Ahead in the Cloud
with Amazon Web Services

Matt Wood
TECHNOLOGY EVANGELIST
Thank you.
Decades of experience

Operations, management and scale
Programmatic access
Unexpected innovation
Blinding flash of the obvious
5 years young
<table>
<thead>
<tr>
<th>Compute</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Databases</td>
<td>Services &amp; Support</td>
</tr>
</tbody>
</table>
4

Cloud concepts

Foundations

Maximising value

Security in the Cloud
Cloud concepts

Or: five things I wish I’d known before getting started
1. Signing up
On the web
Introducing Amazon ElastiCache
Turbo-charge your web apps with a managed in-memory cache. 100% Memcached compatible.

Get Started
Business Managers
Learn how Amazon Web Services enables you to reach business goals faster:
- Solutions & Use Cases
- Security & Compliance
- Economics Center
- Case Studies
- Service Health Dashboard
- Solution Providers
- Videos & Webinars
- AWS Blog

Developers
Access resources to help you build software using the technology of your choice.
- Architecture Center

News & Events
What’s New?
Sep 27, 2011 Amazon Route 53 Reduces Hosted Zone Pricing
Sep 18, 2011 Announcing Windows support for Amazon EC2 Cluster Compute and Cluster GPU instances
Sep 15, 2011 AWS FISMA Moderate
Sep 08, 2011 AWS Direct Connect announces general availability in the US West Region
Sep 08, 2011 Announcing the AWS Toolkit for Visual Studio
Sep 07, 2011 AWS Mobile SDKs Exit Beta With Support for Credential Management

Products & Services
Compute
Amazon Elastic Compute Cloud (EC2)
Amazon Elastic MapReduce
Auto Scaling
Content Delivery
Amazon CloudFront

Networking
Amazon Route 53
Amazon Virtual Private Cloud (VPC)
Elastic Load Balancing
AWS Direct Connect
Free tier

For new customers
Free tier

- 750 hours of compute
- 10Gb network storage
- 5Gb Simple Storage Service
- SimpleDB, queues, notifications
2. Interacting
API driven
API driven
Welcome to the AWS Documentation library. Here you will find official documentation for each AWS product ranging from service introductions, to advanced service features, to API reference, as well as other useful documentation. To get started, click on one of the services below to see a list of available publications.

**Compute**
- Amazon Elastic Compute Cloud (EC2)
- Amazon Elastic MapReduce
- Auto Scaling
- Content Delivery
- Amazon CloudFront
- Database
- Amazon SimpleDB
- Amazon Relational Database Service (RDS)
- Amazon ElastiCache
- Deployment & Management
- AWS Elastic Beanstalk
- AWS CloudFormation
- E-Commerce
- Amazon Fulfillment Web Service (FWS)
- Identity & Access
- AWS Identity and Access Management (IAM)

**Networking**
- Amazon Route 53
- Amazon Virtual Private Cloud (VPC)
- AWS Direct Connect
- Elastic Load Balancing
- Payments & Billing
- Amazon Flexible Payments Service (FPS and ASP)
- Amazon DevPay
- Software Development Kits (SDKs)
- AWS SDK for Android
- AWS SDK for iOS
- AWS SDK for Java
- AWS SDK for .NET
- AWS SDK for PHP
- AWS SDK for Ruby
- AWS Toolkit for Eclipse
- AWS Toolkit for Visual Studio
ec2-run-instances
ec2-terminate-instances
Management console
Select one of your buckets to the left to look at the objects it contains, or to upload objects into it.
Linux
Certificate based root access
mza$ ssh -i web/us-east/aws-web.pem
root@ec2-204-236-247-169.compute-1.amazonaws.com

__|  __|_  ) CentOS
|  (     /    v5.4
___|___|___| HVMx64

Welcome to an EC2 Public Image
:

[root@ip-10-17-135-244 ~]#
Windows
Administrator access
3. Storage options
Ephemeral storage
Ephemeral storage

Included with compute

Lost at termination

Not backed up
When it’s gone, it’s gone
Elastic Block Store
Elastic Block Store

- Network attached
- Mount as volume
- Snapshot
- Persistent
Persistent

Root partitions. Mount as volumes.
S3

- Highly durable
- Tolerant to two simultaneous failures
- Highly available
99.9999999999999999999% durability
Objects in S3

