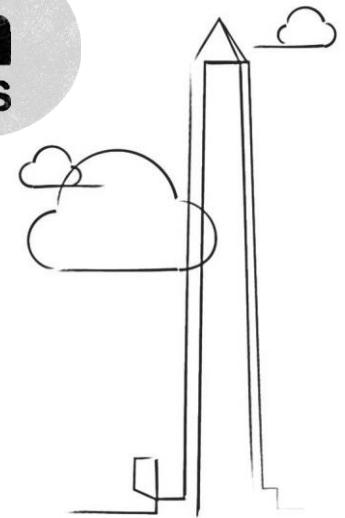




Amazon Web Services



Steve Spano, Brig Gen (Ret), USAF
GM, Defense and National Security
AWS, Worldwide Public Sector

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Overview

Historical Perspective of IT
Transformational Value of Cloud
Why organizations are choosing AWS?
How organizations are using AWS

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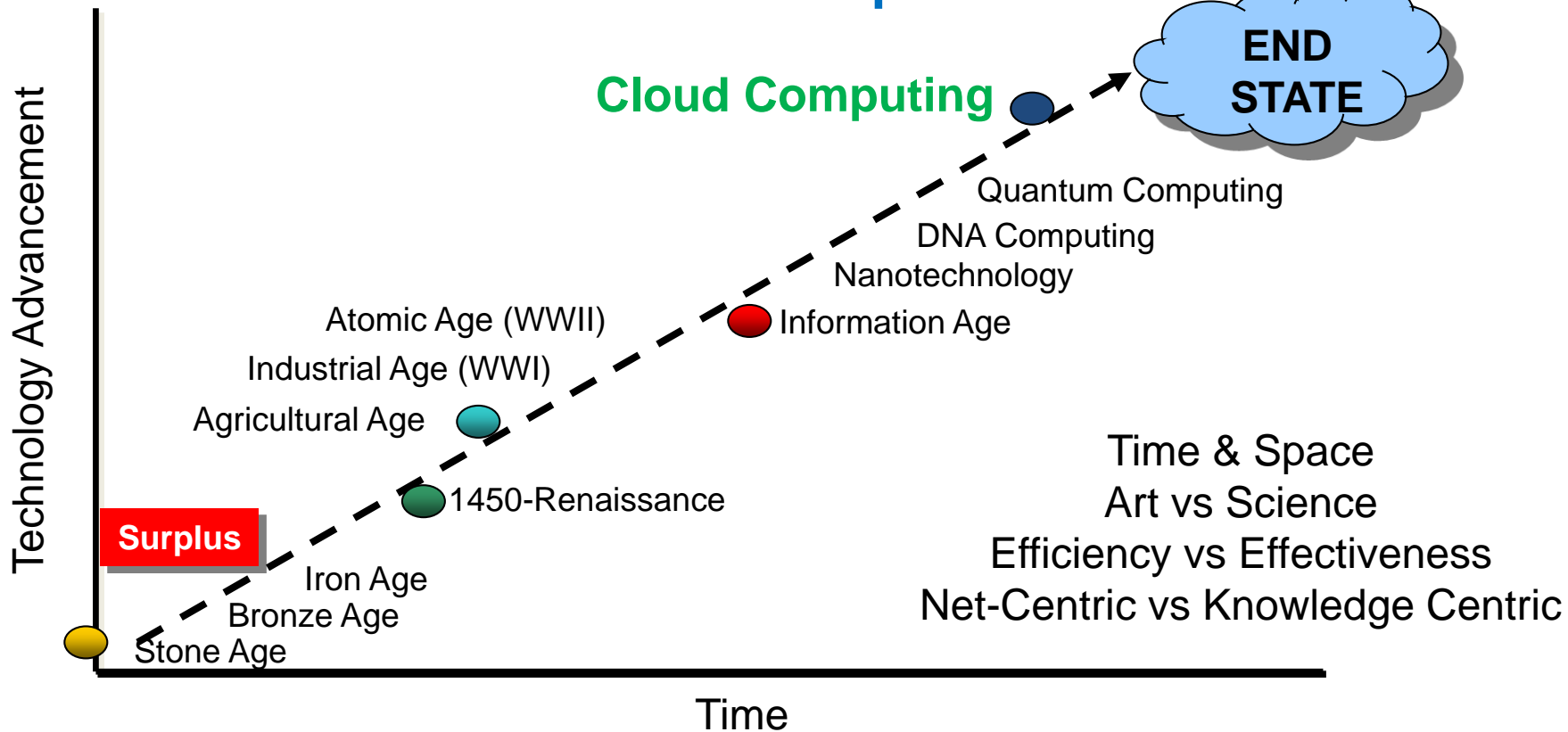
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Historical Perspective



