VMware Tanzu
Observability

The State of Observability 2022

Presented by: VMware



vmware

Introduction

Observability has gained significant momentum since our inaugural State of Observability 2021 survey. With 70% of companies with mission-critical cloud applications either evaluating, implementing, or actively using observability tools, the technology seems poised to become an industry standard.

For the purposes of this survey, we define observability as *"an evolution of traditional monitoring for cloud applications that uses operational telemetry aggregated across distributed applications, application services, containers, and cloud infrastructure."* Observability is a recognition of the fact that traditional monitoring by itself is no longer adequate for modern distributed applications. With observability, you can ask questions about your applications and get answers based on *all* your telemetry data to pinpoint the root cause of failures and identify performance bottlenecks.

Although applications continue to grow in complexity—and many organizations face monitoring challenges as a result—observability helps address those challenges. For those actively using the technology, 41% now believe it to be *necessary.*

This report is divided up into four sections:



Observability Momentum

More are using observability and reaping the benefits.



Cloud Native Apps Growing in Complexity

Traditional monitoring is no longer enough.



Seismic Shift in Perception of Observability

Those with the most experience value observability highest.



Tool Challenges Remain

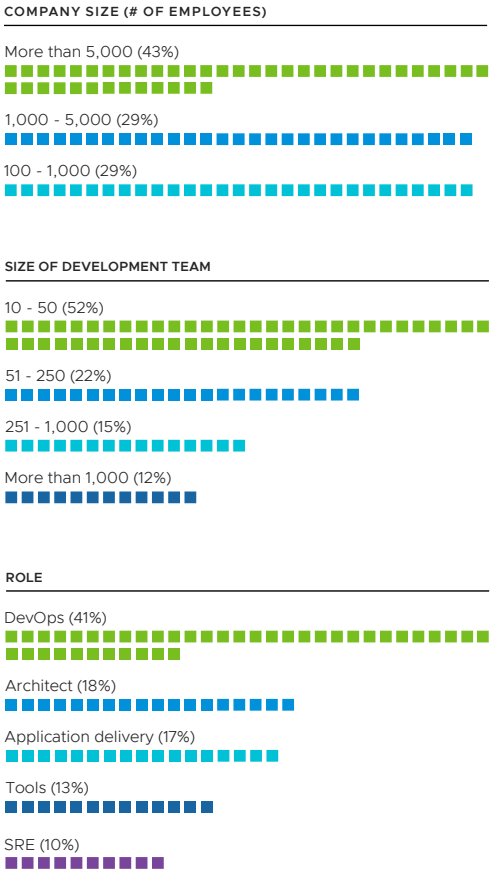
Too many tools and no single path forward.

Demographics

This year's survey included **315 qualified professionals.** All are responsible for mission-critical cloud applications in a DevOps, SRE, Architect, Application Delivery, or Tools role at companies with at least 100 employees and 10 developers. The goal was to keep demographics as similar as possible to last year—including the distribution of respondents based on *company size, dev team size, job level, industry, and geography.*

All organizations represented have more than 100 employees, including 43% that have more than 5,000 employees, and all have a significant software development footprint. About 52% have between 10 and 50 developers, 22% have 51 to 250 developers, 15% have between 250 and 1,000 developers, and 12% have more than 1,000 developers. Top industries represented include Financial Services (16%), Software Development (16%), Healthcare (10%), Manufacturing (10%), and Education (9%).

VMware commissioned Dimensional Research to conduct this survey. Thanks to the Dimensional team for their diligent work and attention to detail.



Observability Momentum

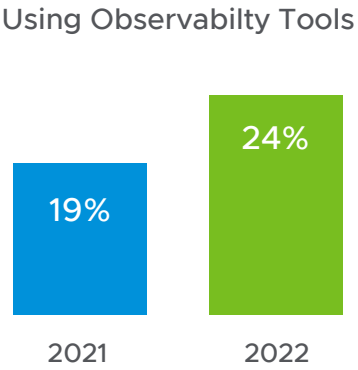
Last year's report noted that adoption of observability was still in the early stages. This year, we see clear signs that observability is gaining momentum—with almost a quarter of respondents currently using observability tools—and many more in the process of implementing or evaluating them.