Billions of objects

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Billions of Objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4 2006</td>
<td>~0</td>
</tr>
<tr>
<td>Q4 2007</td>
<td>~5</td>
</tr>
<tr>
<td>Q4 2008</td>
<td>~20</td>
</tr>
<tr>
<td>Q4 2009</td>
<td>~60</td>
</tr>
<tr>
<td>Q4 2010</td>
<td>~160</td>
</tr>
<tr>
<td>Q3 2011</td>
<td>~556</td>
</tr>
</tbody>
</table>

Q3 2011: 556B
370,000 peak transactions per second
4. Payment options
Pay as you go
Gb/month
ECU/hour
No minimum
No subscriptions
Pricing tiers
Consolidated billing
Options
On-demand
Reserved capacity
Spot instances
On-demand: $0.57 per hour
Bandwidth
Free inbound
Reduced outbound
Pricing calculator
NEW! - Introducing Amazon ElastiCache

FREE USAGE TIER: New Customers get free usage tier for first 12 months

Services

Choose region: US-East (Northern Virginia)

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides resizable compute capacity in the cloud. It is designed to make web-scale computing easier for developers. Amazon Elastic Block Store (EBS) provides persistent storage to Amazon EC2 instances.

### Compute: Amazon EC2 On-Demand Instances:

<table>
<thead>
<tr>
<th>Instances</th>
<th>Description</th>
<th>Operating System</th>
<th>Instance Type</th>
<th>Usage</th>
<th>Detailed Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>Linux/OpenSolaris</td>
<td>Micro</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hours/ Month</td>
</tr>
</tbody>
</table>

### Compute: Amazon EC2 Reserved Instances:

<table>
<thead>
<tr>
<th>Instances</th>
<th>Description</th>
<th>OS</th>
<th>Type</th>
<th>Term</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>Linux</td>
<td>Small</td>
<td>3 yr</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hours/ Month</td>
</tr>
</tbody>
</table>

### Storage: Amazon EBS Volumes:

<table>
<thead>
<tr>
<th>Volumes</th>
<th>Description</th>
<th>Provisioned Storage</th>
<th>Average IOPS in volume</th>
<th>Snapshot Storage*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>0 GB-month</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Elastic IP:

- Number of Elastic IPs: 0
- Elastic IP Non-attached Time: 0
- Number of Elastic IP Remaps: 0 Times/Month

calculator.s3.amazonaws.com/calc5.html
5. Availability Zones
us-east
us-west
eu-west
ap-southeast
ap-northeast
eu-west-1a
eu-west-1b
eu-west-1c
Foundations
Compute
Elastic Compute Cloud
Windows + Linux instances
Instance sizes
Instance sizes

- Micro
- Standard
- Cluster Compute
- High memory
- High CPU
Dual "Nehalem"
1.7Tb disk
HVM
Code \(\rightarrow\) State \(\rightarrow\) Config \(\rightarrow\) Services

\textbf{Amazon Machine Image}

\texttt{ami-219387e}
Pre-configured
Custom
Custom

Private

Public
Elastic Block Store
m1.large
Elastic block store

m1.large

100Gb

Persistent
Scalable
Snapshot
m1.large

100Gb
Private, stored securely
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.

Service Health

- Current Status: Amazon EC2 (US East - N. Virginia)
- Details: Service is operating normally
  → View complete service health details

