

ESG SHOWCASE

Reducing Hybrid and Multi-cloud Complexity: The Importance of Visibility in Multi-cloud Environments

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ABSTRACT: The last five years have witnessed the rapid rise of hybrid and public cloud environments, as well as the emergence of new application architectures and development methodologies, ensuring organizations are able to swiftly respond to ever-changing market requirements. Today, operations teams must contend with highly distributed hybrid and multi-cloud environments. As a result, these teams require holistic and detailed visibility across distributed application and network environments. Deploying a unified Riverbed visibility solution for hybrid and multi-cloud environments can provide greater insights, yielding improved performance, increased productivity, and an enhanced user experience.

Emergence of Multi-cloud Environments

Over the past few years, increasing numbers of organizations have been embracing public cloud environments, enabling them to swiftly respond to market requirements. In fact, ESG research shows that over the last five years, public cloud adoption for infrastructure-as-a-service (IaaS) has grown dramatically from 2016—rising from 38% to 67% in 2020.¹

Another key change that has taken place over the last five years is that the public cloud is being used not just for archiving or as a DevTest environment. According to ESG research, 51% organizations are leveraging the public cloud for business intelligence queries and 45% are using it for deploying production applications.²

But organizations aren't moving everything into just one public cloud—instead they're building out complex hybrid and multi-cloud environments. Based on ESG research, more than three-quarters (76%) of IT professionals said their organizations were leveraging multiple public clouds (defined as more than one IaaS provider).³

What's more, when it comes to emerging modern application environments, ESG research shows that 70% of respondents intend to deploy microservices architectures, DevOps methodologies, and container environments in hybrid cloud environments (hybrid cloud environments include both on-premises and public cloud). Additionally, nearly half (48%) of respondents said it is very important to have a solution that works across multiple disparate public cloud infrastructure services, i.e. multi-cloud.⁴

The research is clear—organizations must have unified visibility across highly distributed environments that span on-premises data centers and multiple public cloud instances to improve agility and ensure performance, as well as deliver an enhanced user experience.

¹ Source: ESG Master Survey Results, [2020 Technology Spending Intentions Survey](#), January 2020.

² Ibid.

³ Source: ESG Master Survey Results, [2019 Technology Spending Intentions Survey](#), March 2019.

⁴ Source: ESG Master Survey Results, [Trends in Modern Application Environments](#), December 2019.

Challenges Created by Multi-cloud Environments

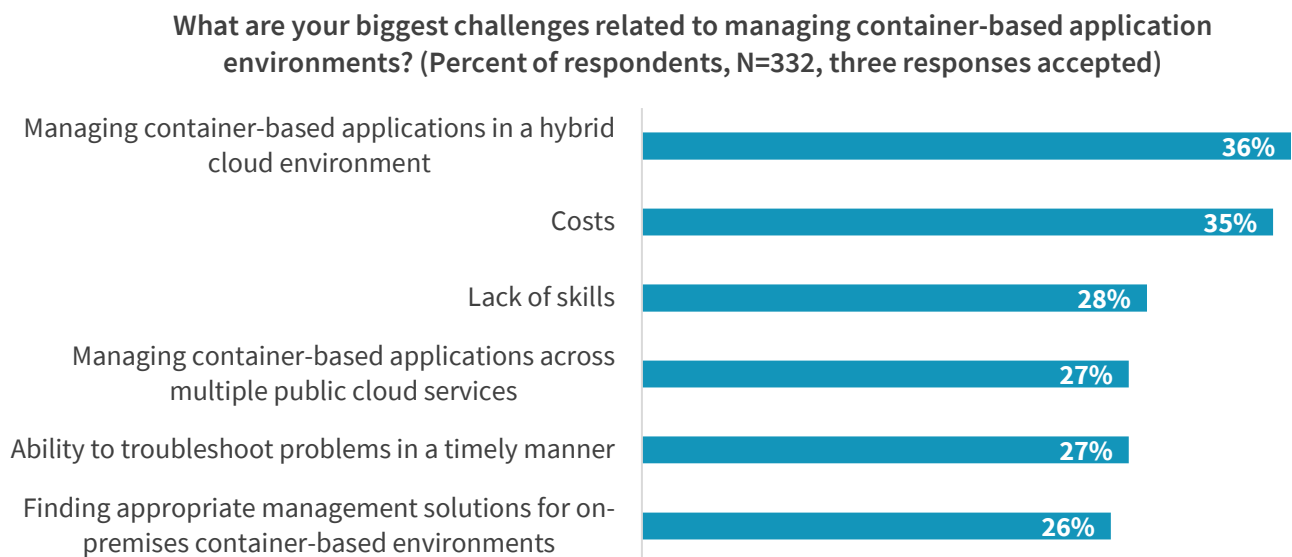
While public cloud adoption offers organizations a variety of benefits, distributing applications and workloads across multiple, disparate clouds (including those on-premises) can present unique challenges as well. Organizations can struggle with limited visibility across the network when using assorted proprietary public cloud vendor tools, while the ephemeral nature of new application environments can create massive data collection challenges. In essence, lack of end-to-end visibility across hybrid and multi-cloud environments make it extremely difficult to quickly troubleshoot issues, maintain network performance, and offer an enhanced user experience.

