

Gerrit User Summit 2018

Gerrit 2.16, 3.0, and Beyond



Dave Borowitz <dborowitz@google.com>

Google

About me: software engineer at Google, currently in Seattle, working on Gerrit for 7 years.

Google runs hosted Gerrit, but we don't fork Gerrit. (We do remove some features, e.g. SSH)

Some of this work is done by Google, some from others in the community, but this is all stuff we want to make available to everyone.

This is not just a list of new features. I've done that talk, it's useful, David Pursehouse told me he assumed that's what I was doing, but I wanted to mix it up.

I want to hit the highlights and show some trends, to hopefully convince you that upgrading is something you want to do.

Out with the old,
in with the new

gerritcodereview.com

Before we get into Gerrit itself, let's take a look at the website.



Gerrit Code Review

[About](#) [Releases](#) [Documentation](#) [Issues](#) [Wiki](#) [Source](#) [Reviews](#) [Builds](#) [Preview our new site design!](#)

Code Review for Git

Gerrit provides web based code review and repository management for the [Git](#) version control system.



Discuss code
and boost your team's code fu by talking about specifics.

Serve Git
as an integrated experience within the larger code review flow.

Manage workflows
with deeply integrated and delegatable access controls.

Download
Gerrit 2.15.3

Discuss code

Read old and new versions of files with syntax highlighting and colored differences. Discuss specific sections with others to make the right changes.

```

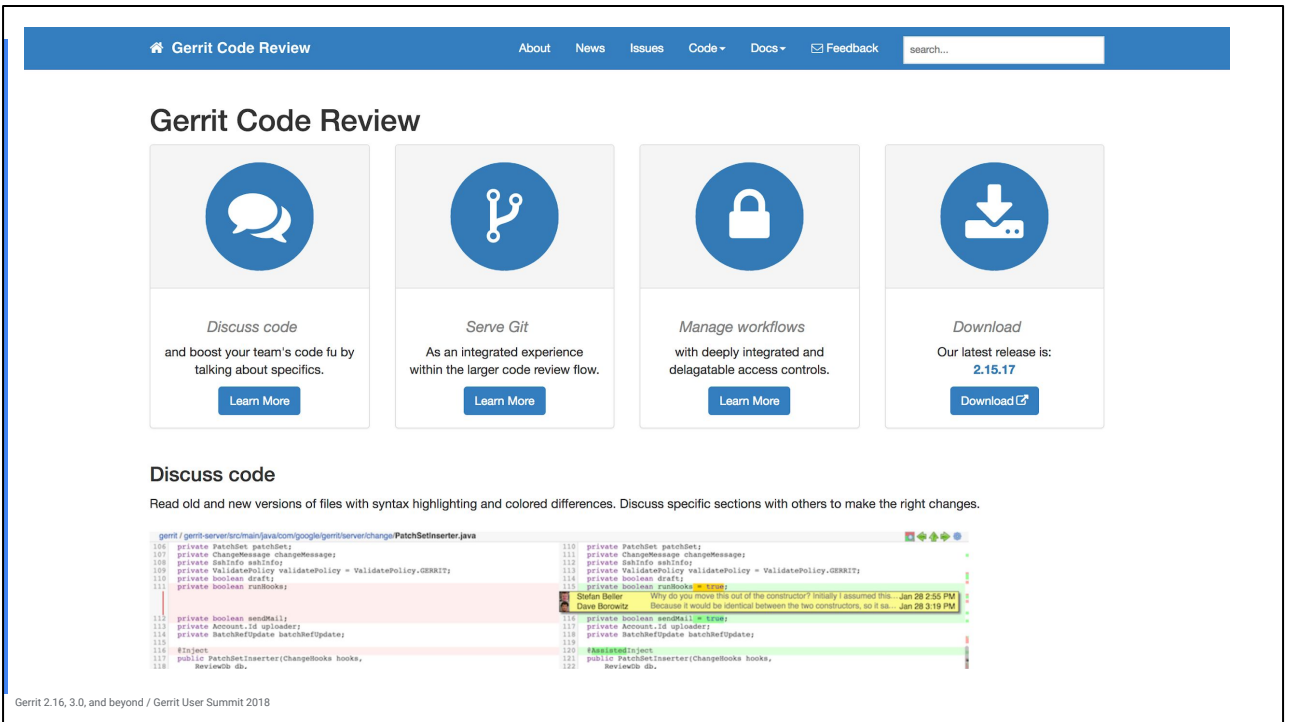
gerrit / gerrit-server/cimany/java/com/google/gerrit/server/change/PatchSetInserter.java
106 private PatchSet patchSet;
107 private ChangeMessage changeMessage;
108 private BatchInfo batchInfo;
109 private ValidatePolicy validatePolicy = ValidatePolicy.GERRIT;
110 private boolean draft;
111 private boolean runHooks;
112
113 private boolean sendMail;
114 private Account id uploader;
115 private BatchMetadata batchMetadata;
116
117 @Inject
118 public PatchSetInserter(ChangeBooks books,
119                       ReviewDb db,
120                       PatchSet patchSet,
121                       ChangeMessage changeMessage,
122                       BatchInfo batchInfo,
123                       ValidatePolicy validatePolicy = ValidatePolicy.GERRIT,
124                       boolean draft,
125                       boolean runHooks,
126                       boolean sendMail,
127                       Account id uploader,
128                       BatchMetadata batchMetadata) {
129     this.patchSet = patchSet;
130     this.changeMessage = changeMessage;
131     this.batchInfo = batchInfo;
132     this.validatePolicy = validatePolicy;
133     this.draft = draft;
134     this.runHooks = runHooks;
135     this.sendMail = sendMail;
136     this.uploader = uploader;
137     this.batchMetadata = batchMetadata;
138 }

```

Manage and serve Git repositories

Gerrit includes Git-enabled SSH and HTTPS servers compatible with all Git clients. Simplify management by hosting many Git repositories together.

