Scaling Autonomous Frontend Teams

Jacob Hilker

Sr. SWE - Frontend Infrastructure - HubSpot

independent, autonomous teams

multi-repos over mono-repo

infrastructure

Frontend Infrastructure @ HubSpot

Enabling product teams to be the most productive they can be

- Build system

- Build system
- HubSpot Canvas design system

- Build system
- HubSpot Canvas design system
- Support

- Build system
- HubSpot Canvas design system
- Support
- Tooling

Autonomy via multi-repos: pros + cons

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Shrinking a multi-repo world

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Maintenance + migrations at scale

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Maintenance + migrations at scale

How do multi-repos help us?

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- Full ownership of applications + shared libraries
- Increase velocity for developers + product
- Freedom to experiment + be innovative

Autonomy has costs at scale

Costs for developers

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- More code spread across many repos

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- Differences increase complexity

Costs for developers

- More code spread across many repos
- Differences increase complexity
- Increases likelihood of orphaned code

Costs for end users

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- Reduces ease of use with inconsistent products

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- Weakens reliability of applications

Costs for end users

- Reduces ease of use with inconsistent products
- Weakens reliability of applications
- Decreases velocity of new features

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Shrinking a multi-repo world

Maintenance + migrations at scale

How do you shrink a multi-repo world?

1. Provide infrastructure

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- Enable product teams to be their most productive

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- Provide common tooling

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- Enable product teams to be their most productive
- Provide common tooling
- Balance autonomy + support
- Don’t police product teams

2. Track what exists

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- Catalogued repos

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- Discoverable code

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- Catalogued repos
- Discoverable code
- Tooling to collect data

3. Track who owns it

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- Team > Individual

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- Close to the code + easy to find

3. Track who owns it

- Team > Individual
- Close to the code + easy to find
- Don’t abandon code, archive it

4. Recommend patterns

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- Discoverable documentation

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- Avoid duplicating decisions

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- Discoverable documentation
- Avoid duplicating decisions
- Generators: the right foundation

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Maintenance + migrations at scale

Maintenance is hard

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- What work needs to be done?

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- When do I need to do this?

Maintenance is hard

- What work needs to be done?
- When do I need to do this?
- Who should do it?

Migrations are painful

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- Cause fragmentation

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- Cause fragmentation
- Reliability issues

Migrations are painful

- Cause fragmentation
- Reliability issues
- Extraordinary time + effort

Mothership

Our internal mass migration ecosystem

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1000 pull requests as easy as 1

