Cool Vendors in Agile and DevOps

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Initiatives: Agile and DevOps

Cloud-native technologies, AI-enabled test automation and programmable infrastructure transform the way organizations develop and deploy applications. I&O leaders working with application leaders in DevOps teams must consider four cool vendors that simplify the adoption of these technologies.

Overview

Key Findings

- Building cloud-native applications requires additional tooling and knowledge, adding complexity to existing continuous integration/continuous delivery (CI/CD) pipelines and restricting the productivity of DevOps teams.

- Many organizations struggle to achieve their desired release frequency and cycle time due to software testing constraints.

- Adoption of hybrid cloud delivery models to support cloud-native platforms creates challenges in leveraging existing tools and processes, resulting in decreased speed and agility.

Recommendations

Infrastructure and operations (I&O) leaders responsible for agile and DevOps initiatives should work with application leaders to:

- Maximize productivity of DevOps teams doing cloud-native application development by providing a self-service, Kubernetes-based platform for rapid application deployment.

- Improve software quality and remove constraints to agility by incorporating easy-to-adopt AI-enabled test automation tools that leverage natural language processing (NLP) and machine learning (ML).

- Increase release velocity by using programmable infrastructure to simplify application deployment in hybrid and multicloud environments.

Analysis
What You Need to Know

Cloud-native architecture provides organizations with unparalleled elasticity, scalability, security and resiliency. These advantages enable DevOps and I&O teams to rapidly deliver scalable solutions that meet the demands of digital business.

This rapid pace of delivery requires new tools that go beyond automation and leverage emerging technologies, such as AI-augmented development and testing, to enable continuous deployments (see "Innovation Insight for AI-Augmented Development").

In particular, cloud-native applications require fast and scalable CI/CD pipelines, fast testing cycles and new ways to provision complex cloud-native or hybrid platforms. In this research, we highlight four new vendors: Codefresh, Diffblue, Functionize and Pulumi. These Cool Vendors offer tools that help remove constraints from three key areas of the pipeline (see Figure 1):

1. Building fast, scalable CI/CD pipelines for cloud-native applications
2. Automating testing and building complex test suites that leverage AI, NLP and ML
3. Provisioning complex, well-architected environments using common software languages

**Figure 1. Cool Vendors Help Remove Constraints to Enable Delivery of Business Value**

Source: Gartner, May 2020

Codefresh
Analysis by Manjunath Bhat and Thomas Murphy

Why Cool: Codefresh allows DevOps teams to create simple, fast and scalable CI/CD pipelines via a modular, container-based approach (like building with Legos). Using Codefresh, DevOps teams can automate the “code to deploy” workflow through integration with infrastructure automation tools, Git repositories, container registries and Kubernetes.

Codefresh provides an easy-to-learn UI and APIs to manage and monitor the end-to-end container deployment life cycle and role-based access control for security and compliance. It can also create pipelines for deploying to test and staging environments and for canary and blue/green deployments to production environments. The tool also supports a manual approval process and auditing as an option for companies that require manual signoff as part of release management. Codefresh provides DevOps teams with real-time debugging features with breakpoints, traceability and observability, and faster build times, resulting in improved developer productivity and operational efficiency.

Challenges: Codefresh faces competition on three fronts. First, the competitive threat from other members of the Cloud Native Computing Foundation (CNCF) namely Armory (Spinnaker), CloudBees, GitHub Actions, Harness and others. Secondly, existing DevOps toolchain providers (such as GitLab, GitHub, Atlassian and CloudBees) are expanding their capabilities across the DevOps value stream delivery life cycle. Lastly, public cloud providers are offering managed Kubernetes services (such as Google Kubernetes Engine [GKE], Azure Kubernetes Service [AKS] and Amazon Elastic Kubernetes Service [EKS]) and hybrid environments (such as Google Anthos, Azure Arc and AWS Outposts). Thus, Codefresh must build a robust set of extensions to enhance its value proposition over the native cloud provider tools.