Gitiles is nice. Live updating is nice. But this uses custom parser code based on CommonMark, and it's really hard to add new features, to say nothing of custom themes.



Unfortunately this isn't live rendered, but this means we can use a system with a lot more features (Jekyll).

Renders clean static HTML, served from a simple static hosting service (FireBase Hosting).

Additional features it's not feasible to build into Gitiles:

- * Client-side search
- * Dropdowns
- * Navbars
- * Wide variety of well-designed templates.

It's 2018, so we can set up triggers to automatically build and deploy the Jekyll site whenever master is updated (cough, Luca).

Thank you Dave Shevitz, Google Tech Writer. No longer primarily assigned to Gerrit, but since he left the team he already completely redesigned the website template and rendering like, last week.

PolyGerrit

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Google

Sorry, these slides are from 2.16-rc3; I finished them literally minutes before 2.16 final was released.

[All](#) [My](#) [Projects](#) [People](#) [Plugins](#) [Documentation](#)

[Changes](#) [Draft Comments](#) [Edits](#) [Watched Changes](#) [Starred Changes](#) [Groups](#)

Search term Changes: [Search](#) Administrator ▾

Change 12 - Needs Code-Review Label Patch Sets (1/1) Download

Add Sub Navbar Support To Gitiles

This change allows subdirectories to specify their own navbars only when the subnavbar markdown config is specified.

Resolves #148.

Change-Id: I2013bf5798a098f0340e3cf6a0ee91286432edc0

Owner Administrator
 Assignee
 Reviewers
 Project gitiles
 Branch master
 Topic
 Strategy Merge if Necessary
 Uploaded 2 minutes ago
 Hashtags

[Reply...](#) [Code-Review+2](#)

[Cherry Pick](#) [Move Change](#) [Rebase](#) [Abandon](#)
[Delete Change](#) [Follow-Up](#) [Mark Private](#) [Mark Reviewed](#)
[WIP](#)

Related Changes (20) **Submitted Together (12)** **Conflicts With (1)**

- Format all Java files with google-java-format
- Upgrade JGit to 5.1.3.201810200350-r
- Increase severity of DefaultCharset to ERROR
- FakeHttpServletResponse: Explicitly specify charset in Prin...
- Fix missing reference name in JSON output
- Fix Truth dependencies
- Bazel: Consume versions directly from lib-versions.bzl in sk...
- Require minimum Bazel version 0.19.0
- Add Sub Navbar Support To Gitiles**
- Update URL for maven version rules description
- Upgrade JGit to 5.1.2.201810061102-r
- Add note about aligning upgrades of prettify with plugins/git...
- Upgrade bazlets to latest revision on master
- bazlets: Replace native git_repository with skylark rule
- Bazel: Require minimum bazel version 0.17.1
- Add Even Stensberg to .mailmap
- Upgrade protobuf-java to 3.6.1

Author [Robert Liao <robliao@google.com>](#) Oct 24, 2018 6:10 PM
 Committer [Robert Liao <robliao@google.com>](#) Oct 29, 2018 5:40 PM
 Commit e8f7411f27e0dac8096b0fe0c1259f87e402c85
 Parent(s) 6be2680878c47134b47735af87d8322678effdf4
 Change-Id I2013bf5798a098f0340e3cf6a0ee91286432edc0

Files [Open All](#) Diff against: **Base** [Edit](#)

File Path	Comments	Size
<input checked="" type="checkbox"/> Commit Message		
<input type="checkbox"/> java/com/google/gitiles/doc/DocServlet.java	22	<div style="width: 22px; height: 10px; background-color: #4CAF50;"></div>
<input type="checkbox"/> javatests/com/google/gitiles/doc/DocServletTest.java	42	<div style="width: 42px; height: 10px; background-color: #4CAF50;"></div>
	+63, -1	<div style="width: 63px; height: 10px; background-color: #4CAF50;"></div>

History [Expand All](#) [Hide tagged comments](#)

Administrator
 Uploaded patch set 1. 11:09 AM ↔

Powered by [Gerrit Code Review \(2.15.6\)](#) | [Switch to New UI](#) | Press '?' to view keyboard shortcuts

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This looks ancient to me but I'm guessing most people here are most familiar with this interface.

Personally, I don't have a problem with it.

But we've learned that FE devs and UX designers will not touch GWT. Plus, GWT the project won't last forever.

