

SOLUTION OVERVIEW

Harnessing the power of Infrastructure Orchestration

Hitachi Vantara delivers Next-Gen IT Operations Management in
Hybrid Cloud Environments – Hitachi Infrastructure Orchestration as a Service



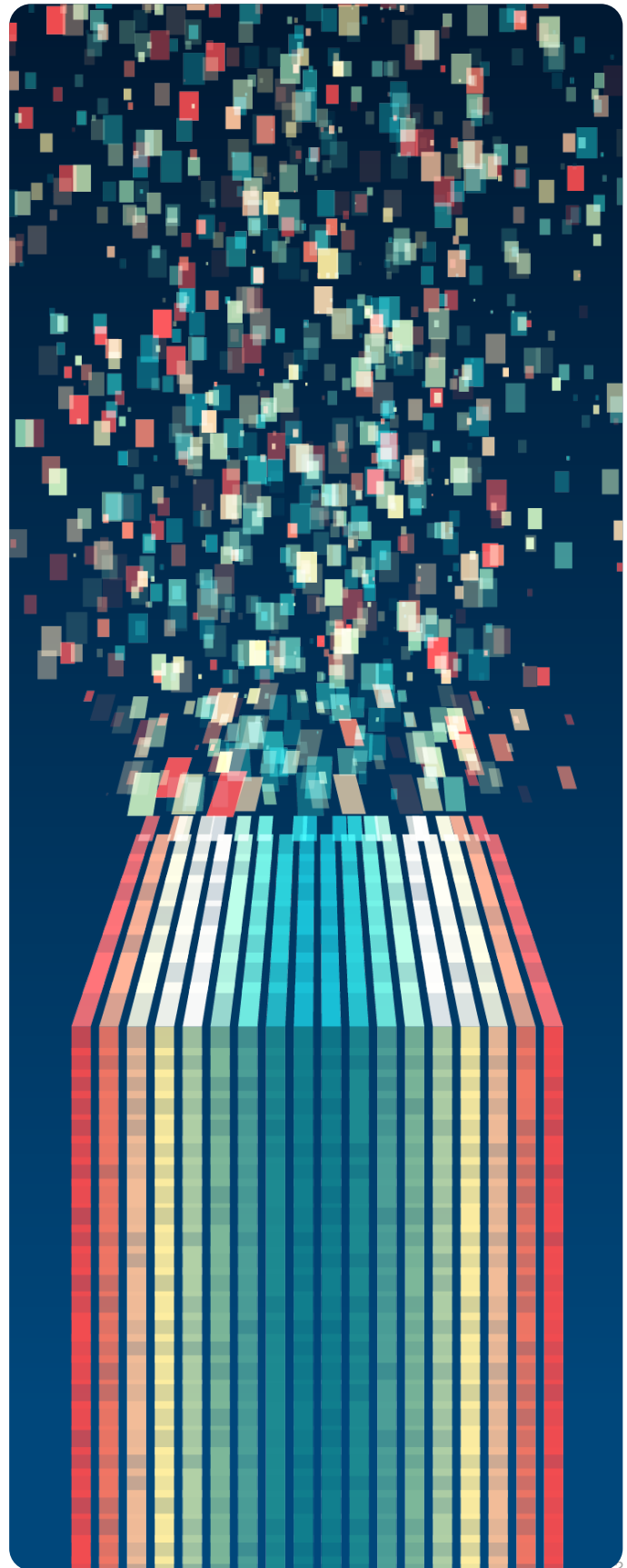
Introduction

Delivering next-generation IT operations in hybrid cloud environments is a complex yet critical endeavor for modern enterprises.

The objective is to create seamless, agile and scalable IT infrastructures that adapt to the ever-changing business landscape that traditional IT operations fail to meet. Managing and optimizing hybrid and cloud environments from a centralized, AI-powered platform is the genesis of Hitachi Infrastructure Orchestration as a Service (HIOaaS).

HIOaaS is an advanced approach to automation that leverages artificial intelligence (AI), machine learning (ML), data processing and advanced analytics to integrate and automate business processes with infrastructure management. Going beyond traditional operations, HIOaaS integrates these technologies to create ecosystems that are more available, connected, resilient, self-healed and orchestrated.

Industries are laser-focused on driving value from current and future IT investments by harnessing innovations across on-premises and cloud environments. HIOaaS natively provides modular capabilities to companies thereby avoiding the horizontal sprawl of disparate tool sets that would typically require multiple applications, platforms and associated hardware. By implementing HIOaaS, organizations can significantly improve efficiency, reduce costs and enhance the overall performance of IT Infrastructure.



