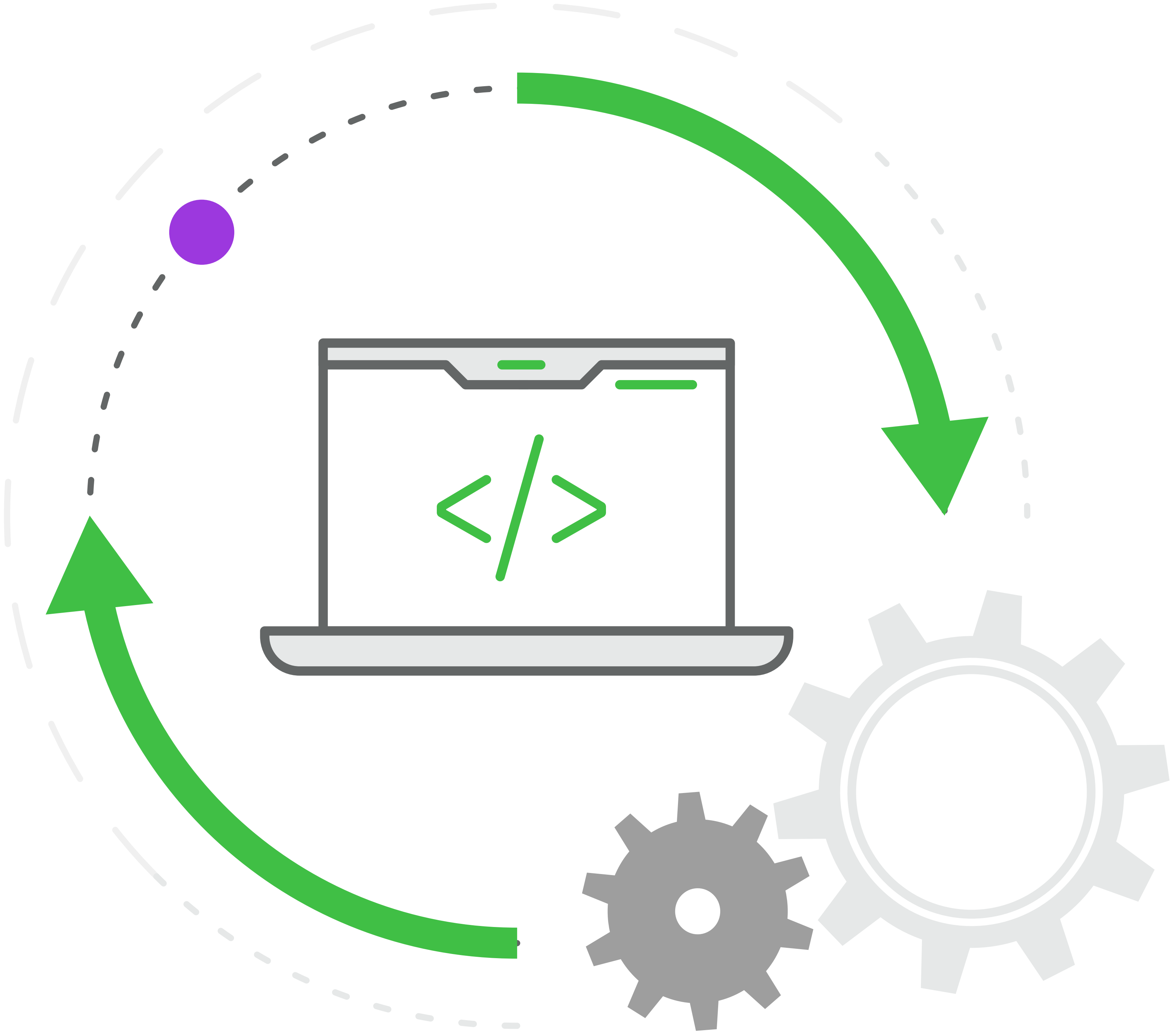
9 KEY FACTORS WHEN CHOOSING AN END-TO-END DEVOPS PLATFORM



Discover How You Can Expedite Software Delivery

LACK OF VISIBILITY

"Challenges around secure containerization begin with a lack of visibility. Containers are everywhere, and despite their benefits, their expansion creates security blind spots and increases the company's attack surface."

Anastasios Arampatzis
Writer, ISBuzz News

Source: What Are The Top 5 Kubernetes Security Challenges And Risks?, ISBuzz News, April 30, 2020

