Checks in Gerrit

First-class CI integration in Gerrit

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Agenda

- Motivation
- Concept: Checks in Gerrit
- Outlook
Currently: How to integrate CI systems?

- “Use labels”
  - Configurable
  - Support permission/submit blocking
- “Build a plugin [on top of labels.]”
  - Task
  - Verify-status
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<th>Assignee</th>
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Labels, at Google scale
Labels & comments at scale

UI: How to rerun?
- Remove label vote (condition: granted global capability)
- Post comment

UI: Many change messages
- **Overview**?
- Redesign message list?

Infra: many change messages
- Parse commits
- Change notes cache $O(message^2)$ memory
Demanding customers build plugins
Checks in Gerrit

<table>
<thead>
<tr>
<th>Files</th>
<th>Checks</th>
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Latest checks for Patchset 1

<table>
<thead>
<tr>
<th>Name</th>
<th>For submit</th>
<th>Status</th>
<th>Started</th>
<th>Duration</th>
<th>View log</th>
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<td>Successful</td>
<td>-</td>
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<td>View log</td>
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<td>Code Style</td>
<td>Optional</td>
<td>Successful</td>
<td>-</td>
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<td>View log</td>
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Configuration

Why configuration?

What to configure?
- Name, description, ...
- Repository
- Query
- Required/Optional
System interaction

Gerrit

CI system

(Trigger event)

Query for pending checks

(Get further change details)

Schedule checks
System interaction

For each pending check
Set state to “running”
Provide further details (e.g. link)

Fetch commit via Git

Update details (e.g. new link)

Set state to “success” or “failure”
Update further details (e.g. link to result)
Check states

- not started
- scheduled
- running
- successful
- failed
- not relevant

Re-run
Checks in Gerrit

Why this design?

- Flexibility + Extensibility
- Robust against lost events
- Performance
- Scalability
  - We want to support 100s of analyzers
- Stored in Git refs, a la NoteDb
- Support of analyzers
  - Robot comments
  - Suggested fixes
Future plans

My CI/analyzer system determines the checks on the fly!

→ Sub-checks
  * On-the-fly checks → very flexible
  * Only one configured check for CI/analyzer system
  * Caveats
    - No details directly after patch set upload or after re-run
    - More data to send (e.g. name, description, ... for every patch set)
    - Less configurability in Gerrit
Future plans

Optimizations (e.g. caches, parallel updates, trigger event)

Bypass blocking checks in emergencies

Copy-over check results

Proper support for analyzers → robot comments
  ● Associate checks ↔ robot comments
  ● Reconsider some behaviors of robot comments (e.g. unresolved ones on older patch sets)
I would like to know ...

Will labels go away?

Humans → labels
Robots → checks

When can I use this?

For testing → right now
For production → depends on needed features

Which Gerrit version is required?

> 3.0.x

Can I start integrating my CI/analyzer system with the new API?

Absolutely!
Questions?