



Redefining Kubernetes management through Platform9

Always-On Assurance™ and proactive support

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The Always-on Assurance™ difference: Platform9's mission and services in Kubernetes management

Platform9 provides a seamless Kubernetes management experience, distinguished by its Managed Kubernetes-as-a-Service (PMK), which is specifically targeted for AI/ML and other Dev/Test workloads running in on-premises data centers, colocations, and edge. At its core, the service is intended to significantly reduce the operational complexities and cost challenges associated with Kubernetes. Platform9's Always-on Assurance™ approach combines a unique SaaS architecture, remote monitoring, white-glove service, proactive troubleshooting, seamless upgrades, and more to provide customers with peace of mind and guaranteed operational SLAs.

Platform9's offering is defined by its SaaS management model which is augmented by its Catapult remote monitoring. This approach ensures 24/7 monitoring of clusters and PMK, ensuring both Platform9 and its clients stay continually informed and thus enabling prompt responses to issues. With its focus on alleviating the burden of cluster management, Platform9 empowers businesses to concentrate on their core business applications, ensuring Kubernetes environments are optimally managed, secure, and scalable.

The emerging challenges in Kubernetes and cloud infrastructure

As organizations increasingly adopt Kubernetes and cloud infrastructure, they encounter a myriad of challenges that can impede their cloud-native journey. One of the primary challenges lies in the initial phase of Kubernetes adoption, where businesses must navigate complex decisions around selecting the right Kubernetes engine, authentication methods, access management, and traffic handling. The lack of in-house Kubernetes expertise further compounds these challenges, making the adoption process daunting and resource-intensive.

Furthermore, the rapid evolution of Kubernetes, APIs and frequent updates presents an ongoing challenge for maintaining current and stable systems. Organizations find themselves grappling with the need to regularly update and upgrade their Kubernetes environments, which can be both time-consuming and risky if not managed properly. This necessitates a support system that is not only reactive to immediate issues, but also anticipates and addresses potential problems proactively, ensuring operational continuity and efficiency in a dynamic cloud infrastructure landscape.

Seamless Kubernetes adoption and resilience with Platform9: A comprehensive day 1 strategy

Platform9 addresses these challenges head-on with its managed Kubernetes service. By providing an infrastructure-agnostic solution, Platform9 allows for deployments across various environments, including on-premises servers, colocations and edge. This flexibility is coupled with Platform9's expert guidance and support, ensuring that organizations can navigate their Kubernetes adoption journey smoothly, regardless of their in-house expertise.

Guided onboarding and customization

Platform9 facilitates a guided onboarding process, enabling organizations to quickly and effectively set up their Kubernetes infrastructure. This process includes assistance with customization options, empowering clients to tailor their Kubernetes environments to meet their specific operational and business needs. From cluster setup to application deployment, Platform9's guided approach ensures organizations can leverage the full power of Kubernetes from day one and delivers a system that's not only powerful and scalable, but also uniquely suited to their specific operational requirements.

Automated backups

Platform9's day 1 setup for all customers is focused on establishing a strong foundation for their Kubernetes infrastructure, ensuring resilience and data integrity from the very beginning. We configure systems to automatically back up critical Kubernetes components, particularly the etcd database. These backups are scheduled regularly, ensuring reliability and easy accessibility for restoration in emergencies.

Archival process

Our setup goes beyond backups. We establish an archival process to provide an additional layer of data protection.

Day 2 and beyond - Solving the ongoing operational complexity with Platform9's Always-On Assurance™