PolyGerrit CHANGES YOUR DOCUMENTATION BROWSE ADMINISTRATOR

★ 12: Add Sub Navbar Support To Gitiles [MORE](#) [CODE-REVIEW+2](#) [REBASE](#) [ABANDON](#)

Updated 9:13 PM [REPLY](#)

Owner Administrator

Assignee Set assignee... Add Sub Navbar Support To Gitiles

Reviewers [ADD REVIEWER](#) This change allows subdirectories to specify their own navbars only when the subnavbar markdown config is specified.

CC [ADD CC](#)

Project [gitiles](#) Resolves #148.

Branch [master](#)

Topic [ADD TOPIC](#) Change-Id: I2813bf5798a898f8348e3cf6a8ee91286432edc8

Strategy Merge if Necessary [EDIT](#)

Hashtags [ADD HASHTAG](#)

Code-Review

Label Status Needs label:
• Code-Review

Relation chain
[Format all Java files with google-java-format](#)
[Upgrade JGit to 5.1.3.201810200350r](#)
[Increase severity of DefaultCharset to ERROR](#)
[FakeHttpServletResponse: Explicitly specify charset in PrintWriter](#)
[Fix missing reference name in JSON output](#)
[Fix Truth dependencies](#)
[Bazel: Consume versions directly from lib:versions.bzl in skylib](#)
[Require minimum Bazel version 0.19.0](#)
 → [Add Sub Navbar Support To Gitiles](#)
[Update URL for maven version rules description](#)
[Upgrade JGit to 5.1.2.201810061102r](#)
[Add note about aligning upgrades of prettify with plugins/gitiles](#)
[Upgrade bazlets to latest revision on master](#)

[SHOW MORE](#)

Files Base → Patchset 1 | e8f7411 | [DOWNLOAD](#) | [Add patchset description](#) [DIFF PREFERENCES](#)

[SHOW DIFFS](#) | [HIDE DIFFS](#) | [Side By Side](#)

▶ Commit message	
▶ M java/com/google/gitiles/doc/DocServlet.java	+21 -1
▶ M javatests/com/google/gitiles/doc/DocServletTest.java	+42 -0
	+63 -1

Messages [EXPAND ALL](#) [SHOW COMMENTS ONLY](#)

Administrator Uploaded patch set 1. 9:13 PM

Powered by [Gerrit Code Review \(2.15.6\)](#) [Send feedback](#) | [Switch to Old UI](#) | Press "?" for keyboard shortcuts

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Still some rough edges here, e.g. dropdown style inconsistency
 In 2.15, change screen looks pretty good but there are still a chunk of missing features. The recommendation is, "if you can't do X in PG, switch back to GWT".

Gerrit CHANGES YOUR DOCUMENTATION BROWSE

ADMINISTRATOR

Active 12: Add Sub Navbar Support To Gittiles

CODE-REVIEW+2 REBASE ABANDON EDIT

Updated 9:13 PM

Owner Administrator

Assignee Set assignee...

Reviewers ADD REVIEWER

CC ADD CC

Repo gittiles

Branch master

Parent 6be2680

Topic ADD TOPIC

Strategy Merge if Necessary

Hashtags ADD HASHTAG

Code-Review No votes.

REPLY

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EDIT

Relation chain

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- Add Even Stensberg to _mailmap
- Upgrade protobuf-java to 3.6.1
- Upgrade guava to 26.0-jre
- Developer guide: Update command to invoke google-java-format
- chore: revise developer guide

Submitted together

- gittiles: master: Add Sub Navbar Support To Gittiles

SHOW MORE

Files Base → Patchset 1 → e8f7411 ADD PATCHSET DESCRIPTION UPDATE CHANGE DOWNLOAD EXPAND ALL

Commit message

M	java/com/google/gittiles/doc/DocServlet.java	+21	-1
M	javatests/com/google/gittiles/doc/DocServletTest.java	+42	-0
		+63	-1

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Notable changes:

- * Material Design
- * Redesigned submit requirements (label status)
- * Adjust whitespace/layout (which is a constant battle)
- * PolyGerrit -> Gerrit
- * Not pictured: inline edit with CodeMirror plugin
- * Update Change button

Instead of just porting features over, this one has had involvement with our UX design team (arnabb@)

Plus...

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☆ Active 12: Add Sub Navbar Support To Gittiles CODE-REVIEW+2 REBASE ABANDON EDIT

Updated 9:13 PM

Owner Administrator

Assignee Set assignee...

Reviewers ADD REVIEWER

CC ADD CC

Repo gittiles

Branch master

Parent 6be2680

Topic ADD TOPIC

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Code-Review No votes.

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- [Developer guide: Update command to invoke google-java-format](#)

SHOW MORE

Files Base Patchset 1 e8f7411 ADD PATCHSET DESCRIPTION UPDATE CHANGE DOWNLOAD EXPAND ALL

Commit message

M	java/com/google/gittiles/doc/DocServlet.java	+21	-1
M	javatests/com/google/gittiles/doc/DocServletTest.java	+42	-8
		+63	-1

Change Log Comment Threads

Only comments EXPAND ALL

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Thanks Kasper (from Lund hackathon)

Gerrit CHANGES YOUR DOCUMENTATION BROWSE

ADMINISTRATOR

Active 12: Add Sub Navbar Support To Gittiles

CODE-REVIEW+2 REBASE ABANDON EDIT

Updated 9:13 PM

Owner Administrator

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Repo gittiles

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SHOW MORE

Files Base → Patchset 1 e8f7411 ADD PATCHSET DESCRIPTION UPDATE CHANGE DOWNLOAD EXPAND ALL

Commit message

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M	javatests/com/google/gittiles/doc/DocServletTest.java	+42	-0
		+63	-1

Change Log Comment Threads

Gerrit 2.16, 3.0, and beyond / Gerrit User Summit 2018

Changes in 3.0 are more modest. Some UI tweaks but not as many. 3.0 is more about GWT parity in the long tail of features (e.g. plugin provided settings).

