

2021 Global Tech Outlook

A Red Hat® report

Each year, Red Hat surveys Information Technology (IT) leaders and decision makers to learn about their digital transformations, and what their technology goals and priorities are for the coming year. This year, we added some questions about how the global pandemic is affecting technology planning for 2021. In July through September, we surveyed 1,470 IT professionals, mostly from companies with more than \$100 million in annual revenue. They were a mix of Red Hat customers and a broader industry panel.

So what are the 2021 IT trends? And how do they seem to be shifting in response to COVID-19 and other factors? The importance of innovation and security were constant themes.

Read on to understand the six main conclusions we gleaned from the survey.

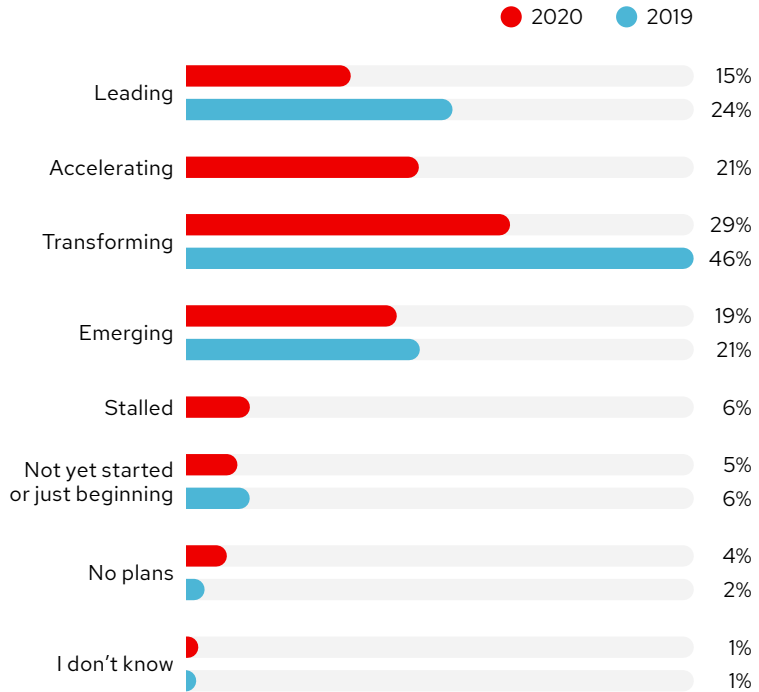
01

Digital transformation remains a priority.

A majority (65%) of respondents indicate they are well into their digital transformations—at the transforming phase of their digital journey or beyond.

Chart 1

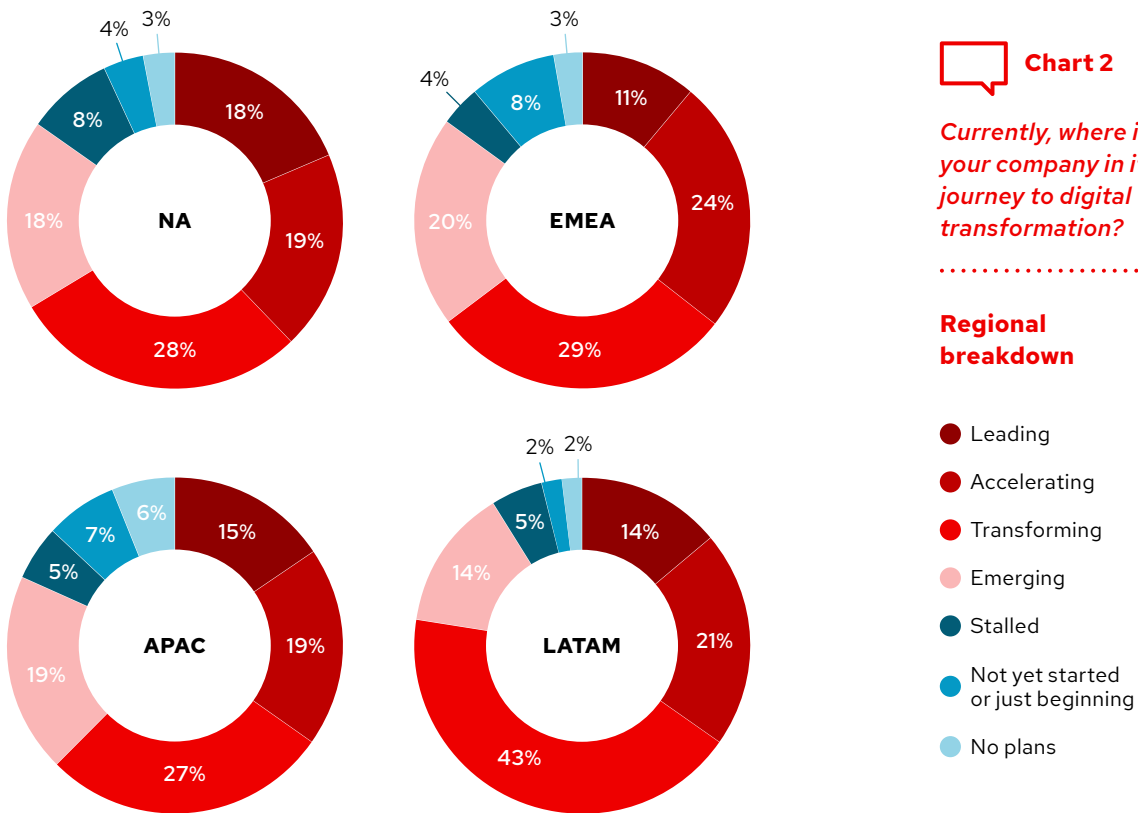
Currently, where is your company in its journey to digital transformation?



This year, we added 2 answer options with “Stalled” and “Accelerating,” where Stalled was defined as “pausing adoption of new processes and technologies,” and Accelerating was defined as “having to begin digital transformation efforts sooner than planned or speeding up efforts that are already in progress.”

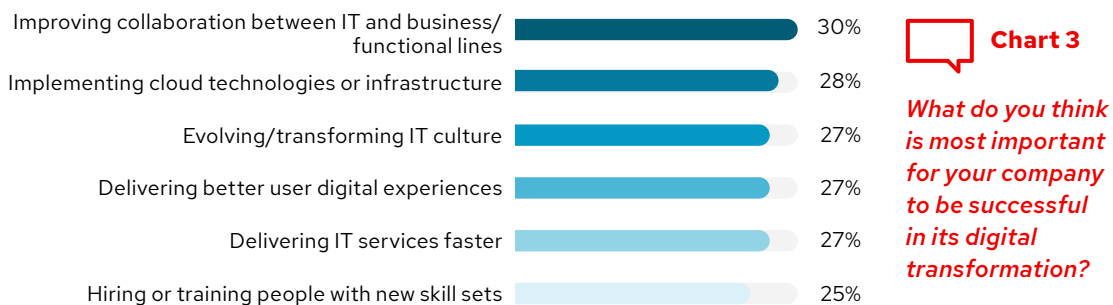
The data may show some reaction to COVID-19. On the one hand, 6% of the respondents said that their digital transformation has stalled this year (and 5% are just getting started). On the other hand, 21% either put their plans into effect sooner than expected or sped up their existing plans. While COVID-19 is unlikely to be the sole cause of these unplanned changes, some effect in both directions would be consistent with what we have heard from talking with our customers.

