



# An Easier Path to the Cloud

Migrate Windows Server and SQL Server  
using Azure Virtual Machines

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## Who should read this e-book?

This e-book is intended for IT professionals and organizations who have been using Windows Server and/or SQL Server on-premises, and are looking for a low-friction way to start adopting the cloud.

After reading this e-book, you'll understand the benefits of migrating your applications to use Microsoft Azure SQL Database. Additionally, you'll find Azure SQL Managed Instance capabilities that can help your organization make a smooth transition to the cloud, minimizing changes to your applications.

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# 01

## Introduction

Many businesses are adopting cloud solutions to support new ways of doing business, enable a remote workforce, scale more efficiently, and ensure business continuity.

However, IT teams have been successfully working on-premises using Windows Server and SQL Server for years—and many businesses, due to regulatory, data governance, and other needs, prefer to keep at least some of their IT assets on-premises. This is often because many organizations have older applications that they can't easily move to the cloud, or they simply prefer to transition gradually, rather than force their IT teams to make a rapid shift to the cloud.

So how can you use your expertise in Windows Server and SQL Server to make the most of your on-premises IT investments, while moving some workloads to the cloud to support innovation and other critical business needs?

This guide focuses on the benefits of migrating your on-premises Windows Server and SQL Server workloads to Azure Virtual Machines. You'll learn about the unique management features and hybrid capabilities in Azure designed to support organizations using Windows Server and SQL Server in both cloud and on-premises environments.

## 02

# Explore migration options

There are many reasons to migrate to the cloud, and a number of modernization and migration approaches to consider. You can get an end-to-end view of cloud migration in the [Microsoft Cloud Adoption Framework for Azure](#). This e-book focuses on the benefits of Azure Virtual Machines, while the following section outlines the five most common options for rationalization.



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"By moving our acquired applications to Azure, we were able to get them up, running, and adding value to the business in three weeks versus the three months needed to requisition servers and storage."

Peter Tomlinson

*Director of IS, Technology Operations  
Allscripts*

**Here's an overview of different migration options:**

Apply these five Rs of rationalization to a digital estate to help you determine the best way to migrate or modernize each asset in the cloud.

**Rehost**

Also known as a "lift-and-shift" migration, a rehost effort moves a current state asset to the chosen cloud provider, with minimal change to overall architecture.

Rehosting your application enables you to:

- Reduce capital expenses.
- Free up more datacenter space.
- Get a rapid return on investment in the cloud.

**Refactor**

Platform as a service (PaaS) options can reduce the operational costs that are associated with many applications. It's a good idea to slightly refactor an application to fit a PaaS-based model. "Refactor" also refers to the application development process of refactoring code to enable an application to deliver on new business opportunities.

Refactoring your application enables you to:

- Perform faster and shorter updates.
- Ease code portability.
- Get greater cloud efficiency (resources, speed, cost, managed operations).

## Rearchitect

Some aging applications aren't compatible with cloud providers because of the architectural decisions that were made when the application was built. In these cases, you may need to rearchitect the application before transformation. In other instances, applications that are cloud-compatible, but not cloud-native, can create cost and operational efficiencies by rearchitecting the solution into a cloud-native application.

Rearchitecting your application enables you to:

- Increase application scale and agility.
- Ease adoption of new cloud capabilities.
- Use a mix of technology stacks.

## Rebuild

Sometimes, moving an application forward can be too large to justify further investment. This is especially true for applications that previously met the needs of a business but are now unsupported or misaligned with the current business processes. In this case, a new code base is created to align with a cloud-native approach.

Rebuilding your application enables you to:

- Accelerate innovation.
- Build applications faster.
- Reduce operational costs.

## Replace

You can implement solutions by using the best technology and approach available at the time. Sometimes, a software as a service (SaaS) application can provide all the necessary functionality for the hosted application. In these scenarios, a workload can be scheduled for future replacement, effectively removing it from the transformation effort.

Replacing your application enables you to:

- Align with industry best practices.
- Accelerate adoption of business-process-driven approaches.
- Reallocate development of investments in applications that create competitive differentiation or advantages.

