

# Tech Secrets to Multi-Cloud Success

Frequently Asked Questions





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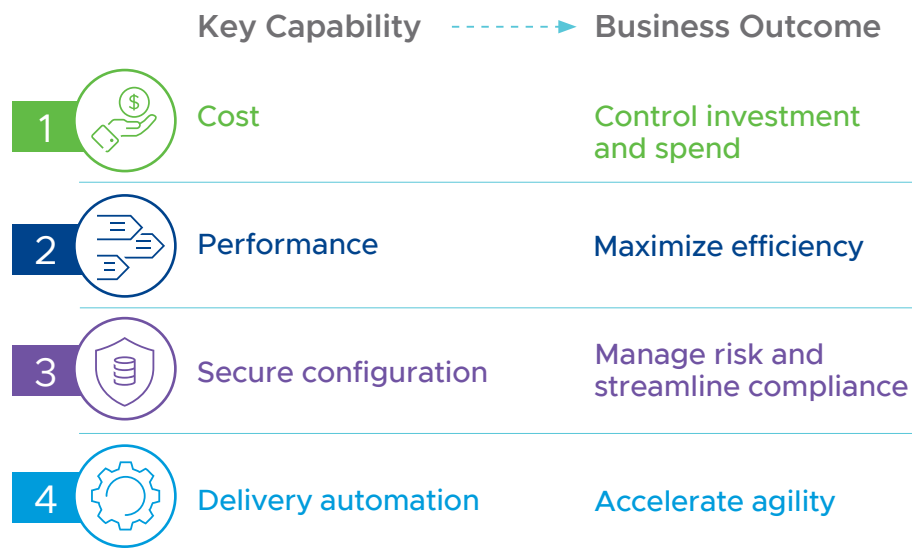
# Achieve Your Multi-Cloud Goals

The business wants app velocity. Your job is to keep systems operational and information secure while enabling it. Instead of consistency slowing teams down, go further, faster to achieving your organization's multi-cloud goals with VMware Aria.

This guide is for IT staff tasked with supporting the following:

- Fiscally responsible digital transformation
- Operational excellence across any cloud with the flexibility to run apps in the data center, at the edge, or in many clouds
- Rapid business transformation while delivering enterprise-level resiliency, security, and operations
- Delivery of modern apps at the speed the business demands

This guide helps to answer the most pressing questions that organizations on a multi-cloud journey have about key capabilities across cost, performance, secure configuration, and delivery automation—with the goal of driving successful business outcomes.



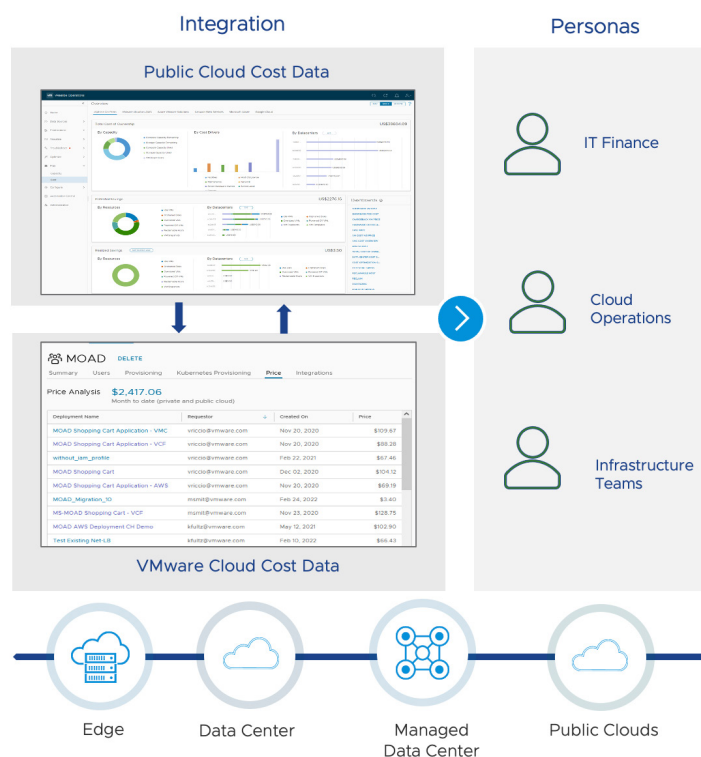




# Control Cloud Spend and Manage Capacity to Drive Financial Accountability

Multi-cloud has become a change accelerator. It has also become a source of friction between business and IT leaders that want to move faster even if it slightly raises costs and financial leaders seeking to stay competitive within budget.

