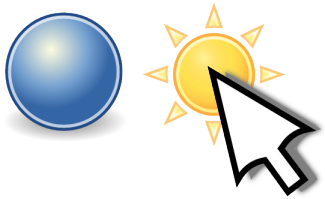
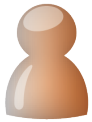
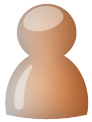


Continuous Deployment with Gerrit and Jenkins

R. Tyler Croy
Lookout, Inc.
http://mylookout.com/about/jobs



Who is this guy?



lookout™

MOBILE SECURITY

I work here

Jenkins CI

@jenkinsci San Francisco, CA

Jenkins CI, an extensible continuous integration engine

http://www.jenkins-ci.org

Home

The State of the Jenkins Project

Submitted by rtyler on Thu, 2011-05-12 15:30

Tweet 75

A few weeks ago our very own Kohsuke Kawaguchi gave a presentation at the Silicon Valley CI Summit held in Mountain View.

Within the presentation, Kohsuke included a collection of numbers about the vibrancy of the Jenkins project that certainly hasn't gotten enough attention. While the slideshow is embedded below, here's some good high-level points:

Home

The State of the Jenkins Project

Submitted by rtyler on Thu, 2011-05-12 15:30

Tweet 75

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Within the presentation, Kohsuke included a collection of numbers about the vibrancy of the Jenkins project that certainly hasn't gotten enough attention. While the slideshow is embedded below, here's some good high-level points:

- Brief overview of Continuous Deployment
- Meet Gerrit
- A Basic Commit-to-Deploy Pipeline
- Multiple branches with Gerrit + Jenkins
- The Human Factor
- Pro-tips/best practices

Continuous Deployment

What it isn't

Create Issue

Project **Server**

Issue Type **Story**

Summary * Engineering should apply continuous deployment

Use "should" or "shouldn't". Example: "Logo on website homepage should be green, not blue"

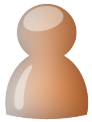
Priority P1

Describes how urgently Engineering has decided to address this issue.
P1 = Must address this ASAP; next release can't go out without this change. P2 = Very important, but may not
P3 = Like to have, but won't delay a release for it. P4 = Do only if have time and doesn't risk anything.

Component/s Testing ×

Start typing to get a list of possible matches or press down to select.

What it is



Who is using it?

Etsy

imvu

digg

flickr

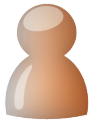
wealthfront

lookout
MOBILE SECURITY

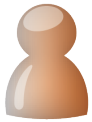
WordPress.com

Grockit

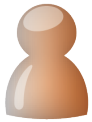
Dropbox



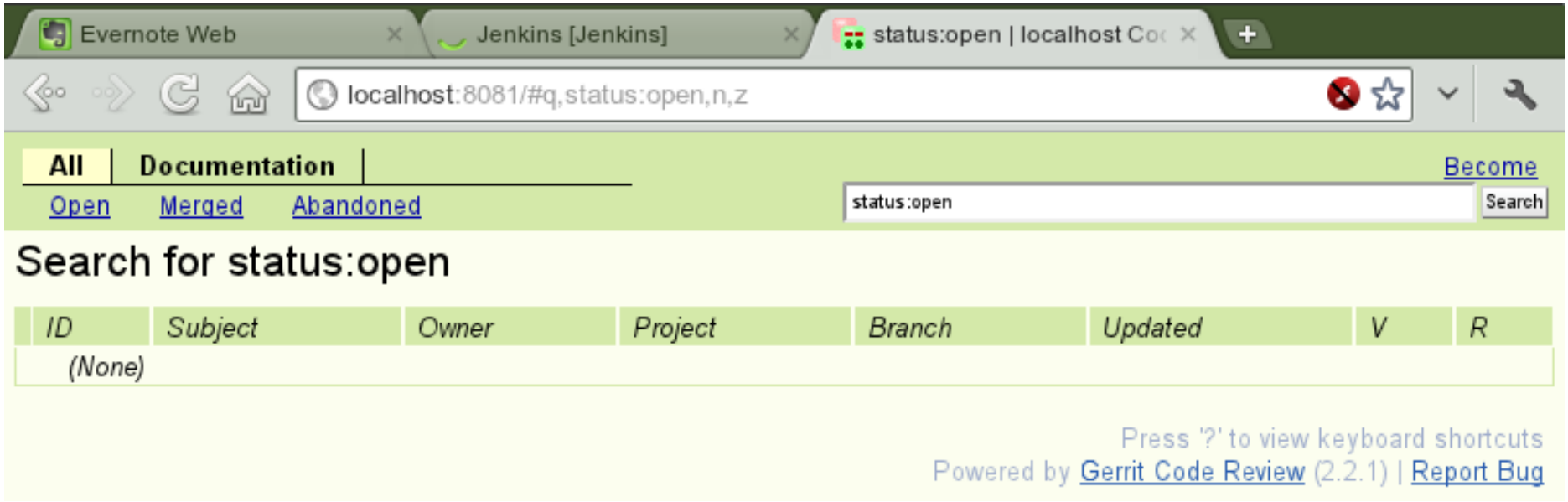
Why Code Review?



Why Code Review?



Meet Gerrit


Evernote Web
Jenkins [Jenkins]
status:open | localhost Co
localhost:8081/#q,status:open,n,z
All
Documentation
Open
Merged
Abandoned
Become
status:open
Search
Search for status:open
ID
Subject
Owner
Project
Branch
Updated
V
R
(None)
Press '?' to view keyboard shortcuts
Powered by Gerrit Code Review (2.2.1) | Report Bug

As a code review tool

Reviewer	*Verified*	*Code Review*	
Leeroy	✘		Fails
Dr Krieger		-1	I would prefer that you didn't submit this
Gilette		-1	I would prefer that you didn't submit this
Lana Kane		-1	I would prefer that you didn't submit this

- Need Verified +1 (Verified)
- Need Code Review +2 (Looks good to me, approved)

Wo Add Reviewer

▶ **Wo**odhouse (1000006)

As a code review tool

```
32
33 #include "ttyclock.h"
34 #include <stdlib.h>
35
36 void
37 init(void)
38 {
39      struct sigaction sig;
40      ttyclock->bg = COLOR_BLACK;
41
42      /* Init ncurses */
43      initscr();
44      cbreak();
45      noecho();
46      keypad(stdscr, True);
47      start_color();
```

```
32
33 #include "ttyclock.h"
34 #include <stdlib.h>
35
36 void
37 init(void)
38 {
39      struct sigaction sig;
40      ttyclock->bg = COLOR_BLACK;
41      int *derp = NULL;
```

(Draft) Draft saved at 12:03 PM

Poor variable naming

Edit

```
42      int foo = 1 + *derp;
```

(Draft) Draft saved at 12:04 PM

This is a seriously terrible idea.

Edit

```
43
44
45      /* Init ncurses */
46      initscr();
47      cbreak();
48      noecho();
49      keypad(stdscr, True);
50      start_color();
```

As a Git repository server

```
~ % git checkout -b change-4
Switched to a new branch 'change-4'
~ % git fetch gerrit refs/changes/04/4/1
From gerrit:ttyclock
 * branch            refs/changes/04/4/1 -> FETCH_HEAD
~ % git cherry-pick FETCH_HEAD
Finished one cherry-pick.
[change-4 1d4351c] Greatly improve the stability of tty-
clock
 1 files changed, 3 insertions(+), 0 deletions(-)
~ %
```

As a collaboration tool

```
39      struct sigaction sig;
40      ttyclock->bg = COLOR_BLACK;
41      int *derp = NULL;
```

