


# Backstage & Tanzu Application Platform

Same same, but different

Robert Jensen

Lead Systems Engineer @Vmware

 @rhjensen / jensenr@vmware.com

28/2/2023



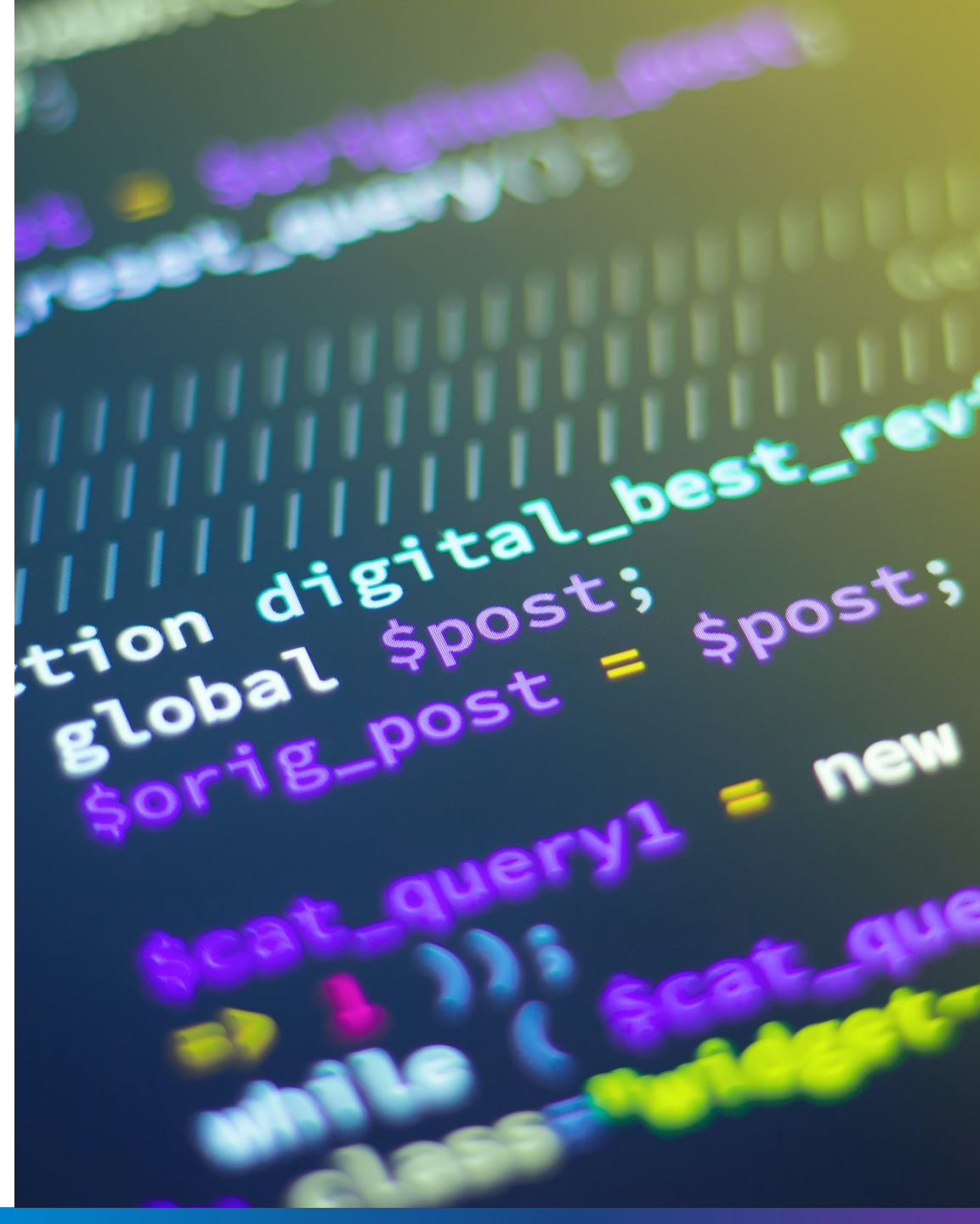
# Agenda

- VMware and Open Source
- What is a developer portal
- The Spotify Journey and Backstage
- VMware and Tanzu Application Platform
- Demo

Inspiration for this talk



# VMware & Open Source



VMware? VMware Tanzu?

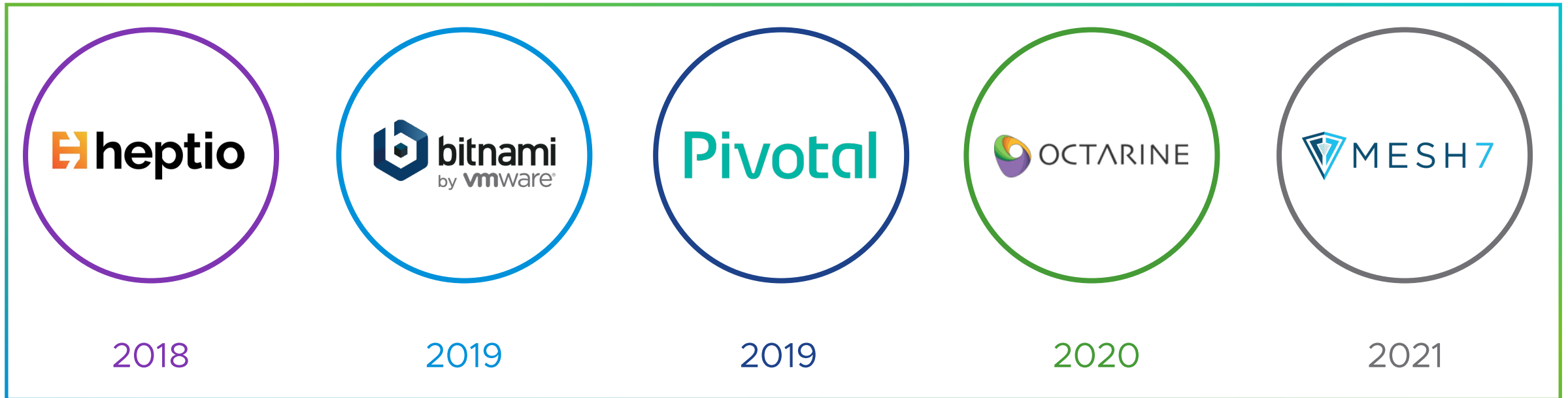
vmware®




VMware  
Tanzu™



# VMware Pivots



VMware Tanzu™



“Open source participation is a win-win for the company and the community... This isn’t about philanthropy, it’s about the opportunity for all and innovation at speed.”

