Using ArcGIS for Server in the Amazon Cloud

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Topics Covered

• What is ArcGIS Server on Amazon Web Services?

• How do you run ArcGIS Server on AWS?

• Case studies and lessons learned

• Q & A
What is ArcGIS Server on Amazon Web Services?
Conceptual Overview

Your Server Room

Amazon EC2
Advantages of EC2

• Robust hardware and network infrastructure
• Elastic deployments
• Fast deployment and prototyping
• Rent high processing power for short-term use
Key terms: **EC2 instance** and **AMI**

- **EC2 instance**
  - Virtual machine running on Amazon EC2
  - You pick the size and spec

- **Amazon Machine Image (AMI)**
  - Defines OS and software on your EC2 instance
How do you run ArcGIS Server on Amazon Web Services?
How do I get started?

• Create an Amazon account and enable it for use with AWS

• Contact Esri Customer service and provide:
  - Your Amazon account number
  - Your Esri license information
How do I work with ArcGIS Server on AWS?

- ArcGIS Server **Cloud Builder** on Amazon Web Services
- AWS Management Console
- Other Third Party Tools
  - Elastic Fox, O2 Amazon EC Browser
- Amazon EC2 API Tools
Launch with Cloud Builder

Elastic Load Balancer

ArcGIS Servers \( \times n \)

Enterprise Geodatabase (Optional)
How does the billing work?

• Two separate costs:
  - Amazon EC2
  - Esri licensing

• Amazon EC2 is billed like a utility
  - Pay by the hour for resources consumed
  - Cost calculators on aws.amazon.com/pricing

• Esri licensing same as on-premises
  - You must license any Esri software you cause to run
  - Short term licensing available
Demo: Using Cloud Builder to create an ArcGIS Server site
Alternate architecture

Launch with AWS console or EC2 API

Elastic Load Balancer

“Siloed” ArcGIS Servers with own copies of data
Esri-developed AMIs at 10.1

- ArcGIS for Server with PostgreSQL (Ubuntu Linux)
- ArcGIS for Server with SQL Server (Windows)
- ArcGIS for Server with SQL Server Express (Windows)

Cloud Builder selects the AMIs for you based on your wizard choices
Getting data to your site

- Remote Desktop into instance and copy data

OR

- Copy data automatically when publishing a service (New at 10.1)
Security on Amazon EC2

• Amazon provides…
  - Secure physical facilities for data centers
  - Key pair required for obtaining passwords
  - Configurable firewall on each instance

• You’re responsible for…
  - Setting up ArcGIS Server security
  - Keeping the admin passwords safe
  - Configuring the security groups correctly
  - Virus scanning, updates, avoiding harmful files
Demo: A tour of the instance
## Instance types & hourly rates

### US East (Virginia)

<table>
<thead>
<tr>
<th>Standard On-Demand Instances</th>
<th>Linux</th>
<th>Windows</th>
<th>Windows with SQL Server Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>$0.12 per hour</td>
<td>$0.23 per hour</td>
<td>$0.75 per hour</td>
</tr>
<tr>
<td>Large</td>
<td>$0.24 per hour</td>
<td>$0.46 per hour</td>
<td>$0.98 per hour</td>
</tr>
<tr>
<td>Extra Large</td>
<td>$0.48 per hour</td>
<td>$0.92 per hour</td>
<td>$1.44 per hour</td>
</tr>
</tbody>
</table>
**Amazon Bill Summary**

**Billing Statement: June 1, 2010**

The billing cycle for this report is May 1 - May 31, 2010.

<table>
<thead>
<tr>
<th>Service</th>
<th>Amount</th>
<th>Download Usage Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon Elastic Compute Cloud</td>
<td>$1,158.43</td>
<td></td>
</tr>
<tr>
<td>Amazon Simple Storage Service</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>Amazon Virtual Private Cloud</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>AWS Data Transfer (excluding Amazon CloudFront)</td>
<td>$0.63</td>
<td></td>
</tr>
</tbody>
</table>

**Taxes**

- $0.00

**Total Charges due on June 1, 2010**

- $1,159.06
# Amazon Cost Breakdown

## Amazon Elastic Compute Cloud

### US East (Northern Virginia) Region

#### Amazon EC2 running Windows

- $0.48 per Large Windows Instance (m1.large) instance-hour (or partial hour) for 2,098 Hrs: $1,070.04

#### Amazon EC2 EBS

- $0.10 per GB-month of provisioned storage for 1,047.867 GB-Mo: $104.79
- $0.10 per 1 million I/O requests for 11,394,333 I/Os: $1.14
- $0.15 per GB-Month of snapshot data stored for 8.767 GB-Mo: $1.32
- $0.01 per 10,000 gets (when loading a snapshot) for 103,623 Requests: $0.10
- $0.01 per 1,000 puts (when saving a snapshot) for 2,488 Requests: $0.02

#### Elastic Load Balancing

- $0.008 per GB Data Processed by the LoadBalancer: $0.03
- $0.025 per LoadBalancer-hour (or partial hour) for 1,057 Hrs: $26.43

#### Amazon CloudWatch

- $0.015 per monitored instance-hour (or partial hour) for 1,171 Hrs: $17.57

**Total Cost:** $1,158.43
Case studies and lessons learned
Traditional Trouble Shooting

- Reboot Servers?
- Spread Services Across Local Machines?
- Order New Equipment?

Panic!
Handle Traffic
What We Learned

- Start in the Cloud
  - Avoid internal, static machines
- Design for the Cloud
  - Architecture should be cloud focused
- Plan Ahead
  - Avoid emergencies
Japan Impact Map
Aggregated Live Feeds…

Authoritative Content

Frequently Changing Data

How Can I Deploy and Scale?
Public Information Map

Get maps and assistance for the following incidents:

- Hurricanes & Cyclones
- Wildfires
- Flooding
- Severe Weather

We can help provide you with:
- Esri software – temporary or replacement software for what has been lost or destroyed
- Data and Imagery
- Consulting, project assistance, and technical support

Global Incident Viewer
See where volcanoes, earthquakes, floods, and cyclones are happening right now.

Launch map
Hurricane PIM
Hurricane PIM

- Over 1 Million hits in 1 day on our web map
- Over 7 Million dynamic map requests in 1 day
Next Phase

Linux

Linux 10.1 instances are cheaper and boot faster

Auto Scaling

Avoid manual load management

Reserved Instances

Plan long term to save money
Articles

• High Availability Blog
  - http://esriurl.com/HighCapacity

• S3 deployment Blog
  - http://esriurl.com/S3Deploy

• Live Feeds Group
  - http://esriurl.com/LiveFeed

• Public Information Map
  - http://esriurl.com/PIM2
Please fill out the survey using the DevSummit app

Offering ID: 224