# How to solve your biggest cloud problems

The cloud poses interesting challenges to businesses. These must be overcome to assure best use and maximum value from cloud investment and use. Discover how to achieve cloud observability to keep up with cloud-based applications, service networks and storage.

Operating in the cloud represents the way business works today, regardless of size and scale. Thus, even small to midsize businesses are investing in and using cloud technologies, right alongside larger enterprises and organizations. It's no exaggeration to make assertions like "The future belongs in the cloud." As businesses implement digital transformation, the value of the cloud model becomes ever more apparent and compelling.
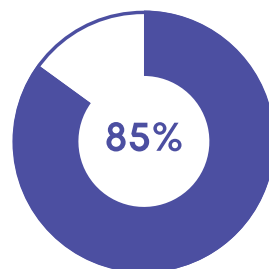
When Frost & Sullivan surveyed U.S.-based decision makers, it learned that cloud was top of mind for that population. Key observations from that survey include:

92%

93%

85%
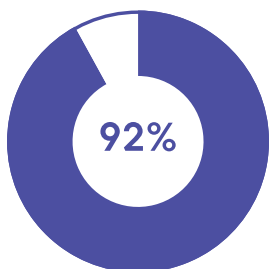
92% agreed that the cloud was "the most critical part" of their digital transformation strategy
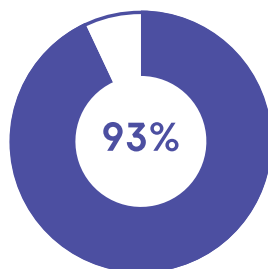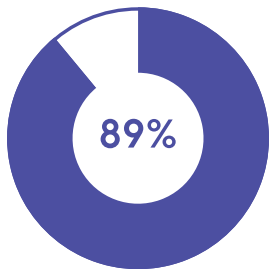
93% agreed that their cloud strategy was "essential to remaining competitive" in their industries
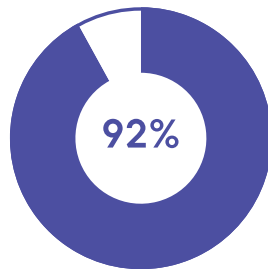
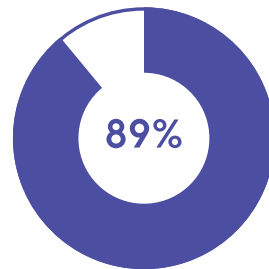85% directly cited "innovation" as a top business priority

In that same study, IT leaders also anticipated that moving to the cloud would help them reach important strategic goals that included:

89%

92%

89%

89% expected cloud technology to deliver overall app availability and performance

92% expected cloud technology to speed delivery of services and applications

89% expected use of cloud technology would result in reduced overall IT costs

The cloud poses interesting challenges to businesses — an environment whose center is everywhere, whose edge is nowhere and whose capabilities and content must be controlled in tandem with the cloud operator. In these circumstances, visibility into cloud assets, resilience, security and more is essential to make sense of costs, compliance and regulatory requirements, user experience needs and so on. That's why cloud monitoring is essential when it comes to obtaining the right kinds and levels of visibility and understanding.

Understanding cloud observability

Many observability solutions operate in real time to report on on-premises and hybrid cloud applications and services, along with their constituent components. The prime impetus that drives such monitoring is to provide visibility across the entire environment. Thus, it covers apps, networks and storage. At the same time, cloud observability tools provide information to help track consumption, activity and traffic for cloud-hosted resources and services.