The regional breakdown shows that 43% of respondents from Latin American companies are in the transforming phase, the highest region in that phase.



The industry breakdown shows 22% of telecommunications companies are in the leading phase, the highest of any industry (see chart 1.5 in the appendix).

Similar to last year, improving collaboration between IT and business functions has emerged as a leading motivation for digital transformation. However, respondents cited quite a few other reasons as almost as important in their decisions. These include: implementing cloud technologies or infrastructure, delivering better user digital experiences, and delivering IT services faster.



27% of all respondents cited the importance of “evolving/transforming IT culture;” more Red Hat customers (35%) agreed. This is consistent with **last year’s Global Customer Tech Survey**, when 37% told us that they are using new processes to move to an open organizational culture.

Only 6% of the overall respondents said that evolving their culture was their top priority, the lowest out of any other response (see *chart 5*). Yet Red Hat customers still had a higher response rate for selecting culture as a priority (at 13% versus 5% for the industry panel).

Digital transformation strategy was the top non-IT funding priority for respondents (36%).



Chart 4

Over the next 12 months, what are your company’s top funding priorities outside of IT technology products or solutions?

And among digital transformation priorities, security again ranked high, surpassed only by innovation.

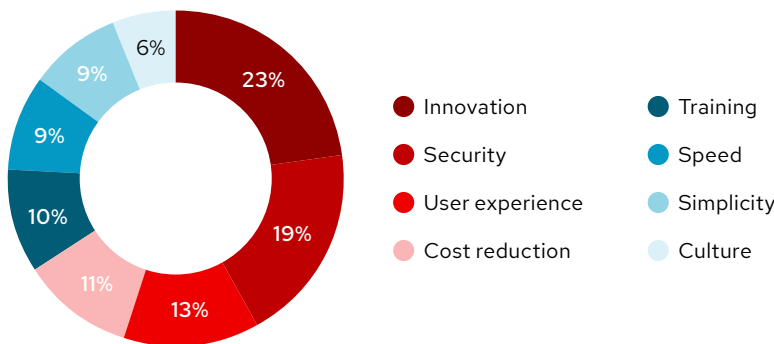


Chart 5

If you were to characterize your absolute top priority for your company’s digital transformation in a single term, which of the following would best fit?

In addition to being among the top priorities for digital transformation, security is also seen as a top barrier for success. The top response was “integration issues,” followed by “security and compliance,” “talent gaps,” and “cost reductions.”

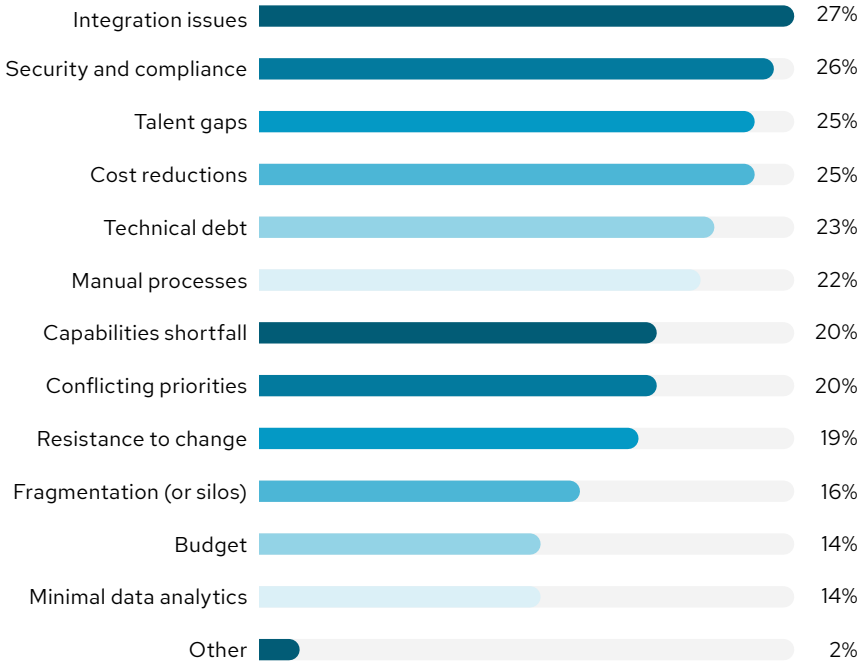


Chart 6

What do you think are the top barriers preventing your company from being successful in its digital transformation?

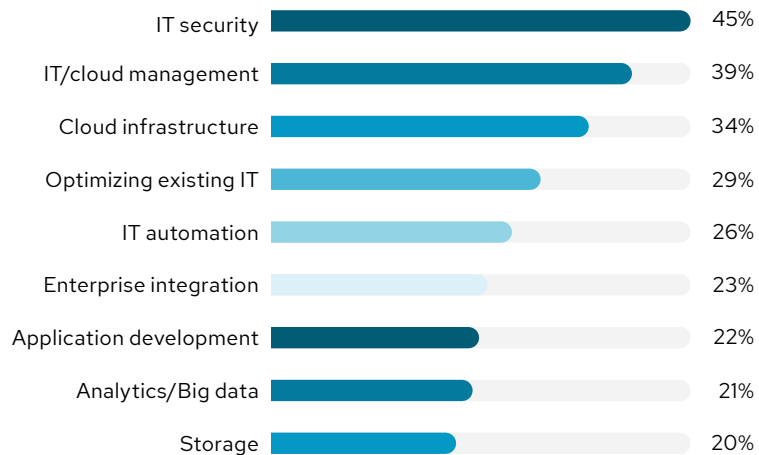
02

IT funding priorities are largely determined by security concerns.

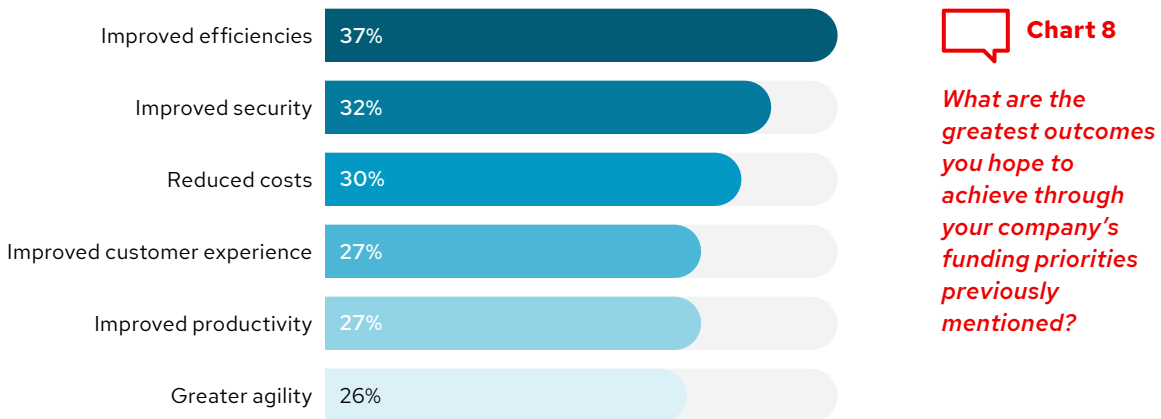
45% of respondents said that IT security was their top priority.

