computing research

RESEARCH PAPER

Why the Cloud should be your database default

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Introduction

Organisations of all sizes, across all sectors, are constantly asking more of their data architecture. Databases must do more, go faster, and adapt to changing needs. Cloud is coming to the forefront as the natural solution across the board. The transition has been underway for years, but with the coronavirus pandemic this past year in particular, the need for cloud has increased, amplifying its advantages and accelerating migration from on-premise options. the advantages of the cloud.

Motivated by a desire to reap the benefits of cloud computing, a growing number of organisations are embracing a cloud-native mindset when it comes to their databases, enabling businesses to get more out of their data while allowing the data to be accessed and used by applications at a fast pace.

In this white paper, supported by bespoke research, we'll explore the state of the nation when it comes to cloud databases–gauging what a standard database architecture looks like today, how it's performing, and companies' near-term plans on what to do with it. We'll tackle IT leaders' opinions around the benefits and potential hurdles that come with a cloud database, comparing real-world experiences of those already in the cloud, to those who have yet to make the switch.

Key findings

- When asked what best defines their approach to the cloud, 51% of respondents chose hybrid cloud, 29% selected multi-cloud, and just 17% chose single cloud.
- 10% of IT leaders said they are planning to migrate to the cloud, 12% are incubating or trialling, 36% are currently rolling out and 19% having already fully implemented plans.
- The data shows that currently 40% of organisations are running more than 50% of their databases in the cloud, with 35% storing 0-25% in the cloud.
- IT leaders who have fully implemented cloud-based databases reported that they were satisfied with the experience, with 92% satisfied with their experience.
- Security and workload portability came out on top as the most significant factor in slowing cloud database adoption.

The cloud database state of play

A cloud database enables organisations to store and manage their databases on a cloud computing platform, be it private, public, or hybrid, with access offered as-a-service or through a virtual machine. This offers organisations the added flexibility of cloud computing and enables enterprises to host databases without purchasing and managing the necessary infrastructure.

Like other cloud services, running databases in the cloud offers organisations a number of significant benefits, including improved agility, making it possible to set up and shut down cloud-based databases as needed at a faster pace, with greater ease of access, speed of deployment and reduced cost.

It's also important to consider the importance of open-source. Companies that offer open-source database solutions offer organisations greater flexibility and support, without being tied to any one company or developer. PostgreSQL, also known as Postgres, is a powerful open-source relational database management system. It is used as the primary data store for many applications. However, as we'll see below, some organisations are hesitant to fully embrace open-source due to perceived security risks.

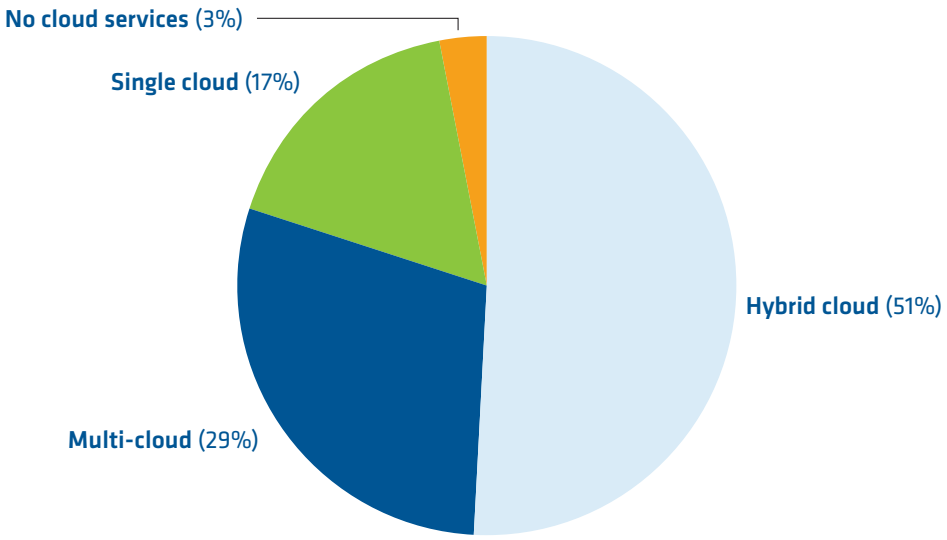
We surveyed 150 IT leaders from a variety of different industries in order to gauge the state of play when it comes to cloud-based databases.

Figure 1 reveals organisations' approach to the cloud. It is clear that the most popular response was hybrid cloud, with 51% of respondents choosing this option. 29% selected multi-cloud, with just 17% choosing single cloud. Just 3% are not currently using any cloud services.