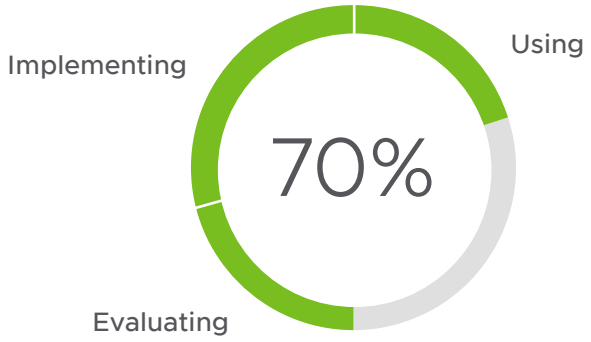
Use of Observability Tools is Growing

Since our inaugural study in 2021, use of observability tools grew from 19% to 24%, increasing more than 25% in a single year. It's clear that teams are recognizing the value of observability and the need to use observability for modern application environments; 84% agreed that *legacy monitoring tools are not adequate for modern cloud applications,* an increase of 4 percentage points since last year.

And Many More are Either Implementing or Planning to Implement Observability

More than four in ten respondents (41%) are either already using observability tools or in the process of implementing them, versus just 32% last year. An additional 29% are evaluating solutions, with 13% planning to implement within the next six months. In total, **more than two thirds** of those surveyed are either using, implementing or evaluating observability tools.





More than two thirds of respondents are using, implementing, or evaluating observabilty.

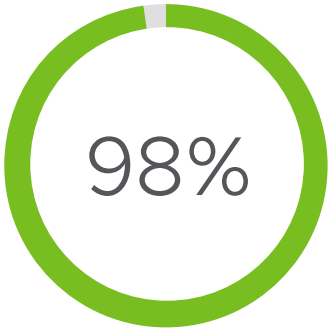
Almost Everyone Thinks They Can Benefit from Observability Capabilities

When asked whether they feel observability capabilities would benefit their organizations, 98% responded that they would. It's clear that teams responsible for cloud applications are thinking about how to keep up with continued growth and increasing complexity. The vast majority (94%, up from 90% last year) believe that *highly distributed applications create monitoring challenges an order of magnitude greater than other applications.*

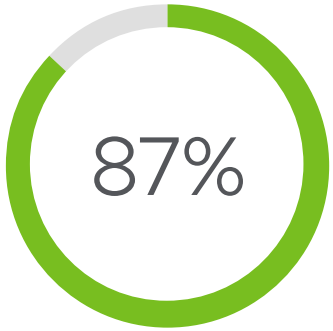
And Those with the Most Experience are the Most Bullish

Among those **using, implementing, or evaluating** observability tools, the perception of their overall value grew this year. More than three quarters (78%) believe that observability is *somewhat valuable or very valuable,* and a further 20% now believe that observability is *necessary.*

The more experience people have with observability tools, the stronger they feel; 87% of those actually **using** observability (as opposed to implementing or evaluating) report that it is *necessary* or *very valuable.*



Almost all respondents believe that observability capabilities would benefit their organizations.



87% of those using observability report that it is necessary or very valuable.

Observability vs Monitoring

The term observability is sometimes used interchangeably with monitoring, but they're not the same thing. Monitoring can be considered a subset of observability. Monitoring is the process of collecting metrics and alerts to monitor health and performance of discrete IT infrastructure components, such as servers or VMs. But by itself, monitoring cannot keep up with the demands of modern distributed applications.

Observability enables you to understand the complex set of disparate systems that make up an application—including microservices, containers, and other software and hardware components—and correlate the data. It goes beyond monitoring to tell you why something is wrong and how to fix it.

