

Backstage & Tanzu Application Platform

Same same, but different

Robert Jensen

Lead Systems Engineer @Vmware



@rhjensen / jensenr@vmware.com

1/7/2023



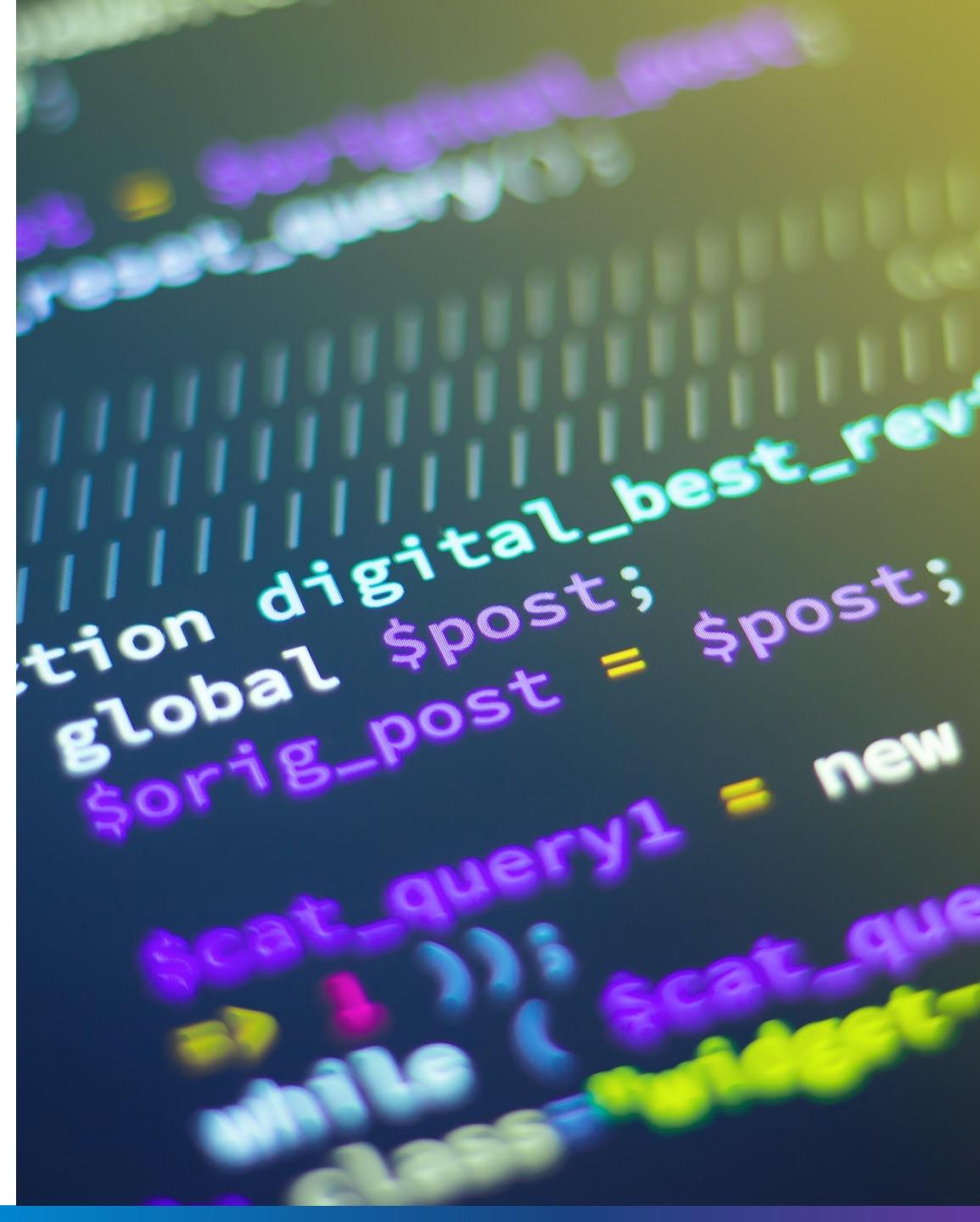
Agenda

- 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



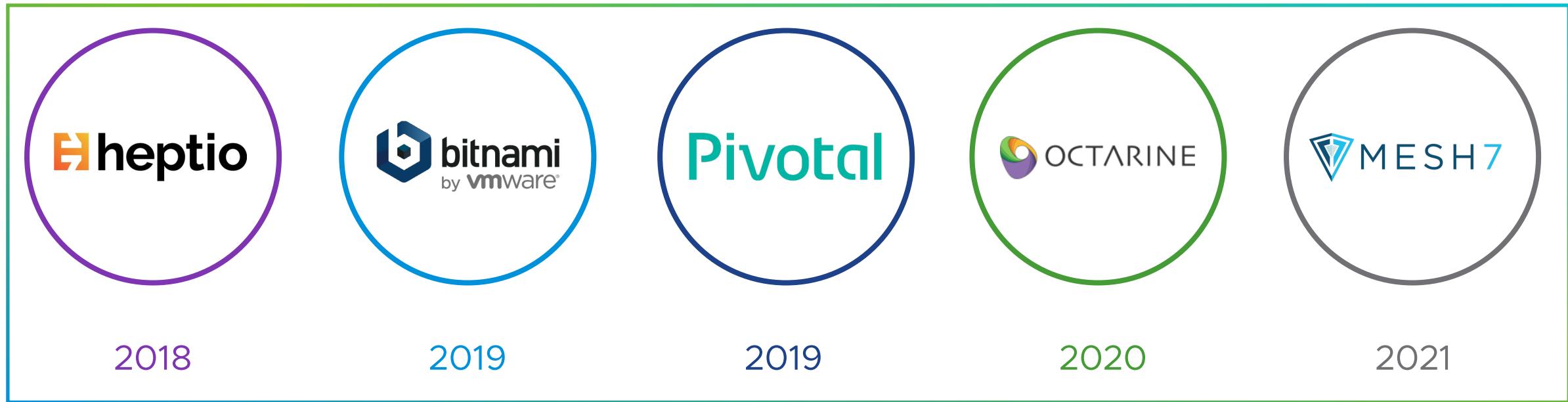
VMware? VMware Tanzu?

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>



kubernetes



Buildpacks.io



spiffe



HARBOR



SPIRE



CONTOUR



APACHE
GEODE



HAWQ



MADlib

CNCF Projects

Apache Software Foundation Projects



spring[®]



RabbitMQ™



GREENPLUM
DATABASE™



CARVEL



OCTANT



steeltoe



ANTREA



Jasmine



VELERO



Robolectric



SONOBUOY



CARTOGRAPHER



PINNIPED

VMware-Driven Projects



Istio



PostgreSQL

Cloud Foundry

OPEN SERVICE BROKER API™

Cloud Foundry
BOSH

Community Projects

Cloud Foundry Foundation Projects

Open Source Packaging



1M+
Deployments Per Month **Every**
Major Cloud

130+
Open Source Applications **Any**
Deployment Format

Open Source Contributions around K8S



Cluster API

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

VMware driven projects



Donations to Cloud Native Computing Foundation

Graduated



HARBOR

Incubated



CONTOUR

Sandbox



CARVEL



ANTREA

VMware is one of 4 commercial partners of Backstage?

The screenshot shows a web browser window for the Backstage Software Catalog. The URL in the address bar is `backstage.io/community`. The page has a dark theme with a navigation bar at the top featuring links for GITHUB, DOCS, PLUGINS, BLOG, RELEASES, DEMOS, and COMMUNITY (which is highlighted in green). A search bar is also present. Below the navigation, the heading "Commercial Partners" is displayed in green. Four logos are shown in a row: FRONTSIDE, Roadie, thoughtworks, and vmware. The VMware logo is positioned at the bottom left of the slide.

What is a Developer Portal ?



