VMware Tanzu®

7 Ways to Improve the Developer Experience and Accelerate Software Delivery on Kubernetes

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Introduction

Today, developers are required to spend too much time grappling with underlying infrastructure instead of writing code. They need to master the concepts, artifacts, and best practices for developing applications running on Kubernetes. Unfortunately, they're often left to explore this complex ecosystem on their own with an incomplete set of unintegrated tools.

In this ebook, we'll cover seven challenges faced in development on Kubernetes, and provide recommendations on how to resolve them.

Why is the developer experience so important?

Your business success depends on a superior developer experience. Organizations want their developers to spend time delivering business value and shipping software quickly in response to market dynamics and customer demands. It's expensive to have developers stitching services and components together when they could be shipping software.

A McKinsey study found that companies with a high developer velocity index grew revenue four to five times faster than those with a low developer velocity index. These organizations also had higher operating margins and were more innovative.

4-5x

faster revenue growth

Outcomes for companies with a higher Developer Velocity Index (DVI) compared to those with a **lower** DVI

Challenges faced by developer teams

Challenge 1: Lack of Kubernetes experience and its steep learning curve
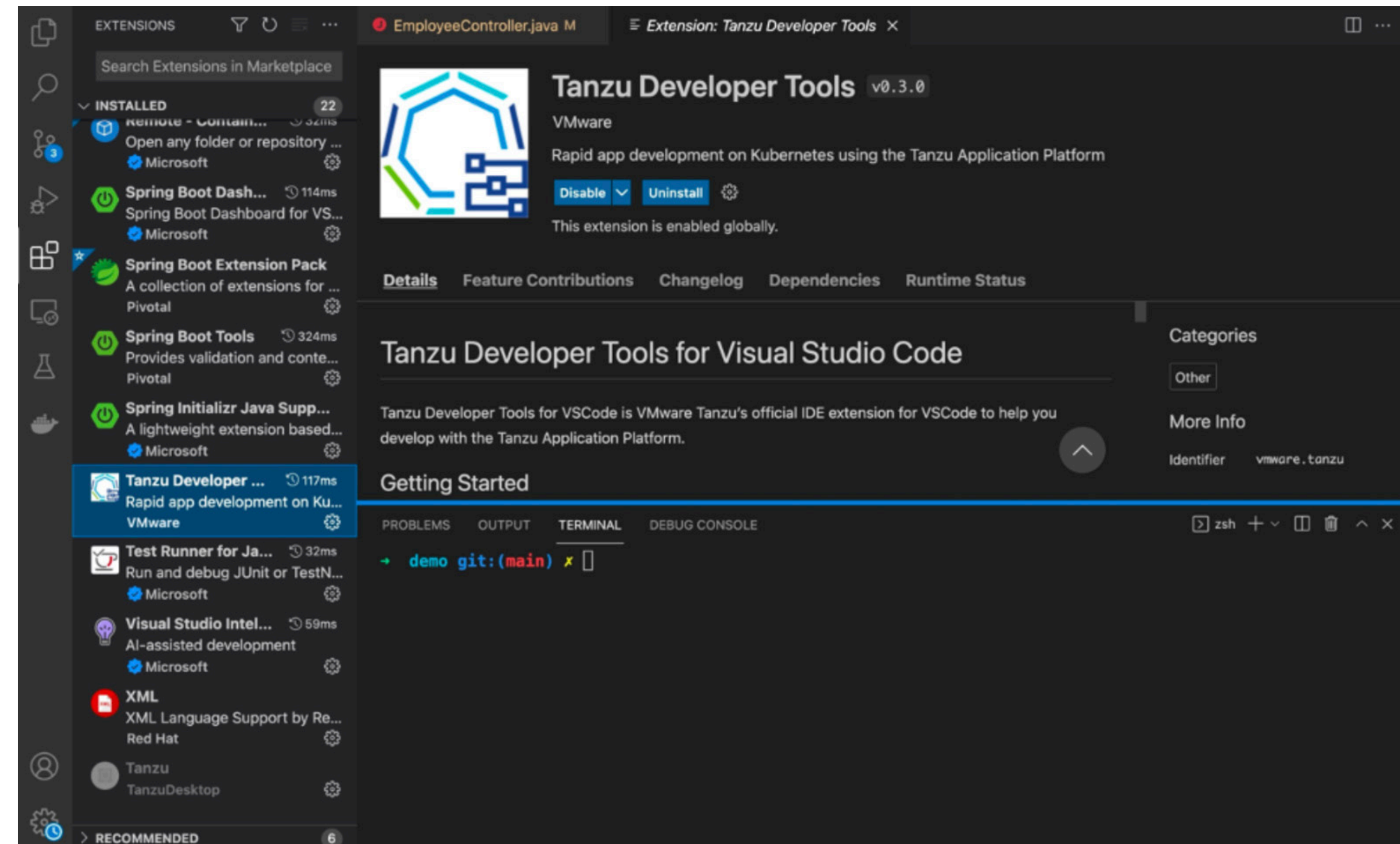
The solution: Use an application-aware platform.

