



KTH Stockholm

17 October 2017

Emanuel Higwall

Amazon Web Services

Business Development

Public Sector Nordic and Baltics



Why Are Customers Adopting Cloud Computing?

AWS provides a highly reliable, scalable, low-cost infrastructure platform in the cloud that powers more than a million active customers in 190 countries around the world.



Trade CapEx for OpEx



Economies of scale



Stop guessing capacity



Increase speed & agility



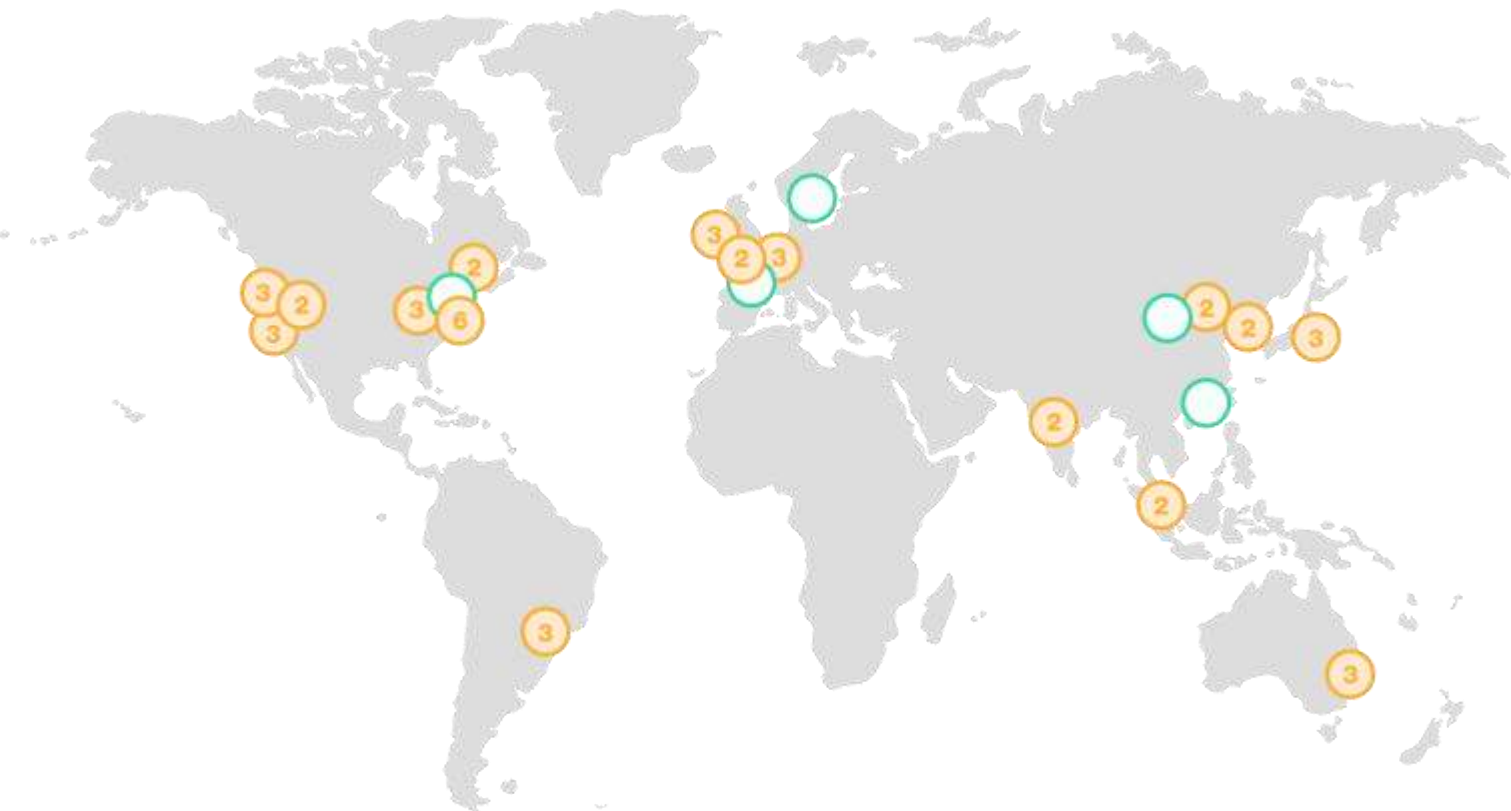
Focus on your business



Go global in minutes

AWS Global Infrastructure

16 Regions – 44 Availability Zones – 77 Edge Locations



Region & Number of Availability Zones

AWS GovCloud (2)

EU

Ireland (3)

US West

Frankfurt (3)

Oregon (3)

London (2)

Northern California (3)

Asia Pacific

US East

Singapore (2)

N. Virginia (6), Ohio (3)

Sydney (3), Tokyo (3),

Seoul (2), Mumbai (2)

Canada

China

Central (2)

Beijing (2)

South America

São Paulo (3)

Announced Regions

China, France, Hong Kong, Sweden,

AWS GovCloud (US East)



2,913

GovCloud
AWS OpsWorks
CodeCommit
Amazon SES
Elastic Transcoder
Amazon WorkMail
AWS Certificate Manager
Amazon EFS
Redshift
Identity & Access Management
Amazon AppStream
Dynamo DB
QuickSight
AWS WAF
Amazon SNS
CloudSearch
Glacier
Amazon Machine Learning
Amazon API Gateway
AWS Direct Connect
Amazon Inspector
AWS KMS
WorkDocs
Amazon Inspector
AWS IoT
Amazon Inspector
AWS Service Catalog
AWS Storage Gateway
Amazon ElastiCache
CloudHSM
Elasticsearch Service
Amazon Config
Amazon CloudTrail
AWS Elastic Beanstalk
EC2 Container Registry
AWS CodePipeline
Amazon Route 53
Lambda
AWS CloudFormation
AWS Device Farm
Directory Service
Amazon RDS for Aurora
AWS Mobile Hub
Mobile Analytics
AWS Import/Export
amazon web services

*As of 1 January 2017

A Rich Set of Programmable Services

- Account
- Support
- Managed Services
- Professional Services
- Partner Ecosystem
- Training & Certification
- Solution Architects
- Account Management
