

*Gilles Querret • Riverside Software*

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# Introduction to Git

PUG Challenge America 2019

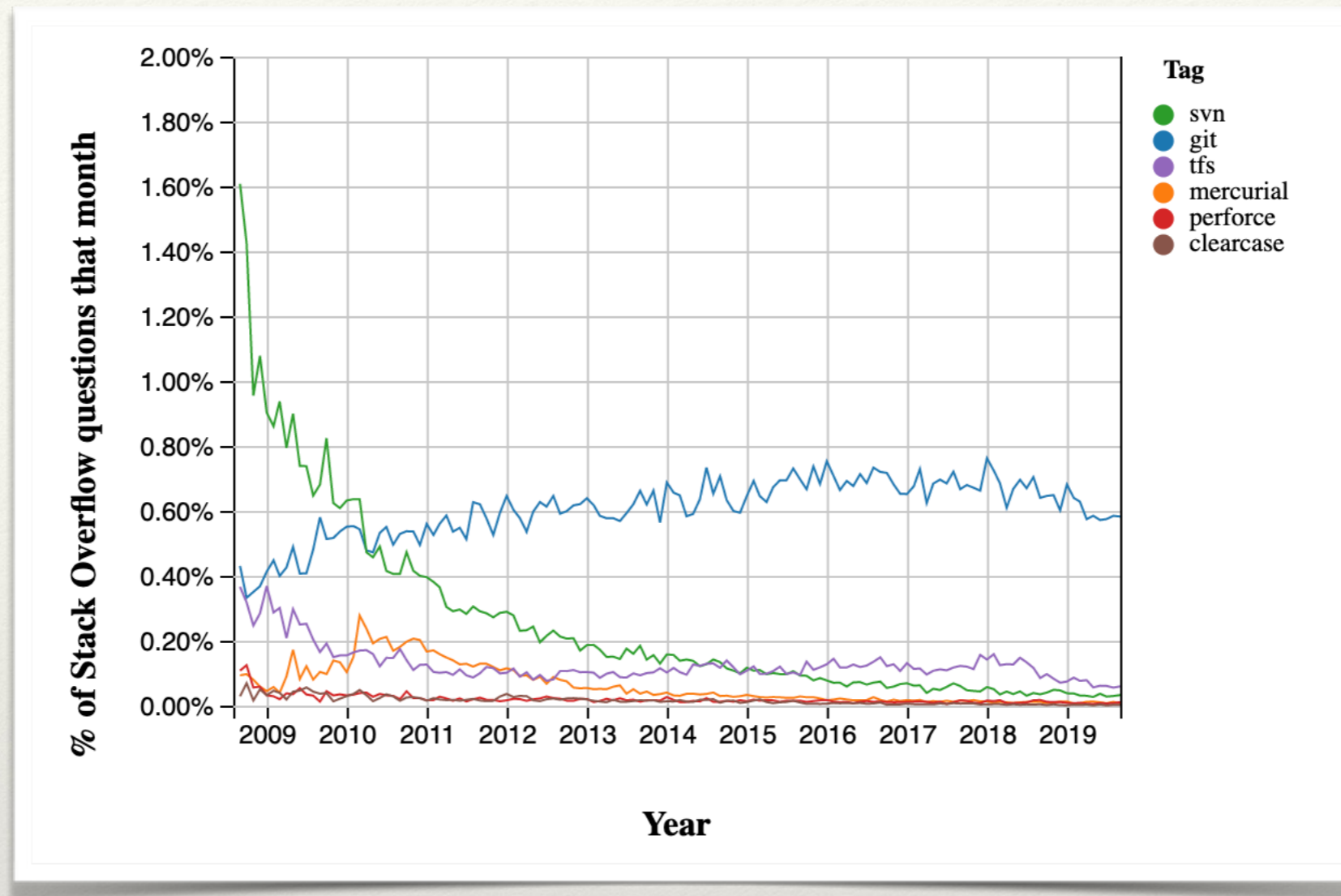
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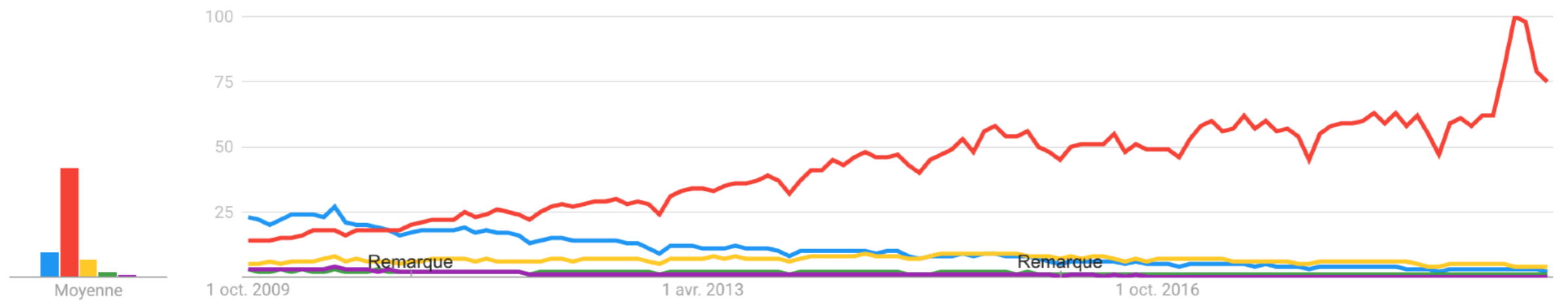
Source code  
management, circa 1930

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From 2009 to 2019

StackOverflow trends



From 2009 to 2019

Google trends

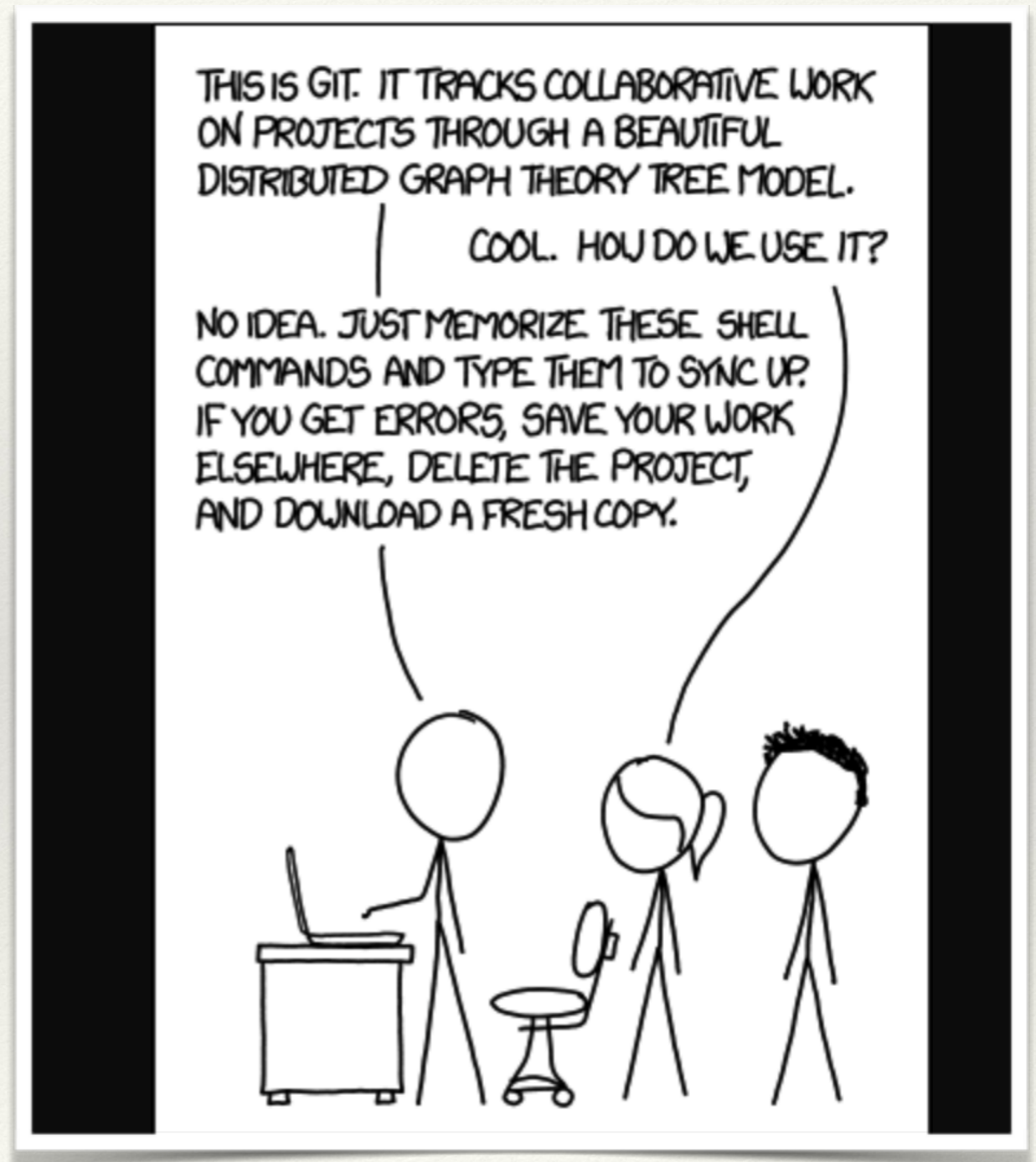
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# From Bitkeeper To Git

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# StackOverflow



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# Things to remember

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- ❖ Commit is a snapshot of all the files
- ❖ A commit only has parent(s) ; it doesn't know about children
- ❖ Git commands are manipulating a tree

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Questions ?

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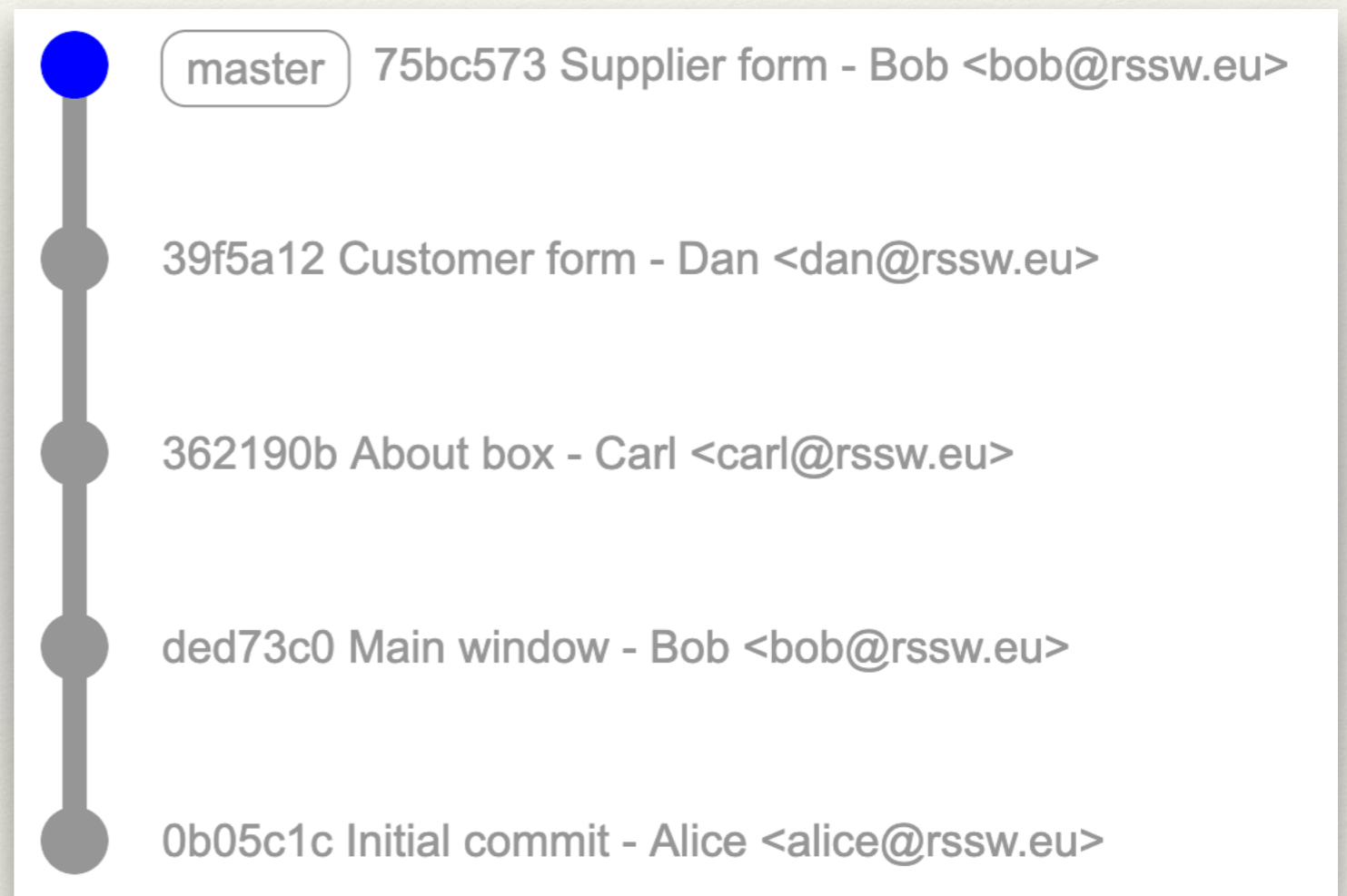
Thank you for coming !





