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| **Microsoft Azure** | |
| [Microsoft Azure Logo.svg](http://www.wiki-zero.co/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvRmlsZTpNaWNyb3NvZnRfQXp1cmVfTG9nby5zdmc) | |
| **Developer(s)** | Microsoft |
| **Initial release** | February 1, 2010 |
| **Operating System** | Linux, Microsoft Windows |
| **License** | Closed source for platform, Open source for client SDKs |
| **Website** | azure.microsoft.com |

**Briefly, what is Microsoft Azure ?**

Microsoft Azure (formerly Windows Azure) is a [cloud computing](http://www.wiki-zero.co/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ2xvdWRfY29tcHV0aW5n) service created by [Microsoft](http://www.wiki-zero.co/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTWljcm9zb2Z0) for building, hosting, testing, deploying, and managing applications and services through a global network of Microsoft-managed [data centers](http://www.wiki-zero.co/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvRGF0YV9jZW50ZXI).

It provides [software as a service (SaaS)](http://www.wiki-zero.co/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvU29mdHdhcmVfYXNfYV9zZXJ2aWNl), [platform as a service (PaaS)](http://www.wiki-zero.co/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvUGxhdGZvcm1fYXNfYV9zZXJ2aWNl), [infrastructure as a service (IaaS)](http://www.wiki-zero.co/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSW5mcmFzdHJ1Y3R1cmVfYXNfYV9zZXJ2aWNl), mobile as a service (mBaaS) and supports many different [programming languages](http://www.wiki-zero.co/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvUHJvZ3JhbW1pbmdfbGFuZ3VhZ2U), tools and frameworks, including both Microsoft-specific and third-party software and systems.

Azure was announced in October 2008, started with codename "Project Red Dog",and released in February 1, 2010 as "Windows Azure" before being renamed "Microsoft Azure" on March 25, 2014.

To ensure availability, Microsoft has Azure data centers located around the world. As of January 2016, Microsoft said Azure services are available in 22 regions across the globe, including in the United States, Europe, Asia, Australia and Brazil.

**Why should we use Microsoft Azure ?**

**1: Familiarity of Windows**

Azure is based on Windows, so you can write applications in the same programming languages you've used for Windows apps: Visual Basic, C++, C#, etc. You can also use familiar tools such as Visual Studio, along with ASP.NET and other familiar Windows technologies. This makes it easy for organizations to find developers who already have the skills to create applications for the Azure platform. And because the Azure environment is much like the standard Windows environment, it's easier to create a cloud version of an existing Windows application.

**2: 64-bit Windows VMs**

Applications running on Azure run in virtual machines, with each instance of the app running in its own VM on the 64-bit Windows Server 2008 operating system. The hypervisor on which they run is designed specifically for the cloud. You don't have to supply your own VMs or deal with managing and maintaining the OS because apps are developed using Web role instances or worker role instances that run in their own VMs. The apps interoperate with other Azure components through a Windows Azure agent that runs in each VM. With Azure, you can focus on the code and don't have to worry about the hardware.

**3: Azure SDK**

Microsoft provides the Windows Azure software development kit (SDK), which includes a version of the Azure environment you can run on your own computer. It's called the Windows Azure Development Fabric, and it includes the Azure agent and storage. You can work locally when developing and debugging an application and then move it to the cloud. You can [download the tools for Vista Studio 2008 and 2010, along with the SDK](http://www.microsoft.com/downloads/details.aspx?FamilyID=6967ff37-813e-47c7-b987-889124b43abd&displaylang=en), from Microsoft.

**4: Scalability and flexibility**

Using Azure, you can easily create applications that run reliably and scale from 10 to 10 thousand or even 10 million users — without any additional coding. Azure Storage provides scalable, secure, performance-efficient storage services in the cloud.

After you create a Web app, you can specify the number of processors for the application to use. If the application needs to scale up to meet growing demand, it's easy to change the settings to use more processors. The "pay as you go/pay as you grow" approach lets you bring your new apps to market sooner and respond more quickly to changes in your customers' needs.

**5: Cost benefits and pricing model**

Taking advantage of resources in the cloud allows you to decrease your costs for building and expanding your on-premises resources. You can also reduce the cost of IT administration because the hardware is being taken care of for you, off-premises. The cost of creating, testing, debugging, and distributing Web-based applications goes down because you have to pay only for the computer processing time and storage space you need at a given time.