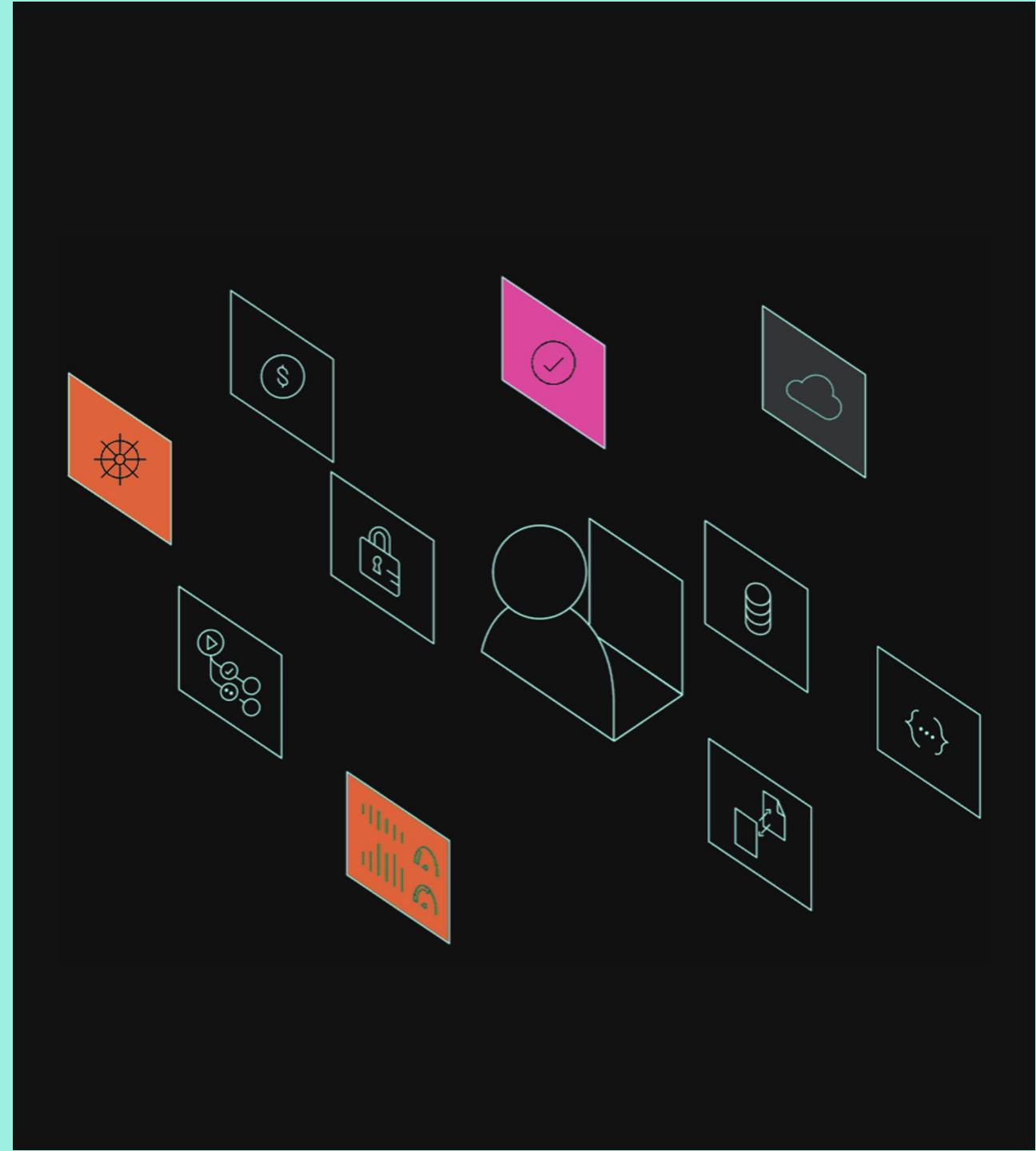
A developer portal = one frontend for your entire infrastructure

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.

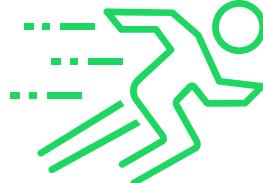
Your whole stack is getting more complex; onboarding and collaboration are becoming more difficult.

The Spotify Journey

.. back in 2016



hyper-growth
mode



speed-to-
market



developer
effectiveness



Backstage is an open platform for building developer portals.



