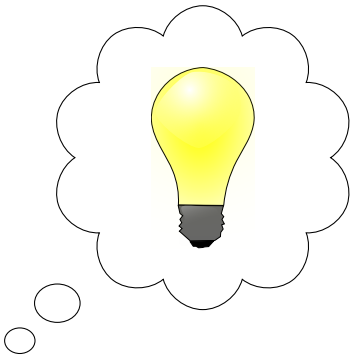
git-series: Tracking the History of History

Josh Triplett
josh@joshtriplett.org

Linux Plumbers Conference 2016




RFC: feature

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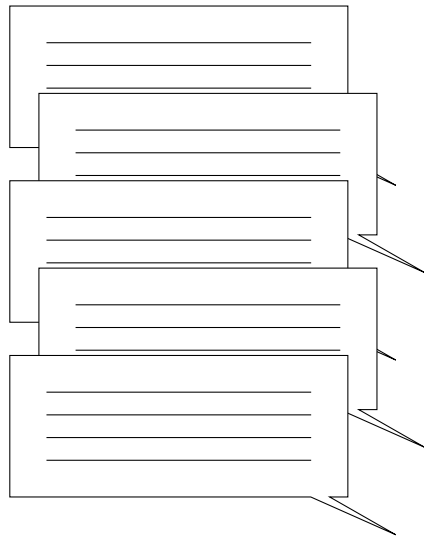


Development

git commit

```
git format-patch -3
```

git format-patch -3

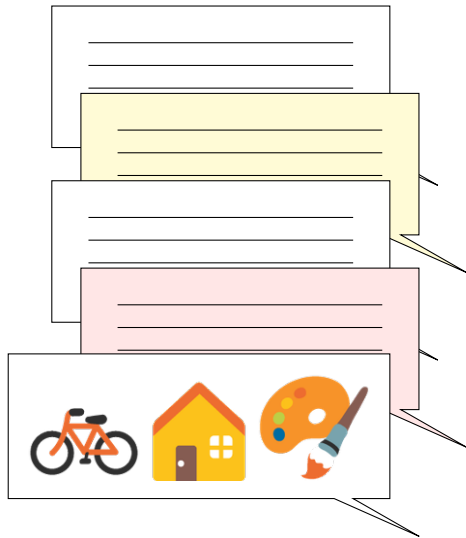
```
[PATCH 1/3] Cleanup and yak shaving
[PATCH 2/3] Implement feature
[PATCH 3/3] Use feature
```

```
git request-pull ...
```

```
git request-pull ...
git hub pull new ...
```