Who Should Care: DevOps teams delivering cloud-native applications can use Codefresh to spin up containers on-demand, making it easy to test and deploy new features. I&O leaders can gain visibility into the software delivery value stream, locate bottlenecks and implement ways to remove them. Codefresh allows platform engineering teams to scale application modernization and cloud migration efforts by reducing toil (low-value tasks) and delivering faster business value.

Diffblue


Analysis by Joachim Herschmann

Why Cool: Diffblue uses AI to automatically write and maintain comprehensive suites of unit tests for rapidly evolving Java code libraries, freeing DevOps teams from manually writing unit test code. Diffblue provides two options for writing unit tests using either the Diffblue Cover IntelliJ IDEA plug-in or a command-line interface (CLI). The company offers different plans and pricing, including a free community edition, a team edition and an enterprise edition.
Challenges: Diffblue can be highly accurate about how the code will behave but cannot be anywhere near as accurate for business logic or requirements. The product is currently limited to Java and the JUnit framework, and there are some differences regarding what is supported in the IntelliJ plug-in and the CLI. Also, while Diffblue enjoys a first-mover advantage that may allow it to establish a strong brand and technical foundation, companies such as Microsoft and Parasoft are also investing in AI-driven test creation projects. AI-enabled open-source solutions (such as EvoSuite) are also emerging. Diffblue's specialized functionality could potentially be subsumed into larger developer or testing tool stacks.

Who Should Care: DevOps teams responsible for accelerating development and improving quality can use Diffblue's solution to automate unit testing, relieving them from a task they are not keen on doing. It enables developers to focus on developing features that provide value to customers.

Functionize

Analysis by Jim Scheibmeir

Why Cool: Functionize offers a novel approach to create test automation by using NLP and ML models. DevOps teams can train the system with simple text or voice-to-text definitions. Functionize will analyze the inputs and then generate a set of test automation scripts. It can then maintain these autonomously as the application evolves.

Challenges: The test automation market includes some established players that have long-standing relationships with partners and customers. Functionize will need to grow partnerships and build tool integrations to compete with technologies and vendors who have had more time to mature in these spaces. Also, test automation solutions are often complemented by other features, such as service virtualization or test data management.

To effectively compete in this market, Functionize must continue building new features and capabilities that complement its innovative test automation approach. The product is mostly geared toward test automation of web applications; however, enterprise concerns include test authoring for applications that range from green-screen to APIs and mobile. Functionize has a novel and attractive approach to test automation authorship, but it only has maturity in one application area web (user interfaces [UIs]).

Who Should Care: DevOps teams who need enhanced test automation capabilities or faster test feedback should evaluate Functionize for their use cases. Functionize is especially useful for accelerating user acceptance or regression automation suites aimed at the web application's UI.

Pulumi

Analysis by Chris Saunderson
Why Cool: Pulumi offers multicloud, multiplatform infrastructure automation in a variety of formats, including libraries, CLIs, software development kits (SDKs) or hosted instances. Pulumi allows DevOps and I&O teams to deliver infrastructure as code (IaC) services using the supported languages and integration methods of their choice.

Pulumi’s 1.0 release provides both open-source and paid platform models that provide robust support for infrastructure, container and serverless deployments. Its upcoming 2.0 release includes support for additional languages and platforms while incorporating policy security and organizational policy compliance, cost optimization, data protection and improved visibility of deployment-driven infrastructure changes. The Pulumi product also serves as the base for higher-level frameworks that accelerate delivery and represent best-practice implementations of the underlying infrastructure.

Challenges: As Pulumi does not use a DSL, it presumes DevOps and I&O teams already have moderate knowledge of both IaC and programming languages to fully leverage the platform. I&O teams lack this dual skill set, and will need assistance and support from DevOps teams to take full advantage of the platform. Pulumi also faces competition from other vendors in this space, including Amazon Web Services, HashiCorp’s Terraform, Microsoft Azure and Google Cloud Platform. As these incumbent vendors further develop their deployment tooling, newer entrants like Pulumi may have limited opportunities to differentiate through their technology.

Who Should Care: DevOps and I&O teams who aim to use programmable infrastructure for cloud-delivered IaaS and container-based platforms should evaluate Pulumi as one of the best-of-breed vendors.

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