- Security & Pricing Reports
- Technical Acct. Management

	Marketplace	Mgmt. Tools	Analytics	Dev Tools	Artificial Intelligence	IoT	Mobile	Enterprise Applications	Game Development
	Business Applications	Monitoring	Query Large Data Sets						
	DevOps Tools	Auditing	Elasticsearch						
	Business Intelligence	Service Catalog	Business Analytics						
	Security	Server Management	Hadoop/Spark		Deep Learning	Rules Engine	Build, Test, Monitor Apps	Document Sharing	
	Networking	Configuration Tracking	Real-time Data Streaming	Private Git Repositories	Voice & Text Chatbots	Local Compute and Sync	Push Notifications	Email & Calendaring	
	Database & Storage	Optimization	Orchestration Workflows	Continuous Delivery	Machine Learning	Device Shadows	Build, Deploy, Manage APIs	Hosted Desktops	
	SaaS Subscriptions	Resource Templates	Managed Search	Build, Test, and Debug	Text-to-Speech	Device Gateway	Device Testing	Application Streaming	3D Game Engine
	Operating Systems	Automation	Managed ETL	Deployment	Image Analysis	Registry	Identity	Backup	Multi-player Backends
Migration	Application Discovery	Application Migration	Application Migration	Data Migration	Database Migration	Server Migration			
Hybrid	Data Integration	Integrated Networking	Identity Federation	Resource Management	VMware on AWS	Devices & Edge Systems			
Application Services	Transcoding	Step Functions	Messaging						
Security	Identity & Access	Key Storage & Management	Active Directory	DDoS Protection	Application Analysis	Certificate Management	Web App. Firewall		
Database	Aurora	MySQL	PostgreSQL	Oracle	SQL Server	MariaDB	Data Warehousing	NoSQL	
Storage	Object Storage	Archive	Exabyte-scale Data Transport	Block Storage	Managed File Storage				
Compute	Virtual Machines	Simple Servers	Web Applications	Auto Scaling	Batch	Containers	Event-driven Computing		
Networking	Isolated Resources	Dedicated Connections	Global CDN	Load Balancing	Scalable DNS				
Infrastructure	Regions	Availability Zones	Points of Presence						