Service Approach

Hitachi has undertaken a highly effective approach bringing HIOaaS to market: Integrate seamlessly with customers, industry-leading platforms and third-party solutions.

We focus on enabling customers and partners to leverage all aspects of HIOaaS quickly and efficiently. Our HIOaaS platform has over 2,500 hardware and software integrations for leading solutions across every industry making us relevant for nearly every IT conversation with customers and partners.

To help customers maximize the value of their current and future IT investments Hitachi Vantara provides professional services experts that partner with customers to ensure proper solution integration to drive maximize business value. Our approach steps well beyond traditional product sales. Our aim



is to provide a comprehensive range of services and product offerings aligning us as a valued strategic partner to our customers. To further enhance our value commitment, we've aligned our entire portfolio to a consumption-based pricing model allowing our customers to buy only what they need when they need it. The outcome of our approach is to provide high-value transformational products and services over time and pivot away from one-time transactional sales.

Key Challenges

Challenges with traditional IT operations in hybrid cloud environments arise from the rapid adoption of new technologies coupled with IT operations teams using tools, processes and best practices designed for legacy environments.

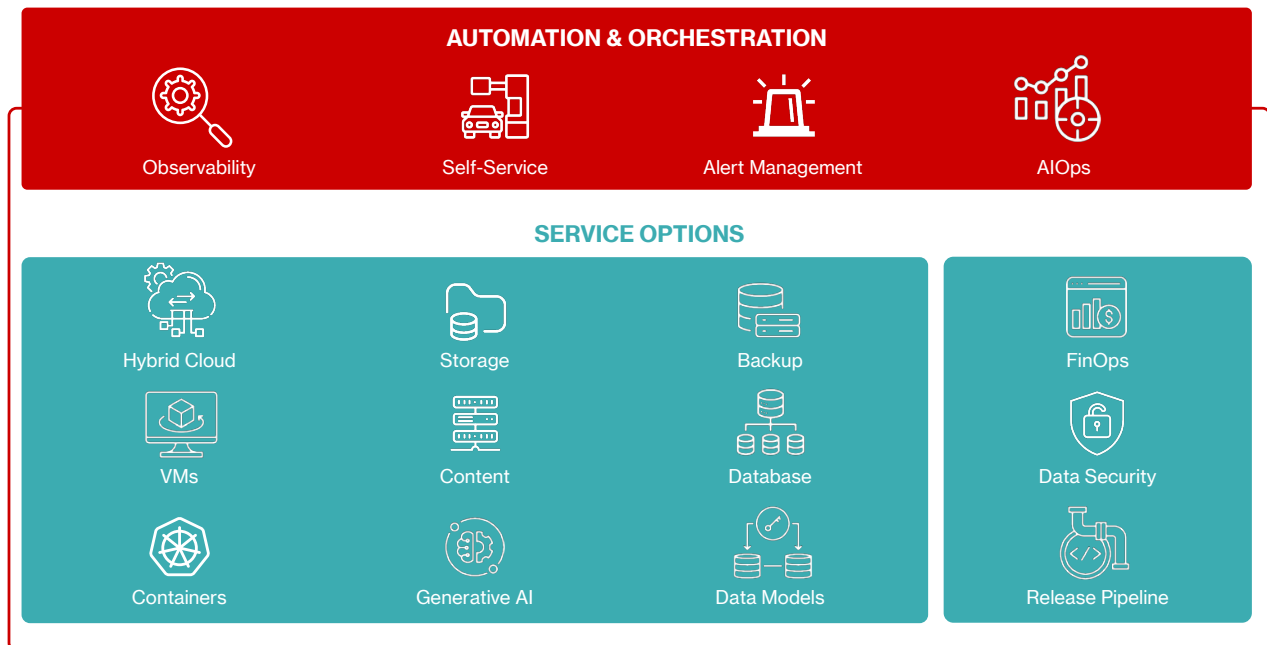
The changes in technology have outpaced the changes in how IT teams provide operations support. Key considerations companies are driving to solve include:

Challenge	Outcome
Deployment	Longer application deployment times
Scalability	As applications scale, performance declines
Observability	Little observability/visibility across environments
Human Error	Manual efforts regarding provisioning and configurations reduce availability
Day 2 Management	Configuration changes, upgrades and patching
Costs	Cloud processing, software licensing and on-premises resources grow extensively
Security	Security, data backup and disaster recovery become a challenge
Application Portability	Variations in multi-cloud deployments restrict the ability to move freely

Benefits of HIOaaS

HIOaaS differentiates itself from other platforms in key areas that matter most to today’s enterprises.

