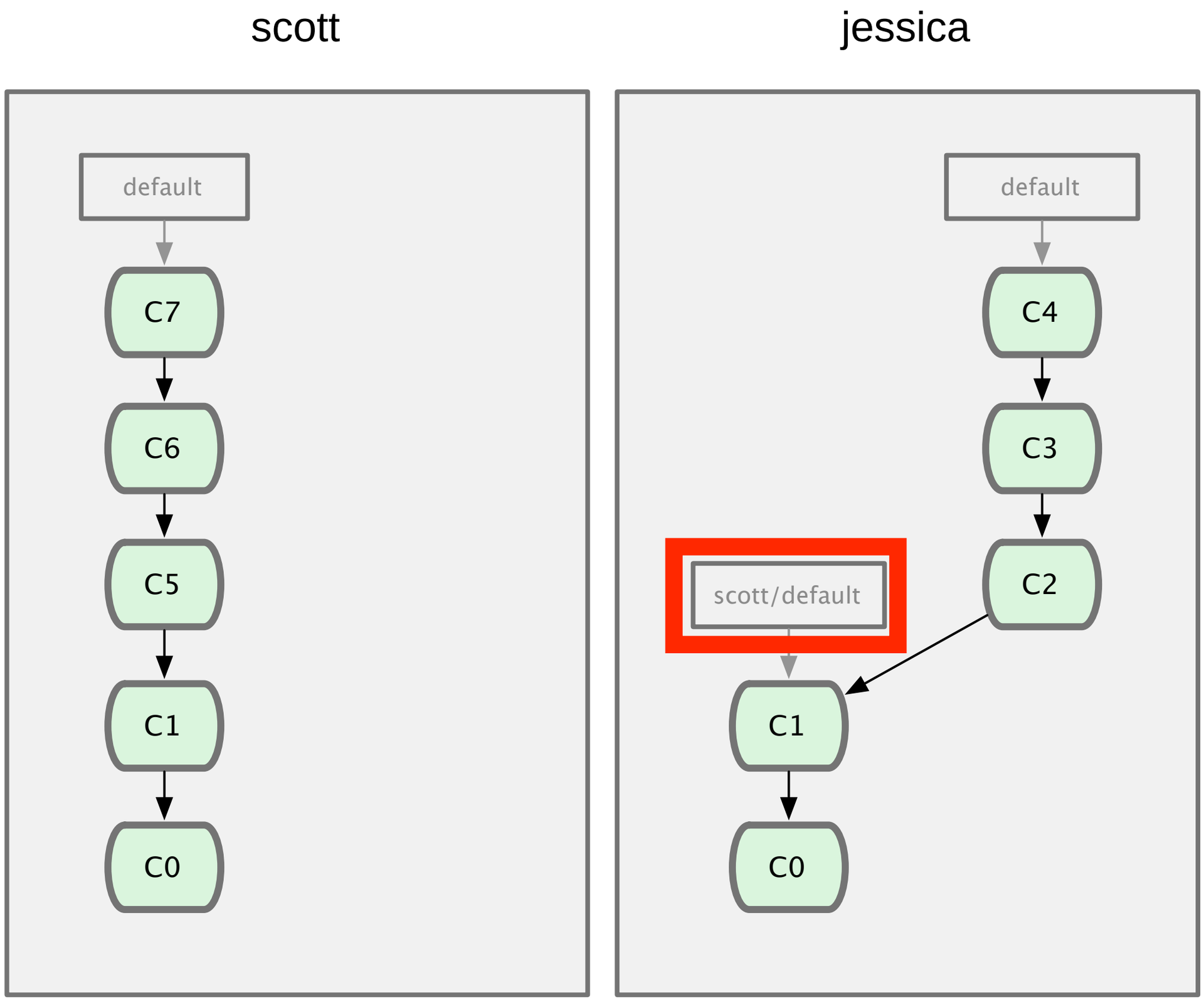
scott



jessica




scott
default
C7
C6
C5
C1
C0
jessica
default
C4
C3
C2
scott/default
C1
C0


scott
default
C7
C6
C5
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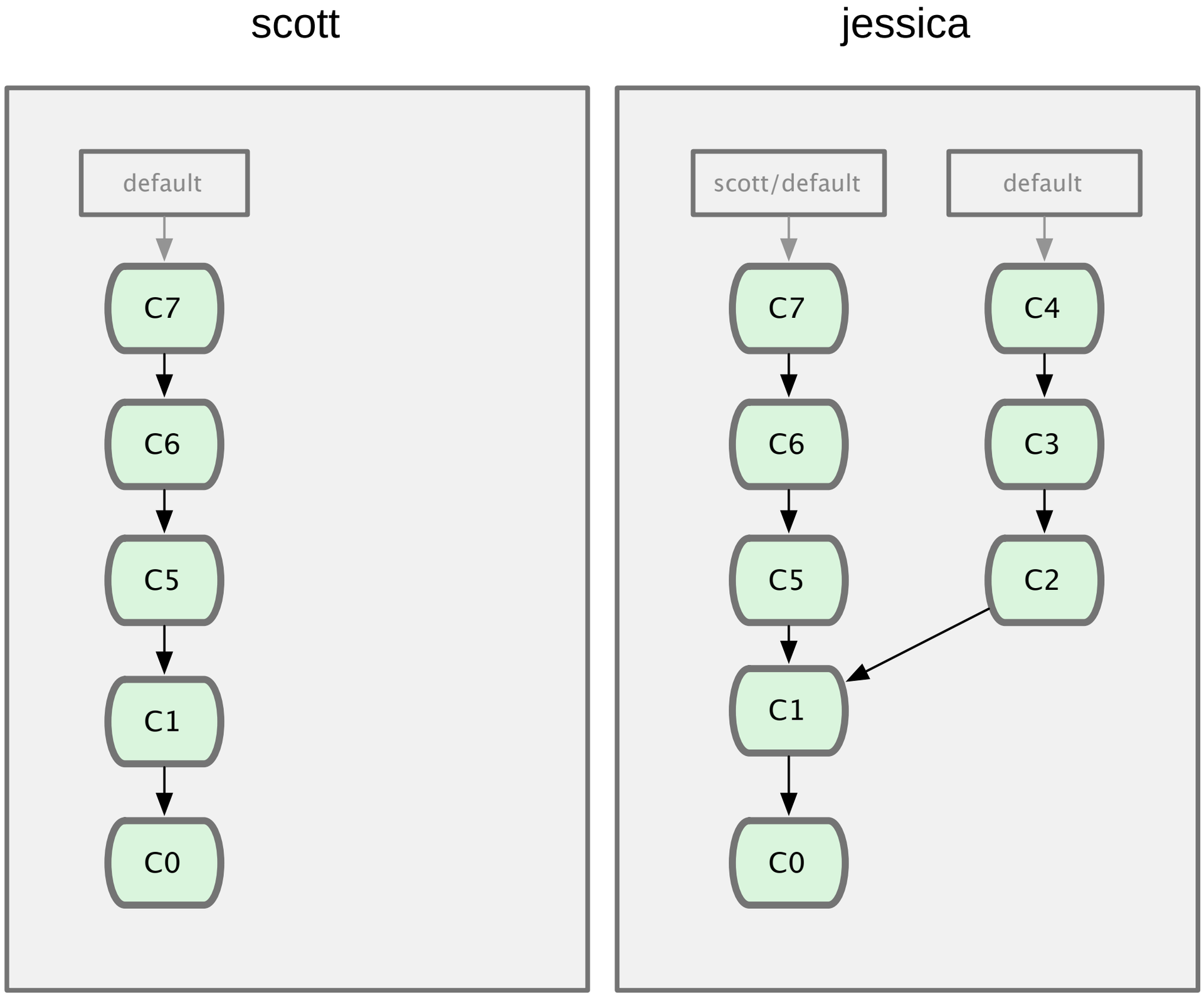
C0
jessica
default
C4
C3
C2
scott/default
C1
C0


