

CLOUD MIGRATION: HOW TO REHOST YOUR APPLICATIONS ON MICROSOFT AZURE

Microsoft Azure is the trusted cloud infrastructure provider for tens of thousands of businesses around the world. Microsoft understands the requirements of enterprise organizations and has been building enterprise software solutions for decades. Azure users benefit from the power of a feature-rich cloud platform with a degree of familiarity, compatibility, and enterprise integration that other cloud vendors can't hope to match.

At VIAcode, we help organizations to build and manage their infrastructure on Microsoft Azure. Cloud infrastructure is cheaper, more flexible, and more scalable than on-premises infrastructure, but moving applications from legacy infrastructure to the cloud is often challenging. We help businesses to overcome those challenges to take full advantage of the cloud.

This ebook is a short guide to rehosting on Azure. We start by asking what an organization will gain when it rehosts to Azure. Then we look at the importance of planning to a successful cloud migration and how to avoid common mistakes. Next we consider some best practices for cloud migration and the tools Azure provides to streamline rehosting. Finally, we provide a comprehensive Azure migration checklist.

Remember: a cloud migration to Azure is a fairly complicated process, and this is meant to be a high level overview. If the process ever starts to feel overwhelming, you can always contact VIAcode for a free migration to Azure and we'll handle the headache for you.

Why Cloud Migration: The Benefits of Rehosting to Azure

Azure cloud migration is the transfer of both applications and workloads from existing bare metal or cloud infrastructure to Microsoft Azure, an enterprise-focused cloud platform.

Microsoft Azure supports a complete range of public, private, and hybrid cloud infrastructure, but it is not merely a platform for launching virtual servers and storage. Azure also offers many network, application hosting, container hosting and management, monitoring and logging, analytics, security, database, and machine learning services.

Cloud Migration Benefits

Azure is a comprehensive IT infrastructure hosting and management solution with platforms and services engineered to meet the diverse IT needs of businesses of all sizes. In this chapter, we discuss the high-level benefits of migrating to the cloud in general and migrating to Microsoft Azure in particular.

Outsourced Infrastructure

Businesses with on-premises or colocated infrastructure are responsible for buying, managing, deploying, and maintaining their servers, network equipment, and associated hardware. That requires a substantial capital investment in hardware and an ongoing investment in staff to maintain it.

In the cloud, those responsibilities are outsourced to the vendor. In the case of Azure, that vendor is Microsoft, a business with decades of experience as a software and infrastructure partner of enterprise organizations.

On Azure, cloud users launch the infrastructure they need, scale it as required, and only pay for the resources they consume.

Reliability and Performance

Azure is built on a global network of data centers in diverse locations around the world. Because cloud infrastructure and networking are virtualized, it is much easier to duplicate data both within data centers and to geographically distant data centers for redundancy and reliability. It would be costly in the extreme for individual businesses to build infrastructure with the redundancy that Azure users gain when they migrate to the cloud.

Designed for Real-World IT Needs

Azure services are engineered to meet the real-world needs of modern businesses. Azure includes over 100 individual services, each designed to help businesses to build and manage fast and scalable infrastructure deployments. Azure services range from general compute and storage; to solutions built for mobile, the Internet of Things, and mixed reality; to infrastructure management and governance tools.

Security and Privacy

Security and privacy are key concerns when businesses migrate to a cloud platform. Can a business trust a third-party cloud provider to take security seriously?

In the case of Azure, the answer is yes. Azure's underlying infrastructure conforms to [global data security standards](#) providing a solid foundation on which Azure users can build secure and compliant deployments.

In addition to the platform's foundational security, Azure includes many services that help businesses to protect data and networks, including Azure Active Directory, VPN Gateway, Key Vault, and Azure Information Protection.

Unlimited Scaling

Azure spans 54 regions around the world. Each region is made up of several data centers, and each data center houses a huge number of servers. Azure is designed to scale, and the resources dedicated to workloads can be grown or shrunk as required. Azure workloads can grow from a single VM or container to a global deployment in dozens of locations. Azure takes care of scaling so that Azure users can focus on building applications and services that generate value for their business.