AWS in the Public Sector



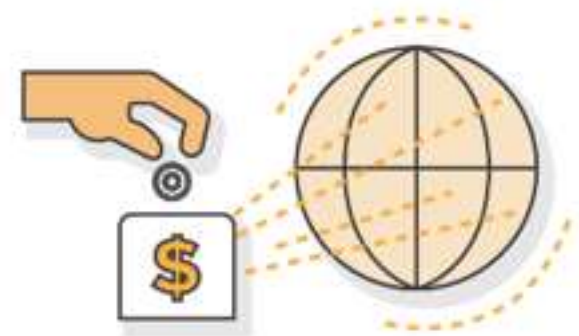
2,300+

government
agencies



7,000+

educational
institutions



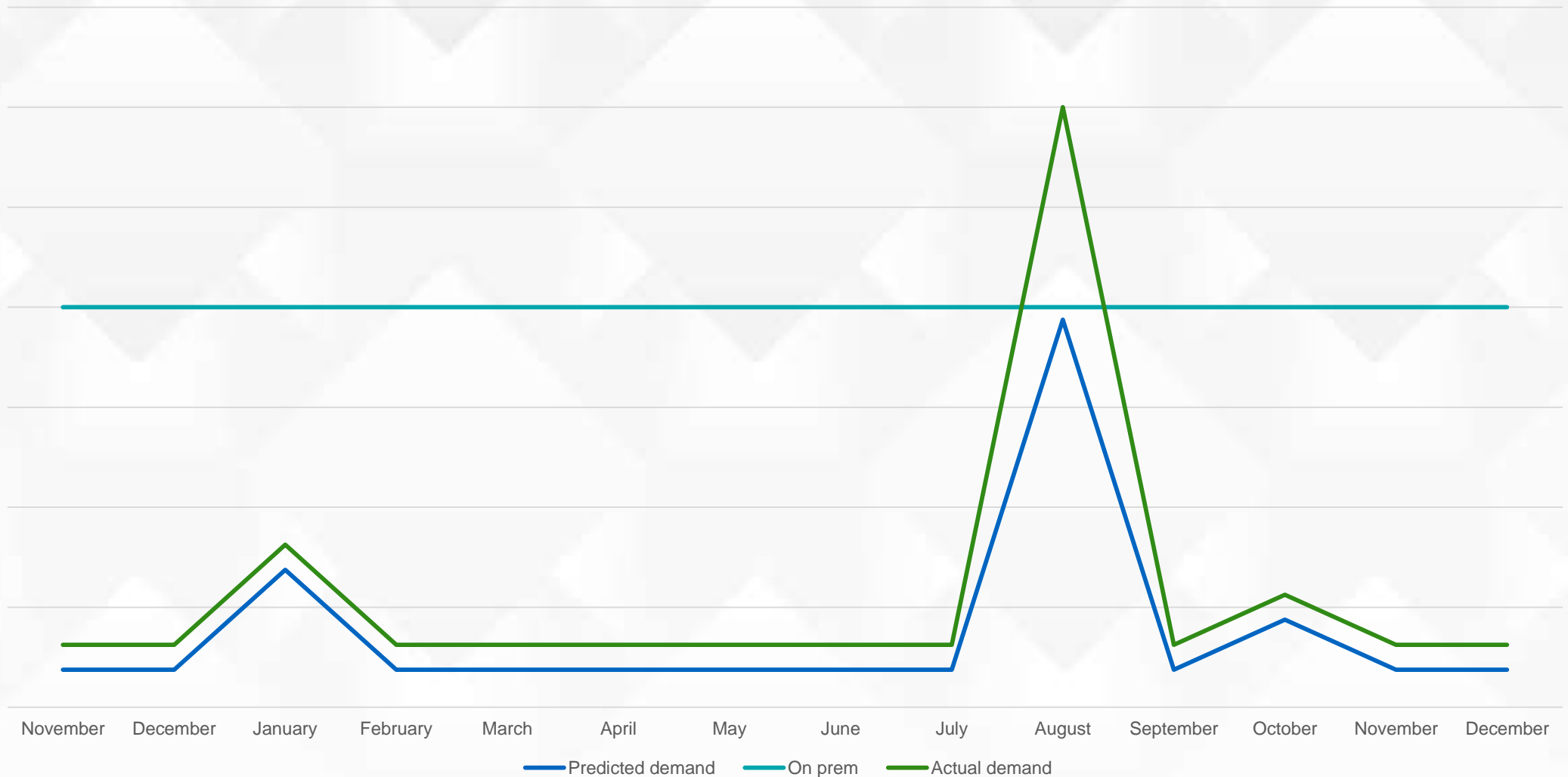
22,000+

nonprofit
organizations

Education customers



UCAS Compute Requirements



UCAS (Universities & Colleges Admissions Service)

The UK's undergraduate admissions platform

- 400+ universities & colleges
- Huge applicant databases
- Real-time catalogues
- Website (ucas.com)

Undifferentiated heavy lifting

- Power, cooling, managing

Increased reliability

Scaling for peaks

- 650,000 applicants
- 200 login/sec

UCAS Manages Massive Web Traffic Surges Using AWS (2:54)



University of Notre Dame

Increased reliability/ Scaling for peaks/40% cost-savings

Target 80% of academic & administrative workloads to the cloud in next 3 years

- **First websites for scalability & availability**
- **Next academic applications for anywhere access**

University of Notre Dame Migrates Website to AWS and Lowers its Operational Costs by 40%
(3:39)



