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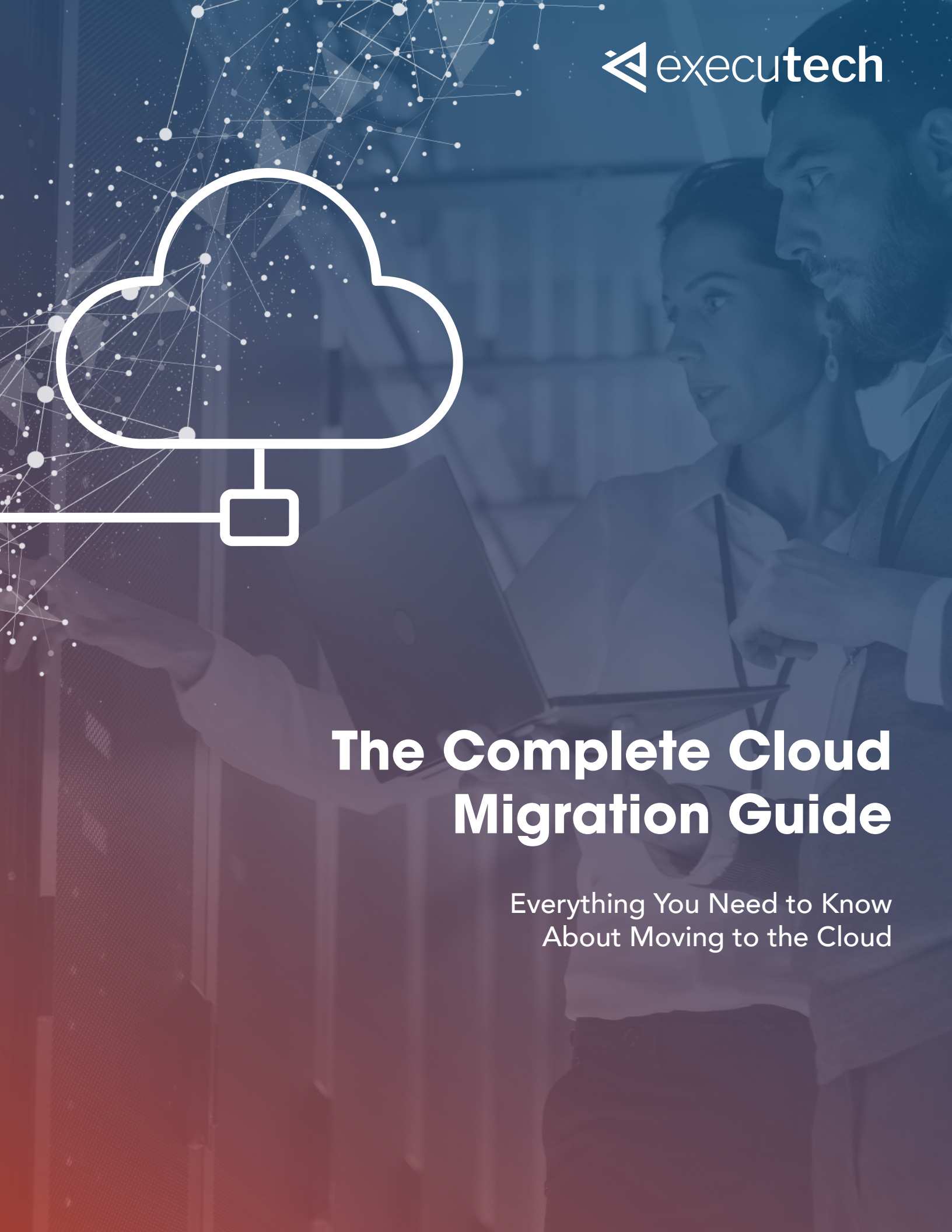

The Complete Cloud Migration Guide

Everything You Need to Know About Moving to the Cloud

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CHAPTER 1

If your eyes glaze over and you just nod along whenever you hear someone bring up cloud technology, you're not alone. Although we've all probably heard of the cloud, some of us are still a little fuzzy on what it actually means. Many of us think of cloud technology a little like magic.

But, as much as we love the idea that some magical, little cloud floats above us storing our data and documents, that's not exactly correct. So then, what is "the cloud" and how does it work?

