A Guided Tour

of Amazon Web Services

Dr. Matt Wood
TECHNOLOGY EVANGELIST
Hello.
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</td>
</tr>
<tr>
<td></td>
<td>&amp; Support</td>
</tr>
</tbody>
</table>
Low cost
Low cost

- Pay as you go
- No contracts
- No cap-ex
- Pay for what you use
Flexible
Flexible

Existing tools

Existing skills

Platform grows with you
Available, low cost, flexible
Productivity
AGENDA

SOCC - October 26th, 2011

- Cloud Concepts
- Foundational Building Blocks
- 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.

Learn more...

News & Events

What's New?  Media Coverage  Upcoming Events

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

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

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)
Elasti Load Balancing
AWS Direct Connect

Developers
Access resources to help you build software using the technology of your choice.
- Architecture Center
Introducing Amazon ElastiCache
Turbo-charge your web apps with a managed in-memory cache. 100% Memcached compatible.
Learn more...

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

Media Coverage

Upcoming Events

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

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
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

REST

SOAP
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
CLI
ec2-run-instances
ec2-terminate-instances
SDK
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
Included with compute

Ephemeral storage

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

Highly available

Tolerant to two simultaneous failures
99.9999999999% durability
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

**Language:** English

### Services

**Choose region:** US-East (Northern Virg.)

**Inbound Data Transfer is Free and Outbound Data Transfer is 1 GB per region per month**

#### Amazon EC2

*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>
</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>
</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 GB-month of Storage</td>
</tr>
</tbody>
</table>

### Elastic IP:

- **Number of Elastic IPs:** 0
- **Elastic IP Non-attached Time:** 0
- **Number of Elastic IP Remaps:** 0

---

calculator.s3.amazonaws.com/calc5.html
5. Availability Zones
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
Amazon Machine Image
Pre-configured
Custom
Custom

Private

Public
Elastic Block Store
m1.large

100Gb
Elastic block store

- m1.large
- 100Gb
- Persistent
- Scalable
- Snapshot
Private, stored securely
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.

Service Health

<table>
<thead>
<tr>
<th>Current Status</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon EC2 (US East - N. Virginia)</td>
<td>Service is operating normally</td>
</tr>
</tbody>
</table>

My Resources

You are using the following Amazon EC2 resources in the US East (Virginia) region:

- 0 Running Instances
- 0 Elastic IPs
- 0 EBS Volumes
- 0 EBS Snapshots
- 0 Key Pairs
- 1 Security Group
- 0 Load Balancers
- 0 Placement Groups

Related Links

- Documentation
- All EC2 Resources
- Forums
- Feedback
- Report an Issue
Choose an Amazon Machine Image (AMI) from one of the tabbed lists below by clicking its Select button.

<table>
<thead>
<tr>
<th>Quick Start</th>
<th>AMIs</th>
<th>Community AMIs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic 32-bit Amazon Linux AMI 1.0 (AMI Id: ami-08728661)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Basic 64-bit Amazon Linux AMI 1.0 (AMI Id: ami-2272864b)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SUSE Linux Enterprise Server 11 32-bit (AMI Id: ami-e0a35789)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SUSE Linux Enterprise Server 11 64-bit (AMI Id: ami-e4a3578d)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Getting Started on Microsoft Windows Server 2008 (AMI Id: ami-c5e40dac)</td>
<td></td>
</tr>
</tbody>
</table>
Choose an Amazon Machine Image (AMI) from one of the tabbed lists below by clicking its **Select** button.

1. **Quick Start**
2. **My AMIs**
3. **Community AMIs**

**Viewing:** Amazon Images

<table>
<thead>
<tr>
<th>AMI ID</th>
<th>Root Device</th>
<th>Manifest</th>
<th>Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>ami-7ea24a17</td>
<td>ebs</td>
<td>amazon/EC2 CentOS 5.4 HVM AMI</td>
<td>CentOS</td>
</tr>
<tr>
<td>ami-aa30c7c3</td>
<td>ebs</td>
<td>amazon/EC2 CentOS 5.5 GPU HVM AMI</td>
<td>CentOS</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:**

- base64 encoded

[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.