Why Cloud Migration is Important

Cloud migration will help your business overcome the limitations of legacy infrastructure. By migrating to Azure, businesses can take advantage of a scalable, redundant, high-performance global infrastructure platform backed by Microsoft, a world leader in enterprise infrastructure services.

Plan To Avoid Cloud Migration Mistakes

Rehosting to Azure can bring incredible improvements to infrastructure agility, scalability, and performance. But Azure is a complex platform, and rehosting isn't as simple as spinning up a few VMs, copying data, and calling it a day. Cloud migration projects often run into challenges that stretch lead times and cause costs to skyrocket.

In this chapter, we're going to look at some of the problems businesses run into when migrating to Azure and how a cloud migration assessment can help them to avoid common mistakes.

When Rehosting Goes Wrong

Rehosting is the most straightforward type of cloud migration. Often called “lift-and-shift,” it involves recreating existing on-premises infrastructure on Azure without refactoring applications or rearchitecting infrastructure.

Nevertheless, without due care, there are plenty of ways that a lift-and-shift migration could go awry:

- Unexpected costs.** It pays to have an understanding of Azure and its cost structure before launching infrastructure.
- Over- and under-provisioning.** Azure allows a user to deploy as much or as little infrastructure as they ask for, which is both powerful and potentially risky.
- Unexpected downtime.** A well-managed cloud migration needn't cause any downtime, but a badly managed migration can cause applications and services to be unavailable for extended periods.
- Security vulnerabilities.** Azure is packed with enterprise-grade security features including secure networks, security monitoring, firewalls, and layered security architecture. However, it is possible for a poorly planned cloud migration to leave a business wide open to data breaches and compliance failures.

These pitfalls and others can be avoided with advanced planning and an understanding of the tools Azure provides to streamline migration.

Creating an Azure Cloud Migration Assessment

The goal of a cloud migration assessment is to establish what the migration is expected to achieve, the best way to achieve it, and to identify potential stumbling blocks.

An assessment provides a blueprint that can be used to work out the cost of the migration and which Azure infrastructure should be deployed to meet the needs of the applications that will be migrated.

A cloud migration assessment should aim to answer the following questions:

Which applications will be migrated, and do they have dependencies?

The purpose of this question is to identify the applications to be migrated and any other applications or services they depend on. It's particularly important to identify service dependencies — databases, storage servers, message queue services, and so on — that may also need to be migrated to Azure.

After answering this question, the business should possess a comprehensive breakdown of the applications that will be migrated and the infrastructure on which they depend.

What data will be migrated, and what are the security implications?

Azure provides rock-solid security. The underlying infrastructure is almost certainly more secure than the infrastructure businesses are migrating from. But Azure won't stop a user from doing something foolish, such as leaving sensitive data unencrypted in an internet-accessible database.

It does, however, provide the tools users need to keep their data safe. Understanding the security and privacy implications of moving data to a new platform will help you to choose the right Azure services and security configurations.

Who should be consulted during cloud migration planning?

A cloud migration is typically lead by a business's IT department and third-party partners, but it affects other business departments too. Professionals use applications and services throughout a business, and they may have relevant insights.

Which Azure infrastructure best fits the needs of the migrating applications?

Because you have developed a comprehensive map of their legacy infrastructure and the applications it hosts, it is now possible to identify the required Azure infrastructure and to begin to formulate a migration plan.

How much will the Azure infrastructure cost?

Now that the business has a preliminary Azure cloud infrastructure assessment, it can use [Azure's Total Cost of Ownership Calculator](#) to develop a cost estimate.

After asking and answering these questions, your organization should have a clear idea of what it wants to achieve by migrating to Azure and the information it needs to begin building a comprehensive cloud migration strategy.

Best Practices for Building a Cloud Migration Strategy

In this chapter, we detail a best practice migration strategy for a successful Azure rehosting project and take a closer look at some of the tools Microsoft makes available to streamline cloud migration.

