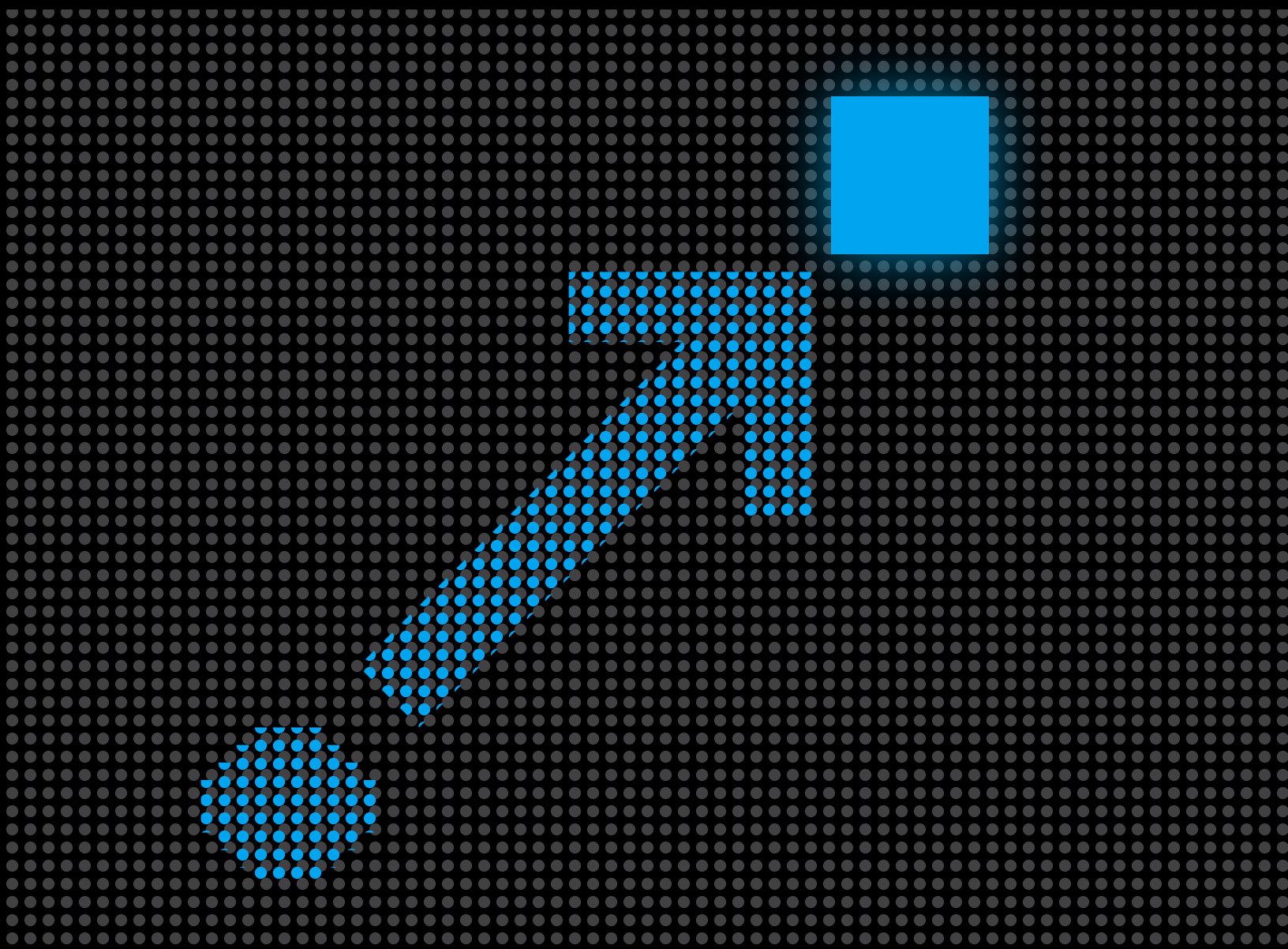
Microsoft Azure

# 5 Benefits of Migrating Your ASP.NET Apps to the Cloud



# Table of contents

# Introduction

The way we live and work has changed, and business conditions are evolving faster than ever before. To survive and thrive in this environment, companies not only need to innovate quickly and develop resilience but also find new avenues to save costs. There is also increased pressure on businesses to shift their strategies from being physical-first to digital-first and to accelerate their digital transformation to increase productivity and quickly recognize and address new opportunities.