One way you can make migration easier is by using the right tools. [Azure Migrate](#), free with an Azure subscription, provides a comprehensive approach to migrating your application and datacenter estate. It supports key migration workloads like Windows, SQL and Linux Server, databases, data, web apps, and virtual desktops. Migrate to destinations including Azure Virtual Machines, Azure VMware Solution, Azure App Service, and Azure SQL Database.

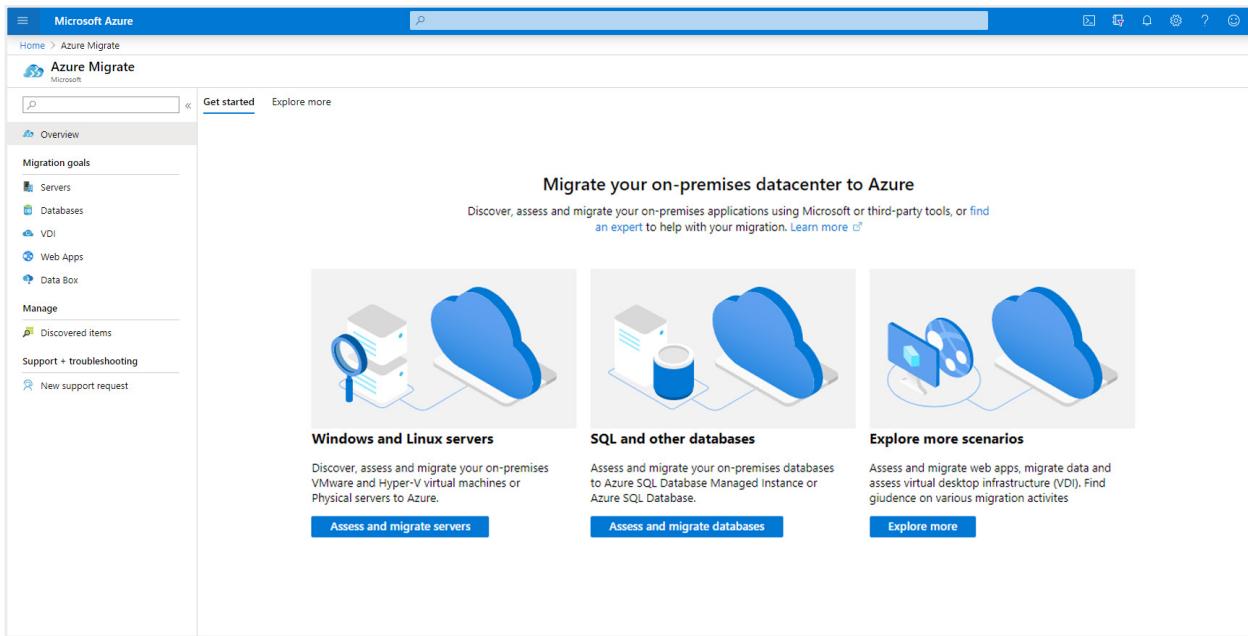


Figure 1: Discover, assess, and migrate your on-premises applications

### Moving to Azure provides advanced features, including:

- Enhanced performance, availability, and security.
- Cloud readiness and scalability.
- Management and programmability.
- Business intelligence, advanced analytics, and artificial intelligence.

# 03

## Get to know Windows Server on Azure Virtual Machines

Prior to cloud platforms, Windows Server was the operating system of choice for enterprise workloads and applications hosted on-premises. While Windows Server continues to power businesses everywhere, it's now built with the flexibility required to help organizations shift to the cloud. This helps you deal with the need to protect against security threats, new and increasing demands for scalability, cost flexibility, and remote work support.

IT professionals and developers must meet the challenge of adapting to and driving change that impacts their businesses. To help accomplish this, they can benefit from ways to adopt cloud solutions that are low friction and help them ease day-to-day management. One of the easiest ways to experience the benefits of the cloud for Windows Server is to do a "lift-and-shift" (rehost) migration to Azure Virtual Machines.

