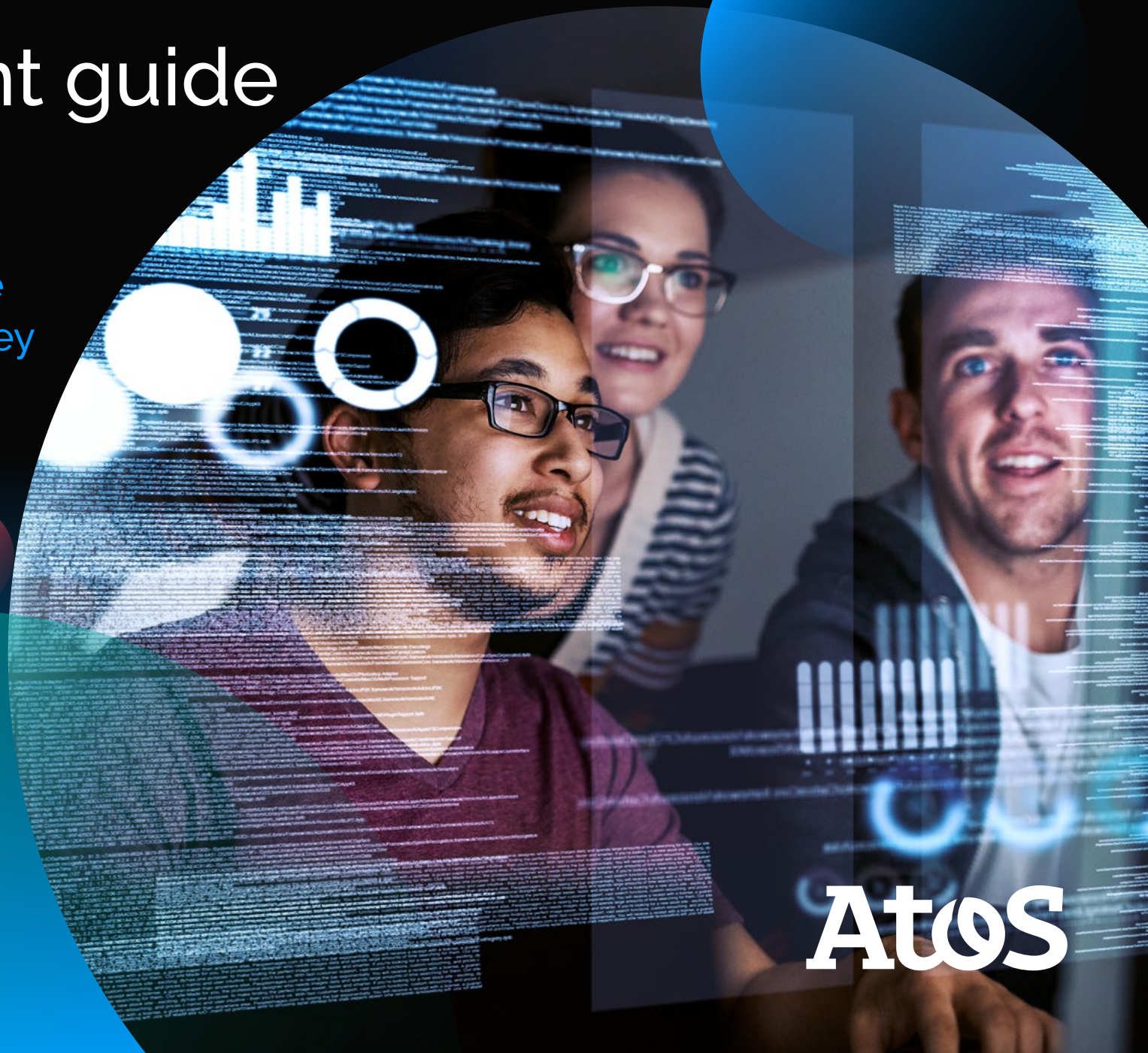
# Your 10-point guide to the cloud

## 10 considerations for the start of your cloud journey



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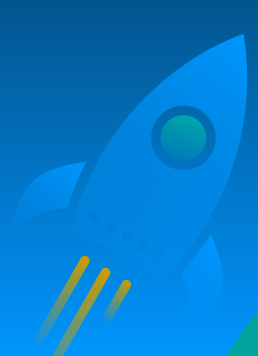


# Navigating the UK government's journey to cloud

To meet the needs of citizens, UK government departments recognise that being cloud-enabled gives them essential agility, cost-efficiency and sustainability. Yet while the need for cloud might be clear, the choices around cloudification can be complex – especially for large institutions with legacy systems.