Joe Beda, Retired Principal Engineer VMware

# VMware is committed to Open Source

<https://tanzu.vmware.com/open-source>



CNCF Projects



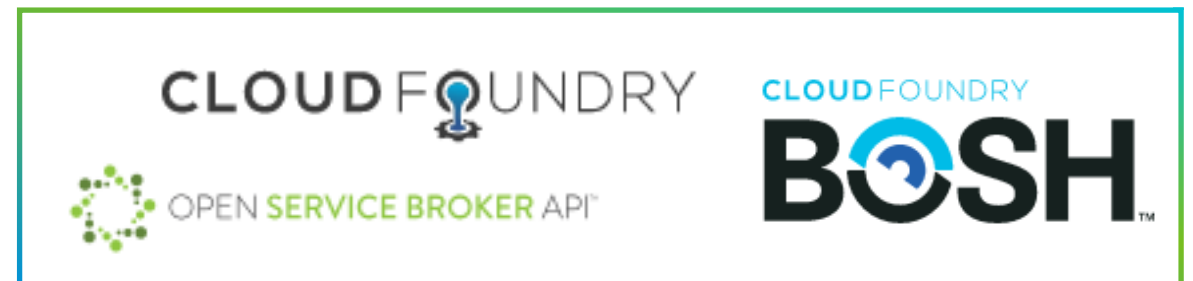
Apache Software Foundation Projects



VMware-Driven Projects



Community Projects



Cloud Foundry Foundation Projects

# Open Source Packaging



<b>1M+</b> Deployments Per Month	<b>Every</b> Major Cloud
<b>130+</b> Open Source Applications	<b>Any</b> Deployment Format



# Open Source Contributions around K8S




**2 of 7**  
steering committee members

**4 of 24**  
special interest groups led by VMware

**3 of 8**  
working groups led by VMware

Contributions to Kubernetes  
Last 3 years

	356352
	200444
	142376
	93669

source: [k8s.devstats.cncf.io](https://k8s.devstats.cncf.io)