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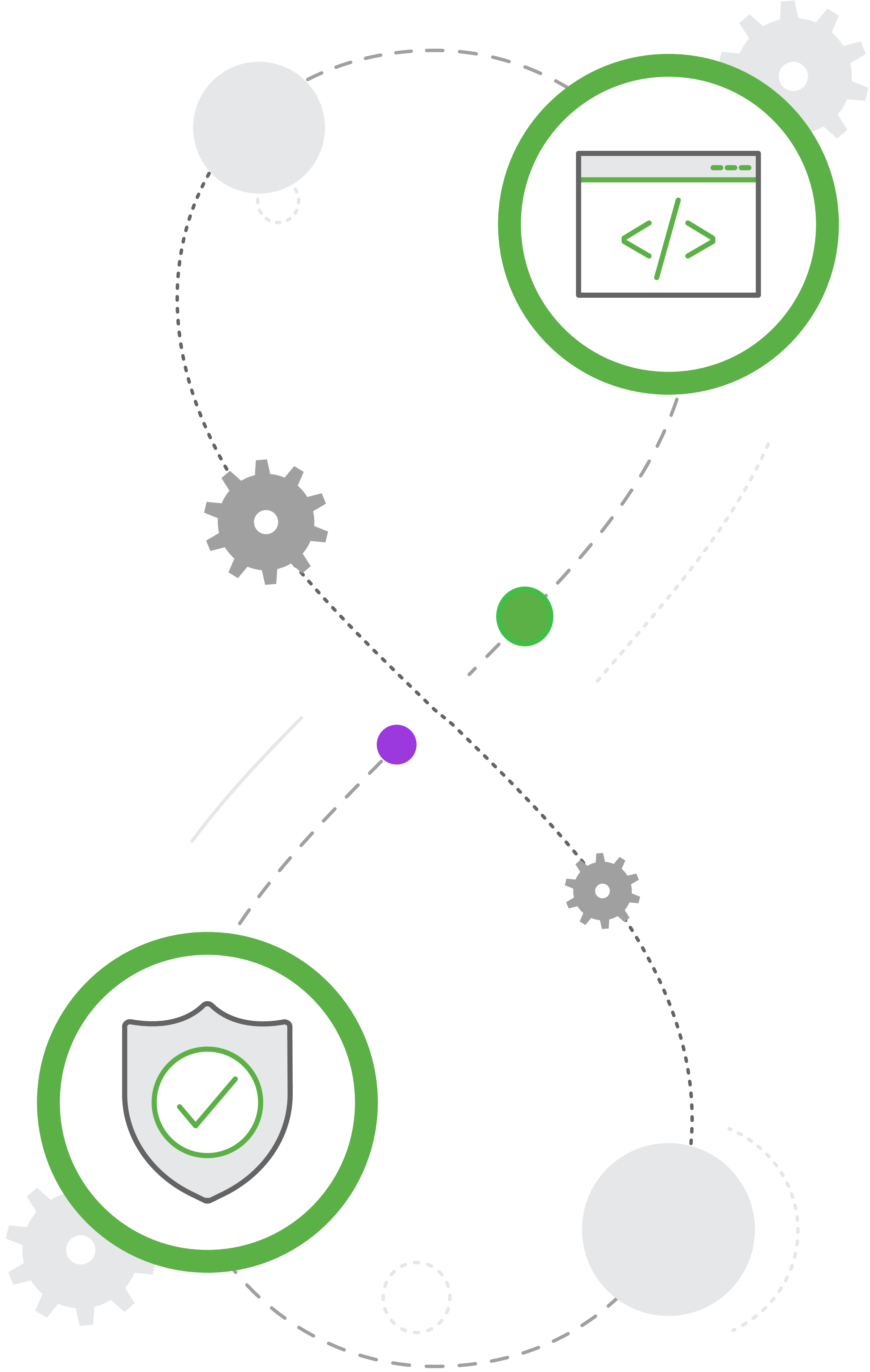
TURN YOUR PLATFORM INTO A DEVOPS POWERHOUSE

Time is always at a premium for software developers and their teams, no matter the size of the organization—startups to SMBs to large enterprises. The pressure to innovate and deliver releases is a race to stay ahead of the competition. However, as DevOps practice evolves, the proliferation of available tools and frameworks is leading to a rise in complexity and raising a barrier to productivity.

Traditionally, DevOps practitioners use many dedicated single components from more than one provider to perform specific actions in their continuous integration (CI) and continuous delivery (CD) pipelines. This could impact your software releases by reducing productivity and disrupting process flow.



There is another way to manage your DevOps pipelines to deliver releases with trust and speed

Rather than managing your software releases with separate components that can reduce productivity and introduce risk, automate the management of your CI/CD pipelines with an end-to-end solution from code to edge. Manage your software development life cycle (SDLC) from a single pane of glass, integrate the tools you currently have for a consistent experience that can handle the growing complexity of your DevOps pipelines.

Make your DevOps platform optimize the delivery of your software

This eBook explains how your DevOps platform should enable you to deliver software updates automatically, continuously, and quickly—while maintaining quality and security. A fully automated and integrated solution allows you to release and distribute software with confidence and speed across the globe.

Get freedom of choice, support all major software build packages, and work with the DevOps tools you already use to accelerate continuous delivery across the software development pipeline from a single, out-of-the-box hybrid solution.

END-TO-END DEVOPS

"The eventual dominant player in the end-to-end DevOps provider market will be rewarded with what should be a great pot of gold. It is this promise of hegemony over DevOps and the rewards it commands that have so many chasing the prize."

Alan Shimel
Founder, CEO, Editor-in-Chief
MediaOps

Source: DevOps.com – The Battle for End-to-End-DevOps champion is on. January 27, 2020.

1. THE CORE OF THE PLATFORM: A SINGLE SOURCE OF TRUTH

Central to your DevOps platform is the automation of your software development processes. A scalable, universal, binary repository manager should automatically manage the artifacts and dependencies across the development and delivery process. The platform should support for all major software build packages and the CI/CD solutions already in your ecosystem.

Universal package support should cover the needs of software engineers across the organization. Back-end developers use Java, .NET, Conan (C and C++), and Go. The front-end team wants npm compatibility, and DevOps wants Ruby and Python. For the deployment team, rpm, Debian, and Docker are popular. Finally, Helm, Chef, Puppet, and GitHub are often used for overall orchestration. The platform should become your single source of truth for reliable access to your artifacts though local, remote, and virtual repositories.

Benefit from flexibility and optimization

End-to-end integration and automation of your CI/CD platform and DevOps tools offer the flexibility to choose how you manage your software libraries and build artifacts. Use an extensive REST API to customize the management of builds and repositories; and a simple CLI can automate access.

Optimize your binary repository replication process by up to 10 times with checksum-based storage for each artifact only once. This prevents slow request response time and averts dropped connections, connection pool depletion, timeouts, and node synchronization issues.

Enable a unified user experience

Using a variety of point solutions for each process can be difficult to manage. Your platform should reinforce a consistent user experience with a familiar look and feel for all services. Have all processes at your fingertips on a highly scalable enterprise platform with unified management, including users, permissions, configurations, metadata, and searches, from a single location.

