

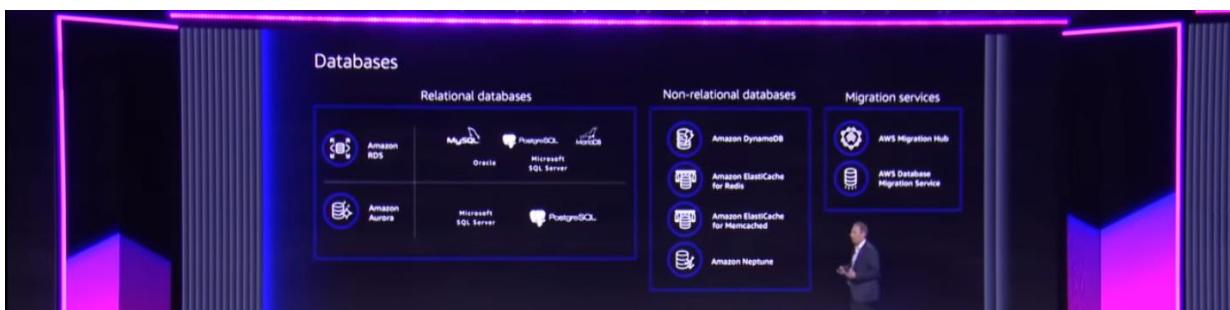
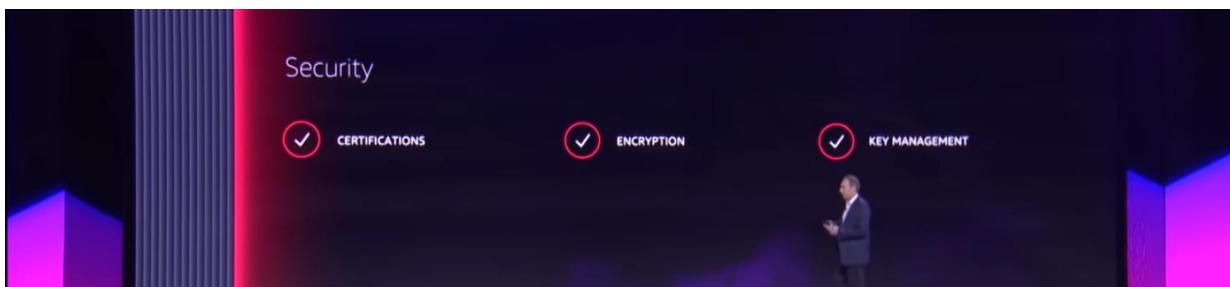
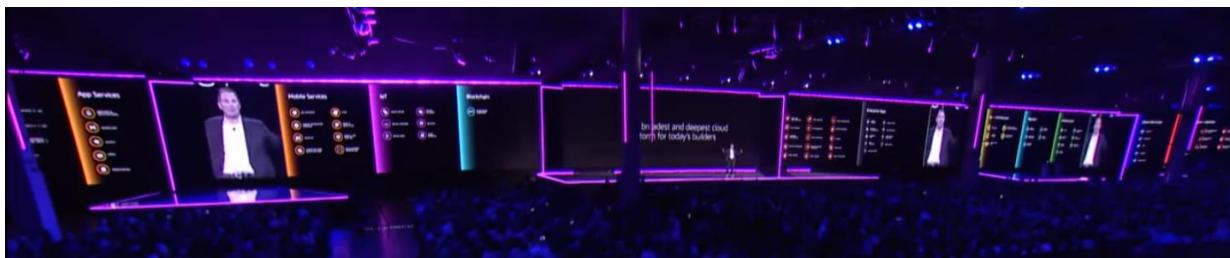


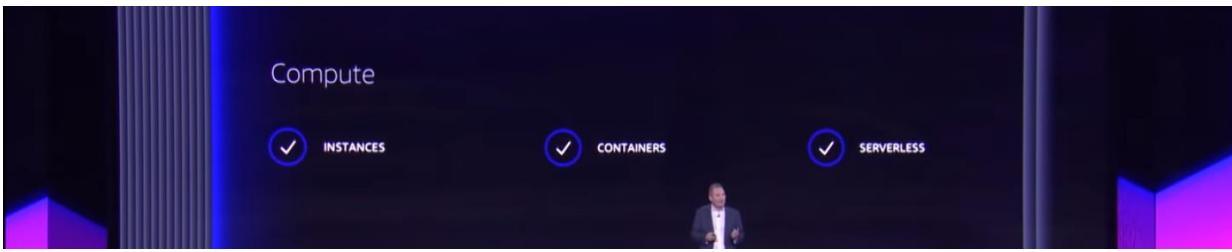




The broadest and deepest cloud platform for today's builders

The broadest and deepest cloud platform for today's builders



A detailed slide under the "Compute" heading. It is divided into three main sections: "Instances", "Containers", and "Lambda".

- Instances:**
 - 175 INSTANCE TYPES
 - Most powerful GPU instances for machine learning (P3dn)
 - Largest in-memory instances (Up to 12TB, SAP-certified)
 - FPGA Instance (F1)
 - New A1 arm instances with AWS processors
 - AMD (IM5, R5, T3 families)
- Containers:**
 - EC2 CAPABILITIES
 - Hibernate
 - EC2 Fleet
 - 100 Gbps performance for HPC, machine learning, and big data
 - Elastic GPUs
 - Spot
 - Lightsail
 - DEEPLY INTEGRATED CONTAINER ORCHESTRATION
 - MANAGED KUBERNETES
 - SERVERLESS CONTAINERS
 - CONTAINER IMAGE REPOSITORY
 - BATCH PROCESSING
- Lambda:**
 - EVENT-DRIVEN SERVERLESS COMPUTING
 - 45 supported event connections
 - 15 minute execution time
 - OS5 Application framework
 - Stream processing
 - API end points
 - Distributed training
 - Workflow orchestration

A detailed slide under the "Storage" heading. It is divided into four main sections: "Block", "Object", "File", and "Data Transfer".

- Block:**
 - THE MOST VOLUME OPTIONS (4)
 - Provisioned IOPS SSD
 - General Purpose SSD
 - Throughput Optimized HDD
 - Cold HDD
 - Elastic Volumes
 - Amazon Data Lifecycle Manager
- Object:**
- File:**
- Data Transfer:**
 - AWS Direct Connect
 - AWS Snowball
 - AWS Snowball Edge
 - AWS Storage Gateway
 - Amazon Elastic File System
 - Amazon Cloud Drive Service
 - Amazon Media Video Stream
 - Amazon S3 Transfer Acceleration
 - AWS DataSync
 - AWS Transfer for SFTP

A detailed slide for Amazon S3, showing its features and benefits.

- Best security, compliance, and audit capabilities**
 - Auditing with CloudTrail Data Events to track how, when, and who is using individual objects in storage
 - S3 Inventory report for daily inventory report with encryption status for objects in a bucket
 - Access control using customer-defined tags on individual objects
 - Write-once-read-many (WORM) controls on individual objects
 - S3 Block Public Access prevents public access for all current and future storage
 - Use ML-powered Amazon Macie to automatically discover, classify, and protect sensitive data
- Unmatched durability, availability, and scalability**
 - All S3 and Glacier 3-AZ storage classes replicate to 3+ AZs in a single region
 - Cross-region replication policies support any AWS region and storage class as destination
 - Fine-grained control of cross-region replication at bucket, prefix group, or object tag level
- Most object-level controls**
 - Extract data from an object with S3 Select
 - Replicate objects by tag with Cross-Region Replication (CRR)
 - Audit access to objects with CloudTrail Data Events
 - Tier using lifecycle by tag
 - Set object-level access control and security policies using tags
 - Apply retention policies to objects (WORM)
 - View operational metrics by tag (CloudWatch)
 - Batch operations on millions or billions of objects
- Easiest to use storage classes**
 - Storage Class Analysis for lifecycle policy setting recommendation
 - Amazon S3 Intelligent-Tiering
 - Amazon S3 Standard
 - Amazon S3 Standard-IA
 - Amazon S3 One Zone-IA
 - Amazon S3 Glacier (Unification)

NEW! COMING IN 2019

Introducing Glacier Deep Archive

Lowest cost storage available in the cloud...even lower than on-premises tape



No tape to manage



Designed for
99.999999999% durability



Recover data in hours vs.
days/weeks



\$0.00099/GB/month
Less than 1/4th the cost of Glacier

A man in a suit stands on stage, presenting the new service.



Amazon Elastic File System

Easiest way to run standard file systems in the cloud



4 performance modes with
General Purpose, Max I/O,
Burst, and Provisioned
Throughput