scott
default
C7
C6
C5
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jessica
scott/default
C7
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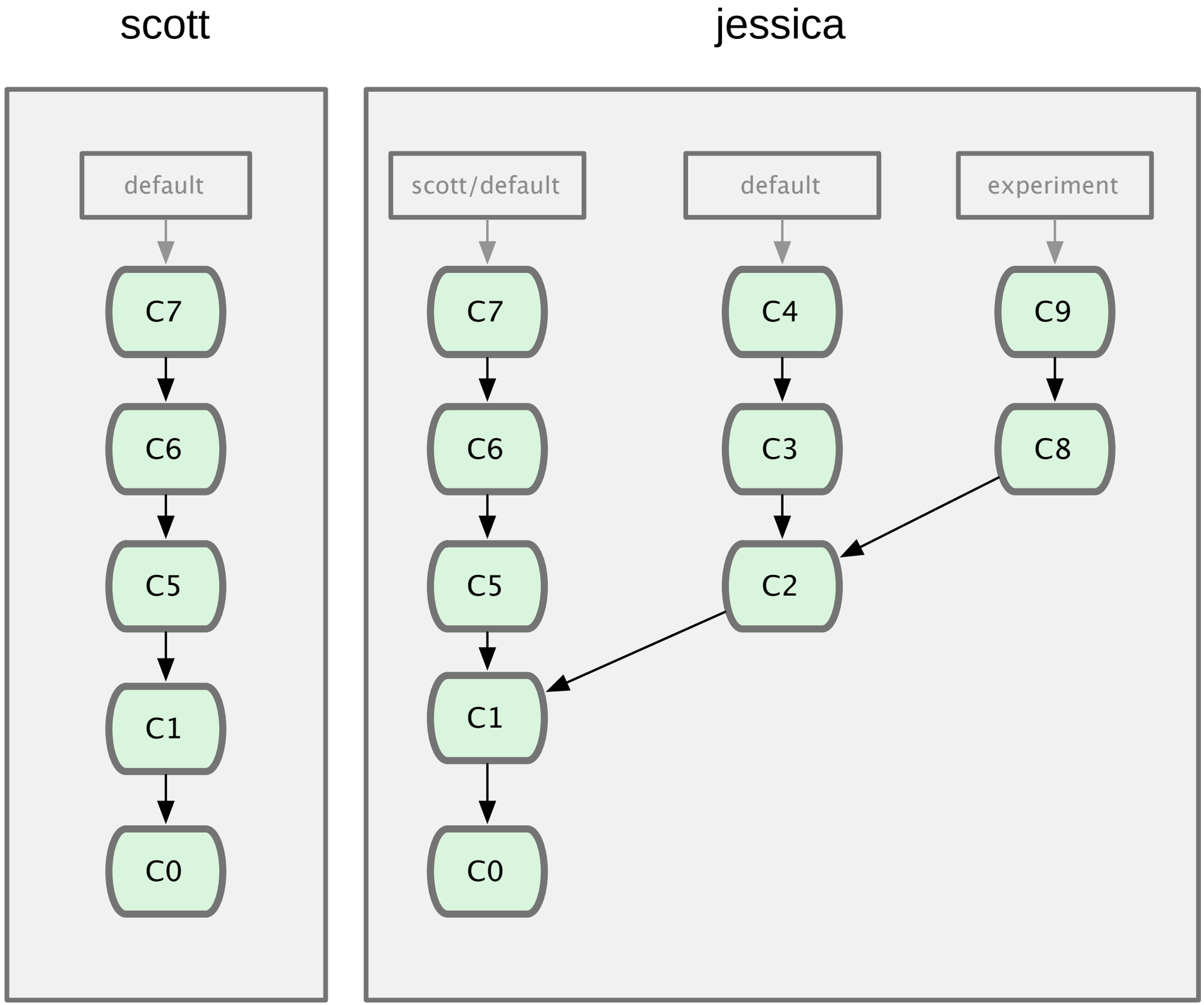
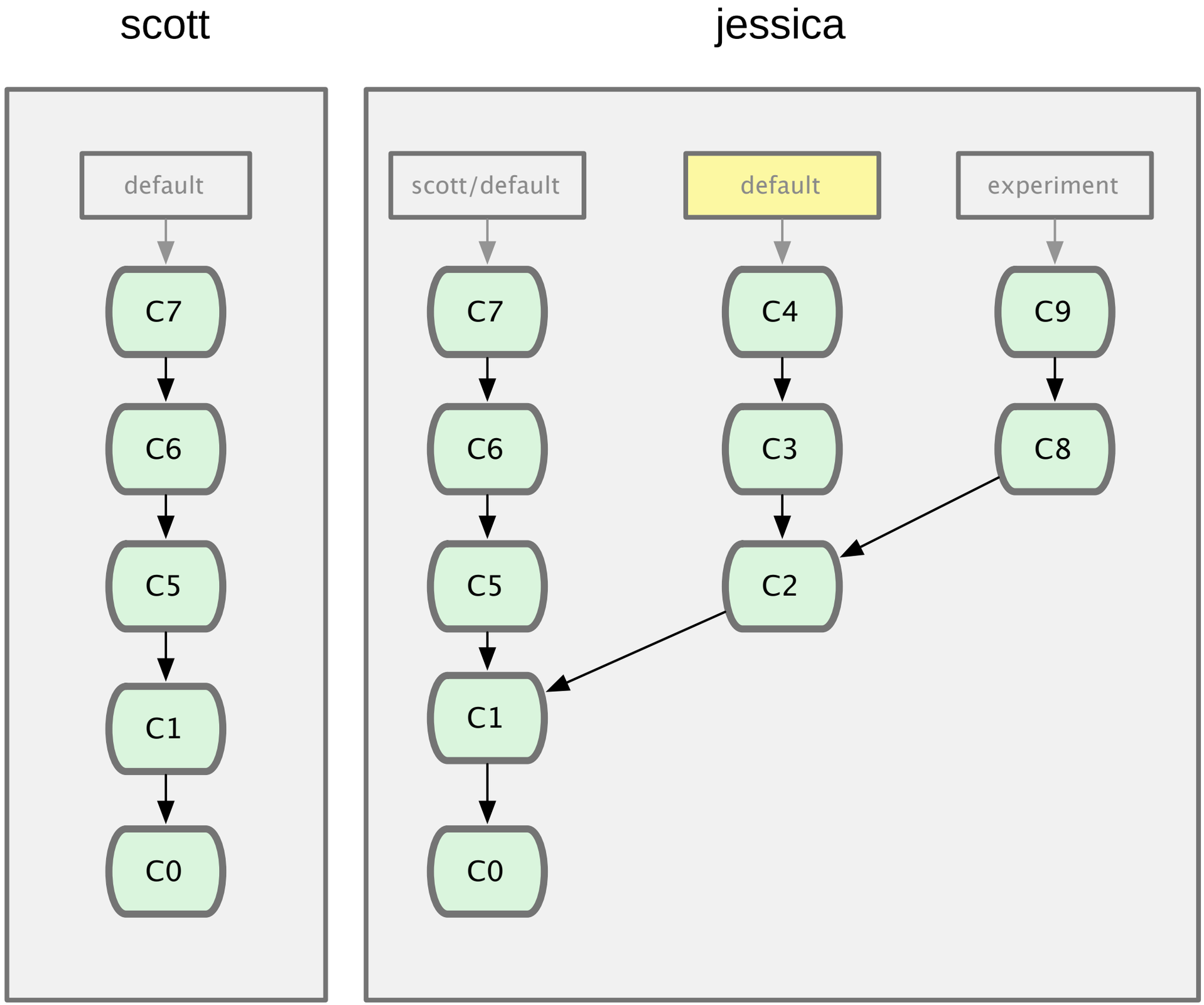
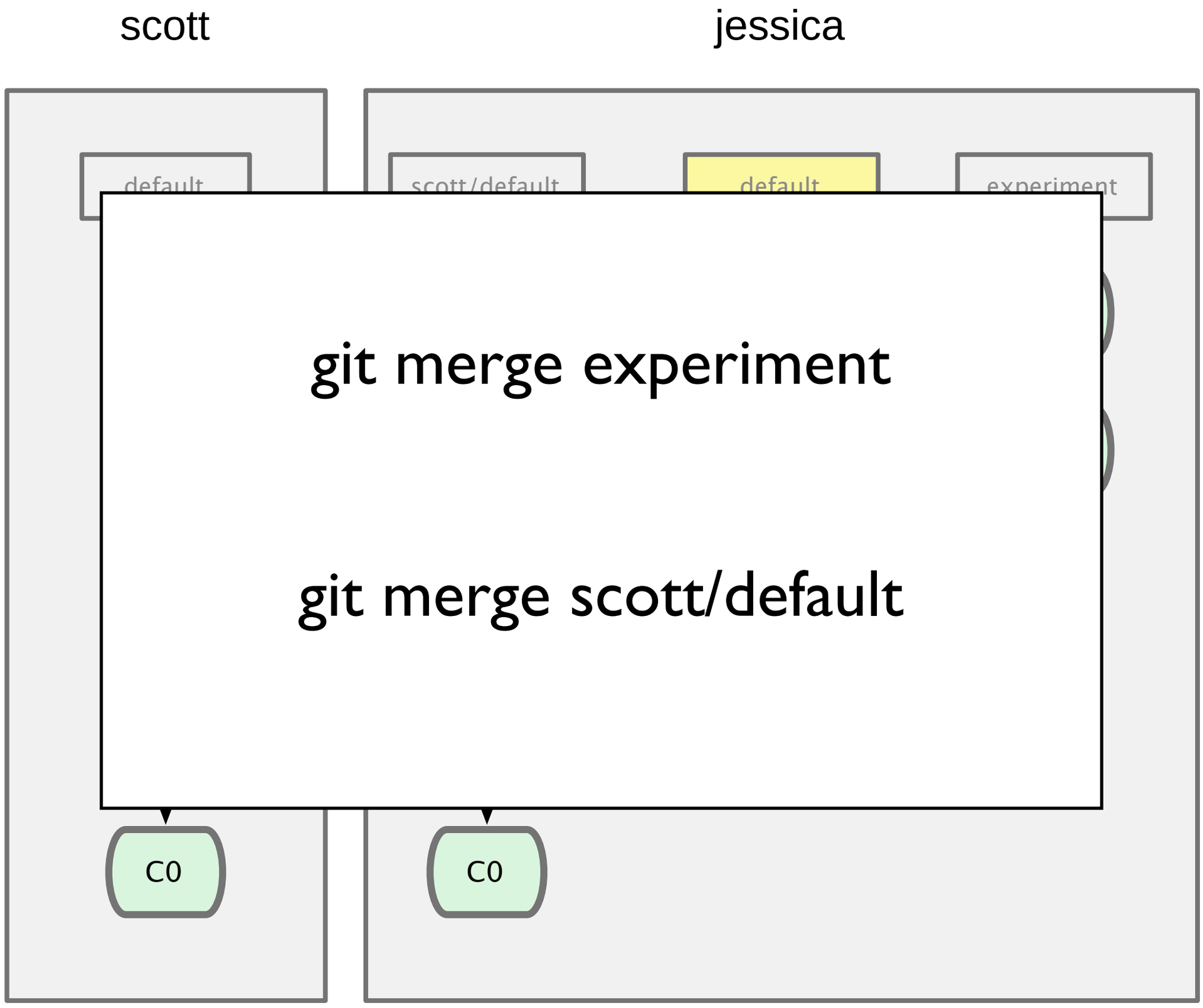
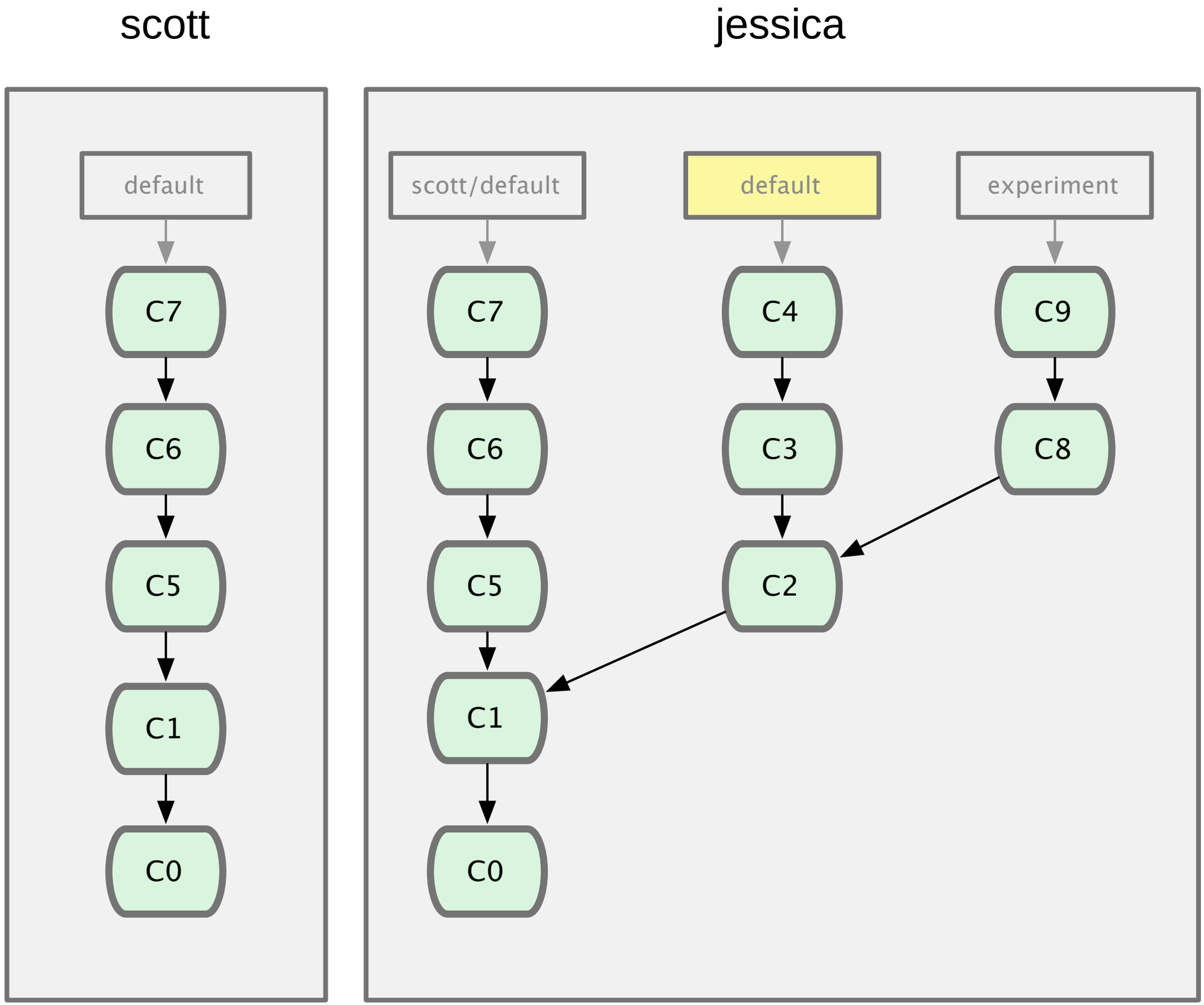
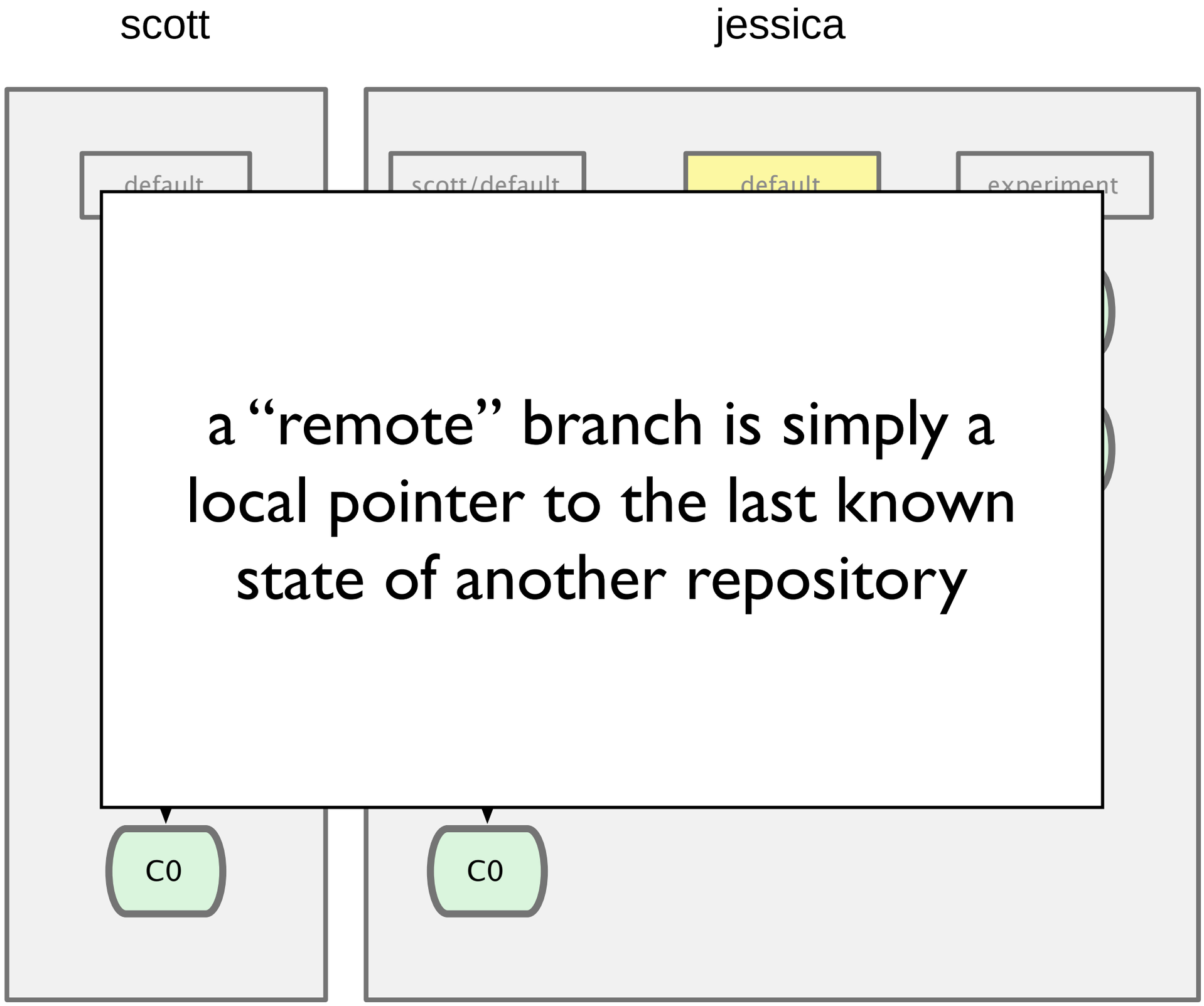
C5
C1
C0
default
C4
C3
C2


