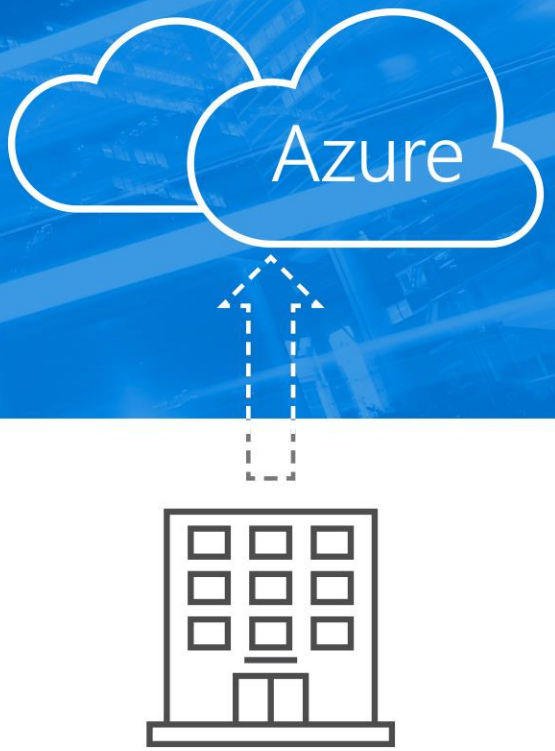
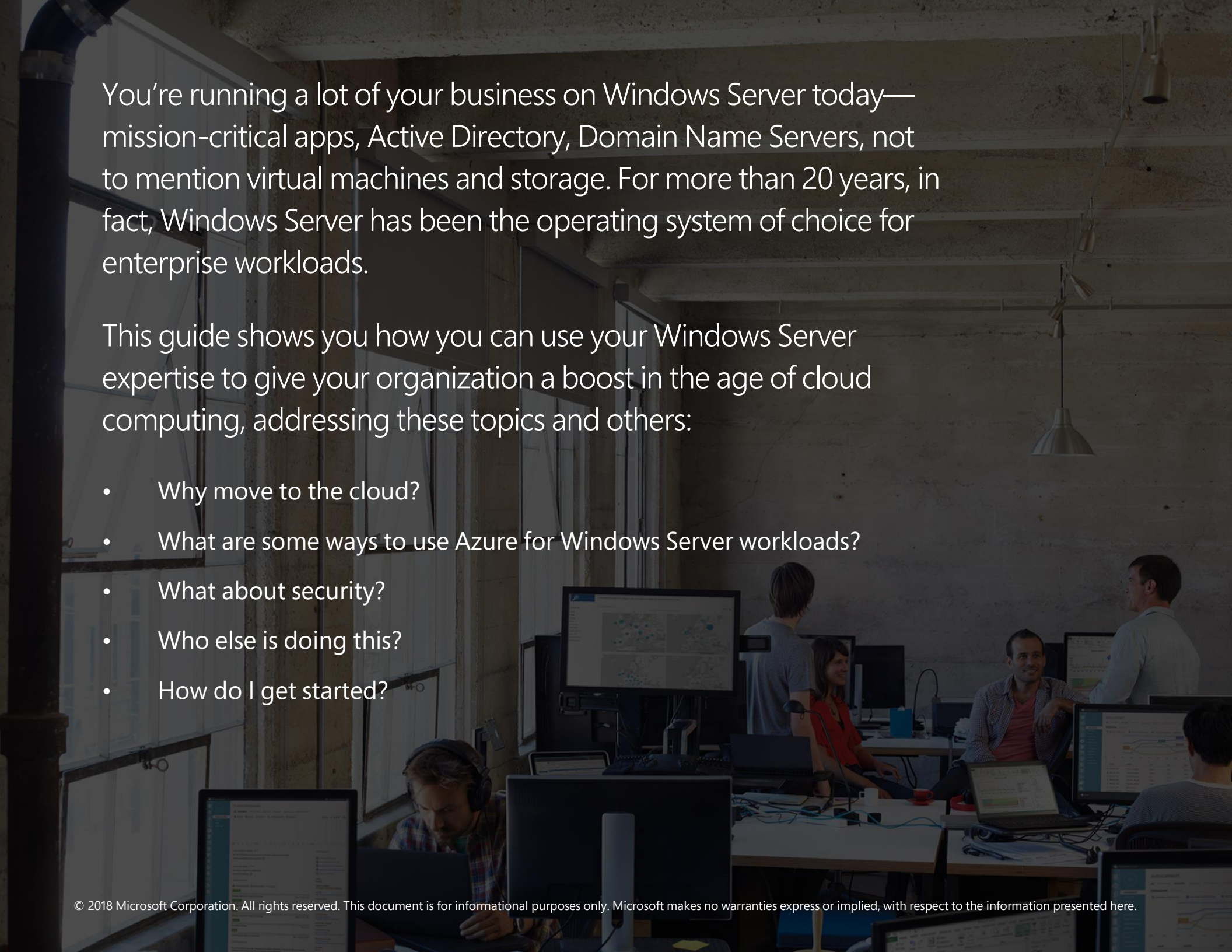
Microsoft

