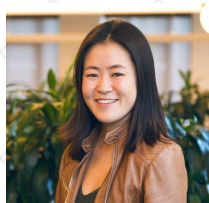


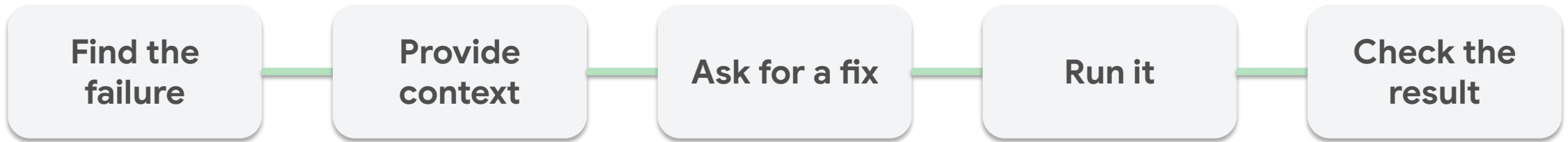


Taking Humans Out of the Build Loop



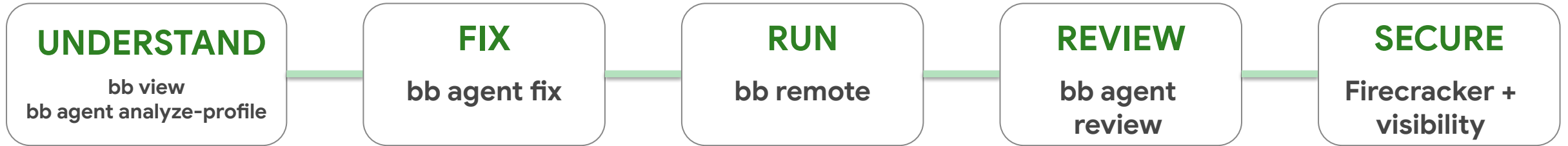
Maggie Lou (she/her)
Software Engineer,
BuildBuddy

Orchestrating agents is still work.



What if the agent could operate the loop itself?

Agent-driven build loop



Goal: Give agents the tools to operate the build loop independently.

Reading build logs

```
$ bb view <invocation-id>
```

```
[→ buildbuddy git:(master) bb view https://app.buildbuddy.io/invocation/ad54d867-cdfd-4016-bac]
a-783f8e83f2f5
===== BUILD LOGS =====
INFO: Invocation ID: ad54d867-cdfd-4016-baca-783f8e83f2f5
INFO: Streaming build results to: https://buildbuddy.buildbuddy.io/invocation/ad54d867-cdfd-40
16-baca-783f8e83f2f5
Computing main repo mapping:
Loading:
Loading: 0 packages loaded
Analyzing: target //enterprise:executor_image (1 packages loaded, 0 targets configured)
Analyzing: target //enterprise:executor_image (1 packages loaded, 0 targets configured)

ERROR: no such package '@@[unknown repo 'erofs_utils_source' requested from @@+git_repository+
com_github_buildbuddy_io_buildbuddy]//file': The repository '@@[unknown repo 'erofs_utils_sour
ce' requested from @@+git_repository+com_github_buildbuddy_io_buildbuddy]' could not be resolv
ed: No repository visible as '@erofs_utils_source' from repository '@@+git_repository+com_gith
ub_buildbuddy_io_buildbuddy'
ERROR: /home/tylerw/.cache/bazel/_bazel_tylerw/0a68226391f72b16f3225575f5267dee/external/+git_
repository+com_github_buildbuddy_io_buildbuddy/enterprise/server/oci/ociconv/BUILD:6:8: no suc
h package '@@[unknown repo 'erofs_utils_source' requested from @@+git_repository+com_github_bu
ilddbuddy_io_buildbuddy]//file': The repository '@@[unknown repo 'erofs_utils_source' requeste
d from @@+git_repository+com_github_buildbuddy_io_buildbuddy]' could not be resolved: No reposi
tory visible as '@erofs_utils_source' from repository '@@+git_repository+com_github_buildbuddy
_io_buildbuddy' and referenced by '@@+git_repository+com_github_buildbuddy_io_buildbuddy//ente
rprise/server/oci/ociconv:erofs_tools'
ERROR: Analysis of target '//enterprise:executor_image' failed; build aborted: Analysis failed
INFO: Elapsed time: 0.933s, Critical Path: 0.05s
INFO: 1 process: 1 internal.
ERROR: Build did NOT complete successfully
FAILED:
→ buildbuddy git:(master) █
```

Teach agents to use
bb view in a skills
file.