What is the Cloud?

When someone says their data is in the cloud, what does that mean? Well, it means that their information isn't stored locally on their computer or server. Often, it's stored on a network of servers off-premise. Users then access this information using the internet.

You probably already use the cloud in your personal life to store photos, videos, or documents. This use of the cloud is referred to as cloud storage.

You might have also heard of "cloud computing." Cloud computing goes beyond just storage. Cloud computing includes servers, storage, databases, networking, software, analytics, and intelligence. If you have ever used Office 365 or Google Docs, you have used cloud computing.

Whether for storage or computing, there are a few different types of clouds that individuals and organizations use. There are public clouds, private clouds, and hybrid clouds.

PUBLIC CLOUD

A public cloud is the most common type of cloud. It's also where most people's minds go to when they think of cloud technology. In a public cloud, your data is stored across remote servers that are hooked together to function as one, all-encompassing network. These servers are not owned by you but rather by a third-party provider.

When you use a public cloud, think of it as renting space on someone else's server. The "who" that you are renting from are cloud service providers. Some major cloud service providers are Amazon, Google, and Microsoft. These companies own and manage all the hardware, software, and infrastructure required for running the cloud.

The key differentiator with a public cloud is that anyone can use it. All you have to do is sign up with a cloud service provider, and you will have access to the cloud. This means that your data uses the same resources as every other customer of that cloud provider.

PRIVATE CLOUD

A private cloud, on the other hand, is reserved for a single organization or business. There aren't any shared resources with a private cloud. All hardware and software is dedicated to the owner of the cloud.

You can create a private cloud using owned resources, such as a data center, or you can also use a third-party provider. If you choose a third-party provider, specific hardware and software are dedicated solely to your organization.

Some organizations choose a private cloud over a public cloud for improved flexibility and security. With a private cloud, a business can customize the cloud to meet its specific needs. It also allows for more control when it comes to security because resources are not shared.

HYBRID CLOUD

A hybrid cloud is a combination of public clouds, private clouds, and on-premise infrastructure. A business using a hybrid cloud model often uses a public cloud for basic computing tasks, while storing more sensitive data on a private cloud or an on-site server. For many companies, a hybrid cloud model is the best of both worlds.

Businesses can maintain control over the entirety of their data while still leveraging the power and scalability of the cloud.

CHAPTER 2

Why are Businesses Choosing the Cloud?

Organizations can use any of the three cloud models, but what makes businesses want to move to the cloud in the first place?

SCALABLE

One of the most significant advantages of businesses using cloud computing is scalability. Physical servers have a limited capacity. So, for companies using servers, any growth or seasonality threatens to hit this maximum. And the only way to increase capacity is to purchase another server. Servers can cost anywhere from a couple thousand dollars to upwards of ten thousand dollars.

With cloud computing, this problem disappears. Cloud service providers offer businesses on-demand capacity. You can adjust the level of computing power, storage, and bandwidth your business needs at any time. No more worrying about capacity issues, and better yet, no more wasted, unused space.

REDUCED COSTS

Another reason businesses choose the cloud is its cost-effectiveness. Companies can achieve significant savings by migrating to the cloud, especially in the long-term.

Compared to a physical server, there is typically no upfront investments with the cloud. On top of that, servers need replacement every 3-5 years. With the cloud, you can choose to pay a fixed monthly cost, avoiding significant capital investments.

Also, with the scalability the cloud offers, you only pay for what you use, rather than using a server that you pay for regardless of demand. By choosing the cloud, businesses can avoid this wasted spend.

Last but not least, by using the cloud, you won't be paying for racks of servers and the electricity and power required for these servers. These energy costs can add up, but with the cloud, you don't even need to worry about them.

INCREASED COLLABORATION

In this global workforce, employees and teams are often spread across offices in different cities, states, and even countries. Without the ability to easily collaborate, it can create silos between teams and reduce efficiency.

If there's one thing it takes to succeed in a competitive business landscape, it's communication. Since the cloud utilizes the internet, it makes collaboration and communication easy. Employees can work on projects at the same time, with documents updating in real-time.

INCREASED FLEXIBILITY FOR EMPLOYEES

In this age of technology, one of the most substantial factors employees value in a job is flexibility. Many workers want the ability to travel and work remotely as opposed to being pinned to a desk from 9-5 every day. With cloud technology, workers can do just that.

