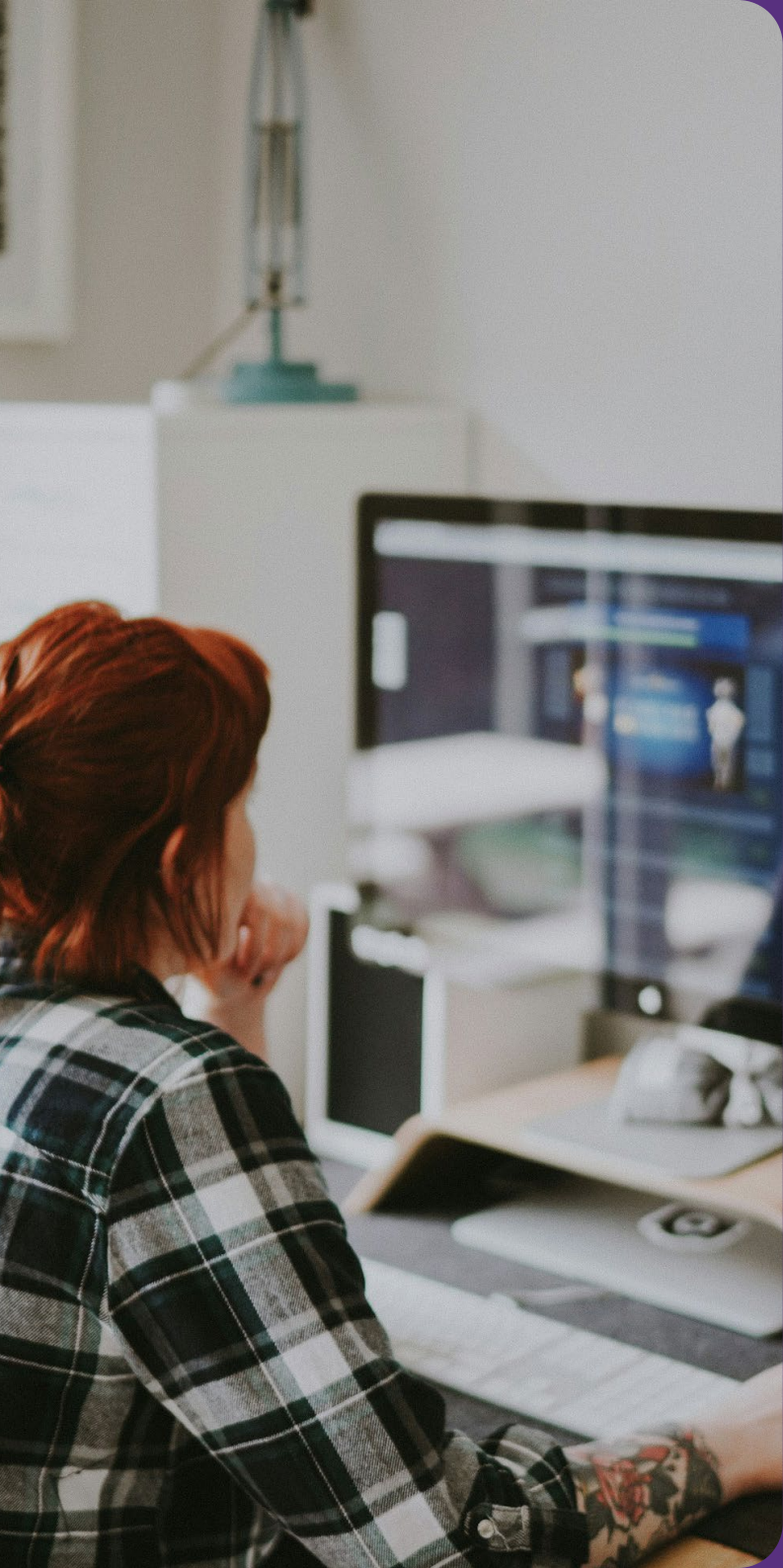# coeo

Migration and Beyond

Moving Windows Server
and SQL Server to the Cloud

Overview

Harnessing the cloud is essential to digital transformation. Cloud computing has reshaped the way businesses operate and manage their IT infrastructure. It offers unparalleled scalability, agility, and cost-efficiency, making it an attractive proposition
for any organisation.

The proof is in the numbers. [According to Deloitte](#), small and medium businesses (SMBs) that use cloud computing enjoyed 20% higher profits and grew 26% faster than businesses that use primarily on-premises infrastructure. Business leaders agree that the cloud is an essential enabler or a [force multiplier for driving digital change](#). It acts as a gateway for innovation, allowing businesses to leverage cutting-edge tools like AI, data analytics and more.

For decades, Windows Server has been the default way that businesses power desktop environments and network services. It is the cornerstone of any Microsoft-powered on-premises solution. Similarly, SQL servers power organisation's on-premises databases.

