

Ahead in the Cloud

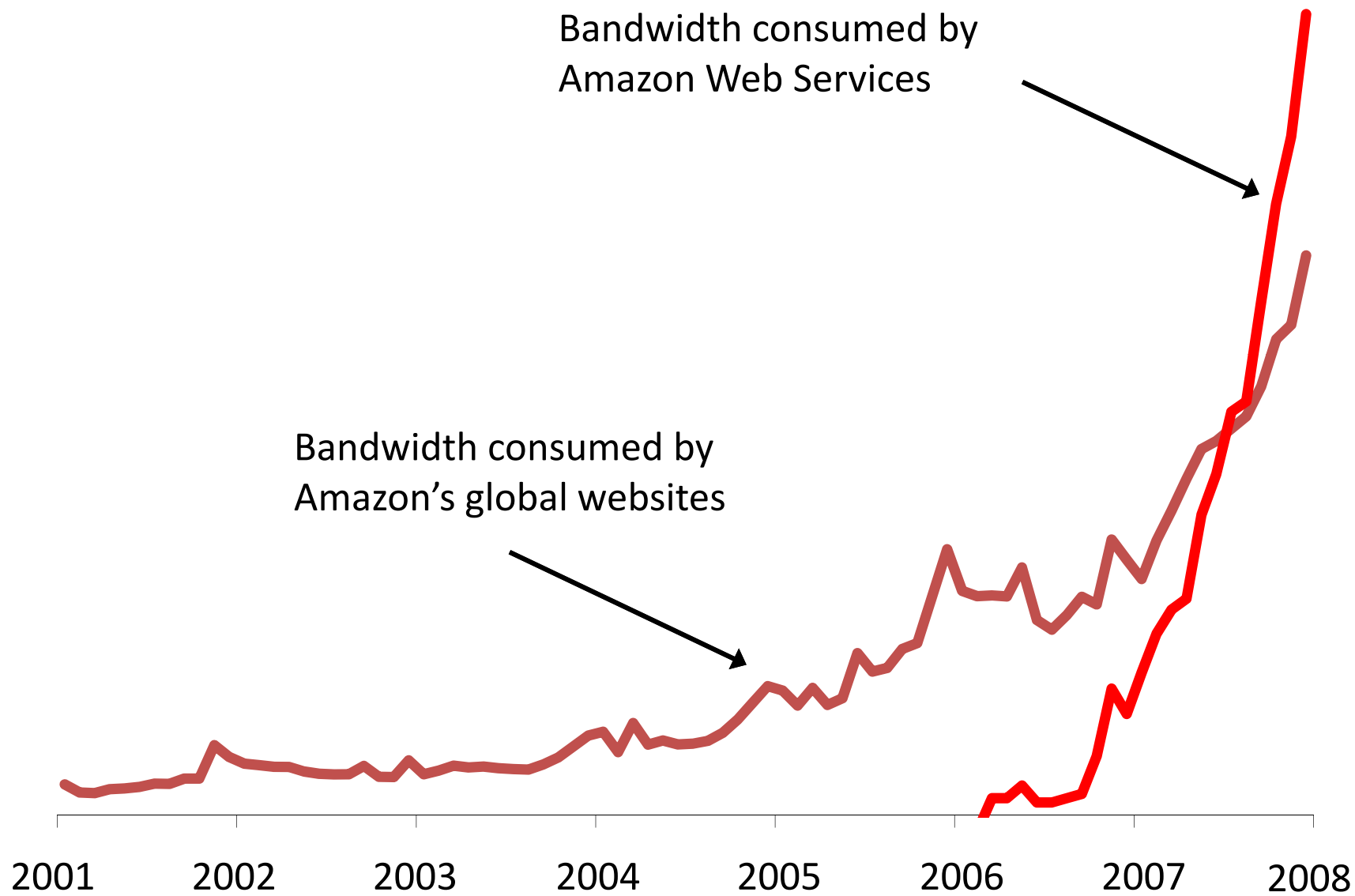
Amazon Web Services for the Enterprise

Jinesh Varia

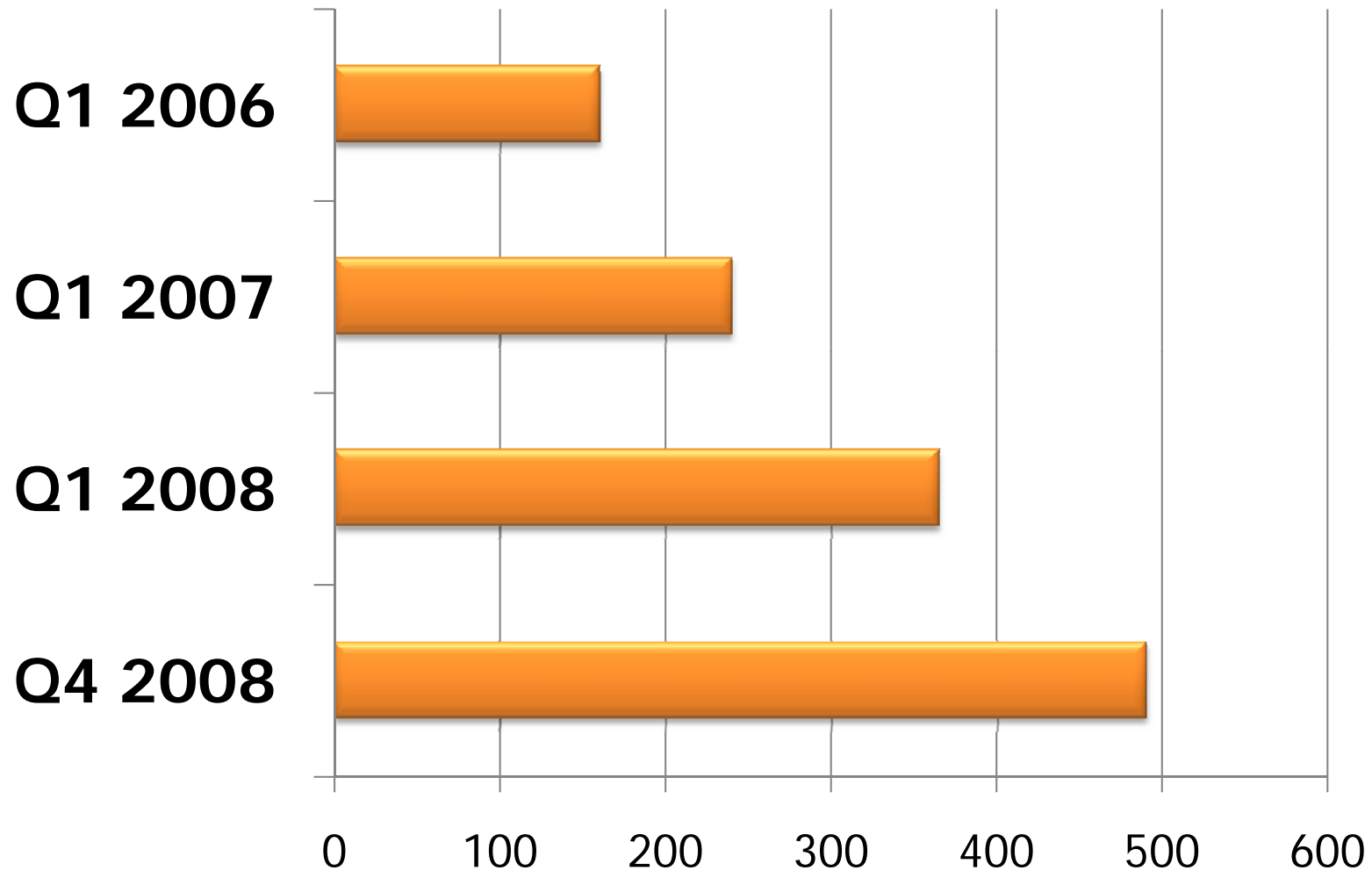
Technology Evangelist

Amazon Web Services

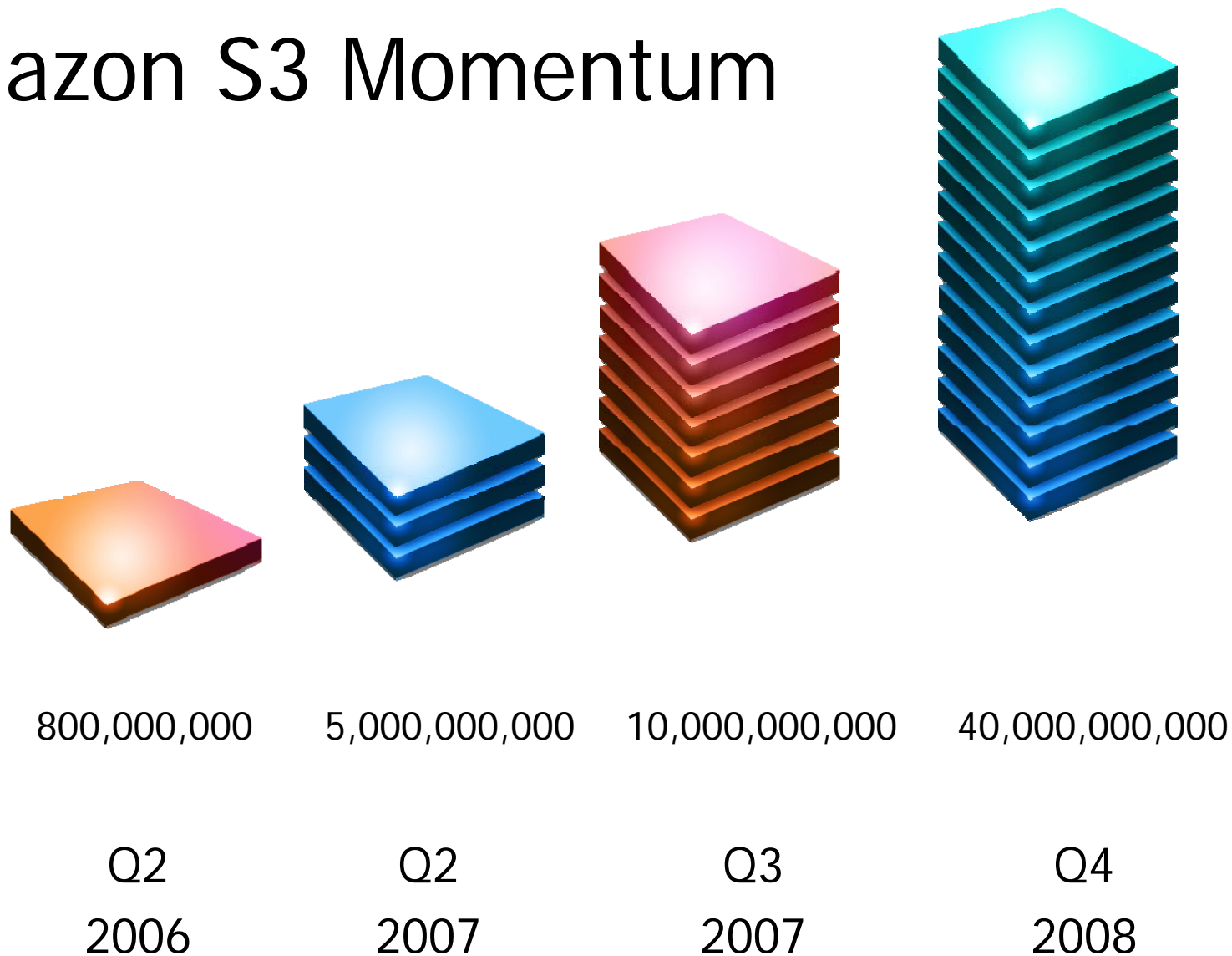
