Microsoft

Best practices when migrating Windows Server to Azure

01

Introduction

This e-book is targeted to system
administrators and engineers.
We'll discuss a few of the best practices
for different stages of a migration to the
Microsoft Azure platform. We'll also explore
tips and tricks used by organizations
migrating from Windows Server 2008
and 2008 R2—either upgrading their
on-premises implementations to the latest
version of Windows Server or moving to
Microsoft Azure. Both of these approaches
can enable digital transformation
and let you take advantage of Azure
Hybrid Benefit.

02

Time for change— Windows Server 2008 and 2008 R2 end of support

Windows Server and SQL Server 2008 and 2008 R2 were hugely popular when they launched nearly 10 years ago, and millions of instances of them have been deployed worldwide. Organizations continue to run many of their business applications on these servers. With the decade anniversary coming, both editions are nearing end of support—SQL Server 2008 and 2008 R2 in July 2019 and Windows Server 2008 and 2008 R2 in January 2020. We know many organizations want to continue using these servers, and we're here to help them find the options that work best for them. End of support means that your software will no longer receive security updates,

which could expose you to security attacks and create compliance issues with industry regulations like the General Data Protection Regulation (GDPR), Federal Risk and Authorization Management Program (FedRAMP), Payment Card Industry Data Security Standard (PCI DSS), and others.

Moving Windows Server 2008 to Azure
Microsoft provides various benefits related to extending Windows Server support, upgrading, and licensing:

Migrate to Azure with free Windows Server and SQL Server 2008 extended security updates. Microsoft has announced free extended security updates for three years past the end-of-support dates for servers running in Azure. This means you get the efficiency of running servers in Azure, as well as three more years of security updates at no additional cost

Upgrade Windows Server on Azure at no additional cost. When you migrate Windows Server 2008 to a virtual machine (VM) in Azure, you can upgrade to a newer version of a Windows Server VM at no extra cost.

Get a free assessment for your Azure migration. With a migration to Azure, Microsoft provides tools to help you assess your migration readiness.

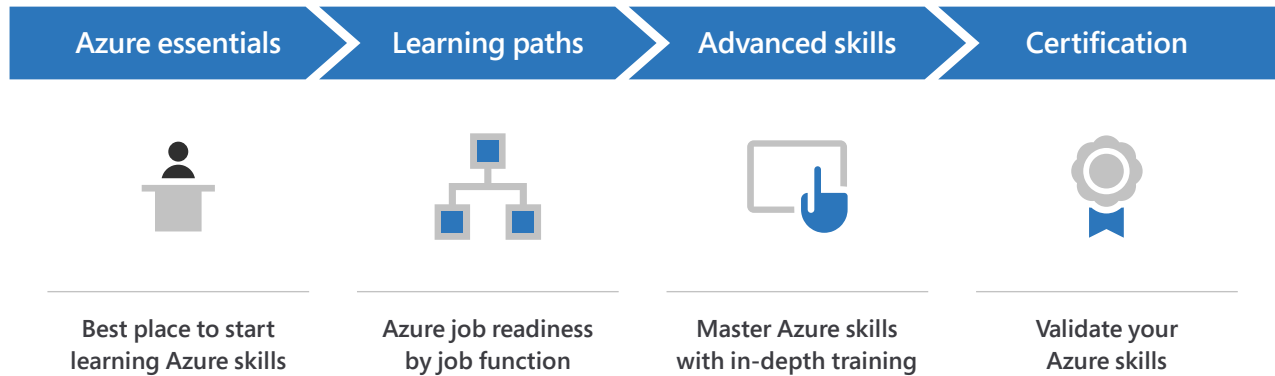Use existing Windows Server licenses. Azure Hybrid Benefit lets you use existing Windows Server licenses to save on virtual machines in the cloud.

Grow your cloud skills
As you prepare your organization's infrastructure for cloud adoption, you also have the opportunity to develop skillsets that help you extend your management knowledge into the cloud. While many of the tools—and much of your experience— for on-premises servers and applications are similar to those needed for the cloud, there are some fundamental differences to consider since nearly all roles in IT will evolve to some degree.

Microsoft and its partners offer a range of options to help learners at all levels develop their skills with Azure services at the Microsoft Virtual Academy and IT Pro Career Center.