The ability to work from anywhere at any time is a major draw for employees. So companies that want to attract and maintain the best employees will need to offer this flexibility to stay competitive.

SECURITY

When considering cloud migration, many companies get hung up on security issues. However, contrary to popular belief, the cloud is often more secure than physical servers.

Later in this guide, we will discuss cloud security more in-depth, but for right now, understand that the cloud can be as safe as servers, if not more so. Cloud service providers are committed to satisfying their customers, which means tight security measures.

Many businesses get concerned about the loss of control of their data, but in reality, the cloud has strict security practices in place. Advanced firewalls, encryption, and best-in-class infrastructure all help provide a safe and secure solution.

DISASTER RECOVERY

Cloud-based backups give businesses the ability for disaster recovery like never before. In the past, typically only larger companies could afford disaster recovery solutions. Cloud solutions now provide businesses of any size the ability to back up their data easily. With all of these benefits, it's no wonder organizations are moving to the cloud.

CHAPTER 3

What is Cloud Migration?

Now that we all understand what the cloud is and the benefits it can offer businesses, you might be wondering how companies "move to the cloud."

When companies choose to transition their data, processes, and systems to the cloud, it's called cloud migration.

CLOUD MIGRATION STRATEGIES

There are a few different approaches companies can take when moving to the cloud. The system complexity, type of information, and purpose of the cloud migration will all affect which method an organization chooses.

A FEW POPULAR CLOUD MIGRATION STRATEGIES ARE:

Rehost (Lift & Shift)

This type of migration strategy, sometimes called a "lift and shift," takes existing data applications and moves them to cloud servers. This approach is typically easier and quicker than other methods because it doesn't require an organization to re-architect anything.

A rehosting strategy can save a company costs on redesigning or rebuilding their systems. It also allows organizations minimal service interruptions during the transition.

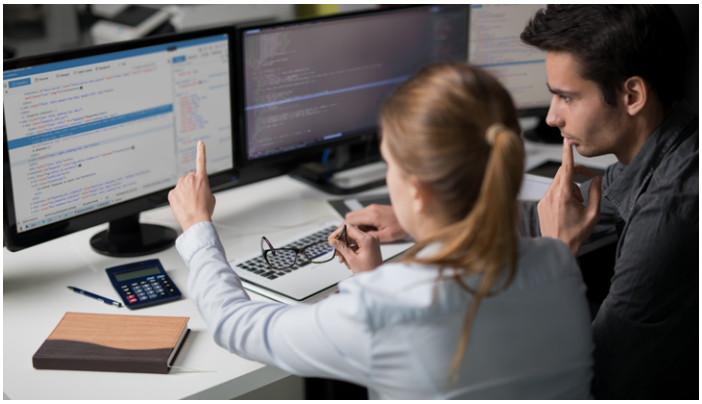
However, this strategy doesn't allow for optimizations beyond simple tweaks. And if your company operates on complex systems, this might not be the right fit. Applications shifted to a cloud platform may not perform as effectively and will often have to be redesigned eventually to take advantage of all the cloud capabilities.

On the other hand, this cloud migration strategy can be a beneficial way for organizations to move to the cloud without much up-front investment. Businesses can make necessary changes over time without compromising essential business operations.

Refactor (Rearchitect)

A refactoring strategy is more complicated than a rehosting approach, with organizations making major changes to utilize cloud capabilities. Using this strategy, companies can maximize their operational cost-efficiency by reconfiguring and recoding applications for cloud-native frameworks and functionality.

However, this approach can be the most expensive and requires significant time and resources. Businesses that need additional features, performance, or scale may choose this option.



Replatform (Lift, Tinker, & Shift)

Sitting between a rehosting strategy and a refactoring strategy is replatforming. With this strategy, organizations aren't entirely changing an application's architecture like refactoring, but they are making some changes and optimizations before moving to the cloud.

Replatforming takes more time than rehosting and doesn't provide as many benefits as refactoring, but it takes a little bit of the best from both strategies. The small amount of optimizations can make a significant difference in cloud functionality. On top of that, the resources needed for this strategy are much lower than for refactoring.

