
Report

# 2023 State of CloudOps

A survey of IT cloud decision makers

dimensional research

Spot by NetApp

# Introduction

Modern businesses are rapidly expanding their use of public cloud for an ever-growing list of applications and services. But as more cloud-focused solutions are thrown into the mix, the more complex things get for enterprises. Every cloud has its rules, tools, and processes, but businesses often struggle to fill their teams with specialists for one cloud provider, let alone multiple.

To clearly understand what services are in use and how they are consumed enterprise-wide, IT organizations should adopt a forward-thinking CloudOps mindset. CloudOps draws on the DevOps principles of automation, continuous improvement, and collaboration to remove complexity and increase efficiency when managing the costs, security, and performance of cloud-based workloads and applications.

Effective CloudOps teams can control costs, improve security, optimize resources, and provide superior services across their cloud environments. These teams can also leverage FinOps, the cross-functional cloud financial management discipline and cultural practice that promotes visibility and collaboration to help organizations manage, optimize, and predict their cloud spend.

But has the cloud fulfilled its promise of organizational transformation, or has it produced more chaos and out-of-control expenses? What is the current reality for teams embracing CloudOps? How do their real-life experiences and outcomes compare to the hype? This study examines the current state of CloudOps for large enterprise teams, primarily focusing on operational activities, staffing and expertise, automation, and FinOps.

The following report, sponsored by Spot by NetApp and conducted by Dimensional Research, is based on an online survey of 310 IT decision makers in the United States responsible for public cloud infrastructure investments. All participants worked in companies that have invested significantly in public cloud infrastructure (IaaS) and have more than 500 employees. Certain questions were repeated from similar prior surveys to enable trend analysis.

This report is in its fifth year in publication and was formerly known as the CloudCheckr Cloud Infrastructure Report.

# Key findings

Cloud operations remains a struggle for IT teams

Automation is the key to success in cloud operations

Enterprise teams are embracing FinOps

# Key findings

Finding #1

## Cloud operations remains a struggle for IT teams

- Only 33% are “very confident” in their ability to operate a public cloud environment
- The top challenges are security and compliance (64%) and cost management (60%)
- Cost management and security tie for top focus area for cloud operations in 2023 (both 66%)
- 45% continue to use spreadsheets and manual methods for cloud costs and budgeting
- 70% have invested in commercial, open-source, or custom solutions for cloud cost management

Finding #2

## Automation is the key to success in cloud operations

- 95% have automated cloud operations; 15% say they have a “significant” level of automation
- Those with “significant automation” say they are very confident (60%) about their visibility into cloud costs compared to only 22% of those with “partial automation” and 14% with “minimal or no automation”
- 82% say automation is “critical” or “very valuable” for optimizing cloud operations and ROI
- 88% plan to increase cloud operations automation in 2023

Finding #3

## Enterprise teams are embracing FinOps

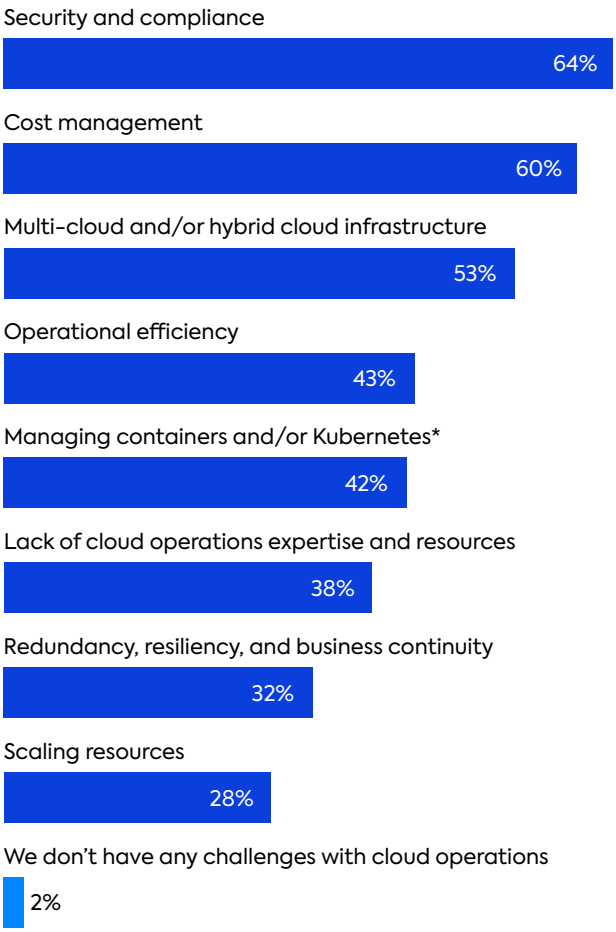
- 96% say FinOps is important to their cloud strategy, but only 9% have a mature FinOps practice
- 92% struggle with FinOps, especially around reducing cloud costs (50%) and forecasting cloud spend (47%)
- The most frequently automated FinOps processes today are cloud usage notifications (55%) and resource sizing (39%)
- Only 19% report that their use of discounted cloud purchase options has been effective
- The most common areas of additional investment in automation planned for 2023 include optimizing the use of compute purchasing options (30%) and container infrastructure right sizing (30%)

# Detailed findings

Finding #1

# Cloud operations remains a struggle for IT teams

**What challenges does your company face with cloud operations?**
Choose all that apply.




*among those using containers

## Security and cost top the list of cloud operations challenges

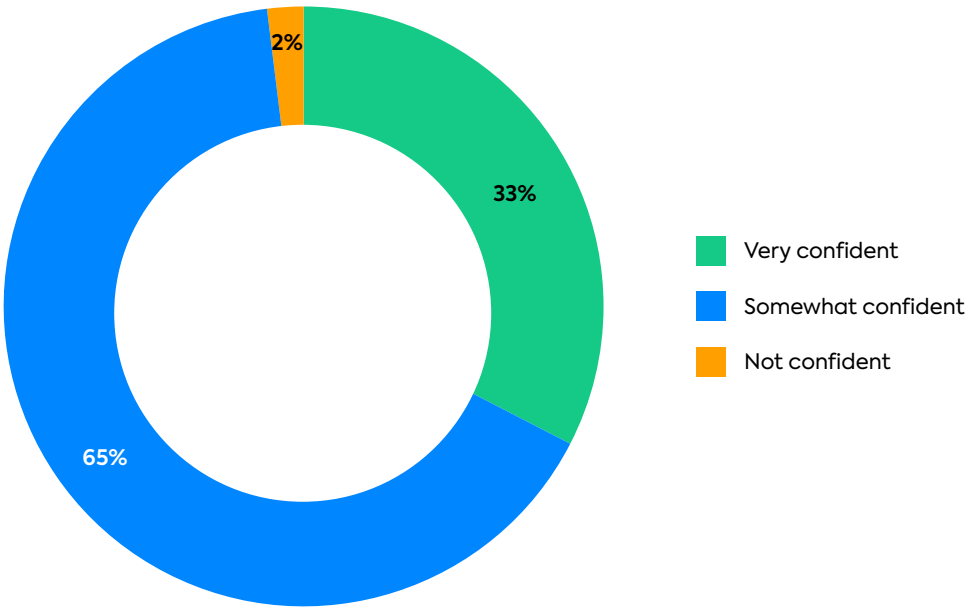
Cloud usage is transformative, but operating in cloud environments can often be messy. Success requires the right operating model, tools, and personnel skillset. As this next era of CloudOps continues to evolve, almost all large enterprises (98%) acknowledge that their organization faces obstacles with cloud operations.