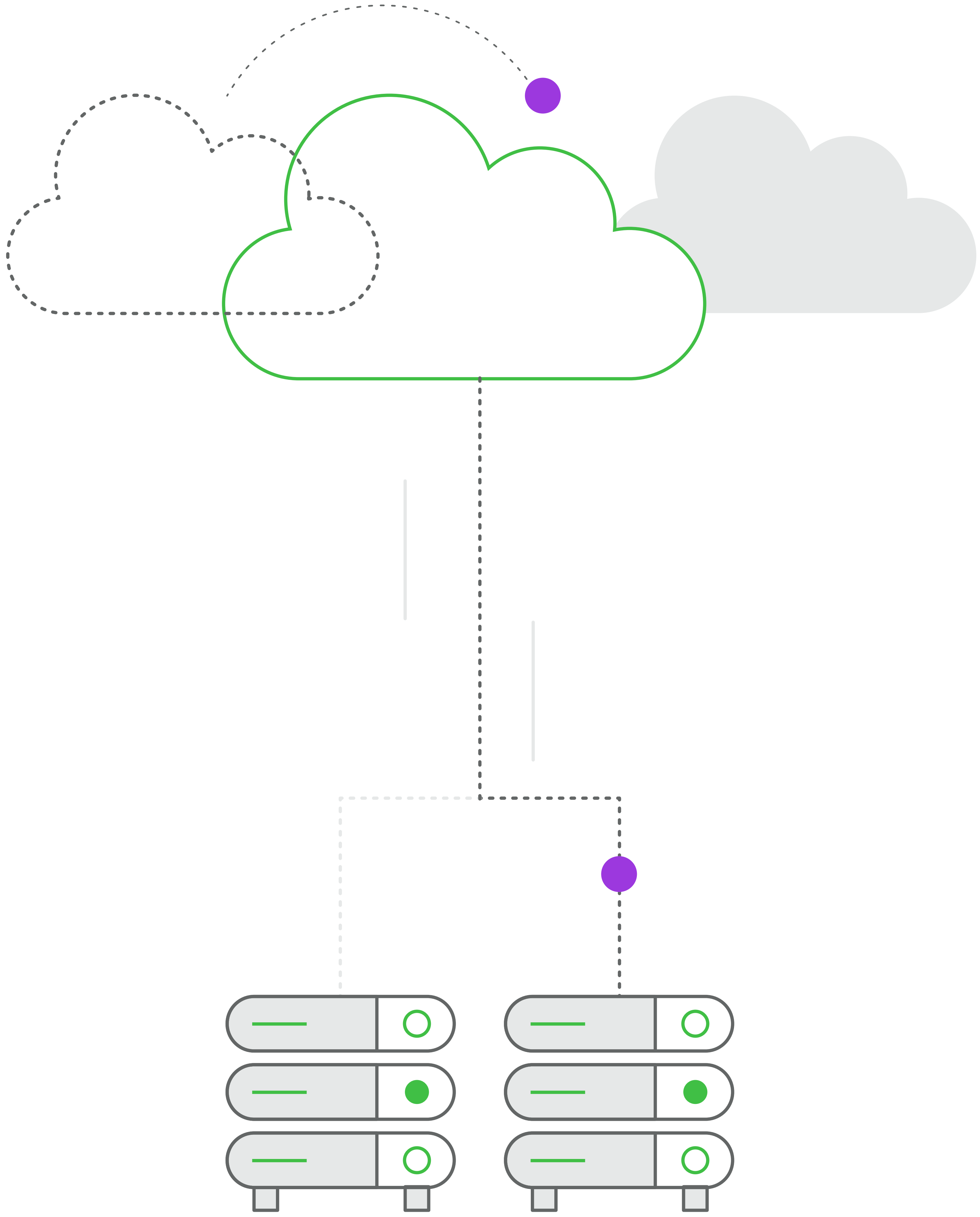
2. GET FLEXIBILITY WITH A HYBRID PLATFORM

As businesses migrate software development from their current on-premises environments to the cloud, they look in adopt a hybrid model for their data and development in the cloud. Depending on business and compliance requirements, a hybrid deployment allows organizations in move data and applications between cloud and on-premises environments.

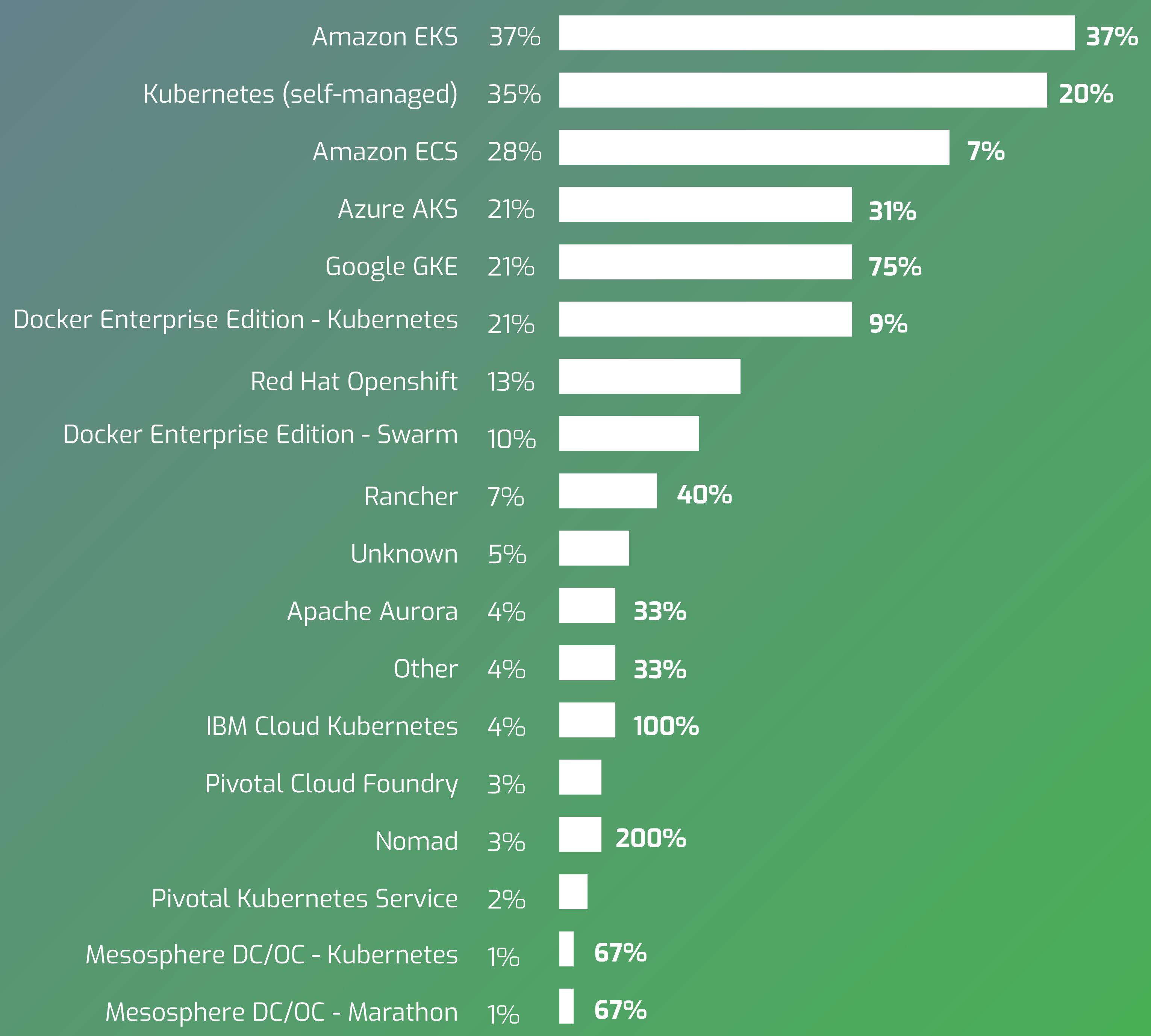
The importance of on-premises and cloud integration