Now, Microsoft Azure offers a robust replacement for this infrastructure. It is a comprehensive cloud computing platform that allows businesses to transition their workloads to a cloud environment.

In this eBook, we will discuss the key benefits of migrating to the cloud and explore some of the tools and capabilities that streamline moving to Azure. We go further, showing some common use cases, and most importantly, what to be aware of post-migration, regarding ongoing security and cost optimisation.

Understanding the Need for Migration

Why Migrate?

CAPEX to OPEX

One of the primary advantages of cloud migration is the shift from a capital expenditure (CAPEX) model to an operational expenditure (OPEX) model. Traditional on-premises IT requires significant upfront costs for hardware and technical infrastructure. Such a model relies heavily on capital expenditure.

By contrast, cloud-reliant companies tend to rely more heavily on operating expenditure (OPEX). This refers to ongoing costs incurred during your organisation's daily operations, such as cloud subscriptions.

What's the advantage? OPEX-heavy companies do not require as much initial investment to start operations. Operating expenses scale with production and offer more flexibility than CAPEX costs. Businesses can pay for the resources they need, and scale cloud costs up or down as required. Finally, OPEX costs are typically more predictable than CAPEX costs, as they are based on usage rather than upfront investments. This can make it easier for businesses to budget and plan for their IT expenses.

Security & Resilence

Cyber security is a core concern for many businesses, with 75% considering security a growing priority in the last 12 months. The threat is clear. The average cost of a data breach to a UK business stands at an eye-watering £3.4m, according to IBM.

However, implementing security tools and best practices can be a difficult endeavour, especially for smaller businesses without the dedicated cybersecurity expertise of the big players. On-premises IT deployments require businesses to manage their own security, which can be complex and error-prone. By contrast, cloud providers offer an abundance of tools to keep your IT infrastructure safe.

Cloud providers regularly update their security systems to protect against the latest threats. This means that businesses don't have to worry about patch management. This is a key threat as out-of-date or unpatched software is responsible for up to 60% of all data breaches.

Finally, using the cloud offers you data redundancy. If your data is kept on-site, a disaster in your workplace could lead to losing all your data. By storing your data in the cloud, you are safeguarding your data and operations from physical threats. Moreover, cloud providers can replicate data across multiple data centres. This means that if one data centre is compromised, your data can still be accessed from another source.

Cloud computing ultimately makes your business more resilient to threats and disasters. It protects you from cyber threats and makes it easier to bounce back when the worst happens, reducing operational downtime.

Scalability

Cloud computing is far more scalable than on-premises IT as it allows businesses to quickly and easily add or remove resources as needed.

On-premises IT requires businesses to purchase and install hardware and software in advance. As you grow, you'll need to make significant investments to purchase new systems and upgrade existing hardware.
With cloud computing, you can simply choose the resources you need and scale up or down as required.

Experiencing seasonal fluctuations in traffic or need to quickly launch new products or services? Cloud providers often have a large pool of resources available, making it easy to scale up to meet sudden spikes in demand - and scale down once the rush is over.

Business Insights & Data Analytics

Migrating to the cloud involves centralising your data, and this can come with a huge potential for improved insights and analytics into your operations. Cloud providers offer tools to process any business data and provide key performance indicators, information and suggestions to improve productivity.

The cloud breaks down data silos, allowing the entire organisation to access information and make decisions accordingly. Your operations team can benefit from sales information to optimise inventory levels, while your marketing team can use customer data to create targeted campaigns. This seamless flow of information enhances collaboration and drives innovation.

By leveraging cloud analytics, you can transform raw data into actionable intelligence. This empowers smarter decisions and ultimately helps your business grow faster.

Innovation

Cloud computing is often seen as an "enabler" for many of the cutting-edge tech innovations of our age. Deloitte says the cloud is the "default platform" for artificial intelligence, machine learning, IoT and more.

We've already discussed how cloud computing unlocks useful business and data insights, improving decision-making within businesses. Through cloud platforms, companies can acquire scalable computing power and storage solutions, and the processing power of these cloud services is immense.

This immense power, coupled with its scalability, allows businesses to develop and deploy innovative solutions faster and more cost-effectively. Cloud-based AI and machine learning tools such as Microsoft Copilot empower companies to analyse massive datasets, uncover patterns and insights, and automate tasks.

Common On-Prem Challenges

Cloud computing helps address the core challenges and pitfalls of on-premises systems. Here are some common problems faced by businesses and how the cloud resolves them.

Remote Work

The pandemic necessitated a working pattern that was alien to many businesses: work-from-home. Those organisations that relied on on-premises IT struggled with this transition. Simply put, on-prem does not easily support remote work.