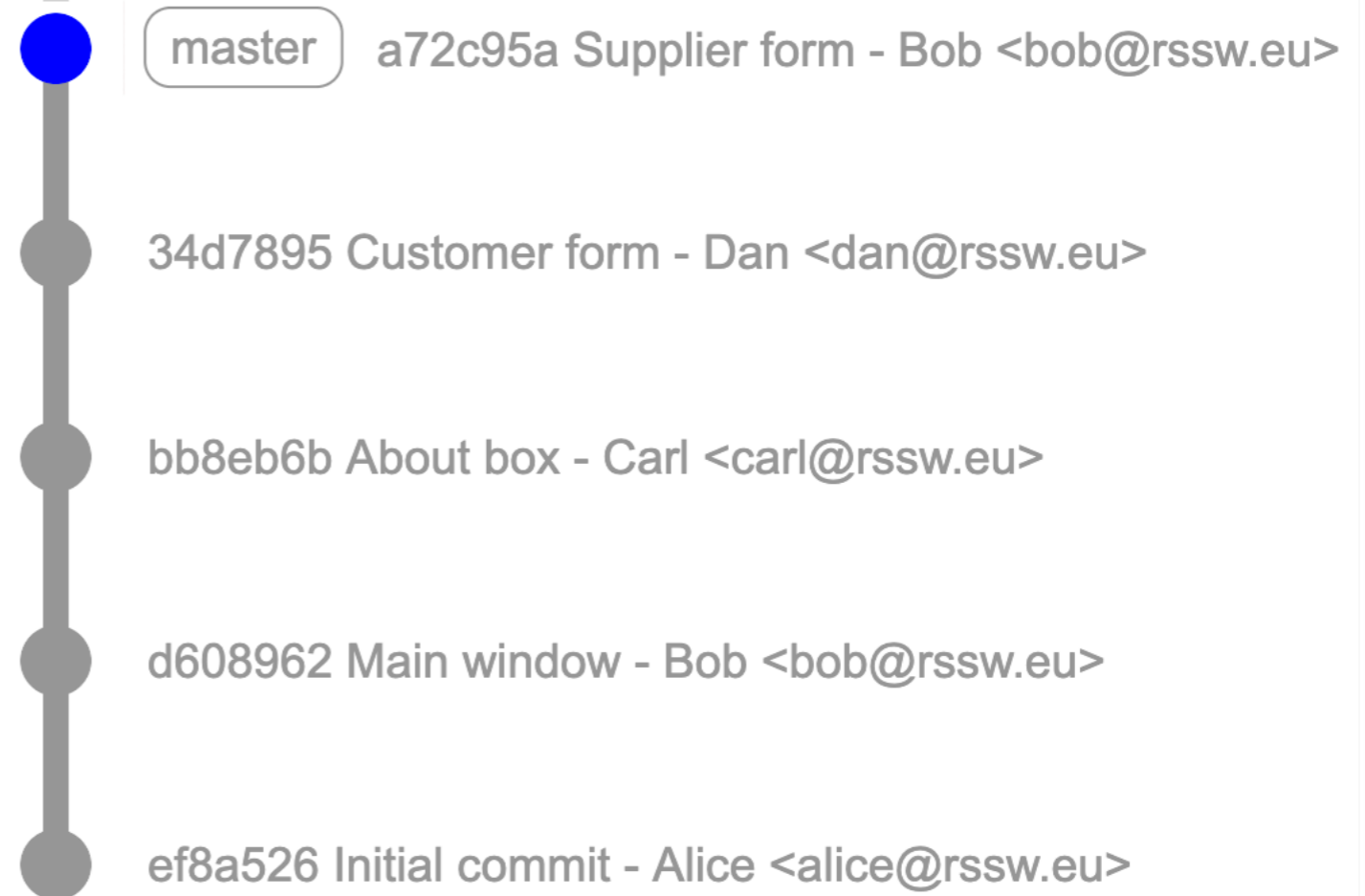
# Initial History

- ❖ Each commit is a snapshot of all the files
- ❖ Each commit has an ID and author
- ❖ Each commit has exactly one parent



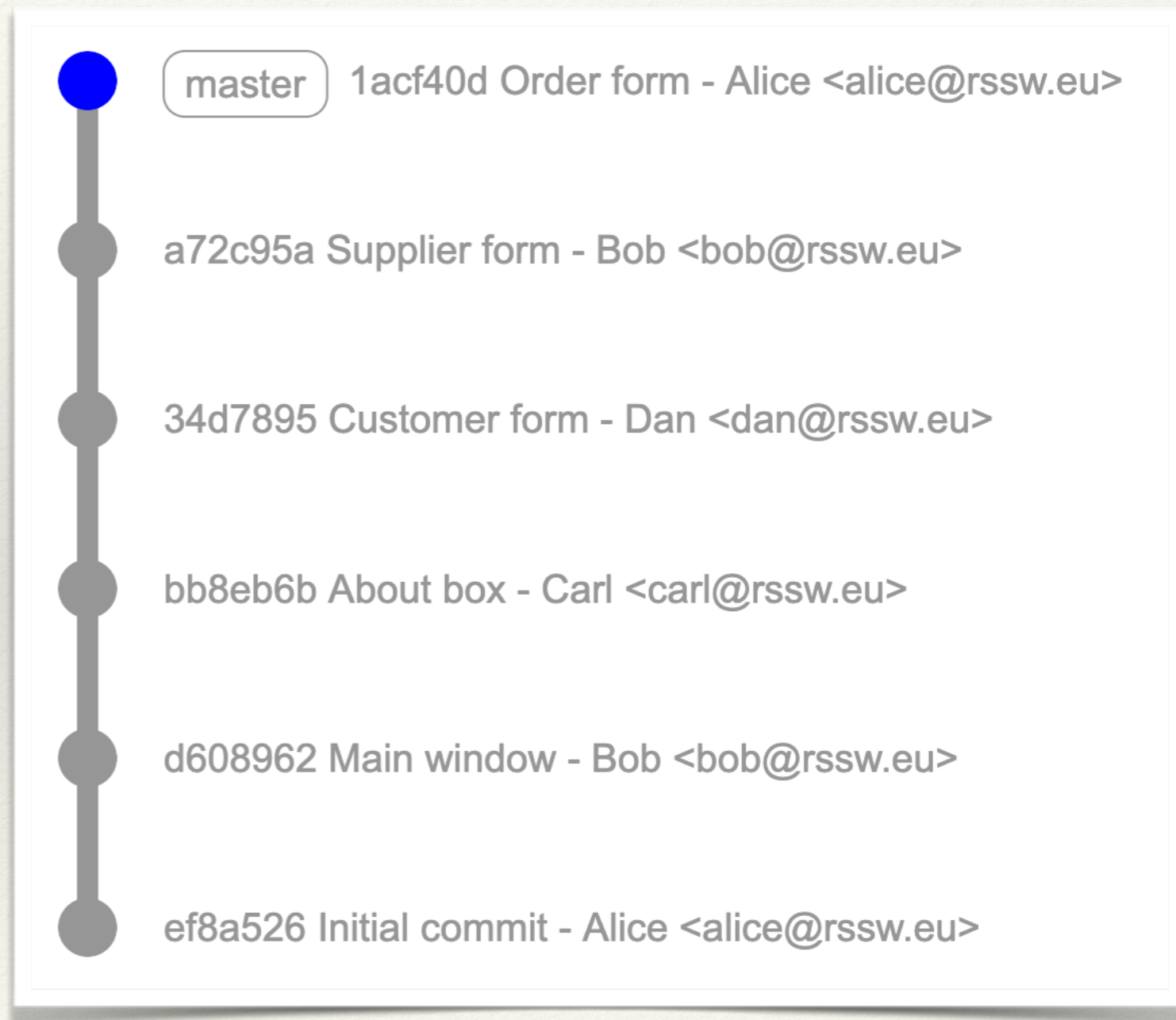
# Branching

- ❖ Branch is just a tag...



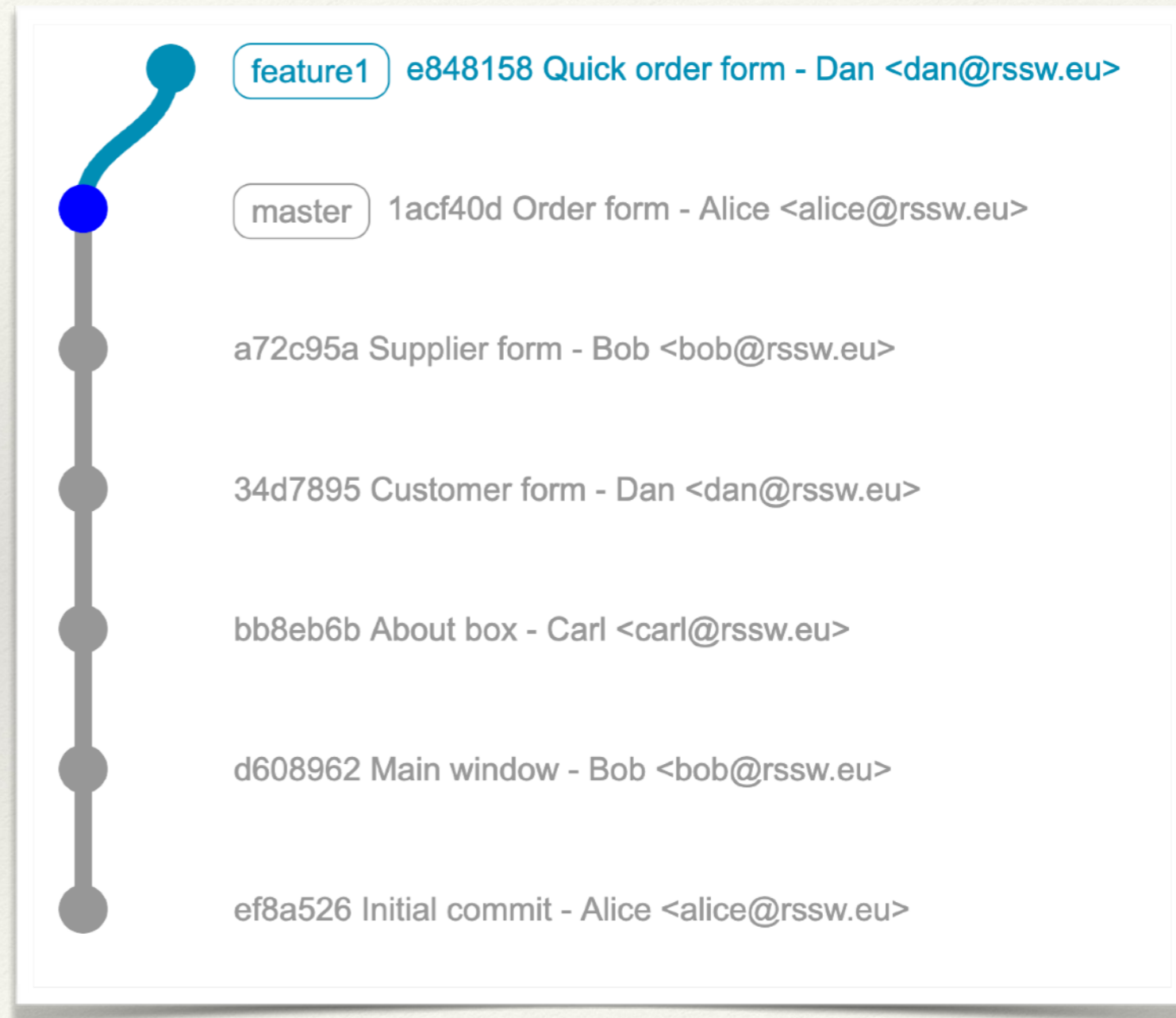
# Branching

- ❖ Branch is just a tag...
- ❖ ... which moves when you 'git commit'