Chart 7

Over the next 12 months, what are your company's top IT funding priorities?



When asked for the greatest outcome of their funding priorities, respondents said improved efficiencies was the top priority, followed by improved security. Beyond security, it seems that companies' investments are focused on gaining efficiencies in their IT processes and reducing costs. Improving customer experience, productivity, and agility are not far behind.



Later questions revealed more specific security concerns. For example, respondents cited data privacy (39%) and overall data security (39%) as the top two reasons for running applications on-prem (see *chart 9 in the appendix*). Those who run their applications in a hybrid cloud likewise highlight overall data security (35%) (see *chart 10 in the appendix*).

Among those who prioritize funding of security over other purposes, network security comes out on top (42%), but is closely followed by both cloud security and data protection/privacy/sovereignty (see *chart 11 in the appendix*). 30% of respondents also identified "threat detection and response" as a leading priority.

Of the respondents who identified cloud infrastructure as one of their top 3 funding priorities, 43% listed cloud security as their top priority, 36% cited cloud management, and 32% cited migrating applications to cloud (see *chart 12 in the appendix*). Again, security is a leading priority.

We were also interested in which factors are affecting these funding priorities. 30% of respondents stated that customer needs determined their company priorities; others cited budget, company restructuring, and downsizing.

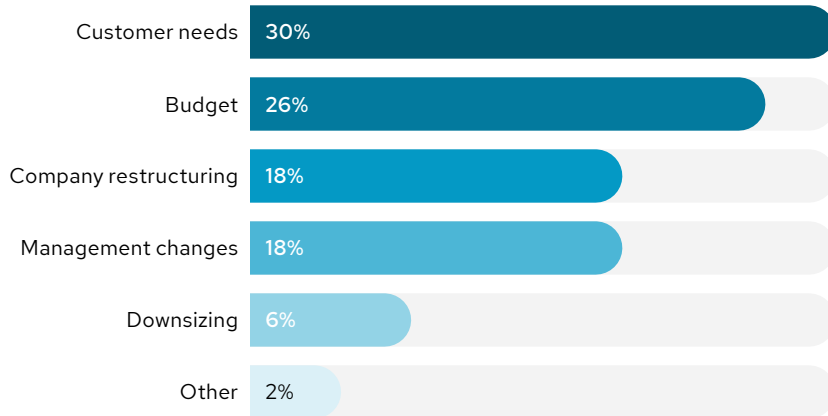


Chart 13

What top factor is impacting or changing your company's priorities overall?

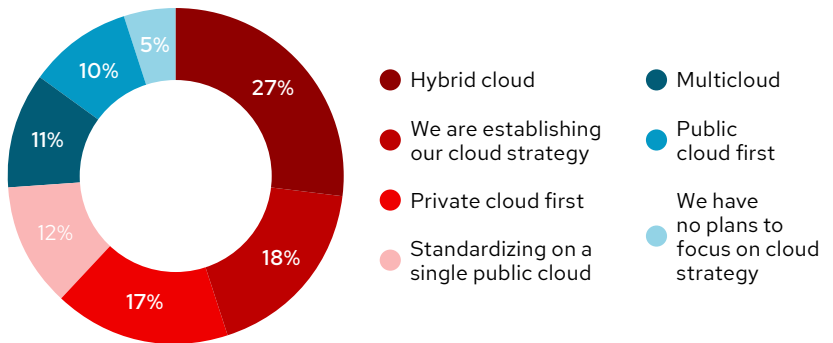
03

Organizations are planning to use multiple clouds—many with a hybrid strategy.

At 27%, hybrid cloud—described as a combination of clouds working together—is the most common way respondents described their cloud strategy.

Chart 14

Which of the following best describes your cloud strategy?

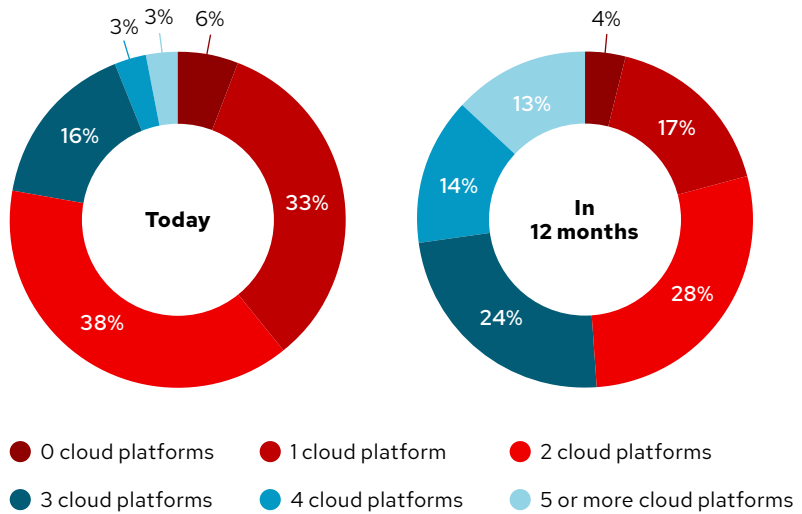


Combine the hybrid cloud respondents with those who are using multiple clouds independently of each other (i.e., multiclouds), and 38% have a cloud strategy involving more than one cloud.

Respondents said that over the next year, they plan to increase the number of clouds they use; today, using two is most common. 60% of respondents cited they are using two or more cloud platforms today.

Chart 15

How many different cloud platforms are you currently using, and how many do you plan to use in the next 12 months?



The biggest shifts are in the Latin American and the Asia-Pacific regions, where they plan to at least triple their usage to four or more clouds (see charts 15.1 in the appendix). All regions say they will be using more clouds—but last year’s survey also showed an intent to use more clouds, which mostly has not happened yet.

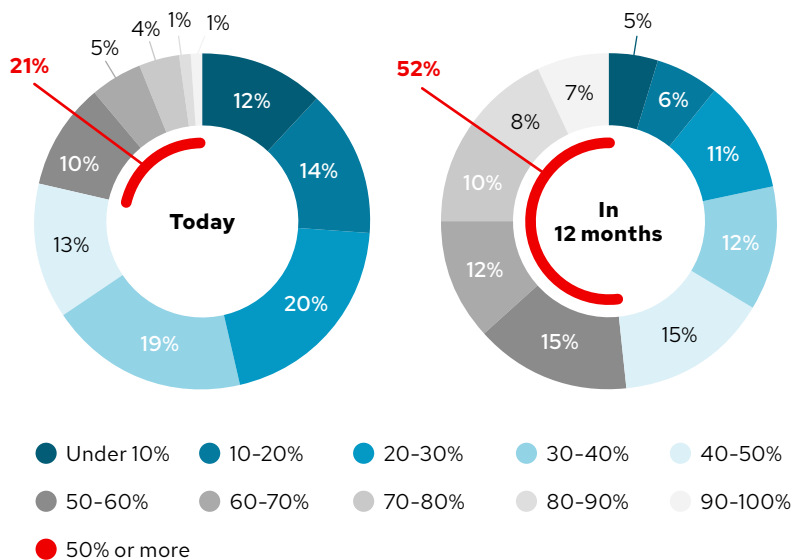
04

Containerization is increasing rapidly, at least in theory.

