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The Role of Unified Kubernetes Management in Application Resiliency, Security, and Compliance

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Modern enterprises increasingly utilize Kubernetes to orchestrate application hosting and delivery across diverse environments and the development lifecycle. As organizations increase container deployments in support of more and more of the estate, many have now found themselves with multiple Kubernetes implementations serving hybrid environments that include more than one cloud and/or on-premises infrastructure. This increasing complexity presents unique challenges for maintaining consistent application performance, security, and compliance.

The Hybrid Kubernetes Environment Challenge

Organizations must maintain consistent and reliable application behavior while still using different infrastructure and cloud platforms. However, a hybrid infrastructure approach has often led teams to use multiple management consoles and processes and manual methods to reconcile varying cloud implementations and maintain uniform service levels.

This variety and complexity only increase as organizations scale a Kubernetes footprint—as it should; environment and cloud choice are a key benefit of containerization. But the challenges are organizations must monitor performance across all environments; ensure consistent policy enforcement; and maintain security standards—all while managing costs and resource utilization. This challenge is particularly acute when dealing with compliance requirements, as most organizations increasingly must do.

Key Takeaways

- Hybrid Kubernetes deployments are a new normal for enterprise container orchestration, exposing a need and demand for unified management.
- Organizations are struggling with increasing operational complexity as their Kubernetes footprint grows and spans platforms and environments.
- The ability to maintain consistent security and compliance with all Kubernetes implementations is becoming more important and critical.
- Teams highly value solutions that simplify operations without losing the core goal of improving Kubernetes application resiliency.
- The future of Kubernetes management lies in platforms that can unify control across hybrid environments in simple and effective ways.

The maturation of application resource orchestration toward multiple hybrid Kubernetes environments represents a challenge as well as an opportunity, and the emergence of unified management platforms offers a path forward. Driving simplicity, application resilience, and risk management are the keys. With these on a unified platform, organizations can continue to use Kubernetes to grow, improve user experiences, respond rapidly to opportunities, and find new values and economies from their application landscapes.

Research Insights

With this in mind, Techstrong Research polled its community of app modernization, cloud, and DevOps readers and viewers in 2024 to understand their perspectives about the challenges of Kubernetes adoption and management in a hybrid world. Half of respondents were actively managing Kubernetes implementations, with over a third managing multiple clusters. Notably, nearly three-quarters of organizations report operating hybrid Kubernetes environments, highlighting the prevalence of multi-platform deployments.

Analyst View

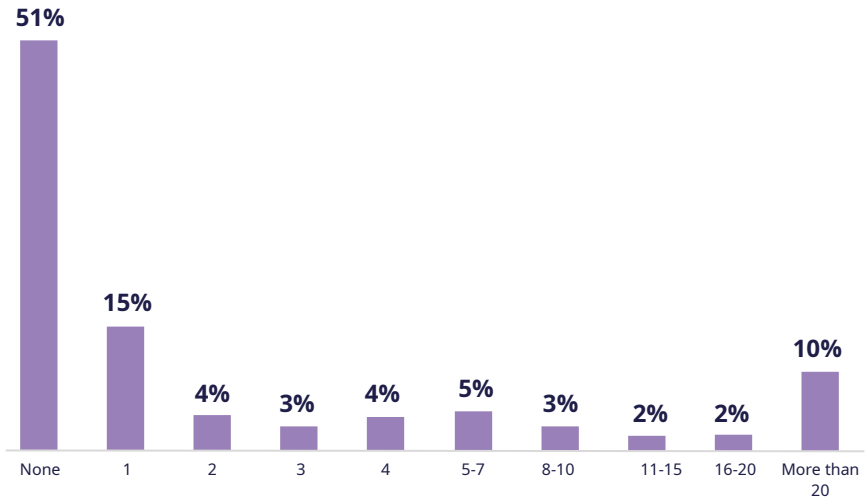
The Kubernetes landscape is evolving rapidly owing to growing estates, increasing complexity, and strategic challenges that threaten the values of rapid production, resilient pipelines, consistency of experience, and choice of host. Organizations are navigating a complex terrain of hybrid environments, where operational efficiency, cost control, and consistent service levels become more difficult just as they remain paramount.

The key trends revealed by our study are clear: organizations seek solutions that can seamlessly manage multi-cloud and hybrid off- and on-premises environments while driving simpler operations. With roughly nine in ten respondents prioritizing all three areas of operational simplification, application resiliency, and security, promising Kubernetes management paradigms are comprehensive, provide centralized control, help keep policy enforcement consistent as environments become more diverse, and ensure adaptability across infrastructures without adding complexity.