Another resource, Azure Essentials,
provides unique learning paths focused
on job roles, as shown in Figure 1.
This readiness tool delivers simple online
training in bite-sized pieces, practical labs,
and assessments to test your knowledge.
It's the fastest way for you or your team to
learn cloud skills, and it's free.

Azure essentials	Learning paths	Advanced skills	Certification
Best place to start learning Azure skills	Azure job readiness by job function	Master Azure skills with in-depth training	Validate your Azure skills

Figure 1: Using Azure Essentials to quickly gain cloud skills

03

Before you migrate, assess, plan, and prepare

In this e-book, we'll take you through the major steps in a typical rehost or lift-and-shift migration, including designing your virtual datacenter, assessing your environment, performing migration, and optimizing post-migration.

Learn more about [tools to migrate your datacenter](#).

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What if you need help?

Knowing your partners makes a big difference. [Azure migration partner solutions](#) include services and tools to support your assessment, migration, and more. Tools like Movere, Cloudamize, CloudPhysics, Corent, TSO Logic, Turbonomic, and many more are also ready-to-use solutions that may fit your migration scenarios.
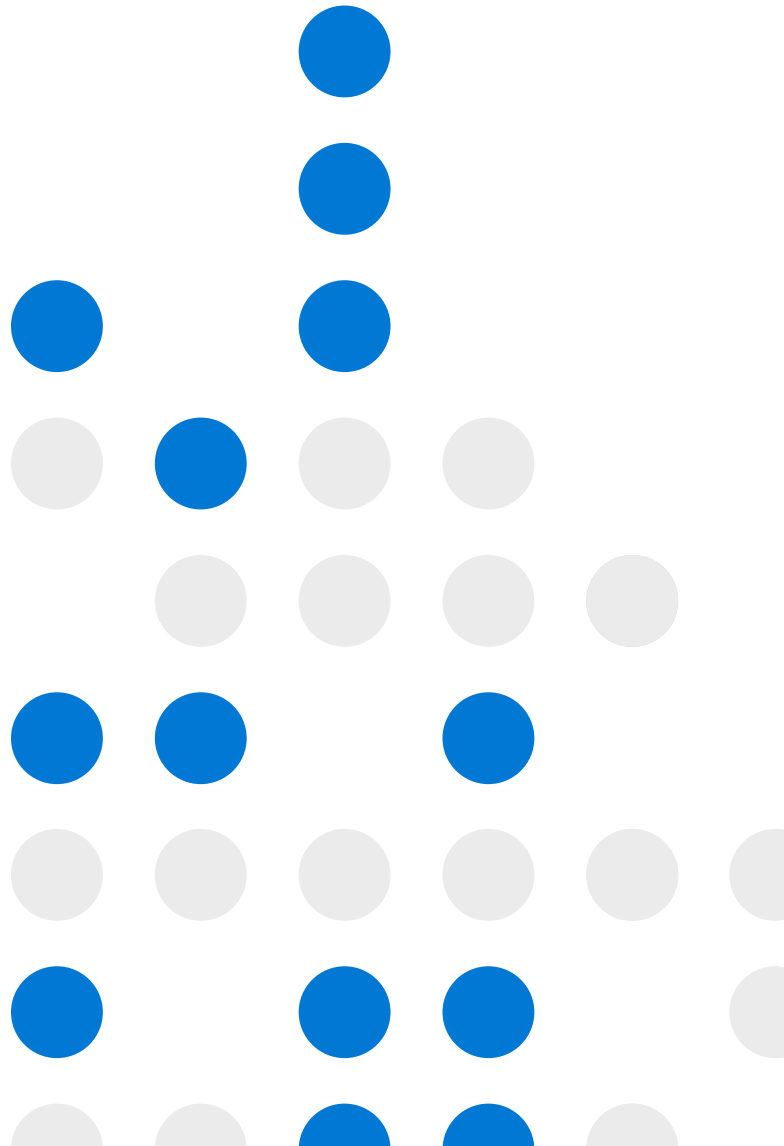
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Tips and tricks for migration

A solid plan and methodology are required for cloud migration. Once you decide to take a cloud-first approach and migrate to the cloud, you might be unsure about where to start. As shown in Figure 2, Microsoft provides a simple three-step migration strategy to help with this.