HIOaaS is a fully integrated cloud platform that brings the management of heterogeneous compute, storage, network and cloud environments under a single web-based interface (console). This solution provides a fully integrated environment to manage cloud and on-premises resources featuring API extensibility dramatically reducing integration efforts with new technologies.



HIOaaS Services	
HIOaaS Portal	HIOaaS portal has a centralized, web-based interface (console) used to access and manage various services and resources across IT environments: compute, storage, multi-cloud containers, clusters, networking and virtualized infrastructure. The portal streamlines operations and enhances productivity.
Automation	HIOaaS includes over 2,500 integrations out of the box allowing for centralized control of automation across the enterprise via the portal. HIOaaS unifies disparate automation tools into a single dashboard view transforming disjointed processes into automation workflows and pipelines.
Personas	Each user role, such as developers, system administrators or business analysts, gets a customized interface that highlights the tools, data, and functionalities most relevant to their work, minimizes distractions and increases productivity.
Alert Reduction	HIOaaS AIOps identifies, tracks and reports operational anomalies that adversely impact performance and resiliency. HIOaaS alert reduction reduces MTTD, MTBF and MTTR times providing increased systems uptime, resiliency and reliability.
Self-healing	HIOaaS self-healing AI tools are a significant advancement in the management and optimization of IT systems, networks and applications. It can automatically implement fixes, such as restarting services, reallocating resources or applying patches, reducing downtime and the impact on business operations.

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Cost Management	HIOaaS delivers control and visibility of spending, identifies cost reductions, provides budget management, chargebacks, showbacks, and budget forecasting, by enabling hybrid cloud elasticity without financial surprises, efficient resource allocations.
Secure Access	HIOaaS seamlessly integrates with existing identity management tools like Active Directory (AD), Identity and Access Management (IAM), SAML, OAuth, MFA (multi-factor authentication) and other zero-trust based security platforms.
Observability	HIOaaS provides real-time observability across cloud and on-premises IT environments by intelligently correlating metrics from monitoring, logging, performance and security tools into a unified report view for identifying corrective actions.
Multi-Cloud Strategy	Enterprises often leverage multiple cloud providers to avoid vendor lock-in and to benefit from the unique features and pricing models of each provider. This requires sophisticated cloud management and orchestration tools native to HIOaaS.
Artificial Intelligence	HIOaaS AIOps automate routine tasks, predict system failures and optimize resource allocation. AI improves efficiency and frees up human resources for more strategic work. AIOps recognizes operational patterns over time and develops a predictive capability that rapidly detects deviations from normal operational standards.
Governance and Policy Management	Establishing governance models and policies ensures that all IT operations adhere to organizational standards and regulatory requirements and crucial for maintaining control and visibility across hybrid and cloud environments. HIOaaS automates the process of continual compliance management for mandated standards and practices.

Total Cost of Ownership

Reducing the Total Cost of Ownership (TCO)

HIOaaS stands apart from other hybrid cloud management platforms from its ability to dramatically reduce costs in areas that directly impact bottom-line spending. HIOaaS can provide a TCO reduction in ranges of 30-50% by tackling four aspects of TCO.