The issue here is the inability of remote workers to access data, documents and applications while working from home. Rudimentary remote solutions do indeed exist, such as Remote Desktop, but these workflows can be clunky, slow and most importantly, not secure. Any remote protocol is an entry point for potential hackers.

Cloud migration, by making your data, resources and applications available through the internet, makes remote work far easier. Protected by cloud provider's security tools, remote work through cloud services such as OneDrive and Azure Virtual Desktop is far more secure. Cloud visibility tools such as Azure Monitor give IT admins end-to-end visibility into how remote devices use the organisation's infrastructure and can detect any vulnerabilities before an attack occurs.

Maintenance

On-premises infrastructure comes with a significant financial burden. A Deloitte survey found that the average enterprise spends 57% of its IT budget on maintaining and supporting daily operations, leaving very little room for innovation.

Beyond the direct costs of hardware, software, and staffing, there are many hidden costs, such as power consumption, cooling, physical security, and the opportunity cost of IT staff focusing on maintenance rather than strategic initiatives.

Moreover, as your systems get older, they'll need refreshing. In fact, slow IT systems cost UK businesses up to £35 billion every year according to Business Insider.

Cloud computing significantly reduces the need for maintenance and hardware refreshes. Organisations that migrate to the cloud can experience a reduction in IT maintenance costs by up to 45%. There's no need to maintain server hardware and remote environments such as Azure VD can reduce how often you need to refresh PCs and workstations too.

IT Budget Allocations by CIOs

57%	26%	16%

- ■ Maintaining and supporting business operations
- ■ Funding incremental business change
- ■ Bolstering ongoing innovation

Disaster Recovery

The most significant cost of a cyber attack or disaster is the time it takes to recover from it. A single day of downtime can cost your business a lot of money, potentially leading to loss of business, clients, reputation and more. The loss of data through damage to your storage servers could even leave you liable for damages under data protection regulations.

Cloud providers offer:

Automated Backup

Data Replication Services

This ensures your data is securely stored and readily available for recovery. By replicating data across multiple data centres in different locations, the cloud protects against regional outages and ensures business continuity.

Cloud-based disaster recovery solutions enable faster recovery time, minimising downtime and potential revenue losses. Finally, in the event of an on-site disaster, such as a fire or flood, the remote capabilities of cloud computing ensure operational continuity, even if your office is out of action.

Common
Migration
Scenarios

Legacy System Modernisation

The most common migration scenario is legacy system modernisation. This refers to the process of replacing outdated on-premises systems with new, cloud-based systems and processes. This is often called "rip and replace" where businesses decide to take the leap into the cloud when their existing infrastructure needs replacing.

Cloud migration offers a chance to modernise these legacy systems by seamlessly transferring them to Azure's scalable and flexible cloud environment. By migrating legacy systems, you gain access to Azure's computing firepower, allowing you to scale applications seamlessly to meet fluctuating demands

Cloud migration offers instant operational efficiencies. For instance, switching from on-premises frees up your IT teams to focus on strategic initiatives. By offloading infrastructure management to Azure, you reduce operational overhead and streamline processes.

Drivers for Legacy System Modernisation

IT	Business
Cost	Business Value
Complexity	Agility
Risk	Business Fit

Pathway to Innovation

Cloud computing offers a clear path to innovation for businesses looking to stay competitive. We mentioned previously how the cloud can unlock the budget for innovation by reducing maintenance costs, but it also offers some useful tools and technologies that can drive digital change within your organisation.

A key technology here is artificial intelligence or AI. Azure offers a suite of cutting-edge tools for businesses looking to craft innovative experiences for customers and employees. These include:

- **Azure AI Search:** Bring AI-powered cloud search to mobile and web apps.
- **Azure OpenAI:** Perform a wide variety of natural language tasks.
- **Bot Service:** Create bots and connect them across channels.
- **Content Safety:** An AI service that detects unwanted content.
- **Custom Vision:** Customise image recognition for your business.
- **Document Intelligence:** Turn documents into intelligent data-driven solutions.
- **Face:** Detect and identify people and emotions in images.
- **Immersive Reader:** Help users read and comprehend text.
- **Language:** Build apps with industry-leading natural language understanding capabilities.
- **Speech:** Speech to text, text to speech, translation, and speaker recognition.
- **Translator:** AI-powered translation technology for over 100 languages and dialects.
- **Video Indexer:** Extract actionable insights from your videos.
- **Vision:** Analyse content in images and videos.

Cloud migrations often include replacing legacy applications. These old tools can hold businesses back from innovation, and may even have outdated security measures, making them susceptible to cyberattacks and data breaches. Azure offers many tools to streamline the application modernisation process, such as Azure Cosmos DB - a fully managed NoSQL database service - and Azure App Service, allowing you to create and deploy web and mobile apps with ease.

