



How we progressively deliver changes to Kubernetes

Using Canary deployments and feature flags

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Bob Walker

Field CTO

Octonaut since 2018

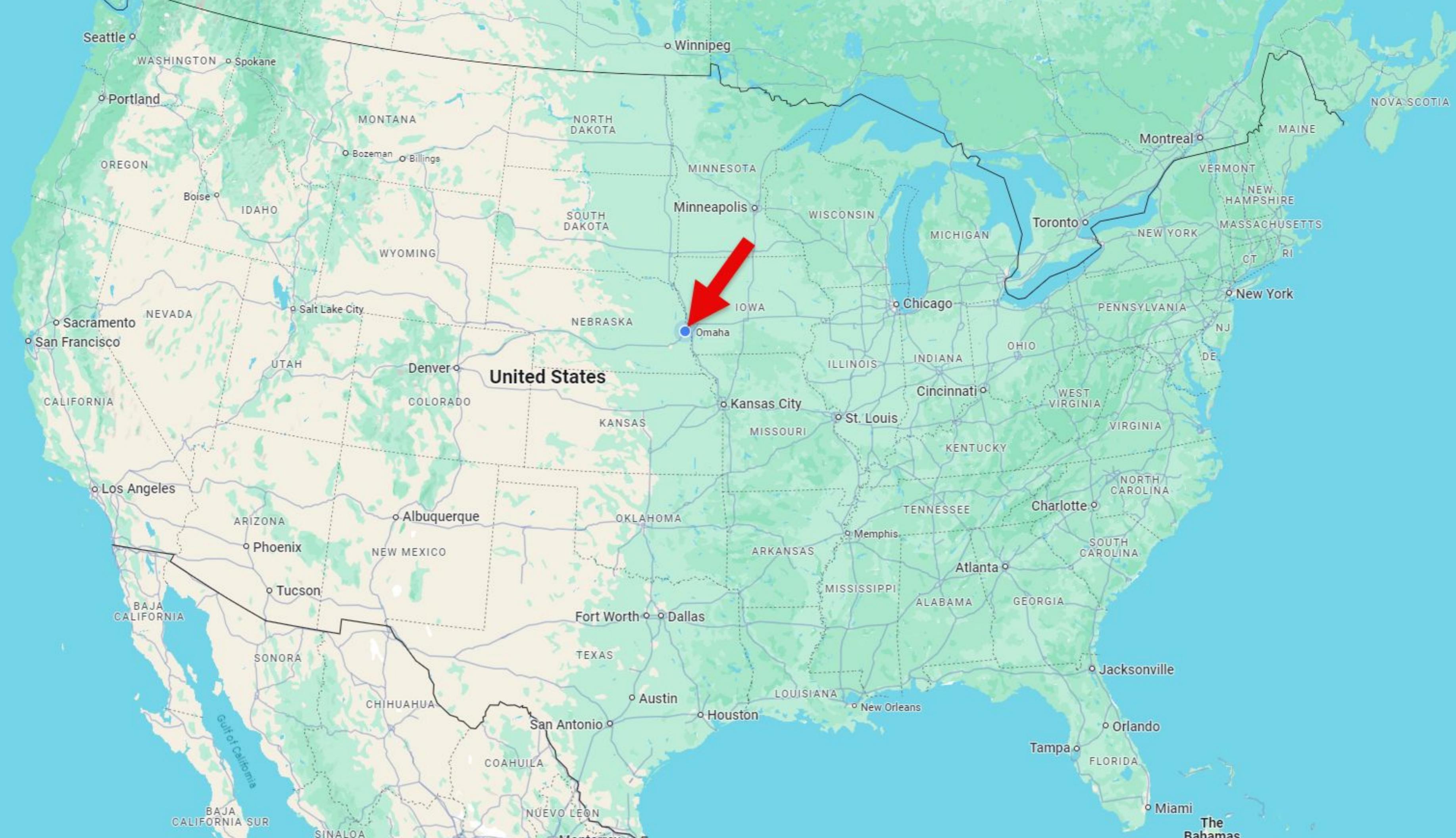
 @bobjwalker

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 bobjwalker.octopus.app







Farm Credit Services
of America



Sandhills Global.



Octopus Deploy



What is the desired outcome?

Goals for this session

- Provide solutions you can apply in your day to day
(Assuming your use case is similar)
- Debunk the myth that canary deployments
means routing traffic
- Why you need to separate deploying new code
from releasing functionality
- Not a sales pitch of Octopus Deploy
(But you will have to learn what we to understand our challenges)



Background + context



Self-hosted + Cloud

Octopus Cloud

Deployment-as-a-service



JULY 2018



Octopus Server

Octopus on customers'
infrastructure



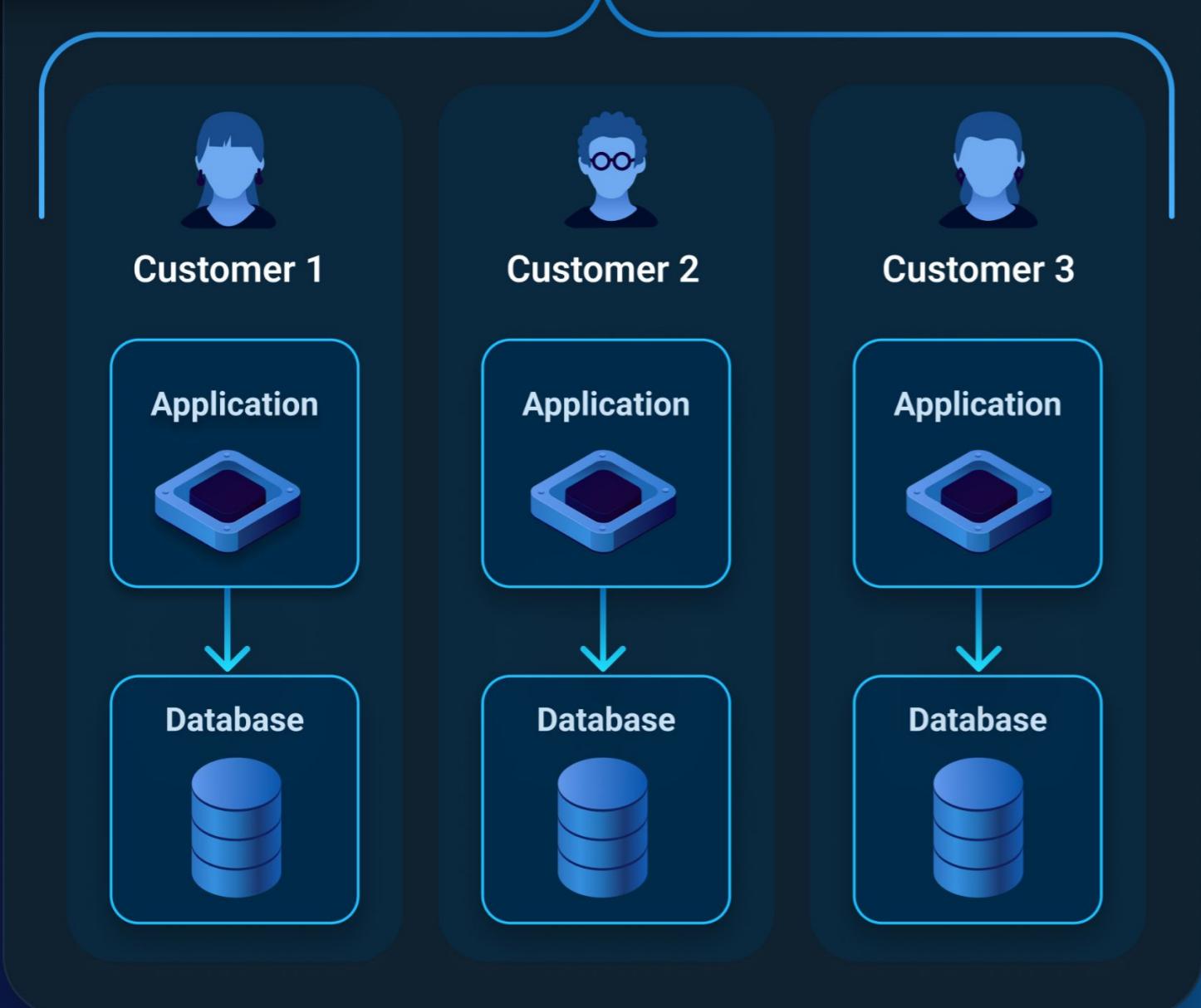
JUNE 2012



Cell-based architecture

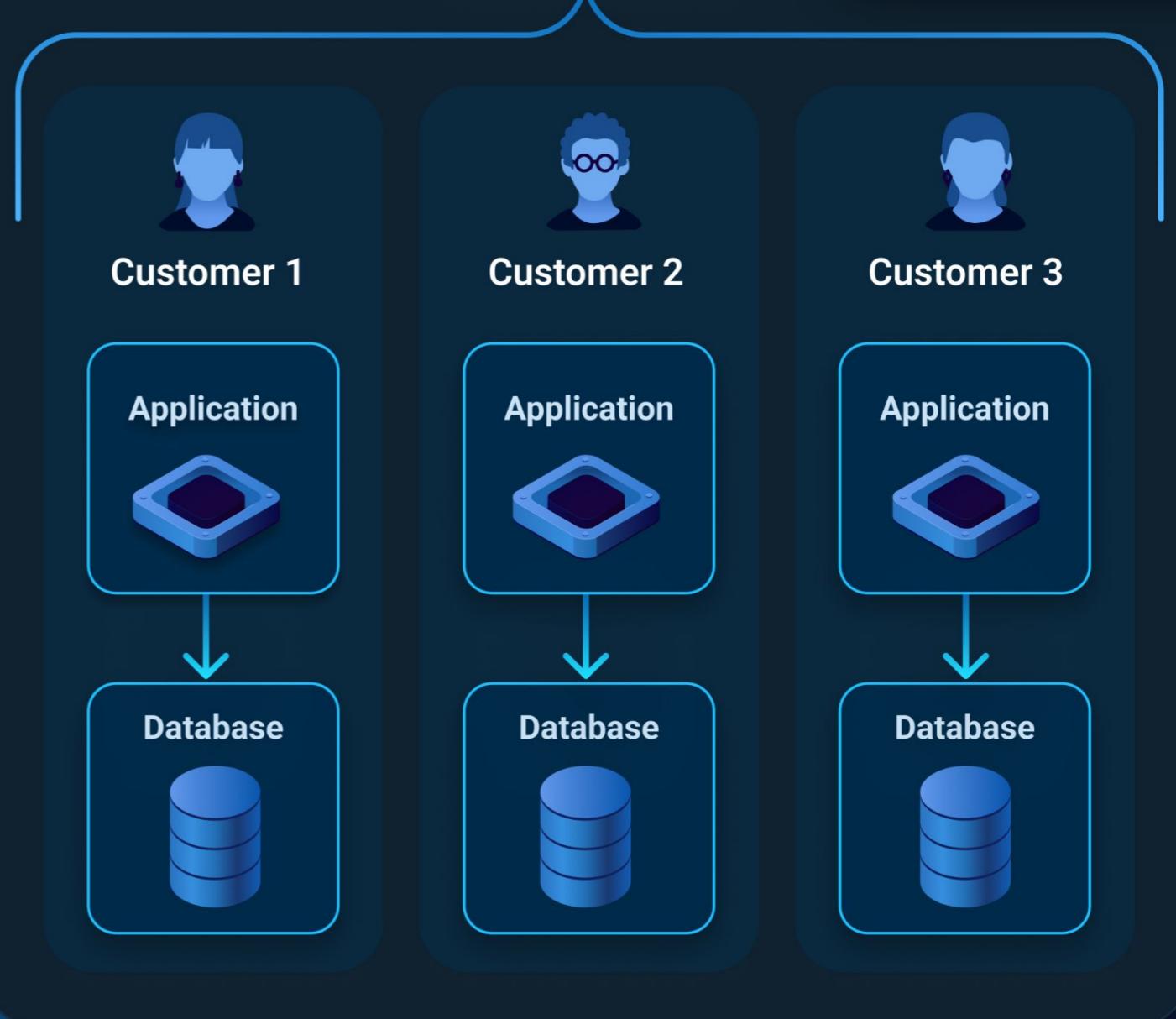
Reef #1

- K8s Cluster
- Azure SQL
- Server
- Azure Storage



Reef #2

- K8s Cluster
- Azure SQL
- Server
- Azure Storage



**1600+ customer
instances hosted
across 3 regions**

US

Europe

Australia



Our **Kubernetes** Config

- 8 Reefs - 8 K8s Clusters
- 300 - 500 Instances per reef
- VMSS - 3 to 6 nodes
- E20s_v4 - 20 vCPUs / 160 GB RAM



2024.4

2024.4 (Build 7107)

Tuesday, January 28, 2025

Recommended

2024.4 (Build 7091)

Wednesday, January 22,

2025

2024.4 (Build 7076)

Friday, January 17, 2025

2024.4 (Build 7065)

Wednesday, January 15,

2025

2024.4 (Build 7056)

Monday, January 13, 2025

2024.4 (Build 7050)

Friday, January 10, 2025

2024.4 (Build 7044)

Wednesday, January 8, 2025

2024.4 (Build 7026)