Mothership

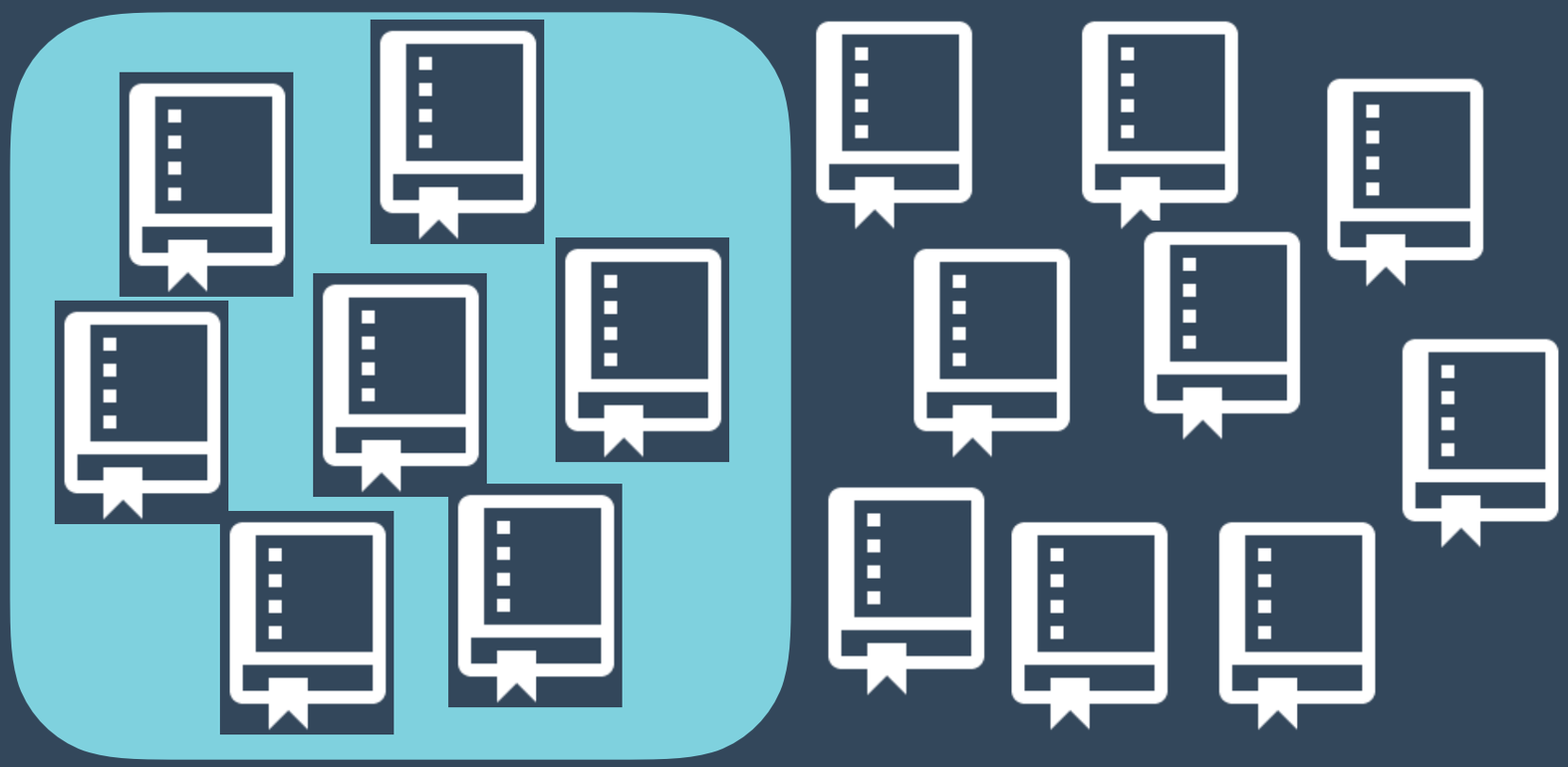
Our internal mass migration ecosystem

1000 pull requests as easy as 1
and anyone can do it

What does Mothership do?

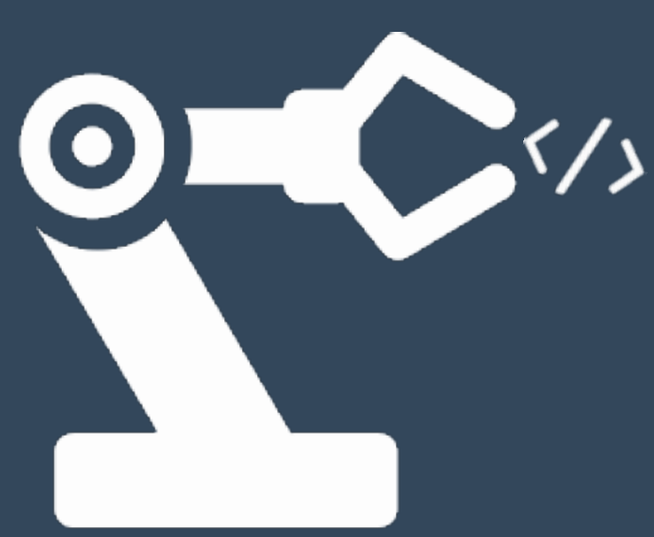
What does Mothership do?

