

AWS Prescriptive Guidance: Migrating Microsoft Workloads to AWS

Why choose AWS for Microsoft workloads?

AWS has been helping customers migrate and modernize their Microsoft workloads for over 14 years and has the broadest portfolio of services, programs, and expertise to accelerate the transformation of key applications that power businesses. If you use AWS to migrate and modernize, you can look forward to the following benefits:

- **Unlock innovation** – Moving from a traditional monolithic architecture to a cloud-based microservices architecture can give you the freedom to adapt and experiment quickly so that your organization can unlock innovation faster. AWS has the broadest set of container technologies, including Amazon Elastic Container Service (Amazon ECS), Amazon Elastic Kubernetes Service (Amazon EKS), and AWS Fargate. Additionally, AWS has the most mature serverless offering (AWS Lambda), deeply integrated .NET support, DevOps utilities to automate development cycles, several open-source integrations, and purpose-built databases such as Amazon Aurora to power modern architectures.
- **Reduce costs** – You can avoid paying for expensive Windows or SQL Server licensing by moving to open-source database solutions. For example, Aurora provides the same functionality as commercial databases at one-tenth the cost. If you move to DevOps and use containers and serverless solutions, you can reduce your total cost of ownership (TCO) and maximize compute consumption.
- **Improve security** – AWS offers 230 security, compliance, and governance services and key features—five times more services than the next largest cloud provider. You can use [AWS Directory Service](#), also known as AWS Managed Microsoft AD, to improve your cloud security and eliminate the need to synchronize or replicate data from your existing Active Directory during migrations. You can also use [AWS Identity Services](#) to manage identities and permissions at scale, while providing flexible options for where and how you manage your employee, partner, and customer information.
- **Develop skills with trusted experts** – AWS has unmatched experience helping millions of organizations reach their migration goals faster through unique tools and services. The [AWS Migration Acceleration Program \(MAP\) for Windows](#) provides best practices, tools, and

incentives to reduce the complexity and cost of migrating to the cloud with support from AWS Partners and AWS Professional Services. The [End-of-Support Migration Program for Windows Server](#) can help you migrate legacy Windows Server applications to the latest supported versions of Windows Server on AWS. 90 percent of Fortune 100 companies and the majority of Fortune 500 companies use AWS Partner solutions and services.

- **Improve the price and performance of your processing power** – AWS is a leader in processing innovation, offering Graviton2-based instances that are 20 percent less expensive per hour than Intel x86-based instances, with up to 40 percent better performance. Aurora also brings five times the throughput of standard MySQL and three times the throughput of standard PostgreSQL. This performance is on par with commercial databases, at one-tenth the cost.
- **Take advantage of flexible licensing options** – AWS offers the most options in the cloud for using new and existing Microsoft software licenses on AWS. If you purchase license-included Amazon Elastic Compute Cloud (Amazon EC2) or Amazon Relational Database Service (Amazon RDS) instances, you get new, fully compliant SQL Server licenses from AWS. You can bring your existing licenses to AWS with [Amazon EC2 Dedicated Hosts](#), [Amazon EC2 Dedicated Instances](#), or EC2 instances with default tenancy by using [Microsoft License Mobility through Software Assurance](#). AWS License Manager makes it easier to track the usage of software licenses and reduce the risk of non-compliance.

For more information, see [Windows on AWS](#) in the AWS documentation.

Foundational Best Practices

Establishing a scalable and secure foundation for your AWS migration can enable you to easily manage and efficiently run your Windows environment on AWS. Before you migrate your Microsoft workloads to AWS, we recommend that you consider the following foundational best practices:

- **Optimize your spending on Microsoft licensing** – Licensing is a critical factor in your cloud migration because it impacts all other decisions moving forward. We recommend that you understand licensing options as early as possible. For more information about licensing, see the [Microsoft licensing on AWS](#) section of this guide.
- **Streamline your cloud architecture** – The [AWS Well-Architected Framework](#) helps you run your workloads reliably in the cloud. You receive guidance and strategies to help you follow

the framework, avoid serious issues, and scale to meet your organization's needs. This guidance also covers billing, access control, and security controls.