The reality is that most public agencies will operate a mixture of public, private and non-cloud services for years to come. Your challenge is how to get best value from cloud while always retaining sovereignty, flexibility and control of your systems and data. Careful consideration of business and data requirements is needed to design the right roadmap for migration, with a nuanced approach to each application.

This guide discusses ten considerations for your move to public and hybrid cloud and is intended as a framework for decision-making in the critical early stages. Technological expertise and domain knowledge are essential to enable balanced decisions, then devise and deliver a coordinated programme of change to accelerate delivery of benefits while building the capabilities you need to operate in the cloud.

This is a critically important journey for any organisation. Cloud is the engine for driving better, faster and cheaper citizen services. It is, in combination with other digital tools and data, the means for public services to remain optimised, secure and resilient as the digital society evolves.

## Benefits of cloud for citizens, government and society

**Better services: citizen-centric innovation**

- Responsive digital public services
- Better citizen experiences and satisfaction

**Better operations: agile, optimized and future-proofed organisation**

- Transformed application landscape
- Cloud-enabled ways of working

**Better world: socially and environmentally responsible operations**

- Lower carbon footprint
- Data compliance, sovereignty and citizen consent

# 1. Does it make sense to move to the cloud?

It's important for your department to understand why you're considering or moving to the cloud. The cloud is no different from any other project in that you need clear goals, objectives and projects leads, as well as executive sponsorship.

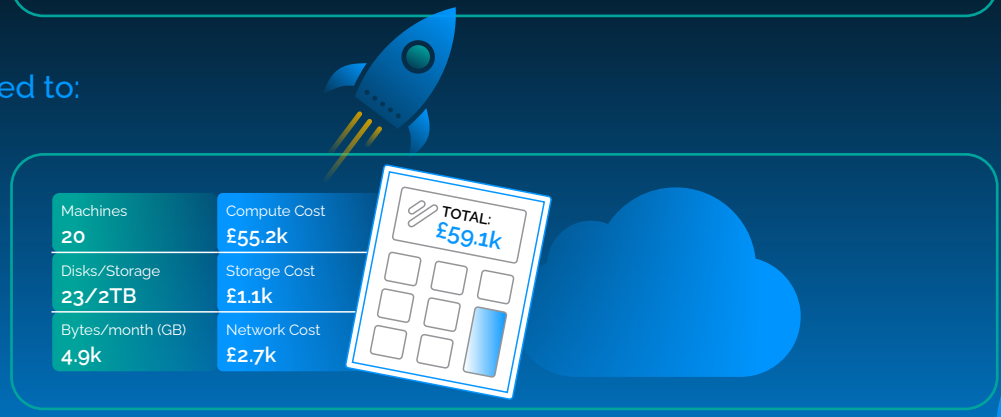
Does it make sense from a cost and performance standpoint to move critical workloads, individually or en masse, to the cloud? You need to assess whether or not the cloud is right for your infrastructure by calculating the total cost of ownership (TCO) of your new cloud. This means accurately understanding what it would cost to run your current infrastructure in the cloud with the same or better performance as your current on-premises environment.

A big mistake both private and public sector organisations make here is to attempt to calculate their cloud TCO by seeing what it would cost to forklift their existing infrastructure into the cloud, in what's known as a like-for-like comparison. This is an inaccurate estimate that does not account for the lower capacity that organisations need once they migrate to the cloud, and will result in a calculation that overstates the costs of migrating your on-premises workloads to the cloud.

Instead, you should form your cloud TCO calculation based on your right-sized cloud. Right-sizing is the process of identifying the optimal compute, storage, and network settings that match your real-world usage and therefore enable you to achieve your maximum performance requirements at the lowest possible cost.


## To calculate your cloud TCO based on your right-sized cloud, you need to:

1. Analyse the performance profile of each machine in your infrastructure, which includes peak CPU utilisation, allocated and peak RAM usage, storage capacity, disc IOPS and bandwidth, and throughput.
2. Based on your performance analysis, for each machine find matching compute, storage, and network configuration options in the cloud that meet your performance requirements at the lowest cost. When you add your compute, storage, and network costs for each machine, you will have an accurate cloud TCO calculation so that you can make the business case for moving – or not moving – to the cloud.



