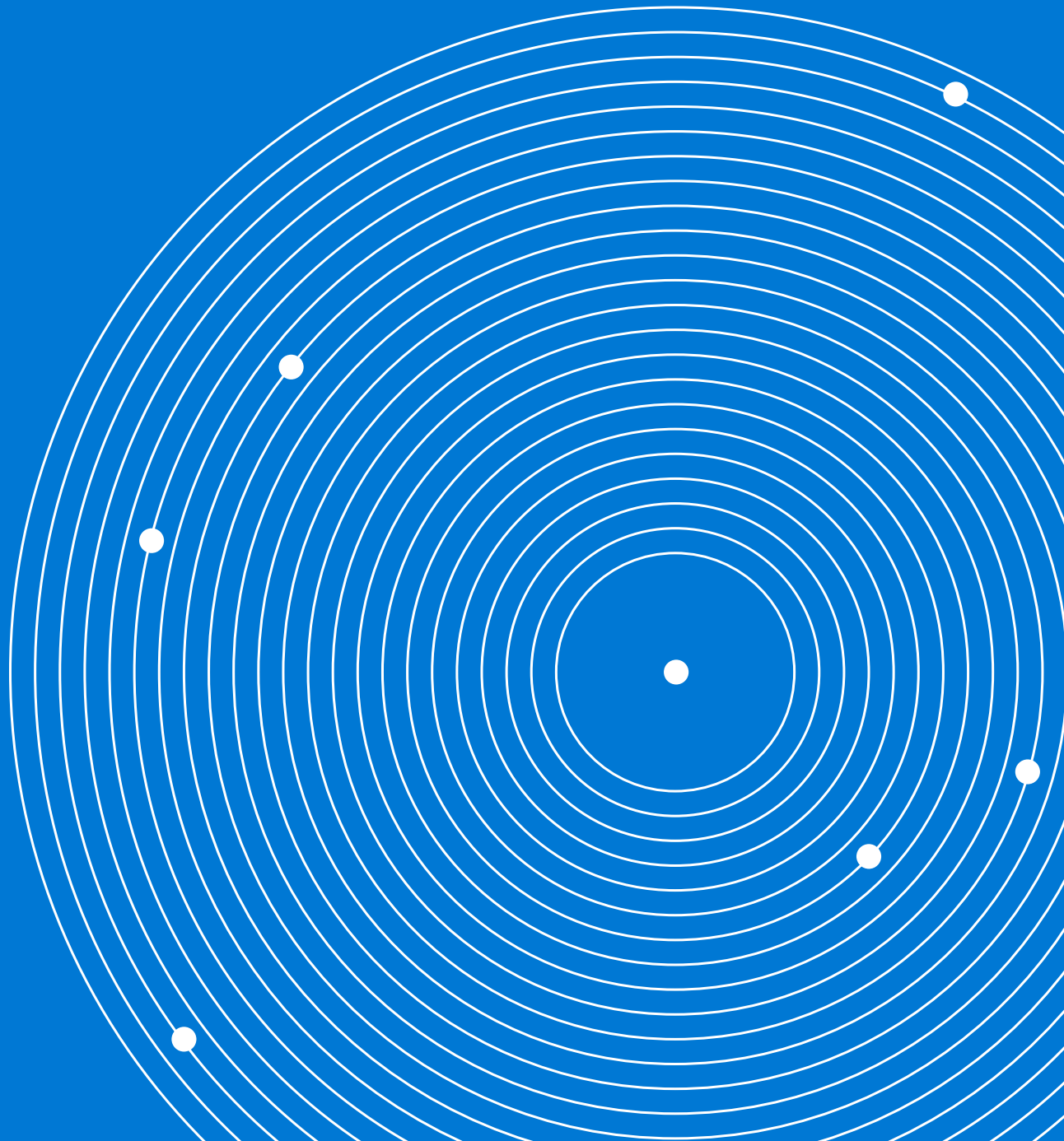


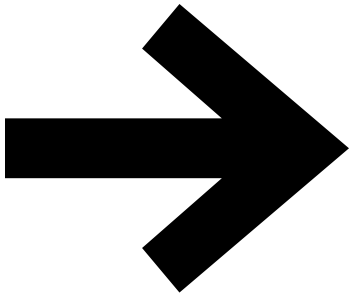
eBook Series



# Windows Server on Azure

The Ultimate Guide





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**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.**

# Give your organisation a boost in the age of cloud computing

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

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

## **Become a cloud guru**

A free eBook, [Enterprise Cloud Strategy](#), details how the move to the cloud effects all aspects of an organisation, 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.

