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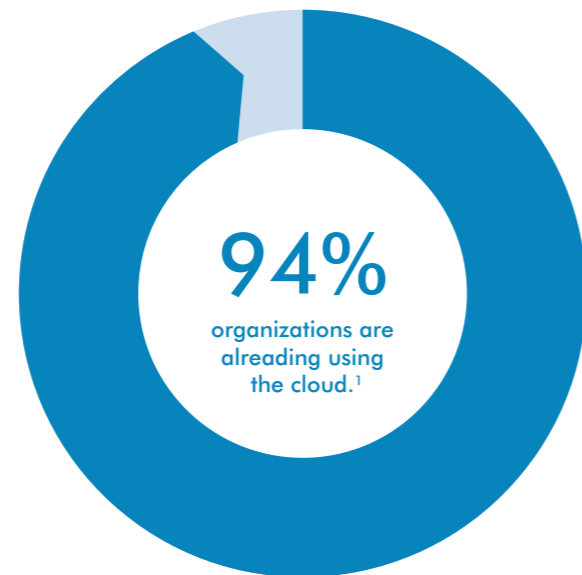
# How Best Practice AWS Foundations Accelerate Cloud Migrations

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# Cloud Migration is Inevitable for Most Businesses



**The use of cloud in all its forms continues to grow across organization types and sizes as businesses recognize the value of cloud.**

It's only a matter of time before your organization embarks on a cloud migration journey of some form.

In the context of organizations that don't come from a traditional IT background, a cloud migration presents a host of challenges, from obtaining stakeholder buy-in to finding the team with the experience to handle the implementation.

This ebook aims to assist businesses considering their first cloud migration.

First, we'll look at the global picture, to help understand the context behind this growth,

and how this long-term trend has been accelerated due to the COVID-19 pandemic.

Then we'll delve into what a cloud migration looks like for a business, and the various levers that can be pulled to enable a successful migration that delivers outcomes.

The final section will dive deep into the importance of secure, industry best practice cloud foundations.

These are essential for a successful migration, but can be difficult to pull off for organizations which lack deep experience in cloud.

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# Why are organizations migrating to the cloud?

## Business Drivers

There are many reasons to migrate from a traditional data center to the cloud, with many drivers originating from internal business goals.



### Security & data protection

One of the top drivers in moving to the cloud in 2020 is improved security and data protection.<sup>2</sup> With the rise in number and sophistication of cyber-attacks, CIOs and CSOs are looking to cloud providers and partners for greater levels of protection for their data.



### Cost reduction and long-term savings

Cost has long been a driver for organizations migrating to the cloud. In 2020, 61% of organizations cite cost reduction as the main driver in migrating to the cloud.<sup>2</sup> Moving to a consumption-based model enables CIOs to better manage their infrastructure costs and reduce their upfront, or CapEx, spend greatly. Over time, even greater savings can be realized as organizations increase the efficiency of their applications by leveraging cloud services, doing more with less.



### Improved speed to market

Operating efficiently in the cloud brings the advantages of greater operational agility. With the right cloud foundations, application developers are able to build, test, and deploy faster than ever, enabling speed to market for businesses wanting to reach their customers sooner.



### Higher availability/scalability

Done right, cloud enables organizations to scale their applications quickly and to be highly available, meeting increased consumer demand, enabling global reach and reducing downtime.



### Greater accountability

Businesses want greater visibility into the cost and compliance of their infrastructure, and greater accountability for teams responsible for keeping applications online and secure. Working in the cloud with the right tools can provide this visibility to execs, resulting in greater accountability for teams and individuals.