Redundantly stored across 3
Availability zones



Elastically scales up
and down with no
provisioning



New EFS IA storage class
saves up to 85% on
infrequently accessed files

Tens of thousands of customers using EFS

aetna

CardinalHealth

loanlogics

SIEMENS

BOESE

AUTODESK

Cornell University

Mercedes-Benz JO

REUTERS CONNECT

The Channel

BBC

DOORDASH

MONSANTO

SPOKEO

toast

Bristol-Myers Squibb

FireEye

photobx

SPICE

Game

PHILIPS

HBO

PROTECTWISE

WP engine

XILINX

HP

Autodesk

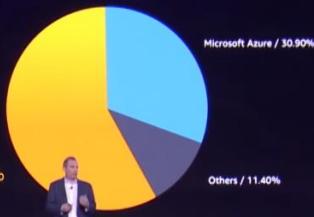
NETSCOUT

WP Engine

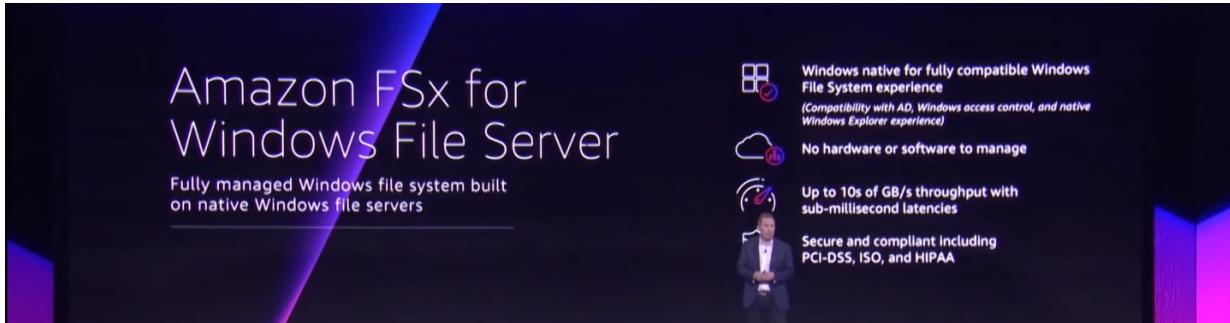
tile

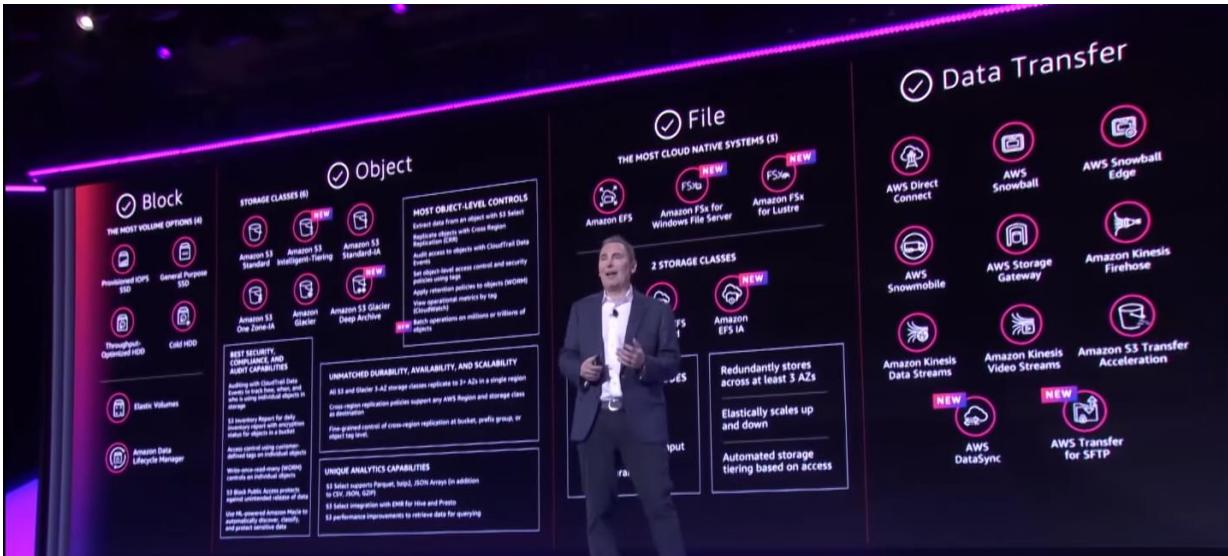
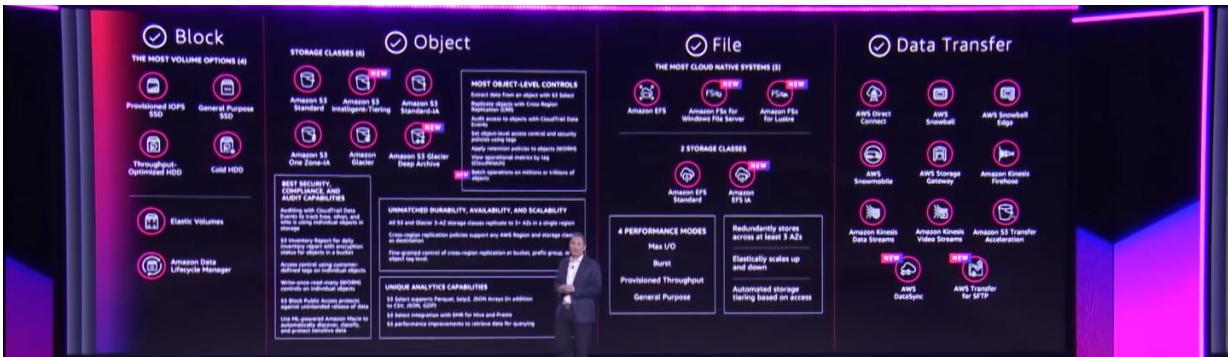
Worldwide Windows
Public Cloud IaaS
Instances by
Cloud Provider

AWS / 57.70%



A man in a suit stands on stage, presenting the chart.

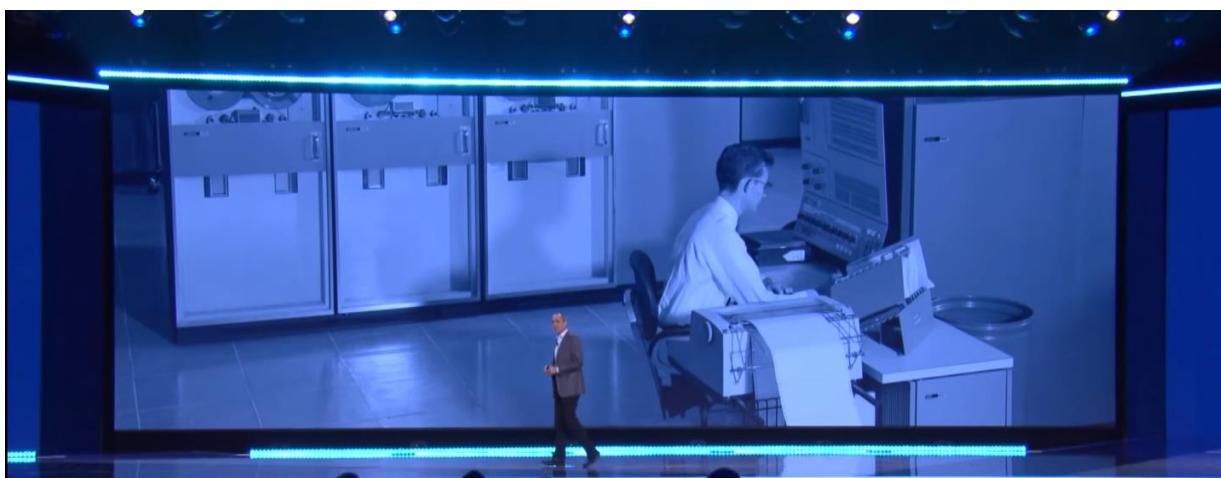




Guardian is a life insurance company that is 158 years old. I am responsible for all the technology, setting the direction and delivering on a host of shared services in real estate, facilities, sourcing, and more.

DEAN DEL VECCHIO

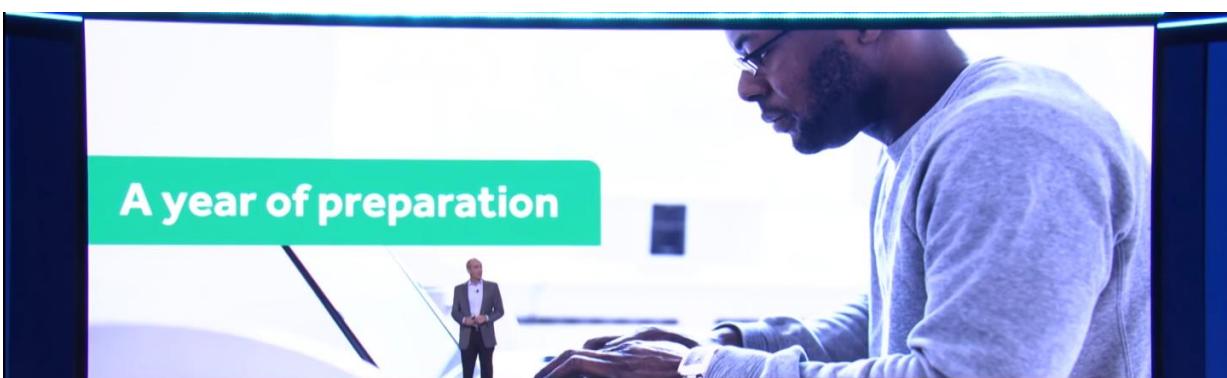
EVP, CIO & Head of Enterprise Shared Services, Guardian



This is an opportunity to take a legacy insurance company into the new digital age and be an enterprise digital-facing company in a highly regulated industry.



You need an environment that supports innovation and a digital workplace strategy to foster teamwork and an agile transformation.



Production first

rollout strategy



Partners.

40 SaaS providers
and AWS



Access.

Data lake and
disaster recovery



Security.

Amazon Macie
Amazon GuardDuty

200 applications

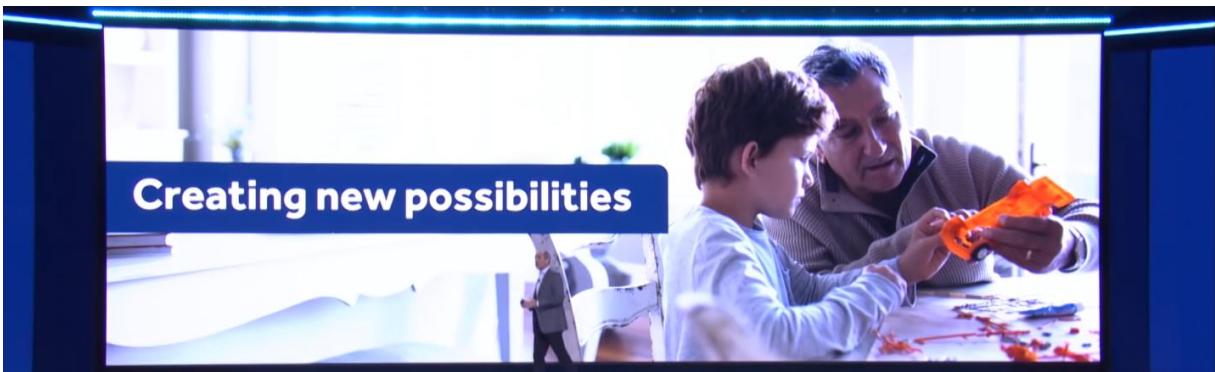
on AWS so far...

3



**Guardian closed
its last data center**

11.05.18



We are now ready to play and collaborate in the new InsurTech space building around us today.



The payoff has been great, we just recently launched our all digital **GuardianDirect platform** that allows consumers to research, purchase, self-service for Guardian products and other 3rd party products in the insurance sector.





Looking ahead

- Modernize core systems
- Expand digital experiences
- Advance data analytics and fraud detection
- Embrace new technologies to improve customer experience

Serving our customers



We do the right thing.

People count.

**We hold ourselves to
very high standards.**



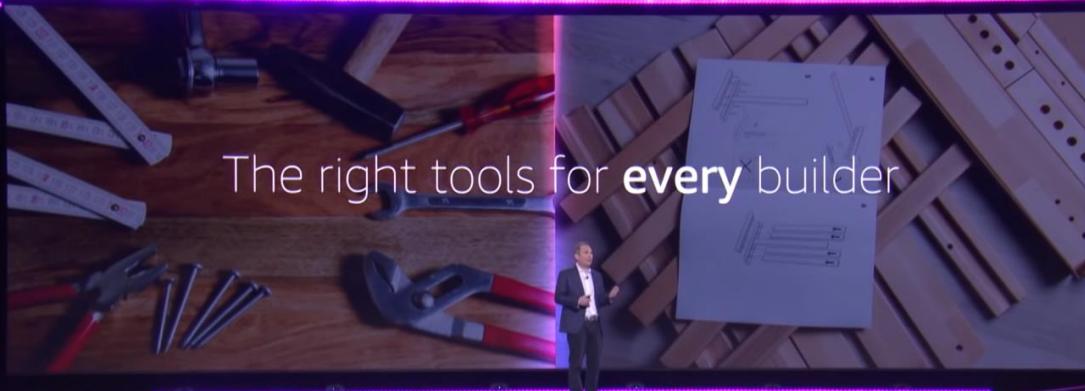
Guardian®



Everyone deserves a Guardian.