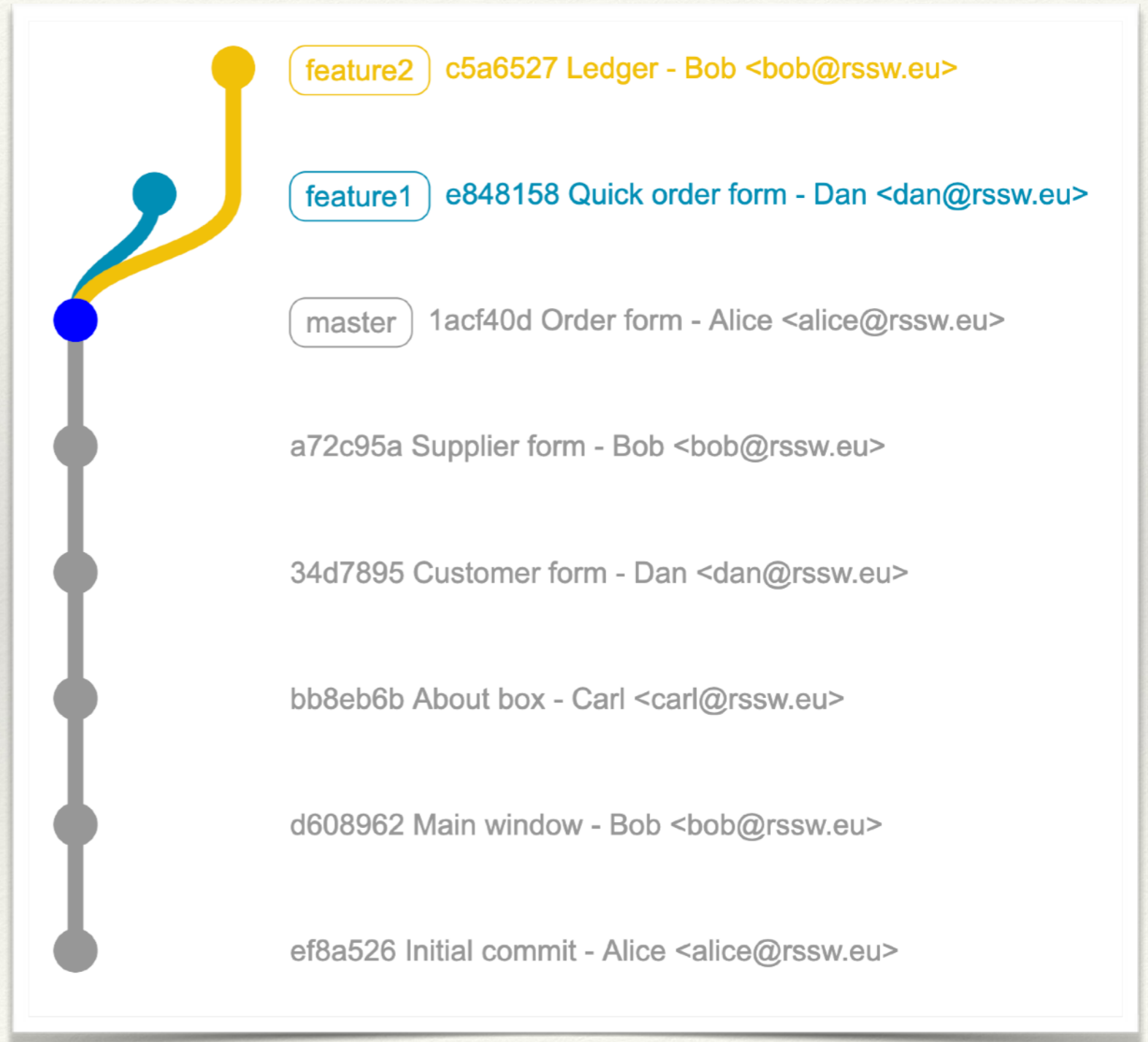
# Branching

- ❖ Creating a new branch is extremely cheap



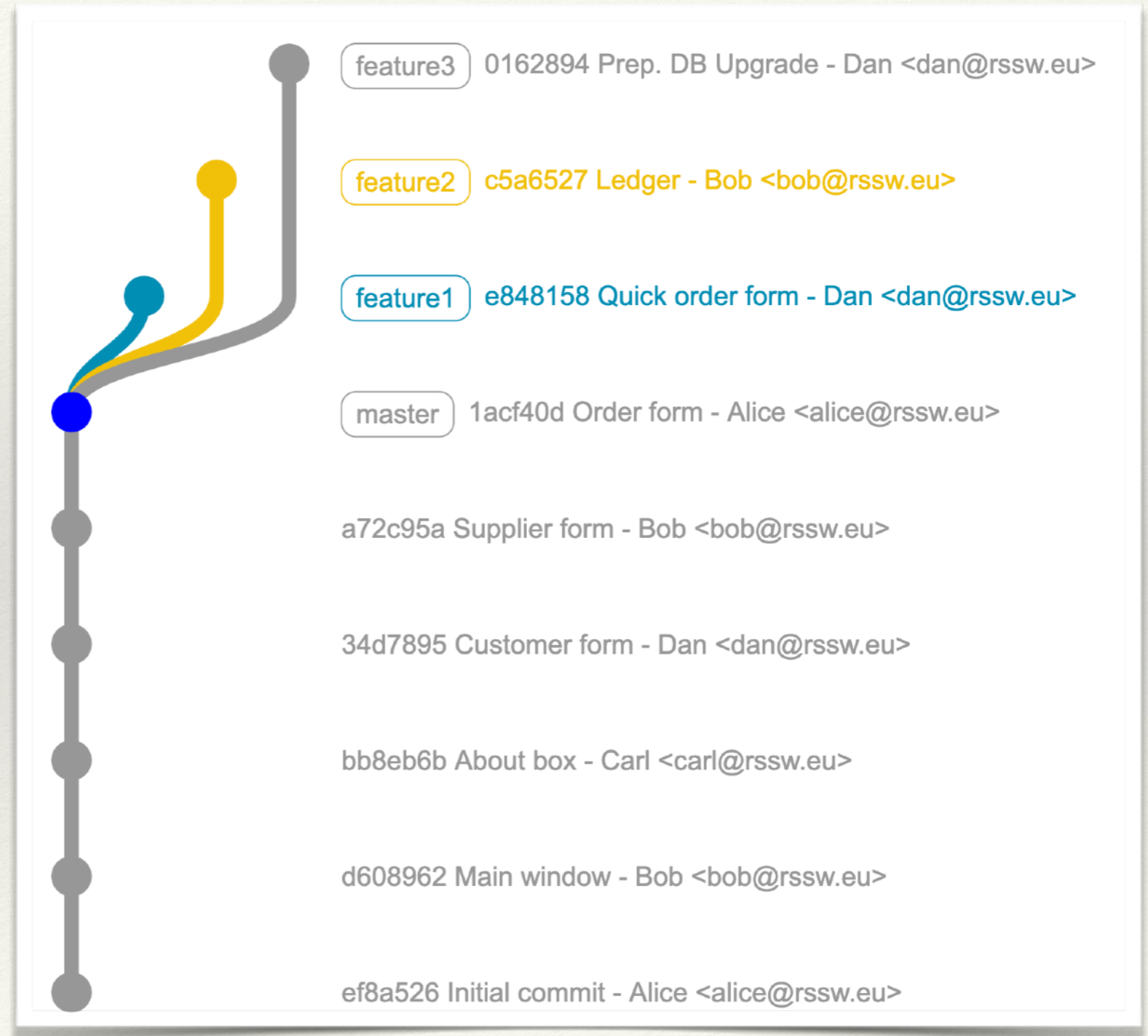
# Branching

- ❖ And new features should always be added on a separate branch



# Branching

❖ ALWAYS



# HEAD tag

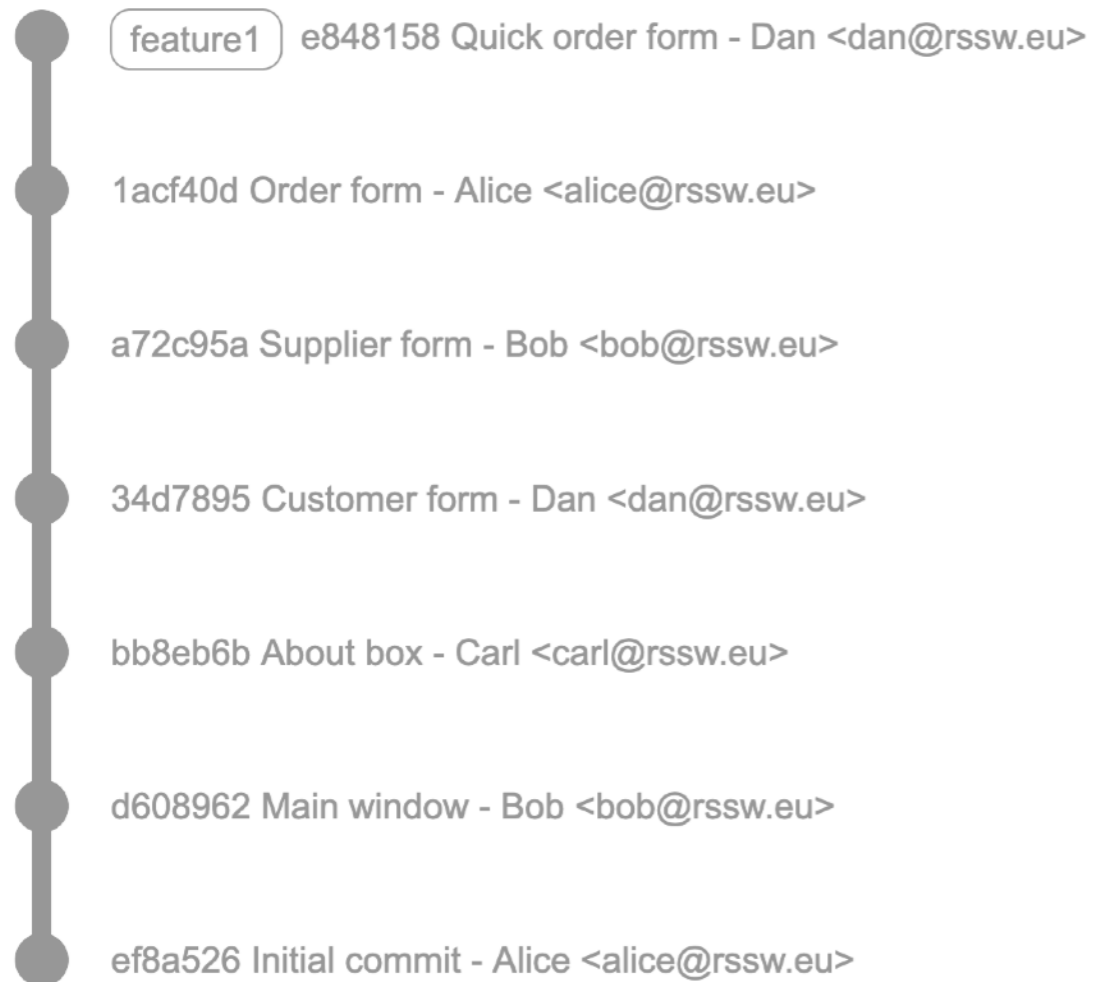
```
* dd8957cf - (2 weeks ago) Next dev cycle - Gilles QUERRET (HEAD → master, origin/master, origin/HEAD)
* 371bf899 - (2 weeks ago) Version 213 - Gilles QUERRET (tag: V213)
* aaeb518e - (2 weeks ago) Build with 12.1 - Gilles QUERRET
* 56e5c9dc - (6 weeks ago) Add Option node to PCTBinaryDump / PCTBinaryLoad (#378) - Gilles QUERRET
* 7ff870ce - (6 weeks ago) Set RCodeInfo buffer size from a Java property (#377) - Gilles QUERRET
* a4c35c89 - (6 weeks ago) Handle white spaces in Profiler:outputFile property (#376) - Gilles QUERRET
* c814cba6 - (6 weeks ago) Fix PCTDynamicRun issues (#375) - Gilles QUERRET
* da1eb340 - (7 weeks ago) BackgroundWorker thread fix - Bill Wang
* 0055bfb0 - (4 months ago) Test case - Gilles QUERRET (origin/bugfix/PCT-366)
* 30770550 - (4 months ago) Test with Corretto 11 and Ant 1.10 - Gilles QUERRET (origin/Ant110Corretto11)
* f459acc0 - (8 weeks ago) Support for OpenEdge 12.1 - Gilles QUERRET
```

# HEAD tag

```
* dd8957cf - (2 weeks ago) Next dev cycle - Gilles QUERRET (origin/master, origin/HEAD, master)
* 371bf899 - (2 weeks ago) Version 213 - Gilles QUERRET (tag: V213)
* aaeb518e - (2 weeks ago) Build with 12.1 - Gilles QUERRET
* 56e5c9dc - (6 weeks ago) Add Option node to PCTBinaryDump / PCTBinaryLoad (#378) - Gilles QUERRET
* 7ff870ce - (6 weeks ago) Set RCodeInfo buffer size from a Java property (#377) - Gilles QUERRET
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* f459acc0 - (8 weeks ago) Support for OpenEdge 12.1 - Gilles QUERRET
```

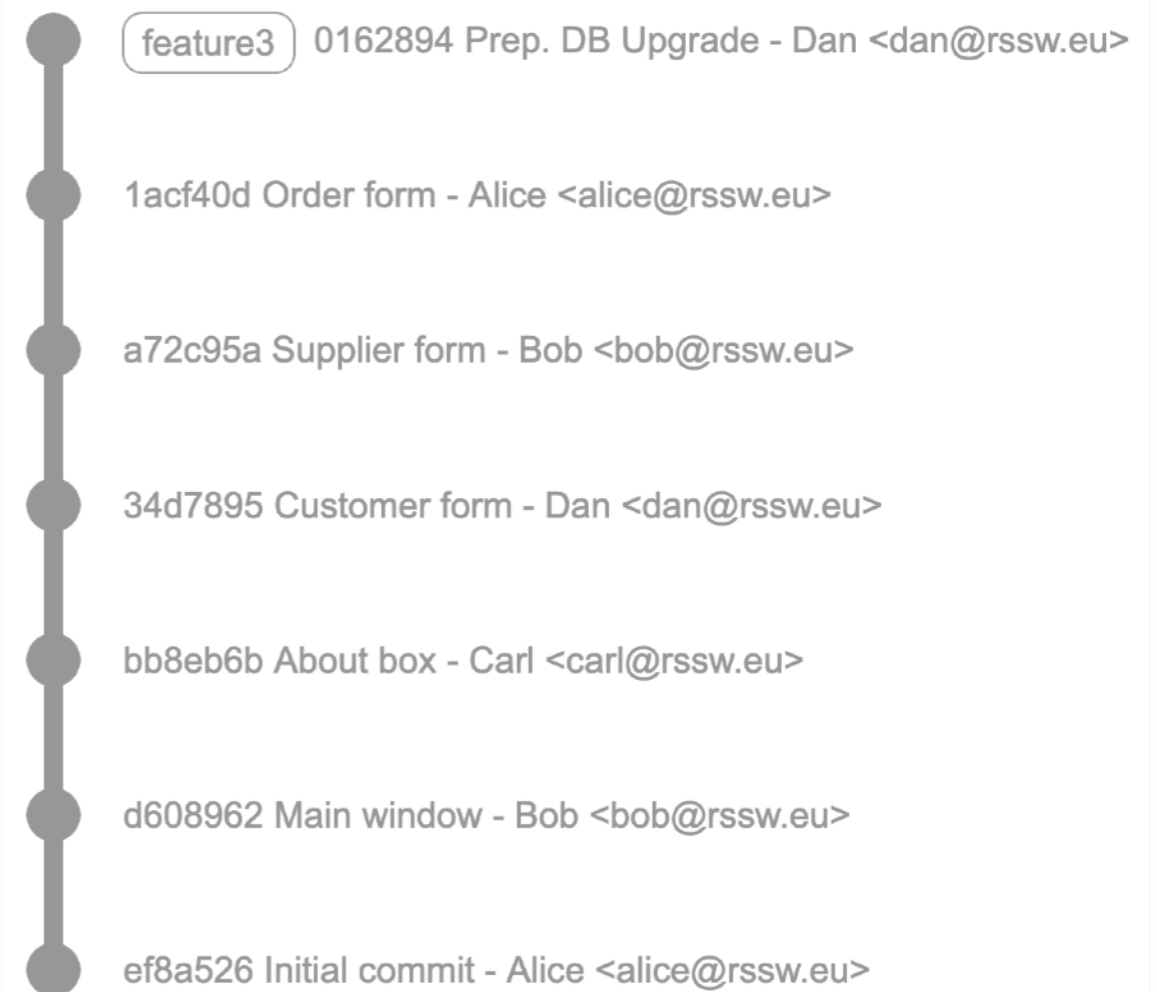


# Merging Step 1 - Common Ancestor



A vertical line of seven black circles on the left side of the box, connected by a vertical line, representing a sequence of commits. The top circle is highlighted with a rounded rectangle.