Dr Krieger Poor variable naming 12:11 PM

```
42      int foo = 1 + *derp;
```

Dr Krieger This is a seriously terrible idea. 12:11 PM

Gilette Girl please 12:11 PM

Lana Kane Jesus christ Archer! Are you an idiot? 12:13 PM

Sterling Archer Watch it Lana, you're in the *danger zone* 12:15 PM

```
43
44
45      /* Init ncurses */
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As a collaboration tool

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44
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As a collaboration tool

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Sterling Archer			
Leeroy	✘		Fails
Dr Krieger		-1	I would prefer that you didn't submit this
Gilette		-1	I would prefer that you didn't submit this
Lana Kane		-1	I would prefer that you didn't submit this
Woodhouse		+1	Looks good to me, but someone else must approve

As a collaboration tool

Comments

Leeroy Patch Set 1: Build Started nulljob/ttyclock_gerrit/9/

Leeroy Patch Set 1: Fails Build Failed nulljob/ttyclock_gerrit/9/ : FAILURE

Dr Krieger Patch Set 1: I would prefer that you didn't submit this (2 inline ...

Gilette Patch Set 1: I would prefer that you didn't submit this (1 inline ...

Lana Kane Patch Set 1: I would prefer that you didn't submit this (1 inline ...

Woodhouse

Patch Set 1: Looks good to me, but someone else must approve

I'm fetching a rug sir

Sterling Archer

Patch Set 1: (1 inline comment)

Code Review “Points”

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Sterling Archer			
Leeroy	✘		Fails
Dr Krieger		-1	I would prefer that you didn't submit this
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Code Review “Points”

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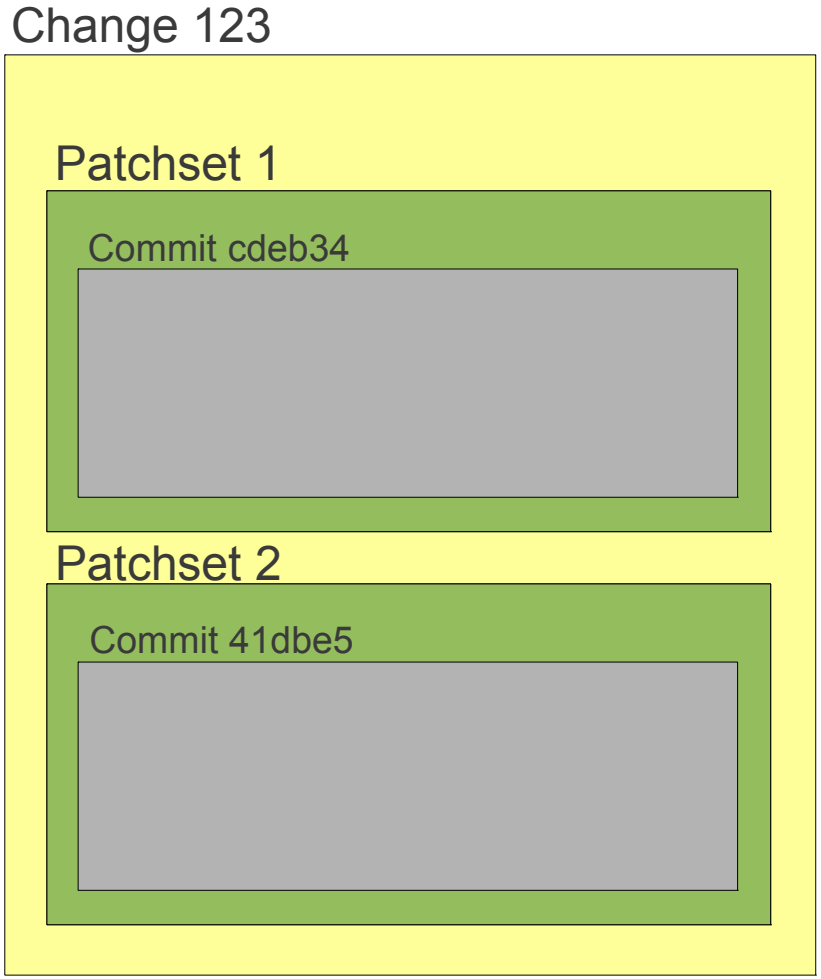
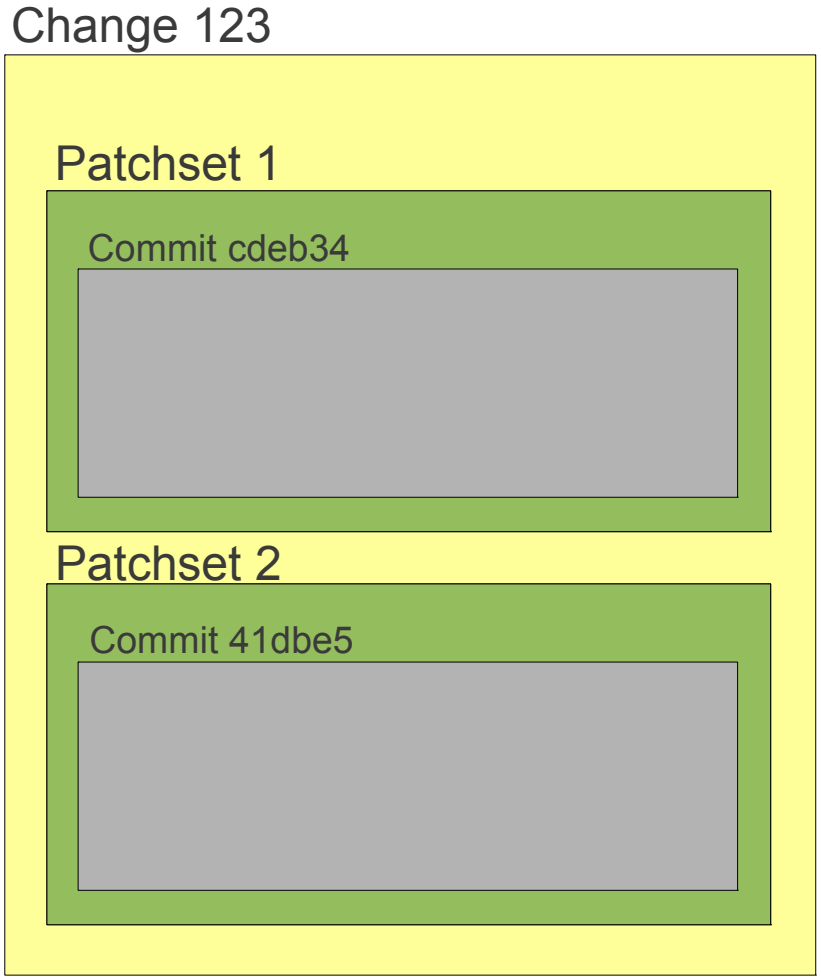
Changes in Gerrit



Changes in Gerrit



Uploaded	Oct 1, 2011 12:42 PM
Updated	Oct 1, 2011 12:44 PM
Status	Review in Progress

Permalink

Reviewer	*Verified*	*Code Review*	
Leeroy	✘		Fails

- Need Verified +1 (Verified)
- Need Code Review +2 (Looks good to me, approved)

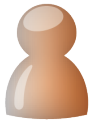
Name or Email Add Reviewer

▶ **Dependencies**

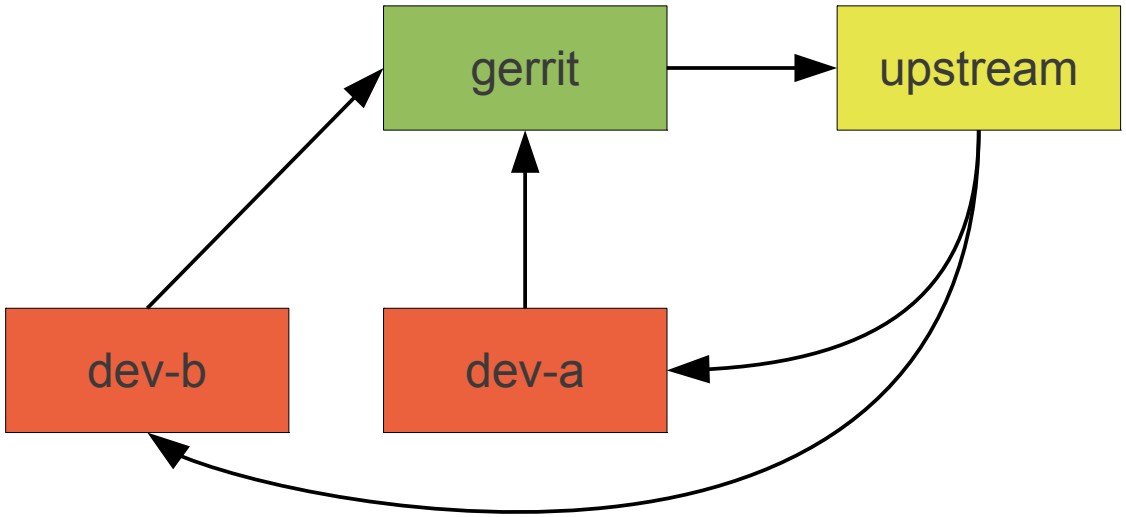
Old Version History: Base ▾

▶ **Patch Set 1**	2b46eeeb675841f5e796e2e2910d2eee743c234e
▶ **Patch Set 2**	a607d3649f17c69070d06163bcc91442ec1eae0f
▶ **Patch Set 3**	2a32f079abcb0ad09a4c59a2a2737a76b11591e9

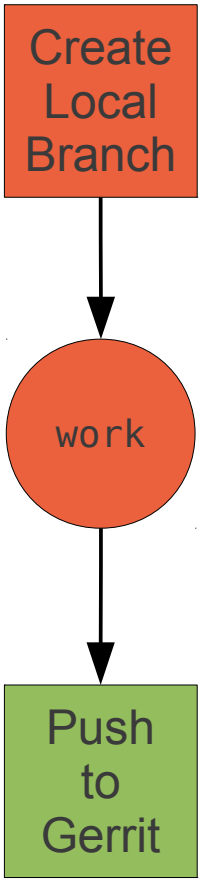
Developer Workflow



The Gerrit Flow



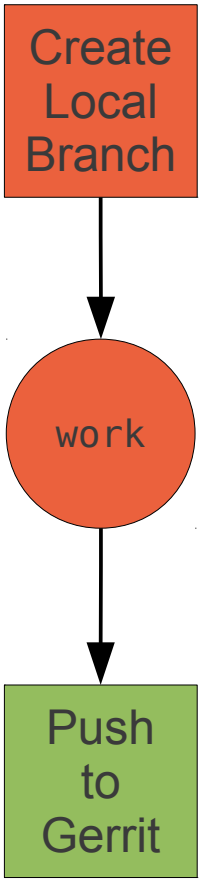
Flow of changes




