Buildkite POC FAQ

Questions that are often asked during Buildkite POCs

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Things that customers often ask about during POCs

- How can I improve monorepo checkout performance?
- What can I do with annotations?
- How can we customize log output?
- How can I manage Mac infrastructure?
- How can Buildkite provide CI observability?
- How do I customize Buildkite to do XYZ?
- What are plugins?

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How can I improve monorepo checkout performance?

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How can I improve monorepo checkout performance?

- Agents keep a cached version of checked-out repos between builds
  - Useful for longer-lived runners
- Using ‘clone flags’ agent config, to tweak git behaviour
  - Shallow clone (not recommended)
- Enable git-mirror, to share checked out repos between agents and pipelines
- Seed the git-mirror with a recent copy of the repo, to slash checkout time

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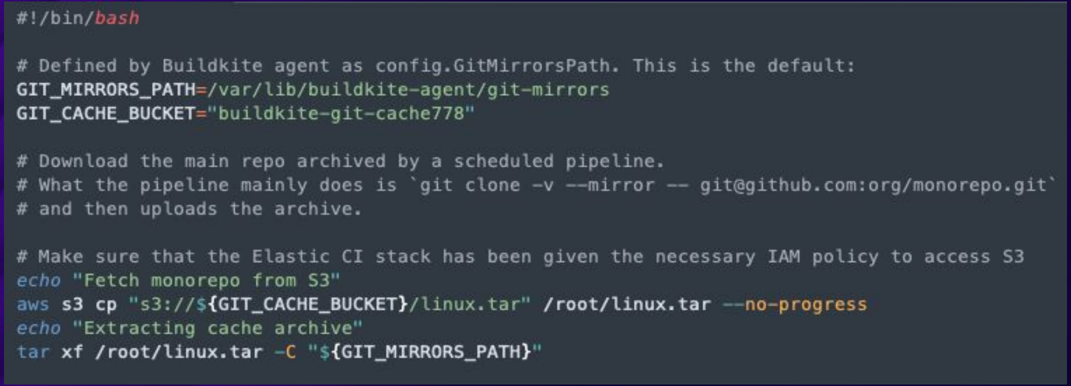
Seeding the git-mirror

- Elastic CI bootstrap script:



```
#!/bin/bash

# Defined by Buildkite agent as config.GitMirrorsPath. This is the default:
GIT_MIRRORS_PATH=/var/lib/buildkite-agent/git-mirrors
GIT_CACHE_BUCKET="buildkite-git-cache778"

# Download the main repo archived by a scheduled pipeline.
# What the pipeline mainly does is `git clone -v --mirror -- git@github.com:org/monorepo.git`
# and then uploads the archive.

# Make sure that the Elastic CI stack has been given the necessary IAM policy to access S3
echo "Fetch monorepo from S3"
aws s3 cp "s3://${GIT_CACHE_BUCKET}/linux.tar" /root/linux.tar --no-progress
echo "Extracting cache archive"
tar xf /root/linux.tar -C "${GIT_MIRRORS_PATH}"
```

- Scheduled pipeline to create archive:
    - https://buildkite.com/moardotnu/unblockconf-checkout-and-archive-linux-repo-linux

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Seeding the git-mirror

- Linux repo - roughly 5gb when cloned.

- Running on a build instance (t3.medium) with an unseeded git-mirror:
  - Job waited 48 seconds (roughly how long it took Elastic CI stack to scale up)
  - Job ran for 14 mins and 13 secs

- Running on a build instance (also t3.medium) with git-mirror seeded at boot:
  - Job waited 2:29
  - Job ran for 25 seconds

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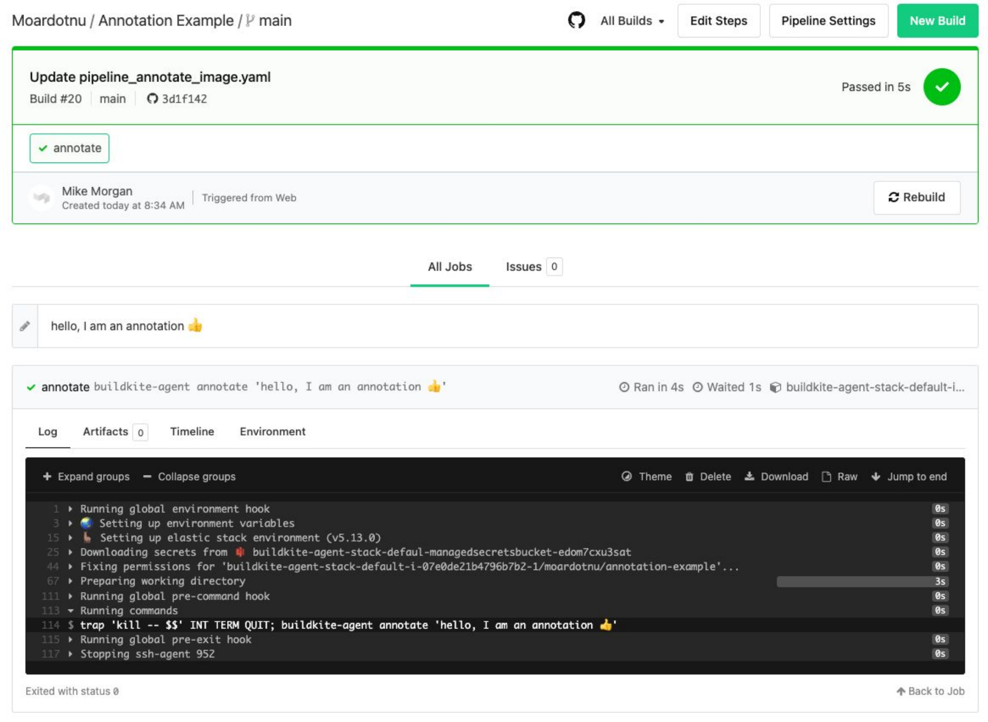
What can I do with annotations?