When we dig deeper to explore cloud operations challenges, there are three leading issues identified: security and compliance (64%), cost management (60%), and multi-cloud or hybrid cloud infrastructure (53%). Other frequently reported challenges are achieving operational efficiency (43%) and a lack of cloud operations expertise and resources (38%). We will discuss container usage more later in this report, but for now, note that managing containers and Kubernetes is often cited as a challenge for the 42% of companies that use containers.

## IT teams lack confidence in their company's ability to operate public cloud environments

Cloud environments are complex with a wide range of challenges, such as keeping up with rapidly evolving technology and inability to easily manage sprawl. However, public clouds are hardly new to IT teams, so it is somewhat surprising that only one-third of cloud stakeholders (33%) characterize themselves as "very confident" in their company's ability to operate public cloud environments effectively.

**Which of the following statements best represents your level of confidence in your company's existing capabilities to effectively operate public cloud environments?**




Since cost management ranked high among this year's CloudOps challenges, it's essential to gauge stakeholder confidence levels in visibility into their company's cloud costs. When we compare 2023 responses to those from previous studies, the data shows that stakeholder confidence in this type of visibility has risen only slightly. For 2023, 25% said they were "very" confident in their visibility into cloud costs, only slightly higher than the 20% who said the same in 2021. This slight trend suggests that confidence in cloud cost visibility is growing but still has significant room for improvement.

**How confident are you that your company has visibility into all aspects of your company's public cloud costs?**


## Cost management and security are top areas for cloud improvements in 2023

Since 2021, the three primary areas of public cloud improvements have been consistent — cost management, security, and automation of processes. For 2023, those top priorities have shifted, with cost management rising to share the number one spot, with security, for the first time. In 2022, security was by far the top area of improvement (74%), process automation was second (67%), and cost management was third (60%). This year, cost management ties with security at the top of the list (both 66%), followed by process automation (60%). This trend aligns with the current economic state as more financial vulnerabilities have risen, and companies are looking for more ways to reduce their bottom lines. Still, they cannot sacrifice security to get there.

**Which of the following areas of your company's public cloud use would your company like to improve for 2023?**
Choose all that apply.

## Large enterprises are turning to purpose-built tools for managing cloud costs

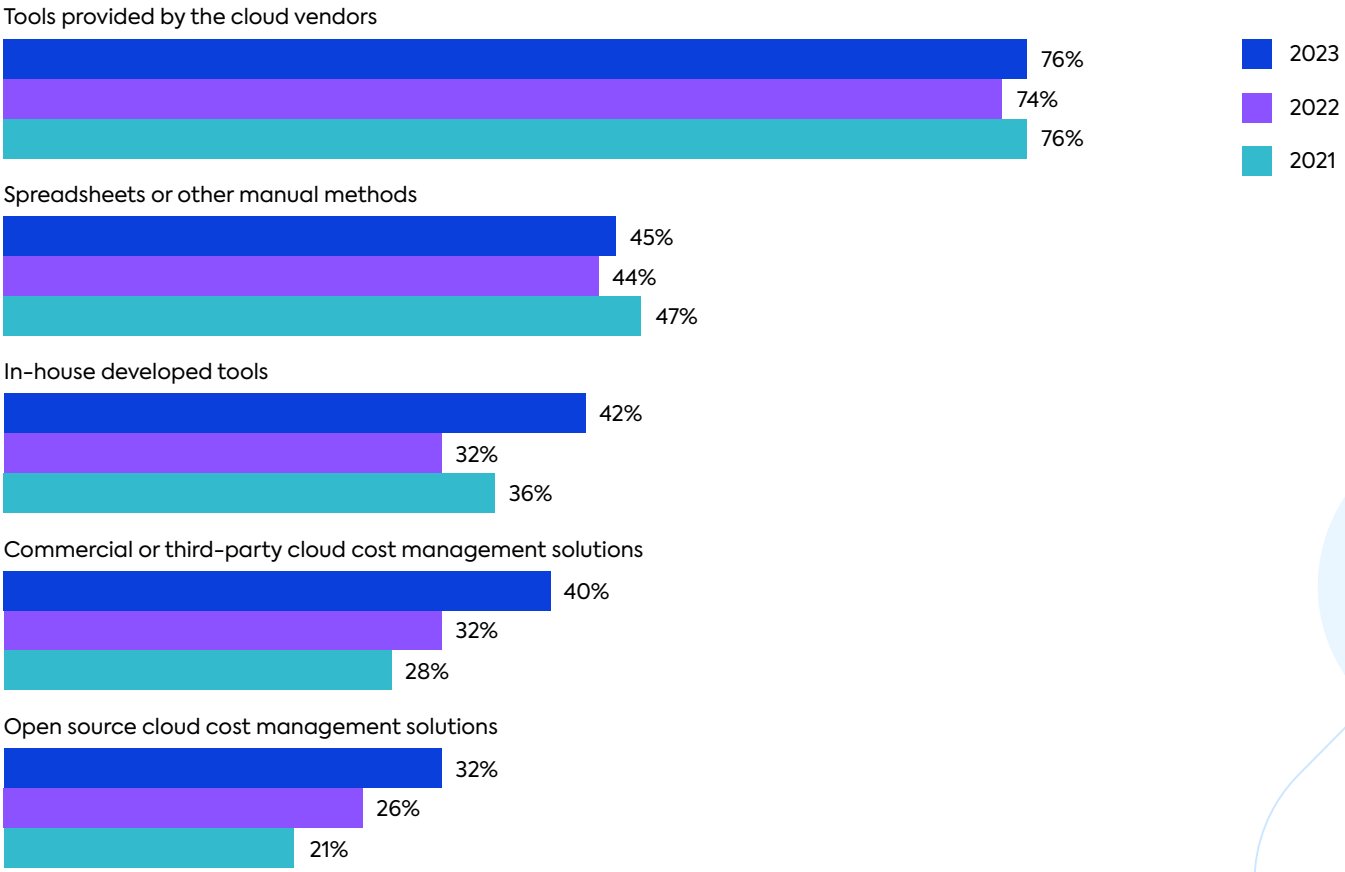
Because cost containment is vital to the business, investing in tools is more critical now than ever. Let's consider the most common approaches used to track cloud costs and budgeting.

There are tools offered by Amazon, Microsoft, and other vendors for managing cloud environments. These have consistently been the most widely used tools, and unsurprisingly, this has not changed for 2023, with three in four (76%) companies reporting their use.

In addition, spreadsheets and manual methods are an easy way to get started with any type of tracking and management, including cloud costs. For the third year in a row, this is the second most common type of tool used (45%). Given the lack of scalability and error-prone nature of tracking using manual methods, it is worrisome that this number is not decreasing.

Where we do see a change is in the types of tools used that are purpose-built for cloud solutions. This year there is a notable increase in the use of cloud cost and budgeting solutions, both "build" solutions that are developed in-house (42%) as well as "buy" solutions purchased from commercial vendors (40%). The use of open-source cost management solutions is also up for 2023 (32%).