In this digital-first world, web applications play a significant role in how customers interact with a business. There are more than 38 million ASP.NET websites in the world, and many of those ASP.NET applications are running on-premises, delivering value to businesses but requiring resource effort and long lead times to roll out new customer experiences.

To retain existing customers and to capture new opportunities, companies need to modernize and migrate their web applications and data to the cloud for optimal performance, scalability, and cost savings. Developers need to be empowered to innovate and have the flexibility to ship features faster. This e-book will show you the five major benefits of migrating your on-premises ASP.NET apps and databases to the cloud.

# Choose the right cloud service

Cloud computing can be broken up into three main services: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Each service has its own benefits in terms of control and operations as shown below.

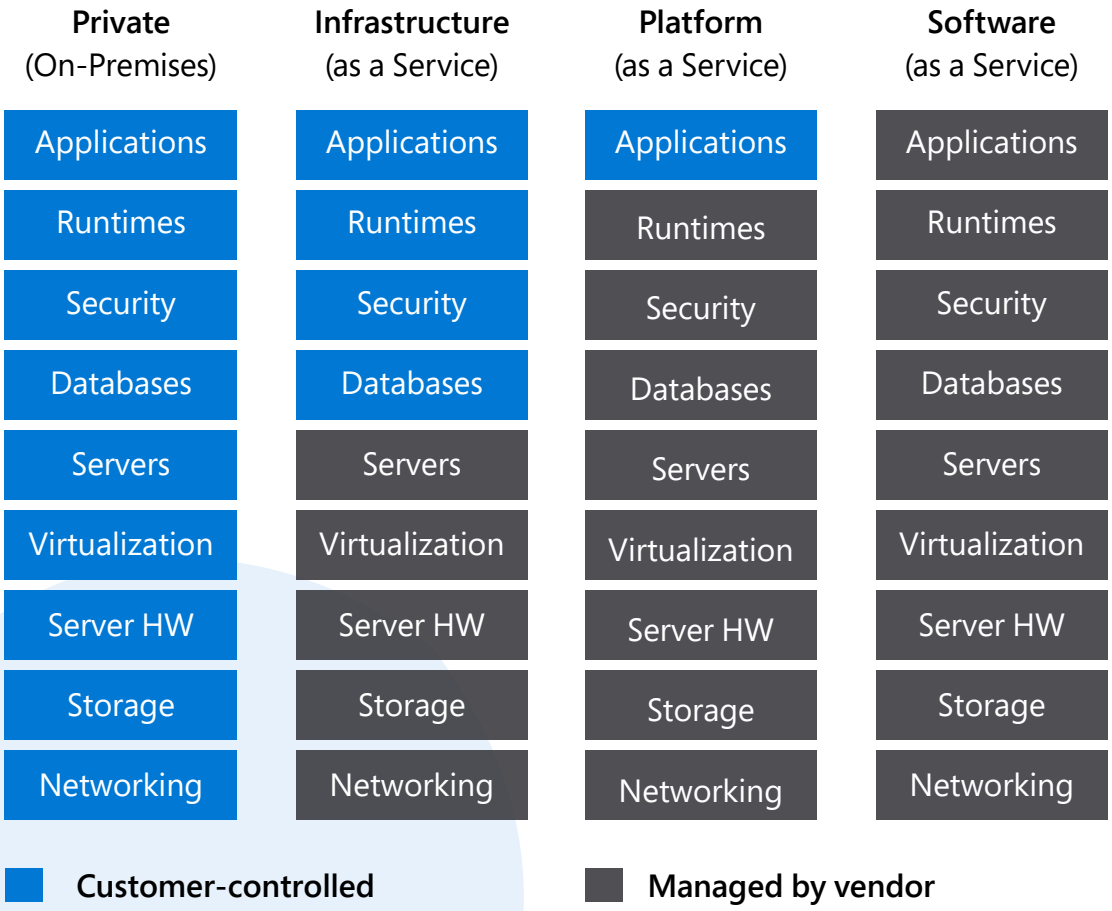



Figure 1: Summary of cloud services

Many businesses choose to migrate their ASP.NET apps to Infrastructure as a Service (IaaS) to achieve cost reduction. In IaaS, a business is renting IT Infrastructure such as servers, network, and storage devices to host the application's virtual machine (VM). This is the easiest and fastest migration strategy, but a technical team is still responsible for supplying and maintaining the operating system and application, and performing tasks such as patch management, updates, and upgrades.