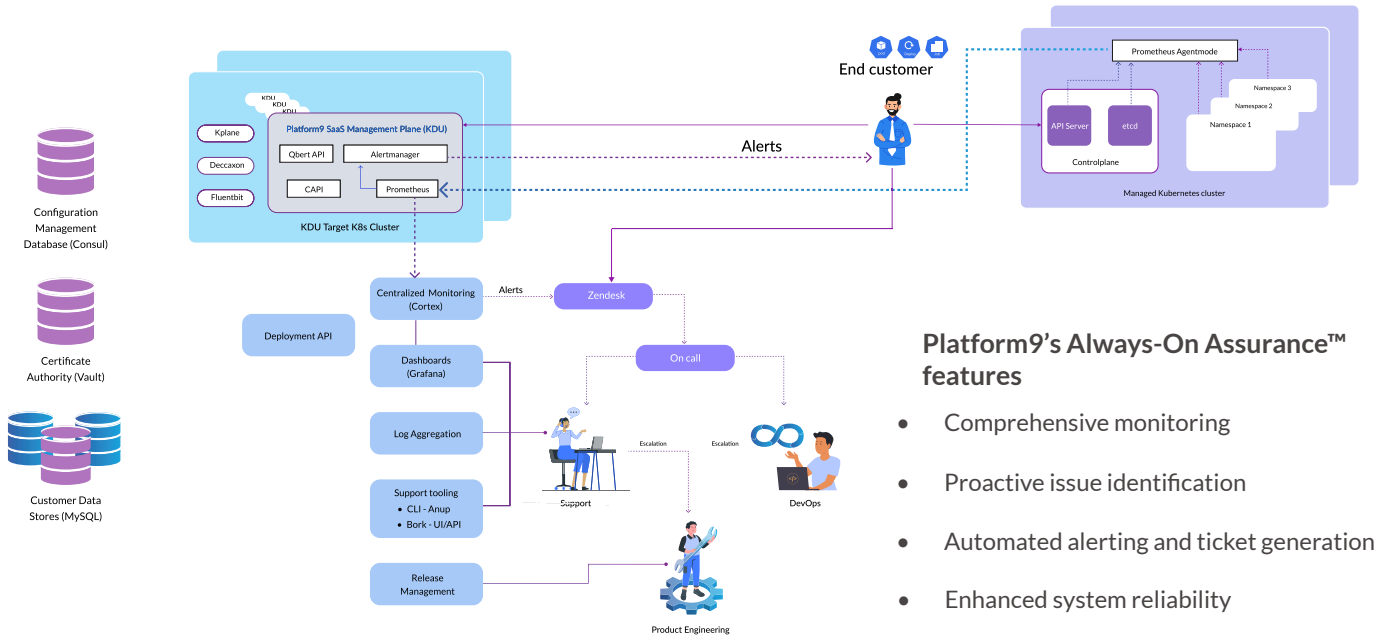
Once a Kubernetes cluster is operational (Day-1), organizations face (Day-2) challenges that include maintaining, scaling, and ensuring the ongoing health of their Kubernetes environments. These challenges encompass:

- **Upgrades:** Keeping Kubernetes clusters updated with the latest versions and features.
- **Monitoring:** Continuously monitoring cluster health and performance.
- **Backup and disaster recovery:** Regularly applying security patches to safeguard against vulnerabilities.
- **Troubleshooting:** Quickly identifying and resolving issues that arise in the Kubernetes environment.
- **Fire drills:** In accordance to SOC 2 compliance, recognizing the importance of preparedness, we conduct fire drills simulating catastrophic failures. This tests the effectiveness of our backup and recovery procedures on a regular basis.

Platform9's unique Always-on Assurance™ is a combination of our unique SaaS management plane, the monitoring and alerting system, and on-call 24/7/365 experts who proactively resolve issues before the customer notices something is wrong with the system.

We will cover each of these areas in detail in the rest of this white paper beginning with the an overall description of the architecture that makes it all possible.