Amazon.com and AWS



AWS Customer Momentum (490,000)



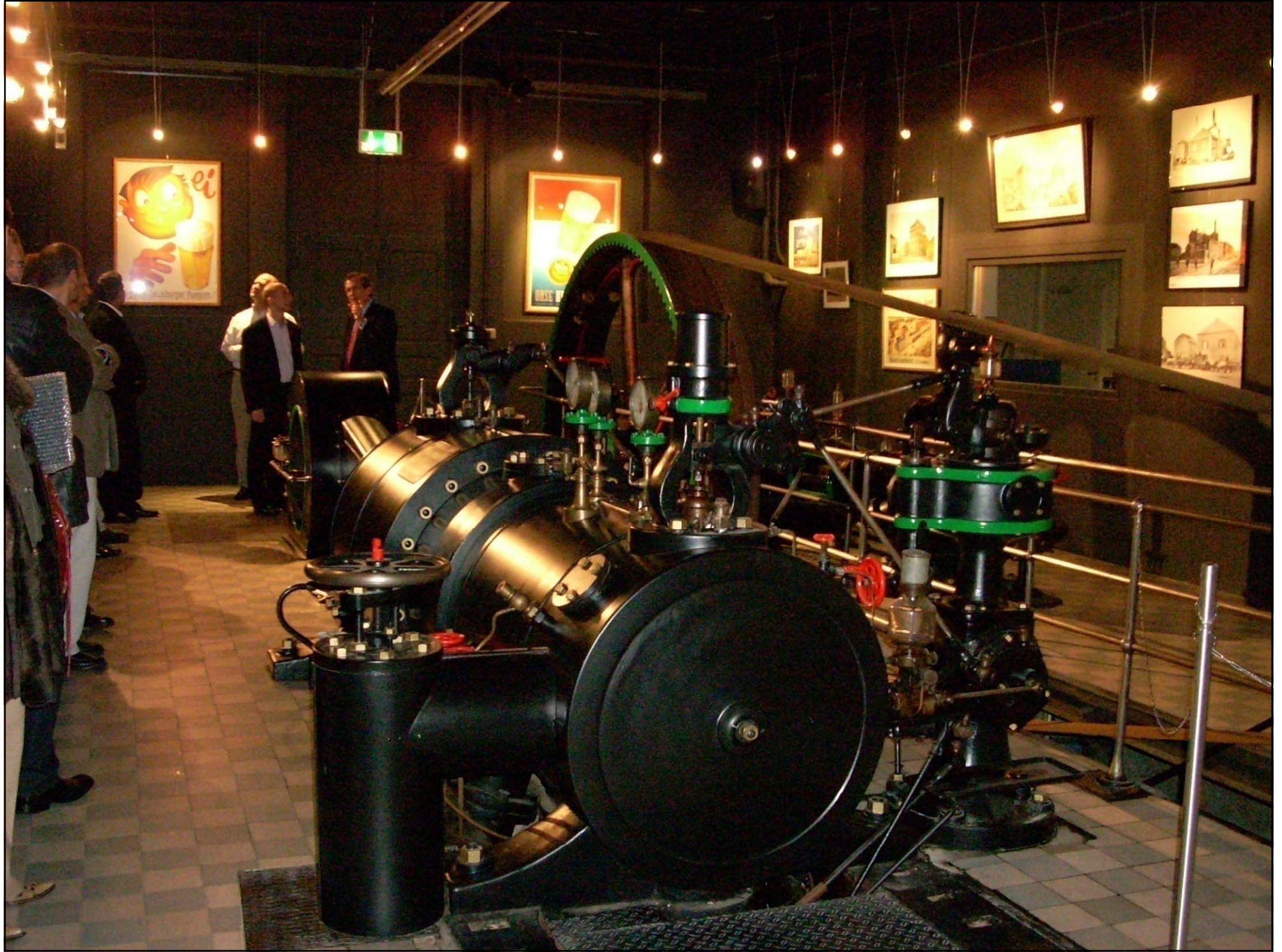
Amazon S3 Momentum



Total Objects Stored in Amazon S3

What do large enterprises like about Cloud Computing?