Reading build logs

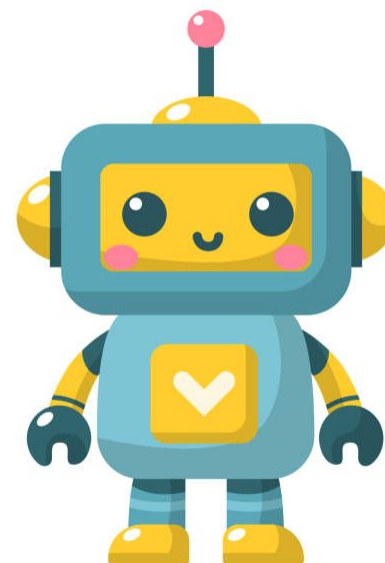
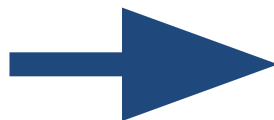
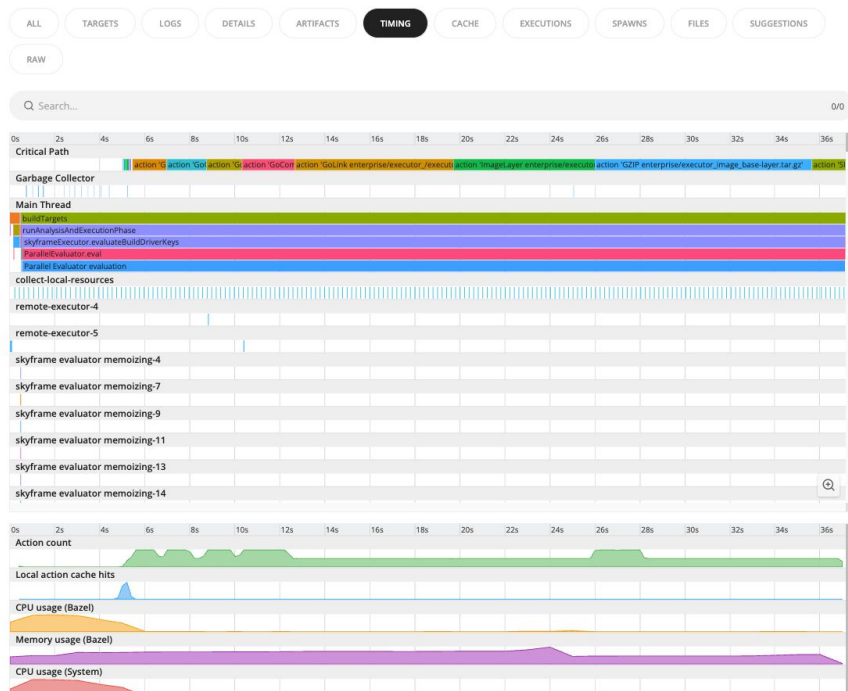
```
$ bb view IID --errors
```

```
$ bb view IID //foo:bar -test_filter=Test_Baz
```

```
[→ buildbuddy git:(master) bb view https://app.buildbuddy.io/invoke/ad54d867-cdfd-4016-bac]
a-783f8e83f2f5 --errors
ERROR: @@[unknown repo 'erofs_utils_source' requested from @@+git_repository+com_github_buildbuddy_io_buildbuddy]//file:file: ANALYSIS_FAILURE: no such package '@@[unknown repo 'erofs_utils_source' requested from @@+git_repository+com_github_buildbuddy_io_buildbuddy]//file': The repository '@@[unknown repo 'erofs_utils_source' requested from @@+git_repository+com_github_buildbuddy_io_buildbuddy]' could not be resolved: No repository visible as '@erofs_utils_source' from repository '@@+git_repository+com_github_buildbuddy_io_buildbuddy'
→ buildbuddy git:(master) █
```

Why was my build slow?

```
$ bb agent analyze-profile IID
```



Give the agent the timing profile — not just the logs.