Overview of the Always-On Assurance™ architecture

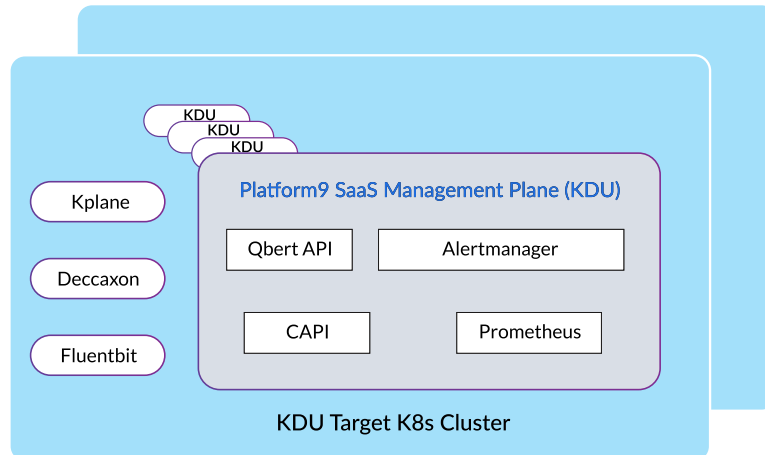


- **Platform9's SaaS management plane** serves as a centralized management system for Kubernetes clusters, integrating Prometheus monitoring to offer comprehensive oversight of cluster performance and health. It provides a user-friendly portal and APIs, enabling end users to efficiently manage the lifecycle of their Kubernetes clusters. This management plane also supports Role-Based Access Control (RBAC) enhancing security and operational efficiency. Additionally, it features robust multi-tenancy capabilities, allowing the creation of isolated environments within the same infrastructure, ensuring resource segregation and compliance for different teams or projects.

- **Platform9's Catapult monitoring system**, utilizing Cortex and Prometheus, is a sophisticated set of tools designed for in-depth surveillance of Kubernetes clusters. Prometheus provides comprehensive monitoring capabilities, gathering metrics and generating insights into the performance and health of various Kubernetes components. Cortex extends these capabilities, enabling scalable, long-term storage of Prometheus metrics and multi-tenancy support. Together, they create a powerful monitoring ecosystem within Catapult, ensuring proactive detection of potential issues, efficient data analysis, and the ability to manage large-scale, complex Kubernetes environments effectively.
- **Log aggregation, alerting, and proactive support systems:** The architecture is designed to aggregate logs from the Platform9 components deployed in customer environments. This aggregated data and insights from various customer environments are displayed on several dashboards accessible to the support team who analyzes them for potential issues. When a condition requiring attention is detected, the system automatically triggers alerts and creates tickets in the support management software, Zendesk. These alerts are then addressed by Platform9's support and operations teams, who work together to resolve the issue promptly, sometimes even before the customer becomes aware of it. This proactive approach to issue resolution is further enhanced by providing customers with root cause analyses and incorporating learnings into product engineering for continuous improvement. This system enables not only timely troubleshooting and resolution of issues, but also contributes to overall disaster preparedness, ensuring that customer environments remain operational and secure.

Platform9 SaaS management plane: The central innovation that enables Always-On Assurance™

Platform9's SaaS management plane plays a pivotal role in enabling Always-On Assurance™ by providing continuous, centralized management and remote monitoring of Kubernetes clusters.



This management plane ensures that the clusters are consistently operational, up-to-date, and secure. Its capabilities in proactive monitoring, automated alerting, and efficient resource utilization contribute to maintaining high availability and performance of Kubernetes environments. By centrally managing all aspects of the Kubernetes infrastructure, the SaaS management plane allows Platform9 to rapidly identify and address potential issues, thereby ensuring Always-On Assurance™ for its clients.

The SaaS management plane has several additional capabilities:

Multi-tenancy support

In addition to centralized management, Platform9's management plane also excels in supporting multi-tenancy, which is an essential feature for organizations that need to segregate resources for different teams or projects.

Isolated environments

The management plane allows for the creation of isolated environments or 'tenants' within the same Kubernetes infrastructure. Each tenant can have its dedicated resources, policies, and access controls, ensuring that the activities in one tenant do not impact others. This isolation is critical for organizations that must maintain strict control over resources for security, compliance, or operational reasons.

Role-based access control (RBAC)

The platform supports fine-grained RBAC, allowing administrators to set precise permissions for each user or group within a tenant. This control is crucial for maintaining the principle of least privilege, ensuring users have only the access they need to perform their roles, thereby enhancing overall security.