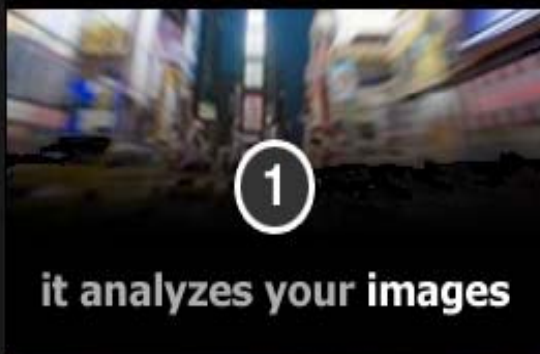




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the end of slideshows

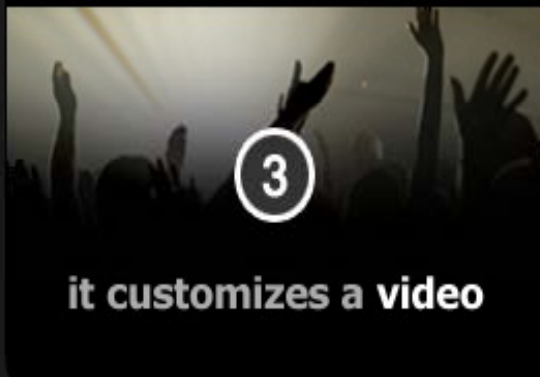
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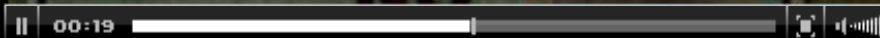
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it analyzes your images



2
it feels your music



3
it customizes a video



Demos: [1](#) [2](#)

why animoto?

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- ✓ completely customized
- ✓ takes just minutes
- ✓ no two videos are ever the same
- ✓ unlimited shorts for free
- ✓ created by tv and film producers

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watch the 60-sec video



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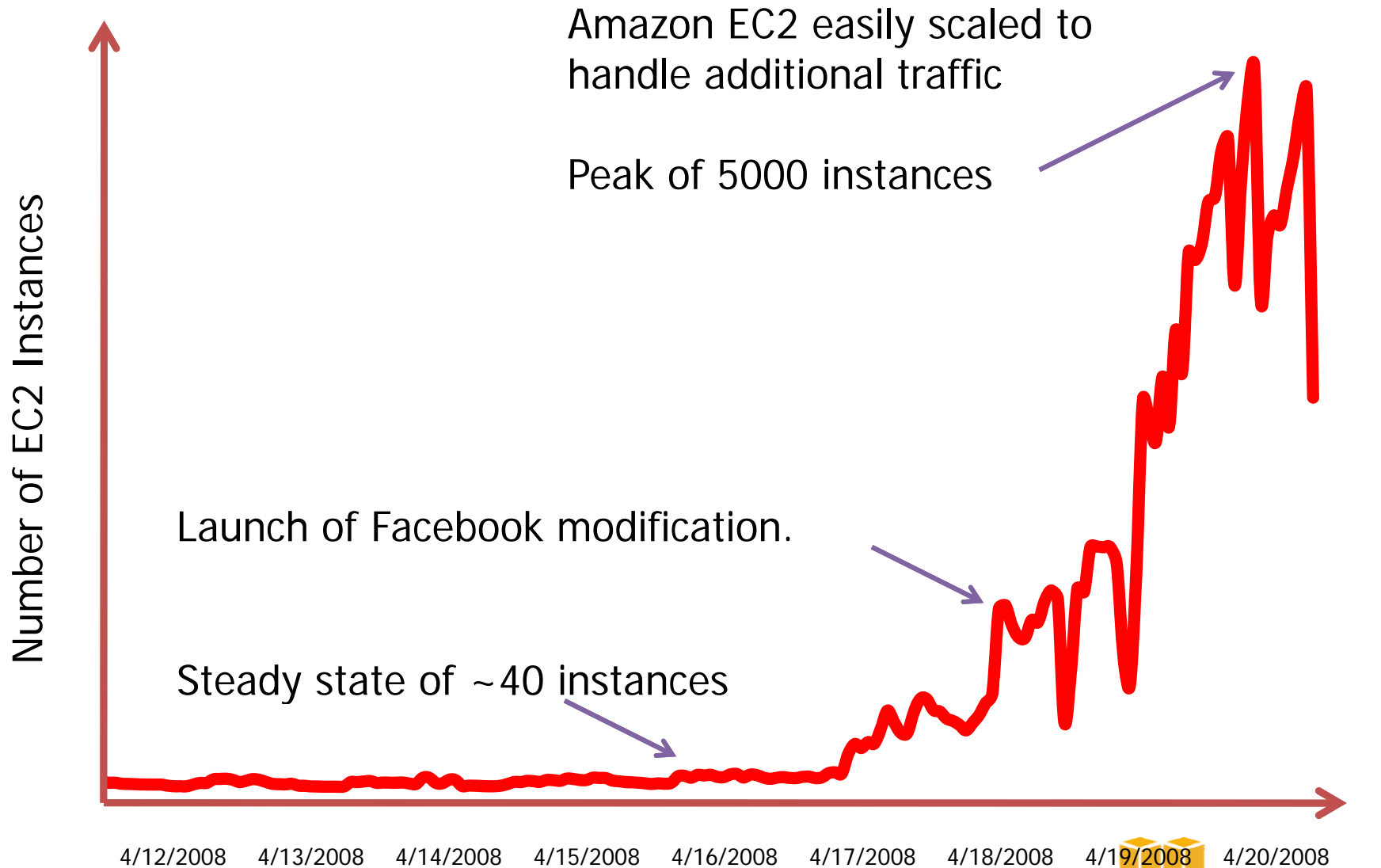
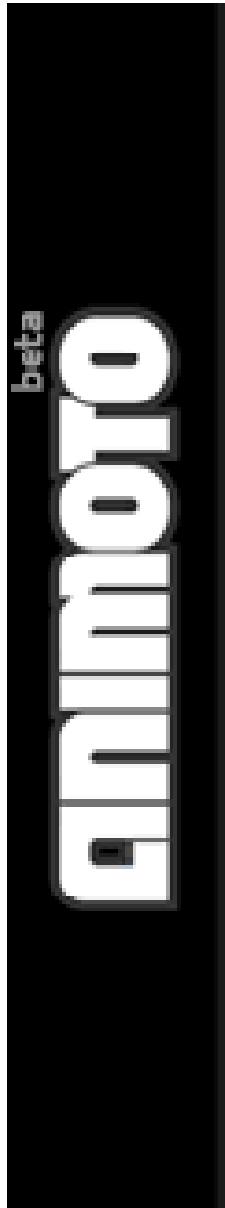
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Scale: 50 servers to 5000 servers in 3 days