What can I do with annotations?



Moardotnu / Annotation Example / main

Update pipeline_annotate_image.yaml

Build #20 | main | 3d1f142

Passed in 5s ✓

✓ annotate

Mike Morgan
Created today at 8:34 AM | Triggered from Web

hello, I am an annotation 👍

✓ annotate `buildkite-agent annotate 'hello, I am an annotation 👍'`

Ran in 4s · Waited 1s · buildkite-agent-stack-default-i...

```
▸ Running global environment hook                                                                          0s
▸ 🌏 Setting up environment variables                                                                      0s
▸ 👆 Setting up elastic stack environment (v5.13.0)                                                        0s
▸ Downloading secrets from 🪣 buildkite-agent-stack-defaul-managedsecretsbucket-edom7cxu3sat               0s
▸ Fixing permissions for 'buildkite-agent-stack-default-i-07e0de21b4796b7b2-1/moardotnu/annotation-example'...  0s
▸ Preparing working directory                                                                              3s
▸ Running global pre-command hook                                                                          0s
▾ Running commands                                                                                         0s
$ trap 'kill -- $$' INT TERM QUIT; buildkite-agent annotate 'hello, I am an annotation 👍'
▸ Running global pre-exit hook                                                                             0s
▸ Stopping ssh-agent 952                                                                                   0s
```

Exited with status 0

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What can annotations display?

- Text!
- Images!
- Links!
- Tables!
- Different styles!
- Console output!

https://buildkite.com/moardotnu/unblockconf-2022-build-annotations

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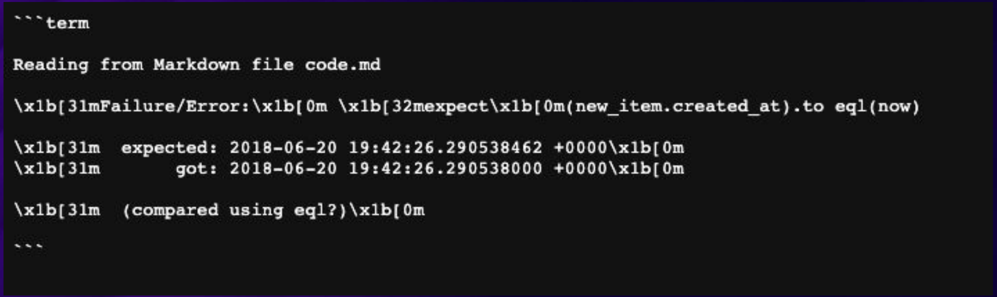
Annotation gotcha – console formatting

- `echo -e "\`\`\`term\nAppended message: This is a \033[0;31mtest\033[0m\n\`\`\`" | buildkite-agent annotate --append`

- `printf '%b\n' "$(cat code.md)" | buildkite-agent annotate --style 'info'`

  `code.md:`



~~~
```term

Reading from Markdown file code.md

\x1b[31mFailure/Error:\x1b[0m \x1b[32mexpect\x1b[0m(new_item.created_at).to eql(now)

\x1b[31m  expected: 2018-06-20 19:42:26.290538462 +0000\x1b[0m
\x1b[31m       got: 2018-06-20 19:42:26.290538000 +0000\x1b[0m

\x1b[31m  (compared using eql?)\x1b[0m

```
~~~

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How can we customize log output?

What can I do with my log output?

- Output and view log data relating to your build (duh)
- Embed images
- Embed links
- Separate portions of logs into unique groups
- Write logs to your own S3 bucket!

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How can I manage Mac infrastructure?

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How can I manage Mac infrastructure?

- Historically, running dedicated Mac hardware to perform builds, or a cloud provider that specializes in Mac virtual hosting

- AWS macOS instances

- Elastic CI Stack for EC2 Mac!
  - https://buildkite.com/docs/agent/v3/elastic-ci-stack-for-ec2-mac/autoscaling-mac-metal
  - https://github.com/buildkite/elastic-ci-stack-for-ec2-mac
  - Some caveats around scaling behavior (minimum host allocation and billing of 24hrs)

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How can Buildkite provide CI observability?