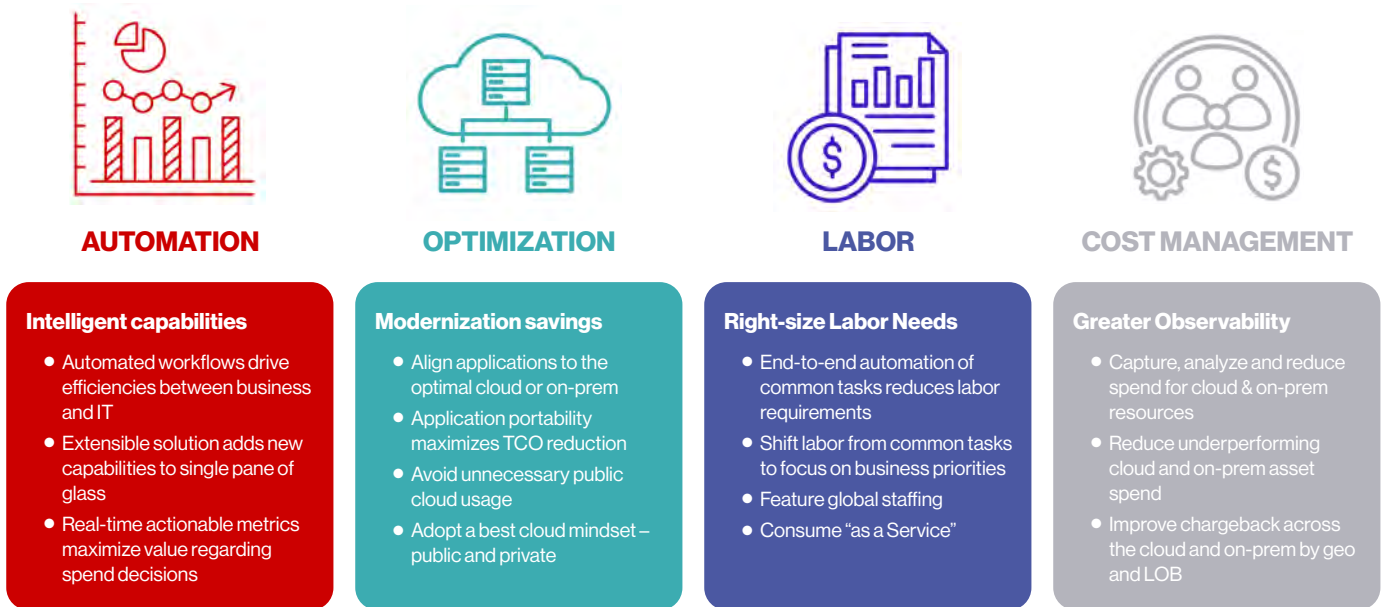


Figure 1. TCO reduction drivers for HIOaaS.

Cost Management

HIOaaS includes cost management tools allowing organizations to track usage and spending.

This is essential for budgeting and for optimizing resource allocation to minimize costs.

- **Hybrid and Multi Cloud Cost Visibility:** HIOaaS FinOps offers real-time insights into cloud expenditures across multiple cloud providers, helping organizations understand where and how their money is being spent. HIOaaS is designed to work seamlessly with multiple cloud providers simultaneously, offering a unified view of all cloud expenditures.
- **Cost Reduction:** By providing a clear view of cloud spending and offering optimization suggestions, HIOaaS can help organizations reduce their overall cloud costs. HIOaaS provides actionable recommendations for optimizing cloud resources, which can lead to significant cost savings.
- **Budget Management:** The platform allows for the setting and tracking of budgets at various organizational levels, ensuring that cloud spending is aligned with business objectives.

- **Chargeback and Showback:** HIOaaS facilitates the allocation of IT costs (including cloud) to different departments or business units, making it easier to account for resource usage. The chargeback and showback features ensure that departments are accountable for their cloud usage, promoting responsible consumption of resources.
- **Compliance and Governance:** The platform ensures that cloud usage complies with organizational policies, industry standards and government regulations. The platform's governance features help in maintaining compliance with internal policies and external regulations, reducing the risk of financial penalties.
- **Reporting and Analytics:** Advanced reporting tools are available for in-depth financial analysis, helping stakeholders understand spending patterns and trends.
- **Integrated Financial View:** HIOaaS FinOps can be integrated with other enterprise systems like ERP, BI tools and ITSM solutions for a more cohesive financial management strategy.
- **Strategic Decision-Making:** The insights provided by HIOaaS enable organizations to make strategic decisions regarding cloud investments, ensuring alignment with business goals.

Understanding HIOaaS

Hitachi HIOaaS is a robust, scalable and secure platform that enables hybrid cloud management, thereby aligning well with the strategic objectives of modern enterprises.

HIOaaS provides a unified interface that allows for the seamless management of cross-functional IT environments. This centralization simplifies operations and reduces the complexity often associated with handling multiple platforms.