Assess   Migrate   Optimize
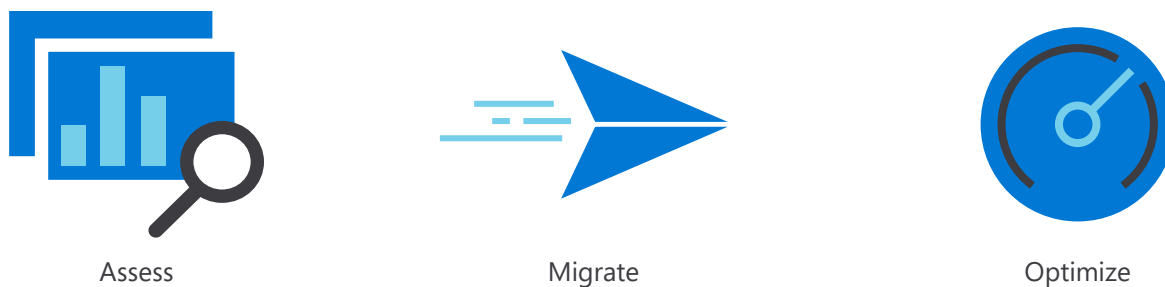
Figure 2: Three-step cloud migration process

Assess your workloads

A cloud migration starts with careful planning and a phased approach to execution. Although the ease of entry to the cloud makes it tempting to rush in without a solid plan, an inadequate cloud architecture almost always ends up preventing organizations from realizing the benefits that prompted the migration in the first place. A cloud migration is a strategic undertaking that must be executed without significantly impacting business operations, service delivery, performance, and data protection requirements. It is crucial that you complete a full assessment to determine what workloads you have, where they are installed, what dependencies they have, and which are the best candidates for migration to Azure.

Microsoft offers the tools needed to help with the assessment, including:

Microsoft Assessment and Planning (MAP) Toolkit

Azure Migrate

Azure Site Recovery Capacity Planner tool

What's in an assessment?

An assessment helps you identify the suitability of on-premises VMs for Azure. You can
also determine right-sizing recommendations and cost estimates for running the VMs in Azure.
You can customize assessments based on your needs by changing their properties of the assessment.
Below are the properties that you should consider while creating an assessment.

Target location	The Azure location to which you want to migrate.
Storage type	Specify the type of disks you want to allocate in Azure. This property is applicable when the sizing criterion is as on-premises sizing. You can specify the target disk type either as premium managed disks or standard managed disks. The default value is premium managed disks for performance-based sizing.
Sizing criterion	Use Azure Migrate to right-size VMs for Azure. You can either do sizing based on performance history of the on-premises VMs or size the VMs as on-premises for Azure without considering the performance history.
Azure offer	You can specify the Azure offer you are enrolled in, and Azure Migrate estimates the cost accordingly.
Azure Hybrid Benefit	If you have Software Assurance, you are eligible for Azure Hybrid Benefit to get discounted costs.
Reserved instances	Specify whether you plan to use reserved instances in Azure, and Azure Migrate will estimate the cost accordingly.
VM uptime	For VMs not running 24x7 in Azure, the duration can be set, and the cost estimations will be handled accordingly.
Pricing tier	Specify the pricing tier (basic/standard) for your VMs. For example, the standard tier provides VMs with low latency but may cost more. The basic tier has higher latency VMs at lower costs. This provides performance where needed.
Performance history	By default, Azure Migrate evaluates the performance of on-premises machines using the performance history of the last day, with a 95 percent percentile value. You can modify these values as needed.
VM series	If you have a production environment that you do not plan to migrate to A-series VMs in Azure, you can exclude A-series from the list and the right-sizing will be performed only on the selected series.
Comfort factor	Azure Migrate considers a buffer (comfort factor) during assessment. This buffer is applied on top of machine utilization data for VMs (CPU, memory, disk, and network). The comfort factor accounts for issues such as seasonal usage, short performance history, and likely increases in future usage.

Microsoft Assessment and Planning Toolkit

One of the best migration tips is to incorporate the use of the Microsoft Assessment and Planning (MAP) Toolkit. MAP is an agentless, automated, multi-product planning and assessment tool designed for faster and easier desktop, server, and cloud migrations. MAP provides detailed readiness assessment reports and executive proposals with extensive hardware and software information. It also offers actionable recommendations to help you accelerate your IT infrastructure planning process and gather more detail on assets that reside within your current environment.

