

mojaloop

# PI-7 Summary

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Abidjan, September 10, 2019

CROSSLAKE 

# OVERVIEW

- **OSS Maintenance + Management**
  - Upgraded Health Checks
  - License Scanning
  - Dependency and Vulnerability Management
- **OSS Lab Workstream Report**
  - Summary
  - Overview
  - Recommendations
- **Other Contributions**
  - Helm + Deployment Fixes
  - Archiving and Tidying old repos
  - Pool Party Updates 



# OSS Maintenance + Management

mojaloop





# Let's get Mojaloopy

mojaloop



# Health Checks

- Improving health check reports for all core services

```
{  
  "status": "OK"  
}
```

BEFORE

```
[  
  "status": "OK",  
  "uptime": 363686.715,  
  "startTime": "2019-09-10T10:15:48.313Z",  
  "versionNumber": "7.4.3",  
  "services": [  
    {  
      "name": "datastore",  
      "status": "OK"  
    },  
    {  
      "name": "broker",  
      "status": "OK"  
    }  
  ]  
]
```

AFTER

- Will help make Kubernetes scheduler ‘smarter’
- Also aids in developer and hub operator debugging and maintenance



# License-Scanning

- Ensure we are free from viral licenses (e.g. GPL)
- Making sure we **stay** free from viral licenses (integrated into the CI/CI Pipeline)
- Allow us to run license scans across all repos at once
- Maintain a blacklist of disallowed licenses



# Introducing: License-Scanner

- <https://github.com/mojaloop/license-scanner>

The screenshot shows the GitHub repository page for 'mojaloop/license-scanner'. The repository has 15 forks and 2 stars. It contains 31 commits, 2 branches, 0 releases, and 1 contributor. The latest commit was made 18 days ago. The repository description is 'A utility for scanning OSS Licences across projects and within CI workflows'. The repository URL is <https://github.com/mojaloop/license-scanner>.

A utility for scanning OSS Licences across projects and within CI workflows

31 commits | 2 branches | 0 releases | 1 contributor | View license

Branch: master | New pull request | Create new file | Upload files | Find File | Clone or download

Commit	Message	Date
lewisdaly	Add buffercursor@0.0.12 to the whitelist (#3)	Latest commit bc5ff29 18 days ago
lib	Add license-checker node module	2 months ago
scripts	Add docker image scan 2 (#2)	19 days ago
.env.template	add env variable override	2 months ago
.gitignore	sort the licenses by name	2 months ago

# Introducing: License-Scanner

- <https://github.com/mojaloop/license-scanner>
- Maintains a blacklist of **licenses** and a whitelist of **packages**
- *CI Mode*: Integrates with existing CI/CD Pipeline
- *Standalone*: Runs against many repositories at once
- Rules can be updated via Pull Request to the license-scanner repo

