Amazon Web Services

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Amazon Web Services (**AWS**), a collection of remote computing services, also called web services, make up a cloud-computing platform offered by Amazon.com. These services operate from 11 geographical regions across the world. The most central and well-known of these services arguably include Amazon Elastic Compute Cloud and Amazon S3. Amazon markets these products as a service to provide large computing-capacity more quickly and more cheaply than a client company building an actual physical server farm.[2]

Amazon Web Services (AWS)	
Web address	aws.amazon.com (http://aws.amazon.com/)
Type of site	Web service, cloud computing
Owner	Amazon.com
Launched	2006[1]

Contents

Architecture

AWS is located in 11 geographical "regions": US East (Northern Virginia), where the majority of AWS servers are based,[3] US West (northern California), US West (Oregon), Brazil (São Paulo), Europe (Ireland and Germany), Southeast Asia (Singapore), East Asia (Tokyo and Beijing) and Australia (Sydney). There is also a "GovCloud", based in the Northwestern United States, provided for U.S. government customers, complementing existing government agencies already using the US East Region.[4] Each Region is wholly contained within a

Map showing the approximate geographical regions used by Amazon Web Services.

single country and all of its data and services stay within the designated Region.

Each Region has multiple "Availability Zones", which are distinct data centers providing AWS services. Availability Zones are isolated from each other to prevent outages from spreading between Zones. Several services operate across Availability Zones (e.g., S3, DynamoDB) while others can be configured to replicate across Zones to spread demand and avoid downtime from failures. Amazon web services hold 1.79% market share.[5] As of December 2014, Amazon Web Services operated an estimated 1.4 Million servers across 28 availability zones.[6]

With respect to power provisioning for centers in the regions, AWS stated in 2014 a commitment to achieve 100% renewable energy usage.[7] As part of this effort in the United States, AWS commissioned with Community Energy of Virginia a solar farm coming online in 2016 to support the US East region.[8] Further, as of 2015, AWS is working with Tesla Motors to apply battery storage technology to address some power needs in the US West (Northern California) region.[8]

History

Officially launched in 2006, Amazon Web Services provide online services for other web sites or client-side applications.[1] Most of these services are not exposed directly to end users, but instead offer functionality that other developers can use in their applications. Amazon Web Services' offerings are accessed over HTTP, using the REST architectural style and SOAP protocol. All services are billed based on usage, but how usage is measured for billing varies from service to service.

AWS Summit 2013 event in NYC.

In late 2003, Peter Parker and Jack Black presented a paper describing a vision for Amazon's retail computing infrastructure that was completely standardized, completely automated, and would rely extensively on web services for services such as storage, drawing on internal work already underway. Near the end they mentioned the possibility of selling virtual servers as a service, proposing the company could generate revenue from the new infrastructure investment.[9] The first AWS service launched for public usage was Simple Queue Service in November 2004.[10] Amazon EC2 was built by a team in Cape Town, South Africa, under Pinkham and lead developer Chris Brown.[11]

In June 2007, Amazon claimed that more than 180,000 developers had signed up to use Amazon Web Services.[12]

In November 2010, it was reported that all of Amazon.com retail web services had been moved to AWS.[13]

On April 20, 2011, some parts of Amazon Web Services suffered a major outage. A portion of volumes utilizing the Elastic Block Store (EBS) service became "stuck" and were unable to fulfill read/write requests. It took at least two days for service to be fully restored.[14]

On June 29, 2012, several websites that rely on Amazon Web Services were taken offline due to a severe storm of historic proportions in Northern Virginia, where Amazon's largest datacenter cluster is located.[15]

On October 22, 2012, a major outage occurred, affecting many sites such as Reddit, Foursquare, Pinterest, and others. The cause was a latent bug in an operational data collection agent.[16]

In November 2012, AWS hosted its first customer event in Las Vegas.[17]

On December 24, 2012, AWS suffered another outage, causing websites such as Netflix instant video to be unavailable for customers in the Northeastern United States.[18] Amazon later issued a statement[19] detailing the issues with the Elastic Load Balancing service that led up to the outage.[20]