Windows Azure pricing will be based on consumption, with a per-hour fee that's dependent on the size of the instance for Azure computing services and per-month or per-transaction fees for Azure storage services based on data size.

**6: Data center in the cloud**

SQL Azure provides organizations with all the benefits of an enterprise-class data center without the hassle, headaches, and cost of maintaining such an entity. You get high availability and reliability with redundant copies of your data and automatic failover. No more worries about backing up data yourself.

It's a relational database model that stores data in the same manner as SQL Server (tables, indexes, views) and thus will be familiar to Windows DBAs, but your SQL Azure Server is spread across multiple physical computers for more flexibility.

**7: Support resources**

Because Azure uses the same familiar tools and technologies as other Windows platforms, you can take advantage of the well-established support structure within Microsoft and company-provided resources, such as TechNet and MSDN, along with the huge ecosystem of Windows developers outside the company. There will always be someone to turn to when you have questions or problems.

**8: Interoperability**

With Azure, you can develop hybrid applications that allow your on-premises applications to use cloud services, such as the cloud database and storage services. Communication services work between on-premises applications and the cloud, as well as mobile devices.

Azure supports open standards and Internet protocols, such as HTTP, XML, SOAP, and REST. There are SDKs for Java, PHP, and Ruby, for applications written in those languages, and Azure tools for Eclipse.

**9: Security**

Knowing that security is one of the biggest concerns for companies considering a move to the cloud, Microsoft designed Azure with security in mind. The .NET Access Control Service provides a way to integrate identities, and Security Assertion Markup Language (SAML) tokens are used by applications to determine whether a user is allowed access. Microsoft has designed its compliance framework to meet regulatory requirements.