AWS Big Data Platform

Collect

Orchestrate

Store

Analyze



Direct Connect



Import Export



AWS IoT



AWS Database Migration Service



AWS Snowball



Kinesis



AWS Lambda



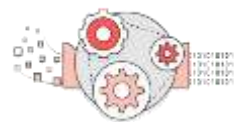
AWS Data Pipeline



Amazon SNS



Amazon SWF



AWS Glue



S3



Glacier



DynamoDB



Amazon Aurora



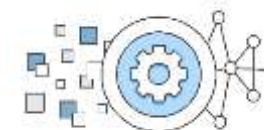
EMR



Redshift



Amazon Kinesis



Amazon Athena



EC2



Machine Learning



Amazon QuickSight

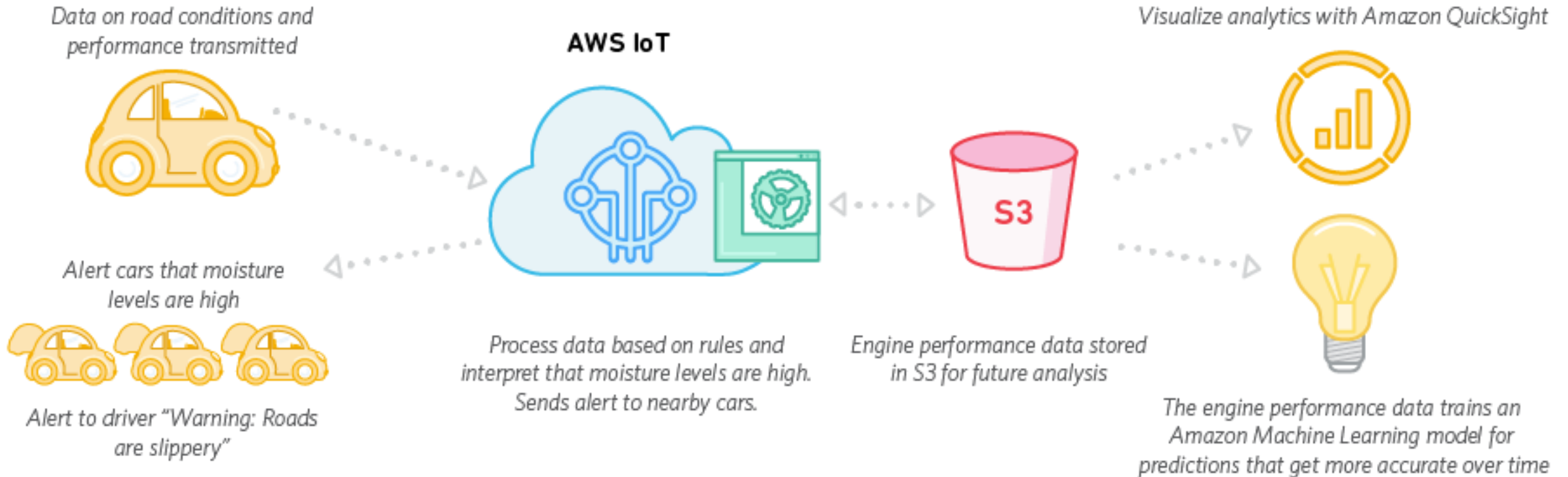
Sample Reference Architecture: Data Lake



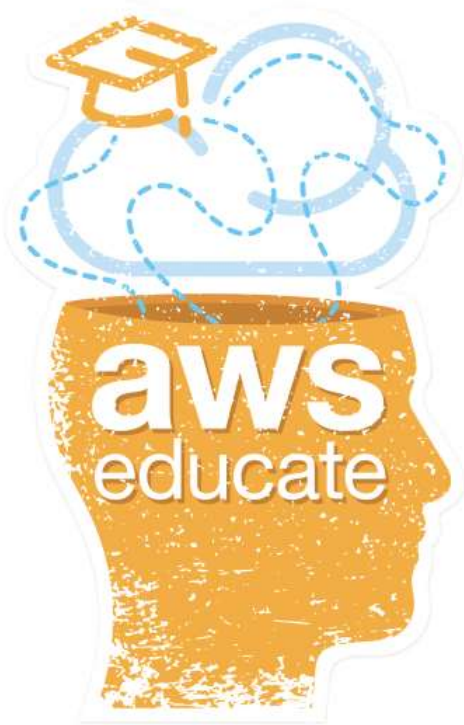
AWS Internet of Things (IoT)

Process and act upon device data

Example: Improve driver safety with connected cars



AWS Educate Value Proposition



Grants for free usage of AWS services



Labs and training on cloud topics and AWS products



Open course content by leading professors and AWS



Communities that share best practices virtually and in person



- ✓ Positively impact students around the world
- ✓ Curriculum change
- ✓ Student app development and entrepreneurship
- ✓ Accelerate hiring pipeline



STARTUPS



Startup Customers



aws activate

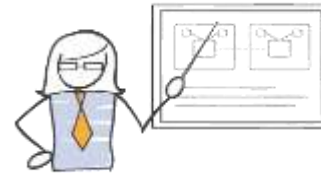
**AWS Promotional Credits
Special Offers**



AWS Support



AWS Training



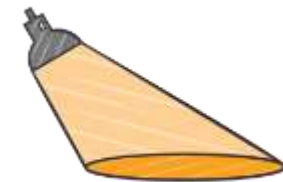
**Startup Community
Spotlight**



Toolbox



Startup



Builder's Package



Builders

The AWS Activate Builders package is designed for startups and entrepreneurs who are just getting started. You have an idea and want to build it. AWS is here to help.