scott
jessica
default
C7
C6
C5
C1
C0
scott/default
C7
C6
C5
C1
C0
default
C4
C3
C2
experiment
C9
C8


scott
jessica
default
C7
C6
C5
C1
C0
scott/default
C7
C6
C5
C1
C0
default
C4
C3
C2
experiment
C9
C8


scott
jessica
default
scott/default
default
experiment
git merge experiment
git merge scott/default
C0
C0


scott
jessica
default
C7
C6
C5
C1
C0
scott/default
C7
C6
C5
C1
C0
default
C4
C3
C2
experiment
C9
C8


scott
jessica
default
scott/default
default
experiment
a “remote” branch is simply a local pointer to the last known state of another repository
C0
C0

Why is this cool?

non-linear development

- clone the code that is in production

- clone the code that is in production
- create a branch for issue #53 (iss53)

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- work for 10 minutes

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- someone asks for a hotfix for issue #102

- clone the code that is in production
- create a branch for issue #53 (iss53)
- work for 10 minutes
- someone asks for a hotfix for issue #102
- checkout ‘production’

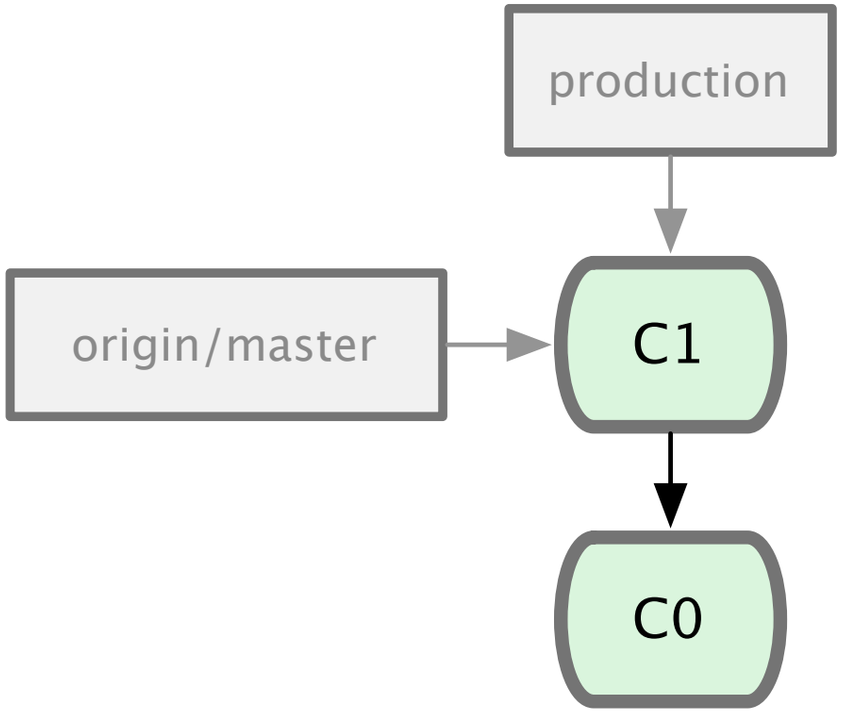
- clone the code that is in production
- create a branch for issue #53 (iss53)
- work for 10 minutes
- someone asks for a hotfix for issue #102
- checkout ‘production’
- create a branch (iss102)

- clone the code that is in production
- create a branch for issue #53 (iss53)
- work for 10 minutes
- someone asks for a hotfix for issue #102
- checkout ‘production’
- create a branch (iss102)
- fix the issue

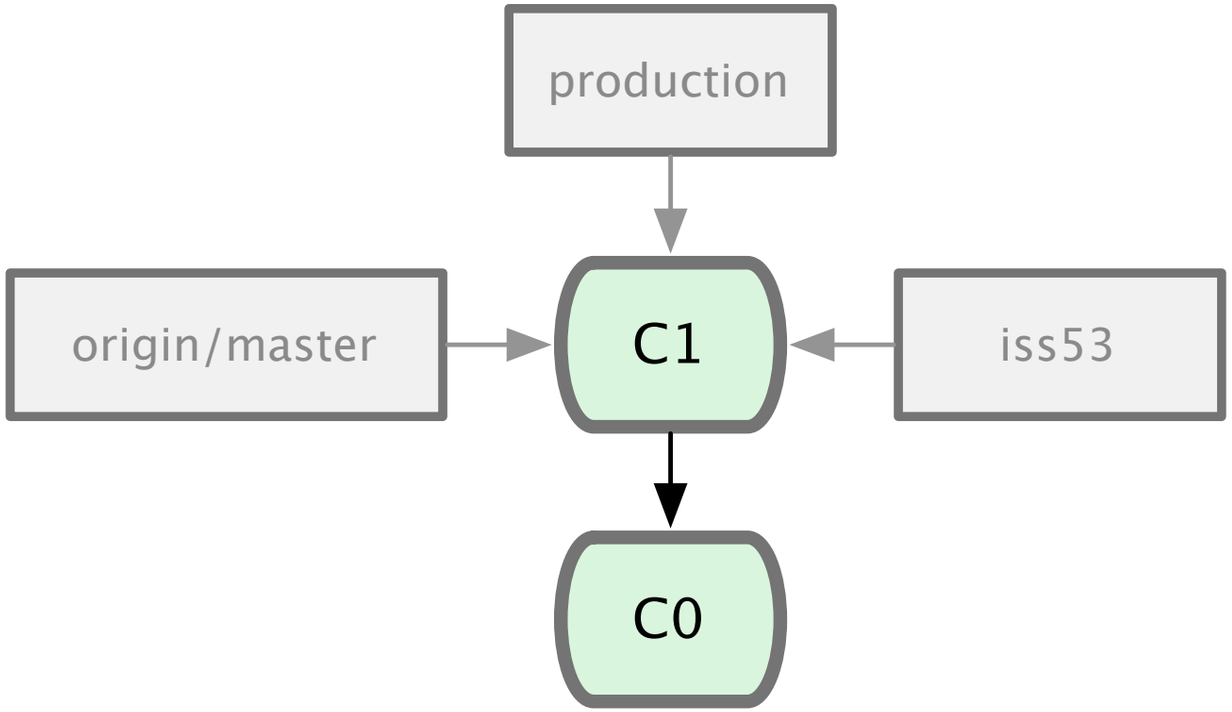
- clone the code that is in production
- create a branch for issue #53 (iss53)
- work for 10 minutes
- someone asks for a hotfix for issue #102
- checkout ‘production’
- create a branch (iss102)
- fix the issue
- checkout ‘production’, merge ‘iss102’

- clone the code that is in production
- create a branch for issue #53 (iss53)
- work for 10 minutes
- someone asks for a hotfix for issue #102
- checkout ‘production’
- create a branch (iss102)
- fix the issue
- checkout ‘production’, merge ‘iss102’
- push ‘production’

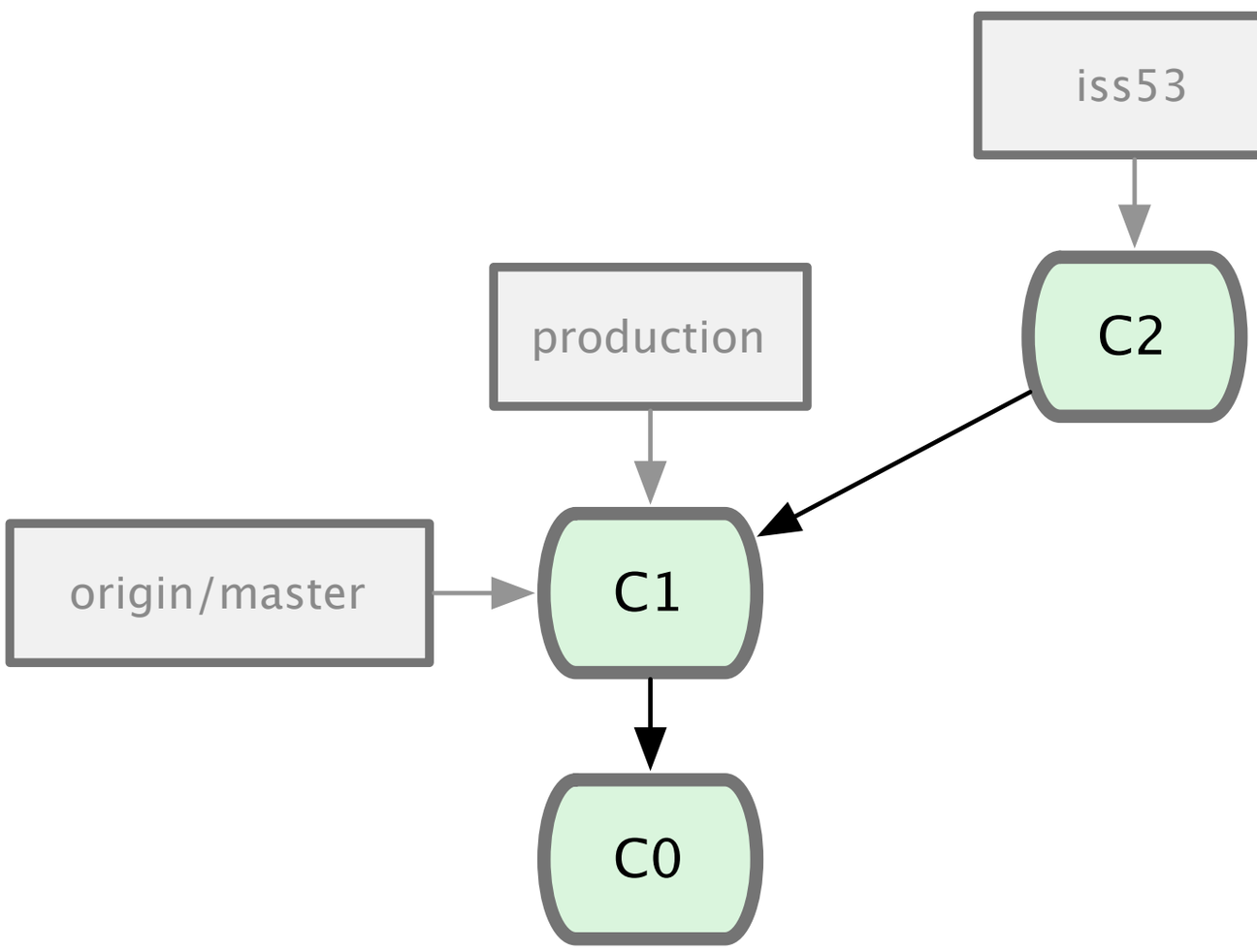
- clone the code that is in production
- create a branch for issue #53 (iss53)
- work for 10 minutes
- someone asks for a hotfix for issue #102
- checkout ‘production’
- create a branch (iss102)
- fix the issue
- checkout ‘production’, merge ‘iss102’
- push ‘production’
- etc