# 2. What's the right hosting strategy?

While the cloud comes in many flavours, essentially organisations have a choice between three basic types of cloud deployment: private, public and hybrid.

There are three main public cloud providers: Amazon Web Services (AWS), Microsoft Azure and Google Cloud Platform (GCP).

## You should consider the following when determining which cloud to move to:

**Business requirements:** While cloud adoption is the right goal, rather than thinking of this as a strategic infrastructure-based decision, look at it from a business and application perspective to create the blend of cloud that is right for you. Once workloads are moved, users should have a seamless experience regardless of where these are hosted. Providing that seamlessness experience requires a gradual migration of the legacy applications into cloud-native solutions, which can be a long journey and should be planned meticulously.

**Cost-performance optimisation:** Each cloud offers different compute, storage, and network options. By doing a performance analysis of your on-premises infrastructure and comparing that to what's available in each cloud, you can project both what your performance and cost will be in each cloud and identify the one that meets your performance requirements at the lowest cost.


**Security:** Covid-19 compelled government to ramp up cloud-based working, which means data sets and applications are spread across generic public cloud and private equivalent versions. The original vision of a move 'to the cloud' has evolved into today's world where organisations routinely use more than one cloud provider. What started as a relatively simple extension of traditional security principles into the cloud has become far more complex as cloud vendors introduce bolt-on security services, siloed in their native environments. Every department or agency must bring these environments, applications and datasets to a common standard and integrated security posture, rather than leave them as standalone pieces.

# 3. Which applications should we migrate?

There are certainly workloads that are easy to lift and shift to the cloud. However, not all workloads can or need to be moved, nor do they necessarily need to be moved in short shrift; legacy may be more easily and rapidly exploited in-situ and processes optimised through targeted intervention, thereby avoiding or delaying the need to move.

## The many benefits of cloud should always be assessed on a case-by-case or needs basis.

### Suitable compute, storage and network options:

Analyse the performance profile of the application and compare it to what's available in the cloud. If you can't find a virtual machine that meets your application's performance requirements at a reasonable cost, then it's not a good option for moving to the cloud.

### Variable usage patterns:

Applications that have variable usage patterns are great candidates for migration. Since they can have bursty behaviour from an CPU/IOPS standpoint, they're likely creating a lot of waste. By moving them to the cloud, you can take advantage of auto-scaling, which can automatically increase the number of virtual machines available during demand spikes to maintain performance and decrease capacity during lulls to reduce costs.

### Specialised workloads.

There are specialised workloads that are difficult to migrate to a cloud environment; these often require certified hardware and complicated licensing and support agreements. They can also be applications with complex security, compliance or regulatory requirements

# 4. Which applications should we prioritise for migration?

Some applications are best to move to the cloud early on, while others should be saved for later.
As a general rule, you should migrate the least complex applications in the initial phases of migration as you get your feet wet in the cloud.

## Higher Priority

- ✓ Mission-critical apps, such as homegrown apps
- ✓ Apps with many dependencies
- ✓ Apps consuming more resources
- ✓ Apps that are being re-factored, revised, or rebuilt

## Lower Priority

- Less mission-critical apps like development, staging, and disaster recovery
- Apps with less connections/ dependencies
- Apps that consume less compute, storage, and network resources
- Apps that are being re-hosted

# 5. What should we do about legacy applications?

The primary challenges around supporting and making safe and predictable changes to legacy systems are the cost and time resulting from manual build, deployment, test and integration methods. In this context, it can be easy to fall into a mindset that legacy has no value when in reality, many legacy systems have considerable locked-in value in terms of the data held, the functionality provided and the deep knowledge that surrounds them.

The question is therefore how best to manage and unlock this value so that it can be readily and rapidly exploited to support a wider digital transformation agenda, which often requires a shift in focus away from the application centricity of legacy towards a data-driven enterprise.