Platform as a Service (PaaS) is the cloud service that can provide the most important benefits. In PaaS, the cloud provider maintains all system software, removing the burden of upgrades from the technical team. A business only needs to focus on deploying the application code on the PaaS machine; the cloud provider ensures that operating systems, database software, integration software, and other features are maintained, kept up to date, and achieve a high service level agreement. Some examples of PaaS offerings are Azure App Service, a fully managed platform with built-in web app security controls for network, data, identity, and logging, and Azure SQL Database, a fully managed database engine that handles most of the database management functions, such as upgrading, patching, backups, and monitoring without user involvement. This e-book will also dive in the benefits you can obtain by migrating your .NET apps to PaaS.

# 5 benefits of migrating your ASP.NET apps to the cloud

# 1. Scale to meet digital demand

Many businesses experience peaks and troughs in digital demand for technology, such as application usage. The digital demands can fluctuate yearly, monthly, daily, or even less, and it can be a challenge to meet intensive business requirements in dynamic and fluid environments. This demand can be generated internally from the business, such as internal on-demand training services, timesheet applications, or monthly accounting and controls reporting. There can also be external pressures, such as customer demand requiring seasonal retail applications and reporting, website peaks due to marketing pushes, or large development projects where development, testing, and user acceptance testing environments are required temporarily throughout the project's duration.

Cloud computing enables you to scale your service to meet customer demand flexibly. In an on-premises environment, organizations need to predict the highest usage in advance and consider this constraint when planning infrastructure capacity. Those extra resources can lie idle and underutilized much of the time, representing a significant financial outlay that could benefit the business in other ways. In these scenarios, the public cloud helps organizations to meet the challenges of digital demand.

Scalability is one of the major benefits of cloud computing, enabling you to handle increases in digital demand or sudden traffic spikes for your web applications. The PaaS service can effectively address your scalability need by automatically allocating and releasing the necessary resources depending on your demand. Businesses can meet the maximum capacity needs all the time, whenever it is required.

## Komplett

Komplett, a Norwegian retail company serving 1.8 million online customers, ensures optimal operations for its most critical systems with Microsoft Azure. Komplett is migrating its mission-critical SAP systems and utilizing PaaS solutions for its customer-facing e-commerce platform.

A key driver of the Komplett Group's move to a cloud-based platform was the ability to scale up to meet huge spikes in seasonal consumer demand. Based on data from previous years, the company knew it needed to be ready to handle up to 30 times its daily volume of web traffic on a single day—Black Friday:

> **"The biggest difference this year was ease of scalability. Last year we depended on adding physical hardware way ahead of the event, adding cost and complexity. This year, we saw more than 500 views a second and delivered 21 TB of data to our customers, with great response times. Using Azure, we were easily able to scale on demand to get the performance we needed."**
>
> **Thomas Wilhelmsen, Head of IT Operations at Komplett**

Before migrating to Azure, Komplett had to go through capacity planning for peak events and purchase additional servers and software licenses to handle huge increases in website traffic. The company also had to find the space to house the equipment and pay for the additional electricity to power it, even when not in use.

With Azure App Service's ability to scale out horizontally, minimal resources are dedicated at all times, and additional instances are brought on board only when required by increased workloads. This means that Komplett can meet user demands flexibly and confidently with the autoscaling features, allowing the organization to proactively focus efforts on other technology-based business initiatives such as the development of new services.

# 2. Optimize your costs

One of the core benefits of moving your applications to the cloud is cost efficiency. Here, we'll look at three ways in which the cloud can optimize costs: saving cost on resources, maximizing your on-premises investment, and reducing the costs for development and testing.

## Save costs on resources

In an on-premises environment, you need to do capacity planning in advance and be careful with the amount of resources you acquire. With over-provisioning, you will be paying for resources that are not used. Besides cost, any infrastructure investments can take months to realize. Some expenses are more natural to gauge, such as the cost of new equipment. Other values are less visible, such as the time and effort to select and evaluate equipment, get approval from business leaders for new purchases, and buy, install, configure, and integrate the required equipment.