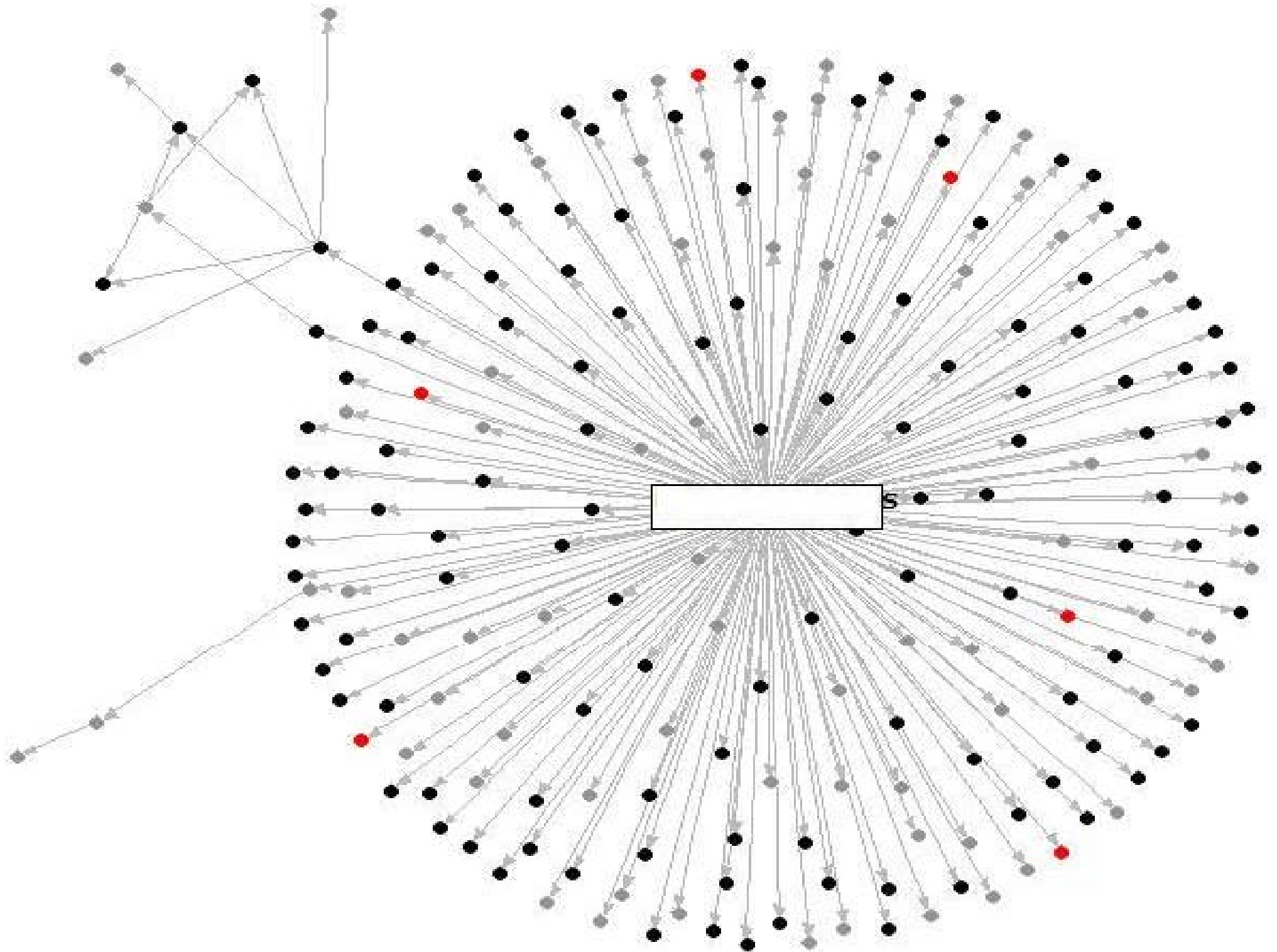




**App Server
& Database**

**Service
Orientation**

**Massively
Scalable
Services**







Develop



Test



Undifferentiated heavy lifting

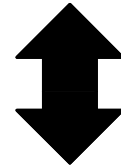
- Hardware costs
- Software costs
- Maintenance
- Load balancing
- Scaling
- Utilization
- Idle machines
- Bandwidth management
- Server hosting
- Storage Management
- High availability



Operate

The 70/30 Switch

**30% of time, energy and dollars
on differentiated value creation**



**70% of time, energy and dollars
on undifferentiated heavy lifting**

A public water fountain with a wooden bench and a sign that says "USE ONLY WHAT YOU NEED." and "DENVER WATER". The fountain is made of concrete and has a black metal bar across the top. The sign is orange with white text. The fountain is set on a concrete base with a grassy area in the background.

USE ONLY
WHAT YOU
NEED.

DENVER WATER

Increased Utilization

CAPEX



OPEX



Value of Time



Software that "*Creates and Manages*" Hardware

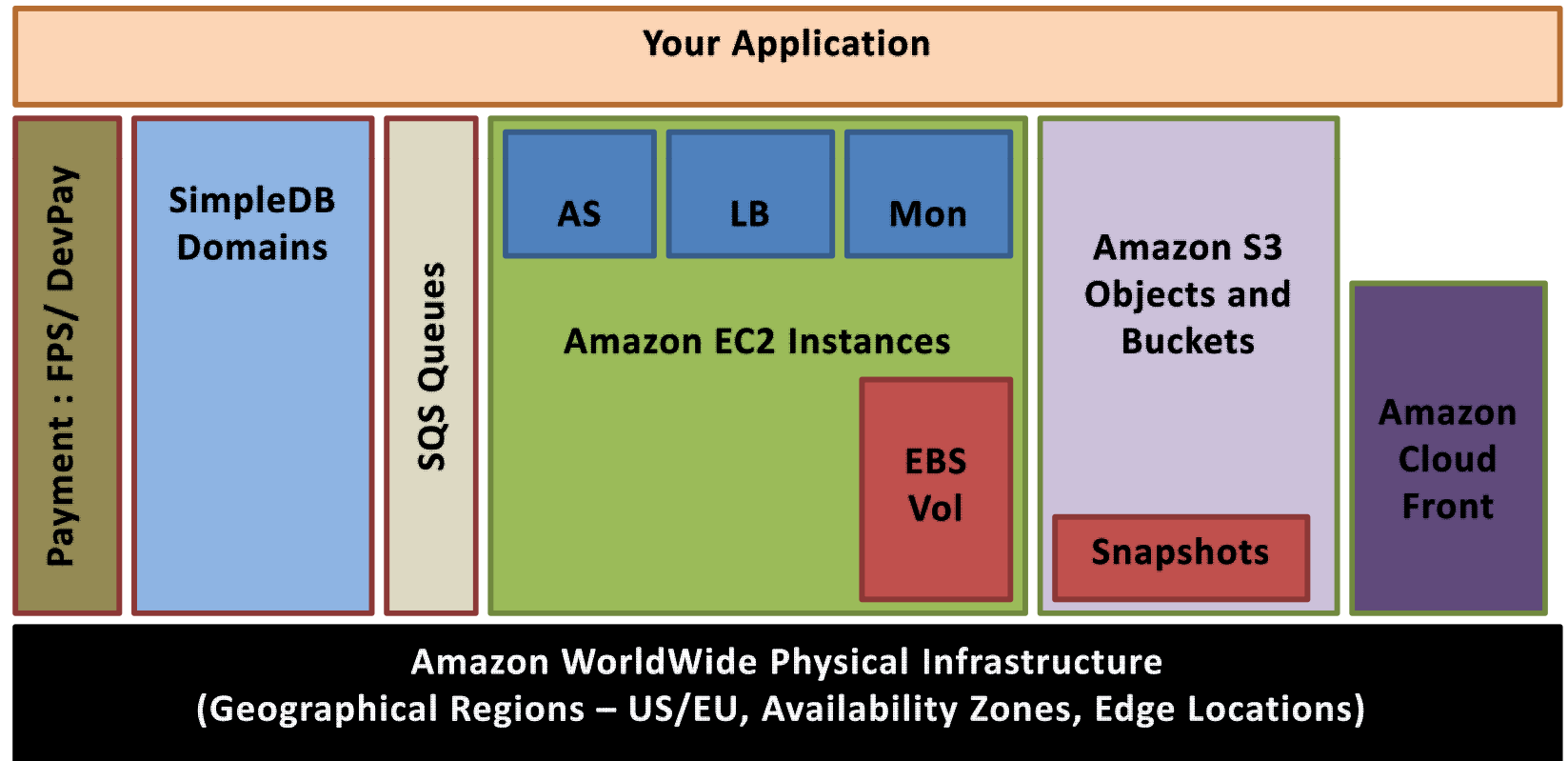
On-demand provisioning through
Web Services

```
package com.amazonaws.sdb.xml;  
  
public class HardwareMagic {  
  
    public static void CreateHardware(String[] args) thro  
    {  
        if (args.length != 6)  
        {  
            System.err.println("Error: Please provide 6  
            System.exit(-1);  
        }  
    }  
}
```


AWS enabling Pluggable Cloud Architectures

Every Application Needs

1. Compute
2. Storage
3. Messaging
4. Payment
5. Distribution
6. Scale



What do large enterprises like about Cloud Computing?