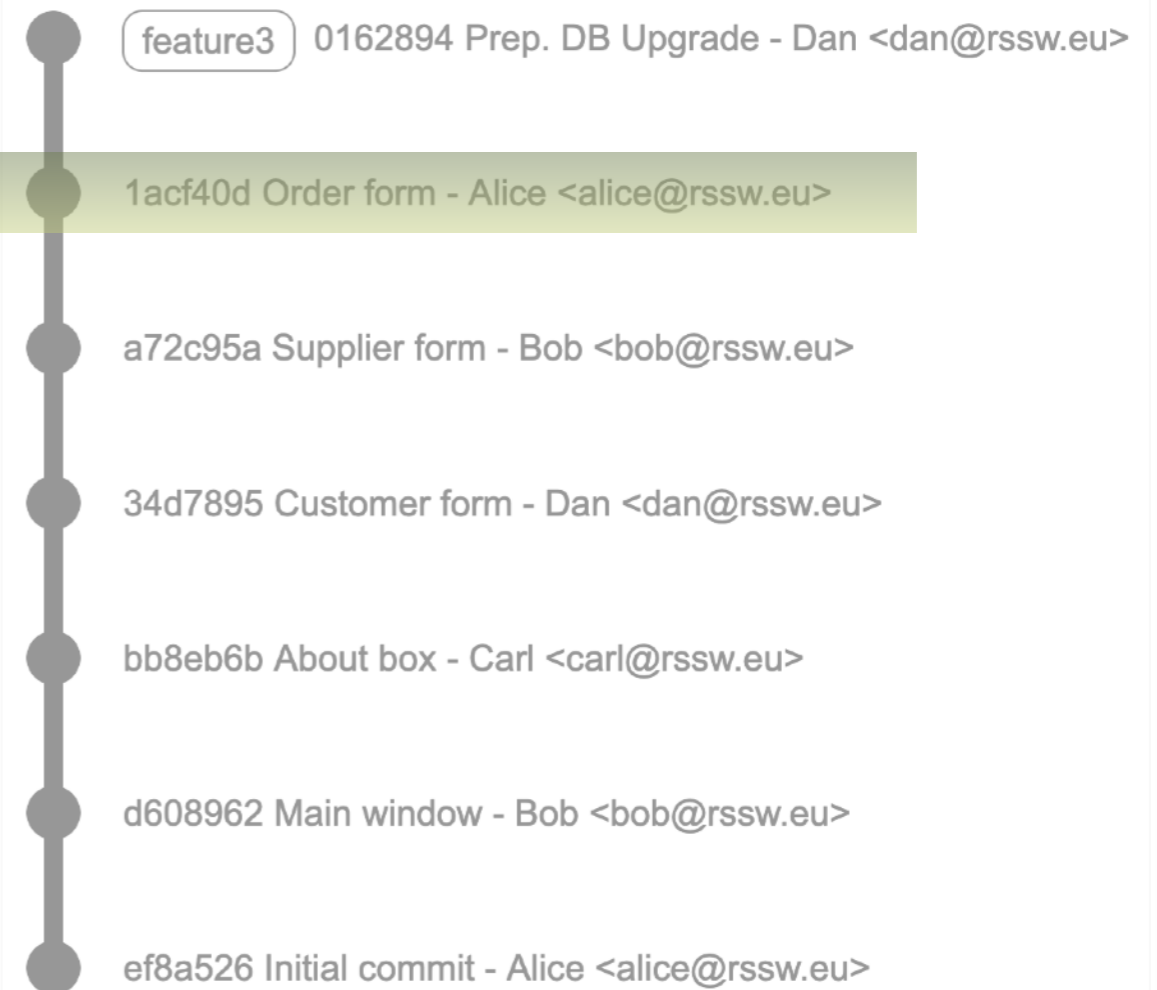
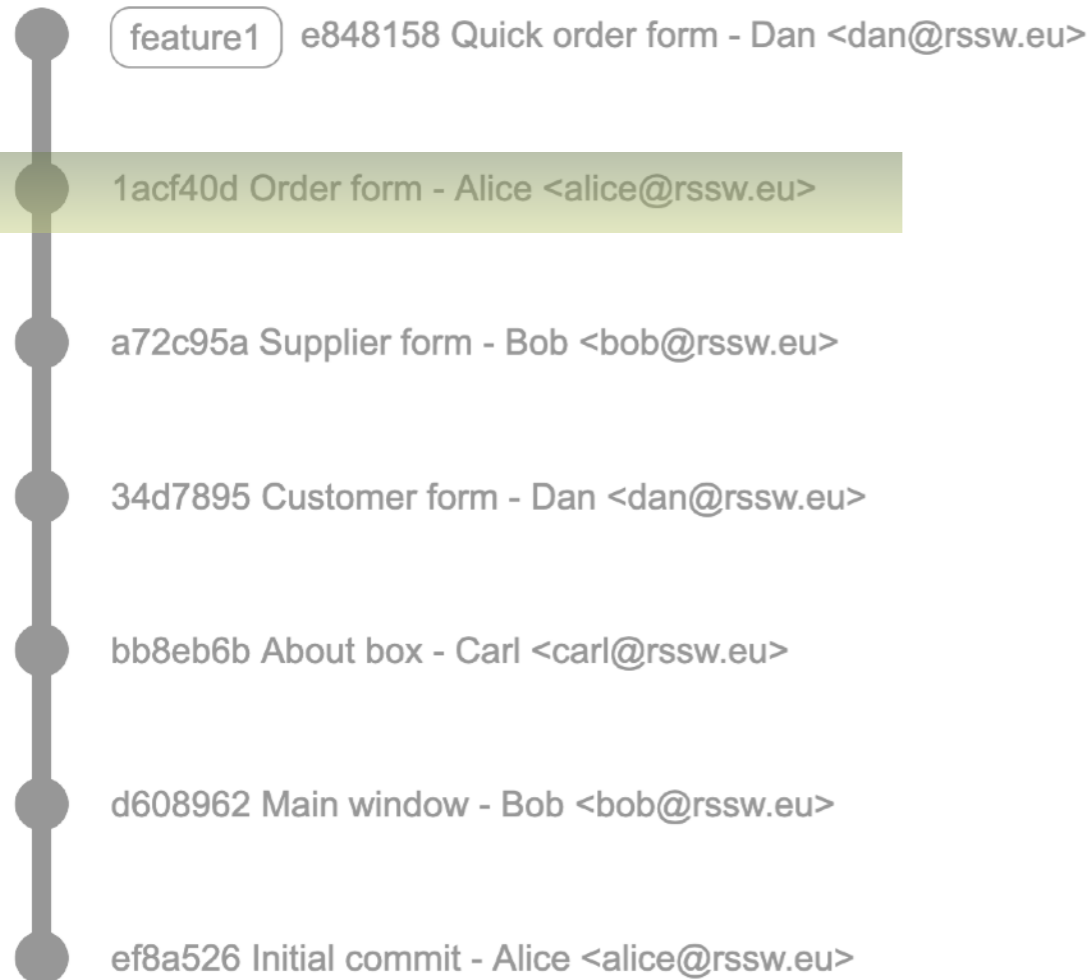
- feature1 e848158 Quick order form - Dan <dan@rsw.eu>
- 1acf40d Order form - Alice <alice@rsw.eu>
- a72c95a Supplier form - Bob <bob@rsw.eu>
- 34d7895 Customer form - Dan <dan@rsw.eu>
- bb8eb6b About box - Carl <carl@rsw.eu>
- d608962 Main window - Bob <bob@rsw.eu>
- ef8a526 Initial commit - Alice <alice@rsw.eu>



A vertical line of seven black circles on the left side of the box, connected by a vertical line, representing a sequence of commits. The top circle is highlighted with a rounded rectangle.

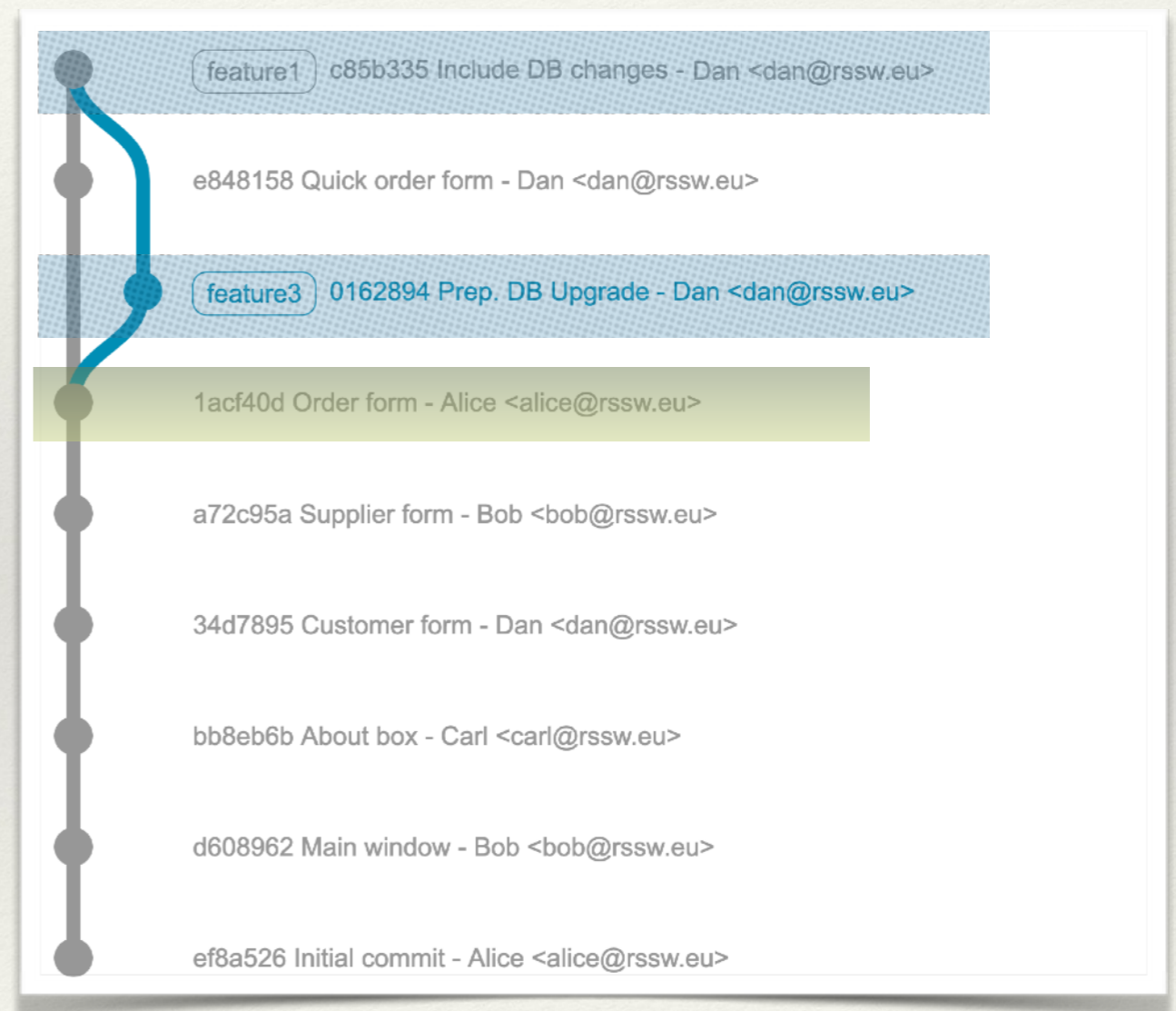
- feature3 0162894 Prep. DB Upgrade - Dan <dan@rsw.eu>
- 1acf40d Order form - Alice <alice@rsw.eu>
- a72c95a Supplier form - Bob <bob@rsw.eu>
- 34d7895 Customer form - Dan <dan@rsw.eu>
- bb8eb6b About box - Carl <carl@rsw.eu>
- d608962 Main window - Bob <bob@rsw.eu>
- ef8a526 Initial commit - Alice <alice@rsw.eu>

# Merging Step 1 - Common Ancestor



# Merging Step 2 - New Commit

- ❖ 1 new merge commit, with two parents
- ❖ No impact on 0162894
- ❖ This commit doesn't know it has been merged