The right tools for **every** builder



Setting up a Landing Zone

Are there any best practices for setting up my multi-account environment?

How do I maintain security and compliance as more of my teams move to the cloud?

How can I set and enforce policies for all my workloads?

What AWS tools should I use?

NEW!

AWS Control Tower

The easiest way to set up and govern a secure, compliant, multi-account environment or Landing Zone

AVAILABLE IN PREVIEW TODAY



AWS Control Tower

The easiest way to set up and govern a secure, compliant, multi-account environment or Landing Zone

 Automated Landing Zone, with best-practices blueprints

Set up and configure multi-account structure using [AWS Organizations](#)
Manage identities with [AWS Single Sign-On](#) or [Microsoft Active Directory](#)
Federate access with [AWS Single Sign-On](#)
Centralize logging using [AWS CloudTrail](#) or [AWS Config](#)
Enable cross-account access using [AWS IAM](#)
Implement network design with [Amazon VPC](#)
Configure an account factory through [AWS Service Catalog](#)

AWS Control Tower

The easiest way to set up and govern a secure, compliant, multi-account environment or Landing Zone

 Automated Landing Zone with best-practices blueprints

 Guardrails for policy enforcement

SET UP GUARDRAILS TO:
Disallow Internet access to a specific account
Disallow public readable storage
Prevent any S3 object from being uploaded to an account if it's not encrypted

AWS Control Tower

The easiest way to set up and govern a secure, compliant, multi-account environment or Landing Zone

 Automated Landing Zone with best-practices blueprints

 Guardrails for policy enforcement

 Dashboard for continuous visibility

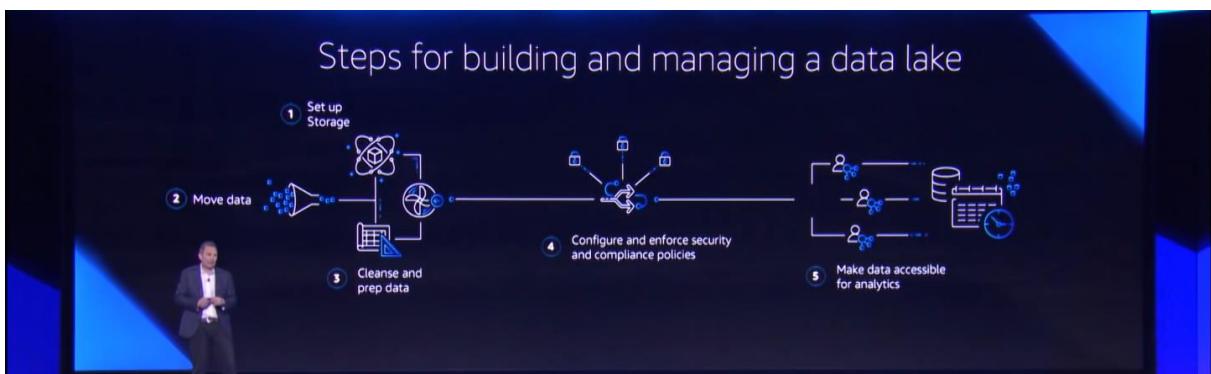
Separating the signal from the noise

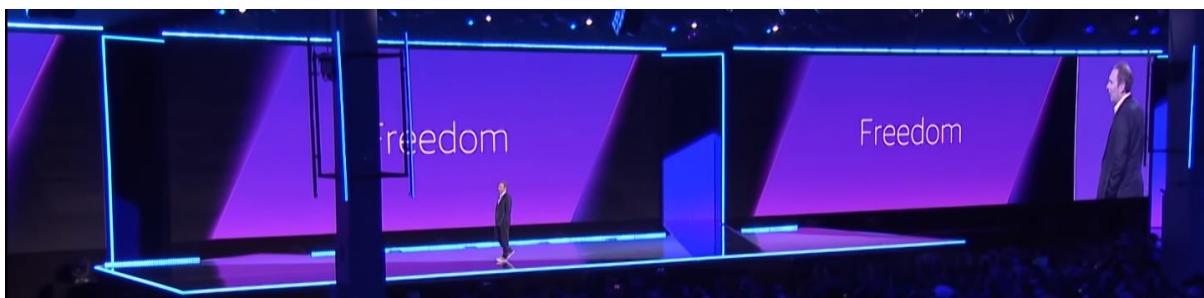
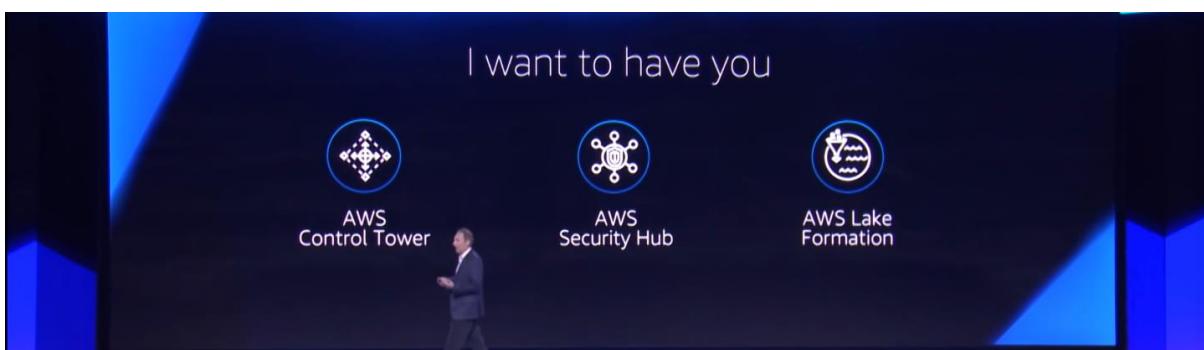
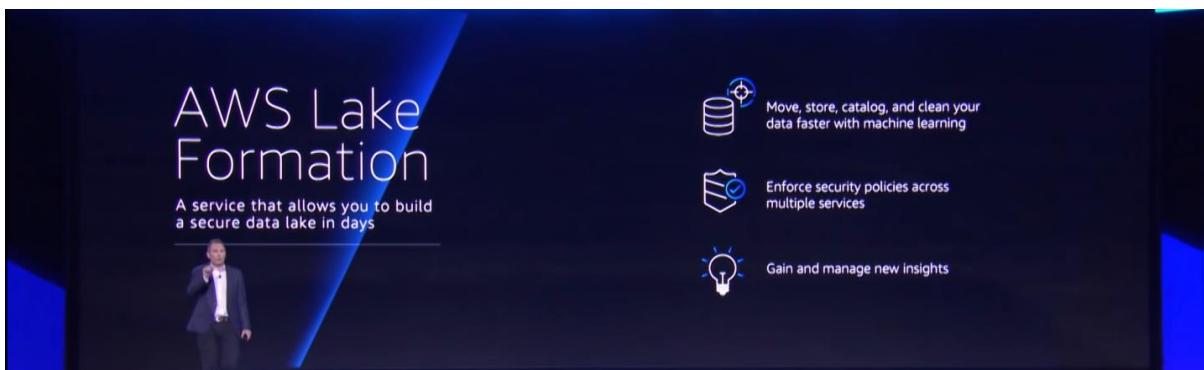
AWS Security Hub

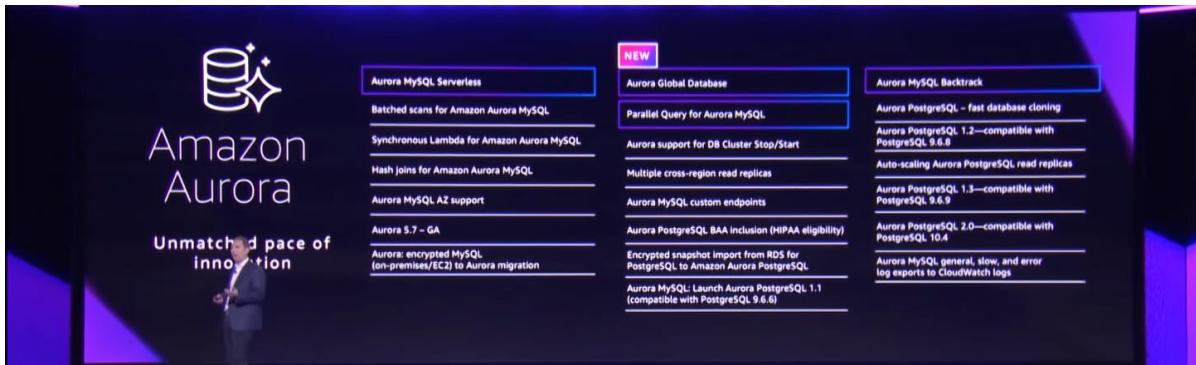
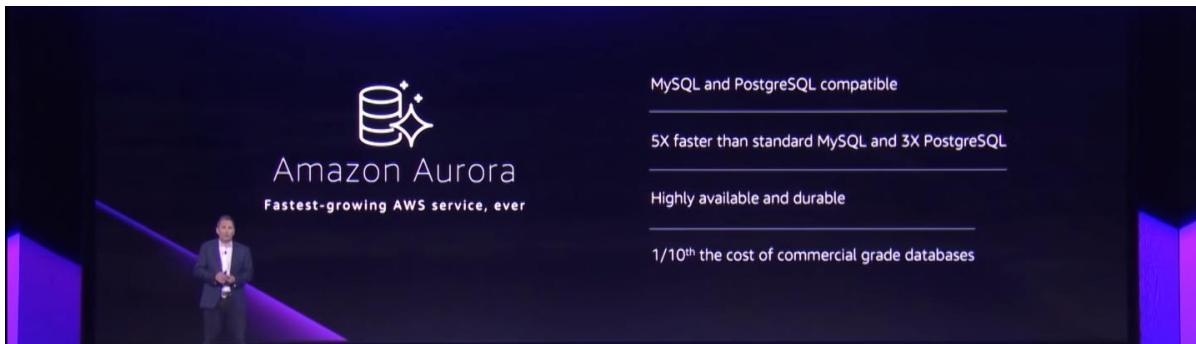
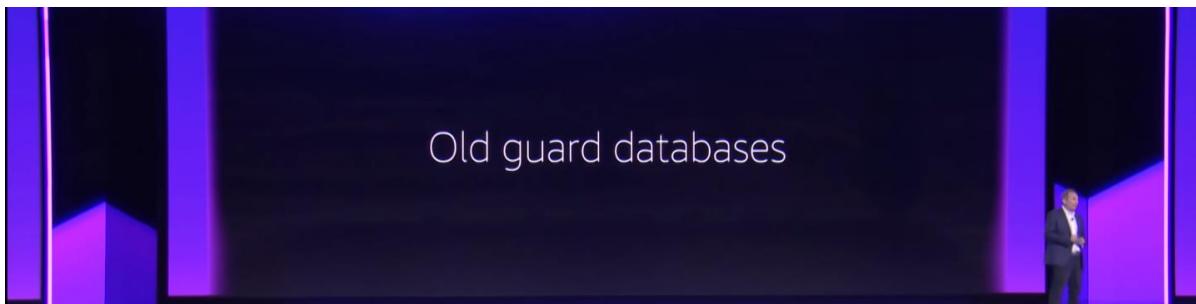
Centrally manage security and compliance across an AWS environment