Meanwhile, hybrid clouds themselves are becoming increasingly sophisticated. A good success factor for organizations expanding their use of Kubernetes will be effective unification of most or all Kubernetes management—a way to transform the complexity of the environments into a strategic advantage. Teams should look closely at intelligent, integrated platforms that prioritize performance, security, and operational efficiency.

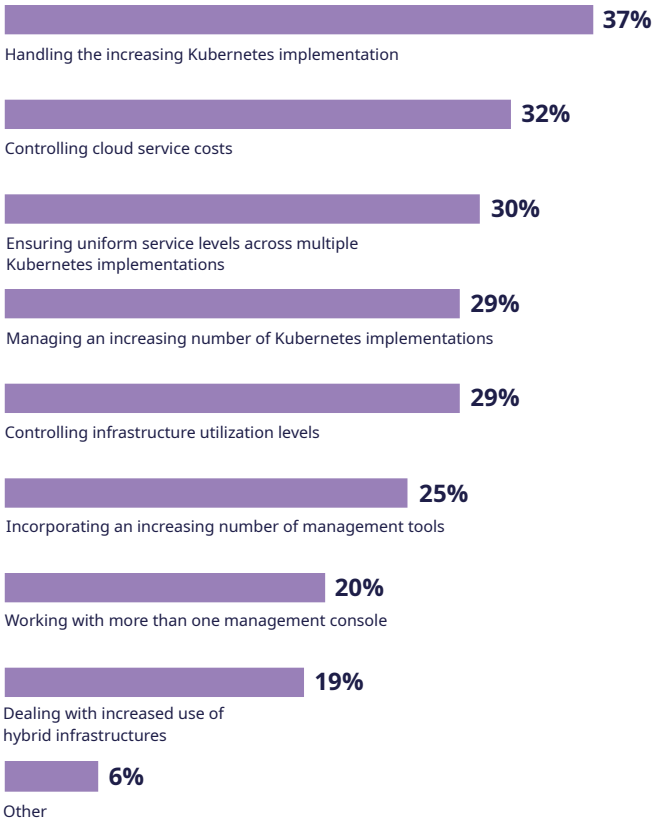
Research Results

How many Kubernetes implementations do you or does your team currently manage?



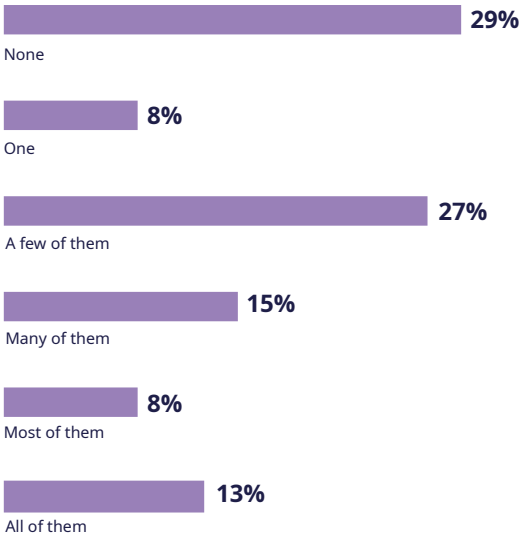
Kubernetes is well-established in the enterprise, with half of respondents deploying one or more Kubernetes implementations. 35% have more than one implementation, and a significant 10% have a multitude—more than 20—implementations. (Note that all the charts that follow represent only organizations managing *at least two* Kubernetes implementations.)

Thinking now about the goal of maintaining the resilience, security, or compliance of your applications running on Kubernetes, what are the top three challenges you or your team faces?



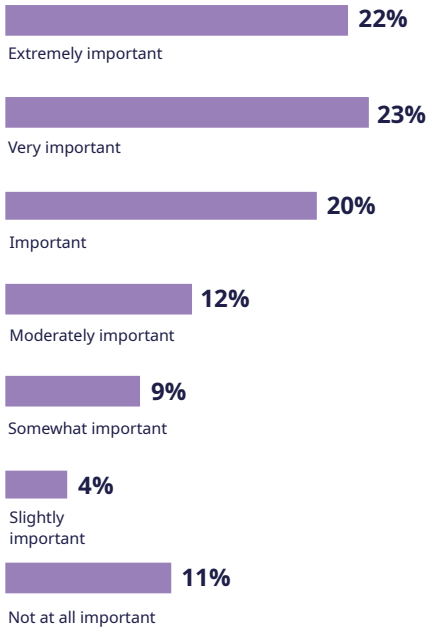
Handling increasing complexity is seen in over a third of organizations as a significant impediment to maintaining security, resiliency, and compliance with Kubernetes implementations (37%). Organizations nearly as often face key challenges with costs (32%), maintaining uniform service levels across multiple implementations (30%), managing those implementations (29%), and controlling infrastructure utilization (29%).