Targets repos based on known data



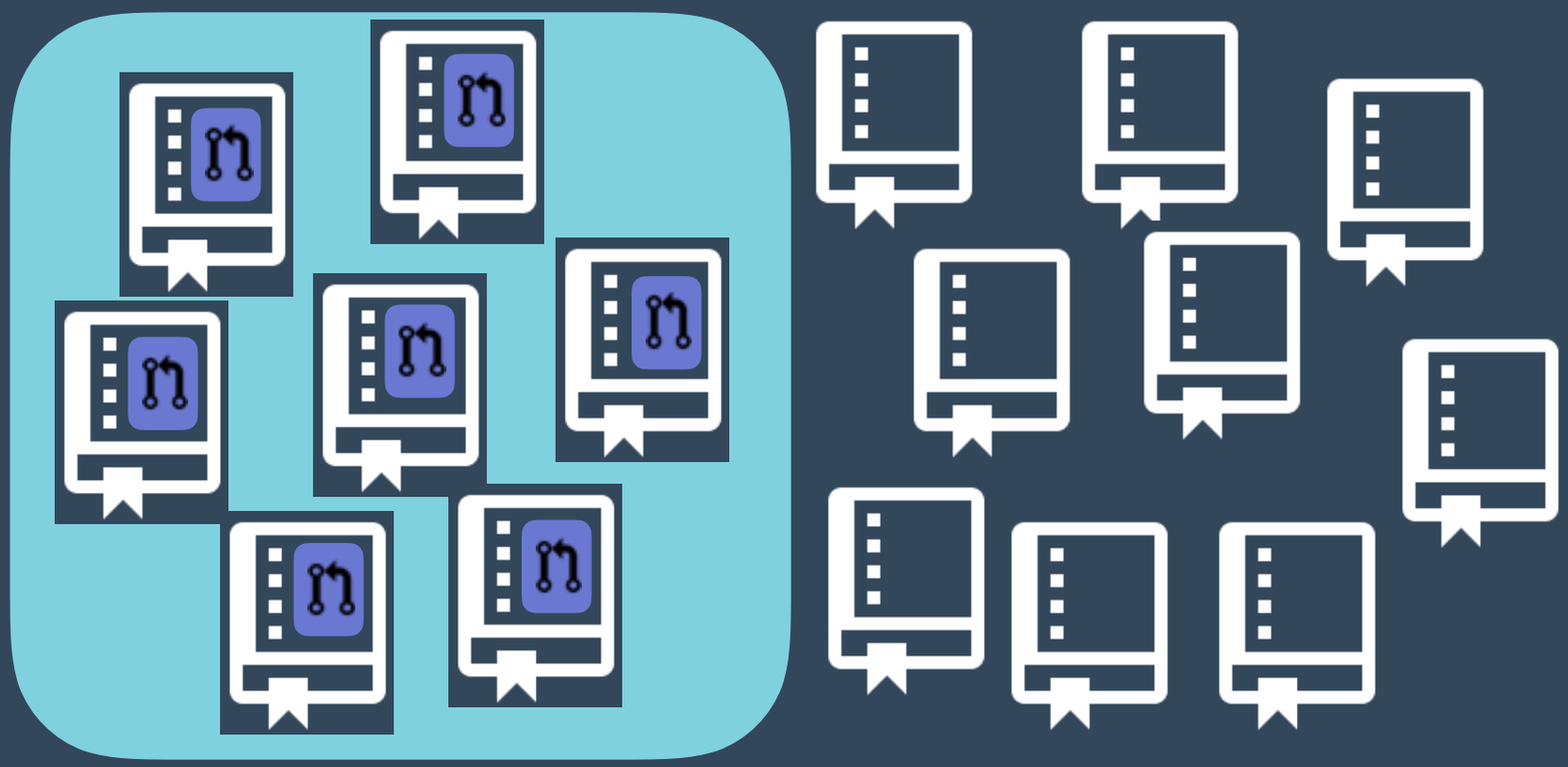
What does Mothership do?

Leverage codemods and other CLI tools



What does Mothership do?