Sunday, December 22, 2024

2024.4 (Build 7005)

Tuesday, December 17,
2024

2024.4 (Build 6995)

Sunday, December 15, 2024

2024.4 (Build 6990)

Friday, December 13, 2024

2024.4 (Build 6983)

Thursday, December 12,
2024

2024.4 (Build 6967)

Wednesday, December 4,
2024

2024.4 (Build 6962)

Tuesday, December 3, 2024

2024.4 (Build 6608)

Wednesday, November 6,
2024

2024.4 (Build 6469)

Tuesday, November 5, 2024

2024.4 (Build 6274)

Saturday, November 2, 2024

Cloud

2024.4 (Build 6143)

Thursday, October 31, 2024

Cloud

2024.4 (Build 5788)

Tuesday, October 29, 2024

Cloud

2024.4 (Build 5422)

Friday, October 25, 2024

Cloud

2024.4 (Build 4698)

Friday, October 18, 2024

Cloud

2024.4 (Build 4317)

Tuesday, October 15, 2024

Cloud

2024.4 (Build 4121)

Saturday, October 12, 2024

Cloud

2024.4 (Build 3812)

Tuesday, October 8, 2024

Cloud

2024.4 (Build 3613)

Friday, October 4, 2024

Cloud

2024.4 (Build 3238)

Tuesday, October 1, 2024

Cloud

2024.4 (Build 2971)

Saturday, September 28,
2024

Cloud

2024.4 (Build 2718)

Wednesday, September 25,
2024

Cloud

2024.4 (Build 2267)

Friday, September 20, 2024

Cloud

2024.4 (Build 1937)

Wednesday, September 18,
2024

Cloud

2024.4 (Build 917)

Tuesday, September 10,
2024

Cloud

2024.4 (Build 401)

Friday, September 6, 2024

Cloud

SELF-HOSTED IS
ALWAYS N-1

SELF-HOSTED IS
RELEASED AFTER
MULTIPLE
CLOUD VERSIONS

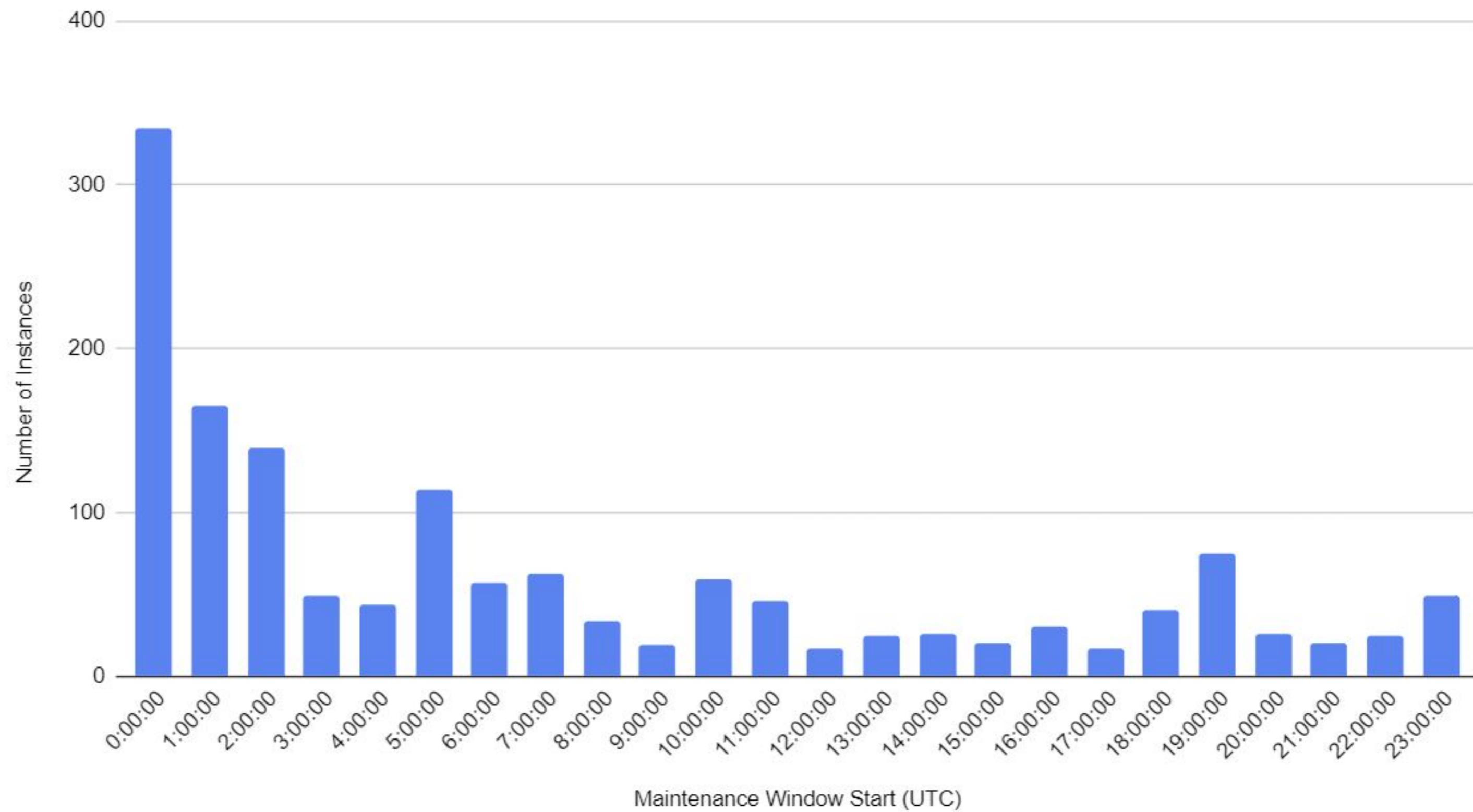
CLOUD IS ONE
QUARTER AHEAD
OF
SELF-HOSTED



Self-inflicted challenges



Number of Instances vs. Maintenance Window



CODE APERTURE

 Personal Demo Instance **Configuration**bobjwalker.octopus.app 

Display name	Personal Demo Instance	Rename
Instance URL	bobjwalker.octopus.app	Change
Technical contact	Bob Walker bob.walker@octopus.com 	Copy email 
Region	West US 2	More info 
Resource usage	File storage: 6 of 1000 GB	More info 
Static IP addresses	52.250.93.128/28	More info 
Maintenance window	In order to update your instance to newer releases of Octopus Deploy, we may occasionally need to take it offline for a short period. You have nominated the following maintenance window: 9:00 AM UTC – 12:00 PM UTC	Change window



2024.3 (Build 12647)

Tuesday, September 3, 2024



Cloud

2024.3 (Build 12251)

Friday, August 30, 2024



Cloud

2024.3 (Build 11587)

Sunday, August 25, 2024



Cloud

2024.3 (Build 10989)

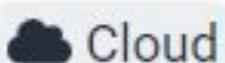
Friday, August 16, 2024



Cloud

2024.3 (Build 10840)

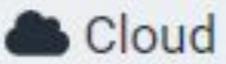
Thursday, August 15, 2024



Cloud

2024.3 (Build 10714)

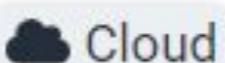
Wednesday, August 14,
2024



Cloud

2024.3 (Build 9887)

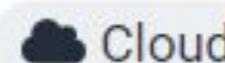
Wednesday, August 7, 2024



Cloud

2024.3 (Build 9242)

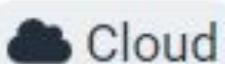
Saturday, August 3, 2024



Cloud

2024.3 (Build 8336)

Thursday, July 25, 2024



Cloud

2024.3 (Build 8206)

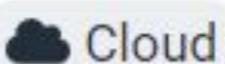
Thursday, July 25, 2024



Cloud

2024.3 (Build 7892)

Tuesday, July 23, 2024



Cloud

2024.3 (Build 7660)

Monday, July 22, 2024

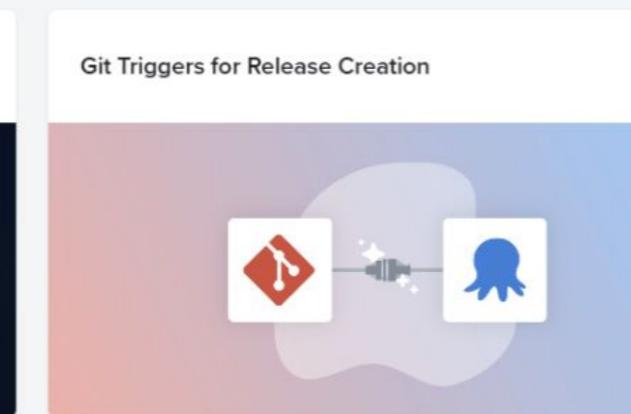
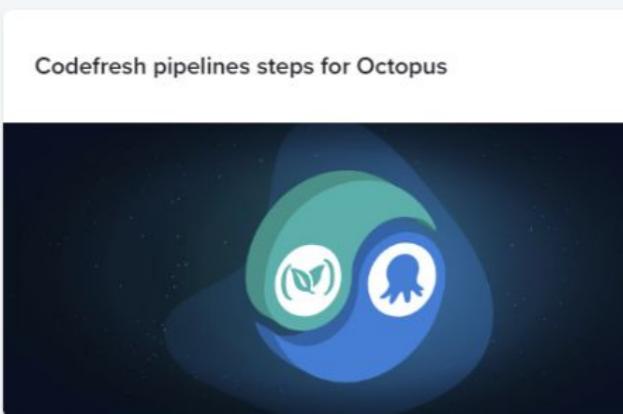
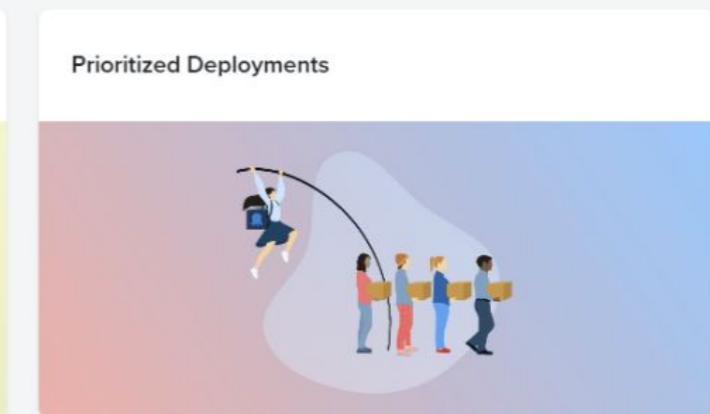
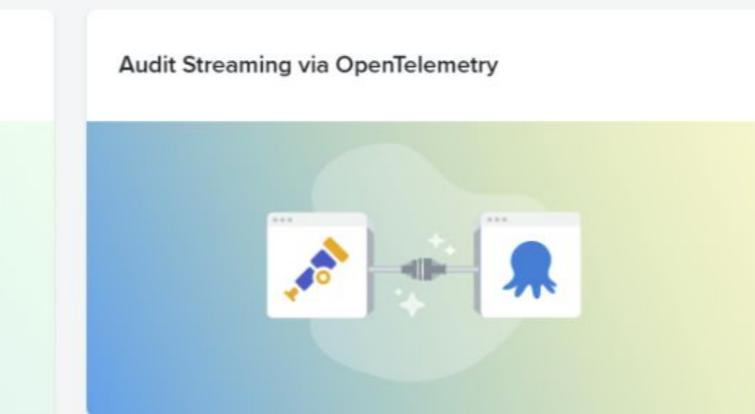
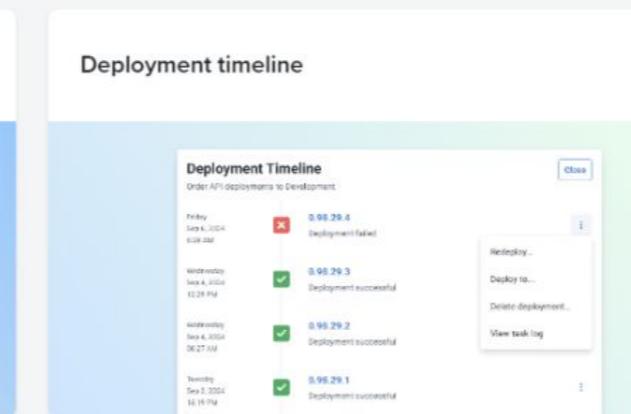
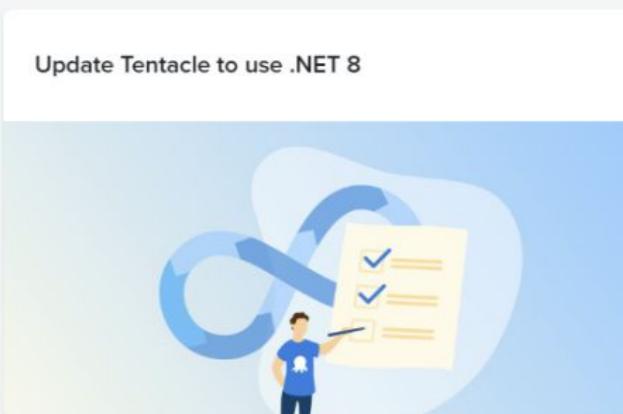