If the embedded value of legacy is not to be lost, dealing with legacy requires a balanced approach. When considering legacy in the context of cloud, treatments traditionally fall into six main categories:

| | |
|---|---|
| **Retire** | Applications that are obsolete, redundant or will become so as a result of a planned replacement or policy/process change. Although by far the most effective solution to legacy, this may require some form of protective intervention as a result of the length of any replacement programme and/or the role it plays during the transition. |
| **Standardise** Replace/ Repurchase | Simplification and standardisation to an industry-standard SaaS. This brings its own challenges such as functional fit, integration, data migration along with managing the various transition states that may be necessary. |
| **Redevelop** Replace/ Rearchitect/ Refactor | Re-instantiate on cloud using a cloud-native equivalent. Whilst this may seem technically attractive, including within a wider remit of digital transformation, business benefit and outcomes may prove necessary to support the business case. Nonetheless, it requires the business logic, data, inputs and outputs for the system to be well-understood. It is also helpful if the system executes a business process where data has a defined life thereby allowing for potential parallel execution of new and old systems and subsequent cutover. |
| **Modernise** Refactor/ Rearchitect/ Replatform/ Encapsulate | Less complex than redevelop but more complex than migrate, this approach adopts a more graduated approach to legacy by treating some application concerns through re-factoring such as exploiting cloud PaaS services; the exposure of functionality and data through microservices and APIs in addition to the underlying migration to IaaS. |
| **Migrate** Rehost | Move to cloud with minimal change or 'lift and shift'. This entry-level cloud migration option typically involves packaging the application and moving to IaaS. Whilst this does not address structural issues within an application, it can be useful both in terms of reducing infrastructure related dependencies and enabling the exploitation of additional readily available cloud services through an onward transformation journey. |
| **Retain** | Leave the application as is, as a result of other priorities, dependencies, levels of investment, compatibility. |

# 6. Which deployment model should we use?

Each of the cloud service providers offer three different deployment models – Infrastructure as a Service, Platform as a Service, and Software as a Service – and each offers different levels of control, flexibility, and management. Understanding the differences can help you decide which model aligns best with your needs.

## Infrastructure-as-a-Service (IaaS)

IaaS contains the basic building blocks for cloud IT and typically provide access to networking features, computers (virtual or on dedicated hardware), and data storage space. IaaS should be used when high scale and performance requirements are important.

| Pros | Cons |
|---|---|
| • Highest level of flexibility<br>• Highest level of management control | • More architecture results in longer time to market<br>• More resource-intensive |

## Platform as a Service (PaaS)

PaaS removes the need for organisations to manage the underlying infrastructure so developers only need to focus on building business functionality.