The Ultimate Guide to Windows Server on Azure





You're running a lot of your business on Windows Server today—mission-critical apps, Active Directory, Domain Name Servers, not to mention virtual machines and storage. For more than 20 years, in fact, Windows Server has been the operating system of choice for enterprise workloads.

This guide shows you how you can use your Windows Server expertise to give your organization a boost in the age of cloud computing, addressing these topics and others:

- Why move to the cloud?
- What are some ways to use Azure for Windows Server workloads?
- What about security?
- Who else is doing this?
- How do I get started?

Cloud computing presents opportunity

Cloud adoption is on the rise, with 87 percent of organizations saying they plan to merge their on-premises datacenter with a hybrid cloud or the public cloud, based on a recent survey (2017 IDC Worldwide Public Cloud Services Spending Guide). As an IT professional, you have an opportunity to grow and leverage your existing skillsets by architecting, migrating, and managing software in the cloud. Maybe upper management has already delivered a mandate to begin moving workloads and applications. Or maybe the upcoming end of support for Windows Server 2008 in January 2020 is driving consideration of a cloud platform.

You can master this shift to the cloud by tapping into a broad range of training, technology, and tools from Microsoft. This document will guide you to the resources available from Microsoft and its partners to understand Microsoft Azure capabilities and the opportunities now available for data centers heavily invested in Windows Server.

Cloud adoption on the rise

$266B
public cloud market by 2021*

62%
use cloud as a platform for modernizing IT environments*

87%
plan to integrate their on-premises datacenter with public cloud

*International Data Corporation
IDC Worldwide Semiannual Public Cloud Services Spending Guide, July 2017.

Become a cloud guru

A free eBook, Enterprise Cloud Strategy, details how the move to the cloud effects all aspects of an organization, with sections focused on IT architects, administrators, and developers. Topics include: how to build capability within IT, cloud security and governance, new application models, and cloud architecture.

Start with a strategy

The transformation to cloud computing is a great opportunity for IT pros, but it's not something to jump into blindly. There are business issues, financial issues, and a broad range of technology issues to face first. Some questions to ask include:

- What benefits (i.e. agility, cost savings, scalability, etc.) are we expecting from the cloud and how do we prioritize them?
- What is our short-term and long-term roadmap for moving to the cloud?
- What is my personal roadmap for building the necessary cloud skills?
- Should we use a certified Azure partner? If so, which one?
- What servers, applications, and data should stay in the data center and what should be cloud-based?
- How can we continue to derive the maximum benefit from existing investments?
- How do we want to design future solutions to best leverage the cloud?

Bringing others along

Cloud strategy development is an evolutionary process in most enterprises. It requires coordination among a variety of stakeholders including IT professionals, developers, compliance experts, procurement, and security.

Part of moving to the cloud is understanding the technology, but you also have to consider business and organizational impacts. Typical stages organizations go through include:

Cloud aware	IT staff is aware of broad cloud trends
Cloud experimentation	IT organization begins to learn about various cloud services such as Software as a Service, Platform as a Service, and Infrastructure as a Service
Opportunistic cloud	IT organization begins to actively migrate workloads to cloud to meet new business requirements
Cloud first	Default assumption is that cloud services will fulfill the majority of the computing needs

Think about your own organization. Where are you along this evolutionary journey?