Here are some solutions that Windows Server professionals have been using to accomplish their goals with Azure:

### Streamline security and management

For Windows Server Virtual Machines in Azure, you can take advantage of Azure Automanage, a service that significantly reduces day-to-day management tasks with automated operations across the entire VM lifecycle. Azure Automanage automatically implements VM management best practices for business continuity and security. If a VM's configuration drifts from the applied best practices, Azure Automanage will detect and automatically bring the VM back to the desired configuration.

There are also unique capabilities in Azure Automanage for Windows Server that allow customers to continue to run their business-critical applications without interruption. Azure Automanage for Windows Server helps customers enable rebootless security patching for new Windows Server Virtual Machines. [Learn](#) how you can enable this capability on Windows Server 2019 Server Core VMs to better protect your environment against critical security threats.

### Azure Automanage

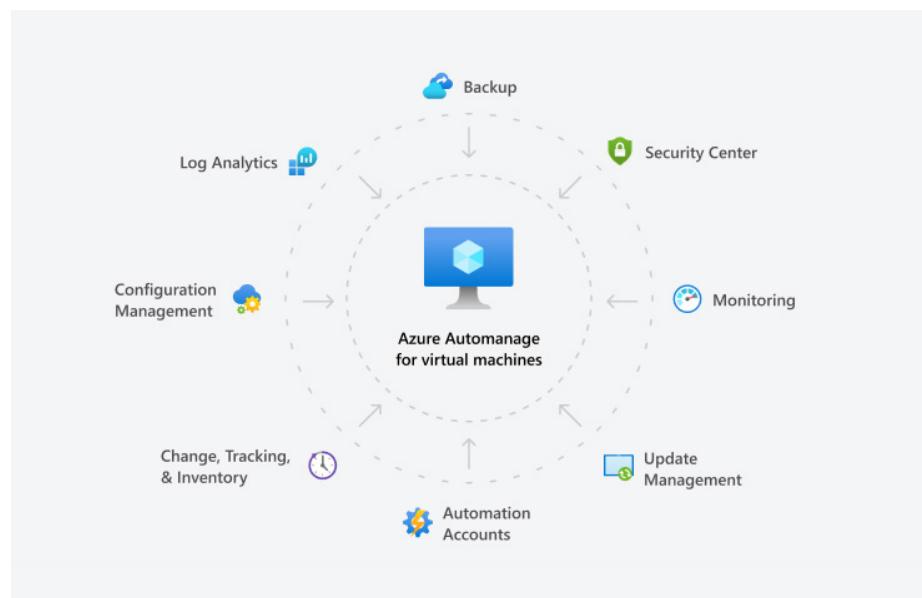


Figure 2: Azure Automanage reduces day-to-day management tasks with automated operations across the entire lifecycle of Windows Server Virtual Machines in Azure

## Manage Windows Server anywhere

Whether your organization has several Windows Servers on-premises, or some in the cloud and others on-premises, Windows Admin Center can help make management tasks easier. [Windows Admin Center](#) is a popular tool that's used to configure, troubleshoot, and perform maintenance tasks on Windows Servers. It's a remote management tool known for its simple user interface, which helps you manage Windows Servers running anywhere—on-premises, in Azure, or in a hybrid environment.

In addition to downloading and using Windows Admin Center via the above link, Windows Admin Center in Azure is now available in preview. This gives you access to Windows Admin Center directly through the Azure portal. Now you can use the same interface you know to perform seamless and granular management of Windows Server Virtual Machines right from the Azure Portal. Customers can manage their files, view expired certificates, monitor performance, view critical events, use PowerShell, use an in-browser Remote Desktop Protocol session, and much more without leaving the portal. This cloud-first offering features an integrated certificate experience that provides a secure connection to your VM over a public or private IP address.