When hosting your applications and data on the public cloud, the migration costs of infrastructure and team time are no longer a problem. Resources are always available, and you can change the amounts that are used at any time. In the case of overestimated workloads, resources can be downsized at any time, and you can avoid paying for unused resources. If workloads are underestimated, you can add additional resources in a matter of seconds.

Like a utility, you only pay for what you use and you can use what you need, when you need it. This way, you don't have to pay in advance for resources that you will rarely use. By planning and using scalability options integrated into PaaS services, you can make significant savings and use additional funds for further development and new services.

Besides giving you more flexibility and cost-saving options, the flexibility of the cloud also enables businesses to experiment with new business ideas with minimal risk or cost. Since there is no need to purchase hardware or locate it in a datacenter, businesses can start to develop new projects in an agile fashion with cloud technology. It is easy for the business to build up and tear down the technology to meet the needs of the current project, learning by trial and error to investigate market needs in light-touch projects.

# Maximize your on-premises investment

One of the main concerns for many organizations considering migrating to the cloud is the existing investment they have in on-premises environments. Even when the technologists can see the benefits of moving to the cloud, it can be challenging to translate the benefits to business stakeholders.

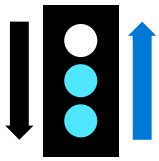
The cloud can help you to maximize your on-premises investments by allowing businesses to assign their existing licenses to cloud resources while making significant license cost savings. Azure Hybrid Benefit is a pricing benefit for customers who have existing licenses with Software Assurance that helps to maximize the value of existing on-premises Windows Server and SQL Server license investments when migrating to Azure. At a time when many organizations are reviewing costs, it's noteworthy that there are options to save money by migrating apps to the cloud. For example, eligible customers can save up to 55% on Azure SQL Database. This saving can help promote innovation as well as reduce costs.

# Reduce your development and testing costs

In a local datacenter, it can be expensive to provide additional resources to deliver quality software products in a traditional software lifecycle project involving development, QA and user acceptance test environments, and potentially pre-production environments. The cost of these software development lifecycle environments can sometimes exceed the cost of production. Using the cloud means that development and testing environments can be created or removed to meet the needs of a project while reducing the overall expenditure in supporting software development lifecycle projects.

Azure offers discounted rates to support your ongoing development and reduce your development and testing costs. Businesses can take advantage of Dev/Test pricing options to save up to 55% on data and infrastructure costs. Dev/Test subscriptions are exclusively for development and testing applications without a financially backed service level agreement.

# 3. Increase your operational efficiencies



Businesses are always looking for ways to increase their operational efficiencies and remove overheads so your team can focus on providing a better customer experience and services. There are two main ways in which the cloud can help you operate more confidently to meet your business and customer needs.

## Maximize your application uptime

Migrating your applications to the cloud ensures high availability, meaning that business users will be able to access your services when they need them. For example, your customers can have a good experience on your website without significant investment, supported by the cloud's promise of high availability, scalability, and maximum uptime. Developers can respond to requests to change the company website in short time frames, delivering business value very quickly.

Building highly available applications in an on-premises environment can be very challenging and require significant investment. There is also the challenge of maintaining data in sync while delivering a responsive website. The cloud can help here, by providing global availability and scalability for your applications, wherever your customers are in the world.

To meet these business needs in a fast-changing business environment, Microsoft Azure offers an enterprise-grade web hosting platform. Azure App Service has a guaranteed SLA of 99.95% and Azure SQL Database can offer SLAs up to 99.995% for the Business Critical and Premium tiers.

It is also important not to overlook the data that underlies the website. Azure SQL Database has the built-in capability of geo-replication, which ensures that your databases are always available. When your data is replicated to different regions, an issue in a single datacenter is no longer a problem. With auto-failover groups, databases will keep running and serving data to the applications. Here is an architecture that showcases how to run an Azure App Service Application that uses Azure SQL Database to achieve high availability in multiple regions:

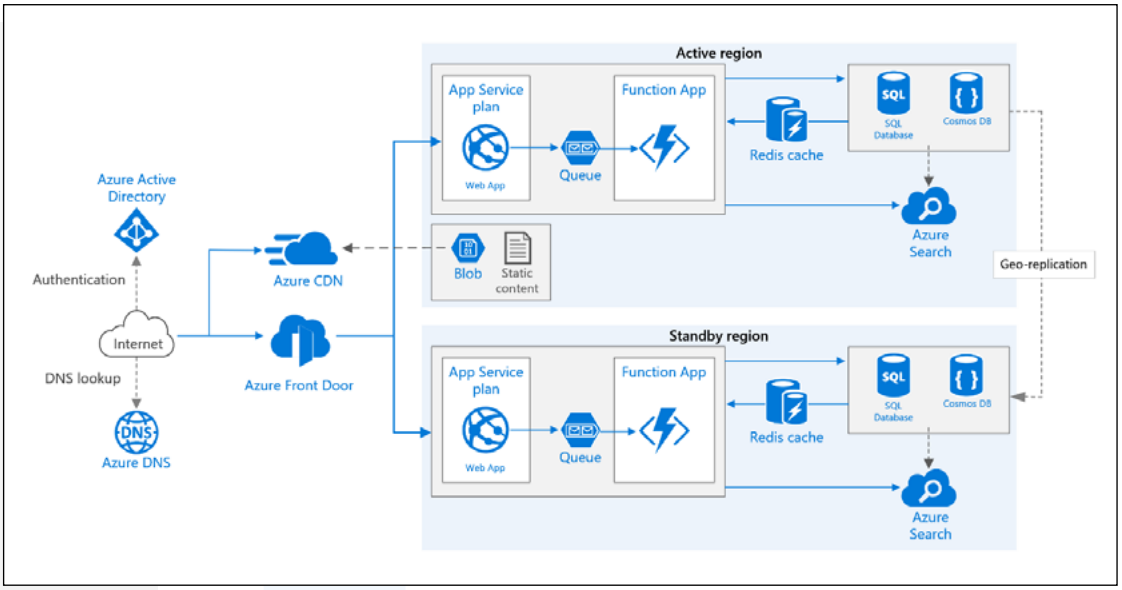



Figure 2: An example of high availability architecture

# Detect and resolve issues early

Cloud accompanies built-in monitoring and diagnostics tools that simplify your operations and help you achieve operational excellence. The granular monitoring and logging diagnostics can keep applications running optimally across the world and log metrics in real time. The tools help detect application issues as they happen and provide the opportunity to resolve them before impacting users. The built-in tools can also identify bottlenecks and help you understand how your applications are performing to proactively improve the customer experience.

Azure App Service diagnostics is an intelligent and interactive experience that helps you troubleshoot your app with no configuration required. When you do run into issues with your app, App Service diagnostics guides you to the right information to more easily and quickly troubleshoot and resolve the issue. It also offers an auto-healing functionality that allows you to restart, log, or trigger a custom mitigation action if your app is experiencing unexpected behavior.

## Premera Blue Cross

Premera Blue Cross cares for its customers. It puts customer convenience and satisfaction first when considering any technical decision. When the health plan company wanted to create new services for its website, it chose Azure App Service to speed up development, increase developer efficiency, and quickly deliver and scale new services.

> **"With features like App Service diagnostics auto-healing, we now have an Azure-native remediation tool. We're now able to create custom developer aids that can be baked into any standard DevOps release pipeline that our developers create."**

**Henry Larrymore, Senior Cloud Engineer in Digital Customer Experience (DCX) at Premera Blue Cross**

Premera's move to Azure gives it access to future-ready toolsets and technology that developers can use to both self-diagnose and prevent issues before they occur. Most of the time, an application runs healthily, but when issues like memory leak occur, it can be difficult and frustrating to figure out what the next steps should be. With App Service diagnostics, it shows Premera that a quick fix for a memory leak is to restart the particular App Service instance that the application was running on. While such a solution might resolve the immediate concern, restarts have to wait until the next slow period. To address this problem, the team uses the App Service diagnostics auto-healing feature to restart their web apps proactively whenever those certain conditions are met.

# 4. Make applications and data more secure

Security breaches incur many different types of risks for businesses: reputational, financial, or legal. For example, a security breach on customer data can lead to public embarrassment and a loss of trust by customers, through lawsuits, or worse. Organizations need to take this topic very seriously and do their best to prevent any security breaches.