An application-aware platform identifies what critical components the application needs and injects them into the file system. It relieves developers from having to learn the intricacies of a new platform, and spares them from the error-prone process of editing a "wall of YAML."

The application-aware nature of VMware Tanzu Application Platform means that developers can focus on writing code using their favorite programming language, while the platform provides features like application configuration or service discovery.

Challenge 2: Inability to quickly iterate due to a longer development cycle on Kubernetes and lack of integrated tools

The solution: Increase velocity by providing instant access to developer tooling. This lets developers iterate and test code changes directly from an integrated development environment (IDE) to a Kubernetes-based personal developer environment.

Developing on Kubernetes increases the number of steps in the development cycle. However, Tanzu Application Platform enables developers to iterate on their application from within their IDE. They can therefore provide live updates of code changes to their personalized Kubernetes development environment. When debugging is required, developers can also initiate breakpoints on a live deployment from within their IDE.

Challenge 3: Lack of troubleshooting and diagnostic tools

**The solution: Use a platform that allows for investigation of running applications and easy diagnosis.**

When iterating on code, developers often need to inspect a running application to analyze behavior for troubleshooting, debugging or fine-tuning the runtime configurations of the application.

Tanzu Application Platform includes a feature called App Live View, which allows developers to drill into the runtime characteristics of an application (e.g., resource consumption, incoming traffic patterns, etc.). It also allows them to change parameters (such as log levels) for troubleshooting running applications.
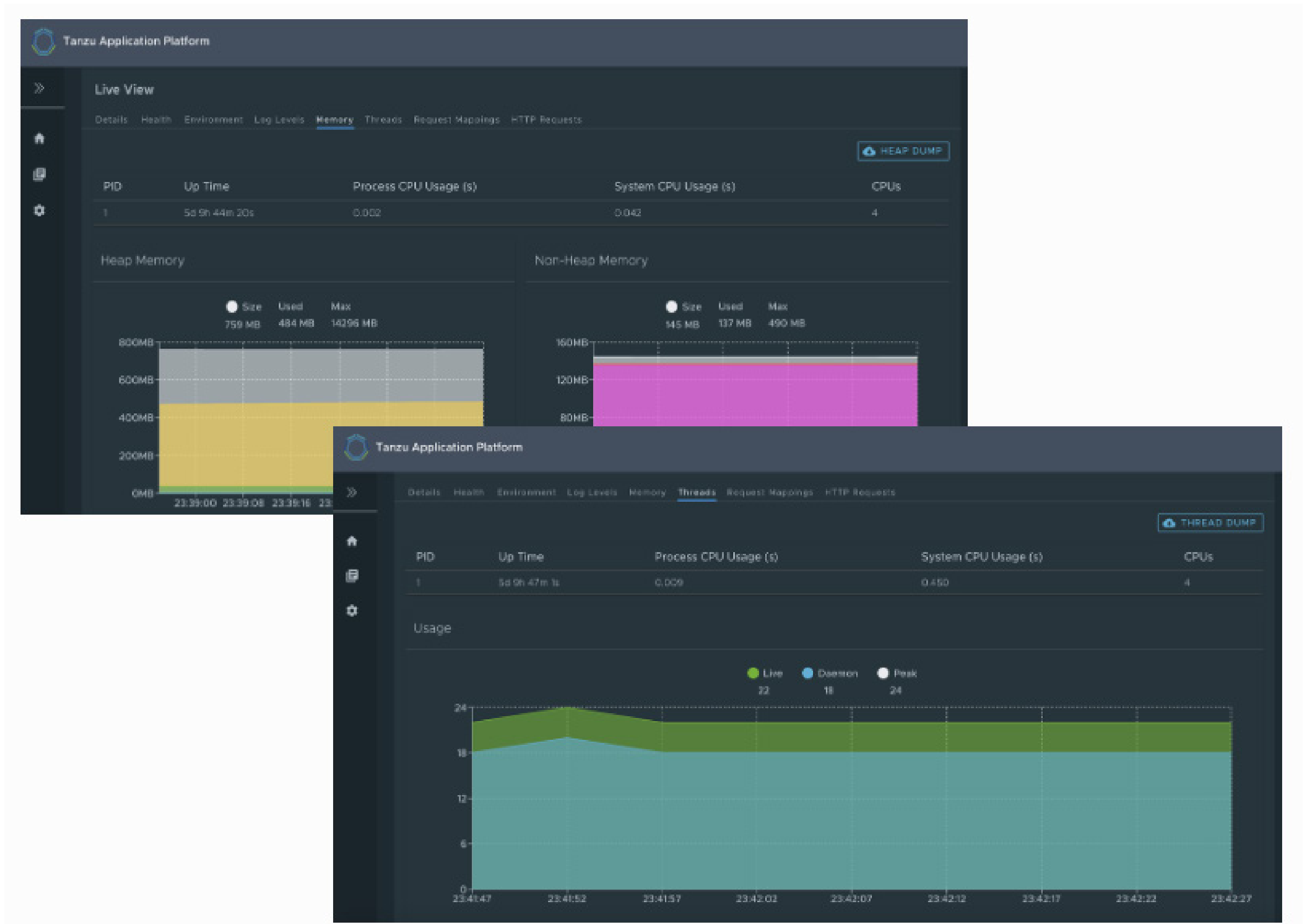
Challenge 4: Complex onboarding inhibits developers from making progress on Day 1, as they must start from scratch with no patterns