Cloud

MULTIPLE DEPLOYS PER WEEK

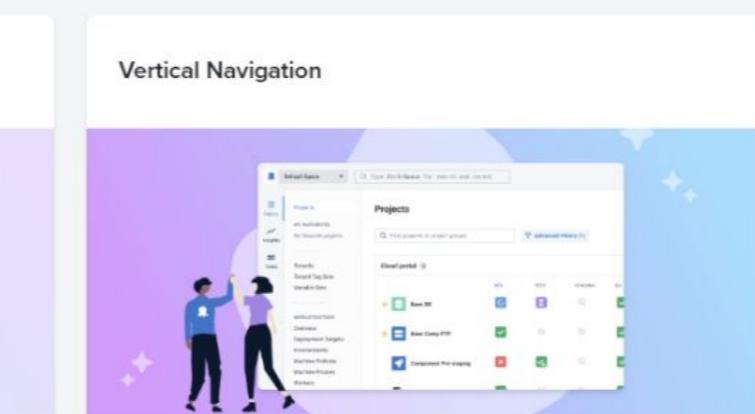
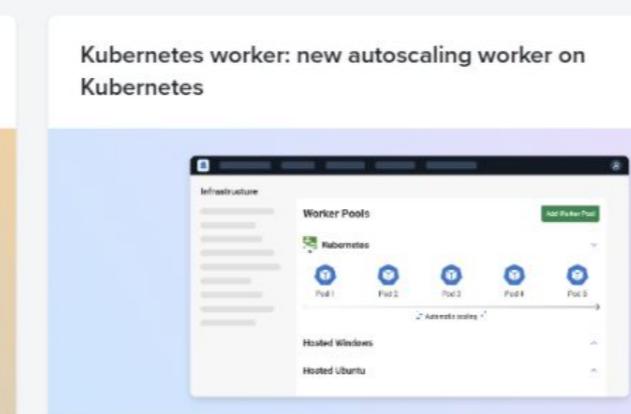
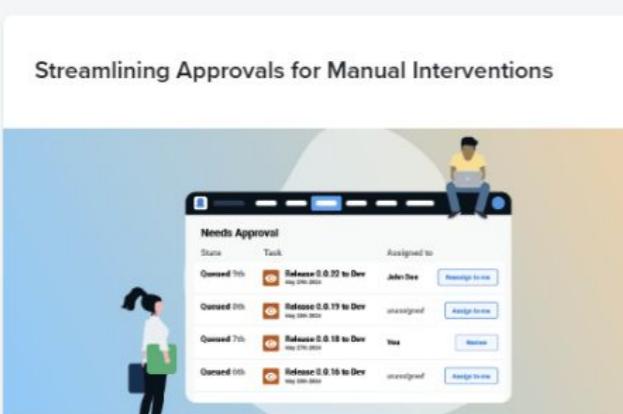
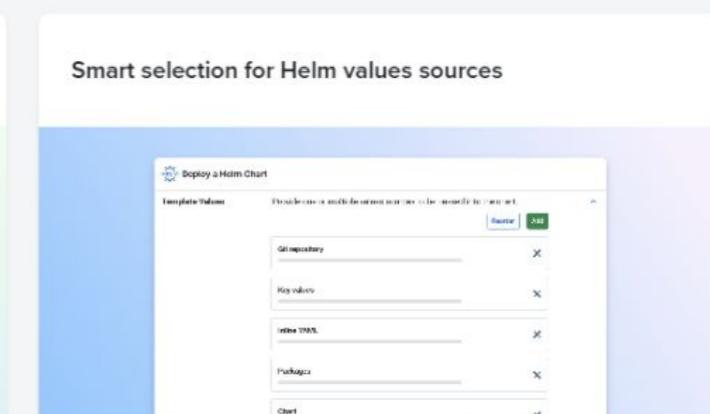
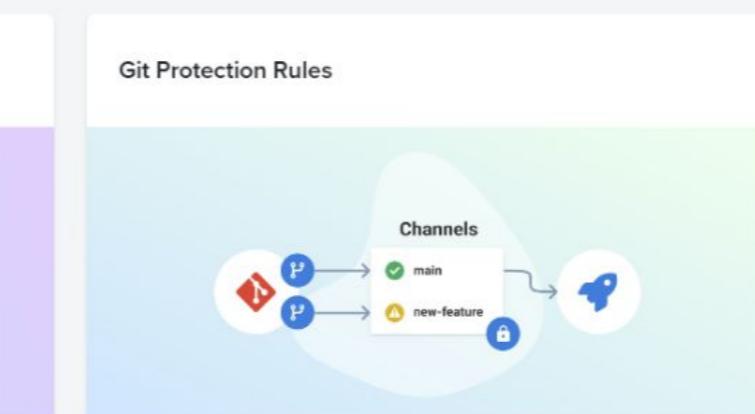
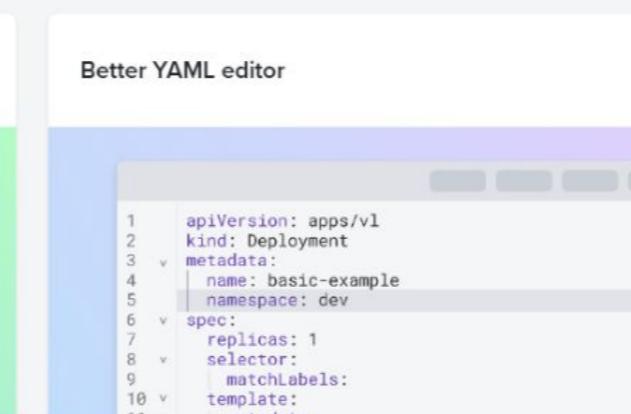
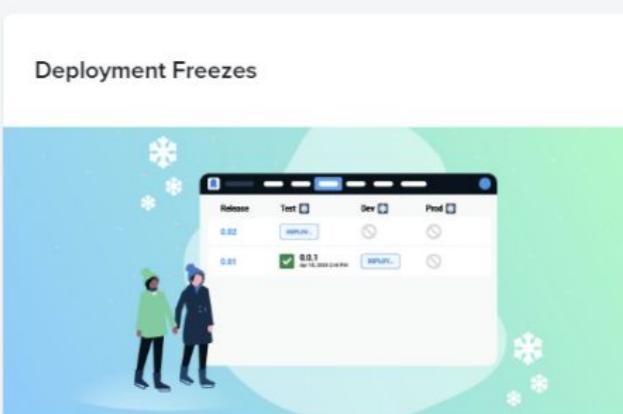