IT staff members may feel anxious about their roles and positions as they realize that a different set of skills is needed for the support of cloud solutions. But agile employees who explore and learn new cloud technologies need not fear. Current skills are still important as you manage a hybrid cloud environment. By adding new skills to manage compute, storage and networking in the cloud, IT can lead the adoption of cloud services and help the organization understand and embrace the associated changes.

Azure: best cloud for Windows Server shops

You probably already have a significant investment in Microsoft technology within your datacenter: Windows Server, as well as Exchange, SQL Server, SharePoint or Dynamics. You might use Active Directory for authentication, certificate management, file server, and other pivotal IT functions as well as System Center to simplify configuration and operations management.

Azure literally runs on Windows Server, so it's easy to move workloads to Microsoft's cloud platform and use existing skills, familiar tools, and established procedures. You'll still have one place to go to for support, and even your Windows Server licenses can be leveraged in Azure.

But maybe your datacenter is more heterogeneous. You may have virtualized software workloads hosted on both Microsoft Hyper-V and VMware virtual machines. Or maybe Oracle and MySQL are operating alongside Microsoft SQL Server and other applications running on Linux. It doesn't matter, because all these and other computing and database environments can also be integrated with or migrated to Azure using a consistent set of tools and services.

Azure is also the only consistent hybrid cloud. You can connect data and apps on premises to those in the cloud—for maximum portability and value from existing investments. Azure offers hybrid consistency in application development, management and security, identity management, and across the data platform. This means your organization is free to decide what computing resources stay in-house and what moves to the cloud. Plus, you can use many of your existing Windows skills and add "cloud administrator" to your list of proficiencies.

Path from Windows Server to the cloud

For people focused on understanding how Azure impacts and integrates with current Windows Server implementations, take a look at the Windows Server on Azure section of the Azure website.

Understand the new IT cost model

Any cloud strategy should involve an analysis of cost-benefit tradeoffs and return on investment. Moving to the cloud upends traditional IT economics. Computers were treated like any other capital expense: typically, a one-time purchase followed by several years of depreciation. As enterprises grew, more capital would be spent on building new datacenters and even more computers.

With cloud computing, enterprises pay for what they use, introducing a subscription-based operating expense model. Services essentially become metered by usage, meaning the more you use the more you're charged. The OpEx model is more flexible and more predictable over time. To help manage costs, Microsoft provides several calculators and capacity planning tools. Azure Cost Management (also known as Cloudyn) enables you to track cloud usage and expenditures for your Azure resources and other cloud providers.

Save on Azure VMs with your Windows Server licenses

Okay, so the cloud transfers many costs to an OpEx-based, pay-as-you-use subscription model. But what about existing Windows Server licenses? With the Azure Hybrid Benefit, you can use existing Windows Server licenses with Software Assurance to save on virtual machines in Azure. For each Windows Server license, Microsoft will cover the cost of the operating system on up to two virtual machines in Azure, while you pay only base compute costs. If you are running Datacenter Edition, you can continue to use the license on-premises while you add two virtual machines in Azure at a discount. (If you use Standard Edition licenses, on the other hand, you can use each license only in one place—either on-premises or in Azure.)

Whether you want to enable a hybrid cloud model or move completely to the cloud, you can maximize the value of existing licenses to make Azure the most cost-effective cloud for Windows Server workloads.

- Save up to 40 percent on Azure virtual machines with Azure Hybrid Benefit.
- Boost savings to 82 percent when you also reserve the Azure virtual machine instances for one-year or three-year terms.

To help you understand the extent of the savings, use this online calculator.

Azure Virtual Machines give you the flexibility of virtualization for a wide range of computing solutions with support for Linux, Windows Server, SQL Server, Oracle, IBM, SAP and more. Select from a wide variety of virtual machine sizes. Most instances include load-balancing and auto-scaling free of charge.

Enterprises across verticals build on cloud security

Saudia Airlines builds new marketing systems in Azure using open source software, Windows Server 2016 and SQL Server.

Tencent Games,the Chinese entertainment giant, uses Azure Service Fabric and Windows Server 2016 with containers to move its PC gaming platform to the cloud.

Blue Dot Consulting migrates Windows Server workloads to Azure.

Ambit Energy moves to Azure hybrid cloud strategy to support innovation.