01 /

# Cloud Computing Presents Opportunities

Cloud adoption is on the rise, with 87% of organisations saying they plan to merge their on-premises datacentre 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 datacentres heavily invested in Windows Server.

## Cloud adoption is on the rise

Analysts predict increasing cloud adoption. Speed is the new currency.



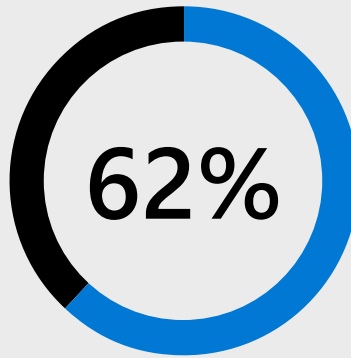
This can feel like an incredible opportunity.



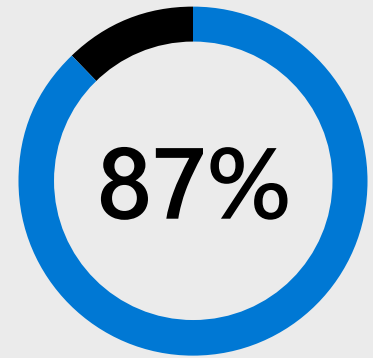
To get there, organisations need to be ready to act.



Public cloud market by 2021\*



use cloud as a platform for modernising IT environments\*



plan to integrate their on-premises datacentre with public cloud

### 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 prioritise 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 datacentre 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?

\*International Data Corporation, [IDC Worldwide Semi-annual Public Cloud Services Spending Guide](#), July 2017

## 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 organisational impacts. Typical stages organisations go through include:

Stage	Impact
Cloud aware	The IT staff are aware of broad cloud trends.
Cloud experimentation	IT organisation 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 organisation begins to actively migrate workloads to cloud to meet new business requirements
Cloud first	The default assumption is that cloud services will fulfil the majority of the computing needs.

## Think about your own organisation

Where are you along this evolutionary journey? IT staff members may feel anxious about their roles and positions as they realise 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 organisation understand and embrace the associated changes.



# Support for Windows Server 2008/2008 R2 is ending soon.

Let's ensure your infrastructure and applications stay protected from security vulnerabilities and non-compliance.

By migrating your digital assets to Microsoft Azure, you can avoid these risks and accelerate innovation with greater cost savings and improved levels of security.

## Azure has you covered:

- [Lift and shift](#) your existing Windows Server 2008/2008 R2 workload to Azure with minimal code changes, helping you reduce risk and save on costs.
- [Get three years of extended security updates](#) at no additional cost to you – leaving the option open to upgrade to a current version when you're ready.
- [Save up to 80%](#) on Azure Virtual Machines (with Azure Hybrid Benefit and Reserved Instances) by using existing Windows Server licences.

We're here to help. Let us assist with your migration planning today.

[Contact a specialist to learn more](#) 



02 /

# Azure: Best Cloud for Windows Server Shops

You probably already have a significant investment in Microsoft technology within your datacentre: 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.

## **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.

**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 licences can be leveraged in Azure.

But maybe your datacentre is more heterogeneous. You may have virtualised 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 organisation 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.

# 03 /

## Understanding the New IT Cost Model

Any cloud strategy should involve an analysis of cost-benefit trade-offs 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 datacentres 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.

### 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](#).

## Save on Azure VMs with your Windows Server licences

OK, so the cloud transfers many costs to an OpEx-based, pay-as-you-use subscription model. But what about existing Windows Server licences? With the Azure Hybrid Benefit, you can use existing Windows Server licences with Software Assurance to save on virtual machines in Azure. For each Windows Server licence, 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 Datacentre Edition, you can continue to use the licence on-premises while you add two virtual machines in Azure at a discount. (If you use Standard Edition licences, on the other hand, you can use each licence 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 maximise the value of existing licenses to make Azure the most cost-effective cloud for Windows Server workloads.

- Save up to 40% on Azure virtual machines with Azure Hybrid Benefit.
- Boost savings to 82% 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 virtualisation 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

[Saudi 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.