My Reviews

Subject	Status	Owner	Project	Branch	Updated	Size	CR																																																																																																																	
Work in progress																																																																																																																								
<i>(None)</i>																																																																																																																								
Outgoing reviews																																																																																																																								
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Subject	Status	Owner	Assignee	Project	Branch	Updated	Size	CR
Work in progress								
No changes								
Outgoing reviews								
▶ ★ Format all Java files with google-java-format		Administrator		gitlees	master	9:13 PM	+3, -6	
★ Upgrade JGit to 5.1.3.201810200350-r		Administrator		gitlees	master	9:13 PM	+5, -5	
★ Increase severity of DefaultCharset to ERROR		Administrator		gitlees	master	9:13 PM	+1, -1	
★ FakeHttpResponse: Explicitly specify charset in PrintWriter		Administrator		gitlees	master	9:13 PM	+7, -2	
★ Fix missing reference name in JSON output		Administrator		gitlees	master	9:13 PM	+13, -1	
★ Fix Truth dependencies		Administrator		gitlees	master	9:13 PM	+25, -3	
★ Bazel: Consume versions directly from lib:versions.bzl in skylib		Administrator		gitlees	master	9:13 PM	+1, -1	
★ Require minimum Bazel version 0.19.0		Administrator		gitlees	master	9:13 PM	+2, -2	
★ Add Sub Navbar Support To Gitlees		Administrator		gitlees	master	9:13 PM	+63, -1	
★ Update URL for maven version rules description		Administrator		gitlees	master	9:13 PM	+1, -1	
★ Upgrade JGit to 5.1.2.201810061102-r		Administrator		gitlees	master	9:13 PM	+5, -5	
★ Add note about aligning upgrades of prettify with plugins/gitlees		Administrator		gitlees	master	9:13 PM	+1, -8	
★ Upgrade bazlets to latest revision on master		Administrator		gitlees	master	9:13 PM	+1, -1	
★ bazlets: Replace native git_repository with skylark rule		Administrator		gitlees	master	9:13 PM	+3, -1	
★ Bazel: Require minimum bazel version 0.17.1		Administrator		gitlees	master	9:13 PM	+13, -8	
★ Add Even Stensberg to .mailmap		Administrator		gitlees	master	9:13 PM	+2, -1	
★ Upgrade protobuf-java to 3.6.1		Administrator		gitlees	master	9:13 PM	+2, -2	
★ Upgrade guava to 26.0-jre		Administrator		gitlees	master	9:13 PM	+2, -2	
★ Developer guide: Update command to invoke google-java-format		Administrator		gitlees	master	9:13 PM	+1, -1	
★ chore: revise developer guide		Administrator		gitlees	master	9:13 PM	+2, -2	
Incoming reviews								
No changes								
Recently closed								

Subject	Status	Owner	Assignee	Repo	Branch	Updated	Size	CR
Outgoing reviews								
☆ Format all Java files with google-java-format	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Upgrade JGit to 5.1.3.201810200350-r	--	Administrator	--	gitle	master	9:13 PM	S	
☆ Increase severity of DefaultCharset to ERROR	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ FakeHttpResponse: Explicitly specify charset in PrintWriter	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Fix missing reference name in JSON output	--	Administrator	--	gitle	master	9:13 PM	S	
☆ Fix Truth dependencies	--	Administrator	--	gitle	master	9:13 PM	S	
☆ Bazel: Consume versions directly from lib:versions.bzl in skylib	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Require minimum Bazel version 0.19.0	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Add Sub Navbar Support To Gitle	--	Administrator	--	gitle	master	9:13 PM	M	
☆ Update URL for maven version rules description	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Upgrade JGit to 5.1.2.201810061102-r	--	Administrator	--	gitle	master	9:13 PM	S	
☆ Add note about aligning upgrades of prettify with plugins/gitle	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Upgrade bazlets to latest revision on master	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ bazlets: Replace native.git_repository with skylark rule	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Bazel: Require minimum bazel version 0.17.1	--	Administrator	--	gitle	master	9:13 PM	S	
☆ Add Even Stensberg to .mailmap	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Upgrade protobuf-java to 3.6.1	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Upgrade guava to 26.0-jre	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Developer guide: Update command to invoke google-java-format	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ chore: revise developer guide	--	Administrator	--	gitle	master	9:13 PM	XS	
Incoming reviews								
No changes								