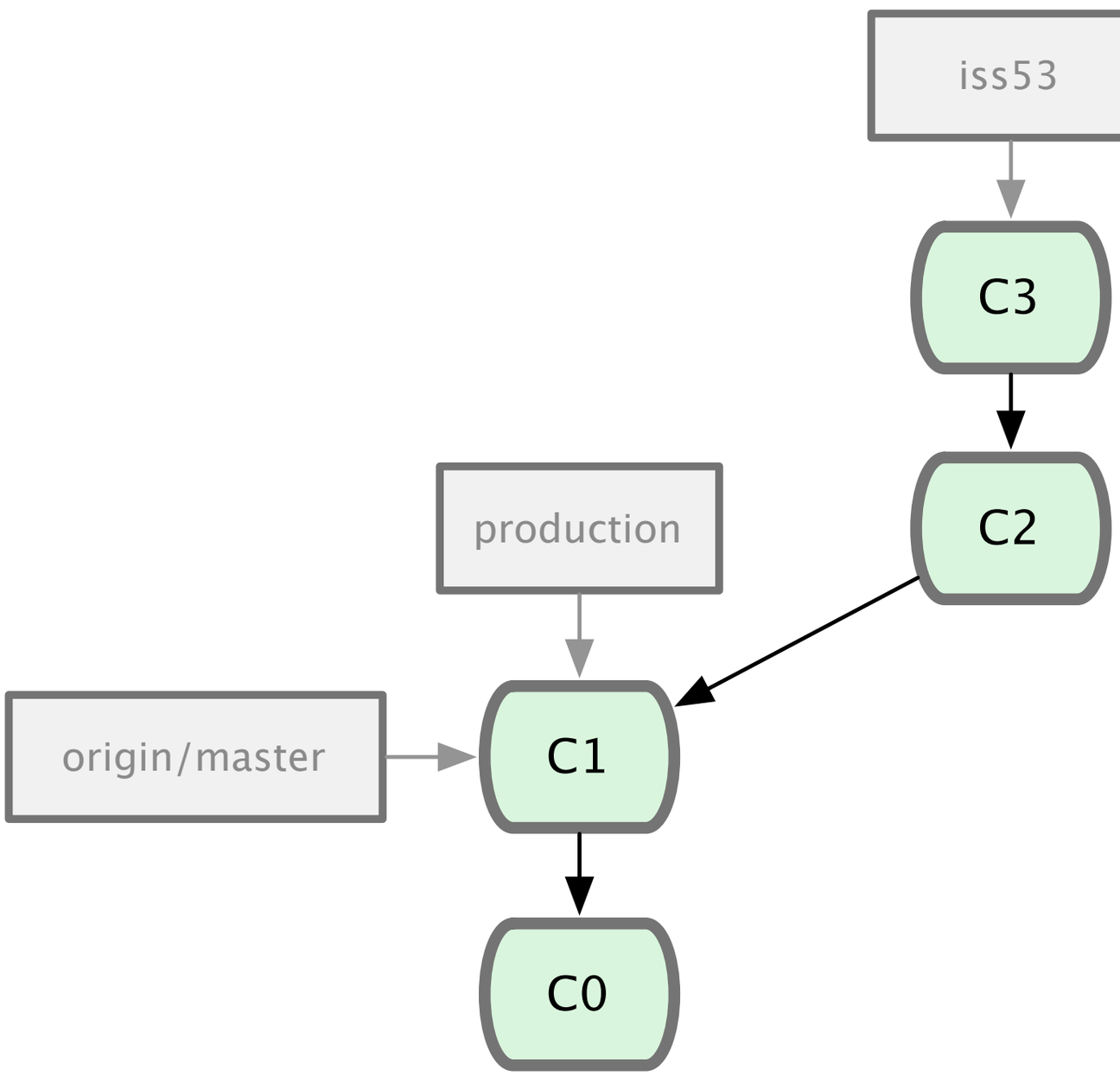
git clone



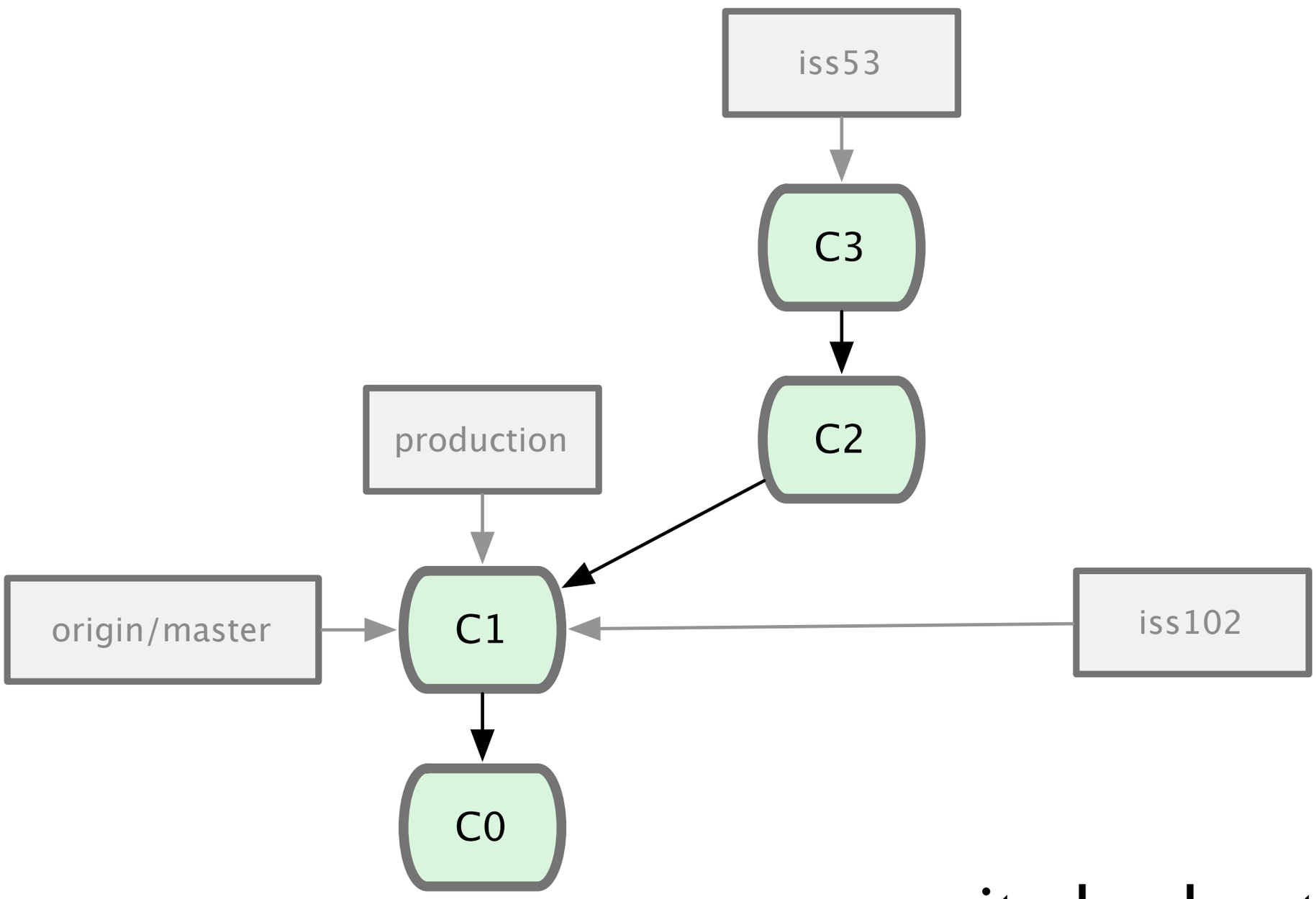
git checkout -b iss53



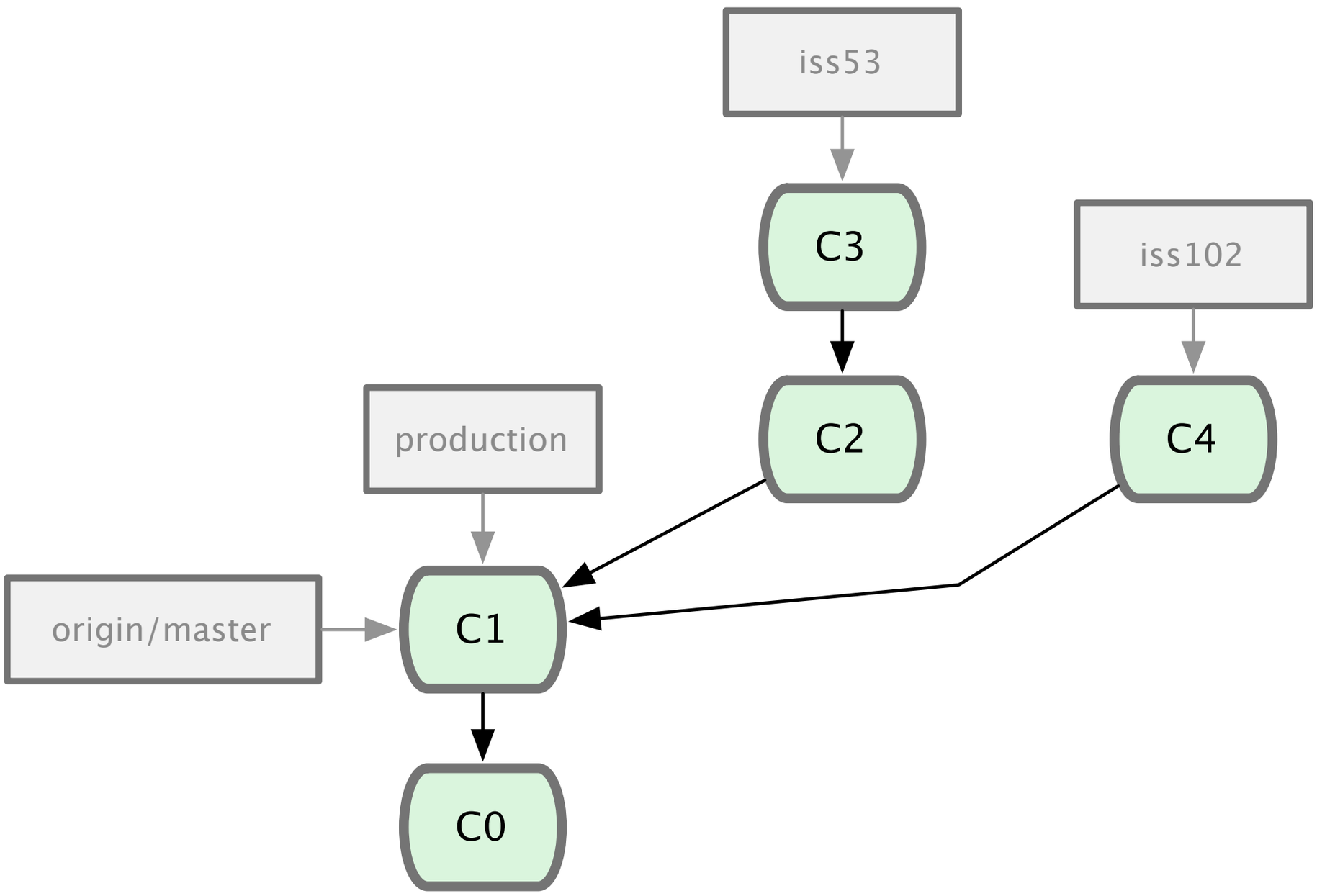
git commit



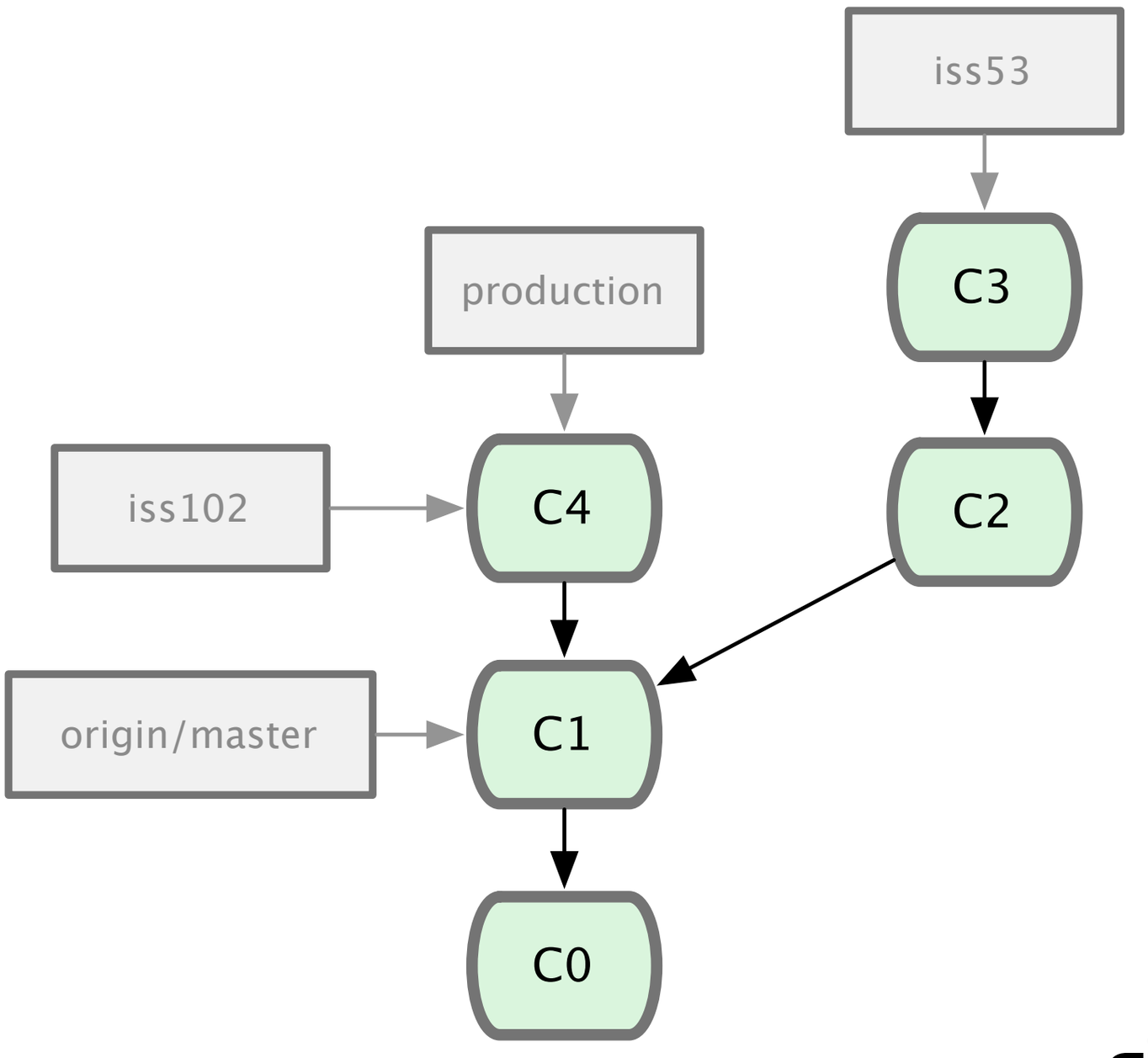
git commit



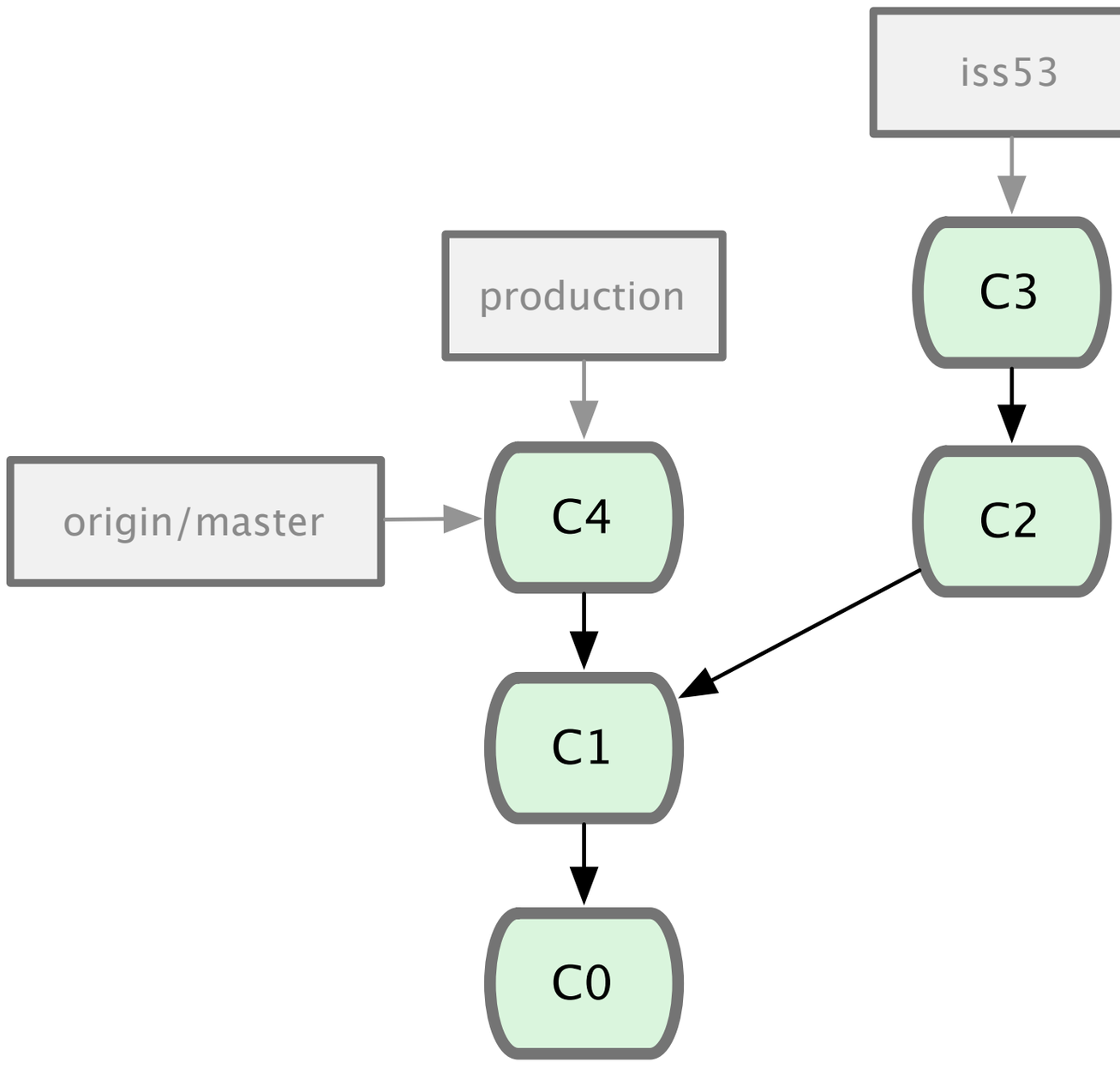
git checkout production
git checkout -b iss102