04 /

# Azure and Windows Server – Industry-Leading Security

Microsoft spends more than \$1 billion each year on cyber security to keep workloads safe. Azure offers a secure platform for your cloud workloads, providing industry-leading security intelligence, multi-layer threat discovery and defence and a strong network of integrated partner solutions. These easy-to-deploy, built-in protections maximise 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 the state of security 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.

# 05 /

## Tap into Azure Services for Innovation

Beyond efficiency and reliability, extending the datacentre to the cloud provides an opportunity to enhance and extend IT offerings. Most organisations 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 table on the next page.

### **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 organisation 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 about the services can be found on the [Azure services pages](#).

## Azure services

Category	Services
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 PostgreSQL, 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 Catalogue, Data Factory, Event Grid and more
Security & Identity	Key Vault, Security Centre, 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



06 /

## 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 datacentres in 19 regions around the world, Azure achieves 99.95% 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 organisation's adoption of Azure, it's important to consider the needs of your business and the requirements of your applications. You'll need to determine:


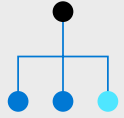
- Which apps you can "lift and shift" directly to the cloud.
- Which apps benefit from integrating with Azure services.
- Which apps require a transformation or re-architecting.

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
- Modernise legacy applications for the cloud. Move applications into containers, rearchitect 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 organisation 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 optimised IT operations and resources.

## Build Your Cloud Plan

 <p>I am ready to move these apps to Azure</p>	Commodity workloads	→	SaaS: E.g. Office 365
	Rewrite as cloud-native apps	→	Azure PaaS offerings
	Lift & modernise	→	Containers and microservices
	Lift & shift	→	Azure IaaS virtual machines
 <p>I need to keep these apps on-premises</p>	New cloud-native apps	→	Azure Stack
	Existing apps	→	Upgrade to Windows Server 2016

## Migrate and Modernise

To ensure a successful migration, it's important to fully evaluate your current datacentre 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 minimise the risk of migration, Microsoft provides several comprehensive tools for doing the initial discovery and assessment of your environment, and prioritising 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 white papers, based on hundreds of real-life migrations, will take you step-by-step through the process, so you can experience a successful first migration and then build from that.

## Use cases

*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 organisations have used Azure services to migrate workloads, applications, virtual machines and data to Azure. For more information about migration to Azure, see [azuremigrationcenter.com](http://azuremigrationcenter.com).

Use cases	
Discover: Catalogue existing applications; identify migration candidates	To understand what applications should be moved, when and how, it's important to create a complete catalogue 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: Catalogue current data environment prior to migration	Use Data Migration Assistant to catalogue 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.
Modernise: Lift and shift existing .NET applications by optimising 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.
Optimise: 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.

## Extend Windows Server with Azure services

Many organisations will choose to remain hybrid, retaining their current datacentre 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 organisations have used Azure services to extend the capabilities of their existing in-house Windows Server environment. More information about extending Windows Server using Azure services can be found on the [Azure services web page](#).

Use cases	How Microsoft Azure helps	How organisations benefit
Ensure business continuity and data protection	Azure Backup and Azure Site Recovery increase compliance, reduce complexity and 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 virtualised datacentre. 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 utilisation 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 up 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 the freedom and speed of developing 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 sharing performance for users whether they work locally or remotely.	Leverage Azure as centralised 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 an 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 datacentre needed. Reduce capacity purchases and infrastructure maintenance.

07 /

## Getting Started

How you get started with Azure depends on where your organisation is in the cloud evolution. Are you just beginning to investigate what's out there?

Or, are you already moving datacentre 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](https://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.
- 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 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](https://www.azure.com/windowsserver) and check back often for resources specific to Window Server on Azure.

### **Jump right in**

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](https://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](#)  
[Azure Virtual Datacenter guidance](#)  
[Azure Architecture Center](#)  
[Azure Reference Architecture](#)  
[Azure Solutions Architect training](#)

## **IT Admin role**

[Windows Server on Azure](#)  
[White paper: Azure On-Boarding Guide for IT Organisations](#)  
[Microsoft Academy IT Pro training](#)  
[Azure Administrator training](#)  
[Get Started with Azure Virtual Machines](#)  
[Guides and white papers on migration](#)

## **DevTest role**

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[Azure code samples](#)  
[Get started with Azure apps](#)

## **All roles**

[All core Azure information](#)  
[Azure pricing calculator](#)  
[Azure TCO calculator](#)  
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