```
% git checkout -b topic-branch
```

```
% git push gerrit HEAD:refs/for/master
```

Flow of changes

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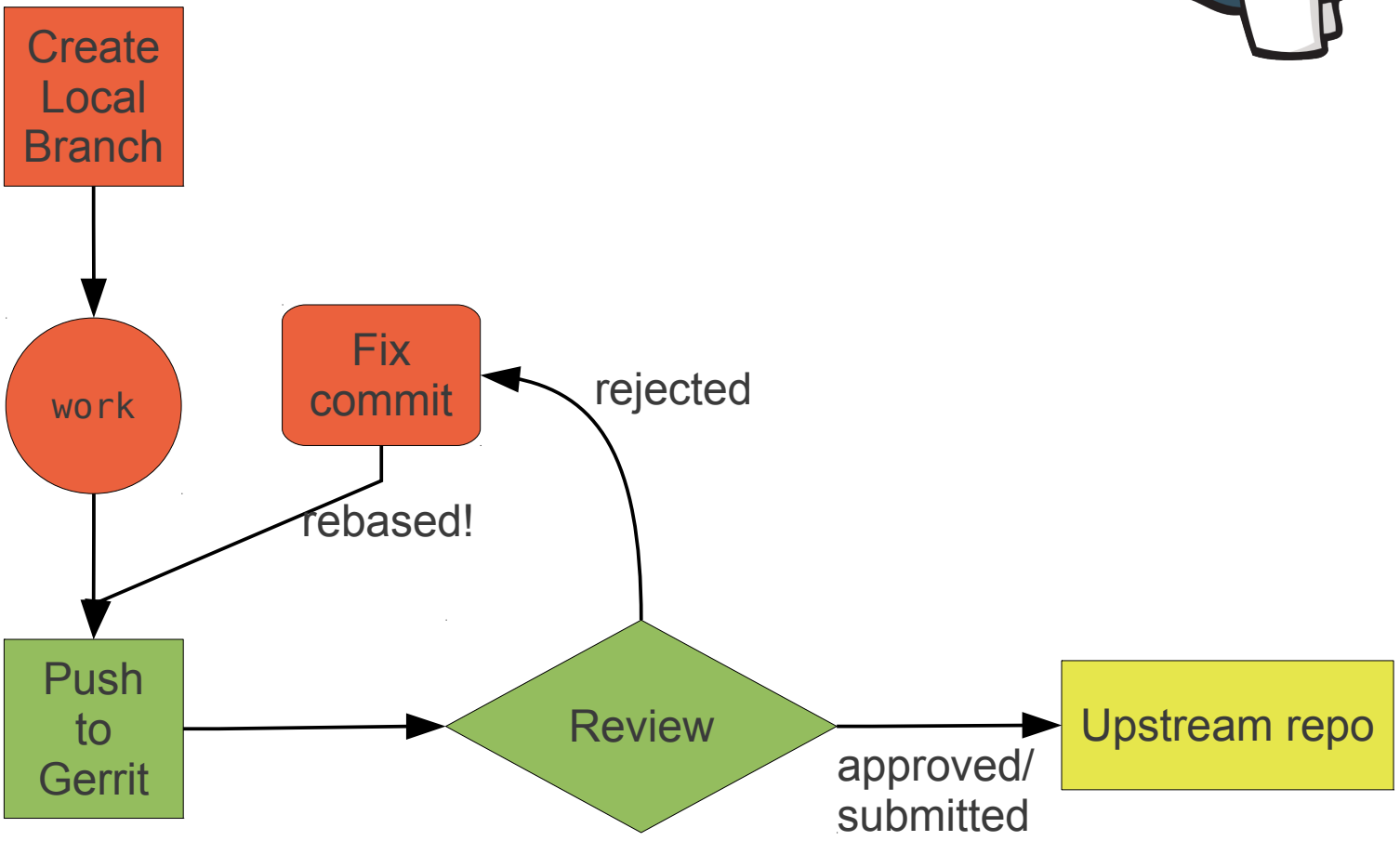
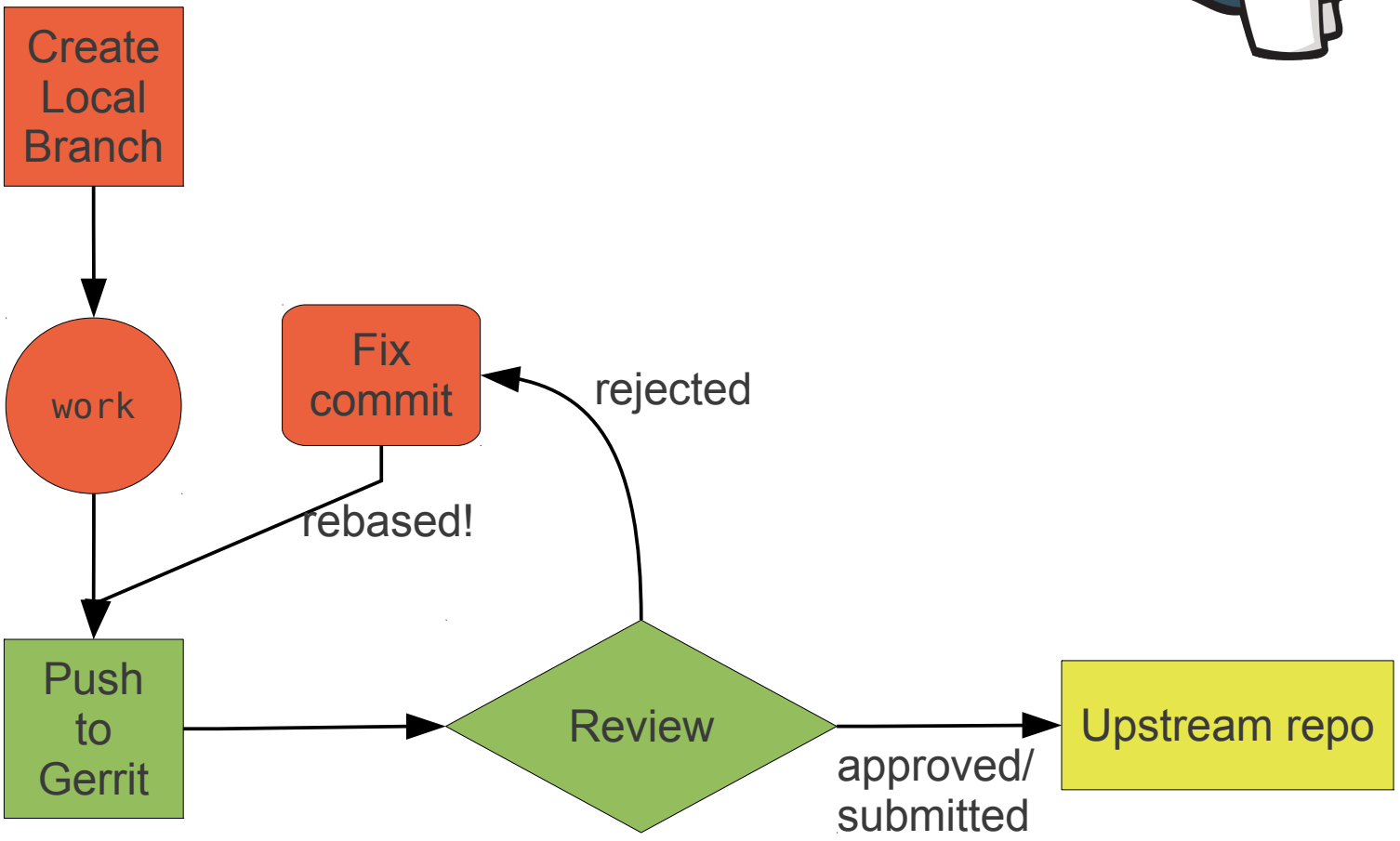


Flow of changes

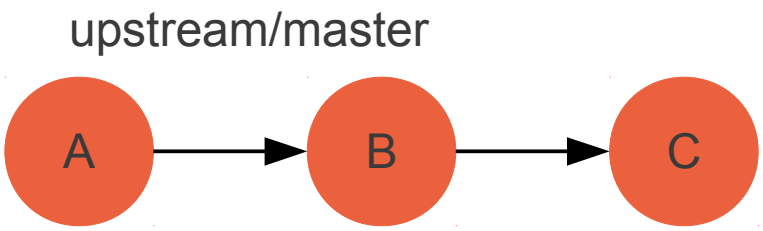


Your development workflow in commands

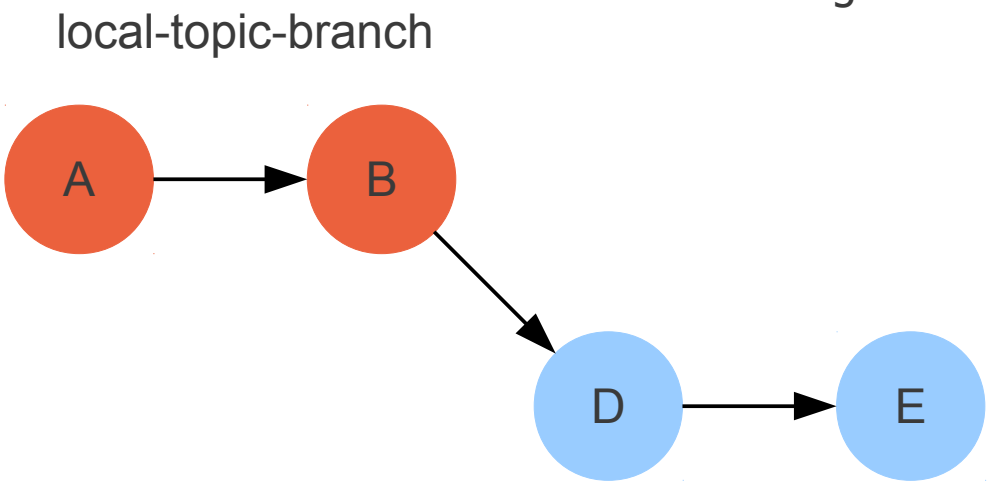
- `git checkout -b local-topic-branch`
- work work work
- `git rebase -i upstream/master # fix up commits`
- `git push gerrit HEAD:refs/for/master`
- Create new commits based on reviews
- `git rebase -i upstream/master # squash up`
- `git push gerrit HEAD:refs/for/master`

REBASE IS SCARY
(but necessary)

How it works




```
% git rebase upstream/master
```



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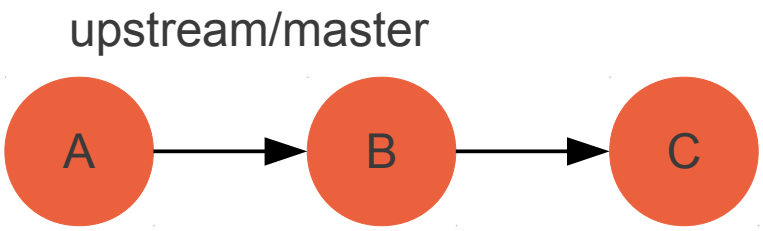

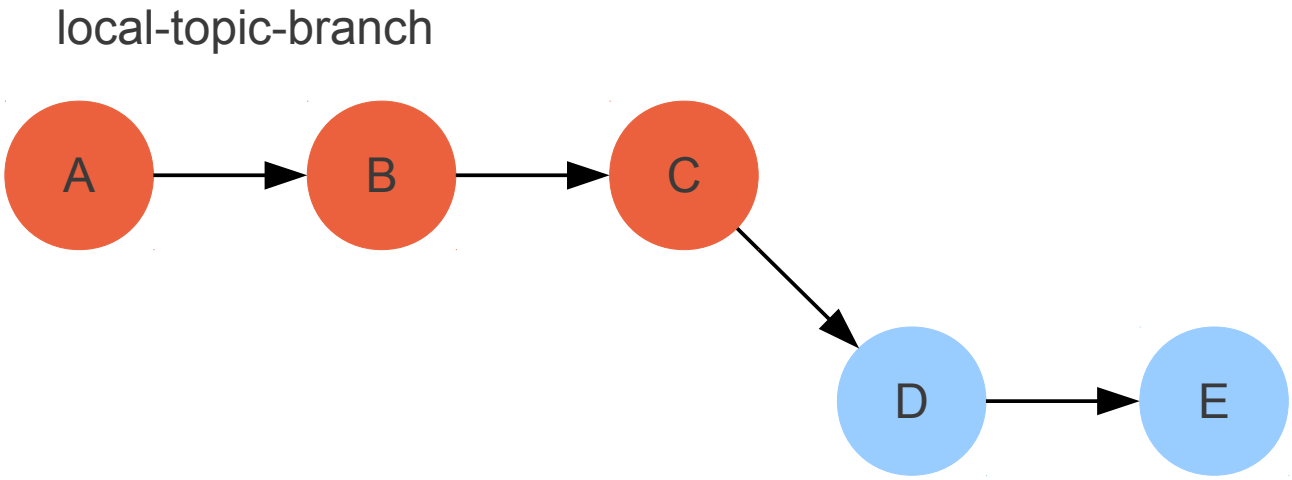

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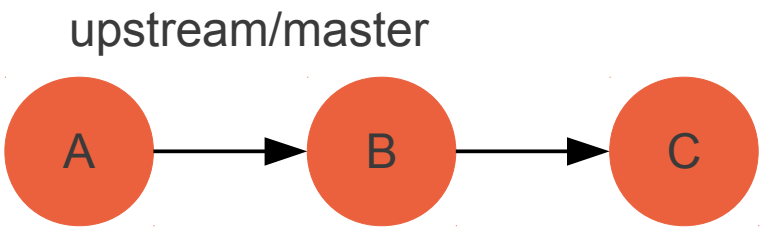
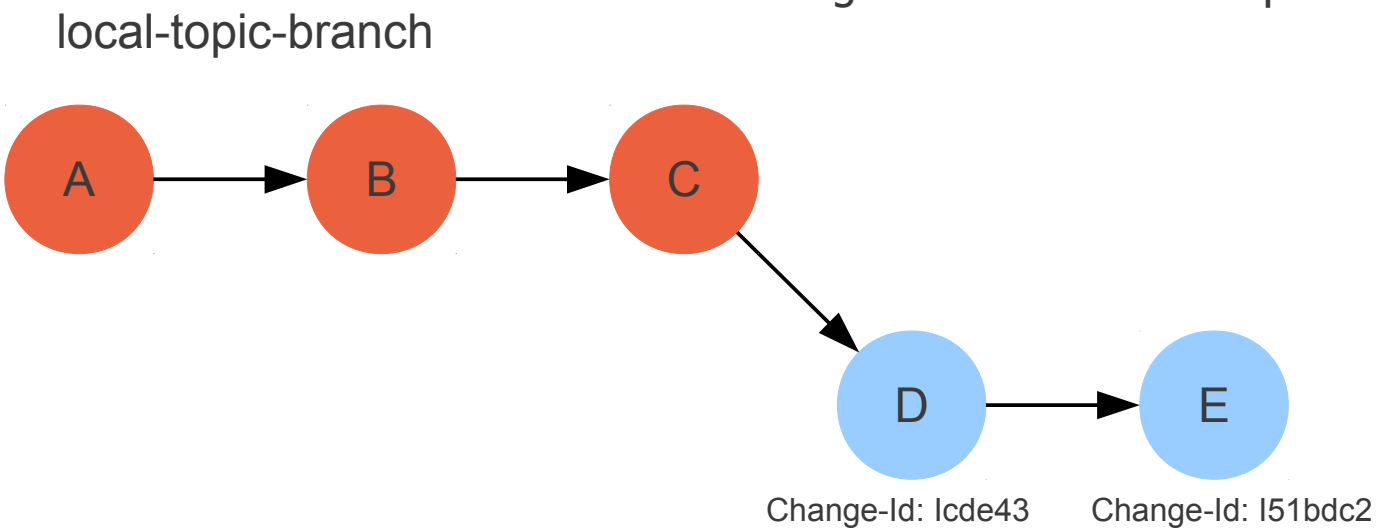



```
% git rebase -i upstream/master
```



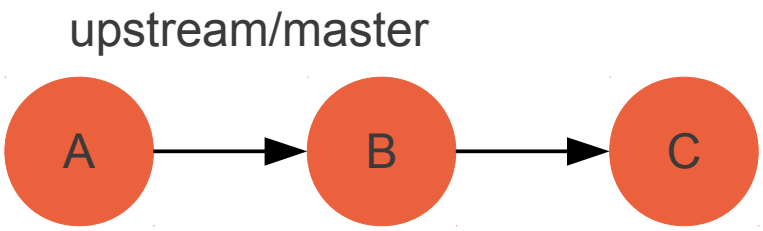
```
~ % git rebase -i origin/master