Repurchase

Organizations use this strategy when they replace their current application with a new one. Whether it's a CRM, an HR system, or some other type of application, businesses may find another product that better fits their needs.

Some popular software options companies might choose to replace their current systems with include:

- Office 365
- SalesForce
- Workday
- Drupal

This strategy is cost-effective and easy to implement, but commercial products offer less customization and may require a change in business processes.

Retire

This final strategy is used when organizations find applications that are no longer useful for their business process. In this case, organizations should choose the "retire" strategy and remove the software from their business systems.

Knowing and understanding these various cloud migration strategies is great, but you might be wondering how to actually put them into practice.

CHAPTER 4

Planning a Cloud Migration

When companies decide to go through the process of cloud migration, it can be overwhelming to know where to start. Organizations store large amounts of data, along with applications, software, and other business processes.

But, having a plan in place is the key to a successful cloud migration. Here are a few steps to ensure your transition is as smooth as possible.

1. CHOOSE YOUR MODEL

Before you begin your cloud migration journey, you have to choose which cloud model is right for your business. Do you want to move all of your data to the cloud, or does a hybrid model fit your needs better?

Look at your data, applications, and systems. Will it be difficult to move certain parts of your business to the cloud? Do you need the increased flexibility that a private cloud offers? All of these aspects will affect which model you adopt.

2. CHOOSE YOUR CLOUD PROVIDER

The next step in your cloud migration process will be to choose your provider. There are many different providers you can choose from, but here are three worth mentioning:

1 - Amazon Web Services (AWS)

AWS was the first major cloud provider and has been the leader in market share since day one. With AWS, companies can easily manage their capacity and build and manage applications.

Because AWS has been around the longest, they offer a vast amount of tools and capabilities for businesses. On the other hand, AWS focuses heavily on the public cloud model. If you're looking for a private or hybrid option, AWS might not be the right choice for your organization.

2 - Microsoft Azure

Although AWS has been a popular choice since it was the first to the market, Microsoft has been gaining ground in the last few years. Their cloud platform, named Microsoft Azure, is one of the most effective solutions for storing and managing data, especially for an enterprise-level organization. Azure also understands the possible need for a hybrid model, working hard to integrate with on-premise servers and data centers.

However, because of the enterprise-focus of Microsoft Azure, it can be overly complex or expensive for small to mid-sized businesses.

3 - Google Cloud Platform

The Google Cloud Platform has come about slightly later than other competitors, but it is well-backed to begin gaining exposure and market share. The platform isn't as enterprise-focused as Microsoft Azure is, but offers helpful tools utilizing artificial intelligence and machine learning.

As for disadvantages, because of its smaller market share when compared to AWS and Azure, Google doesn't offer as many features and services as the other providers. Google also doesn't own as many global data centers as the other two competitors.

4 - Multi-Cloud Approach

When choosing a cloud service provider, there is also the option for a multi-cloud approach. A multi-cloud strategy is when an organization utilizes more than one cloud service provider. The benefits of a multi-cloud architecture include: avoiding vendor lock-in, cost savings, performance optimization, a lowered risk of DDoS attacks, and improved reliability.

So, essentially, you could choose more than one cloud provider for your organization.

3. CONDUCT AN AUDIT

After you have determined your cloud model and provider, assess the state of your current systems. Take note of where all your data is currently stored, what applications you have, and how complicated the migration process will be.

Some existing applications may be more suitable for the cloud than others. With this information, you can organize a unique plan to meet your organization's needs. For example, depending on the complexity of your systems, a refactoring strategy might be a better fit than a rehosting strategy.

4. SECURE THE RIGHT KNOWLEDGE

Unless your organization has an experienced IT team or employee, you may not have the knowledge needed for migration. To maintain a smooth and thorough transition, you may need to bring in extra help. Some organizations choose to hire someone internally while others prefer to outsource. Either way, it's essential to have someone with the skills and knowledge to do the job.

The right technical team will understand how to maintain data integrity and prevent data loss during migration. On top of that, they will ensure a business's processes are set up correctly and preserved in the cloud.

5. BACKUP DATA

Even with an experienced technical team, organizations should back up all data before moving to the cloud. Having a backup in place will mitigate the risk of data corruption or data loss. No organization wants to hear that their data has been compromised. But, with a good backup in place, this doesn't have to be the end of the world.