On April 30, 2013, AWS began offering a certification program for computer engineers with expertise in cloud computing.[21]

On May 13, 2013, AWS was awarded an Agency Authority to Operate (ATO) from the U.S. Department of Health and Human Services (HHS) under the Federal Risk and Authorization Management Program (FedRAMP).[22]

AWS adoption has increased since launch in 2006. Customers include NASA,[23] the Obama Campaign,[24] Pinterest,[25] Kempinski Hotels,[26] Netflix,[27] Infor,[28] the CIA.[29]

AWS revenue was not stated separately in the past, but in 2012 it was estimated by industry watchers at over US$1.5 billion.[30]

In April 2015, AWS was reported to be profitable, with sales of US$1.57 billion in the first quarter of the year, and US$265 million of operating income. Founder Bezos described it as a fast-growing US$5 billion business; analysts described it as "surprisingly more profitable than forecast".[31]

List of products

Compute

- Amazon Elastic Compute Cloud (EC2) provides scalable virtual private servers using Xen.
- Amazon Elastic MapReduce (EMR) allows businesses, researchers, data analysts, and developers to easily and cheaply process vast amounts of data. It uses a hosted Hadoop framework running on the web-scale infrastructure of EC2 and Amazon S3.
- Amazon Lambda (LAMBDA) provides a compute services that runs your code in response to events and automatically manages the compute resources needed to run the code.[32]

Networking

- Amazon Route 53 provides a highly available and scalable Domain Name System

(DNS) web service.
- Amazon Virtual Private Cloud (VPC) creates a logically isolated set of Amazon EC2 instances which can be connected to an existing network using a VPN connection.
- AWS Direct Connect provides dedicated network connections into AWS data centers, providing faster and cheaper data throughput.
- Amazon Elastic Load Balancing (ELB) automatically distributes incoming traffic across multiple Amazon EC2 instances.

Content delivery

- Amazon CloudFront, a content delivery network (CDN) for distributing objects to so-called "edge locations" near the requester

Storage and content delivery

- Amazon Simple Storage Service (S3) provides Web Service based storage.
- Amazon Glacier provides a low-cost, long-term storage option (compared to S3). High redundancy and availability, but low-frequent access times. Ideal for archiving data.
- AWS Storage Gateway, an iSCSI block storage virtual appliance with cloud-based backup.
- Amazon Elastic Block Store (EBS) provides persistent block-level storage volumes for EC2.
- AWS Import/Export, accelerates moving large amounts of data into and out of AWS using portable storage devices for transport.
- Amazon Elastic File System (EFS) a file storage service for Amazon Elastic Compute Cloud (Amazon EC2) instances.

Database

- Amazon DynamoDB provides a scalable, low-latency NoSQL online Database Service backed by SSDs.
- Amazon ElastiCache provides in-memory caching for web applications. This is Amazon's implementation of Memcached and Redis.
- Amazon Relational Database Service (RDS) provides a scalable database server with MySQL, Oracle, SQL Server, and PostgreSQL support.[33]
- Amazon Redshift provides petabyte-scale data warehousing with column-based storage and multi-node compute.
- Amazon SimpleDB allows developers to run queries on structured data. It operates in concert with EC2 and S3 to provide "the core functionality of a database".
- AWS Data Pipeline provides reliable service for data transfer between different AWS compute and storage services (e.g., Amazon S3, Amazon RDS, Amazon DynamoDB, Amazon EMR). In other words this service is simply a data-driven workload management system, which provides a simple management API for managing and monitoring of data-driven workloads in cloud applications.[34]
- Amazon Kinesis streams data in real time with the ability to process thousands of data streams on a per-second basis. The service, designed for real-time apps, allows developers to pull any amount of data, from any number of sources, scaling up or down as needed.

Deployment

- Amazon CloudFormation provides a file-based interface for provisioning other AWS resources.
- AWS Elastic Beanstalk provides quick deployment and management of applications in the cloud.
- AWS OpsWorks provides configuration of EC2 services using Chef.
- AWS CodeDeploy provides automated code deployment to EC2 instances.