A hybrid platform bridges cloud and on-premises infrastructures offering you invaluable capabilities:

- **Integration of on-premises and cloud deployments** enables flexibility, scalability and consistency. A hybrid environment provides many benefits, including low-cost development and testing on-premises and the scalability and availability of deploying storage to the cloud. The hybrid platform enables you to orchestrate and control the development, testing, delivery, and management ecosystem.
- **Data ownership and localization** Hybrid platforms can also help organizations meet regulatory compliance policies and manage permissions and access. Additionally, hybrid allows you to easily move back and forth from the cloud to your on-premises environment as needed.
- **Integration facilitates utilization of resources that support development.** You can deliver from the cloud to your on-premises environment as you need. This includes enabling cloud native capabilities such as Kubernetes or utilizing the on-premises data center for risk-based considerations, such as the control of equipment locations and IoT delivery to provide as close to runtime and the edge as possible.



KUBERNETES DOMINATES THE CONTAINER ORCHESTRATION MARKET**



** Source: Stackrox.com, Kubernetes-Adoption and-Security Trends and Market Share for Containers

3. BE KUBERNETES-READY

The Microservices Adoption in 2020 survey* reported that **62% of the 1502 global respondents are using containers for at least some of their deployment of microservices.** The survey also noted that a majority (54%) of microservices adopters were "mostly successful."

Kubernetes has become the industry choice in orchestration tools for automating deployment, scaling, and management of microservices and containerized applications. Its current adoption rate is high at 86%. However, the self-managed approach is falling slightly behind Amazon Elastic Kubernetes Service (Amazon EKS), 35% to 37%.

Supporting Kubernetes and containerized (Docker) microservices

You will need a robust, highly scalable container registry to be the single access point to manage and organize your container images to provide:

- Reliable, consistent, and efficient access to remote container registries
- Full integration with your build ecosystem
- Security and access control
- Distribution and sharing images across your organization
- Smart search for images

You will also need a "Kubernetes Registry" so you can:

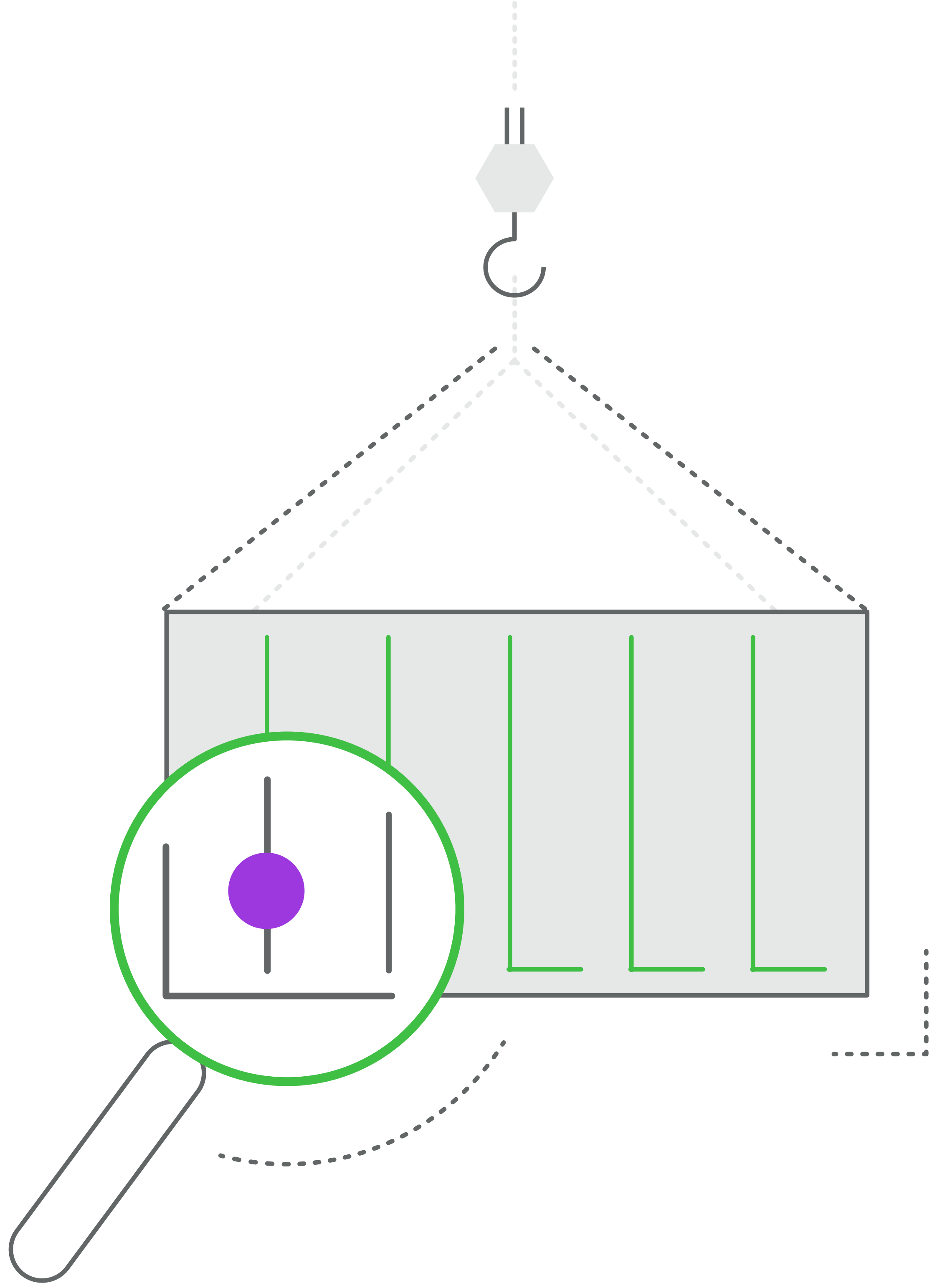
- Gain insights and full control of your code-to-cluster process
- Manage application packages, the operating system's component dependencies, open source libraries, Docker containers, and Helm charts with full visibility of all dependencies