Modern Application Environment Challenges

As organizations evolve to adopt modern application environments, they will create additional difficulties for managing performance across multi-clouds. For example, the nature of these environments requires granular data collection. While virtual machines created a highly dynamic environment, new container-based environments can be ephemeral, with services that may only be spun up for a few seconds. As a result, a traditional performance management solution that only collects information every five minutes (or even every minute) could still be missing a great deal of important data.

It should come as no surprise that assorted management challenges abound in a modern application environment. According to ESG research, when asked to select their biggest challenges related to container-based application environments, more than one-third (36%) of respondents reported that managing a hybrid cloud environment was a challenge, while 35% said costs, and 28% reported lack of skills. Additionally, 27% reported managing across multiple public cloud services was one of their biggest challenges, and another 27% indicated the ability to troubleshoot problems in a timely manner, making it the fourth most common response (see Figure 1).⁵

Figure 1. Top Five Container-based Application Environment Management Challenges



Source: Enterprise Strategy Group

Lack of Visibility Across Environments

Another key issue when dealing with hybrid and multi-cloud environments is the lack of visibility of the connections in and between on-premises and public cloud environments. In many cases, organizations struggle with the ability to troubleshoot these environments in a timely manner. Without unified visibility into the network, it is enormously difficult (if

⁵ ibid.

not impossible) to isolate and resolve problems before they can adversely affect application and network performance—and the user experience.

Disparate Cloud Vendor Tools

Solely relying on public cloud vendor tools can create multiple problems, since each vendor tool was designed for a specific public cloud. First, organizations need to understand the capabilities of each cloud-based tool; for example, does it provide deep visibility and troubleshooting capabilities found in purpose-built visibility solutions? Next, relying on public cloud vendors also means that organizations must use multiple vendor tools to view their entire network and application environment—across multiple public clouds and on-premises locations. This untenable situation forces organizations to revert to manual “swivel chair management” (i.e., viewing a variety of management tools by literally swiveling back and forth in your chair). Because these environments require manual, labor-intensive correlation to achieve end-to-end analysis, IT teams must spend time dealing with an arduous, error-prone process rather than working on value-added initiatives.

In addition, it’s essential for organizations to know where cloud-specific management applications are hosted (i.e., if they’re in the same location as the applications or workloads). This is exceptionally significant because in the event of an outage in the cloud, it’s possible that these applications, as well as their management solutions, could just stop working.

A Modern Multi-cloud Visibility Solution Can Help

It stands to reason that leveraging the cloud should enable organizations to accelerate digital transformation initiatives—not constrain them. However, it’s vital for organizations to select the appropriate multi-cloud visibility solution to ensure that all components, on-premises infrastructure, and network and public cloud environments can deliver the requisite performance to drive higher levels of efficiency and productivity. Specifically, organizations need to leverage visibility solutions that can offer the following benefits:

- **Comprehensive visibility.** This includes full transparency across on-premises clouds, multiple public cloud environments, and the networks that support them. As organizations evaluate solutions, they should consider solutions that include or have this capability on their roadmap. It will be important to map which cloud vendors your organization is using or planning to use to the vendors’ current or projected list.
- **Support for both legacy and emerging applications.** Organizations must look at solutions that support legacy applications typically housed in on-premises environments (usually deployed in physical or virtual environments) and emerging modern applications that are either hosted on-premises or in the public cloud. This requirement will be more important for older, more established organizations as they transition to the modern apps but still have a large percentage of legacy application environments.
- **Ability to auto-discover application environments and performance.** As complexity grows in highly distributed environments, organizations will need to further rely on automation. This means that organizations must understand where applications, services, and workloads are located, and how they are connected. A multi-cloud visibility solution must be able to provide insight into an application path and show dependencies between services and locations (including TCP and UDP applications, and Web transactions). With this level of awareness, IT should quickly be able to isolate issues, and swiftly locate intermittent performance issues or brown outs.
- **Ability to integrate with other solutions to gain the broadest possible data collection.** A multi-cloud visibility solution should have the ability to collect data from individual cloud services to augment data collection (such as AWS

CloudWatch), or be able to discover and determine the health of an AWS EC2 instance to increase visibility and connect the dots between applications, workloads, networks, and locations.