Azure Migrate

The Azure Migrate service helps you evaluate on-premises machines for migration to Azure. It assesses the migration suitability of the machines and provides sizing recommendations for Azure VMs based on the performance history of on-premises VMs and dependencies.

Calculating application risk

Both business impact and complexity are factors that drive migration risk, which can be determined as below:

You can score business impact by assessing how important a workload is to your business operations.

Complexity can be scored by evaluating how complex the application is and how well your team understands it.

A critical workload will score a higher risk even if it's simple, whereas a more complex but less critical workload might end up with a lower risk score—and thus might be a better candidate for early migration.

Organizing your workloads

Organize your inventory into four basic categories of workloads and apps in order to set the pace and course for your migration to Azure, including:

Custom applications, or line-of-business (LOB) applications, developed in house.

Microsoft applications, including Exchange and SharePoint, and workloads running on Remote Desktop Services.

Microsoft-partner applications, like SAP and Adobe, and other off-the-shelf partner applications.

Servers that run key workloads, including network services like Domain Name System (DNS), file and print servers, and other Windows Server components.

Right-sizing your VMs

After a machine is marked as ready for Azure, Azure Migrate sizes the VM and its disks for Azure. If performance-based sizing is specified in the assessment properties, Azure Migrate analyzes the performance history of the machine to identify the VM size and disk type for Azure. This method is helpful when you've overallocated an on-premises server, but the utilization is low, so you want to right-size the VM in Azure to improve efficiency. Conversely, you can use Azure Migrate to size VMs to save resources and add greater density to your cloud computing model.
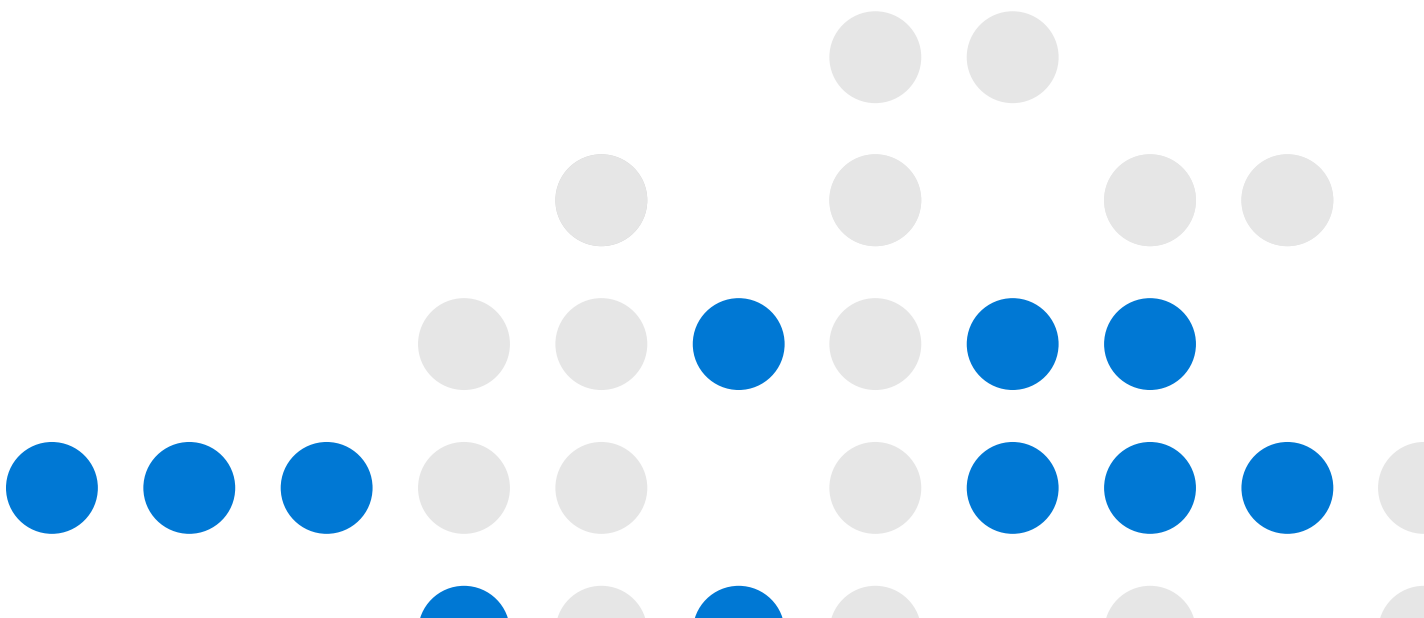
Azure Site Recovery Capacity Planner tool