With VMware Aria solutions you can maximize resource utilization at minimal cost. You don't need to be surprised by cloud costs. Compare on-premises services to newly adopted public clouds and SaaS services. Bring together public, hybrid, and private cloud costs in a coherent way that drives accountability and provides opportunities to lower TCO. Drive financial accountability through cost and capacity optimization.





**Q: How can I improve cloud vendor, service commitment, discount, and reservation management to maximize savings and control spend?**

**A:** VMware Aria delivers complete cost visibility. View and analyze spend and capacity decisions no matter which cloud operating model you choose. For example, view service sizes, types, and reservations in public clouds as well as review capacity utilization and density expenses of virtual machines (VMs) in hybrid models. Granular metrics in integrated VMware cloud management solutions help you also understand which departments, teams, projects, or apps are responsible for driving cloud cost and usage. By accurately comparing cloud capacity and costs, you can reduce miscalculations. Visualizing costs also empowers you to recognize lower TCO and ROI savings faster.

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**Q: How do I make cloud consumers more aware of cloud costs?**

**A:** Enterprise-grade automation in VMware Aria allows you to show your consumers, or lines of business, the performance and cost characteristics of their deployed resources to help them make more informed decisions about their workloads. Present pre-deployment cost information to consumers through an easy-to-access user interface so they can see their applications ongoing costs (e.g., daily, weekly, and monthly) for on-premises, hybrid, and public cloud workloads. With that information, you can determine rightsizing and budgetary requirements to best control costs together.

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**Q: How do I support continuous cost optimization?**

**A:** VMware Aria rightsizes your capacity no matter how you choose to deploy apps and services—in public, hybrid, or multi-clouds. If you are scaling with public cloud, elasticity management helps ensure you select optimal service sizes and types in public clouds. Best practice is to rightsize, then buy reservations. Custom recommendations—for the rightsizing of workloads and the termination of unused assets—improve efficiency while helping you cut unnecessary costs and investment. Manage commitment-based discounts (i.e., Reserved Instances, Savings Plans) using purchase modeling, optimization, and amortization capabilities during the app lifecycle to maximize savings. For VMs, rely on capacity and cost-saving recommendations to boost density and avoid incurring additional host costs. Improve cloud capacity efficiency and forecasting by directly correlating capacity and cost analytics with VMware Aria cloud management as it helps you visualize savings opportunities and speed decision making.



A Fortune 50 technology company using VMware Aria is achieving 35% average savings on compute costs.<sup>1</sup>

**Q: How do I simplify capacity optimization and planning?**

**A:** Simplify capacity optimization and planning with VMware Aria. Gain optimal app, VM, and workload consolidation while improving proactive planning with the real-time, forward-looking VMware cloud management capacity analytics engine. It effectively forecasts future demand and initiates actionable capacity planning with automated recommendations for rightsizing, reclamation, procurement, and cloud migration steps. Enjoy directional TCO analysis if you are considering migrating apps to public clouds. For example, use the VMware solution to perform a data center to public cloud migration assessment; conduct what-if scenarios for migration plans or calculate egress traffic on VMs to quickly understand the impact of changes; and to set alerts for big moves in traffic or a static threshold to avoid surprise network expenses.

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**Q: How do I achieve comprehensive cost governance?**

**A:** VMware Aria delivers complete cost governance. Monitor your environment for opportunities to reduce wasted spend. Use the dynamic policy engine to automate cost control measures by building governance policies that monitor native public clouds as well as your on-premises and hybrid cloud environments. Understand where costs originate (e.g., by department, organization, or team) and ensure lines of business are complying with budget guidelines by proactively alerting stakeholders when cost centers are forecasted to exceed ranges, or the system detects spending anomalies. Rapidly set up and manage your multi-cloud environment throughout its lifecycle with an intuitive, self-service consumption experience from VMware.