[Learn more and get started using Windows Admin Center in Azure.](#)

## Windows Admin Center

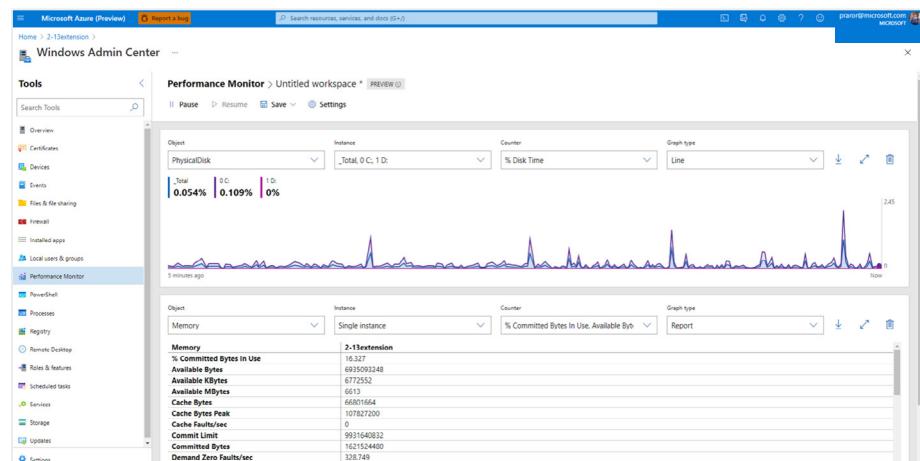


Figure 3: Windows Admin Center dashboard

[\*\*Windows Admin Center in the Azure Portal:\*\*](#) Provides a built-in capability that enables you to manage Windows Server Virtual Machines right within Azure Portal.

# 04

## Get to know SQL Server on Azure Virtual Machines

The Azure SQL family consists of the following Azure services: SQL Server on Azure Virtual Machines, Azure SQL Managed Instance, and Azure SQL Database. In this section, we'll focus on SQL Server on Azure Virtual Machines.

SQL Server on Azure Virtual Machines is a "lift-and-shift" of your on-premises VMs into the cloud. It enables you to move with ease, and without the need to learn new skills or manage hardware. If you're already familiar with SQL Server, SQL Server on Azure Virtual Machines is a way to take advantage of the cloud, while also achieving code compatibility. Having SQL Server on Azure Virtual Machines gives you access to the latest SQL Server updates and releases, including SQL Server 2019. Plus, you get free benefits such as extended security updates for Windows and SQL 2008/r2.

Whether you use a prebuilt image or bring your own software, you can take advantage of free management capabilities for SQL Server on Azure Virtual Machines. This enables you to run your virtual machines in a cost effective, secured, and optimized manner by registering with [SQL IaaS Agent extension](#).

SQL IaaS Agent extension allows you to optimize cost with simplified license conversions between bring-your-own-license with Azure Hybrid Benefit and pay-as-you-go licensing. It enhances security with optional automatic security patching and built-in encryption features. SQL IaaS Agent extension enables you to boost uptime with easily configurable, high availability automated backup, and high availability/disaster recovery license benefits. SQL IaaS Agent extension also simplifies management with optional, automatic implementation of best practices. To register virtual machines with SQL IaaS Agent extension, just go to the SQL Server VM blade of the Azure Portal and use the "Automatic SQL Server VM registration" button.

As you migrate your SQL Server estate to Azure, you may find additional savings in fully automating your database maintenance and administration with [Azure SQL Managed Instance](#). Analyst firm Enterprise Strategy Group [reported](#) that customers who migrated their SQL Server from on-premises to Azure Virtual Machines saved up to 47 percent. They can save an additional 17 percent by migrating to Azure SQL Managed Instance and further reducing spend on application and system administration. In addition, as customers move to PaaS, it can become easier to automate other pieces of the business, such as creating a continuous integration/continuous delivery pipeline with Azure Dev Ops.

# 05

## Make the most of a hybrid environment

As you begin migrating to the cloud and move to Azure Virtual Machines, you may discover workloads that you want to keep on-premises. In these types of scenarios, having the latest version of Windows Server helps you get cloud-and DevOps-ready while you support current workloads. If you're working with a hybrid cloud and on-premises strategy, Azure gives you powerful and cost-efficient options to achieve an impactful combination of upgraded on-premises applications, rehosted workloads in the cloud, and eventually, rebuilt applications native to the cloud.