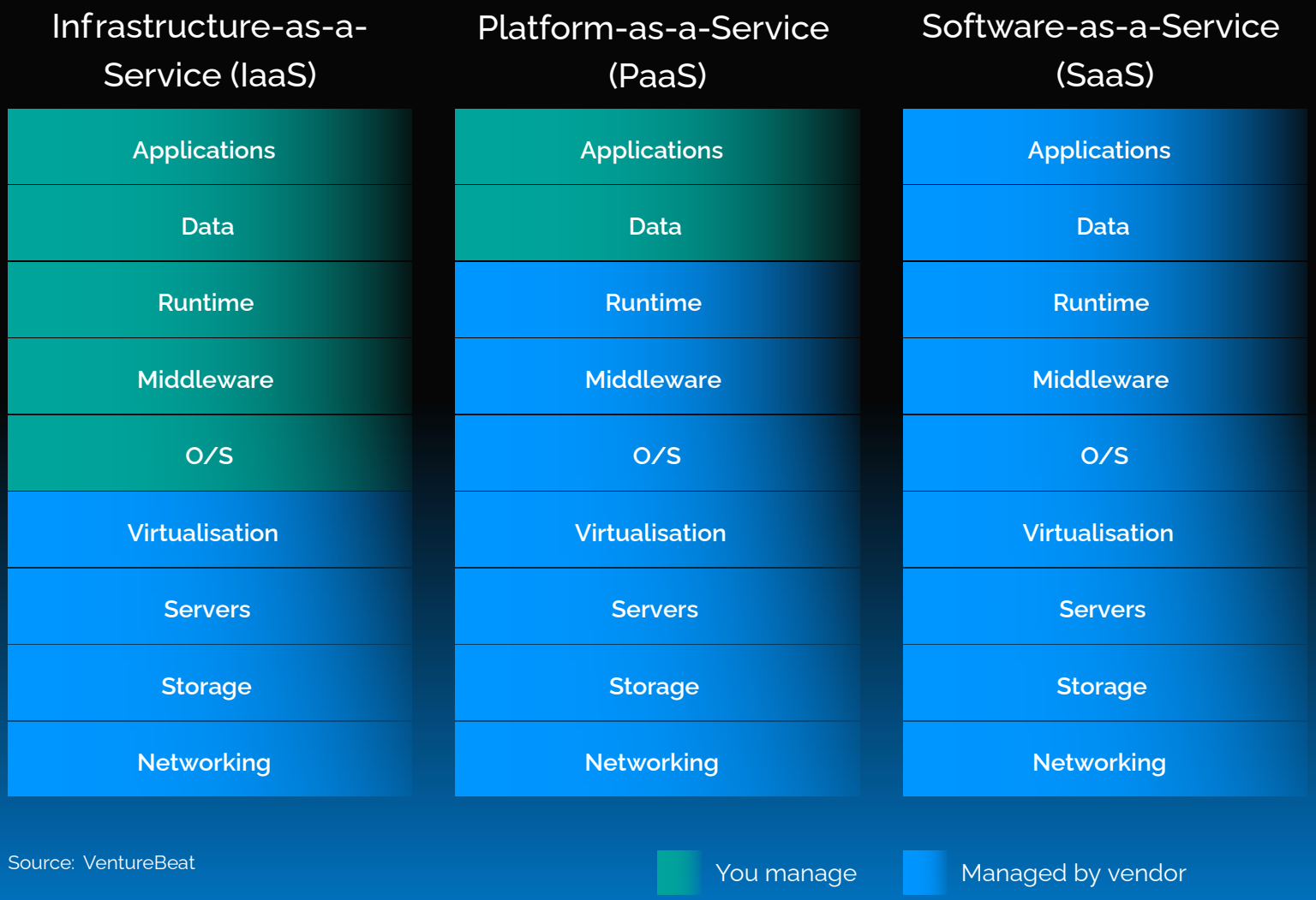
| Pros | Cons |
|---|---|
| • Increased speed to market<br>• Less IT resources required | • Restrictions on technical functionality and compute resources<br>• Vendor lock-in |

## Software as a Service (SaaS)

SaaS provides a completed product that is run and managed by the service provider. You do not have to think about how the service is maintained or how the underlying infrastructure is managed—you only need to think about how you will use that particular piece of software.

| Pros | Cons |
|---|---|
| • Rapid deployment<br>• Free up IT resources | • Little control of your applications<br>• Little to no flexibility |

# 6. Which deployment model should we use?




Source: VentureBeat

# 7. What organisational changes do we need to think about?

Once you've decided it makes sense to move to the cloud, you'll need to determine how roles, culture, and policies will need to change. Some organisational changes to think about include:

### New security policies

When you move to the cloud, sensitive data will now be accessible from any device, anywhere. As a result, the CIO must implement new security policies and train their team on these cloud security policies.

### New skills

Given that the decision to become cloud-based should be part of a wider digital transformation agenda, new skills and tools will be required by digital teams and frontline staff to ensure cloud adoption and drive out the benefits of new ways of working. Procuring external support to access specialist expertise and learning from other organisations and sectors while building a sustainable internal capability will accelerate the journey.

### New mindset

As organisations migrate to the cloud to handle their infrastructure, platform and software needs, often they fail to undergo a similar migration in their organisational mindset. They think fixed instead of elastic and approach their new cloud-based resources in the same way they approached their on-premises data centre. Active management of your cloud deployment is the essential, and a frequently overlooked, ingredient in making the promise of the cloud a reality. Through active management, your infrastructure becomes fluid and dynamic, and provides you with greater levels of flexibility than were ever possible through an on-premises data centre.

Business and financial skills

Negotiation and contractual skills

Project management skills

Security and compliance skills

Technical skills

# 8. Which new technologies do we need?

Making the most out of your cloud investment requires implementing new technologies to help you manage and optimise your cloud. You'll need to consider how the tools you use today translate into the cloud world—should you use these same tools and modify them or purchase new technologies from cloud vendors? Overall, these tools together analyse, monitor, and manage your cloud infrastructure.

## These new technologies include:

### Cloud migration

Cloud migration solutions automate the migration of applications and machines from physical and virtual environments to the cloud.