Approximately how many of the Kubernetes implementations you or your team manages are "hybrid"—span more than one cloud or infrastructure platform?



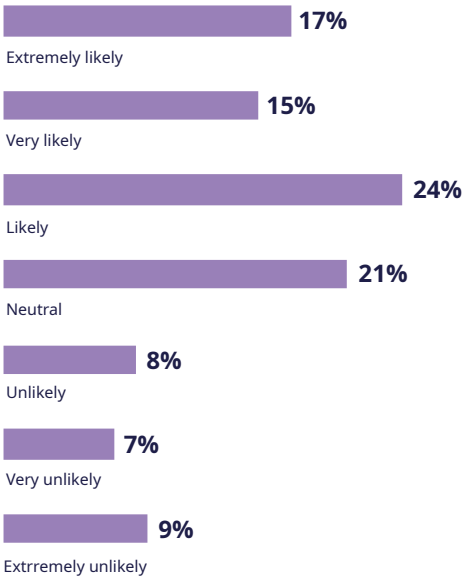
Hybrid deployments—those that span infrastructure environments, both cloud and on-premises—dominate: 71% have at least one. For one in five (21%) organizations, most or all of their Kubernetes implementations are hybrid.

How important do you think it is for your next Kubernetes management platform or upgrade to simplify your operations?



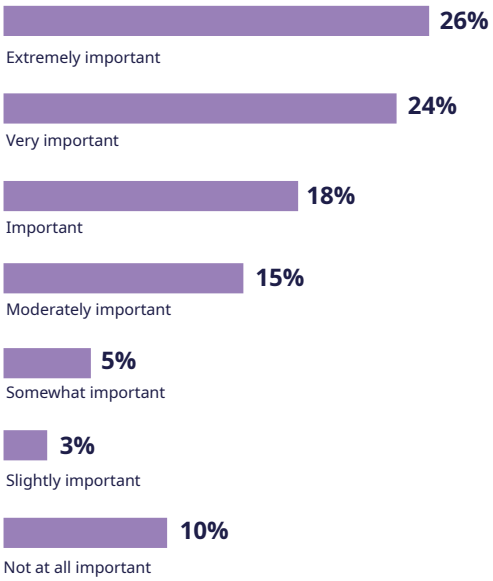
With the increasing complexity of Kubernetes implementations ranking as the greatest challenge, it's no surprise that nearly 9 in 10 organizations (85%) think it's important for their next Kubernetes platform or upgrade to simplify operations. In fact, nearly half (45%) find this very or extremely important.

How likely would you be to consider a Kubernetes management platform with the ability to cover all of your implementations, whether cloud, infrastructure, or hybrid?



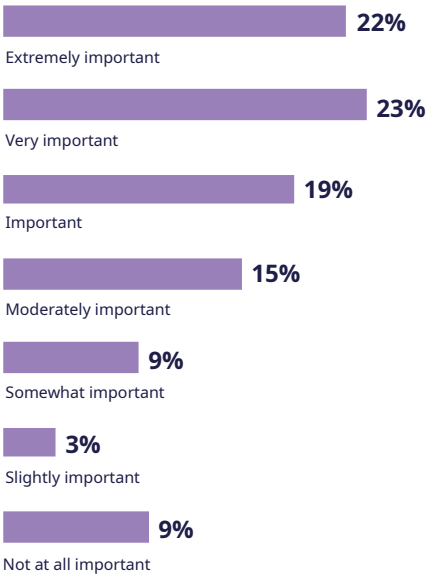
Facing increasing scale, complexity, and other management challenges, more than half (56%) of organizations are likely to consider a Kubernetes management platform with the ability to comprehensively cover cloud, infrastructure, and hybrid implementations.

How important do you think it is for your next Kubernetes management platform or upgrade to improve application security or compliance?