## Make the most of your current investments

Azure Hybrid Benefit is a licensing benefit that helps you to significantly reduce the costs of running your workloads in the cloud. It enables you to use your on-premises Software Assurance-enabled Windows Server and SQL Server licenses on Azure. And now, this benefit applies to RedHat and SUSE Linux subscriptions, too.

### Why Azure Hybrid Benefit?

#### SQL Server

Only on Azure you can:

- Maximize savings by using Azure Hybrid Benefit for both Windows Server and SQL Server workloads.
- Use existing SQL Server licenses in platform as a service (PaaS) environments.
- Apply to SQL Server 1 to 4 vCPUs exchange: For every 1 core of SQL Server Enterprise Edition, you get 4 vCPUs of SQL Managed Instance or Azure SQL Database business critical tier, or 4 vCPUs of SQL Server Standard edition on Azure VMs.
- Help meet compliance requirements with unlimited virtualization on Azure Dedicated Host.
- Get 180 days of dual-use rights between on-premises and Azure.

#### SQL Server Enterprise Edition savings example

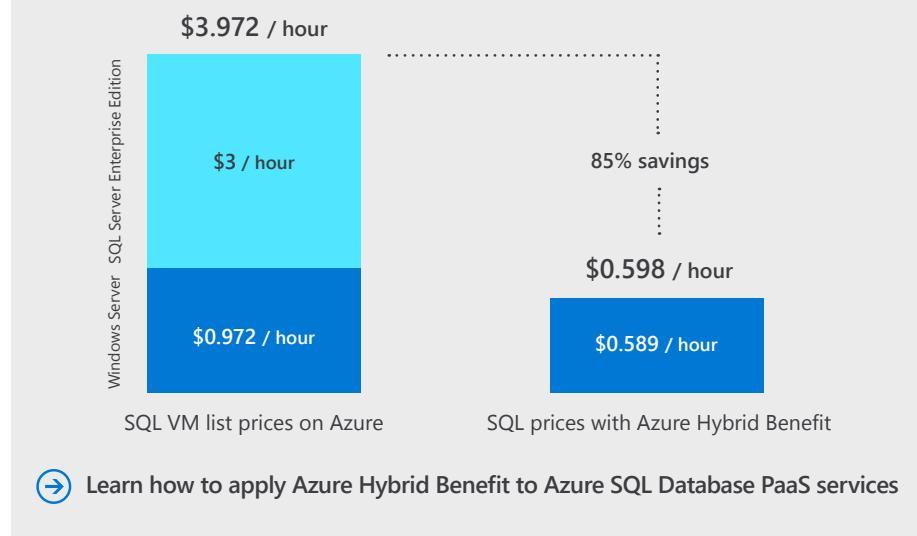


Figure 4: Advantages of Azure Hybrid Benefit on SQL Server

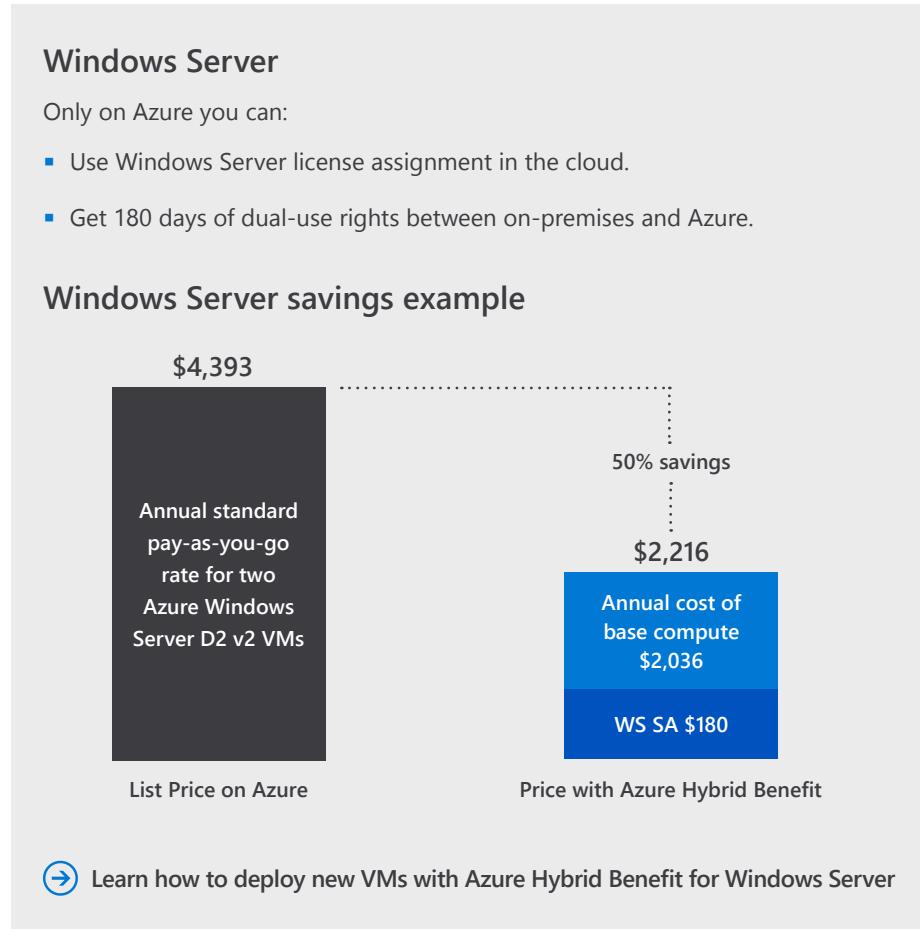


Figure 5: Advantages of Azure Hybrid Benefit on Windows Server

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**"It's a game-changer for us to be able to deliver a cloud-centered delivery model for the complete hybrid infrastructure."**

**Andrew Brabban**

*Vice President, Head of Microsoft Global Business Development  
Fujitsu*

## The Azure Stack hyperconverged infrastructure

The newly released Azure Stack Hyperconverged Infrastructure (HCI) is the best Azure Stack option for modernizing on-premises software and integrating with Azure. Azure Stack HCI is a new hyperconverged infrastructure operating system from Microsoft delivered as an Azure hybrid service in partnership with Microsoft original equipment manufacturers (OEMs). With Azure Stack HCI, you can run Windows and Linux VMs on-premises with industry-leading, cost-effective HCI solutions from Microsoft OEMs to leverage your existing tools, processes, and skill sets with DevOps, APIs, and services identical to Azure.