# VMware driven projects



CLOUDFOUNDRY



# Donations to Cloud Native Computing Foundation

## Graduated



## Incubated

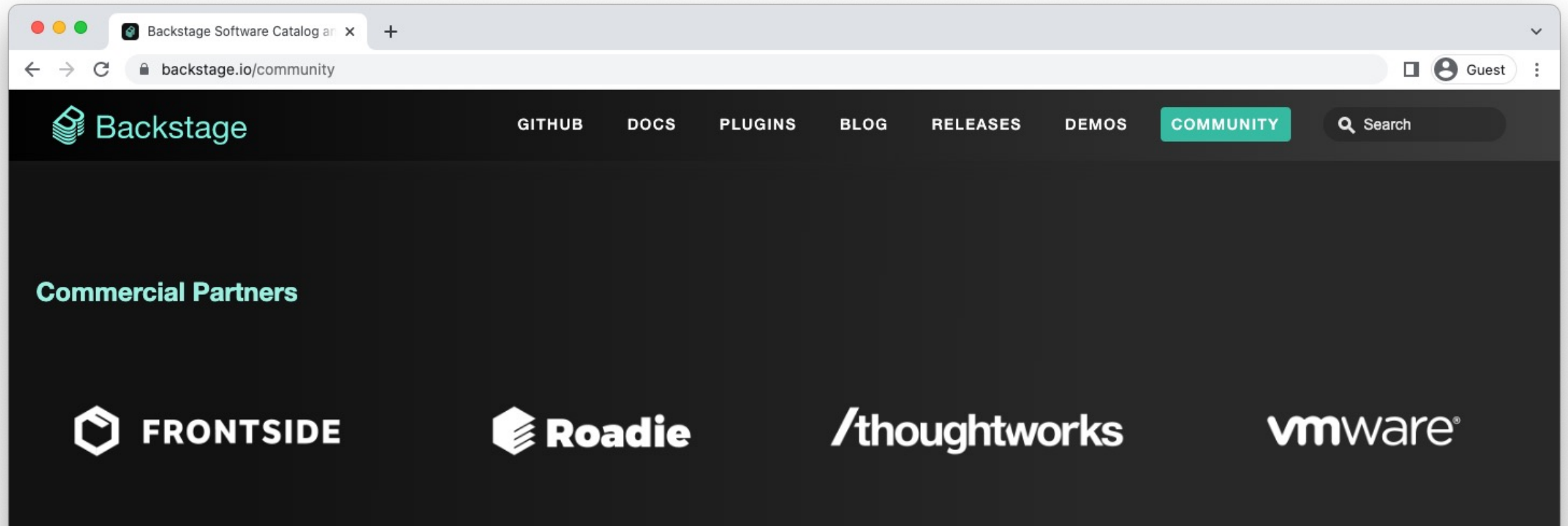


## Sandbox





# VMware is one of 4 commercial partners of Backstage?



# What is a Developer Portal ?



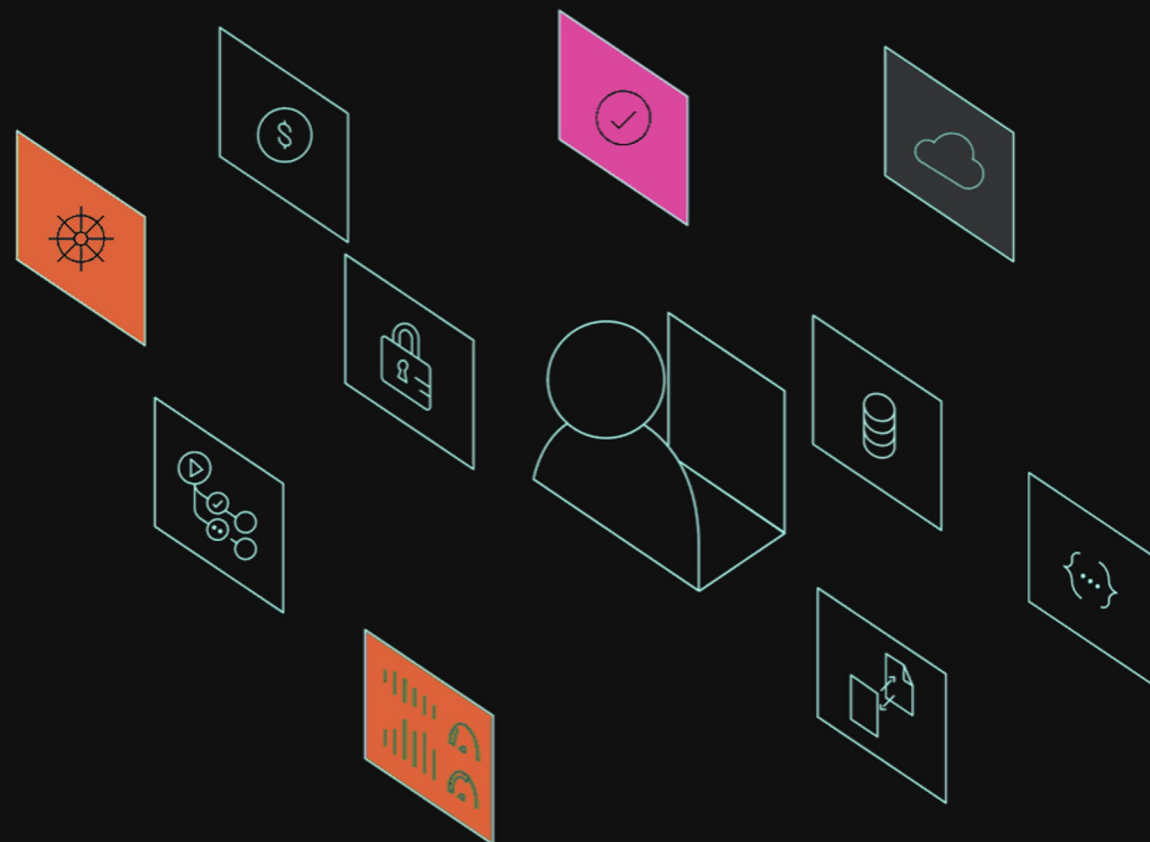
# A developer portal = one frontend for your entire infrastructure

Unifies all your tooling, services, apps,  
data, and docs with a single, consistent UI

Makes sense of everything in your  
ecosystem, regardless of how and where  
individual components are running

Let developers focus on what they do best  
(leading to much less activity in #aaargh  
Slack channel)

NerdOut Podcast





# Backstage





# Backstage

«Happy developers make happy code»

# “Software is still eating the world”



**CAUSES FRICTION**

**AFFECTING DEVELOPER HAPPINESS**

Trends like microservices, SaaS sprawl, and cloud-everything create a chaotic ecosystem for engineers.

Every company uses different subsets of these tools and faces different challenges.

Your whole stack is getting more complex; onboarding and collaboration are becoming more difficult.