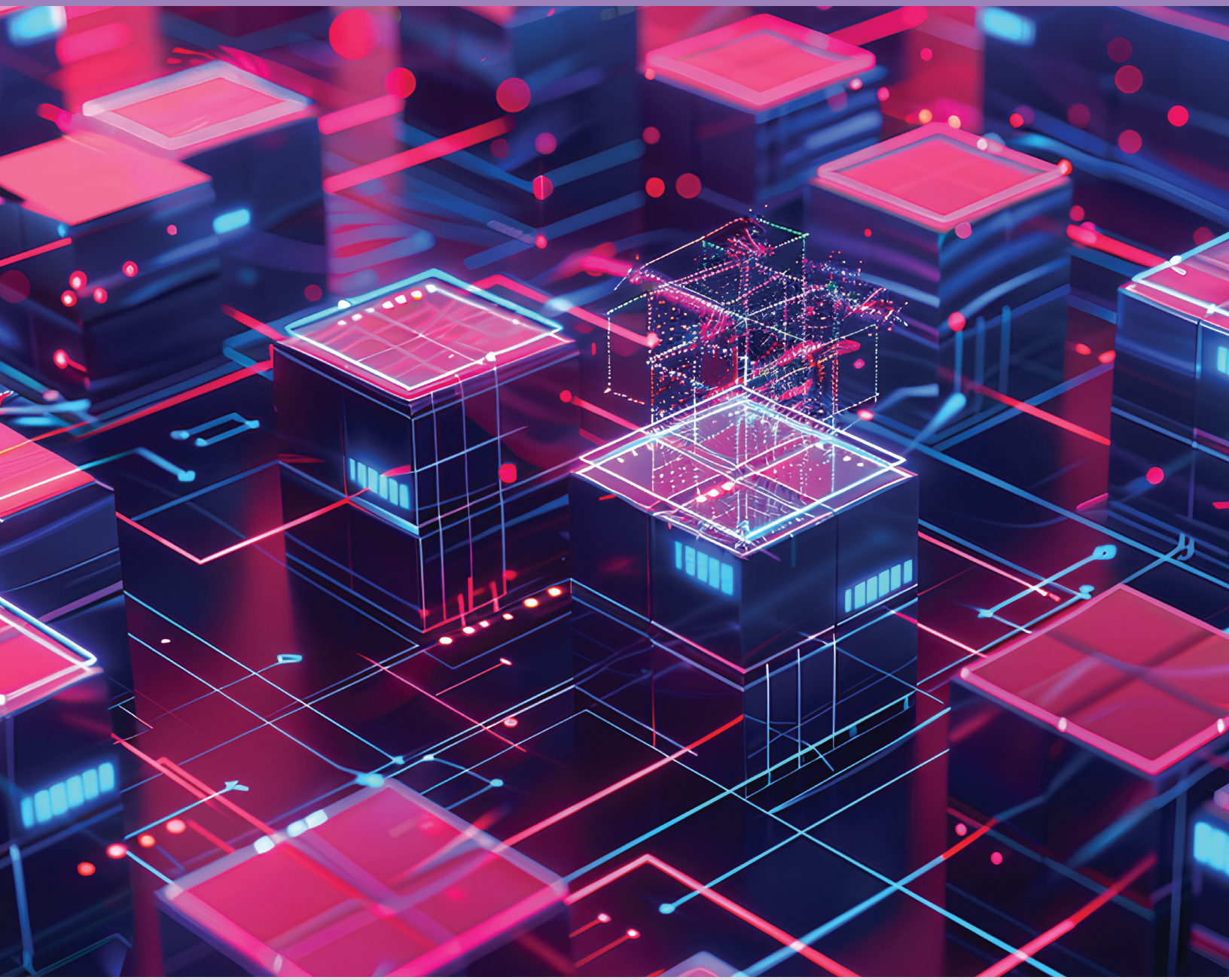


With the increasing sophistication of malicious actors and a greater attack surface with multiple hybrid Kubernetes implementations, security is also an important Kubernetes consideration on a par with simplifying operations and ensuring application resiliency. 88% of organizations find it important for their next Kubernetes platform or upgrade to improve application security or compliance, with half of them saying that it is very or extremely important.

How important do you think it is for your next Kubernetes management platform or upgrade to improve application resiliency?



In close relationship to the desire for simplification, ensuring uniform service levels across multiple Kubernetes implementations remains a top challenge, with a similar share of organizations (88%) seeing it as important for their next Kubernetes platform or upgrade to improve application resiliency.



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