**What tools does your company use to manage cloud costs and budgeting?**
Choose all that apply.



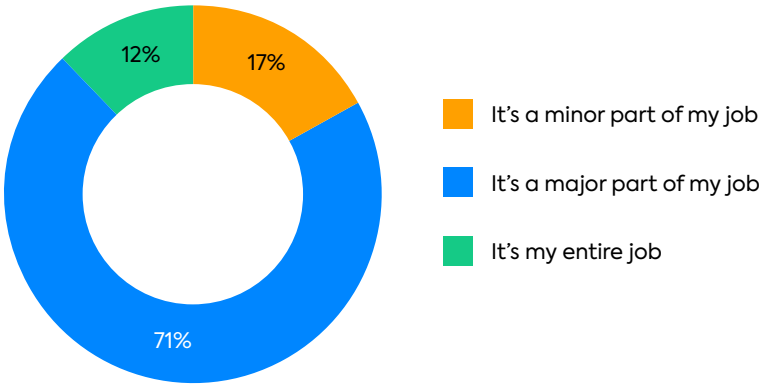
If we consider these three types of purpose-built cloud cost and budgeting solutions as a group — in-house, commercial, and open-source — we see a distinct upward trend in use. In 2023, 70% of companies report using at least one of these solutions. This number has risen notably over the past two years, compared to 63% in 2022 and 61% in 2021.

**Have invested in a dedicated cloud cost management solution**


## The CloudOps role is taking shape

We asked our survey participants, all with decision-making responsibility for public cloud, how much of their job was spent on CloudOps. While this question was asked primarily to help us understand the perspective of the individuals in our study, it also gave an interesting insight into the existence of dedicated CloudOps professionals. Within our study, we see that having CloudOps as the sole focus of a job is not typical, but it clearly exists (12%). For now, CloudOps is more likely to be a major part of an IT or application professional's role (71%) than it is to be considered a dedicated responsibility.

**Role with CloudOps**



Finding #2

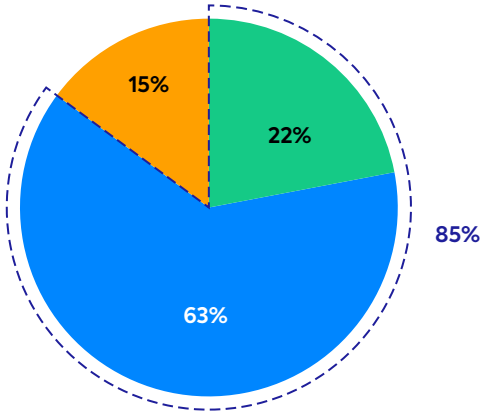
# Automation is the key to success in cloud operations

## Lack of cloud operations skills and expertise is impacting business outcomes

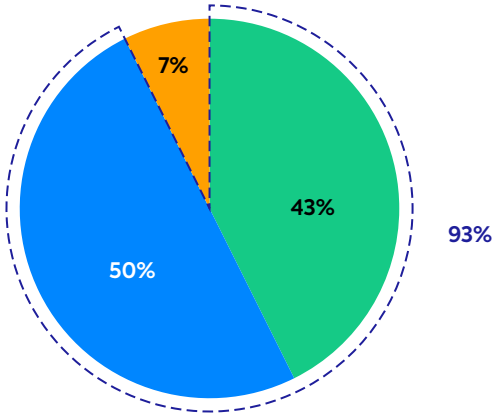
A low point of this year's study is an evident lack of cloud operations skills and expertise that is holding organizations back from achieving their critical objectives. When we asked cloud stakeholders if they believed this absent skillset negatively affected their organization's ability to meet their business goals, the majority (85%) admitted it did.

Automation is one possible solution for addressing a gap in technology skillsets. Cloud automation typically improves efficiency by replacing manual configuration processes with automated processes, enabling the management of more cloud resources by fewer people. Cloud stakeholders couldn't agree more, with the vast majority of those who reported a lack of skills saying automation would be helpful (93%) . Notably, 43% report that automation could "significantly" address their organization's gap in cloud infrastructure expertise.

**Do you believe a lack of cloud operations skills and expertise is impacting your organization's ability to meet key business goals?**




**In your opinion, could automation help address your company's lack of cloud infrastructure skills?**

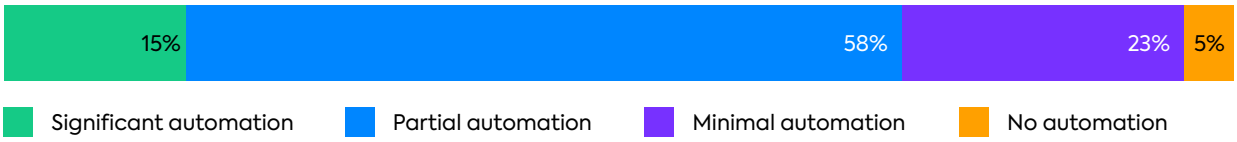



n = lack of skills is impacting business goals

## CloudOps automation is ubiquitous, but limited

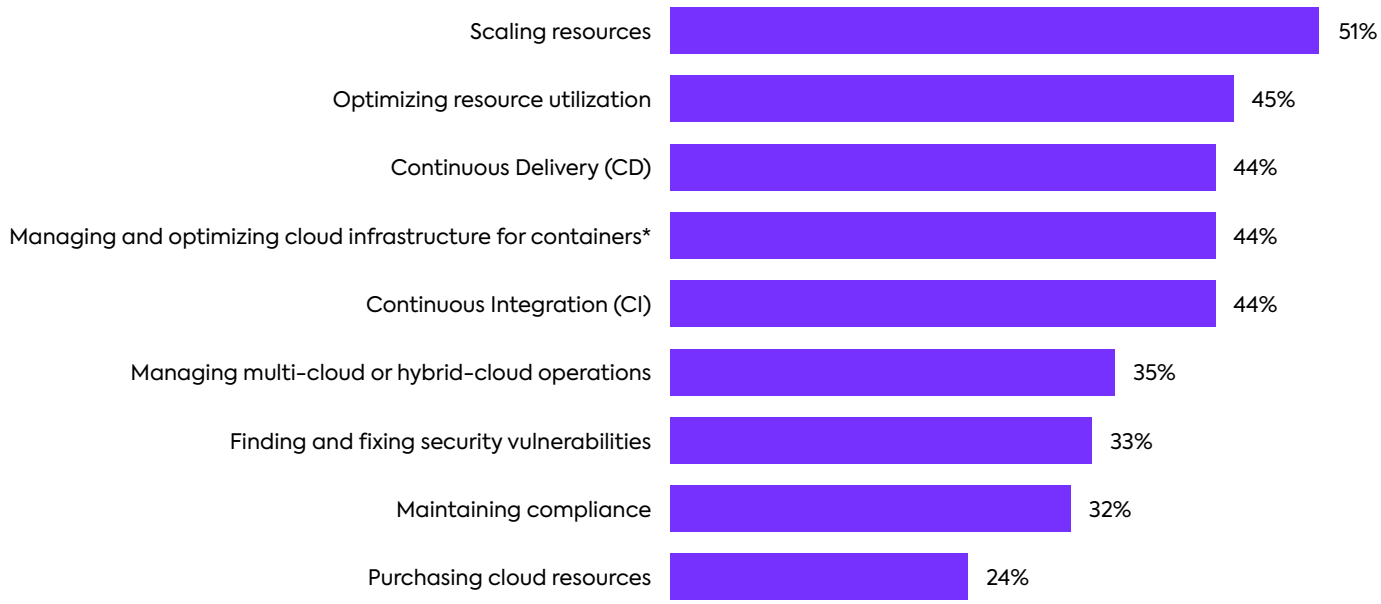
The good news is that an overwhelming number of companies (95%) do some level of CloudOps automation today — anything from compute provisioning to commitment management to resource scaling. A large number (81%) of stakeholders characterize their company's existing level as either partial or minimally automated, while only 15% say they do it "significantly," which leaves ample room for improvement.