Security and Compliance Requirements

A common characteristic of an on-premises IT network is poor security and siloed data. This causes security and compliance concerns, where data is at risk of being breached and IT managers do not have the correct visibility into how data is being used to ensure compliance with regulations.

Migrating to the cloud unifies organisational data, and Azure provides advanced threat intelligence and analytics capabilities, such as Microsoft Sentinel to help you identify and respond to potential security threats. You can easily create and deploy cloud environments that are compliant with the necessary regulations using Azure Blueprints and create and apply specific policies in real-time with Azure Policy.

Using Azure unlocks Microsoft's industry-leading security expertise. Microsoft invests heavily in security research and development, employing security experts who work tirelessly to protect the Azure platform. Firstly, Azure has multiple layers of security built into the platform to protect your data, applications, and infrastructure. Moreover, Microsoft's global network of threat intelligence feeds constantly monitors and analyses emerging threats, allowing Azure to proactively respond and protect against attacks.

Microsoft Sentinel
See and stop cyberthreats across with intelligent security analytics.

Azure Blueprints
Create, define, and deploy compliant artifacts in your Azure environment.

Azure Policy
Enforce organisational standards and to assess compliance at-scale.

Defender for Cloud
Protect cloud-based applications from various cyber threats and vulnerabilities.

Unified Data Analytics and Business Intelligence

Cloud migration isn't just about shifting data to a new location; it's also about transforming how you leverage that data. By unifying your data sources within the cloud, you can open a gold mine of possibilities for unified data analytics, insights, and business intelligence.

The core idea here is simple: when all of your data is consolidated, AI can process and analyse it, offering valuable insights into your processes and overall performance. Microsoft Fabric, an all-in-one analytics and data platform, unlocks this. It seamlessly integrates Azure's powerful analytics tools like Power BI, Azure Data Factory, and Azure Synapse Analytics, giving you a comprehensive suite for data integration, transformation, analysis, and visualisation.

With interactive dashboards and reporting tools, businesses can explore their data, ask questions, and generate insightful reports. With Power BI, you can easily generate visualisations using your data and quickly share them with colleagues and stakeholders.

Ultimately, cloud migration helps you get more value from your data. It turns raw data into useful insights and helps you make better, more informed strategic decisions.
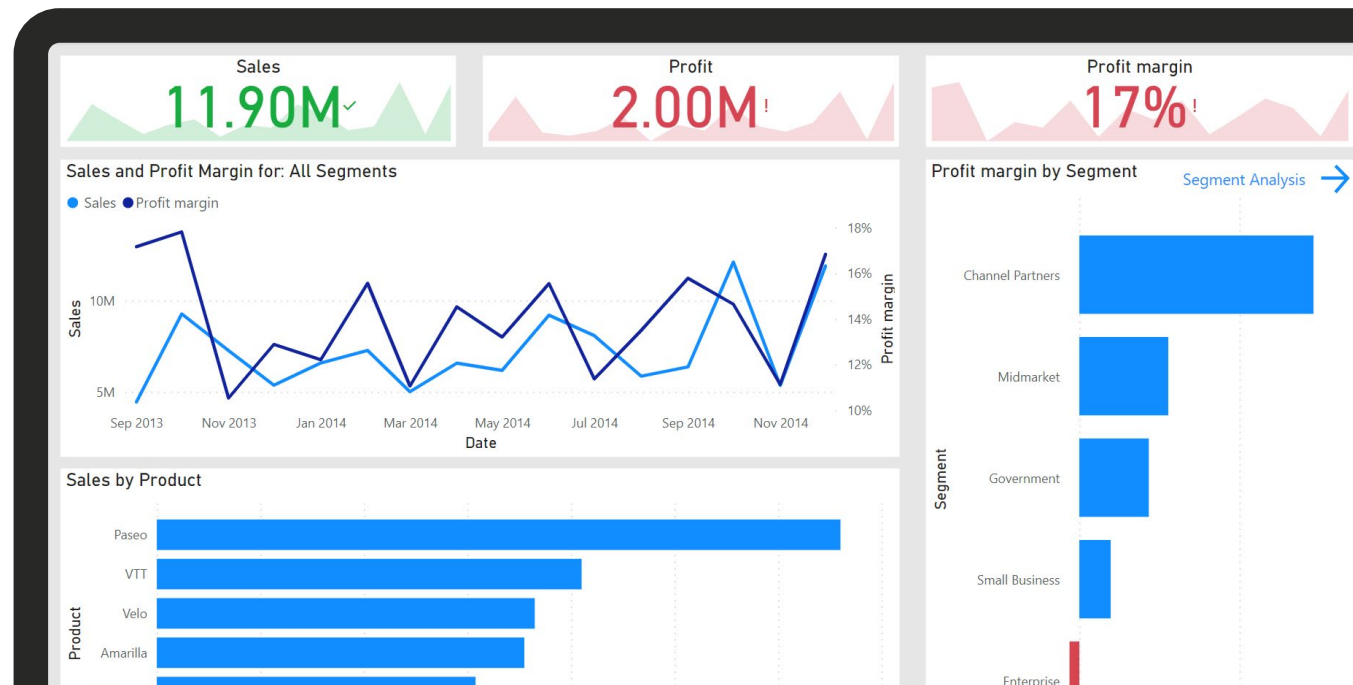
Supporting a Hybrid Environment