**Create a new Key Pair**

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*

**Proceed without a 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.
The Request Instances Wizard is used to configure a new security group. The wizard provides the ability to choose existing security groups or create a new one. The new security group will allow access to instances using suggested ports. Additional ports can be added or updated at any time using the Security Groups page. Changes take effect immediately.

1. Choose one or more of your existing Security Groups
2. Create a new Security Group
   - Name your Security Group: HPC
   - Describe your Security Group: Security settings for HPC applications
   - Define allowed Connections:
     - SSH: TCP, Port 22, Source Network: All Internet

You can select, add, or remove rules as needed. Click 'Continue' to proceed.
## 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>Remove</td>
</tr>
<tr>
<td>Custom...</td>
<td></td>
<td></td>
<td></td>
<td>HPC</td>
<td>Save</td>
</tr>
</tbody>
</table>
Request Instances Wizard

Choose an AMI | Instance Details | Create Key Pair | Configure Firewall | Review

Please review the information below, then click Launch.

AMI: { Cent OS 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:

Key Pair Name: amazon-hpc

Security Group(s): HPC

Edit AMI | Edit Instance Details | Edit Advanced Details | Edit Key Pair | Edit Firewall
### My Instances

<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></td>
<td>i-142d7e79</td>
<td>ami-7ea24a17</td>
<td>ebs</td>
<td>cc1.4xlarge</td>
<td>pending</td>
<td>HPC</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>Security Groups</td>
<td>Key Pair Name</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></td>
<td>HPC</td>
<td>amazon-hpc</td>
</tr>
</tbody>
</table>

**Avg CPU Utilization (Percent)**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>12/3</td>
<td>13:00</td>
</tr>
<tr>
<td>50</td>
<td>12/3</td>
<td>13:30</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Avg Disk Reads (Bytes)**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>12/3</td>
<td>13:00</td>
</tr>
<tr>
<td>0.5</td>
<td>12/3</td>
<td>13:30</td>
</tr>
<tr>
<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Avg Disk Writes (Bytes)**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>12/3</td>
<td>13:00</td>
</tr>
<tr>
<td>0.5</td>
<td>12/3</td>
<td>13:30</td>
</tr>
<tr>
<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Max Network In (Bytes)**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>12/3</td>
<td>12/3</td>
</tr>
<tr>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Max Network Out (Bytes)**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>12/3</td>
<td>12/3</td>
</tr>
<tr>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Volume ID</td>
<td>Capacity</td>
</tr>
<tr>
<td>----------</td>
<td>---------------</td>
<td>----------</td>
</tr>
<tr>
<td>vol-9b7bc3f</td>
<td>20 GiB</td>
<td>snap-1099e57b1</td>
</tr>
</tbody>
</table>

0 Elastic Block Store Volumes selected

Select a volume above
<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-b7b8bf3</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

Oracle Database 11G
Oracle E-business suite
Oracle Fusion middleware
Oracle Enterprise manager
Oracle Enterprise Linux
Oracle on RDS
Oracle

Licence on EC2

Use existing licences
Days to minutes
Rapid Deployment Solutions

Licence for EC2

SAP BusinessObjects

Use existing licences
Storage
Simple Storage Service
Files in directories
Objects in buckets
Large objects

5Tb
Import/Export
S3 websites
Databases
Flexibility
Packaged + ready to roll
Oracle 11g
32 and 64 bit
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.