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**Q: How do I help our organization achieve multi-cloud accountability?**

**A:** VMware Aria can help you simplify the alignment of public cloud financial data with strategic business metrics and key performance indicators (KPIs) (e.g., gross margins and cost of goods sold) for common goal achievement. Leverage chargeback and showback capabilities to hold teams accountable while ensuring they can accurately track spend and forecast budgets by looking at consumption patterns over time. For example, an out-of-the-box dashboard provides per-application costs, giving stakeholders granular cost visibility by using actual values or a reference database of industry values for expenses such as server hardware, storage, network, licensing, maintenance, labor, power, cooling, and facilities to calculate cost drivers. This visibility also enables you to chargeback these types of assets to app owners.

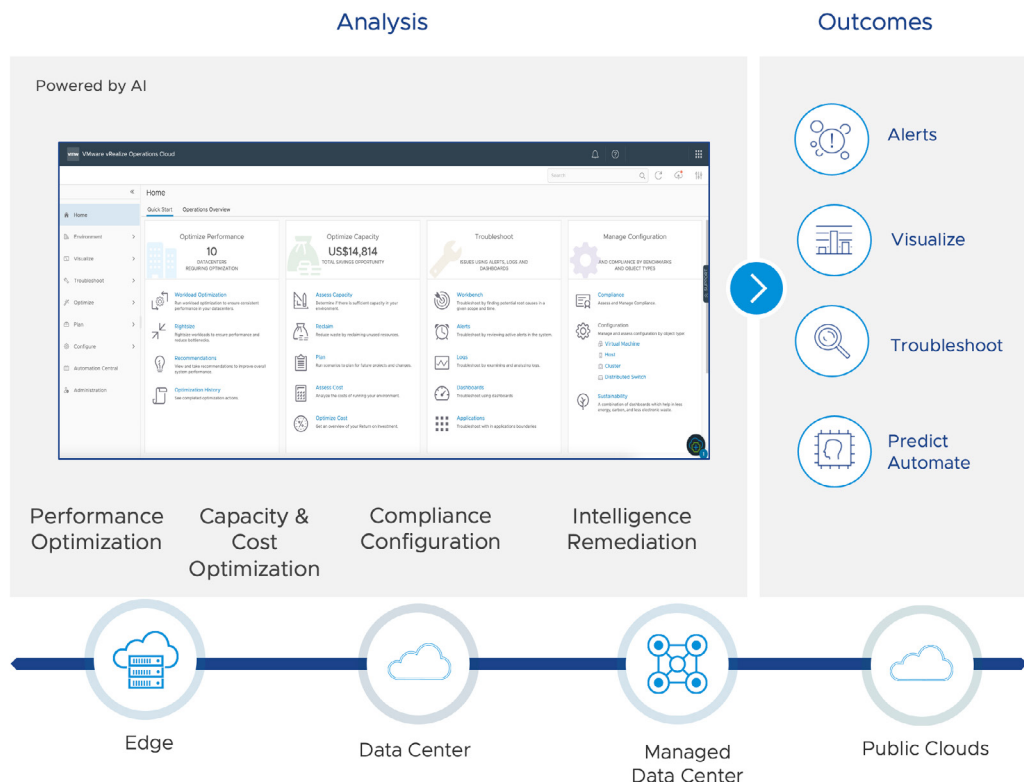
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1. VMware. "How CloudHealth Enabled VMware to Regain Control and Optimize Public Cloud Spend," 2019.



# Unify Operations and Optimize Performance to Maximize Efficiency

Your success depends on the delivery of highly performant multi-cloud operations. How do you assure your customers and employees that all of their apps and cloud infrastructure will always be available? VMware Aria solutions allow you to optimize resources for maximum performance no matter where your apps and workloads run. Don't let poor performance negatively impact your user experience. Unify and balance your multi-cloud goals for scale, governance, security, and costs with performance while introducing intelligence and self-healing to maintain consistent operations.





**Q: How do I automate the balancing and placement of workloads based on business and operational intent?**

**A:** VMware Aria delivers continuous performance optimization that assures hybrid cloud performance meets service-level agreements (SLAs) at minimal cost. You establish operational and business intent then enforce it using real-time predictive analytics and artificial intelligence (AI). That way, you proactively avoid contention and automate workload balancing and placement for VMware Cloud, including carving up cloud zones. The result: minimal cost to maximize efficiency.