The solution: Save time and eliminate the learning curve by bootstrapping new applications using cloud native patterns (Application Accelerators).
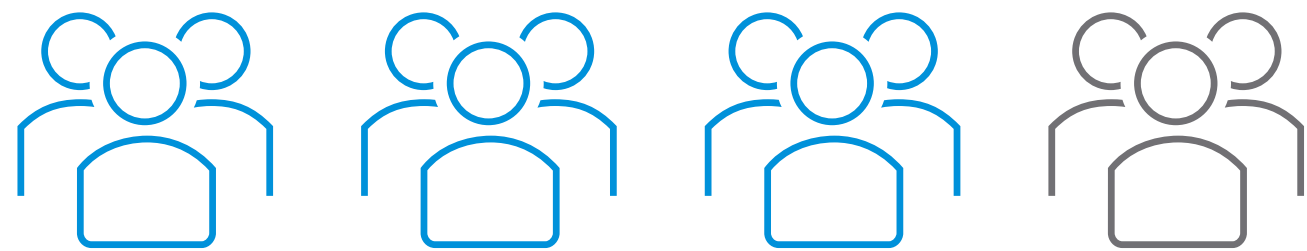

3 out of 4 software engineering teams
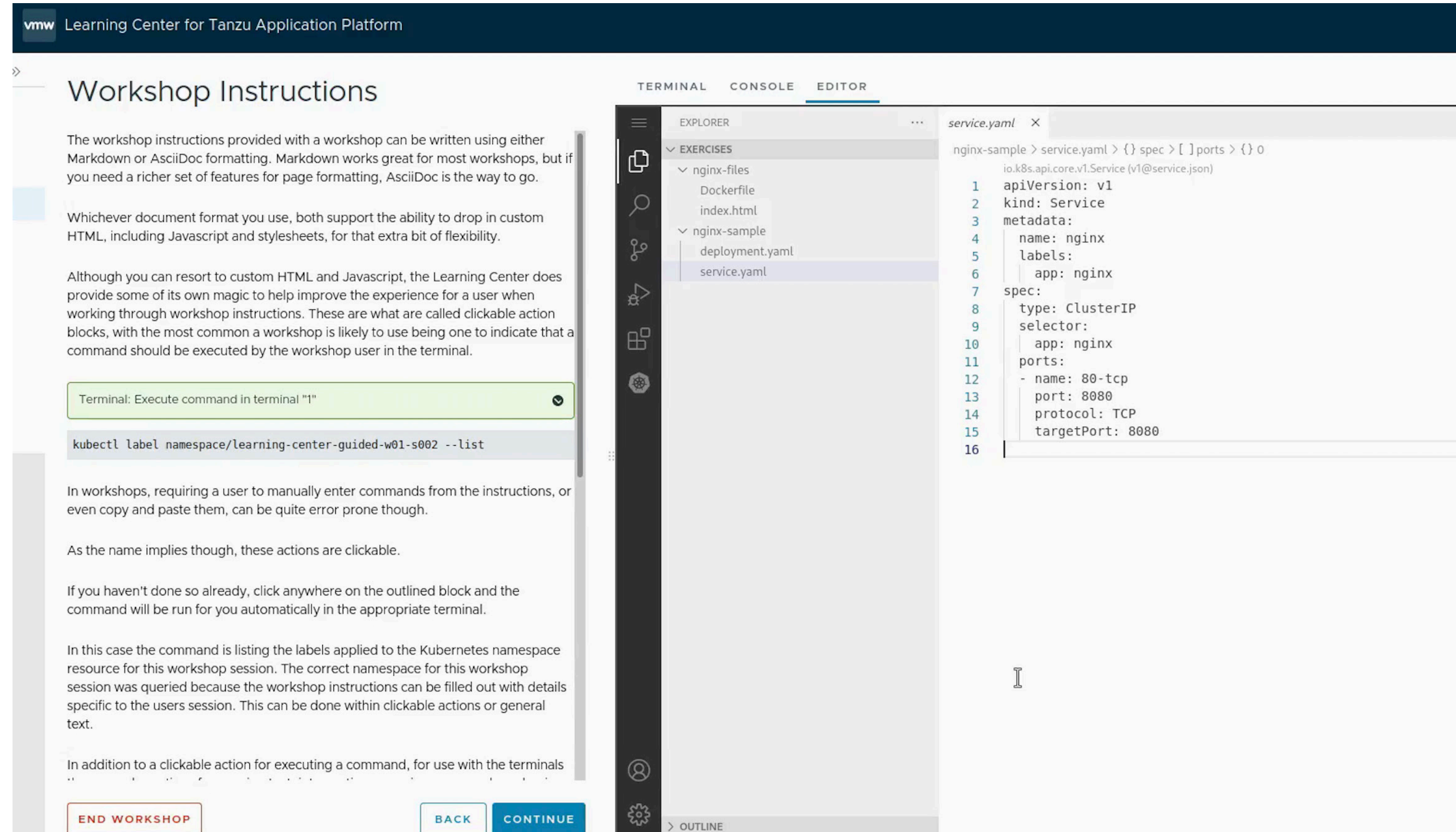
experience friction that requires them to exert unnecessary time and effort to achieve their objectives.