Security needs to consider a variety of potential scenarios, ranging from malicious attacks from external hackers to thoughtlessness by internal employees who do not appreciate the risks. Many organizations often forget physical security, but local infrastructure needs to protect against break-ins and disasters such as floods and fires. Keeping applications and data secure on-premises requires different tools, including firewalls, encryption tools, monitoring tools, antivirus software, penetration testing tools, and more. It is time-consuming to detect and confirm an issue, and security tools are expensive and require staff with specialized skillsets, which can incur recruitment, retention, and training costs.

For many organizations, security is an additional complex constraint that adds pressure to meet business expectations. Security is a crucial part of meeting the digital demand, and using the cloud means that the responsibility of security is shared with the cloud provider.

## Shared responsibility model

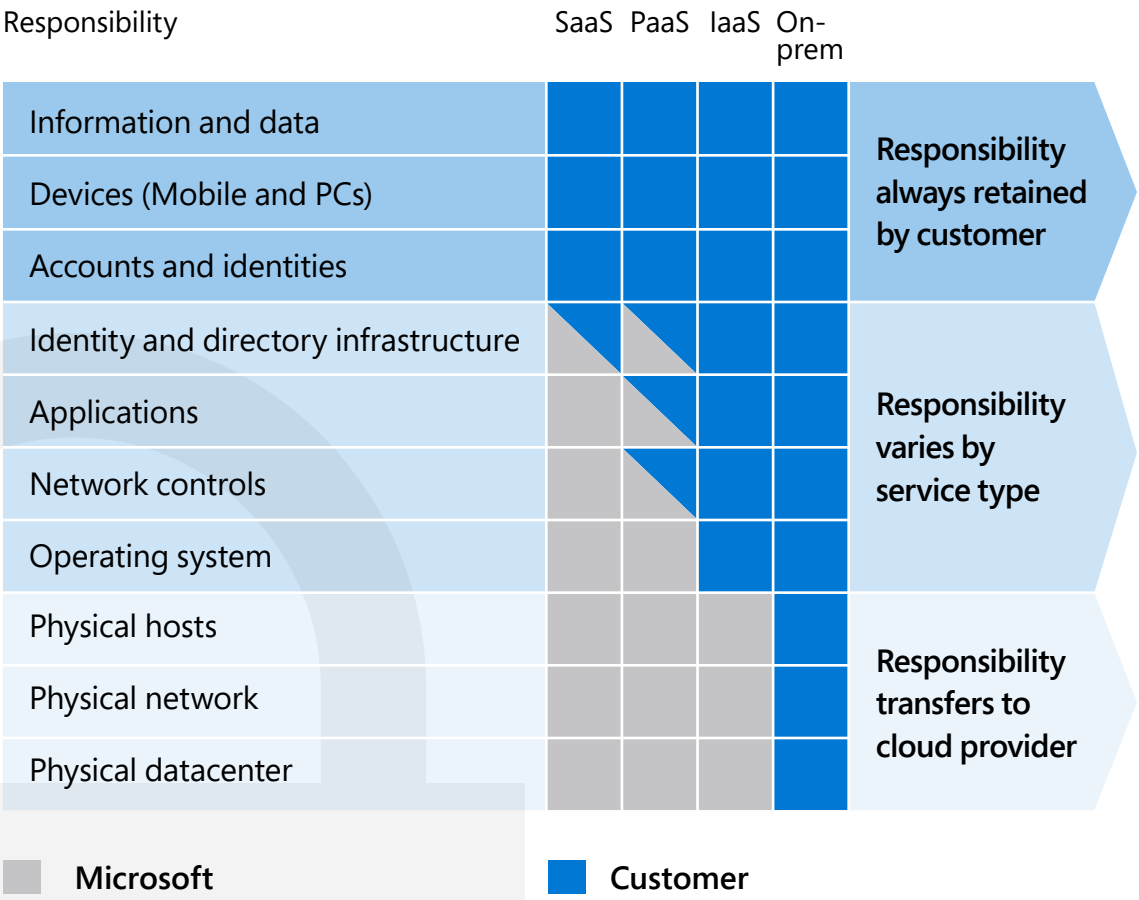



Figure 3: The cloud security shared responsibility model

In a shared responsibility model, the cloud provider handles the physical and infrastructure security, and the customer is responsible for endpoints, identity, access, and applications. To share the responsibility with customers, Microsoft spends over USD1 billion annually on security, with more than 3,500 security professionals and a host of cloud-based security technologies and products. Microsoft Azure offers enterprise-grade services and built-in security features to help secure your application and data.