Customizable environments

Each tenant within the management plane can be customized to meet the specific needs of different teams or projects. This flexibility includes setting up custom network policies, storage options, and computing resources. It allows teams to work in an environment tailored to their application requirements without impacting or being limited by other tenants.

Efficient resource utilization

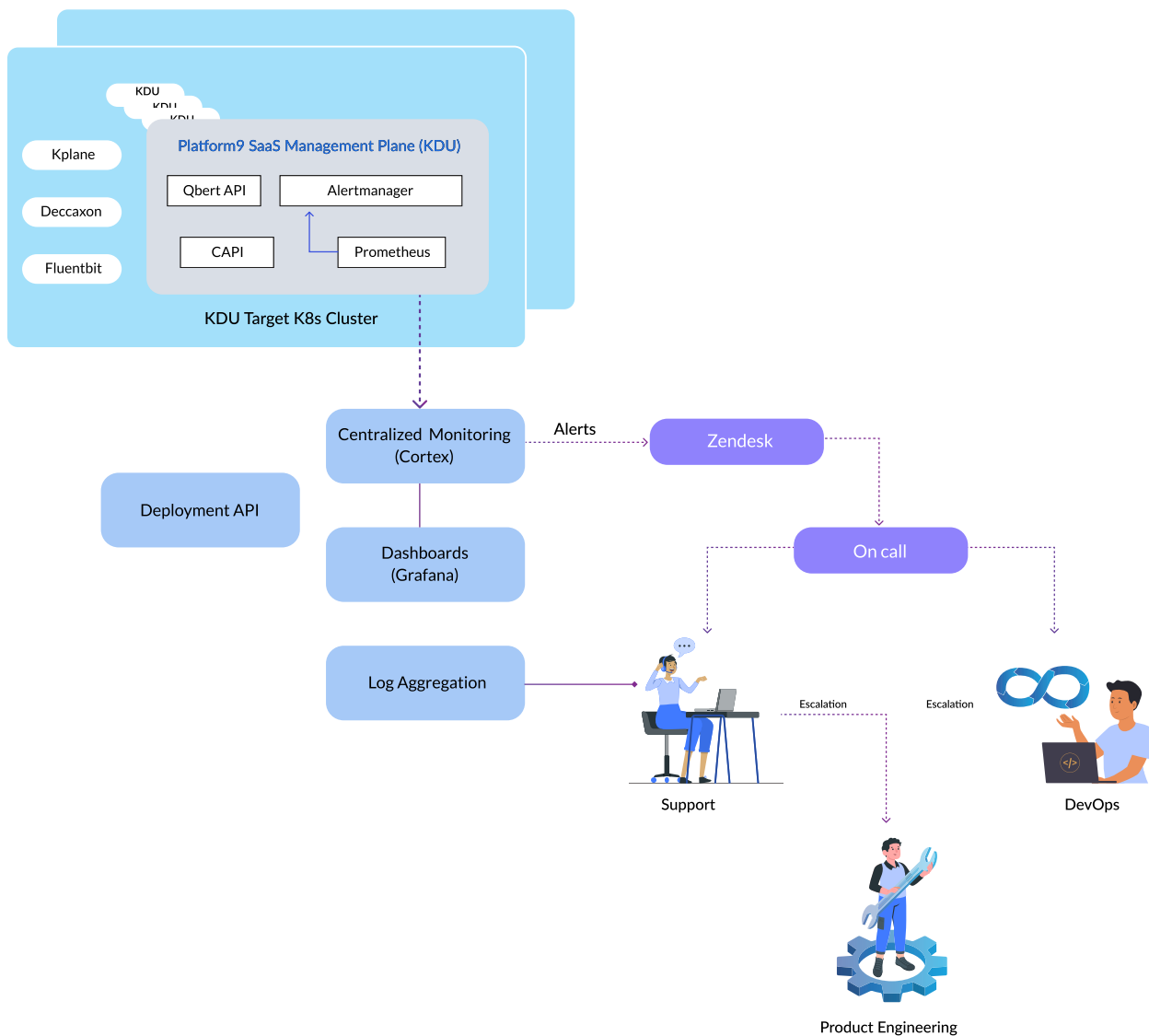
By supporting multi-tenancy, the management plane enables more efficient use of underlying resources. Resources can be allocated and adjusted based on the specific needs of each tenant, leading to better utilization and cost efficiencies.

