

Whitepaper

Multi-Cloud Monitoring and Management: The Key to Optimizing and Scaling Cloud Operations

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Abstract

“Multi-Cloud,” as the name implies, refers to cloud-based products and services being provisioned by multiple cloud vendors or, in other words, consumption of these services by customers from various cloud vendors based on their requirements. Essentially the primary rationale for organizations to adopt multi-cloud is to elude “Vendor-Lock in” and its associated limitations of cloud-based services being offered by a single vendor.

Large-scale organizations are inclined towards adopting multi-cloud to minimize and eliminate vendor-lock-in and decoupling issues as they have associated cost implications. Also, it inserts more intricacies in architecture strategy and design level resulting in additional investments and overheads for an organization. Hence it has become extremely vital for organizations to emphasize the right toolset being shortlisted and deployed for monitoring and management before adopting multi-cloud.

With the significant increase in multi-cloud adoption by organizations, it also becomes evident for organizations to focus on key functionalities, i.e., enterprise monitoring, service management, automation, and reporting toolset, as they form the core for monitoring and managing cloud-based products and services. The right selection, evaluation, and deployment of the desired toolset in a multi-cloud environment also assure that all IT/business-critical applications, related components, and its underlying IT infrastructure are being continuously monitored and managed successively.

Moreover, it also becomes obvious for the integrated IT operations command center, converged operations team, managed services, SMEs, etc., to be equipped with best-in-class monitoring and management toolset to make them more agile and proactive to meet ever-changing business demands and deal with technical complexities in a multi-cloud environment.



How Multi-Cloud Benefits an Organization?

Presently all large-scale organizations are embarking on their digital transformation journey by adopting a multi-cloud approach. However, with a multi-cloud approach, organizations need to ensure that they are not hooked up to a single cloud service provider and are flexible to adopt a best-of-breed, scalable approach.

This approach will also benefit organizations to:



**Avoid single vendor
"lock-in"**



**Build resiliency and become less
disaster-prone**



**Mitigate technical and
financial risks**



Avoid latency issues



**Take advantage of the latest
technological disruptions and
innovations**



**Strict adherence to
regulatory compliances and
data protection laws**



Have more power to negotiate

This whitepaper emphasizes on providing a high-level approach, recommendations, and guidance for selecting a vendor-agnostic toolset based on our enriched consulting experience in monitoring and managing toolsets for a multi-cloud environment. Additionally, it also guides overall tools legislation, compelling strategy, functionality mapping, operating model design, and architecture for multi-cloud monitoring and management.



Multi-cloud adoption and consumption trends include:

- 42% faster time to release applications, resulting in 35% more revenue.
- 41% lower costs and fewer hours spent on IT infrastructure and security incidents.
- 35% savings in productivity across a distributed workforce.



The multi-cloud management market is expected to grow from \$1,169.5 Mn in 2017 to \$4,492.7 Mn by 2022, at a Compound Annual Growth Rate (CAGR) of 30.9% from 2017 to 2022.



According to the most recent **Global Market Insights Inc. study**, the multi-cloud management market size is expected to record a valuation of \$55 Bn by 2030 with the increasing adoption of cloud computing technology.

Need for a compelling toolset for monitoring and management in multi-cloud

Adopting next-generation monitoring and management toolsets and technologies have been the enabler for an organization's digital transformation journey. However, it infuses complexities when multiple toolsets from multiple cloud vendors are deployed and integrated into a multi-cloud environment. This also has an adverse impact and exponential increase on operational cost, expenditure, tools license subscription, upgrades, administration, maintenance, and support cost, etc.

To eliminate and minimize such complexities and associated cost impact, it becomes apparent to formulate an effective tools strategy to monitor and manage workloads in a multi-cloud environment. This tools strategy should emphasize on identifying and evaluating the desired functionalities of complete IT infrastructure and cloud landscape.

Moreover, an effective tools strategy will also help evaluate the right toolset, design enterprise monitoring and management tools architecture, high-level and low-level design. These are crucial prior to deploying a multi-cloud environment with seamless execution during IT operations.