**How would you characterize your company's existing level of cloud operations automation (compute provisioning, commitment management, resource scaling, etc.)?**
Choose the one answer that most closely applies.




Automation is happening across a wide variety of cloud operations tasks. The leading areas mentioned are scaling resources (51%), optimizing resource utilization (45%), continuous delivery (44%), continuous integration (44%), and more. Among companies that use containers, 44% are automating the management and optimization of cloud infrastructure for containers. These wide-ranging responses suggest a broad potential for automating additional areas of cloud operations.

**Which aspects of cloud operations does your company automate?**
Choose all that apply.




n = have automated cloud operations
*among those using containers

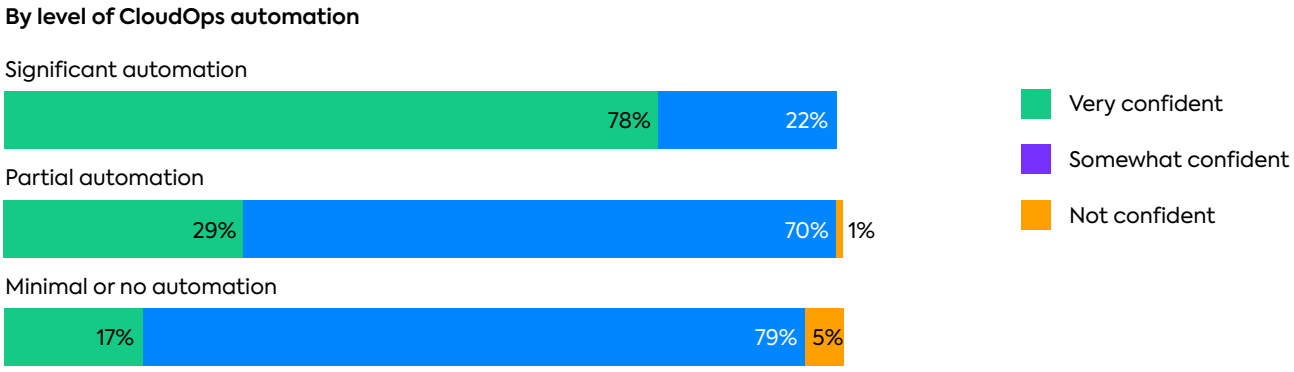
## High levels of automation map to dramatically higher levels of confidence

One very encouraging takeaway from the research is that greater amounts of CloudOps automation promote greater team confidence in effectively managing cloud environments. This trend stood out in two specific ways.

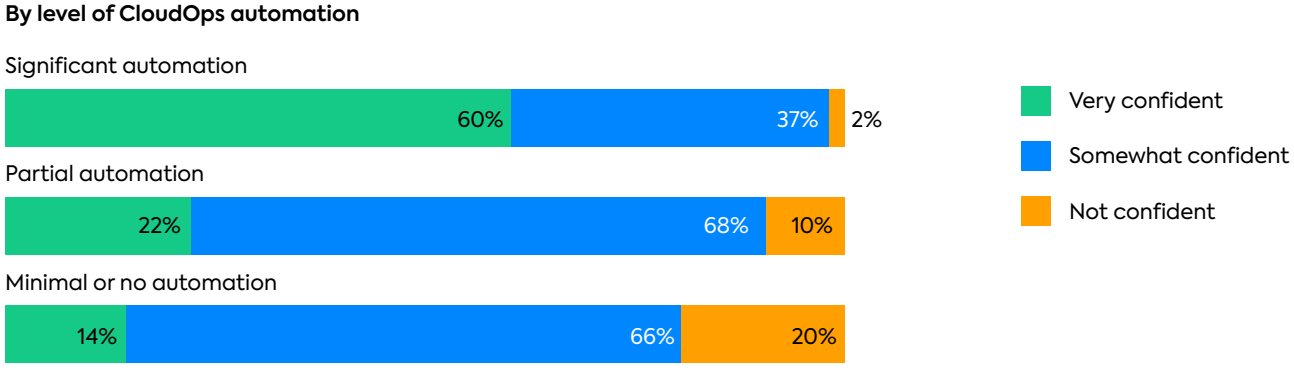
First, when participants were asked about their confidence levels in their company's existing capabilities to operate effectively in the cloud, we saw tremendous differences based on their level of automation. Among those who reported "significant automation," more than three-quarters (78%) said they are "very" confident in their company's ability to operate cloud environments, dramatically more than the 29% of those with "partial automation" and 17% with "minimal or no automation."

Second, we see the same pattern when we look at the confidence of visibility into cloud costs. Those with "significant automation" are far more likely to say they are very confident (60%) compared to only 22% of those with "partial automation" and 14% with "minimal or no automation."

**Which of the following sentiments best represents your level of confidence in your company's existing capabilities to effectively operate public cloud environments?**



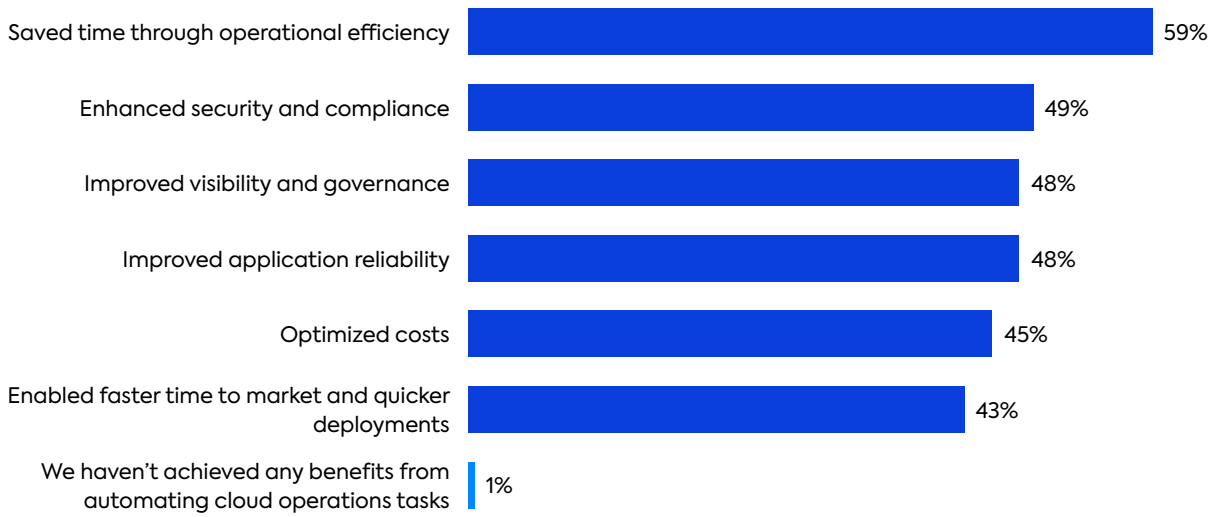

**How confident are you that your company has visibility into all aspects of your company's public cloud costs?**



## Companies are benefiting from automation, with time savings topping the list

While we clearly see benefits in confidence from adopting automation, does this translate to actual business benefits? According to cloud decision makers, almost all (99%) who have automated cloud operations tasks report that they have benefitted from doing so. The number one benefit cited is time savings (59%), followed by enhanced security and compliance (49%), improved visibility and governance (48%), more reliable applications (48%), optimized costs (45%), and faster time to market and quicker deployments (43%).