2016



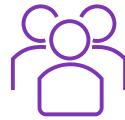
2020

Backstage is a developer portal

The screenshot displays the Backstage developer portal interface. On the left is a dark sidebar with a white header "Backstage" and a list of links: Search, Explore, Manage, Experiment, Data, ML, Docs, Create, More, Add Shortcuts, BOSS.com, Fleet, Org Chart, XTL, and Unpin Sidebar. The main area features a large teal gradient background with three white icons: a rocket ship, a stack of books, and a neural network. A search bar at the bottom of the sidebar contains the placeholder "Search Backstage". Below the search bar are two sections: "Quick access" and "Toolbox". The "Quick access" section is divided into "FREQUENTLY VISITED" and "RECENTLY VISITED" sections, each showing a list of items with tags like Documentation, Service, and Provisioning. The "Toolbox" section is divided into "GENERAL" and "DATA" sections, featuring various tools such as Spotify Start, Code Search, Cloud Search, Stack Overflow, Skill Exchange, PagerDuty, Tech Insights, Band Manager, Golden Paths, Tech Radar, EngSat Survey, and Engineering Handbook.

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

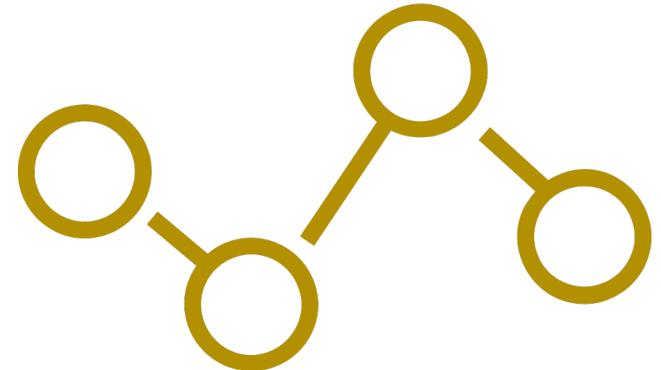


Maximizes Time to Value

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



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

Paid plugins

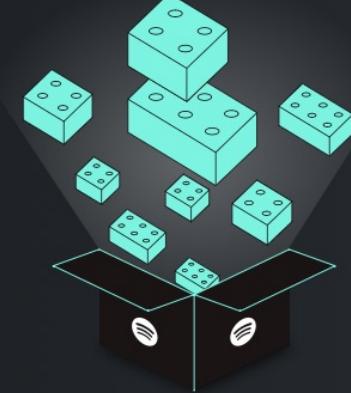
- 15 December 2022 announcement
- New marked for Spotify ?

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

DK Companies

LUNAR



bankdata



NETFLIX

ROKU®

PELOTON

Expedia®

zalando

American
Airlines

TELUS

The Toyota logo, a red square containing a white stylized "T".

TOYOTA

Currently 75 224 226 246 public adopters

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

Demo Backstage OSS



The screenshot shows the Backstage Catalog interface with a dark theme. The left sidebar includes links for Home, APIs, Docs, Explore, Tech Radar, Cost Insights, and GraphQL. The main area is titled "Backstage Catalog" and displays a "Components" section. Under "Kind", "Component" is selected. Under "Type", "all" is selected. A summary box shows "Owned" (3), "Starred" (0), and "BACKSTAGE" (15). The "Owned" section lists three components:

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

Free Backstage Course



Jorge Lainfiesta (He/Him) · 1st

Author of the Linux Foundation Backstage course, certified sommelier

Talks about #devex, #backstageio, #cloudnative, and #platformengineer
Barcelona, Catalonia, Spain · [Contact info](#)