Developers can get a jumpstart on developing new applications using Tanzu Application Platform's application starter templates, known as Application Accelerators, instead of starting from scratch.

These templates consist of skeleton code, configuration and cloud native patterns combined with best practices and security policies. They can save developers significant time in bootstrapping new applications.
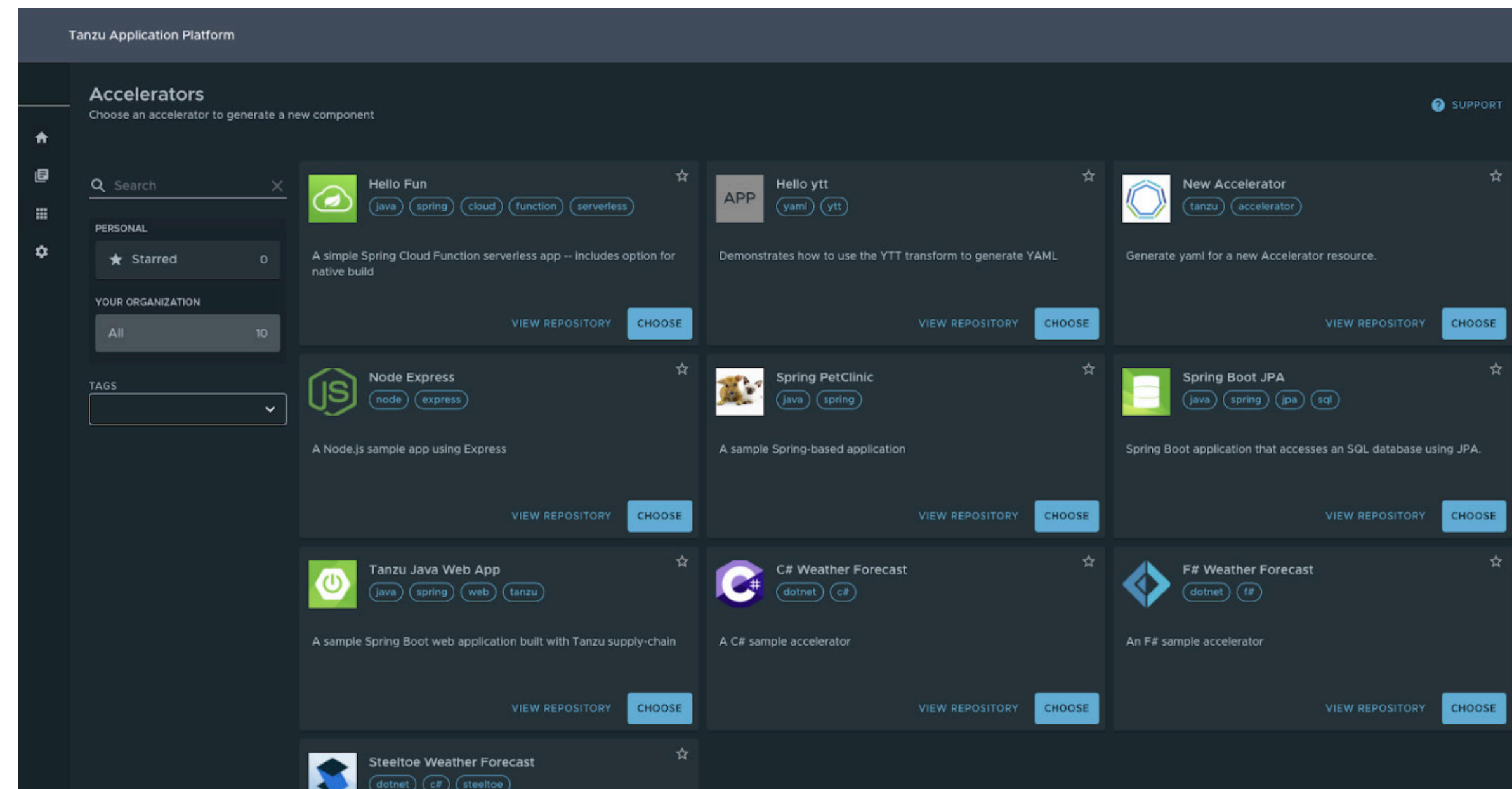
Additionally, the Learning Center experience in [Tanzu Application Platform](#) includes capabilities that enable developers to learn how to build production-ready code faster. Based on an internally developed platform that runs on Kubernetes, the Learning Center offers the ability to create interactive workshops with session-based environments alongside guided technical content.