## Stay secure on-premises and in the cloud

Windows Server 2022 (now in preview) and Azure Stack HCI will include a [Secured-core server](#), which brings powerful threat protection to provide multi-layer security across hardware, firmware, and the operating system. In addition to multi-layer security, Windows Server 2022 offers enhanced hybrid capabilities with Azure, and a flexible platform to modernize applications with containers. To learn more, read [this announcement](#).



# 06

## Accelerate innovation with Azure

You may have been using SQL Server and Windows Server on-premises successfully for years. Yet, as your business needs change and compel you to take advantage of the cloud, Azure offers many benefits that make managing your servers in a hybrid environment easier. Intuitive security and broad compliance capabilities help protect your data.

Managed services, a global network, and reduced administrative burden put the focus on innovation. A cost-effective platform reliably supports applications that rely on Windows Server and SQL Server. Make the most of your existing expertise and IT investments, while also facilitating innovation and meeting critical business needs.

- ➡ Get guidance and expert help—[join the Azure Migration and Modernization Program](#).

Additional resources to help you to:

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Learn how you can save by using your existing on-premises Windows Server and SQL Server licenses in the cloud with [Azure Hybrid Benefit](#).

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Automate management with [Azure Automanage](#) and [SQL Server IaaS Agent extension](#).

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Manage Windows Server instances anywhere—on-premises—in Azure, or in any cloud with [Windows Admin Center](#).