

Microsoft Azure

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Microsoft Azure /ˈæʒər/ is a cloud computing platform and infrastructure, created by Microsoft, for building, deploying and managing applications and services through a global network of Microsoft-managed and Microsoft partner hosted datacenters. It provides both PaaS and IaaS services and supports many different programming languages, tools and frameworks, including both Microsoft-specific and third-party software and systems. Azure was announced in October 2008 and released on 1 February 2010 as **Windows Azure**, before being renamed to Microsoft Azure on 25 March 2014.^[1]

Microsoft Azure

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Developer(s)	Microsoft
Initial release	1 February 2010 ^[1]
Operating system	Microsoft Windows, Linux
License	Closed source for platform, Open source for client SDKs
Website	azure.microsoft.com (http://azure.microsoft.com)

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Services

Websites

High density hosting of websites. Allows developers to build sites using ASP.NET, PHP, Node.js, or Python and can be deployed using FTP, Git, Mercurial or Team Foundation Server. This feature was announced in preview form in June 2012 at the Meet Microsoft Azure event.^[2] Customers can create websites in PHP, ASP.NET, Node.js, or Python, or select from several open source applications from a gallery to deploy. This comprises one aspect of the Platform as a Service (PaaS) offerings for the Microsoft Azure Platform. It was renamed to Web Apps in April 2015. <http://azure.microsoft.com/en-us/services/app-service/web/>

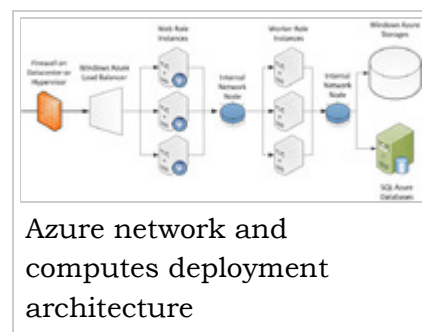
Virtual machines

Let developers migrate applications and infrastructure without changing existing code and can run both Windows Server and Linux virtual machines. Announced in preview form at the Meet Windows Azure event in June 2012^[2] the Windows Azure Virtual Machines comprise the Infrastructure as a Service (IaaS) offering from Microsoft for their public cloud. Customers can create Virtual Machines, of which they have complete control, to run in the Microsoft Data Centers. As of the preview the Virtual Machines

supported Windows Server 2008 and 2012 operating systems and a few distributions of Linux. The General Availability version of Virtual Machine was released in May 2013.

Cloud services

Microsoft's Platform as a Service (PaaS) environment can be used to create scalable applications and services. It supports multi-tier architectures and automated deployments. Previously named "Hosted Services", the Cloud Services for Windows Azure comprise one aspect of the PaaS offerings from the Windows Azure Platform. The Cloud Services are containers of hosted applications. These applications can be Internet-facing public web applications (such as web sites and e-commerce solutions), or they can be private processing engines for other work, such as processing orders or analyzing data.



Developers can write code for Cloud Services in a variety of different programming languages. There are specific software development kits (SDKs) provided by Microsoft for Python, Java, Node.js and .NET.^[3] Other languages may have support through Open Source projects. Microsoft published the source code for their client libraries on GitHub.^[4]

Compute

Batch

```
ArrayList<String> lst = new ArrayList<String>();
Collection<String> col = lst;
lst.add("one" );
lst.add("two" );
lst.add("three" );
lst.remove(0);
col.remove(0);
System.out.println("Added three items, remove two, so 1 item to remain." );
System.out.println("Number of elements is: " + lst.size());
System.out.println("Number of elements is: " + col.size());
```

Scheduler

Remote App

Application virtualization system

Data management

SQL Database, formerly known as SQL Azure Database, works to create, scale and extend applications into the cloud using Microsoft SQL Server technology. It also integrates with Active Directory and Microsoft System Center and Hadoop.^[5]

SQL Database

Tables

BLOB Storage

Azure Search

Document DB

DocumentDB a NoSQL document database service.