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**Q: How do I get the visibility I need to reclaim wasted resources and optimize performing resources so we can more effectively and proactively plan?**


**A:** You enjoy app-aware intelligent remediation for full stacks across VMware Clouds and public clouds with VMware Aria. Predict, prevent, and troubleshoot issues faster with AI and unified visibility from apps to infrastructure. A federated view across multiple regions and distributed environments lets you unify visibility and monitoring for the entire cloud ecosystem in one place. Correlate metrics and logs across onsite and multi-cloud infrastructure and apps, expanding management process, services, and apps. Streamline and centralize IT operations through native integrations across VMware Cloud and extend capabilities to monitor the health of multiple public cloud services across Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform and other VMware Cloud Provider Partner (VCP) offerings.

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**Q: How do I get seamless Kubernetes operations?**

**A:** VMware Aria helps you ensure reliability with operating standards across VMs and Kubernetes environments. Whether you are running VMware Aria Operations for App in the public cloud or on premises, using OpenStack, or another upstream build of Kubernetes, Day 2 capabilities improve Kubernetes operations. They provide insights into managed Kubernetes services (e.g., Amazon EKS, Google GKE, and Azure AKS) and through an integration with the popular observability platform Prometheus, allowing your developers and application teams to share the same view. Concurrently, infrastructure and platform operators can consume the metrics and speed time to resolution because there's less friction between teams able to see the full Kubernetes landscape without having to learn new tools. When Kubernetes is running on top of VMware vSphere, VMware Aria also can map the relationships between vSphere objects and Kubernetes environments for side-by-side views of K8s and infrastructure metrics, and if needed, speed remediation by coupling the powerful AI-driven features of other VMware cloud management solutions.





VMware Aria  
delivers a 93%  
reduction in  
unplanned  
downtime.<sup>2</sup>

**Q: How do I optimize network operations across apps and clouds?**

**A:** You improve performance and availability with converged visibility across physical and virtual networks in hybrid and multi-cloud environments with VMware Aria. End-to-end network visibility for workloads in VMware Cloud makes troubleshooting easier and faster. Securely and confidently manage networks at scale; achieve connectivity between overlay and underlay networks; and take advantage of end-to-end traffic and path analytics and network assurance and verification. Benefit from log analysis displays for private, hybrid, and public clouds in a single UI that improves last-mile troubleshooting and speeds time to repair. With VMware cloud management, optimize app performance with intelligent app discovery and by eliminating network bottlenecks. Design app security with firewall policy recommendations and network segmentation for apps as well as troubleshoot security for hybrid applications across VMs, containers, and clouds.

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**Q: How does VMware Aria help support our company's sustainability and carbon reduction commitments?**

**A:** VMware Aria helps to lower workload carbon footprints through infrastructure reductions, energy-efficient operations, and renewable energy-powered data centers. Proactively monitor on-premises and as-a-service resources to discover zombies—compute assets such as VMs, storage, and physical servers no longer engaged in useful work—and identify then remediate oversized VMs that increase business energy output, costs, and risk. Using VMware cloud management sustainability dashboards (e.g., views into carbon efficiency with virtualization, carbon transparency, green supply, clean demand, and more), drive secure, resilient, and sustainable IT infrastructure as well as catalyze the transition to zero-carbon clouds.

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**Q: How do I simplify and speed migrations?**

**A:** You can simplify your migrations of apps and workloads to multiple clouds with VMware Aria. More easily evaluate and migrate applications with a full view of component dependencies, network requirements, and security postures. Detect application and tier boundaries as well as understand common or shared services with a high degree of connections using machine learning (ML) on traffic patterns. Uncover undocumented dependencies before establishing migration waves to speed time to new platforms and save resources. Post-migration, perform checks to determine whether traffic patterns remain consistent or have deviated, dropping packets, for example, due to misconfigured security policies.