Key challenges in a multi-cloud environment

Below mentioned are some of the key challenges and risks that can be mitigated by evaluating an effective management toolset in a multi-cloud environment:

■ Increase in deployment complexity

The tool(s) deployment must have a phased approach and a robust deployment plan. For e.g. if the application landscape is widespread across different clouds, data integrity, integrations, etc. poses a risk for effective deployment; similarly, if deployment on a cloud is based on best-fit rationalization, the identification of such applications or components that would best fit a particular cloud has to be well analyzed and accordingly deployed. All such scenarios in a multi-cloud environment may result in increased deployment complexity.

■ Increase in operational costs

The multi-cloud model has a complex and detrimental impact on IT operations costs. This cost could spark investment in people, processes, and technology. Additionally, organizations may find it difficult to hire multi-cloud cross-skilled resources, resulting in a single cloud. Additionally, there are many monitoring and management tools available in the market, however, they may have functional limitations that may not support the multi-cloud model. Such situations mandate organizations to deploy multiple toolsets to monitor and manage their complex IT landscape. Also, there are scenarios wherein users do not shut down or stop cloud services after using them, leading to cloud sprawl, making it challenging to get visibility and impacting overall cloud usage and cost (pay per use).

■ Chargeback and billing complexities

Many cloud vendors allow organizations to create multiple service accounts or provision on-demand services, leading to the need for extensive account tracking, reporting on how many accounts have been created, costing and chargeback, services provisioned and subscribed under each account. There are also scenarios where many organizations do not have an appetite, FinOps model, or framework in place to cater to such on-demand and ad-hoc subscriptions, exponential growth, and to track the billing and chargeback. Traditionally, most organizations allow their employees and users to create their accounts and subscribe/un-subscribe as and when required without having legitimate financial controls in place.

■ Organizations lose economies of scale with multi-cloud vendors

In a multi-cloud scenario, there is no single cloud vendor lock-in, and demand is widespread across multiple cloud vendors, which restricts the capability of an organization to reduce IT operations costs and stabilize operations. As a result, organizations tend to lose their negotiating power since they are not able or restrict their potential to procure larger amounts of services (compute, storage, etc.) at significant discounts.

- **Increase in investment in skilled resources**

In a multi-cloud model, organizations tend to hire resources with skills for dedicated tools and functionalities, hence increasing the overheads and IT operations costs. Over and above hiring costs, organizations may require the existing pool of resources to be cross-trained and cross-skilled in multiple areas, which may incur additional investments.

- **Leaving the enterprise open to cyber threats with a significant increase in the number of cloud service providers**

Cloud services are most often exposed to security threats that are experienced by traditional data centers. One must ensure that all security controls are in place to prevent data theft as security is essentially on a shared responsibility model in a multi-cloud environment.

- **Increase in Operational Expenses (OPEX) due to an increase in demand for configuration and management of multiple cloud-native tools**

Each cloud vendor provides its own set of monitoring and management cloud-native toolsets. By default, these cloud-native tools provide minimal metrics and allow each organization to create and maintain their own set of monitoring and alerting policies, rules, etc. A cost may be associated with developing additional monitoring metrics, enabling advanced metrics, or storing the alerting and log data for longer periods.

Addressing toolset challenges/ complexities in multi-cloud

Before deploying monitoring and management tools in multi-cloud, it is important to identify and evaluate what functionalities need to be monitored and managed. Also, the core capabilities are expected to be delivered along with potential outcomes that could be identified. Below is the 4-step approach to address multi-cloud's toolset-related challenges/complexities.

■ Identify the cloud hosting provider and evaluate the functionalities that need to be monitored

The first step is to identify the workloads and the cloud hosting provider. This will ensure there are no "blind spots" in what functionalities need to be monitored and managed. Identifying the cloud hosting provider will also ensure a comparative study of "what needs" to be monitored and Out-Of-The-Box (OOTB) monitoring functionalities provided by the cloud-native toolset from the cloud vendor.