Roadie
University of California, Los Angeles

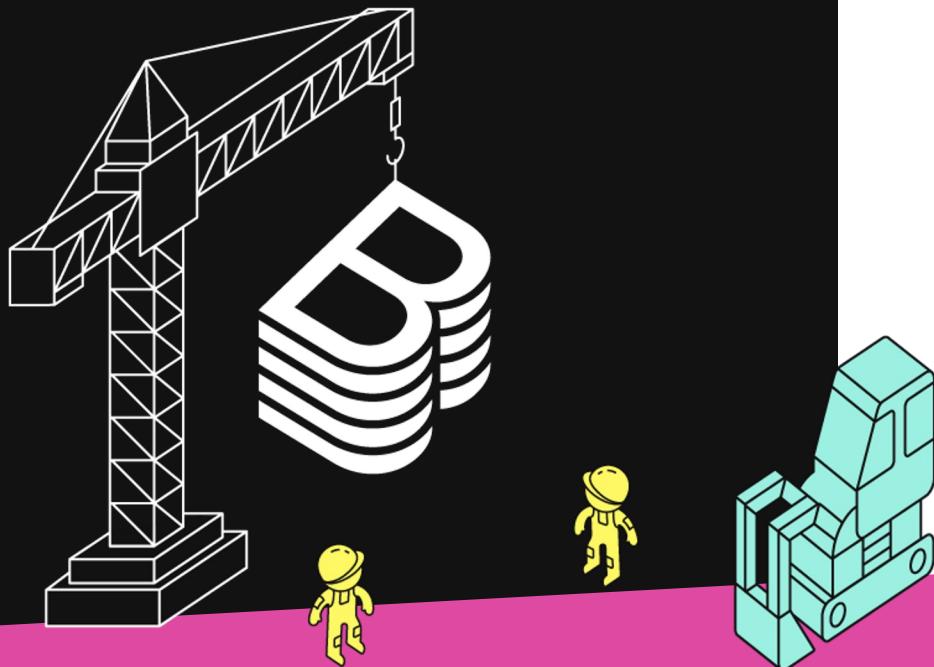
Great resources

Case studies, explainers, and one-on-one demos:
backstage.spotify.com

Community Sessions:
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)

The screenshot shows the Tanzu Application Platform interface. At the top, there's a search bar and a sidebar with sections for Accelerators (Hello Fun, Helloytt, New Accelerator), Personal (Starred), and Your Organization (All, Node Express, Tanzu Java Web App, Steeltoe Weather Forecast). The main area is titled "Your Organization Catalog" and shows a list of components under "All (3)". The list includes:

Name	System	Owner	Type	Lifecycle	Description	Tags	Actions
backstage-component	backstage	default-team	service	alpha	Tanzu... (appsv1)		
petclinic-app	petclinic	spring-devs	service	experimental	PetClinic...		
tanzu-java-web-app	demo	default-team	service	demo	Tanzu... (app-accelerator)		

Below this is a detailed view for the "petclinic-app" service. It shows tabs for Overview, Dependencies, and Workloads (selected). The Overview tab displays the service name "tanzu-spring-pet-clinic" and its status as "Ready: True". It also shows status conditions like Ready, ConfigurationsReady, and RoutesReady, all of which are true. The Workloads tab shows annotations and labels. Annotations include kapp.k14s.io/dentity, kapp.k14s.io/original, kapp.k14s.io/original-diff-mots, serving.knative.dev/creator, and serving.knative.dev/listModifier. Labels include app.kubernetes.io/component, carto.run/workload-name, kapp.k14s.io/app, and kapp.k14s.io/association.



Pre installed with

➤ Docs

➤ Accelerators

➤ API's

➤ Supply Chain

➤ Security Analytics

Only runs on K8S

Documentation

DOCUMENTATION / PYTHON TEST

Python Test

Home

Component
python-test

Python Test

The Application

Links

Python Demo app

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's a simple application, showing Uber pickups, in New York City.

All data can be manipulated, using sliders, and it's also possible to see the raw data.