Gerrit CHANGES YOUR DOCUMENTATION BROWSE

ADMINISTRATOR

Subject	Status	Owner	Assignee	Repo	Branch	Updated	Size	CR
Outgoing reviews								
☆ Format all Java files with google-java-format	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Upgrade JGit to 5.1.3.201810200350-r	--	Administrator	--	gitle	master	9:13 PM	S	
☆ Increase severity of DefaultCharset to ERROR	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ FakeHttpResponse: Explicitly specify charset in PrintWriter	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Fix missing reference name in JSON output	--	Administrator	--	gitle	master	9:13 PM	S	
☆ Fix Truth dependencies	--	Administrator	--	gitle	master	9:13 PM	S	
☆ Bazel: Consume versions directly from lib:versions.bzl in skylib	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Require minimum Bazel version 0.19.0	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Add Sub Navbar Support To Gitle	--	Administrator	--	gitle	master	9:13 PM	M	
☆ Update URL for maven version rules description	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Upgrade JGit to 5.1.2.201810061102-r	--	Administrator	--	gitle	master	9:13 PM	S	
☆ Add note about aligning upgrades of prettify with plugins/gitle	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Upgrade bazlets to latest revision on master	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ bazlets: Replace native.git_repository with skylark rule	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Bazel: Require minimum bazel version 0.17.1	--	Administrator	--	gitle	master	9:13 PM	S	
☆ Add Even Stensberg to .mailmap	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Upgrade protobuf-java to 3.6.1	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Upgrade guava to 26.0-jre	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ Developer guide: Update command to invoke google-java-format	--	Administrator	--	gitle	master	9:13 PM	XS	
☆ chore: revise developer guide	--	Administrator	--	gitle	master	9:13 PM	XS	
Incoming reviews								
No changes								

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So yeah, 3.0 is pixel-identical to 2.16.

Notice a trend: less chrome surrounding the dashboard, so your content is more front and center. This allows us to add whitespace to make things slightly less cramped without actually changing the amount of content on any one screen.

This is the dashboard for an obviously experienced user. But what about inexperienced users?

Gerrit [CHANGES](#) [YOUR](#) [DOCUMENTATION](#) [BROWSE](#)

JANE DOE

Subject	Status	Owner	Assignee	Repo	Branch	Updated	Size	CR
Outgoing reviews								
 <p>Push your first change for code review Pushing a change for review is easy, but a little different from other git code review tools. Click on the 'Create Change' button and follow the step by step instructions.</p> <p>CREATE CHANGE</p> <p>No outgoing changes yet</p>								
Incoming reviews								
☆ Format all Java files with google-java-format	--	Administrator	--	gitiles	master	11:30 PM	XS	
CCed on								
No changes								
Recently closed								
No changes								

Powered by [Gerrit Code Review](#) (2.16-rc3-165-gcc730b6fd4) [Send feedback](#) | [Switch to Old UI](#) | Press "?" for keyboard shortcuts

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Actually, something did change!

Subject Status Owner Assignee Repo Branch Updated Size CR

Outgoing reviews



Push your first change for code review
Pushing a change for review is easy, but a little different from other git code review tools. Click on the 'Create Change' button and follow the step by step instructions.

[CREATE CHANGE](#)

No outgoing changes yet

Incoming reviews

☆	Format all Java files with google-java-format	gitiles	master	11:30 PM	XS
	CCed on				
	No changes				
	Recently closed				
	No changes				

Create change

Repository: gitiles > Branch: master

If you haven't done so, you will need to clone the repository.

[CANCEL](#) [VIEW COMMANDS](#)

Subject Status Owner Assignee Repo Branch Updated Size CR

Outgoing reviews



Push your first change for code review

Pushing a change for review is easy, but a little tricky if you are not familiar with the review tools. Click on the 'Create Change' button for instructions.

[CREATE CHANGE](#)

No outgoing changes yet

Incoming reviews

☆ Format all Java files with google-java-format

CCed on

No changes

Recently closed

No changes

Create change commands

1. Make the changes to the files on your machine
2. If you are making a new commit use

```
$ git commit
```

Or to amend an existing commit use

```
$ git commit --amend
```

Please make sure you add a commit message as it becomes the description for your change.

3. Push the change for code review

```
$ git push origin HEAD:refs/for/master
```

4. Close this dialog and you should be able to see your recently created change in "Outgoing changes" section on "Your changes" page.

DONE

gitiles master 11:30 PM XS

NoteDb

NoteDb

Simplicity

- All data stored in one place (git)
- No more database management

Consistency

- Replication natively includes code review data
- Atomic backups are as easy as "git clone --mirror"

Auditability

- No mutable records; every modification is a git change
- Every action is logged.

Extensibility

- Plugins can add new fields
- ...eventually

New Features (really!)

- Federation
- Interoperation

I continue to copy and paste this slide from older presentations.
But now it's real! Really real!

Also since last time: one of our partners is doing actual federation, copying review data from a googlesource.com site to their own site (with more plugins)

Go project has a tool called maintnr that bypasses the whole REST API to use an in-memory copy of NoteDb data

The best part is I didn't know about either of these products a month ago. People are using this tool in ways I hadn't envisioned.