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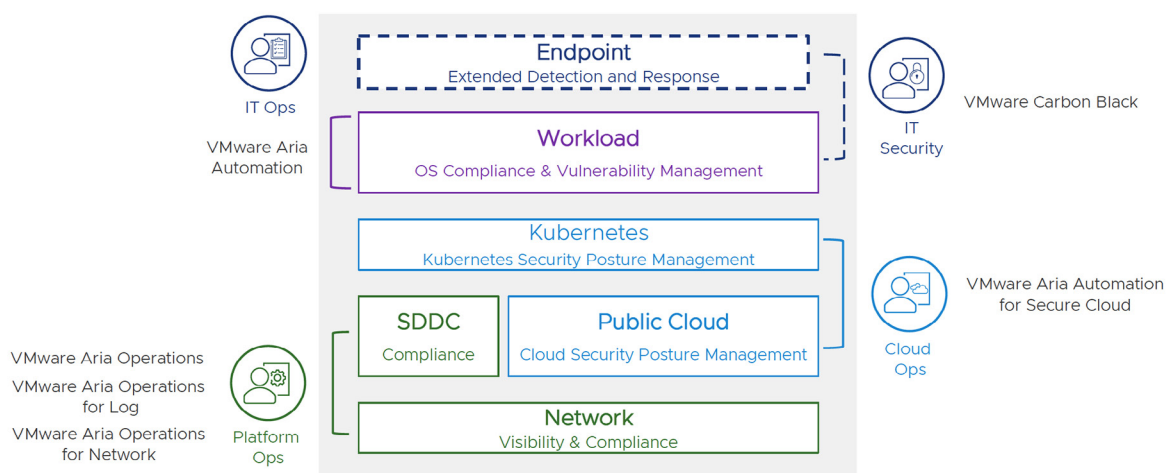
2. Forrester. "Forrester Total Economic Impact™ of VMware vRealize Operations," 2021.



# Strengthen Security Configuration and Streamline Compliance to Lower Risk

Multi-cloud environments boost agility. Yet keeping enterprise data and infrastructure secure and compliant becomes increasingly difficult with each new cloud. Escalating cyber threats and increasing competition for security talent mean organizations like yours have to continuously manage risk, maintain governance, and ensure multi-cloud environments remain in compliance with legal and regulatory obligations. VMware Aria solutions empower your IT and Operations (ITOps) team to proactively reduce misconfigurations and harden assets while enforcing compliance guardrails across environments. Improve collaboration between developer, security, and operations (DevSecOps) teams and proactively detect and remediate violations before they negatively impact your users and business. Don't let a data breach or regulatory non-compliance negatively impact your revenue or brand reputation. Ensure your data and infrastructure are protected and your business isn't overburdened by requirements.

## VMware Multi-Cloud Security and Compliance Capabilities





Teams using VMware Aria see less than six seconds from change notification to risk detection for 95% of security findings.<sup>3</sup>

**Q: How do I detect threats in real time and prevent unauthorized access to apps and infrastructure?**

**A:** VMware Aria reduces risk at scale by establishing and enforcing configuration best practices within and across multi-clouds.

- **Cloud Workloads** – You simply define optimized, compliant software states and then enforce them across your entire environment. Powerful, intuitive event-driven configuration automation rapidly deploys and configures VMs, servers, containers, and network devices on any cloud or on-premises network. Speed time to market; expand application scale, scope, and business impact; and dynamically adapt application and cloud resources to meet your changing needs. Lower risk and enforce IT regulatory standards for digital cloud platforms with integrated compliance and automated drift remediation. Strip away unnecessary software from your digital infrastructure to limit potential vulnerabilities that cyber attackers or insider threats could exploit for gain.
- **Cloud Services** – VMware software helps your operations team improve cloud security and compliance postures with organization-wide standards and fine-tuned policies to protect hundreds of services across multi-cloud environments. An intelligent cloud data model improves risk visibility with real-time visibility, multi-cloud inventory search, and over 1000 best practices rules to detect 95 percent of security and compliance violations within 6 seconds of a cloud configuration change notification. Reduce misconfigurations and prioritize threats with advanced risk correlation, visual risk context, and a secure auto-remediation approach.

3. CloudHealth. "CloudHealth Secure State Platform Telemetry," 2022.





**Q: How do I streamline compliance?**

**A:** If you are under pressure to stay up to date with ever-changing regulatory standards and industry best practices, VMware Aria can help streamline compliance.

- **Cloud Workloads** – The software uses event-driven automation to detect changes in the workload and auto-remediate drift by enforcing the desired state. VMware cloud management also features more than a dozen out-of-the-box compliance templates (i.e., Payment Card Industry [PCI], Health Insurance Portability Accountability Act [HIPAA], Federal Information Security Management Act [FISMA], Defense Information Systems Agency [DISA], Sarbanes–Oxley Act [SOX], and more) for multiple clouds or you can create your own custom templates.
- **Cloud Services** – Frameworks continuously benchmark and automate reporting. The software tracks compliance scores including open violations and the progress different teams are making or have made to resolve issues. Create security policies and scan systems, including in-guest workloads, for common vulnerabilities and exposures (CVEs), then immediately apply appropriate updates or patches to remediate. Seamless integration lets you import security scans from third-party scanning services, then immediately remediate these advisories as well.