This indicates that almost all organisations are using the cloud in some capacity, which is unsurprising considering the technology is now an established part of most organisations' technological infrastructure.

When it comes to the type of cloud services organisations are choosing, the majority are opting for a combination of public and private clouds, as well as multiple cloud services or multiple providers.

Fig. 1 : Which of the following most accurately reflects your organisation's cloud approach?



During a recent *Computing* webinar, Gabriele Bartolini, VP, Cloud Native at EDB said that organisations may opt for a mixture of public and private cloud for data protection reasons,

> "One reason for me is data protection. Databases are where data is stored, and data is the most important asset of a company. Especially in Europe with GDPR, in the last three years there has been a lot of change in that direction. I think there's still this feeling that having full control of the data is an important principle. Having the private cloud, primarily, and then hosting data on a public cloud for disaster recovery purposes, for example."

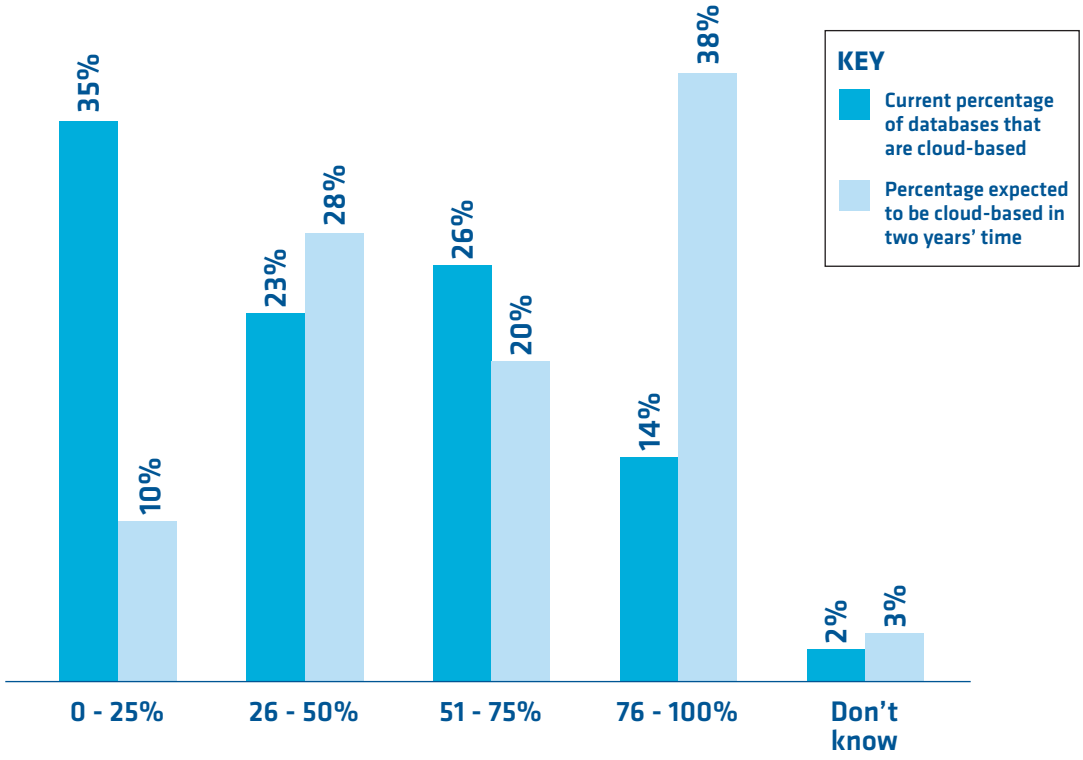
Many organisations opt for a phased approach to cloud migration, choosing to keep some mission-critical data or applications on-premise, as part of a hybrid approach.

Let's look at the proportion of databases that are cloud-based today and how this is set to change. *Computing* found that 40% of organisations use the cloud to store more than half of their databases, while 35% store up to a quarter in the cloud.

In just two years, nearly 60% of respondents expect over half of their databases to be based in the cloud, indicating that while a significant proportion of databases are not yet cloud-based, organisations are strongly trending in that direction.

Cloud-based databases are particularly useful when developing software and applications that are themselves cloud native, require access to large volumes of data and must handle high volumes of low latency traffic. As organisations become increasingly digitised, the need for cloud native databases to support them is only likely to increase.

Fig. 2 : What proportion of your organisation's databases are cloud-based?