Redis Cache

An implementation of Redis

StorSimple

Business Analytics

SQL Reporting

Data Marketplace

HDInsight (<http://azure.microsoft.com/en-in/services/hdinsight/>)

HDInsight is Microsoft's cloud based Hadoop distribution^[6]

Azure Machine Learning (<http://azure.com/ml>)

Cloud-based predictive analytics and publishing of APIs on the cloud

Stream Analytics

Event Hubs

Data Factory

Identity

Active Directory

Rights Management

Access Control Service

Multi-Factor Authentication

Messaging

Microsoft Azure Service Bus

Queues

Media services

A PaaS offering that can be used for encoding, content protection, streaming, and/or analytics.

CDN

A global Content delivery network for audio, video, applications, images, and other high-bandwidth files.

- Mobile Services

Networking

Virtual Network

A hosted Virtual private network

Express Route

Traffic Manager

Integration

Backup

Site Recovery

BizTalk Services

Developer

Visual Studio Online

Application Insights

Design

Microsoft Azure uses a specialized operating system, called Microsoft Azure, to run its "fabric layer": a cluster hosted at Microsoft's data centers that manages computing and storage resources of the computers and provisions the resources (or a subset of them) to applications running on top of Microsoft Azure. Microsoft Azure has been described as a "cloud layer" on top of a number of Windows Server systems, which use Windows Server 2008 and a customized version of Hyper-V, known as the Microsoft Azure Hypervisor to provide virtualization of services.

Scaling and reliability are controlled by the Microsoft Azure Fabric Controller so the services and environment do not crash if one of the servers crashes within the Microsoft data center and provides the management of the user's web application like memory resources and load balancing.

Azure provides an API built on REST, HTTP, and XML that allows a developer to interact with the services provided by Microsoft Azure. Microsoft also provides a client-side managed class library which encapsulates the functions of interacting with the services. It also integrates with Microsoft Visual Studio, Git, and Eclipse.

History

October 2008 (PDC LA)

- Announced the Windows Azure Platform
- First CTP of Windows Azure

March 2009

- Announced SQL Azure Relational Database

November 2009

- Updated Windows Azure CTP
- Enabled full trust, PHP, Java, CDN CTP and more
- Announced VM Role, Project Sidney, Pricing and SLAs
- Project "Dallas" CTP

February 2010

- Windows Azure Platform commercially available

June 2010

- Windows Azure Update
 - .NET Framework 4
 - OS Versioning
 - CDN
- SQL Azure Update (Service Update 3)^[7]
 - 50 GB databases
 - Spatial data support
 - DAC support

October 2010 (PDC)

- Platform enhancements
 - Windows Azure Virtual Machine Role
 - Role enhancements
 - Admin mode, Startup tasks
 - Full-IIS support
 - Extra Small Instances
- Windows Azure Connect
 - Access to on-premise resource for cross-premise apps
 - Support for domain-joining VMs
 - Direct role-instance connectivity for easier development
 - Use your existing remote administration tools
- Improved Dev / IT Pro Experience



Ray Ozzie announcing Windows Azure at PDC 2008, October 27

- New Windows Azure Platform Management Portal
- Multiple users & roles for management
- Remote Desktop
- Enhanced Dev Tools
- PHP development
- Marketplace

December 2011

- Traffic manager
- SQL Azure reporting
- HPC scheduler

June 2012

- Websites
- Virtual machines for Windows and Linux (backed by persistent storage)
- Python SDK
- New portal
- Locally redundant storage

April 2014

- Windows Azure renamed to Microsoft Azure
- New beta preview management portal released
- Azure experiences an outage affecting several customers - "An internal server error has occurred".