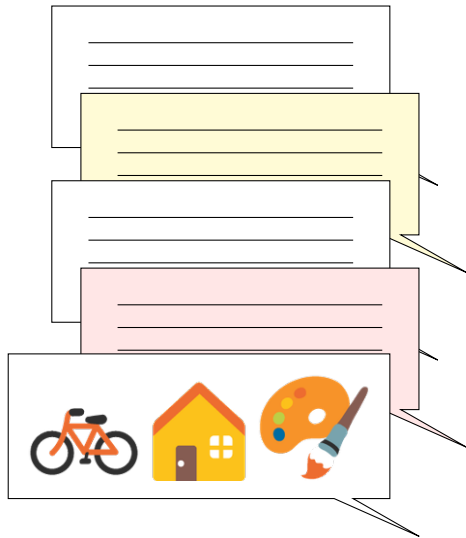
Feedback

- Split cleanup and yak shaving



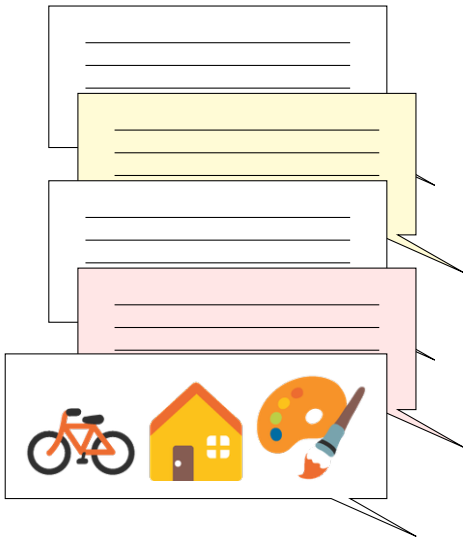
Feedback

- Split cleanup and yak shaving
- Additional use of feature



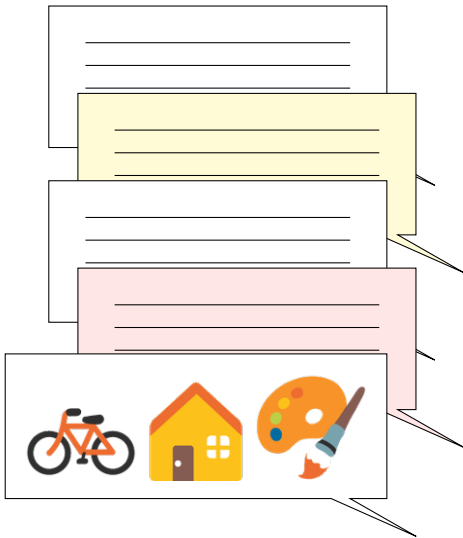
Feedback

- Split cleanup and yak shaving
- Additional use of feature
- Add benchmark data



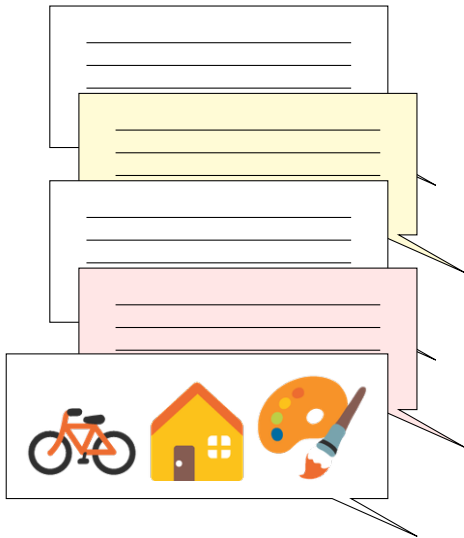
Feedback

- Split cleanup and yak shaving
- Additional use of feature
- Add benchmark data
- Add tests



Feedback

- Split cleanup and yak shaving
- Additional use of feature
- Add benchmark data
- Add tests
- Fix typo



Rewriting history

```
git commit --amend
```

```
git rebase -i
```

“fast-forward” vs “non-fast-forward”

```
git format-patch -v2 -6
```

git format-patch -v2 -6

```
[PATCH v2 1/6] Cleanup
[PATCH v2 2/6] Yak shaving
[PATCH v2 3/6] Implement feature
[PATCH v2 4/6] Tests for feature
[PATCH v2 5/6] Use feature
[PATCH v2 6/6] Use feature elsewhere
```

What about v1?

git reflog

```
mutt -f =Sent
```

Public mailing list archives

Git tracks history

We rewrite history

We need the history of history

git submodule

```
git submodule --  --fthagn
```

Two common solutions

Two common solutions

Pull one of the histories out of git

Pull the patches out of git

quilt patch files

debian/patches/*

```
git rebase -i
```

Pull the history of the patches out of git

Versioned branch names

feature-v1

feature-v1
feature-v2

```
feature-v1
feature-v2
feature-v3-typofix
```

```
feature-v1
feature-v2
feature-v3-typofix
feature-v8-rebased-4.6-alice-fix
```

feature-v1
feature-v2
feature-v3-typofix
feature-v8-rebased-4.6-alice-fix


feature-v8-rebased-4.6-alice-fix.pptx

We have a version control system!

Cover letter

Cover letter

```
[PATCH v2 0/5] feature: summary of new idea
```

Base

Base

```
git format-patch -3
git format-patch -v2 -6
```

Base

```
git format-patch -3
git format-patch -v2 -6
git rebase -i ...
```

Base

```
git format-patch -3
git format-patch -v2 -6
git rebase -i ...
git log
```

Collaboration

“Never rewrite published history”

How can you collaborate on it?