Timing Breakdown

Phase breakdown

Breakdown of build phases



10m 30s Execution (97%)

15.5s Evaluation (2%)

1.78s Launch (0%)

Execution breakdown

Breakdown totals across all threads



5h 47m Executing remotely (79%)

1h 2m Checking cache hits (14%)

22m 56s Uploading missing inputs (5%)

2m 54s Merkle tree building (1%)

1m 31s Downloading outputs (0%)

772ms Generating stable-status.txt (0%)

106ms Action dependency checking (0%)

11.2ms Detect modified output files (0%)

All events

Sort by [start time](#) | [duration](#) • Group by [thread](#) | [flat](#) • Threads [10](#) | [100](#) | [1000](#) | [10000](#) • Events [10](#) | [100](#) | [1000](#) | [10000](#)

Suggest speedups



Download profile

Critical Path

action 'Expanding template external/llvm++musl+musl_libc/obj/x86_64/include/bits/alltypes_common.h'

0%

11.4ms

action 'Copying files to directory external/llvm++musl+musl_libc/generated/x86_64/includes'

0%

197ms

action 'Writing file external/llvm++llvm_toolchain_minimal+llvm-toolchain-minimal-linux-amd64/module_map.modulemap'

0%

11.0ms

action 'Compiling compiler-rt/lib/builtins/truncsf2.c'

0%

1.95s

action 'Creating static library external/llvm++llvm+llvm-project/compiler-rt/clang_rt.builtins.static/_libclang_rt.builtins.static.a'

0%

66.0ms

action 'Copying file external/llvm++llvm+llvm-project/compiler-rt/clang_rt.builtins.static/_libclang_rt.builtins.static.a'

0%

25.2ms

action 'Copying files to directory external/llvm+/runtimes/resource_directory_default'

0%

90.3ms

action 'Copying files to directory external/llvm+/toolchain/linux_x86_64_cc_toolchain_resource_directory'

0%

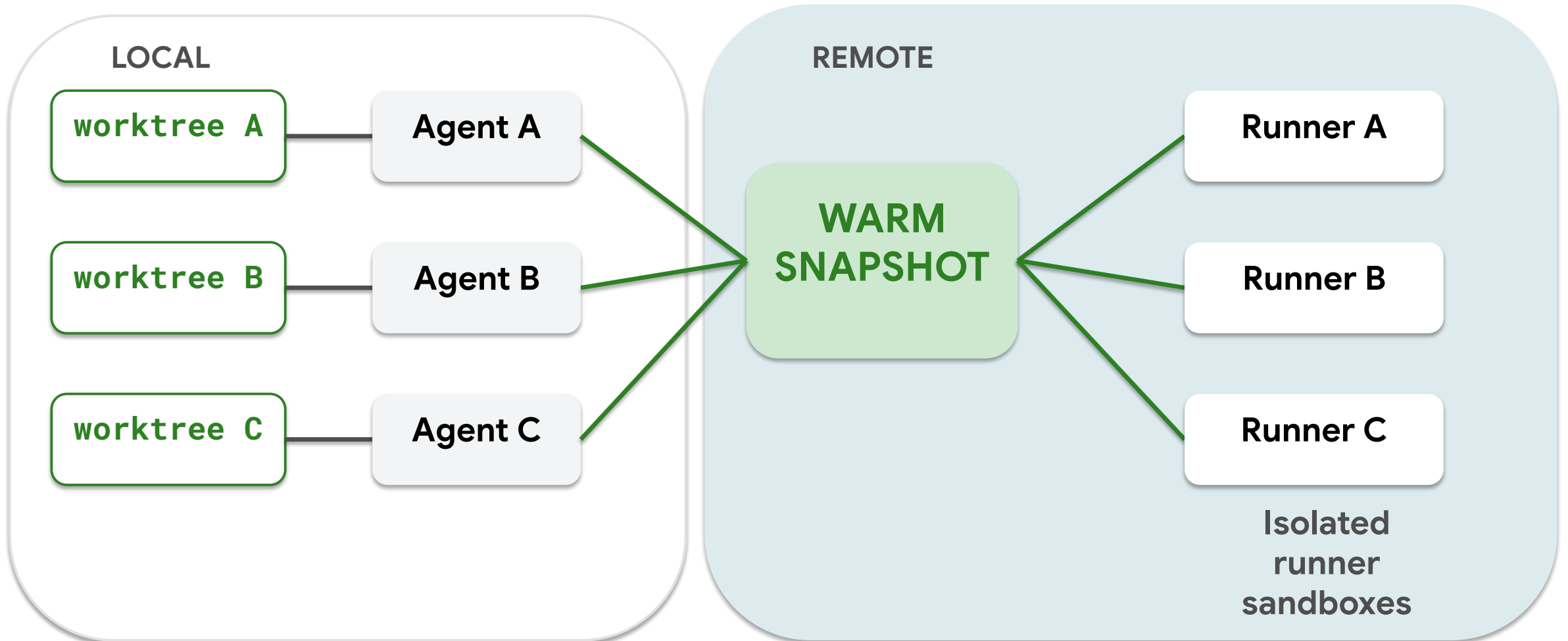
1.07s

action 'GoStdlib external/rules_go+/stdlib/pkg'