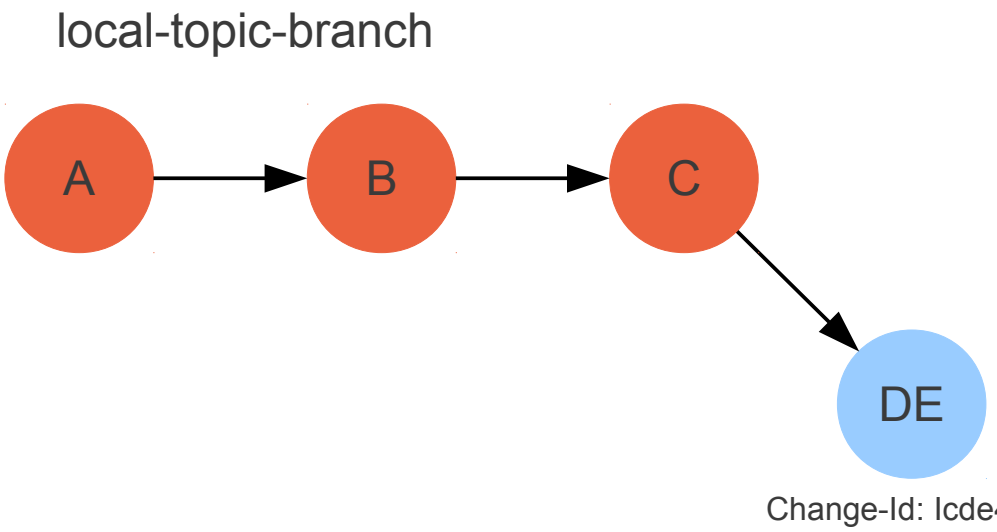

pick e59df21 Greatly improve the stability of tty-clock
squash 6c1ffe1 Fix some whitespace



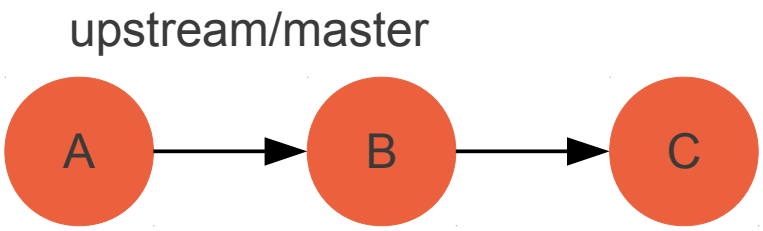
[detached HEAD 785692b] Greatly improve the stability of tty-clock
 1 files changed, 2 insertions(+), 0 deletions(-)
Successfully rebased and updated refs/heads/change-4.
~ %
```

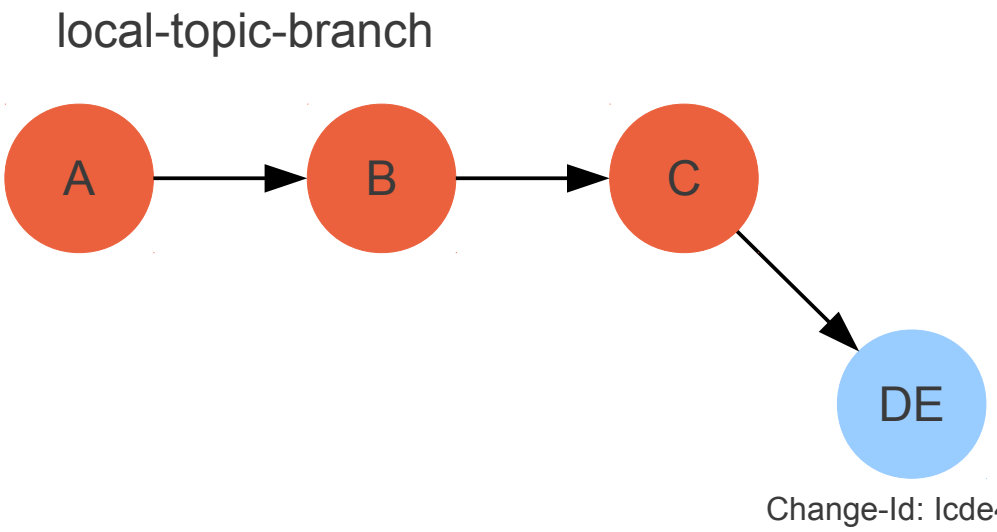
How it works


upstream/master
A
B
C


local-topic-branch
A
B
C
DE
Change-Id: Icde43

How it works

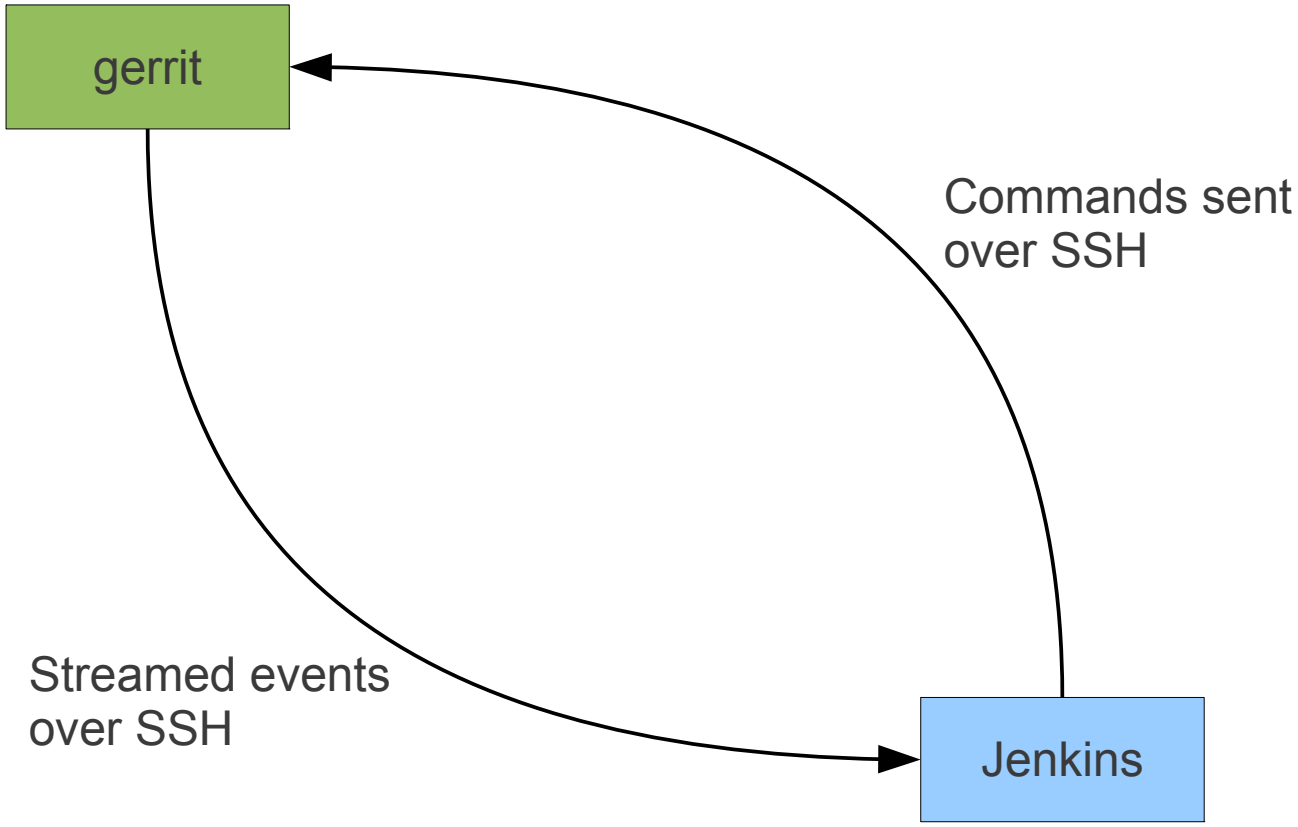

upstream/master
A
B
C

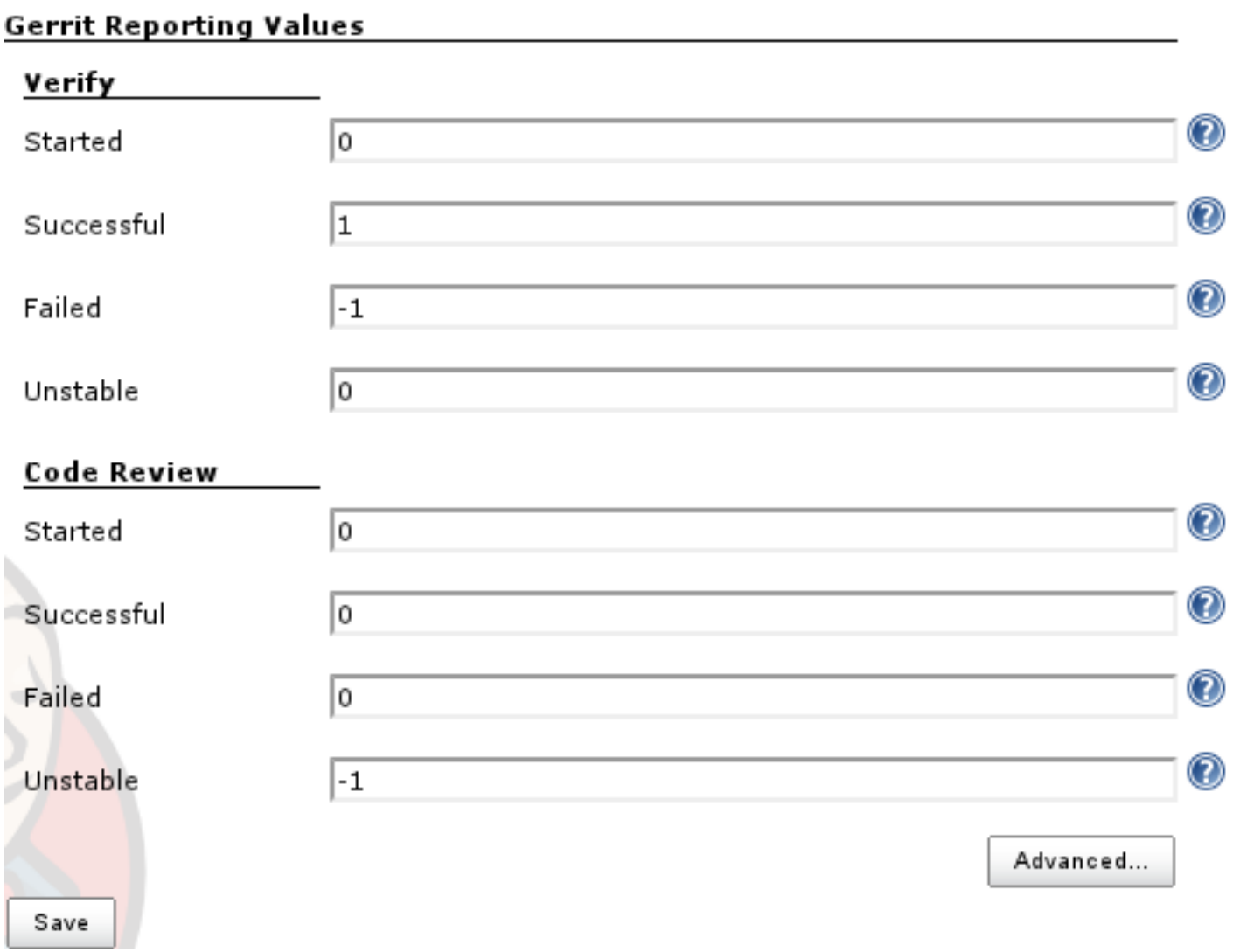

local-topic-branch
A
B
C
DE
Change-Id: Icde43

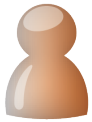
Gerrit Trigger Plugin

Creating a role account