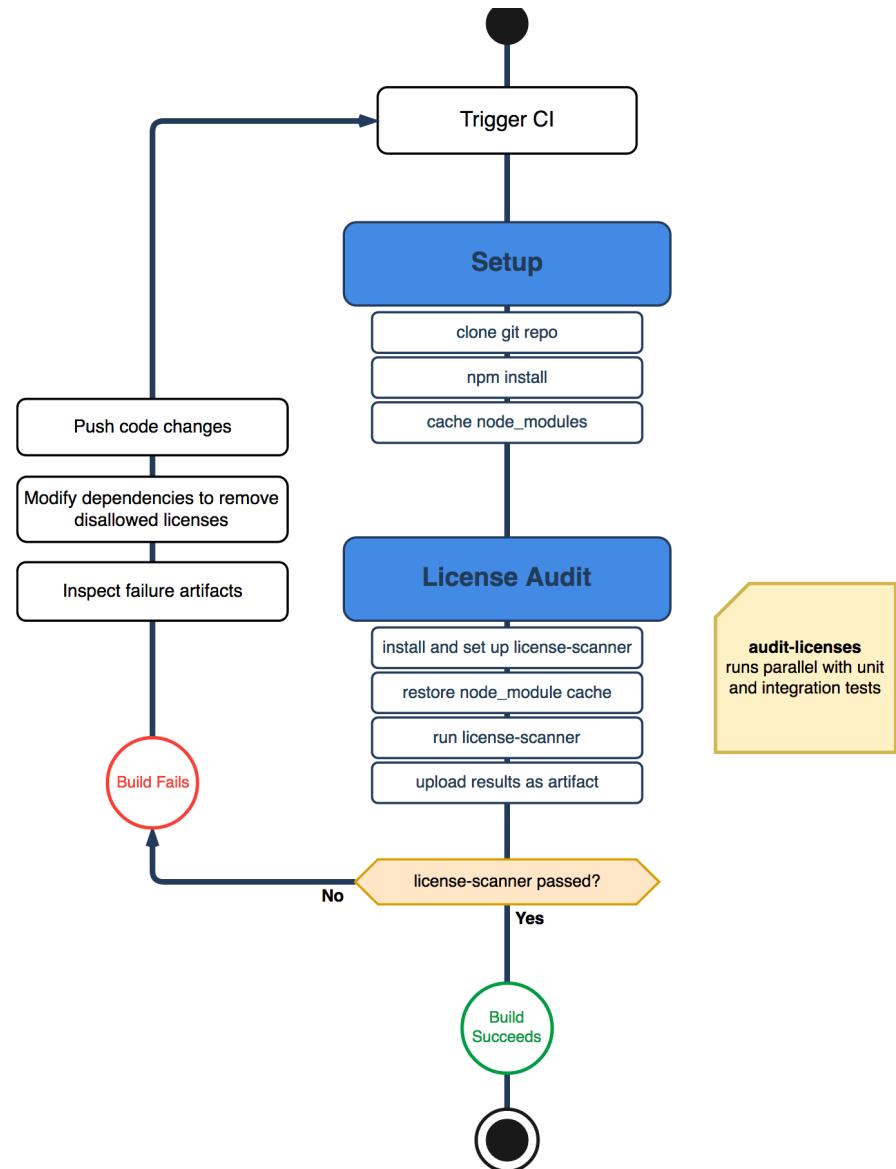


# License-Scanning - CI/CD Process

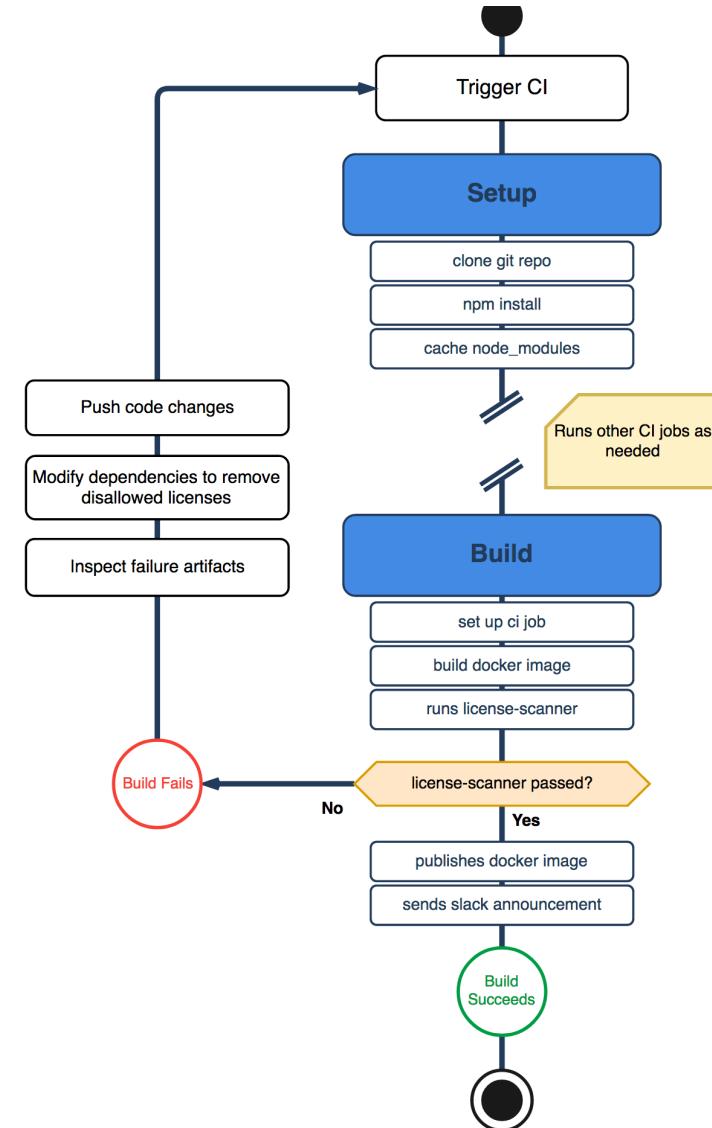
- In the CI/CD Pipeline, license scanner runs in 2 places:
  1. During the PR approval build, against local node\_modules
  2. During a release, after docker build, against node\_modules inside a docker image