Cloud migration doesn't always have to be an all-or-nothing approach. Businesses can instead adopt a hybrid model, where some workloads remain on-premises while others move to the cloud. This is particularly useful in a phased migration where you migrate workloads incrementally.

This approach does come with its drawbacks. It can often be expensive to maintain licences
and hardware for both cloud and on-prem workloads. It can also be difficult to centrally manage your IT environment.

Fortunately, Azure offers two tools to resolve these issues: Hybrid Benefit and Azure Arc.

Hybrid Benefit is a licencing offer that allows you to apply your existing Windows Server or SQL Server core licence to the corresponding Azure resource. The software cost is removed and all you'll need to pay is the infrastructure costs. This can save you up to 85% over the standard pay-as-you-go rate for SQL Server licences and 80% standard the pay-as-you-go rate for Windows Server.

Azure Arc is a hybrid cloud management platform that allows you to manage both non-Azure (such as Windows servers, SQL servers and Kubernetes clusters) and Azure resources together in Azure Resource Manager. Through Arc, you can apply consistent policies, governance, and security controls across your whole IT infrastructure, keeping your operations safe and compliant.

Step-by-Step:
The Migration

Earlier, we discussed the key benefits and use cases for cloud migration. It is therefore clear that migrating your resources and data to the cloud is key in driving a digital transformation.

Now, we will explore the steps you'll need to take to ensure your migration to the cloud is a success. We begin by covering how to develop a migration plan and then discuss the best practices for implementing this plan.

Planning a Migration

Define a Business Case

The first step is to define a **business case**. This answers a simple question: why do we want to migrate the cloud? A business case provides the 'goalposts' needed to guide your migration strategy and helps you accurately judge its effectiveness.

This should include insights into:

– The key motivations and drivers behind the decision to migrate

– The intended and expected outcomes of migration

– Who are the key stakeholders that are involved in the motivations or outcomes of the project

When deciding on the motivations of migration, you should be asking:

What **critical business events**, if any, are driving the decision? For instance, a merger or acquisition, end-of-life of a legacy system, or regulatory changes could be a motivating factor in the desire to migrate.

———————

What **pain points or limitations** are users and customers experiencing with the existing infrastructure?

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What **innovations** are you looking to capture or capitalise on? What technologies are on your radar? Is the migration strategy focused on transforming a product, service or the business as a whole?

It is important to scope out the **intended outcomes** of a migration strategy. Outcomes could be fiscal, such as a cost reduction or revenue increase.

A business case should set out the **timeline of costs with and without a migration**. It should compare the projected 'status quo' of remaining on-prem with the expected cloud costs. The gap that appears between these projections describes the **transformation value** of a cloud migration.
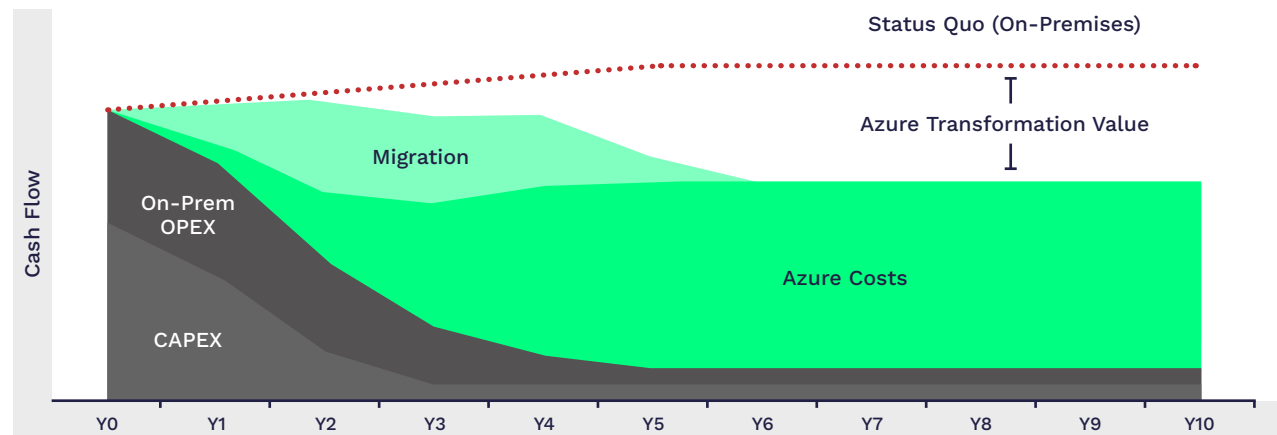
This quantitative element of a business case provides a robust justification for embarking on a migration plan and sets the 'goalposts' for fiscal outcomes.