NoteDb

```
$ git log --no-decorate refs/changes/12/12/meta
commit 7c614f3cbf8e5e37b195bcf824828e1d24815f39
Author: Administrator <1000000@321034a2-38e6-4248-9d0d-32d2f31e68c6>
Date:   Wed Nov 14 21:13:23 2018 -0800
```

Create change

Uploaded patch set 1.

```
Patch-set: 1
Change-id: I2013bf5798a098f0340e3cf6a0ee91286432edc0
Subject: Add Sub Navbar Support To Gitiles
Branch: refs/heads/master
Status: new
Topic:
Commit: e8f7411f27fe0dac8096b0fe0c1259f87e402c85
Tag: autogenerated:gerrit:newPatchSet
Groups: 966c93a524cdb445545b6f50be8e1633759966c1
Private: false
Work-in-progress: false
```

NoteDb happened

Production ready in 2.15; Google has been using in production for ~1.5 years.
Online or offline migration in 2.16; still stores a tiny bit of data in ReviewDb
3.0 will not know how to talk to a database.

Submit Rules

Prolog

```
submit_rule(submit(R)) :-
    Gerrit:unresolved_comments_count(0),
    !,
    Gerrit:uploader(U),
    R = label('All-Comments-Resolved', ok(U)).

submit_rule(submit(R)) :-
    Gerrit:unresolved_comments_count(U),
    U > 0,
    R = label('All-Comments-Resolved', need(_)).
```

Show of hands: who **enjoys** writing Prolog rules? Or better yet, debugging them?
And that's assuming you aren't writing your own predicates.
I can squint at this and sort of figure out what it does: if there are no unresolved comments, the "All-Comments-Resolved" label is ok, if it's >0, then it's needed
But if you asked me to write this from scratch...

Java!?

Proprietary + Confidential

```
public class NoUnresolvedCommentsRule implements SubmitRule {
    private static final SubmitRequirement REQUIREMENT =
        SubmitRequirement.builder()
            .setType("unresolved_comments")
            .setFallbackText("Resolve all comments")
            .build();

    @Override
    public Collection<SubmitRecord> evaluate(ChangeData cd, SubmitRuleOptions options) {
        Integer unresolvedComments = cd.unresolvedCommentCount();
        SubmitRecord sr = new SubmitRecord();
        sr.requirements = Collections.singletonList(REQUIREMENT);
        sr.status =
            unresolvedComments == null || unresolvedComments > 0
            ? SubmitRecord.Status.NOT_READY
            : SubmitRecord.Status.OK;
        return ImmutableList.of(sr);
    }
}
```

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Google

Ok, sorry, this is Java so it's a little verbose. But the logic is transparent!
And with scripting plugins these can be even simpler, written in Groovy (as Luca reminded me yesterday).
Don't want to steal Han-Wen's thunder, he will talk much more about this in his talk.
(2.16)

Logging

Flogger

Proprietary + Confidential

```
} catch (IOException e) {  
    log.warn("cannot update description of " + project.getName(), e);  
}
```

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Google

This is more exciting to developers like me who can never remember how to use the slf4j API.

Huge thanks to Edwin for all the migration work, including adding some new features to the Flogger project

I don't
(2.16)

Flogger

Proprietary + Confidential

```
} catch (IOException e) {  
    logger.atWarning().withCause(e).log("cannot update description of %s", project);  
}
```

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Google

Ok, that wasn't very exciting. What is more exciting is the new features Flogger enables.

Request Tracing

Proprietary + Confidential

```
$ curl 'http://myserver/a/changes/12/suggest_reviewers?trace=bug/123&q=A'
```

```
logger.atFine().log("Base reviewer scores: %s", reviewerScores);
```

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Google

A user files bug #123 complaining about latency of reviewer auto-completion. You can get more information than you would ever want about the latency!

Request Tracing

Proprietary + Confidential

```
TRACE com.google.gerrit.metrics.Timer1 : query/query_latency (changes) took 10ms [CONTEXT
forced=true TRACE_ID="bug/123" ]
TRACE com.google.gerrit.metrics.Timer0 : query/query_latency_total took 10ms [CONTEXT forced=true
TRACE_ID="bug/123" ]
TRACE com.google.gerrit.metrics.Timer0 : query/query_latency/changes took 10ms [CONTEXT forced=true
TRACE_ID="bug/123" ]
DEBUG com.google.gerrit.server.restapi.change.ReviewerRecommender : Base reviewer scores:
{1000000=30.0} [CONTEXT forced=true TRACE_ID="bug/123" ]
DEBUG com.google.gerrit.server.restapi.change.ReviewerRecommender : Reviewer scores: {1000000=30.0}
[CONTEXT forced=true TRACE_ID="bug/123" ]
DEBUG com.google.gerrit.server.restapi.change.ReviewerRecommender : Remove change owner 1000000
[CONTEXT forced=true TRACE_ID="bug/123" ]
DEBUG com.google.gerrit.server.restapi.change.ReviewerRecommender : Sorted suggestions: [] [CONTEXT
forced=true TRACE_ID="bug/123" ]
TRACE com.google.gerrit.metrics.Timer0 : reviewer_suggestion/recommend_accounts took 51ms [CONTEXT
forced=true TRACE_ID="bug/123" ]
```

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Google

Just search for "bug/123" in your logs!

Because of this feature we are able to add **much** more detailed logging, which is there only when you want it.