It should be stressed that a successful cloud migration depends on an accurate assessment of an application's existing infrastructure and an understanding of the best way to replicate it efficiently on Azure.

At VIAcode, we live and breathe Azure, and we've carried out hundreds of successful migrations. The cloud migration process we outline here is based on years of rehosting experience.

Azure Cloud Migration Strategy

A typical VIAcode Azure rehosting strategy follows a flexible pipeline that includes capacity planning and cost optimization.

The onboarding phase involves a preliminary configuration of the Azure platform, including the creation of Accounts, Subscriptions and Management Groups, Gateways, and Authentication. It lays the essential groundwork for the next phase, infrastructure deployment. During the deployment phase, we set up and configure the infrastructure on which applications and services run, including virtual networks, public IP addresses, and load balancers. This stage is also the best opportunity to implement security configurations and disaster recovery planning. Firewalls and security policies should be in place before data and virtual machines are migrated.

Next is the service rehosting phase, during which virtual machines, data, and other workloads are migrated. It's crucial that this phase runs smoothly, which is why it must be carefully planned. A properly planned and well-executed migration minimizes downtime and costs. A badly planned migration can be an expensive disaster.

Finally, the optimization phase, an ongoing process to optimize Azure infrastructure for cost and performance. Tools such as Azure Monitor and Network Watcher provide a wealth of data that can be used to adjust Azure infrastructure and applications for optimal efficiency.

Azure Cloud Migration Services

Microsoft wants your infrastructure on its platform and has created several tools to help businesses make the transition. They aren't a replacement for an understanding of Azure and its component services, but they can help businesses to gather essential information and to streamline the rehosting process.

Azure Migrate

[Azure Migrate](#) can be used to automate the assessment of on-premises infrastructure and workloads before migration. Azure Migrate doesn't perform migrations; it uses a Collector Appliance running on an on-premises VM to gather information about VMware virtual machines and to generate reports about the resources required to rehost them on Azure, including VM CPU and memory estimates and cost estimates.

Azure Migrate only works with VMware virtual machines, and VIAcode uses other strategies to assess infrastructure requirements for physical servers and other VMs running on non-VMware hypervisors.

Azure Site Recovery

[Azure Site Recovery](#) is primarily intended as a business continuity and disaster recovery tool, but it has capabilities that make it an essential migration tool too:

- Replication of VMs and physical servers to Azure.
- Workload replication. Unlike Azure Migrate, Azure Site Recovery supports both Hyper-V and VMware VMs as well as physical servers running Windows and Linux.

Azure Recovery is capable of migrating a mix of virtual and physical servers from your data center to Azure. It's the fastest way to carry out a "lift and shift" migration, but it is not suitable for more complex migrations. It's worth emphasizing that a successful migration consists of

more than server and workload replication; once the replication is complete, there are several configuration, security, and monitoring tasks remaining to complete the migration process.

Azure Database Migration Service

As the name suggests, [Azure Database Migration Service](#) is used to migrate data from multiple sources to Azure. It generates reports that include recommendations to help businesses align their databases with the tool's requirements and then automatically performs the migration. Azure Database Migration Service supports many different database sources, including SQL Server, MySQL, and PostgreSQL. For other relational databases, it may be necessary to use [SQL Server Migration Assistant](#) which supports a wider range of databases, including Oracle, SAP ASE, and DB 2.

The cloud migration services provided by Azure make it easier to migrate, but they cannot account for complex migration scenarios and edge-cases. A successful cloud migration involves more than server replication. Businesses planning to rehost on Azure must also consider onboarding, the initial configuration of networks, security, and disaster recovery, and ongoing monitoring and performance optimization.

To learn how VIAcode can help your business to negotiate the complexity of rehosting to Azure, contact our Azure cloud migration experts for a free initial consultation.

Cloud Migration Checklist: a Step by Step Guide to Rehosting with Azure

As we discussed in the previous chapter, there are five essential phases to a successful cloud migration: planning, onboarding, infrastructure deployment, service rehosting, and monitoring and optimization.