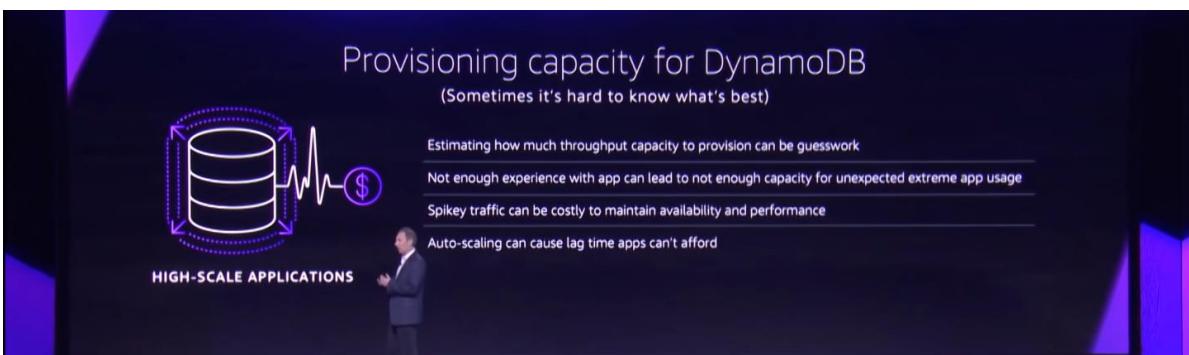
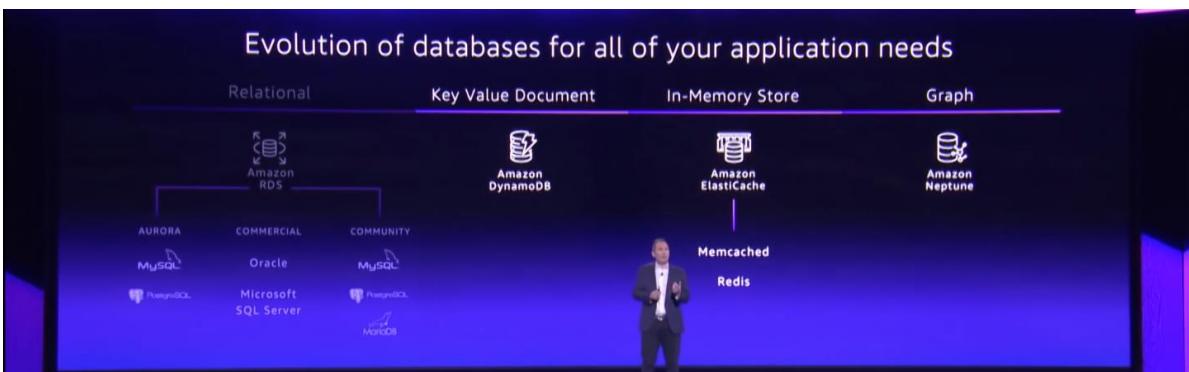
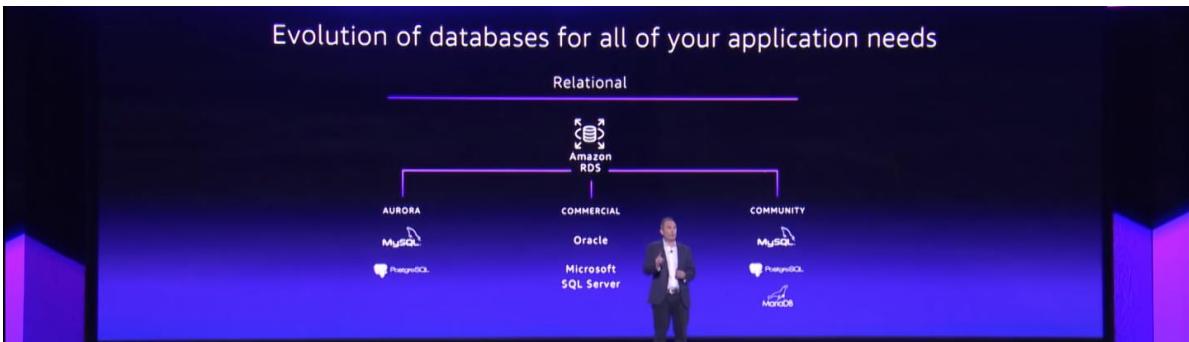
AVAILABLE IN PREVIEW TODAY











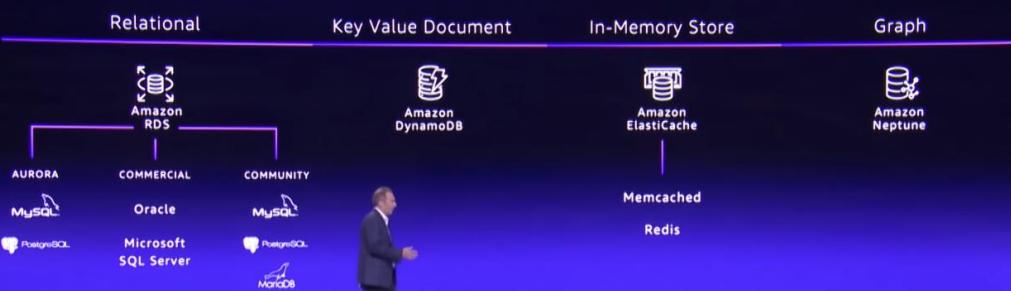
NEW! GENERALLY AVAILABLE TODAY

Introducing DynamoDB Read/Write Capacity On Demand

No more capacity planning – pay only for what you use



Evolution of databases for all of your application needs



Tracking change over time



Relational databases

Unnatural for time-series data

Lack time-series analytic functions like smoothing, approximation, and interpolation

Rigid schema inflexible for fast-moving time-series data

Building with time-series data is challenging



Existing time-series databases

Manual effort needed for enterprise-grade availability and reliability

Difficult to scale

Limited data lifecycle management capabilities



Two needs, what to do?



NEW!

Amazon Quantum Ledger Database (QLDB)

Fully managed ledger database with a central trusted authority

AVAILABLE IN PREVIEW TODAY



Amazon (QLDB)

Fully managed ledger database with a central trusted authority

AVAILABLE IN PREVIEW TODAY



Immutable

Append-only, immutable journal tracks history of all changes



Fast

Execute 2-3X more transactions



Cryptographically Verifiable

All changes are cryptographically chained and verifiable



Highly scalable

Automatically scale up or down



Transparent

Full visibility into entire data linear



Easy to use

Query with familiar SQL operators

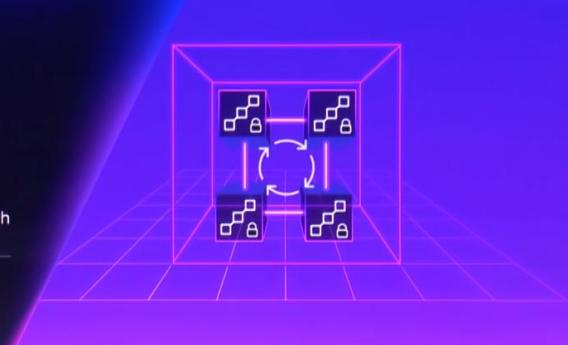


NEW!

Amazon Managed Blockchain

Fully managed blockchain service, supporting both Hyperledger Fabric and Ethereum frameworks