Alternatively, a new breed of cloud observability offerings focuses on monitoring modern applications built using cloud provider application services, as well as modern container technology such as Kubernetes. For example, Cloud Native Application Observability delivers a dynamic view of all cloud native environments, including cloud infrastructures to Kubernetes orchestration layers and applications (see **Figure 1**). It lets admins explore and analyze cross-domain data, follows dependencies and provides ready access to relevant metrics, events, logs and traces (MELT) by way of telemetry data.
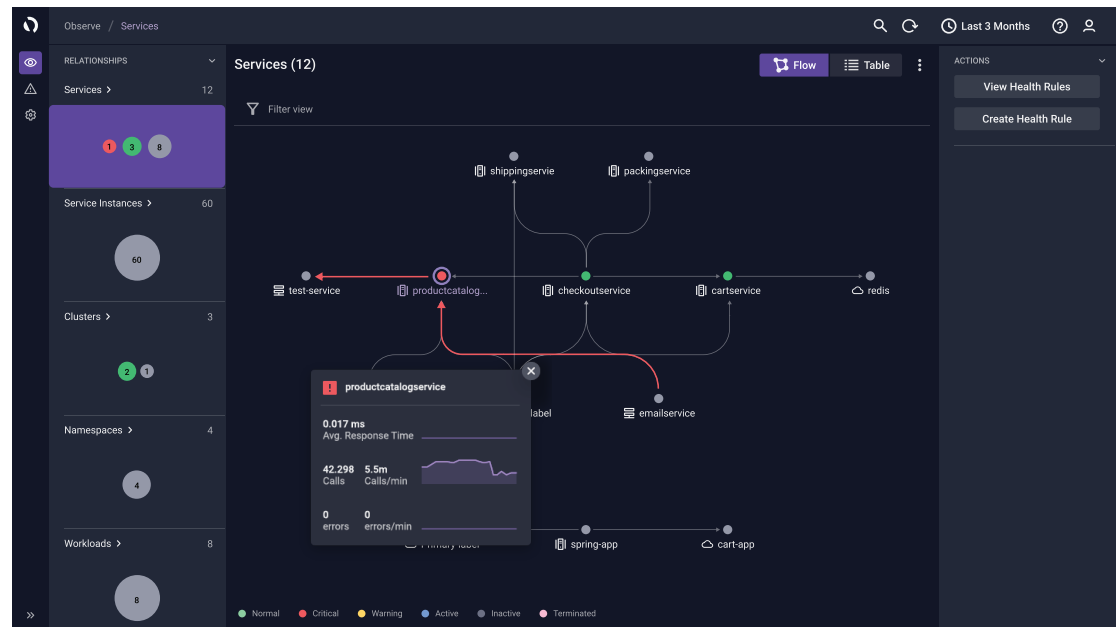

Figure 1: Cloud Native Application Observability provides a dynamic view of all your cloud native environments, from the cloud infrastructure to your Kubernetes orchestration layers and applications

To provide as much information as possible, cloud observability tools employ dashboards — such as charts, graphs, lists and so forth — to put their measurements and analyses into immediately understandable forms. Such visualizations offer useful insights into application and network performance for hybrid cloud, private cloud and public cloud services alike. These kinds of tools also help to illustrate and illuminate how to unify large data volumes across distributed locations. Understanding what cloud observability is and what it does, helps establish its importance and value.

To tie the cloud to business success, some cloud observability solutions combine application and business performance metrics together in real time. This helps organizations prioritize the resolution of issues that could negatively impact desired business outcomes. It also serves to establish and maintain confidence in cloud computing to drive business value by optimizing costs, reducing waste, improving performance and more.

Definitions for a cloud taxonomy

The most general definition possible for cloud is servers and their resources, accessed via the Internet, especially to make use of applications, services, databases and so forth. Within this context, we can distinguish multiple types of clouds, namely:

- **Private:** Computing services from the internet or an internal in-house network available only to select users — usually, paid-up — rather than to the general public
- **Public:** Computing services from the internet available to the public, usually on a metered, pay-as-you-go consumption basis
- **Hybrid:** A combination of private and public cloud elements working together to bring users and applications or services together
- **Multi-cloud:** A computing environment that includes two or more distinct public or private cloud platforms

In addition, an application or service is said to be "cloud native" when it is built to run in the cloud, using either an open cloud computing framework such as OpenStack or using the APIs and services directly available in various private and public cloud platforms (e.g., Amazon Web Services, Microsoft Azure and Google Cloud Platform).

Why is cloud native a good thing? Because it lets organizations build and use scalable applications across all types of clouds, including private, public and hybrid ones. The hallmarks of a cloud native approach include containers, service meshes, microservices, immutable infrastructures and declarative APIs. Kubernetes represents a typical container environment well-suited for cloud native applications because it's subject to highly automated approaches for set-up, configuration, orchestration and management.

What is cloud observability all about?

At its core, cloud observability means proactively monitoring the availability, performance and security of cloud-based IT infrastructures. This is the basis from which visibility into applications and underlying cloud infrastructure comes, including databases and networking.

Cloud native observability means measuring and tracking a new, modern breed of applications built using cloud provider application services — such as those from Amazon Web Services (AWS), Microsoft Azure and Google Cloud Platform (GCP) — along with modern container-based technologies, especially Kubernetes.