GEICO adopted a DevOps development strategy and is transitioning development to Azure to engage customers more personally and dynamically.

Azure and Windows Server— Industry-leading security

Microsoft spends more than $1 billion each year on cybersecurity to keep workloads safe. Azure offers a secure platform for your cloud workloads, providing industry-leading security intelligence, multi-layer threat discovery and defense, and a strong network of integrated partner solutions. These easy-to-deploy, built-in protections maximize security, reduce complexity, and free up operations team resources for more critical functions.

Windows Server also includes multiple layers of security built right into the operating system to protect workloads whether you run them on-premises or in a cloud environment. And when you run Windows Server VMs or containers on Azure, you get unique security advantages that are not available on competitors lacking Azure's Hyper-V host. Using the Windows Server capabilities, you can enable unique, extra layers of isolation for applications running in Azure virtual machines:

- Use Device Guard to protect software running in kernel and user mode on your Azure VMs.
- Beginning with Windows Server version 1709, Azure VMs offer unique security features to protect applications that run in Windows or Linux containers with Hyper-V isolation, ideal for multi-tenant environments.

Additionally, Azure Security Center helps you:

- **Understand security state across workloads**. Manage security on-premises, Azure, and other cloud platforms—in one console. Built-in dashboards provide instant insights into potential security issues.
- **Extend advanced threat protection to your workloads.** Continuously monitor the security of your machines, and networks across hybrid environments using hundreds of built-in security assessments.

Shortcut to savings

Want to know how much Azure will cost? Are you curious about the total cost of ownership? Cost and TCO calculators, plus related pricing details and information about the Azure Hybrid Benefit, can be found on the Azure pricing page.

Tap into Azure services for innovation

Beyond efficiency and reliability, extending the datacenter to the cloud provides an opportunity to enhance and extend IT offerings. Most organizations begin with small steps: quickly start up some VMs on Azure for DevTest, migrate simple workloads, develop some cloud-aware apps.

But with Azure's comprehensive set of cloud services, much more is possible. Find everything from new storage and security capabilities to support for the Internet of Things, machine learning, data analytics, and artificial intelligence. Choose to implement what you need, when you need it. Start small and expand your Azure footprint as expertise grows and business needs dictate. Find what you need in the following table.

Compute	Virtual Machines, VM Scale Sets, Batch, Service Fabric, Containers, and more
Networking	Load Balancer, VPN Gateway, Azure DNS, Content Delivery Network, Azure DDoS Protection, and more
Storage	Blob, Queue, File, Disk, Data Lake, StorSimple, Backup, Site Recovery
Web & Mobile	Mobile Apps, API Management, Media Services, Notification Hubs, Streaming, Content Protection, and more
Containers	Container Registry and Instances, Azure Container Service, Container Instances, Batch, App Service
Databases	SQL Database, Azure Database for MySQL and PostgresSQL, Data Warehouse, Stretch Database, and more
Data & Analytics	Stream Analytics, Data Lake Analytics, Power BI Embedded, Log Analytics, Customer Speech Service, and more
AI & Cognitive Services	Machine Learning, Bot Service, Cognitive Services, Computer Vision API, Speech Services, and more
Internet of Things (IoT)	IoT Hub and Edge, Time Series Insights, Stream Analytics, Notification and Event Hubs, and more
Enterprise Integration	Service Bus, StorSimple, SQL Server Stretch Database, Data Catalog, Data Factory, Event Grid, and more
Security & Identity	Key Vault, Security Center, Azure Active Directory, Active Directory B2C and Domain Services, Multi-Factor Authentication
Developer Tools	Visual Studio Team Services, Azure DevTest Labs, Application Insights, API Management, HockeyApp
Monitoring & Management	Azure portal, Azure mobile app, Resource Manager, Automation, Scheduler, Service Health, and more

Express lane to app innovation

Have an idea for a cool cloud app but don't want to reinvent the wheel? Find the right Azure services to kick your development process into high gear.

Use what you need when you need it

While the list of available Azure services may seem overwhelming, remember that you and your organization have the freedom to select which services you want to use and pay for, and this usage can always be adjusted as needs change. Details on the services can be found on the Azure services pages.

What to do first: Migrate or extend?