* Source: O'Reilly: Microservices Adoption in 2020, July 15, 2020

4. DELIVER TRUSTED SOFTWARE

Security risks are growing at an alarming rate. Just look at the news for the latest security breaches. Applications today consist of up to 90% open source components* exposing your code to potential security vulnerability risks. Additionally, it could also introduce complex licensing compliance issues for organizations that use components with limiting or harmful license agreements.

Adopting a comprehensive and universal software composition analysis (SCA) tool to continuously scan artifacts and dependencies for known security vulnerabilities and open source license compliance violations helps empower developers and DevSecOps teams to identify and mitigate issues before they manifest in production. When natively integrated with your artifact repository manager, it provides optimized scanning, unified operation, and a view of all security and compliance information from a single pane of glass.



Gain visibility by scanning for vulnerabilities recursively

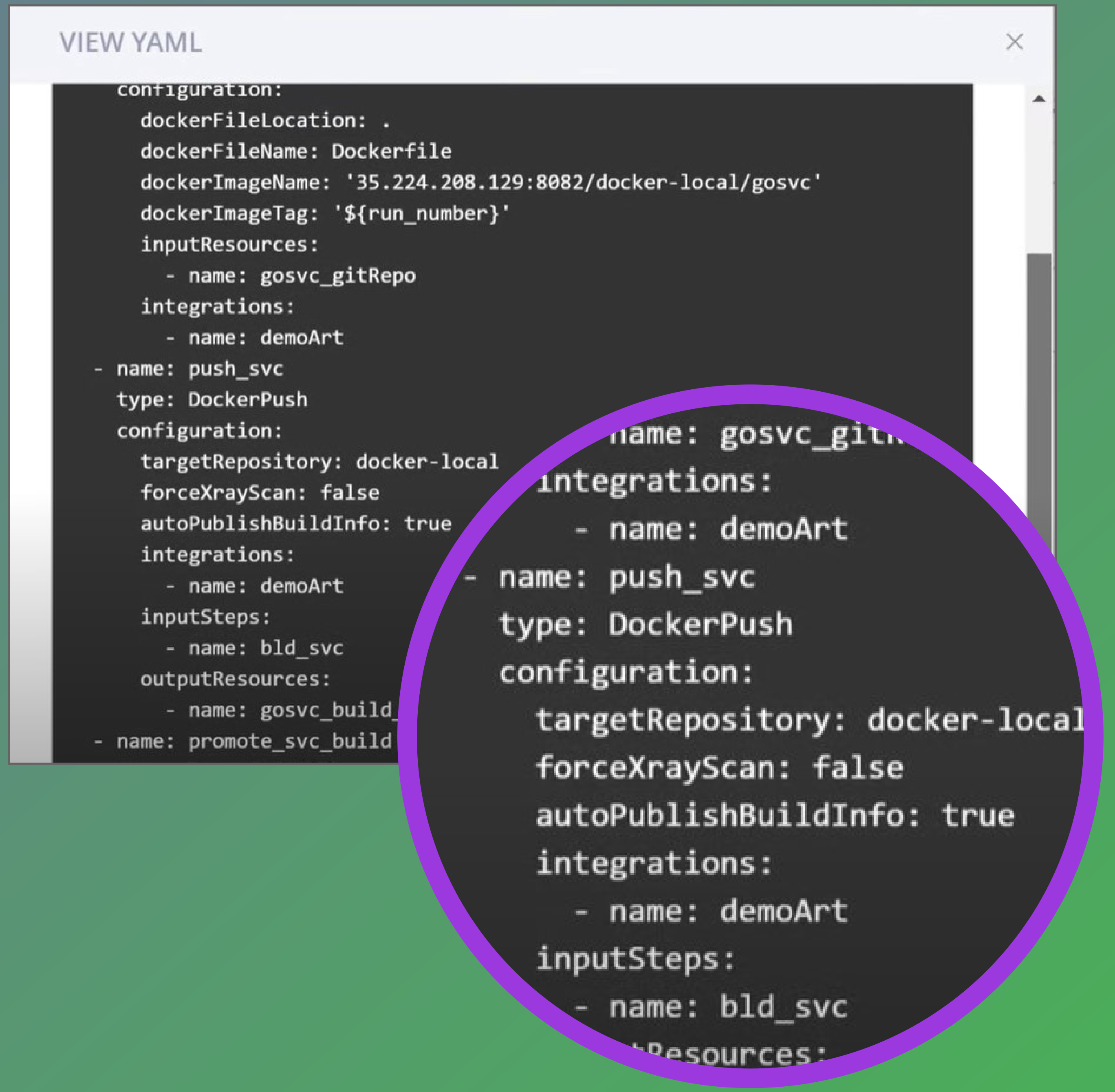
A truly comprehensive solution that scans for security vulnerabilities provides visibility into all your artifact metadata, including all dependencies. It should include deep recursive scanning to reveal any security and license compliance issues in the underlying layers and dependencies, especially those packaged in Docker images and zip files.