Capacity planning is a critical concern for any organization. Accurate capacity planning can ensure optimized use of your underlying infrastructure and allows you to pay only for the resources you are using. The Azure Site Recovery Capacity Planner tool helps you figure out your capacity requirements for protecting Hyper-V VMs, VMware VMs, and Windows/Linux physical servers with Azure Site Recovery. It provides guidelines across the following areas:

VM eligibility assessment, based on disks, disk size, IOPS, churn, and select VM characteristics.

Network bandwidth need versus recovery point objective (RPO) assessment.

Azure infrastructure requirements.

Decreased time to market/release.

Initial replication batching guidance.

Estimated total disaster recovery cost to Azure.

Use migration best practices

Through a well-defined migration effort, you'll determine the right approach for your requirements. This approach is best defined per application workload. Essentially, during migration, you're physically moving your workloads and applications (including their data) to the cloud and then planning to retire the on-premises versions.

Be sure to consider application dependencies, tiers, network connectivity like firewalls and subnetting, and Windows Server roles. Replicate these elements into your cloud infrastructure.

The rehost approach—moving applications running on traditional servers and virtual machines to Azure infrastructure as a service (IaaS)—is the easiest way to drive a lift-and-shift for rapid migration and early cost savings. There is virtually no change in your app or workload framework or architecture; it's simply an exchange of hardware and OS management with the cloud environment. Therefore, because of its flexibility and capability in staged migrations, the lift-and-shift method most often employed for server or VM migration is real-time replication.

Azure Site Recovery

Employing real-time replication, Azure Site Recovery sets up a copy of the workload in the cloud and allows asynchronous replication to keep the copy and the original in sync. This means that while you're building and executing your migration plans, any data or server updates are synced between the copies.

Real-time replication enables groups of virtual machines to be connected, even when they're actively being used. This is important when testing and the final migration cut-over begin. Using your assessment plans as a guide—and your migration tool of choice—you can configure each VM to replicate to the correct VM instance in your cloud. Several tools also support automatic application-aware replication. Microsoft applications (like SharePoint, Dynamics, SQL Server, and Active Directory) and apps from other companies (including Oracle, SAP, IBM, and Red Hat) can be migrated with application-aware replication.