Compliance and security

For organizations with stringent compliance and security requirements, multi-tenancy provides an added layer of segregation and control. It ensures that sensitive workloads are isolated and that the necessary compliance standards are upheld.

Catapult: Platform9 remote monitoring, the key to proactive support

Platform9’s monitoring system, Catapult, plays a pivotal role in our support ecosystem, elevating both the support we provide and our operational efficiency to unparalleled levels. At its core, Catapult is an advanced, proactive monitoring tool designed to vigilantly oversee Kubernetes clusters across diverse environments, whether they are deployed on-premises, colocations or on the edge.

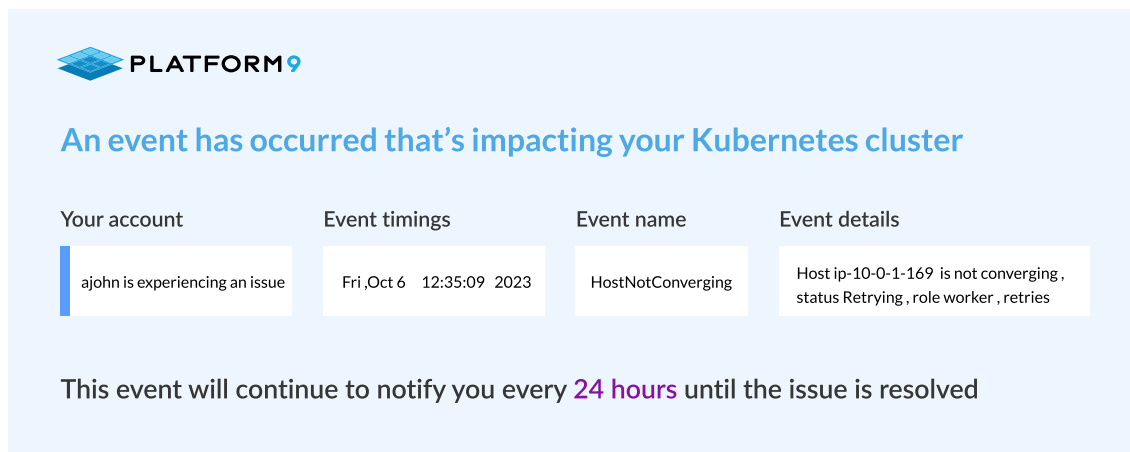


Proactive issue identification

The first layer of Catapult's functionality is its proactive nature. Traditional monitoring systems often rely on reactive measures, waiting for issues to occur before alerting the support teams. Catapult, however, is engineered to anticipate and identify potential issues before they escalate into significant problems. This is achieved by continuously scanning for key indicators of potential disruptions, including but not limited to, etcd health, node accessibility, and API server functionality.

Automated alert generation and ticket creation

When a potential issue is identified, Catapult doesn't just alert our support team; it automatically generates a ticket in our support management system. This automation streamlines the process, ensuring rapid response times. It means that often, we are working on resolving issues even before our customers are aware of them, significantly reducing potential downtime and enhancing overall system reliability.



The screenshot shows a Platform9 alert notification. At the top left is the Platform9 logo. Below it is the heading "An event has occurred that's impacting your Kubernetes cluster". The main content is a table with four columns: "Your account", "Event timings", "Event name", and "Event details".

Your account	Event timings	Event name	Event details
ajohn is experiencing an issue	Fri, Oct 6 12:35:09 2023	HostNotConverging	Host ip-10-0-1-169 is not converging, status Retrying, role worker, retries

Below the table, it states: "This event will continue to notify you every 24 hours until the issue is resolved".