<https://landscape.cncf.io>

# The Spotify Journey

.. back in 2016



hyper-growth  
mode



speed-to-  
market

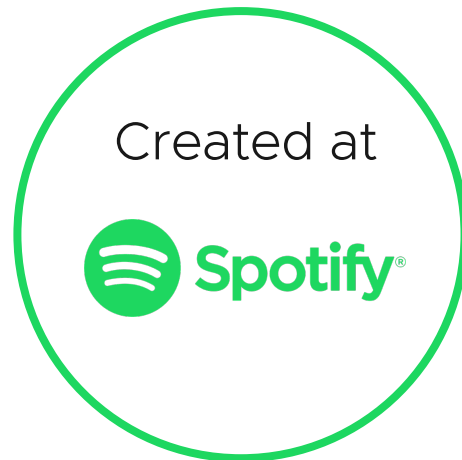


developer  
effectiveness

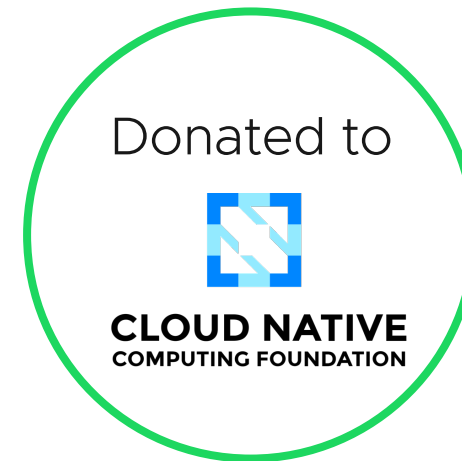




# Backstage is an open platform for building developer portals.

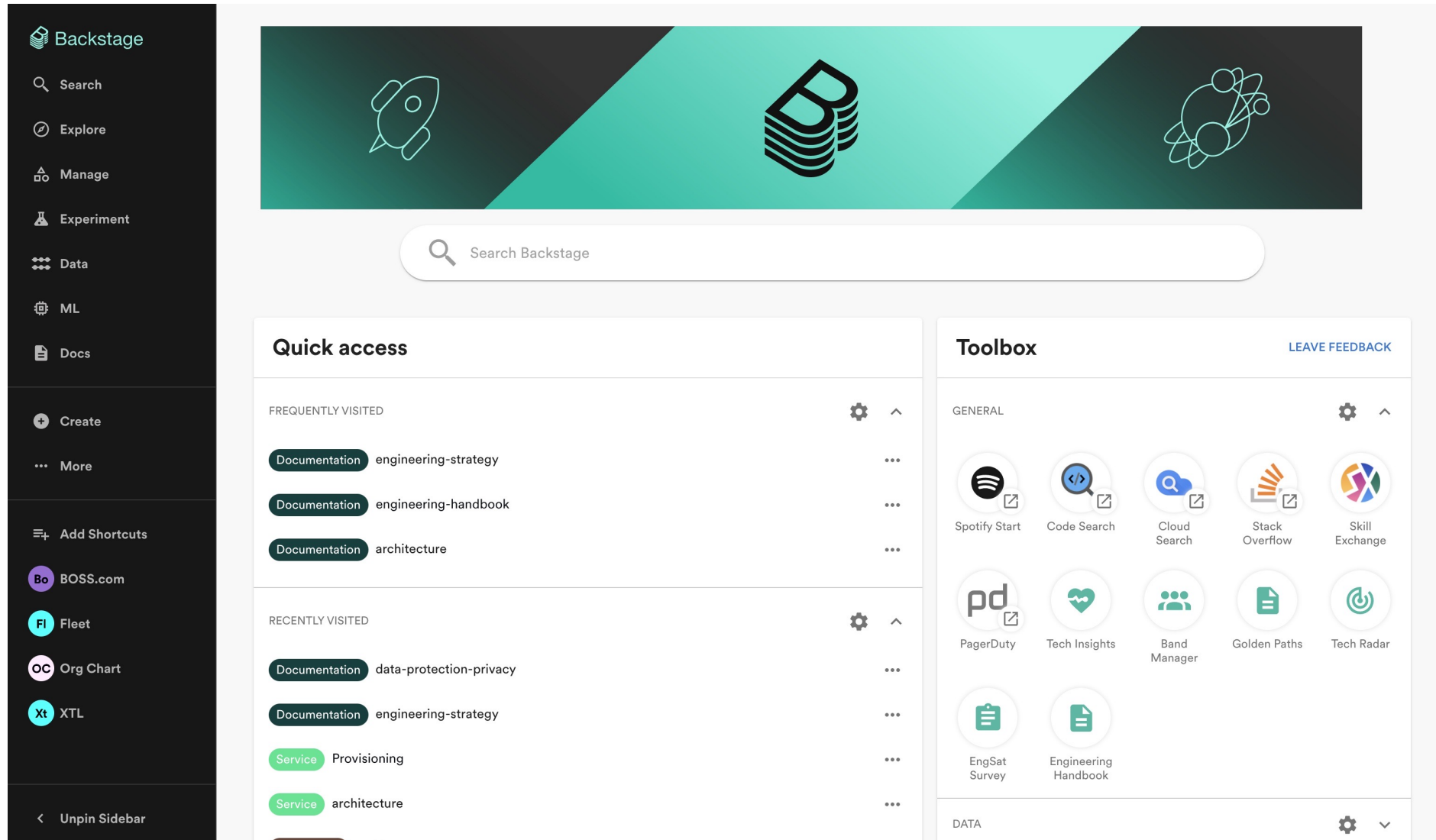


2016



2020

# Backstage is a developer portal



# Attributes Of Developer Portal

Lowers **cognitive load** for developers and boosts Developer Productivity by creating



Provides a developer centric view



Abstracts away underlying technology



Provides a pluggable framework

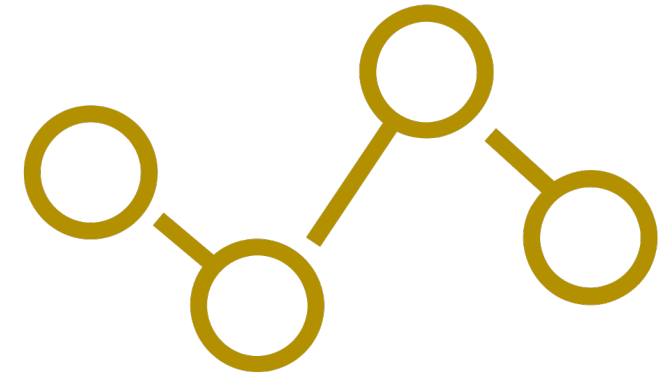


Maximizes Time to Value

# Finding the golden path | path to production



This is the way















Golden Path

# Backstage plugin ecosystem

## Customizable and extensible plugin architecture

- Built with modern technologies and common frameworks
- Makes it easy to develop for and contribute to your dev portal
- Cloud-agnostic and vendor-neutral



 <b>Azure Sites</b> by FRISS <a href="#">Infrastructure</a> Azure Sites (Apps & Functions) support for a given entity. View the current status of the site, quickly jump to site's Overview page, or Log Stream page. <a href="#">Explore</a>	 <b>backstage-plugin-api-linter</b> by Zalando <a href="#">Linting</a> API Linter is a quality assurance tool that checks the compliance of API's specifications to Zalando's API rules. <a href="#">Explore</a>	 <b>Badges</b> by Andreas Stenius <a href="#">Discovery</a> The badges plugin offers a set of badges that can be used outside of Backstage, showing information related to data from the catalog. <a href="#">Explore</a>
 <b>Bazaar</b> by Axis Communications AB <a href="#">Discovery</a> A marketplace where engineers can propose projects suitable for inner sourcing <a href="#">Explore</a>	 <b>Bitrise</b> by SDA SE <a href="#">CI/CD</a> View Bitrise builds and download the build artifacts within Backstage. <a href="#">Explore</a>	 <b>Bugsnag</b> by roadie.io <a href="#">Monitoring</a> View and monitor Bugsnag errors. <a href="#">Explore</a>
 <b>Buildkite</b> by roadie.io <a href="#">CI/CD</a> View Buildkite CI builds for your service in Backstage. <a href="#">Explore</a>	 <b>Catalog Graph</b> by SDA SE <a href="#">Discovery</a> Extend the Backstage Software Catalog with a graph that shows all entities and their relationships providing an easier way to discover the ecosystem. <a href="#">Explore</a>	 <b>CircleCI</b> by Spotify <a href="#">CI/CD</a> Automate your development process with CI hosted in the cloud or on a private server. <a href="#">Explore</a>
 <b>Cloud Carbon Footprint</b> by Thoughtworks <a href="#">Metrics</a> View your cloud carbon footprint by estimating energy use (kilowatt-hours) and carbon emissions (metric tons CO2e) from public cloud usage. <a href="#">Explore</a>	 <b>Cloudify</b> by Cloudify <a href="#">Orchestration</a> Cloudify provides a remote execution and environment management backend for Kubernetes, Terraform, Ansible, etc. <a href="#">Explore</a>	 <b>CodeScene</b> by CodeScene <a href="#">Quality</a> CodeScene is a multi-purpose tool bridging code, business and people. See hidden risks and social patterns in your code. Prioritize and reduce technical debt. <a href="#">Explore</a>

# Paid plugins

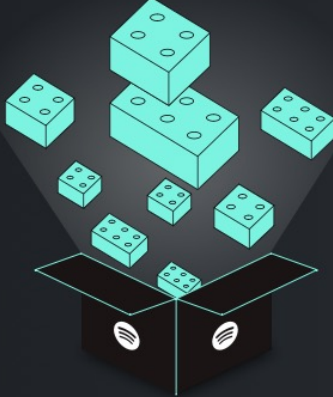
- 15 December 2022 announcement
- New marked for Spotify ?

## Spotify Plugins for Backstage BETA






Spotify Plugins for Backstage is a paid subscription that includes a bundle of premium plugins designed to bring even more of Spotify's maturity with Backstage to our adopters.

Built by our developers — for your developers — these plugins put humans at the center of developer experience and accelerate your Backstage goals.