■ Identify the monitoring and management requirements

The second step is identifying the monitoring and management requirements. This is usually done in consultation with varied groups, stakeholders from IT, business service owners, and technology leads. From an IT service management perspective, list down the ITIL® processes that could be designed, configured, customized, automated, and operationalized using the ITSM tool. In addition to the core ITSM practices like Incident Management, Problem Management, Change Enablement, Release Management, Service Level Management, Knowledge Management, Service Request Management, Service Catalog Management, Configuration Management, and IT Asset Management (HAM & SAM), there should be a focus on some of the key functionalities like CI auto-discovery, business service mapping, provisioning, patch management and capacity management (performance optimization and capacity forecasting), billing and chargeback. From a multi-cloud monitoring perspective, all parameters that need to be monitored should be documented alongside threshold settings and polling intervals. This will enable the finalization of the IT monitoring (infrastructure, applications) tools landscape that must be

deployed – be it 3rd party solutions or cloud-native tools. Third-party solutions, if already deployed in the IT environment, can be considered too. Based on the requirements, the desired toolset could be identified and evaluated with a Proof of Concept.

■ The desired toolset could be identified and evaluated based on the requirements - cloud environment

A set of clearly defined goals, stakeholders, problem statement, business case, success factors, and criteria for measurement must be preceded before initializing the Proof-of-Concept (PoC) phase. It may not be practically feasible to perform PoC of every tool and functionality due to the effort and time which needs to be invested. However, a PoC should be done to ensure that all the functionalities required from a monitoring and management perspective can either be leveraged by cloud-native tools or 3rd party solutions (SaaS-based, on-premises) or a combination of both a hybrid approach. The PoC report published would primarily emphasize the below-mentioned criteria, which help in decision making.

- SWOT analysis of monitoring and management tools?
- Can all monitoring and management requirements be delivered via the finalized shortlisted monitoring and management toolset?
- Verification of the concept can be turned into reality, i.e., can monitoring tools be deployed and expanded across the organization?

■ Deploying and onboarding of configuration items on the platform

Post PoC report finalizes the functionalities and toolset to be deployed. During this phase, the enterprise tool architects, implementation and testing specialists, and SMEs can be onboarded to ensure that the low-level platform technical design (which covers all the functionalities to be deployed) is in-line with the overall vision and strategy of the IT organization. The enterprise tools architect should ensure that the underlying IT/cloud infrastructure is resilient and scalable to meet ever-changing business demands. Post technical and implementation specialists can start the platform build after technical and business signoffs on the low-level designs in-scope modules should be done in an agile way to ensure the desired quality output and reduce/manage risks to create seamless interactions between stakeholders and the deployment team.

Selection criteria and key parameters

- Multi-cloud monitoring and management platform

Multi-cloud primarily aims at each cloud vendor's best and most distinct monitoring, management, automation and real-time reporting, analytics capabilities. Hence, selecting the right toolset to monitor and manage seamlessly and efficiently becomes evident.

Based on our experience, below are the selection criteria and critical parameters that provide guidance and help evaluate the fitment of the toolset solution.

Licensing Model					
License Type	OEM Support Costs	Modularity	License exclusions	Deployment & Hosting Type	Minimum Commitments

Implementation & Administration					
Ease of Deployment	Ease of Configuration	Ease of Customization	Ease of Integration	Ease to operate	Ease to Upgrade

Built-in Features				
Security, Audit & Compliance	Role-based Access	Automation capability	Analytics	Reports & Dashboards

Potential benefits/outcomes

- Multi-cloud monitoring and management platform

Below mentioned are some of the potential benefits of the deployment of multi-cloud monitoring and management platform:



Increased operational efficiency

By using self-service capabilities and automation, organizations can left-shift tasks and reduce lead time for provisioning/de-provisioning services, and automate routine, manual and mundane tasks. This helps in making the support team lean and more agile.



Reduced operational cost

Reduce operating cost by deploying a single unified monitoring and management toolset while leveraging cloud-native capabilities offered by cloud vendors.



Reduced lead times

Reduce lead times associated with deploying and migrating workloads in a large and complex IT landscape.



Minimize monitoring complexities associated with infrastructure

Minimize monitoring and management complexities by leveraging the capabilities and services from multiple cloud vendors.



Agility in business

Multi-cloud platform also brings agility to business by optimizing the time and effort required for executing business-critical tasks/activities in a multi-cloud environment.

Conclusion

Although the market for hybrid clouds is expected to have exponential yearly revenue growth, it is crucial to optimize operational costs while integrating, administering, and monitoring multi-clouds from all angles, including security, compliance, and governance. To enable seamless monitoring and control of the multi-cloud platform, choose, adapt, and deploy the appropriate toolset based on the suggested selection criteria and key important factors stated above.

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