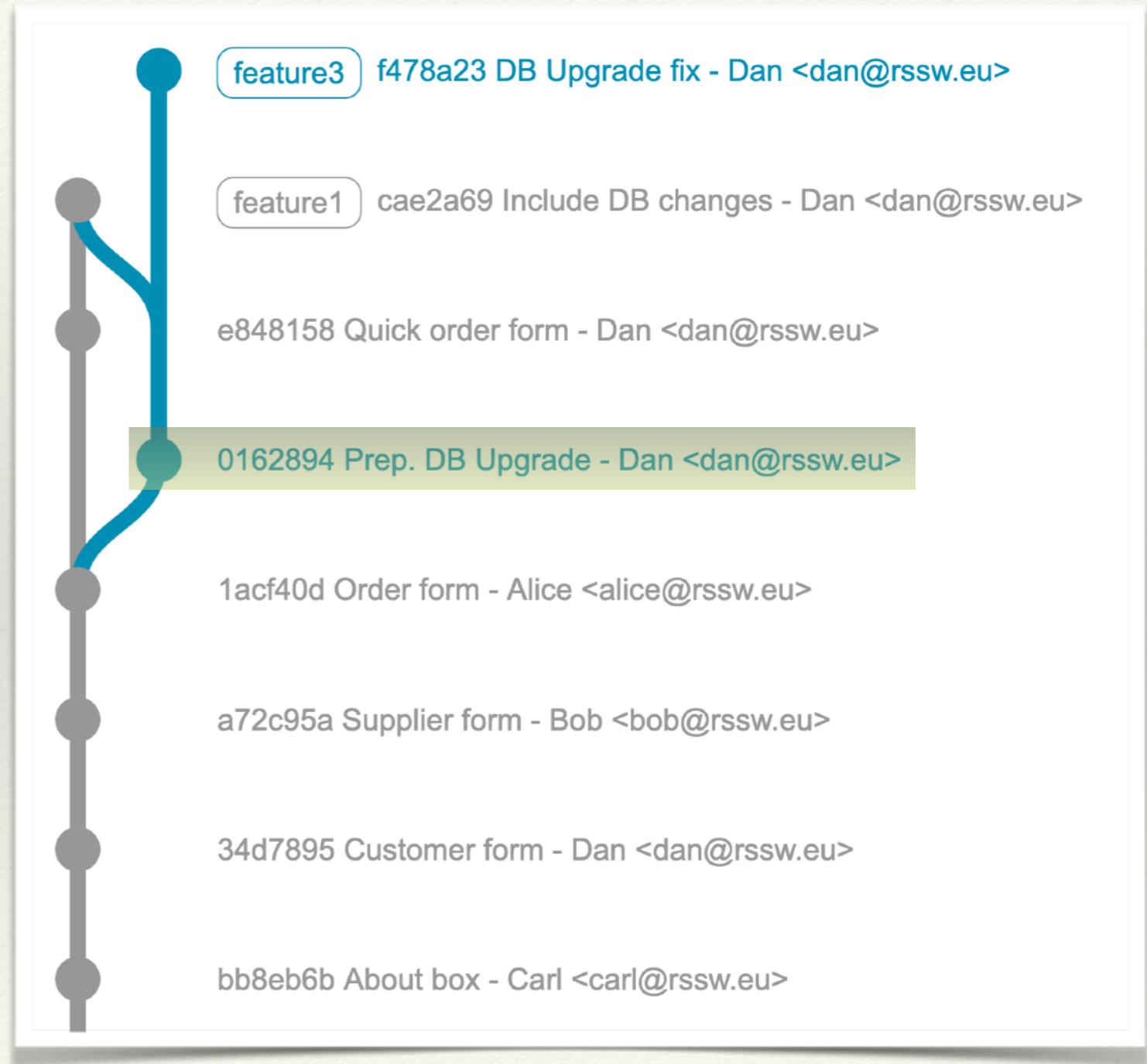
# Merging - Cont'd

- ❖ New commit on feature3



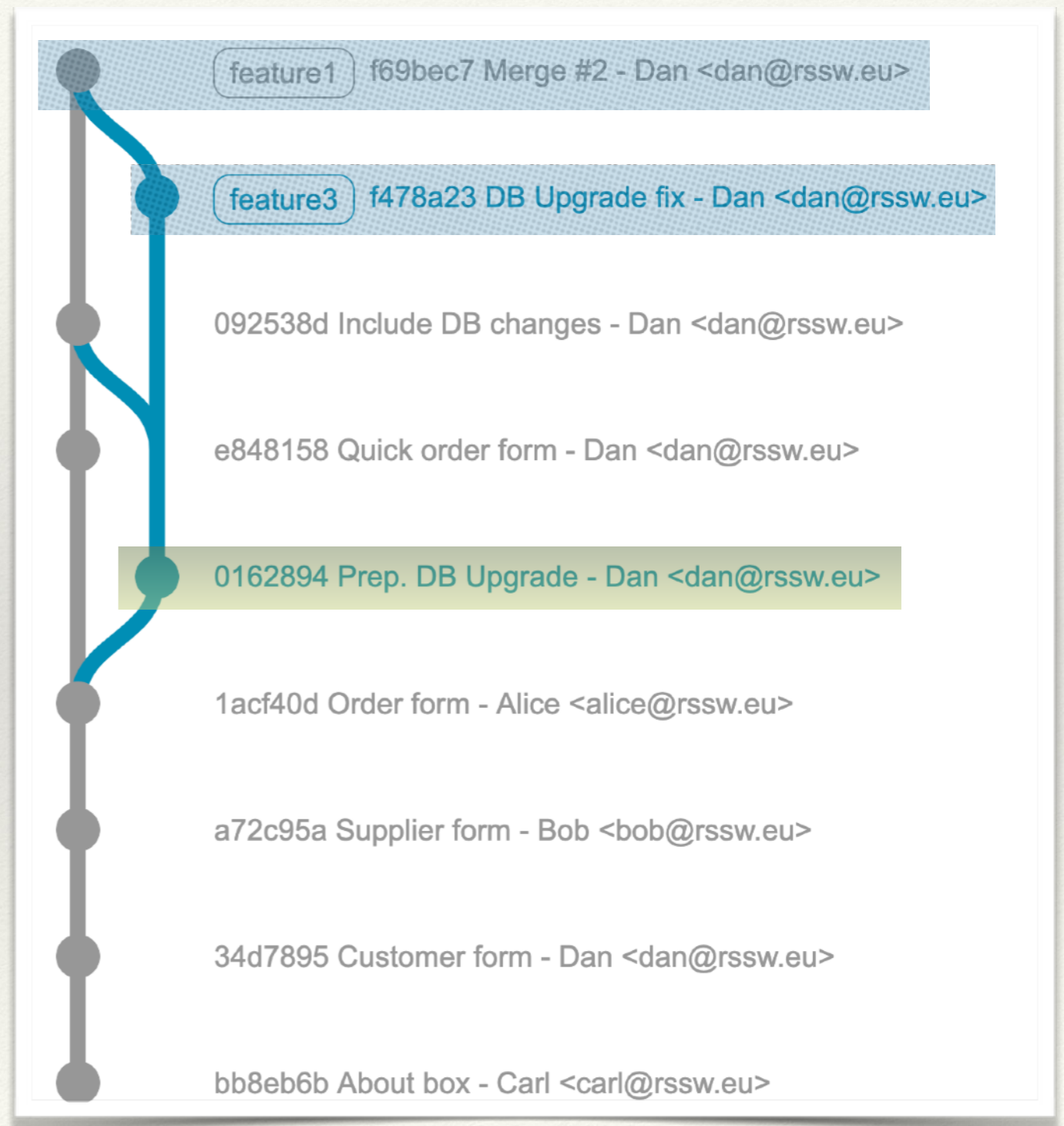
# Merging - Cont'd

- ❖ Look for common ancestor



# Merging - Cont'd

- ❖ Look for common ancestor



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# Distributed Repositories

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- ❖ Each developer has an entire copy of the repository
  - ❖ Or even more than one
- ❖ All commits are done locally
  - ❖ Not visible to anybody else
- ❖ Repositories have to be synchronized
  - ❖ Tree reconciliation

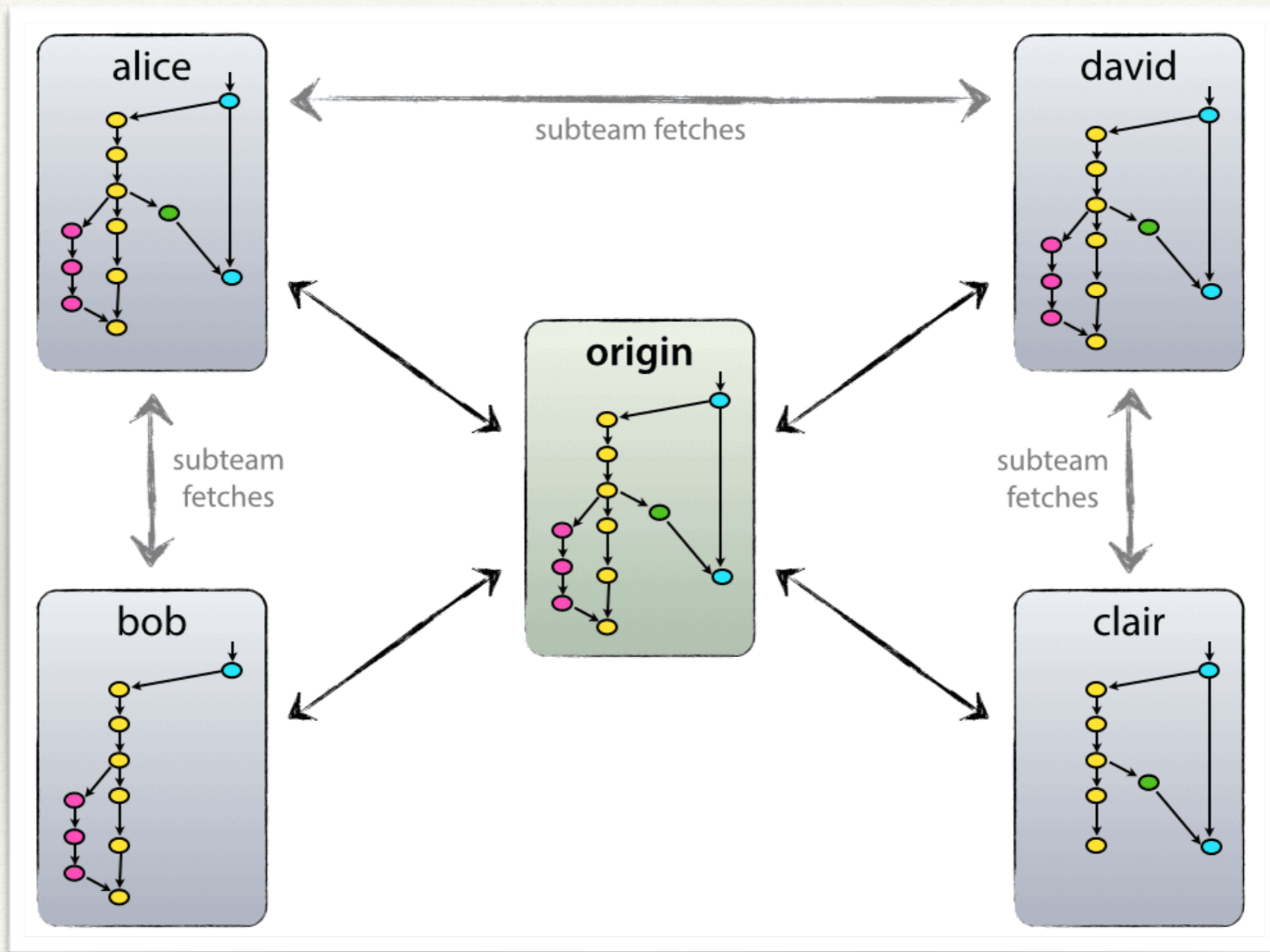
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# Distributed Repositories

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- ❖ By convention, the "central" repository is called "origin"
- ❖ Push to origin means making your local commits public
- ❖ Fetch from origin means retrieving locally the remote commits

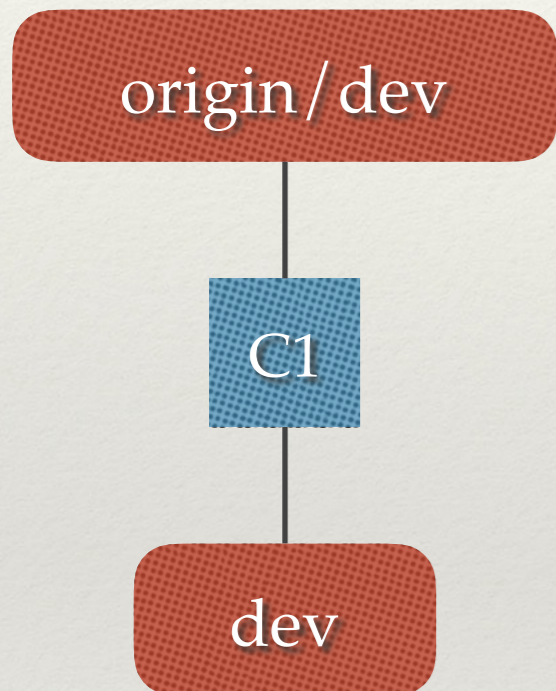




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# Commit & Fetch & Merge

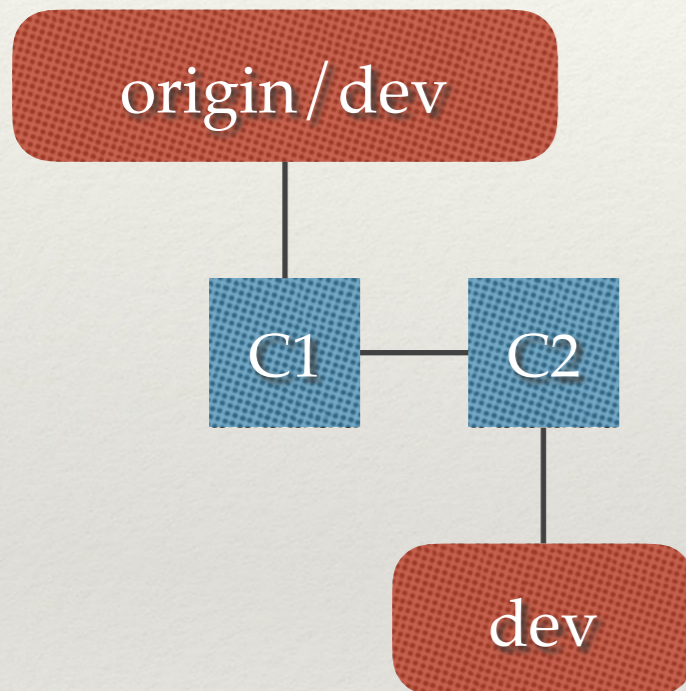
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# Commit & Fetch & Merge

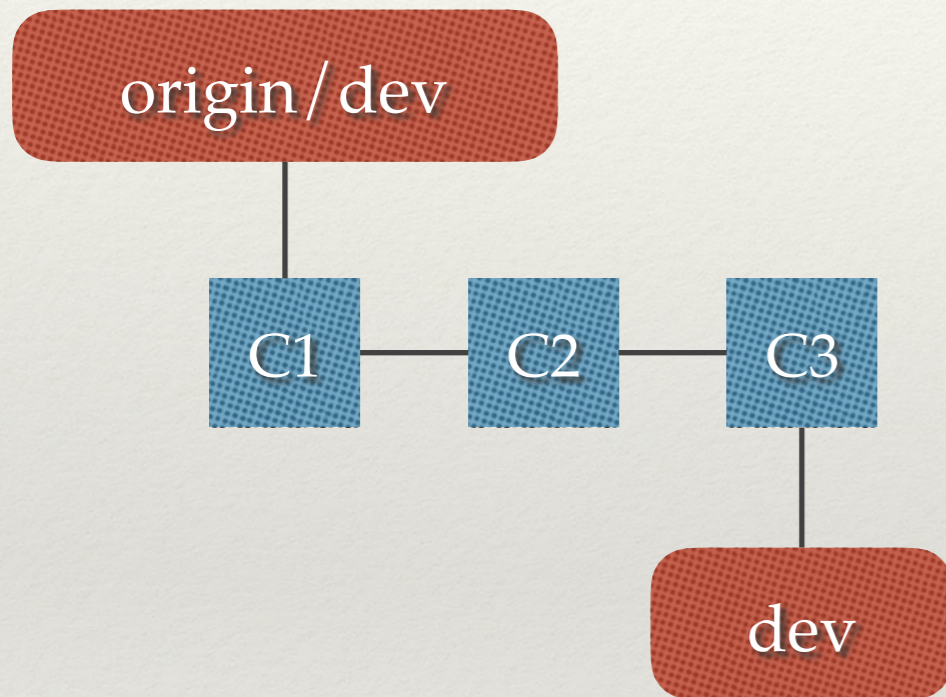
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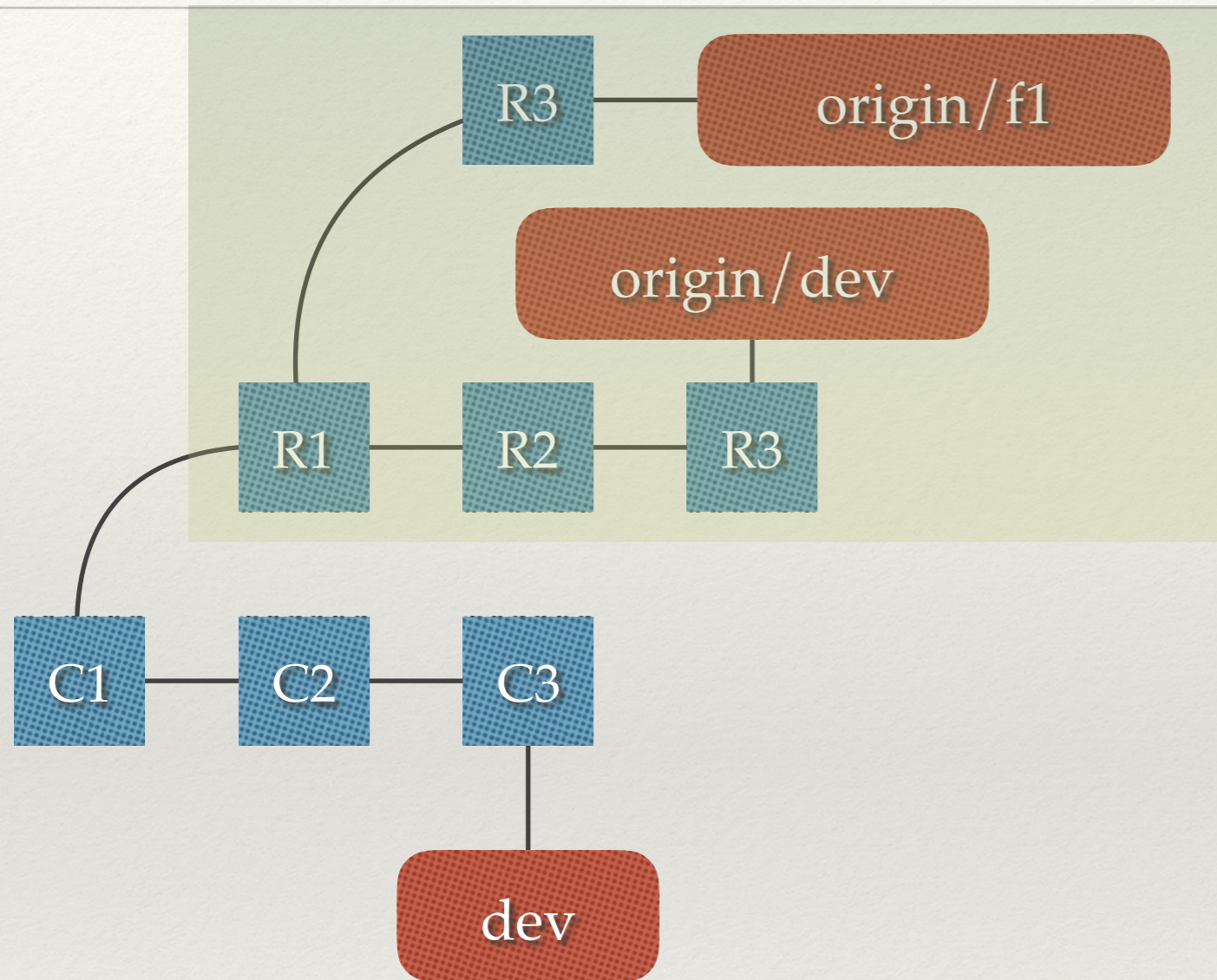
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# Commit & Fetch & Merge