Jan Karremans, Director, Product Marketing at EDB explained that developing new applications is an ideal opportunity to consider adopting cloud-based databases,

> "In this digital transformation, where applications are being newly built, I think the adoption of cloud-based databases is very natural as it's the easiest way, as you start building a new application, to actually provision a new database for your staff and projects. Migrations are challenging and organisations often shy away from them, leading to lags in transformation and modernization. Organisations are only just getting their feet wet on new application development using cloud databases."

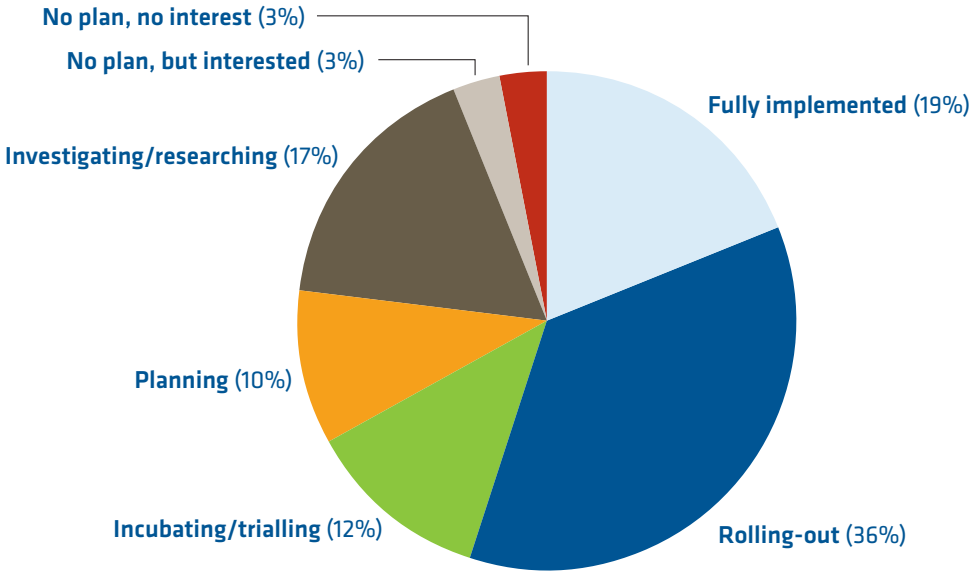
Bartolini also explained that the rise of DevOps culture is accelerating cloud database adoption: "This containerised way of deploying and developing applications with automated tests is the highest performing way of delivering software. This innovation requirement is pushing us in the direction of the cloud."

Respondents were asked what stage their organisation is at in migrating to cloud-based databases. 36% of IT leaders said they are rolling out cloud-based database plans, with 12% incubating or trialling, 10% planning and 19% having already fully implemented plans.

This suggests that for the majority, making the switch to cloud-based databases is a priority, with only 3% indicating they have no plan or interest. With almost half of respondents either rolling out or trialling the technology, the next few years will see a significant rise in cloud-based database adoption as these plans come to fruition.

In fact, according to research by Gartner, 75% of databases will be deployed or migrated to cloud platforms by next year as organisations build new applications and advance their digital transformation strategies.[1]

Fig. 3 : What stage is your organisation at in migrating to cloud-based databases?