Cloud Native Apps Growing in Complexity

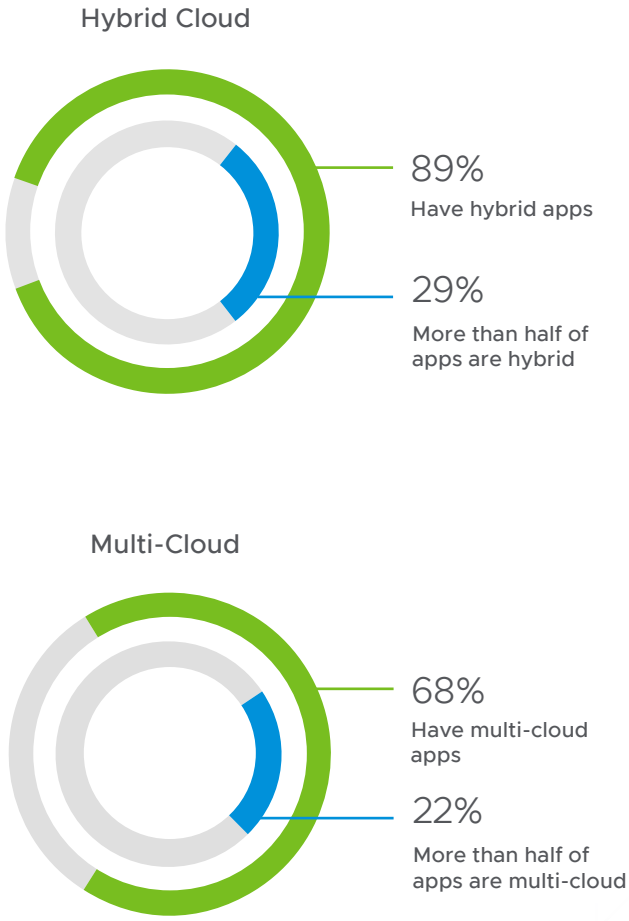
To understand why adoption of observability is accelerating, you must understand current cloud and application trends. Enterprise IT operations are increasingly hybrid and multi-cloud, and 89% of respondents believe *today's cloud applications are significantly more complex.* Development teams are moving to microservices architectures and picking up the pace of code delivery. All this translates to an increased need for observability tools.

Operations are Increasingly Hybrid and Multi-Cloud

When asked how many of their applications are hybrid—running in both a public cloud and on-prem—89% of respondents reported running at least some hybrid apps. This includes almost a third (29%) who say that more than half of their apps are hybrid.

The trend is similar for multi-cloud applications—apps running across multiple public clouds. More than two thirds (68%) are running multi-cloud applications, including 22% who report that more than half of their applications are multi-cloud.

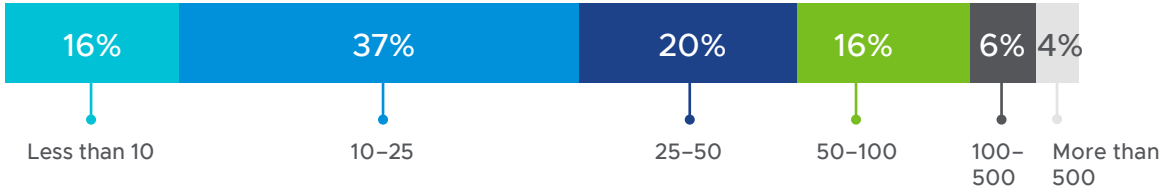
These findings correlate closely with this year's State of Kubernetes 2022 survey, which found *an accelerating trend away from on-premises and single-cloud Kubernetes deployments in favor of hybrid and multi-cloud.*



Applications Touch Dozens of Technologies

Hybrid and multi-cloud applications add complexity, so it's not surprising that 89% of stakeholders agree that *today's cloud applications are significantly more complex than they were five years ago.* When we asked how many technologies (clouds, microservices, networks, VMs, containers, storage, APIs, etc.) were involved in a typical cloud application request, 37% said a request touched 10-25 technologies, 20% said 25-50, and 16% said 50-100. And 10% reported that a request might touch more than 100 technologies.

How many different technologies does one of your cloud applications typically touch?



State of Kubernetes 2022

Adoption of observability goes hand-in-hand with adoption of cloud native technologies like Kubernetes. According to this year's State of Kubernetes 2022 survey, K8s has been on a wild ride, moving from science project to the IT mainstream in a matter of a few years. Almost a third of stakeholders surveyed are now operating 50 or more clusters. And almost half expect the number of Kubernetes clusters they have to increase more than 50% in the coming year.