## During PR:



## During Release:



# License-Scanning

- Specify a list of github projects (must contain a package.json in the root directory)
- \$> make run
- Produces a complied .xlsx file with a summary of licenses.
- Red is a disallowed license, Yellow is a warning that the license was manually allowed

# Example License Scan Summary

	A	B	C	D	E	F	G	H
1	License Summary							
2								
3								
4	Project	Package	License	Github	Decision	Notes		
5								
6								
7	account-lookup-service	spdx-exceptions@2.2.0	CC-BY-3.0	<a href="https://github.com/kemitchell/spdx-exceptions.json">https://github.com/kemitchell/spdx-exceptions.json</a>	WARN	Requires attribution		
8	account-lookup-service	taffydb@2.6.2	UNKNOWN	<a href="https://github.com/typicaljoe/taffydb">https://github.com/typicaljoe/taffydb</a>	WARN	Contains MIT license on github, but not listed in package.json		
9	central-directory	cycle@1.0.3	Custom: https://gitl https://github.com/dscape/cycle		WARN	Listed as Public-Domain on npm, but no License file in github		
10	central-directory	buffcursor@0.0.12	UNKNOWN	<a href="https://github.com/tjfontaine/node-buffcursor">https://github.com/tjfontaine/node-buffcursor</a>	WARN	No license on github or npm		
11	central-ledger	spdx-exceptions@2.2.0	CC-BY-3.0	<a href="https://github.com/kemitchell/spdx-exceptions.json">https://github.com/kemitchell/spdx-exceptions.json</a>	WARN	Requires attribution		
12	central-ledger	taffydb@2.6.2	UNKNOWN	<a href="https://github.com/typicaljoe/taffydb">https://github.com/typicaljoe/taffydb</a>	WARN	Contains MIT license on github, but not listed in package.json		
13	central-settlement	taffydb@2.6.2	UNKNOWN	<a href="https://github.com/typicaljoe/taffydb">https://github.com/typicaljoe/taffydb</a>	WARN	Contains MIT license on github, but not listed in package.json		
14	interop-switch-js	cycle@1.0.3	Custom: https://gitl https://github.com/dscape/cycle		WARN	Listed as Public-Domain on npm, but no License file in github		
15	ml-api-adapter	taffydb@2.6.2	UNKNOWN	<a href="https://github.com/typicaljoe/taffydb">https://github.com/typicaljoe/taffydb</a>	WARN	Contains MIT license on github, but not listed in package.json		
16	mock-pathfinder	buffcursor@0.0.12	UNKNOWN	<a href="https://github.com/tjfontaine/node-buffcursor">https://github.com/tjfontaine/node-buffcursor</a>	WARN	No license on github or npm		
17	simulator	spdx-exceptions@2.2.0	CC-BY-3.0	<a href="https://github.com/kemitchell/spdx-exceptions.json">https://github.com/kemitchell/spdx-exceptions.json</a>	WARN	Requires attribution		
18								
19								
20								
21								
22								
23								
24								
25								
26								



# License-Scanning

- Now integrated into our Helm release workflow
- For every Helm release made, you will be able to download an Excel summary of all of the licenses

[Edit release](#) [Delete](#)

Latest releasev7.4.37b19402Verified

## v7.4.3 Release

mdebarros released this 11 days ago

### Helm release changes

- Added missing config items to ml-api-adapter config for:
  - MAX\_CALLBACK\_TIME\_LAG\_DILATION\_MILLISECONDS <-- default to 100ms
  - MAX\_FULFIL\_TIMEOUT\_DURATION\_SECONDS <-- default to 240s (4m)
- Added configs for the above config items in the values.yaml
- Bump to moialoon chart to reflect the above changes

▼ Assets 3

<a href="#">license-summary.xlsx</a>	770 KB
<a href="#">Source code (zip)</a>	
<a href="#">Source code (tar.gz)</a>	

# License-Scanning

- But what to do about existing viral licenses?
  - Work on removing dependencies as we can.
  - Submit updates to packages and hope that maintainers will release new versions.
    - This has already been done... now we are just waiting.