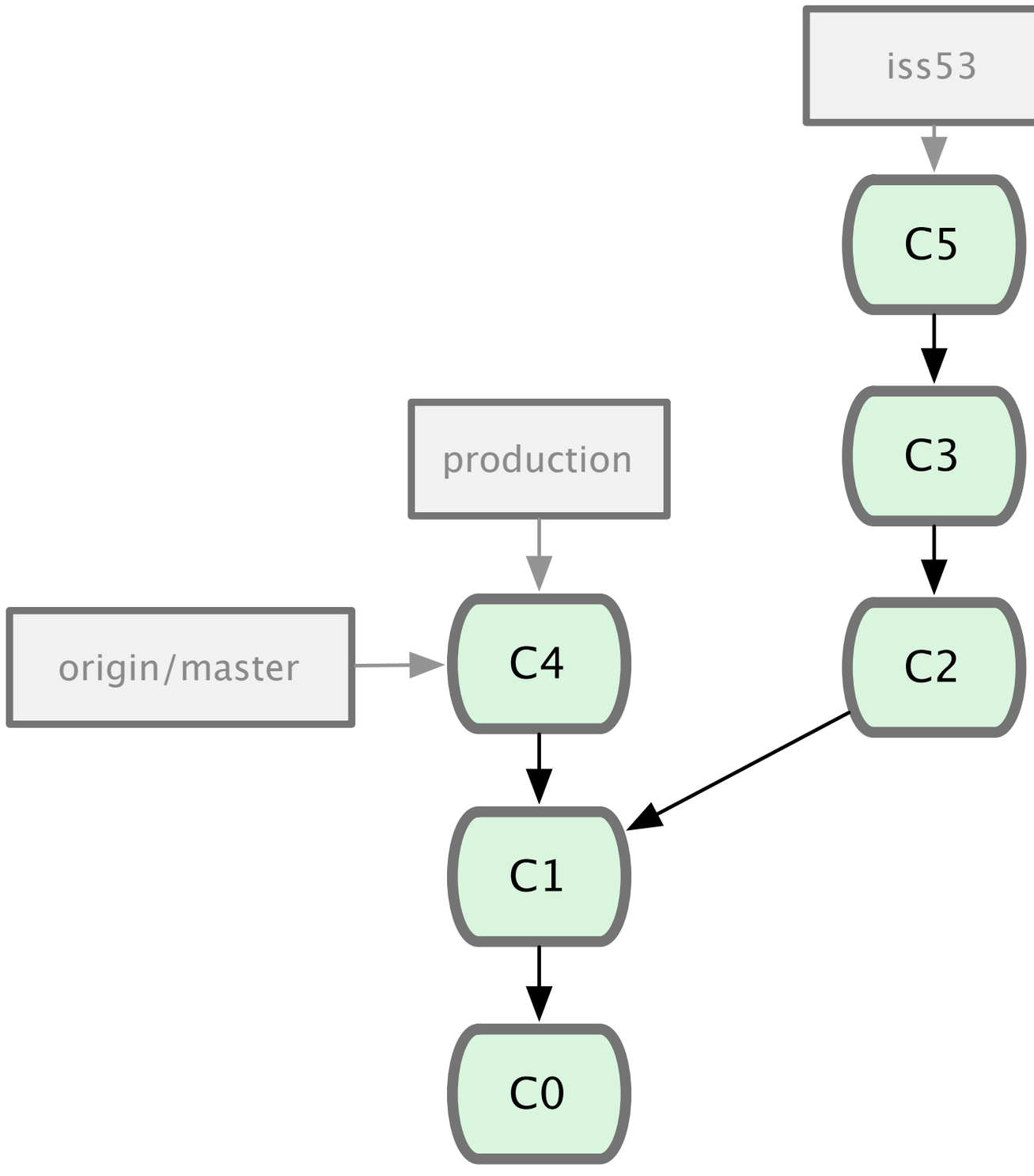
git commit



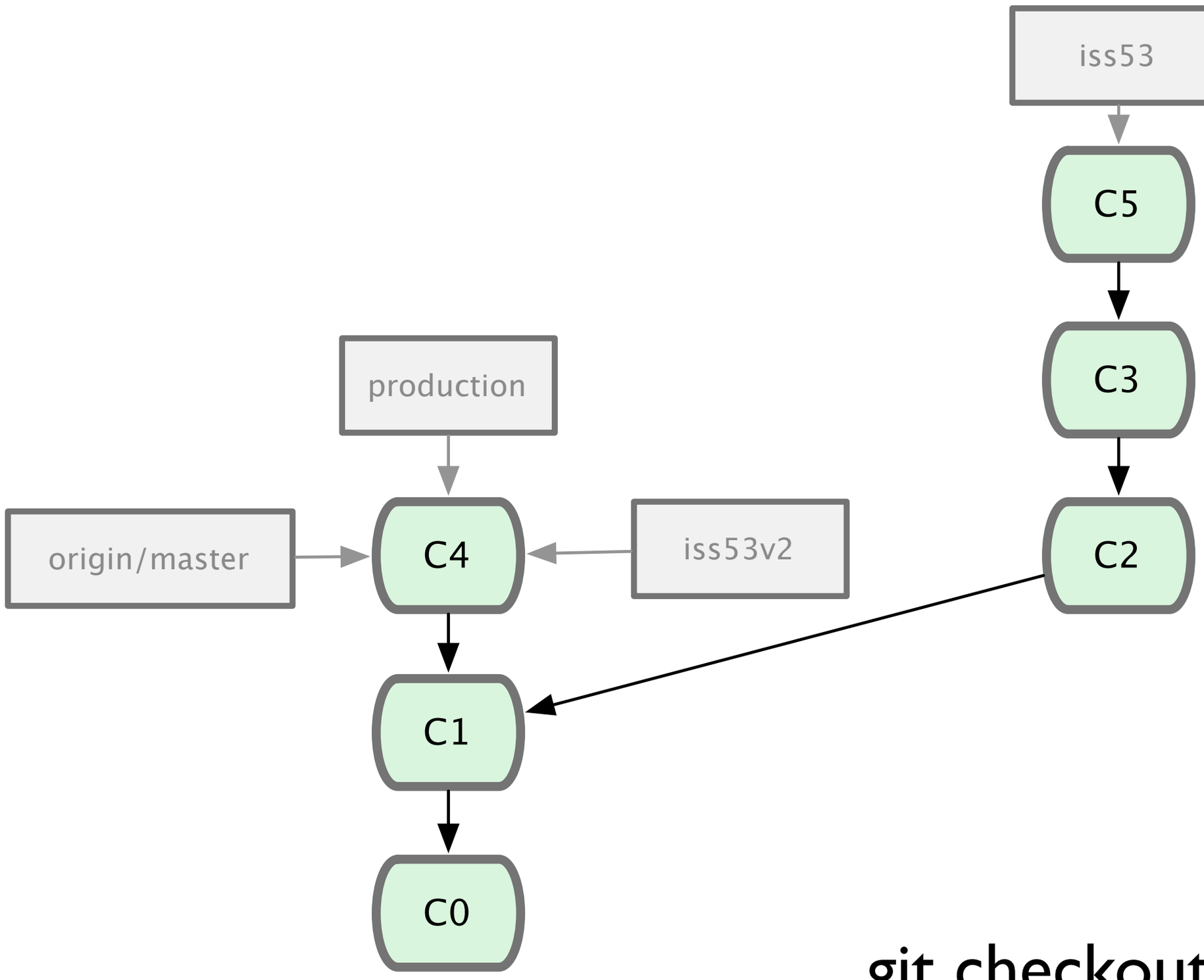
git checkout production
git merge iss102