Uber pickups in NYC

Build using Tanzu Application Platform v1.3.2 - kongsberg

Data loaded

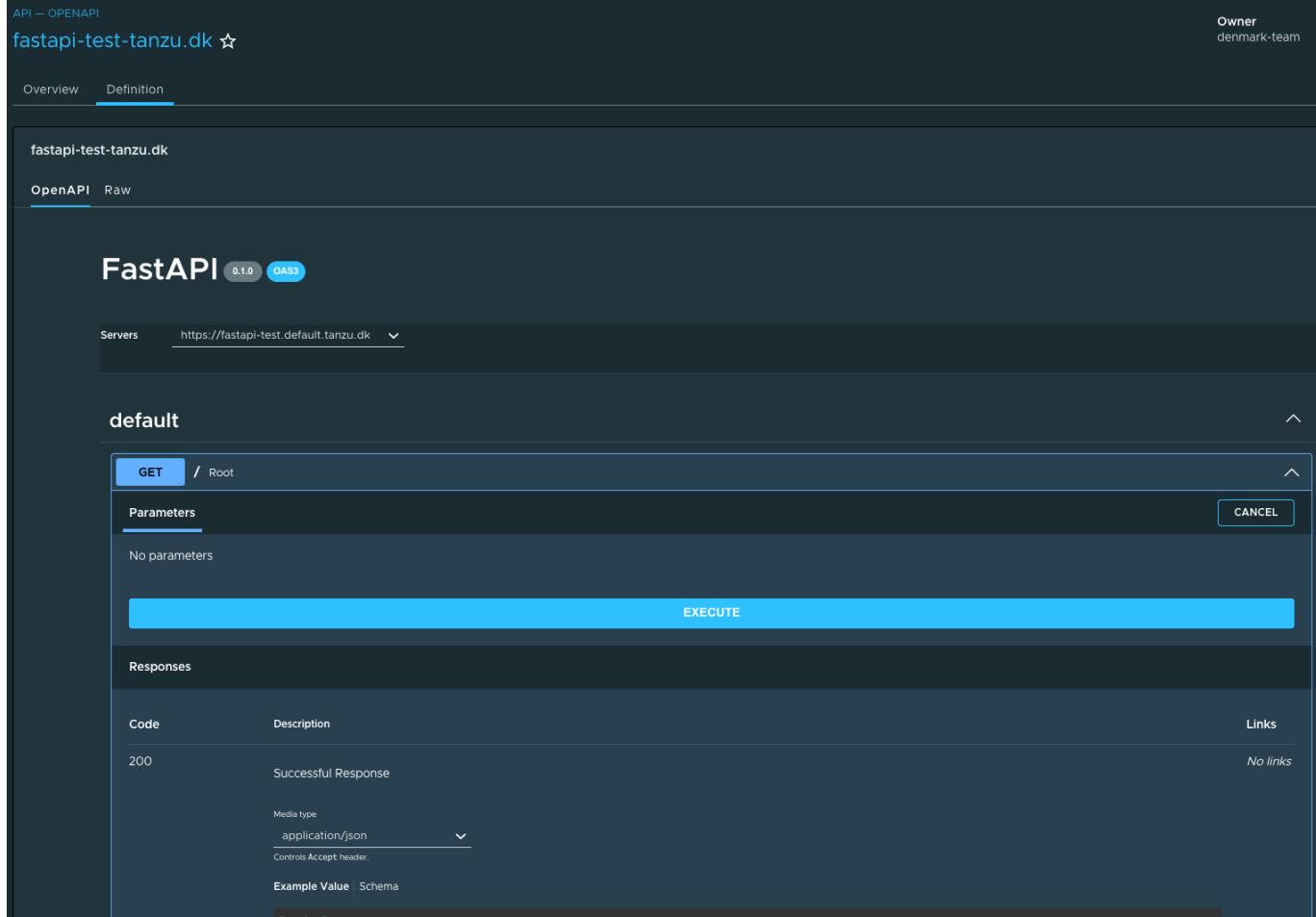
Show raw data

Number of pickups by hour

Hour	Number of pickups
00:00	~100
01:00	~150
02:00	~200
03:00	~250
04:00	~300
05:00	~350
06:00	~400
07:00	~450
08:00	~500
09:00	~550
10:00	~600
11:00	~650
12:00	~700
13:00	~750
14:00	~700
15:00	~650
16:00	~600
17:00	~750
18:00	~700
19:00	~650
20:00	~600
21:00	~550
22:00	~500
23:00	~450
24:00	~400

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

API



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

Application Accelerators

Application Accelerators

Create new software components using accelerators

Available Accelerators

Search X

SUPPORT

PERSONAL	YOUR ORGANIZATION
★ Starred 0	All 16

TAGS

AppSSO Starter Java Spring Boot application that supports single sign-on (SSO) via Spring Security OAuth 2 Client library. [VIEW REPOSITORY](#) [CHOOSE](#)	**Golang-accelerator** Clean Golang environment ready to code. [VIEW REPOSITORY](#) [CHOOSE](#)
Java Function A FaaS Java function powered by Function Buildpacks for Knative [VIEW REPOSITORY](#) [CHOOSE](#)	**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. [VIEW REPOSITORY](#) [CHOOSE](#)
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. [VIEW REPOSITORY](#) [CHOOSE](#)	**Node Express** A Node.js sample app using Express [VIEW REPOSITORY](#) [CHOOSE](#)
Node Function A FaaS Node.js sample function using FaaS Node.js Runtime Framework [VIEW REPOSITORY](#) [CHOOSE](#)	**python-accelerator** Clean Python environment ready to code. [VIEW REPOSITORY](#) [CHOOSE](#)