Related Links

- Documentation
- All EC2 Resources
- Forums
- Feedback
- Report an Issue
<table>
<thead>
<tr>
<th>Quick Start</th>
<th>AMI Type</th>
<th>Details</th>
<th>Select</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>My AMIs</strong></td>
<td>Basic 32-bit Amazon Linux AMI 1.0</td>
<td>Amazon Linux AMI Base 1.0, EBS boot, 32-bit architecture with Amazon EC2 AMI Tools. <strong>Root Device Size:</strong> 10 GiB</td>
<td><img src="Select" alt="Select" /></td>
</tr>
<tr>
<td><strong>Community AMIs</strong></td>
<td>Basic 64-bit Amazon Linux AMI 1.0</td>
<td>Amazon Linux AMI Base 1.0, EBS boot, 64-bit architecture with Amazon EC2 AMI Tools. <strong>Root Device Size:</strong> 10 GiB</td>
<td><img src="Select" alt="Select" /></td>
</tr>
<tr>
<td><strong>My AMIs</strong></td>
<td>SUSE Linux Enterprise Server 11 32-bit</td>
<td>SUSE Linux Enterprise Server 11 Service Pack 1 basic install, EBS boot, 32-bit architecture with Amazon EC2 AMI Tools preinstalled; Apache 2.2, MySQL 5.0, PHP 5.3, Ruby 1.8.7, and Rails 2.3. <strong>Root Device Size:</strong> 15 GiB</td>
<td><img src="Select" alt="Select" /></td>
</tr>
<tr>
<td><strong>Community AMIs</strong></td>
<td>SUSE Linux Enterprise Server 11 64-bit</td>
<td>SUSE Linux Enterprise Server 11 Service Pack 1 basic install, EBS boot, 64-bit architecture with Amazon EC2 AMI Tools preinstalled; Apache 2.2, MySQL 5.0, PHP 5.3, Ruby 1.8.7, and Rails 2.3. <strong>Root Device Size:</strong> 15 GiB</td>
<td><img src="Select" alt="Select" /></td>
</tr>
<tr>
<td><strong>My AMIs</strong></td>
<td>Getting Started on Microsoft Windows Server 2008</td>
<td>Microsoft Windows Server 2008 R1 SP2 Datacenter edition, 32-bit architecture, Microsoft SQL Server 2008 Express, Internet Information Services 7, ASP.NET 3.5. <strong>Root Device Size:</strong> 30 GiB</td>
<td><img src="Select" alt="Select" /></td>
</tr>
</tbody>
</table>
Choose an Amazon Machine Image (AMI) from one of the tabbed lists below by clicking its **Select** button.

**Community AMIs**

<table>
<thead>
<tr>
<th>AMI ID</th>
<th>Root Device</th>
<th>Manifest</th>
<th>Platform</th>
<th>Select</th>
</tr>
</thead>
<tbody>
<tr>
<td>ami-7ea24a17</td>
<td>ebs</td>
<td>amazon/EC2 CentOS 5.4 HVM AMI</td>
<td>CentOS</td>
<td><img src="select.png" alt="Select" /></td>
</tr>
<tr>
<td>ami-aa30c7c3</td>
<td>ebs</td>
<td>amazon/EC2 CentOS 5.5 GPU HVM AMI</td>
<td>CentOS</td>
<td><img src="select.png" alt="Select" /></td>
</tr>
</tbody>
</table>
Request Instances Wizard

Provide the details for your instance(s). You may also decide whether you want to launch your instances as "on-demand" or "spot" instances.

Number of Instances: 1  Availability Zone: No Preference

Instance Type: Cluster Compute (cc1.4xlarge, 23 GB)

Launch Instances

EC2 Instances let you pay for compute capacity by the hour with no long term commitments. This transforms what are commonly large fixed costs into much smaller variable costs.

Request Spot Instances

Launch Instances Into Your Virtual Private Cloud

Continue
Request Instances Wizard

Number of Instances: 1
Availability Zone: No Preference

Advanced Instance Options
You can choose to launch Cluster Compute Instances in a placement group by either providing a new name for one to be created or selecting one of your existing placement groups. You can also choose to enable CloudWatch Detailed Monitoring or enter data that will be available from your instances once they launch.

Placement Group: Create new placement group... cluster
Strategy: Cluster
Monitoring: Enable CloudWatch detailed monitoring for this instance (additional charges will apply)

User Data:

Continue
Public/private key pairs allow you to securely connect to your instance after it launches. To create a key pair, enter a name and click Create & Download your Key Pair. You will then be prompted to save the private key to your computer. Note, you only need to generate a key pair once - not each time you want to deploy an Amazon EC2 instance.

1. Enter a name for your key pair: *amazon-hpc (e.g., jdoekey)
2. Click to create your key pair: Create & Download your Key Pair

Save this file in a place you will remember. You can use this key pair to launch other instances in the future or visit the Key Pairs page to create or manage existing ones.

