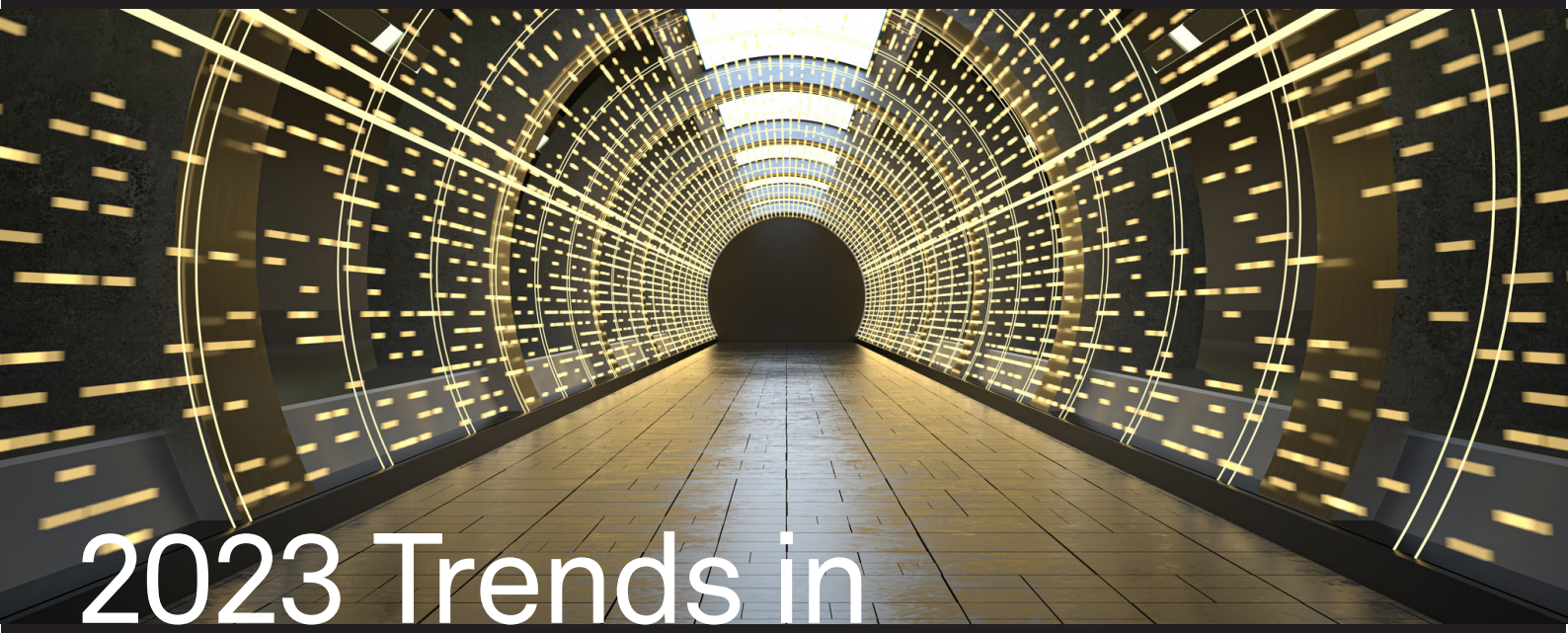
451 Research

S&P Global
Market Intelligence

2023 Preview

November 2022



2023 Trends in Cloud Native

William Fellows, Founder & Research Director, Cloud Native

John Abbott, Principal Research Analyst

Jean Atelsek, Senior Research Analyst, Cloud Transformation and Digital Economics Unit

Henry Baltazar, Research Director, Storage

Liam Eagle, Research Director, Head of Voice of the Enterprise & Voice of the Service Provider

Mike Fratto, Senior Research Analyst, Applied Infrastructure & DevOps

Eric Hanselman, Principal Research Analyst

Carl Lehmann, Senior Research Analyst, Applied Infrastructure & DevOps

Jay Lyman, Senior Research Analyst, Cloud Native and DevOps

Brian Partridge, Research Director, Applied Infrastructure & DevOps

Melanie Posey, Research Director, Cloud & Managed Services Transformation

A demonstration of this industry's superpower of abstraction in delivering Kubernetes has been a boon for organizations steeped in cloud-native engineering. However, it introduces its own set of problems for enterprises: how to secure connections between services in distributed environments, enable cost visibility and control, and ensure compliance with company and sovereign policies — all while maintaining innovation. It's these Day 2 challenges which are now being faced down.