622ms

Give every agent its own machine

```
$ bb remote test //...
```



Give every agent its own machine

```
# Runner OS, architecture, image can be easily  
configured.
```

```
$ bb remote --os=darwin --arch=arm64  
--container_image=XXX test //...
```

```
# We support very large runners.
```

```
$ bb remote \  
--runner_exec_properties=EstimatedFreeDiskBytes=100GB \  
--runner_exec_properties=EstimatedMemory=32GB \  
test //...
```

```
# Any bash command is supported.
```

```
$ bb remote --script='echo "Future of builds!"'
```

Reusing bazel's analysis cach x +

youtube.com/watch?v=YycEXBlv7ZA&list=PLxNYx... New Chrome available

YouTube Search

BazelCon

Reusing Bazel's Analysis Cache by Cloning Micro-VMs

Maggie Lou (she/her)
Software Engineer, Buildbuddy
maggie@buildbuddy.com

10X - Tech Talk (de-muc-arp)

0:03 / 27:29

BazelCon 2023
Google Open Source - 9 / 40

Technical
Implementation
bit.ly/bbhow

Product overview
bit.ly/bbremoteconf

Complete agent-driven fixes

```
$ bb agent fix IID
```

```
# Creates a PR or pushes a commit with the changes.
```

```
$ bb agent --push
```

bb view
to read the
error

Recreate the
error

Generate a
patch

Verify the fix

Pull request
/ commit

Complete agent-driven fixes

~/ .bashrc

```
# Pulls the logs for the most recent failing invocation  
on the same git branch
```

```
alias fix="bb agent fix"
```

Instead of opening the logs...

```
$ fix
```

Configuring the agent

```
$ bb agent --agent=claude --model=claude-opus-5-5 fix ...  
$ bb agent --agent=codex --effort=high fix ...
```

Authentication

LOCAL

Uses your existing
agent
subscription

REMOTE RUNNER

Set an agent API
key as a secret in
the runner

Re-run

Compare

Fix

Share

Test

Workflow

September 29th, 2026 at 3:10:40 pm

Failed 3m 32s k8 buildbuddy-io/buildbuddy #13562 testserver-fail-on-race 4333de

Builds from this run

Click a command to see detailed build and test information.

test //... --config=linux-workflows --config=race --config=tests-ci --experimental_enable_execution_graph_log --experimental_execution_graph_log_dep_type=all --experimental_execution_graph_include_change_pruned_actions

3m 25s

Compare

Fix

RUN WITH

Claude

✓ Codex

Copy command to run locally

Docs

SUGGESTIONS

RAW



1 test failed 



Recently flaky

> //cli/test/integration/cli:cli_test

```
cli_test.go:635:
```

```
Error Trace:  cli/test/integration/cli/cli_test.go:635
               cli/test/integration/cli/cli_test.go:472
```

```
Error:        timed out waiting for function to succeed
```

```
Test:        TestBazelBuildWithBuildBuddyServices
```

```
Messages:    last error: scorecard results list is empty?
```

```
FAIL: TestBazelBuildWithBuildBuddyServices (18.25s)
```



- All builds
- Trends
- Drilldown
- Targets
- Tests
- Flakes
- Users
- Repos
- Branches
- Commits
- Hosts
- Executors
- Cache Proxies
- Workflows
- Search
- Quickstart
- Settings
- Usage
- Audit logs
- Docs
- Collapse

BuildBuddy > Builds > Workflow 0e926664-7aeb-4f65-80cd-3f60c4d19e71 > Invocation 63f61d53-bb17-4ece-b955-264db61bde94

Compare, Fix, Share

root's test //... CI September 22nd, 2026 at 3:28:48 pm

Test failed 7m 8s root 192.168.241.2 bazel v9.2.0 test buildbuddy-cli-5.0.478 //... 6,546 targets 1,073 actions 3,926 packages
2 fetches x86_64 fastbuild buildbuddy-io/buildbuddy #13453 agent-auto-update 29e254 Minimal cache Remote execution on
linux-workflow