Today, the average respondent has 20%–40% of their workloads containerized. They plan to double that figure in the next 12 months.

Chart 16

What percentage of your workloads are containerized today, and what percentage do you expect will be containerized in the next 12 months?



From a regional standpoint, containerization in Latin America seems to be growing at a faster rate compared to other regions (see *chart 16.1 in the appendix*). Looking at an industry breakdown, government organizations have a lower percentage of containerized workloads than other industries (see *chart 16.2 in the appendix*).

05

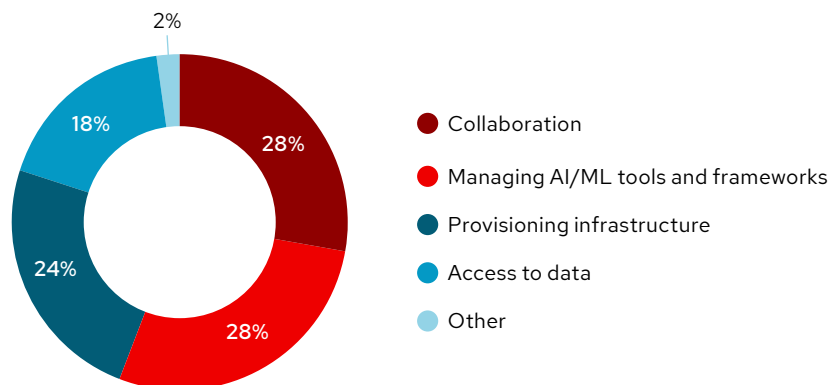
Collaboration across teams to get machine learning models into production is a top challenge.

About half of respondents are considering using artificial intelligence/machine learning (AI/ML) during the next 12 months—but have identified the challenges involved.

Respondents cited “collaboration to get models into production” and “managing AI/ML tools and frameworks” as the top two machine learning challenges, tied at 28%.

Chart 17

What is your top challenge to get a machine learning project up and running?



Getting IT to provision infrastructure and getting access to relevant data were the next highest identified challenges—but solutions are emerging. Self-service container platforms are one such approach to better integrate and simplify the use of AI/ML tools. But the large variation in tools and the complexity of infrastructure used for AI/ML, from public clouds to bare metal hardware, make simplifying AI/ML for data scientists a challenging problem.

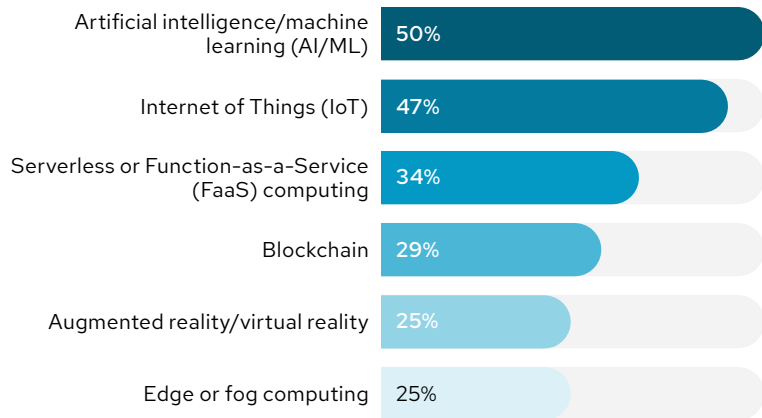
06

The Internet of Things (IoT) remains an important emerging technology.

IoT is just behind AI/ML, with just under half of respondents likely to consider use over the next 12 months. IoT is closely related to AI/ML, given that the data used by many AI/ML models comes from IoT sensors—so using one often means using the other.

 **Chart 18**

What emerging technology workloads are you most likely to consider using in the next 12 months (or are currently planning on using)?



However, IoT is a particular type of edge computing. When we combine IoT respondents with those who plan to use edge computing, we get 72% of respondents. Even though there is likely some overlap between the two categories, edge, in its various forms, is an increasingly important workload. Furthermore, both are up considerably from our 2019 survey (see *chart 18.1 in the appendix*).

Conclusion

A digital transformation strategy is key for organizations to innovate. Digital transformation initiatives continue to progress, and many companies accelerated their transformation plans this year. In these plans to innovate, security remains a top challenge and priority, and hybrid cloud environments continue to grow. Containerization, machine learning, and the Internet of Things also are trends that organizations continue to prioritize.

Appendix

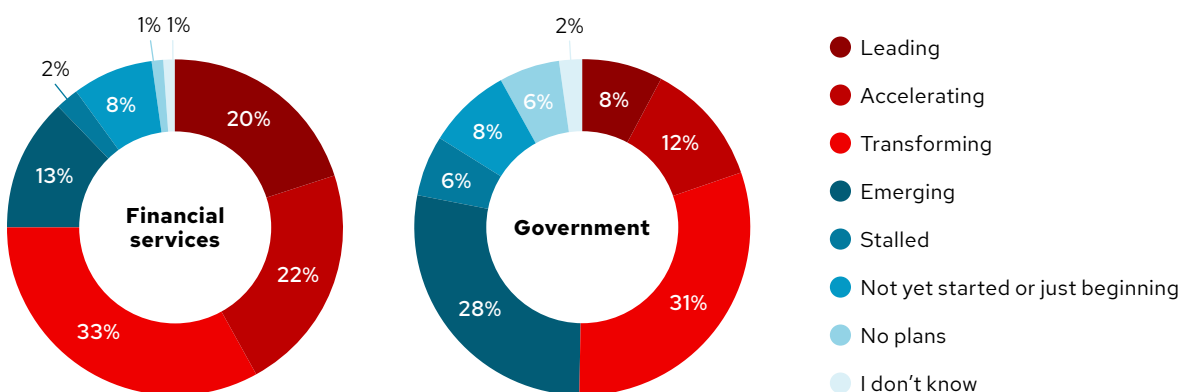
The original survey questions and answers have been condensed in the main text for legibility. This appendix includes the charts with the full questions and answers as they were posed in the survey, and some charts that were omitted from the main text.

Charts 1 and 2 | Digital transformation can be described as the continuous process by which organizations adapt to or lead disruptive changes in their customers and markets by leveraging digital capabilities and innovative technology to create new business models, products, or services. Currently, where is your company in its journey to digital transformation?

- No plans: We are not at all working on digital transformation.
- Not yet started or just beginning: We are doing some initial investigation and research.
- Stalled: We began adopting new technologies and processes but have had to take a step back or pause adoption.
- Emerging: We are starting to adopt new transformative technologies and processes.
- Transforming: We are using technologies and processes to innovate and transform.
- Accelerating: We have had to begin our digital transformation efforts sooner than we expected or have had to speed up the efforts we had already started.
- Leading: We are well into transformation and leading the market through innovation.

Chart 1.5 | Currently, where is your company in its journey to digital transformation?

Responses are sorted by industry (financial services, government, healthcare, and telecommunications).