```
~ % ssh gerrit gerrit create-account
```


gerrit
Commands sent
over SSH
Streamed events
over SSH
Jenkins


Gerrit Reporting Values
Verify
Started
0
Successful
1
Failed
-1
Unstable
0
Code Review
Started
0
Successful
0
Failed
0
Unstable
-1
Advanced...
Save



A simple pipeline

Creating a Jenkins “verifier” job

URL of repository: ssh://gerrit.example.com:29418/ttyclock.git

Name of repository (blank to create default): origin

Refspec (blank to create default): $GERRIT_REFSPEC

Delete Repository

Add

Branch Specifier (blank for default): origin/$GERRIT_BRANCH

Delete Branch

Creating a Jenkins “verifier” job

Skip internal tag ☑

Clean after checkout ☑

Recursively update submodules ☐

Use commit author in changelog ☐

Wipe out workspace before build ☐

Choosing strategy [Gerrit Trigger]

Creating a Jenkins “verifier” job

Gerrit Trigger

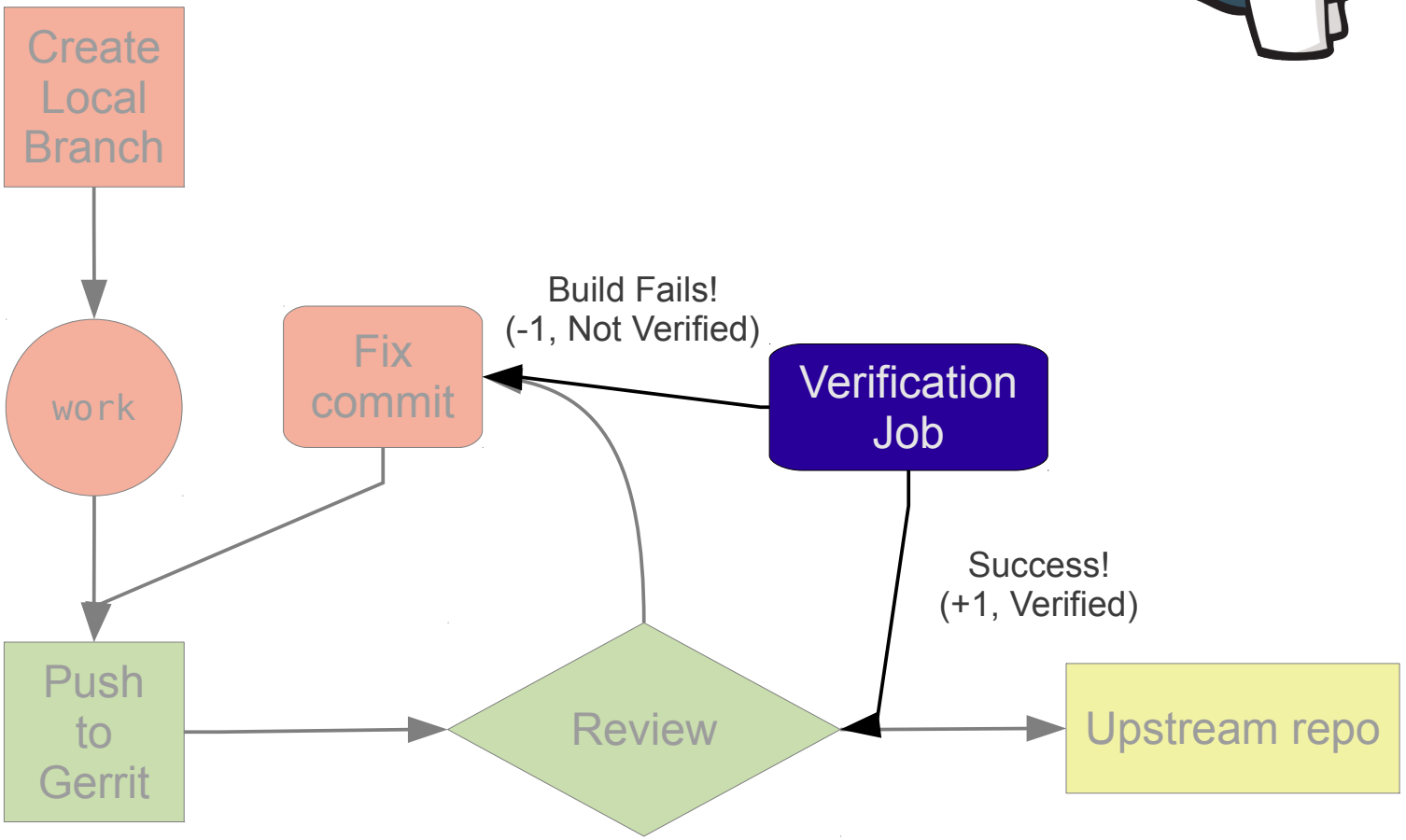
Silent Mode

Gerrit Project

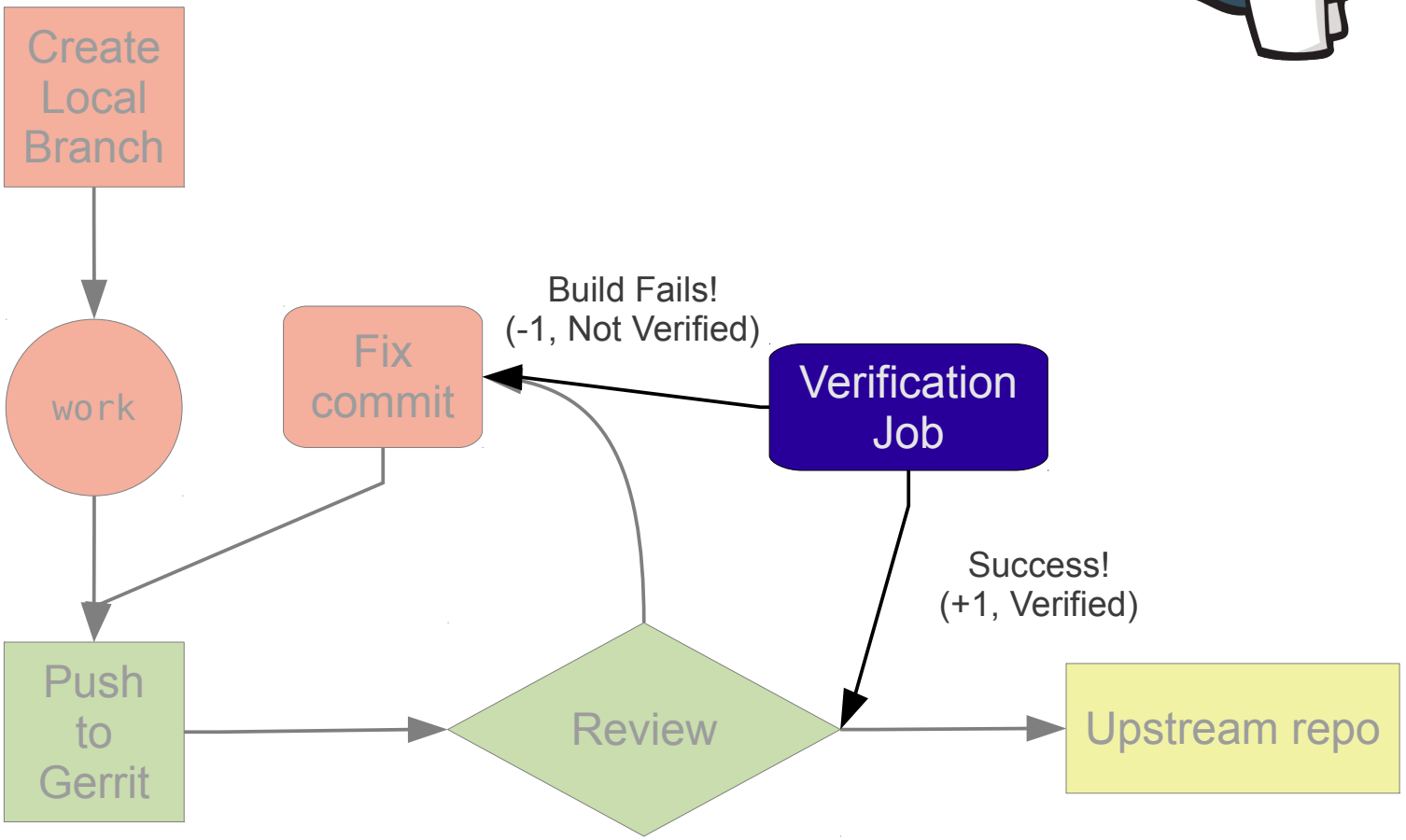
Delete	Type	Pattern	Branches	
	Plain	ttyclock	Type: Path	Pattern: **
			Add Branch	