Proceed without a Key Pair
Security groups determine whether a network port is open or blocked on your instances. You may use an existing security group, or we can help you create a new security group to allow access to your instances using the suggested ports below. Add additional ports now or update your security group anytime using the Security Groups page. All changes take effect immediately.

### Create a new Security Group

1. **Name your Security Group**
   - HPC

2. **Describe your Security Group**
   - Security settings for HPC applications

3. **Define allowed Connections**

<table>
<thead>
<tr>
<th>Application</th>
<th>Transport</th>
<th>Port</th>
<th>Source Network (IPv4 CIDR)</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSH</td>
<td>TCP</td>
<td>22</td>
<td>All Internet</td>
<td>Remove</td>
</tr>
</tbody>
</table>

[Continue button]
### Security Groups

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPC</td>
<td>Security settings for HPC applications</td>
</tr>
<tr>
<td>default</td>
<td>default group</td>
</tr>
</tbody>
</table>

#### 1 Security Group selected

- **Group Name:** HPC
- **Description:** Security settings for HPC applications

#### Allowed Connections:

<table>
<thead>
<tr>
<th>Connection Method</th>
<th>Protocol</th>
<th>From Port</th>
<th>To Port</th>
<th>Source (IP or group)</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSH</td>
<td>tcp</td>
<td>22</td>
<td>22</td>
<td>0.0.0.0/0</td>
<td></td>
</tr>
<tr>
<td>Custom...</td>
<td></td>
<td></td>
<td></td>
<td>HPC</td>
<td>Save</td>
</tr>
</tbody>
</table>

---
Request Instances Wizard

Please review the information below, then click Launch.

AMI: CentOS AMI ID ami-7ea24a17 (x86_64) Edit AMI

Number of Instances: 1
  Availability Zone: No Preference
  Instance Type: Cluster Compute (cc1.4xlarge)
  Instance Class: On Demand

Placement Group: cluster
  Strategy: cluster
  Monitoring: Disabled
  User Data: Edit Advanced Details

Key Pair Name: amazon-hpc
  Edit Key Pair

Security Group(s): HPC
  Edit Firewall
<table>
<thead>
<tr>
<th>Name</th>
<th>Instance</th>
<th>AMI ID</th>
<th>Root Device</th>
<th>Type</th>
<th>Status</th>
<th>Security Groups</th>
<th>Key Pair Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>i-142d7e79</td>
<td>ami-7ea24a17</td>
<td>ebs</td>
<td>cc1.4xlarge</td>
<td>pending</td>
<td>HPC</td>
<td></td>
<td>amazon-hpc</td>
</tr>
<tr>
<td>Name</td>
<td>Instance</td>
<td>AMI ID</td>
<td>Root Device</td>
<td>Type</td>
<td>Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>--------</td>
<td>-------------</td>
<td>--------------</td>
<td>------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i-142d7e79</td>
<td>ami-7ea24a17</td>
<td>ebs</td>
<td>cc1.4xlarge</td>
<td>running</td>
<td>HPC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Kernel ID:**

**AMI Launch Index:** 0

**Monitoring:** basic

**Root Device:** /dev/sda1

**Elastic IP:**

**Root Device Type:** ebs

**Block Devices:**

/dev/sda1=vol-9b78bcf3:attached:2010-12-03T13:40:52.000Z:true

**Lifecycle:** normal

**Public DNS:** ec2-75-101-217-74.compute-1.amazonaws.com

**Private DNS:** ip-10-17-53-51.ec2.internal

**Private IP Address:** 10.17.53.51

**Launch Time:** 2010-12-03 13:40 GMT

**State Transition Reason:**
### My Instances

<table>
<thead>
<tr>
<th>Name</th>
<th>Instance ID</th>
<th>AMI ID</th>
<th>Root Device</th>
<th>Type</th>
<th>Status</th>
<th>Security Groups</th>
<th>Key Pair Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>i-142d7e79</td>
<td>ami-7ea24a17</td>
<td>ebs</td>
<td>cc1.4xlarge</td>
<td>running</td>
<td>HPC</td>
<td>amazon-hpc</td>
</tr>
</tbody>
</table>