2024.4



2024.4
FEATURES

2024.3



2024.3
FEATURES

Feature Flags are for SaaS only

34%

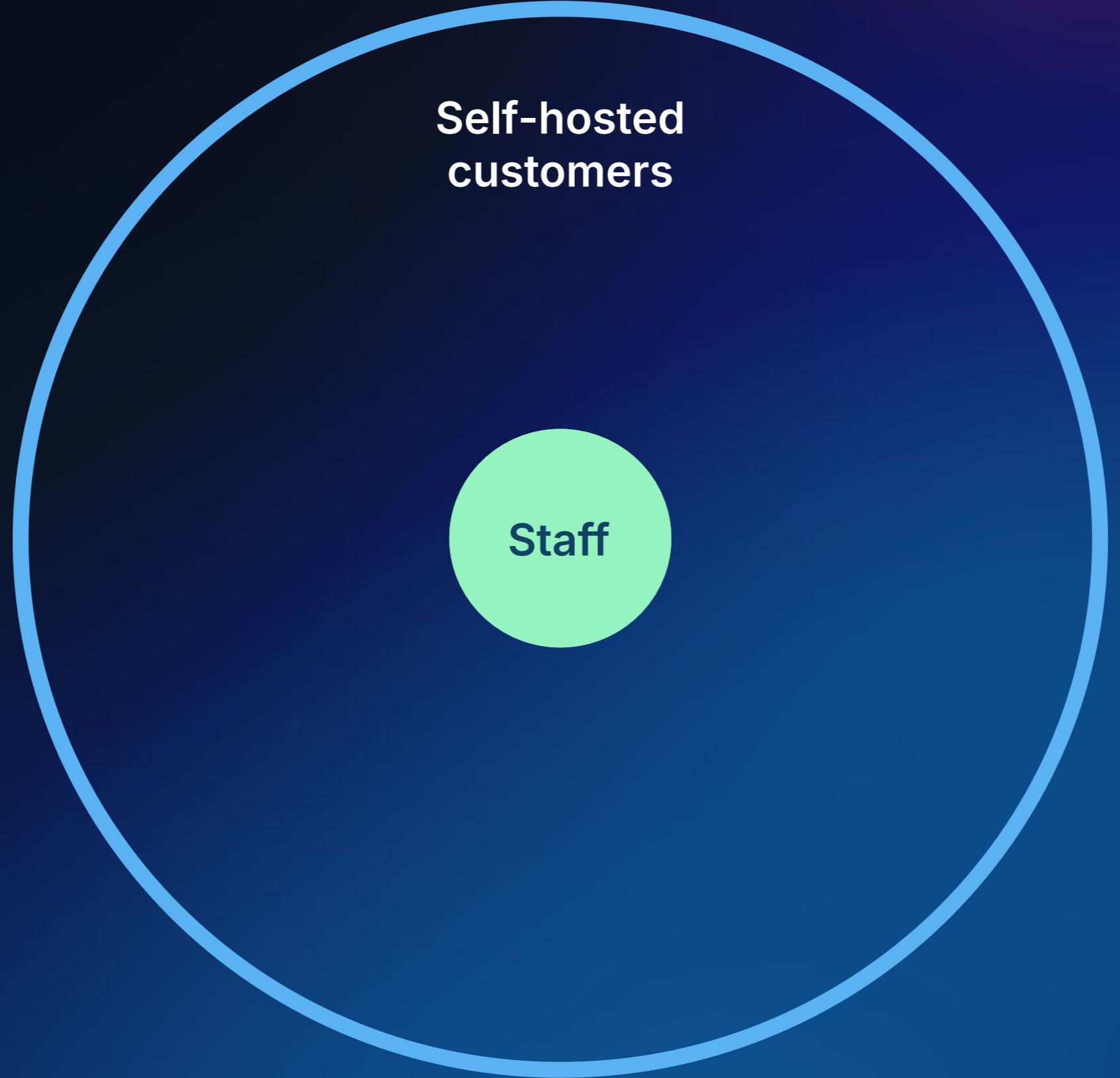
Total customers are
on Octopus Cloud

66%

New customers
choose Octopus
Cloud

25%

Will never move to
Octopus Cloud



Self-hosted
customers

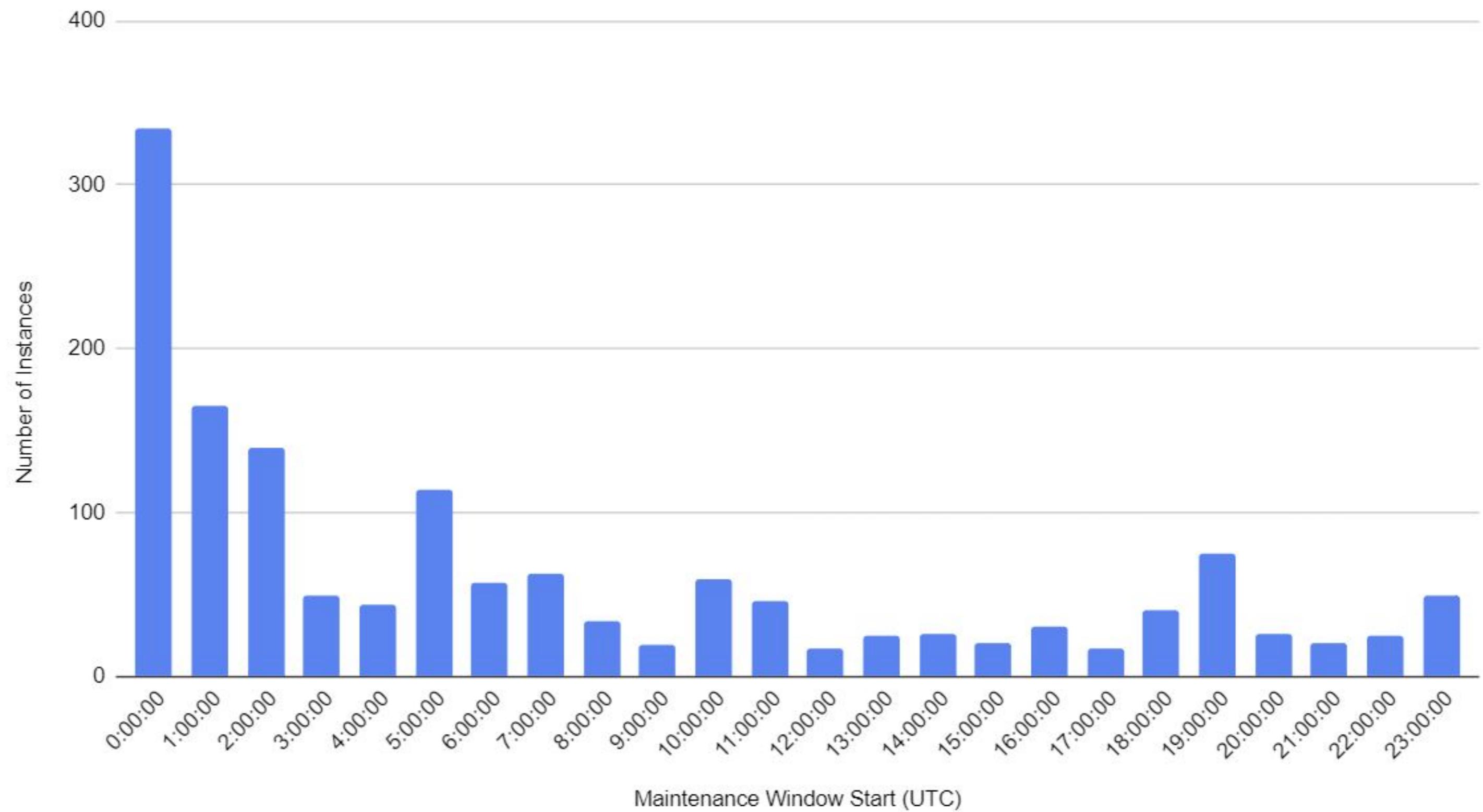
Staff



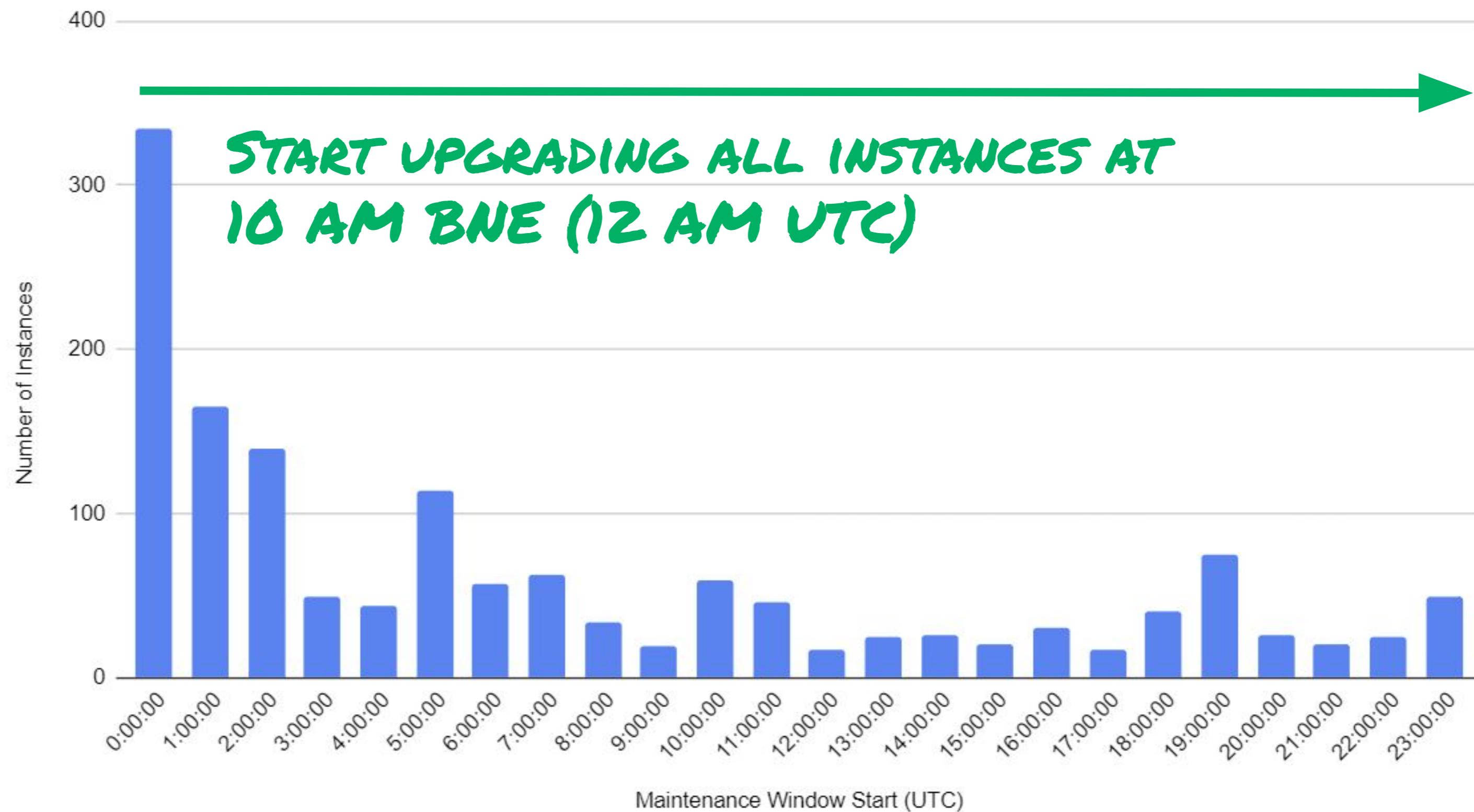
Solution v1



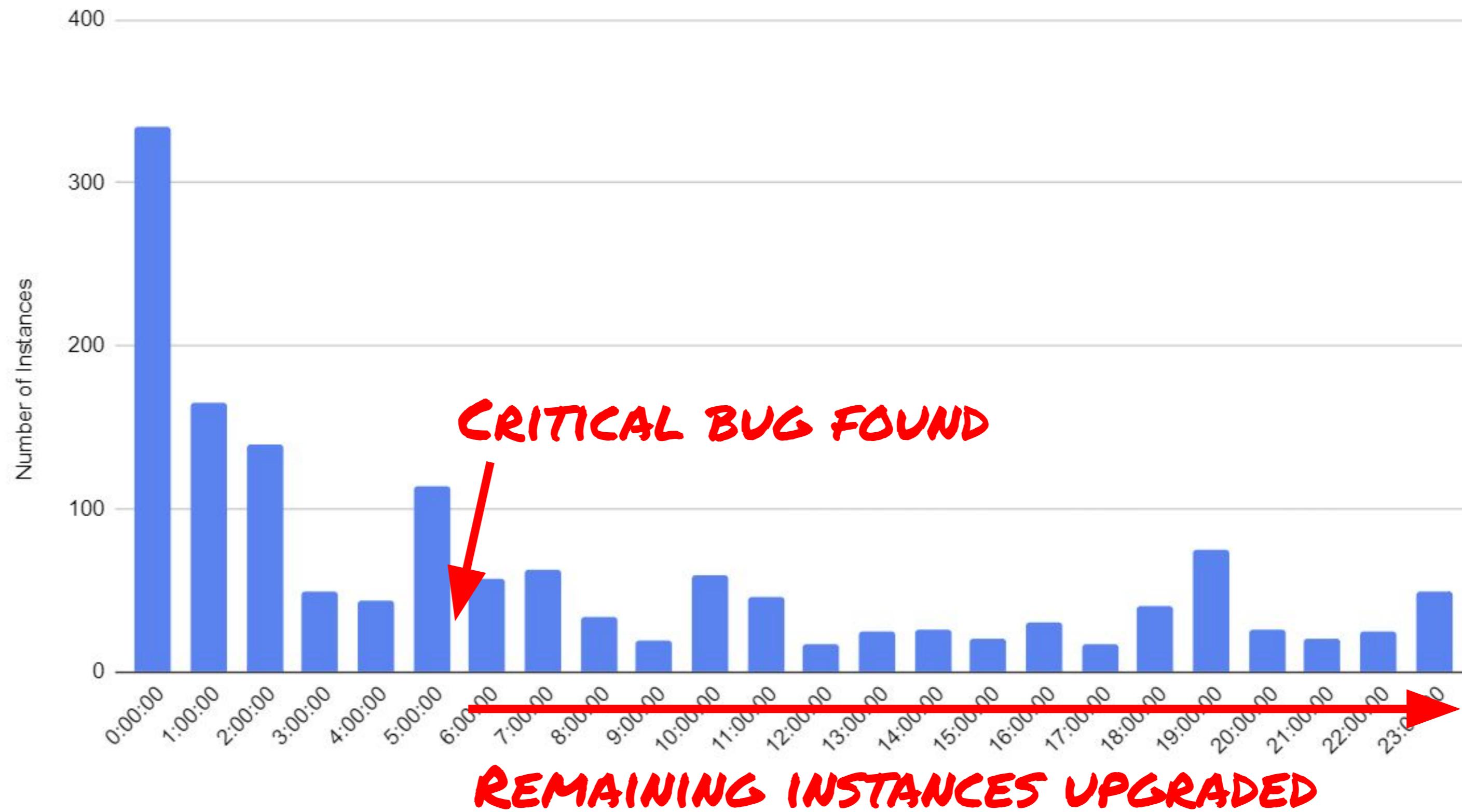
Number of Instances vs. Maintenance Window



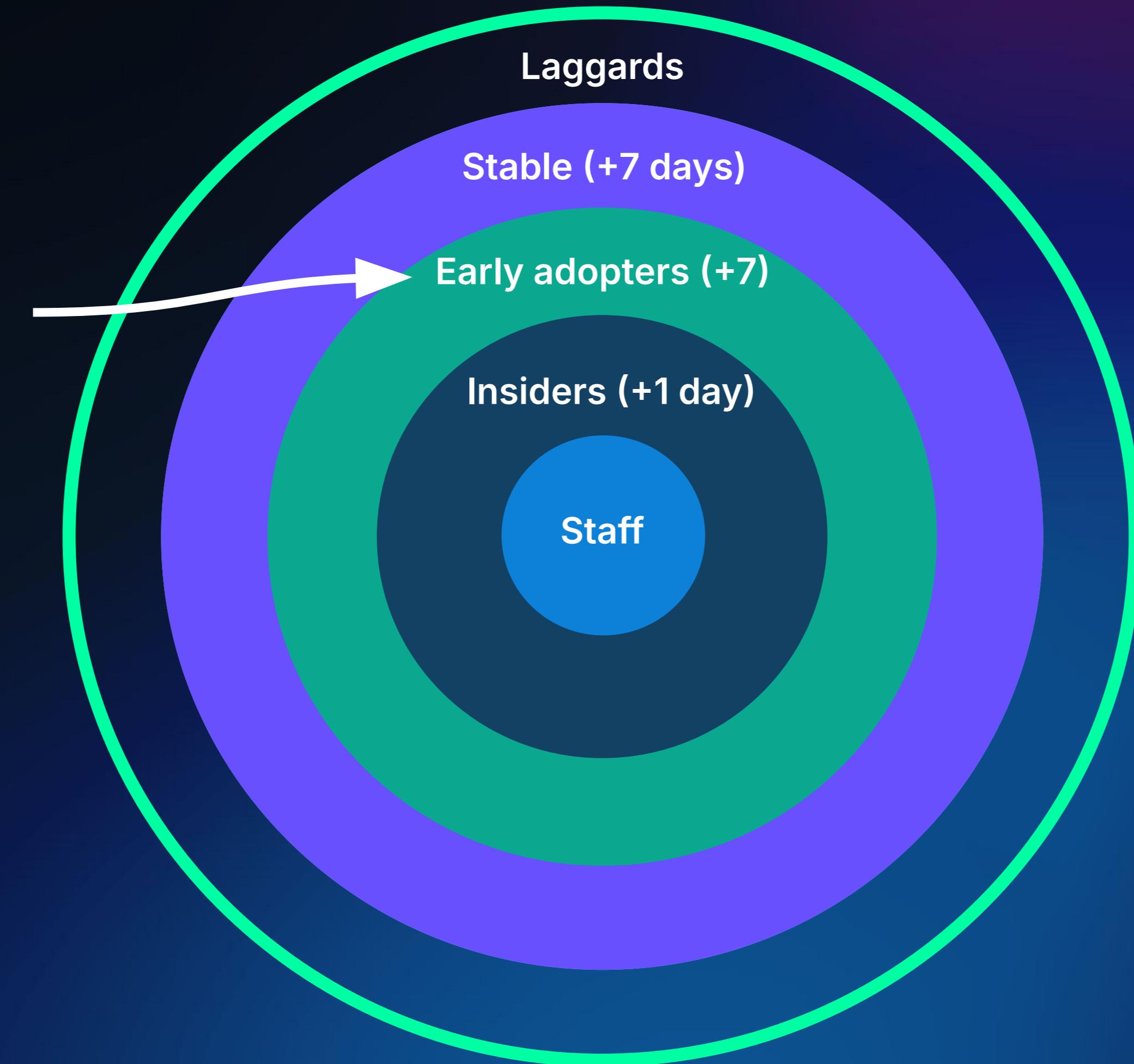
Number of Instances vs. Maintenance Window