Cloud observability challenges and complications

While it's true the cloud offers a broad range of capabilities that might not otherwise be available to businesses — especially smaller operations — it's equally true that getting the most out of cloud use requires overcoming a range of complications and challenges. Some can be complex, others daunting, but all must be considered carefully and overcome when putting the cloud to work in your company.

To begin with, companies need to consider all the potential problems that occur when they pull apart applications. App components may get scattered across on-premises data centers, into public and private clouds, mobile devices and at network edge-computing facilities. This placement may make sense for performance and agility reasons, but governance over different portions of data must also play a role. In addition, consuming cloud resources costs money. Once data is placed into the cloud, it can be difficult and labor-intensive to move around.

Cultural challenges that organizations face in cloud adoption and deployment are legion. They involve organizational changes in mindsets, problem-solving approaches and IT knowledge and skill sets. Some of these hurdles include transitioning to cloud native ITOps, as well as DevSecOps and Site Reliability Engineering (SRE) tools and methods. They also often entail agile methodologies and getting tooling right to make a successful transition to cloud native applications and services.

In fact, this kind of cultural shift is a big part of the risk that companies take on when they transition into the cloud, whether deliberately or unknowingly. This transition will require them to operate differently — and most likely, to adopt unfamiliar methods, tools and approaches they may not have used before. This kind of shift requires planning and training to ensure success. It also benefits from access to highly skilled technical consulting and assistance, to help ensure that local "experts" can turn to other, already experienced professionals as they learn and absorb what they need to know to learn cloud ways and make the transition successful.

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Also, government regulations or requirements such as the European Union's General Data Protection Regulation (GDPR) add to this complexity. In some situations, businesses need country data to reside specifically within their country (or area) of origin. Then, too, there are privacy and confidentiality rights that must be honored and disclosure requirements to be met in case of an unwanted breach or unauthorized access or disclosure. Within many businesses, a high percentage of stakeholders don't have complete visibility into application performance in cloud native architectures. They need that visibility to make the best business and investment decisions and to guide change and growth over time.

Next, the complexity of cloud native technologies and distributed infrastructures too often creates operational silos across the technology stack. This makes it challenging to understand when a performance issue impacts user experience and key business metrics, like revenue. Indeed, managing the application lifecycle becomes more complicated and fragmented when services and applications involve multiple runtime environments across multiple clouds. This has profound implications for design, implementation, testing, deployment, maintenance and troubleshooting. In cloud-based environments, services can be available one second, then gone the next. This makes it much more challenging to diagnose and resolve performance issues. But access to proper MELT data makes traces of prior activity amenable to analysis and visualization and provides insight and information to ensure more optimal results in the future.

Finally, security is an especially interesting challenge. In circumstances where businesses must connect and secure users, devices and data centers, security understanding and insights are essential. This applies equally when Software-as-a-Service (SaaS) and public cloud properties come into the mix and as businesses must interact with providers, partners and regulators.

Best-of-breed cloud observability solutions

A basic cloud observability solution provides insight into the various metrics and data that a company needs to track to know what's going on in its cloud. This means watching how applications are performing, who's using them (and what for) and levels of resource consumption for compute, storage, networking and more. It also means observing user experiences and applying optimizations to improve those experiences where and when they make sense.

The best cloud observability solutions:

- Provide visibility into applications and underlying cloud infrastructure
- Correlate full-stack context across domains and data types (MELT)
- Are purpose-built for observing cloud native architectures at scale
- Deliver AIOps-driven insights across observable data
- Leverage direct data collection from cloud provider servers, as well as OpenTelemetry and metric data from its own specific agents

We all know the future is cloud based and cloud native. There's a massive ramp-up in new digital services — be that metaverse-augmented reality (AR), Web3, or the Internet of Things (IoT) — underway right now. Thus, businesses the world over need tools purpose-built to understand and manage rapidly accelerating changes. They'll benefit most from platforms engineered to scale with them as they grow. And they're going to need a single observability platform to manage their ever-increasing ecosystem of apps and digital services. And that's where AppDynamics can help.

Cloud Native Application Observability — a new, fully cloud native observability platform — is built from the ground up for precisely today's cloud-based environments. Cloud Native Application Observability offers a direct way to observe what matters. Looking ahead, it's designed to deliver a capable foundation for an unending stream of rapid-fire innovations to provide the tools and insights to let the world work the way it wants — and needs — now and in the months and years ahead.

Dig into AppDynamics cloud monitoring resources and materials

Learn more about Cloud Native Application Observability or talk to a cloud specialist!

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