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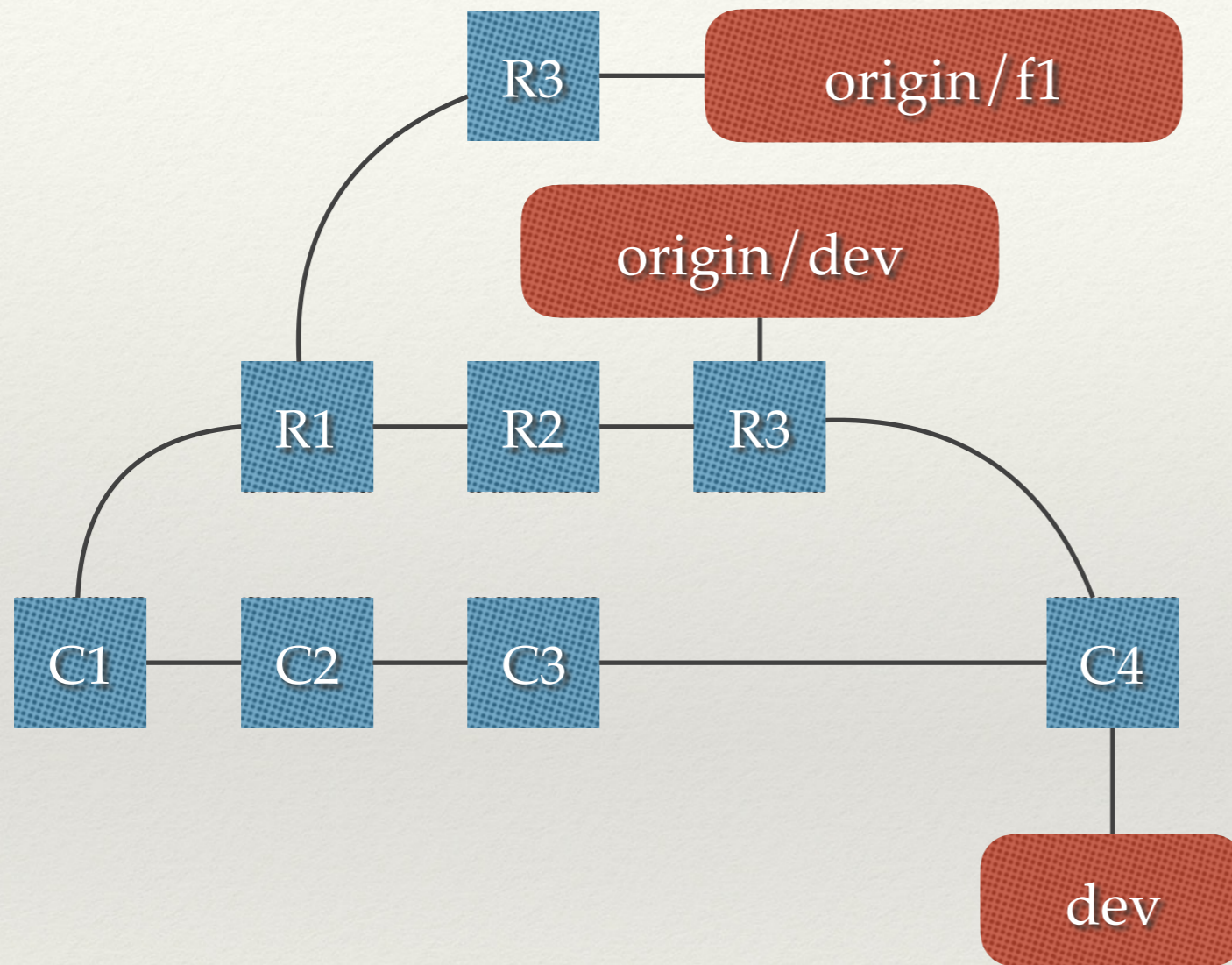