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Transformational Value of Cloud

- Re-leveling the playing field for innovation
- Disrupting current business models
- Driving new organizational constructs
- Commoditizing IT and service delivery
- Accelerating speed, agility, and innovation

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What is Cloud Computing?

The on-demand delivery of IT resources via the Internet with pay-as-you-go pricing

- **Pay on-demand** -- not buying assets
- **Our platform** -- your implementation
- **Awesome** -- not magical

Programmable Infrastructure

Elastic Services

Design for high availability

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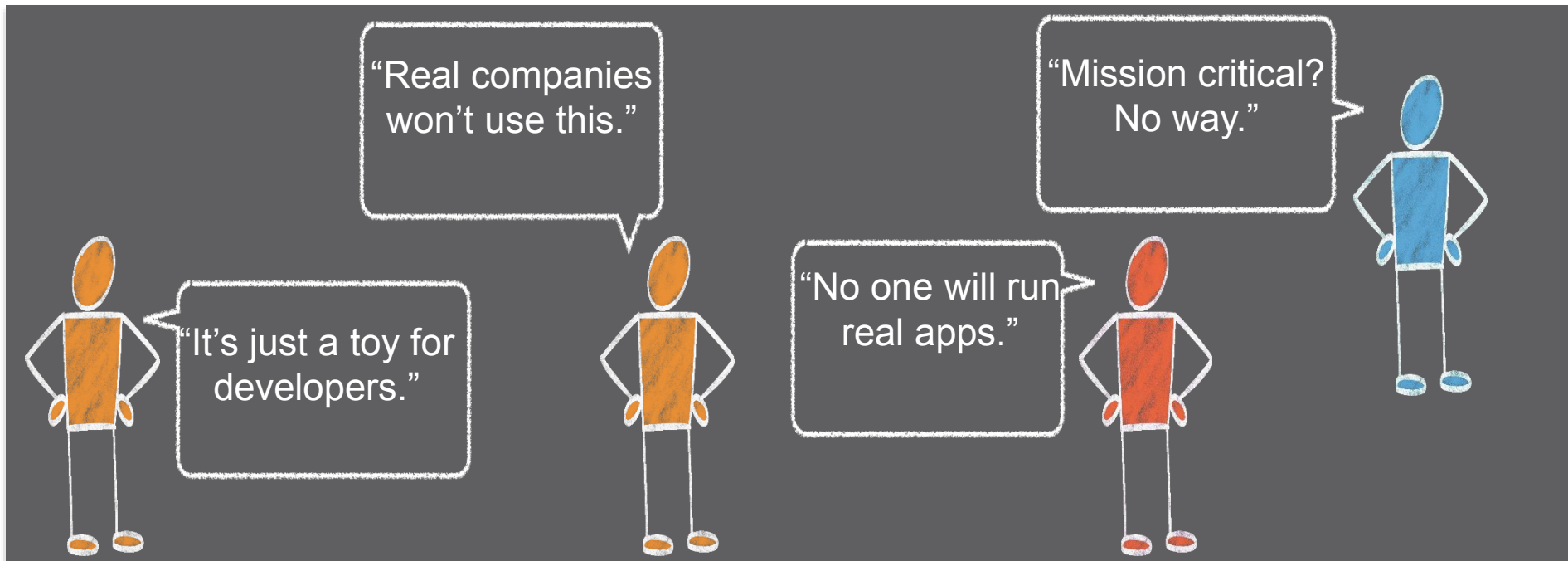
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“First they ignore you, then they laugh at you, then they fight you, then you win” Mahatma Gandhi