Challenges faced by operations and security teams

Challenge 5: Security and compliance requirements mean no secure, consistent way to build containers from source code

The solution: Standardize one simple solution that can build and deploy code quickly and securely.

Tanzu Application Platform uses Cloud Native Buildpacks to turn source code into robust container images that adhere to industry best practices. When utilized within the supply chain, Tanzu Application Platform helps to develop and automate secure, containerized source-to-promotion or source-to-deploy workflows on any Kubernetes platform (VMware, AWS, Azure, Google, and more). Teams will not experience any security "surprises" along the journey to production.

The software supply chain is secure from the very beginning when a shift-left mentality is used, with developers sharing more responsibility for the security of their code.

Using tools like Tanzu Application Platform, which help developers take a stronger security posture and automate security tasks, is key to a shift-left security strategy.
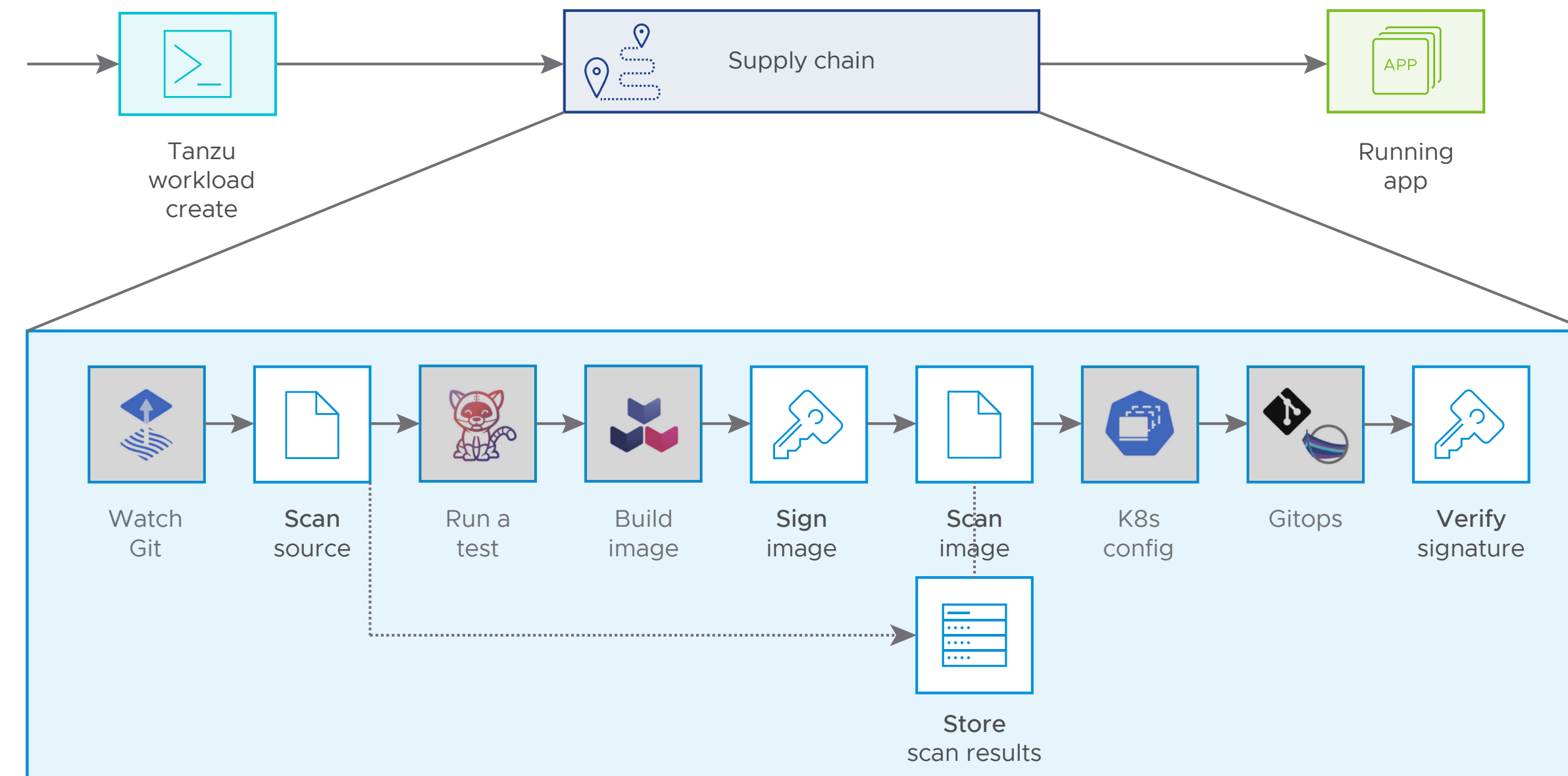
The solution: Secure software supply chain tools that seamlessly shift security left by increasing efficiency across dev and ops, and accelerating the path to production.