6. MAINTAIN THE SYSTEM POST-MIGRATION

When considering cloud migration, organizations need to plan for the future as well. Once the migration is complete, the new system will still need to be observed and managed. Having a team in place to provide support will significantly enhance the potential and efficiency of the new system and business.

Technology problems don't disappear in the cloud. But, with expert support, these issues don't have to result in loss of time or resources.

CHAPTER 5

How Secure is the Cloud?

In this digital age, it's no wonder that businesses are worried about security. Every year new cyber threats pop up, and a data breach can cost a business everything. Even large enterprises are not immune. We've seen some of the largest companies affected by data breaches, including Facebook, Yahoo, Marriott, Target, and many more.

With this in mind, many organizations are hesitant to trust cloud technology. Handing over their data to a cloud provider scares them. So how secure is the cloud? Is it true that your data is at risk in the cloud?

CLOUDS ARE MORE SECURE THAN TRADITIONAL IT SYSTEMS

Let's bust this myth right here and now: reliable cloud technology is not any less secure than traditional IT systems. Often, it's more secure.

If cloud providers weren't able to offer a secure solution, they would be out of business. That's why they make cybersecurity a priority. They employ individuals strictly to monitor and improve security services. Single organizations typically don't have access to the same level of skill sets and specialized knowledge cloud providers have access to.

They also employ several layers to secure data. Between passwords, advanced firewalls, encryption, intrusion detection, and more, providers can offer their users an enhanced level of security.

On top of the digital layers of protection, providers ensure that their data centers are physically secure too. With 24-hour monitoring, fingerprint locks, and armed guards, these data centers look like they were taken straight out of an action movie.

But security is more than that. It really comes down to how your systems are built and setup. You can design a system full of vulnerabilities on traditional hardware and infrastructure just as easily as you can on cloud technology. It's not the location of the data that matters; it all comes down to controlling access.

If you understand this, then cloud technology becomes more secure than on-premise infrastructure simply because of the added layers of protection. If your organization can detect vulnerabilities, fix them, and continually test your systems, then security in the cloud shouldn't be an issue.

REGULATORY COMPLIANCE

If you work in an industry that is heavily regulated, like healthcare, security may be even more essential to you. But even in most of these industries, the cloud holds up. Cloud providers can be certified to show that they are compliant with HIPAA and HITECH regulations, as well as PCI standards.

Any cloud provider that has been audited and certified has proven that it can handle even the most sensitive information.

CHAPTER 6

What are the Challenges of Moving to the Cloud?

Now that you understand the many benefits of the cloud, you may be wondering why every business is not utilizing cloud technology. Well, just like any other newer technology, some companies are hesitant to change or find that it doesn't work with their business or industry. The main reasons organizations choose not to adopt cloud technology are:

SPEED

Speed is often one of the biggest considerations for companies thinking about moving to the cloud. Many, if not all, organizations cannot afford to lose any speed. And this can be a limiting factor for a small number of businesses. However, rest assured that for the majority of organizations, this isn't an issue.

If your organization has software or a database that requires an amount of horsepower above the average, the cloud may not be able to meet your need for speed.

Fortunately, most cloud providers allow you to test their capabilities before you migrate everything to ensure that it works for you. So, if this is something you are worried about, know that you can try it before you buy it. But again, for most businesses, moving to cloud computing won't affect speed.

LEGAL RESTRICTIONS

Another limiting factor for cloud migration is legal restrictions. It's important to understand that this does not equate to poor security standards. As mentioned above, cloud computing is often as secure, if not more so, than on-premise infrastructure.

But, even if a cloud provider offers strict security standards, some organizations can't move to the cloud because of legal requirements. Government contractors and some other organizations have extreme limitations and restrictions on what they can and cannot put on the cloud. Therefore, it's best to be familiar with your organization's legal limits before moving to the cloud.

LACK OF KNOWLEDGE

And finally, many companies simply don't have the knowledge to make cloud migration possible. Moving to the cloud can be complicated and requires time and hard work. Sometimes it seems easier to keep doing things the same and not worry about changing everything.

Organizations may have IT departments or support that have decades of experience with physical hardware. They might have a deep understanding of your on-premise infrastructure but aren't as well-versed in cloud technology. This makes moving to the cloud difficult because of both the limited knowledge and buy-in.