**What benefits has your company achieved by automating cloud operations tasks?**
Choose all that apply.

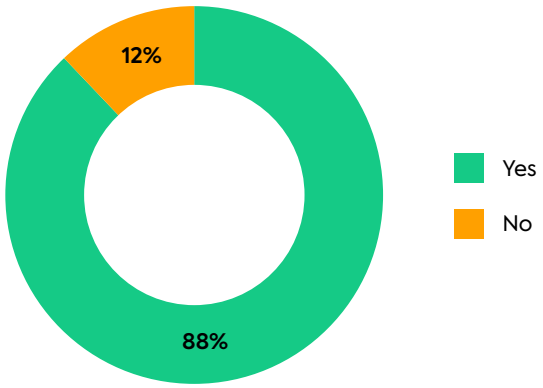



n = have automated cloud operations

## Most companies plan to increase cloud operations automation in 2023

Despite, or perhaps because of, an unpredictable economy with persistent inflation, a tight labor market, a looming recession, and continual supply chain disruptions, most businesses (88%) expect to increase automation in their cloud operations this year. In fact, 93% of the largest companies (with more than 5,000 employees) are planning to increase their cloud operations automation for 2023.

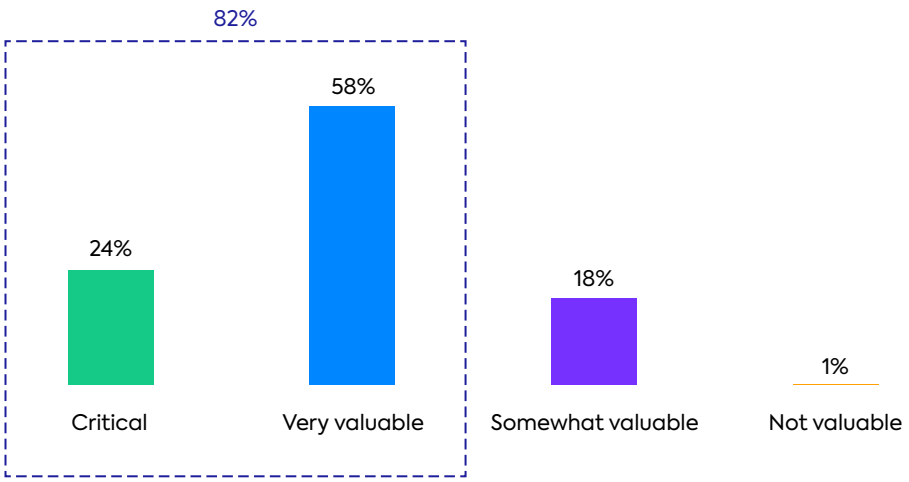
**Does your company plan to increase automation of cloud operations in 2023?**




## Automation benefits companies — and individual team members

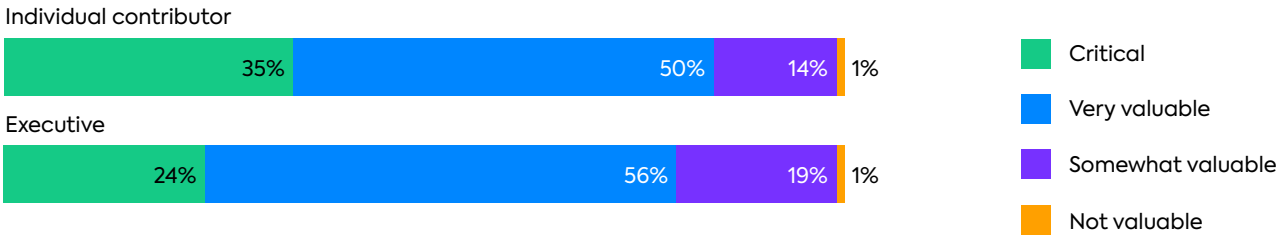
While our research generally tracks data trends at company and organizational levels, it's also imperative to factor in personal opinions about cloud operations. In this study, we asked cloud decision makers to share their own viewpoints about the value of automation for optimizing cloud operations and ROI. Almost all (99%) say that cloud operations automation is valuable, and of those, 82% characterize it as "critical" or "very valuable."

**What is your personal opinion about the value of automation for optimizing cloud operations and ROI?**



When we drill down on their responses by job position or classification, individual contributors are the most optimistic about the value of automation for optimizing cloud operations, with 35% reporting it is “critical” compared to 24% of executives. This data suggests that frontline staff are not scared about losing their jobs to automation but appreciate that automation helps them do their jobs more effectively.

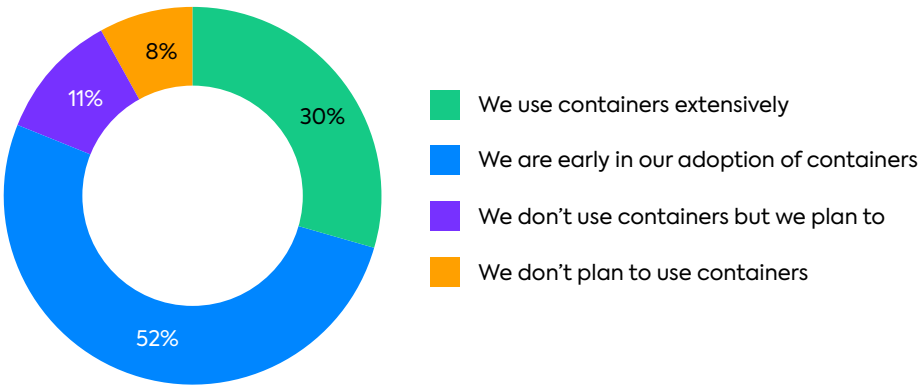
**What is your personal opinion about the value of automation for optimizing cloud operations and ROI?**




## Containers are ubiquitous — and so is automation for managing containers

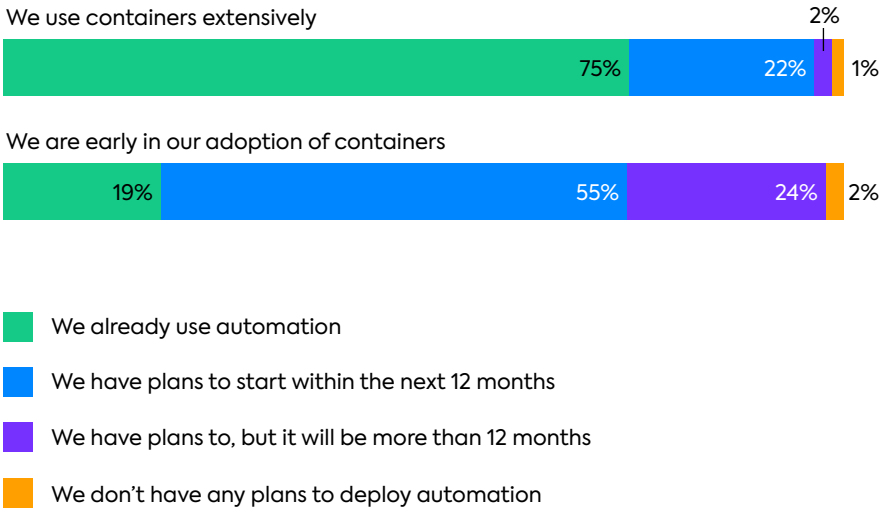
Containers are a common approach for deploying and managing services hosted in the cloud. A single container might be used to run anything from a small microservice or software process to a larger application. Most companies (92%) report using or planning to use containers for cloud operations, although it is a work in progress for many, with less than a third (30%) reporting that they use containers extensively.