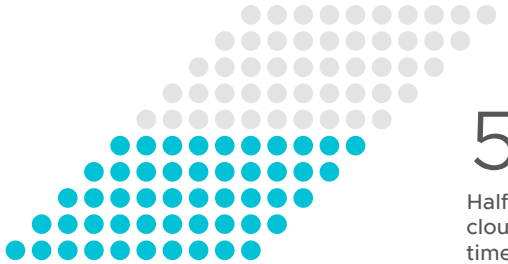
Cluster growth and multi-cloud deployment are changing the nature of Kubernetes operations. A do-it-yourself strategy and homegrown processes are no longer enough, with lack of adequate experience and expertise a challenge for more than half of respondents. Teams are increasingly turning to observability and other tools to help take up the slack, with 97% of respondents now willing to pay for support and services for important Kubernetes tools.

Read the full report to learn more.

The Pace of Development Drives the Need for Observability

Another factor contributing to the need for better observability tools is that half of organizations surveyed release or make updates to *critical cloud applications* many times a week or more. A quarter (26%) of those make updates *many times a week,* and 24% make updates either *many times a day, many times an hour, or constantly.* Another third (31%) do updates *many times a month,* while just 19% of respondents do updates *less often than monthly.*

Even with the best QA processes, you can't expect updates to always go smoothly when you make frequent changes. Observability tools make it possible to detect problems in production, rollback changes sooner, and pinpoint issues that sometimes arise from complex interactions between components.

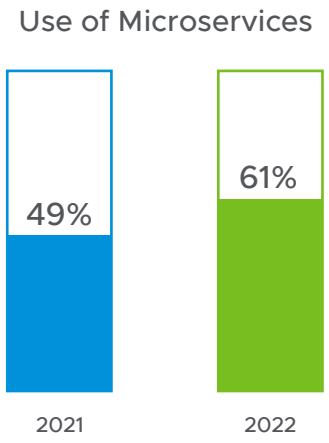


50%

Half update critical cloud applications many times a week or more.

And Use of Microservices is Exploding

One of the most notable changes seen in this year's survey was the increase in microservices. The number of stakeholders using microservices was up 12 percentage points to 61%, from 49% last year. And people aren't just dipping a toe in the water; 83% of those using microservices report that they *have hundreds or thousands* of microservices in operation. One of the side effects of increased use of microservices is an increased need for distributed tracing. More on that later.

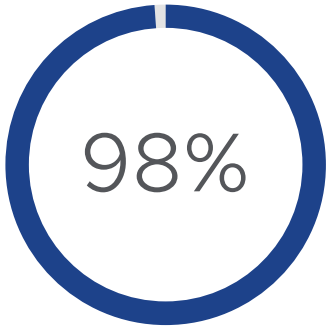


Seismic Shift in Perception of Observability

The clearest signal of the true value of observability may be the attitudes of the people using it. Something that stands out in this year's survey is that users of observability really love it; 41% say that it's not just *valuable* but *necessary.*

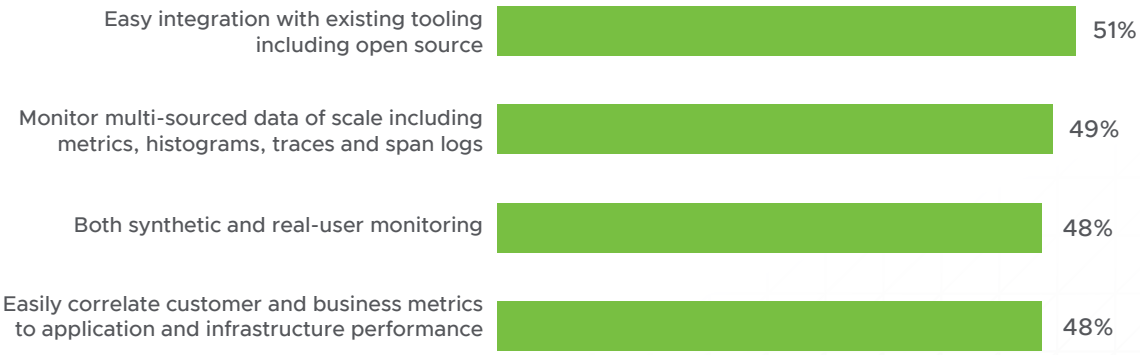
The Perceived Value of Observability is High