To conclude this ebook, here is a comprehensive cloud rehosting checklist that will help you to organize your cloud migration and to understand the rehosting process followed by VIAcode's cloud migration team.

Planning

Successful cloud rehosting projects depend on careful planning. The goal of this phase is to develop an understanding of the application's infrastructure requirements on Azure.

- Determine the scope of the rehosting project.

- Which applications will be migrated to Azure?
- What are the project's initial budget expectations?
- Who in the company should be informed about the migration project?
- Who in the company be involved in the initial planning?
- Assess the application's current infrastructure and what will need to be replicated on Azure.
- Which physical servers, virtual machines, and other services does the application depend on?
- Does the application have dependencies that will also be migrated to Azure. Dependencies might include databases, caching systems, and queue management services?
- Use tools such as [Azure Migrate](#) and [Azure Database Migration Service](#) to assess the infrastructure to be migrated.
- Investigate Azure's infrastructure services and decide which cloud services will replace the application's current infrastructure.
- Calculate the expected infrastructure costs.
- What is a reasonable expectation for the cost of replicating the application's existing infrastructure on Azure?
- Use Azure tools such as [Azure Pricing Calculator](#) and [Azure Total Cost of Ownership Calculator](#).

Once the planning phase is complete, you should have a preliminary understanding of the application's current infrastructure needs, its infrastructure needs following the migration, how those needs will be met, and the cost of meeting them.

On-Boarding

Next, we perform the initial Azure configuration.

- Set up authentication and access rights with Azure Active Directory.
- Create Azure resources that will be used during the migration. These include:
 - Azure Subscriptions, a high-level abstraction that allows groups within your organization to manage resources.
 - Azure Management Groups, used to manage groups of subscriptions and apply policies and access controls for infrastructure use.
 - Azure Blueprints, templates for creating groups of resources that comply with predetermined standards.
 - Configure secure network connections between on-premises infrastructure and Azure with Azure Virtual Network Gateways.

The on-boarding phase lays the foundations, providing managed access to services and network connections that will be used during the migration phase.

Deployment

This is the final preparation phase before the application is rehosted. We configure and deploy security, backup, storage, and network infrastructure.

- Configure and deploy network infrastructure, including Virtual Networks, Public IPs, and Load Balancers.
- Create Network Security Groups and configure firewalls.
- Configure and deploy backup infrastructure, using tools such as Recovery Services Vaults.
- Create storage accounts and configure the storage infrastructure for the application.

Once this phase is complete, we're ready to deploy the application hosting infrastructure.

Rehosting

This is where the planning and preparation of the previous phases pays off. Everything we've done thus far is intended to ensure that migration is as swift and painless as possible.

- Migrate virtual machines from on-premises infrastructure to Azure with Azure Site Recovery and third-party tools.
- Migrate databases with Azure Database Migration Service, SQL Service Migration Assistant, or other appropriate tools.
- Migrate .NET and PHP applications using App Service Migration Assistant.
- Migrate dependencies and development workflow tooling (CI/CD) workloads.
- Use best-in-class migration tools from third-party vendors to complete specific workload migrations.

The application is now rehosted on Azure.

Optimization

The final phase implements monitoring and alert systems to provide the information that we and our clients need to optimize Azure infrastructure for cost and performance.

- Configure Azure infrastructure metrics and logs to deliver actionable information and alerts to Azure Monitor.
- Integrate Azure Application Insights for code-level performance monitoring.
- Implement usage analytics to provide information to guide application performance optimization.
- Refine infrastructure to maximize availability and minimize costs.
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VIAcode's Azure rehosting specialists work with clients to complete every step in this checklist, ensuring a smooth transition to Azure infrastructure and the efficient use of cloud resources. To learn how VIAcode can help your business to negotiate the complexity of rehosting to Azure, contact our Azure cloud migration experts for a free initial consultation and free migration to Azure today!