Introduction to Amazon Web Services

Jeff Barr
Senior AWS Evangelist
@jeffbarr / jbarr@amazon.com
What Does It Take to be a Global Online Retailer?
The Obvious Part...
And the Not-So Obvious Part
How Did Amazon Get into Cloud Computing?

- We’d been working on it for over a decade
- Development of a platform to enable sellers on the Amazon global infrastructure
- Internal need for centralized, scalable deployment environment for applications
- Early forays into web services proved developers were hungry for more
This Led to a Broader Mission

- Enable businesses and developers to use web services (what people now call “the cloud”) to build scalable, sophisticated applications.

“It's not the customers' job to invent for themselves. It's your job to invent on their behalf. You need to listen to customers. You need to invent on their behalf. Kindle, EC2 would not have been developed if we did not have an inventive culture.”

- Jeff Bezos, Founder & CEO, Amazon.com
Attributes of Cloud Computing

No Up-Front Capital Expense

Low Cost

Pay Only for What You Use

Self-Service Infrastructure

Easily Scale Up and Down

Improve Agility & Time-to-Market
Last-Generation IT Services
Cloud-Generation IT Services
Cloud-Generation IT Services

Request Instances Wizard

Choose an Amazon Machine Image (AMI) from one of the tabbed lists below by clicking its Select button.

- **Amazon Linux AMI 2012.03**
  - The Amazon Linux AMI 2012.03 is an EBS-backed, PV-Guest image. It includes Linux 2.6, AWS tools, and repository access to multiple versions of MySQL, PostgreSQL, Python, Ruby, and Tomcat.
  - Root Device Size: 8 GB
  - 64 bit

- **Red Hat Enterprise Linux 6.3**
  - Root Device Size: 7 GB
  - 64 bit

- **SUSE Linux Enterprise Server 11**
  - SUSE Linux Enterprise Server 11 Service Pack 2 basic install, EBS boot with Amazon EBS AMI Tools preinstalled, Apache 2.2, MySQL 5.0, PHP 5.3, and Ruby 1.8.7.
  - Root Device Size: 10 GB
  - 64 bit

- **Ubuntu Server 12.04.4 LTS**
  - Ubuntu Server 12.04.4 LTS with support available from Canonical
  - Root Device Size: 8 GB
  - 64 bit

- **Ubuntu Server 11.10**
  - Ubuntu Server version 11.10, with support available from Canonical
  - Free tier eligible if used with a micro instance. See AWS free tier for complete details and terms.
What’s the Difference?

<table>
<thead>
<tr>
<th>Last-Generation</th>
<th>Cloud-Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT department</td>
<td>Empowered users</td>
</tr>
<tr>
<td>Manual Setup</td>
<td>Automated Setup</td>
</tr>
<tr>
<td>Hours/Days/Weeks</td>
<td>Seconds/Minutes</td>
</tr>
<tr>
<td>Error-prone</td>
<td>Scripted &amp; repeatable</td>
</tr>
<tr>
<td>Small scale</td>
<td>Any scale</td>
</tr>
</tbody>
</table>
## AWS PLATFORM

### Cloud-Powered Applications
- Administration Console
- Identity & Access
- Deployment
- Monitoring

### Application Platform Services
- Content Distribution
- Messaging
- Parallel Processing
- Libraries & SDKs

### Foundation Services
- Compute
- Storage
- Database
- Networking

### Global Infrastructure
- Regions
- Availability Zones
- Edge Locations
Regions and Availability Zones

- **Region** – One of 8 distinct physical locations:
  - Northern Virginia, San Francisco, Oregon, AWS GovCloud (US), Tokyo, Singapore, Brazil, Ireland

- **Availability Zone:**
  - Physical infrastructure (1 or more data centers)
  - 2 or more AZ’s per Region
  - Fault tolerance across AZ’s
EC2 Instance

- Amazon EC2: A Virtual Server in the Cloud
  - Provision and boot new servers in minutes
  - Boot from AMI (Amazon Machine Image)
  - Your choice of Linux or Windows
  - Quickly scale capacity up or down
  - Deploy across Regions and Availability Zones for flexibility & reliability
  - Choose from 14 different instance types

Getting Started

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

Launch Instance

Note: Your instances will launch in the US East (Virginia) region.
EC2 Security Group