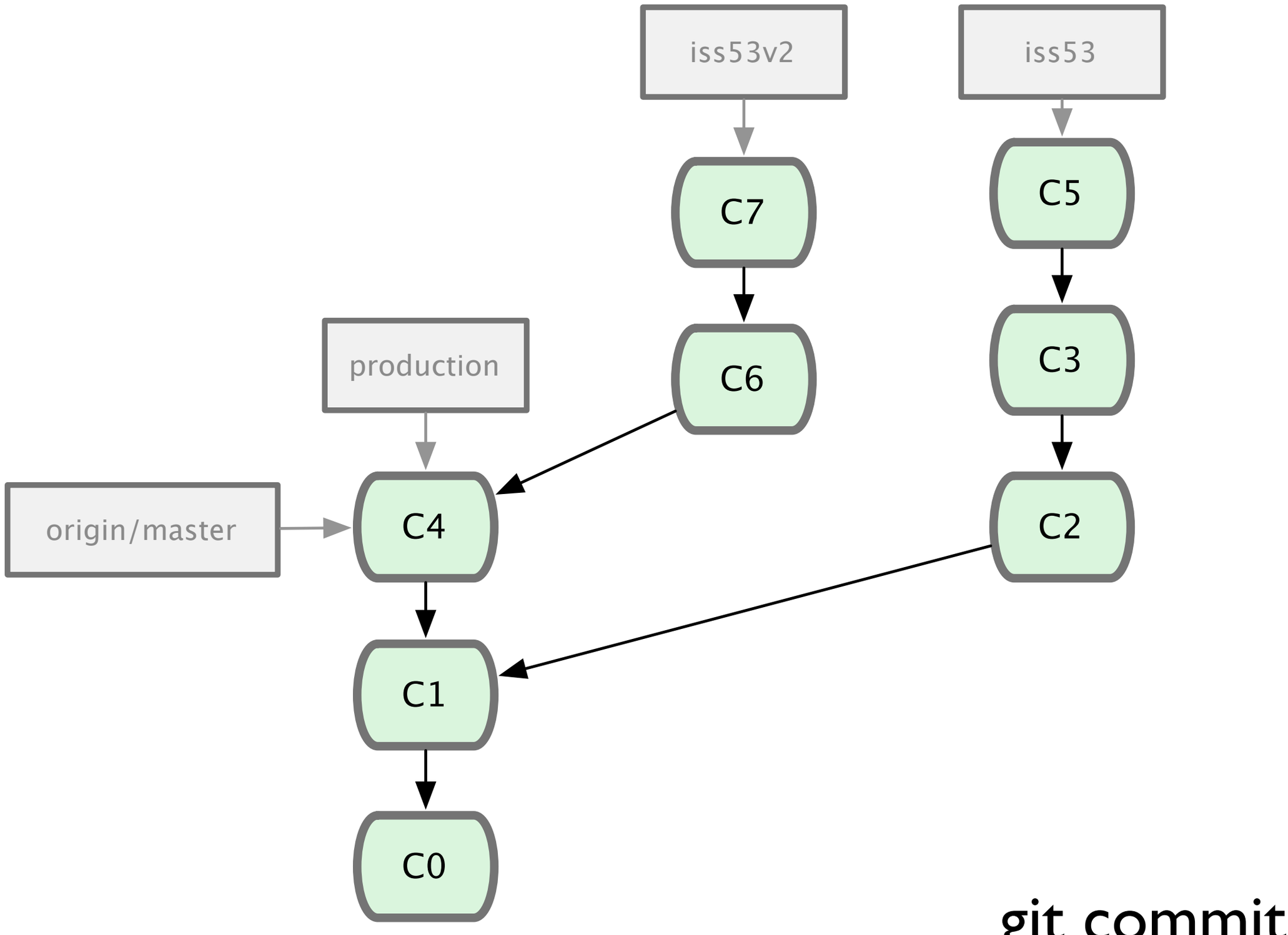
git push



git checkout iss53
git commit



git checkout production
git checkout -b iss53v2



git commit
git commit

try out an idea

isolate work units

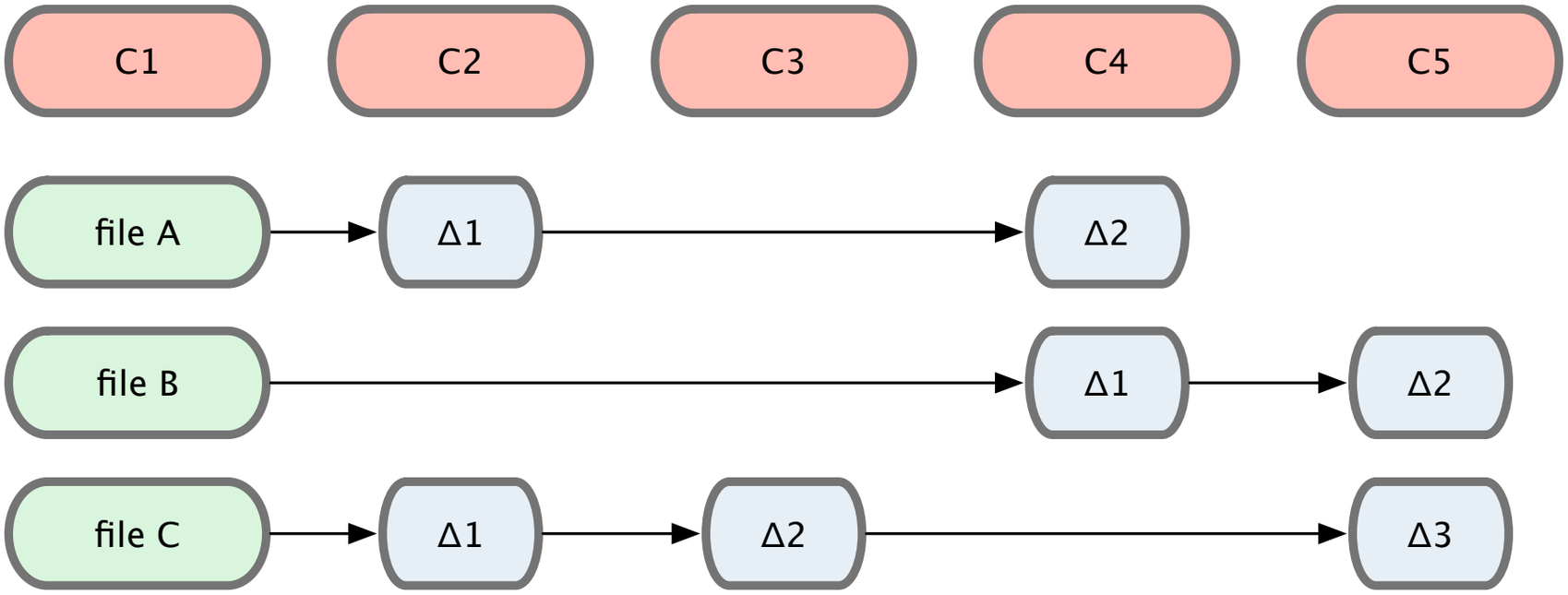
long running topics

pain free

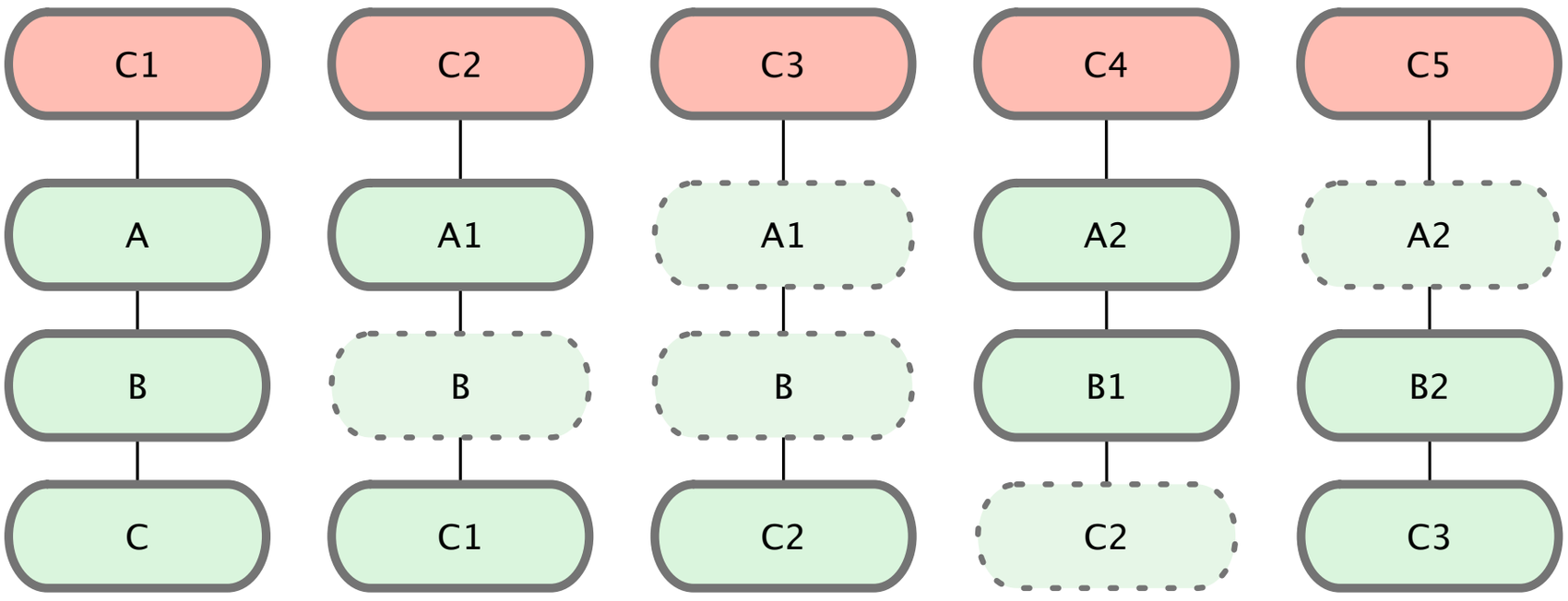
context switching

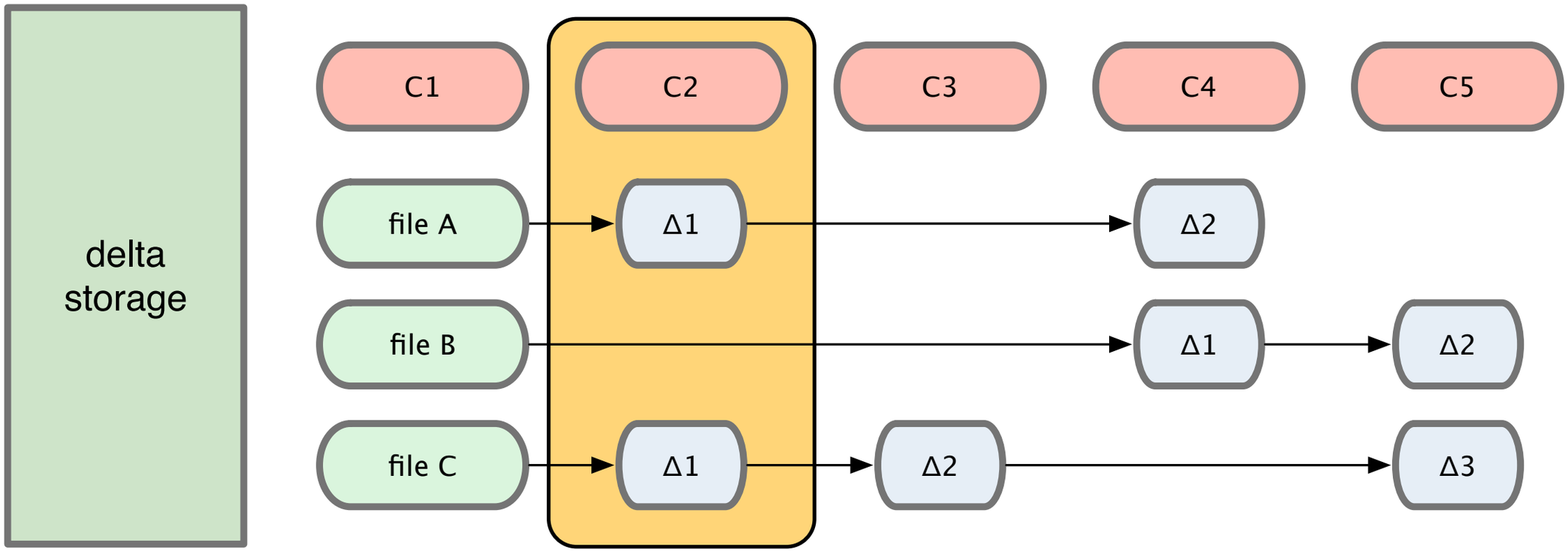
Changes

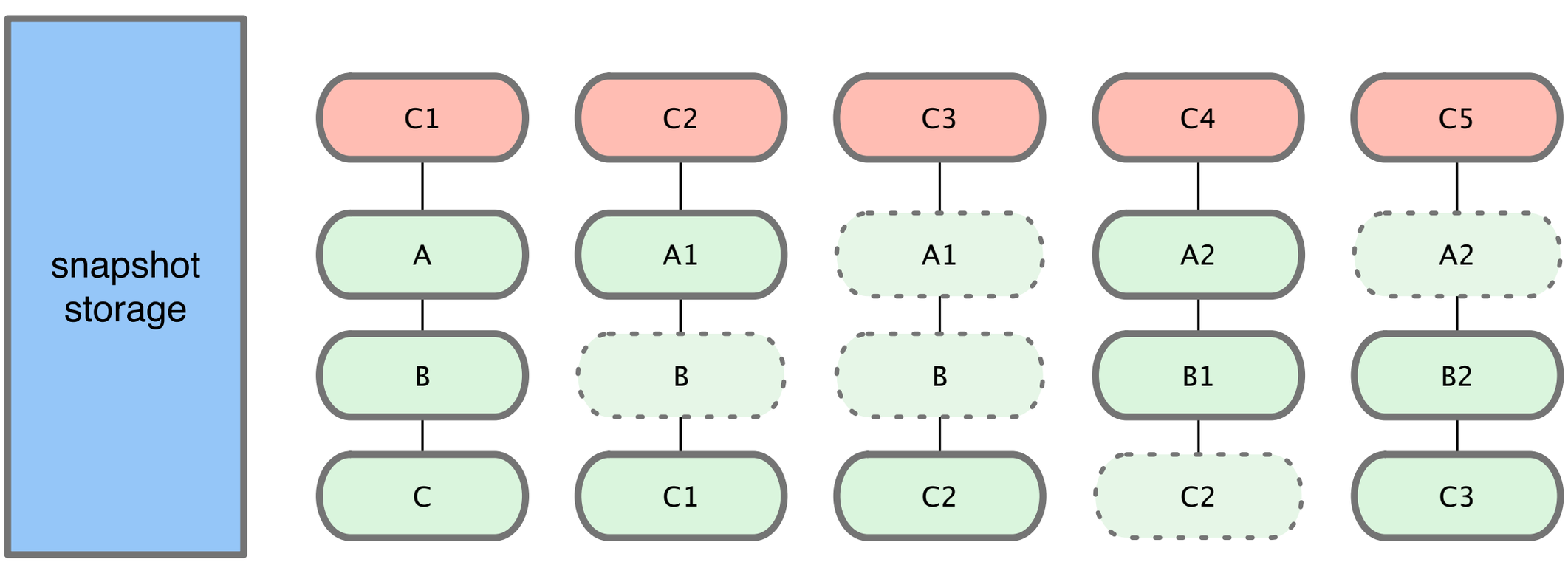
delta storage

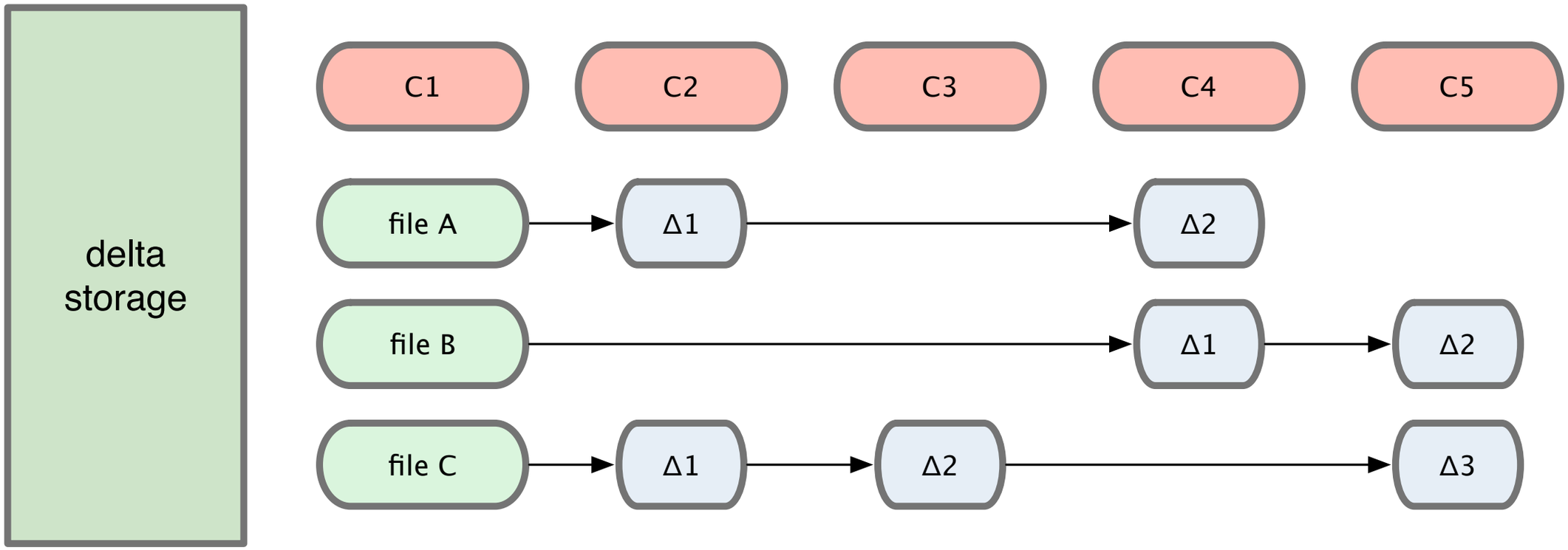


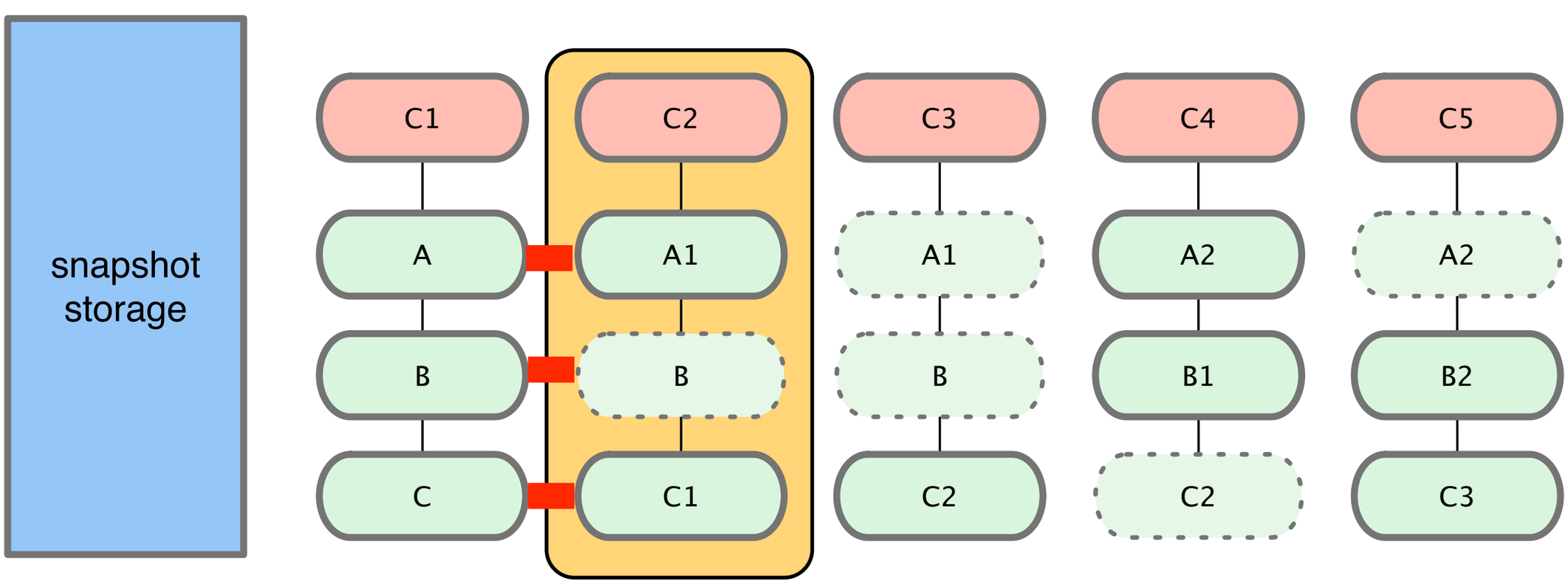
snapshot storage




delta
storage
C1
C2
C3
C4
C5
file A
Δ1
Δ2
file B
Δ1
Δ2
file C
Δ1
Δ2
Δ3


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


delta
storage
C1
C2
C3
C4
C5
file A
Δ1
Δ2
file B
Δ1
Δ2
file C
Δ1
Δ2
Δ3


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

git diff

```
diff --git a/main.py b/main.py
index 6db8b97..b9bcc62 100755
--- a/main.py
+++ b/main.py
@@ -2,10 +2,12 @@
 import wsgiref.handlers
 from google.appengine.ext import webapp

+# this program prints out 'hello world'
+
 class MainHandler(webapp.RequestHandler):

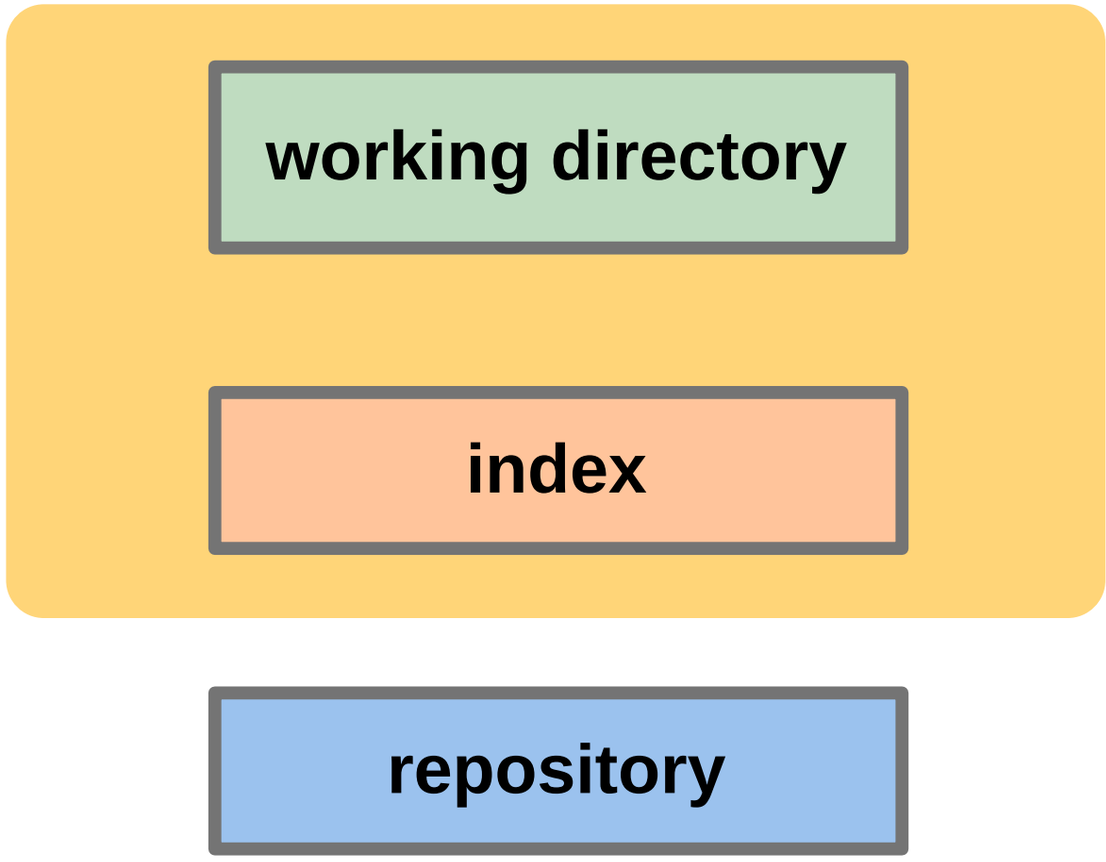
   def get(self):
-    self.response.out.write('Hello world!')
+    self.response.out.write('Hola mundo!')

 def main():
   application = webapp.WSGIApplication([('/', MainHandler)],
```

What is not yet staged?