Microsoft is helping to simplify the process with a range of options in the .NET framework and the cloud. Microsoft has been building software for decades and is familiar with this journey and well-placed to help, advise, and lead in this area. For example, Microsoft has crafted Azure Security Center to provide a unified infrastructure security management system that provides advanced threat protection across your applications.

With modern applications, it's not enough just to secure the application; it is crucial to consider the data that underlies it. Azure SQL Database also has specific security options built in. With native support for Azure Active Directory, it has several additional security features such as securing the data at rest as well as while it is being transported between the application and the database.

If the application is dealing with Personally Identifiable Information (PII), then your database will need additional security to protect it. Applications can store data in Azure SQL Database, which has a range of options for providing additional security measures. One of the important options is the advanced data security that provides a set of advanced SQL security capabilities, such as protecting personally identifiable data and alerting team members to potential database vulnerabilities. Advanced data security can be enabled for all the databases on your server in Azure with one click, simplifying the security process to help organizations become immediately responsive to security requirements.

# 5. Ship new features faster

To survive in the digital-first era, it is crucial to be able to react to changing market conditions and reach customers. Every company wants to push forward and deploy changes as soon as possible in order to stay competitive. They also want to innovate and provide the best possible experience for their customers while maintaining cost efficiency. On-premises solutions can be resource- and cost-hungry to maintain and can be slow and inflexible when shipping new features.

Organizations are now moving toward adopting DevOps for faster and more agile development. Research shows that the DevOps market will grow 20% over the next seven years as businesses move toward adopting new frameworks for development. DevOps can be challenging to adopt, but the cloud can help to streamline the process with a range of options in the .NET ecosystem. There is now even higher demand for developers and IT talent. Developer and tech managers are constantly being challenged to find the right talent to join their teams, and often their teams are stretched with lots of different hardware and software management tasks in on-premises environments. Organizations can attract, recruit, and retain the right talent by moving with the trends and currents in the market.

The cloud provides a potential for innovation and agile delivery that is difficult to match in an on-premises environment. When hosting your applications and data on a managed cloud platform, your team no longer has to manage the operating system, install updates, or worry about hardware. All these tasks are managed by the cloud platform, so your team can focus more on application development and adding capabilities that matter to your business and customers. As a manager, you also want to keep your developers motivated by having them spend more time coding than maintaining your infrastructure.

Having your developers continue using tools that they are already familiar with can provide greater productivity as well as helping the organization to move forward with a DevOps agile strategy. The native integration between Visual Studio, GitHub, and App Service enables developers to build and ship changes faster. Features such as remote and live-site debugging for ASP.NET apps allow developers and operators to easily diagnose issues in production environments and resolve them quickly, without impacting traffic.

The Windows version of App Service is powered by an IIS server in the backend and SQL Database shares the same codebase as on-premises SQL Server, enabling developers and admins to use familiar tools and processes for their ASP.NET apps.

## Chipotle Mexican Grill

Chipotle Mexican Grill is a long-time leader and innovator in the food industry. The company is committed to cultivating a better world by serving responsibly sourced and classically cooked real food with wholesome ingredients—all without artificial colors, flavors, or preservatives. As of September 2019, Chipotle had more than 2,500 restaurants in the United States, Canada, the United Kingdom, France, and Germany, all company owned and operated.

Instead of maintaining three on-premises websites, Chipotle decided to unify its web presence by having one customer-facing website that would let the company be more agile in reaching out to and serving Chipotle's rapidly growing online customer base.

> **"In less than 20 minutes, I had a working prototype in .NET Core, deployed to Azure, with permissions properly set up. Instead of spending a lot of time debating theories and approaches with no prior experience to rely on, we had a working demo ready to drive decision-making in minutes."**
>
> **Mike Smith, Lead Software Developer at Chipotle Mexican Grill**

The development team for the new website was new and only consisted of four members, so it was critical for them to pick the right platform and tools. The team decided to use .NET Core and Visual Studio Code as their development platform and built a single-page app that integrates with the company's existing content management system and back-end services. The new site was up and running in less than eight months. Marketers can now make changes to the site in minutes, including menu items and availability, while developers are freed up to focus on making the site richer in other ways. Best of all, because almost everything is running on Azure, Chipotle no longer needs to worry about operational issues such as maintenance, patching, availability, and scalability.