Other outcomes that can be captured in a business case may include **improved agility** of the organisation to respond to market changes, increased customer **engagement**, improved **performance** or advancing **sustainability** outcomes. These outcomes may be more qualitative.

Once you have a full purview of your existing digital estate, it is time to develop your cloud adoption plan. The main aspects of this are as follows:

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Define prerequisite tasks required before creating an adoption plan

In addition to the previous steps, there may be other tactical considerations to make. For instance, what is the organisation's 'skill readiness' for the cloud? How will a skills gap be addressed?

Define and prioritise workloads

Microsoft recommends that organisations establish a 'top 10' list of key workloads to begin migrating first. A key step here is to define a 'tagging strategy' that aligns with your desired outcome. What information will you use to prioritise and tag workloads? Will it be operational/business criticality? Business unit? Data/confidentiality classification? Budget required? Compatibility with cloud infrastructure?

Align assets to workloads

Determine the assets that are required to complete these workloads. These should be those who are prioritised in the initial migration backlog.

Establish a timeline

Identify an iteration period for releases and provide a rough timeline for these releases.

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Creating a plan can be a significant undertaking, especially for leaders without prior migration experience. Assistance from a managed service provider (MSP) or a migration expert is highly recommended. Working with experts helps ensure that scopes, plans and priorities involved are as efficient and unbiased as possible, increasing the likelihood of success.

Developing a Migration Plan

Once the business case has been defined, the next step involves creating a blueprint for the switch - a migration plan. A key aspect here is to scope out and understand your existing IT infrastructure, commonly referred to as a digital estate.

A digital estate is much more than just a list of your systems. It describes how your current infrastructure powers and supports your business operations and **workloads**. It includes virtual machines (VMs), servers, applications, data, automation, etc.

How exactly you measure a digital estate is dependent on your desired outcome. A business targeting fiscal outcomes will focus largely on the value, capital and operating expenditures of IT assets. One targeting data-driven innovation may scope out data silos and connections, whereas an organisation with a sustainability outcome may place heavier emphasis on the environmental impact of assets.

What is a workload?

According to the Microsoft Cloud Adoption Framework (CAF), a workload is a collection of IT assets (servers, VMs, applications or data) that facilitate a business process. Workloads may share assets or support multiple processes, but clear boundaries regarding their function. It essentially refers to the resources needed to complete a clear, distinct business task.

Executing a Migration

The migration process is iterative, with the steps broadly split into three categories: assessing, deploying and releasing workloads. These classifications follow Microsoft's robust Cloud Adoption Framework (CAF). We will discuss each of these steps.

Assessing Workloads

This step is heavily linked to the preparation stage but involves taking a closer look at the workloads being considered for migration. This involves:

Classifying workloads

Using your chosen tagging strategy, workloads should be classified based on their importance to the migration strategy. This is often their business criticality.

Establish workload readiness

Evaluate the current state of each workload, including its performance, scalability, and security posture, to determine its readiness for migration.

Architect workloads

Design the architecture of the migrated cloud workloads, including the supporting services required for their operation. Establish whether your planned architecture still fits within the allocated cloud budget.

Prepare → Assess → Deploy → Release
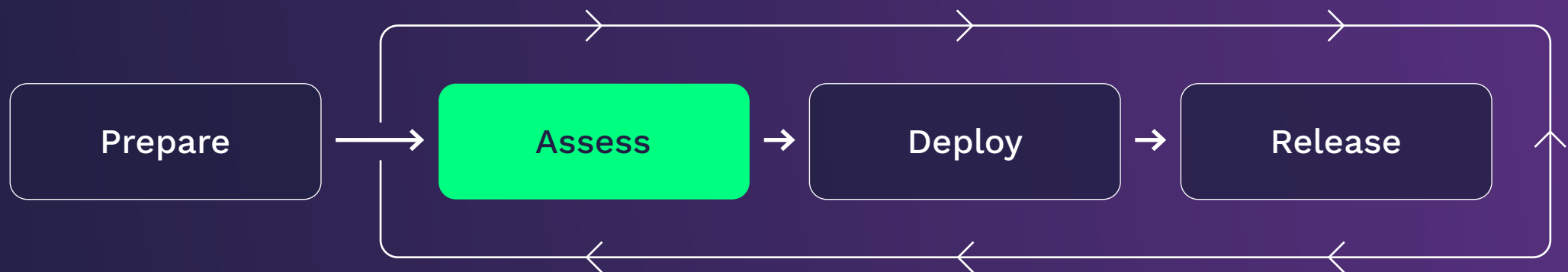
Deploy Workloads

Next, it is time to deploy the workloads to the cloud environment. This is the technical implementation of the migration and is often the most challenging stage. Here are the key steps:

Implement supporting services

Nearly all workloads require some support services to function. These are non-server resources that workloads use and these services must be replicated into the cloud environment before workloads are moved over.