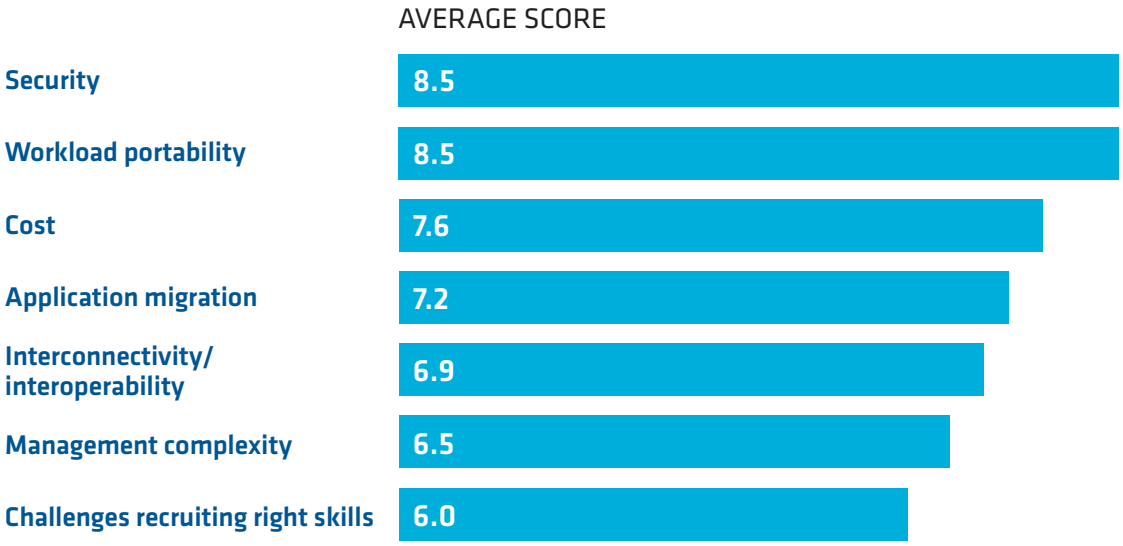


[1] https://www.gartner.com/en/newsroom/press-releases/2019-07-01-gartner-says-the-future-of-the-database-market-is-the

Risks and rewards

What about the barriers to cloud-based database adoption, both for those that have implemented cloud-based databases at their organisation and those that have not? Security and workload portability emerged as the most significant factors in slowing adoption.

Fig. 4 : On a scale of 1 (not at all) to 10 (a great extent) to what extent have the following slowed cloud-based database adoption?



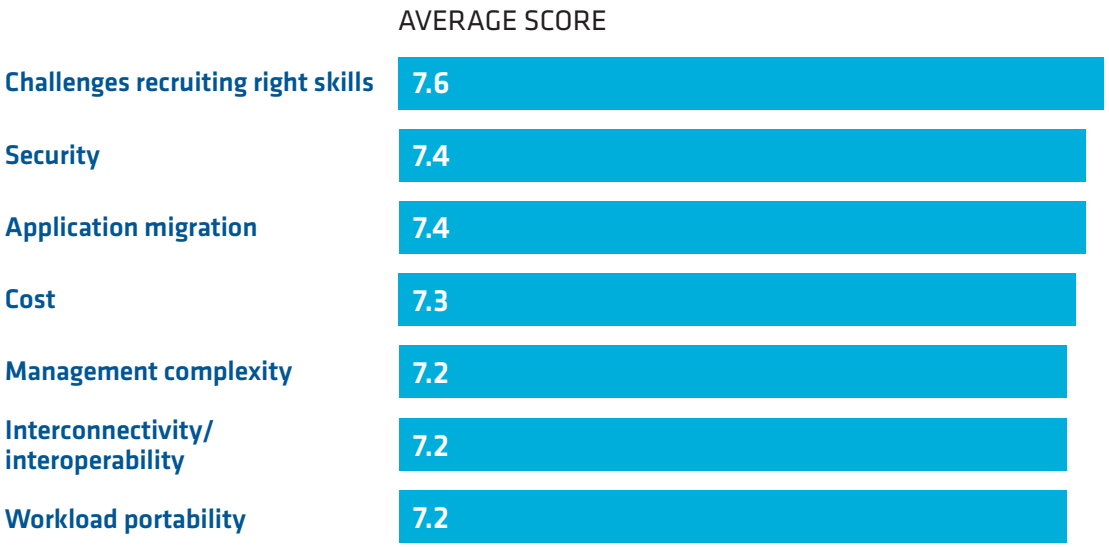
It is unsurprising that security has come out on top in this area, as many organisations are still hesitant when it comes to the security implications of the cloud. However, major cloud providers typically have a far greater volume of security resources than most organisations and offer solutions that meet international and industry-specific compliance requirements. Therefore, cloud providers' provision of off the shelf product and service around compliance and cyber security should go some way to remedying these concerns.

When it comes to workload portability, Karremans explained that cloud-based database adoption can in fact improve portability, with data accessible when and where it is needed,

> "Monolithic applications are being redesigned to be more microservices oriented – with which portability gets easier. If you can split up your very big back end and monolithic databases into smaller extents and adopt cloud native principles for this, that portability automatically gets a lot easier."

Conversely, recruiting the right skills emerged as the main factor in preventing cloud-based database adoption, followed by security and application migration. However, in both cases, all of the barriers were ranked as a 7 or higher, suggesting they have all slowed or prevented cloud-based database adoption to some extent.

Fig. 5 : On a scale of 1 (not at all) to 10 (a great extent) to what extent have the following prevented cloud-based database adoption?



Bartolini stressed the importance of ensuring teams have the necessary skills to fully benefit from what cloud native technology has to offer: "This technology is relatively new. To some extent it's counter intuitive. There's a steep learning curve, especially at the start, and it can take a bit of time to learn these new technologies... finding the right people, working as a team to solve complex problems, but you need the right skills."