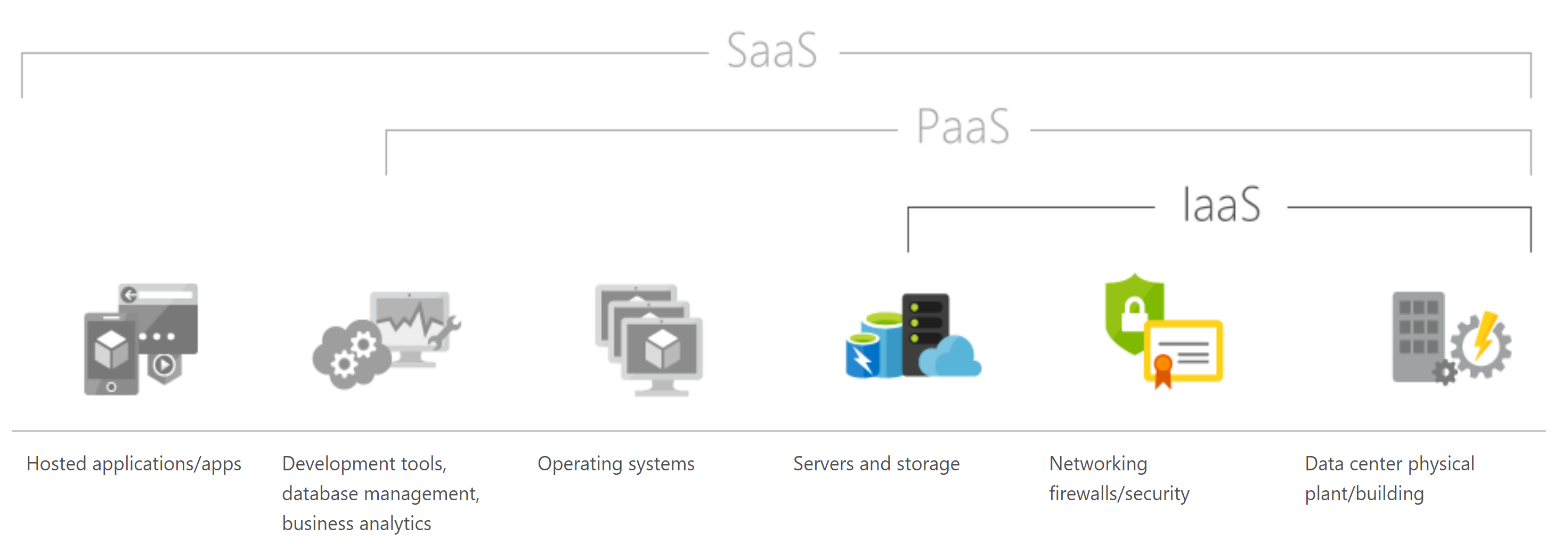
**10: Something for everyone**

Windows Azure can benefit hosting providers, ISVs (independent software vendors), systems integrators, and custom software developers. Hosting providers can expand their services to areas where they don't have existing infrastructure and add new services without more infrastructure investment. ISVs can use Azure to create, deploy, and manage Web apps and SaaS without large capital expenditures, and they can scale those applications more quickly and cost effectively. Systems integrators can take advantage of Azure's ability to work with existing on-premise infrastructures. Custom software developers can create software solutions for customers who can't afford the costs of in-house development, including hardware costs, and they can deliver their applications to customers as services without building and maintaining an expensive data center.

**What kind of services does Microsoft Azure offer?**

Microsoft categorizes Azure services into 11 main product types:

1. Compute – these services provide [virtual machines](https://searchservervirtualization.techtarget.com/definition/virtual-machine), [containers](https://searchservervirtualization.techtarget.com/definition/container-based-virtualization-operating-system-level-virtualization), batch processing and remote application access.
2. Web and mobile – these services support the development and deployment of web and mobile applications, and also offer features for API management, notification and reporting.
3. Data storage – this category includes [Database as a Service](https://searchcloudapplications.techtarget.com/definition/cloud-database) offerings for [SQL](https://searchsqlserver.techtarget.com/answer/What-is-SQL) and [NoSQL](https://searchdatamanagement.techtarget.com/definition/NoSQL-Not-Only-SQL), as well as unstructured and cached cloud storage.
4. Analytics – these services provide distributed analytics and storage, as well as [real-time analytics](https://searchcrm.techtarget.com/definition/real-time-analytics), [big data](https://searchdatamanagement.techtarget.com/definition/big-data) analytics, [data lakes](https://searchaws.techtarget.com/definition/data-lake), [machine learning](https://searchenterpriseai.techtarget.com/definition/machine-learning-ML) and [data warehousing](https://searchsqlserver.techtarget.com/definition/data-warehouse).
5. Networking – this group includes [virtual networks](https://searchservervirtualization.techtarget.com/definition/virtual-networking), dedicated connections and [gateways](https://internetofthingsagenda.techtarget.com/definition/gateway), as well as services for traffic management, [load balancing](https://searchnetworking.techtarget.com/definition/load-balancing) and [domain name system (DNS)](https://searchnetworking.techtarget.com/definition/domain-name-system) hosting.
6. Media and [content delivery network (CDN)](https://searchaws.techtarget.com/definition/content-delivery-network-CDN) – these services include on-demand streaming, encoding and media playback and indexing.
7. Hybrid integration – these are services for server backup, site recovery and connecting [private](https://searchcloudcomputing.techtarget.com/definition/private-cloud) and [public clouds](https://searchcloudcomputing.techtarget.com/definition/public-cloud).
8. Identity and access management (IAM) – these offerings ensure only authorized users can employ Azure services and help protect encryption keys and other confidential information.
9. Internet of Things (IoT) – these services help users capture, monitor and analyze [IoT](https://internetofthingsagenda.techtarget.com/definition/Internet-of-Things-IoT) data from sensors and other devices.
10. Development – these services help application developers share code, test applications and track potential issues. Azure support a range of application programming languages, including JavaScript, Python, .NET and Node.js.
11. Management and security – these products help cloud administrators manage their Azure deployment, schedule and run jobs, and create automation. This product group also includes capabilities for identifying and responding to cloud security threats.

Just as they can with other public cloud platforms, some organizations use Azure for data backup and disaster recovery. The full list of Azure services is constantly subject to change. Users should check the Microsoft Azure website for updates.

# What is IaaS?

## Infrastructure as a service

Infrastructure as a service (IaaS) is an instant computing infrastructure, provisioned and managed over the Internet. Quickly scale up and down with demand and pay only for what you use.