Remediate assets

Some assets may be incompatible with some cloud configurations. You may have identified these during the Assess phase, whilst others may be uncovered during testing. This step involves addressing these problems, such as outdated hosts or adjustments required to applications.

Replicate assets

Replicate the information of digital assets onto the cloud environment. This involves creating a snapshot of assets and seeding them on the new platform. A key consideration here is **synchronisation** as new and old code should be constantly updated as changes are made up until its migration is complete.

Migration testing

Once assets are replicated, it is important to test them for incompatibilities or instability. If any faults are uncovered, the remediation step should be repeated. You should develop a test plan where the expected behaviour of a workload is compared to the observed behaviour.
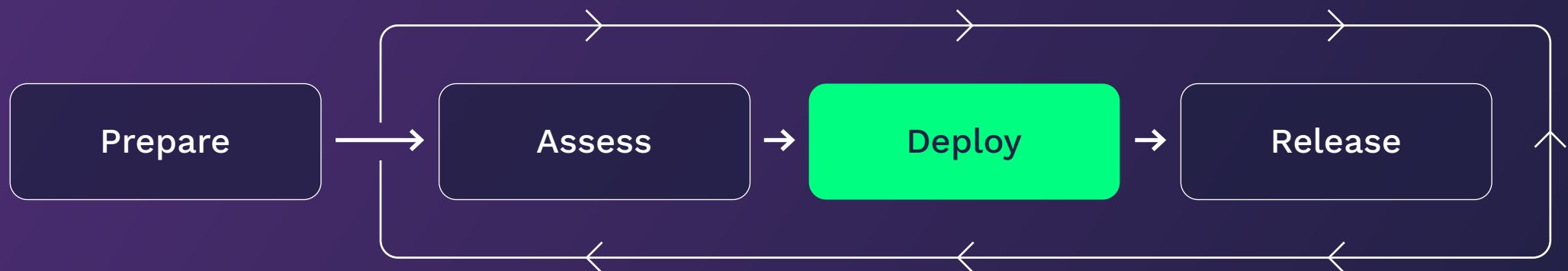
This step requires a high level of technical expertise, especially if you're opting for a **phased migration**. Mistakes here can be costly. Working with a migration partner such as an MSP can streamline this process.

Prepare → Assess → **Deploy** → Release

Release Workloads

Once assets are replicated and tested, they are ready to be released. What are some important considerations here?

Carefully plan release communication

This involves informing colleagues and stakeholders about the changes experienced during migration. Each workload should have its own change communication. You should carefully consider who the intended audience is and tailor the tone and technical content accordingly.

Undergo business testing

Also known as user acceptance testing, this involves observing how your real users navigate and respond to migrated workloads. This is to ensure that new solutions perform as users expect.
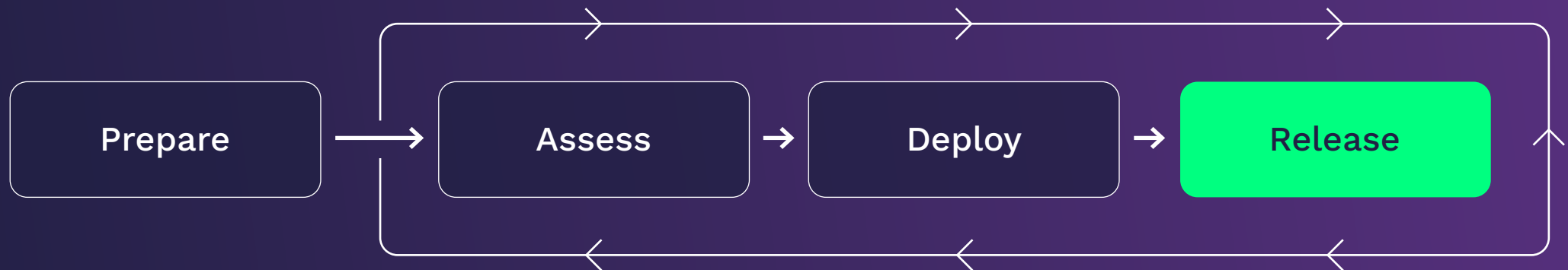
Complete the migration

Here you complete the final steps needed to enable the migrated workflow. This includes **updating the DNS, connection strings and load balancing** to transition to the new workload. This is to direct user traffic to the migrated local.