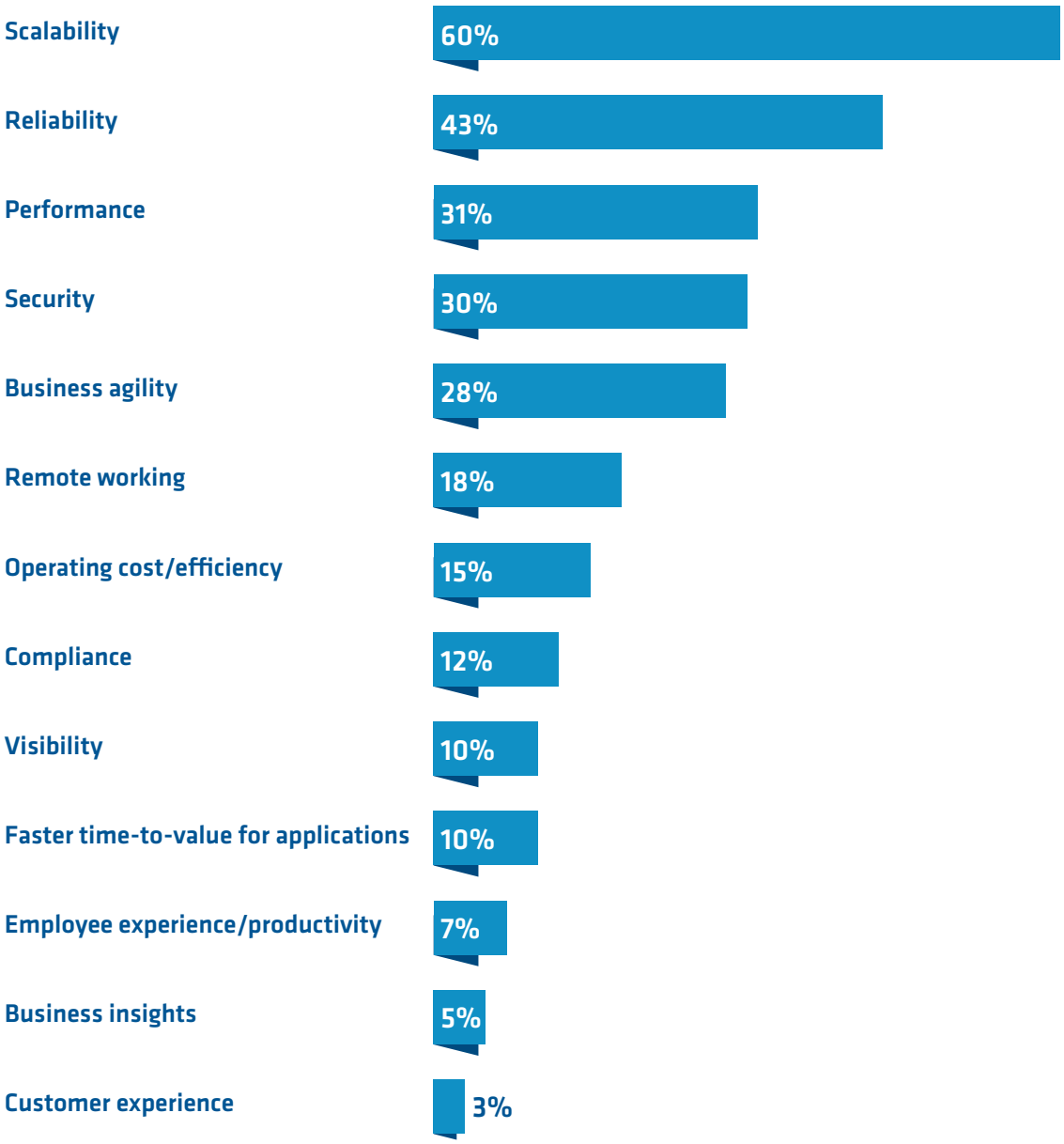
When it came to the rewards of shifting to cloud-based databases, the most common benefit seen by those who have implemented cloud-based databases is scalability, followed by reliability, performance and security. Business insights and customer experience were the least popular responses.

Cloud databases can be rapidly built and deployed and can also be scaled up and down as needed, with additional instances and resources of storage and computing assigned at speed. With organisations under pressure to deliver new applications faster, as well as needing to keep up with the increasing volumes of data at their disposal, these are important factors when deciding whether to migrate to the cloud. Furthermore, as some cloud databases are serviced via managed providers, IT teams are freed up to focus on supporting the core business.