Number of Instances vs. Maintenance Window



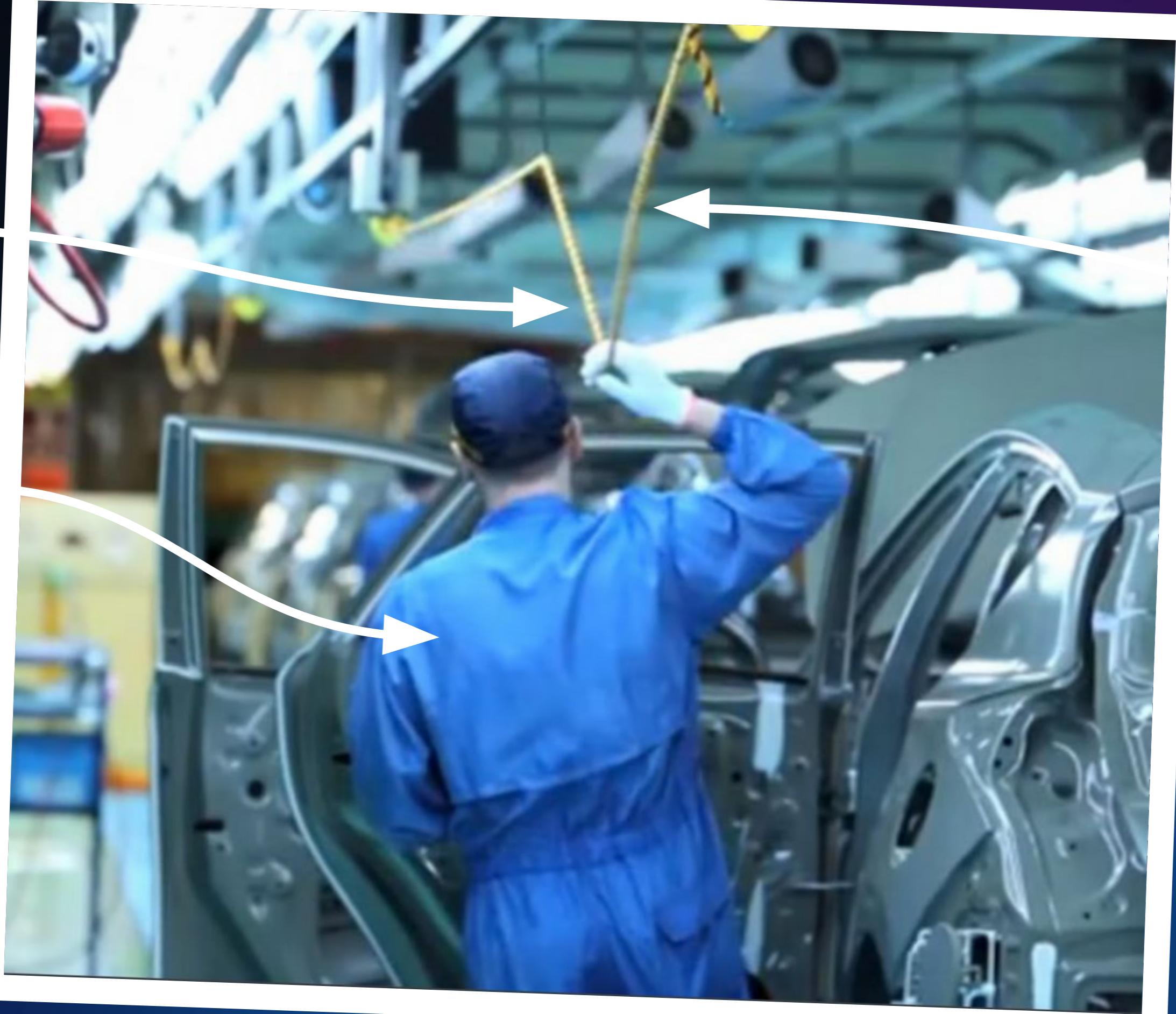
THE LIST
OF EARLY
ADOPTERS
INSTANCES
WERE
STATIC



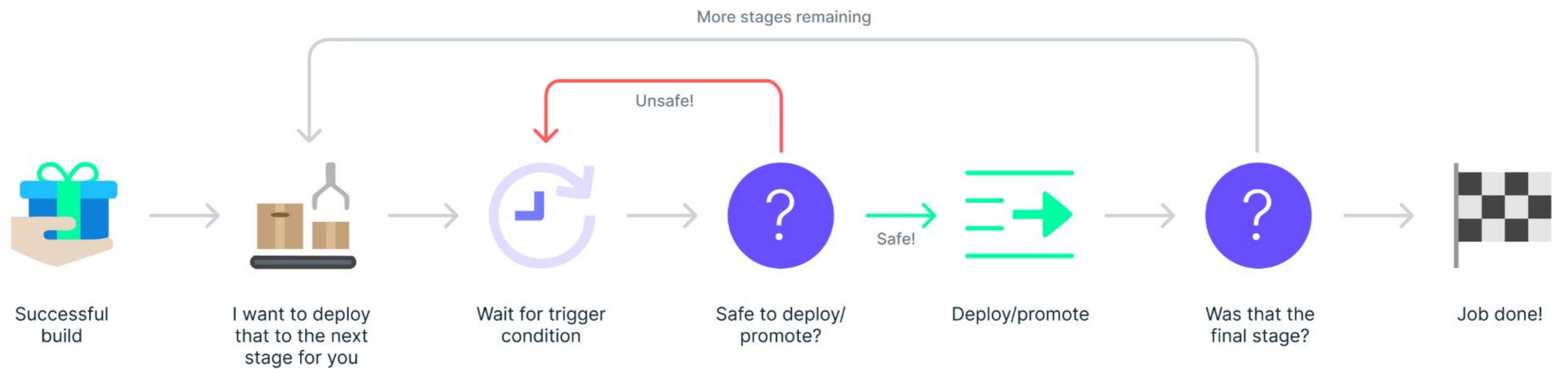
ANDON
CORD

ANYONE
CAN PULL
IT

PULLING
STOPS
ASSEMBLY
LINE



Let the enthusiastic machines do the work



Andon Cords

Healthy

The release pipeline will continue to move forward.

Who can pull the Andon Cord?

- **Anyone.** Yes, that means you!

When should you pull an Andon Cord?

- You can't deploy.
- You can't edit or create a deployment process, project or space.
- You can't create or edit releases.
- You can't run or run, edit or create a runbook.
- You can't edit or create users and/or permissions.
- Something in the product doesn't look or feel right. You're not sure what yet, but something is off.
- ***If you're not sure, pull the Andon Cord!*** This ensures nothing bad will happen, and it buys time to think.

For more information about why we use Andon Cords, please see the [helpful docs](#).

 Pull Andon Cord

Open (0)

No open problems.

Resolved / Closed (549)



April 21st, 2022

NEW



Rhys Parry 6:42 PM



I'm concerned about the progress of updates to Cloud and thought it might be helpful to discuss here.

- The dominant, stable version in cloud is currently [2022.2.387-hotfix.903](#) from March 7 (46 days ago)
- Updates, including fixes since then, have not been available to cloud customers
- One consequence has been that step package updates are available for self-hosted customers (2022.1), but not cloud customers.
- As far as I can tell, the current early adopters' release ([2022.2.3108](#) from today) is the next possible candidate for going to cloud. That won't be for at least another week, assuming no further issues.
- With more changes continuing to accumulate, the likelihood of new issues seems high, reinforcing these delays. We ([#topic-steps](#)) have marked a delivery risk on the Milestones spreadsheet to indicate that work merged last month has not yet gone out widely to cloud customers.

Is the current approach scaling appropriately?

ISSUES DISCOVERED

- Multiple days to make it through all rings to “stable”
- Staff / Insiders / Early Adopters didn’t cover **all** possible paths
- **Critical bugs** still made it to “stable”
- Weeks before a stable release



Solution v2



DOG FOOD OUR APP

MAIN DEPLOY INSTANCE IS
FIRST ONE UPDATED

DEPLOY TO RANDOM
SUBSET OF INSTANCES

- 5% of active customers
- Rotating / randomized
- Updated after 3 days (at most)

MAJORITY OF USERS
IN STABLE RING

Laggards

Stable (+2 days)

Canary customers
(+3 days)

Staff





Default



Type Ctrl+Space to search or switch projects...



All Projects



Tenants

Tenant Tag Sets



Variable Sets

INFRASTRUCTURE

Overview

Deployment Targets

Environments

Machine Policies

Machine Proxies

Workers

Worker Pools

MANAGE

Accounts

Build Information

Certificates

External Feeds

Git Credentials

Lifecycles

Packages

Script Modules

Step Templates

All Projects

Search projects...

Advanced filters

Filters applied

Default Project Group

Development

Test

Staging

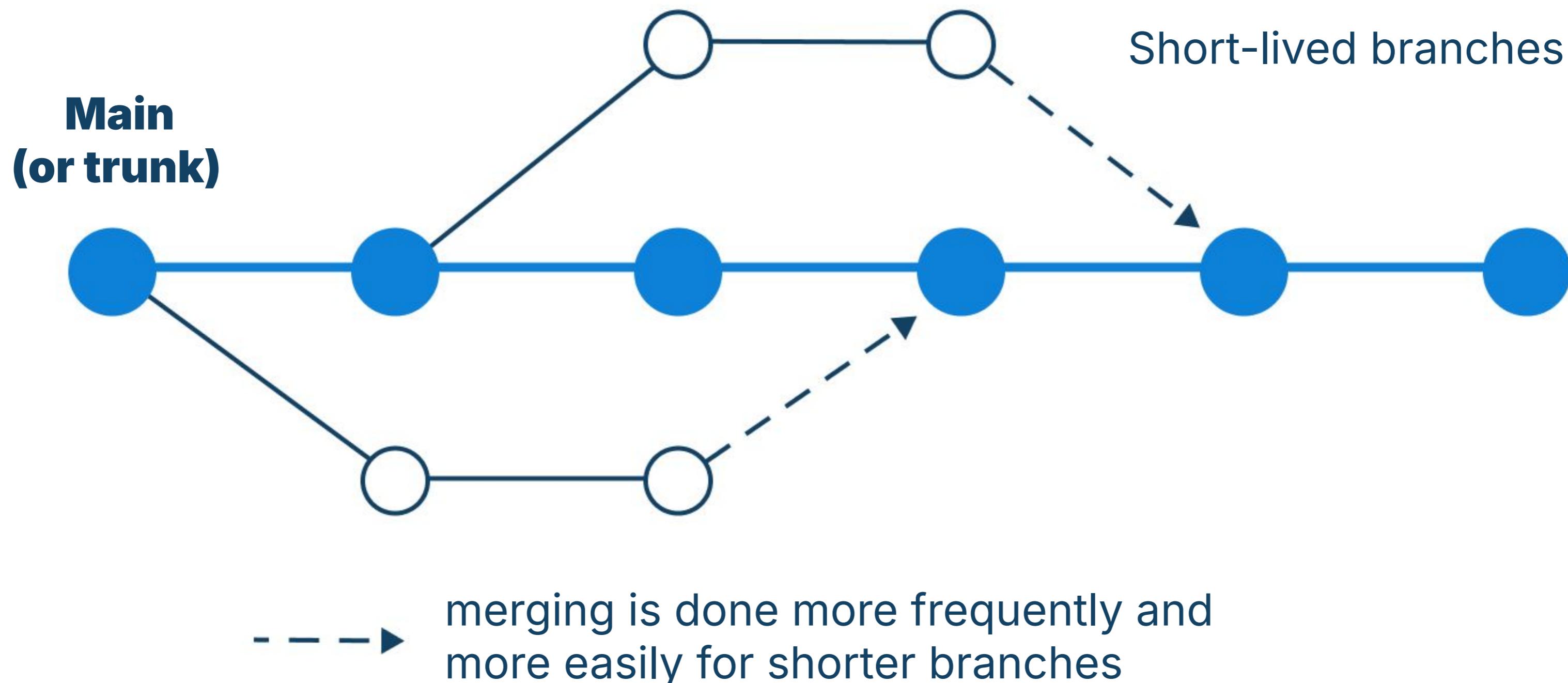
Production

Pet Shop	2024.3.1.1-ClinicsBrand ing Mar 11, 2024 3:22 PM	1/1	2024.3.0.9 Mar 11, 2024 3:26 PM	1/1	2024.3.0.9 Mar 11, 2024 3:41 PM	4/4	2024.3.0.9 Mar 11, 2024 3:35 PM	5/12
Random Quotes	0.1.42 Feb 27, 2024 3:01 PM		0.1.79.1 Feb 27, 2024 3:24 PM		0.1.79.1 Feb 27, 2024 3:26 PM		0.1.79.1 Feb 27, 2024 3:30 PM	
Trident	4.0.56-helm.9 Apr 17, 2024 9:55 AM		4.0.56.466 Apr 17, 2024 10:21 AM		4.0.56.466 Apr 17, 2024 10:27 AM		4.0.43.421 Mar 19, 2024 8:56 AM	