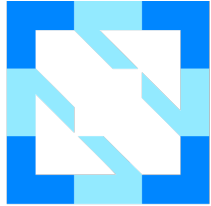
[Contact us](#)



### Meet the plugins

- **Soundcheck**  
Ensure quality, reliability, and alignment of software development with codified checks and guidance. [↗](#)
- **Pulse**  
Collect data that drives continuous improvements to your R&D tooling, processes, and culture. [↗](#)
- **Role-Based Access Control (RBAC)**  
Control access to actions and data in Backstage with ease. [↗](#)
- **Insights**  
Identify, benchmark, and understand Backstage usage trends. [↗](#)
- **Skill Exchange**  
Build an internal marketplace for learning and growth opportunities within R&D. [↗](#)

# Backstage in open source



**CLOUD NATIVE  
COMPUTING FOUNDATION**



**1,500+  
contributors**



**3,200+  
project forks**



**400+  
adopters**



**7,300+  
members**



**13,000+  
contributions**



## Backstage success

80%

of contributions come from  
outside the core team

180+

plugins contributed

# Backstage is building a proven track record across industries



**NETFLIX**

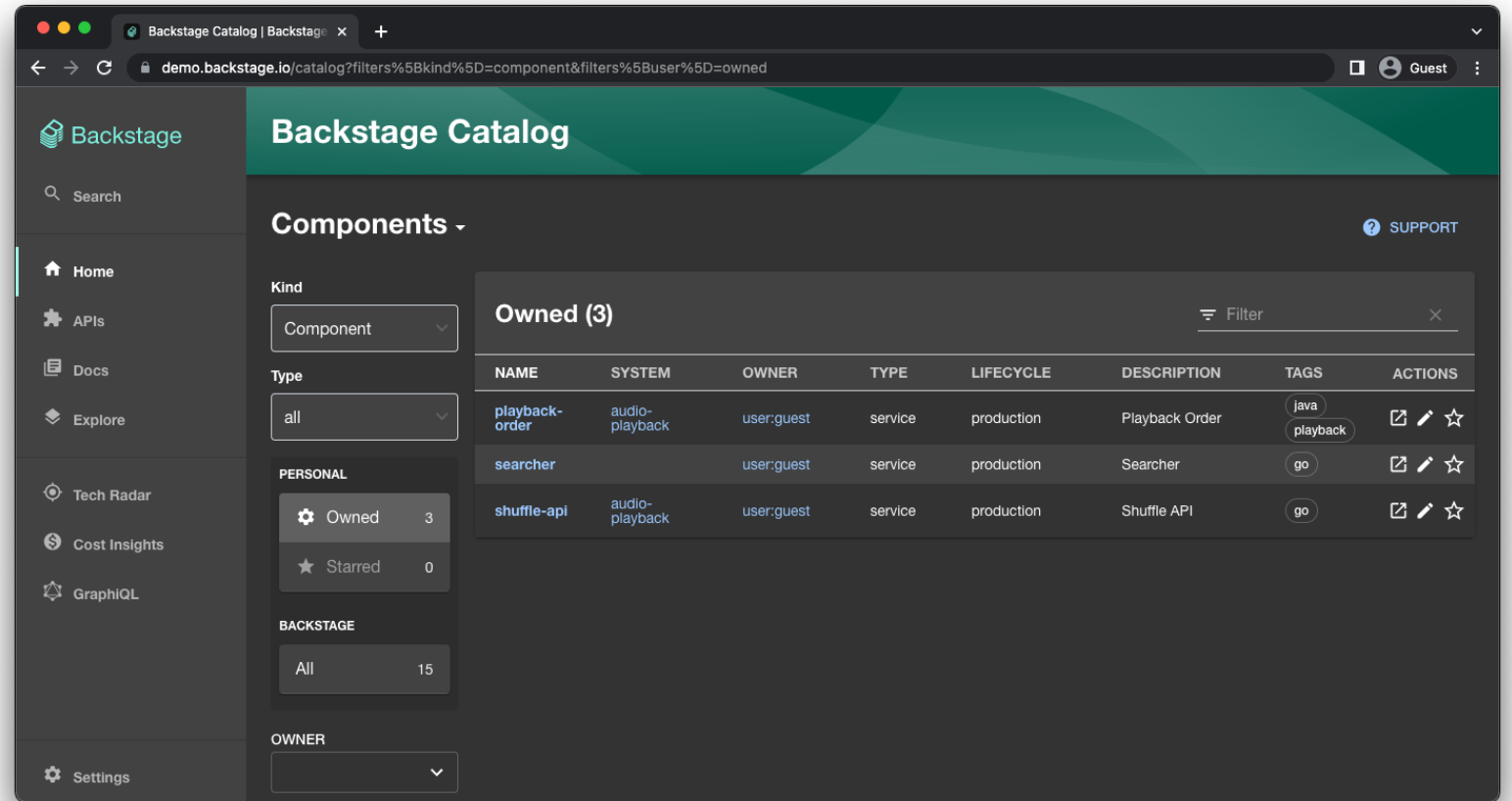
**ROKU**



Currently ~~75-224~~ 226 public adopters

<https://github.com/backstage/backstage/blob/master/ADOPTERS.md>

# Demo Backstage OSS



The screenshot shows the Backstage Catalog interface. The left sidebar contains navigation links: Home, APIs, Docs, Explore, Tech Radar, Cost Insights, GraphQL, and Settings. The main content area is titled "Backstage Catalog" and displays a "Components" section. The "Owned (3)" filter is selected, showing a table of three components:

NAME	SYSTEM	OWNER	TYPE	LIFECYCLE	DESCRIPTION	TAGS	ACTIONS
playback-order	audio-playback	user:guest	service	production	Playback Order	java, playback	[Link] [Edit] [Star]
searcher		user:guest	service	production	Searcher	go	[Link] [Edit] [Star]
shuffle-api	audio-playback	user:guest	service	production	Shuffle API	go	[Link] [Edit] [Star]

Below the table, there are filters for "PERSONAL" (Owned: 3, Starred: 0) and "BACKSTAGE" (All: 15). The "OWNER" filter is currently empty.

# Free Backstage Course

A promotional banner for a course. The background is dark blue with a pattern of small white dots. On the right is a large, stylized cyan 'B' logo for Backstage. In the center, the text 'Introduction to Backstage: Developer Portals Made Easy' is written in white. Below this text is a cyan button with the text 'Free Enrollment' and a white mouse cursor icon pointing at it. At the bottom left, the logo for 'THE LINUX FOUNDATION' is displayed next to the text 'Training & Certification'. Three small cyan dots are visible in the top right corner of the banner area.