Knowledge aggregation and application

A unique aspect of Catapult is its ability to aggregate knowledge from issues encountered across our entire customer base. When a problem is detected in one environment, the insights gained from resolving that issue are fed back into Catapult's knowledge base. This collective intelligence is crucial, as it allows us to not only address similar issues more efficiently in the future, but also to anticipate and prevent them from occurring in other customer environments. Essentially, every challenge we encounter and solve makes Catapult smarter and more effective.

Cross-customer benefit and system improvement

This process of continuous learning and improvement has a cumulative benefit for all our customers. Catapult's growing intelligence means we can preemptively address issues that have occurred in one customer's environment before they manifest in another's. This cross-customer benefit is a testament to the collaborative and shared growth model that Platform9 embraces. As we resolve issues for one client, we improve the service for all.

Integration with support and operations teams

The efficiency of Catapult goes beyond just its monitoring and alerting capabilities. Once an alert is raised, it is seamlessly integrated into our support workflow, and managed through our support software like Zendesk. This integration ensures that our support and operations teams work in tandem to address the issue swiftly and effectively. Whether the issue requires immediate action or can be scheduled for a more convenient time, our teams are equipped to handle it with the right priority and resources.

Customer education and engagement

While addressing technical issues is a primary function of Catapult, another vital aspect is customer education and engagement. We believe in not just solving problems for our clients, but also in empowering them with knowledge. A significant portion of the issues handled involves educating customers about best practices, how to optimally use our product, and how to avoid potential pitfalls. This educational approach ensures that our customers grow more proficient and self-reliant over time, reducing the likelihood of similar issues reoccurring.

Continuous feedback loop to product engineering

Finally, the insights gained from Catapult's monitoring and the subsequent issue resolution are not just kept within the support realm. They are fed back into our product engineering process. This feedback loop ensures that each new release of our product is informed by real-world challenges and solutions, making our offerings more robust, user-friendly, and aligned with our customers' evolving needs. In summary, Catapult is more than just a monitoring tool; it is an integral part of our commitment to provide proactive, intelligent, and continually improving support to our customers. By harnessing the power of collective intelligence, automated processes, and a strong feedback loop, we ensure that our support is not just reactive, but also anticipatory, educational, and evolving – embodying the very essence of what modern, efficient operational support should be.

Platform9's approach to ensuring data privacy and compliance

Platform9 takes a stringent, multi-layered approach to securing customer data and upholding privacy across managed Kubernetes deployments:

Encrypted storage buckets

- Monitoring data aggregated across clusters stored securely in encrypted buckets
- Emphasizes safety and confidentiality of information
- Prevents unauthorized external access to sensitive data

Log collection for management components

- Monitoring focuses on management plane components rather than customer environments
- Does not collect or analyze customer data
- Exception requires explicit customer consent and secure transfer and collaborative troubleshooting