[Apply Now.](#)

-
- \$1,000 AWS Promotional Credit, valid up to 2 years
 - [AWS Business Essentials](#) Online Training (\$600 value)
 - [AWS Technical Essentials](#) Online Training (\$600 value)
 - 80 credits for [self-paced labs](#) (\$80 value)



Our Partners

Northzone



ANDREESSEN
HOROWITZ



Katapult
Accelerator



CREANDUM



OpenOcean

Index
Ventures

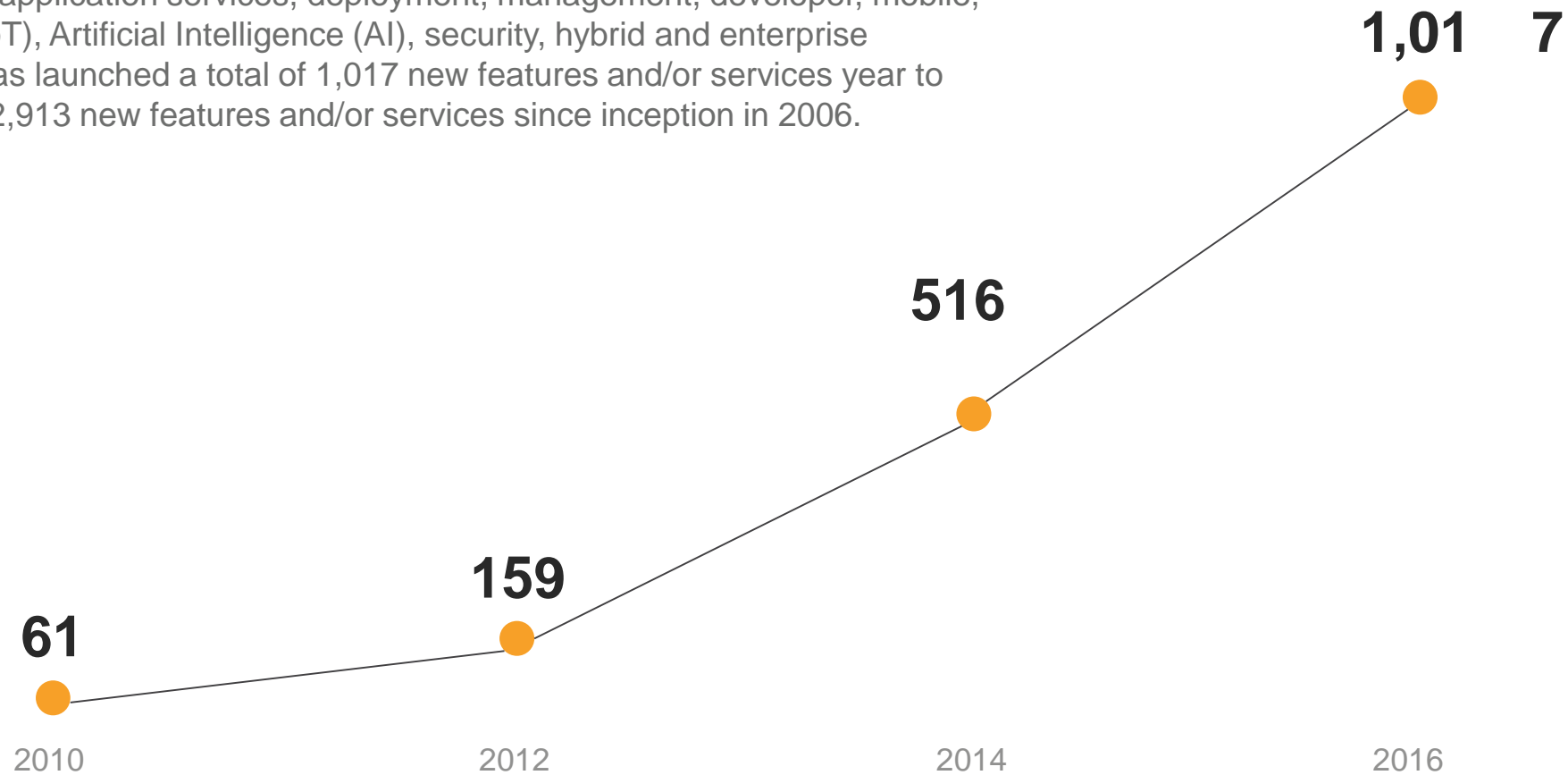


STARTUP
LAB







AWS Pace of Innovation

AWS has been continually expanding its services to support virtually any cloud workload, and it now has more than 90 services that range from compute, storage, networking, database, analytics, application services, deployment, management, developer, mobile, Internet of Things (IoT), Artificial Intelligence (AI), security, hybrid and enterprise applications. AWS has launched a total of 1,017 new features and/or services year to date* - for a total of 2,913 new features and/or services since inception in 2006.



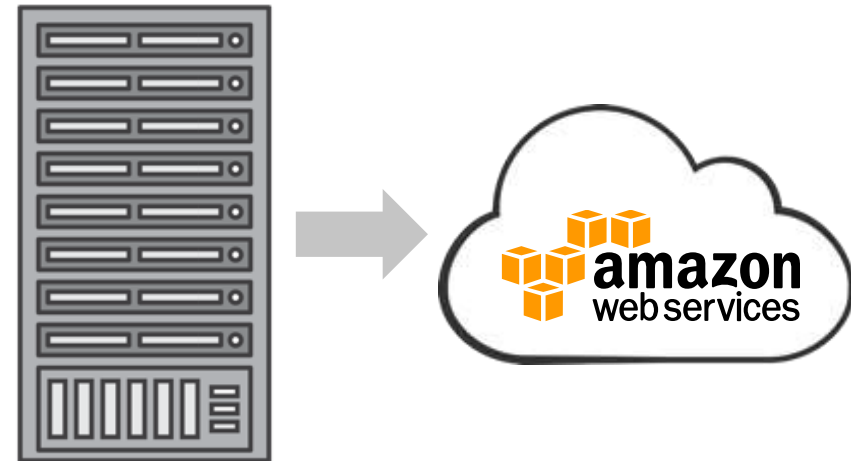
* As of 1 January 2017

What sets AWS apart?

-  **Experience** Building and managing cloud since 2006
-  **Service Breadth & Depth** 90+ services to support any cloud workload