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Data Center Community Industry Association



Now, the Cloud Brings You the World's Biggest Events



dancing
the stars with



Mars Rover



Obama for America

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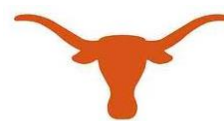


& DC|A proudly present:
Diverse Community Energy Solutions



AWS Cloud Adoption in the Public Sector

600+ Government Agencies



2,400+ Education Institutions

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Growing Public Sector Partner Eco System



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Why are organizations
adopting cloud computing and
AWS so quickly?

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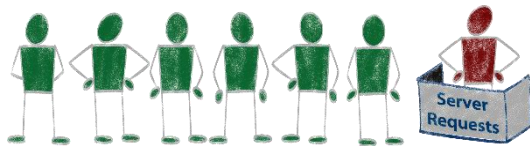
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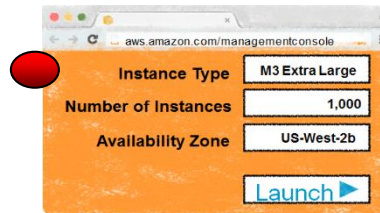


#1: Agility:

Old World:
Infrastructure in **Weeks**



AWS:
Infrastructure in **Minutes**



- Add New Dev Environment
- Add New Prod Environment
- Add New Environment in Japan
- Add 1,000 Servers
- Remove 1,000 Servers
- Deploy 1 PB Data Warehouse
- Shut down 1 PB Data Warehouse

Everything changes with this kind of agility



It's Not Just Having Services in a Couple of Regions



AWS Global Infrastructure

- 10 Regions (including GovCloud US)
- 26 Availability Zones
- 51 Edge Locations

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Every Imaginable Use Case



Free steak campaign



BandPage

Facebook page



Mars exploration ops



Consumer social app



Ticket pricing optimization

LIONSGATE

SAP & Share Point



Securities Trading
Data Archiving



Unilever

Gene sequencing



Marketing web site



Interactive TV apps



Financial markets analytics



R&D data analysis



Consumer social app



Big data analytics



Web site &
media sharing



Washington
Trust Bank

Disaster recovery



Media streaming



RED LION HOTELS
CORPORATION

Web and mobile apps



THOMSON
REUTERS

Streaming webcasts

The Washington Post

Facebook app



Flipboard

Consumer social app

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#2: Platform Breadth

A broad and deep platform helps customers build sophisticated, scalable applications

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Your Applications

Deployment & Management

<p>Web Interface</p> <p>Management Console</p>	<p>Deployment & Automation</p> <p>Beanstalk CloudFormation</p>	<p>Identity & Access</p> <p>IAM Federation Billing</p>	<p>Monitoring</p> <p>Amazon CloudWatch</p>
--	---	--	--

Application Services

<p>Content Delivery</p> <p>CloudFront</p>	<p>Networking</p> <p>Amazon SES Amazon SNS Amazon SQS</p>	<p>Search</p> <p>CloudSearch</p>	<p>Distributed Computing</p> <p>Elastic MapReduce Amazon SWF</p>	<p>Libraries & SDKs</p> <p>iOS php Java python Microsoft .net android</p>
---	---	----------------------------------	---	--

Foundation Services

<p>Compute</p> <p>EC2</p>	<p>Storage</p> <p>S3 EBS Glacier</p>	<p>Networking</p> <p>VPC ELB Route 53</p>	<p>Database</p> <p>RDS Dynamo ElastiCache SimpleDB</p>
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Regions	Availability Zones	Edge Locations
---------	--------------------	----------------