ALL TARGETS LOGS DETAILS ARTIFACTS TIMING CACHE EXECUTIONS SPAWNS FILES SUGGESTIONS RAW

1 test failed Recently flaky

> //cli/test/integration/cli:cli_test

536.861 seconds

Build logs

Search No results

```
INFO: Checking for file changes...
INFO: Analyzed 3273 targets (3926 packages loaded, 677761 targets configured, 5686 aspect applications).
INFO: //cli/test/integration/cli:cli_test (shard 2 of 4) (Exit 1) (see /root/workspace/output-base/execroot/_main/bazel-out/linux_x86_64-fastbuild/testlogs/cli/test/integration/cli:cli_test/shard_2_of_4/test.log)
INFO: //cli/test/integration/cli:cli_test (shard 2 of 4) (Exit 1) (see /root/workspace/output-base/execroot/_main/bazel-out/linux_x86_64-fastbuild/testlogs/cli/test/integration/cli:cli_test/shard_2_of_4/test_attempts/attempt_1.log)
INFO: //cli/test/integration/cli:cli_test (Summary)
INFO: /root/workspace/output-base/execroot/_main/bazel-out/linux_x86_64-fastbuild/testlogs/cli/test/integration/cli:cli_test/shard_2_of_4/test.log
INFO: /root/workspace/output-base/execroot/_main/bazel-out/linux_x86_64-fastbuild/testlogs/cli/test/integration/cli:cli_test/shard_2_of_4/test_attempts/attempt_1.log
INFO: Found 2585 targets and 688 test targets...
INFO: Elapsed time: 428.568s, Critical Path: 348.87s
INFO: 1073 processes: 44737 action cache hit, 137 remote cache hit, 884 internal, 53 remote.
INFO: Build completed, 1 test FAILED, 1073 total actions
INFO: //cli/test/integration/cli:cli_test FAILED in 2 out of 5 in 312.7s
Stats over 5 runs: max = 312.7s, min = 47.0s, avg = 126.1s, dev = 94.8s
INFO: /root/workspace/output-base/execroot/_main/bazel-out/linux_x86_64-fastbuild/testlogs/cli/test/integration/cli:cli_test/shard_2_of_4/test.log
INFO: /root/workspace/output-base/execroot/_main/bazel-out/linux_x86_64-fastbuild/testlogs/cli/test/integration/cli:cli_test/shard_2_of_4/test_attempts/attempt_1.log
INFO: Executed 7 out of 688 tests: 686 tests pass, 1 fails remotely, and 1 was skipped.
INFO: There were tests whose specified size is too big. Use the --test_verbose_timeout_warnings command line option to see which ones these are.
```



Runner logs

No results



2026-09-23 16:29:28.636 UTC \$ bb agent fix --agent=claude --push 63f61d53-bb17-4ece-b955-264db61bde94

Running agent to fix the failure (this may take a few minutes)...

I fixed the flaky `TestBazelBuildWithBuildBuddyServices` test. The failure reproduced: 2 of 22 attempts failed on the first working run, and 4 of 120 failed on an unmodified baseline. With the fix, the 30-run check passed with retries turned off.

1. ****Root cause:**** By default the CLI's sidecar (the background helper bazel uploads through) sends cache uploads asynchronously. Sometimes an upload landed after the server had already finalized the invocation, so it was never counted in the cache scorecard. That leaves the scorecard empty, and the test's retry loop can't recover.
2. ****Patch:**** The test now passes `--bes\_upload\_mode=wait\_for\_upload\_complete` (`cli/test/integration/cli/cli\_test.go`). This makes the sidecar finish its cache writes and event upload before the build returns, so the uploads are counted when the invocation is finalized.

Commit 843cbf7

 Browse files

 BuildBuddy committed 2 days ago ·  22 / 23

Fix flaky TestBazelBuildWithBuildBuddyServices cache scorecard

By default the CLI sidecar uploads cache writes asynchronously. Some uploads arrived after the server had already finalized the invocation. Those uploads were left out of the cache scorecard, so the scorecard stayed empty and the test's retry loop could not recover.

Pass `--bes_upload_mode=wait_for_upload_complete` in the test. The sidecar then finishes its cache writes and event upload before the build returns, so every upload is counted at finalization.