VMware Tanzu® Application Platform™ offers an ecosystem of supported vulnerability scanners, including a beta integration with VMware Carbon Black Container™ vulnerability scanning, in addition to Snyk (beta) and Grype.

Scanning early in the continuous integration/continuous delivery (CI/CD) pipeline allows customers to gain context in runtime and secure their supply chain. Development teams can address vulnerabilities and misconfigurations at build, quickly and more efficiently. This increase of visibility and risk prioritization allows them to deliver faster, without compromising security.

The centralized vulnerability monitoring dashboard of Tanzu Application Platform also aids app teams with their pre-deployment security checks and secure app deployments, allowing teams to centrally monitor the software supply chain.

Tanzu Application Platform provides software bill of materials (SBoM) support for SPDX (in addition to CycloneDX), which gives teams choices on how they import and export SBoMs via the VMware Tanzu insight CLI plug-in.
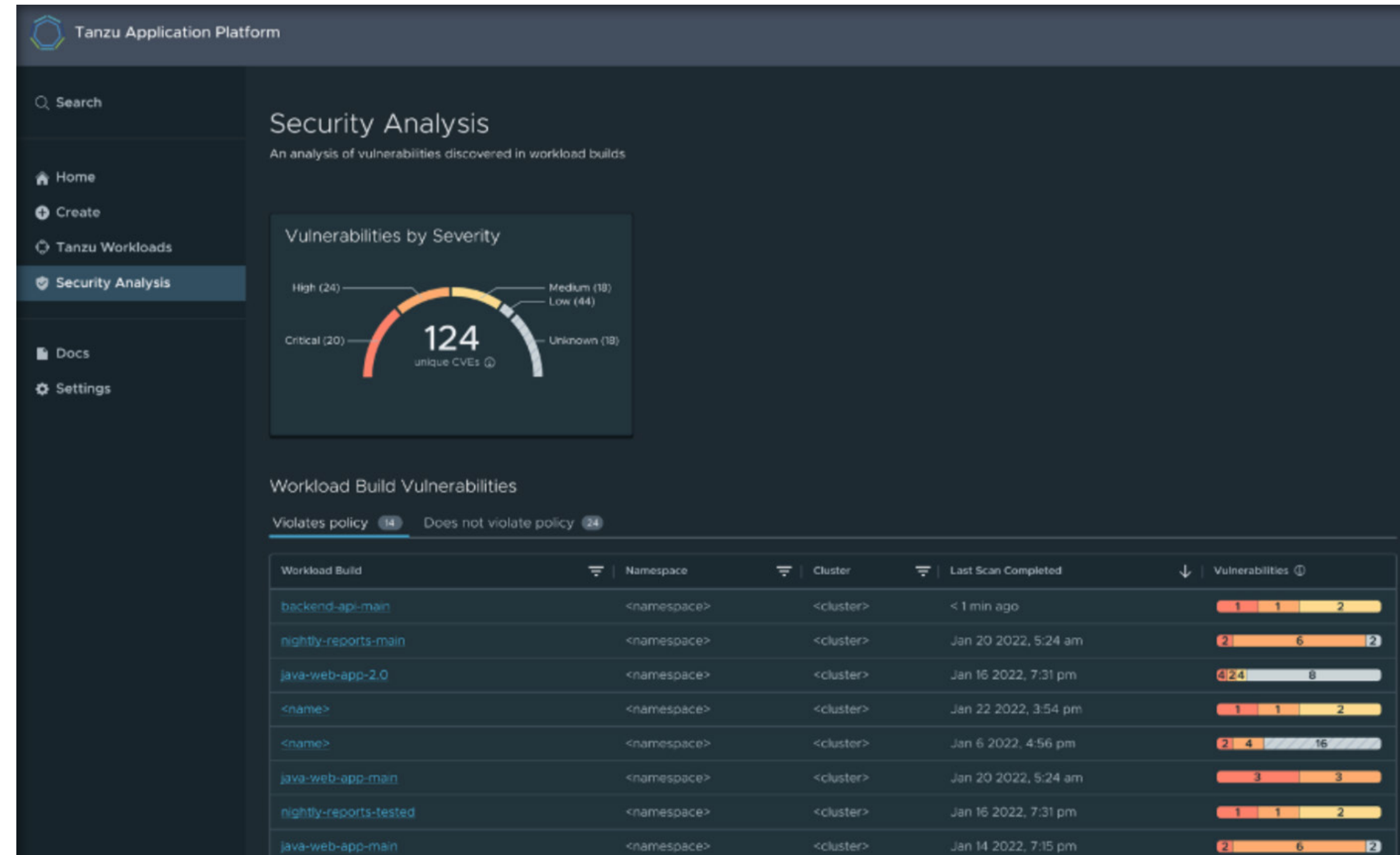
Challenge 6: Custom pipelines for every app create the issue of no reusable supply chains

The solution: Define a strong set of defaults and automate the entire application deployment process via a secure software supply chain workflow.