AVAILABLE IN PREVIEW TODAY



Amazon Managed Blockchain

Create and manage scalable blockchain networks



Choose Hyperledger Fabric or Ethereum



Scales to support thousands of applications running millions of transactions

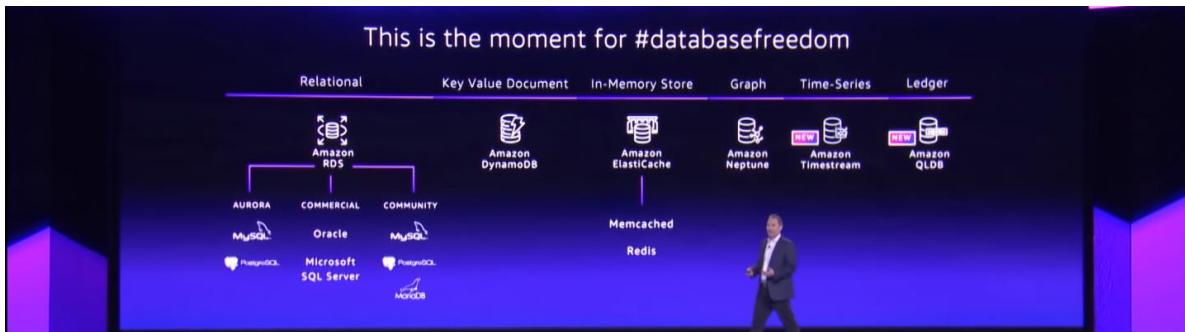


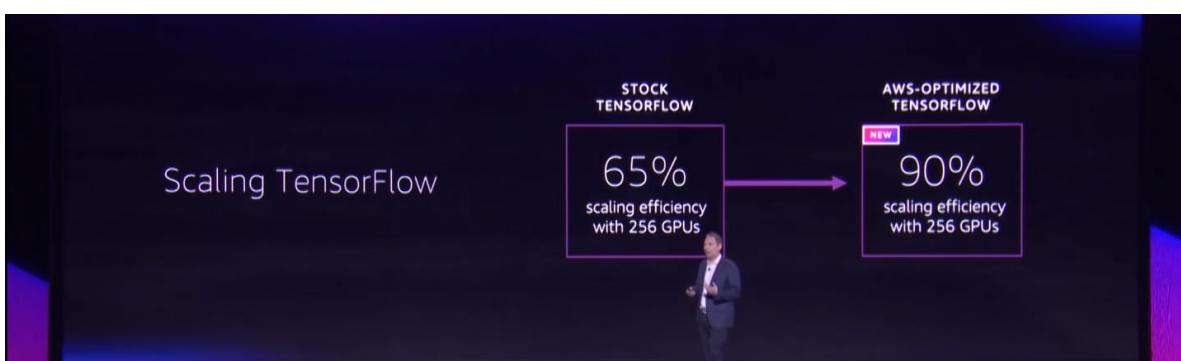
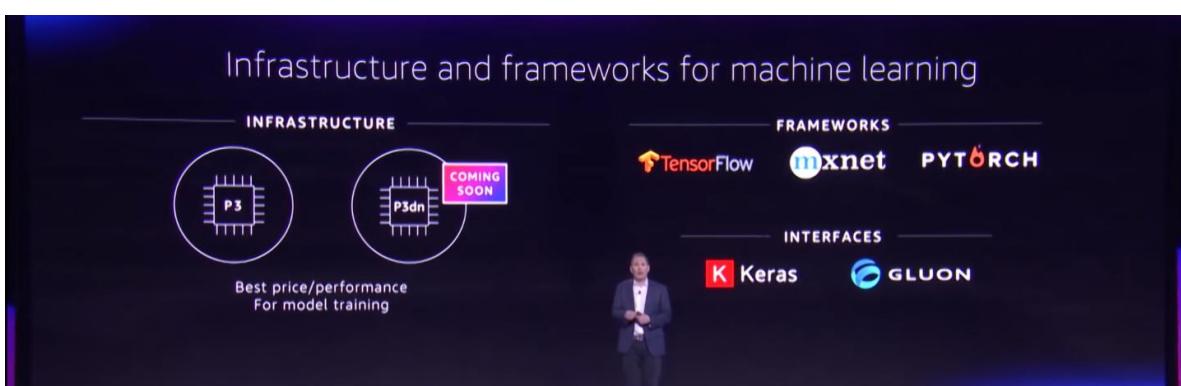
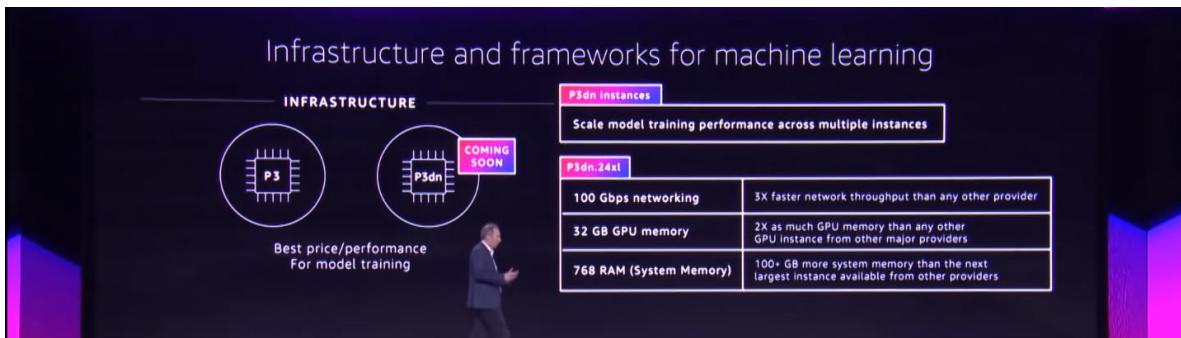
Create blockchain networks with a few clicks; manage them with simple API calls



Easy to move data into QLDB for further analysis







Fastest training times for TensorFlow

30m training time (Mountain View)	14m training time (Seattle)
ResNet50 only	ResNet50, convolutional neural networks (for images), recurrent neural networks (for language recommendations)
Specialized hardware only available in beta	Optimized for P3 with global availability

It's never been easier, faster, or more cost-effective to train machine learning models

But what about inference?

Running inference in production drives the majority of cost for machine learning



One size does not fit all

Two main drivers of inference inefficiency: complexity and cost of machine learning inference today



Elasticity is important

NEW!

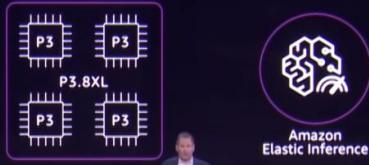
Amazon Elastic Inference

Add GPU acceleration to any Amazon EC2 instance for faster inference at much lower cost (up to 75% savings)

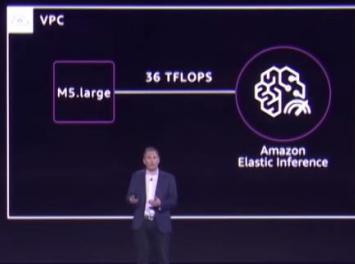
GENERALLY AVAILABLE TODAY



Amazon Elastic Inference: how it works



Amazon Elastic Inference: how it works



Amazon Elastic Inference: fast, low-cost machine learning inference

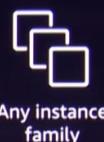
Provision Elastic
Inference capacity
inside VPC

Starting at
1 TFLOPS

Simple speech and
language models

Up to
32 TFLOPS

Recommendation engines
or fraud detection models



Any instance
family

mxnet
TensorFlow
PYTORCH

Lowering inference costs with Amazon Elastic Inference

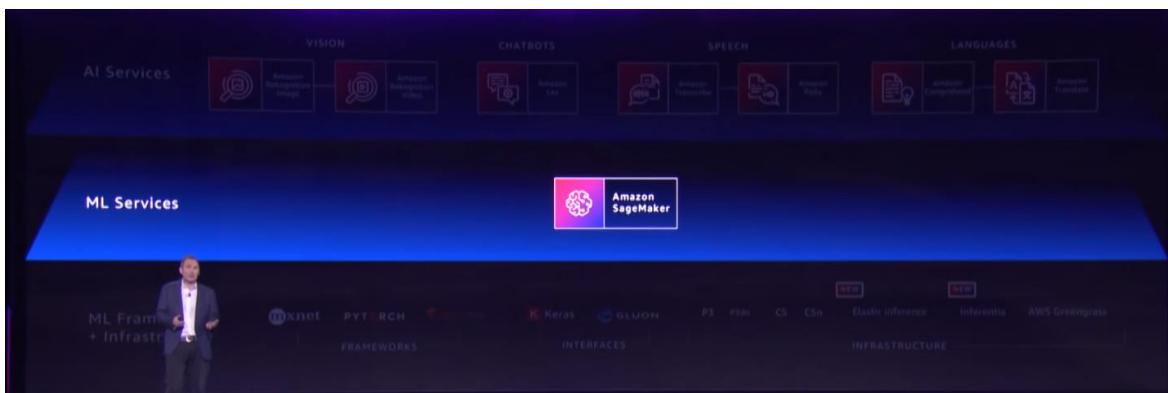
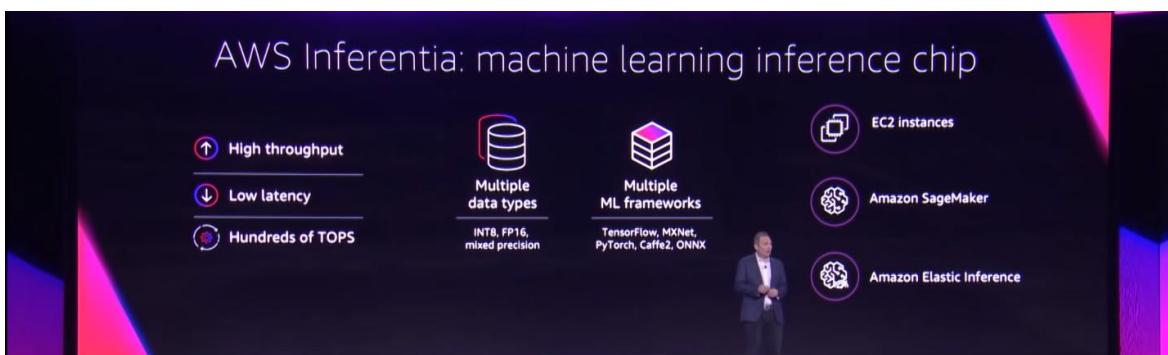
ResNet-50
Computer vision
deep learning model

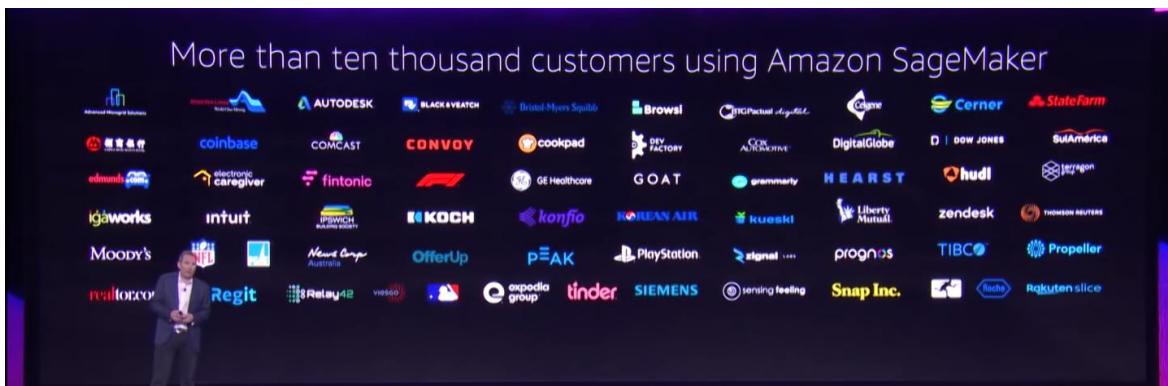
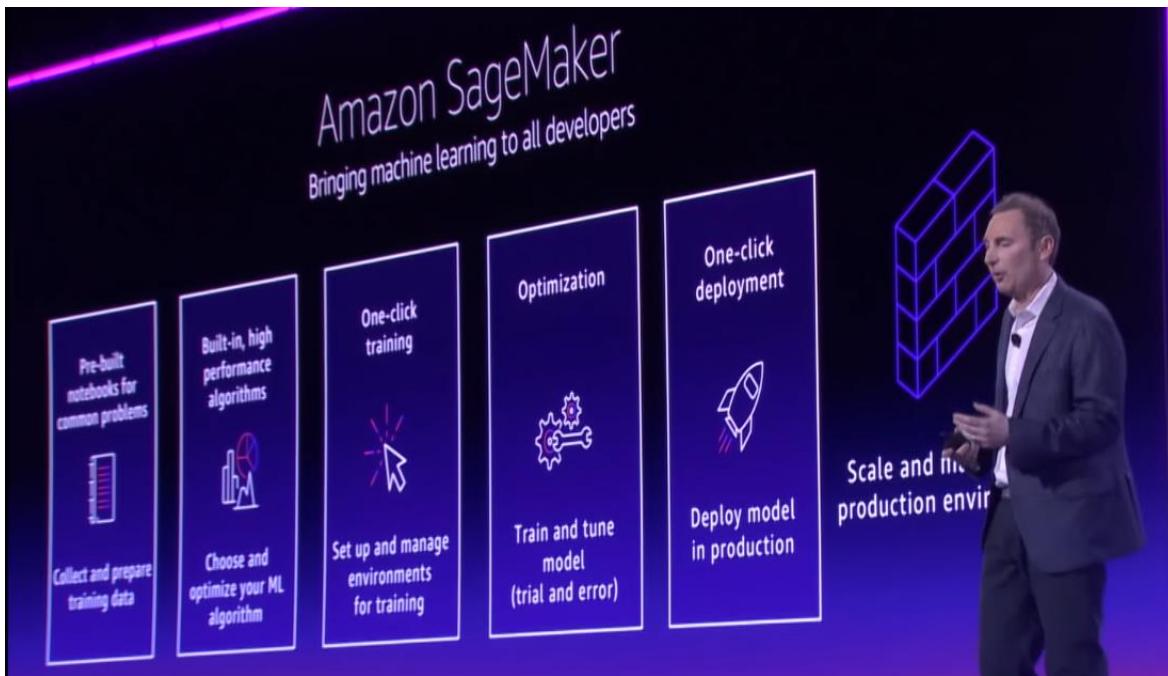
360,000
images per hour,
inference