Should a vulnerability be discovered, a component graph and impact analysis of the component in question should be generated to assess any impact to other components. This helps you deliver trusted software to your customers.

* Source: Open Source Projects: Why Security Still Matters, Dice, August 3, 2020

5. OPTIMIZE AND CONTROL PIPELINES

YAML CODE EXAMPLE



```yaml
  configuration:
    dockerFileLocation: .
    dockerFileName: Dockerfile
    dockerImageName: '35.224.208.129:8082/docker-local/gosvc'
    dockerImageTag: '${run_number}'
    inputResources:
      - name: gosvc_gitRepo
    integrations:
      - name: demoArt
- name: push_svc
  type: DockerPush
  configuration:
    targetRepository: docker-local
    forceXrayScan: false
    autoPublishBuildInfo: true
    integrations:
      - name: demoArt
    inputSteps:
      - name: bld_svc
    outputResources:
      - name: gosvc_build_
- name: promote_svc_build
```

As a software developer, you probably deal with a plethora of pipelines. This can slow down and complicate your software releases.

How you can efficiently manage your pipelines

Take control by automating, orchestrating, and optimizing your critical workflows with increased velocity across your pipelines and development environments. With a next-generation, pipelines-as-code solution for end-to-end CI/CD automation and workflow orchestration, you can increase the velocity of all critical processes in real time from a centralized command and control mechanism across the DevOps pipelines.

This way, you can gain high availability by maintaining robust pipelines that will keep your binaries flowing smoothly to production so you can deliver value to your customers faster.

Pipeline control is easy to learn

Create workflows with pre-built steps and interactive diagrams and graphical display using easy-to-learn, declarative, YAML-based language with versioned, modular, and reusable configurations.

You can integrate existing CI/CD and DevOps tools. Integrate with the most common DevOps technologies you already use for version control, storage, issue-tracking, and notification, including GitLab, Jenkins, Docker, and Kubernetes. Additionally, you can scale horizontally with centralized management to support thousands of users, pipelines, configurations, metadata, and searches. You should even be able to keep Jenkins sprawl under control.

6. DELIVER GLOBAL UPDATES

From small startups to the largest enterprises, organizations look for ways to accelerate their software delivery processes in the race to get ahead of the competition.

Centralized orchestration and distribution of software releases across the globe

Accelerate the velocity of software delivery with effective network utilization and optimized replication. You should be able to efficiently distribute immutable release packages and automate the delivery of your software updates across the globe to hybrid (on-premises and cloud) targets in one step.

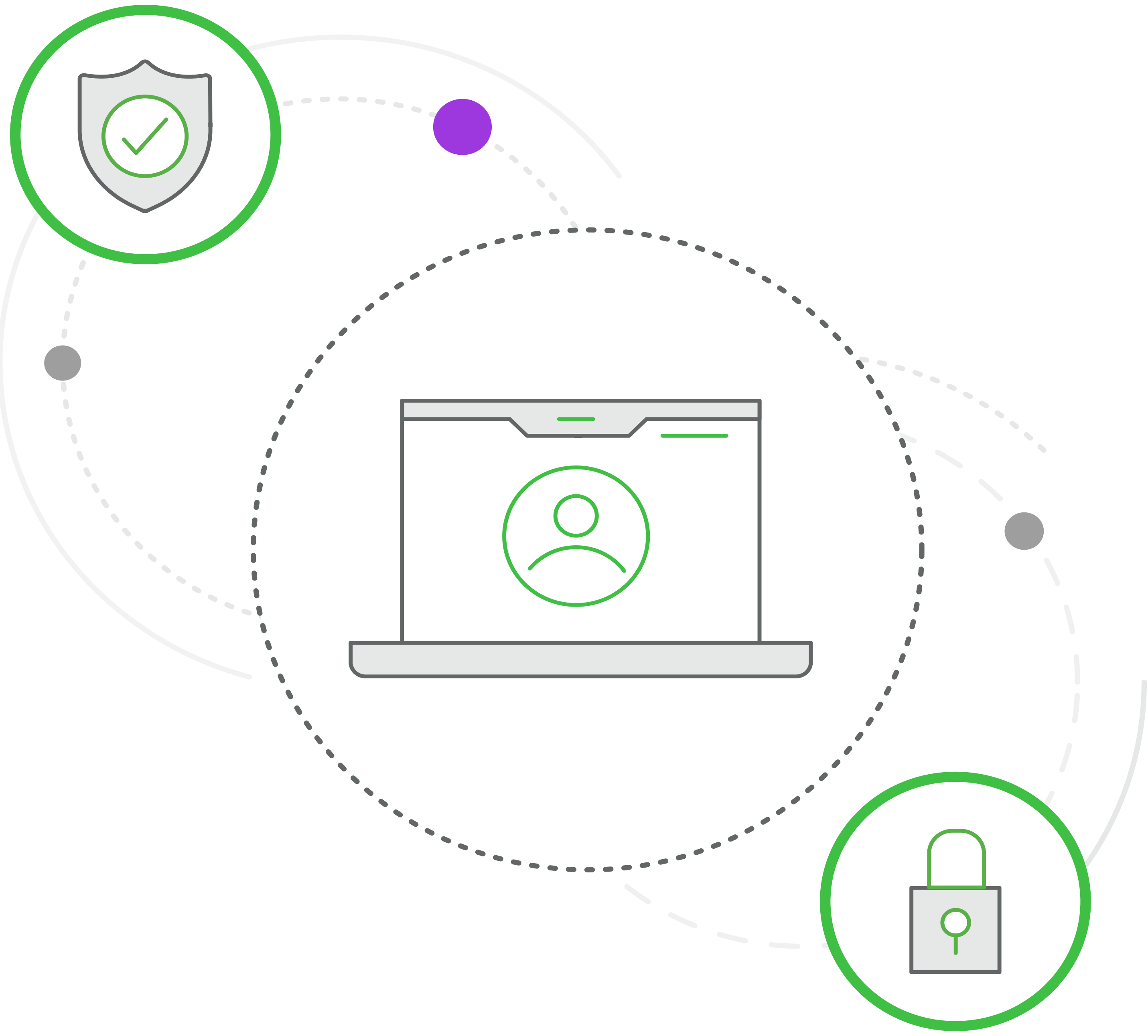
Software distribution should provide auditing and traceability of releases controlling permissions and tracking of bill of materials capabilities. This way, you can deliver secure and trusted releases that are digitally signed and verified at the target site. Moreover, you should be capable of automatically blocking release distribution based on security scanning results.