The image is a composite. The upper portion shows a bright blue sky with a world map where the continents are formed by white, fluffy clouds. The lower portion shows a flat, vibrant green field under a sky filled with white, puffy clouds. A single, small green tree stands on the horizon line of the field.

What do large enterprises like about Cloud Computing?

Is the Cloud ready for enterprises?

EC2: Compute on Demand



Amazon EC2 : 2007 and Now

2007

- New Terms and Features
 - Amazon Machine Images
 - Instances
 - Security Groups
- Platforms
 - Fedora
- AMIs : 15+
- Partnerships



Today

- New Terms and Features
 - Elastic IP Addresses
 - Availability Zones (4) and Regions (US & EU)
 - New Instance Types (M1, C1)
 - Elastic Block Store and Snapshots
 - Public DataSets
- Platforms
 - Windows, Open Solaris, Linux (Fedora, Debian, Ubuntu, Centos
- AMIs : 1300+
- ISVs, SIs, Universities, Training
- Partnerships



Virtual Machine Choices

	Standard			High CPU	
	Small	Large	Extra Large	Medium	Extra Large
Bits	32	64	64	32	64
RAM	1.7 GB	7.5 GB	15 GB	1.7 GB	7 GB
Disk	160 GB	850 GB	1690 GB	350 GB	1690 GB
EC2 Compute Units	1	4	8	5	20
I/O Performance	Medium	High	High	High	High
Firewall	Yes	Yes	Yes	Yes	Yes
Linux	\$0.10	\$0.40	\$0.80	\$0.20	\$0.80
Windows	\$0.125	\$0.50	\$1.00	\$0.30	\$1.20

Security



Security

Amazon S3

- Access Control Lists
- Encryption
- SSL Encryption end Points

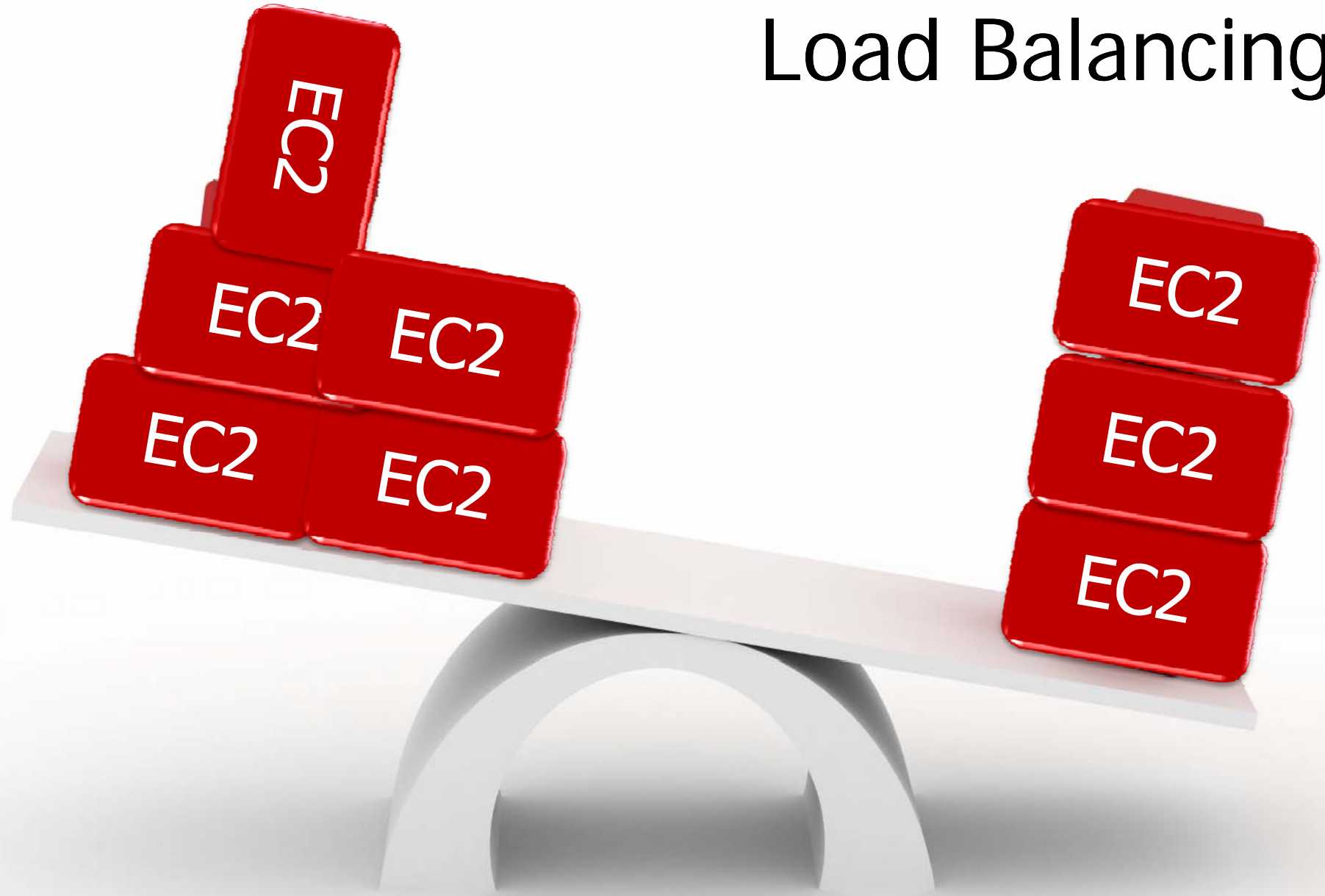
Amazon EC2

- SSH keys, X.509 Certs
- EFS
- Stateful firewall

Overall AWS

- Amazon.com Physical Infrastructure
- HIPPA/SOX
- Working on SAS 70 Type II Certifications

More Services: Load Balancing



More Services: Monitoring



EC2 

A red rounded rectangular button containing the text "EC2" in white and a green waveform icon on a black grid background.