Azure allows IT to quickly create and configure new Windows Server virtual machines. With the proper tools and procedures, you can literally set up thousands of servers (VMs) in the cloud in minutes, compared to the weeks it typically takes to set up on-premises servers. Also, with data centers in 19 regions around the world, Azure achieves 99.95 percent availability, along with 24/7 support and constant health monitoring.

Of course, just having a lot of VMs on Azure isn't worth much if you don't put applications on them. To ensure the success of your organization's adoption of Azure, it's important to consider the need of your business and the requirements of your applications. You'll need to determine:

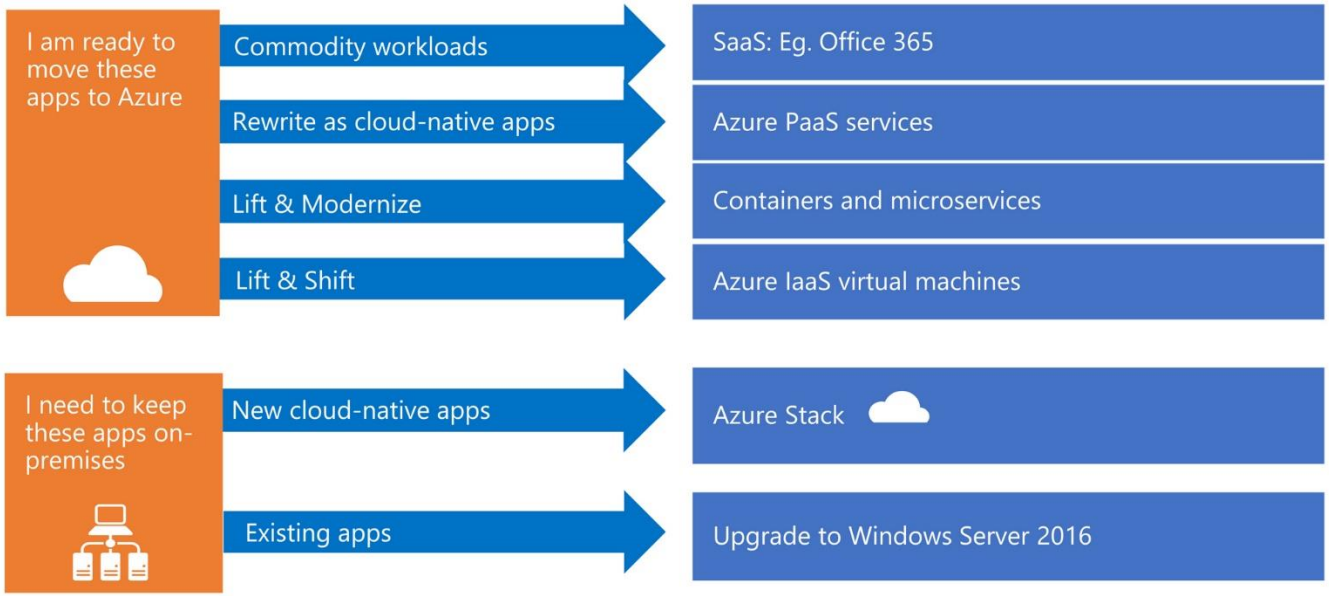
- Which apps can you "lift and shift" directly to the cloud?
- Which apps benefit from integrating with Azure services?
- Which apps require a transformation or re-architecting?

Based on the analysis of your operating systems and applications, you have a number of options:

- Migrate the applications and data to the Azure platform
- Extend existing on-premises Windows Server environments to the cloud with new Azure services
- Modernize legacy applications for the cloud. Move applications into containers, re-architect applications using microservices architectures or rewrite using Azure PaaS services.

If you're building a cloud plan, begin by getting an inventory of all on-premises workloads and then decide on a strategy. Microsoft's own IT organization has been going through the process of moving the bulk of its computing resources to Azure, and a case study is available detailing the process and how it's optimizing IT operations and resources.

Build your cloud plan



Migrate and modernize

To assure a successful migration, it's important to fully evaluate your current datacenter environment using a discovery process. Some of the questions you'll want to ask include:

- Which applications can migrate to Azure and which should remain on-premises?
- What about the services applications depend on? Can they be split across on-premises and the cloud?
- What will the impact be on the network?
- What databases do the applications depend on and where should they be located?
- How will a migration to Azure impact budgeting and costs?