- * Every time a plugin is invoked

- * Every time a metric is recorded

- * Every index query

- * etc. It's...possible we now have too much logging, but honestly this is a good problem to have.

Notice that we didn't have to mention tracing at all in the log lines.

Flogger lets you set a per-request logging context which is implicitly logged.

Git Protocol v2

Gerrit 2.16, 3.0, and beyond / Gerrit User Summit 2018

Google

Google's git core team in Sunnyvale drove this work.

Thanks Brandon Williams (core; now at Facebook), Jonathan Tan (JGit)

Git Protocol v2

```
$ GIT_TRACE_PACKET=1 git -c protocol.version=0 ls-remote \
  https://chromium.googlesource.com/chromium/src master 2>&1 | wc
965947 5795683 124688167
```

Git 2.16, 3.0, and beyond / Gerrit User Summit 2018

Google

Historically, the git protocol hasn't been very extensible (long story; like all good C stories, it involves null bytes), so this has made it hard to add new features. What we have today is a few features to entice you to switch, but there are more in store.

You read that right: Chromium has almost 1M refs, and you have to fetch them all just to get the value of "master"

The 124M is inflated; uncompressed size is about half that.

For a no-op fetch of a single branch of Chromium over a slow connection, you just spent 60 MiB of your ISP's bandwidth cap on ref advertisements.

(2.16)

Git Protocol v2

```
$ GIT_TRACE_PACKET=1 git -c protocol.version=2 ls-remote \  
  https://chromium.googlesource.com/chromium/src master 2>&1 | wc  
  49      267     3866
```

More than 1 line in the response due to protocol chatter & the server advertising a small number of ref *prefixes*. But still this is, like, 4 IPv6 packets.

Mail Templates

VTL

```
$fromName has restored this change.**  
*##if($email.changeUrl) ( $email.changeUrl )#end
```

```
Change subject: $change.subject
```

.....

```
#if ($coverLetter)  
$coverLetter
```

```
#end
```

VTL has been deprecated since 2.14; removed in 2.16.
Sorry, this one actually created work for you.

tl;dr:

- * Difficult language to learn, supports arbitrary Java code
- * HTML templating features lack sufficient XSS protection

Soy

```
{template .RestoredHtml}
  <p>
    {$fromName} <strong>restored</strong> this change.
  </p>

  {if $email.changeUrl}
    <p>
      {call .ViewChangeButton data="all" /}
    </p>
  {/if}
{/template}
```

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Google

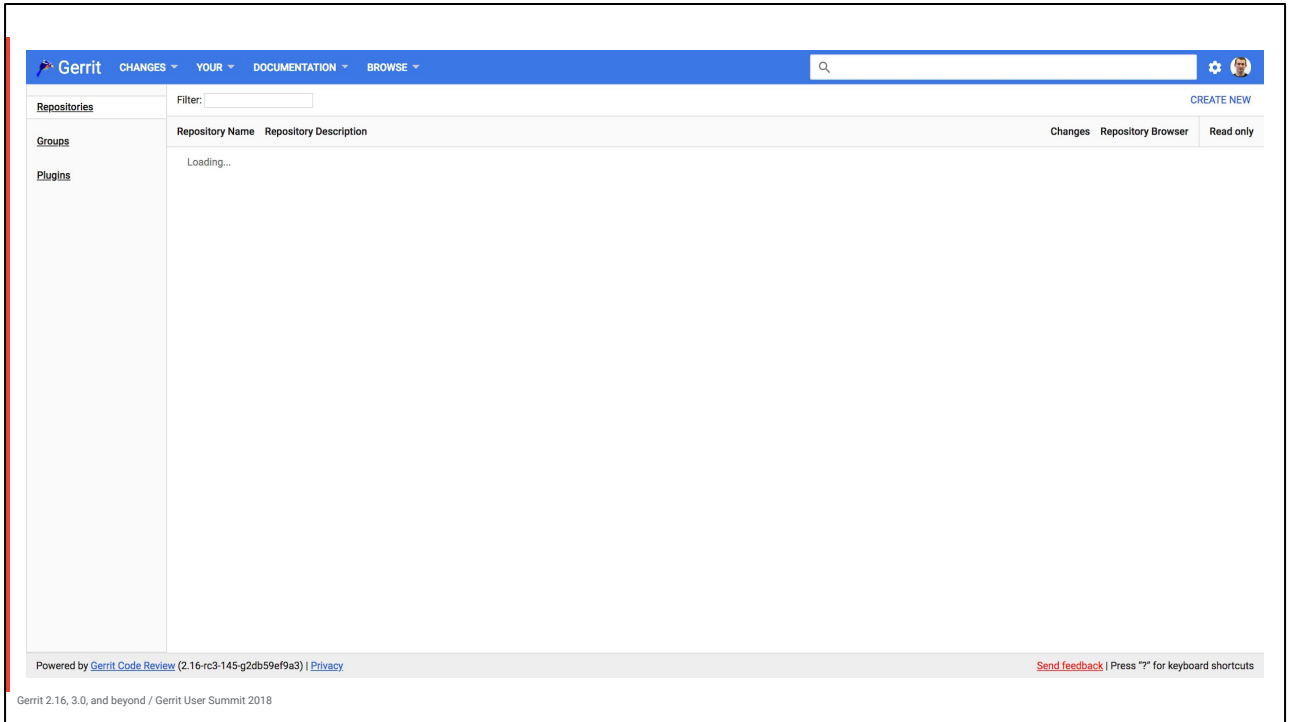
VTL has been deprecated since 2.14; removed in 2.16.
Sorry, this one actually created work for you.

tl;dr:

- * Difficult language to learn, lots of arbitrary Java code
- * HTML templating features lack sufficient XSS protection

Project Index

I'm probably losing your attention so it's back to screenshots.



