

## Windows Azure versus Amazon EC2: Comparing two leading cloud computing platforms

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Cloud computing solutions provide companies with some compelling alternatives to building critical business applications or services internally. Two of the biggest names in the business world—Amazon and, more recently, Microsoft—provide platforms for a variety of cloud computing solutions.

If your organization is evaluating the potential of cloud computing, you will need to understand the basics of these two options—enough to make an educated decision about the right alternative for your needs. This article reviews the basics of both platforms: What is it? What are the key benefits? What are the key considerations? How could you use it?

### What is the Windows Azure platform?

Microsoft recently announced its entry into the cloud computing and hosted services world: the Windows Azure Platform, which offers a variety of service capabilities housed within Microsoft's datacenters. Businesses can use the platform to build and deploy new applications and databases or integrate data with their internal systems and/or partners.

The Windows Azure platform provides some unique features that differentiate it from other cloud computing platforms. First, Microsoft designed and built Windows Azure from the ground-up to be a cloud computing platform—a comprehensive platform for data storage, hosting, computation, and service bus capabilities that allow customers simple options to quickly build applications in the cloud. This provides customers the ability to quickly and easily grow and scale their environment instantly to meet demands, with clear and predictable Service Level Agreements (SLA) that ensure customers' systems will be up and running when they need it. A primary difference from the Amazon platform is that the Windows Azure platform does not allow direct access to configure the server's operating system or to install third-party packaged applications for your cloud-based environment.

The services provided by the Windows Azure platform include:

- ◆ **Windows Azure**—Provides on-demand hosting, computing, and storage capability using technologies like Microsoft .NET, PHP, Java, Ruby, and Python.
- ◆ **SQL Azure**—Provides the ability to host SQL Server databases in the cloud, enabling users to store relational and structured data.
- ◆ **Windows Azure Platform AppFabric**—Provides service bus capabilities, allowing users to easily integrate with their internal systems and with partners, with identity management services that enable them to control web application security by using standard identity providers like Windows Live ID.

### What are the benefits of Windows Azure?

The capabilities and design of the Windows Azure platform combine to provide users with a number of benefits:

#### Get up and running quickly.

Traditionally, getting an application up and running on the web meant procuring and installing servers, configuring the network, registering addresses, and performing many other tasks. These tasks could take weeks or even months of time. With the Azure platform, these “basics” are set up and ready to go at any time. This means you can get an application deployed to the cloud in a matter of days rather than weeks.

### Scale dynamically to meet your demands.

The platform allows you to quickly and easily add more processing power, by assigning instances to your application to meet the speed and usage demands of your users. It also allows you to dial your usage up or down to meet peak demand while minimizing the cost, time, and overhead and adding servers.

### Reduce IT complexity and increase reliability.

By using a cloud computing environment, you get the benefit of a large, scalable, and stable environment, but your IT environment does not have to host servers, storage, backup, or monitoring tools to support the application. This helps reduce the burden on your IT team and allows you to focus on creating useful applications to drive your business. The Azure platform has automated tools to monitor your application to ensure that it is up and running all the time, so you never have to worry about applying updates, patches, or service packs to your servers. In addition, with Azure, you don't have to pay for additional software licensing for tools like SQL server or Windows Server.

### How can you use the Windows Azure Platform?

The Azure platform has many potential applications—from deploying small tactical applications to a enabling whole suite of tools for your IT environment.

- ◆ Maximize your server utilization by using Windows Azure to host an application that sees only periodic use. Do you have an application that only gets used once a month? Once a quarter? Once a year? With Azure you don't have to have a server sitting dormant during the times that users are not accessing the application.
- ◆ Use Azure to host your corporate website, without having to maintain the hardware to support your traffic. If your latest product or service announcement suddenly causes your website traffic to spike to hundreds of thousands of hits, you can utilize Azure's scaling capabilities to respond quickly to handle this added traffic.
- ◆ Host your SQL server data using Microsoft SQL Azure, eliminating the need to build or maintain large SQL database servers within your environment.
- ◆ Use AppFabric to make Web Services available for your business partners to ease their ability to do business with you.

### Windows Azure in action: The 2009 Taste of Chicago interactive map.

In May 2009, the City of Chicago asked West Monroe Partners to develop an interactive website for its largest event, the Taste of Chicago. The City wanted the map to be ready for public use in less than two weeks; one month before the July event. The web traffic requirements were somewhat unknown but estimated to be around 50,000 hits per day.

Because it would receive a significant number of hits in a short timespan and because the City didn't have sufficient time to coordinate a hosted environment to support an unknown amount of traffic, this application was an ideal candidate for hosting via a cloud application. To meet these demands, West Monroe Partners chose to implement the map and host it on the Azure platform, utilizing the Windows Azure Hosting Services and Data Services.

