

The 3 Critical Monitoring Tools for Hybrid Cloud Applications

A best-practices guide for monitoring business-critical, hybrid apps on AWS



Introduction:

Giving end users a high-quality experience is critical for today's businesses: internal and external users alike demand high-performing, low-latency applications. Your ability to meet this demand hinges on your monitoring approach. That's why you need a solution that can effectively monitor and promote the health and performance of your applications as well as the infrastructure that supports them—as you run them in a hybrid cloud.

This can be difficult when leveraging legacy, on-premises monitoring solutions. That's because many organizations leverage numerous monitoring tools on-premises, each to support a small fraction of their overall architecture. If these tools don't speak to one another, it becomes difficult to pinpoint the root-cause(s) of issues and correlate the issues to the user's experience. Furthermore, these solutions are not optimized for hybrid clouds, and will have a hard time solving performance and health issues in these environments.

This eBook details a monitoring approach that helps you overcome these challenges when running applications on a hybrid cloud with Amazon Web Services (AWS). Made up of three key technologies, enterprises can gain robust visibility across their complex hybrid environments to ensure that applications are healthy, performant, and have a positive impact on the business. First, let's take a closer look at traditional, on-premises monitoring solutions and the challenges they create.

Introduction:

EXISTING ON-PREMISES MONITORING APPROACHES

Prior to moving any application to AWS, many enterprises monitor their applications on-premises using a piecemeal approach, often needing 10+ monitoring solutions to gain comprehensive visibility. Common solutions that make up this approach include the following:



Infrastructure: Monitor the availability and resource utilization of the IT resources powering your applications in real time.



Network: Establish performance thresholds for bandwidth, latency, responsiveness, and more. Get alerted when metrics fall outside of a given threshold, signifying an issue.



Application: Quickly discover and remediate issues caused by an application or its dependencies that impact an application's performance or the user's experience.



Log management: Automatically produce time-stamped records of events generated by your systems and applications for retroactive remediation.

While these solutions cover a lot of ground, using this many tools at once can create operational complexity, as it is difficult to move from one tool to the next and build a comprehensive narrative when issues occur, resulting in needless “war room” finger-pointing sessions. Given the speed at which you need to solve issues, this added complexity is simply unacceptable. Furthermore, many tools being used on-premises fail to instrument cloud-based applications, limiting their value once businesses are running applications on AWS.

HOW CAN YOU THRIVE WITH HYBRID CLOUD MONITORING?

Enterprises need a simple way to deliver high-quality application experiences, regardless of the application or where it resides. This means embracing a monitoring approach with less tools, that is easy to use, and supports all IT environments, application types, and users. While businesses may continue to use multiple tools, the tools must be tightly integrated, and their approach must consist of enterprise-grade offerings.

3 Critical Tools for Hybrid Cloud Monitoring

To gain full visibility into the services, infrastructure, and applications that deliver great user experiences, it's important to combine best-of-breed monitoring solutions. We've identified three leading solutions that provide a solid foundation.

1. AMAZON CLOUDWATCH

Application and Infrastructure Monitoring

Amazon CloudWatch lays the groundwork for robust monitoring in your hybrid cloud environment. Native to AWS, Amazon CloudWatch helps you monitor the health and performance of the cloud resources supporting your applications.

In the early stages of AWS adoption, it can be difficult to fully understand your new cloud resources. Amazon CloudWatch makes this simple through automatic monitoring of AWS cloud services, while also providing deep visibility into your own critical applications. Deeper functionality helps you take advantage of the cloud's cost-effectiveness and agility.

Advantages of Amazon CloudWatch

- **Easily monitor AWS cloud services:** Gain deep visibility into the cloud resources supporting your applications via built-in integrations. Amazon CloudWatch provides automatic one-minute metrics for 70+ AWS cloud services, including Amazon Elastic Compute Cloud (Amazon EC2), Amazon DynamoDB, and Amazon Elastic Block Store (Amazon EBS).
- **Leverage granular, custom application metrics:** Monitor custom metrics with up to one-second granularity to support your own applications via a simple API request. These metrics can then be visualized in the AWS Management Console.
- **Automatically improve the end-user experience:** Implement high-resolution alarms that go off when metrics deviate from a given threshold and set these alarms to trigger AWS Lambda functions. This functionality allows you to automate corrective action that improves the end-user experience, while only using the resources you need, when you need them.