### Cloud management

Cloud management platforms provide administrative control over public, private, and hybrid clouds. They allow cloud administrators to access, configure, and manage cloud compute, storage, and network resources, as well as enable metering and billing, workflow automation, and resource management.

### Performance monitoring

Performance monitoring tools enable real-time monitoring so that cloud administrators can optimise performance and reliability, and quickly resolve issues that are causing a poor user experience.

### Cloud computing analytics

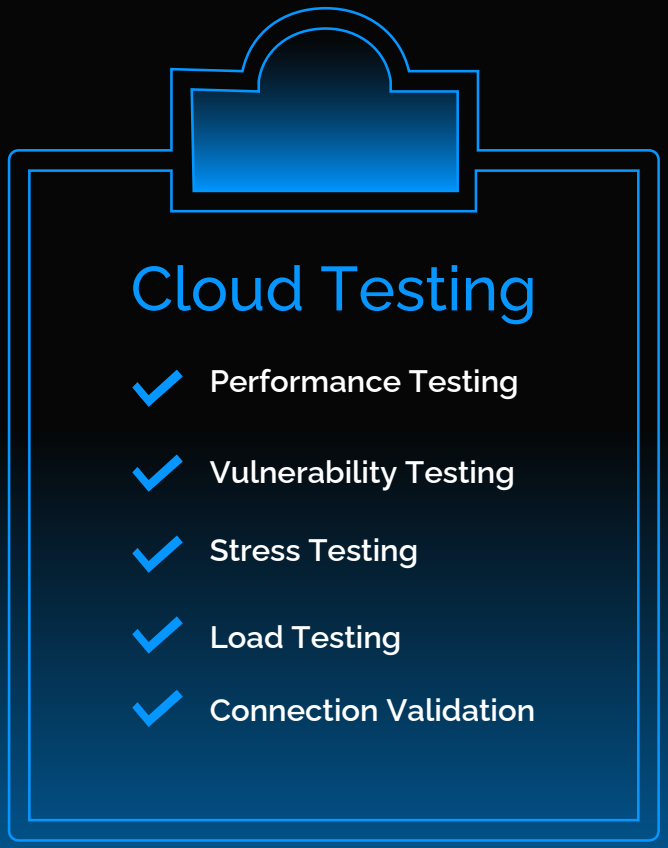
Cloud computing analytics platforms analyse your infrastructure performance and cloud bills to help you understand, control, reduce, and project your cloud costs and achieve cost performance optimisation.

# 9. What and how should we test before and during migration?

Even with the right planning, it's inevitable that you will encounter some issues somewhere when migrating to the cloud, which is why you should have testing tools and processes in place prior to migration.

To ensure your new cloud environment is secure and performing as it should, your testing protocols should include general performance and compatibility testing, stress and load tests, and vulnerability testing. Once you move to the cloud, you should run functionality tests and connection validations. Load testing confirms that your new cloud environment can support high user volumes and helps you understand what your infrastructure can handle. Vulnerability testing should include security reviews to ensure that sensitive data is fully protected, as well as basic security and malware scans. Source: Ryan Pelerin

One of the most common cloud migration issues is application connection breaks, often a result of incomplete dependency mapping. Therefore, once your migration does go live, have a tool in place that not only verifies your application connections are operating as they did on-premises, but can also identify what's causing the connection issue so you can quickly rectify it and avoid major performance issues or downtime.



# 10. What are the common cloud pitfalls?

Pitfall 1:

## Making the wrong move

If you don't correctly calculate your cloud TCO and compare the cost and performance you'll get across all three major public clouds, you'll either make the decision not to move thinking it will cost you more – when in reality it could save you millions – or you'll move to the wrong cloud and not experience the cost and performance benefits that you could be realising. Inaccurate calculations will also impact your department's financial planning and projections.