- Virtual firewall
- Control access to instance
- Default configuration: no access
EC2 Elastic IP Address

- Fixed IP address
- Map to any EC2 instance in a Region
- Retain address after switching instances
EC2 Elastic Load Balancer

- Distribute traffic to an array of EC2 instances
- Scale up or scale down
- Health checks
- Traffic goes to healthy instances
- Configurable list of ports
Amazon CloudWatch

- Tracks and stores AWS and user-defined metrics
- 2 week retention period
- Detect issues
- Raise alerts
EC2 Auto Scaling

- Control number of running EC2 instances
- Scale up or down as needed
- Drive decisions based on CloudWatch metrics
  - CPU load
  - Network traffic
- Auto-scaling group
  - Instance collection
  - Actions (rules)
EC2 Elastic Block Storage (EBS)

- Virtual disk volumes
- 1 GB – 1 TB per volume
- Create and attach to EC2 instance
- Format and write data
- Snapshot and restore
- Provision desired IOPS (up to 1000 per volume)
### Relational Database Service

To get started, choose the DB Instance details below and click **Continue**

<table>
<thead>
<tr>
<th>Engine</th>
<th>Edition</th>
<th>Select</th>
</tr>
</thead>
<tbody>
<tr>
<td>MySQL</td>
<td>MySQL Community Edition</td>
<td></td>
</tr>
<tr>
<td>ORACLE®</td>
<td>Oracle Database Standard Edition One</td>
<td></td>
</tr>
<tr>
<td>ORACLE®</td>
<td>Oracle Database Standard Edition</td>
<td></td>
</tr>
<tr>
<td>ORACLE®</td>
<td>Oracle Database Enterprise Edition</td>
<td></td>
</tr>
<tr>
<td>sqlserver-ex</td>
<td>Microsoft SQL Server Express Edition</td>
<td></td>
</tr>
</tbody>
</table>

*Note that SQL Server Express Edition limits the storage of per database to a maximum of 10GB. Refer to this link for.*
Amazon DynamoDB

DynamoDB is a fully managed NoSQL database service that provides extremely fast and predictable performance with seamless scalability.
DynamoDB Highlights

• Low Latency
  – SSD-based storage nodes
  – Average reads<5ms, writes<10ms

• Massive and Seamless Scalability
  – No table size or throughput limits
  – Live repartitioning for changes to storage and throughput

• Predictable Performance
  – Provisioned throughput model

• Durable and Available
  – Consistent, disk-only writes
Provisioned Throughput Capacity:

- Help me calculate how much throughput capacity I need to provision

**Throughput capacity to provision:**

Amazon DynamoDB lets you specify how much read and write throughput capacity you wish to provision for your table. Using this information, Amazon will provision the appropriate resources to meet your throughput needs.

More Information

- Read Capacity Units: 10
- Write Capacity Units: 10

⚠️ Throughput capacity for this table will cost up to $8.93 per month if you have exceeded the free tier.

⚠️ If you exceed the free tier you are charged for the provisioned throughput capacity of your table **even if you do not actively use your provisioned capacity.** Learn more about DynamoDB's free tier and pricing.
WEB APPLICATION HOSTING

Highly available and scalable web hosting can be complex and expensive. Dense peak periods and wild swings in traffic patterns result in low utilization rates of expensive hardware. Amazon Web Services provides the reliable, scalable, secure, and high-performance infrastructure required for web applications while enabling an elastic, scale out and scale down infrastructure to match IT costs in real time as customer traffic fluctuates.
Online games back-end infrastructures can be challenging to maintain and operate. Peak usage periods, multiple players, and high volumes of write operations are some of the most common problems that operations teams face. But the most difficult challenge is ensuring flexibility in the scale of that system. A popular game might suddenly receive millions of users in a matter of hours, yet it must continue to provide a satisfactory player experience. Amazon Web Services provides different tools and services that can be used for building online games that scale under high usage traffic patterns. This document presents a cost-effective online game architecture featuring automatic capacity adjustment, a highly available and high-speed database, and a data processing cluster for player behavior analysis.
For More Information

• AWS Home Page – http://aws.amazon.com

• AWS Blog – http://aws.typepad.com

• AWS Architecture Center - http://aws.amazon.com/architecture/

• @jeffbarr

• @awscloud
Thank You
Q & A