Interestingly, security was cited as both a benefit of implementing cloud-based databases and a factor in slowing their deployment. This may suggest that concerns pre-migration aren't born out in reality. Cloud database providers can offer a number of tools to improve security, such as the use of automation to check for bugs or security risks, as well as static code analysis and the scanning of containers.

It is also important for organisations to incorporate security into every stage of the development process, rather than at the end.

Fig. 6 : What do you perceive as the main benefits of implementing cloud-based databases?

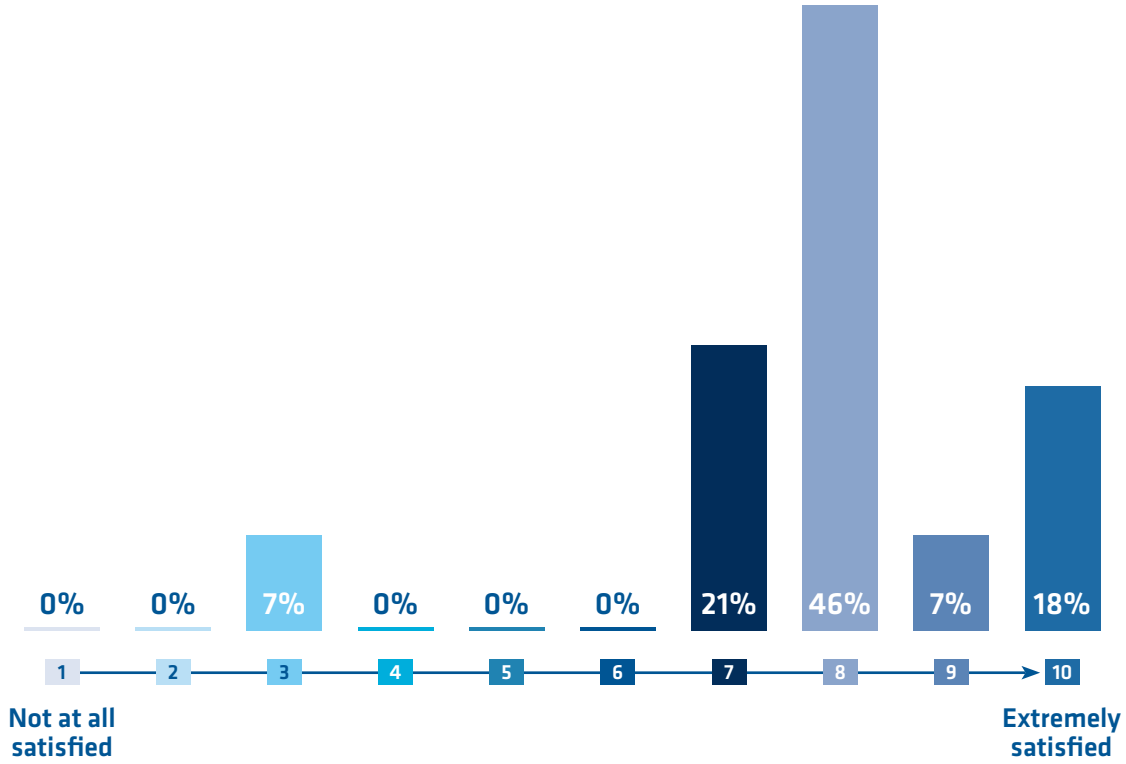


For Bartolini, the driving factor behind cloud database adoption is the customer: "The goal, if you work in IT, is to always meet customer expectations. It's to achieve higher velocity in terms of producing new features for applications in a very innovative world that is volatile, uncertain, complex and ambiguous. Thanks to the DevOps movement, there are no barriers between departments, so this concept of multi-disciplinary teams is working. The goal is to make the database live closer to application developers."