To learn more or to request a demo, visit spglobal.com/marketintelligence.

Table of contents

Executive summary

Introduction

Momentum continues to shift to tooling that resolves Kubernetes' complexity for developers and operations teams. Securing the software supply chain remains a top priority, but the need for cost governance is rising as cloud-native deployments expand. The ecosystem is under some stress given post-pandemic churn and widespread talent shortages, but big tech suppliers and end users (e.g., Apple Inc., Intuit Inc., Amazon Web Services Inc.) are stepping up their open-source commitments, acknowledging that collective effort is the best way to solve common challenges and move to the next level.

About this report

Reports such as this showcase insights derived from a variety of market-level research inputs, including financial data, M&A information and other market data sources both proprietary to S&P Global and publicly available. This input is combined with ongoing observation of markets and regular interaction with vendors and other key market players.

This report specifically includes data from the following sources:

451 Research's Voice of the Enterprise: Storage, Data Management and Disaster Recovery 2022, a global survey of enterprise IT decision-makers familiar with storage technologies and services, fielded during January and February 2022.

451 Research's Voice of the Enterprise: Cloud Native, Adoption & Usage 2022, a survey of enterprise IT decision-makers at organizations currently making use of cloud-native technologies, fielded May 24-July 8, 2022.

The Take

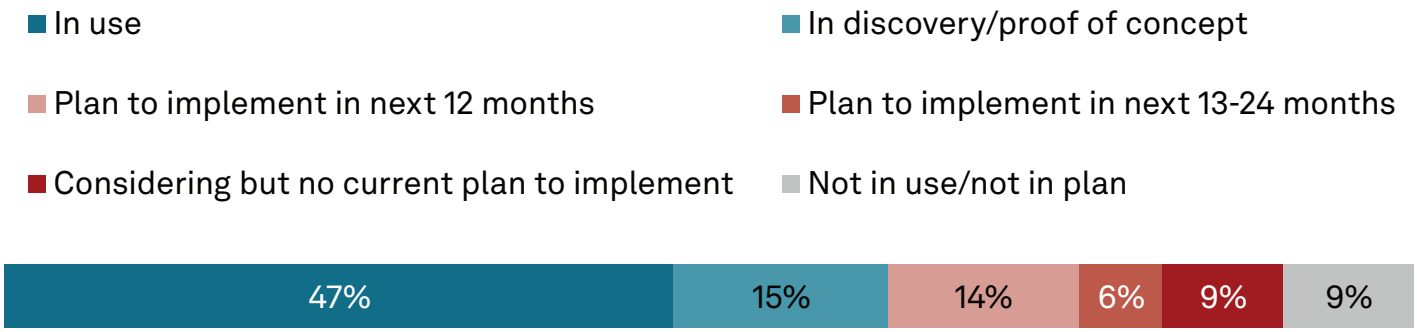
The focus for the ecosystem in 2023 is getting down to Day 2 business as cloud native becomes mainstream. Standardization on Kubernetes took the level of addressable infrastructure up a notch, from servers (virtual or physical) to clusters and pods that can run on any compliant infrastructure. While this abstraction has been a boon for organizations steeped in cloud-native engineering, it introduces its own set of problems for enterprises, such as how to secure connections between services in distributed environments, enable cost visibility and control, and ensure compliance with company and sovereign policies — all while maintaining innovation. Vendors and end users are wrestling with the complexity and limitations of deploying and maintaining applications in production. Issues of security, connectivity, telemetry and resiliency are bound up together in a way that IT hasn't had to resolve in the past, and vendors across the spectrum — from cloud-native startups to hyperscalers and incumbent hardware suppliers — are floating solutions to meet the need. Continued creation of abstractions that are more meaningful and powerful for customers continues both commercially and in community projects. The next wave of adoption will be by companies that don't have Kubernetes ninja teams, which means better tooling right across the landscape will need to be baked in. As such, Kubernetes is getting increasingly abstracted (often by platform engineering teams). The enterprise mix of cloud native that has historically been focused on containers and Kubernetes is shifting to include additional technology and methodology including serverless, service mesh and observability.