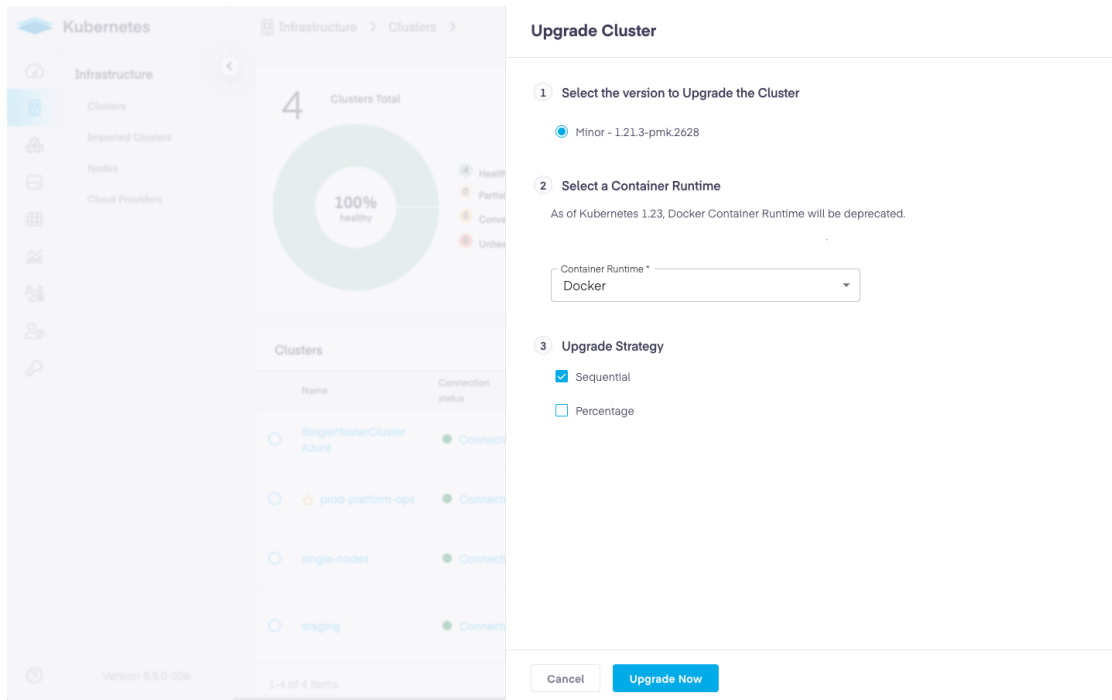
Compliance-driven processes

- Strict access controls across supporter and customer data
- Consent-based manual log collection uses secure out-of-band shipping
- Regular audits validate security controls and meet enterprise standards

This defense-in-depth model balances the collaboration needed to provide Kubernetes-as-a-Service with ensuring corporate compliance and customer trust. As solutions expand across hybrid and multi-cloud environments, security and governance will continue outpacing industry benchmarks.

Mastering Kubernetes upgrades with Platform9

Platform9 offers industry-leading zero-touch upgrade capabilities spanning multiple layers of the managed Kubernetes stack allowing customers to reduce operational burdens drastically. Upgrades encompass the SaaS management plane, host agents running on infrastructure, and the Kubernetes distribution itself.



Lets break this down further.

SaaS management plane upgrades

- Platform9 engineering continually enhances the management plane in the background
- New capabilities and fixes roll out incrementally to customers without disruption
- This enables accessing new features and security patches over time automatically

Host agent upgrades

- Agents run on cluster nodes to enable management plane integration
- Agents can be upgraded on-demand with a single click
- Platform9 pushes out updates to customers automatically
- Ensures latest bug fixes and features improve agents continuously

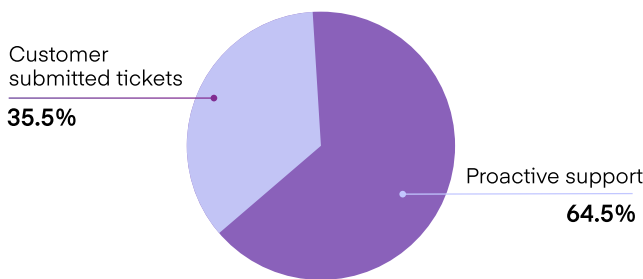
Kubernetes version upgrades

- Customers control upgrade timing on-demand
- Single click to upgrade distribution version across clusters
- Underlying platform handles entire automated upgrade process
- Eliminates complex manual cluster upgrades saving customers time

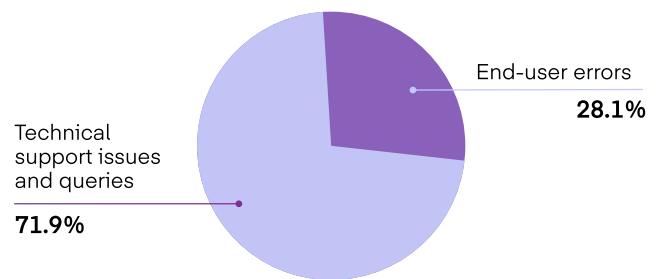
The key benefit is customers always have access to the latest stability, security, and innovation improvements without undergoing complex OS-style upgrades. Our team handles testing and monitors upgrades end-to-end, so customers enjoy the peace of mind on consumption of enterprise-grade Kubernetes-as-a-Service enhanced continuously in the background.