# Commit & Fetch & Merge

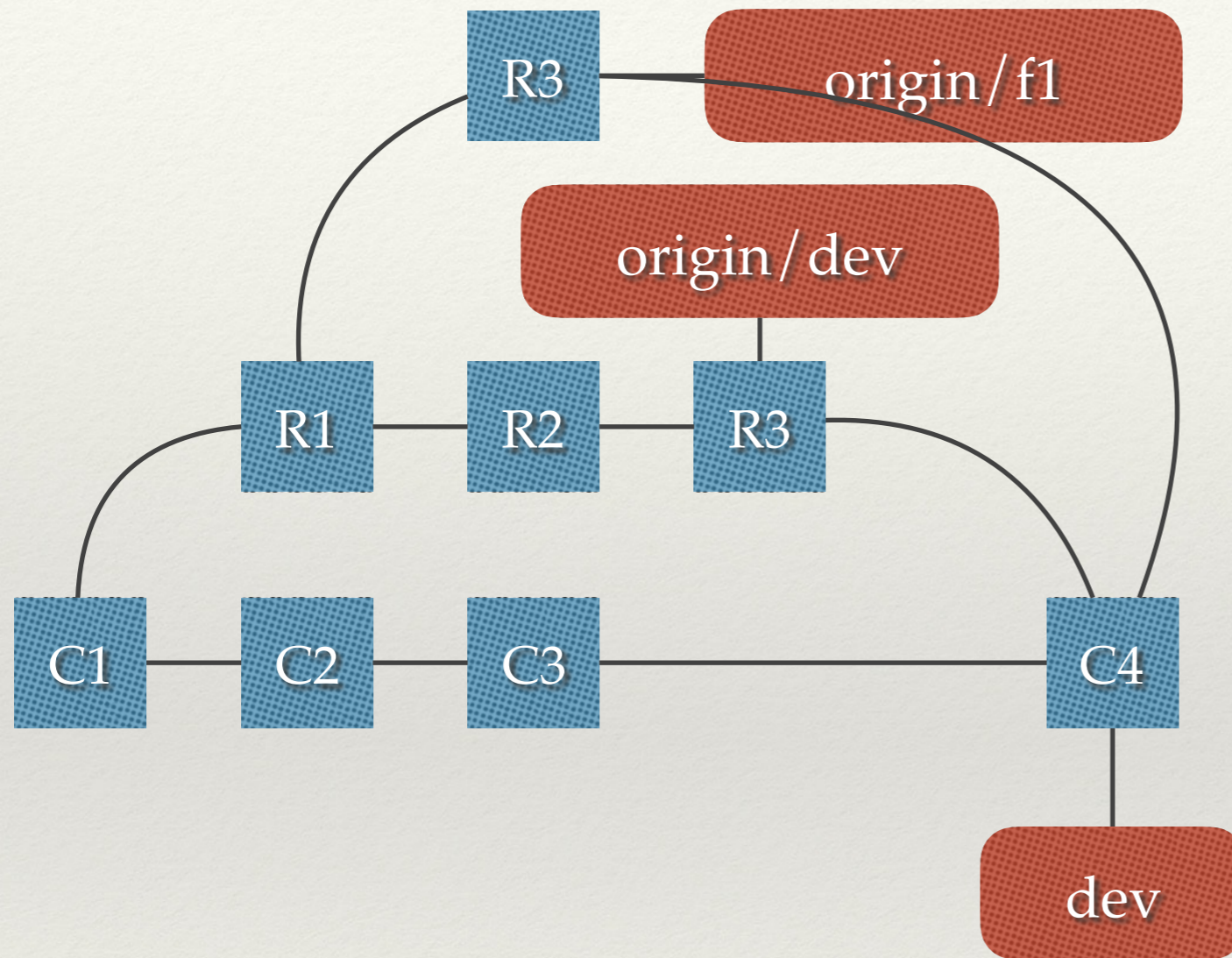


git fetch origin

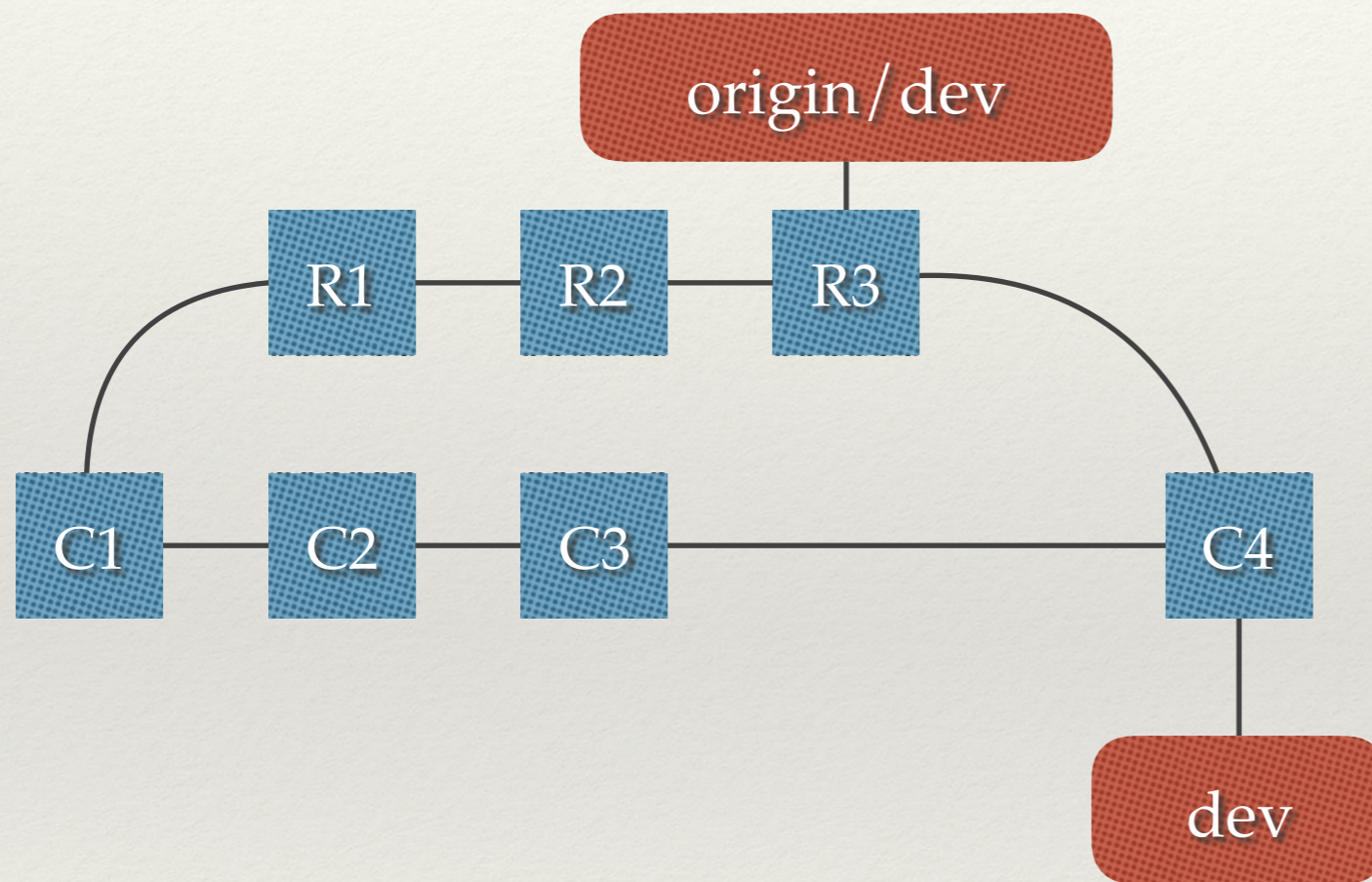
# Commit & Fetch & Merge



# Commit & Fetch & Merge

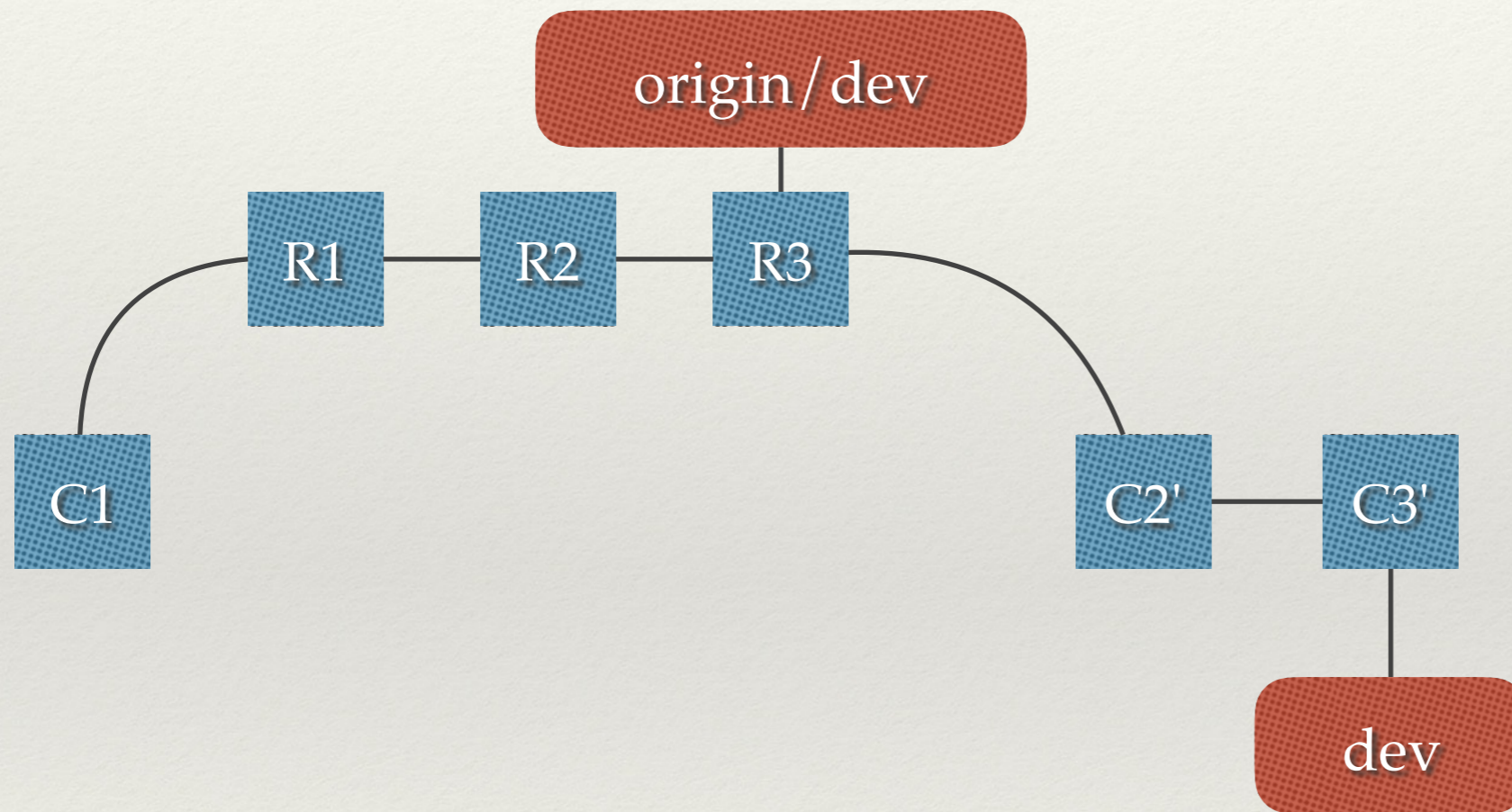


# Fetch & Rebase

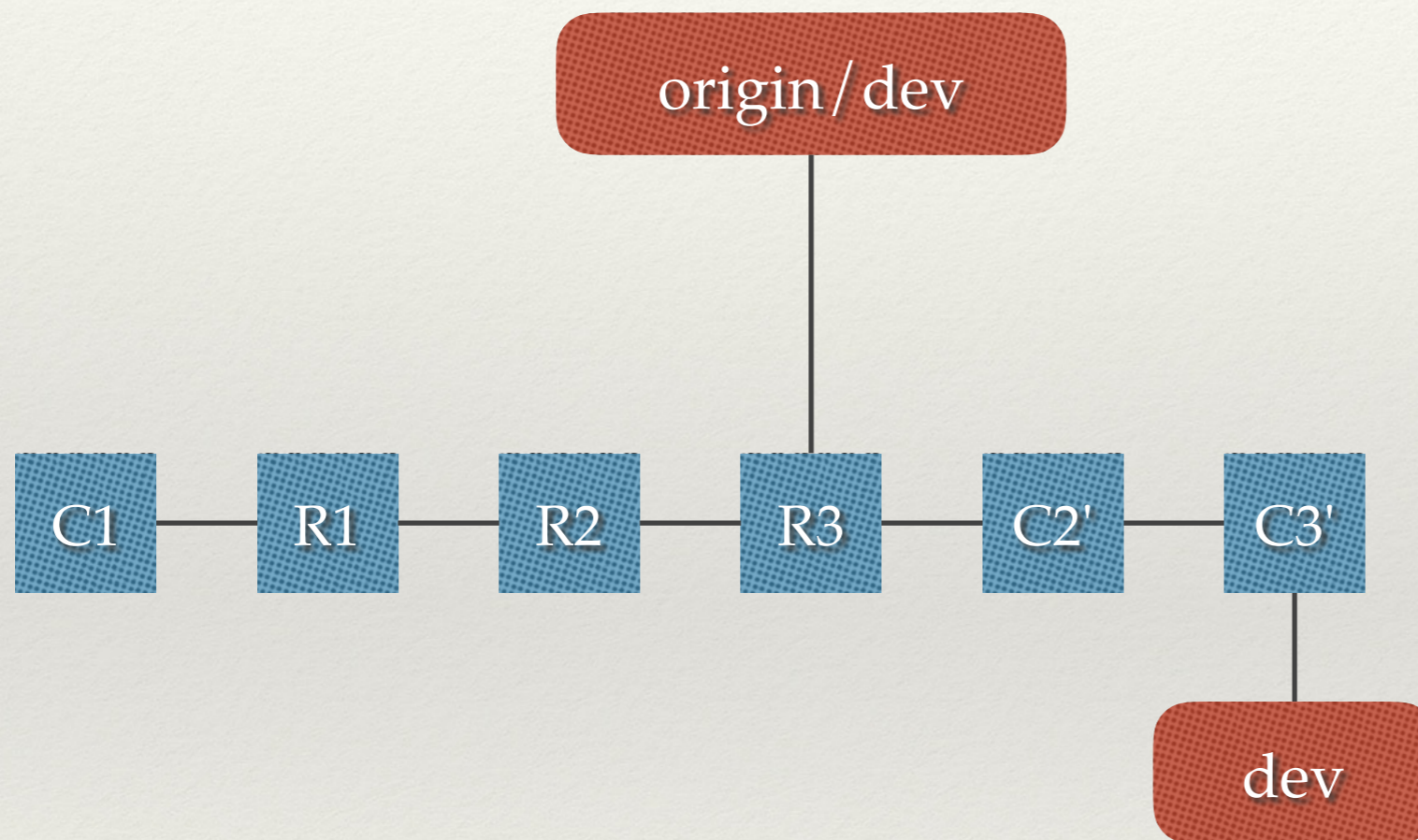




# Fetch & Rebase



# Fetch & Rebase

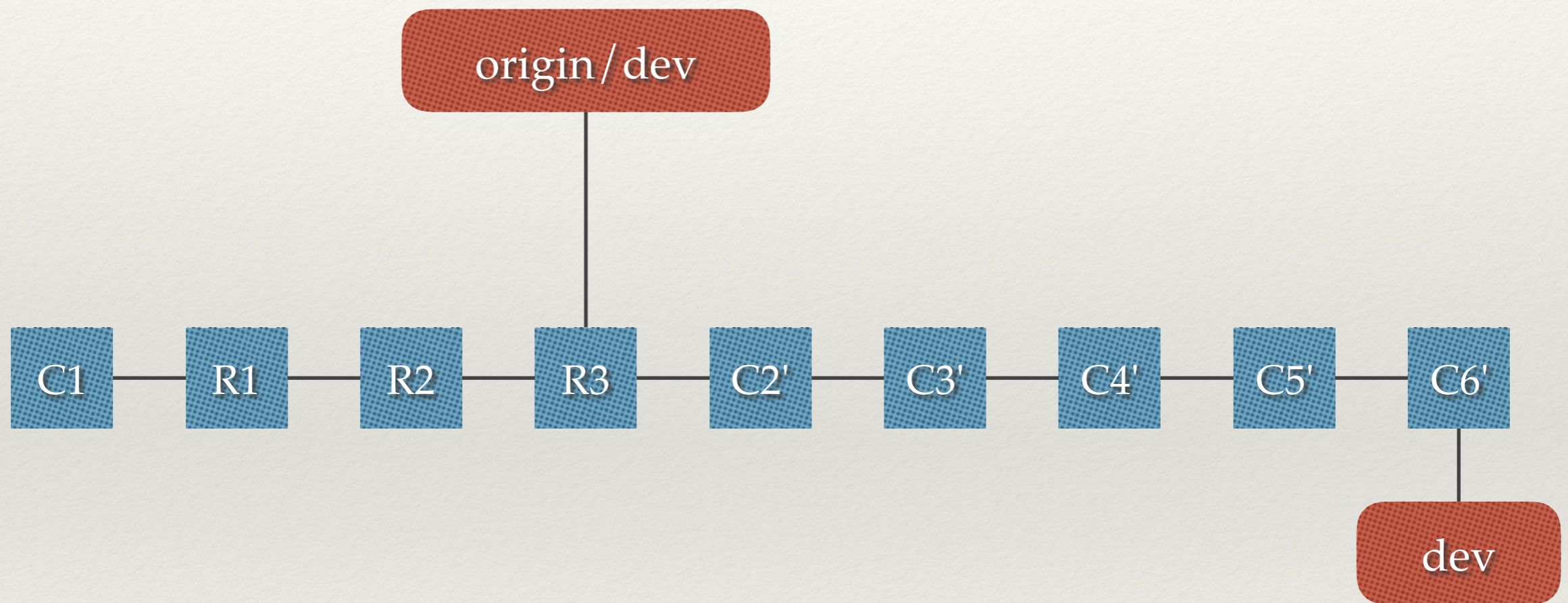


# Squash

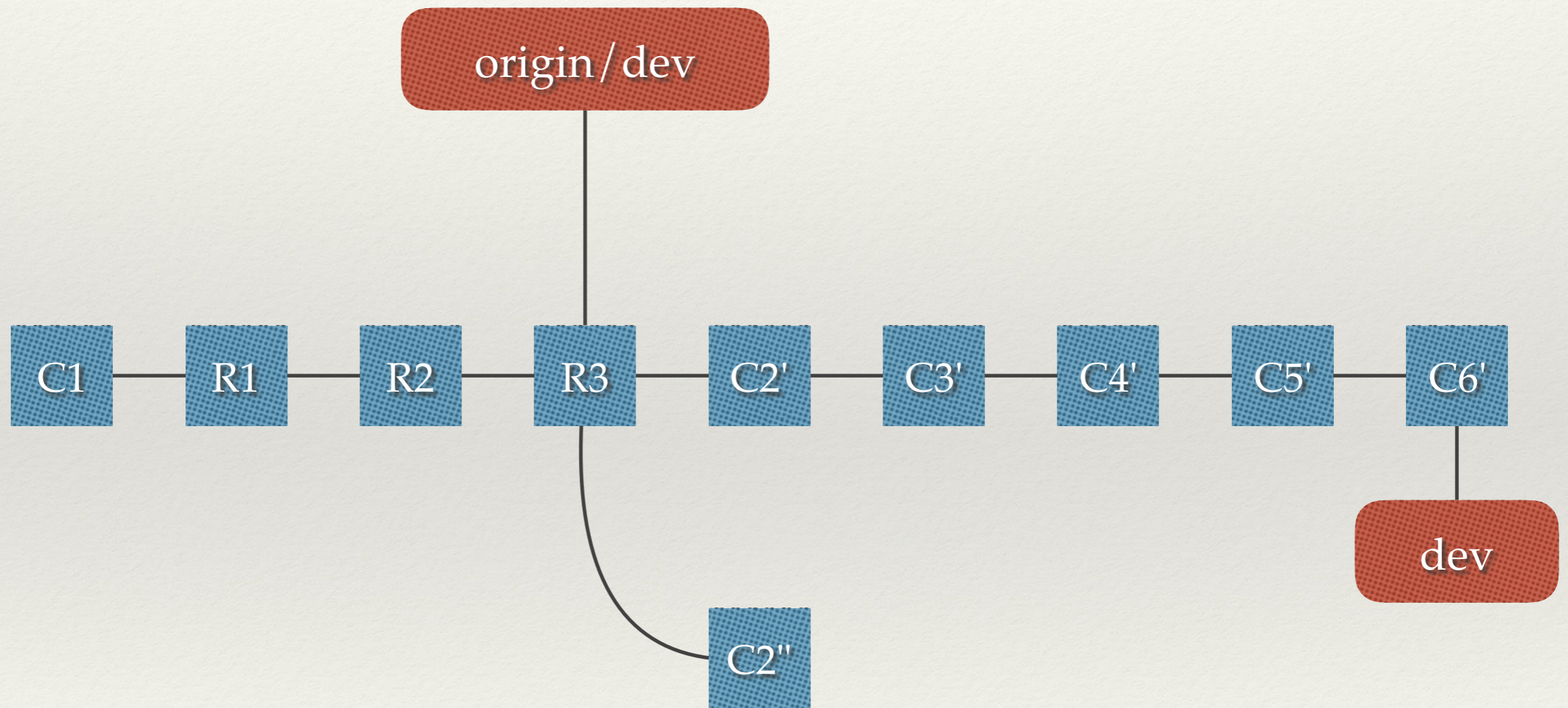
	COMMENT	DATE
○	CREATED MAIN LOOP & TIMING CONTROL	14 HOURS AGO
○	ENABLED CONFIG FILE PARSING	9 HOURS AGO
○	MISC BUGFIXES	5 HOURS AGO
○	CODE ADDITIONS/EDITS	4 HOURS AGO
○	MORE CODE	4 HOURS AGO
○	HERE HAVE CODE	4 HOURS AGO
○	AAAAAAAAAA	3 HOURS AGO
○	ADKFJSLKDFJSDKLFJ	3 HOURS AGO
○	MY HANDS ARE TYPING WORDS	2 HOURS AGO
○	HAAAAAAAAAANDS	2 HOURS AGO

AS A PROJECT DRAGS ON, MY GIT COMMIT MESSAGES GET LESS AND LESS INFORMATIVE.