-  **Global Footprint** 16 regions, 42 availability zones, 68+ edge locations
-  **Pricing Philosophy** 61 proactive price reductions to date
-  **Ecosystem** Thousands of partners; 3500+ Marketplace products

How is Government Using AWS?

- Development and testing
- Enterprise applications
- Big data and high-performance computing (HPC)
- Storage, backup, and archiving
- Disaster recovery
- Web, mobile, and social apps
- Virtual desktops
- Data center migrations



Reducing Costs, Improving Outcomes in the Cloud



Predict student outcomes within 2 weeks of a semester with 81% accuracy



Saved \$500,000 while improving performance of analytics platform 20x



THE UNIVERSITY OF WESTERN AUSTRALIA

Reduced upfront costs of MOOC by 99%, making it .07% cost of similar projects

Initial Considerations Getting Started

Security, certifications & accreditations

Where will your data be held?

Governance

- **Identity & Access Management**
- **Billing controls**

Start small, scale fast

- **Dev & test**
- **Websites**
- **Production workloads (lift & shift, or redesign?)**

ISVs building in the cloud & SAAS

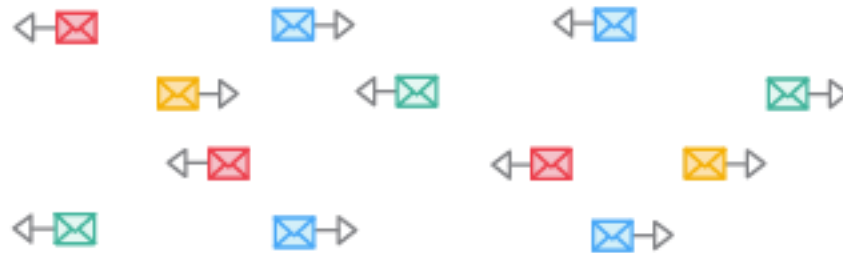
AWS Internet of Things (IoT)

Easily and securely connect devices to the cloud.