### Avg CPU Utilization (Percent)

<table>
<thead>
<tr>
<th>Percent</th>
<th>100</th>
<th>50</th>
<th>0</th>
<th>12/3 13:00</th>
<th>12/3 13:30</th>
</tr>
</thead>
</table>

### Avg Disk Reads (Bytes)

<table>
<thead>
<tr>
<th>Bytes</th>
<th>1.0</th>
<th>0.5</th>
<th>0.0</th>
<th>0.0</th>
<th>0.0</th>
<th>-0.5</th>
<th>-1.0</th>
<th>12/3 13:00</th>
<th>12/3 13:30</th>
</tr>
</thead>
</table>

### Avg Disk Writes (Bytes)

<table>
<thead>
<tr>
<th>Bytes</th>
<th>1.0</th>
<th>0.5</th>
<th>0.0</th>
<th>0.0</th>
<th>0.0</th>
<th>-0.5</th>
<th>-1.0</th>
<th>12/3 13:00</th>
<th>12/3 13:30</th>
</tr>
</thead>
</table>

### Max Network In (Bytes)

<table>
<thead>
<tr>
<th>Bytes</th>
<th>1.0</th>
<th>0.5</th>
<th>0.0</th>
<th>0.0</th>
<th>0.0</th>
<th>-0.5</th>
<th>-1.0</th>
<th>12/3 13:00</th>
<th>12/3 13:30</th>
</tr>
</thead>
</table>

### Max Network Out (Bytes)

<table>
<thead>
<tr>
<th>Bytes</th>
<th>1.0</th>
<th>0.5</th>
<th>0.0</th>
<th>0.0</th>
<th>0.0</th>
<th>-0.5</th>
<th>-1.0</th>
<th>12/3 13:00</th>
<th>12/3 13:30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Volume ID</td>
<td>Capacity</td>
<td>Snapshot</td>
<td>Created</td>
<td>Zone</td>
<td>Status</td>
<td>Attachments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>--------------</td>
<td>----------</td>
<td>------------</td>
<td>----------------------</td>
<td>---------</td>
<td>----------</td>
<td>-------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>vol-9b78bcf3</td>
<td>20 GiB</td>
<td>snap-1099e578</td>
<td>2010-12-03 13:40 GMT</td>
<td>us-east-1a</td>
<td>in-use</td>
<td>i-142d7e7f</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0 Elastic Block Store Volumes selected

Select a volume above
Create Volume

Size: 100 GiB

Availability Zone: us-east-1a

Snapshot: No Snapshot

Create
<table>
<thead>
<tr>
<th>Name</th>
<th>Volume ID</th>
<th>Capacity</th>
<th>Snapshot</th>
<th>Created</th>
<th>Zone</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>vol-4179bd29</td>
<td>100 GiB</td>
<td>--</td>
<td>2010-12-03 13:41 GMT</td>
<td>us-east-1a</td>
<td>available</td>
</tr>
<tr>
<td></td>
<td>vol-9b78bcf3</td>
<td>20 GiB</td>
<td>snap-1099e578</td>
<td>2010-12-03 13:40 GMT</td>
<td>us-east-1a</td>
<td>in-use</td>
</tr>
</tbody>
</table>
Attach Volume

Volume: vol-4179bd29 in us-east-1a
 Instances: i-142d7e79 in us-east-1a
 Device: /dev/sdh

Windows Devices: xvdf through xvdp
Linux Devices: /dev/sdf through /dev/sdp

Attach
Mount, and away you go...
Oracle
Oracle

Licence on EC2

Use existing licences
Days to minutes
Certified
+
supported
Rapid Deployment Solutions

SAP BusinessObjects

Licence for EC2

Use existing licences
Storage
Simple Storage Service
Files in directories
Objects in buckets
http://s3.amazonaws.com/bucketname/objectid

http://bucketname.s3.amazonaws.com/objectid
https://s3.amazonaws.com/bucketname/objectid

https://bucketname.s3.amazonaws.com/objectid
Large objects

5Tb
Import/Export
S3 websites
Flexibility
Packaged + ready to roll
IBM DB2

32 and 64 bit
SQL Server

32 and 64 bit
PostgreSQL
and EnterpriseDB
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 West (N. California) region.