Almost all (98%) of those surveyed think that observability capabilities would benefit their organizations. In terms of observability capabilities, the top four were: *easy integration with existing tooling including open source* (chosen by 51%), *monitor multi-sourced data at scale including metrics, histograms, traces, and span logs* (49%), *perform both synthetic and real-user monitoring* (48%), *and easily correlate customer and business metrics to application and infrastructure performance* (48%). Also notable was *reliably ingest, process, and observe millions of metric points per second in real-time,* chosen by 38% of respondents.



Almost all who are using, implementing or evaluating observability believe it is either valuable or necessary.

Which observability capabilities would benefit your organization?



And Everyone Sees Value in Broader Use of Observability

Almost nine out of ten respondents (88%) agree that cloud services and applications *would have better availability and performance if more stakeholders—DevOps, developers, SREs, architects, etc.—had visibility into key infrastructure and application behavior metrics,* a 4-point increase from last year. This is a clear recognition of the value of data, both for troubleshooting and operational decisions.

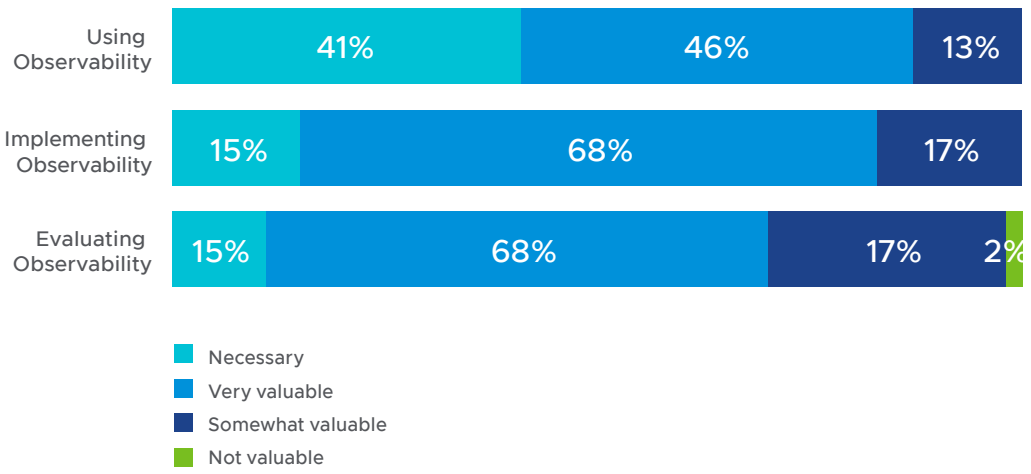
And 95% of those surveyed agree that *the massive volumes and types of data captured by observability tools would enable technical teams to more effectively support business decisions.* As companies accelerate digital transformation, strategic use of operational data and insights becomes a competitive advantage.

Those with the Most Observability Experience Value It Highest

For those with direct experience with observability—either **using, implementing, or evaluating it**—the perceived value of observability is even higher. For this cohort, 20% rate observability as *necessary, there is no other way to effectively manage large scale cloud applications* (up from 14% last year) and 58% rate it as *very valuable, there are significant advantages compared to other approaches.* No one currently using or implementing observability characterizes it as *not valuable.*

Narrowing the field to just those **using observability** (as opposed to implementing or evaluating it), 41% now believe it to be *necessary,* a significant jump from 32% last year.

What value do you see in observability for large-scale cloud applications?