- **Build an integrated, easy-to-manage cloud network** – [AWS Transit Gateway](#) can help you more easily manage networks and prevent overlapping networks—for example, Classless Inter-Domain Routing (CIDR) range planning—from being created with your on-premises or other cloud environments. That way, you can route traffic to each network as needed. You must determine how accounts route to each other and to on-premises environments and the internet. This enables you to set up proper controls to protect your network traffic. For example, you must decide to make the AWS accounts an extension of existing on-premises data centers and use their perimeter defenses, such as firewalls, intrusion detection systems (IDS) and intrusion prevention systems (IPS), or set up an AWS network account encompassing these perimeter defenses to protect your AWS resources.
- **Prioritize cloud security** – We recommend moving from a single-account to a multi-account environment while adhering to the security best practice of applying least-privilege permissions. We also recommend that you have a thorough understanding of the [AWS shared responsibility model](#) and plan how you can [secure your environment](#) while maintaining your organization's agility. To improve and maintain security, you can use Amazon API Gateway, AWS WAF, Application Load Balancers, Amazon CloudWatch, AWS CloudTrail, Amazon GuardDuty, and other services. To learn more about multi-account strategy, see [Transitioning to multiple AWS accounts](#) in the AWS Prescriptive Guidance documentation.
- **Manage shared IT services in the cloud** – To efficiently manage workloads in the cloud, it's critical to identify all shared services used by your workloads and plan how they will be provided in the cloud. For example, these include Active Directory, file servers, SQL databases, Domain Name System (DNS), virtual private network (VPN), Simple Mail Transfer Protocol (SMTP), backup, and monitoring services. After you take an inventory, you can decide between extending existing services to the cloud, setting up a completely new instance of the service, or using an alternative managed cloud service. Subsequent sections of this guide will cover these considerations in more detail.

Paths to the Cloud

This section describes a high-level approach for implementing best practices to migrate your Windows applications to AWS. Details of these migration strategies and steps are described in the subsequent sections of this guide.

Migration strategies

A migration strategy is the approach used to migrate a workload to the AWS Cloud. There are seven migration strategies for moving applications to the cloud. These strategies are known as the 7 Rs and build upon the 7 Rs that Gartner identified in 2019.

- **Rehost (lift and shift)** – Move an application to the cloud without making any changes to take advantage of cloud capabilities.
- **Relocate (hypervisor-level lift and shift)** – Move infrastructure to the cloud without purchasing new hardware, rewriting applications, or modifying your existing operations.
- **Replatform (lift and reshape)** – Move an application to the cloud and introduce some level of optimization to take advantage of cloud capabilities.
- **Repurchase (drop and shop)** – Switch to a different product, typically by moving from a traditional license to a software as a service (SaaS) model.
- **Refactor/re-architect** – Move an application and modify its architecture by taking full advantage of cloud-native features to improve agility, performance, and scalability.
- **Retain (revisit)** – Keep applications in your source environment. These might include applications that require major refactoring, and you want to postpone that work until later, and legacy applications that you want to retain, because there's no business justification for migrating them.
- **Retire** – Decommission or remove applications that are no longer needed in your source environment.

Main transformations

The following main transformations take place when you modernize legacy Windows applications and databases:

- **Rehost** – The first step is moving your on-premises infrastructure to cloud infrastructure. This strategy is often referred to as “lift and shift” or rehosting. Rehosting means migrating existing applications and databases to a cloud server instance. There is no need for code changes and you're responsible for managing the instance configuration, software image, and other resources.
- **Replatform** – After you migrate to a cloud environment, the next transformation is around replatforming the applications and databases into a more automated and managed environment. From an application perspective, that means moving from virtual machines (VMs) to containers. Containerizing applications can help you develop, maintain, and deploy applications faster and improve portability. AWS has tools, like [AWS App2Container](#), to help automate the process of containerizing legacy applications. On the database side, moving from a self-service model to a managed database service, like Amazon RDS for SQL Server, eliminates the need for provisioning, patching, and backups. This ultimately frees up resources for activities that can add more value to your organization.
- **Refactor/re-architect** – The third area of transformation is to move from commercial software licensing to open-source options. Many traditional commercial software vendors have built their businesses around software license agreements that are aimed at locking in customers and using punitive licensing terms to force upgrades and migrations. Often, commercial software license fees typically add 20-50 percent of cost on top of equivalent open-source options. We recommend refactoring your applications and databases to take advantage of open-source options so that you can reduce costs, improve performance, and gain access to the latest innovations.

You can complete these main areas of transformation progressively in stages or all at once depending on your application and overall readiness to modernize.

Choosing a migration strategy

The migration strategy to choose depends on the business and IT goals of your organization. Some of the most common business drivers are reducing cost, reducing risk, improving efficiency, addressing skill gaps, and speeding up innovation. We recommend that you evaluate which drivers are important for you, and then choose a migration strategy based on your drivers by using the

following guidance. Also, remember that all three approaches are possible roads on your cloud modernization journey, depending on your priorities during each phase of the journey.

When to rehost

Rehosting (or lift and shift) is typically faster and easier because you don't need to make code or architecture changes in the application. Rehosting also minimizes risks and disruption to the business. The operations team can continue to run the business as usual because the application isn't changed. This is especially true for migrations at scale where even a small change becomes significant because of the large number of workloads involved. However, it's important to consider that rehosting doesn't take full advantage of cloud benefits. For example, if you migrate an application with an existing platform issue, that issue will remain after the migration. Finally, it's worth considering that the total cost of ownership (TCO) and return on investment (ROI) for rehosting is lower compared with the other migration approaches.