Third-party migration tools

For a wider range of supported virtual machines, there are third-party tools that use replication to migrate VMs to Azure with no impact to the original source machine. This enables automation in the migration of even the most complex workloads to Azure without downtime, disruption, or data loss. Processes like continuous block-level replication, automated machine conversion, and application stack orchestration are simplified and reduce the potential for human error.
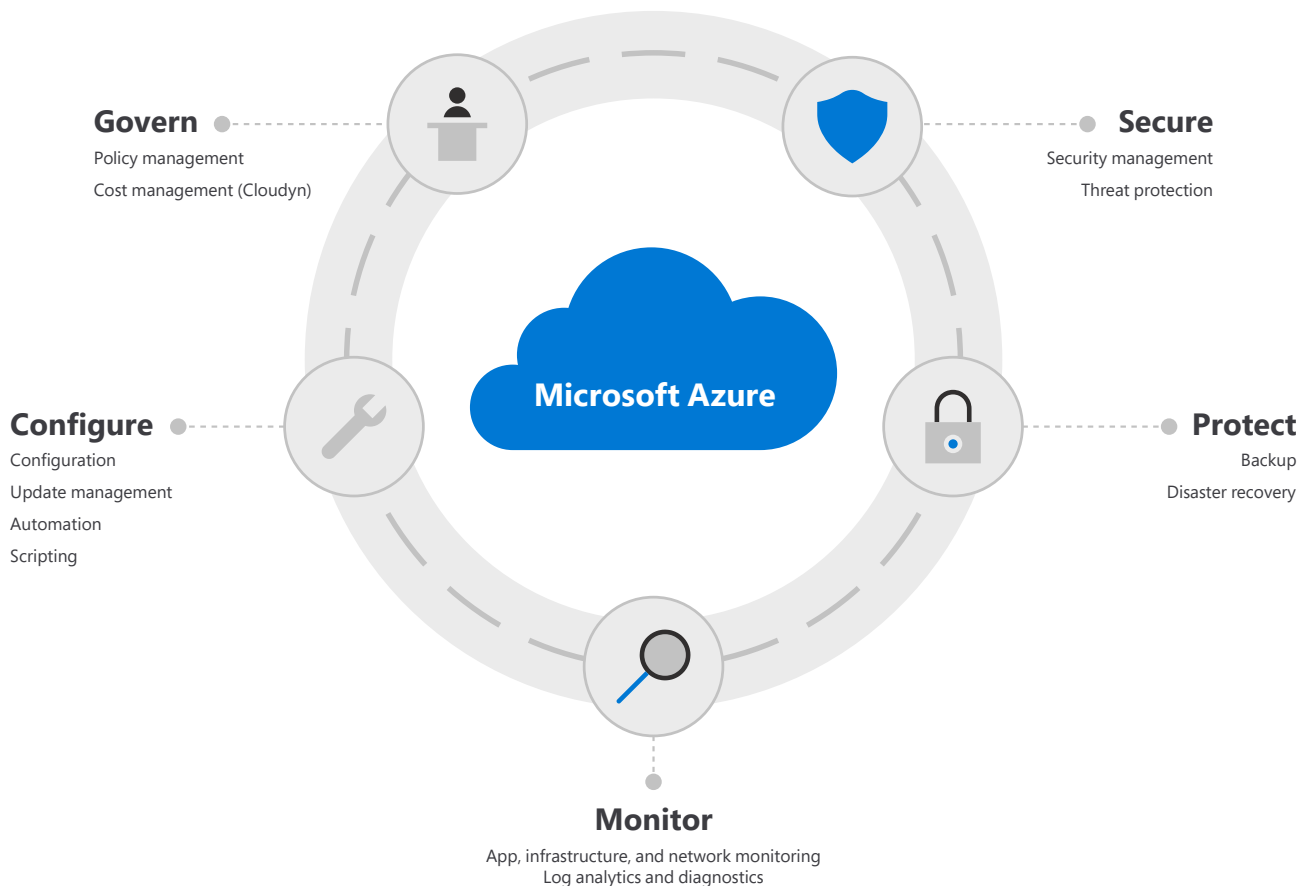
To learn more about third-party tools, check out the Azure Migration Center.

Consider optimization

Remember that migration is never the final step. When you optimize, you ensure that the new environment meets your security and governance requirements, that it performs as well as possible, and that it's highly cost efficient. With services like the Azure Security Center, you can strengthen security and ensure compliance across your hybrid environment. Cost Management for Azure and Azure Advisor can help you better manage your cloud resources.

Plus, as Microsoft introduces new Azure tools and features, your cloud operations can benefit from improved speed, agility, and security, as well as capabilities that optimize workloads on Azure as an ongoing process (Figure 3). This best practice continuously streamlines your cloud resources to enhance security, improve performance, and maximize return on investment (ROI).

Govern
Policy management
Cost management (Cloudyn)

Secure
Security management
Threat protection

Configure
Configuration
Update management
Automation
Scripting

Microsoft Azure

Protect
Backup
Disaster recovery

Monitor
App, infrastructure, and network monitoring
Log analytics and diagnostics

Figure 3: Using Azure tools and features to optimize cloud environments.

Security and governance. The Security Center gives you full visibility into and control over the security of your cloud applications in Azure. Quickly detect threats and take responsive action and reduce your exposure by enabling adaptive threat protection.

Cloud health monitoring. You can get visibility into the health and performance of your apps, infrastructure, and data in Azure with cloud monitoring tools like Azure Monitor, Log Analytics, and Application Insights.