Service Health

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

My Resources

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

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-ami/64-b</td>
<td>Other Linux</td>
</tr>
<tr>
<td>ami-51693814</td>
<td>instance-store</td>
<td>oracle-corporation-linux-us-west-1/enterprise-linux-ami/32-b</td>
<td>Other Linux</td>
</tr>
<tr>
<td>ami-5b69381e</td>
<td>instance-store</td>
<td>oracle-corporation-linux-us-west-1/enterprise-linux-ami/64-b</td>
<td>Other Linux</td>
</tr>
<tr>
<td>ami-5d69382b</td>
<td>instance-store</td>
<td>oracle-corporation-linux-us-west-1/enterprise-linux-ami/32-b</td>
<td>Other Linux</td>
</tr>
<tr>
<td>ami-936c3dd6</td>
<td>instance-store</td>
<td>oracle-corporation-linux-us-west-1/enterprise-linux-ami/32-b</td>
<td>Other Linux</td>
</tr>
<tr>
<td>ami-f96c3dbc</td>
<td>instance-store</td>
<td>oracle-corporation-linux-us-west-1/enterprise-linux-ami/64-b</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

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 Edit Key Pair
Security Group(s): default Edit Firewall

Launch
## My Instances

### Viewing: All Instances

<table>
<thead>
<tr>
<th>Name</th>
<th>Instance</th>
<th>AMI ID</th>
<th>Root Dev</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-</td>
<td>c1.mediur</td>
<td>pending</td>
<td>default</td>
<td>aws-1</td>
</tr>
</tbody>
</table>

0 EC2 Instances selected

*Select an instance above*
running
Configure, optimise
Snapshots + backup
Relational Database Service
MySQL

Oracle

Relational Database Service
Managed
Rapid
Scalable storage
Scalable instance
High availability. Multi-AZ.

Synchronous replication

MySQL

eu-west-1a  eu-west-1b
Asynchronous replication

Read replicas
Remove the "muck"
Extra services
Simple Queue Service
Simple Notification Service
Elastic MapReduce
Elastic MapReduce

Code

Input data

S3

Elastic MapReduce

Name node
Input data

Code

Elastic MapReduce

Name node

Elastic cluster

S3
Elastic MapReduce

Input data

S3

Elastic cluster

HDFS

Elastic cluster

Name node

Code

Elastic MapReduce

Input data
Elastic MapReduce

Input data

S3

Elastic cluster

HDFS

Queries + BI

Via JDBC, Pig, Hive

Code

Elastic MapReduce

Name node

Elastic cluster

HDFS
Elastic MapReduce

Code

Input data

Elastic cluster

Name node

Output

S3 + SimpleDB

HDFS

Queries + BI

Via JDBC, Pig, Hive

Elastic cluster
Elastic MapReduce

Input data

S3

Output
S3 + SimpleDB
Create a Job Flow

You have not yet created any job flows. Click the button below to create your first job flow. Sample processing applications are available to help get you started.

Create New Job Flow

How do I create one?

1. **Upload data to Amazon S3 Bucket**
   - Upload your application and any data you wish to process to an Amazon S3 bucket, using client tools available here.

2. **Create a job flow on Amazon Elastic MapReduce**
   - To create your job flow, simply specify data inputs, outputs, the processing application, and number of EC2 instances.

3. **Get results from Amazon S3 Bucket**
   - Monitor the status of your job flow and, when complete, pick up your results from the Amazon S3 bucket.
Create a New Job Flow

Creating a job flow to process your data using Amazon Elastic MapReduce is simple and quick. Let’s begin by giving your job flow a name and selecting its type. If you don’t already have an application you’d like to run on Amazon Elastic MapReduce, samples are available to help you get started.

Job Flow Name*: My Job Flow

Job Flow Name doesn’t need to be unique. We suggest you give it a descriptive name.

Create a Job Flow*: Run your own application

- Run a sample application

Word count is a Python application that counts occurrences of each word in provided documents.