Who is familiar with this lovely loading screen?

Gerrit CHANGES YOUR DOCUMENTATION BROWSE

Filter:

CREATE NEW

	Repository Name	Repository Description	Changes	Repository Browser	Read only	
Groups	All-Projects	gerrit-review.googlesource.com configuration	(view all)	(gittiles)		
	All-Users	Individual user settings and preferences.	(view all)	(gittiles)		
	Core-Plugins	Parent project for core plugins in Gerrit.	(view all)	(gittiles)		
	Public-Plugins	Parent project for plugins/*	(view all)	(gittiles)		
	Public-Projects	Parent project enabling Anonymous Users read	(view all)	(gittiles)		
	Plugins	apps/analytics-etl	Spark ETL to extra analytics data from Gerrit Projects using the Analytics plugin	(view all)	(gittiles)	
		apps/reviewit	The 'Review It!' app is an Android application for Gerrit that allows sorting of incoming changes and review of small/trivial changes. This is not an official Google product.	(view all)	(gittiles)	
		bazlets	Re-usable building blocks for Bazel build tool	(view all)	(gittiles)	
		buck		(view all)	(gittiles)	
		bucklets	Reusable building blocks for Buck build system.	(view all)	(gittiles)	
		docker-gerrit	Official Docker image of Gerrit Code Review	(view all)	(gittiles)	
		executablewar	Support for running code directly from WAR files	(view all)	(gittiles)	Y
		gcompute-tools	Tools for Google Compute Engine	(view all)	(gittiles)	
		gerrit	Gerrit Code Review	(view all)	(gittiles)	
		gerrit-attic	Aborted experiments and ancient revisions of Gerrit Code Review	(view all)	(gittiles)	Y
gerrit-bug-		(view all)	(gittiles)			

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Now project search is fast even when you don't have the project cache fully loaded. You now only have to size your project cache to the number of projects that are actually used.

What's Next?

Disclaimer: these are my viewpoints; I don't claim to have convinced the community/maintainers that any or all of these *good* ideas.

Now we don't even have screenshots, it's just big words from here on out.

Faster Development

I'm really excited about getting rid of ReviewDb.

We have been holding ourselves back from developing big new features that require substantial DB support because (surprise!) supporting them in both ReviewDb and NoteDb would be too painful.

Lower Support Burden

A lot of my team's time is spent doing user support, triaging bugs, tracking down Prolog errors in logs, etc. This doesn't scale.

We want to figure out which legacy features are causing the most support burden and provide simpler alternatives.

Prolog

Case in point: Prolog rules. I literally cannot help people with Prolog.

Fun fact: we had an outage **yesterday** where the internal Android review server was unusable because their prolog rules grew too big for the `rules.maxPrologDatabaseSize` config option. What does that even mean?

Permission Backends

Not everyone needs the rich multi-dimensional ACL system of Gerrit. 90% of users only need 10% of the features (WAG).

Can we scale this back? Maybe. Who knows. But now we have at least factored out an interface that we can implement in different ways, e.g. Role-Based Access Control.

Account Backends

Probably our #1 complaint from new users: "I can't add my coworker as a reviewer because they haven't logged in yet."

Problem is that Gerrit needs to have a local numeric account ID associated with each user.

What if it didn't? What if it just treated everyone on your LDAP server (in a specific group) as a user?

What if preferences were stored as attributes on your LDAP account so they could be shared across Gerrit servers?

CI Integration

Customers **love** creating new custom labels to handle different CI verification steps. Some of our customers have dozens.

But this isn't great:

- * No structured display of build results; bots have to leave comments.
- * UI doesn't scale to 10+ labels.

We can do better.

Polymer 3(?)

We are on Polymer 1. That's EOL in 2019.

Polymer 2+3 are each migrations that will take up the PG team's time.

The new hotness, recommended by the Polymer team, is LitElement.

Or maybe we should be moving to some other framework. Welcome to the JavaScript treadmill.

Onboarding

Getting people to grok Change-Ids and interactive rebases is tough.

Right now you kind of have to be a "git expert" to use Gerrit effectively.

We want to flesh out in-product help, tutorials, and better concept documentation.

You can tell we're a bunch of developers because by far the best documentation we have is our REST API docs.

Branch Review?

Gerrit is strongly opinionated that each commit is a completed thought.

But even within this framework, sometimes it makes sense to review multiple commits as a single unit.

The only way to do this today by reviewing merge changes, but they can be tough to create and work with (even more so than normal series).

Do we want something more like GitHub pull requests?

Can we achieve that while keeping Gerrit, Gerrit?

Thanks!

Maintainers are coming up so you can ask questions about these topics or anything else.