### Faster failure identification and recovery

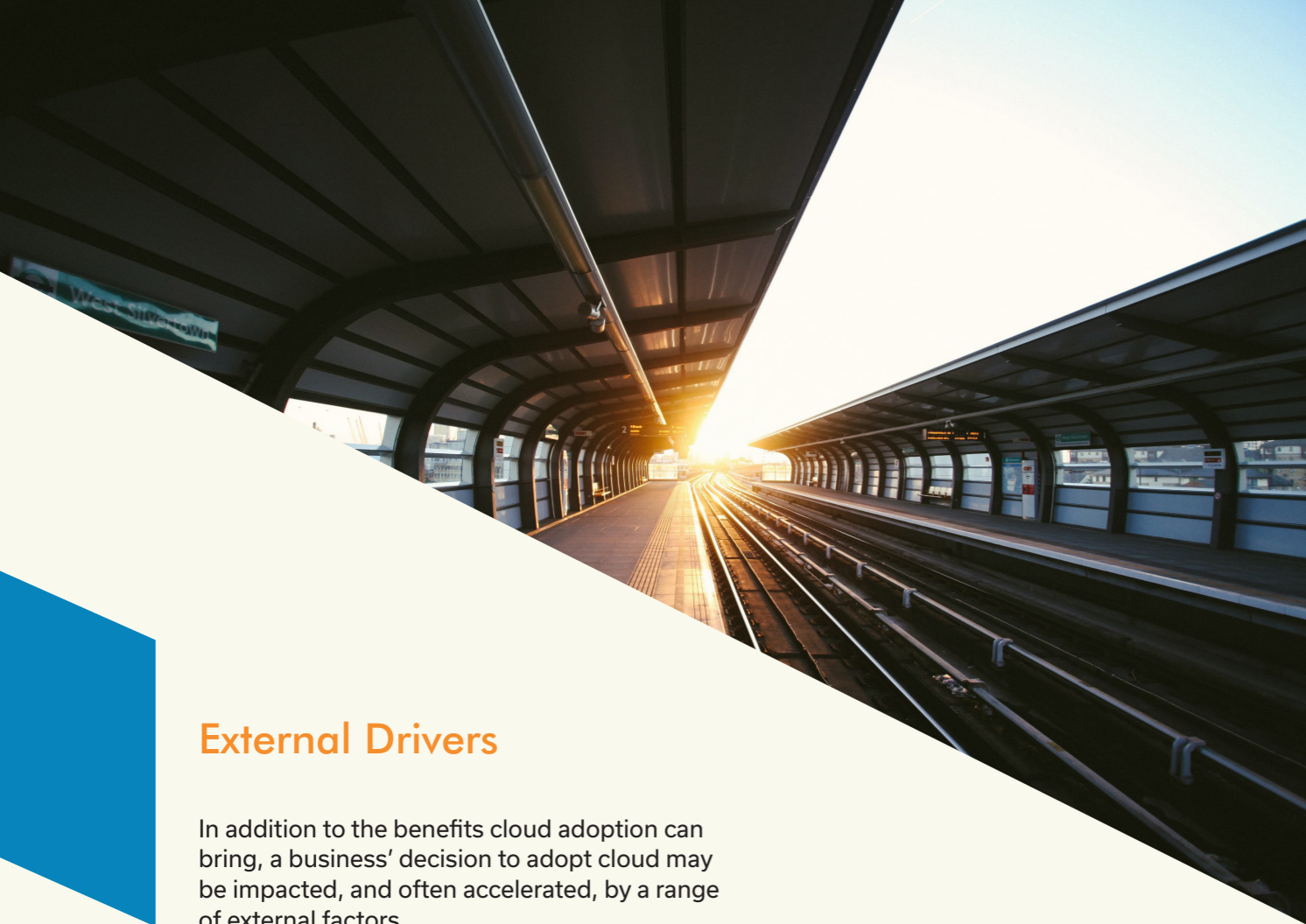
When set up correctly, the enhanced monitoring capability available in the cloud, coupled with an increased speed of deployment, enables organizations in the cloud to respond rapidly to system failures, reducing downtime for consumers and reducing the cost impact of issues.



### Data modernization

55% of IT leaders and executives strongly agree that data modernization - moving data from legacy databases to more modern databases - is a key reason for their shift to the cloud.<sup>2</sup> With the explosion of data that is created, stored, mined and analyzed by organizations, the need for modernization of data platforms is stronger than ever.





## External Drivers

In addition to the benefits cloud adoption can bring, a business' decision to adopt cloud may be impacted, and often accelerated, by a range of external factors.



### Legacy IT systems

Businesses may be looking to remove the risk of their legacy systems, which may be outdated and unreliable, impacting their delivery time, cost and performance.



### Expiring IT hardware contracts

Many businesses choose the strategy of cloud adoption as their contracts with hardware providers come to an end. The impending end-date can create a hard deadline for organizations to exit data centres as CIOs look to avoid higher costs of hanging around after the contract ends.