git diff

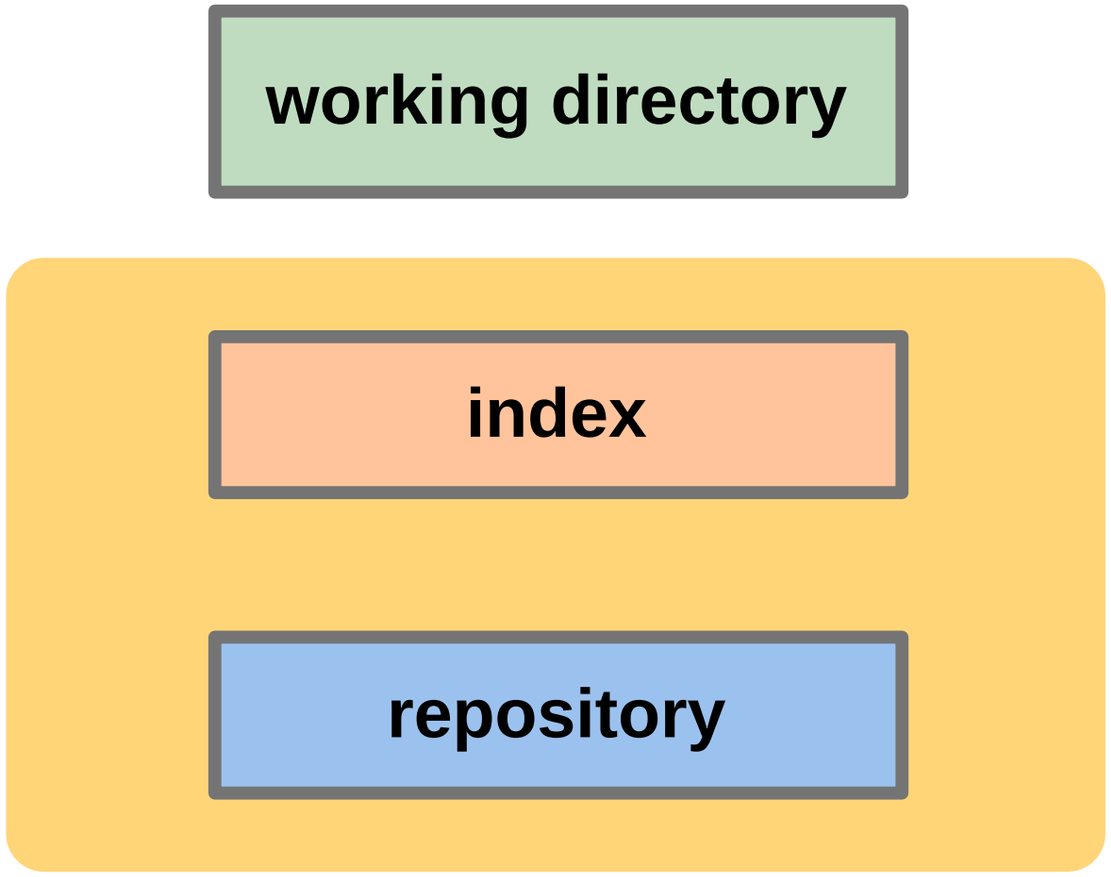
git diff



What is staged?

git diff --cached

git diff --cached



Unified Diff

```
git diff > change.patch
```

```
git diff > change.patch
```

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

```
git diff > change.patch
```

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

or

```
git apply change.patch
```

History

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

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    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

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Date:   Sun Apr 13 10:45:01 2008 -0700

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What am I about to submit?

git log [branch]..

```
git log origin/master..
```

```
git log origin/master..
```

what you've committed that isn't pushed yet

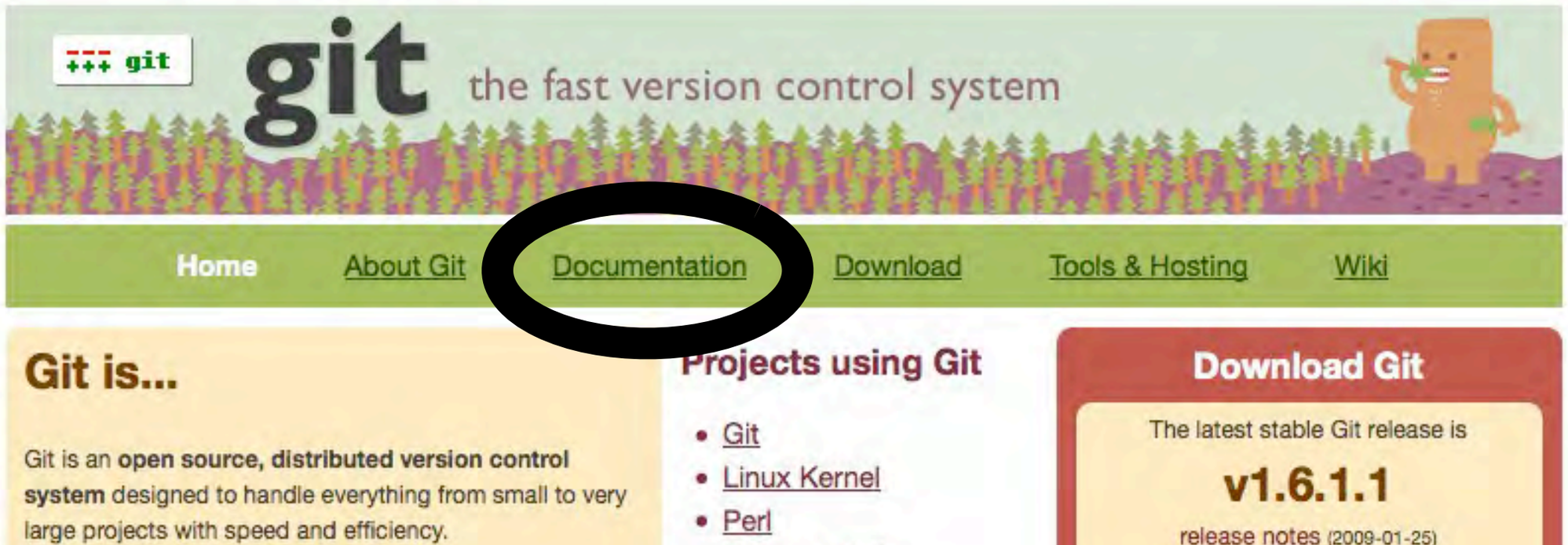
Git Help

```
git [command] --help
```

git help [command]

git-scm.com

git-scm.com


git
the fast version control system
Home
About Git
Documentation
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Tools & Hosting
Wiki
Git is...
Git is an open source, distributed version control system designed to handle everything from small to very large projects with speed and efficiency.
Projects using Git
Git
Linux Kernel
Perl