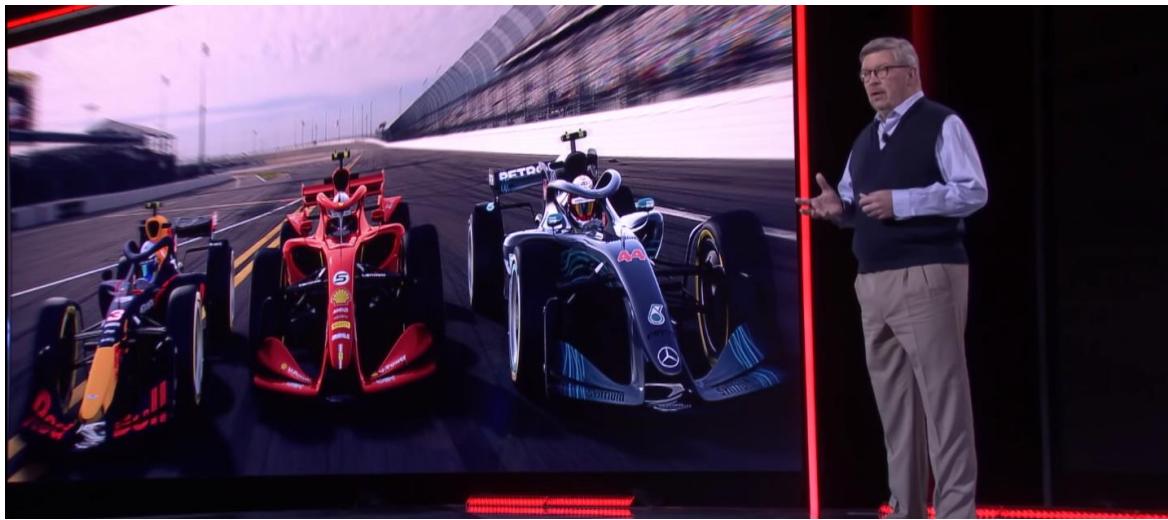
\$0.22
per hour
on medium EI accelerator
LOWEST COST AVAILABLE

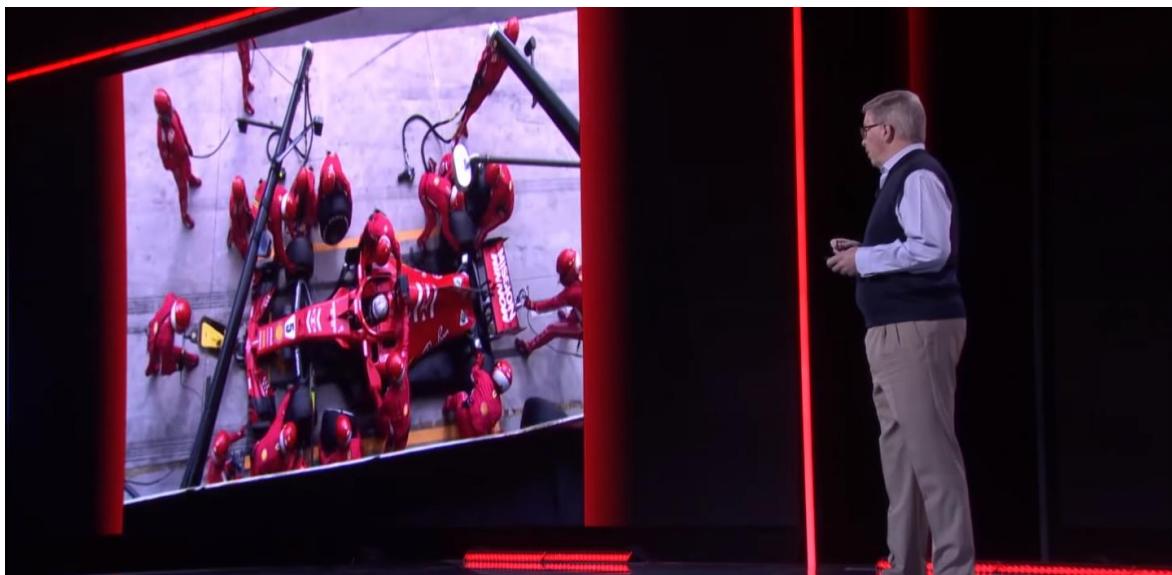
75%
lower cost

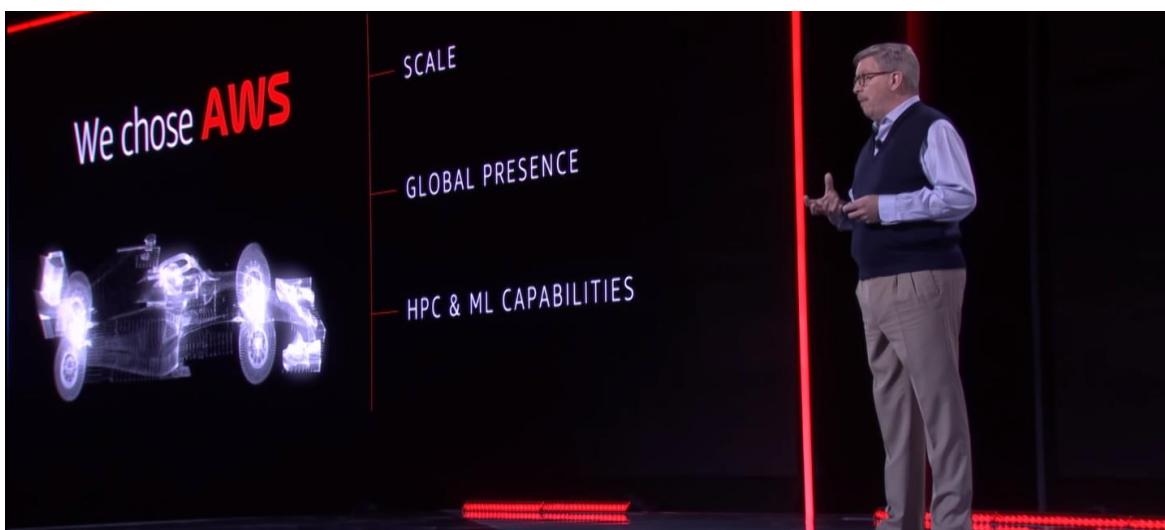
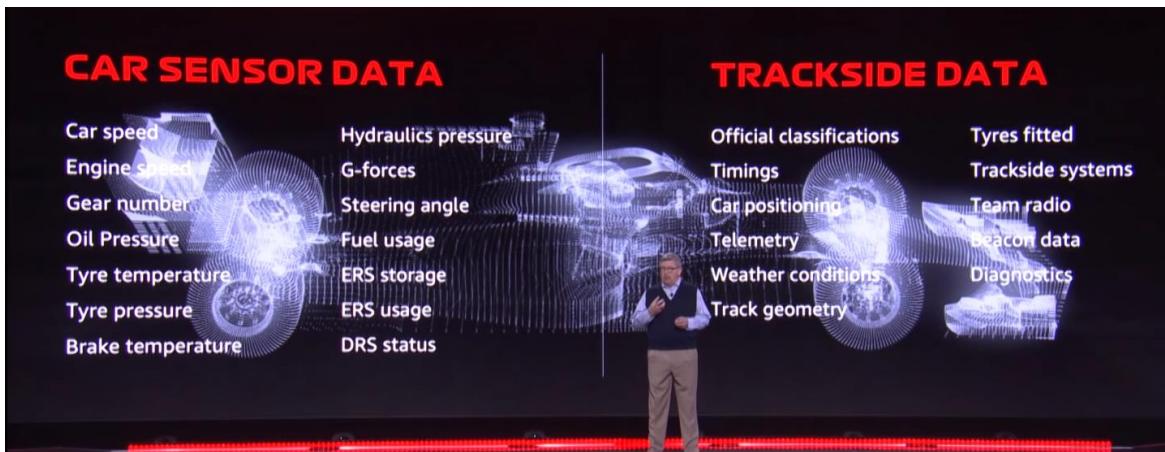
Workloads needing entire GPU
or that are latency sensitive