Becoming cloud-first

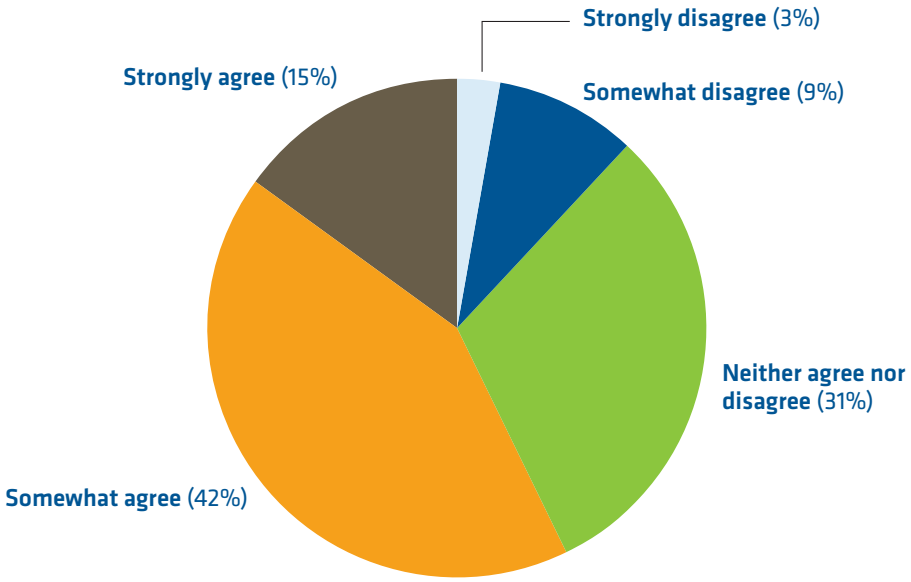
When it comes to the migration itself, organisations were generally happy with the process. Overall, IT leaders who have fully implemented cloud-based databases reported that they were satisfied with the experience, with 92% ranking it as a 7 or higher. Just 7% rated the experience as a 3 out of 10. The average score was 7.9, indicating respondents had a largely positive experience. However, only 25% rated the experience a 9 or higher.

Fig. 7 : On a scale of 1 (not at all satisfied) to 10 (extremely satisfied) how satisfied are you with your experience of moving your organisation's databases to the cloud?



Respondents were also asked if the Covid-19 pandemic had accelerated the migration of on-premises database solutions at their organisation.

Fig. 8 : To what extent do you agree with the statement, "The pandemic has accelerated the migration from on-premise database solutions at my organisation"?



While the pandemic may have accelerated the need for databases to be accessible regardless of geographic location, many organisations had already embarked on cloud migration projects. However, such plans may have gained a new sense of urgency due to the current circumstances, with 57% at least somewhat agreeing that the pandemic has accelerated the migration from on-premise solutions.

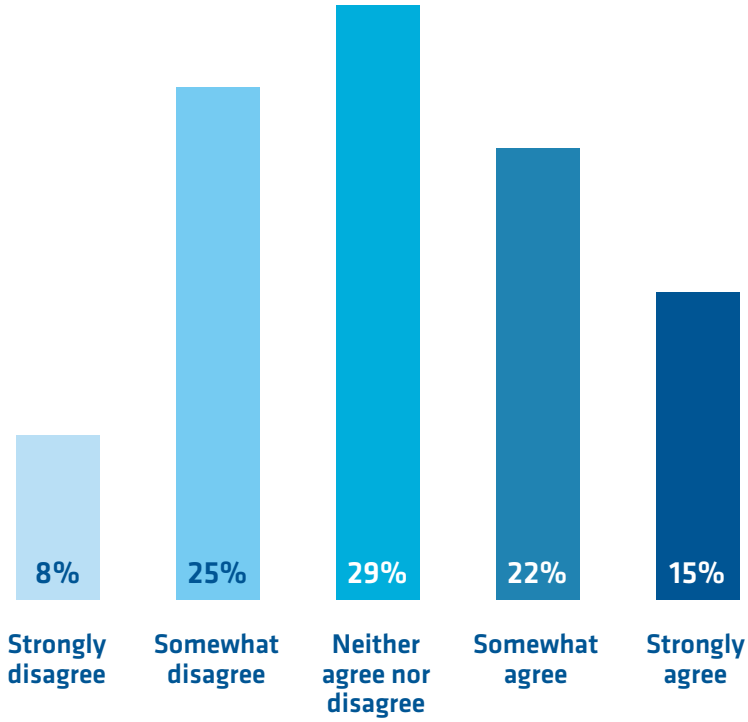
Karremans believes that for some organisations, the pandemic has caused them to accelerate their digital transformation plans.

"What you see is that some companies are saying, 'let's not do too much, let's keep our feet still because we don't know what's going to happen after, what sort of resources we'll end up with.' The other group of organisations said, 'this is the time to start doing a lot of this transformation'."

IT leaders were asked whether they are concerned by possible security implications of open-source databases. 33% disagreed with the statement, with 37% agreeing and 29% neither agreeing nor disagreeing. While opinion is split, concerns around security still exist.

While organisations are increasingly open to using open-source software for some applications, relational databases are often complex systems, touching many points in the organisation. Therefore, opting for open-source may be perceived as a risk.

