There Are Clouds In Your Future

Jeff Barr
Amazon Web Services
jbarr@amazon.com
@jeffbarr (Twitter)
My Goals For This Talk

- Introduce you to cloud computing
- Show you what others are already doing
- Alert you to the possibilities
- Get you to start thinking about it
- Start some conversations
Introduction

- Based in Seattle, Washington, USA
- Lifetime technologist
- Career path:
  - Startups
  - Microsoft
  - Consultant to VCs and startups
  - Amazon Web Services
    - Senior Developer
    - Web Services Evangelist
    - Technology Strategist
What is Cloud Computing?

- New model for resource delivery
- IaaS - Infrastructure As A Service
- Programmable data center
- Over the internet
- Flexible
- On-demand
- Pay-as-you-go
What Problems Does It Solve?

- Reduce IT friction:
  - Contract negotiations
  - Bandwidth management
  - Power/cooling management
  - Purchasing decisions
  - Physical growth
  - Disaster recovery

- Fix broken economic model:
  - Capital expenses become operating expenses
  - Costs track actual usage
  - No more up-front provisioning
  - Address the “Prediction Problem”
Predictions Cost Money

Infrastructure Cost $ 

Large Capital Expenditure 

Opportunity Cost 

Predicted Demand 

Traditional Hardware 

Actual Demand 

Automated Virtualization 

You just lost users
Amazon Has Three Parts
Amazon Web Services

- AWS - Amazon Web Services
  - Thought leader in cloud computing space
  - Scalable
  - Cost-effective
  - Reliable
  - Secure
  - Large-scale
- Long-term effort – Now 4 years old
- Third major business
Amazon Web Services are Building Blocks

- **Infrastructure As a Service**
  - Amazon Simple Storage Service
  - Amazon Elastic Compute Cloud
  - Amazon Simple Queue Service
  - Amazon SimpleDB
  - Amazon CloudFront

- **Payments As a Service**
  - Amazon Flexible Payments Service
  - Amazon DevPay

- **Fulfillment and Associates**
  - Amazon Fulfillment Web Service
  - Amazon Associates Web Service

- **People As a Service**
  - Amazon Mechanical Turk
Cloud Computing Success Stories

- Batch Processing – New York Times
- Rapid Scaling – Animoto
- Agility – Washington Post
- Scale - SmugMug
Welcome. TimesMachine can take you back to any issue from Volume 1, Number 1 of The New York Daily Times, on September 18, 1851, through The New York Times of December 30, 1922. Choose a date in history and flip electronically through the pages, displayed with their original look and feel.
The New York Times

4 TB Data  
100 Nodes  
11 Million PDFs
50 Servers to 3500 Servers in 3 Days
Clinton’s Schedule  Hillary Clinton’s activities as First Lady, 1993-2001

The William J. Clinton Presidential Library on Wednesday, March 19, released more than 11,000 pages of former first lady Hillary Rodham Clinton’s official schedule during her husband’s two terms in the White House. The records offer the most comprehensive public record to date of her daily activities throughout President Clinton’s eight years in office, including private meetings, public speeches, social engagements and trips.

The records were released in response to Freedom of Information requests filed by a half-dozen journalists and organizations, including Judicial Watch, the watchdog group that spent much of the Clinton years probing various controversies and scandals.

SEARCH CLINTON’S SCHEDULE

Enter word(s): [boston]  Search

Disclaimer: This data was machine-generated, and it represents a rough searchable transcription of original PDF files that were released on March 19. Because the original documents were low-quality PDF files, the search results here should not be treated as 100 percent inclusive; individual results should be manually verified with the original PDF files.
Hillary Clinton’s public record about to be released

How to process 17K page PDF?