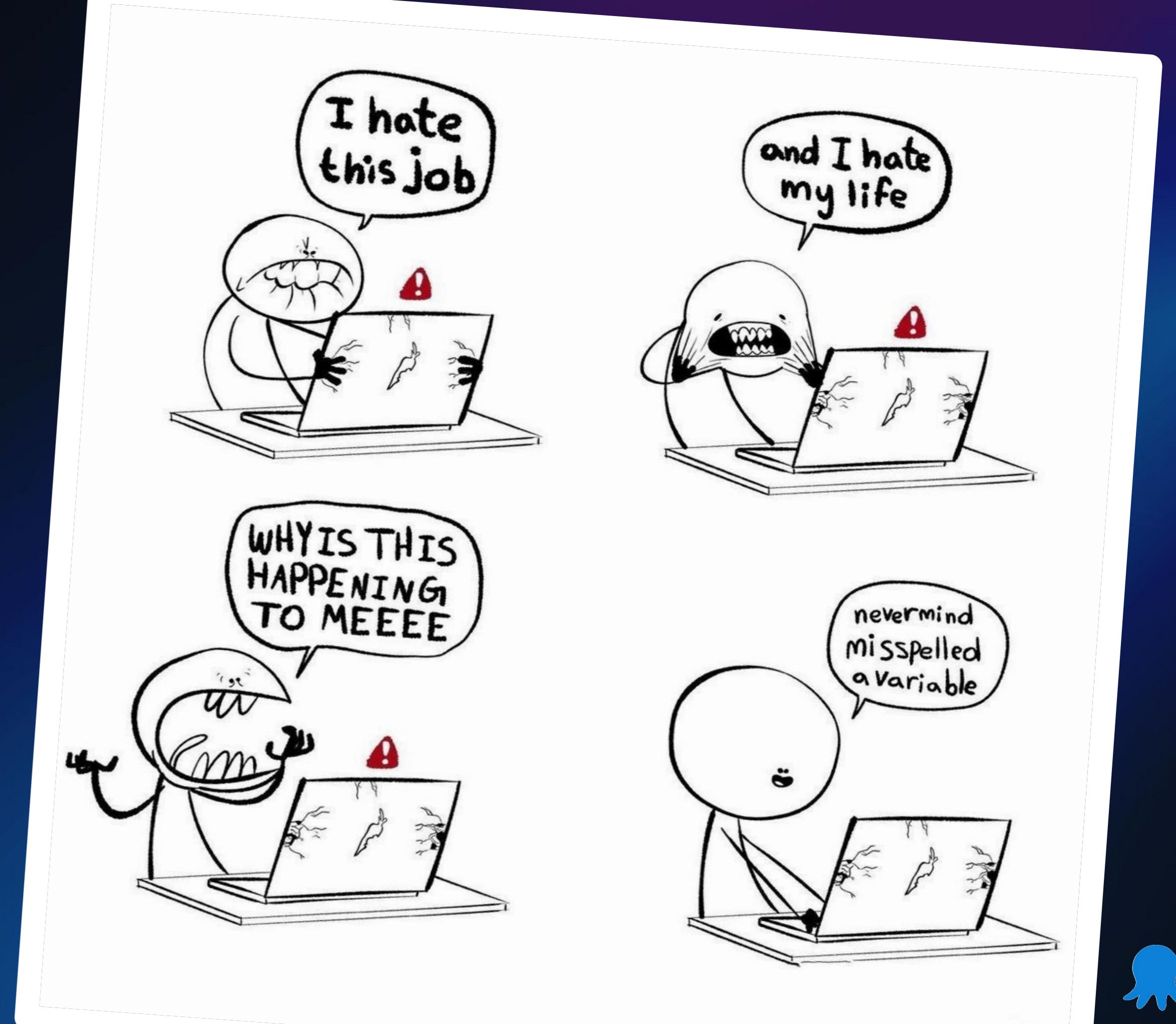
When you are gonna merge two branches after a long time