AWS Global Infrastructure

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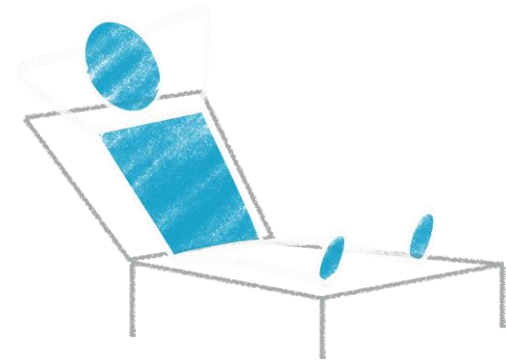
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#3: Continual Iteration and Innovation

AWS continuously upgrades infrastructure, so you don't have to



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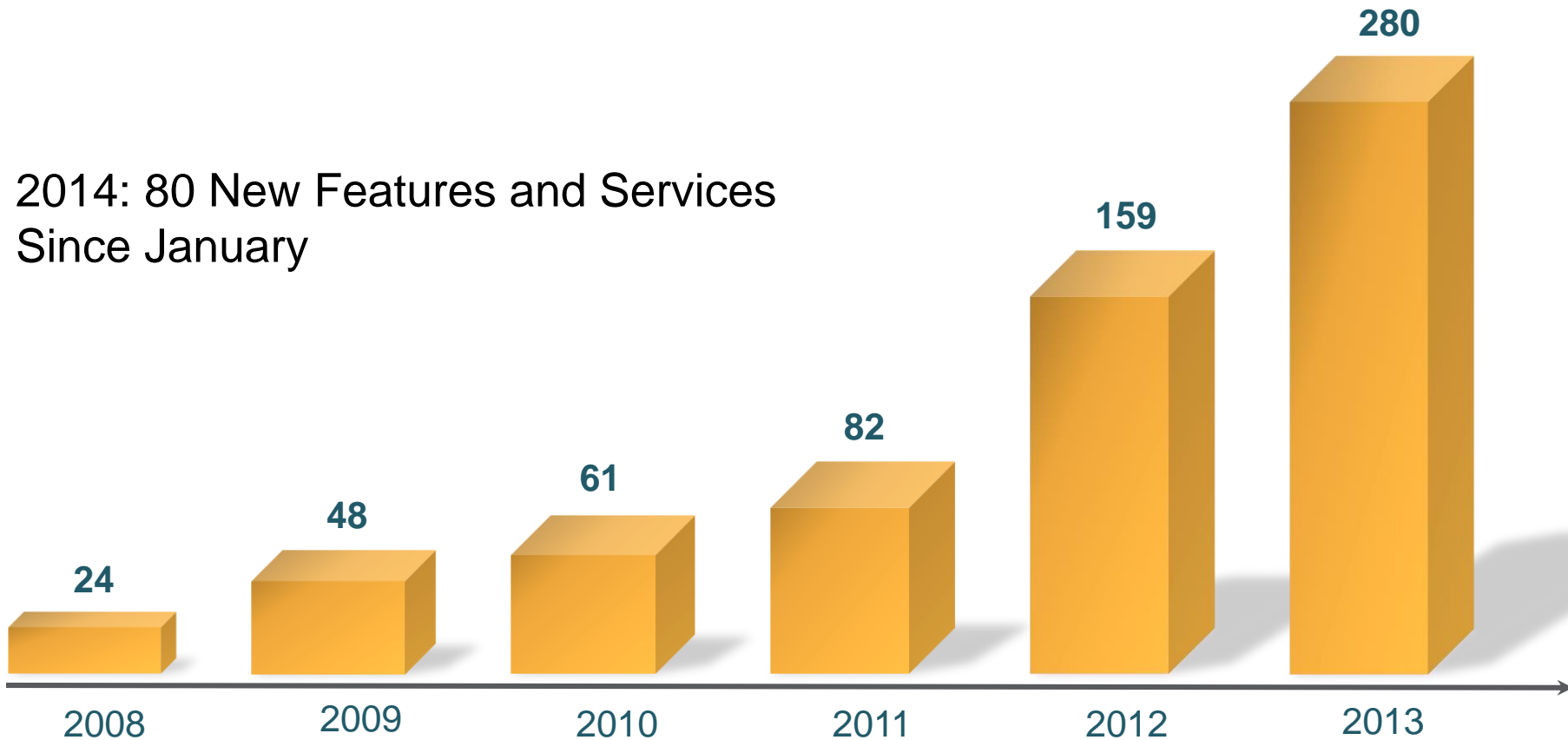
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AWS Pace of Innovation