Trends we anticipate for 2023

Trend #1: Platform teams will drive cloud-native adoption

Just as containers shifted the IT conversation away from virtualized infrastructure, Kubernetes — the decided-on substrate for cloud-native applications — has become the backdrop to the action in this sector as vendors use it to deliver cloud-native services (connectivity, developer tools, security, etc.) across distributed environments. We're seeing the rise of platform teams as kingmakers in the enterprise, growing traction in the telco realm, a continuing focus on securing the software supply chain and expanded options for application networking (beyond service mesh). While adoption is accelerating, the market remains fragmented, with customers facing a massive amount of vendor and Cloud Native Computing Foundation (CNCF) options. The next wave of adoption will be by companies that don't have Kubernetes ninja teams, which means better tooling right across the landscape will need to be baked in by necessity. The next steps are to reduce cloud-native complexity and improve integration of its parts to drive increased developer productivity. Additional abstractions, unified APIs, a common dashboard and developer portal/PaaS — all of which are under way to different degrees at commercial vendors and as CNCF projects — will make Kubernetes in cloud easier to use. Meanwhile, the universal "shift left" into all of the 'ops' (e.g., DevOps, SecOps, FinOps, MLOps) demands investment in tools and training to fill the gap between Kubernetes and DevOps teams, a need that can also be met by platform engineers.

Figure 1: Cloud native is mainstream



Q. Overall, what is the state of adoption of cloud-native technologies and methodologies for application development or deployment within your organization today?
Base: All respondents (n=539)
Source: 451 Research's Voice of the Enterprise: Cloud Native, Adoption & Usage 2022.

Trend #2: Application modernization will remain a difficult part of IT transformation

In less than a decade, cloud nativity has become the prevailing mindset and methodology for application and infrastructure architecture modernization and transformation. Net new and modernized applications are increasingly being deployed on cloud-native platforms. Meanwhile, monolithic legacy applications (and the associated technical debt) endure, limiting enterprises' ability to reap the full range of clouds agility benefits. Deconstructing and modularizing monolithic code bases is not easy or straightforward. Organizations will increasingly look to automation and managed/professional services to modernize their application estates to keep the IT transformation train on track.

Trend #3: Cloud-native 5G networks will hit the mainstream phase

The success of 5G at its core will be determined by the extent to which telecom vendors and their customers can master cloud-native technologies and practices. So far, results have underwhelmed during initial rollouts. The next radical shift in network service delivery architecture and approach — to cloud native and DevOps — is necessary to fully take advantage of 5G capabilities such as slicing and network programmability, which will enter the mainstream in 2023. Cloud-native design and deployment principles bring an optimal mix of application portability, reusability, time to market, automation and scale for the next generation of network operations and monetization. 5G core — and by extension edge — are "killer apps" for cloud native.

Trend #4: AIOps will see observability's role continue to expand

Observability platforms create a system-wide view of an entire application and its infrastructure and generate models of the application stack that are used for context tasks such as performance analysis, troubleshooting and forecasting. AIOps relies on accurate, reliable and timely data that feeds machine learning (ML) and AI engines, which then create recommendations for optimizing and troubleshooting applications, with the goal of automated workflows. As DevOps teams continue to distribute applications across multiple clouds, the resulting infrastructure will become too complex to manage efficiently. Teams will rely on observability platforms to provide an accurate and current view of the application estate upon which AIOps operates. None of this will happen overnight. DevOps teams will have to gain confidence in the accuracy of observability data and the generated recommendations before they will use them to automate tasks. Based on past performance, we expect the use of observability platforms to continue to grow; supporting AIOps is a natural fit. This means we will also see a growth in ML and AI based on observability data and an emphasis on tooling and visualizations to help teams assess the accuracy of the analytic output.