**To what degree is your company using containers for cloud operations?**



Container adoption goes hand-in-hand with automation, and thinking strategically about scale means considering automation early. Companies that already use containers extensively rely on automation to help manage the infrastructure for containers, with 75% reporting the use of automation. Even those who are early in their adoption of containers report that they are already using automation (19%) or have plans to (79%, including 55% that will do so within the next 12 months).

**To what degree is your company using containers for cloud operations?**




Finding #3:

# Enterprise teams are embracing FinOps

## FinOps adoption is a work in progress

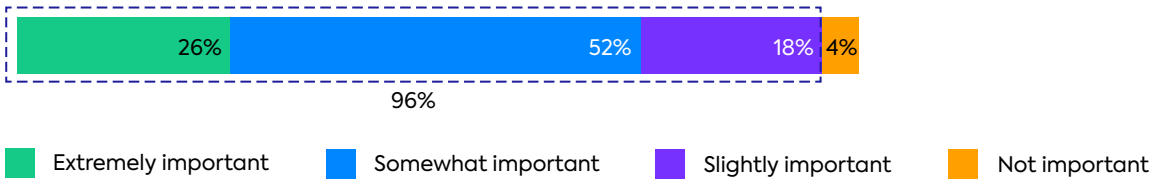
One way cloud decision makers can proactively manage their cloud costs is by implementing a FinOps, or cloud financial management, practice. More than simply managing and monitoring costs, FinOps takes a holistic view of the cloud's business value along with an organization's objectives. To understand this evolving aspect of cloud cost management, we asked participants questions about FinOps. We started by defining the term as a practice "designed to help organizations align cloud adoption and investment with business strategy and promote enterprise-wide acountability for cloud financial operations."

**Given this definition, how would you describe your company's adoption of FinOps?**


According to participants, FinOps is still a work process for their organizations, with 60% implementing it to some degree. This includes one in five (21%) who report they are starting to develop a FinOps practice and a third (30%) that have made some progress but are still working on it. Only 9% report that they have a mature FinOps practice. And just a small number (13%) report that they don't do any kind of FinOps.

Even though there is still more work to do, nearly all (96%) cloud decision makers believe FinOps is essential to their cloud strategy. This number includes a quarter (26%) who characterize FinOps as "extremely" important.

**In your opinion, how important is FinOps to the success of your company's cloud strategy?**

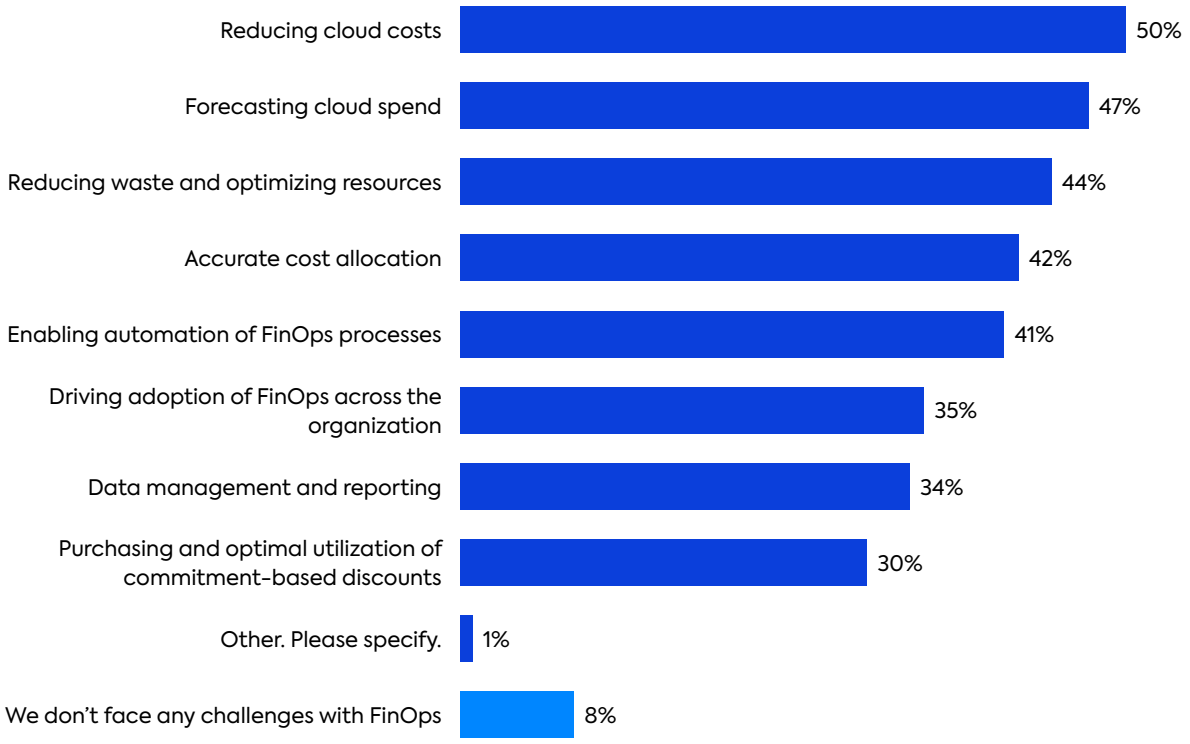


## Companies are struggling with FinOps

FinOps can be highly beneficial, especially now, as many organizations need help managing cloud costs and improving visibility into their spending. However, there is no silver bullet to this complicated business problem.

An overwhelming number (92%) of cloud stakeholders acknowledge their teams struggle with FinOps. Their main challenges are reducing cloud costs (50%), forecasting cloud spending (47%), reducing waste and optimizing resources (44%), allocating costs accurately (42%), enabling automation of FinOps processes (41%), driving adoption of FinOps across the organization (35%), managing data and reporting (34%), and purchasing and optimal utilization of commitment-based discounts (30%).

**What FinOps challenges is your company facing?**
Choose all that apply.




Several individuals also mentioned compliance, getting started, developing and implementing effective governance policies, managing vendor relationships, and navigating the changing landscape of cloud technology and pricing models as "other" FinOps challenges.