My Resources

You are using the following Amazon EC2 resources in the US West (N. California) region:

- 0 Running Instances
- 0 Elastic IPs
- 1 EBS Volume
- 0 EBS Snapshots
- 1 Key Pair
- 3 Security Groups
- 0 Load Balancers
- 0 Error

Service Health

Current Status: Amazon EC2 (US West - N. California) Service is operating normally

View complete service health details

Related Links

- Documentation
- All EC2 Resources
- Forums
- Feedback
- Report an Issue
<table>
<thead>
<tr>
<th>AMI ID</th>
<th>Root Device</th>
<th>Manifest</th>
<th>Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>ami-4f69380a</td>
<td>instance-store</td>
<td>oracle-corporation-linux-us-west-1/enterprise-linux-am</td>
<td>Other Linux</td>
</tr>
<tr>
<td>ami-51693814</td>
<td>instance-store</td>
<td>oracle-corporation-linux-us-west-1/enterprise-linux-am</td>
<td>Other Linux</td>
</tr>
<tr>
<td>ami-6b69381e</td>
<td>instance-store</td>
<td>oracle-corporation-linux-us-west-1/enterprise-linux-am</td>
<td>Other Linux</td>
</tr>
<tr>
<td>ami-6d693828</td>
<td>instance-store</td>
<td>oracle-corporation-linux-us-west-1/enterprise-linux-am</td>
<td>Other Linux</td>
</tr>
<tr>
<td>ami-936c3dd6</td>
<td>instance-store</td>
<td>oracle-corporation-linux-us-west-1/enterprise-linux-am</td>
<td>Other Linux</td>
</tr>
<tr>
<td>ami-f96c3dbc</td>
<td>instance-store</td>
<td>oracle-corporation-linux-us-west-1/enterprise-linux-am</td>
<td>Other Linux</td>
</tr>
</tbody>
</table>

Free tier eligible. This AMI will not incur additional costs when used with a free tier instance.
Request Instances Wizard

Choose an AMI

Provide the details for your instance(s). You may also decide whether you want to launch your instances as “on-demand” or “spot” instances.

Number of Instances: 1

Availability Zone: No Preference

Instance Type: High-CPU Medium (c1.medium, 1.7 GB)

Termination Protection: Prevention against accidental termination.

Note, launching a t1.micro instance requires that you select an AMI with an EBS-backed root device.

Launch Instances

EC2 Instances let you pay for compute capacity by the hour with no long term commitments. This transforms what are commonly large fixed costs into much smaller variable costs.

Request Spot Instances

Continue
Request Instances Wizard

Please review the information below, then click Launch.

AMI: Other Linux AMI ID ami-51693814 (i386) Edit AMI

Number of Instances: 1
Availability Zone: No Preference
Instance Type: High-CPU Medium (c1.medium)
Instance Class: On Demand
Termination Protection: Disabled
Monitoring: Disabled
Kernel ID: Use Default
RAM Disk ID: Use Default
User Data: Edit Advanced Details
Key Pair Name: aws-1
Security Group(s): default

Launch
<table>
<thead>
<tr>
<th>Name</th>
<th>Instance ID</th>
<th>AMI ID</th>
<th>Root Device</th>
<th>Type</th>
<th>Status</th>
<th>Security Groups</th>
<th>Key Pair Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>empty</td>
<td>i-80b9f9c4</td>
<td>ami-51693814</td>
<td>instance-s</td>
<td>c1.mediur</td>
<td>running</td>
<td>default</td>
<td>aws-1</td>
</tr>
</tbody>
</table>

EC2 Instance: i-80b9f9c4

- AMI ID: ami-51693814
- Security Groups: default
- Status: running
- Zone: us-west-1b
- Type: c1.medium
- Owner: 545609309072
- VPC ID: -
- Subnet ID: paravirtual
- Virtualization: r-446a0200
- Placement Group: -
Configure, optimise
Snapshots + backup
Relational Database Service
Relational Database Service