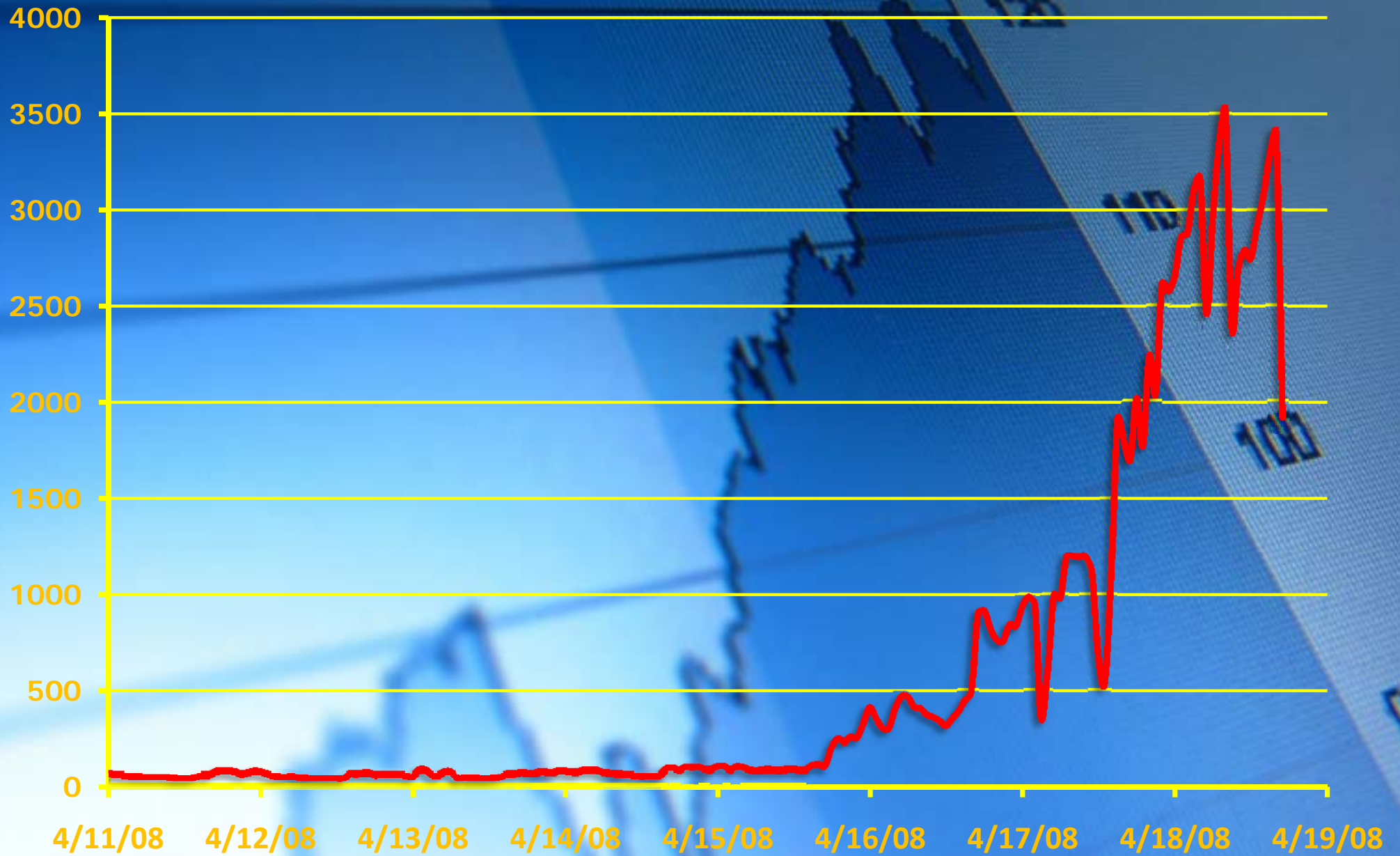
EC2 

A red rounded rectangular button containing the text "EC2" in white and a green waveform icon on a black grid background.

EC2 

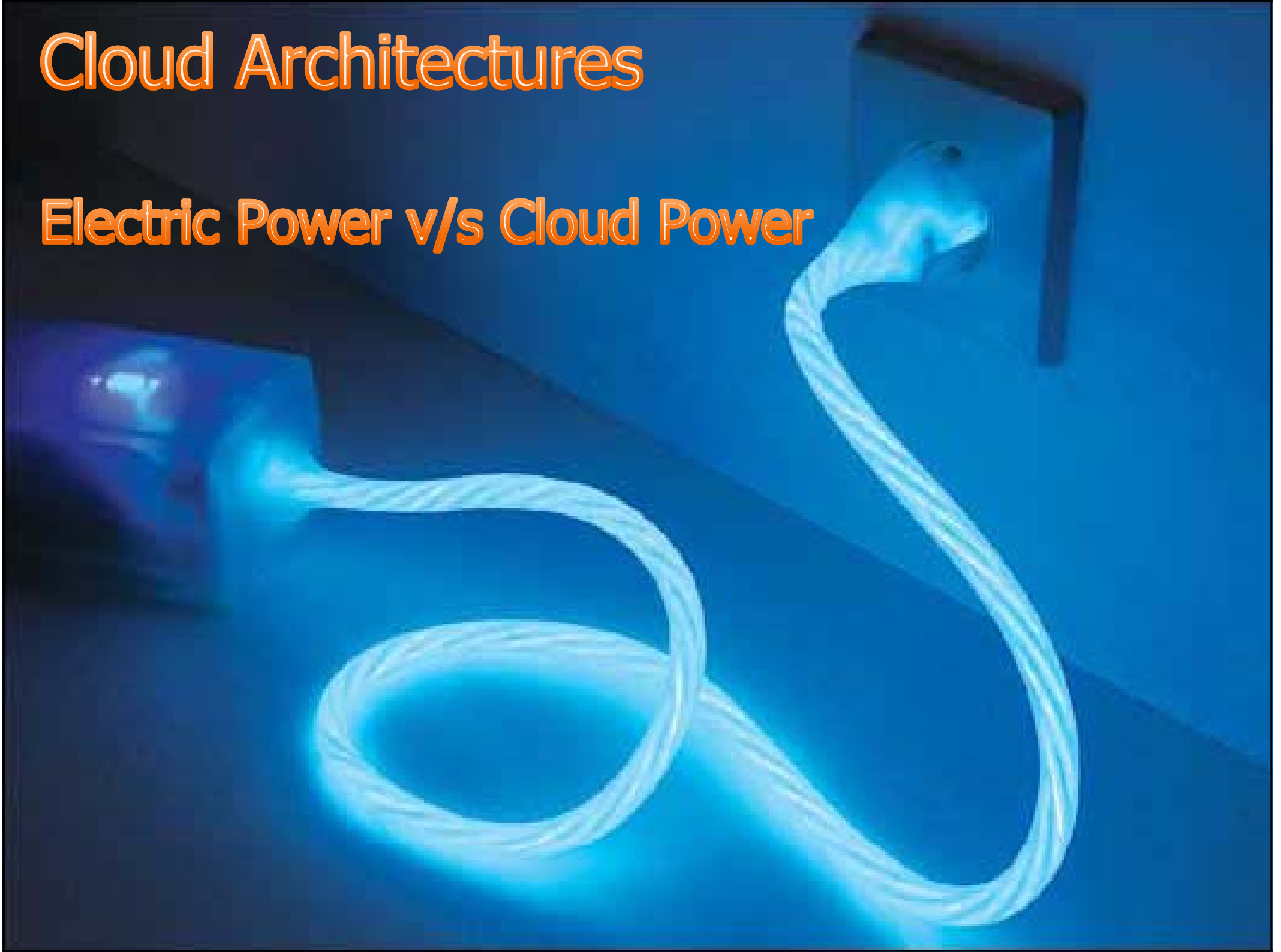
A red rounded rectangular button containing the text "EC2" in white and a green waveform icon on a black grid background.

More Services : Auto Scaling



Cloud Architectures

Electric Power v/s Cloud Power



The image is a composite. The top half shows a world map where the continents are represented by white, fluffy clouds against a clear blue sky. The bottom half shows a bright green, rolling field with a single, isolated tree on the right side. The text is overlaid on the top half of the image.

What do large enterprises like about Cloud Computing?

Is the Cloud ready for enterprises?



What do large enterprises like about Cloud Computing?

Is the Cloud ready for enterprises?

What are enterprises currently doing in-the-Cloud?