On top of that, migrating to the cloud might require retraining some or all of your employees. But, there are many ways to get around this.

You can hire a new team member that has experience and knowledge of the cloud. You can have your current IT team attend trainings, courses, and educational seminars to learn more about the cloud and acquire the skills needed. Or you can even hire a managed service provider (MSP) with specialized cloud knowledge to help you with your migration and even your management.

Speed and legal concerns can be valid reasons for some companies to stick with physical hardware. But, if organizations are ignoring the cloud because they don't know how to migrate or don't want to go through the hassle, they might find themselves left in the dust. Cloud computing can offer businesses new and improved capabilities.

If your competitors are utilizing cloud technology and you aren't, it gives them new opportunities and a leg up on you.

CHAPTER 7

How Much Does a Cloud Migration Cost?

So, we've gone through the benefits and challenges of the cloud, types of cloud migration strategies, and how to implement a cloud migration strategy. Now let's talk about the number one thought that's probably on your mind: cost. What does the pricing on a cloud migration look like?

Well, just like most things, it's complicated. Several factors are in play that make up what a cloud migration process will cost an organization. So, let's go through them.

FACTORS THAT INFLUENCE THE COST OF A CLOUD MIGRATION

Before you can determine a ballpark figure of your cloud migration cost, you will need to audit your current systems and data. Understanding your current portfolio will help you determine many of your needs in the cloud, which will most likely equate to cost.

Cloud Infrastructure Costs

One of the big factors that will influence the cost of your cloud migration is your estimated cloud infrastructure costs. Based on the applications, data, and systems your business utilizes, you can estimate the network, storage, and database capacity you will need in the cloud.

Another thing that influences your infrastructure cost is which provider you choose. Some providers are more expensive than others, and based on what your business needs, you may decide to go with a more costly option.

Once you determine which provider will work best with your business model, you will know the cost structure available to you. Then, you will be able to calculate everything else that factors into the infrastructure.

Many cloud service providers offer helpful tools and calculators to help you determine these costs. Amazon, Microsoft, and Google all offer pricing calculators:

- AWS Total Cost of Ownership (TCO) Calculator
- Microsoft Pricing Calculator
- Google Cloud Platform Pricing Calculator

These calculators will help take into account the server type, number of virtual machines (VMs), memory needed, and more. Of course, the more storage, bandwidth, and features you need, the more expensive the infrastructure will be.

Migration Costs

The actual process of moving to the cloud has inherent costs associated with it. This also goes back to which cloud migration strategy you will be using. For example, a rehosting strategy will be less expensive than a refactoring strategy. Knowing how you will be migrating is a major factor in cost.

Other things to consider are:

- How long will the migration take?
- Will you be hiring additional help?
- Will you be purchasing any new software?

The answers to these questions will affect the pricing, with more time, resources, and knowledge dedicated to the project pushing the cost higher.

It's especially important to keep your eye on the labor cost. Labor is a high-ticket item when it comes to a cloud migration, and the more you need of it, the more you will be spending. This includes consultant or outsourcing fees. Acquiring the specialized knowledge to assist with your cloud migration will most likely pay off in the long run, but it will cost you more.

Post-Migration Costs

Another cost you will have to factor into the overall pricing of your cloud migration is the cost of management post-migration. How will you maintain and improve your cloud environment? Will you be growing your IT team, or can your current team handle it? Will you be outsourcing some of your management? Also, think about the costs of training employees on any new systems or apps post-migration.

Overall Cost

After you have determined all of your segmented costs for migration, add them all up. You'll probably see a fairly large number. Before you crumple up your paper and throw it immediately into the trash, it's important to compare that number to what you are currently paying for your on-premise IT.

Remember that by moving to the cloud, you won't be paying for physical hardware or the labor to maintain it. You also won't be paying for the energy needed to power that hardware. In the end, the cost of moving to the cloud is often smaller than the costs you're currently paying. Hence, why we listed "reduced costs" as one of the benefits of moving to the cloud. And, remember all of the other benefits of moving to the cloud.

However, cloud migration may not be for everyone - or it might just not be the right time. If your migration costs outweigh your current expenses for on-premise infrastructure and you don't feel the other benefits make up for this, it might not be the right time to move to the cloud.

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