Trunk-based development

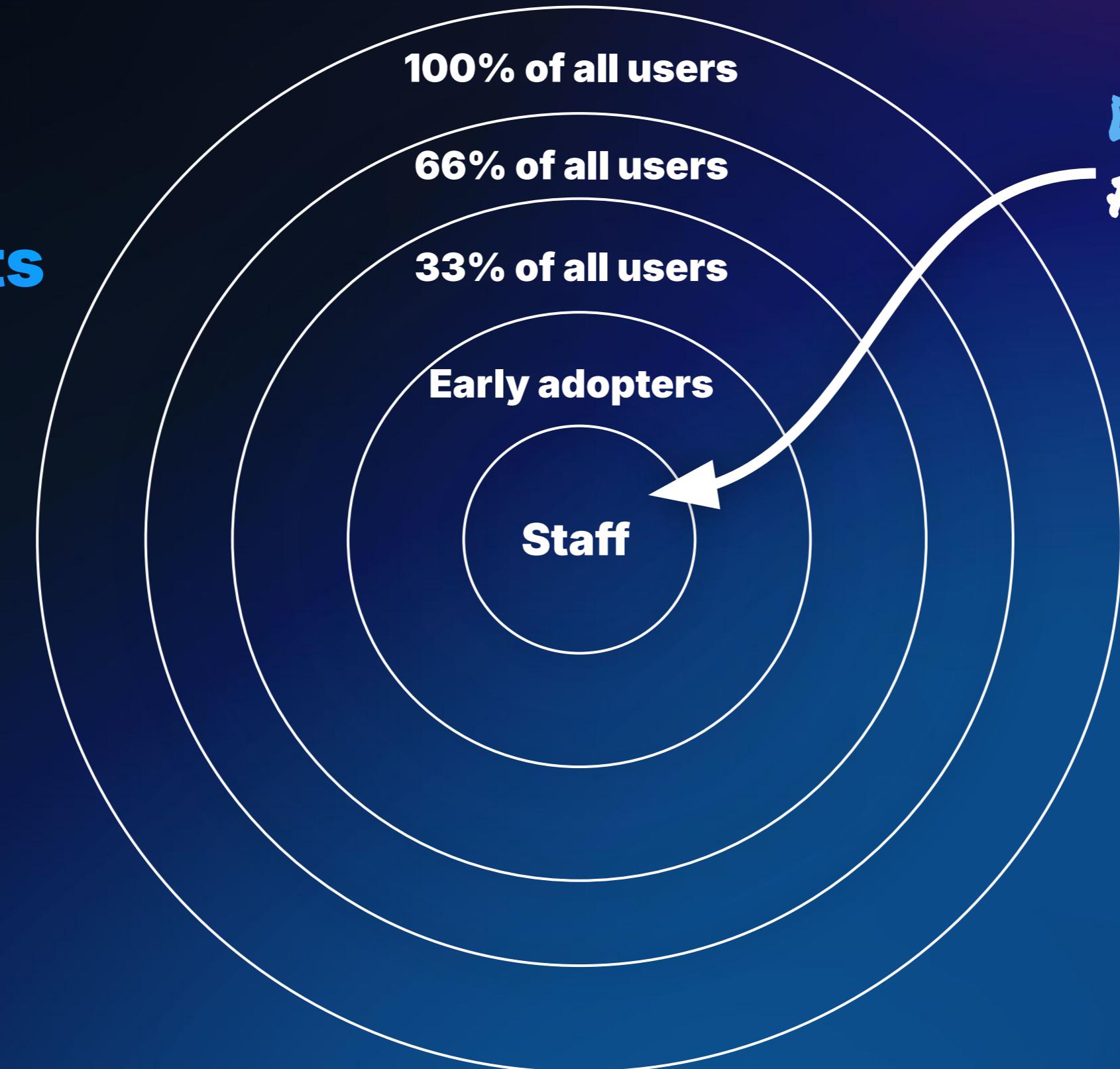


We needed to
gather **feedback**
before updating
all users



Open feature to create segments of users

- Location
- Team
- Usage History
- Deploy Environment
- User Sign-upA



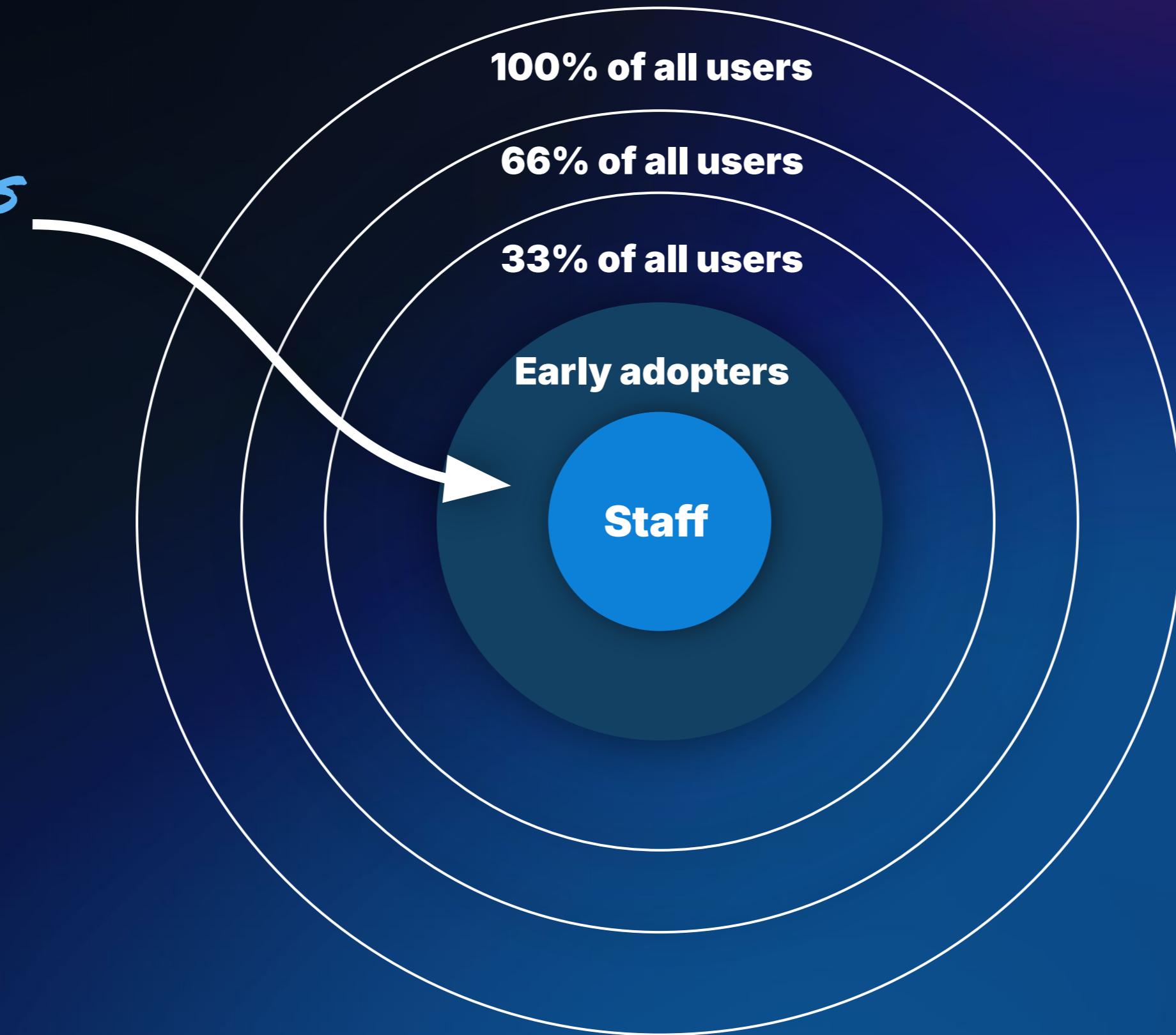
DEPLOY WITH
FLAG TURNED OFF

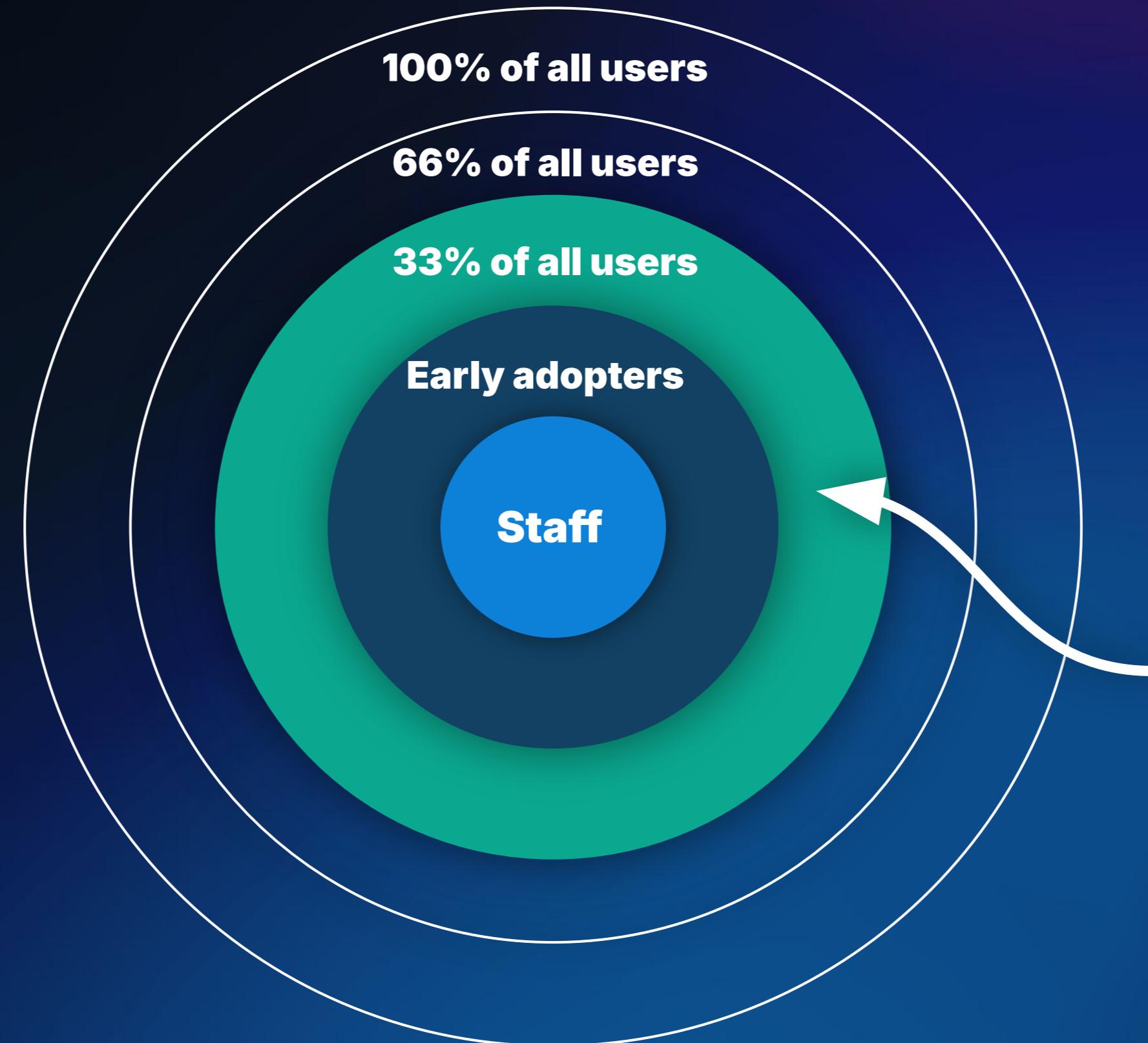




TURN ON FLAG
FOR STAFF USERS

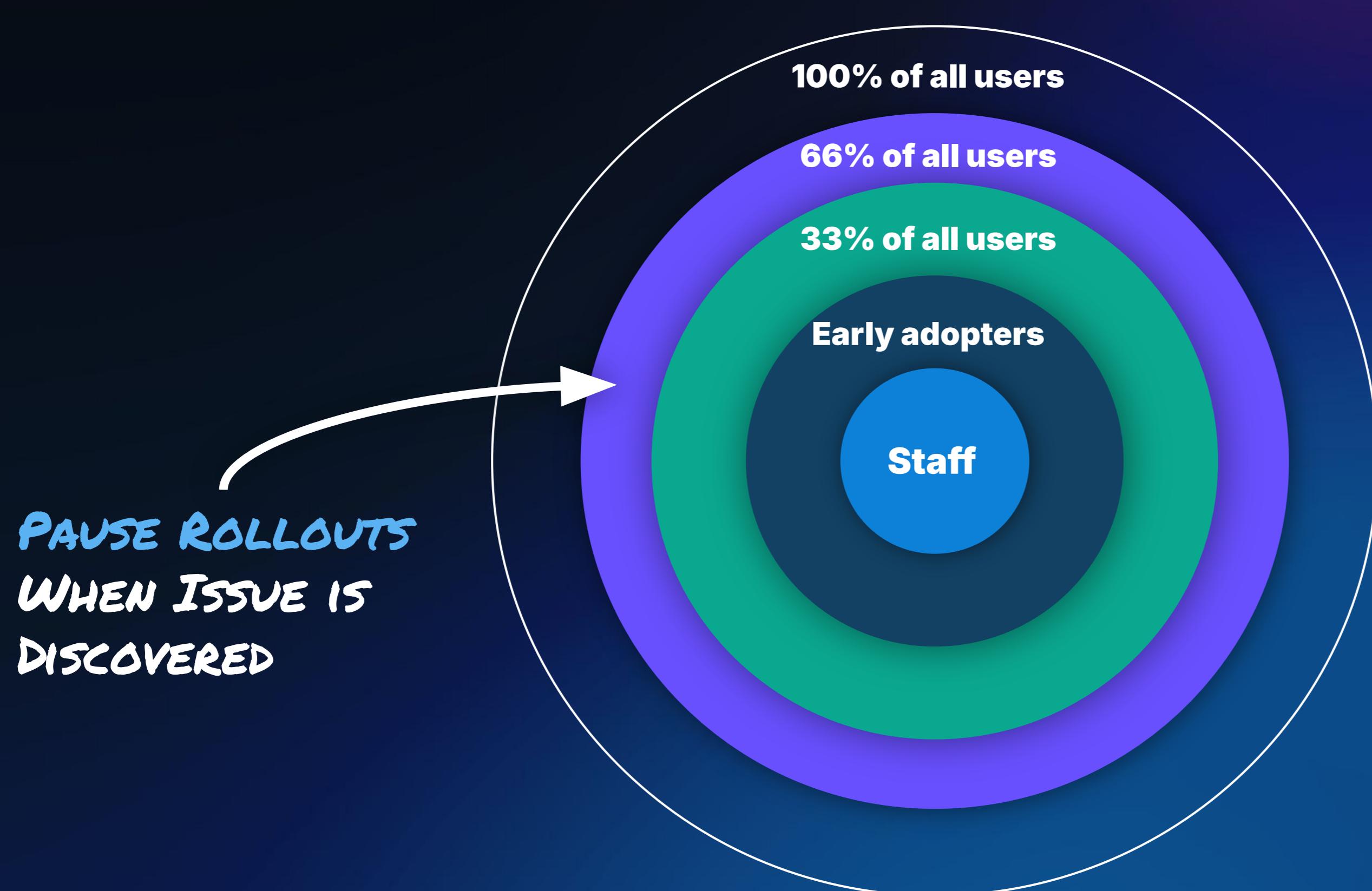
**EARLY ADOPTERS
CAN OPT-IN**

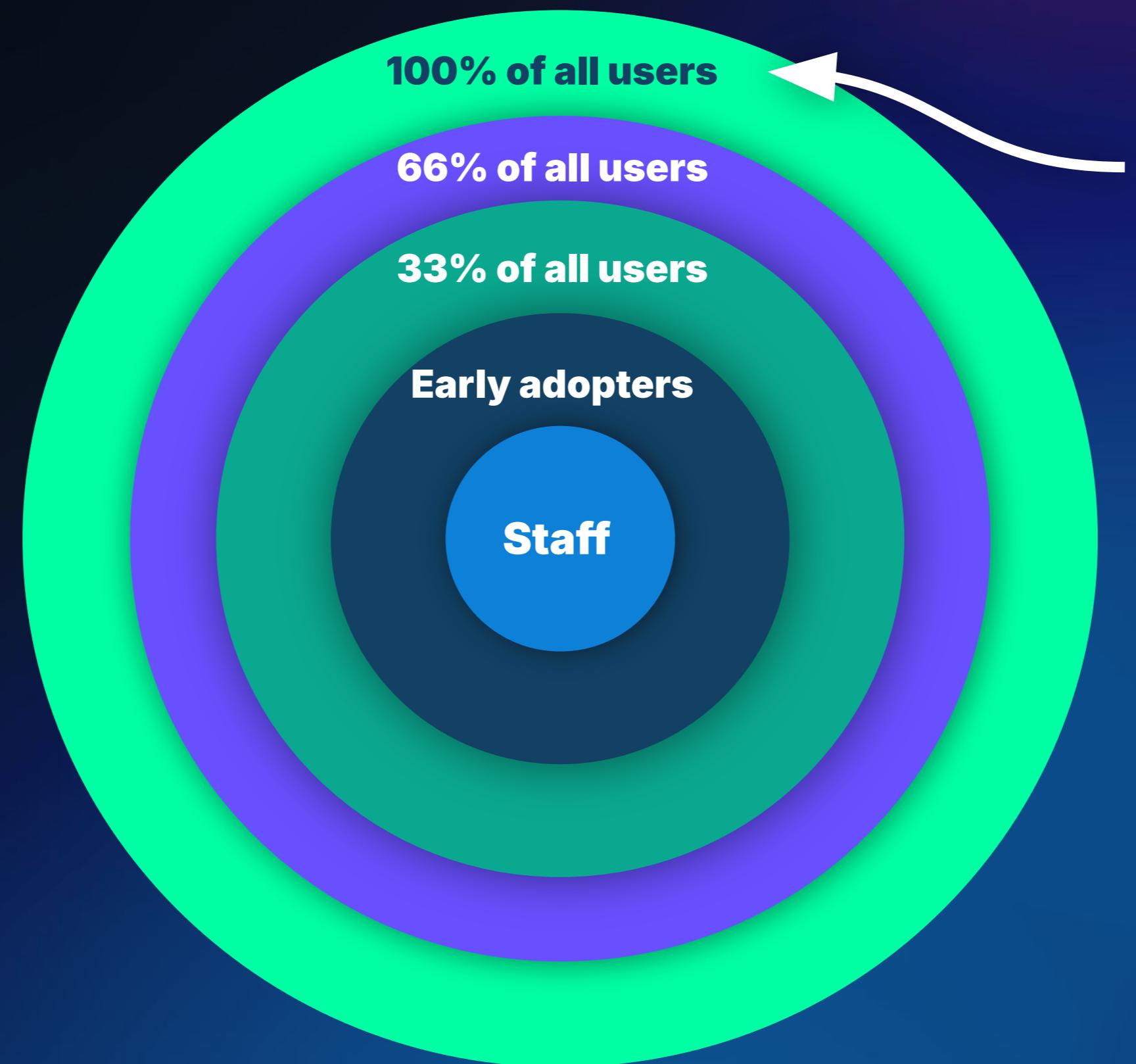




ENABLE FOR
REMAINING
USERS OVER
PERIOD OF TIME







CONTINUE TO 100%
BUT EXCLUDE
CUSTOMERS UNTIL
ISSUE IS RESOLVED



Feature Toggles

Git Runbooks Migration

Save

⋮

EXPAND AI

Name Git Runbooks Migration git-runbooks-migration

Notes Enter markdown notes

Environments

Add Environment

Branch Instances (Staging)

Production bobjwalker (93210-38123-34424-0240)

geofflamrock (52813-83013-13426-32423)

matt-richardson (14422-43153-05428-91393)

michrich (26536-51719-66422-08236) robpearson (07302-11441-38429-68838)

Cloud Customers caitlyn (81532-51943-29424-61)

claimsxten (85067-69362-42425-31633) deploy (86975-7807)

fctg (28283-23273-85426-51305) fish-net (51662-13732-134)

recruitwizard (40147-20555-01421-42353) vista (85312-6343)

vista2 (95223-72613-36426-49244)

Edit Environment



Production

Tenants

Select which tenants should be targeted by this toggle

Included tenants

All Tenants

Specific Tenants

bobjwalker (93210-38123-34424-02406) michrich (26536-51719-66422-08236)

geofflamrock (52813-83013-13426-32423)

matt-richardson (14422-43153-05428-91393)

robpearson (07302-11441-38429-68838)

Included Tenants

Percentage of Tenants

Excluded Tenants

Segments

Cancel

Ok



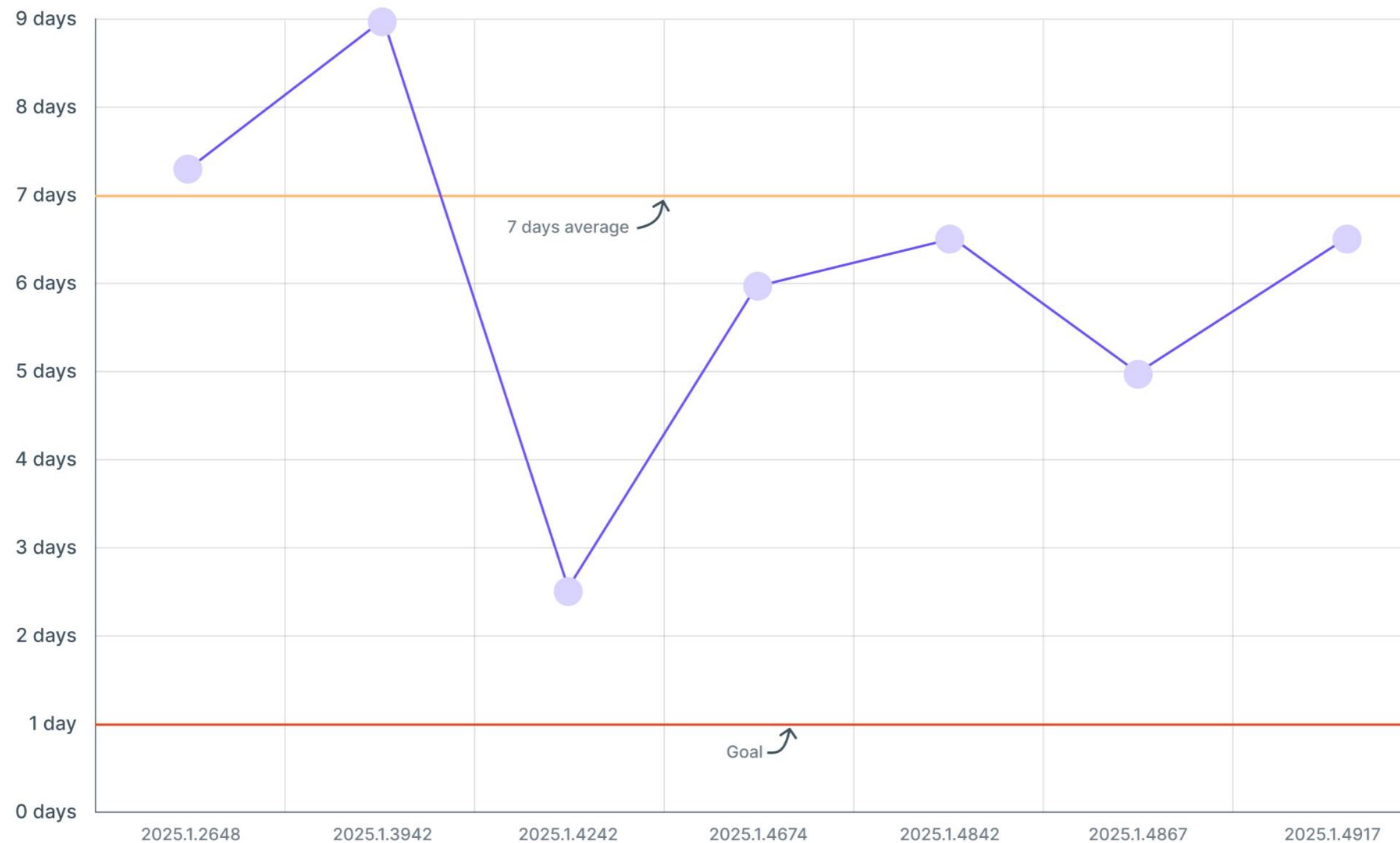
Month	Uptime %	Average weekly unplanned downtime	Uptime % incl. planned maintenance	Average weekly downtime incl. planned maintenance
December 2024	100%	2s	99.9666%	114s
November 2024	100%	2s	99.8895%	446s
October 2024	99.9973%	5s	99.917%	309s
September 2024	99.9977%	4s	99.9165%	313s
August 2024	99.9955%	8s	99.8978%	447s
July 2024	99.9978%	6s	99.8602%	616s
June 2024	99.9931%	9s	99.9196%	* 279s
May 2024	99.9976%	11s	-	-
April 2024	99.9687%	17s	-	-
March 2024	99.9914%	10s	-	-
February 2024	100%	2s	-	-
January 2024	99.9976%	3s	-	-