*As of now, there is no real method to replace or swap out dependencies in NodeJS*



# Dependency Management

- In our package.json files, we are strict with locking down dependencies
  - This is great for producing reliable, reproduceable code, but can make it hard to stay up to date with dependencies
  - Dependabot does this for us
- 
- Github also has an integrated vulnerability checker which sends regular security alerts
  - We've also integrated npm's native audit tool into our CI/CD pipeline.
    - If new vulnerabilities are found after committing code, it's not going to be built!



## 1. Automatically creates PRs when new packages are available

Screenshot of a GitHub pull request list showing a new PR from dependabot-preview.

1 Open ✓ 319 Closed    Author ▾ Labels ▾ Projects ▾ Milestones ▾ Reviews ▾ Assignee ▾ Sort ▾

 Bump sinon from 7.3.2 to 7.4.0 ✓ dependencies

#339 opened yesterday by dependabot-preview bot • Review required ||| In Progress

## 2. Triggers CI/CD Pipelines

✓  ci/circleci: audit-licenses — Your tests passed on CircleCI!	Required	<a href="#">Details</a>
✓  ci/circleci: setup — Your tests passed on CircleCI!	Required	<a href="#">Details</a>
✓  ci/circleci: test-coverage — Your tests passed on CircleCI!	Required	<a href="#">Details</a>
✓  ci/circleci: test-integration — Your tests passed on CircleCI!	Required	<a href="#">Details</a>
✓  ci/circleci: test-unit — Your tests passed on CircleCI!	Required	<a href="#">Details</a>
✓  ci/circleci: vulnerability-check — Your tests passed on CircleCI!	Required	<a href="#">Details</a>

## 3. Automatically Rebases when new commits are made to master



# OSS Lab Investigation



A man with dark hair and a beard, wearing a light-colored striped shirt, is looking down at a smartphone held in his hands. He is standing outdoors, with a yellow and purple structure visible in the background.

It's time to get Mojaloopy.

# OSS Lab Investigation

## Goal for PI7:

Investigate what an “OSS Lab” looks like, how it fits in with other efforts in the community, and determine what might be worth pursuing.



# OSS Lab Investigation

Produced a discussion document available on Github:

<https://bit.ly/2mauhB5>

<https://github.com/mojaloop/documentation/blob/master/discussions/workbench.md>

The screenshot shows a GitHub file page for 'workbench.md'. At the top, there's a navigation bar with 'Branch: master', a breadcrumb trail ('documentation / discussions / workbench.md'), and buttons for 'Find file' and 'Copy path'. Below this, a commit card is displayed for a commit by 'lewisdaly' titled 'Feature/lab discussion (#109)', made 6 days ago with hash '4f17ac0'. It shows '1 contributor'. Further down, file details are shown: '246 lines (182 sloc) | 15.8 KB', with buttons for 'Raw', 'Blame', 'History', and icons for download, edit, and delete. The main content area features a large heading 'Mojaloop Lab/Workbench Discussion' and a paragraph about the goal of the document. A section titled '1. Goals for the PI8 Convening:' is also visible.

**Mojaloop Lab/Workbench Discussion**

*Goal: This discussion document aims to lay out the case and align the community around the development of an educational Mojaloop Lab environment.*

**1. Goals for the PI8 Convening:**



# OSS Lab Investigation - Nomenclature

## 1. Tool

- A device used to carry out a function
- Different tools for different functions: You wouldn't use a screwdriver to drive a nail.
- In a Mojaloop context, one example of a tool is the Bank Oracle

## 2. Workbench

- Combines different tools together in one place
- For example, a hand plane, table saw and chisel can make up a woodworking workbench, while a hacksaw, file and angle grinder can make up a metalworking workbench
- In the Mojaloop parlance, tools to test my DFSP's JWS keys are in a different workbench than tools that demonstrate to a fintech how wholesale APIs can work on top of Mojaloop