Patch series

Patch series

Feature backport

Patch series

Feature backport

Distribution package

git-series

git-series

- Tracks the history of a patch series

git-series

- Tracks the history of a patch series
- Handles non-fast-forwarding changes

git-series

- Tracks the history of a patch series
- Handles non-fast-forwarding changes
- Tracks a cover letter

git-series

- Tracks the history of a patch series
- Handles non-fast-forwarding changes
- Tracks a cover letter
- Tracks the base of the series

Demo

Internals

Internals

`INTERNALS.md`

https://github.com/git-series/git-series/blob/master/INTERNALS.md

Review of git internals

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- blob (file)

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- tree (directory)

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- tree (directory)
- commit (tree, message, parents)

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- tree (directory)
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- tag

Review of git internals

- blob (file)
- tree (directory)
- commit (tree, message, parents)
- tag
- ref

trees can refer to commits

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“gitlink”

Requirement: Every object must remain reachable by git.

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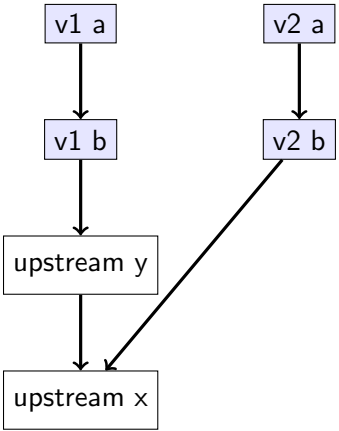
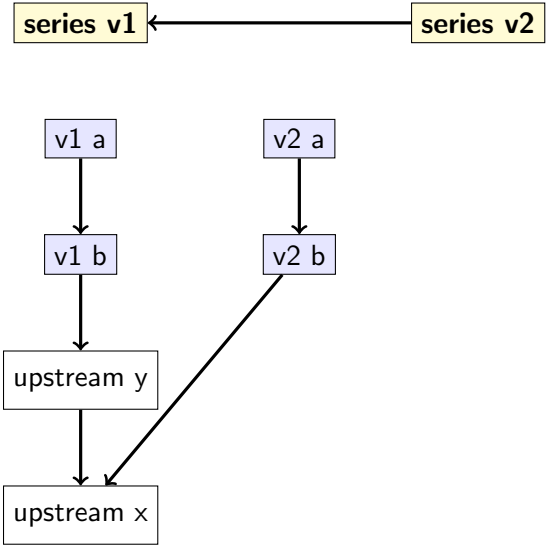
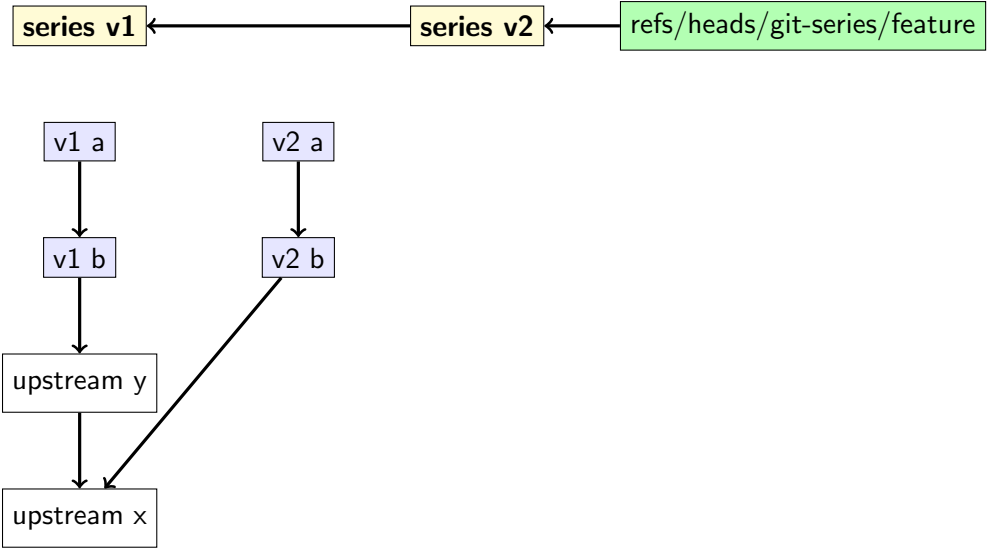
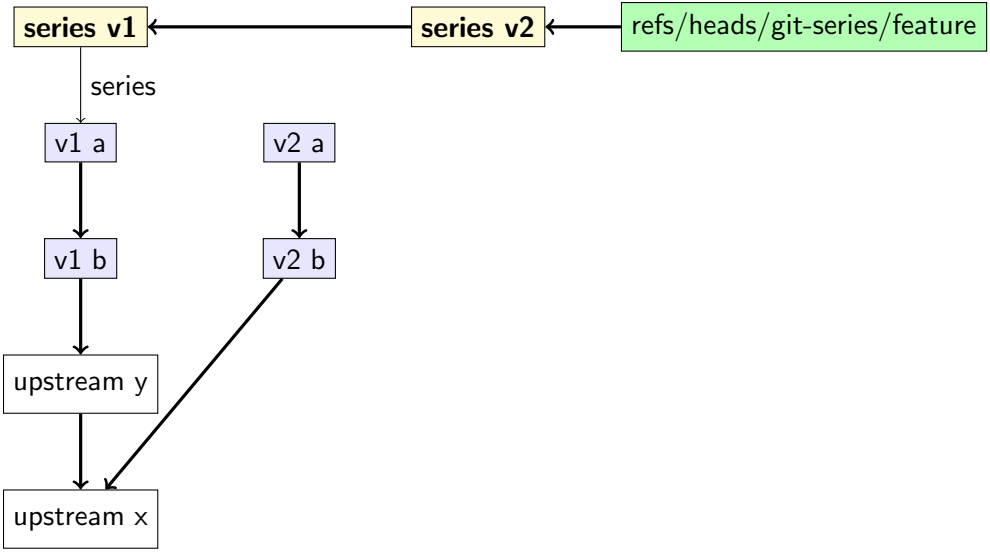
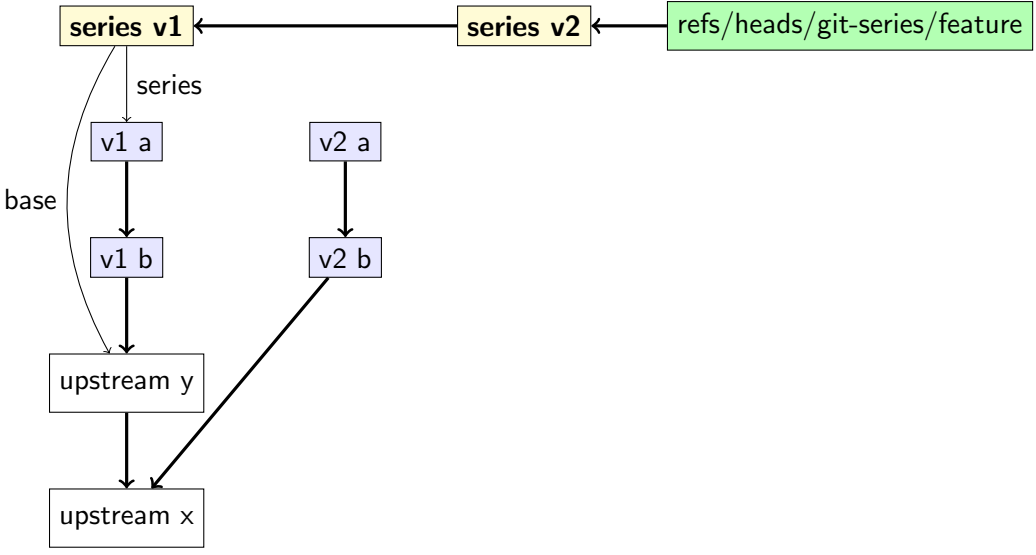
- Required to keep git from pruning objects
- Required for push/pull of series