Delivering artifacts globally

For efficient software distribution, you will need to manage, control, and distribute high volumes of software across multiple locations using Content Distribution Network (CDN) capabilities. This helps you deliver the major package software types globally for both public and private access.

Software distribution at runtime

Overcoming latency and reduced bandwidth consumption issues can be effectively achieved when handling download bursts with peer-to-peer (P2P) distribution. P2P distribution can be used when thousands of clients need to download a particular container image or artifact in a short period of time in a secure hybrid environment.



7. ADMINISTER TRUSTED ACCESS

The secure management of all functionalities on your platform is essential to maintaining the integrity of your software releases.

Your DevOps platform should provide secure, unified access to the management of all functionalities—artifact management, security and compliance,, optimized CI/CD pipelines, and distribution—all from a single pane of glass from any location. This capability can facilitate pipeline visibility and metrics as well. Moreover, you can securely manage all your software development life cycle functionalities globally through a single login session.

Enable a federated “circle of trust”

You should be able to safely put all your metadata, searches, user setups, configurations, and permissions together. Additionally, a single, federated “circle of trust” for access services should be established on the platform. This allows you to synchronize users, groups, tokens, and permissions, as well as support for LDAP, SAML, and OAuth, between sites rather than having to define them separately.

This capability enables single sign-on (SSO) for all your DevOps platform services connected to any access service within the circle of trust, resolving the need to log into each product separately. These features together with advanced capabilities for replication across multi-site topologies set you up for a complete, global end-to-end artifact management solution.

8. GET THE BENEFITS OF CLOUD DEPLOYMENT

The DevOps platform you choose should integrate well with the critical processes in your software delivery lifecycle. Likewise, deployment to the cloud. Depending on your business and compliance requirements, the principal benefits of the cloud should focus on:

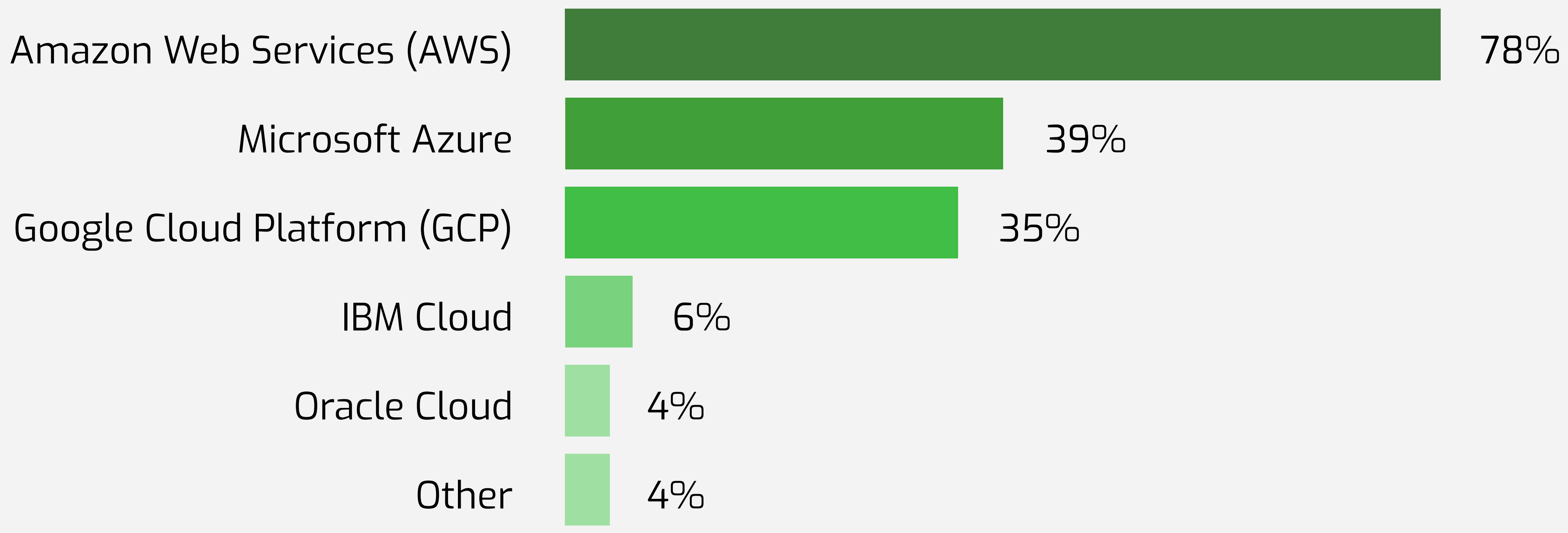
- **Automation**, which is central to DevOps practice
- **Scalability** that allows you to fit processes and workflow to your changing needs and traffic demands
- **Collaborative capabilities—**the essence of DevOps as a process that unifies automation and enhanced operations to accelerate and optimize software delivery
- **Quality and performance** through automated testing, continuous delivery, and infrastructure
- **Security—**where automation and managed cloud computing make it easier to apply updates and deploy quickly with an ability to track changes in code and help ensure the right security measures are in place

By deploying your DevOps platform to the cloud, you will be able to deliver software releases more quickly and efficiently. Running your DevOps solutions on Amazon Web Services (AWS) allows you to achieve the following benefits:

- Secure and scalable AWS services like Amazon Elastic Compute Cloud (Amazon EC2) with security and management features
- Amazon Elastic Container Service (Amazon ECS) to run containerized applications in production