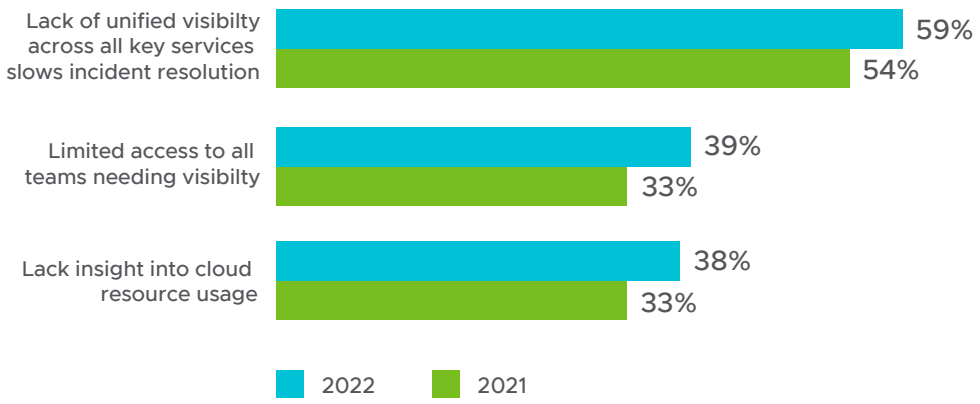


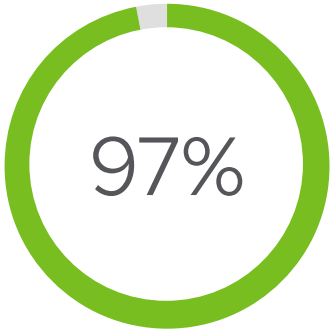
But Visibility Challenges Continue to Grow

Visibility challenges are still growing, with 97% reporting challenges monitoring cloud application environments. The top three visibility challenges all increased by 5-6 points versus 2021. The top challenge at 59% remains: *lack of unified visibility across all key services slows incident resolution.* Rounding out the top 3 are: *limited access to all teams needing visibility* (selected by 39%) and *lack insight into cloud resource usage* (38%). It appears that these challenges exist because disparate monitoring tools aren't able to create a unified view of an application's environment.

Other challenges that saw increases since last year included *open-source tooling requires huge effort* (31%) and *cannot cope with huge volumes of application and infrastructure metrics* (25%). It's clear that teams need tools that can deliver better visibility and deeper insight while also coping with tremendous growth and scale.

What challenges do you face monitoring cloud application environments?





Have challenges monitoring cloud application environments.

Microservices and Observability

The microservices pattern breaks an application into its component services, each running in a separate container. This approach enables greater parallelism during both development and execution, reducing cycle time.

However, when a request comes into a monolithic application, it's relatively easy to trace through what happened because everything is self-contained. When a request comes into a microservice, that request often results in a cascading chain of calls to various other services. Distributed tracing, an important observability capability, is essential to pinpoint problems in chains of microservices requests.

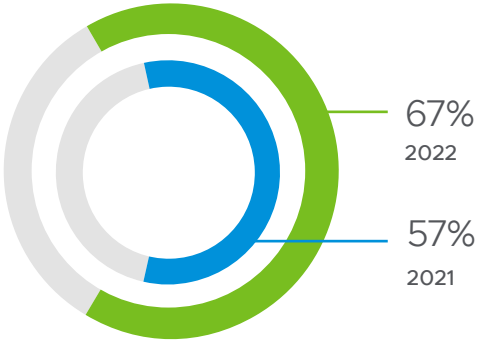
Tools Challenges Remain

Organizations continue to experience challenges with their monitoring toolsets, with almost half using more than 5 separate tools and no clear consensus on how to rationalize them. One thing that is clear is that separate app and infrastructure monitoring tools don't provide the visibility needed for fast incident resolution or operational and business insights.

Separate App and Infrastructure Monitoring Doesn't Cut It

This year, two thirds of respondents (67%) agreed that *it is a mistake to monitor applications and infrastructure separately in a cloud environment,* up significantly from 57% who felt that way last year. The clear implication is that having separate tools for infrastructure and application monitoring, with no way to visualize and correlate metrics across domains, is increasingly inadequate when it comes to troubleshooting incidents. Perhaps this isn't exactly a revelation given that the top visibility challenge (see earlier) was *lack of unified visibility across all key services slows incident resolution.*

Observability tools help solve this problem by integrating metrics, accelerating troubleshooting, and increasing insight. Among the most desired observability capabilities were: *monitor multi-sourced data at scale including metrics, histograms, traces,* and *span logs* and *correlate customer* and *business metrics to application* and *infrastructure performance* (see *The Perceived Value of Observability is High* earlier).