Outputs well-formatted pull requests

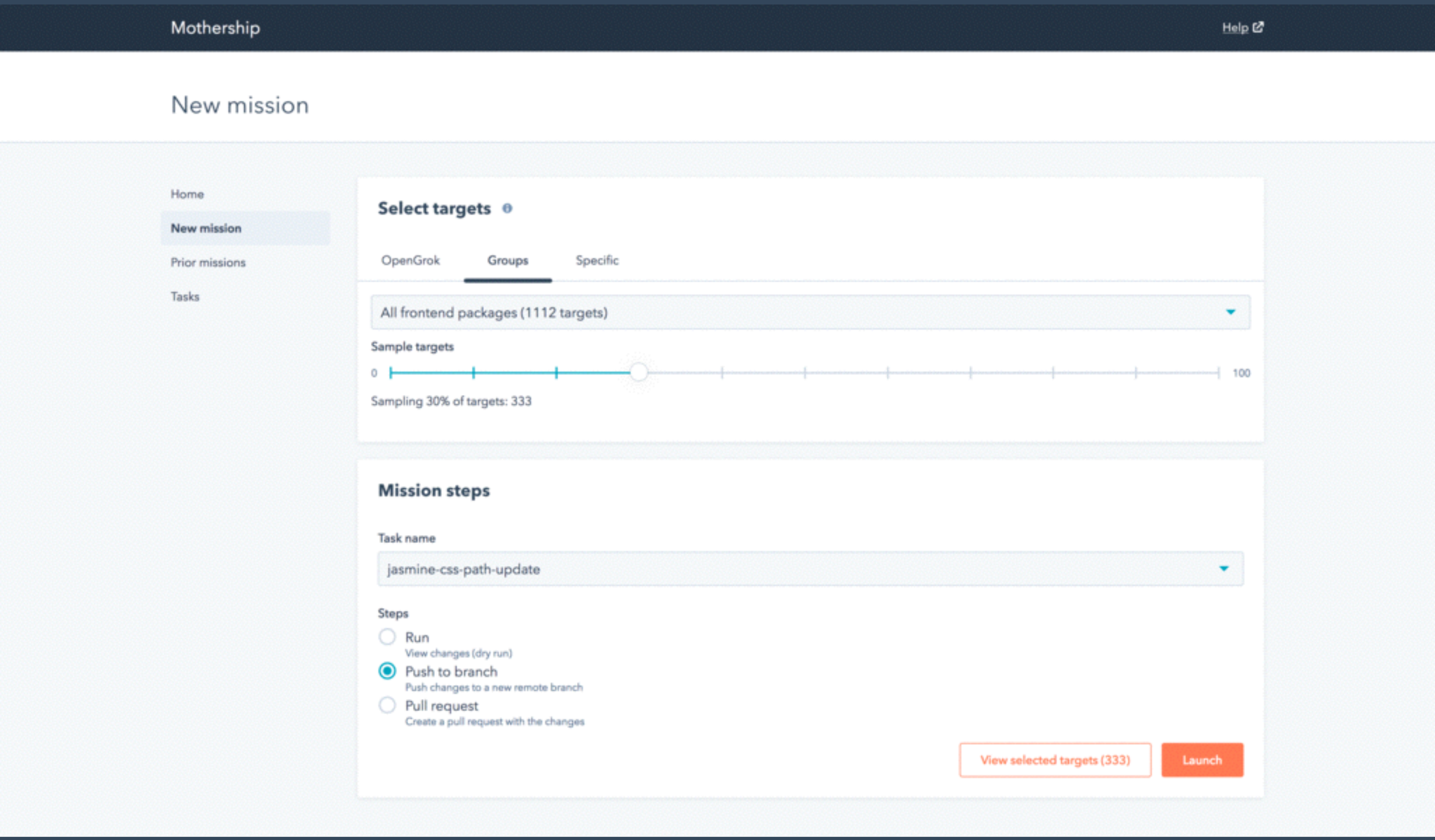


A quick workflow

1. Write a task

- `detect()`
- `run()`
- `generateCommit()` / `generatePullRequest()`

2. Select targets



3. Review changes

HubSpot/quotes-ui/quotes-ui-components#master

```
From 283e59103ba3ad0f9714f871009b70ea93a8406f Mon Sep 17 00:00:00 2001
From: HubSpot AutoPR <paas-build-deploy-notifications-groups@hubspot.com>
Date: Thu, 15 Feb 2018 16:22:58 +0000
Subject: [PATCH] update jasmine css path to a version-less path

---
 quotes-ui-components/static/test/test.html.jade | 2 +-
 1 file changed, 1 insertion(+), 1 deletion(-)

diff --git a/quotes-ui-components/static/test/test.html.jade b/quotes-ui-components/s
index 3e7db2b..5cfd0d6 100644
--- a/quotes-ui-components/static/test/test.html.jade
+++ b/quotes-ui-components/static/test/test.html.jade
@@ -5,7 +5,7 @@ html

     insert_bundle jasmine/static/js/all-jasmine-libs.js
     insert_bundle jasmine-runner/static/runner.js
-    insert_bundle jasmine/static/vendor/jasmine-2.2.0/jasmine.css
+    insert_bundle jasmine/static/vendor/jasmine/jasmine.css

     insert_bundle quotes-ui-components/static/test/bundle.js
     script
--
2.14.2
```