MySQL  ->  Oracle

Relational Database Service
Managed
Rapid
Scalable storage
Scalable instance
Synchronous replication

eu-west-1a  eu-west-1b

High availability. Multi-AZ.
Asynchronous replication

Read replicas
Remove the "muck"
Extra services
Simple Queue Service
Simple Notification Service
Elastic MapReduce
Input data ➔ S3

Code ➔ Elastic MapReduce
Input data

S3

Code

Elastic MapReduce

Name node
Input data

S3

Code → Elastic MapReduce → Name node → Elastic cluster
Input data

S3

Elastic cluster

HDFS

Queries + BI
Via JDBC, Pig, Hive

Elastic MapReduce

Name node

Code

File

Elastic MapReduce

HDFS

Elastic cluster

Queries + BI
Via JDBC, Pig, Hive
Input data

Code

Elastic MapReduce

Name node

Elastic cluster

Queries + BI

Via JDBC, Pig, Hive

HDFS

Output

S3 + SimpleDB
Input data

Elastic MapReduce

S3

Output
S3 + SimpleDB
Undifferentiated
heavy lifting
Platform grows with you
Premium support

Bronze, Silver, Gold, Platinum
Maximising Value
Elasticity
Design for elasticity
Horizontal scale
“Everything fails, all the time”

Werner Vogels
Build for failure
Build for availability
Treat your data as your royal garden.
Compute as an interchangeable resource
Auto-scaling
Elastic Load Balancer
Choice of instance sizes
Elastic by default

SimpleDB, SQS, SNS, S3
Applications in the cloud
3 tiers
Application tier

- Code
- Configuration
Application tier:
- Code
- Configuration

Service tier:
- Operating system
- Launch configuration
- Integration settings
- Services + configuration

Infrastructure tier:
- AMIs
- Architecture
- Multi-AZ
- Scaling rules
- Security groups
- Middleware
Value baked into each tier
Value in application
Value in service tier
Value in service tier

Optimisation
Configuration
Technology choices
Value in infrastructure
Value in infrastructure

- Engine room
- Optimised
- Scalable
- Fault tolerant
Maximising value

Automation maximises this value
Automate everything
CloudFormation
Template
Define a full infrastructure stack
Resources

EC2

Auto-scaling

SNS

RDS

SimpleDB

SQS

Elastic Beanstalk

CloudWatch

Security groups

Tags
Complete definition
Atomic
Idempotent
Declarative language
{
    "AWSTemplateFormatVersion" : "2010-09-09",
    "Description" : "Create an EC2 instances",
    "Parameters" : {
        "KeyName" : {
            "Description" : "Name of an existing EC2 KeyPair to enable SSH access to the instance",
            "Type" : "String"
        }
    },
    "Mappings" : {
        "RegionMap" : {
            "us-east-1" : {
                "AMI" : "ami-76f0061f"
            },
            "us-west-1" : {
                "AMI" : "ami-655a0a20"
            },
            "eu-west-1" : {
                "AMI" : "ami-7fd4e10b"
            },
            "ap-southeast-1" : {
                "AMI" : "ami-72621c20"
            },
            "ap-northeast-1" : {
                "AMI" : "ami-8e08a38f"
            }
        }
    },
    "Resources" : {
        "Ec2Instance" : {
            "Type" : "AWS::EC2::Instance",
            "Properties" : {
                "KeyName" : { "Ref" : "KeyName" },
                "ImageId" : { "Fn::FindInMap" : [ "RegionMap", { "Ref" : "AWS::Region" }, "AMI" ]},
                "UserData" : { "Fn::Base64" : "80" }
            }
        }
    },
    "Outputs" : {
        "InstanceId" : {
            "Description" : "InstanceId of the newly created EC2 instance",
            "Value" : { "Ref" : "Ec2Instance" }
        },
        "AZ" : {
            "Description" : "Availability Zone of the newly created EC2 instance",
            "Value" : { "Fn::GetAtt" : [ "Ec2Instance", "AvailabilityZone" ]}
        },
        "PublicIP" : {
            "Description" : "Public IP address of the newly created EC2 instance",
            "Value" : { "Fn::GetAtt" : [ "Ec2Instance", "PublicIp" ]}
        }
    }
}
{
    "AWSTemplateFormatVersion": "2010-09-09",
    "Description": "Create an EC2 instances",
    "Parameters": {
        "KeyName": {
            "Description": "Name of an existing EC2 KeyPair to enable SSH access to the instance",
            "Type": "String"
        }
    },
    "Mappings": {
        "RegionMap": {
            "us-east-1": {
                "AMI": "ami-76f0061f"
            },
            "us-west-1": {
                "AMI": "ami-655a0a20"
            },
            "eu-west-1": {
                "AMI": "ami-7fd4e10b"
            },
            "ap-southeast-1": {
                "AMI": "ami-72621c20"
            },
            "ap-northeast-1": {
                "AMI": "ami-8e08a38f"
            }
        }
    },
    "Resources": {
        "Ec2Instance": {
            "Type": "AWS::EC2::Instance",
            "Properties": {
                "KeyName": { "Ref": "KeyName" },
                "ImageId": { "Fn::FindInMap": [ "RegionMap", { "Ref": "AWS::Region" }, "AMI" ]},
                "UserData": { "Fn::Base64": "80" }
            }
        }
    },
    "Outputs": {
        "InstanceId": {
            "Description": "InstanceId of the newly created EC2 instance",
            "Value": { "Ref": "Ec2Instance" }
        },
        "AZ": {
            "Description": "Availability Zone of the newly created EC2 instance",
            "Value": { "Fn::GetAtt": [ "Ec2Instance", "AvailabilityZone" ]}
        },
        "PublicIP": {
            "Description": "Public IP address of the newly created EC2 instance",
            "Value": { "Fn::GetAtt": [ "Ec2Instance", "PublicIp" ]}
        }
    }
}
Elastic Beanstalk
Java web applications
Upload WAR
Your Application