To minimize the risk of migration, Microsoft provides several comprehensive tools for doing the initial discovery and assessment of your environment, and prioritizing what workloads should migrate first. To make things even easier, Microsoft allows you to try Azure for free. You can set up your own "sandbox" to experiment with Azure free for 12 months. Deployment guides and technical whitepapers, based on hundreds of real-life migrations, will step you through the process, so you can experience a successful first migration and build from that.

> Capstone Mining uses Azure Site Recovery to migrate existing apps to the cloud with just a few clicks, ensuring a seamless experience for end users. The service has become the backbone for the company's disaster recovery strategy as well, which is also performed with minimal disruption to business operations.

The table on this page lists some of the ways Capstone and other organizations have used the Azure services to migrate workloads, applications, virtual machines, and data to Azure.

Use cases	
Discover: Catalog existing applications; identify migration candidates	To understand what applications should be moved, when and how, it's important to create a complete catalog of applications managed by IT. Use Azure Migrate or other tools to assess current computing environment, identify what can be moved, and understand costs.
Discover: Catalog current data environment prior to migration.	Use Data Migration Assistant to catalog the existing data environment, identify compatibility issues, and suggest performance and reliability improvements.
Migrate: Shift VMs and workloads to Azure.	Azure Site Recovery offers one-click failover and replication of applications and workloads from Windows Server, Linux and VMware machines. Automation reduces time and complexity of migration tasks.
Migrate: Shift data and databases to Azure.	Database Migration Service migrates existing on-premises SQL Server, Oracle, and MySQL databases to Azure SQL Database, Azure SQL Database Managed Instance or SQL Server on Azure virtual machines.
Modernize: Lift and shift existing .NET applications by optimizing deployments with Windows containers.	Improve your DevOps operations for your dev/test/production environment. Make your application cloud DevOps-ready. Containers remove friction caused by application dependencies when you deploy in multiple stages.
Optimize: Manage your cloud spend with transparency and accuracy.	Azure Cost Management (also known as Cloudyn) provides granular, real-time visibility into cloud consumption, cost, and performance.

For more information about migration to Azure, see azuremigrationcenter.com

Extend Windows Server with Azure services

Many organizations will choose to remain hybrid, retaining their current datacenter environment while shifting some functions to the cloud. But even these on-premises workloads can benefit by extending capabilities using Azure services. This might include integrating more robust high-availability and disaster recovery, high-performance cloud storage, and hybrid identity and management capabilities. Typically this can be done without touching a line of code.

The table below lists some of the ways organizations have used the Azure services to extend the capabilities of their existing in-house Windows Server environment.

Use cases	How Microsoft Azure helps	How organizations benefit
Assure business continuity and data protection	Azure Backup and Azure Site Recovery increase compliance, reduce complexity, lower costs. Replicates on-premises virtual machines to Azure and orchestrates failover and failback.	Reduce disaster recovery infrastructure by paying for only the compute, storage and network needed in Azure with software as a service--no need to purchase hardware. Onboard faster, because the capability is built into Azure.
Manage diverse hybrid cloud environment.	System Center simplifies deployment, configuration, management, and monitoring of your infrastructure and virtualized datacenter. Use Azure monitoring and analytics to collect, correlate, and search your systems and application data across Azure and on-premises servers.	Gain visibility into the health, performance, and utilization of your applications, workloads, and infrastructure. Proactively find and fix issues before they impact your users.
Quickly establish dev/test environments	Use Azure Virtual machines to simplify and speed the process of running a dev-test environment. Spin up as many virtual machines as you need, network them, and allocate to your developers.	Give your developers freedom and speed to develop in Azure, and then deploy where needed. Choose Linux or Unix. Use your own virtual machine image or download a certified pre-configured image. Use your preferred coding language natively.
Extend on-premises file servers to the cloud	With Azure File Sync (in preview), you can deliver consistent file share performance for users whether they work locally or remotely.	Leverage Azure as centralized storage for less frequently used file server data while turning your local Windows server into a high performance cache for frequently used file data.
Unite identity and access management across on-premises directory and Azure	Use Azure Active Directory to manage users and secure access to on-premises and cloud information. Extend Active Directory and any other on-premises directory to Azure AD.	Enable single sign-on to simplify access to thousands of cloud applications across multiple devices. Protect sensitive data and apps with multi-factor authentication.
Archive on-premises data to Azure	Azure Blob storage stores from hundreds to billions of objects in hot, cool, or archive tiers, depending on how often data access is needed. Use StorSimple to automatically archive inactive primary data from on-premises to the cloud for effortless capacity expansion.	Cloud snapshots provide off-site data protection. With cloud storage, no secondary datacenter needed. Reduce capacity purchases and infrastructure maintenance.