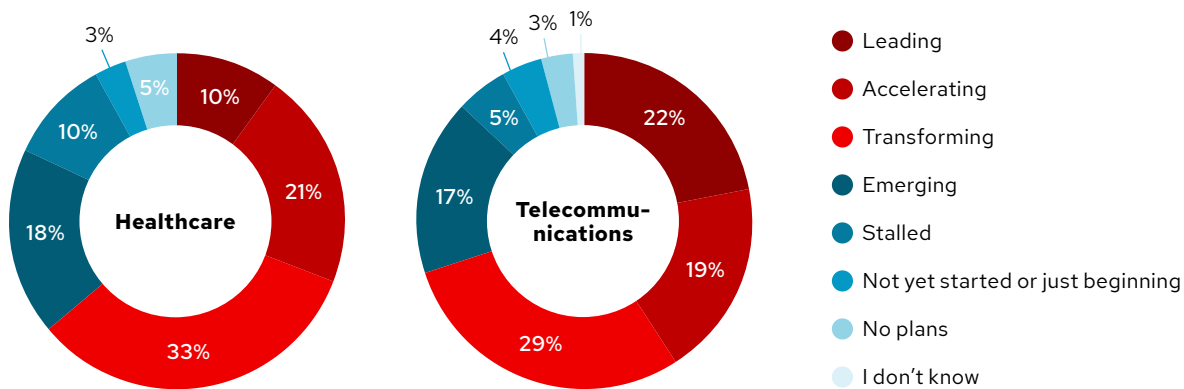


Chart 3 | What do you think is most important for your company to be successful in its digital transformation? Please select up to 3 of your top priorities.

- Improving collaboration between IT and business/functional lines
- Implementing cloud technologies or infrastructure
- Evolving/transforming IT culture
- Delivering better user digital experiences
- Delivering IT services faster
- Hiring or training people with new skill sets
- Gaining data insights/business intelligence (including AI/ML)
- Driving business outcomes
- Embracing agile processes/DevOps/SRE
- Building/delivering modern applications
- Organizational change or restructuring

Chart 4 | Over the next 12 months, what are your company's top funding priorities outside of IT technology products or solutions? Please select up to 3 of the top areas your company is investing.

- Digital transformation strategy
- Technical/technology skills training
- People and process skills training
- IT or developer hiring and retention
- Organizational stability
- Compliance (processes, training, or audits)
- IT consulting
- Change management/culture change

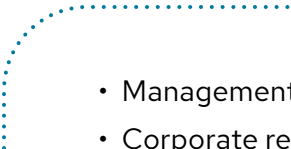
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- Management consulting
 - Corporate responsibility and/or volunteering

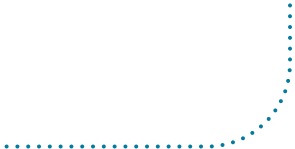
Chart 5 | If you were to characterize your absolute top priority for your company's digital transformation in a single term, which of the following would best fit?

- Innovation: We need to deliver innovative solutions.
- Security: We need to protect our digital assets.
- Experience: We need to deliver greater user experiences.
- Cost: We need to reduce costs.
- Skill set: We need different skills or trained IT staff.
- Speed: We need to move faster.
- Simplicity: We need to make IT easier.
- Culture: We need to evolve our culture.

Chart 6 | What do you think are the top barriers preventing your company to be successful in its digital transformation? Please select up to 3 of the top barriers.

- Integration issues (data, apps, APIs, etc.)
- Security or regulatory compliance gaps/risk
- Skillset or talent gaps
- Cost-reduction mandates
- Technical debt (existing or legacy IT)
- Manual processes or IT operations (limited automation tooling)
- Changing capabilities needed for IT management
- Conflicting priorities
- Organizational resistance to change/inertia
- Silos/lack of cross-team collaboration
- No or minimal budget/funding
- Minimal data analytics or insights
- Other

Chart 7 | Over the next 12 months, what are your company's top IT technology funding priorities? Please select up to 3 of the top areas your company is investing.

- IT security
 - IT/cloud management
 - Cloud infrastructure (public, private, hybrid, multicloud)
- 

- Optimizing/modernizing existing or legacy IT
- IT operations automation (e.g. Ansible, Puppet, etc.)
- Enterprise integration (data, apps, APIs, etc.)
- Application development
- Analytics/big data
- Storage (hardware or software)

Chart 8 | What are the greatest outcomes you hope to achieve through your company's funding priorities previously mentioned?

- Improved efficiencies
- Improved security and data protection
- Reduced costs
- Improved customer experience
- Improved staff productivity
- Greater agility
- Increased revenue
- Increased competitive advantage
- Reallocation of budget to innovation or new technologies
- Faster time to market
- Better recruitment, hiring, and retention

Chart 9 | What are the main reasons for having your applications run on-premises only today? Choose up to 3 answers.

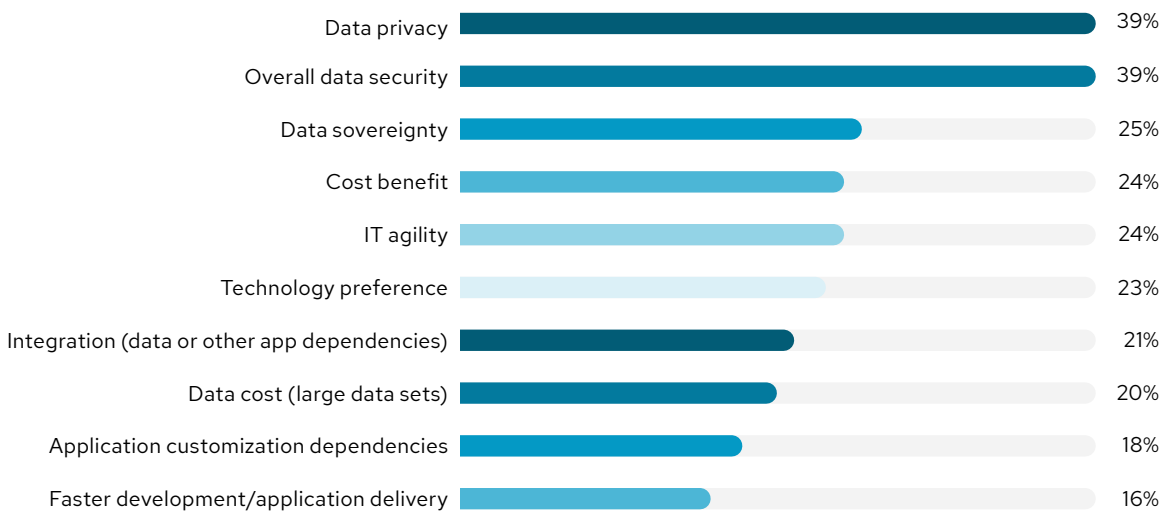


Chart 10 | What are the main reasons for having your applications run across hybrid cloud (on-premise and public cloud combined) today? Choose up to 3 answers.