Introduction to Backstage:  
Developer Portals Made Easy

Free Enrollment

THE LINUX FOUNDATION | Training & Certification

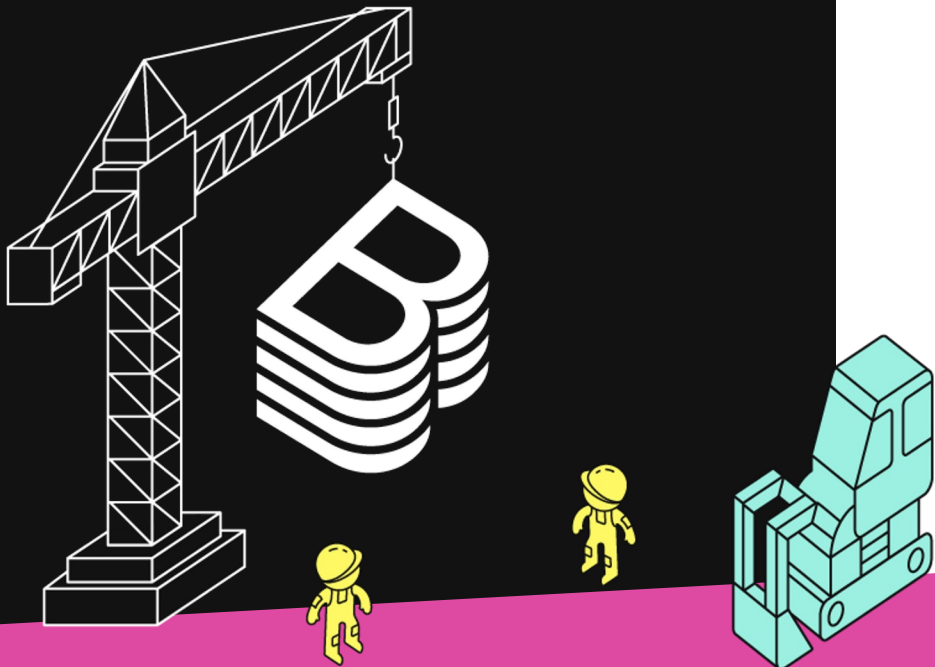
# Great resources

**Case studies, explainers, and one-on-one demos:**  
[backstage.spotify.com](https://backstage.spotify.com)

**Community Sessions:**  
[github.com/backstage/community](https://github.com/backstage/community)

**Newsletter:**  
<https://spoti.fi/backstagenewsletter>

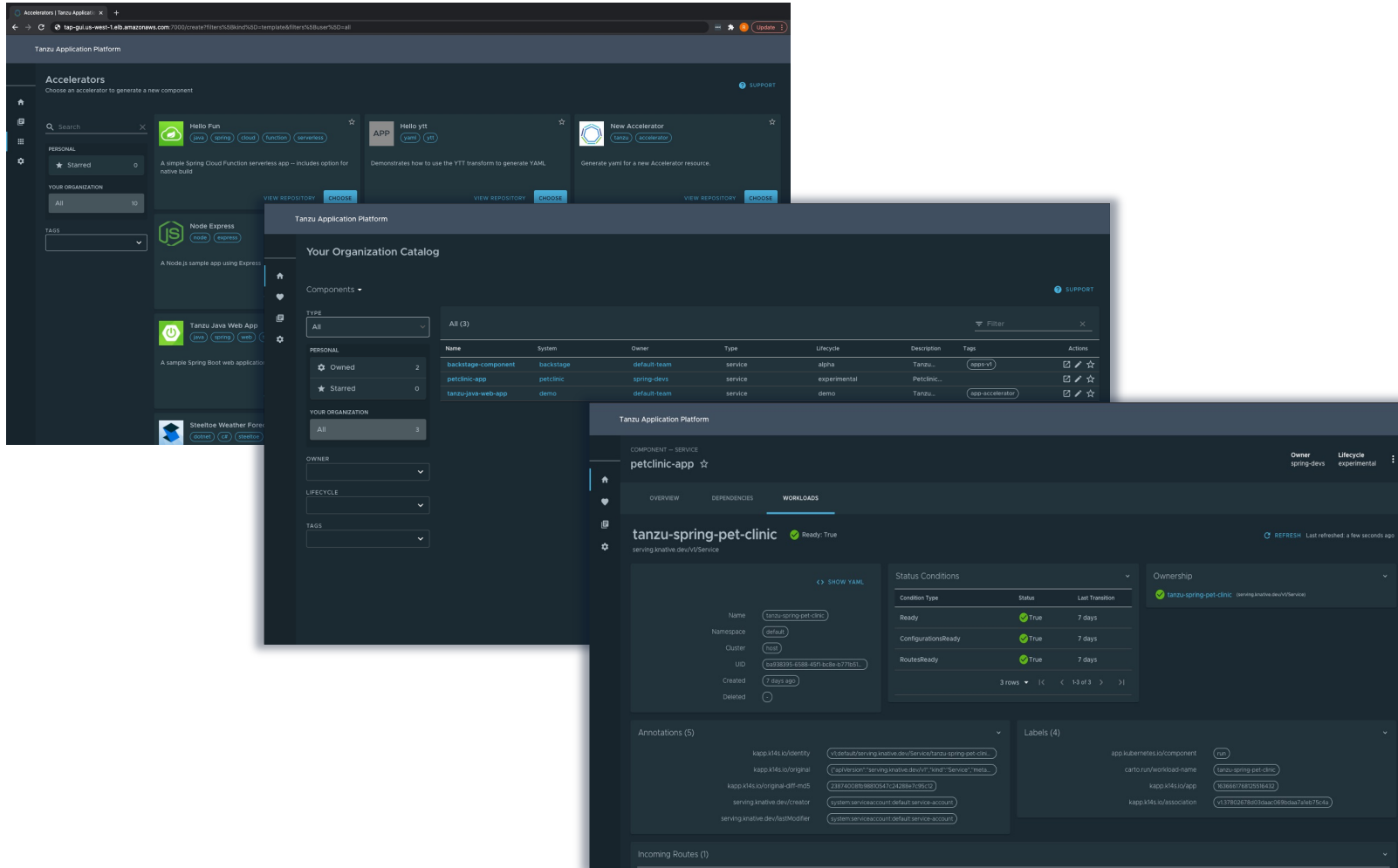
**Discord:**  
<https://discord.gg/MUpMjP2>



# Tanzu Application Platform (TAP)



# Based on Backstage, but with it's own opinions (and focus)



Pre installed with

- Docs
- Accelerators
- API's
- Supply Chain
- Security Analytics

Only runs on K8S



# Documentation

The screenshot shows a dark-themed documentation page for 'Python Test'. At the top left, it says 'DOCUMENTATION / PYTHON TEST' and 'Python Test'. Below that is a 'Home' link. On the right, it says 'Component python-test'. A search bar is present with the text 'Search python-test docs'. On the left sidebar, there are links for 'Python Test', 'The Application', and 'Links'. The main content area is titled 'Python Demo app' and contains the following text: 'This demo app is showing Uber pickups in New York City', 'It's based on the Python module Streamlit, and is part of their demo applications. It a simple application, showing Uber pickups, in New Yoyk City.', and 'All data, da be manipulated, using sliders, and it's also possible to see the raw data.' Below this text is a section titled 'Uber pickups in NYC' with a subtitle 'Build using Tanzu Application Platform v1.3.2 - kongsberg'. It includes a 'Data loaded' indicator and a checkbox for 'Show raw data'. At the bottom of this section is a bar chart titled 'Number of pickups by hour' showing pickup counts for each hour of the day. The y-axis ranges from 500 to 800. The data shows a peak in the middle of the day, around 7:00-8:00, with approximately 750 pickups.