CONTAINER ADOPTION TRENDS

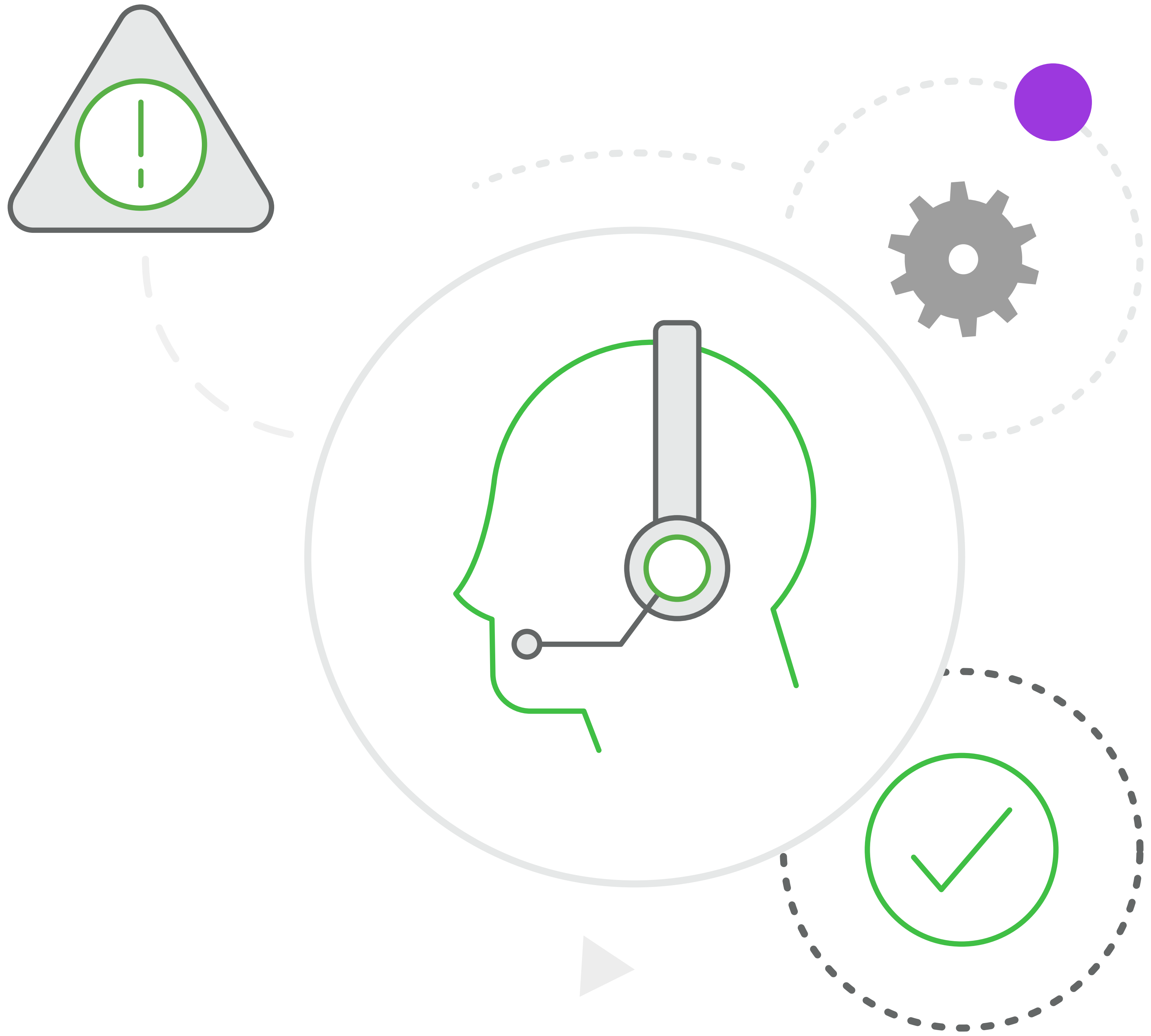
If you are running containers in the public cloud, which provider(s) are you using (pick as many as apply).



Source: 6 Container Adoption Trends of 2020, StackRox, March 4, 2020 >

- EKS managed services that run Kubernetes
- Flexibility, reliability, and scalability of deployment to innovate and deliver ahead of the competition.

By deploying on AWS, you can scale to meet various business needs with support for any Amazon Simple Storage Service (Amazon S3) cloud object storage provider through AWS' API and a reverse proxy for your Docker repository using AWS Elastic Load Balancing (ELB) to support high availability. These can help lower your OpEx cost and maintain a single source of billing from AWS Marketplace.



9. WORLD CLASS PRODUCT SUPPORT

When supporting a complex product such as an end-to-end DevOps platform, there are many moving parts that need to fit into your organization's specific ecosystem. If managing Jenkins can present a challenge, you will need even broader support for an entire platform. A world-class support team should be capable of handling technical questions and providing a hands-on, one-on-one approach, globally, 24/7—in any geo.

Your support system should be for developers by developers. This allows you to benefit from a close and convenient channel of communication with around-the-clock, quick-response support, as well as access to an easy-to-use customer portal.

IN CONCLUSION

When innovation and the swift delivery of software releases are part of your DevOps strategy, integrating the components you already use to support productivity and maintaining the process flow with a universal, hybrid platform from code to the edge should be your goal.

Consider the benefits you'll get with a highly scalable enterprise platform that unifies the management of all services in a single pane of glass, including users, permissions, configurations, metadata, and searches in one location.

ABOUT JFROG

JFrog is on a mission to enable continuous updates through liquid software that helps empower developers to deliver high-quality applications that securely flow to end-users with zero downtime. Our solutions meet your business model needs and support on-premises, cloud, hybrid, on AWS.

JFrog Artifactory solutions are used by more than 5,800 customers—from startups to large enterprises—who depend on JFrog to manage their binaries for their mission-critical applications. This includes more than 75% of the Fortune 100 companies such as Amazon, Facebook, Google, Netflix, Uber, VMware, and Spotify who put their trust in JFrog.

TURN YOUR PLATFORM INTO A FULLY AUTOMATED AND INTEGRATED DEVOPS POWERHOUSE

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