When to replatform/re-architect

Replatforming is generally more cost-effective than rehosting. You can use replatforming to enhance automation and enable your applications to better use cloud capabilities such as auto-scaling, monitoring, and performing backups. Replatforming reduces operational overhead for the cloud operations team and minimizes risks from pre-existing platform issues. However, replatforming takes longer than a rehosting migration. Also, replatforming requires additional skills to configure the automation that performs code changes on the application and to operationalize the new platform.

When to refactor

A refactor is generally the most cost-effective migration approach. Refactoring is a cloud-native approach that enables applications to rapidly adapt to new requirements by decoupling application components to improve on application resiliency. However, refactoring requires more advanced coding and automation skills. Refactoring also takes longer to implement because it involves rebuilding applications.

Windows migration process

Migrating an existing Windows environment to AWS requires careful planning and implementation. The process involves identifying your current usage of resources, assessing the cost savings potential of migrating to AWS, determining your security needs, and building a well-defined cloud architecture that meets all your organization's requirements. You can use AWS to migrate your current Windows server infrastructure quickly and easily, reducing operational costs while maximizing system efficiency. AWS also offers a range of powerful tools and services to help you maintain control over the entire process and to make sure that your Windows environment in the cloud is optimally configured for maximum performance.

This section provides an overview of the three-phase migration process that AWS developed to assist organizations in the successful migration of several applications to the AWS Cloud: assess, mobilize, and migrate and modernize.

Assess

The assess phase helps you understand the state of your organization's readiness to move to the cloud. You can use AWS tools to assist you in the assess phase by assessing your on-premises computing resources and building a cost projection for running applications on AWS. We recommend that you consider the following tools:

- Use the [migration readiness assessment](#) to understand where you are in the cloud journey.
- Use the [AWS Optimization and Licensing Assessment \(AWS OLA\)](#) to assess and optimize current on-premises and cloud environments, based on actual resource utilization, third-party licensing, and application dependencies.
- Use the [Migration Evaluator](#) to help you build a data-driven business case for migration to AWS.
- Use the [Cloud Economics Center](#) to build a business case for your migration by defining your objectives, such as improved reliability, cost optimization, and scalability.
- Use [AWS Migration Hub](#) to collect server and application inventory data for the assessment, planning, and tracking of your migration.
- Use the [Migration Validator Toolkit PowerShell module](#) to discover your Microsoft workloads and migrate them to AWS.

Mobilize

During the mobilize phase, you develop a migration plan and iterate on your business plan and address any gaps in your readiness that were revealed in the assess phase. It's critical to focus on building your baseline environment, driving operational readiness, and developing cloud skills. Migrating a large application portfolio can be a complex task. To ease this process, AWS provides a range of tools and services to help you migrate a set of pilot workloads to the cloud quickly, securely, and cost effectively. Gathering data on your application portfolio and rationalizing applications using one or more of the seven common migration strategies—rehost, relocate, replatform, repurchase, refactor/re-architect, retain, and retire—can provide an improved basis for decision-making. AWS offers a suite of services that you can use to migrate Windows-based applications and workloads to the cloud, including the following:

- ❑ [AWS Application Discovery Service](#)
- ❑ [AWS Application Migration Service](#)
- ❑ [AWS Database Migration Service](#)
- ❑ [AWS Migration Competency Partners](#)
- ❑ [Management and Governance on AWS](#)
- ❑ [AWS Control Tower](#)

Migrate and modernize

In the migrate and modernize phase, you must carefully design, migrate, and validate each application that's in scope for migration. Application Migration Service makes it easy to migrate large numbers of servers from physical, virtual, or cloud infrastructure to AWS. With Application Migration Service, you can use the same automated process for a wide range of applications and quickly lift and shift them from an existing environment to the cloud.

The [Cloud Migration Factory on AWS](#) solution is designed to coordinate and automate manual processes for large-scale migrations involving a substantial number of servers. This solution helps you improve performance and prevents long cutover windows by providing an orchestration platform for migrating workloads to AWS at scale. [AWS Professional Services](#), [AWS Partners](#), and other enterprises have already used this solution to help customers migrate thousands of servers to the AWS Cloud.

After the migrations are complete, you can use [AWS Migration Hub Refactor Spaces](#) to reduce undifferentiated work when refactoring your application for AWS. Refactor Spaces provides an easy-to-use workspace that enables developers to incrementally refactor existing applications into

a modern architecture with minimal overhead or disruption. You can use Refactor Spaces to quickly take advantage of the full range of AWS services optimized for your application.

Your teams are experts in building and running Microsoft workloads on premises. That experience can be enhanced in the cloud. Migrating to AWS can provide an even more efficient and reliable experience for the Windows world you've come to rely on. With AWS, you'll get access to a broad range of cloud services that are designed to make it easier and faster to migrate your existing Microsoft workloads. You can benefit from more scalable capacity, improved storage options, and enhanced security.

Credit to: AWS Documentation