**Q: How do I add security earlier into our app development and delivery process?**

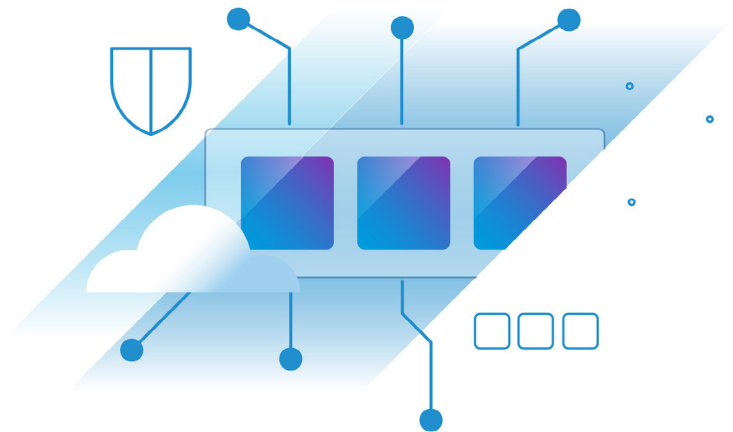
**A:** With VMware Aria, you can efficiently operationalize cloud security programs while boosting developer, security, and operations teams collaboration. Take advantage of dashboards that continuously display results, including anomalies, and monitor suspicious activity. Gain real-time visibility to detect security events and misconfigurations within minutes as well as build a unified approach for managing risk across clouds using both security rules and custom guardrails. Shifting left or verifying security configurations earlier in the delivery pipeline allows you to proactively remediate violations before production. VMware cloud management automates cloud security operations with an API-first platform that easily integrates with other IT, security, and developer tools. For example, you can:

- Proactively identify and resolve violations through API-based verification within CI/CD pipelines
- Enable developers to manage cloud risk with role-based access controls for monitoring security and compliance findings

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**Q: How do I enhance our network security?**

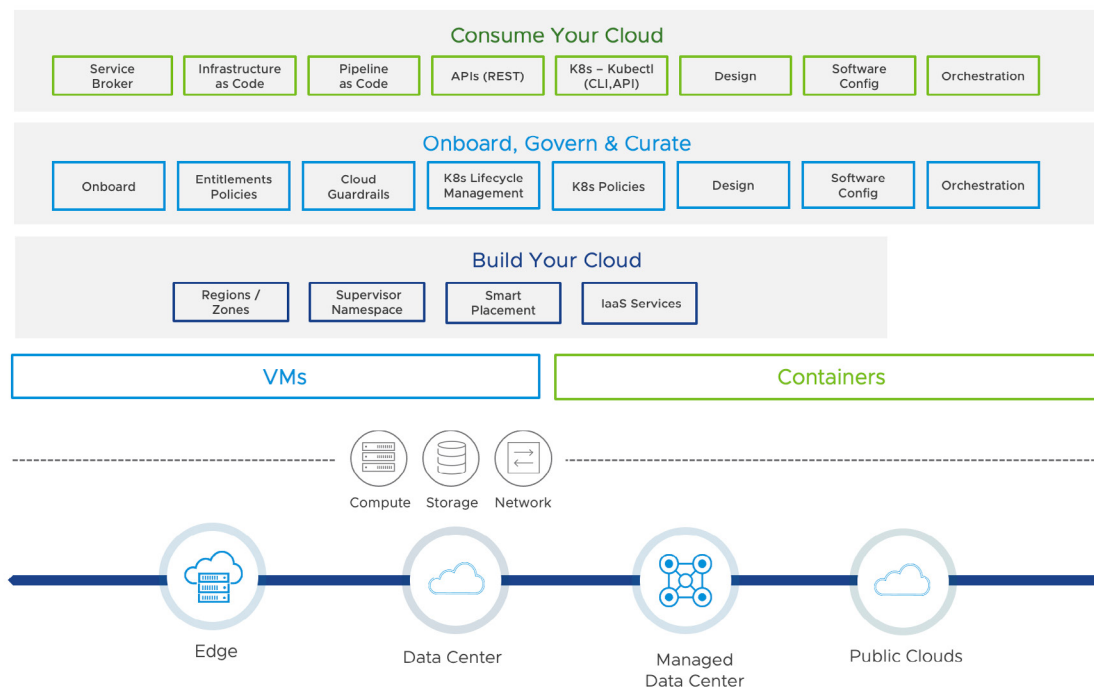
**A:** VMware Aria gives you complete coverage in a converged networking and security stack that puts security next to every user and workload, protecting all user-to-app and app-to-app communications—inside and among clouds. Simply firewall deployment and operations, eliminate blind spots, and deliver security as code while improving user and distributed workload protection.