View target in GitHub

Previous patch 6/18 Next patch

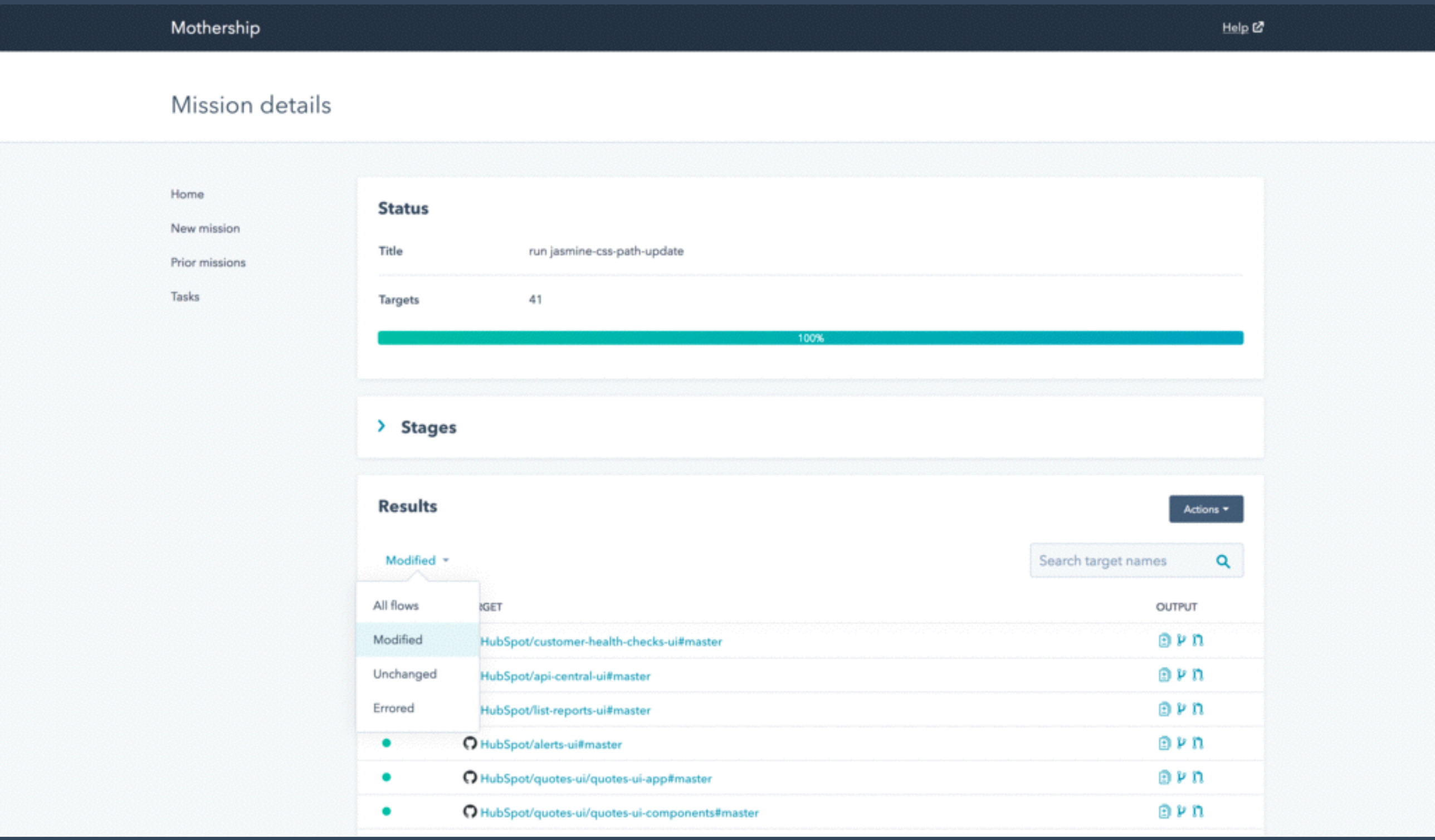
4. Make pull requests

435 items not shown
View more

This was referenced on Jan 23

Update path to jasmine.css file HubSpot/IntegrationsUISpaceSword#413 Merged
Update path to jasmine.css file HubSpot/EmailUILib#2 Merged
Update path to jasmine.css file HubSpot/content_static#1689 Merged
Update path to jasmine.css file HubSpot/ComposeUI#627 Merged
Update path to jasmine.css file HubSpot/PartnersUI#518 Merged
Update path to jasmine.css file HubSpot/SalesSidebar#299 Merged
Update path to jasmine.css file HubSpot/MeetingsUI#946 Merged
Update path to jasmine.css file HubSpot/MeetingsUI#947 Merged
Update path to jasmine.css file HubSpot/MeetingsUI#948 Merged
Update path to jasmine.css file HubSpot/paywall-ui#9 Merged
Update path to jasmine.css file HubSpot/popup-police#1 Closed
Update path to jasmine.css file HubSpot/StyleGuideReact#92 Merged
Update path to jasmine.css file HubSpot/mainsail-ui#2 Merged
Update path to jasmine.css file HubSpotProtected/AttributionUI#37 Merged
Update path to jasmine.css file HubSpot/Atlas#411 Merged
Update path to jasmine.css file HubSpot/Atlas#412 Merged
Update path to jasmine.css file HubSpot/gating-manager#84 Merged
Update path to jasmine.css file HubSpot/ContentEmailUI#454 Merged
Update path to jasmine.css file HubSpot/blog-import-ui#3 Merged
Update path to jasmine.css file HubSpot/draft-signature-plugin#4 Merged
Update path to jasmine.css file HubSpot/ui-addon-infra#15 Merged
Update path to jasmine.css file HubSpot/AdvancedMenus#12 Merged
Update path to jasmine.css file HubSpot/optimization-ui-components#3 Merged
Update path to jasmine.css file HubSpot/IntegrationsDashboardUI#17 Merged
Update path to jasmine.css file HubSpot/DataTablesUI#235 Merged
Update path to jasmine.css file HubSpot/settings-ui-nav#161 Merged
Update path to jasmine.css file HubSpot/products-ui-components#40 Merged
Update path to jasmine.css file HubSpot/ui-embed-modal#7 Merged
Update path to jasmine.css file HubSpot/ui-availability-calendar#24 Merged

5. Track the results



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- Consistent styles for internal files
- Generic dependency upgrades
- Seamless Jasmine migration

Other teams are doing even more

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- Having small, autonomous teams *can* scale

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- Autonomy is the right choice for HubSpot
- Having small, autonomous teams *can* scale
- Investments in infrastructure + tooling are essential

Questions?