# OSS Lab Investigation - Nomenclature

## 3. Lab

- A lab is a place you go to run experiments
- We run experiments in order to learn, and test our assumptions
- A single lab combines multiple workbenches together in one place

## 4. Simulator

- A tool that simplifies or abstracts away some function so you can test one thing at a time
- Pilots train with simulators *before* flying a real life, dangerous and expensive plane.
- Within Mojaloop: a simulator can simulate interacting with some component of the system



# OSS Lab Investigation – Assumptions

*Many of these go without saying... but let's say them regardless.*

1. The Gates Foundation wants to encourage adoption for Mojaloop at all levels (not just the ‘big fish’)
2. We don't need a lab environment to serve the needs of a Switch deployment or implementing DFSP - these needs will be met elsewhere
3. The Mojaloop OSS Community wants to make itself attractive to all



## OSS Lab Investigation – Primary users

- DFSPs needing to integrate with Mojaloop: (shorthand: Implementing DFSP)
- Organisations/Individuals wishing to learn about Mojaloop and wanting to build and test functionality or use cases as a DFSP (shorthand: Evaluating DFSP)
- Organisations/Individuals wishing to learn about Mojaloop and wanting to build and test functionality or use cases as a Hub Operator (shorthand: Evaluating Hub Operators)
- Regulators, Organisations or Individuals wishing to understand and evaluate Mojaloop and how it might impact their existing service (shorthand: General Evaluators)



## OSS Lab Investigation – Secondary users

- Systems Integrators wishing to offer Mojaloop as a Service or pieces of Mojaloop integration as a Service (Systems integrator)
- Individual Contributors (including bug bounty hunters?) (Individual Contributor)
- Fintechs operating on top of or who will operate on top of a mojaloop-enabled switch (Mojaloop-powered fintech)
- 3rd Party App Provider interacting with wholesale mobile money APIs, selling integrations to fintechs and the like (3rd party app provider)
- Financial Advocates, who are interested in promoting Mojaloop and other technologies that help drive financial inclusion (Financial Inclusion Advocates)



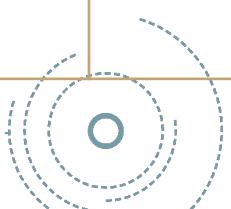
# OSS Lab Investigation – Use Cases

- a. Test a Mojaloop compatible DFSP implementation
- b. Validate assumptions about Mojaloop
- c. View and use a reference implementation
- d. Learn about Mojaloop internals
- e. Learn about Mojaloop-enabled switches and associated use cases (technology)
- f. Assess how Mojaloop will change fintech business landscape
- g. Be able to demonstrate a value proposition for DFSPs/Fintechs/etc. to use mojaloop (instead of technology \_x\_)



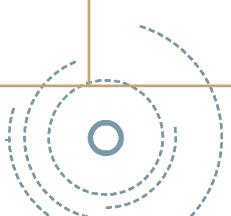
# Use Case Matrix

	a. Test DFSP Impl	b. Validate Assumptions	c. Reference Impl	d. Learn Internals	e. Learn about Tech	f. Evaluate Business Cases	g. Demonstrate ML Value
User:							
1. Implementing DFSP	X		X				
2. Evaluating DFSP		X	X		X	X	
3. Evaluating Hub Operator			X		X	X	
4. General Evaluator					X	X	
5. Systems Integrator	X	X	X	X			X
6. Individual Contributor		X	X	X			
7. Mojaloop-powered fintech		X			X	X	X
8. 3rd Party App Provider				X			X
9. Financial Inclusion Advocates		X				X	X

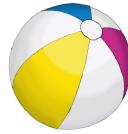


# Use Case Matrix

	a. Test DFSP Impl	b. Validate Assumptions	c. Reference Impl	d. Learn Internals	e. Learn about Tech	f. Evaluate Business Cases	g. Demonstrate ML Value
User:							
1. Implementing DFSP	X		X				
<b>2. Evaluating DFSP</b>		X	X		X	X	
3. Evaluating Hub Operator			X		X	X	
4. General Evaluator					X	X	
5. Systems Integrator	X	X	X	X			X
6. Individual Contributor		X	X	X			
<b>7. Mojaloop-powered fintech</b>		X			X	X	X
8. 3rd Party App Provider				X			X
9. Financial Inclusion Advocates		X				X	X