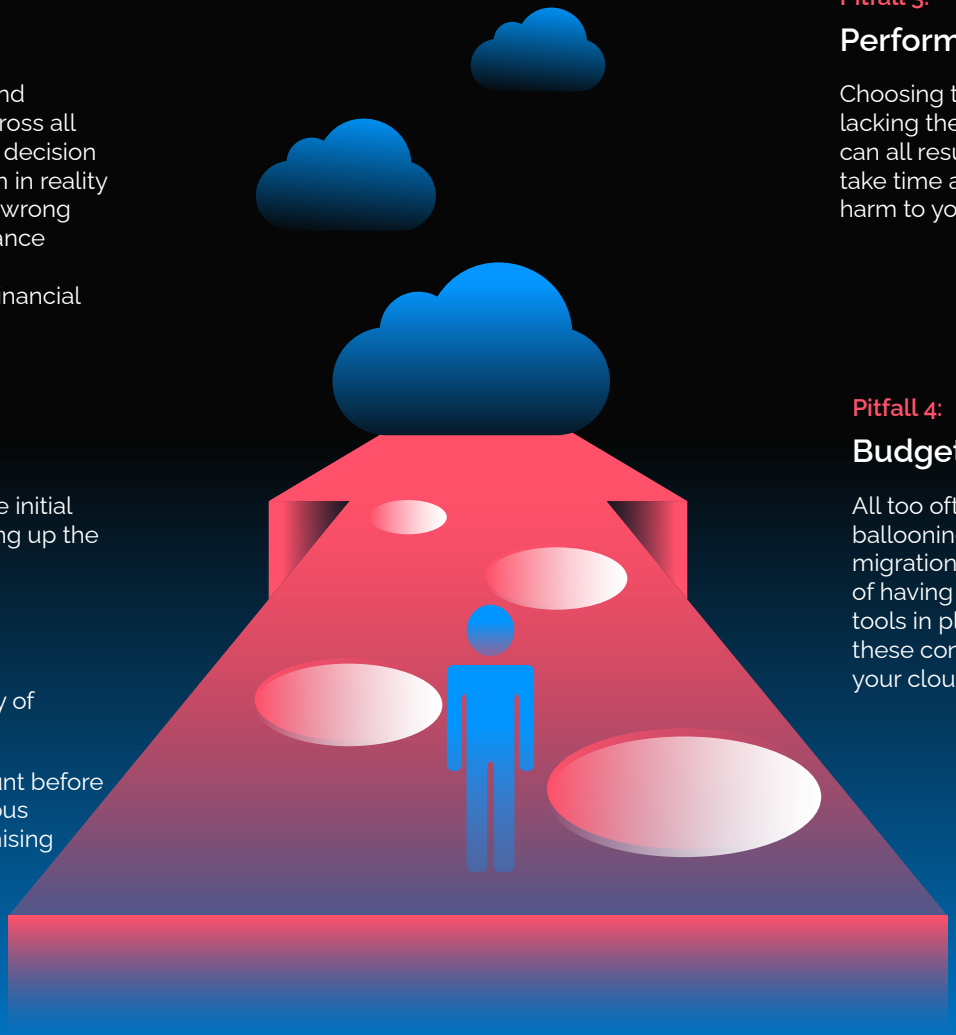
Pitfall 2:

## Running before you walk

Understanding which applications to move in the initial phases of your cloud migration is critical to setting up the success of your overall migration.

Beginning your move to the cloud with complex applications can create major headaches for an organisation and if this is your organisation's first experience with the cloud, it may make you wary of migrating anything else.

It's critical you take considerations 1-9 into account before you move to the cloud, or you'll experience serious pitfalls during your cloud journey. After all, optimising your cloud begins before leaving the ground.



Pitfall 3:

## Performance setbacks

Choosing the wrong cloud or cloud configuration and lacking the right organisational mindset, skills, and tools can all result in performance issues in the cloud that will take time and money to address, and potentially cause harm to your brand.

Pitfall 4:

## Budget mishaps

All too often, organisations see their initial cloud costs ballooning out of control, forcing them to halt their cloud migration execution. Don't underestimate the importance of having the right skills set, mindset, and technology tools in place. A failure to adequately address any of these considerations can cause you to blow right past your cloud budget.

# What next?

The 10 points covered in this guide are the foundation to get you started on the next stage of your cloud journey. Some will require analysis of your existing infrastructure and available cloud options; others will involve internal discussions around your business objectives and resources.

Accurately answering these questions will require automated analysis. This will ensure you de-risk the decision-making at each cloud stage and give you peace of mind that you're making the best decisions so that you can quickly get the most out of your investments in the cloud.

Learn how Cloudamize brings simplicity and data-driven decision making to cloud migration planning.

Request a demo

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