Trend #5: The event-driven enterprise will modernize apps and processes

The event-driven enterprise maintains a constant state of awareness and can quickly sense and respond — reactively, proactively and even autonomously — to sudden change, market dynamics, risks posed by rivals and customer opportunities. Out-of-stock inventory, failed financial transactions, delayed customer orders, unfulfilled claims, unexpected customer demand, production line problems, equipment failure and predatorial strategies from aggressive rivals are examples of business events that must be remedied quickly, if not predicted.

Event-driven enterprises are modernizing the applications and processes they use to run and manage their digital businesses. They are using cloud-native computing and software design patterns to perform operations that respond to notifications of current or predicted "events." Event-driven enterprises are able to sense, interpret, decide and act accordingly, in real time, upon events that then rapidly trigger communications between, and actions among, interested and effected services, systems and stakeholders.

The promise of an event-driven enterprise has been discussed for several years now, but the technology needed to enable it efficiently and reliably was lacking. This has changed. The advent of cloud-native computing, the emergence of several classes of discovery technologies, the evolution of analytics and AI technologies, and new low-code application development platforms can now make the concept of an event-driven enterprise a reality.

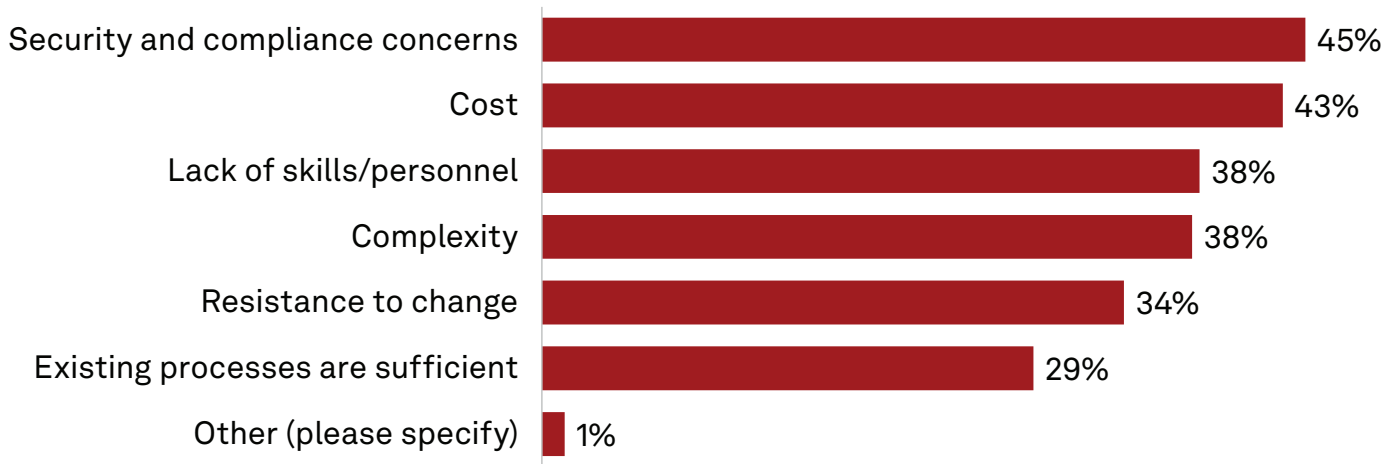
Trend #6: Workload deployment strategies will continue to evolve along with the cloud operating model

The cloud operating model (flexible, on-demand infrastructure managed independently of the applications on top) once applied only to public cloud. Now it applies to a way of doing things — not a specific destination or workload deployment venue — and includes both private and public clouds, and brings in core, cloud and edge operations. Modern, digital-era IT environments built on the cloud operating model involve more than just a choice between on- and off-premises IT resources and operations. They include other considerations such as how enterprises want to consume infrastructure, how they want to pay for it and who is best placed to supply it to deliver specific technology and business outcomes. This new IT paradigm increases complexity and heightens the need for interoperability and cross-environment management. As a result, market dynamics will shift dramatically as vendors across IT jostle for position in the "cloud anywhere" landscape.