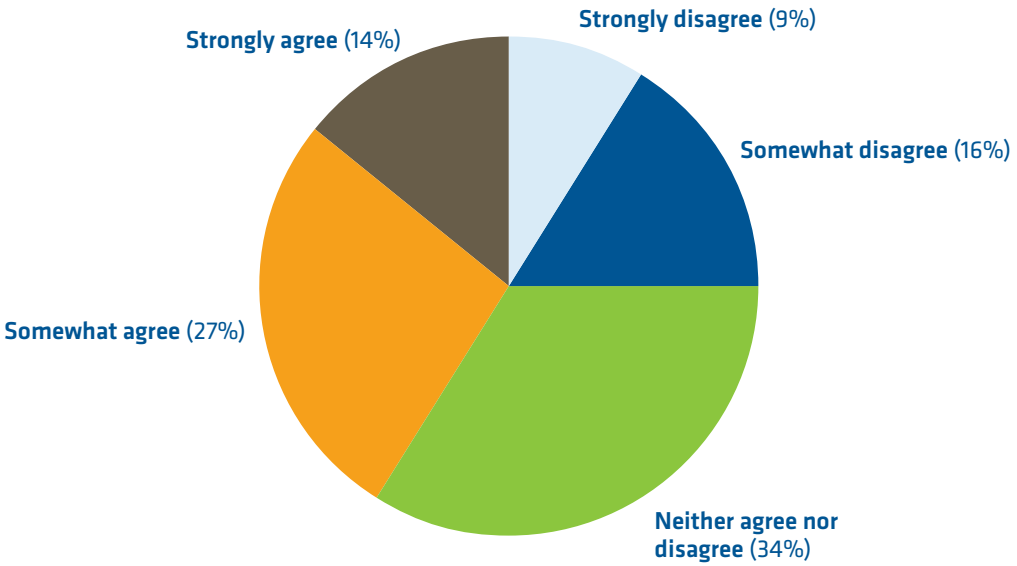
Fig. 9 : To what extent do you agree with the statement, "I am concerned by the security implications of open-source databases"?



However, Karremans explains that open-source is often more secure than alternatives: "Many consider open-source databases to be the most secure solution as there are more people reviewing codes and if there are any security vulnerabilities everybody will know them. Not just those that look to exploit vulnerabilities but also those that guard against those vulnerabilities."

Respondents were asked whether their organisation sees itself as cloud native when it comes to databases, with cloud native referring to building and running applications in a way that harnesses the benefits of cloud computing. Again, opinion was somewhat split, with 25% of respondents disagreeing with the statement, and 34% neither agreeing nor disagreeing. However, 41% at least somewhat agreed with the statement, indicating that a significant proportion of organisations now think of themselves as cloud native in this area.

Fig. 10 : To what extent do you agree with the statement, "We now see ourselves as cloud native when it comes to databases"?



Bartolini emphasises the importance of company culture when it comes to being cloud native: "The most important part is the culture. Call it digital transformation, call it DevOps, call it agile. We need a cultural movement that sees the importance of principles, processes, and tools; most importantly, we need people to start a journey and create a company that wants to innovate."

Conclusion

Migrating your databases to the cloud might sound like a daunting task, with data infrastructure touching many different points in your organisation. However, our research shows that while over 50% of organisations are still storing up to half of their data on-premise, many are actively implementing cloud-based databases and a growing number now view themselves as cloud native in this area.

When it comes to databases, many organisations are still opting for a mixture of on-prem and cloud storage, and this hybrid environment creates complexity that can increase downtime and maintenance. However, PostgresSQL can help remedy this by enabling organisations to avoid vendor lock-in and reap the benefits of greater consistency and containerisation.

For any migration project, planning is key, and organisations must take stock of the size and scale of their databases, the types of data stored, how cloud databases will fit with the assets left on-prem, and the impact potential downtime could have on applications.

In addition to the practicalities of adopting cloud-based databases, Karremans emphasises that fully embracing the benefits of this technology involves a paradigm shift,

> "A lot of these things start with a mindset shift. If you start looking at the new world like you looked at the old world, a lot of these cloud implementations are running VMs in the cloud. If you start doing that, it's not really something that adds true value to the organisation... the DevOps culture needs to be ingrained in the organisation and you need to find the projects that are fitting for cloud adoption."

Before you start your journey to the Cloud, take a moment to reflect on where you are today. How would seizing the full opportunity of moving to the cloud fuel your organisation's success? Start your journey small, but start it profoundly.

About the sponsor, EDB

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