Tanzu Application Platform automates the entire application deployment process via an automated, secure supply chain workflow, relieving developers of the error-prone process of editing a "wall of YAML."

Tanzu Application Platform includes the entire end-to-end supply chain with its pre-instrumented components that work together seamlessly.

Having a set of strong defaults eliminates the crippling uncertainty arising from the thousands of technology choices available in the Kubernetes ecosystem.
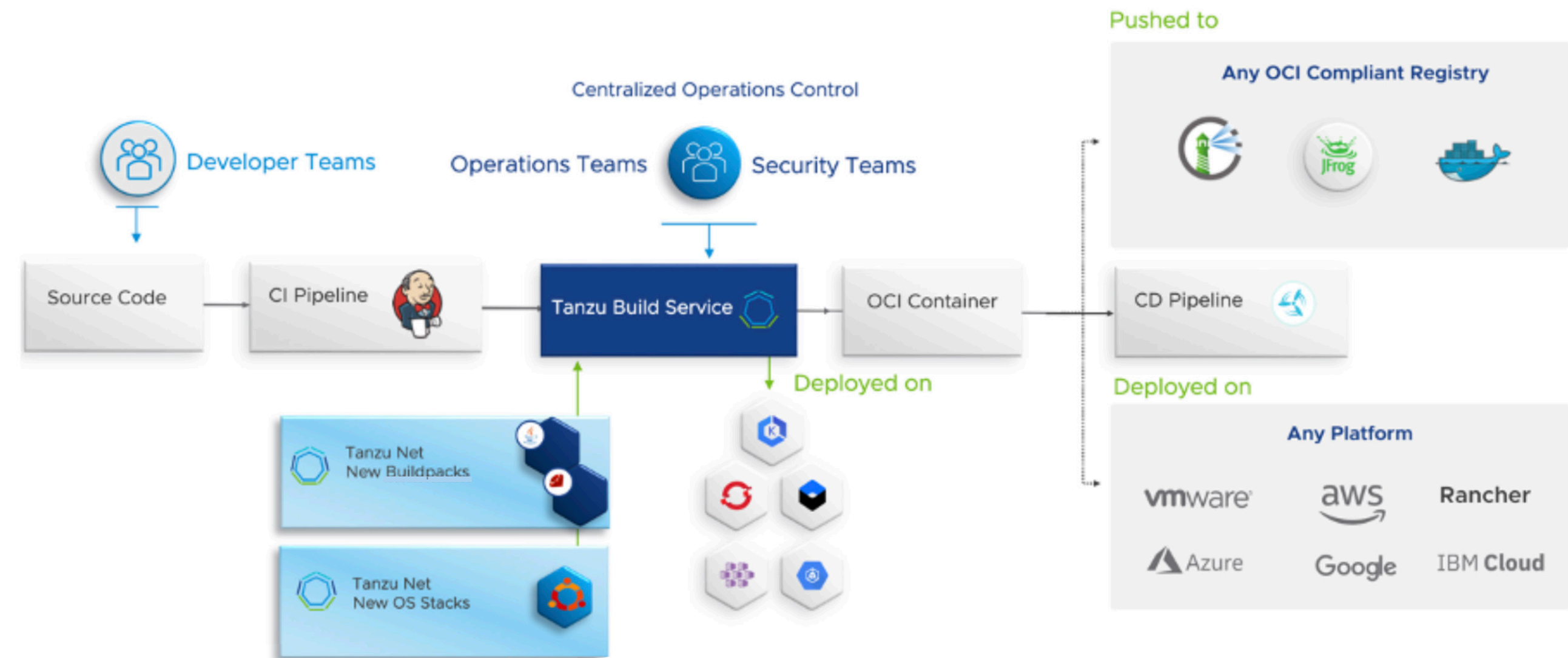
Challenge 7: Too many options in building a development platform; can't use existing tooling or opinions

The solution: Swap default components for your preferred tooling. Tanzu Application Platform has picked the best options, but is still a modular, composable platform.

Platform engineers and developer operations teams can swap out components based on their organization's requirements and preferences. (See image.)

Built with modularity in mind, Tanzu Application Platform is composable. It lets operations teams set guardrails based on their opinions. They can even substitute individual components easily through adapters. From continuous integration to the container build system, operators can use whatever they prefer.