Percentage of respondents who believe *it is a mistake to monitor applications and infrastructure separately.*

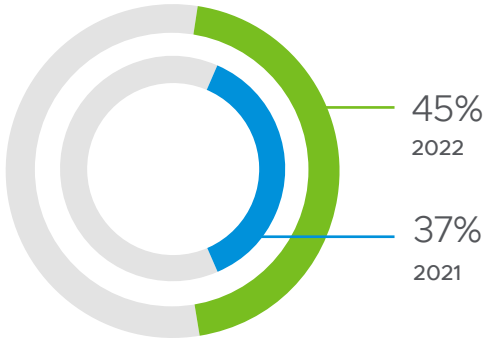
What is OpenTelemetry?

OpenTelemetry is an industry standard that merges the OpenTracing and OpenCensus projects to create a complete telemetry system for applications, infrastructure, and services. It provides a set of APIs, SDKs, and integrations for collecting and exporting metrics, traces, and logs for monitoring and analysis. This open source project is currently incubating under the auspices of the Cloud Native Computing Foundation (CNCF).

Distributed Tracing Grows in Importance

In our 2021 survey, we asked respondents to pick the observability capabilities that would benefit their organizations most. The rankings this year remained remarkably stable with one notable exception: **distributed tracing;** 45% of respondents chose distributed tracing as an important capability this year, an increase of 8 percentage points.

This increase is almost in lockstep with the 12-point rise in the use of microservices this year. (See the section, *Use of Microservices is Exploding*.) The importance of distributed tracing increases with the use microservices and serverless.



Distributed tracing is an important observability capability.

Too Many Tools

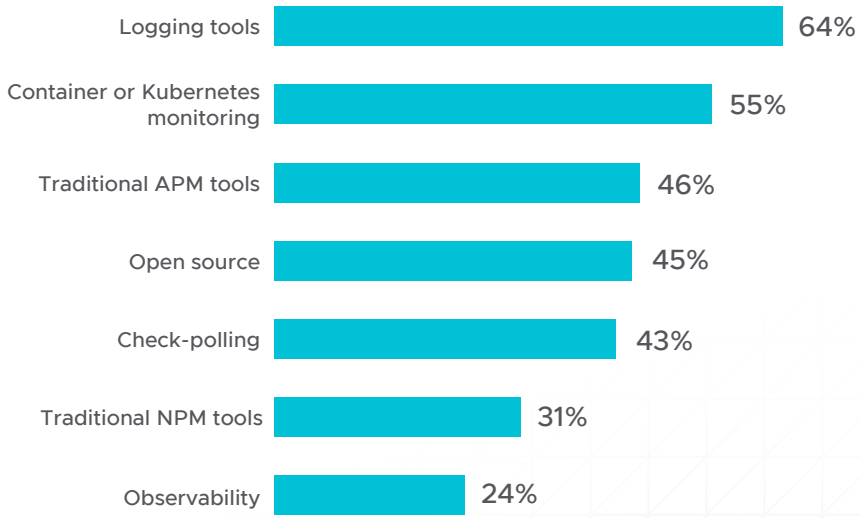
While there is value in having individual software tools that are ideally suited to a particular need, every tool you utilize requires a certain amount of effort to deploy and maintain. This year, just 1 in 5 respondents (21%) describe their monitoring toolset as *unified*.

Stakeholders report using a tremendous number of different monitoring tools. Almost half (46%) use more than 5 different monitoring tools, 15% use 11-20 separate tools, and 9% report using more than 20.

The types of monitoring tools in use range widely. In addition to observability tools (24%), many teams are using logging, container and Kubernetes monitoring, traditional APM and NPM tools, check-polling, and open source tools like Prometheus. Of all these classes of tools, observability showed the greatest growth since last year.

With so many tools in use, just 7% of all respondents say they are *very satisfied* with their *current toolset for monitoring*. That number increases when we break out those using observability tools, 15% of whom are *very satisfied*.

What types of tools do you use to monitor cloud applications and infrastructure?