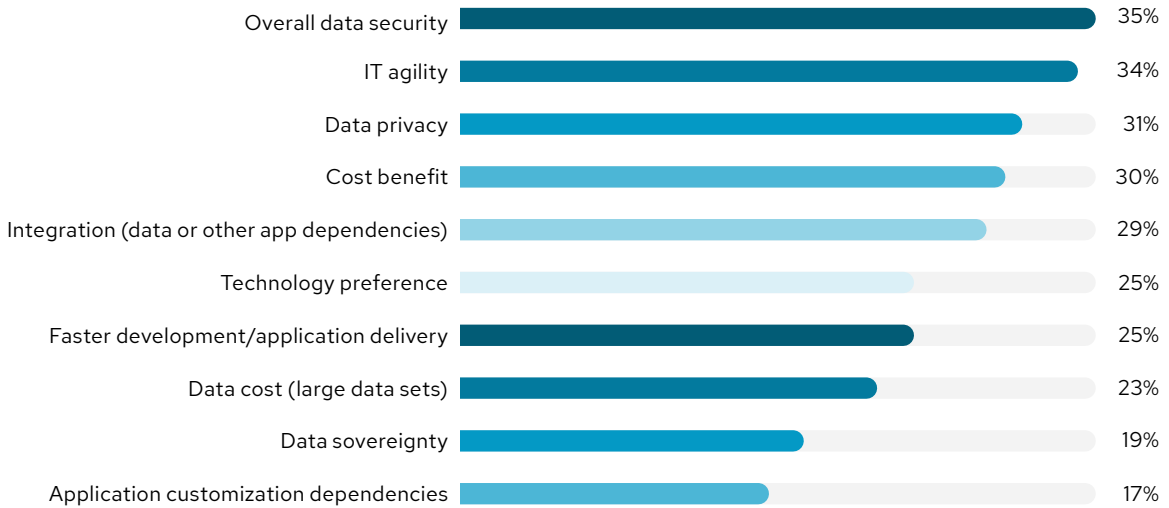


Chart 11 | Over the next 12 months, what are your company's top funding priorities for security? Please select up to 3 of the top areas your company is investing.

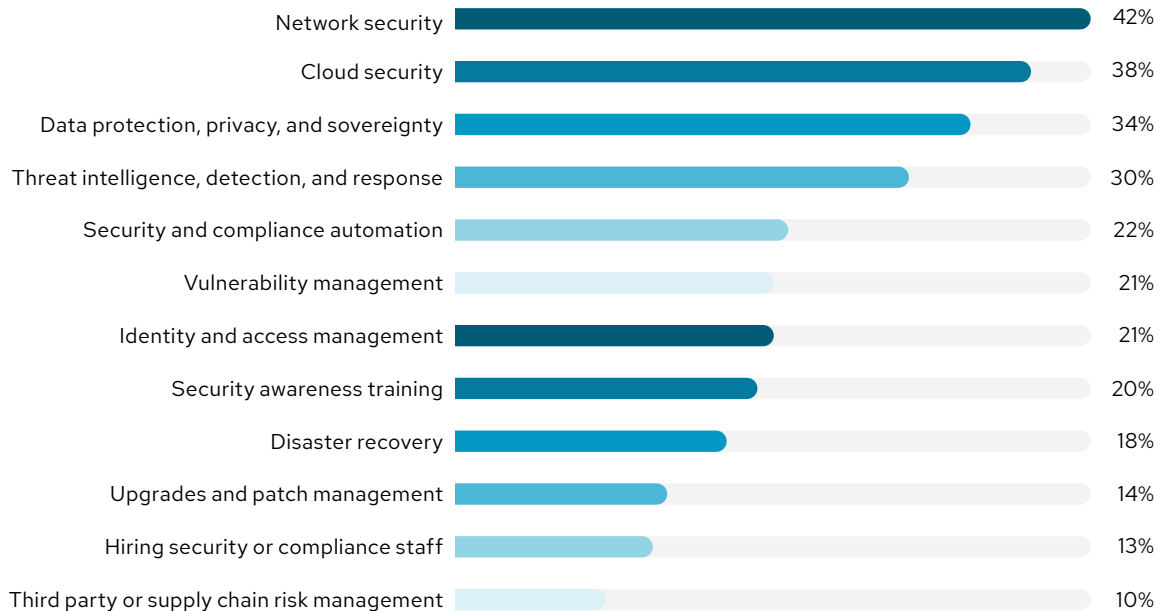


Chart 12 | Over the next 12 months, what are your company's top funding priorities for cloud infrastructure (public, private, hybrid, multicloud)? Please select up to 3 of the top areas your company is investing.

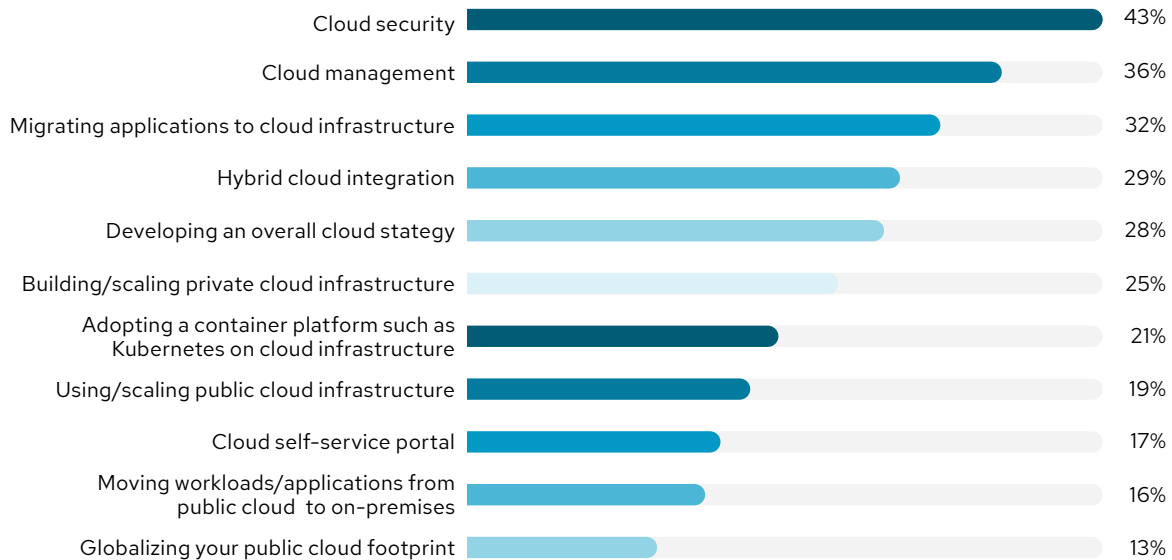


Chart 13 | What top factor is impacting or changing your company's priorities overall?

- Customer/end user needs
- Budget reallocation or reduction
- Department/company restructuring
- Management changes
- Downsizing
- Other