- Based on Mkdocs
- Written in markdown
- Documentation & Code in same repo.
- Build when you push(sort of)

# API

API — OPENAPI  
fastapi-test-tanzu.dk ☆ Owner: denmark-team

Overview Definition

fastapi-test-tanzu.dk

OpenAPI Raw

FastAPI 0.1.0 OAS3

Servers: https://fastapi-test.default.tanzu.dk

default

GET / Root

Parameters: No parameters

EXECUTE

Responses

Code	Description	Links
200	Successful Response	No links

Media type: application/json

Example Value Schema

- Based on OpenAPI
- Auto updated with app
- Dependencies
- Internal / External Api's
- Swagger interface

# Application Accelerators

The screenshot displays the VMware Application Accelerators interface. At the top, it says "Application Accelerators" and "Create new software components using accelerators". Below this, there's a search bar and a "SUPPORT" link. The main area is titled "Available Accelerators" and contains a grid of accelerator cards. Each card includes a title, a brief description, a "VIEW REPOSITORY" link, and a "CHOOSE" button. The cards are:

- AppSSO Starter Java**: Spring Boot application that supports single sign-on (SSO) via Spring Security OAuth 2 Client library. Tags: sso, authentication, openid, spring, java.
- Golang-accelerator**: Clean Golang environment ready to code. Tags: golang, web.
- Java Function**: A FaaS Java function powered by Function Buildpacks for Knative. Tags: beta, java, spring, function, serverless, knative, faas.
- Tanzu Java Restful Web App**: A Spring Boot Restful web application including OpenAPI v3 document generation and database persistence, based on a three-layer architecture. Tags: java, spring, web, jpa, postgresql, tanzu.
- Tanzu Java Web UI**: Spring Boot application with server side rendered web UI. Application supports single sign-on (SSO) via Spring Security OAuth 2 Client library. Tags: java, spring, web, tanzu, appssso, oidc.
- Node Express**: A Node.js sample app using Express. Tags: node, express, tanzu.
- Node Function**: A FaaS Node.js sample function using FaaS Node.js Runtime Framework. Tags: beta, node, function, serverless, knative, faas.
- python-accelerator**: Clean Python environment ready to code. Tags: python, streamlit, web.

- Templates for Apps, Baselines etc.
- Can be "anything"
- Takes input
- Customizable using Sed, YTT, etc.

# Supply Chain

golang-demo

Supply Chain: source-test-scan-to-url  
Supply Chain Cluster: host  
Delivery Cluster: host

Source Provider ✓  
GitRepository  
a day ago

Source Tester ✓  
Runnable  
a day ago

Source Scanner ✓  
Grype  
a day ago

Image Provider ✓  
Image  
a day ago

Image Scanner ✓  
Grype  
a day ago

Stage Detail: Source Tester  
a day ago

Overview

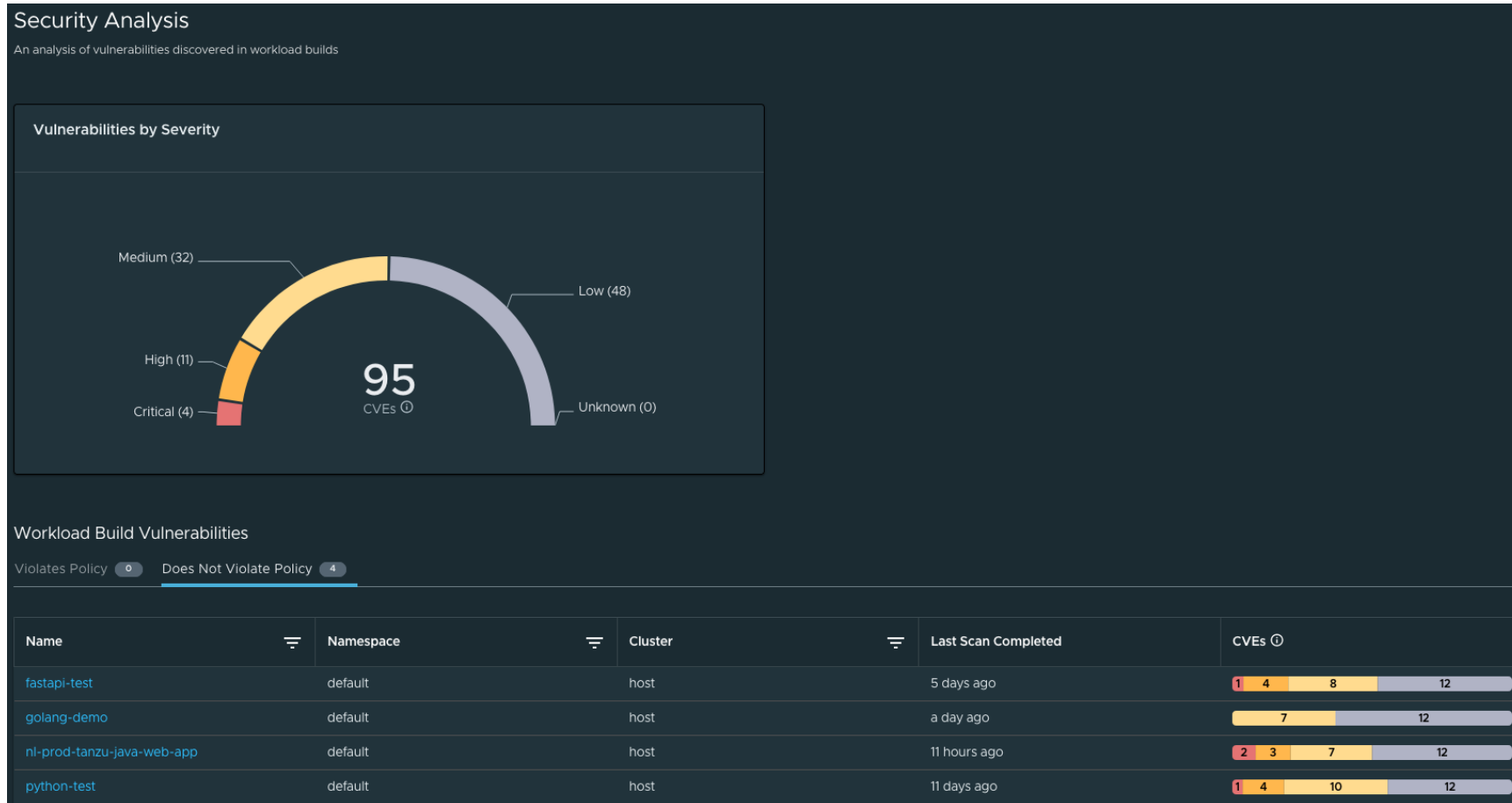
Name golang-demo  
Kind Runnable  
Version carto.run/v1alpha1  
Namespace default