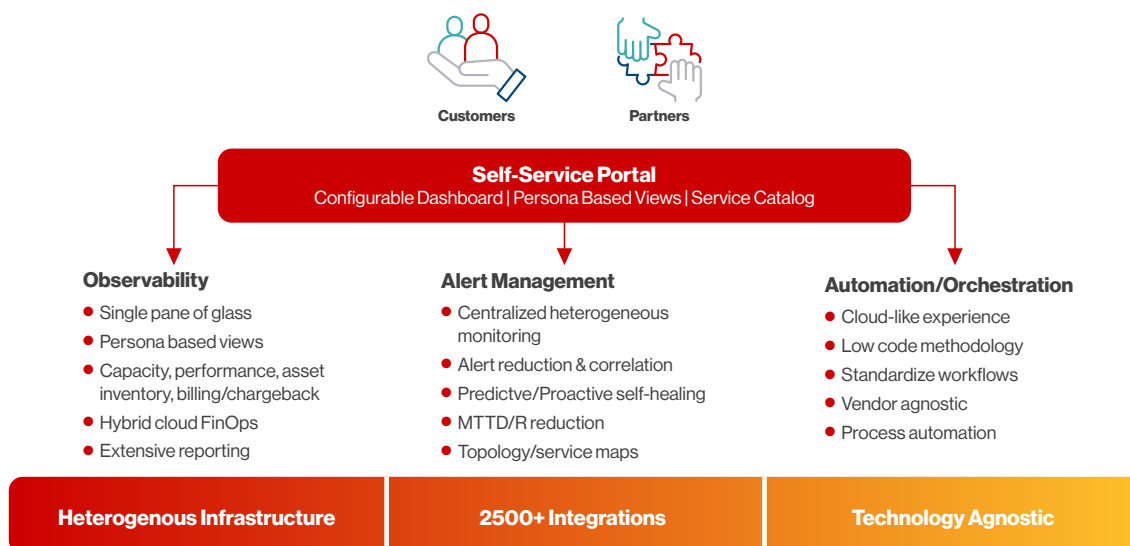


Figure 2. HIOaaS Self-Service Portal

HIOaaS Solution Components	
Modular and Open Architecture	Hitachi's HIOaaS platform divides its functionality into modular components that focus on different aspects of IT operations, such as infrastructure management, AI, observability, monitoring, cost management, etc. Users can easily customize and integrate these modules to tailor the platform to their specific needs. HIOaaS builds on an open architecture, providing access to its core APIs to encourage collaboration among developers, teams and organizations. As a result, users can continually enhance their automation.
Multi Tenancy	HIOaaS is inherently a multi-tenant platform by design. This enables multiple users, or tenants, to share a common infrastructure while maintaining independent, isolated and secure spaces for their operations. It offers the capability to centrally managed all tenants simplifying management and updates. Administrators can implement changes seamlessly across the platform, ensuring consistency and reducing operational overhead.
Pricing Model	HIOaaS offers a flexible pay-as-you-go pricing model, which allows companies to only pay for the services they use. This model is particularly beneficial for businesses that need to scale their operations up or down rapidly, as it eliminates the need for significant upfront investments.
Security	HIOaaS console integrates Security as Code with built-in access control security features such as Identity and Access Management (IAM), which allows administrators to set granular permissions for each user and provides persona-specific views for different types of users. This ensures that only authorized personnel can access specific resources and view information relevant to their needs, thereby enhancing the overall security posture.
Real-Time Monitoring	HIOaaS console provides real-time insights by integrating with or replacing leading monitoring and security platforms such as Splunk, Dynatrace, Datadog and New Relic, enabling companies to monitor the performance, operational health, utilization and security metrics of their on-prem and cloud resources. It supports both agentless and agent-based monitoring capabilities
AI/ML Engine	HIOaaS has an inbuilt AI/ML engine that can learn patterns and identify anomalies. This engine is trained on known data and continues to learn as new data arrives which helps it in even identifying patterns that it may not have seen before.
Automation and Orchestration	HIOaaS supports most automation tools like Ansible, Chef, Puppet, Terraform, Helm, Jenkins and others. These tools help in automating repetitive tasks and orchestrating complex DevOps and CI/CD workflows, thereby increasing operational efficiency. It also provides a user interface to build workflows using predefined or custom components to easily automate business flows.
Global Reach	HIOaaS consolidates views of multiple data centers and public clouds across most geographic locations, allowing companies to deploy their services closer to their end-users. This results in reduced latency and a better user experience.
Compliance and Governance	HIOaaS adheres to multiple global compliance standards, ensuring that companies can meet regulatory requirements more easily. The centralized management console aids in maintaining compliance by providing features like audit trails and encryption.
Disaster Recovery	HIOaaS offers robust disaster recovery capabilities through onsite DR storage, storage as a service and offsite cloud DR environments creating a resilient DR storage fabric. Companies can easily back up their critical data and applications, ensuring business continuity in the event of a disaster.
Multi-Vendor Ecosystem	HIOaaS has over 2,500 integrations enabling a rich vendor ecosystem that provides various third-party tools and services that can be easily integrated into the HIOaaS platform. This allows companies to extend their capabilities without significant development effort.