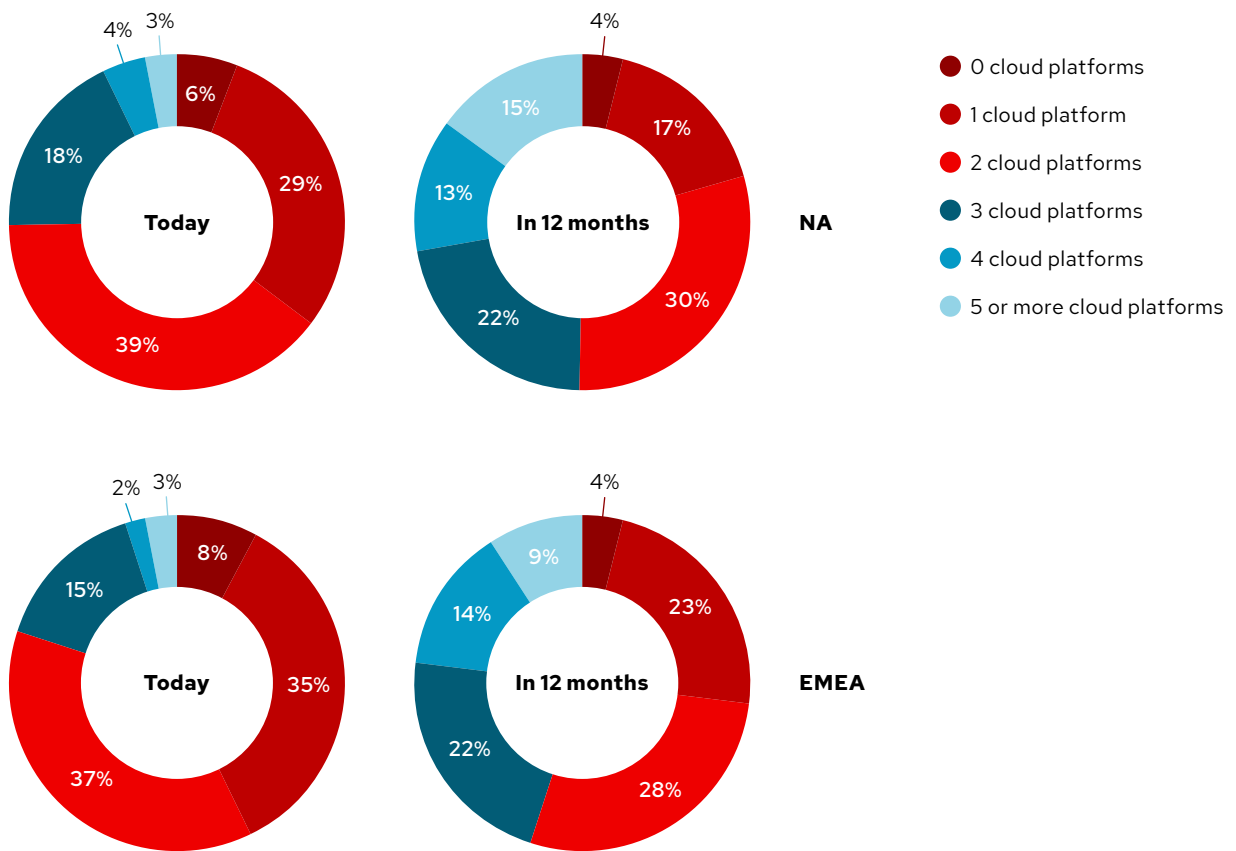
Chart 14 | Which of the following best describes your cloud strategy?

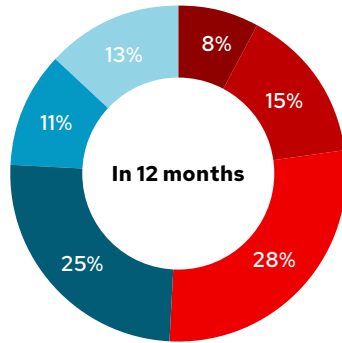
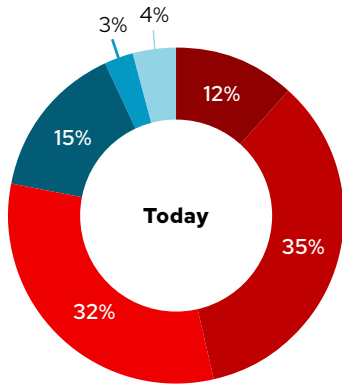
- We are establishing our cloud strategy
- Public cloud first
- Private cloud first
- Hybrid cloud (combination of clouds working together)
- Multicloud (more than one cloud but not working together)
- Standardizing on a single public cloud (e.g. AWS, Azure, etc.)
- We have no plans to focus on cloud strategy

Chart 15 | How many different cloud platforms are you currently using, and how many do you plan to use in the next 12 months? This includes both private and public clouds (e.g., OpenStack, Azure, AWS, etc). Choose one for each.

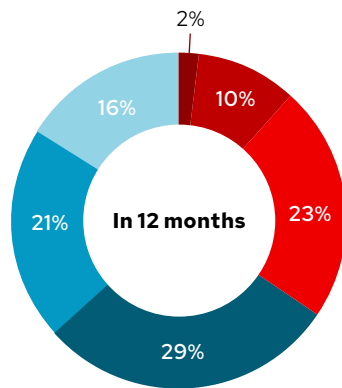
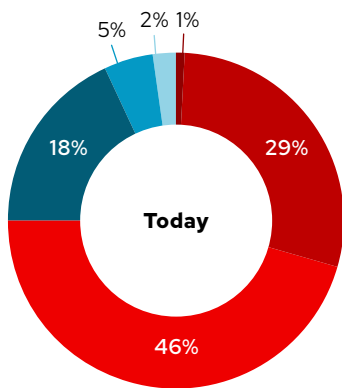
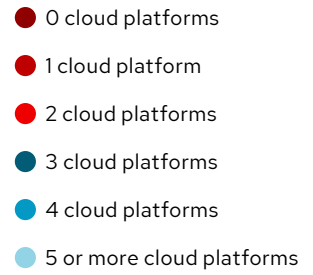
- 0 cloud platforms
- 1 cloud platform
- 2 cloud platforms
- 3 cloud platforms
- 4 cloud platforms
- 5 or more cloud platforms

Chart 15.1 | How many different cloud platforms are you currently using, and how many do you plan to use in the next 12 months? Responses are sorted by region.





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Chart 16 | What percentage of your workloads are containerized today, and what percentage do you expect will be containerized in the next 12 months?

- Under 10%
- 10 - 20%
- 20 - 30%
- 30 - 40%
- 40 - 50%
- 50 - 60%
- 60 - 70%
- 70 - 80%
- 80 - 90%
- 90 - 100%

Chart 16.1 | What percentage of your workloads are containerized today, and what percentage do you expect will be containerized in the next 12 months? Responses are sorted by region.