2014: 80 New Features and Services Since January



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#4: Cost Savings and Flexibility

1

Replace up-front capital expense with low variable cost

“Average of 400 servers replaced per customer”

2

Economies of scale allow us to continually lower costs

42 Price Reductions

3

Pricing model choice to support variable & stable workloads

On-demand
Reserved
Spot

4

Save more money as you grow bigger

Tiered Pricing
Volume Discounts
Custom Pricing

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#5 Security: Architected for Enterprise Security Requirements



- Facilities
- Physical security
- Compute infrastructure
- Storage infrastructure
- Network infrastructure
- Virtualization layer (EC2)
- Hardened service endpoints
- Rich IAM capabilities

Customer

- Network configuration
- Security groups
- OS firewalls
- Operating systems
- Applications
- Proper service configuration
- Account management
- Authorization policies



A Shared Responsibility Model



proudly present:

“AWS is the overwhelming market share leader, with **more than five times the compute capacity** in use than the aggregate total of the other fourteen providers.”



Gartner “Magic Quadrant for Cloud Infrastructure as a Service,” Lydia Leong, Douglas Toombs, Bob Gill, Gregor Petri, Tiny Haynes, August 19, 2013. This Magic Quadrant graphic was published by Gartner, Inc. as part of a larger research note and should be evaluated in the context of the entire report.. The Gartner report is available upon request from [Steven Armstrong \(asteven@amazon.com\)](mailto:asteven@amazon.com). Gartner does not endorse any vendor, product or service depicted in its research publications, and does not advise technology users to select only those vendors with the highest ratings. Gartner research publications consist of the opinions of Gartner’s research organization and should not be construed as statements of fact. Gartner disclaims all warranties, expressed or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.

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Gartner®

“Increasingly, organizations are asking what can’t go to the cloud, rather than what can...”

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The Journey We're Seeing with AWS Customers



1

Dev & Test

Development and test environments

2

True Production

*Build production apps
Migrate production apps
Marketing*

3

Mission Critical

*Build mission-critical apps
Migrate mission-critical apps*

4

All-in

Corporate standard

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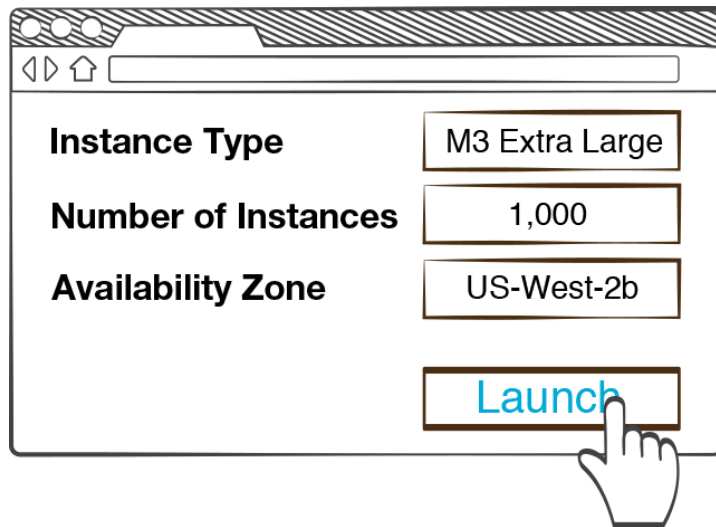
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Stage 1: Dev & Test

Self-service access to infrastructure



Benefits

- Experiment more, with no CapEx
- Resource projects instantly
- Eliminate idle servers
- Maintain consistency across teams

Use Cases

- Technology evaluation
- Prototyping
- Agile Development

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Stage 1: Cloud for Development & Test Environments