Many organizations have deployed packet telemetry tools, which provide traffic data integral to understanding where data originated—and where it is going. It would also be helpful to have a multi-cloud management solution that leverages existing investments in virtual or cloud-based agents, or physical probes, to acquire additional information. Organizations should look to employ solutions that utilize Open APIs to ensure the greatest flexibility connecting to new data sources, as well as connecting to any northbound interfaces, such as ServiceNow.

- **Holistic and granular data collection.** Modern application environments are ephemeral, with services spinning up and down in mere seconds. As a result, a multi-cloud management solution must ensure extreme granular visibility (e.g., monitoring intervals down to one second). While granular data is vital, holistic data is just as critical. Holistic data enables organizations to gain insight from network packets, flow data (NetFlow, IPFIX, etc.), and device telemetry to ensure IT receives a complete data picture.

Riverbed Solutions Offer Holistic Multi-cloud Visibility

A recognized leader in digital performance management, Riverbed enables organizations to achieve control over complex hybrid and multi-cloud environments using the fully unified and integrated Network and Application Performance Platform in conjunction with Riverbed solutions. Riverbed Network Performance Management (NPM) solutions, such as AppResponse (full-stack application analysis); NetProfiler (full-fidelity flow monitoring for hybrid network visibility and network security analytics); NetIM (mapping, monitoring, and troubleshooting infrastructure components); and the Riverbed Portal offer organizations the capability to gain end-to-end network visibility, eliminating blind spots in and between hybrid and multi-cloud environments, and driving greater operational efficiencies, better network performance, and a higher degree of user productivity and satisfaction.

End-to-end Visibility Across Hybrid and Multi-cloud Environments

Covering on-premises, network, and multiple public clouds, Riverbed solutions have built their reputation providing performance management solutions that deliver deep visibility and insight for on-premises locations with a proven history covering legacy physical and virtual environments. With assistance from Riverbed, organizations on their journey to the cloud (and modern application environments) can rely on familiar tools to achieve insights across hybrid and multiple public cloud environments. Holistic network coverage and granular data collection allow organizations to quickly locate and isolate faults—with full transparency across highly distributed environments.

Greater Operational Efficiencies

Operational teams rely on the Riverbed Portal to provide a holistic view of an organization's dynamic application and network data, and user experience. Speeding application- and network-related performance and availability troubleshooting, the Riverbed Portal enables IT to focus on strategic projects (and less on routine tasks), while providing meaningful data to line-of-business stakeholders across the organization. With its unified approach, the Riverbed Portal aids collaboration among IT teams and will continue to expand its capabilities over time.

The Riverbed Portal curates data and provides machine learning analysis against other Riverbed NPM solutions, including AppResponse, AppResponse Cloud, NetProfiler, NetIM, UCExpert, Aternity End-User Experience Monitoring (EUM), and Application Performance Monitoring (APM), combining cross-domain performance data together for a comprehensive, multi-cloud picture. This new deep machine learning enabled analytics will include the ability to discover and notify

administrators about sudden changes in network activity, and predict future issues based on extrapolation of embedded trends.

The Bigger Truth

Hybrid and multi-cloud environments are driving increased complexity for organizations—especially for operations teams that require complete visibility and insight to effectively manage performance in these environments. This level of visibility and insight should enable operations to create closer relationships with the DevOps teams as well.

While existing tools and solutions may have worked in the past, organizations must to acknowledge the necessity of effectively managing a mix of legacy infrastructure and application models in conjunction with modern applications distributed across on-premises data centers, as well as in multiple public clouds.

To that end, organizations requiring end-to-end network visibility should look at Riverbed multi-cloud visibility solutions to deliver holistic, granular performance management of complex hybrid and multi-cloud environments. These solutions provide the intelligence and automation required to accelerate key business initiatives. For more information on Riverbed products, please visit www.riverbed.com/cloudvisibility.

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