Verification: without the fix, 4 of 120 runs of the test failed. With the fix, 30 of 30 runs passed with `--flaky_test_attempts=1`.

Co-Authored-By: Claude Opus 5.5 (1M context) <noreply@anthropic.com>

Original failing invocation: 63f61d53-bb17-4ece-b955-264db61bde94

1 parent [29e2540](#) commit 843cbf7 

1 file changed

+3   



Q Search within code



cli/test/integration/cli/cli_test.go  

+3    ...

@@ -452,6 +452,9 @@ sh_binary(name = "nop", srcs = ["nop.sh"]),

452 args = append(args, app.BESBazelFlags()...)

453 args = append(args, app.RemoteCacheBazelFlags()...)

454 args = append(args, "--remote_upload_local_results")

455 uid, err := uuid.NewRandom()

456 require.NoError(t, err)

457 iid := uid.String()

452 args = append(args, app.BESBazelFlags()...)

453 args = append(args, app.RemoteCacheBazelFlags()...)

454 args = append(args, "--remote_upload_local_results")

455 + // Make the sidecar finish cache writes before the invocation
is

456 + // finalized, so that they are reflected in the cache
scorecard.

457 + args = append(args, "--
bes_upload_mode=wait_for_upload_complete")

458 uid, err := uuid.NewRandom()

459 require.NoError(t, err)

460 iid := uid.String()

Run results

[ALL](#)[LOGS](#)[DETAILS](#)[ARTIFACTS](#)[EXECUTIONS](#)[RAW](#)

⬇️ 1 target with artifacts 

steps[1]

[bb-agent-fix-63f61d53-bb17-4ece-b955-264db61bde94.patch](#)  View 42d6d7... 706B



bb-agent-fix-63f61d53-bb17-4ece-b955-264db61bde94.patch

```
1 diff --git a/cli/test/integration/cli/cli_test.go b/cli/test/integration/cli/cli_test.go
2 index a71f5d2..e88417f 100644
3 --- a/cli/test/integration/cli/cli_test.go
4 +++ b/cli/test/integration/cli/cli_test.go
5 @@ -452,6 +452,9 @@ sh_binary(name = "nop", srcs = ["nop.sh"]))`,
6     args = append(args, app.BESBazelFlags()...)
7     args = append(args, app.RemoteCacheBazelFlags()...)
8     args = append(args, "--remote_upload_local_results")
9 + // Make the sidecar finish cache writes before the invocation is
10 + // finalized, so that they are reflected in the cache scorecard.
11 + args = append(args, "--bes_upload_mode=wait_for_upload_complete")
12     uid, err := uuid.NewRandom()
13     require.NoError(t, err)
14     iid := uid.String()
```