3 Critical Tools for Hybrid Cloud Monitoring

2. AWS X-RAY

Trace Monitoring for Distributed, Production Applications

Many organizations running hybrid applications are modernizing development practices through the implementation of microservices and/or serverless architectures. Doing so helps you build high-quality applications faster, and at a lower cost. That's where AWS X-Ray comes into play.

AWS X-Ray is a distributed trace monitoring solution that makes it easy for developers to analyze and debug any type of application, including those running on microservices and serverless architectures. AWS X-Ray can detect issues in your applications, whether they're in development or production.

Advantages of AWS X-Ray

- **Get started easily:** Begin monitoring applications running on Amazon EC2, Amazon Elastic Container Service (Amazon ECS), Amazon Elastic Container Service for Kubernetes (Amazon EKS), AWS Lambda, and AWS Elastic Beanstalk by integrating the software development kit (SDK) with your application and installing the AWS X-Ray agent.
- **Gain deep application visibility:** AWS X-Ray uses tracing to monitor requests throughout your entire application, gathering data on the services and cloud resources that make up your applications. This gives you a more robust view of how your applications are performing and makes it easier to determine the root cause of application issues.
- **Improve end-user experiences:** Drill down into trace data using service maps – a detailed view of the services making up your applications, how they're connected, and their aggregated data. This view enables you to identify performance bottlenecks to improve end-user experiences.



3 Critical Tools for Hybrid Cloud Monitoring

3. APPDYNAMICS

Application and Business Transaction Monitoring

AppDynamics complements native AWS monitoring tools with cross-stack, end-to-end visibility and direct correlation between technical issues and business performance. This empowers both technical and non-technical users to gain deep insights into how applications are performing and how they affect business. Native extensions for 20+ AWS cloud services, including Amazon CloudWatch and AWS X-Ray, provide even richer context around the AWS metrics.

AppDynamics also makes it easier for organizations to monitor microservices and serverless architectures by providing end-to-end visibility, retaining historical performance and health data, and correlating this data to past and future instances. These capabilities make it simpler to understand how microservices or serverless functions impact the rest of the components in an application's ecosystem to deliver better end-user experiences.

Advantages of AppDynamics:

- **Monitoring for hybrid applications:** Whether applications are running entirely on-premises, on AWS, or with components distributed across both environments, AppDynamics provides deeper visibility to find bottlenecks, address inefficiencies, and accelerate performance.
- **Validation of end-user experience:** A Business Transaction is an aggregation of the required services needed to fulfill an end-user request, such as a login or a search. AppDynamics tracks every Business Transaction across a user session and automatically captures metrics, including errors, crashes, network requests, and page load details. This enables you to better understand how users are experiencing the application, quickly solve issues, and create greater satisfaction.
- **Better understanding of business impact:** To verify if your applications are meeting their goals, AppDynamics enables you to define the business value of an application and identify key metrics that inform whether that value is being fulfilled. For example, you can baseline the sales and average order size metrics of your e-commerce site. If these metrics dip below normal, AppDynamics will correlate the drop with potential application performance issues and help you determine what actions you need to take to fix it.



3 Critical Tools for Hybrid Cloud Monitoring

WHAT THIS APPROACH MEANS FOR YOU

Using this three-legged approach to hybrid cloud monitoring gives enterprises a comprehensive view of their entire environment. Native to AWS, Amazon CloudWatch and AWS X-Ray make it easy to monitor the IT resources powering your applications and modern, distributed applications respectively. Complementing these solutions with AppDynamics helps you account for every type of application that may exist in your company – from on-premises monolithic to re-architected, cloud-based applications. Furthermore, AppDynamics empowers both technical and non-technical users to make sure that applications are healthy and performant, and that end users are satisfied. The comprehensiveness of this approach removes blind spots in application visibility. Because these tools can be tightly integrated, there is little-to-no operational complexity, making it easy to navigate from one tool to the next.