Enterprise Cloud Computing Usecases

- Development
- Testing
- POC/Pilot Provisioning
- HPC/Research
- Media Distribution
- Informatics
- Data Analytics
- Steady State Websites
- Training/Labs
- Disaster Recovery
- Archiving
- Manage Unpredictable Peaks
- Application Maintenance



Autodesk

“Autodesk is the industry leader in design innovation technology. Traditionally, our software products for managing, analyzing and rendering CAD data are built for the Windows operating system. However, new web-based applications require large scale processing of CAD data and we’ve made EC2 our environment of choice for data processing. . . .”



HPC/Grid for Discovery Research

"Amazon EC2 has given us the ability to easily spin up tailored computing environments that can quickly and cost-effectively process tremendous amounts of research data. This is a huge step forward in maximizing our results relative to IT spend."

Dave Powers

Lilly



Traditional Web Hosting

- ESPN launched their social network, ESPN FanPages, built entirely on Amazon EC2 with data hosted in Amazon S3

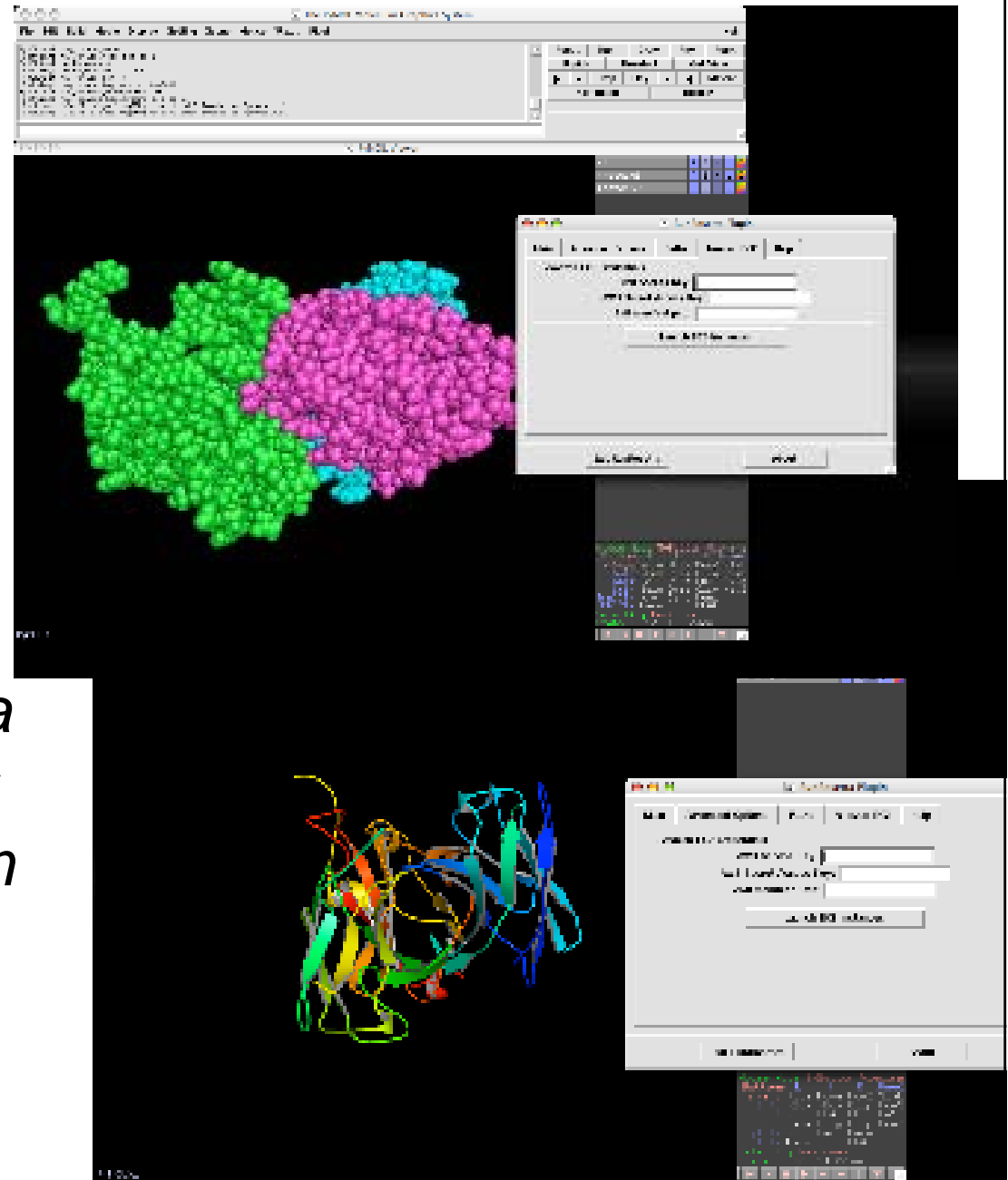


Major Pharmaceutical Company Protein Docking Calculations

- 200 High CPU instances
- 60,000 structures computed in ~4 hours

"This is much cheaper than building and maintaining a physical 200-node cluster and you pay nothing when it's not running"

<http://bioteam.net>



“TimesMachine” from NYTimes

HOME PAGE TODAY'S PAPER VIDEO MOST POPULAR TIMES TOPICS

The New York Times
Friday, January 30, 2009

“All the News That Was Fit to Print”

Welcome to
TimesMachine
Browse 70 years of New York Times archives

1850s
1860s
1870s
1880s
1890s
1900s
1910s
1920s

Welcome. TimesMachine can take you back to any issue from Volum Daily Times, on September 18, 1851, through The New York Times of Decce history and flip electronically through the pages, displayed with their origi

TUESDAY
APRIL 16, 1912
The Titanic Sinks

MONDAY
NOVEMBER 11, 1918
World War I Ends



- 1851-1922 Articles
- TIFF -> PDF
- Input: 11 Million Articles (4TB of data)
- What did he do ?
 - 100 EC2 Instances for 24 hours
 - Input: All data on S3
 - Output: 1.5 TB of Data
 - Hadoop, iText, JetS3t



Washingtonpost.com

The screenshot shows the Washington Post website interface. At the top left is the logo 'washingtonpost.com' and at the top right is 'The Washington Post Print Edition | Subscribe'. Below this is a banner advertisement for bedding with the text 'We've updated our bedding so you can feel refreshed!' and a list of items: 'Crisp sheets', 'Plush comforter', 'Cozy fleece blanket', and 'Fluffy pillows'. Below the ad is a navigation bar with categories: NEWS, POLITICS, OPINIONS, LOCAL, SPORTS, ARTS & LIVING, and CITY GUIDE. A search bar contains the text 'Try Our New Search' and 'go' button, with 'washingtonpost.com' and 'Web: Results by Google' visible. Below the search bar, the breadcrumb trail reads 'washingtonpost.com > Politics > Elections'. The main heading is 'Clinton's Schedule' with a sub-heading 'Hillary Clinton's activities as First Lady, 1993-2001'. The main text describes the release of over 11,000 pages of Hillary Clinton's official schedule. A search box titled 'SEARCH CLINTON'S SCHEDULE' is at the bottom, with the text 'Enter word(s):' and a 'Search' button.

- 1993-2001
- 11,000 Articles
- TIFF -> Searchable PDF
- Input: 10,000 Articles
- What did they do ?
 - 1467 hours of Machine usage
 - 200 EC2 instances
 - Up 26 hours later
 - Released on March 19

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.



Coding in the Cloud





What do large enterprises like about Cloud Computing?

Is the Cloud ready for enterprises?

What are enterprises currently doing in-the-Cloud?

In retrospect,

- Cloud Computing is Inevitable
- It will get more mature in 2009
- Early mover advantage to Enterprises





What do large enterprises like about Cloud Computing?

Is the Cloud ready for enterprises?

What are enterprises currently doing in-the-Cloud?

What would you like to do, but cannot? Why?