More information about extending Windows Server using Azure services can be found on the Azure services web page.

Getting started

How you get started with Azure depends on where your organization is in the cloud evolution. Are you just beginning to investigate what's out there? Or, are you already moving datacenter workloads to the cloud or developing cloud-native applications?

Find all core Azure information—training, documentation, pricing, partners, code samples, and more—at azure.com. Free documentation and training is available for everyone from cloud beginners to Azure experts. You can also speed up the entire process by engaging with Microsoft partners who have tools and expertise that help guarantee success.

- Azure Essentials offers a complete set of learning resources to learn new Azure skills – quickly. Choose a topic and watch a short video, use hands-on demos and product trials. Azure Essentials also offers learning paths by Azure job function featuring free Pluralsight courses, Join for free.
- Try free Azure hands-on labs to acquire the cloud skills you need at your own pace.
- Create a free Azure account. Get started with a $200 credit, keep going with free access to services for 12 months.

And for Windows Server admins, we've created a special page of resources just for you! Bookmark www.azure.com/windowsserver and check back often for resources specific to Window Server on Azure.

Jump right in

Jump right in and launch your first virtual machine on Azure. Or go a little slower and do some reading or view videos to get more acquainted with cloud architectures and the Azure environment. The Get Started page of the Azure website will help you start your exploration in the right place.

In case you become lost

Remember, azure.com serves as the central point for all of Microsoft's core Azure information, including documentation, training, and code samples.

Resources

IT Architect role	
Enterprise Cloud Strategy eBook	info.microsoft.com/enterprise-cloud-strategy-ebook.en-gb.1.html
Azure Virtual Datacenter guidance	azure.microsoft.com/en-us/blog/azure-virtual-datacenter
Azure Architecture Center	docs.microsoft.com/azure/architecture
Azure Reference Architecture	docs.microsoft.com/azure/architecture/reference-architectures
Azure Solutions Architect training	azure.microsoft.com/training/learning-paths/azure-solution-architect
IT Admin role	
Windows Server on Azure	www.azure.com/windowsserver
Whitepaper: Azure On-Boarding Guide for IT Organizations	azure.microsoft.com/resources/whitepapers
Microsoft Academy IT Pro training	mva.microsoft.com/product-training/microsoft-azure
Azure Administrator training	azure.microsoft.com/ training/learning-paths/azure-administrator
Get Started with Azure Virtual Machines	azure.microsoft.com/get-started
Guides and whitepapers on migration	azuremigrationcenter.com
DevTest role	
Azure for developers training videos	azure.microsoft.com/resources/videos/azurecon-2015-azure-for-developers
Azure languages and frameworks	docs.microsoft.com/azure/#pivot=sdkstools
Azure .NET training	azure.microsoft.com/training/learning-paths/dotnet-developer
Azure Node.js training	azure.microsoft.com/training/learning-paths/node-js-developer
Azure code samples	azure.microsoft.com/resources/samples
Get Started with Azure apps	azure.microsoft.com/get-started
All roles	
All core Azure information	azure.com
Azure pricing calculator	azure.microsoft.com/pricing/hybrid-benefit/#ahub-calculator
Azure TCO calculator	www.tco.microsoft.com
Azure pricing	azure.microsoft.com/pricing
Azure services	azure.microsoft.com/services
Azure training	azure.microsoft.com/training
Azure documentation	docs.microsoft.com/azure
Azure partners	azure.microsoft.com/partners
Azure Essentials	azure.com/essentials
Free Azure account	azure.com/free
Azure hands-on labs	azure.microsoft.com/training/hands-on-labs