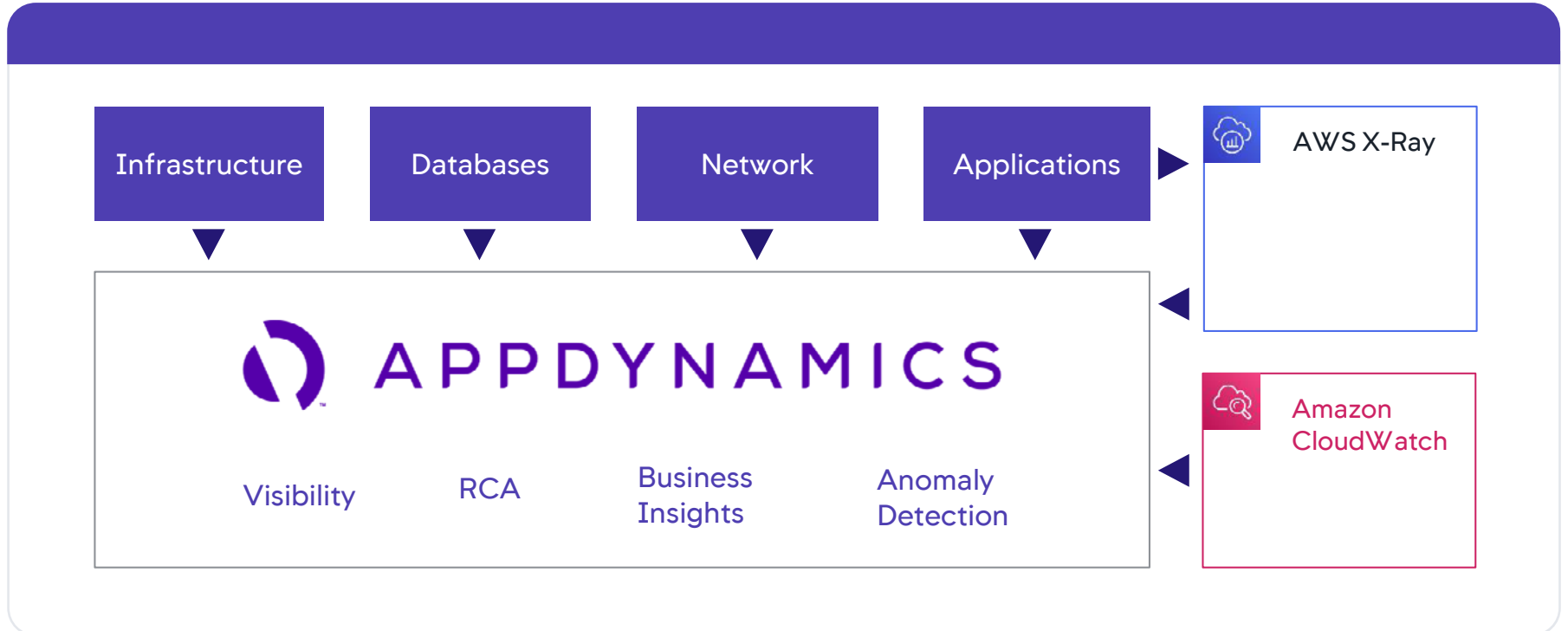
OPEN SOURCE TOOLS

Some businesses opt to use Open Source tools in addition to AWS and AppDynamics solutions. Open Source tools tend to be oriented towards metrics and traces and often provide high granularity. These traits can be advantageous if you need to capture as much data as possible on a specific workload or infrastructure stack to feed to an upstream or downstream system.