# Conclusion

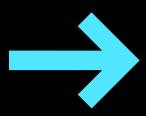
# Why Azure?

More than ever, businesses need to maintain low operating costs while responding to evolving user needs. Azure App Service and Azure SQL Database together take care of the availability, scale, security, and infrastructure management of your apps, allowing you to spend more time growing your business and empowering your employees.

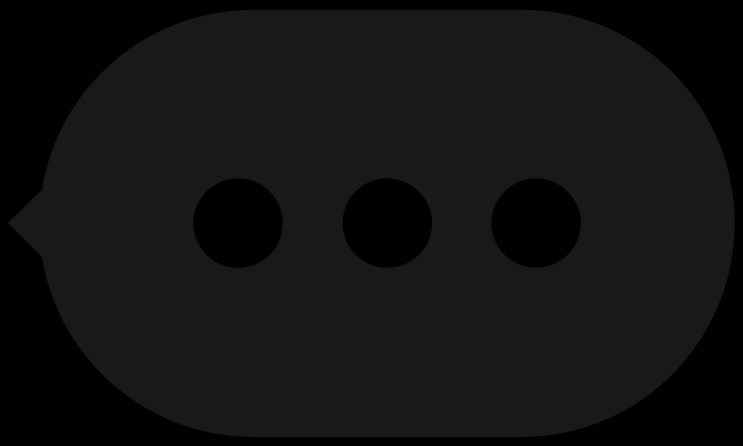
For ASP.NET applications, Azure provides the only end-to-end fully managed platform that natively supports Windows, offering unparalleled developer productivity with deep Visual Studio and GitHub integration, and builds on 25 years of SQL innovation together with Azure SQL Database. You can enrich your apps in numerous ways with other services that Azure offers after migration. There is no better platform to build, host, and manage your .NET web apps and databases.

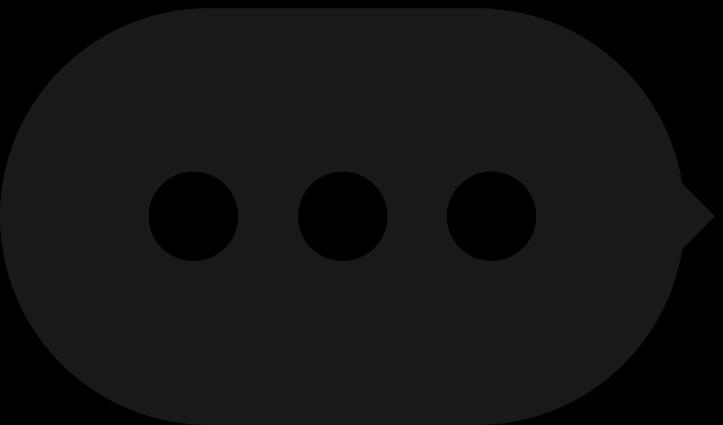
# Get started today

Most organizations fear moving to the cloud because they are unsure of where to start and how to find resources and tools for their teams to learn about the cloud and migration. Azure provides a comprehensive set of migration tools to simplify your cloud migration journey and offers easy-to-use tools and a step-by-step learning module to help you migrate your apps and data to Azure efficiently. Create your Azure free account to use the migration tools and start moving your apps and databases to the cloud today:



Start now



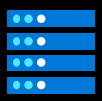


# Resources for your team

There are many additional resources that can be truly helpful in your deployment and administrative tasks. You can browse the following resources for documentation, example code, tutorials, and more, depending on your needs and requirements:

**Microsoft Azure:** Learn how to build and manage powerful applications using Azure cloud services with documentation, example code, tutorials, and more. Explore documentation

**Azure App Service:** Learn how to use Azure App Service with our quickstarts, tutorials, and examples. Read more



**Azure SQL Database:** Find more about the Azure SQL family of SQL Server database engine products in the cloud. Check these resources

**Free training with Microsoft Learn:** Help your developer teams gain new skills and certifications with interactive online learning to ensure that developer teams become and stay proficient with Azure. Find training

**Azure Migration and Modernization Program:** Accelerate your cloud migration journey with best practices, resources, and guidance. Join for free

**Contact Azure Sales Specialist:** Talk to our team of specialists to see how Microsoft can help you migrate your ASP.NET apps and data to Azure. Contact sales

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