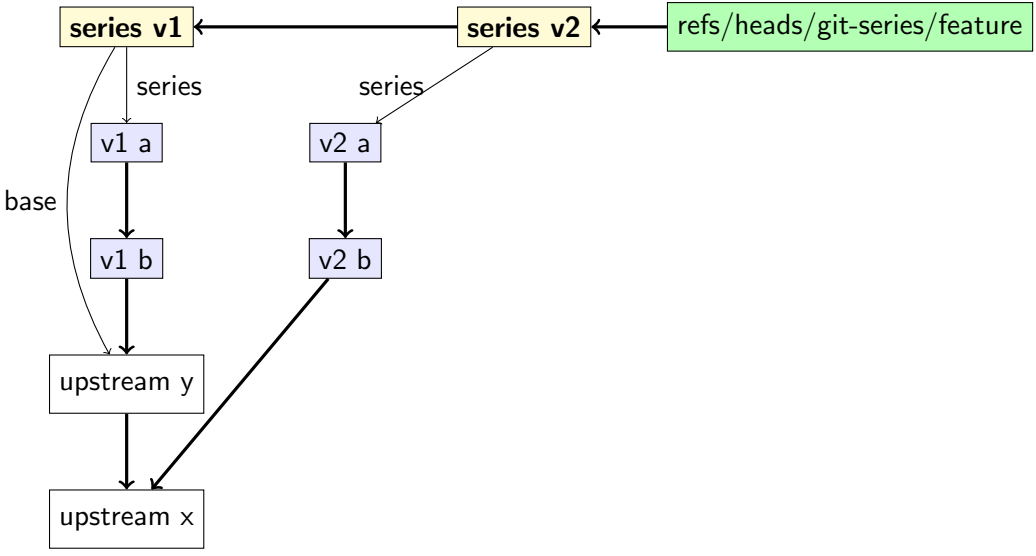

v1 a
v2 a
v1 b
v2 b
upstream y
upstream x

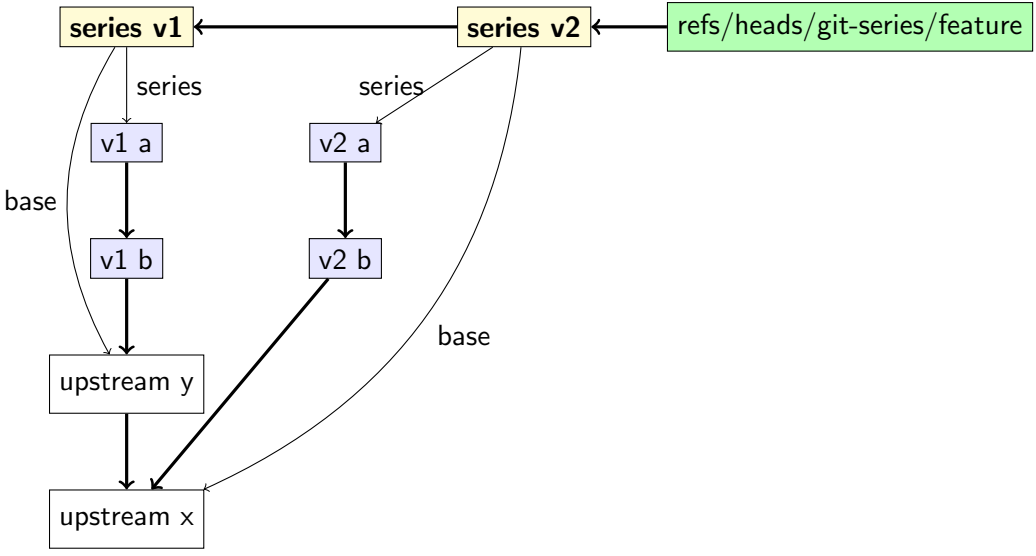

series v1
series v2
v1 a
v2 a
v1 b
v2 b
upstream y
upstream x

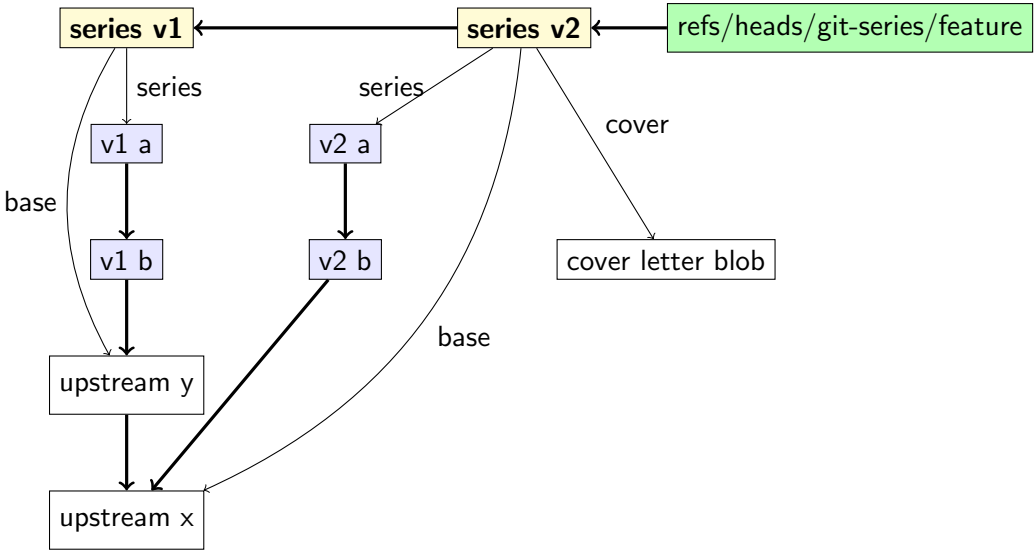

series v1
series v2
refs/heads/git-series/feature
v1 a
v2 a
v1 b
v2 b
upstream y
upstream x


series v1
series v2
refs/heads/git-series/feature
series
v1 a
v2 a
v1 b
v2 b
upstream y
upstream x


series v1
series v2
refs/heads/git-series/feature
series
v1 a
v2 a
base
v1 b
v2 b
upstream y
upstream x


series v1
series v2
refs/heads/git-series/feature
series
series
v1 a
v2 a
base
v1 b
v2 b
upstream y
upstream x


series v1
series v2
refs/heads/git-series/feature
series
series
v1 a
v2 a
base
v1 b
v2 b
base
upstream y
upstream x


series v1
series v2
refs/heads/git-series/feature
series
series
cover
v1 a
v2 a
base
v1 b
v2 b
cover letter blob
base
upstream y
upstream x

- git doesn't follow gitlinks for reachability or push/pull

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- Have to also include "series" as a parent

- git doesn't follow gitlinks for reachability or push/pull
- Have to also include "series" as a parent
- `git-series` ignores that parent when traversing

HEAD $\rightarrow$ Current branch

HEAD $\rightarrow$ Current branch

refs/SHEAD $\rightarrow$ Current series

Working and staged (as seen in status)?

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refs/git-series-internals/working/feature

refs/git-series-internals/staged/feature

Avoiding errors

Long and complex error messages

Long and complex error messages suggest a design flaw

Long and complex error messages
suggest a design flaw

Redesign to make the error impossible

Detach from a series or check out a new series with uncommitted changes to the series (series, base, cover)

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Every series has its own independent working and staged versions

Detach from a series or check out a new series without making any commits

Detach from a series or check out a new series without making any commits

`git series start` makes working/staged

Detach from a series or check out a new series without making any commits

`git series start` makes working/staged "(new, no commits yet)"

Detach from a series or check out a new series without making any commits

`git series start` makes working/staged "(new, no commits yet)"

`git series checkout` works

Long and complex error messages
suggest a design flaw

Redesign to make the error impossible

```
git series rebase
```

```
git series rebase

git rebase --continue
```

Rust and libgit2

https://github.com/git-series/git-series

https://github.com/git-series/git-series

Questions?