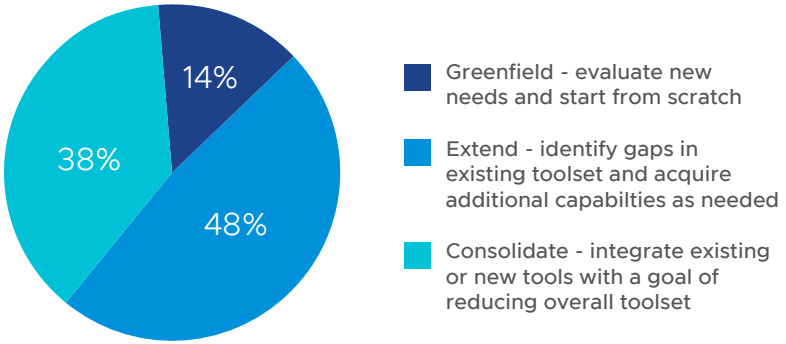


And No Consensus How to Rationalize Toolsets

We also wanted to understand what people thought was the best way to improve their existing monitoring toolsets. The preferred approach for rationalizing toolsets this year remains *identify gaps in existing toolset and acquire additional capabilities as needed* (48%). In second place (38%) was *integrate existing or new tools with a goal of reducing overall toolset*.

Although it remains in third place with 14%, *evaluate new needs and start from scratch* gained 6 points, up from just 8% last year. This may be a sign that the monitoring situation is becoming dire for many respondents, and they are ready to seek a new approach. We'll keep an eye on this trend for next year.

When you think about rationalizing your existing monitoring toolset, what is your preferred approach?



VMware Tanzu Observability

Tanzu Observability goes beyond monitoring, with cloud native observability to support the needs of modern cloud applications in multi-cloud environments.

Tanzu Observability delivers full stack enterprise visibility by ingesting, analyzing, and visualizing metrics, traces, event logs, and analytics from distributed applications and cloud infrastructure. Whether your goal is to extend your existing monitoring toolset, consolidate tools, or start over with a greenfield solution, Tanzu Observability addresses your needs. With 250+ integrations, Tanzu Observability works with your existing tools, offering a solution for every observability use case.

Summary and Recommendations

Observability gained significant momentum in the last year. With 70% of those surveyed either using, implementing or evaluating observability tools, observability has reached a tipping point and is poised to enter the mainstream—98% report observability would benefit their organizations and more respondents this year (95%) agree that observability tools *enable technical teams to more effectively support business decisions.*

Today's IT landscape is complex, dynamic and multi-cloud. Monitoring can tell you something is wrong, but only observability can tell you why it is wrong and how to fix it. Observability provides visibility across the entire IT stack, from the health of applications to the underlying infrastructure, allowing organizations to innovate faster in cloud native environments. Observability resolves cloud complexity—teams can identify problems in complex cloud applications because they can see how all the underlying systems are connected, including containers, microservices and code.

Organizations that are using observability report significant benefits, with 87% rating the technology as either *necessary* (41%) or *very valuable* (46%). However, the sheer number of monitoring tools in most organizations' toolsets presents a problem, with almost half (46%) using more than 5 different tools. Just 7% of all respondents say they are *very satisfied* with their *current toolset for monitoring*. While there's a need to rationalize and simplify monitoring toolsets, a consensus on the best way to accomplish this hasn't yet emerged. Almost half (48%) believe it is best to *identify gaps in existing toolsets and acquire additional capabilities,* and 38% would prefer to *integrate existing or new tools with a goal of reducing the overall toolset.* While *evaluate new needs and start from scratch* was favored by just 14%, it was the only alternative that gained ground since last year.

If the findings of this survey resonate for your organization, consider looking for observability and monitoring tools that can reduce the size of your monitoring toolset while improving scalability and visibility across software and hardware domains. Ability to integrate with existing tools is essential since few are able to simply switch off existing monitoring. However, don't be afraid to consider a greenfield approach if it seems like the best path forward.

The right partners can provide help where and when you need it, whether that means identifying gaps, assisting with tool selection, or improving development and operational skills.

VMware Tanzu Observability

Try Tanzu Observability for Free

Learn more

vmware®