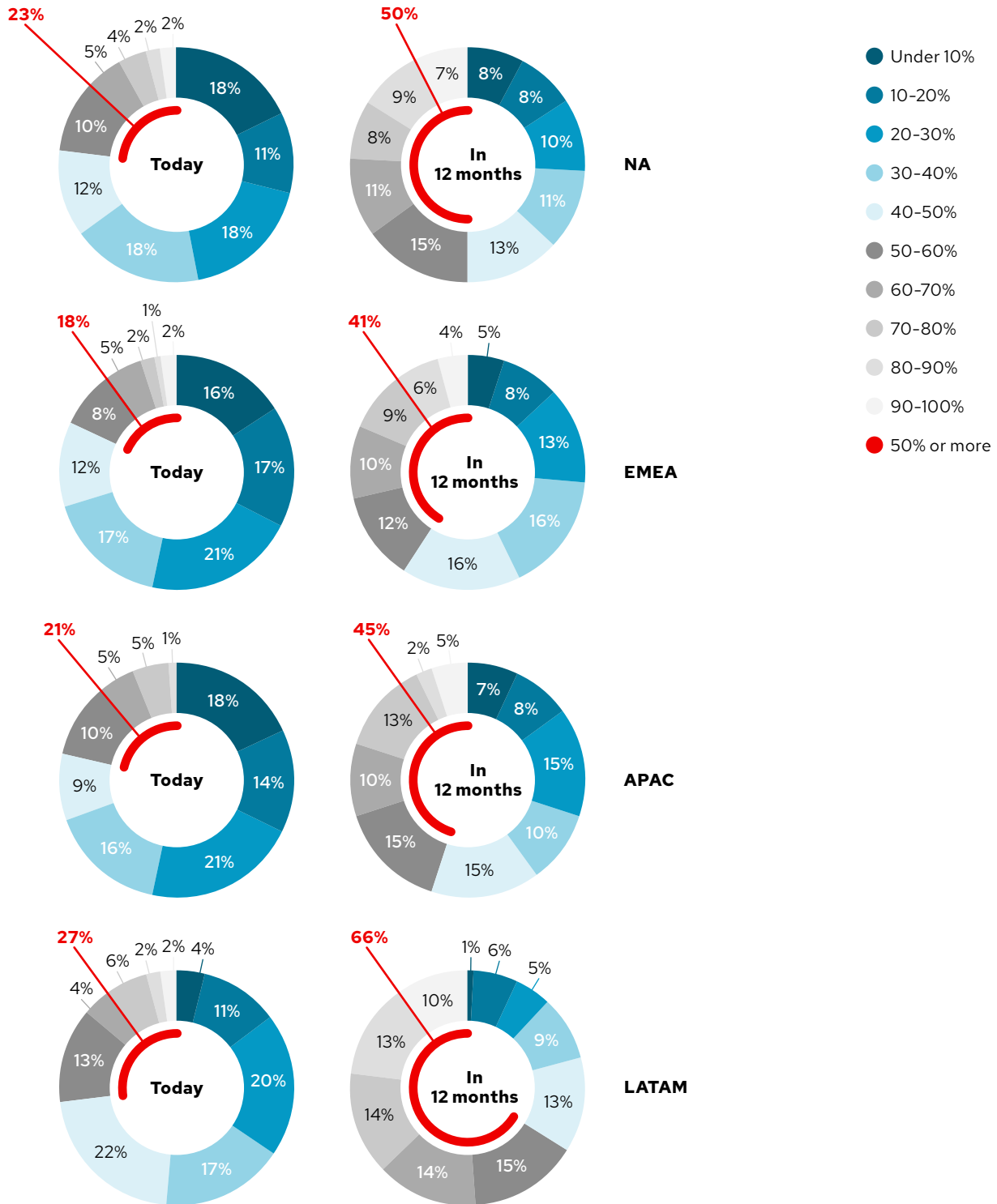


Chart 16.2 | What percentage of your workloads are containerized today, and what percentage do you expect will be containerized in the next 12 months? Responses are sorted by industry (government, financial services, healthcare, and telecommunications).

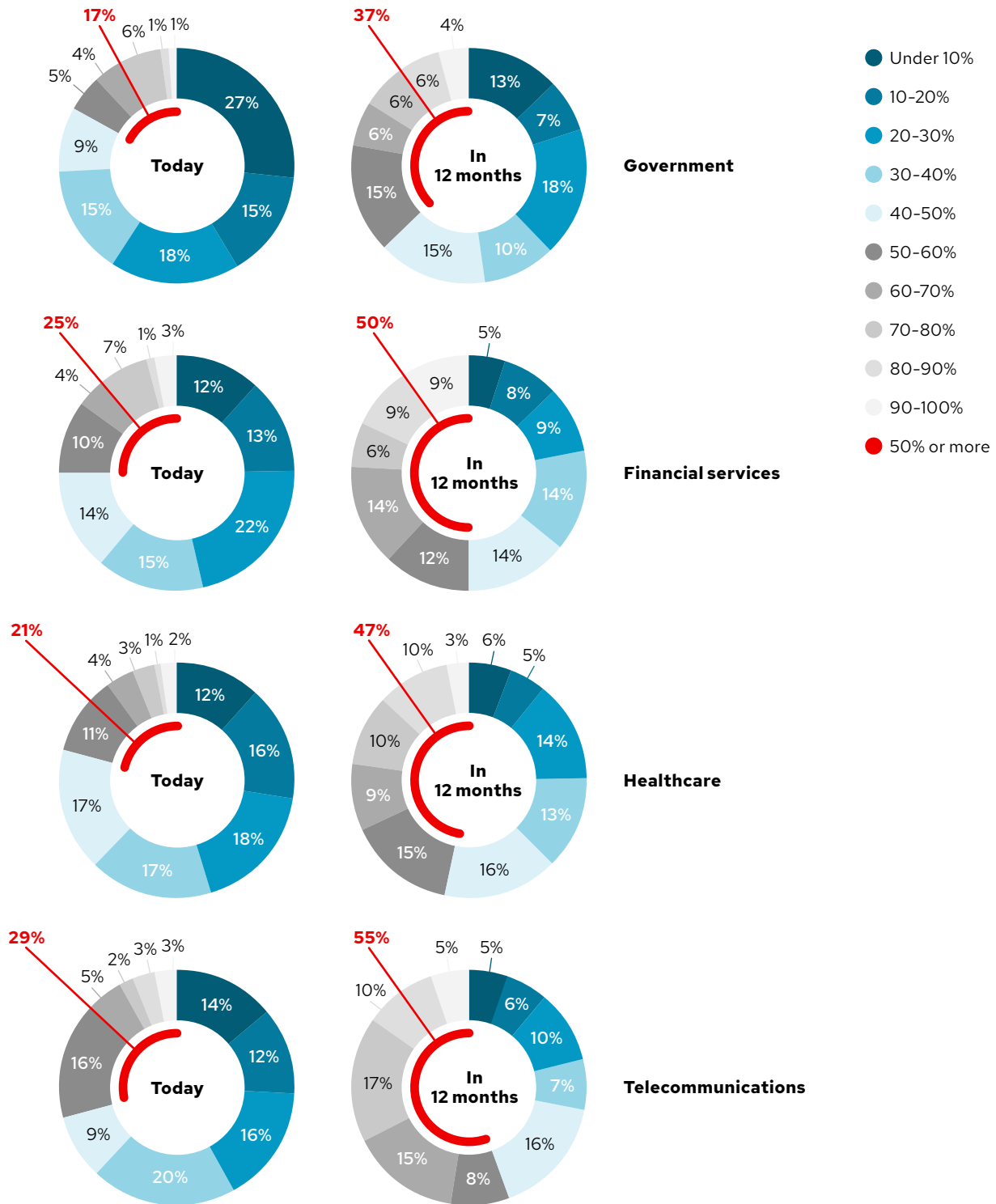


Chart 17 | What is your top challenge to get a machine learning project up and running?

- Collaboration across teams to get ML models into production
- Selecting, deploying, and lifecycle managing AI/ML tools and frameworks
- Getting IT to provision infrastructure
- Getting access to relevant data

Chart 18 | What emerging technology workloads are you most likely to consider using in the next 12 months (or are currently planning on using)? Select all that apply.

- Artificial intelligence/machine learning (AI/ML)
- Internet of Things (IoT)
- Serverless or Function-as-a-Service (FaaS) computing
- Blockchain
- Augmented reality/virtual reality
- Edge or fog computing

Chart 18.1. | What emerging technology workloads are you most likely to consider using in the next 12 months (or are currently planning on using)?

Results show a year-over-year comparison.