Data protection. Azure Backup lets you back up (or protect) and restore your data in the Microsoft cloud. Unlike on-premises backup management solutions, Azure Backup automatically allocates and manages backup storage, and it uses a pay-as-you-use model—so you only pay for the storage you consume.
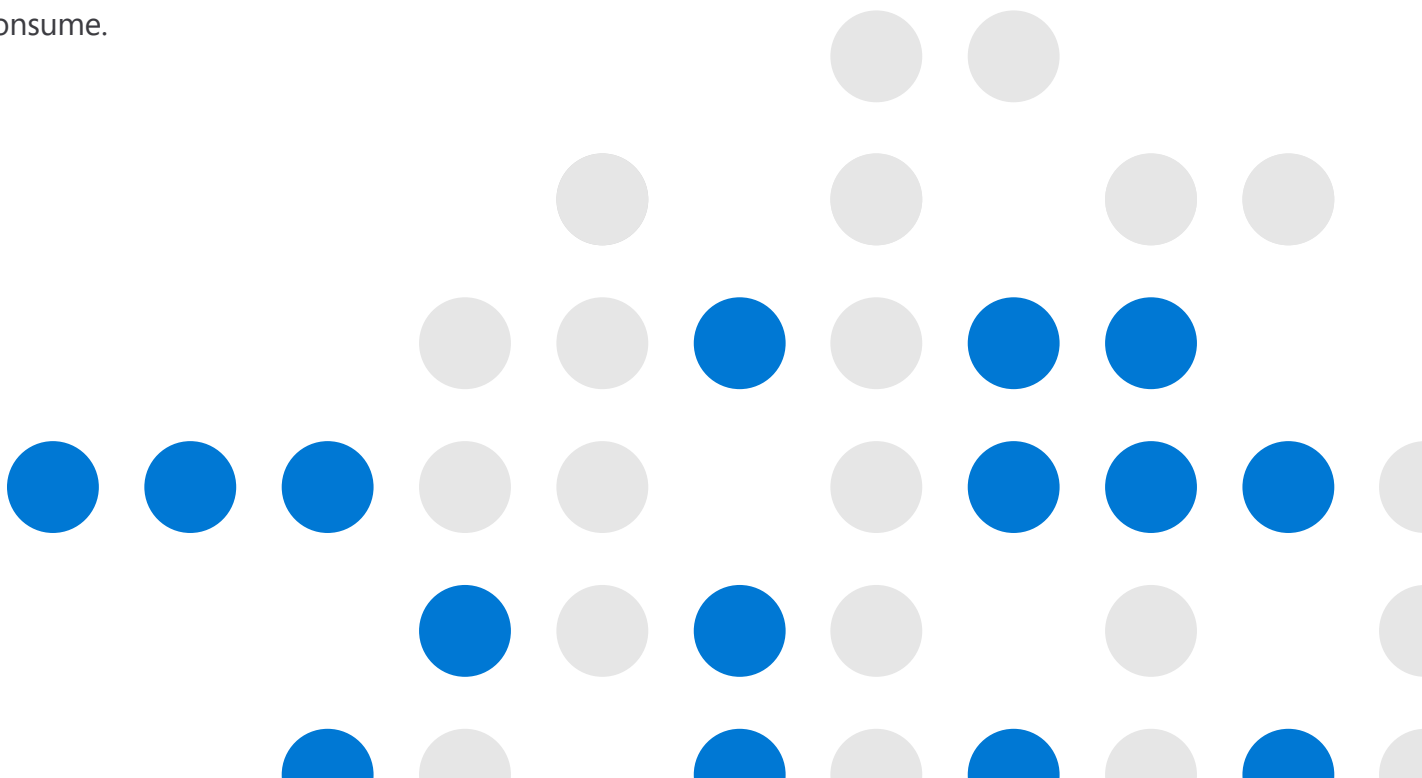
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Next steps

Manage the Windows Server 2008 end-of-support transition with Azure. Get three more years of security updates for Windows Server 2008 and 2008 R2 at no additional charge.

Find resources for Windows Server on Azure, and develop a framework for migration with the Azure Migration Guide for Windows Server.

Get governance and controls for risk and compliance in the Azure enterprise scaffold, which can help you define and build parameters to meet legal requirements.
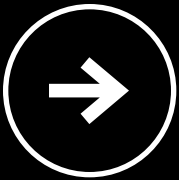
Prepare for Windows Server 2008 and 2008 R2 end of support.

Sign up for an Azure free trial—$200 credit for 30 days, 12 months of free services.

Use Azure Hybrid Benefit to save up to 80 percent on Azure VMs.

Find more best practice solutions on the Azure Migration Center.

Get resources for most application and cloud operations in the Azure Architecture Center.

Get Azure security best practices and patterns.