- 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

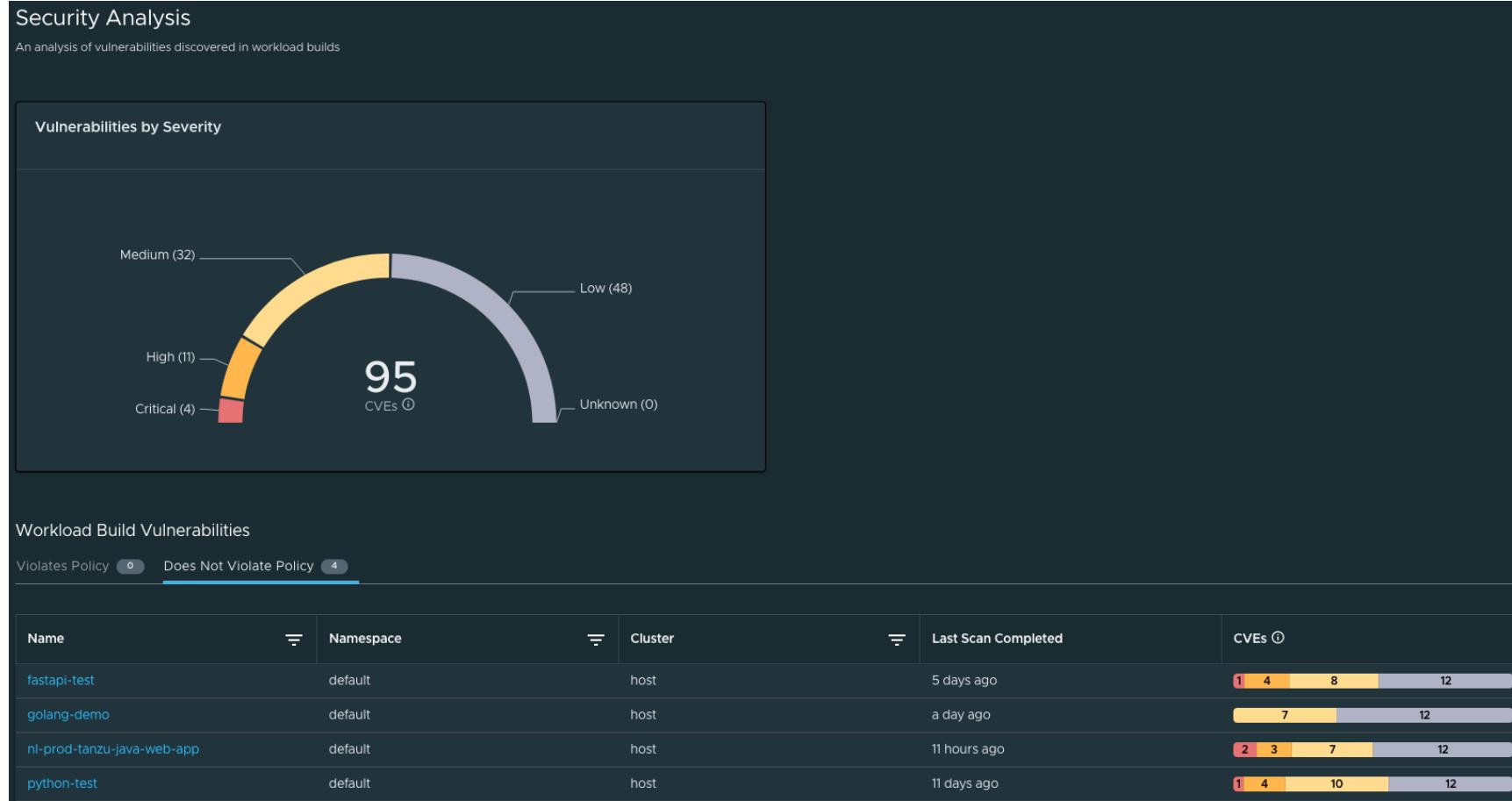
The screenshot shows a supply chain pipeline for a project named "golang-demo". The pipeline consists of several stages connected by arrows: Source Provider (GitRepository, a day ago) → Source Tester (Runnable, a day ago) → Source Scanner (Grype, a day ago) → Image Provider (main/587) → Image Scanner (Grype, a day ago). Each stage has a unique ID (58746d22, 58746d22, main/587, 6e301862, 1e958eb9) and a green checkmark icon indicating success. Below the pipeline, there is a "Stage Detail: Source Tester" section with an "Overview" table and a "Tests" table.