### M&As or businesses decoupling

The business may be involved in a merger, acquisition or decoupling from another business, and so IT systems will need to adapt to the changing structure. Adopting the cloud can help in all these scenarios, and so they are often a driver for a move to the cloud. When merging or acquiring businesses, cloud can help with faster integration and collaboration between teams; and when decoupling, migration to the cloud is often a faster way to decouple IT systems and data.<sup>3</sup>

# Cloud Migration and COVID-19

The pandemic has not slowed cloud down.

During times of economic slowdown - such as those experienced as a result of the current COVID-19 pandemic - cloud becomes a better choice for enterprises. CIOs will have to prioritize spending on technology and services that are deemed "mission-critical" over initiatives aimed at growth or transformation.

**“The use of public cloud services offers CIOs two distinct advantages during the COVID-19 pandemic: cost scale with use and deferred spending.”**

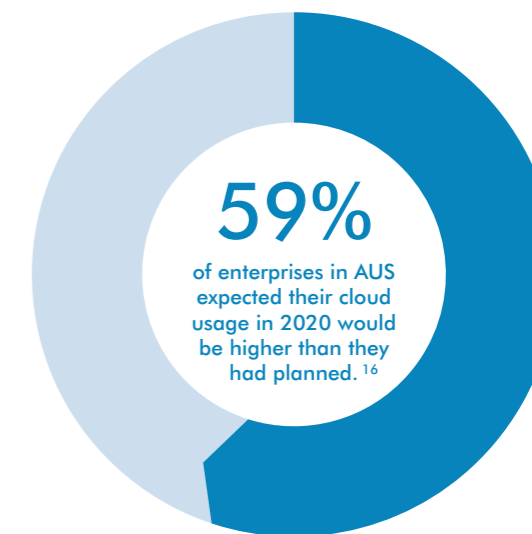
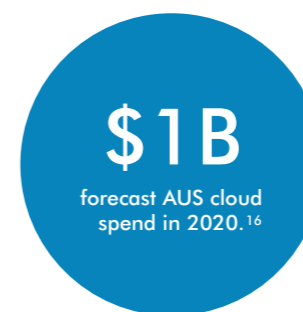
- Sid Nag, Research VP, Gartner<sup>4</sup>

Organizations are shifting operations and customer-facing services online as a result of the pandemic and utilizing cloud services enables CIOs to manage this shift with significantly less upfront cash investment than traditional data centers.

**“As far as cloud market numbers go, it’s almost as if there were no COVID-19 pandemic raging around the world. As enterprises struggle to adopt to new norms, the advantages of public cloud are amplified.”**

- John Dinsdale, Chief Analyst, Synergy Research Group<sup>4</sup>

Additionally, the rise of remote working will result in growth in public cloud services – with 19% forecast growth in 2020, as well as cloud-based telephony, messaging and conferencing services.<sup>5</sup> Organizations need to adapt rapidly to a new way of working, and the cloud enables them to do that quickly, efficiently and cost-effectively.







# AWS: The Most Reputable Public Cloud Platform

Choosing a cloud provider is one of the key steps in planning a cloud migration.

**Amazon Web Services (AWS) is by far the leader in public cloud, with 33% global market share in Q2, 2020, almost double that of its largest competitor.**<sup>6</sup>

An early market leader, organizations continue to trust AWS as their public cloud partner, as their service offering both matures and expands.

## Why Choose AWS?

### Geographic reach

Twenty-six regions and 84 availability zones (with more in the works)<sup>7</sup> give AWS the leading edge in terms of location availability. Organizations that operate in multiple regions choose AWS as they receive better support, and their global capability extends into services such as automated multi-region backups<sup>8</sup>, giving organizations peace of mind when storing critical data in multiple regions.

### Breadth and depth of services

Over 200 fully featured services are on offer to AWS customers, ranging from Compute, Storage and Networking, to Security and Identity, Machine Learning, IoT, VR, Containerization and Serverless, Blockchain and more<sup>9</sup>. In terms of developer functionality, AWS takes the cake.<sup>10</sup>

### Reliability

AWS consistently outranks its competitors in terms of downtime, with the lowest downtime compared to major competitors reported over multiple years since 2017.<sup>11,12</sup> Reliability is a key requirement for businesses running mission-critical workloads in the cloud, so choosing a service that will consistently provide the least downtime is important for business leaders.