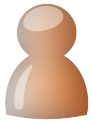
Add Project

Flow of changes

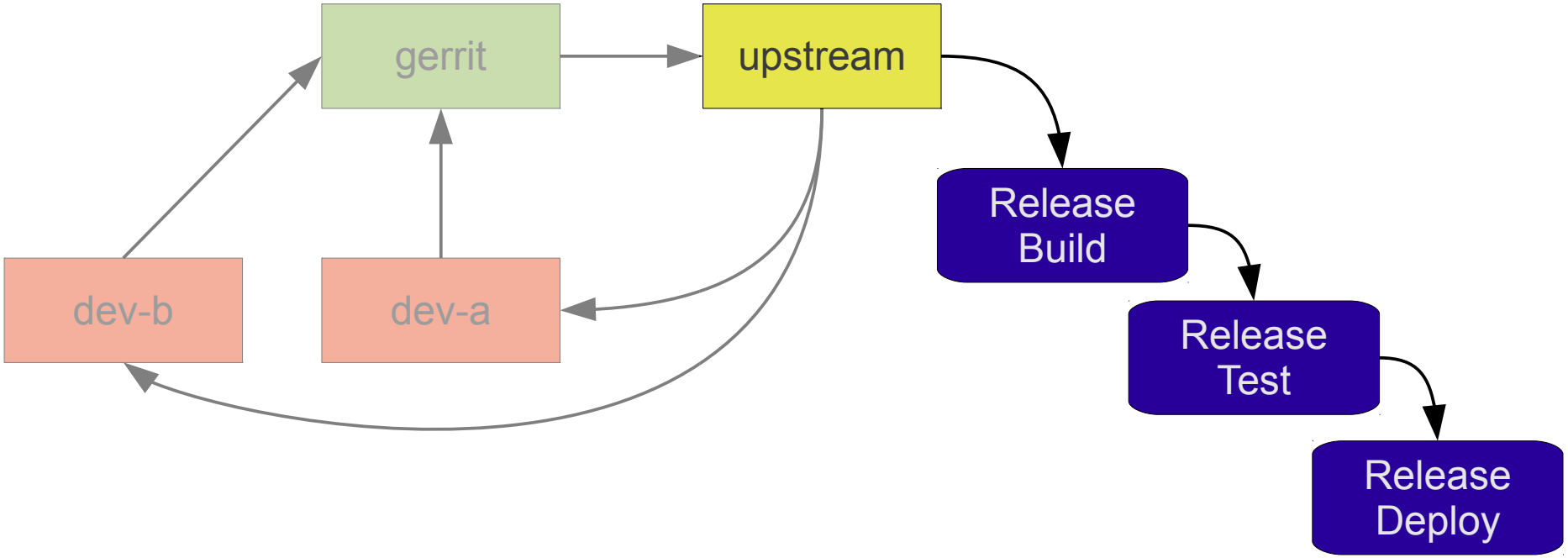


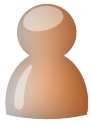
Flow of changes



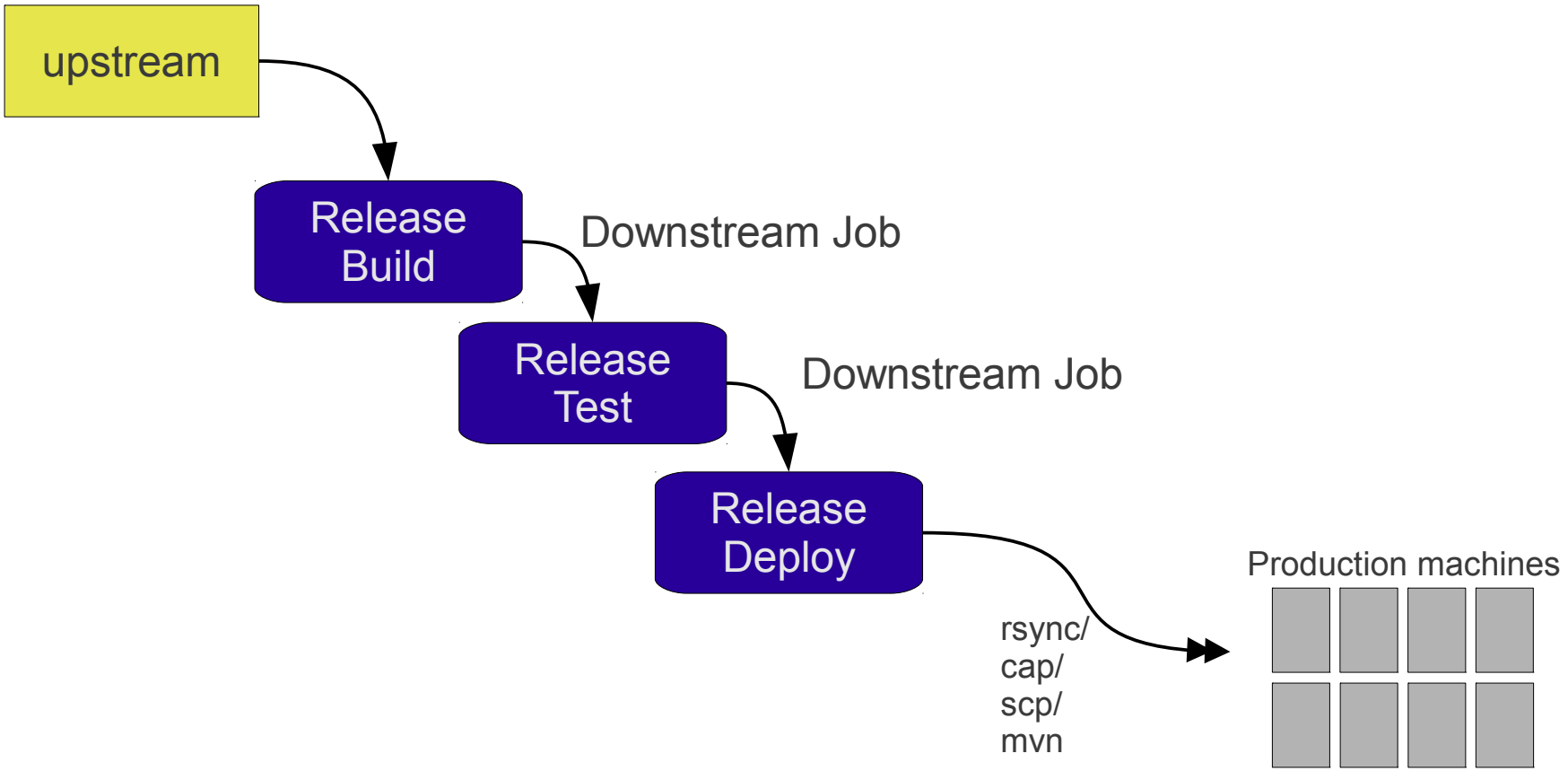


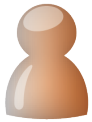
Deployment


gerrit
upstream
Release Build
Release Test
Release Deploy
dev-b
dev-a

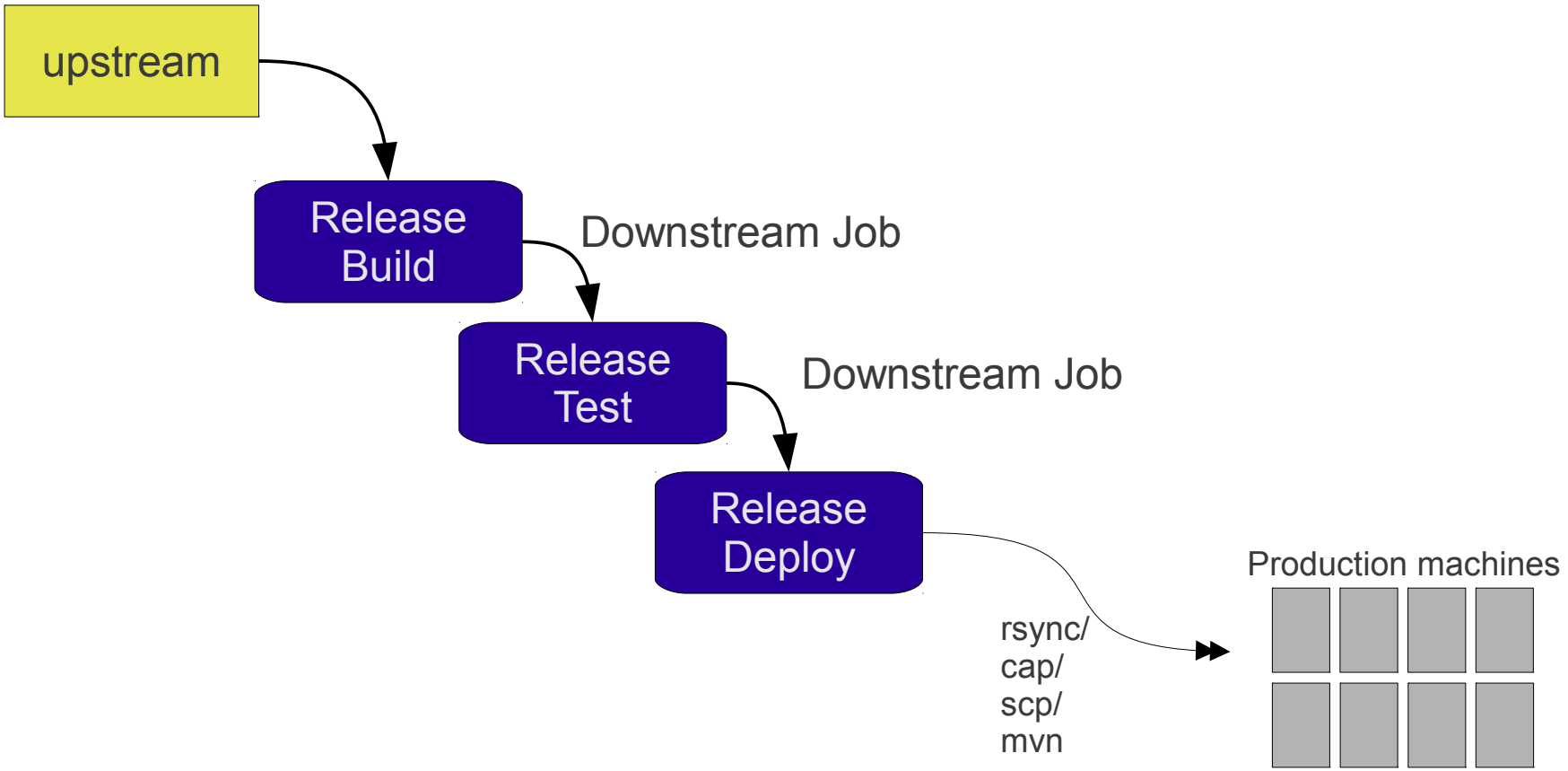


Deployment


upstream
Release Build
Downstream Job
Release Test
Downstream Job
Release Deploy
rsync/
cap/
scp/
mvn
Production machines



Deployment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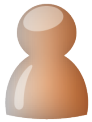
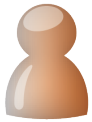


Multiple Branches



Creating the branches in Gerrit

Project ttyclock

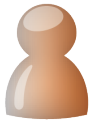
General
Branches
Access

Branch Name	Revision
HEAD	master
master	613252c20000ed6b3f2390ebd566fa24411c22d3

Branch Name: fakey

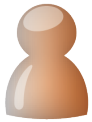
Initial Revision: 0xdeadbeef

Create Branch



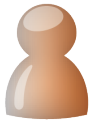
Creating the branches in Gerrit