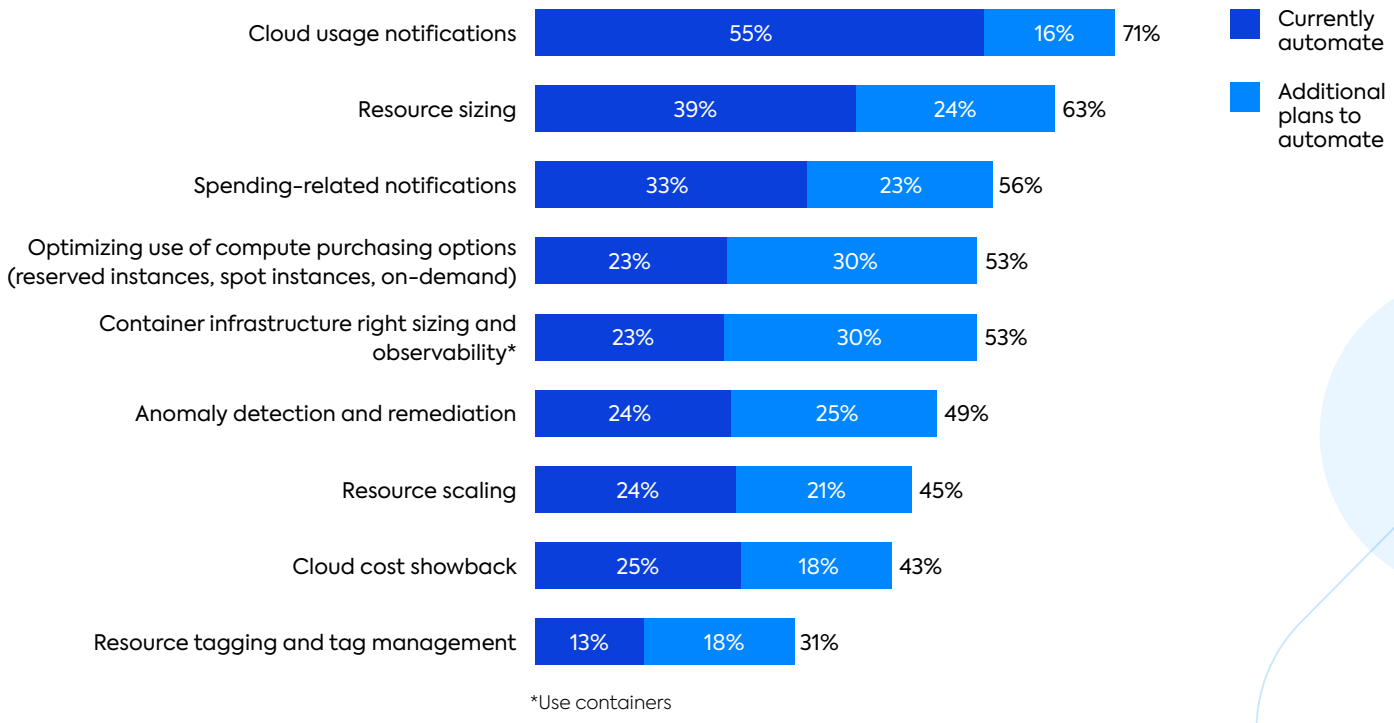
## FinOps automation is a work in progress

Challenges are not preventing companies from implementing automation of crucial FinOps processes. According to cloud stakeholders, 84% are already automating or have plans to automate key FinOps processes.

Automating usage notifications for cloud environments is already done broadly, with more than half (55%) of large enterprises already automating this fundamental task. A further 16% report that they will begin this type of automation within the next 12 months. Two-thirds (63%) will automate resource sizing, including 39% that already do so and a further 24% that will add this in the coming year.

The biggest area of focus for new FinOps process automation in the coming months will be optimizing compute purchasing options (30%). Among those adopting containers, an additional 30% will begin automation of infrastructure right sizing and observability for their container infrastructure, in addition to the 23% already doing so today.

**Which types of FinOps processes does your company CURRENTLY automate?**
**What ADDITIONAL FinOps processes does your company plan to automate within the next 12 months?**
Choose all that apply.



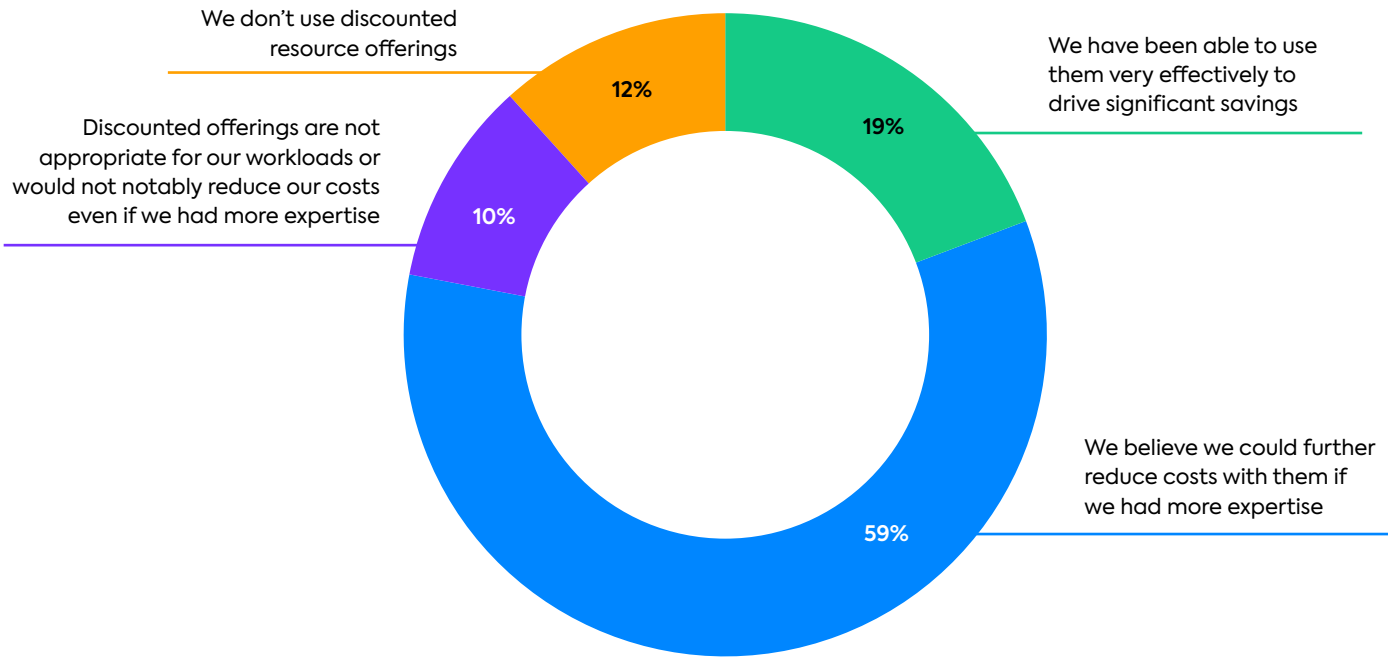

For simplicity, we have labeled the graphs in this report without decimal places. As a result, the sums calculated from the labels on this bar graph may be slightly larger or smaller than the totals displayed on the right side of the chart. These percent totals accurately represent the report data when calculated without rounding.

## Few stakeholders feel they are effectively using discounted offerings

Public cloud providers offer a wide range of procurement options for their customers. These options include reserved instances, savings plans, committed-use discounts, spot instances, and more. In theory, enterprises can take advantage of different cloud purchase options based on the specific needs of different environments to get the optimal return on their investment. In practice, the data shows that results so far have been limited.