Billions of devices can publish and subscribe to messages

Example: *Connect a device using MQTT*



Messages are transmitted and received using the MQTT protocol which minimizes the code footprint on the device and reduces network bandwidth requirements

AWS IoT



AWS IoT enables devices to communicate with AWS services and each other

AWS Internet of Things (IoT)

Secure device connections and data

Example: Authenticate connections between sensors, a device and an application

1 An array of temperature sensors transmit data



2 The connection to AWS IoT is authenticated



AWS IoT



Only authenticated users can control the fan



4 The connection to the fan is authenticated

3 If the sensors agree the temperature is above a threshold they turn on the fan

5 The fan receives a command and turns on



AWS Internet of Things (IoT)

Read and set device state at any time

Example: Analyze chemicals in a sample with a mass spectrometer



Cloud Data Migration

Moving existing on-premises data to a new cloud storage location in batches, trickles and streams.



Direct Connect



Storage Gateways



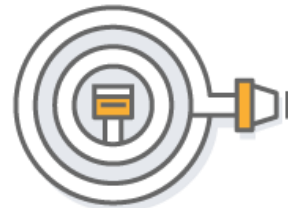
**Import/Export
Snowball**



Technology Partnerships



**Amazon S3 Transfer
Acceleration**



Kinesis Firehose

Big Data Services

Amazon Elastic MapReduce (Amazon EMR)

Hosted **Hadoop**
framework



AWS Data Pipeline

Move data among
AWS services and
on-premises data sources



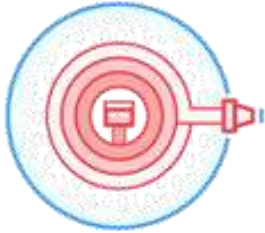
Amazon Redshift

Petabyte-scale **data**
warehouse service



Analytics Services – Amazon Kinesis

Powerful services to process, analyze, visualize data easily and cost-effectively



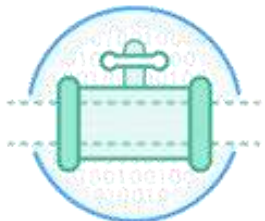
Amazon Kinesis Firehose

Easily load massive volumes of streaming data into AWS



Amazon Kinesis Analytics

Easily analyze streaming data with standard SQL



Amazon Kinesis Streams

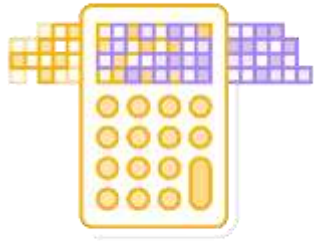
Build your own custom applications that process or analyze streaming data

**SUP
ERC
ELL**

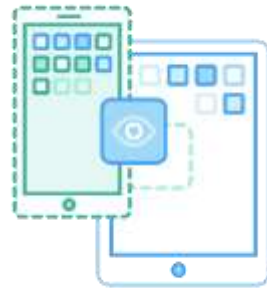
Supercell is using Amazon Kinesis for real-time delivery of in-game data, handling **45 billion events** per day.

Analytics Services – Amazon Quicksight

Powerful services to process, analyze, visualize data easily and cost-effectively



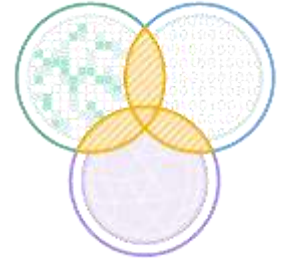
Super-fast, Parallel, In-memory, Calculation Engine ("SPICE")



Native Access on Major Mobile Platforms



Sharing and Collaboration



Smart Visualizations

Tack !