Application Service
  Java Web Platform

HTTP Service
  Tomcat

Language Interpreter
  Java

Operating System
  Linux

Server
  Amazon EC2
Best practice
Highly available
Customisable
Flexible
Free

Only pay for the provisioned resources
Monitored
Insight
Free

5 minute resolution
Detailed monitoring

1 minute resolution
CPU Utilization
Disk Read Bytes
Disk Read Ops
Disk Write Bytes
Disk Write Ops
Network In
Network Out
Database Connections
Free Storage Space
Read Latency
Read Throughput
Swap Usage
Write Latency
Write Throughput
Custom metrics
Price aware
Mix On-demand, Reserved Capacity and Spot
Relate to business metrics
Cost per user
Cost per operation
White papers:
aws.amazon.com/whitepapers
Premature
Maximise value
Security in the Cloud
Shared responsibility
Requirement based access
Certification
ISO 27001
+
SAS 70 Type II
PCI DSS
Level 1
## Control objectives

<table>
<thead>
<tr>
<th>Security organisation</th>
<th>Employee lifecycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical security</td>
<td>Secure data handling</td>
</tr>
<tr>
<td>Physical security</td>
<td>Environmental safeguards</td>
</tr>
<tr>
<td>Change management</td>
<td>Incident handling</td>
</tr>
<tr>
<td>Data integrity</td>
<td>Availability and redundancy</td>
</tr>
</tbody>
</table>
DDOS
Man in the Middle
IP spoofing
Data access control
Detailed logging
Data stays local
Identity and access control
API level rights management
Account

Roles

- DBA
- Developer
- Sys admin
- Finance
Security credentials
Multifactor authentication
Management console access
Data read/write access
API level access
Network isolation
Virtual Private Cloud
Virtual network topology
Virtual network topology

- IP address range
- Public, private subnets
- Route tables
- Network gateways
Network access control
Network access control

Inbound

Outbound

S3 access

VPN
Dedicated instances
Public facing website

Public subnet
Multi-tier applications

Public subnet

Network ACLs + security groups

Private subnet
Extend your data centre

Public subnet

Private subnet

On-premise

IPsec VPN
Extend your data centre

Private subnet

IPsec VPN

On-premise

Extend your data centre
DR

Backup to EC2 and EBS

VM import
aws.amazon.com
Thank you!
QUESTIONS + FEEDBACK:

matthew@amazon.com

@amza

ON TWITTER