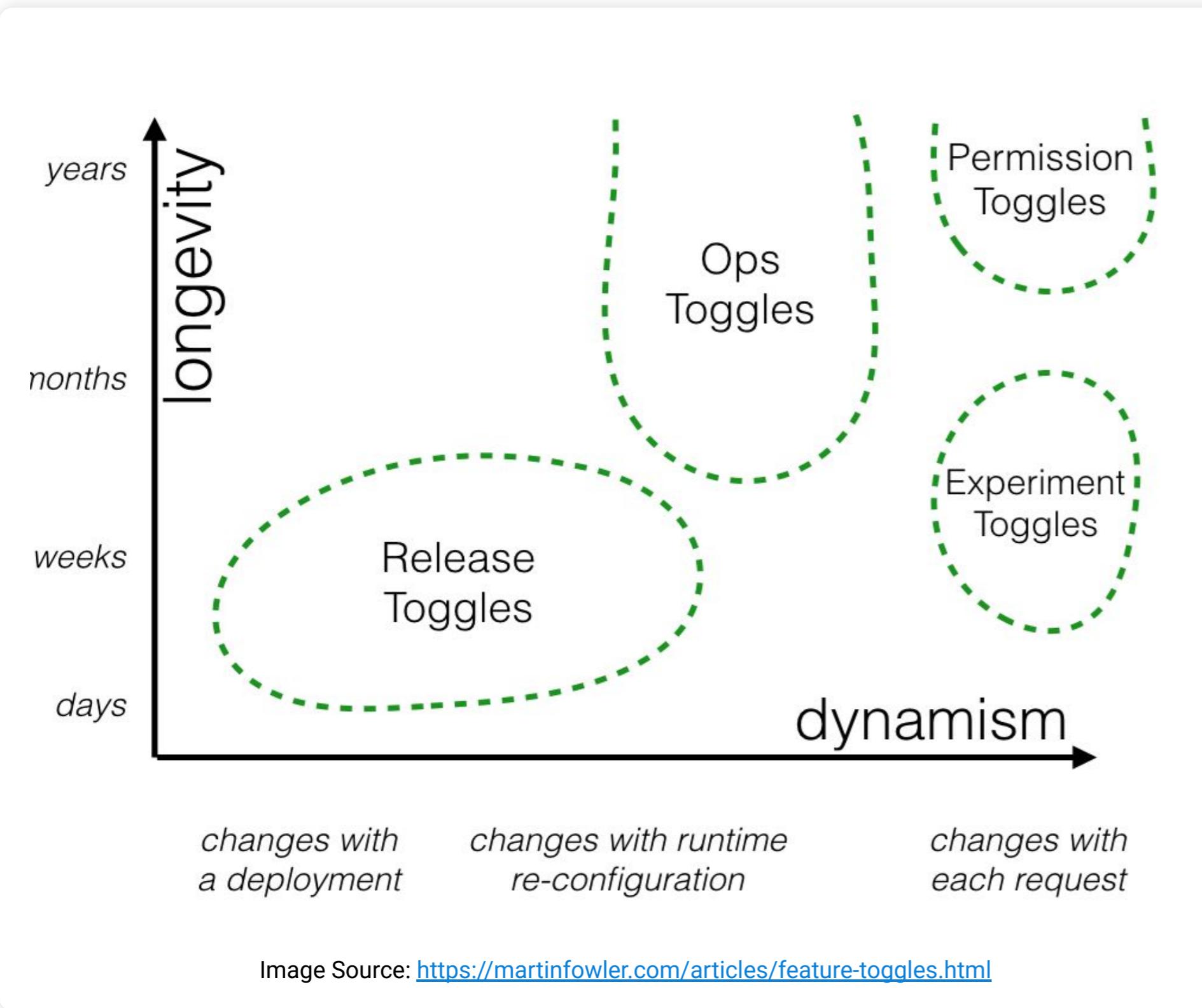
Lead time changes (Cloud)

● Current measure: 4 days, 3 hrs. [Details]

● Goal: 1 day



Feature flags require Expand and Contract Pattern



OpenFeature

Standardizing Feature Flagging for Everyone

Remaining challenges



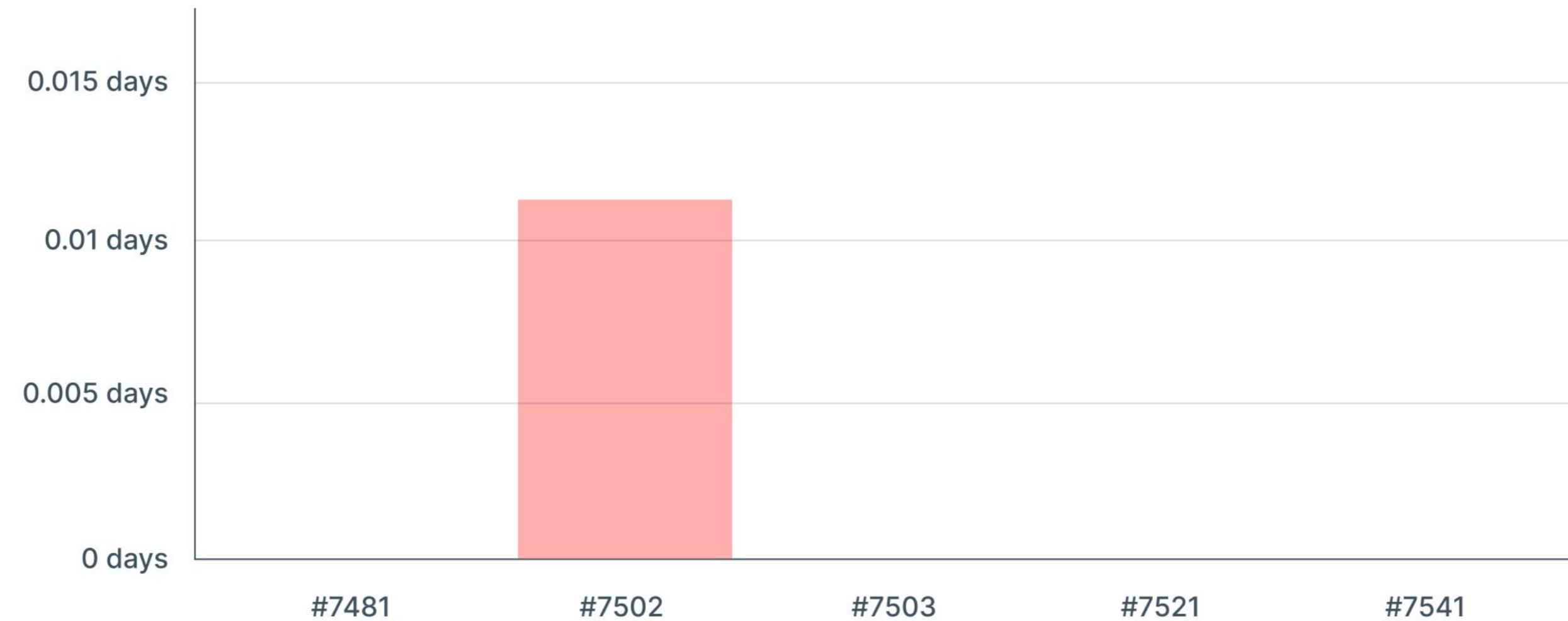
Mean time to recovery (MTTR)

Time to detect

5 days, 20hrs average

Time to fix

- Current measure [Details]: < 1 hour
- Goal: < 1 hour to fix



High severity defect escape rate

Only SEV-0 and SEV-1 issues are shared here.

For more details on tracking the high-severity defect escape rate, read [this document](#).

See [Vision: Octopus Server Delivery Pipeline \(2024 Update\)](#) for further details on change failure rate goal)

● December

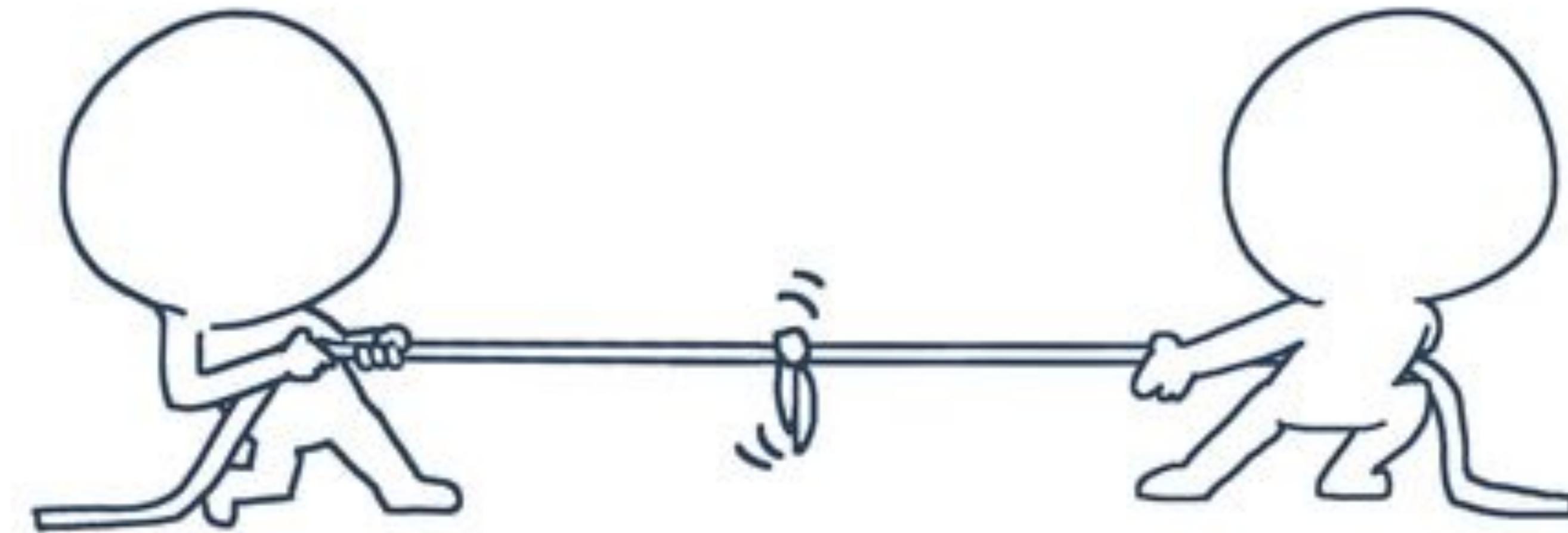
- High severity defect escape rate = 1%
- Number of Commits: 550
- Number of commits causing high severity issues: 2

Reporting date	Defect Title	Defect Details	Platform of initial request	ARR affected(in USD)	Link
9th Dec	Deployment failure if there is an error in Pipeline Selector	This happened after adding a timeout cancellation token when running Compatibility Detector	Andon cord	N/A	Andon cord pull Slack Thread Github PR
10th Dec	Task view will not tasks for Runbooks in Git Projects	The task view would try and load a Runbook from Git if the project is in Git, but Runbooks are not. This means the form does not display data.	Andon cord	N/A	Andon cord pull Github PR

When to use **feature toggles**?

Feature Risk

Toggle Overhead



What is the desired outcome?

Goals for this session

- Provide solutions you can apply in your day to day
(Assuming your use case is similar)
- Debunk the myth that canary deployments
means routing traffic
- Why you need to separate deploying new code
from releasing functionality
- Not a sales pitch of Octopus Deploy
(But you will have to learn what we to understand our challenges)



Thank you



Bob Walker

Field CTO

Octonaut since 2018

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@bobjwalker

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