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An introduction to Lighthouse

Andrew Bayer, August 6, 2020

What is Lighthouse?



ChatOps for pull requests

- Trigger pipelines for PRs and pushes
- Track results of pipelines on the SCM provider
- Manage approvals and automatically merge PRs which meet pipeline and approval requirements



Why Lighthouse exists



History of Prow

- Coming from and used by Kubernetes test-infra
- Makes it easier to organize, define, and run tests on PRs
- Allows for management of approvals and merges without giving full push permissions to users
- Suite of components deployed as Kubernetes applications
- Adopted by other OSS projects for their own test infra



Prow and Jenkins X

- Prow fit perfectly into Jenkins X's approach
- Incorporated into Jenkins X in late 2018
- Used by the Jenkins X project itself as well as within Jenkins X



Prow and other SCM providers

- Prow only supports github.com
- Tightly integrated with GitHub APIs, optimizations around caching and rate limits, and more
- Jenkins X wanted to support other SCM providers



Why not add support to Prow?

- Prow exists to serve the needs of Kubernetes test-infra
- Therefore, Prow is conservative when it comes to changes - for good reason!
- GitHub integration is extremely tightly coupled with Prow - supporting other providers could cause problems with caching/rate limit optimization, for example



And so - Lighthouse!

- Started as a fork of relevant Prow code
- Uses go-scm for abstraction of SCM provider interaction
- Full compatibility with existing Prow configuration
- Replaced Prow in Jenkins X distribution



go-scm

- Originally a drone.io project
- We needed to iterate on it too rapidly, so we forked
- Library now used by Lighthouse, Tekton, and others
- We'd love to merge our changes back in with the original!



Lighthouse's current capabilities



Most of Prow's capabilities

- `/lgm`, `/approve`, `/test this`, `/override`, `/assign`, etc
- Approval management via OWNERS file
- Merging of approved/successful PRs
- Triggering of PR and post-merge builds
- Not included:
 - Coming soonish: batch merges, Jenkins and Kubernetes pod as build engines
 - Not planned: Deck UI equivalent



Build engines

- Jenkins X
- Tekton Pipelines
- Extensible for addition of further engines



SCM Providers

- GitHub
- GitHub Enterprise
- GitLab
- BitBucket Server (7.x and greater)



External Plugin Architecture

- Prow already had the concept
- Lighthouse can't use Prow external plugins, but has its own approach:
 - Relays go-scm serialization of abstracted webhook rather than provider webhook
 - Relays build events (start, finish, stage completion) to external plugins as well as webhooks



Demo!

Lighthouse, Tekton Pipelines, GitLab



The future of Lighthouse



More functionality

With subtitle



More build engines

- Kubernetes pods
- Jenkins
 - Initially aiming to support triggering of existing jobs, like Prow
 - Investigating ways to integrate with Jenkins multibranch pipelines as well
- Additional engines _always_ welcome!
- Improved, flexible, pluggable support for adding engines going forward



Reporting, UI, metrics

- Observability/metrics to be added
 - I definitely need help with this one!
- Perhaps some sort of UI for reporting on PR and job statuses, as well as retriggering post-submit jobs?



Installation and initial setup

- We have a Helm chart, but it is tuned for Jenkins X's use case and isn't the best for all scenarios
- Since Jenkins X creates the Lighthouse ConfigMaps automatically, we need to have a better “default” setup w.r.t. the configuration



Configuration rework

- Retaining compatibility with Prow config has meant Lighthouse retains a lot of Prow-specific terminology/unused configuration in its config
- While backwards compatibility needs to be kept, Lighthouse should be able to have its own configuration formats as well as supporting Prow's.
 - Particularly interesting: definition of PipelineRun to use for Tekton-powered builds could live in the project repository, rather than in the centralized Lighthouse configuration



Long-term home?

With subtitle



Lighthouse is not just for Jenkins X

- Lighthouse was started to meet the needs of Jenkins X, but it has grown beyond just that one use case
- Additional build engines can be added, providing pull request-focused ChatOps for more SCM providers than Prow
- Lighthouse is a lower-level piece of the puzzle than Jenkins X - it has value on its own and for integration with other tools/systems



Lighthouse needs to build a community

- It is not ready to be a top-level project - not enough of a developer community
- For Lighthouse to thrive, it needs a community of contributors
- Looking for a home in which to build interest, usage, and a developer community



Questions?



Links

- Lighthouse: <https://github.com/jenkins-x/lighthouse>
- Prow: <https://github.com/kubernetes/test-infra/tree/master/prow>
- Jenkins X: <https://jenkins-x.io/>



Thank you!