Use Cases

Use Case 1: Cloud Management and Automation Platform - CMAP (Single Pane of Glass)

Cloud management and automation platforms are strategic assets and integral components in the modern enterprise IT landscape, offering a range of functionalities that drive business value and enable enterprises to maximize the ROI of their cloud investments, while ensuring operational efficiency, security and business continuity.

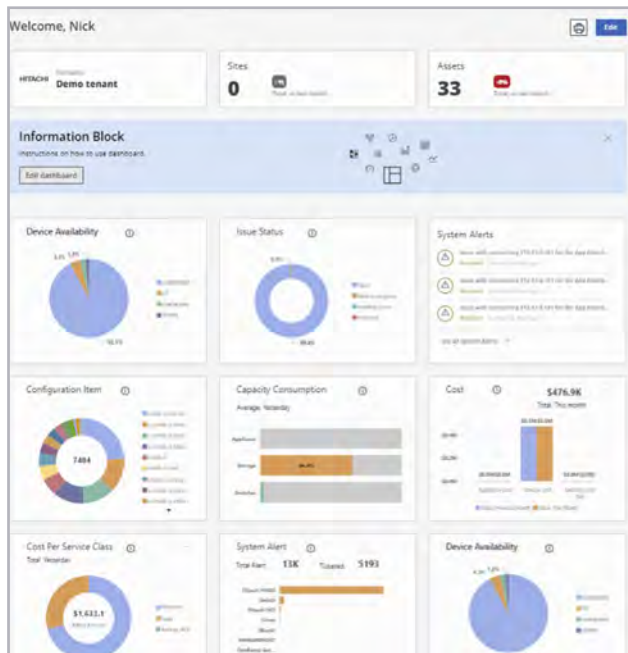


Figure 3. HIOaaS Single Pane of Glass.

Cost Management and Optimization

- **Resource Allocation:** CMAPs help in the efficient allocation of cloud resources, ensuring that you are not over-provisioning or underutilizing resources.
- **Budget Control:** They offer budgeting tools that allow you to set spending limits and receive alerts when you approach or exceed them.
- **Cost Analysis:** Detailed reports and dashboards provide insights into your cloud spending, helping you identify areas for cost reduction.

Operational Efficiency

- **Automation:** CMAPs automate repetitive tasks such as provisioning, scaling and patching, thereby reducing manual effort and the risk of human error.

- **Self-Service Portals:** These platforms often include self-service portals where users can provision their own resources within set limits, reducing the burden on IT staff.
- **Configuration Management:** They help maintain the desired state of cloud resources, ensuring consistency and compliance.

Security and Compliance

- **Access Control:** Role-based access control (RBAC) ensures that only authorized personnel can change cloud resources.
- **Audit Trails:** Detailed logs and audit trails help in monitoring user activity and ensuring compliance with regulatory standards like GDPR, HIPAA, etc.
- **Encryption and Data Protection:** HIOaaS features data encryption at rest and in transit.

Scalability and Flexibility

- **Auto-Scaling:** These platforms can automatically scale resources up or down based on demand, ensuring optimal performance.
- **Multi-Cloud Management:** CMAPs often support multi-cloud environments, allowing you to manage resources across different cloud providers from a single pane of glass.
- **Container Orchestration:** Many CMAPs integrate with container orchestration tools like Kubernetes, providing greater flexibility in application deployment and management.

Business Continuity

- **Disaster Recovery:** CMAPs often include features for automated backups and disaster recovery, ensuring business continuity in case of failures.
- **High Availability:** Set up high-availability configurations, reducing downtime and improving the user experience.

Analytics and Monitoring

- **Performance Monitoring:** Real-time analytics help in monitoring the performance of cloud resources, enabling proactive issue resolution.
- **Usage Analytics:** These platforms provide insights into how cloud resources are being used, helping in capacity planning and optimization.

Developer Productivity

- **DevOps Integration:** CMAPs often integrate seamlessly with CI/CD pipelines, enabling faster code deployments.
- **APIs and SDKs:** APIs and SDKs for custom integrations, allowing developers to focus on building features rather than managing infrastructure.

