

Lecture 12. Cloud monitoring

Definition of cloud monitoring

Cloud monitoring is a method of reviewing, observing, and managing the operational workflow in a cloud-based IT infrastructure. Manual or automated management techniques confirm the availability and performance of websites, servers, applications, and other cloud infrastructure. This continuous evaluation of resource levels, server response times, and speed predicts possible vulnerability to future issues before they arise.

Types of cloud monitoring

The cloud has numerous moving components, and for top performance, it's critical to safeguard that everything comes together seamlessly. This need has led to a variety of monitoring techniques to fit the type of outcome that a user wants. The main types of cloud monitoring are:

- Database monitoring
- Website monitoring
- Virtual network monitoring
- Cloud storage monitoring
- Virtual machine monitoring

Benefits of cloud monitoring

Monitoring is a skill, not a full-time job. In today's world of cloud-based architectures that are implemented through DevOps projects, developers, site reliability engineers (SREs), and operations staff must collectively define an effective cloud monitoring strategy. Such a strategy should focus on identifying when service-level objectives (SLOs) are not being met, likely negatively affecting the user experience.

Benefits

- **Holistic:** Cloud monitoring goes beyond basic infrastructure health. It optimizes application performance all the way down to transaction and code-level metrics.
- **Scalable:** Cloud-monitoring tools should grow with your infrastructure. The on-demand provisioning of licenses enables you to add new workstations or servers on a self-serve basis. It is not necessary to engineer for peak loads.
- **Cost-effective:** Cloud monitoring is generally subscription-based, which means you pay only for the systems you want to monitor. You should be up and running within minutes with no upfront costs or infrastructural changes to your network.
- **Proactive:** Gone are the days of manual checks. Automated monitoring finds patterns in cloud health to predict vulnerabilities before they arise. The faster and more data-driven reporting leads to faster resolution. And by discovering the root cause of these issues, you can better plan for the future.
- **Remote:** Cloud monitoring takes a 360-degree snapshot of your environment. It is independent of your own systems, whether or not it is on the corporate network. Most solutions also offer web-based dashboards you can view from any device.
- **Secure:** The security and privacy of all customer data should be a solution's number one priority. With that taken care of, you can focus on creating superior customer experiences.

Monitoring in public, private, and hybrid clouds

A private cloud gives you extensive control and visibility. Because systems and the software stack are fully accessible, cloud monitoring is relaxed when it's operated in a private cloud. Monitoring in public or hybrid clouds, however, can be tough. Let's review the focal points:

- Because the data exists between private and public clouds, a **hybrid cloud** environment presents curious challenges. Limited security and compliance create problems for data access. Your administrator can solve these issues by deciding which data to store in various clouds and which data to asynchronously update.
- A **private cloud** gives you more control, but to promote optimal performance, it's still wise to monitor workloads. Without a clear picture of workload and network performance, it's nearly impossible to justify configuration or architectural changes or to quantify quality-of-service implementations.

Cloud monitoring best practices

When your organization decides to make cloud monitoring a priority, your plan must include questions with quantifiable answers that accomplish your goals for implementation. As a general guideline, follow these best practices:

- Observe your cloud service usage and fees. Increased costs can be triggered when scaling kicks in to meet demand. Strong monitoring solutions should track how much activity is on the cloud and its associated cost
- Identify metrics and events that affect your bottom line. Not everything that can be measured needs to be reported
- Use a single platform to report all data. You need solutions that can report data from different sources to a single platform. This consolidated information enables you to calculate uniform metrics and results in a complete performance view
- Trigger rules with data. If activity surpasses or drops below certain levels, the right solution should be to add or subtract servers to maintain efficiency and performance
- Separate your centralized data. Your organization must store your monitoring data separately from your proprietary apps, but the information should still be centralized for easy access
- Monitor the user experience. To get the full picture of performance, review metrics such as response times and frequency of use
- Try failure. Test tools to see what happens when an outage or a data breach occurs. This evaluation can create new standards for the alert system

How does cloud monitoring work?

Ideally, cloud monitoring works in real time alongside its on-premises and hybrid counterparts. This helps improve visibility across the entire environment, including storage, networks, and apps. Key capabilities of cloud monitoring tools include tracking the consumption and traffic of cloud-hosted resources, unifying large volumes of data across distributed locations, identifying anomalies and their root causes, and predicting potential risks or production outages.

Best Cloud monitoring tools

1. Sematext Cloud
2. AppDynamics
3. Datadog
4. New Relic
5. Dynatrace
6. Sumo Logic
7. CA Unified Infrastructure Monitoring (UIM)
8. Site 24x7
9. Zabbix
10. Stackify Retrace
11. Zenoss
12. Amazon CloudWatch
13. Azure Monitor
14. Google Stackdriver
15. PagerDuty
16. VictorOps
17. OpsGenie
18. xMatters

Cloud monitoring is primarily part of cloud security and management processes. It is normally implemented through automated monitoring software that provides central access and control over cloud infrastructure. Your cloud administrator can review the operational status and health of any cloud-based device or component.

Thank you for your attention!