**Let's Dive a Little Deeper...**



# Use Case Deep Dive – Evaluating DFSP

**Evaluating DFSP:** Organizations/Individuals wishing to learn about Mojaloop and wanting to build and test functionality or use cases as a DFSP

## Use Cases:

- Validate assumptions about Mojaloop
- View and play with a reference implementation
- Learn about mojaloop-enabled hubs and associated use cases (technology perspective)
- Assess how Mojaloop will affect their business in the future

## Outputs:

- help to onboard to the Mojaloop ecosystem
- help to understand the technology, where it works well, and the potential pitfalls/drawbacks
- minimize investment in getting things working so they can focus on building out use case prototypes
- take them from little to no understanding of Mojaloop -> demonstrating real prototypes

## Inputs:

- Improved Mojaloop documentation specific for this role.
  - Think about and design the documentation and onboarding flow specifically for \*Evaluating DFSPs\*
  - Documentation should be approachable by product manager etc. with little technical knowledge
- Technical deep dive on the technology behind Mojaloop, why, how it works
- Improved guides for up and running on 2-3 major kubernetes providers, self service and install scripts
- Helm charts for 1-2 simulators/labs that can be spun up alongside a switch, with opinionated pre-configured settings



# Use Case Deep Dive – Mojaloop Powered Fintech

**Mojaloop Powered Fintech:** Fintechs operating on top of or who will operate on top of a Mojaloop-enabled switch

## Use Cases:

- Validate assumptions about Mojaloop (how it works, what it does, what it doesn't do)
- Learn how Mojaloop is aligned with wholesale APIs, and what it would take to get a DFSP using these APIs over a Mojaloop switch
- Learn about Mojaloop enabled hubs and associated use cases (technology perspective)
- Assess how Mojaloop will affect their business in the future

- take them from little to no understanding of Mojaloop -> demonstrating real prototypes

## Inputs:

- Improved Mojaloop documentation specific for this role.
- Documentation or working document on how Mojaloop will work with wholesale APIs
- Self-deployed lab environment with DFSP that expose some wholesale APIs with basic functionality for Fintechs to test against

## Outputs:

- Understand how Mojaloop and Wholesale APIs fit together (or don't)
- Enable Fintechs to interact with Mojaloop over 1 or 2 wholesale banking APIs (e.g. GSMA MM API)



# OSS Lab Investigation – Other Efforts

*I won't cover this all here, but it's important to keep in mind...*

## **Mifos**

- Extensive progress in this area with Fineract
- Working on Open API integrations
- Have an existing Lab deployment with Mojaloop that is currently being upgraded to work with the latest Helm chart deployments

## **GSMA**

- GSMA Mobile Money API – want to see end to end prototypes talking over Mojaloop switch
- GSMA Lab covers a wide scope, Mojaloop is one piece
- Interested in seeing how GSMA can add the most value to Mojaloop



# OSS Lab Investigation – Other Efforts

*I won't cover this all here, but it's important to keep in mind...*

## **ModusBox**

- Open sourced **SDK** and **Scheme Adapter** (*building blocks for building lab environments quickly*)
- Want to be able to show ‘how the engine works’ and build confidence for non-technical stakeholders
- Interested in Mojaloop Lab as a place for fintechs to learn and test concepts on top of Mojaloop
- How can we assist orgs. With little-to-no technical capacity to become confident with Mojaloop?



# OSS Lab Investigation – Our Recommendations

*I won't cover this all here, but it's important to keep in mind...*

## 1. Find a target user that we can build a lab for/with

- Perhaps one of the more serious hackathon teams?

## 2. Address and improve documentation gaps: driving from a role-specific perspective

## 3. Build a self-service lab prototype

- Opinionated set of helm charts that can be deployed alongside general switch
- Gather feedback from the community, and see where and how people are using it (or not)
- Mojaloop Over Spreadsheets Demo



# Other Contributions



## Other Contributions

- **Active in OSS Community meetings**
- **Design Authority Participation**
- **Misc. bug fixes and improvements**
  - Helm and Deployment fixes
  - Improving the local development experience with docker-compose
  - Archiving and Tidying old repos
- **Pool Party**
  - Was planned for Sprint 5
  - Ended up going to the beach...





Brand Deal Idea?



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# Thanks!

## Any Questions?

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...or hit me up on Slack