<http://aws.amazon.com>

[/sdb](#)

[/sqs](#)

[/ec2](#)

[/s3](#)

[/support](#)

[/forums](#)

[/blog](#)

Thank You!

Jinesh Varia
jvaria@amazon.com



Enterprise Customers Using AWS

Elastic Computing

The New York Times

Media Distribution



Scalable Web Sites



Backup and Recovery



Financial Applications



Large-scale Simulation



NASDAQ OMX

AMZN on 09/19/2008 @ 09:30:00.000

Request New Replay

Symbol: AMZN
 Date: 09/19/2008
 Time: 09:30:00.000
 Timespan: 12:00:00.000

Quotes Trades All

Run

Replays

- AMZN 09/19/2008 09:30:00.000
- NDAQ 09/19/2008 09:30:00.000
- NDAQ 07/03/2008 12:00:00.000
- NDAQ 07/02/2008 16:00:00.000
- DIA 06/23/2008 10:50:00.000
- F 06/23/2008 10:50:00.000
- F 06/23/2008 10:40:00.000
- F 06/30/2008 15:30:00.000
- NDAQ 06/30/2008 15:30:00.000
- AMZN 06/27/2008 15:10:00.000
- F 06/27/2008 10:10:00.000
- DIA 06/27/2008 10:04:05.000
- DIA 06/27/2008 16:04:05.000
- DIA 06/16/2008 09:25:05.000
- NDAQ 06/16/2008 09:25:00.000
- FFHS 06/16/2008 09:30:00.000
- QQQQ 06/27/2008 15:50:00.000
- MSFT 06/27/2008 16:00:00.000
- NDAQ 06/27/2008 16:00:00.000
- NDAQ 04/01/2008 15:40:00.000
- NDAQ 04/01/2008 15:40:00.000
- QQQQ 04/04/2008 15:40:00.000
- QQQQ 04/04/2008 09:40:00.000

Open Send Delete

Market Replay version: 2.1.616

Quotes Trades Exchange Filter



Last Sale: 83.0800 Quantity: 400 Exchange: ARCX Time: 09:33:15.170

		Best Bid	Best Offer		
NBBO	200	83.03	83.14	300	NBBO
NSDQ	200	83.03	83.14	300	ARCX
ARCX	100	83.00	83.15	500	CBOE
CINN	100	79.21	83.49	100	NSDQ
ISEG	900	77.00	84.00	100	ISEG
ADFN	100	69.99	85.00	100	CINN
CBOE	100	0.01	91.00	100	ADFN
CHXE	0	0.00	999,999.00	0	CHXE

Timespan 09:25:00.000 09:34:59.000

Trades

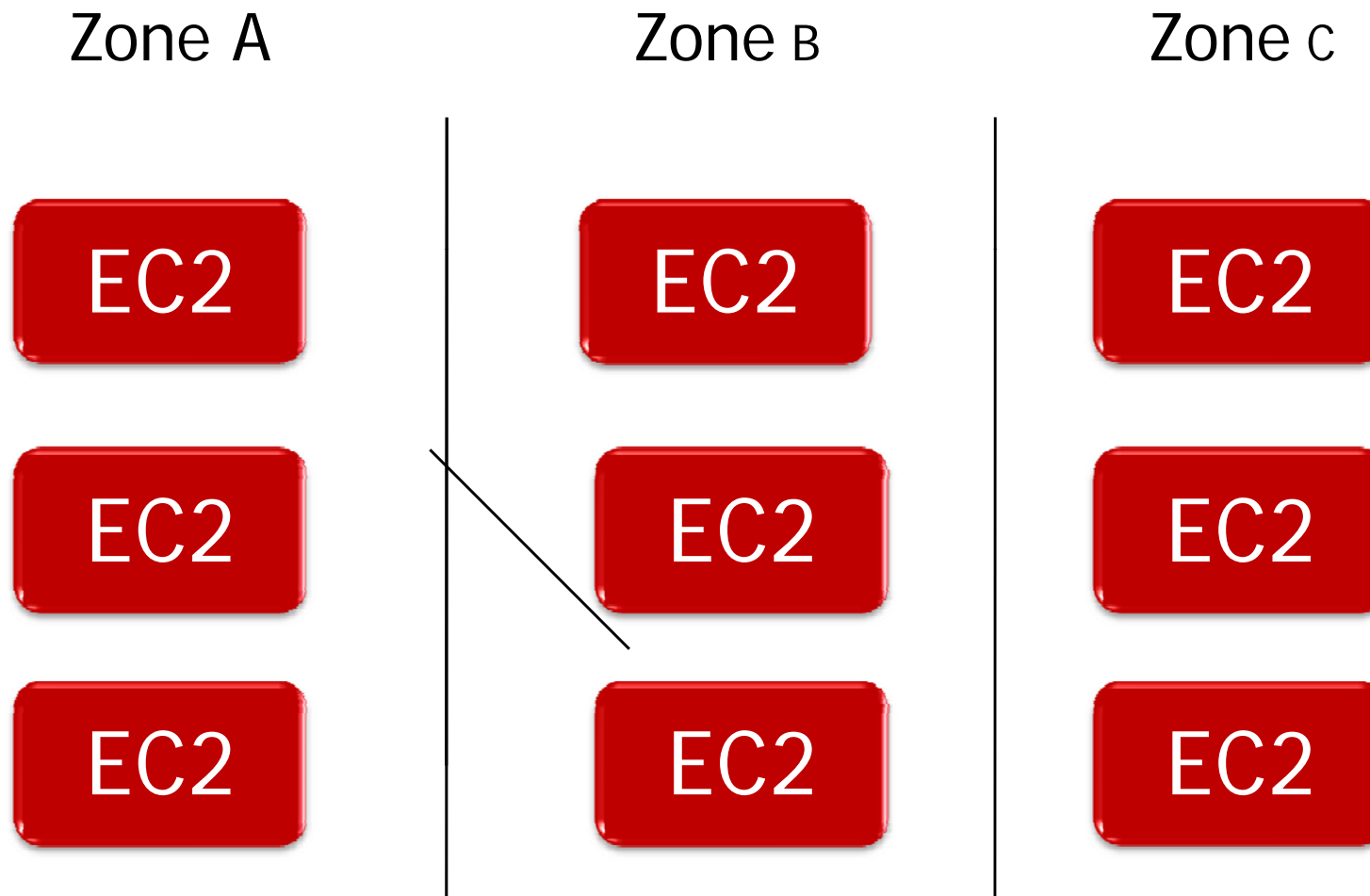
High: 86.3700 Trades: 3,401
 Low: 76.5000 Shares: 2,139,106
 VWAP: 81.1067

Time	Price	Quantity	MC
09:33:15.623	83.0800	500	P
09:33:15.623	83.0800	300	P
09:33:15.623	83.0800	100	P
09:33:15.623	83.0800	100	P
09:33:15.623	83.0800	100	P
09:33:15.640	83.0800	200	P
09:33:15.640	83.0800	100	P
09:33:15.843	83.0800	200	P
09:33:15.843	83.0800	100	P
09:33:15.843	83.0800	100	P
09:33:15.843	83.0800	100	P
09:33:15.937	83.0700	100	P
09:33:15.937	83.0800	100	P
09:33:15.937	83.0800	400	P
09:33:15.937	83.0800	16,000	P

Quotes

	Low Bid	High Bid	Low Ask	High Ask
NBBO	78.20	86.34	78.01	86.40
NSDQ	78.00	86.34	78.61	86.40
ISEG	77.00	77.00	82.00	999,999.
CINN	76.50	86.31	79.01	999,999.
ARCX	75.00	86.33	78.01	86.40
ADFN	63.00	69.99	82.00	999,999.
CBOE	0.01	84.29	79.31	999.99
CHXE	0.00	86.16	85.03	999,999.

Redundancy



Elastic Block Storage