```
~ % git push gerrit release-1.0
```



From the developer point of view

```
~ % git checkout -b relfix –track
upstream/release-1.0
~ % # work work work
~ % git add/commit
~ % git push gerrit HEAD:refs/for/release-1.0
```



From the Jenkins point of view

Gerrit Trigger

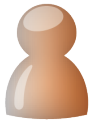
Advanced...

Silent Mode

Gerrit Project

Delete	Type	Pattern	Branches	
	Plain	ttyclock	Type: Path	Pattern: ** Delete
			Add Branch	

Add Project



From the Jenkins point of view

Gerrit Trigger

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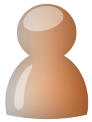
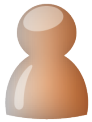
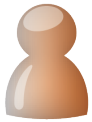
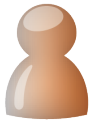




The Human Factor

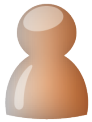


Working with changes “in review”



Working with “in-review” changes

```
~ % git checkout -b topic-with-17
~ % git fetch gerrit refs/changes/17/17/1
~ % git cherry-pick FETCH_HEAD
~ % # work work commit work work commit
```



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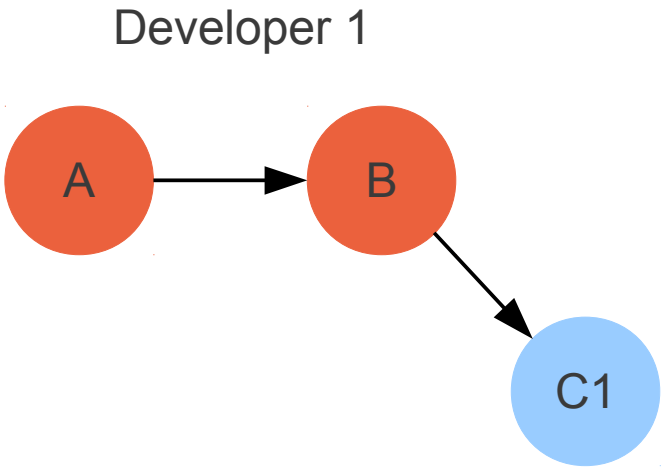

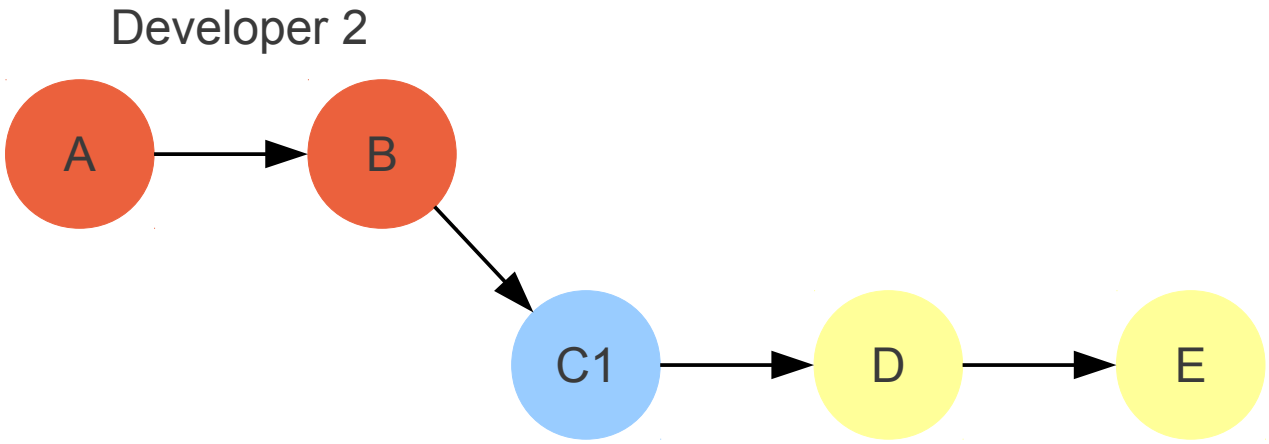

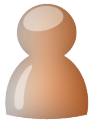

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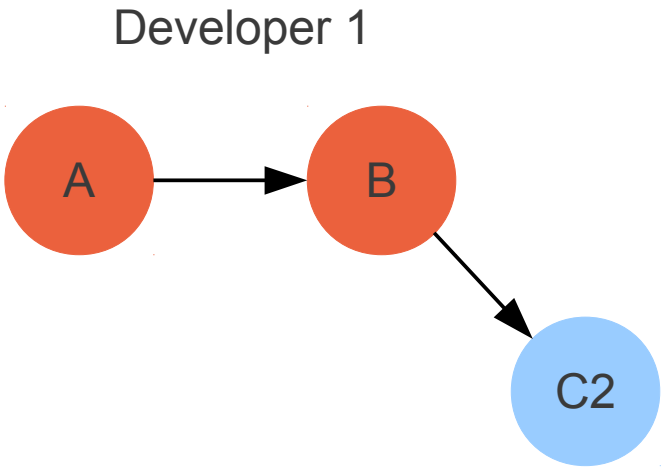
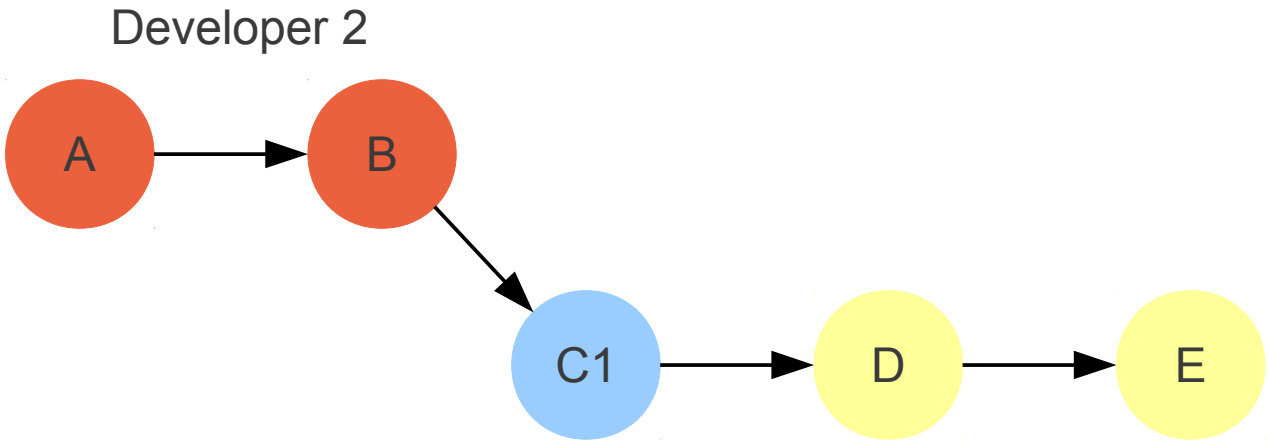
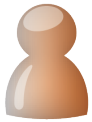
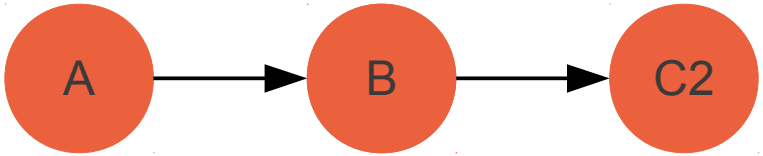




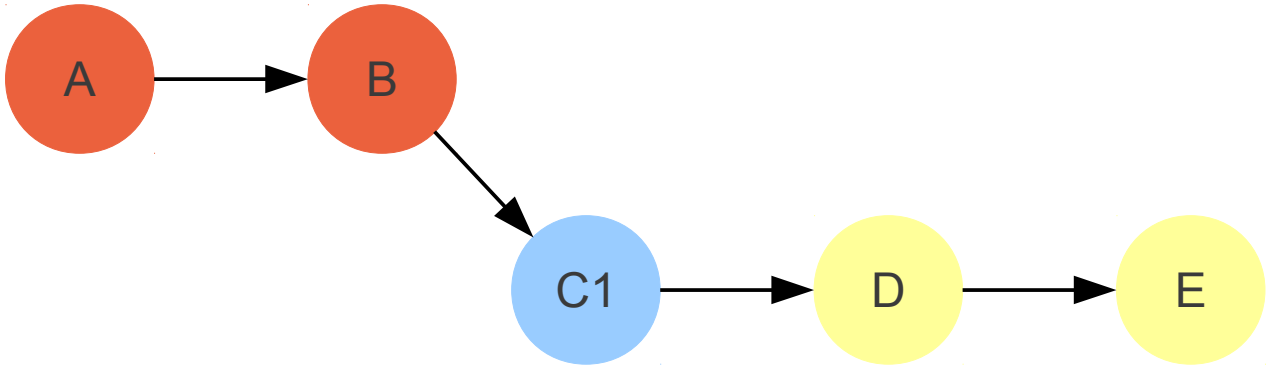


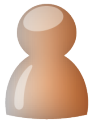
Working with “in-review” changes

Upstream



Developer 2



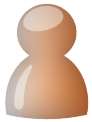


Working with “in-review” changes

```
~ $ git rebase gerrit/master
First, rewinding head to replay your work on top of it...
Applying: Unused variable
Using index info to reconstruct a base tree...
Falling back to patching base and 3-way merge...
Auto-merging ttyclock.c
CONFLICT (content): Merge conflict in ttyclock.c
Failed to merge in the changes.
Patch failed at 0001 Unused variable

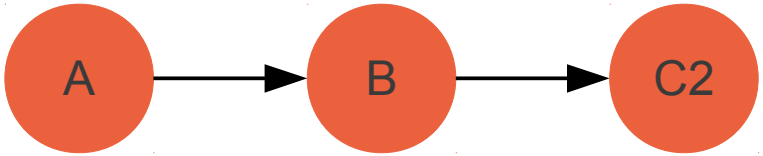
When you have resolved this problem run "git rebase --continue".
If you would prefer to skip this patch, instead run "git rebase
--skip".
To restore the original branch and stop rebasing run "git rebase
--abort".