July 2014

- Azure Machine Learning public preview ^[8]

November 2014

- Microsoft Azure experiences outage affecting major websites including MSN.com. ^[9]

Data center regions

Some data center regions have servers grouped inside containers, each containing 1800–2500 servers. ^{[10][11]} As of 2014, the servers running in China (North) and China (East) are available for customers signed up through 21Vianet only, the local Microsoft Azure operator. ^[12] Microsoft Azure officially launched its Oceania location on 27 October 2014, ^[13] the Australia Regions is currently limited to customers with billing addresses in Australia and New Zealand. ^[14] Pricing, terms and conditions may differ between regions.

The locations of the data centers ^{[15][16]} are

- North America
 - Central US: Iowa
 - North-central US: Chicago, IL
 - South-central US: San Antonio, TX

- West US: California
- East US: Boydton, VA^[17]
- South America
 - Brazil: São Paulo State
- Asia
 - China (North): Beijing
 - China (East): Shanghai
 - East Asia: Hong Kong
 - South East Asia: Singapore
- Europe
 - North Europe: Dublin, Ireland
 - West Europe: Amsterdam, Netherlands
- Japan
 - Japan East: Saitama
 - Japan West: Osaka
- Oceania^{[18][19]}
 - Sydney, New South Wales
 - Melbourne, Victoria

The CDN nodes are located in 24 countries.^{[20][20][21]}

As of July 2010, Microsoft had completed 6,000 installations of Azure in Ireland.^[22] Executives at Microsoft hoped that this figure would rise to 100,000 installations by 2011.^[22]

Construction of the \$500 million facility required one million man-hours of work with a peak workforce of around 2,100 workers.^[23] The facility, which began operating on 1 July 2009, currently covers 303,000 square feet (2.815 hectares), with 5.4 megawatts of critical power available. Over time, the data center is expandable to a total of 22.2 megawatts of critical power to support future growth.

Privacy

Microsoft has stated that, per the USA Patriot Act, the US government can have access to the data even if the hosted company is not American and the data resides outside the USA.^[24] However, Microsoft Azure is compliant with the E.U. Data Protection Directive (95/46/EC). To manage privacy and security related concerns, Microsoft has created a Microsoft Azure Trust Center,^[25] and Microsoft Azure has several of its services compliant with several compliance programs including ISO 27001:2005 and HIPAA. A full and current listing can be found on the Microsoft Azure Trust Center Compliance page.^[26] Of special note, Microsoft Azure has been granted JAB Provisional Authority to Operate (P-ATO) from the U.S. government in accordance with guidelines spelled out under the Federal Risk and Authorization Management Program (FedRAMP) - A U.S. government program that provides a standardized approach to security assessment, authorization, and continuous monitoring for cloud services used by the federal government.^[27]

Significant outages

Documented Microsoft Azure outages and service disruptions.

Date	Cause	Notes
2012-02-29	Incorrect code for calculating leap day dates ^[28]	
2012-07-26	Misconfigured network device ^{[29][30]}	
2013-02-22	Expiry of an SSL certificate ^[31]	Xbox Live, Xbox Music and Video also affected ^[32]
2013-10-30	Worldwide partial compute outage ^[33]	
2014-11-18	Azure storage upgrade caused reduced capacity across several regions ^[34]	Xbox Live, Windows Store, MSN, Search, Visual Studio Online among others were affected. ^[35]

As of February 18, 2015 Azure has been available for 99.9459% of the past year.^[36]

See also

- Amazon Web Services
- Bluemix
- Engine Yard
- Enlight cloud
- Force.com
- GoGrid
- Google App Engine
- Google Compute Engine
- Heroku
- HP Converged Cloud
- IBM cloud computing
- Iomart Group
- Jelastic
- Nodejitsu
- OpenShift
- OpenStack
- Rackspace Cloud
- ServIT
- Softlayer
- Skytap
- VMware

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External links

- Official website (<http://www.windowsazure.com>)
- Official blog (<http://www.windowsazure.com/en-us/community/blog>)
- Microsoft Azure (<https://www.dmoz.org/Computers/Programming/Internet/Databases/>) at DMOZ

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