Learn More

Continue
Specify Mapper and Reducer functions to run within the Job Flow. The mapper and reducers may be either (i) class names referring to a mapper or reducer class in Hadoop or (ii) locations in Amazon S3. (Click Here for a list of available tools to help you upload and download files from Amazon S3.) The format for specifying a location in Amazon S3 is bucket_name/path_name. The location should point to an executable program, for example a python program. Extra arguments are passed to the Hadoop streaming program and can specify things such as additional files to be loaded into the distributed cache.

**Input Location**: eu-west-1.elasticmapreduce/samples/wordcount/input
- The URL of the Amazon S3 Bucket that contains the input files.

**Output Location**: mza/wordcount/output/2011-05-12
- The URL of the Amazon S3 Bucket to store output files. Should be unique.

**Mapper**: eu-west-1.elasticmapreduce/samples/wordcount/wordSplit
- The mapper Amazon S3 location or streaming command to execute.

**Reducer**: aggregate
- The reducer Amazon S3 location or streaming command to execute.

**Extra Args**: 
-
Enter the number and type of EC2 instances you'd like to run your job flow on.

**Number of Instances**: 10

If you wish to run more than 20 instances, please complete the limit request form.

**Type of Instance**: Small (m1.small)

Learn more about instance types.

**Amazon EC2 Key Pair**: aws

Use an existing Key Pair to SSH into the master node of the Amazon EC2 cluster as the user "hadoop".

Configure your debugging options. Learn more.

**Enable Debugging**: No

**Amazon S3 Log Path**: 

An Amazon S3 Log Path is required if you are enabling debugging.

**Enable Hadoop Debugging**: No

To enable Hadoop Debugging you will need to sign up for Amazon SimpleDB.
Your Elastic MapReduce Job Flows

Region: EU West

Viewing: All

<table>
<thead>
<tr>
<th>Name</th>
<th>State</th>
<th>Creation Date</th>
<th>Elapsed Time</th>
<th>Normalized Instance Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Job Flow</td>
<td>STARTING</td>
<td>2011-05-12 13:40 GMT+0100</td>
<td>0 hours 0 minutes</td>
<td>0</td>
</tr>
</tbody>
</table>

1 Job Flow selected

**Job Flow:** job-3KCBEUQQ4GS5H

**Last State Change Reason:**

**Description**

<table>
<thead>
<tr>
<th>Name</th>
<th>Steps</th>
<th>Bootstrap Actions</th>
<th>Instance Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: My Job Flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start Date:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability Zone:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master Instance Type:</td>
<td>m1.small</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key Name:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master Public DNS Name:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Creation Date:** 2011-05-12 13:40 GMT+0100

**End Date:**

**Instance Count:** 10

**Slave Instance Type:** m1.small

**Log URI:**

**Hadoop Version:** 0.20
### Your Elastic MapReduce Job Flows

<table>
<thead>
<tr>
<th>Job Flow</th>
<th>State</th>
<th>Creation Date</th>
<th>Elapsed Time</th>
<th>Normalized Instance Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Job Flow</td>
<td>COMPLETED</td>
<td>2011-05-12 13:40 GMT+00</td>
<td>0 hours 4 minutes</td>
<td>10</td>
</tr>
</tbody>
</table>

#### Job Flow: j-3KBEUQQ4GS5H

**Last State Change Reason:** Steps completed

<table>
<thead>
<tr>
<th>Description</th>
<th>Steps</th>
<th>Bootstrap Actions</th>
<th>Instance Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start Date:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability Zone:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master Instance Type:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key Name:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master Public DNS Name:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|                |       |                   |                 |
| Creation Date: | 2011-05-12 13:40 GMT+0100 |       |                 |
| End Date:      | 2011-05-12 13:47 GMT+0100 |       |                 |
| Instance Count:| 10    |                   |                 |
| Slave Instance Type: | m1.small |                 |                 |
| Log URI:       | -     |                   |                 |
| Hadoop Version:| 0.20  |                   |                 |
### Your Elastic MapReduce Job Flows