~ $ git rebase --skip
HEAD is now at edff388 Unused variable
Applying: Local change
```

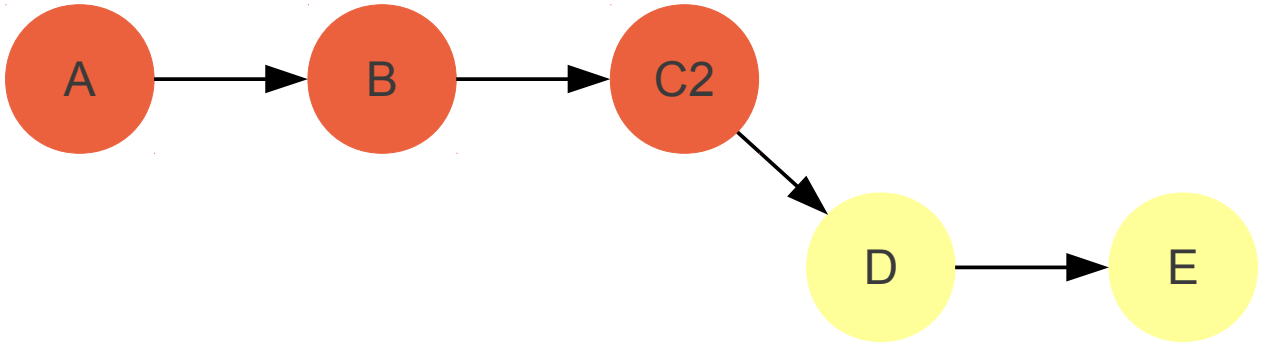


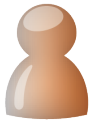
Working with “in-review” changes

Upstream

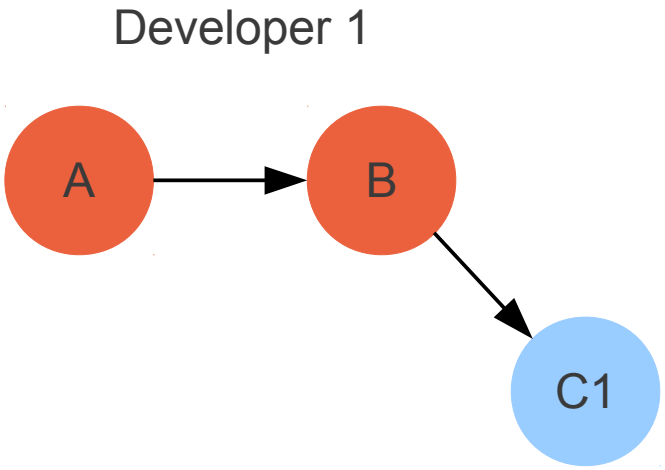


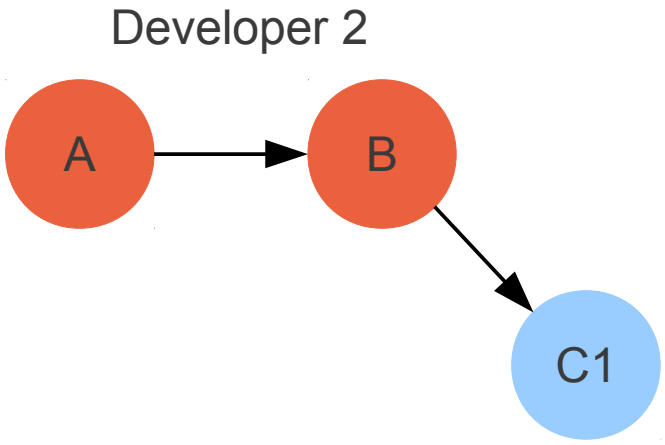
Developer 2

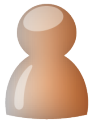




Picking up changes







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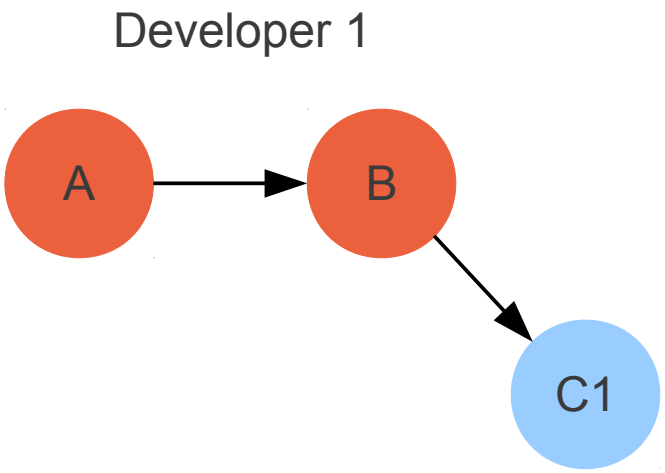
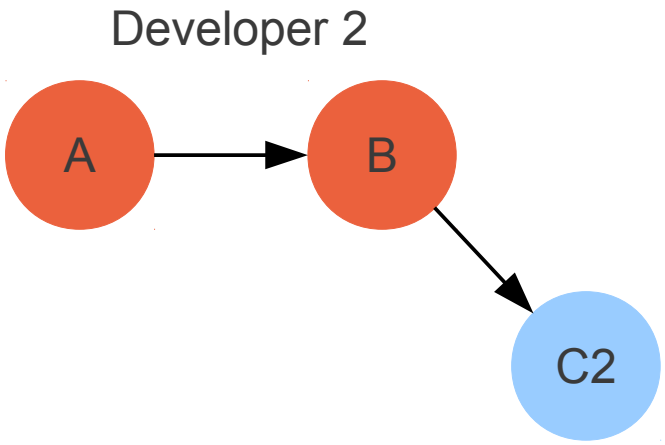
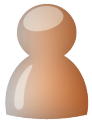
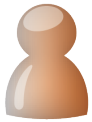






Performing manual verification by QA



Manual verification

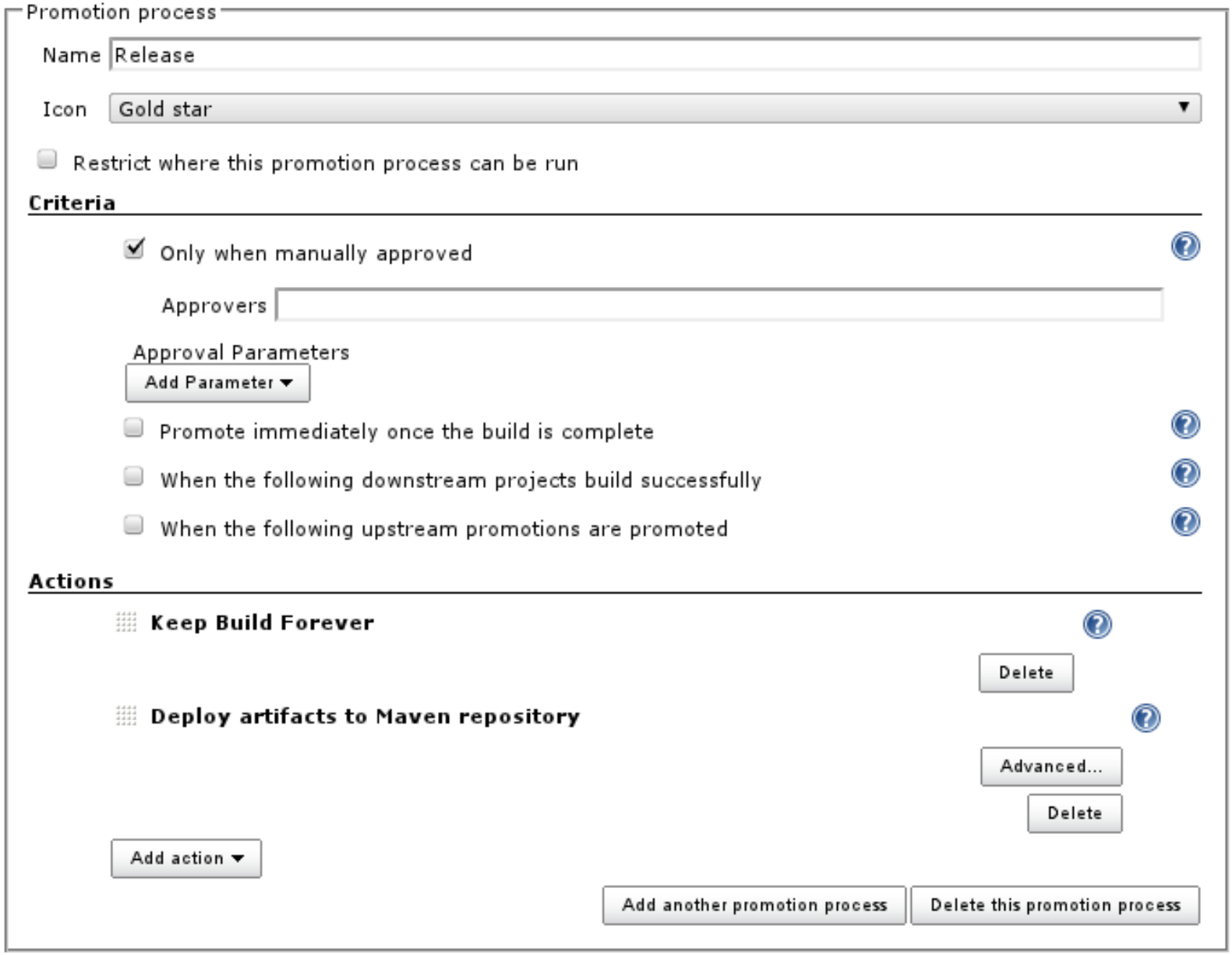
Label Verified

Exclusive

-1 +1 QA

-1 +1 Robots

Kick-off deployments with the Promoted Builds plugin


Promotion process
Name Release
Icon Gold star
Restrict where this promotion process can be run
Criteria
Only when manually approved
Approvers
Approval Parameters
Add Parameter
Promote immediately once the build is complete
When the following downstream projects build successfully
When the following upstream promotions are promoted
Actions
Keep Build Forever
Delete
Deploy artifacts to Maven repository
Advanced...
Delete
Add action
Add another promotion process
Delete this promotion process

Promotions

Release Candidate

Promotion History
ttyclock » promotion » Release Candidate #1

Qualification **(promoted 2 mo 14 days ago — 1 sec after build)**

Automatically promoted immediately after the build

Status

Successfully promoted (log)

Re-execute promotion

Release

Promotion History
ttyclock » promotion » Release #1

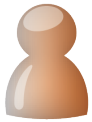
Qualification **(promoted 15 sec ago — 2 mo 14 days after build)**

Manually Approved
Approved by anonymous

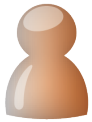
Status

Successfully promoted (log)

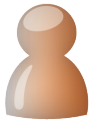
Re-execute promotion



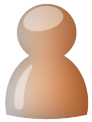
Pro Tips



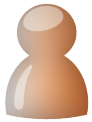
Use “squash” or “fixup” to condense changes



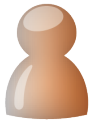
Create per-topic/ticket local branches for clearer isolation of work



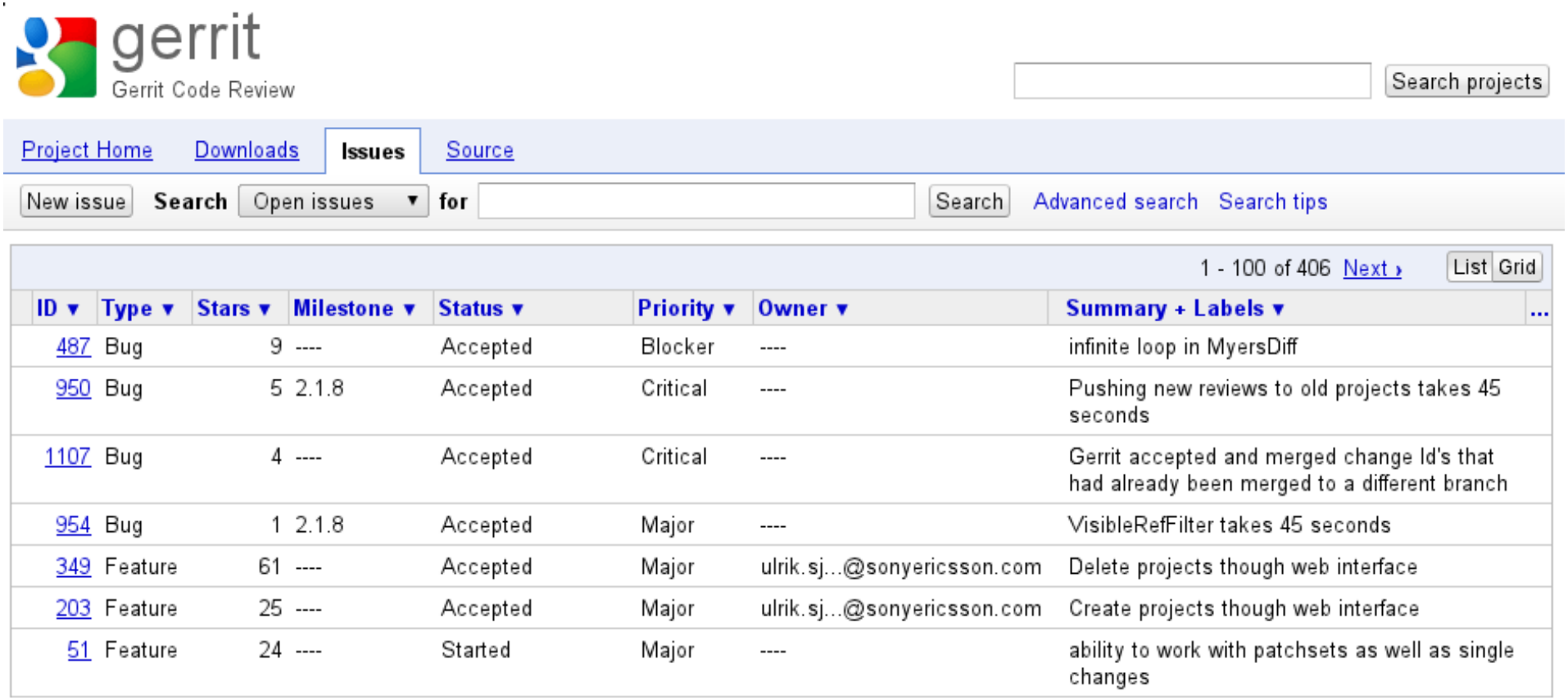
Multiple jobs with the same trigger criteria



Investigate the EC2 plugin for burstable testing capacity



Gotchas and Errata



ID	Type	Stars	Milestone	Status	Priority	Owner	Summary + Labels
487	Bug	9	----	Accepted	Blocker	----	infinite loop in MyersDiff
950	Bug	5	2.1.8	Accepted	Critical	----	Pushing new reviews to old projects takes 45 seconds
1107	Bug	4	----	Accepted	Critical	----	Gerrit accepted and merged change Id's that had already been merged to a different branch
954	Bug	1	2.1.8	Accepted	Major	----	VisibleRefFilter takes 45 seconds
349	Feature	61	----	Accepted	Major	ulrik.sj...@sonyericsson.com	Delete projects though web interface
203	Feature	25	----	Accepted	Major	ulrik.sj...@sonyericsson.com	Create projects though web interface
51	Feature	24	----	Started	Major	----	ability to work with patchsets as well as single changes

“Dependencies” in Gerrit

▼ **Dependencies**

	ID	Subject	Owner	Project	Branch	Updated
Depends On						
☆	I613252c2	Minor test (MERGED)	Jenkins Demo	ttyclock	master	Jul 13
Needed By						
	(None)					

Old Version History: Base ▼

▶ **Patch Set 1** 2b46eeeb675841f5e796e2e2910d2eee743c234e

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Old Version History: Base ▼

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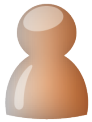
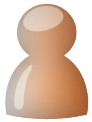
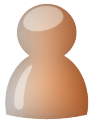


Final Thoughts



Final Thoughts



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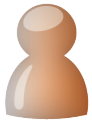

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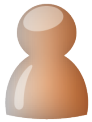

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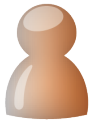

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- Gerrit Trigger Plugin: http://urlenco.de/oyhmac
- These slides (w/ notes): http://urlenco.de/vhqjl
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