IaaS helps you avoid the expense and complexity of buying and managing your own physical servers and other datacenter infrastructure. Each resource is offered as a separate service component and you only need to rent a particular one for as long as you need it. The [cloud computing service provider](https://azure.microsoft.com/en-in/overview/choosing-a-cloud-service-provider/) manages the infrastructure, while you purchase, install, configure and manage your own software—operating systems, middleware and applications.

## **Common IaaS business scenarios**

Typical things businesses do with IaaS include:

**Test and development.** Teams can quickly set up and dismantle test and development environments, bringing new applications to market faster. IaaS makes it quick and economical to scale up dev-test environments up and down.

**Website hosting.** Running websites using IaaS can be less expensive than traditional web hosting.

**Storage, backup and recovery.** Organizations avoid the capital outlay for storage and complexity of storage management, which typically requires a skilled staff to manage data and meet legal and compliance requirements. IaaS is useful for handling unpredictable demand and steadily growing storage needs. It can also simplify planning and management of backup and recovery systems.

**Web apps.** IaaS provides all the infrastructure to support web apps, including storage, web and application servers and networking resources. Organizations can quickly deploy web apps on IaaS and easily scale infrastructure up and down when demand for the apps is unpredictable.

**High-performance computing.** High-performance computing (HPC) on supercomputers, computer grids or computer clusters helps solve complex problems involving millions of variables or calculations. Examples include earthquake and protein folding simulations, climate and weather predictions, financial modeling and evaluating product designs.

**Big data analysis.** Big data is a popular term for massive data sets that contain potentially valuable patterns, trends and associations. Mining data sets to locate or tease out these hidden patterns requires a huge amount of processing power, which IaaS economically provides.

## **Advantages of IaaS**

**Eliminates capital expense and reduces ongoing cost.** IaaS sidesteps the upfront expense of setting up and managing an on-site datacenter, making it an economical option for start-ups and businesses testing new ideas.

**Improves business continuity and disaster recovery.** Achieving high availability, business continuity and disaster recovery is expensive, since it requires a significant amount of technology and staff. But with the right service level agreement (SLA) in place, IaaS can reduce this cost and access applications and data as usual during a disaster or outage.

**Innovate rapidly.** As soon as you have decided to launch a new product or initiative, the necessary computing infrastructure can be ready in minutes or hours, rather than the days or weeks—and sometimes months—it could take to set up internally.

**Respond quicker to shifting business conditions.** IaaS enables you to quickly scale up resources to accommodate spikes in demand for your application— during the holidays, for example—then scale resources back down again when activity decreases to save money.

**Focus on your core business.** IaaS frees up your team to focus on your organization’s core business rather than on IT infrastructure.

**Increase stability, reliability and supportability.** With IaaS there is no need to maintain and upgrade software and hardware or troubleshoot equipment problems. With the appropriate agreement in place, the service provider assures that your infrastructure is reliable and meets SLAs.

**Better security.** With the appropriate service agreement, a cloud service provider can provide security for your applications and data that may be better than what you can attain in-house.

**Gets new apps to users faster.** Because you don’t need to first set up the infrastructure before you can develop and deliver apps, you can get them to users faster with IaaS.

# What is PaaS?

## Platform as a service

Platform as a service (PaaS) is a complete development and deployment environment in the cloud, with resources that enable you to deliver everything from simple cloud-based apps to sophisticated, cloud-enabled enterprise applications. You purchase the resources you need from a [cloud service provider](https://azure.microsoft.com/en-in/overview/choosing-a-cloud-service-provider/) on a pay-as-you-go basis and access them over a secure Internet connection.

Like [IaaS](https://azure.microsoft.com/en-in/overview/what-is-iaas/), PaaS includes infrastructure—servers, storage and networking—but also middleware, development tools, business intelligence (BI) services, database management systems and more. PaaS is designed to support the complete web application lifecycle: building, testing, deploying, managing and updating.

PaaS allows you to avoid the expense and complexity of buying and managing software licenses, the underlying application infrastructure and middleware or the development tools and other resources. You manage the applications and services you develop and the cloud service provider typically manages everything else.

## **Common PaaS scenarios**

Organizations typically use PaaS for these scenarios:

**Development framework.** PaaS provides a framework that developers can build upon to develop or customize cloud-based applications. Similar to the way you create an Excel macro, PaaS lets developers create applications using built-in software components. Cloud features such as scalability, high-availability and multi-tenant capability are included, reducing the amount of coding that developers must do.