Trend #7: Cloud-native deployments will have security baked in

Security remains top of mind in the Kubernetes ecosystem, and it is one of the top barriers to cloud-native adoption (see Figure 2). Organizations are compensating for the loss of security visibility in the shift to distributed applications with vulnerability and image scanning as part of software release cycles. But this isn't enough: With a large share of code being procured via open-source repositories, software bills of materials and code signing are taking their place as proactive measures to ensure that inputs haven't been tampered with. The focus of cloud-native security is building in capabilities early in the deployment process to "shift left" the guardrails and protections that can keep development and operations teams operating at speed. The market is complicated by vendor expansion into new areas of controls, creating overlaps in coverage and duplication of functionality as they vie for competitive position.

Figure 2 Challenges of cloud-native adoption



Q. What are the primary barriers to greater use of cloud-native technologies such as containers, Kubernetes or serverless in your organization. Please select all that apply.
Base: Organizations with cloud-native technologies in-use or proof of concept for application development/deployment.
Source: 451 Research's Voice of the Enterprise: Cloud Native, Adoption & Usage 2022.

Trend #8: Cloud native will accelerate the enterprise appetite for professional and managed services relationships

Driven by the growing complexity of cloud platforms and feature sets, enterprises are more likely to lean on professional and managed services to support them in their transformation and modernization efforts, which are leading them toward cloud platforms and, increasingly, to cloud-native technologies and methodologies. Cloud-native approaches are both a catalyst for maximizing the value of the cloud and an accelerant for the complexity that is putting pressure on enterprise skill sets. This creates a valuable role for advisors in how enterprises conceive of, design and implement efforts to build or refactor applications using cloud-native methodologies. Service providers and technology suppliers across a variety of types are working to position themselves as trusted advisors capable of providing the necessary professional and managed services to enterprises undergoing these initiatives. Cloud-native capabilities will be critical for organizations seeking these roles, and acquiring the necessary skill sets will be a major priority, driving investment and potential acquisitions within the service provider space.

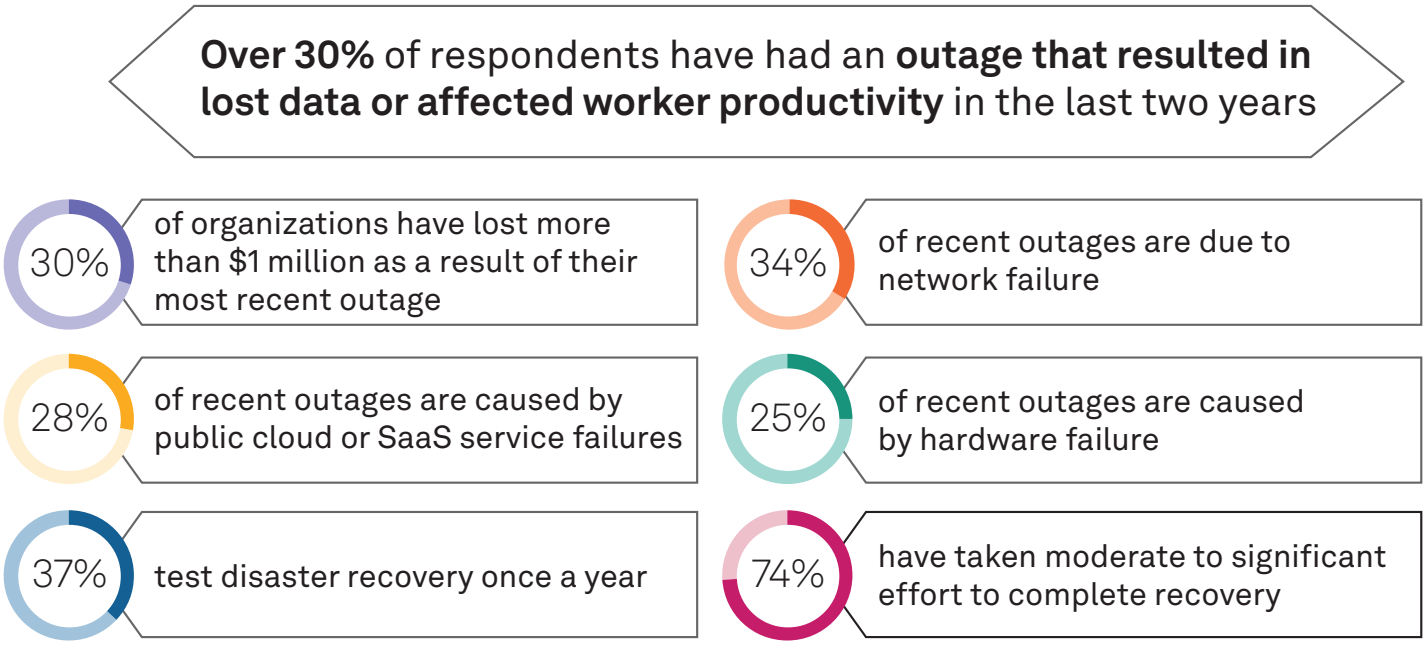
Trend #9: The need for resiliency and disaster recovery will continue to grow