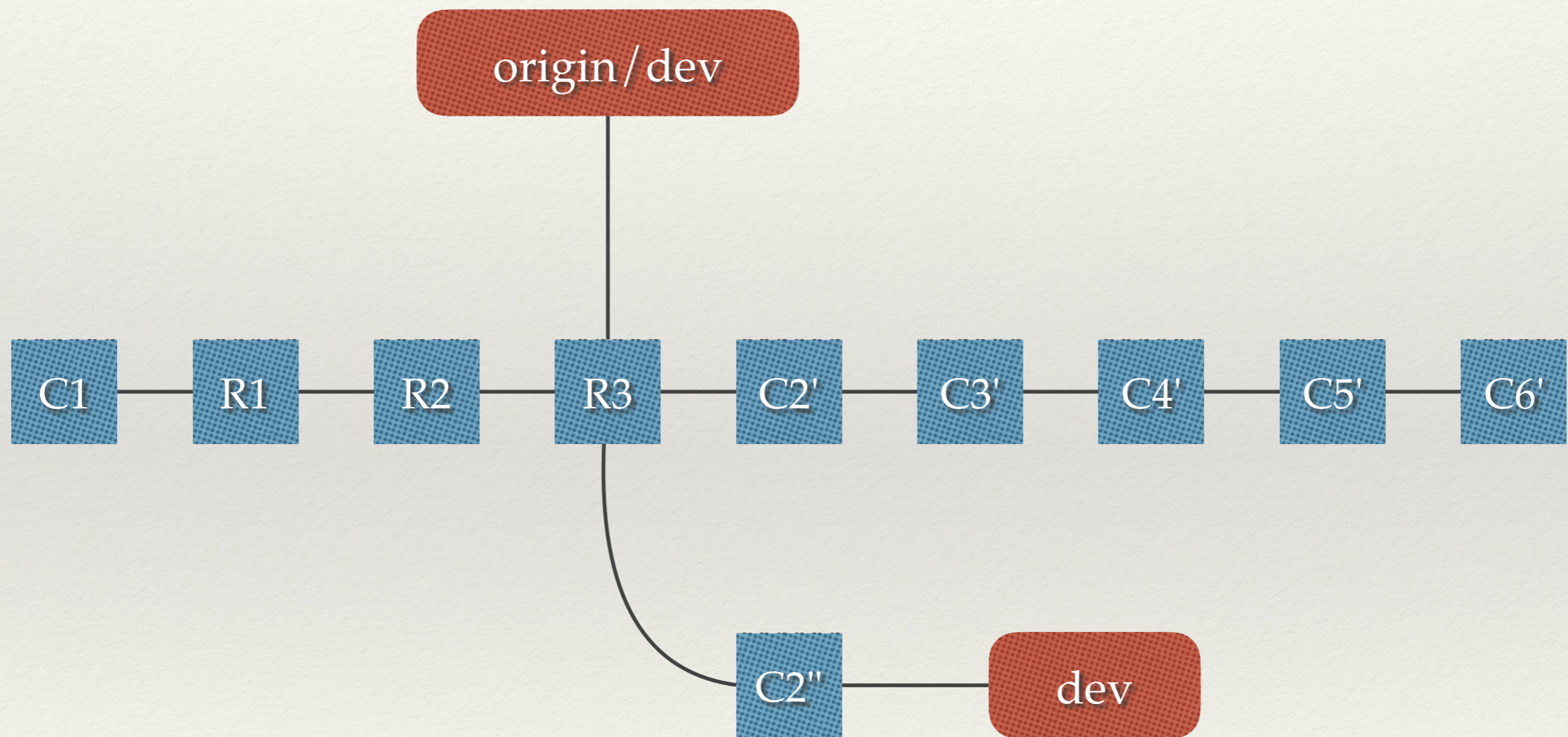
# Squash



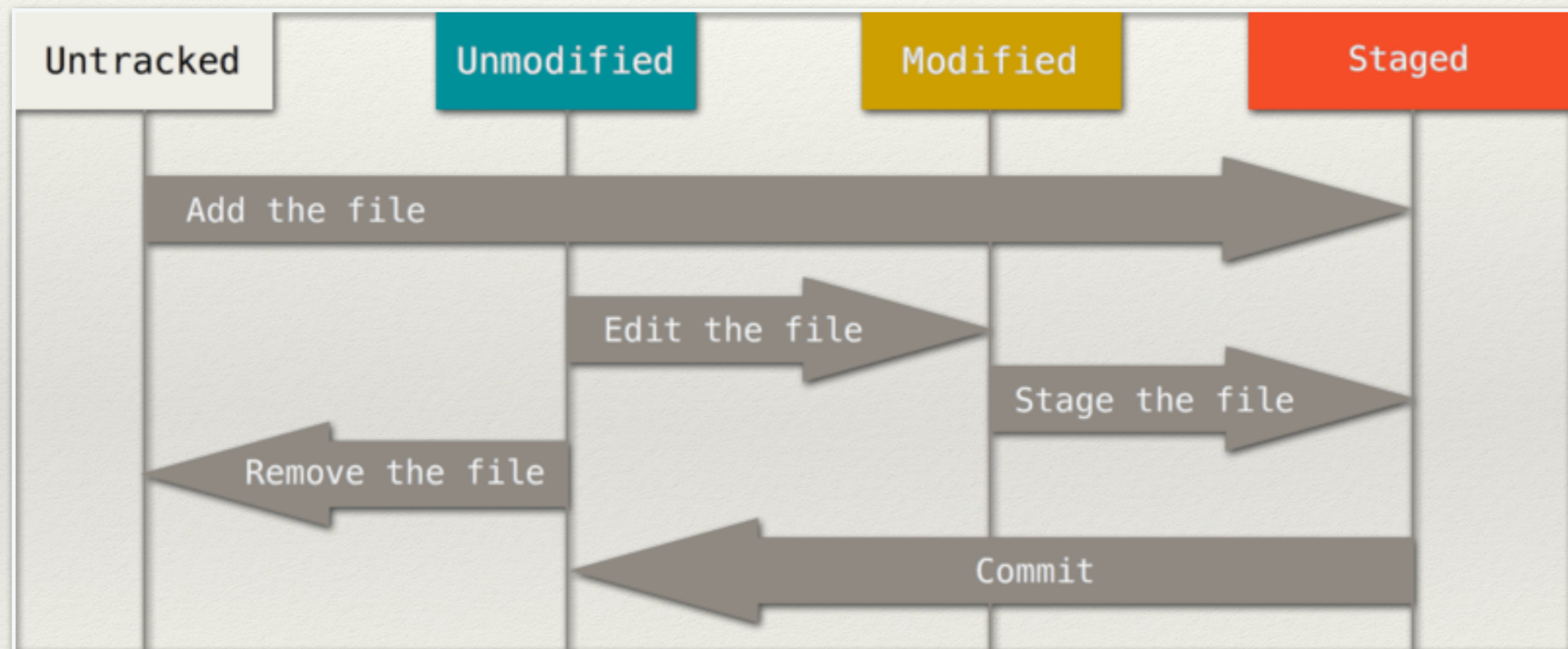
# Squash



# Squash



# Staging



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# Pull (Merge) Request

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- ❖ GitHub / BitBucket / GitLab concept
- ❖ Allows code review from a Web UI
- ❖ Which then triggers server-side Git actions



# Pull (Merge) Request

## Exception in BackgroundWorker when using multiple threads #364

Merged gquerret merged 3 commits into [Riverside-Software:master](#) from [droppedcalls:master](#) on 15 Aug

Conversation 8 Commits 3 Checks 0 Files changed 9 +175 -26

droppedcalls on 1 May • edited by gquerret

### Description

When running multiple threads on some systems, in particular our Red Hat Jenkins build agents, the following exception would occur:

```
[PCTCompile] Exception in thread "Thread-1351" java.lang.NullPointerException
[PCTCompile]     at com.phenix.pct.BackgroundWorker.listen(BackgroundWorker.java:105)
[PCTCompile]     at com.phenix.pct.PCTBgRun$ListenerThread$1.run(PCTBgRun.java:686)
[PCTCompile]     at java.lang.Thread.run(Thread.java:748)
```

Fixes [#363](#)

### Type of change

Bug fix (non-breaking change which fixes an issue)

### Checklist:

- My branch is started from the latest commit in master
- My commit history is clean
- My code follows the style guidelines of this project
- I have performed a self-review of my own code
- I have commented my code, particularly in hard-to-understand areas
- I have made corresponding changes to the documentation
- My changes generate no new warnings
- I have added tests that prove my fix is effective or that my feature works
- New and existing unit tests pass locally with my changes

Reviewers

Assignees – assign yourself

Labels

Projects  
None yet

Milestone  
No milestone

Notifications [Customize](#)  
You're receiving notifications because you modified the open/close state.

[Unsubscribe](#)

[Mark as unread](#)

4 participants

[Lock conversation](#)

# Pull (Merge) Request

The screenshot displays a GitHub Pull Request interface. At the top, it shows 'Conversation 8', 'Commits 3', 'Checks 0', and 'Files changed 9'. A progress bar indicates '+175 -26' changes. Below this, there are filters for 'all commits', 'File filter...', and 'Jump to...'. A 'Review changes' button is visible. The main content shows two files with their respective changes:


**5 .classpath**


```
@@ -13,5 +13,10 @@
13 13 - <classpathentry kind="lib" path="lib/ast-dependencies.jar"/>
14 14 - <classpathentry kind="lib" path="lib/ini4j-0.5.1.jar"/>
15 15 - <classpathentry kind="lib" path="lib/commonmark-0.11.0.jar"/>
16 16 + <classpathentry kind="lib" path="lib/mockito-core-3.0.0.jar"/>
17 17 + <classpathentry kind="lib" path="lib/byte-buddy-1.9.14.jar"/>
18 18 + <classpathentry kind="lib" path="lib/byte-buddy-agent-1.9.14.jar"/>
19 19 + <classpathentry kind="lib" path="lib/hamcrest-2.1.jar"/>
20 20 + <classpathentry kind="lib" path="lib/objenesis-2.6.jar"/>
16 21 - <classpathentry kind="output" path="bin"/>
17 22 </classpath>
```

**22 build.xml**


```
@@ -102,6 +102,11 @@
102 102 .....<pathelement location="lib/testng-6.13.1.jar" />
103 103 .....<pathelement location="lib/ini4j-0.5.1.jar" />
104 104 .....<pathelement location="lib/guava.jar" />
105 105 .....<pathelement location="lib/mockito-core-3.0.0.jar" />
106 106 .....<pathelement location="lib/byte-buddy-1.9.14.jar" />
107 107 .....<pathelement location="lib/byte-buddy-agent-1.9.14.jar" />
108 108 .....<pathelement location="lib/hamcrest-2.1.jar" />
109 109 .....<pathelement location="lib/objenesis-2.6.jar" />
105 110 ..</path>
106 111
107 112 ..<target name="init" description="Initialize PCT builder" depends="init-properties">
@@ -404,7 +409,22 @@
404 409 .....<zipfileset dir="${build-test}" includes="**/*" prefix="build/test" />
405 410 .....<zipfileset dir="tests" includes="**/*" prefix="testbox" />
406 411 .....<zipfileset dir="${src.progress}" includes="Consultingwerk/**/*" prefix="testbox/ClassDocumentation/test3/src" />
407 412 .....<zipfileset dir="lib" includes="ast.jar,ast-dependencies.jar,ini4j-0.5.1.jar,guava.jar,testng-6.13.1.jar,jcommander-4.11.0.jar" />
412 412 .....<zipfileset dir="lib" prefix="lib">
413 413 .....<include name="ast.jar" />
414 414 .....<include name="ast-dependencies.jar" />
415 415 .....<include name="ini4j-0.5.1.jar" />
416 416 .....<include name="guava.jar" />
417 417 .....<include name="testng-6.13.1.jar" />
418 418 .....<include name="jcommander-1.30.jar" />
419 419 .....<include name="jacocoant-0.8.4.jar" />
420 420 .....<include name="xmltask.jar" />
421 421 .....<include name="mockito-core-3.0.0.jar" />
422 422 .....<include name="objenesis-2.6.jar" />
423 423 .....<include name="hamcrest-2.1.jar" />
424 424 .....<include name="byte-buddy-1.9.14.jar" />
425 425 .....<include name="byte-buddy-agent-1.9.14.jar" />
426 426 .....<include name="*.pl" />
427 427 .....</zipfileset>
408 428 .....</zip>
409 429 ..</target>
410 430
```

# Pull (Merge) Request


 **droppedcalls** force-pushed the `droppedcalls:master` branch 2 times, most recently from `fcb5bec` to `7f974e1` on 1 May

 **gquerret** on 2 May Member + 😊 ✎ ⋮


PR status available here: [ci.rssw.eu/job/PCT/job/PR-364](https://ci.rssw.eu/job/PCT/job/PR-364)  
I've modified build.xml in your master branch so that tests can be executed on slaves

 **gquerret** on 1 Jun Member + 😊 ✎ ⋮


Regarding dependencies, hamcrest-core is [tagged as deprecated](#), and another one has to be used. I don't have anything against using new dependencies for tests, but I'd prefer having more recent versions. Would you mind upgrading them ?

 **tabeebyeamin** on 3 Jul + 😊 ✎ ⋮

Hi, I'm Bill's friend Tabeeb (with Alias Dharmesh). [5aa3357](#) updates hamcrest to the latest version as requested.

 **gquerret** on 3 Jul Member + 😊 ✎ ⋮

Didn't explicitly ask in the PR, but could you also upgrade the other dependencies ? Unless there's a good reason not to do it.

 **tabeebyeamin** on 8 Jul + 😊 ✎ ⋮

Hey, you mean Mockito-core (3.0.0) and Objenesis (3.0.1)?

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# Pull (Merge) Request

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**gquerret** merged commit **da1eb34** into `Riverside-Software:master`

on 15 Aug

1 check passed

[View details](#)

[Revert](#)

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Questions ?