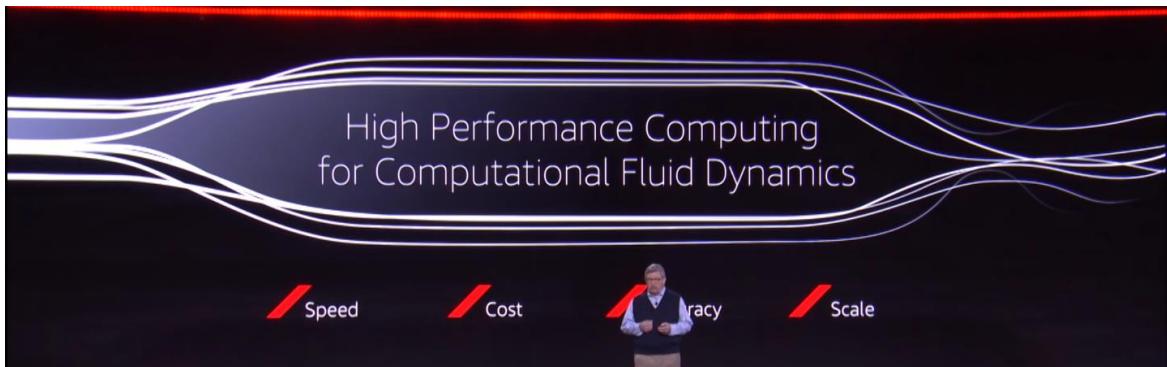




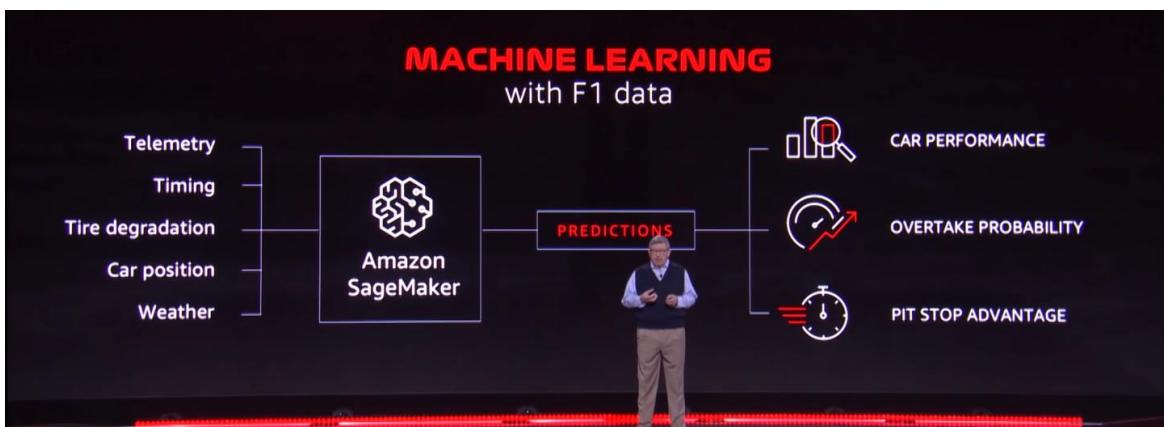






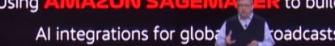




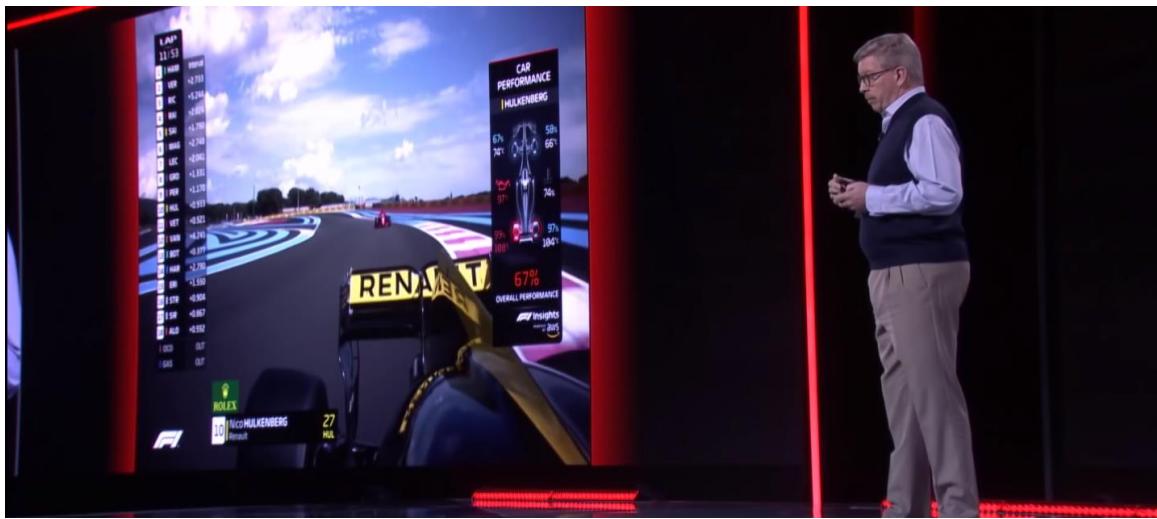


2019 F1 insights preview

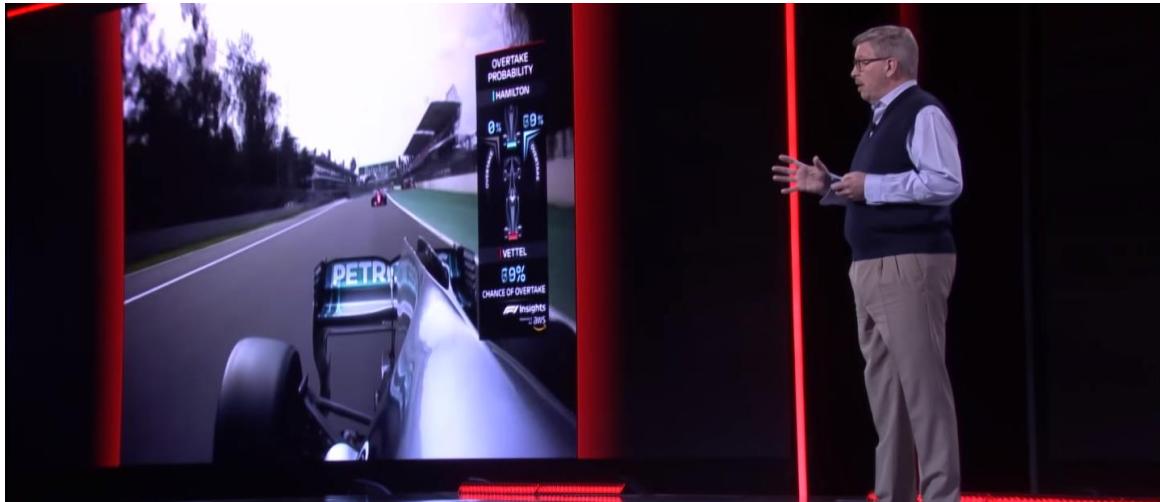
Using **AMAZON SAGEMAKER** to build new
AI integrations for global broadcasts



Car performance



Overtaking probability



Pit stop advantage





Increasing the **INTENSITY** of the race

- Race formats
- Track design
- Addition of sprint races
- Change of grid formations

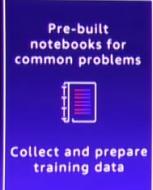


What else are customers asking us for, to give them



Amazon SageMaker

Bringing machine learning to all developers



Pre-built
notebooks for
common problems

Built-in, high
performance
algorithms

Choose and
optimize your ML
algorithm

One-click
training

Set up and manage
environments
for training

Optimization

Train and tune
model
(trial and error)

One-click
deployment

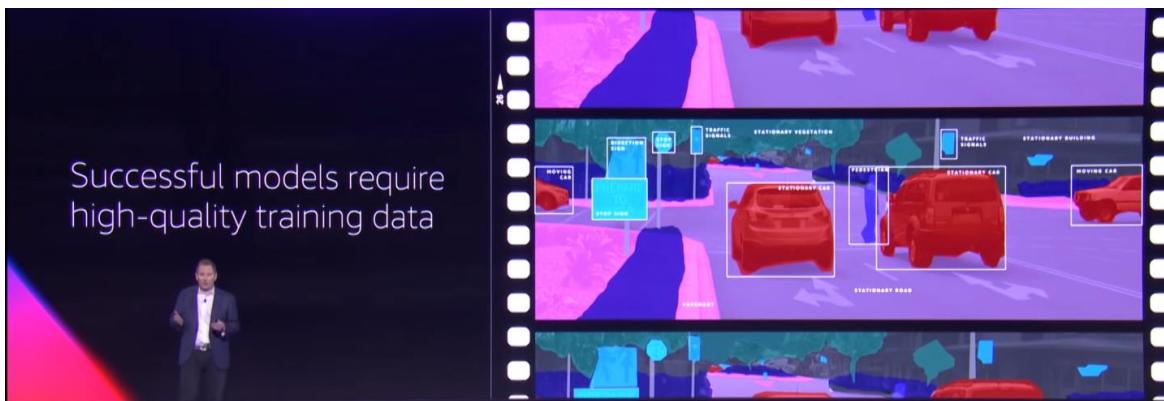
Deploy model
in production

Fully managed
hosting with auto-
scaling

Scale and manage
the production
environment

Successful models require
high-quality training data



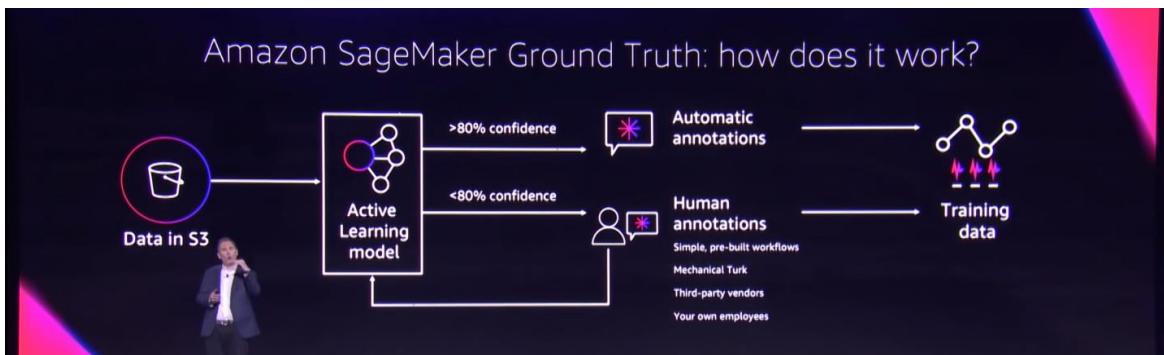


NEW!