Developer suggests EC2

12 hour development time

200 instance EC2 job

9 hours to OCR and index

First to market
- Consumer / Professional photo storage
- Family business
- No venture capital
- Moved to Amazon S3
- Saved $1MM in first year of operation
- Storing about 1 PetaByte ($10^{15}$) of data
Amazon Elastic Compute Cloud (Amazon EC2)

- Resizable compute capacity in the cloud
  - Boot Linux or Windows server instances in minutes
  - Scale capacity, up or down, as requirements change
  - Open source and commercial application stacks
- Full administrator access to a virtual machine
- Pay-as-you-go:
  - CPU hour: - $0.10 - $0.80
  - Bandwidth: $0.10/GB inbound, $0.17/GB outbound
  - Persistent disk storage: $0.10/GB/month
- AWS Management Console
Amazon Simple Storage Service (Amazon S3)

- Highly scalable data storage in-the-cloud
- Programmatic access via web services API
- Highly available and durable
- Pay-as-you-go:
  - Storage: $0.15 / GB / month, ($0.12 @ 500TB)
- Data Transfer:
  - Inbound to cloud $0.10 / GB
  - Outbound: $0.17 / GB, ($0.10/GB @ 150 TB)
- Requests: nominal charges
AWS Public Data Sets

Public Data Sets on AWS

Federal Contracts from the Federal Procurement Data Center (USASpending.gov)

A data dump of all federal contracts from the Federal Procurement Data Center found at USASpending.gov.

<table>
<thead>
<tr>
<th>Submitted By:</th>
<th>Santiago@AWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Snapshot ID (Linux/Unix):</td>
<td>snap-e91fer80</td>
</tr>
<tr>
<td>Size:</td>
<td>180GB</td>
</tr>
<tr>
<td>Creation Date:</td>
<td>04/24/2009</td>
</tr>
<tr>
<td>Last Updated:</td>
<td>04/24/2009</td>
</tr>
<tr>
<td>License:</td>
<td>Other</td>
</tr>
<tr>
<td>Source:</td>
<td>USASpending.gov</td>
</tr>
</tbody>
</table>
Reliability, Security & Certification

- SLAs for availability
- Managed by Amazon NOC

- Default deny-all firewall
- Network security groups

- Certifications:
  - SOX
  - SAS 70 Type II (underway)

- White papers available:
  - Overview of Security Processes
  - Creating HIPAA-Compliant Apps
EC2 Dashboard

EC2 Dashboard

My Instances

Instance: i-aaba69c3
AMI ID: ami-2b5fba42
Security Groups: default, ssh_private
Type: m1.small
Status: running
Public DNS: ec2-75-101-154-199.compute-1.amazonaws.com
Key Pair: gsg-keypair

1 EC2 Instance selected

Instance:
AMI ID: ami-2b5fba42
Security Groups: default, ssh_private
Status: running
Reservation: r-f1c90698
Platform: -
Kernel ID: aki-a71df9ce
Elastic ID: -
Public DNS: ec2-75-101-154-199.compute-1.amazonaws.com
Private DNS: dcmU-12-31-38-00-AO-01.compute-1.internal
Launch Time: 2008-07-13 11:44 GMT+0800
State Transition Reason: -

Zone: us-east-1a
Type: m1.small
Owner: 8899279108296
Ramdisk ID: ari-a51df9ce

Seattle Winter 2008

The WSDOT Blog
From the Washington State Department of Transportation

Web site
We reached 5.8 million page views yesterday. A new record for our site. Unfortunately we are experiencing internal network issues this morning. Pages may be slow to load or may not come up at all.

December 18, 2008...

1 p.m. update

So here is what we know so far. Our Web site is getting slammed with traffic and due to technical challenges are hearing that it has been difficult to access. We put a text page up on our homepage about half an hour ago so that you can get at least the basics of what is going on. Here is the rundown:

[Map and images related to transportation and snow conditions]
WSDOT Traffic (Page Views)

Normal Day:

January Snow:

March Snow:
Challenges

- Emergency operating conditions
- Traffic 10-20x normal
  - Hard to simulate in advance
  - Expensive to provision
  - Stresses architecture in new ways
- Multiple bottlenecks:
  - Server
  - Connection
  - ISP issues
Final Thoughts

- Do more with less
  - Existing applications
  - New, on-demand applications

- Be more responsive to your audience
  - Focus on features, not on infrastructure
  - Control costs
  - Innovate
Let’s Head to the Clouds!

More Info:
http://aws.amazon.com

Blog:
http://aws.typepad.com

Email:
jbarr@amazon.com
Thank You!