Conduct retrospectives

Holding retrospective meetings to discuss the successes and pitfalls of the migration can help improve the effectiveness of future migration tasks.

Prepare → Assess → Deploy → Release

Beyond Migration: Optimisation and Management

Once you have deployed and released the migrated workflow, the new resources are available to use on the cloud. However, the job isn't complete just yet. In this section, we will discuss some of the important optimisation and management considerations required for a successful migration.

Cost Management and FinOps

It's important to optimise the cost of the migration to ensure you don't overspend. This can be a significant problem for migrating businesses. Up to 40% of businesses who have migrated to the cloud found that their costs increased, according to 451 research. This issue is linked to 'cloud waste', where businesses over-provision their cloud resources and end up underutilising their infrastructure

Gartner estimates that companies will waste $135 billion in cloud resources in 2024, 30% of the global cloud spending. Fortunately, companies are aware of this risk, with 71% stating they will focus on optimising their existing use of the cloud in the next year.

Here are some key ways you can optimise cloud costs:

Remove zombie resources: These are resources that are running but not actively being used or contributing to your operations. They can include idle virtual machines or unused storage volumes. We recommend regular audits of your digital to identify zombie resources, both in the cloud and on-prem. Do not forget to remove or decommission assets after their migration is complete.

Rightsizing: You should match your cloud resources to your actual workload demands, ensuring you're not over-provisioning resources (paying for more than you need) or under-provisioning (impacting performance). Azure Advisor can help here by providing AI recommendations for cost reductions.

Tagging resources for greater financial visibility: Tags are metadata labels you can attach to your cloud resources, such as project name, cost centre, or environment type. They allow you to track and allocate cloud costs, providing visibility into which teams, projects, or departments are using which resources.

Ongoing Security Reviews

The security landscape is constantly changing, and exposing your operations to the cloud can increase the risk of a cyber attack. Cloud environments have robust security tools to protect your data, but your cloud strategy should **constantly adapt to emerging threats and trends**.

Here are some important tips:

Follow initial best practices: Establish a strong security foundation by implementing best practices during your cloud migration. This includes using MFA, encrypting data at rest and in transit, and updating software and security patches.

Review threat analytics, and implement additional security if necessary: Using cloud-native security tools like Microsoft Sentinel and Defender for Cloud, you can monitor and detect potential threats and respond to incidents quickly.

Work with a security expert to leverage their expertise: Consider partnering with a cloud security expert or managed service provider (MSP) to gain access to their security expertise. They can help you assess your security posture, identify areas for improvement, and implement security solutions for your organisation.

Continuous Improvement and Innovation

To make the most out of your migration, you should focus on **continually improving your cloud environment to spur change and innovation** within your organisation.

To fully leverage the benefits of the cloud, consider these strategies:

Make use of all the benefits of the cloud: Explore and adopt cloud-native services that can enhance your operations and accelerate innovation. This includes building new experiences for your customers using omnichannel technology, harnessing AI to automate workflows or unlocking actionable data-driven insights using tools like Microsoft Fabric.

Use Azure AI services to build cutting-edge experiences: On the topic of AI, Azure AI Services offers a useful framework for innovative solutions. From natural language processing to computer vision and predictive analytics, these services can help you create **intelligent applications** that drive business outcomes.

Use data warehousing and analytics to improve decision-making: Microsoft Fabric enables unified data analytics and business intelligence by consolidating data sources and facilitating AI-driven analysis. It provides tools like Power BI for interactive visualisation and reporting.

Prioritise backup and disaster recovery: Safeguard your cloud environment through backup and disaster recovery strategies. Azure Backup can automate backups and provide geo-redundancy, while Azure Site Recovery ensures your disaster recovery plan is ready to go in case of disaster.

How We Can Help

Cloud migration is not a destination but a transformative journey. Migrating Windows Server and SQL Server to Azure sets the stage for businesses to unlock greater scalability, agility, and innovation. Remember, this journey doesn't end with the migration. The real value lies in continuously optimising your cloud environment, embracing FinOps practices and improving your cloud security posture using tools like Microsoft Sentinel.

The cloud migration journey is undoubtedly a difficult one. From building an accurate digital estate to assessing workloads and ensuring cloud assets are correctly configured, there's a lot to do to ensure success.

We recommend working with a managed service provider (MSP) such as ourselves to guide you through the process. MSPs are experts in migrating to Azure and can ensure that no stone is left unturned. They can help you understand your key requirements, assist in drafting a migration plan and ensure that workloads are deployed and configured correctly. MSPs can continually monitor and optimise environments to ensure you're getting the most out of your cloud budget.

Ready to explore cloud migration? Get in touch today and see how we can transform your business.

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