The Azure platform provided these benefits in building the application:

- ◆ **Quick to market**—With little available time, the team was able to focus its attention on building functionality rather than setting up the environment.
- ◆ **Smaller development team**—With no infrastructure setup required, the team consisted solely of developers.
- ◆ **Streamlined process**—Using Silverlight, .NET, and Visual Studio required little ramp-up time. The City's project team did not need to involve its internal IT department in decisions, saving time and possibly headaches.
- ◆ **Reliable and scalable**—The site is being run across 25 Azure instances, without the need to worry about backups, redundancy, and site uptime. Although the project team wasn't concerned that traffic load would cause the site to run slow, the potential for adding instances, if needed, provided the City with some peace of mind.

West Monroe Partners provided the City of Chicago with a test application within two days of starting the project—ultimately enabling it to get the finished map up and running, with all of the features that the City of Chicago requested and more, within the City's two-week time frame.

## What is Amazon EC2 and S3?

Amazon's EC2 offering is similar to Azure in that it is a cloud computing platform; however, Amazon's offering allows you to control and interact with the operating system while Azure keeps the operating system hidden. Of course there is some overlap with Azure. You can spin up an EC2 Windows server instance and use the .NET platform to host an application or website; however, now you have to worry about ensuring that the operating system, as well as the .NET platform and any other components that might be in use, have the latest updates. In a similar fashion, with EC2 you have the flexibility to run any program since you essentially are given a full Windows or Linux server from which you can control all aspects of the server, network, and storage. This adds flexibility to the platform, but at the cost of additional maintenance and configuration effort required.

## What are the benefits of the Amazon cloud?

Amazon has built out the components needed for large, scalable server farms. The ability to take advantage of the features and have them grow as demand increases is a huge benefit. Some companies spend significant amounts of money to build data centers and/or perform cluster/load balancing well before needs exist. For some, it pays off. For others, the need never presents itself; thus, both the time and money spent are wasted.

Some of the key features of the Amazon cloud include:

- ◆ **Simple storage service (S3)**—Provides file level object storage.
- ◆ **Simple DB**—Includes database services that allow for storage and query of objects.
- ◆ **Simple queue service (SQS)**—Uses queue service for processing requests, similar to MSMQ.
- ◆ **Elastic load balancing**—Clusters instances and spreads traffic and requests across them.
- ◆ **Auto scaling**—Includes the ability to bring up new instances as load increases, with manual intervention.
- ◆ **Elastic IP**—Maintains a single IP externally, but maps it to an instance IP. Provides very fast switch of traffic without making DNS changes.
- ◆ **Geographic scaling, regions, and availability zones**—Makes sure a disaster in a single geography does not impact the system.

## Key considerations.

There are several key considerations for building out infrastructures on the Amazon cloud:

### Reserved vs. On-Demand.

Amazon has two different pricing models. The most common is on-demand pricing. This allows you to quickly bring up a server, use it for as long as needed, and then drop it and not pay any more for it. A lower-cost model for companies seeking a longer-term solution to outsource infrastructure is the reserved-instance pricing model. This model offers a lower cost per hour, but it requires a longer-term commitment for use. If, for example, a department wants to host an application for three months during its busy season, the on-demand approach will prove a lower cost. If, however, it wants to outsource its e-mail and customer relationship management (CRM) systems for a three-year period, the reserved-instances model will provide a lower cost over that course of time.

### Security.

Amazon has a wealth of information about its processes for keeping information secure and only available to the realm of servers needed. Two significant considerations include mapping Elastic Block Storage (EBS) volumes to servers and the firewall configuration. EBS volumes can only be made available to instances within the Availability Zone. In addition, they can only be attached to one server at a time, but it is possible to have multiple volumes attached to the same server for added redundancy or performance.

The firewall rules determine how the EC2 environment can be accessed. This allows you to set up rules that determine the type of traffic, which ports and IP addresses can access machines, and anything that should be blocked. This feature can be used to define what internet traffic can hit the various services that your infrastructure provides. This protects servers from unwanted port scanning, in addition to lowering the risk of data theft.

## The Amazon cloud in action: Morgan Street Document Systems & SharePoint

In order to provide for a better growth strategy for one of its applications, Morgan Street Document Systems sought to move its Secure Vault product to a lower-cost infrastructure. Using EC2 instances that are saved to facilitate disaster recovery, the company moved SharePoint and its custom application into the cloud. It set up data volumes for SQL files using EBS and used snapshots to S3 repositories to capture critical data. If a machine stops responding, a new instance can be brought online and data volumes attached in order to restore access. While this is a manual process, it does allow for a recovery from the full failure of an instance.

In this case, the Amazon platform provided several key benefits:

- ◆ **Lower storage cost**—Overall infrastructure and storage is about one tenth of that associated with a data center architecture.
- ◆ **Scalable backup and redundancy**—The ability to bring up new servers quickly and pull data for EBS volumes from S3 ensures top system up time.
- ◆ **Ability to expand**—Adding new servers, even for a new SharePoint farm, can be accomplished very quickly, and adding capacity is quickly accomplished using servers or bandwidth additions.

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