Download and apply agent fixes

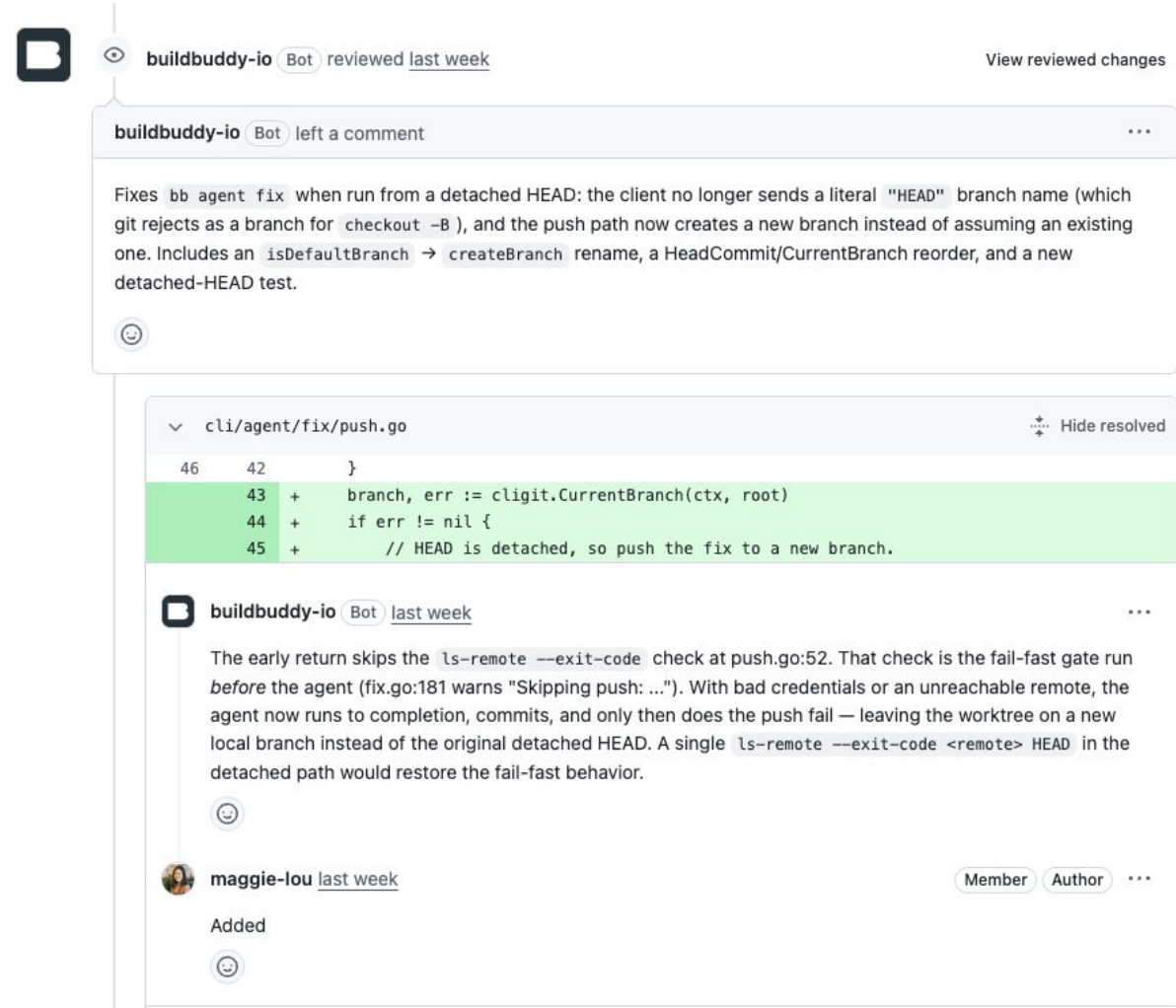
```
# Downloads artifacts from an invocation
$ bb download artifacts IID

# Patchsets can be applied with git apply
$ git apply bb-agent-fix-IID.patch
```

AI code review

buildbuddy.yaml

```
actions:
  - name: "Agent code review"
  triggers:
    pull_request:
      branches:
        - "*"
  steps:
    - run: bb agent review
```



The screenshot displays a GitHub pull request interface. At the top, a comment from the bot **buildbuddy-io** is visible, stating it reviewed the changes last week. Below this, a detailed code review comment is shown, explaining a fix for a detached HEAD state. The review includes a diff view for the file `cli/agent/fix/push.go`, highlighting changes to the `branch` variable and the `if err != nil` condition. A second comment from **buildbuddy-io** explains the rationale for the fix, noting that the early return skips a fail-fast gate check. At the bottom, a comment from user **maggie-lou** is partially visible, starting with the word "Added".

buildbuddy-io (Bot) reviewed [last week](#) [View reviewed changes](#)

buildbuddy-io (Bot) left a comment

Fixes `bb agent fix` when run from a detached HEAD: the client no longer sends a literal "HEAD" branch name (which git rejects as a branch for `checkout -B`), and the push path now creates a new branch instead of assuming an existing one. Includes an `isDefaultBranch` → `createBranch` rename, a `HeadCommit/CurrentBranch` reorder, and a new detached-HEAD test.

cli/agent/fix/push.go [Hide resolved](#)

```
46 42    }
43 +   branch, err := cligit.CurrentBranch(ctx, root)
44 +   if err != nil {
45 +       // HEAD is detached, so push the fix to a new branch.
```

buildbuddy-io (Bot) [last week](#)

The early return skips the `ls-remote --exit-code` check at `push.go:52`. That check is the fail-fast gate run before the agent (`fix.go:181` warns "Skipping push: ..."). With bad credentials or an unreachable remote, the agent now runs to completion, commits, and only then does the push fail — leaving the worktree on a new local branch instead of the original detached HEAD. A single `ls-remote --exit-code <remote> HEAD` in the detached path would restore the fail-fast behavior.

maggie-lou [last week](#) [Member](#) [Author](#)

Added

More autonomy requires more trust

TODAY

**Firecracker microVM
isolation**

**Control which secrets are
available**

NEXT

Network visibility

Which destinations did the
agent access?