WATCH GIT   RUN TEST   BUILD IMAGE   K8S CONFIG   GITOPS
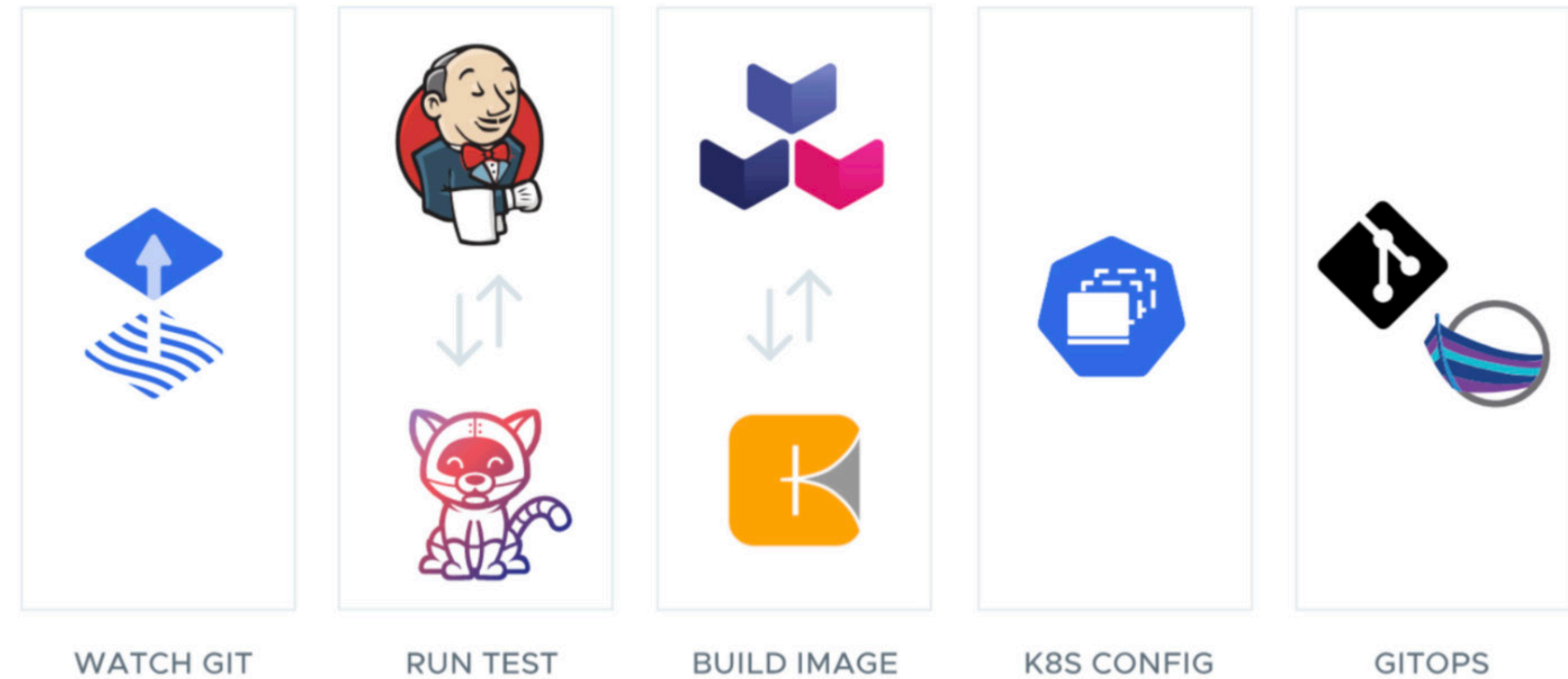
Choose a trusted software delivery partner

Try VMware [Tanzu Application Platform](#) to employ a smooth path to production that is secure, scalable, modular, and can run on any Kubernetes.

DEV

SEC

OPS

Choreograph: (Pipeline Service + Build Service)

Learn
Developers can start with prebuilt workshops on how to build production-ready code faster

Discover & Start
A consistent graphical user interface (GUI) to underlying services and APIs makes them easy to integrate; use pre-configured templates

Iterate
Developers can test code changes instantly as they iterate

Debug
Diagnostic tool App Live View enables app teams to quickly drill into runtime characteristics of apps and trouble-shoot issues

Test & Build
Delivers end-to-end secure software supply chains, with components preinstrumented to work out of the box

Scan, Sign & Store
Operators configure the software supply chain with security and compliance baked in

Deploy
The VMware Tanzu Convention Service provides a framework for operators to configure policies; it automatically applies conventions to workloads

Run
Cloud Native Runtimes is the app runtime for Kubernetes that decreases developer complexity

VMware Tanzu®

A Tanzu Activation Services engagement delivered by VMware Tanzu Labs can get you up and running quickly with Tanzu Activation Platform, giving you the confidence to push high-value code to production consistently and with confidence. Tanzu Labs works with organizations to address the tooling, people and process considerations necessary to develop and deploy secure software continuously at scale, forever.

Combat roadblocks with Tanzu Application Platform: a modular, application-aware platform that runs on any compliant public cloud or on-premises Kubernetes cluster.

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