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The latest stable Git release is
v1.6.1.1
release notes (2009-01-25)

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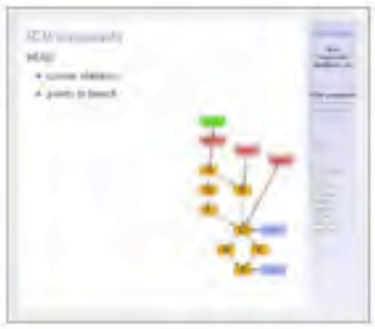

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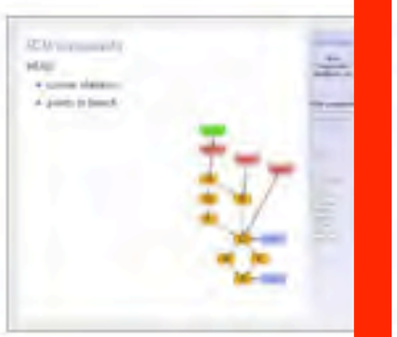

Basic Commands

Review

12

git init

12

git init

git clone

12

git init

git clone

git add

12

git init

git clone

git add

git commit

12

git init

git clone

git add

git commit

git branch

12

git init

git clone

git add

git commit

git branch

git checkout

12

git init

git clone

git add

git commit

git branch

git checkout

git merge

12

git init

git clone

git add

git commit

git branch

git checkout

git merge

git remote

12

git init

git clone

git add

git commit

git branch

git checkout

git merge

git remote

git fetch

12

git init

git clone

git add

git commit

git branch

git checkout

git merge

git remote

git fetch

git push

12

git init

git clone

git add

git commit

git branch

git checkout

git merge

git remote

git fetch

git push

git diff

12

git init

git clone

git add

git commit

git branch

git checkout

git merge

git remote

git fetch

git push

git diff

git log

12

that's it!

Resources

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