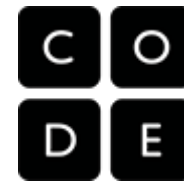
ArcGIS

Expanded data storage quickly
 100% reliability over 18 months
 Cost savings



Oracle Enterprise Applications

Reduced test environment costs



Large Scale Education Application

Aggressive testing to prepare for more than 18M youth coding on their website in a week, with a peak load of 330K concurrent users

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Stage 2: True Production Apps

1

Dev & Test

2

True Production

*Build production apps
Migrate production apps
Marketing*

3

Mission Critical

4

All-in



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Bristol-Meyers Squibb moved clinical trials to AWS

	On-Premises	Cloud
# of Simulations	2000	2000
# of Servers	2	256
Total Run Time (hr)	60	1.2



Clinical trial simulations took 98% less time
 More efficient and iterative simulations results in fewer human trials
 64% savings on clinical trial costs



We're using fewer subjects in these trials, and **needing fewer blood samples.**

*Russell Towell
 Senior Solutions Specialist*





1,000 Genome Data Set on AWS

- World's largest Human Genetic Dataset
 - Over 2,500 Sequences of the Human Genome
 - 250 Terabytes in total
- Prior to being hosted on AWS, Scientists had to download the entire data set from NIH
 - Only large institutions were able to work on the dataset
 - Cost of failure was high
- Now 1,000 Genome Dataset is publically available on AWS
 - Democratization of research
 - Low cost of failure
 - Analytics done on AWS next to dataset
 - Increased ability for collaboration from multiple research institutions

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Stage 3: Mission-critical Apps

1

Dev & Test

2

True Production

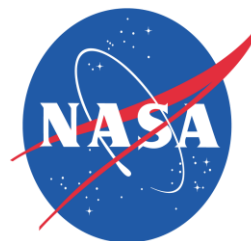
3

Mission Critical

Build mission-critical apps
Migrate mission-critical apps

4

All-in

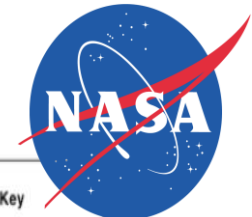


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NASA JPL uses AWS for Image Processing and Streaming of the Mars Landing

NASA's Jet Propulsion Laboratory used AWS to stream the images and video associated with the **Mars Curiosity** landing. Cloud enabled JPL to **provision capacity rapidly** and leverage the AWS to deliver successfully engaging experiences of Mars to the public.

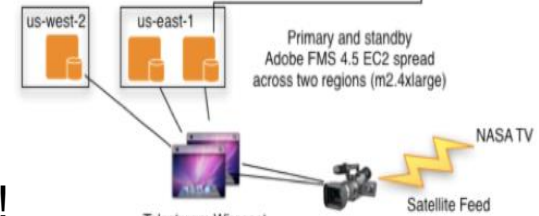
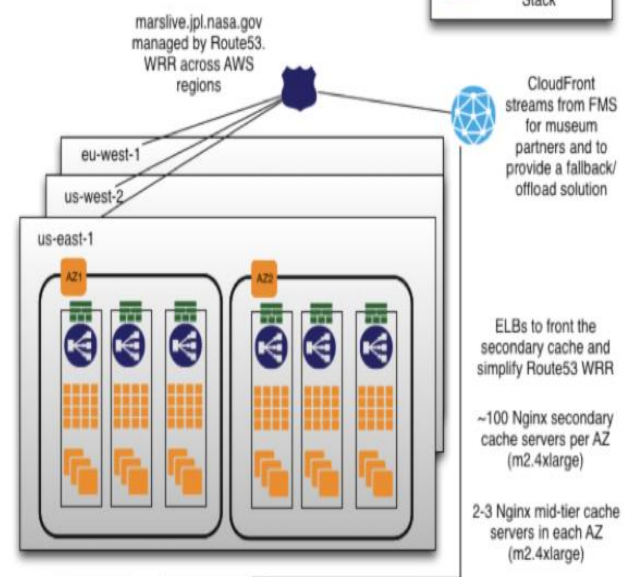
NASA/JPL Live Video Streaming Architecture



Avoiding latency-based routing in order to preferentially send more traffic to AWS regions and AZs in predictable ratios

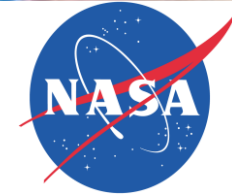
Key

- Ngix Edge cache
- Adobe FMS 4.5
- Amazon Elastic Load Balancer
- CloudFormation Stack





proudly present:



CASE STUDY

NASA - Mission Data Processing

Daily Mars Rover Data Processing Window

Pre-cloud:



Cloud:



Increase available mission planning time from 15 minutes to 105 minutes!