<table>
<thead>
<tr>
<th>Name</th>
<th>State</th>
<th>Creation Date</th>
<th>Elapsed Time</th>
<th>Normalized Instance Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Job Flow</td>
<td>COMPLETED</td>
<td>2011-05-12 13:40 GMT+0</td>
<td>0 hours 4 minutes</td>
<td>10</td>
</tr>
</tbody>
</table>

#### 1 Job Flow selected

**Job Flow: j-3KCBEUQQ4GS5H**

Last State Change Reason: Steps completed

#### Instance Groups

<table>
<thead>
<tr>
<th>Instance Group Id</th>
<th>Role</th>
<th>Instance Type</th>
<th>State</th>
<th>Running Count</th>
<th>Request Count</th>
<th>Creation DateTime</th>
<th>Last State Change Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>ig-2XVTCKNOBXNY</td>
<td>MASTER</td>
<td>m1.small</td>
<td>ENDED</td>
<td>0</td>
<td>1</td>
<td>2011-05-12 13:40 GMT+0100</td>
<td>Job flow terminated</td>
</tr>
<tr>
<td>ig-X0QNDMX7MACL</td>
<td>CORE</td>
<td>m1.small</td>
<td>ENDED</td>
<td>0</td>
<td>9</td>
<td>2011-05-12 13:40 GMT+0100</td>
<td>Job flow terminated</td>
</tr>
<tr>
<td>Term</td>
<td>Count</td>
<td></td>
<td></td>
<td></td>
<td></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>abbreviated</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>abdellah</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>abderazzak</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>abdication</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>abducted</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>abena</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>abu</td>
<td>83</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>acceded</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>accession</td>
<td>73</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>accorded</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>accumulate</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>acevedo</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>act</td>
<td>144</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>actual</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>adamkus</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>adams</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>add</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>additionally</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>address</td>
<td>668</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>adil</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>adiyaman</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>admonition</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>adolf</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>adrift</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>adulyadej</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>advantages</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>advisory</td>
<td>55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>aer</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>aerosol</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>afar</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>afrikopen</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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
eu-west-1

Web servers

Application servers

Data store

eu-west-2
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
Automatic
Applications in the cloud
3 tiers
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
Automation maximises this value
Automate everything
CloudFormation
Template
Define a full infrastructure stack
Template → CloudFormation → Provisioned resources
Complete definition
Atomic
Idempotent
Free

Only pay for the provisioned resources
JSON
JSON

Plain text

Perfect for version control

Validate-able
Declarative language


```json
{
    "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
Best practice
Highly available
Customisable
Flexible
Free

Only pay for the provisioned resources
Monitored
CloudWatch
Free

5 minute resolution
Detailed monitoring

1 minute resolution
CPU Utilization
DiskReadBytes
DiskReadOps
DiskWriteBytes
DiskWriteOps
NetworkIn
NetworkOut
DatabaseConnections
FreeStorageSpace
ReadLatency
ReadThroughput
SwapUsage
WriteLatency
WriteThroughput
Custom metrics
Price aware
Optimise for throughput
Vertical scale
Increase instance size
Increase instance size
Horizontal scale
Increase instance count
Optimise for cost

Maximise bang for buck
Bang for buck:

Instance size
Bang for buck:
Monitoring & metrics
My new application Environments

Production
Successfully running version First Release.

Environment Details
Overview Logs Monitoring Events

Below are graphs for resources in this environment. Times are displayed in UTC.
View your current charges and account activity, itemized by service and by usage type.
Bang for buck:

Cost options
Mix On-demand, Reserved Capacity and Spot
Relate to business metrics
Cost per user
Cost per operation
White papers:

aws.amazon.com/whitedpapers
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>
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 subnet

Public facing website
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

Test drive with the free tier.
AGENDA

SOCC - October 26th, 2011

- Cloud Concepts
- Foundational Building Blocks
- Maximising Value
- Security in the Cloud
Thank you!
QUESTIONS + FEEDBACK:

matthew@amazon.com

@mza

ON TWITTER