### Customer base

Aside from 'web pioneers'<sup>10</sup>, AWS has successfully migrated many traditional businesses to the cloud. Millions of organizations trust AWS to host their application workloads, from internet giants such as Netflix and Pinterest, to government agencies and traditional businesses like National Australia Bank, Qantas, GE, or Kelloggs Cereals<sup>13</sup>. With such a large and varied customer base, CIOs can be confident that AWS can cater to their individual needs, as chances are the cloud provider has worked with a similar organization before.

# Steps to Achieving Cloud Migration

**There are so many things to consider when planning a cloud migration, and so many stakeholders to keep happy. Where do you start?**

## Discover Phase

### Business drivers

Identifying what is important to your business, who your key stakeholders are and what their needs are, is vital to ensuring a successful migration. Working with each department, gaining buy-in early, and helping educate them will go a long way to ensuring a smooth migration to the cloud.

### Application analysis & categorization

The complexity, performance and security requirements for each application will vary,

and as such, organizations may choose a different approach for how their applications are migrated to the cloud. There are six main options - 'the 6 Rs'<sup>14</sup>. Each 'R' comes with different cost, time and capability considerations, and must be carefully chosen to select the right cloud fit for your service. A detailed breakdown of how each R differs follows, but let's look at the two extremes first.

Re-architecting an application to become cloud native can take months of work – albeit with potentially very positive outcomes from a cost and risk standpoint.

At the other end of the scale, simply 'lifting and shifting' - leaving the architecture of an application relatively untouched - may be cheaper and quicker in the short term but could cost the organization more as the benefits of cloud cannot be realized. For example, the application may not be architected to scale automatically with demand, and so rather than using smaller compute instances that automatically spin up and down as demand fluctuates, the application needs to be hosted on much larger instances, essentially 'over-provisioning' compute so that in times of high demand, the application and instance can manage the load. During the times of low demand, the organization ends up paying for compute that is not being used.

## The 6 Rs of Application Migration

### Re -host, or 'lift and shift'

The application is moved to the cloud with no changes made to optimize the application for the cloud. A widely adopted strategy when needing to move applications quickly, with most CIOs planning to optimize the application once it's in the cloud environment.

### Re -platform

Making a few optimizations, e.g. moving to a database-as-a-service platform, rather than migrating a legacy data base with the application.

### Re -architect

Changing how the application is architected and developed to be cloud-native. E.g. moving from a monolithic structure, to a service-oriented architecture.

### Re purchase

Moving away from perpetual licenses, to a Software-as-a-Service (SaaS) model.

### Re tire

Turning applications off that are no longer required, to achieve cost savings and operational efficiencies.

### Re tain

Choosing to re-visit applications that will require significant re-architecting before migration.



## Cost calculations

Especially in today's climate, cost considerations are top of mind for CIOs and CFOs when embarking on a cloud migration. Understanding:

- Your main cost drivers
- The right technology for your business
- The migration partner that fulfills this required capability

... will go a long way to reduce your upfront or CAPEX spend, but more importantly, will help get your migration plan across the line.

## Operating model analysis

Moving to the cloud requires a fundamental shift in the way that teams think, work and collaborate. The cloud brings many opportunities to improve how your teams work and adapting existing operating models to new ways of working will need to happen over time. Addressing this upfront and considering how you'll need to change your operating model to embrace this new world, can save a lot of pain down the track.

## Detailed planning and design

When migrating complex systems and services, with many dependencies, risks and customer impacts, detailed planning is required to create a solid roadmap for delivery. Just like any project, working through all the nuances and requirements upfront will result in a smoother migration. Building out a detailed design for the end-state, and steps to achieve it, keeps everyone on the same page, and reduces the chance of surprises as you start the migration work.

## Plan Phase

### The five foundational levers of enabling a cloud migration

Regardless of the nuances of your cloud migration strategy, every successful cloud migration requires five foundational levers to be considered.

Understanding these levers and how you will use them will determine the success of your cloud migration and overlooking just one of these levers can result in the failure, delay or significant cost impact to your migration.