The need and expectations for resiliency only continue to grow, and in the Voice of the Enterprise: Storage, Data Management and Disaster Recovery 2022 study nearly a third of respondents suffered a significant outage in the last two years, and approximately 30% of recent outages cost the organizations affected more than $1 million (see Figure 3). The growing threat of ransomware has forced organizations of all sizes to rethink their standards for resiliency and disaster recovery, while also providing C-suite executives with an existential threat that will drive data protection investments to avoid a crisis.

The future of resiliency extends well beyond traditional data protection tools such as backup and disaster recovery software and services. Cloud-based data protection is already the norm, with just 28% of respondents favoring on-premises only for backup and disaster recovery use cases. The rise of cloud-native technologies such as containers, microservices and observability have given organizations the ability to build resiliency into their applications and leverage automation and cloud elasticity to restart workloads in alternative execution venues when a disaster or other incident impacts the primary site.

Expect to see tighter communication and collaboration among the various groups within an organization, including infrastructure teams, DevOps, developers, security and compliance teams. Also expect infrastructure players to continue to add new partnerships with security software and services players to make their tools more proactive about detecting potential issues and to accelerate the recovery process after an attack.

Figure 3: State of disaster recovery



Q. When was the last time your organization experienced an outage that resulted in lost data or affected worker productivity? Base: All respondents (n=372).
Q. Please estimate the total cost to your organization of its most recent cloud outage or downtime (from outage to full recovery, including direct costs, opportunity costs, etc.) Base: Organizations with recent service outages/incidents and have estimated costs (n=192).
Q. What was the cause of your organization's most recent outage that resulted in lost data or affected worker productivity? Please select all that apply. Base: Organizations that had an outage that resulted in lost data or lost worker productivity (n=256).
Q. How much effort is required to resume normal operations after a failure (i.e., a failback)? Base: All respondents (n=367).
Source: 451 Research's Voice of the Enterprise: Storage, Data Management and Disaster Recovery 2022.

Trend #10: Hybrid cloud storage will bridge the gap between on-premises and public cloud

Hybrid and multicloud infrastructures are the desired state for many organizations, though customers are still facing numerous challenges as they build out their deployments. Data migration continues to be a key challenge for customers and in the Voice of the Enterprise: Storage, Data Management and Disaster Recovery 2022 study, and we are seeing organizations changing their strategies for moving data, with 34% now using provider enabled transports for data migration, which was up substantially from 18% two years ago. Given that the future of infrastructure is likely "all of the above," organizations should carefully examine how they will securely and quickly migrate data between a wide variety of execution venues including on-premises datacenters, public cloud, SaaS environments and the edge.