**Analytics or business intelligence.** Tools provided as a service with PaaS allow organizations to analyze and mine their data, finding insights and patterns and predicting outcomes to improve forecasting, product design decisions, investment returns and other business decisions.

**Additional services.** PaaS providers may offer other services that enhance applications, such as workflow, directory, security and scheduling.

## **Advantages of PaaS**

By delivering infrastructure as a service, PaaS offers the same advantages as IaaS. But its additional features—middleware, development tools and other business tools—give you more advantages:

**Cut coding time.** PaaS development tools can cut the time it takes to code new apps with pre-coded application components built into the platform, such as workflow, directory services, security features, search and so on.

**Add development capabilities without adding staff.** Platform as a Service components can give your development team new capabilities without your needing to add staff having the required skills.

**Develop for multiple platforms—including mobile—more easily.** Some service providers give you development options for multiple platforms, such as computers, mobile devices and browsers making cross-platform apps quicker and easier to develop.

**Use sophisticated tools affordably.** A pay-as-you-go model makes it possible for individuals or organisations to use sophisticated development software and business intelligence and analytics tools that they could not afford to purchase outright.

**Support geographically distributed development teams.** Because the development environment is accessed over the Internet, development teams can work together on projects even when team members are in remote locations.

**Efficiently manage the application lifecycle.** PaaS provides all of the capabilities that you need to support the complete web application lifecycle: building, testing, deploying, managing and updating within the same integrated environment.

Software as a service (SaaS) allows users to connect to and use cloud-based apps over the Internet. Common examples are email, calendaring and office tools (such as Microsoft Office 365).

# What is SaaS?

## Software as a service

Software as a service (SaaS) allows users to connect to and use cloud-based apps over the Internet. Common examples are email, calendaring and office tools (such as Microsoft Office 365).

SaaS provides a complete software solution which you purchase on a pay-as-you-go basis from a [cloud service provider](https://azure.microsoft.com/en-in/overview/choosing-a-cloud-service-provider/). You rent the use of an app for your organization and your users connect to it over the Internet, usually with a web browser. All of the underlying infrastructure, middleware, app software and app data are located in the service provider’s data center. The service provider manages the hardware and software and with the appropriate service agreement, will ensure the availability and the security of the app and your data as well. SaaS allows your organization to get quickly up and running with an app at minimal upfront cost.

## **Common SaaS scenarios**

If you have used a web-based email service such as Outlook, Hotmail or Yahoo! Mail, then you have already used a form of SaaS. With these services, you log into your account over the Internet, often from a web browser. The email software is located on the service provider’s network and your messages are stored there as well. You can access your email and stored messages from a web browser on any computer or Internet-connected device.

The previous examples are free services for personal use. For organizational use, you can rent productivity apps, such as email, collaboration and calendaring; and sophisticated business applications such as customer relationship management (CRM), enterprise resource planning (ERP) and document management. You pay for the use of these apps by subscription or according to the level of use.

## **Advantages of SaaS**

**Gain access to sophisticated applications.** To provide SaaS apps to users, you don’t need to purchase, install, update or maintain any hardware, middleware or software. SaaS makes even sophisticated enterprise applications, such as ERP and CRM, affordable for organizations that lack the resources to buy, deploy and manage the required infrastructure and software themselves.

**Pay only for what you use.** You also save money because the SaaS service automatically scales up and down according to the level of usage.

**Use free client software.** Users can run most SaaS apps directly from their web browser without needing to download and install any software, although some apps require plugins. This means that you don’t need to purchase and install special software for your users.

**Mobilize your workforce easily.** SaaS makes it easy to “mobilize” your workforce because users can access SaaS apps and data from any Internet-connected computer or mobile device. You don’t need to worry about developing apps to run on different types of computers and devices because the service provider has already done so. In addition, you don’t need to bring special expertise onboard to manage the security issues inherent in mobile computing. A carefully chosen service provider will ensure the security of your data, regardless of the type of device consuming it.

**Access app data from anywhere.** With data stored in the cloud, users can access their information from any Internet-connected computer or mobile device. And when app data is stored in the cloud, no data is lost if a user’s computer or device fails.