Tests

Id	Age	Duration	Message	Status
6b75d15d-5419-43b9-8653-408d9761d741	a day ago	31s	Tasks Completed: 1 (Failed: 0, Cancelled 0), Skipped: 0	Success
6c31e029-95ae-447f-b017-b88c23e18e58	a day ago	30s	Tasks Completed: 1 (Failed: 0, Cancelled 0), Skipped: 0	Success
3d90b4ea-3ae4-4c25-90b3-9ab9f8394c39	a day ago	6s	Tasks Completed: 1 (Failed: 0, Cancelled 0), Skipped: 0	Success

- Supply Chain UI
- CVE info
- Test info
- Overview

# Security Analysis



- Security overview

# Built with an open source-first mindset

Innovative, interoperable, scalable and secure solutions

Tanzu Application Platform is backed by some of the most mature and popular open-source projects available today

## In addition to Backstage Backstage

Garnering 200+ plugins Backstage has gained tremendous traction by helping organizations build self-service developer portals

## Carvel CARVEL

Developers build, deploy, and manage their own apps and package them so they are more easily distributable

## Cartographer CARTOGRAPHER

Operator teams create secure, reusable supply chains that define all of application CI and CD in one place

## And many more....



TEKTON



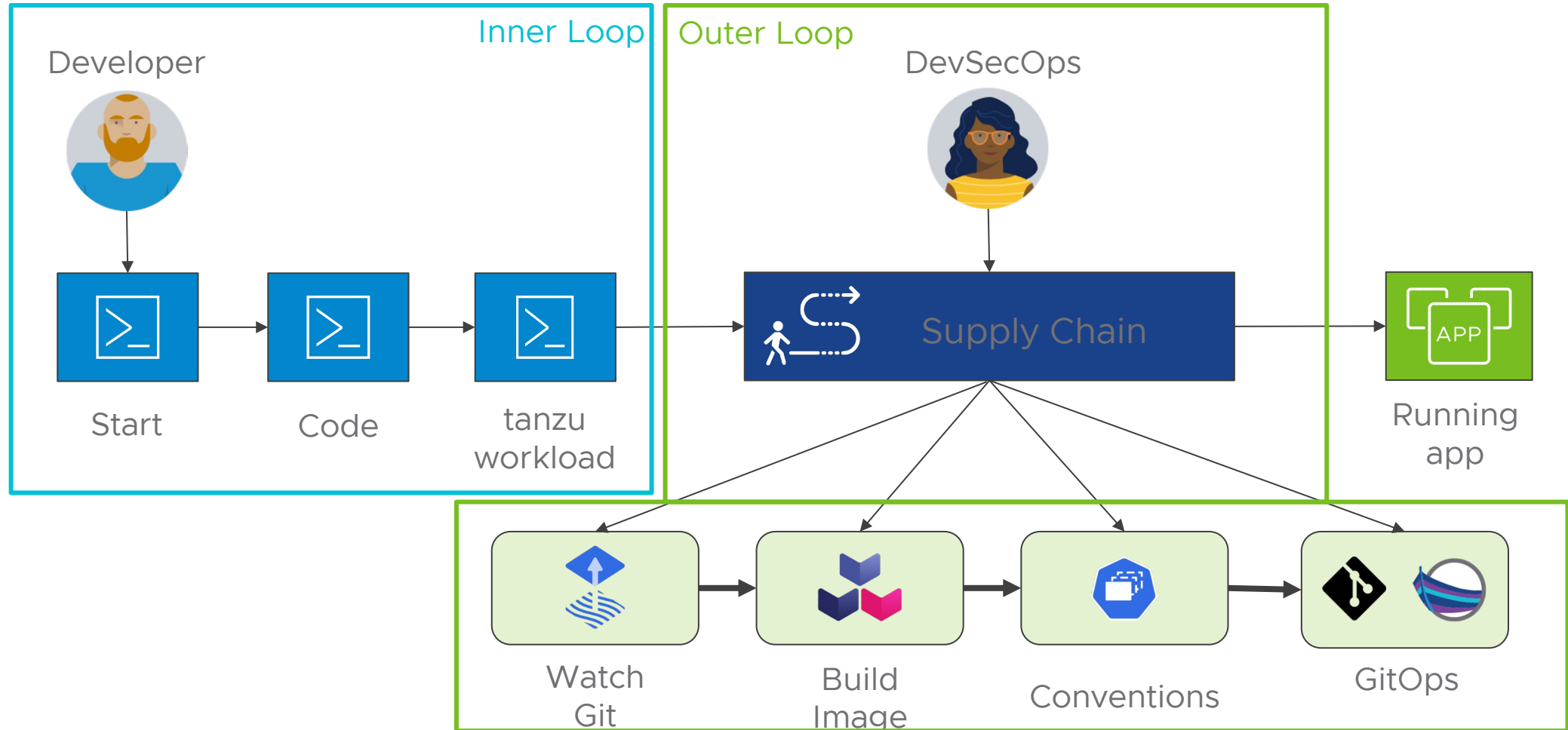
Buildpacks.io

TILT

Building open-source software and contributing to communities is at the core of VMware's engineering spirit



# Deploying an App with Tanzu Application Platform



Demo



Recap: what have we saw today?

- VMware | VMware Tanzu OSS Contributions
- What a developer portal is
- The Spotify Journey and Backstage
- VMware and Tanzu Application Platform

QUESTIONS