### 1. People

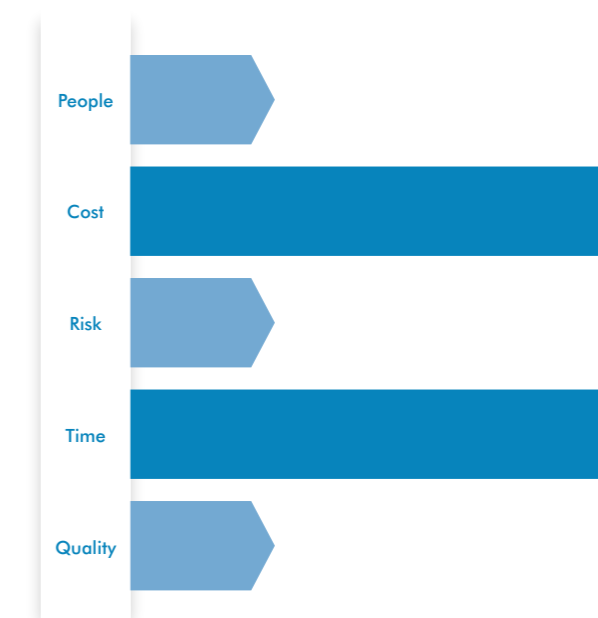
There is a shortage of skilled cloud-native engineers in today's talent market. Even consulting businesses are struggling to find people with the skills necessary to build the right foundations, and successfully modernize and migrate applications for the cloud.

Upskilling developers or systems engineers with limited cloud experience takes time and can significantly delay migrations. Forecasts suggest insufficient cloud IaaS skills will delay half of enterprise migrations by two years or more.<sup>15</sup>

This skills shortage makes it even harder to retain good people, as the demand is so high that they are constantly tempted away by better offers.

### 2. Cost

While cost is a main driver for cloud adoption and migration, without careful planning and without the right tools for cost visibility, migration can often bring significant upfront costs to organizations.



Using a migration partner to build the foundational elements of a cloud platform can be expensive, and is often required as an upfront capital investment, which most organizations struggle to find.

Additionally, as the organization begins to consume cloud services, visibility of variable costs becomes vital to maintaining control over your cost base, and in giving internal stakeholders peace of mind that costs are under control, are attributable to business units, and can be managed if they differ from plan.

### 3. Risk

Two types of risks impact migrations and both must be considered when choosing how to migrate to the cloud:



## Managing security and compliance risk in the cloud

While the cloud offers many benefits for organizations looking to improve their risk and security posture, the reality is cloud services need to be implemented correctly and monitored consistently to ensure adherence to your risk management framework.

When building cloud foundations, teams need to follow best practices, ensuring security measures are in place and that cloud environments are set up securely before migrating any application workloads. Without doing this foundational work, it is inevitable that problems will emerge. Costs will blow out as applications are run inefficiently, security issues will arise as application data is left unsecured, and teams will work inefficiently without careful planning, design and building of deployment processes.

To do this in-house requires in-depth expertise with the cloud services you are working with, as well as a set of guidelines to work against that align to your internal and external requirements, such as compliance standards or security standards like the Centre for Internet Security (CIS) AWS Foundations Benchmark. When migrating to AWS, organizations choose to use the Well-Architected Framework (WAF), a set of guidelines that ensure your AWS setup is secure and hardened.

However, using in-house or external teams to build these foundations from scratch can require significant up-front investment.

An alternative is to use a technology partner that lays cloud environment foundations securely and provides ongoing customizable monitoring and alerting of your cloud environments to ensure adherence to your risk management framework.

### Program or project delivery risk

Often migration programs run behind schedule, which carries significant risks in terms of cost impacts. Being able to 'buy-out' of this risk brings not only piece of mind for CIOs,

but a large reduction in delivery risk for the organization.

## 4. Time

A successful migration needs a strong foundation but building one can take months.

Cloud providers like to advertize that organizations can get going in the cloud very quickly – and they can, anyone can open an AWS account and provision services within minutes. However, successfully migrating enterprise-grade applications requires the implementation of foundational layers that take time, often months, to design and build.

Accounts need to be set up securely, guardrails need to be implemented, patterns designed and established, networks designed and built. Operationalizing your cloud foundations can be a significant investment in time and money and can delay migrations.