With inflation already having a major impact on the price of infrastructure hardware and cloud services, the need for cost optimization has never been greater for companies. Optimization and planning must not only account for the cost of the cloud resources consumed when workloads shift to public cloud, but also the potential egress and API access charges that occur when data must be repatriated out of public clouds.

Cloud-native storage and data protection vendor ecosystems continue to evolve at a rapid rate, and customers are now starting to see the benefits of newer tools. In the study, 58% favor backup/disaster recovery tools optimized for container platforms, while just 29% are committed to using legacy tools to handle cloud-native workloads.

Methodology

S&P Global Market Intelligence provides essential insight into key trends driving digital transformation across the entire technology, media and telecommunications (TMT) landscape. By offering a combination of expert analyst insight and differentiated data, our TMT Research group enables the industry with the information and perspectives they require to make more effective decisions.

Reports such as this offer a holistic perspective on key trends and themes driving the technology, media and telecommunications space over the coming year. These markets evolve quickly, so S&P Global Market Intelligence offers a wide range of research services that provide critical marketplace updates on an ongoing basis. These reports, datasets and perspectives are published frequently, in numerous short- and long-form factors, available on S&P Capital IQ Pro and 451Research.com. Forward-looking M&A analysis and perspectives on strategic acquisitions and the liquidity environment for TMT companies are also updated regularly via these platforms, backed by industry-leading databases such as the 451 Research M&A KnowledgeBase.

Our research is organized into channels that align with the prevailing key issues driving digital transformation across TMT. These channels include: Applied Infrastructure & DevOps; Cloud Transformation; Cloud Native; Customer Experience & Commerce; Data, AI & Analytics; Datacenter Services & Infrastructure; ESG; FinTech; Global Media; Global Mobile; Global Multichannel and Broadband; Information Security; Internet of Things; and Workforce Productivity & Collaboration.

For more information about S&P Global Market Intelligence, please go to: Vital TMT Insight | S&P Global Market Intelligence (spglobal.com).

For more information about 451 Research, please go to: www.451research.com.

Further reading

Survey Data Hub - Voice of the Enterprise: Cloud Native, Adoption & Usage 2022, August 2022

Survey Data Hub - Voice of the Enterprise: Cloud Native, Observability 2022, September 2022

Enterprises anticipate a growing embrace of cloud-native practices – Highlights from Voice of the Enterprise: Cloud Native, August 2022

Kubernetes primer: The technology and its market, August 2022

Value sought and gained in observability tools differs – Highlights from VotE: Cloud Native, August 2022

KubeCon Europe 2022: What's next for Kubernetes?, July 2022

About the authors

William Fellows
Founder & Research Director, Cloud Native

John Abbott
Principal Research Analyst

Jean Atelsek
Senior Research Analyst, Cloud Transformation and Digital Economics Unit

Henry Baltazar
Research Director, Storage

Liam Eagle
Research Director, Head of Voice of the Enterprise & Voice of the Service Provider

Mike Fratto
Senior Research Analyst, Applied Infrastructure & DevOps

Eric Hanselman
Principal Research Analyst

Carl Lehmann
Senior Research Analyst, Applied Infrastructure & DevOps

Jay Lyman
Senior Research Analyst, Cloud Native and DevOps

Brian Partridge
Research Director, Applied Infrastructure & DevOps

Melanie Posey
Research Director, Cloud & Managed Services Transformation

About S&P Global Market Intelligence

S&P Global Market Intelligence's Technology, Media and Telecommunications (TMT) Research provides essential insight into the pace and extent of digital transformation across the global TMT landscape. Through the 451 Research and Kagan products, TMT Research offers differentiated insight and data on adoption, innovation and disruption across the telecom, media and technology markets, backed by a global team of industry experts, and delivered via a range of syndicated research, advisory and go-to-market services, and live events.

CONTACTS

The Americas
+1 877 863 1306
market.intelligence@spglobal.com

Europe, Middle East & Africa
+44 20 7176 1234
market.intelligence@spglobal.com

Asia-Pacific
+852 2533 3565
market.intelligence@spglobal.com
www.spglobal.com/marketintelligence