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

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

- 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

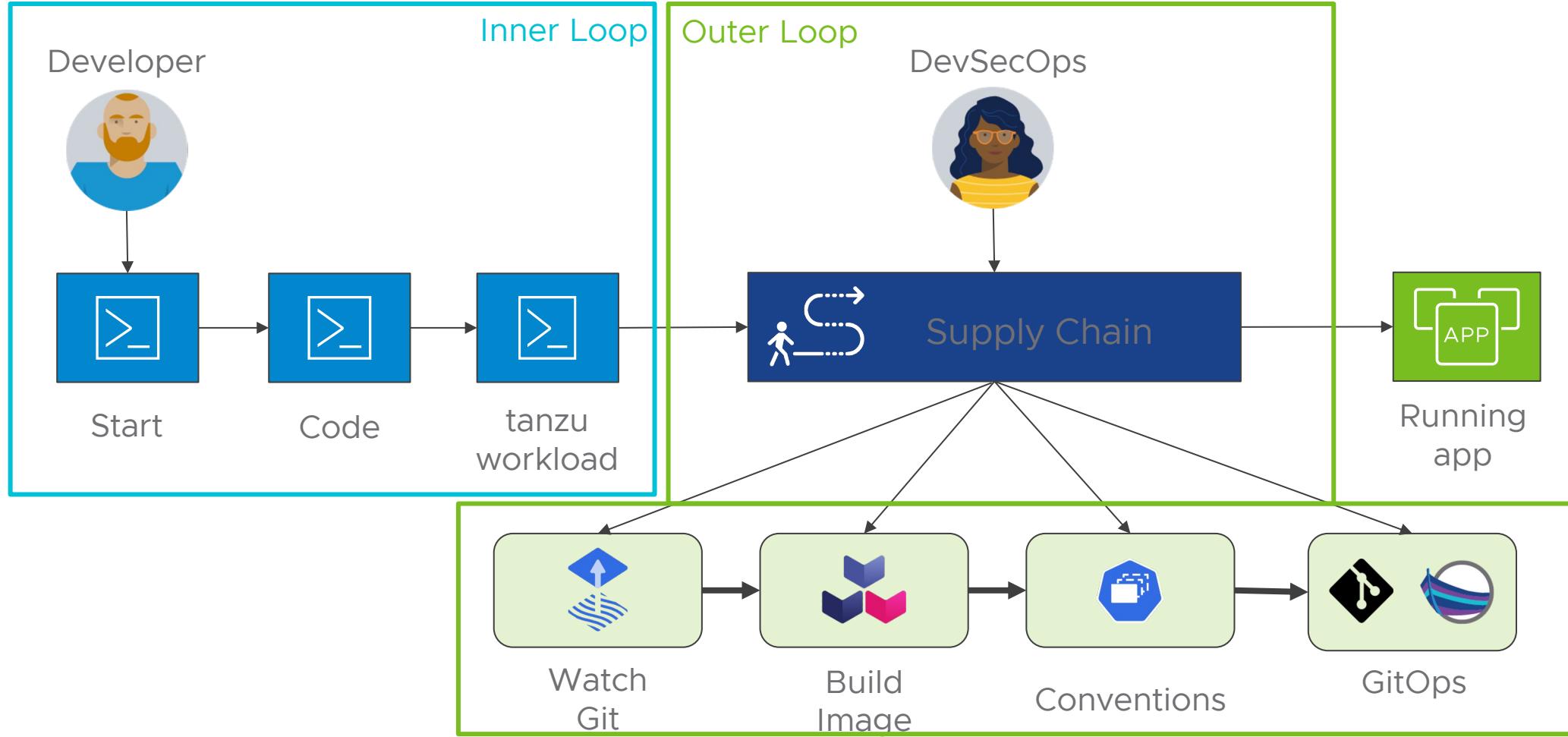
And many more....



 cosign

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

More info about TAP



QUESTIONS