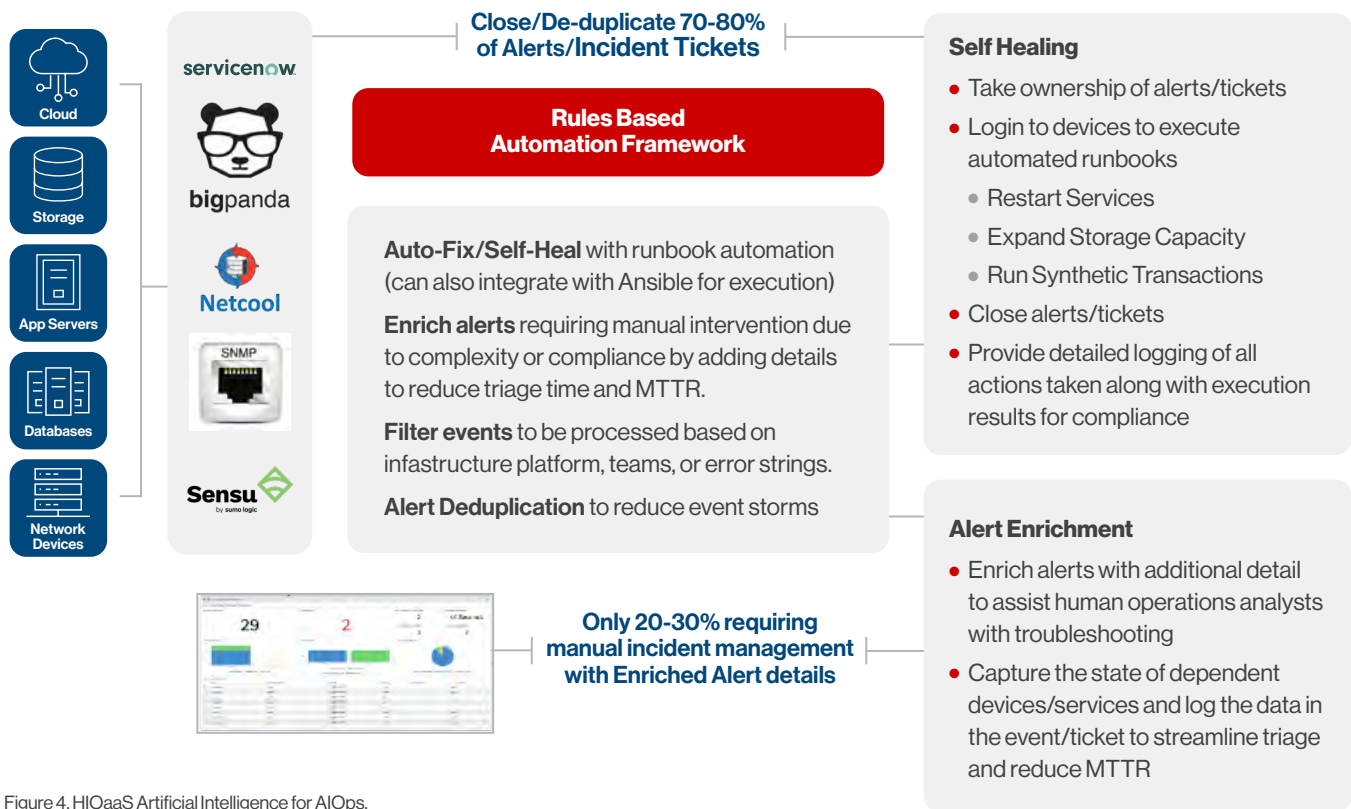


Figure 4. HIOaaS Artificial Intelligence for AIOps.

Use Case 2: Performance - Artificial Intelligence for IT Operations (AIOps)

AIOps in a hybrid cloud environment is a powerful tool for automating complex IT operations, providing actionable insights, and driving strategic advantages. It addresses the unique challenges of hybrid cloud architectures, making it an indispensable asset for modern enterprises.

Unified Monitoring and Analytics

- **Single Pane of Glass:** AIOps provides a unified dashboard that aggregates data from both on-premises and cloud resources, offering a holistic view of the entire infrastructure.
- **Cross-Environment Analytics:** Advanced algorithms analyze data across different environments to identify patterns, trends and anomalies, enabling more informed decision-making.

Automated Incident Resolution

- **Root Cause Identification:** AIOps can automatically pinpoint the root cause of issues occurring in either the cloud or on-premises infrastructure, facilitating quicker resolution.
- **Intelligent Remediation:** The platform can execute automated workflows to resolve known issues, thereby reducing the Mean Time to Detect (MTTD) and Mean Time to Resolution (MTTR).