Why reinvent the wheel? Using an experienced technology partner who can lay these foundations for you can significantly reduce your time to value, automating your cloud operations so that your engineers can focus on building or re-architecting your applications rather than operationalizing your foundations.

## 5. Quality

Often in cloud migrations, CIOs have to forego quality to meet timeframes or reduce costs.

Trade-offs have to be made, resulting in sub-par implementations, that ultimately will cost more in the long run as rework is required to bring your cloud environments back up to standard.

Choosing a technology partner that delivers quality cloud foundations out of the box, enables you to launch a cloud migration that aligns to best practice, is secure and production-ready.





BUILD

# The Importance of Solid Cloud Foundations

**Just as a builder starts with the foundations of a house, your cloud environment also needs solid foundations.**

If you were migrating a building from one site to another, you wouldn't just buy the site and drop the house onto it. You'd assess and prepare the land, pour a slab, ensure that water and electricity are accessible at the right points... the list goes on.

A successful migration to the cloud requires the same type of up-front blueprint.

## Cloud Foundations Components

### Hardened, secure accounts

Before migrating anything to the cloud, it's important to ensure the environment into which your applications are moving is secure and aligns with best practice.

Cloud providers do not necessarily provide fully secure or hardened accounts or environments out of the box. They do give limited guidance on the best way to set up your accounts or environments. For example, AWS provides the Well-Architected Framework as a detailed guide for AWS users to ensure their accounts adhere to best practice.

Enabling and using services that apply security controls consistently across all your accounts and environments is fundamental to managing the security of your applications and data.

### Guardrails

Whether you have the best possible AWS engineers, or those with little to no cloud experience, it's vital to have guardrails in place to ensure that any work done in the cloud aligns with your security and compliance requirements.

Guardrails are designed to keep engineers in check, preventing issues from occurring and reducing your organization's risk in the cloud.

For example, a guardrail might be a policy that restricts engineers to only create resources in specific geographical locations, or that requires specific types of cloud storage to be encrypted.

### Repeatable workload deployments

When working in the cloud, engineers use 'Infrastructure as Code' (IaC) to provision and manage cloud services using software and automation, rather than a manual process. Stemming from DevOps practices, Infrastructure as Code offers many benefits including visibility, stability, security and scalability.<sup>16</sup>

Much of working in the cloud requires engineers to deploy the same packages of Infrastructure as Code to different accounts or environments. Having a repeatable storage and deployment process for these packages ensures that your ongoing build processes are much faster and more reliable.

## User access

Designing and managing user access to your cloud environment centrally will help to reduce your risk in the cloud. Governing who has each level of access ensures that the right people have the right access to do their job and removes the possibility of access falling into the wrong hands.

For example, teams may configure user access to certain applications only, or to certain types of data, based on their role type. Or certain users may require read-only access to view information about the cloud environment, while others need full access to make changes in the cloud environment.

## Network configuration and management

Designing, configuring and managing networks that support your business needs is another fundamental foundation for your cloud environment. This component of your foundations requires careful planning and can take a significant amount of time if doing it yourself. Repeatable processes for creation and deployment of networks can save your teams a lot of time in your cloud migration.

# Executing a Cloud Migration

**When planning a cloud migration, executives are faced with a question: to execute the migration in-house or to outsource the work? There are pros and cons for each approach:**

## Inhouse

- ✗ Usually significant upskilling of incumbent teams required before migration can commence due to lack of cloud expertise
- ✗ Often takes longer
- ✓ Teams know applications and internal stakeholders well - have the context that outsourced teams do not have
- ✓ May be cheaper in the short run with less upfront or CAPEX investment
- ✗ Manage all the delivery risk internally



## Outsourced


- ✓ Get access to expert cloud engineers quickly with no upskilling required
- ✓ Can be much faster
- ✗ Lack the internal context needed and will need to work with internal teams to understand applications and business requirements
- ✗ More upfront investment required
- ✓ Outsource components of delivery risk



## Cloud Foundations: Build or Buy?

Previously, organizations had to build their cloud foundations from scratch for every cloud migration. But with Stax, they can purchase cloud foundations out-of-the-box, significantly accelerating delivery.