Open Source tools should be continuously maintained and audited to make sure you have the latest data at your fingertips. You can then use AppDynamics to ingest metrics from these tools to pinpoint problem areas and connect the dots between these workloads to show how end users and the business are being affected. By augmenting Open Source tools with a monitoring tool like AppDynamics you can help to eliminate finger pointing and get to the root cause faster when something goes wrong.



3 Critical Tools for Hybrid Cloud Monitoring



Use Cases for Monitoring Success

Once you've implemented a monitoring approach that takes advantage of these three solutions, you can reap significant value through the following use cases.

UNDERSTANDING INFRASTRUCTURE SPEND IN HYBRID ENVIRONMENTS

Intended for: re-hosted and re-platformed applications

Customers running hybrid applications often find it difficult – if not impossible – to understand costs being incurred by the disparate environments. Amazon CloudWatch helps you reduce total cost of ownership with automated alarms that can be enabled to help you detect and shut down unused Amazon EC2 instances and improve resource optimization. This feature also helps you mitigate billing overages. With AppDynamics, you can further cut costs with a holistic view of IT resource usage across cloud and on-premises environments. In utilizing this data, customers can better understand the cost-efficiency of running applications on AWS.

AWS RESOURCE INSTRUMENTATION

Intended for: re-platformed and re-architected applications

AppDynamics enables enterprises to instrument their applications running on AWS resources, such as Amazon EC2, AWS Elastic Beanstalk, Amazon ECS, AWS Lambda, and AWS Fargate. This means that as you build cloud-native applications, you gain full visibility into all tiers of the application stack. Furthermore, AppDynamics provides Amazon CloudWatch and AWS X-Ray extensions for these services, making it easier for customers to monitor AppDynamics metrics alongside their AWS metrics, from a single dashboard.