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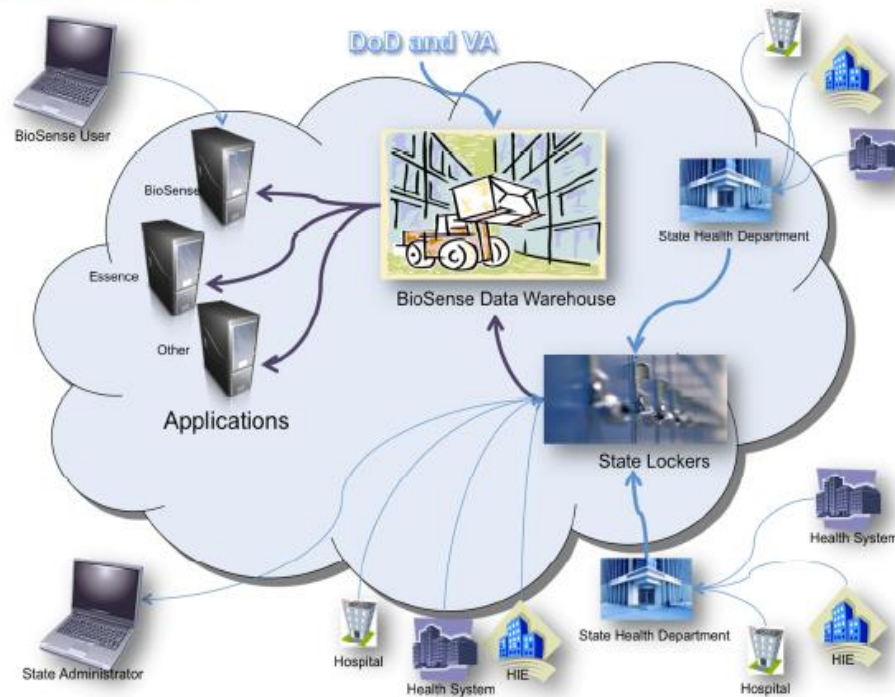
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CDC BioSense 2.0

Functional Diagram



Tracks public health problems to better prepare for and coordinate responses to safeguard the wellbeing of the American people.

Watch the video:

<http://www.youtube.com/watch?v=AGgm2j5axPY>

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Stage 4: All-in

1

Dev & Test

2

True Production

3

Mission Critical

4

All-in



News Corp



DOW JONES

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All In



Built nearly 200 applications leveraging diverse data sets as a shared data source

Campaign website
Donation processing
Data analytics

Enabled thousands of volunteers to make millions of calls to voters in last four days of campaign

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Think Big, Start Small, Scale Fast



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Backup slides



3 Fundamental Rules to Cloud Computing

Renting Services, not buying assets

Our Cloud, your implementation

Awesome, not magical

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Why organizations are choosing AWS

Broad & Deep Services to Support Virtually Any Cloud Workload

Compute	Networking	Storage & CDN	Database	App Services	Management
EC2	Route 53	S3	RDS	CloudSearch	IAM
EMR	VPC	Glacier	DynamoDB	SWF	CloudWatch
ELB	Direct Connect	EBS	ElastiCache	SQS	Elastic Beanstalk
		Import/Exp	Redshift	SNS	CloudFormation
				SES	Data Pipeline
				Elastic Transcoder	OpsWorks
					CloudHSM
					Trusted Advisor
					Marketplace
AWS Premium Support		Professional Services		AWS Training	

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