When cloud decision makers were asked to describe their company's use of discounted offerings for cloud resources, only one in five (19%) felt they were effective. More than half (59%) believed they could further reduce costs if they had more expertise, while 10% admitted their discounted offerings are not appropriate for their workloads or would not notably reduce costs even if they had more expertise. Surprisingly, 12% don't use discounted offerings in any way.

**How would you describe your company's use of discounted offerings for cloud resources (e.g., reserved instances, savings plans, committed-use discounts, spot instances/VMs)?**



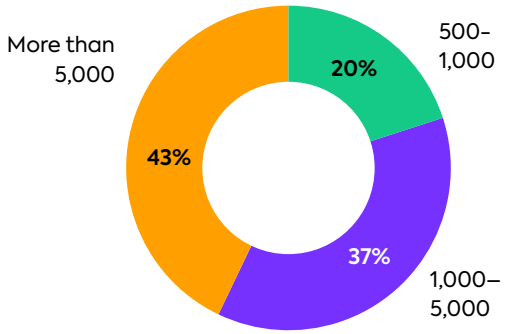

Interestingly, if we look at our question on FinOps challenges, optimal usage of commitment-based discounts was at the bottom of the list of FinOps problems faced by large enterprises. Considering that data point with the above graph, it suggests that companies simultaneously struggle with implementing discounted offerings and de-prioritize them in favor of tackling more pressing FinOps issues.

# Survey methodology and participant demographics

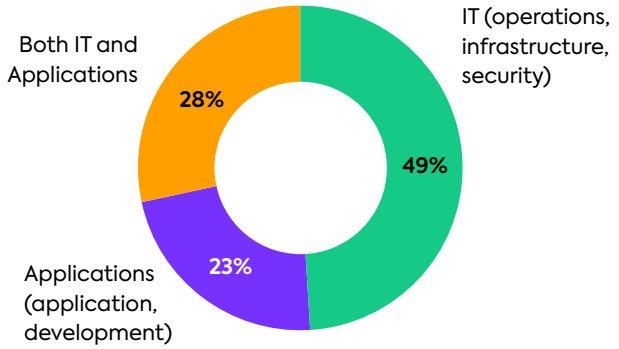
In March 2023, an online survey was sent to independent sources of IT stakeholders. A total of 310 qualified individuals completed the survey. All participants had decision-making (budget and/or technology selection) responsibility for public cloud infrastructure investments in an IT operations or applications role. All lived in the United States and worked in companies with more than 500 employees that had significantly invested in public cloud infrastructure. Participants represented a mix of industries, job levels, and functions.

Certain questions were repeated exactly as asked in prior surveys conducted in 2022 and 2021. Note that prior surveys included a segment of business stakeholders (finance, etc.) not included in the 2023 audience. To accurately compare trend data for 2022 and 2021, we used only the participants' responses in roles that match this audience. This represented just over 200 participants working in IT or applications roles for both prior surveys. Because of rounding, certain graph options may not add up to exactly 100%.

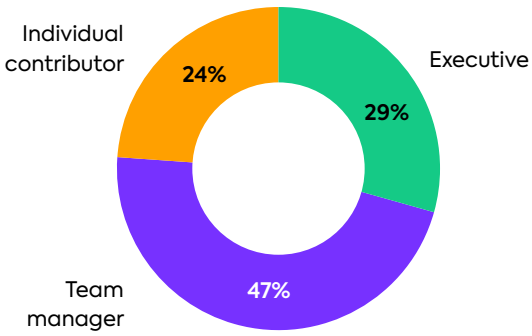
### Company size (# of employees)



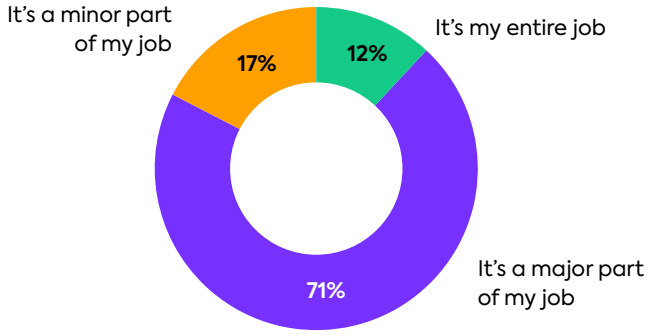

### Function



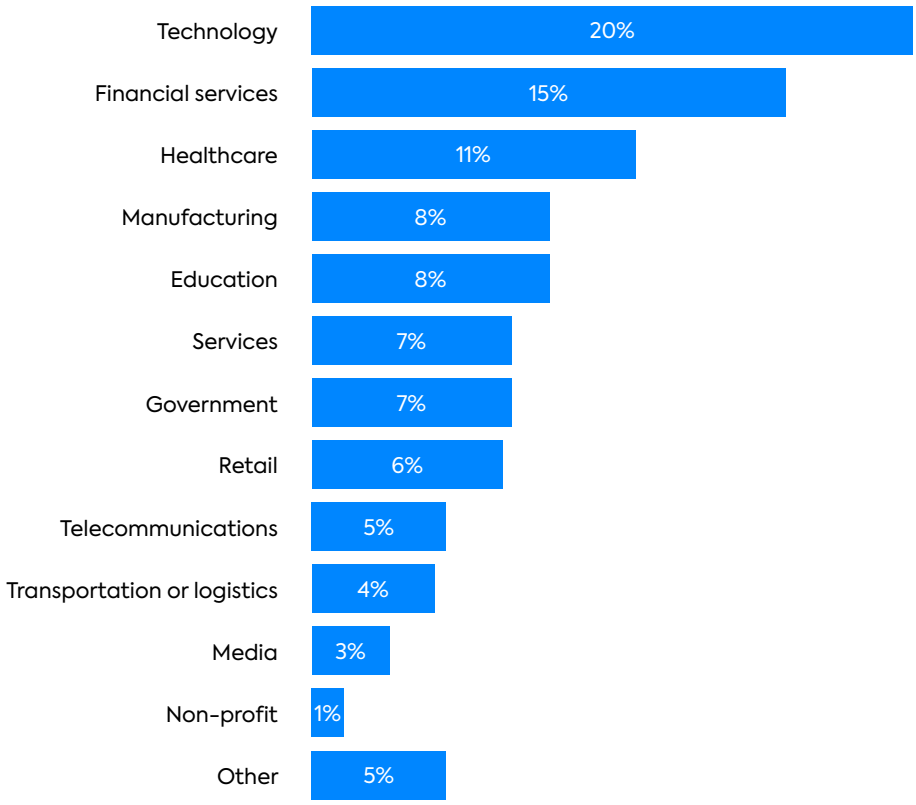

### Job level




### Role with CloudOps



## Industry




**A total of 310 qualified individuals completed the survey**

## About Dimensional Research

Dimensional Research® provides practical market research for technology companies. We partner with our clients to deliver actionable information that reduces risks, increases customer satisfaction, and grows the business. Our researchers are experts in the applications, devices, and infrastructure used by modern businesses and their customers. For more information, visit dimensionalresearch.com.

## About Spot by NetApp

The Spot by NetApp portfolio enables cloud operations teams to deliver scalability, performance and security for cloud infrastructure and applications — at the lowest possible cost — through continuous automation and optimization combined with deep visibility and governance. From cloud-native startups to global enterprises and managed services providers, thousands of customers rely on Spot solutions to unlock the full value of the cloud.

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