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How can Buildkite provide CI observability?

- Tracing of build jobs via Open Tracing and Open Telemetry
  - https://buildkite.com/docs/agent/v3/tracing
- Datadog metrics (https://buildkite.com/docs/agent/v3/configuration#metrics-datadog)
  - buildkite.jobs.success
  - buildkite.jobs.duration.success.avg
  - buildkite.jobs.duration.success.max
  - buildkite.jobs.duration.success.count
  - buildkite.jobs.duration.success.median
  - Buildkite.jobs.duration.success.95percentile
- Buildkite-agent-metrics:
  - https://github.com/buildkite/buildkite-agent-metrics

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How do I configure Buildkite to do XYZ?

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How do I configure Buildkite to do XYZ?

- Agent hooks!
- Hooks can be configured on the agent itself, in the source repo, or as a plugin
- Written in bash, but can call other applications/scripts
- They have access to all Buildkite or user-configured environment variables
- https://buildkite.com/docs/agent/v3/hooks

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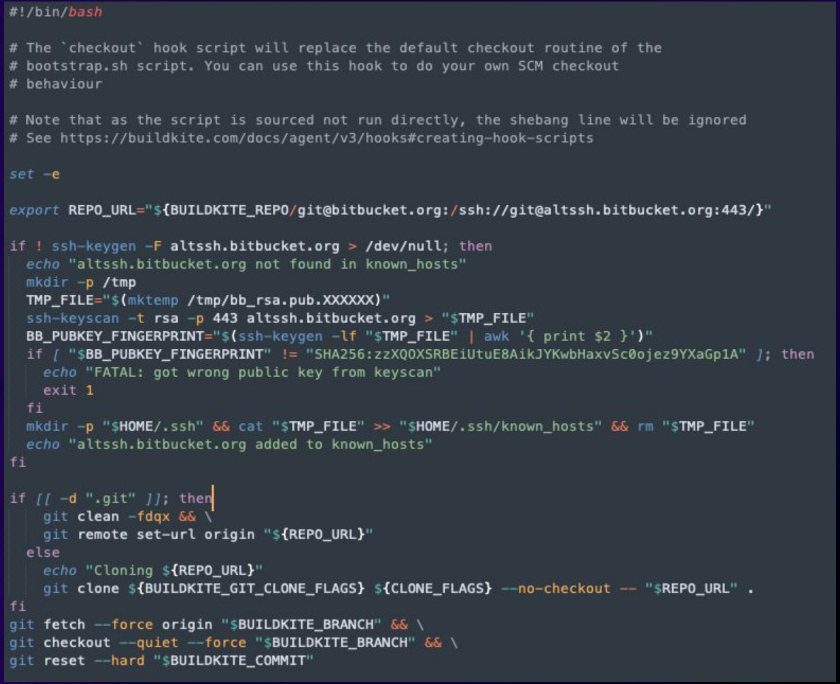
How do I configure Buildkite to do XYZ?



```bash
#!/bin/bash

# The `checkout` hook script will replace the default checkout routine of the
# bootstrap.sh script. You can use this hook to do your own SCM checkout
# behaviour

# Note that as the script is sourced not run directly, the shebang line will be ignored
# See https://buildkite.com/docs/agent/v3/hooks#creating-hook-scripts

set -e

export REPO_URL="${BUILDKITE_REPO/git@bitbucket.org:/ssh://git@altssh.bitbucket.org:443/}"

if ! ssh-keygen -F altssh.bitbucket.org > /dev/null; then
  echo "altssh.bitbucket.org not found in known_hosts"
  mkdir -p /tmp
  TMP_FILE="$(mktemp /tmp/bb_rsa.pub.XXXXXX)"
  ssh-keyscan -t rsa -p 443 altssh.bitbucket.org > "$TMP_FILE"
  BB_PUBKEY_FINGERPRINT="$(ssh-keygen -lf "$TMP_FILE" | awk '{ print $2 }')"
  if [ "$BB_PUBKEY_FINGERPRINT" != "SHA256:zzXQOXSRBEiUtuE8AikJYKwbHaxvSc0ojez9YXaGp1A" ]; then
    echo "FATAL: got wrong public key from keyscan"
    exit 1
  fi
  mkdir -p "$HOME/.ssh" && cat "$TMP_FILE" >> "$HOME/.ssh/known_hosts" && rm "$TMP_FILE"
  echo "altssh.bitbucket.org added to known_hosts"
fi

if [[ -d ".git" ]]; then
    git clean -fdqx && \
    git remote set-url origin "${REPO_URL}"
  else
    echo "Cloning ${REPO_URL}"
    git clone ${BUILDKITE_GIT_CLONE_FLAGS} ${CLONE_FLAGS} --no-checkout -- "$REPO_URL" .
fi
git fetch --force origin "$BUILDKITE_BRANCH" && \
git checkout --quiet --force "$BUILDKITE_BRANCH" && \
git reset --hard "$BUILDKITE_COMMIT"
```