Always-On Assurance™: 97.2% resolution without escalation

Approximately 65% of the issues that come into Zendesk, Platform9’s support management software, are tickets automatically opened by our monitoring infrastructure. This high percentage reflects our proactive stance in identifying and addressing potential issues before they escalate, often before the customer becomes aware of them. The automated creation of tickets not only speeds up the resolution process, but also ensures that issues are logged and tracked systematically, allowing for more efficient management and resolution of problems.



Issue identification



Customer submitted spread

Customer-submitted tickets

Customer Engagement: The remaining 35% of issues are customer-submitted tickets. This reflects active engagement from customers in seeking support, which is crucial for addressing more specific or nuanced problems that automated systems might not detect.

Focus on education and empowerment

Within these customer-submitted tickets, a significant portion relates to Platform9 as a product. This includes both technical support issues and educational queries, highlighting Platform9's role not just as a solution provider, but also as a knowledge resource for its customers.

Diverse issue resolution

The rest of the customer-submitted tickets pertain to end-user errors or misconfigurations. This demonstrates Platform9's commitment to assisting customers beyond the platform's technical aspects, addressing broader issues in customer environments.

World-class proactive support built on certified expertise and collaborative culture

Platform9's customer support system is built on a foundation of expertise and a collaborative culture, crucial for delivering exceptional service:

- **Certified expertise:** All Kubernetes support engineers at Platform9 are CKA (Certified Kubernetes Administrator) certified, or in the process of obtaining certification, ensuring deep understanding and skilled problem-solving.
- **Specialized security knowledge:** Approximately half of the team holds CKS (Certified Kubernetes Security Specialist) certifications, enhancing their ability to handle critical security aspects of Kubernetes.
- **Collaborative approach:** A dedicated support team works closely with the engineering team, facilitating smooth escalations and resolutions. This collaborative culture results in efficient problem-solving, providing a seamless and supportive experience for customers.

- **Customer-centric service:** Emphasizing empathy and understanding, the support team guides customers through issues and onboarding processes, aiming to be an extended part of the client's team, thus ensuring customer satisfaction and trust.



CKA/CKS Certified



100%CSAT



99.9%SLA



24/7 Support



SOC 2 compliant

- **Quick Case Study:** Navigating an etcd deletion crisis with Platform9's expertise.

In one notable case study, a Platform9 customer experienced a critical incident where their etcd cluster, a crucial component of Kubernetes, was accidentally deleted. This deletion posed a significant threat to their entire Kubernetes environment. However, due to Platform9's robust backup and recovery processes, the team was able to swiftly restore the etcd cluster. Each master node in the customer's system had been configured for regular etcd backups, which provided redundancy and recovery capability. This quick and effective restoration of the etcd cluster was instrumental in bringing the customer's systems back online with minimal disruption, showcasing the resilience and reliability of Platform9's Kubernetes management services.

Conclusion

The insights gathered in this white paper solidify that our Always-On Assurance™ is much more than a slogan; it's backed by state-of-the-art technology, extensive expertise, and a cadre of certified professionals. This assurance embodies our steadfast commitment to support in the rapidly evolving Kubernetes realm. At Platform9, we serve as an integral extension to our client teams, adeptly filling the gaps in skills and talent typical in Kubernetes management. Our sophisticated solutions, proactive approach, and collaborative ethos establish us as an essential partner for organizations traversing the complexities of cloud-native technologies.



Platform9 empowers enterprises with a faster, better, and more cost-effective way to go cloud native. Its fully automated container management and orchestration solution delivers cost control, resource reduction, and speed of application deployment. Its unique always-on assurance™ technology ensures 24/7 non-stop operations through remote monitoring, automated upgrades, and proactive problem resolution. Innovative enterprises like Juniper, Kingfisher, Mavenir, Rackspace and Cloudera achieve 4x faster time-to-market, up to 90% reduction in operational costs, and 99.9% uptime. Platform9 is an inclusive, globally distributed company backed by leading investors.

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