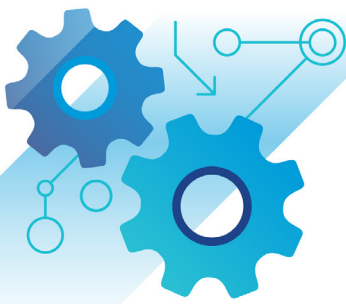




# Accelerate Delivery Automation to Unlock Innovation

More aggressive competitors and tighter margins mean your customers and employees have higher expectations and partners greater demands of IT than ever. Continue to adapt and accelerate your service delivery with VMware Aria solutions. Speed IT access to the multi-cloud infrastructure and services that application and development teams need, when they need them without increasing business risk. Prevent many clouds from becoming new computing silos using automation, APIs, and self-service consumption to your advantage.





VMware Aria delivers one-week faster deployment for end-user environments.<sup>4</sup>

**Q: How do I use self-service, multi-cloud infrastructure automation to speed app innovation?**

**A:** The fastest path to improving app velocity is automating the provisioning of infrastructure, platform, and app services with VMware Aria. You can automate the consumption and delivery of infrastructure resources and services across onsite and multiple public clouds. Allow teams—developers, consumers, and operators—to choose from a unified and consistent self-service catalog with aggregated content including VMware Cloud Templates, orchestration workflows, infrastructure and app pipelines, and action-based extensibility (ABX) actions.

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**Q: How can automation detect possible issues?**

**A:** VMware Aria uses powerful automation to save you time. Policy-based runbooks, for example, include automated alerts when conditions deviate from desired states and supports automated actions executing changes in environments, as needed. With the powerful event-driven automation engine, you detect and auto-remediate critical issues before they impact the business. Better manage patches, orchestrate system maintenance, and enable full-scale remote execution to maintain critical business system performance and efficiency. Enjoy out-of-the-box software configuration of data center and multi-cloud technologies. Get a broad set of application-aware content that prevents dependency on third-party integrations while driving Platform Ops and DevOps agility and speed and cutting down on time-consuming, costly, and manual management tasks.

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**Q: How do I support modern DevOps for infrastructure and Kubernetes automation concurrently?**

**A:** VMware Aria delivery automation streamlines infrastructure resource consumption and delivery using DevOps principles. Empower your developers, site reliability engineers (SREs), and DevOps engineers with Infrastructure as Code (IaC) capabilities in VMware Cloud Templates as well as Git-based infrastructure pipelining and iterative development capabilities. Enable automated self-service delivery and consumption of K8s infrastructure, leveraging IaC, and pipelining.

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4. Forrester. "The Total Economic Impact™ of VMware vRealize Automation," July 2019.

# Common Control Plane and Data Model Are Keys to Multi-Cloud Success

VMware Aria has a common control plane and data model that is central to optimizing your multi-cloud environment and driving successful business outcomes. The advantages are significant—full visibility, rapid remediation, proactive planning, optimization, automation, security, and governance to properly manage and operate your systems and apps across multi-cloud environments. With unified understanding of every app and every system plus security and intelligence built in, VMware cloud management safeguards your data and connects insights so you can consistently deliver on your organization's cost, performance, security configuration, and automated services goals.

Try VMware Aria today to power your organization's:

- Fiscally responsible digital transformation
- Operational excellence across any cloud with the flexibility to run apps in the data center, at the edge, or in many clouds
- Rapid business transformation while delivering enterprise-level resiliency, security, and operations
- Delivery of modern apps at the speed the business demands



**Learn more**  
about VMware Aria