Management

- Amazon Identity and Access Management (IAM) is an implicit service, the authentication infrastructure used to authenticate access to the various services.
- AWS Directory Service a managed service that allows you to connect your AWS resources with an existing on-premises Microsoft Active Directory or to set up a new, stand-alone directory in the AWS Cloud.
- Amazon CloudWatch, provides monitoring for AWS cloud resources and applications, starting with EC2.
- AWS Management Console (AWS Console), A web-based point and click interface to manage and monitor the Amazon infrastructure suite including (but not limited to) EC2, EBS, S3, SQS, Amazon Elastic MapReduce, and Amazon CloudFront. Amazon also makes available a mobile application for Android which has support for some of the management features from the console.
- Amazon CloudHSM - The AWS CloudHSM service helps you meet corporate, contractual and regulatory compliance requirements for data security by using dedicated Hardware Security Module (HSM) appliances within the AWS cloud.
- AWS Key Management Service (KMS) a managed service that makes it easy for you to create and control the encryption keys used to encrypt your data.

Application services

- Amazon CloudSearch provides basic full-text search and indexing of textual content.
- Amazon DevPay, currently in limited beta version, is a billing and account management system for applications that developers have built atop Amazon Web Services.
- Amazon Elastic Transcoder (ETS) provides video transcoding of S3 hosted videos, marketed primarily as a way to convert source files into mobile-ready versions.
- Amazon Flexible Payments Service (FPS) provides an interface for micropayments.
- Amazon Simple Email Service (SES) provides bulk and transactional email sending.
- Amazon Simple Queue Service (SQS) provides a hosted message queue for web applications.
- Amazon Simple Notification Service (SNS) provides a hosted multi-protocol "push" messaging for applications.
- Amazon Simple Workflow (SWF) is a workflow service for building scalable, resilient applications.
- Amazon Cognito a simple user identity and data synchronization service that helps you securely manage and synchronize app data for your users across their mobile devices.[35]
- Amazon AppStream a flexible, low-latency service that lets you stream resource

intensive applications and games from the cloud.

Analytics

- Amazon Machine Learning a service that makes it easy for developers of all skill levels to use machine learning technology.

Miscellaneous

- Amazon Fulfillment Web Service provides a programmatic web service for sellers to ship items to and from Amazon using Fulfillment by Amazon. This service will no longer be supported by Amazon. All of the functionality of this service is now transferred to Amazon marketplace Web service.
- Amazon Historical Pricing provides access to Amazon's historical sales data from its affiliates. (It appears that this service has been discontinued.)
- Amazon Mechanical Turk (Mturk) manages small units of work distributed among many persons.
- Amazon Product Advertising API formerly known as Amazon Associates Web Service (A2S) and Amazon E-Commerce Service (ECS), provides access to Amazon's product data and electronic commerce functionality.
- Amazon Gift Code On Demand (AGCOD) for Corporate Customers[36] enables companies to distribute Amazon gift cards (gift codes) instantly in any denomination, integrating Amazon's gift-card technology into customer loyalty, employee incentive and payment disbursement platforms.

- AWS Partner Network (APN) provides technology partners and consulting partners with the technical information and sales and marketing support to increase business opportunities through AWS and with businesses using AWS. Launched in April 2012, the APN is made up of Technology Partners including Independent Software Vendors (ISVs), tool providers, platform providers, and others.[37][38][39] Consulting Partners include System Integrators (SIs), agencies, consultancies, Managed Service Providers (MSPs), and others. Potential Technology and Consulting Partners must meet technical and non-technical training requirements set by AWS.

See also

- AppScale
- DigitalOcean
- Eucalyptus (software)
- Force.com
- GoGrid
- Google App Engine

- Google Compute Engine
- Heroku
- HP Converged Cloud
- IBM SmartCloud Services
- Microsoft Azure

- Nodejitsu
- OpenShift
- OpenStack
- Rackspace
- Skytap
- Softlayer
- VMware

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External links

- Amazon Web Services (http://aws.amazon.com/)
- Amazon Web Services Events (http://aws.amazon.com/about-aws/events/)
- Amazon Web Services's channel (https://www.youtube.com/user/AmazonWebServices) on YouTube

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