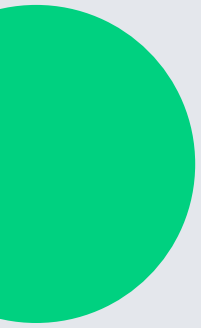
Use Cases for Monitoring Success



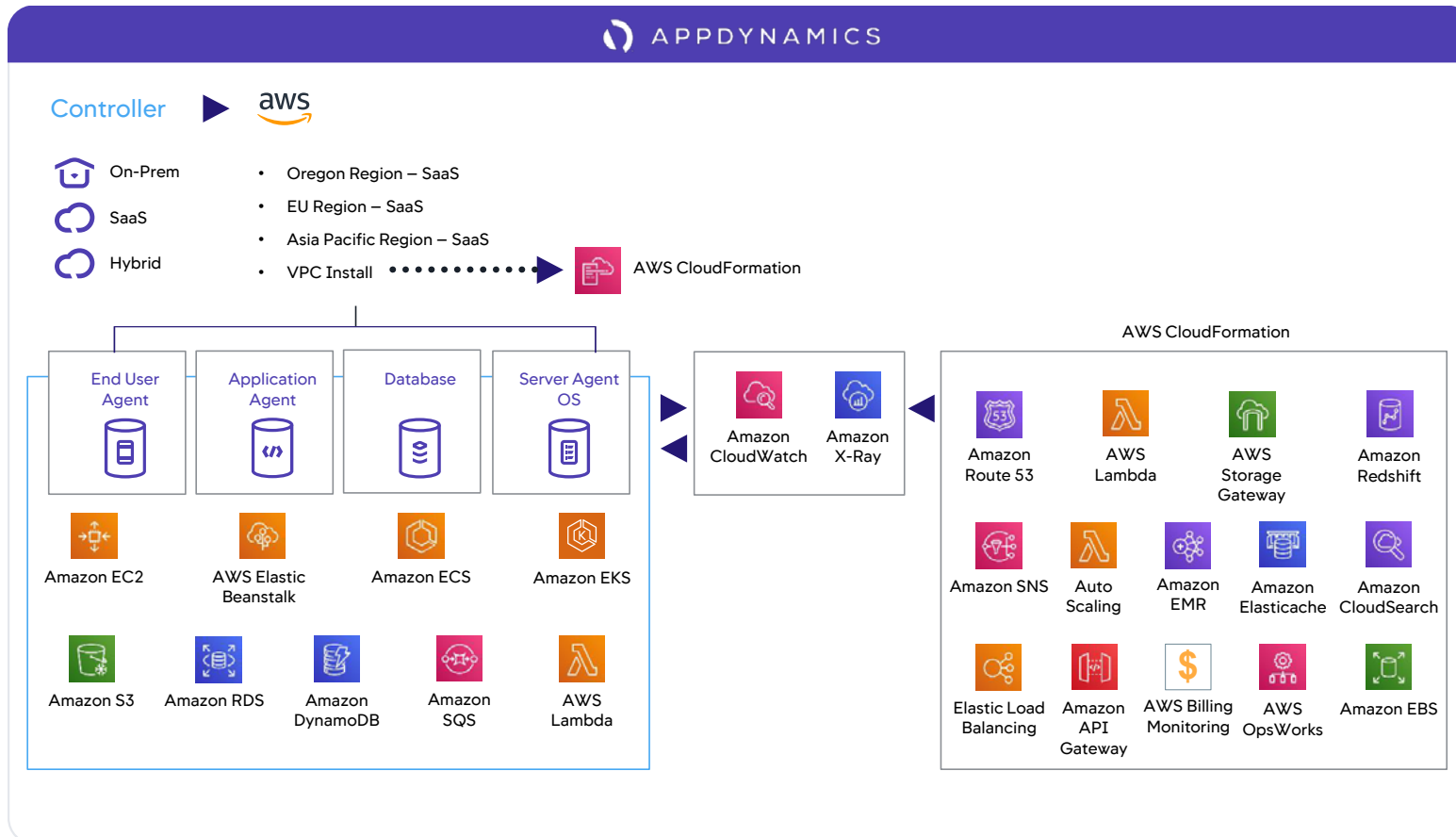
MONITORING SERVERLESS APPLICATIONS

Intended for: re-architected applications

Enterprises are driven to embrace AWS Lambda serverless architectures in part due to their cost-effectiveness. However, since serverless architectures are transient in nature, it can be challenging to fully understand how much you're actually saving, as well as understand why applications experienced an issue. AWS X-Ray helps you overcome these challenges by collecting AWS Lambda metadata that is used to illustrate application performance issues and their underlying causes. With AppDynamics, you can retroactively determine how AWS Lambda functions performed so you can validate cost savings, understand any issues that occur, and take action to fix them in the future. These solutions can be used in tandem to help you optimize costs and the end-user experience with serverless applications.



AWS and AppDynamics Architecture



This image shows some of the AWS cloud services AppDynamics supports and the extensions available for more comprehensive, centralized monitoring. You can find out more about the various ways AppDynamics monitors AWS services on their [website](#).

Get Started

By leveraging a combination of AppDynamics, Amazon CloudWatch, and AWS X-Ray, enterprises can gain deep visibility to support their diverse collection of applications, IT environments, and users. In particular, AppDynamics provides a number of advantages to support your hybrid cloud applications:

- Validate the success of your applications from both a technology and business standpoint with metrics that inform how application performance impacts user experiences and business outcomes.
- Tag-and-follow functionality enables you to monitor distributed applications across your environments, giving you a clear view of their application performance regardless of where they reside.
- Automatically baseline every application metric to easily create alerts when application behavior and performance deviates from normal standards and generate health rules that trigger remedial events.

Check out the AppDynamics product listing on [AWS Marketplace](#).





ABOUT APPDYNAMICS

AppDynamics is the Application Intelligence company. With AppDynamics, enterprises have real-time insights into application performance, user performance, and business performance so they can move faster in an increasingly sophisticated, software-driven world. AppDynamics' integrated suite of applications is built on its innovative, enterprise-grade App iQ Platform that enables its customers to make faster decisions that enhance customer engagement and improve operational and business performance. AppDynamics is uniquely positioned to enable enterprises to accelerate their digital transformations by actively monitoring, analyzing, and optimizing complex application environments at scale.

Learn more at appdynamics.com.