Did the agent access any new
IPs?

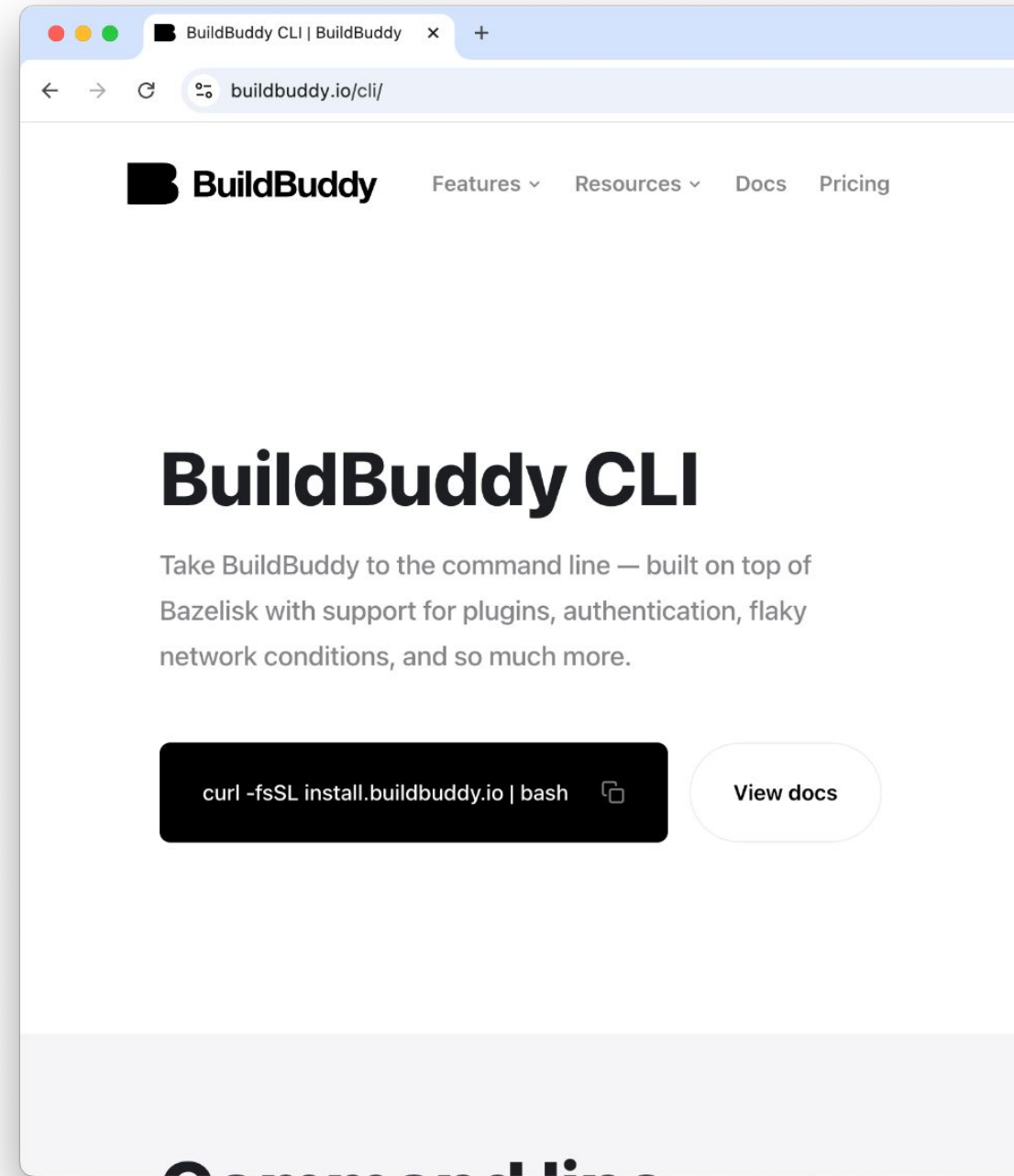
**How do I establish trust when the agent has unfettered
access?**

Try it out!

1. Download the free bb cli

<https://www.buildbuddy.io/cli/>

2. Create a free BuildBuddy account



Happy Hour

October 14th
@ 6:30pm

Ventuno Skylounge
Amstelvlietstraat 4, 1096 GG
Amsterdam, Netherlands

Hosted by



Google Cloud



BuildBuddy

Register at bazelcon.buildbuddy.io