 Build	 Buy Stax
Significant time investment required which can delay migration by months.	Time to deliver cloud foundations reduced from months to days.
Unable to start actual migration until foundational build is finished, keeping application engineers 'on the bench' for longer.	Foundations are provided within five days, so application engineers can get started on their work much sooner, reducing your costs and speeding up delivery.
Upskilling of engineers is required to build foundations that align with the latest best practice.	Foundations purchased align with best practice out of the box and are continuously updated.
Significant upfront or CapEx investment is required to run a cloud foundation build as its own project, eating into your overall cloud migration budget.	Purchased as an ongoing monthly operating or OpEx cost which can be built into your ongoing budget and is cheaper over time.
Ongoing maintenance of foundations requires time, effort and updated skills.	Buying a foundation layer includes the ongoing management of each element, with repeatable processes for account creation, workload deployment and network configuration and deployment. Implement once, use ongoing.
Using inexperienced cloud engineers can result in major security issues, such as sensitive data or ports being left open to the internet. Without the experience or knowledge of the nuances of the cloud platform, these issues can occur regularly.	Foundations are built and managed by the Stax platform, reducing the risk of security or cost issues occurring due to a lack of experience. In addition, risk management features ensure teams adhere to an organization's technology risk management framework.



## How Stax Enables Successful Cloud Migrations

### A Stax tenancy enables cloud migrations with an enterprise-grade production ready platform.

A successful migration needs a strong foundation but building one can take months, come with significant upfront costs, and require an experienced team to build and maintain over time.

But CIOs do have another option.

A Stax tenancy enables cloud migrations with an enterprise-grade, production-ready platform. It's engineered to AWS best-practice and can be ready for you to build on in just a few days.

With industry best practice, prefabricated patterns and proactive guardrails to automate cloud operations, engineers can focus on building your applications rather than operationalizing your foundations.

Stax offers an evergreen cloud foundation, with a pay-as-you go model that eliminates the need for major capital expenditure.

Choosing a technology partner that will lay cloud foundations in days, not months, will reduce your costs, ensure security and compliance, getting you into the cloud cheaper,



**See how the Stax platform's evergreen cloud foundations can help your organization overcome risk and drive innovation in the face of ongoing change.**

Visit **stax.io** and book a no obligation demonstration today.

#### Sources

1. <https://hostingtribunal.com/blog/cloud-adoption-statistics/#gref>
2. <https://www2.deloitte.com/us/en/insights/industry/technology/why-organizations-are-moving-to-the-cloud.html> 3 <https://www.datavail.com/blog/4-reasons-the-cloud-helps-with-mergers-acquisitions/>
4. <https://www.gartner.com/en/newsroom/press-releases/2020-07-23-gartner-forecasts-worldwide-public-cloud-revenue-to-grow-6point3-percent-in-2020>
5. <https://www.gartner.com/en/newsroom/press-releases/2020-05-13-gartner-says-global-it-spending-to-decline-8-percent-in-2020-due-to-impact-of-covid19#:~:text=Spending%20on%20Cloud%20Services%20is,latest%20forecast%20by%20Gartner%2C%20Inc.>
6. <https://www.srgresearch.com/articles/quarterly-cloud-spending-blows-past-30b-incremental-growth-continues-rise>
7. <https://aws.amazon.com/about-aws/global-infrastructure/#:~:text=AWS%20Global%20Infrastructure%20Map,Indonesia%2C%20Japan%2C%20and%20Spain>
8. <https://cloudranger.com/10-reasons-to-choose-aws/>
9. <https://aws.amazon.com/products/>
10. <https://www.computerworld.com/article/3429365/aws-vs-azure-vs-google-whats-the-best-cloud-platform-for-enterprise.html>
11. <https://www.theinformation.com/articles/how-aws-stacks-up-against-rivals-on-downtime>
12. <https://www.networkworld.com/article/3394341/when-it-comes-to-uptime-not-all-cloud-providers-are-created-equal.html>
13. <https://aws.amazon.com/solutions/case-studies>
14. <https://d1.awsstatic.com/whitepapers/migration/aws-migration-whitepaper.pdf>
15. <https://www.gartner.com/smarterwithgartner/4-trends-impacting-cloud-adoption-in-2020/>
16. <https://containeronaws.com/introduction/infrastructure-as-code/#:~:text=Infrastructure%20as%20code%20is%20the,as%20code%20is%20AWS%20CloudFormation>





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