Cost Management

- **Optimal Resource Allocation:** AIOps analyzes usage patterns to recommend the most cost-effective distribution of workloads between on-premises and cloud resources.
- **Budget Forecasting:** Machine learning models can predict future costs for both cloud and on-premises resources, aiding in budget planning.

Security and Compliance

- **Real-Time Threat Detection:** AIOps continuously monitors for security threats across both environments and triggers alerts for suspicious activities.

- **Automated Compliance Checks:** The platform can enforce compliance policies across hybrid environments, ensuring that both cloud and on-premises resources meet regulatory standards.

Scalability and Performance

- **Dynamic Scaling:** AIOps can automatically adjust resources in real-time to meet demand, whether it's scaling a cloud service or provisioning additional on-premises servers.
- **Load Distribution:** Intelligent algorithms distribute workloads optimally between cloud and on-premises resources to maximize performance and minimize costs.

Enhanced User Experience

- **Service Quality Monitoring:** AIOps uses machine learning to understand user behavior and preferences, thereby optimizing service delivery for enhanced user experience.
- **Latency Reduction:** The platform can route user requests to the nearest data center, whether it's on-premises or in the cloud, to reduce latency.

DevOps and CI/CD Integration

- **Automated Testing:** AIOps can integrate with CI/CD pipelines to automate performance and security testing across hybrid environments.
- **Feedback Loops:** Real-time analytics and insights can be fed back into the development process, fostering a culture of continuous improvement.

Business Continuity

- **Disaster Recovery Planning:** AIOps can automate and optimize backup and recovery processes across both cloud and on-premises environments.
- **Risk Mitigation:** By predicting potential issues before they occur, AIOps allows for proactive risk management.

Use Case 3: Sustainability

Sustainability is most often viewed as reducing infrastructure in data centers and is a multifaceted strategy that offers a host of operational and financial benefits. It allows organizations to operate more efficiently, be more agile and most importantly, realize significant cost savings that can be invested back into the business for growth and innovation. Operational Benefits

- **Enhanced Agility:** A leaner infrastructure allows for quicker changes and adaptations, making the organization more agile in responding to market demands or technological advancements.

- **Simplified Management:** Fewer servers, storage units and networking devices make it easier to manage the data center, reducing the complexity of tasks such as patching, updating and monitoring.
- **Reduced Footprint:** Less hardware means less physical space is needed, which could allow companies to operate in smaller, more cost-effective locations.
- **Energy Savings:** Reduced infrastructure leads to lower energy consumption, not only for powering the hardware but also for cooling systems.
- **Lower Maintenance Costs:** Fewer machines mean fewer chances of hardware failure, reducing the time and money spent on maintenance.
- **Enhanced Security:** With fewer points of potential failure, the attack surface is reduced, making it easier to secure the environment.
- **Business Continuity:** A simplified environment is easier to replicate for disaster recovery purposes, enhancing business continuity planning.

Financial Savings: Capital Expenditure (CapEx) Savings:

- **Hardware Costs:** Reducing the number of servers, storage devices and networking equipment directly cuts down the capital expenditure.
- **Software Costs:** Fewer servers may mean fewer software licenses are required, leading to additional savings.
- **Facility Costs:** Smaller space requirements can lead to savings on property costs or even enable the sale or subletting of unused space.

Operational Expenditure (OpEx) Savings:

- **Energy Costs:** Lower energy consumption translates to lower utility bills.
- **Maintenance Costs:** Reduced infrastructure means fewer maintenance contracts and lower costs for replacement parts.
- **Personnel Costs:** Fewer resources to manage can potentially reduce the size of the IT team required, saving on salaries and benefits.

Total Cost of Ownership (TCO) Reduction:

The cumulative effect of CapEx and OpEx savings leads to a lower Total Cost of Ownership for the data center.

Tax Benefits:

Reduced capital expenditure can also yield tax benefits in the form of depreciation.

Resource Reallocation:

The money saved can be reallocated to other strategic initiatives, such as research and development, marketing or human resources, providing a competitive edge.

Conclusion

The delivery of next-gen IT operations in hybrid and cloud environments is a multifaceted approach that involves a blend of modern technologies methodologies, and best practices.

Leveraging HIOaaS and adopting these strategies, enterprises can build resilient, agile and efficient hybrid and cloud environments that are well-equipped to meet the challenges of today's dynamic business landscape.



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