Amazon SageMaker Ground Truth

Build highly accurate training datasets and reduce data labeling costs by up to 70% using machine learning

GENERALLY AVAILABLE TODAY



Amazon SageMaker: broad set of built-in algorithms

ALGORITHMS

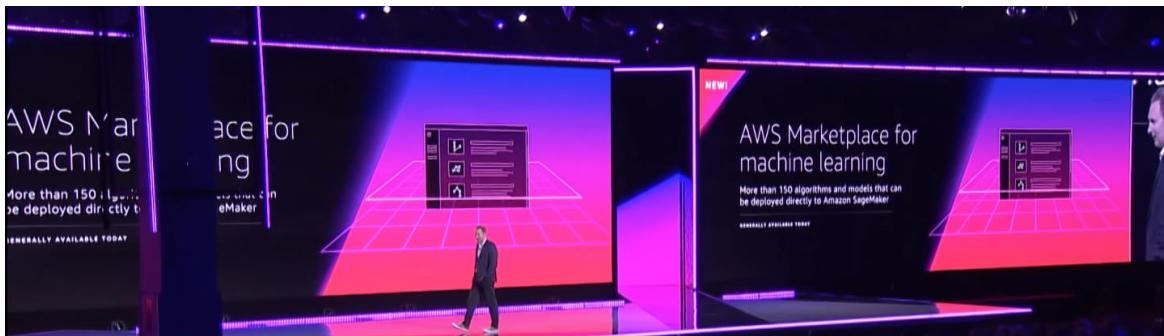
K-Means Clustering	XGBoost
Principal Component Analysis	Topic Modeling (LDA)
Neural Topic Modelling	Image Classification
Factorization Machines	Seq2Seq
Linear Learner (Regression)	Linear Learner (Classification)
BlazingText	DeepAR Forecasting
Reinforcement learning	

Designed to be 10x faster

Built into Amazon SageMaker

Improving and expanding continually

40% more algorithms added since SageMaker launch



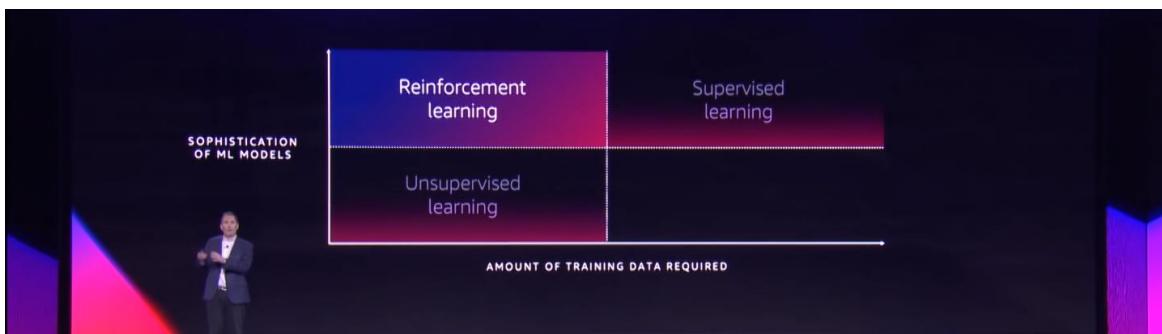
AWS Marketplace for machine learning

Brow AWS Search Marketplace Subscribe in a single click Available through Amazon SageMaker

Natural Language Processing Grammar and Parsing Text OCR
Computer Vision Named Entity Recognition Video Classification
Speech Recognition Text to Speech Speaker Identification
Text Classification 3D Images Anomaly Detection
Text Clustering Handwriting Recognition Ranking
Text Generation Object Detection in Images Regression

Selling algorithms & models on AWS Marketplace

- Package algorithm, models, and configuration
- Register with AWS Marketplace
- Automatically validate the algorithm or model with a test run on SageMaker
- Self-service listing on AWS Marketplace



How does reinforcement learning work?

IUP 930 HIGH SCORE 16440

Algorithm controls PAC-MAN
Learn to play to get the highest score possible
Maximize rewards and minimize penalties
Learn advanced strategies

NEW!

Amazon SageMaker RL

New machine learning capabilities in Amazon SageMaker to build, train, and deploy with reinforcement learning

GENERALLY AVAILABLE TODAY

Amazon SageMaker RL

Reinforcement learning for every developer and data scientist



Fully managed reinforcement learning algorithms



TensorFlow, MXNet, Intel Coach, and Ray RL



2D and 3D simulation environments via OpenGym



Simulate environments with Amazon Sumerian and AWS RoboMaker



Example notebooks and tutorials

Can we help developers get rolling
with reinforcement learning?
(literally)

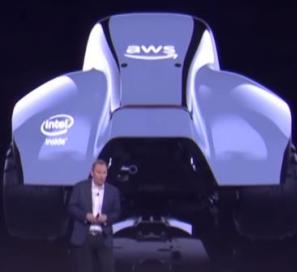


NEW!

AWS DeepRacer

Fully autonomous 1/18th scale race car,
driven by reinforcement learning

AVAILABLE FOR PRE-ORDER ON AMAZON.COM



Introducing AWS DeepRacer

HD Video Camera mounted high for a view of the road

Dual-core Intel Atom® Processor

All wheel drive, monster truck chassis

Suspension

Two batteries:
one to power on-board compute, one to drive motors

Accelerometer
for measuring change in speed

Gyroscope
for direction and orientation

Both accelerometer and gyroscope useful in the future for building more sophisticated models such as finding the perfect racing line or path finding

AWS DeepRacer: how does it work?



3D simulator with virtual car and track

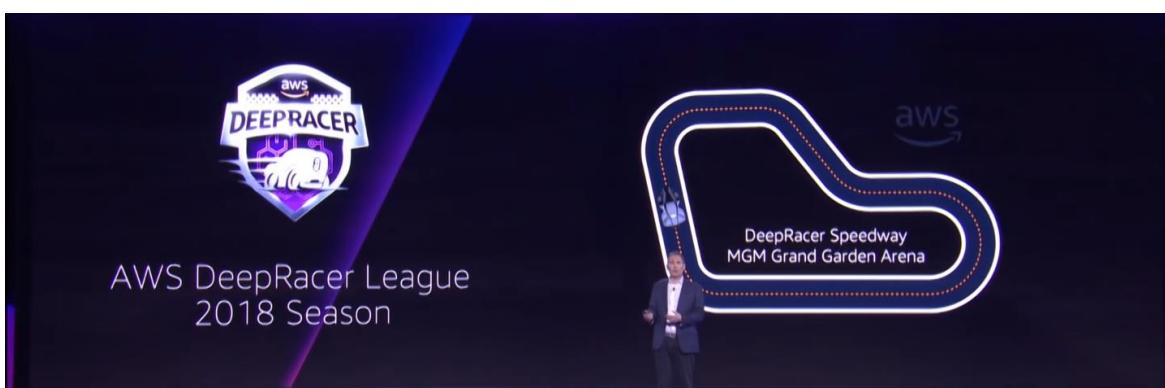
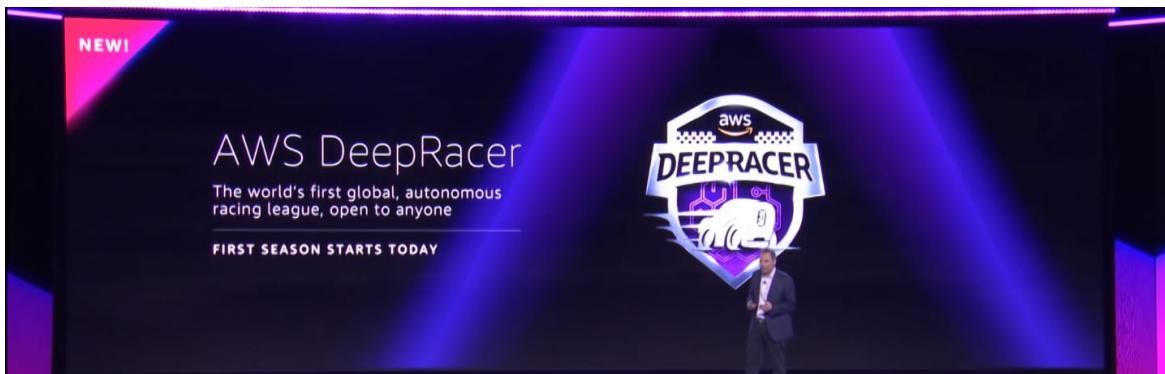


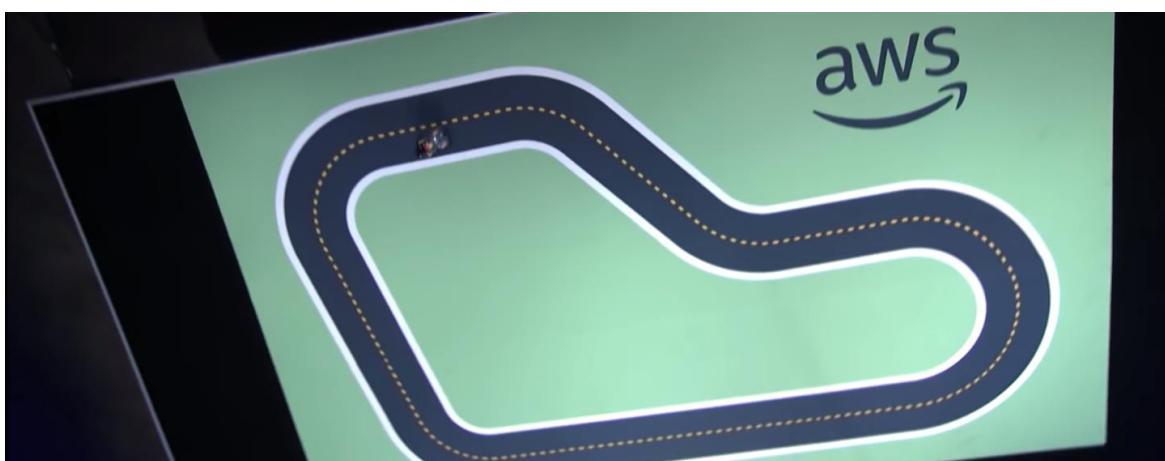
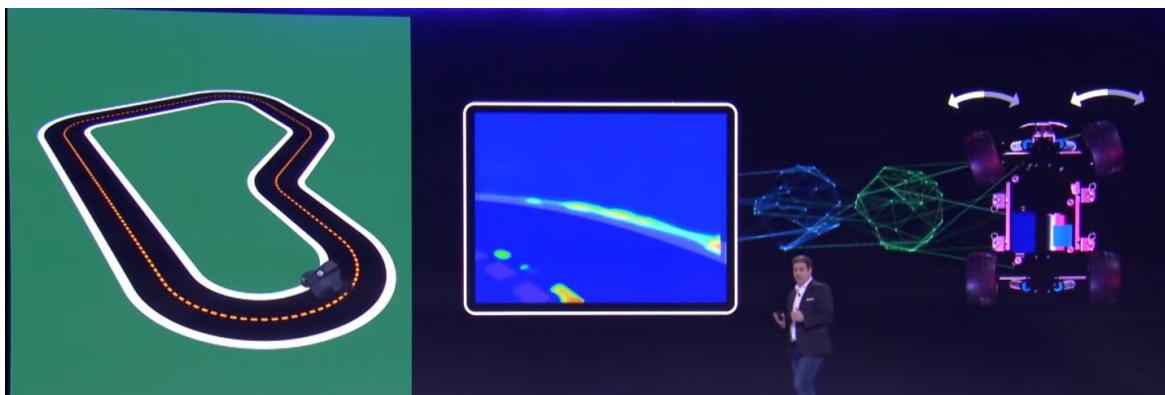
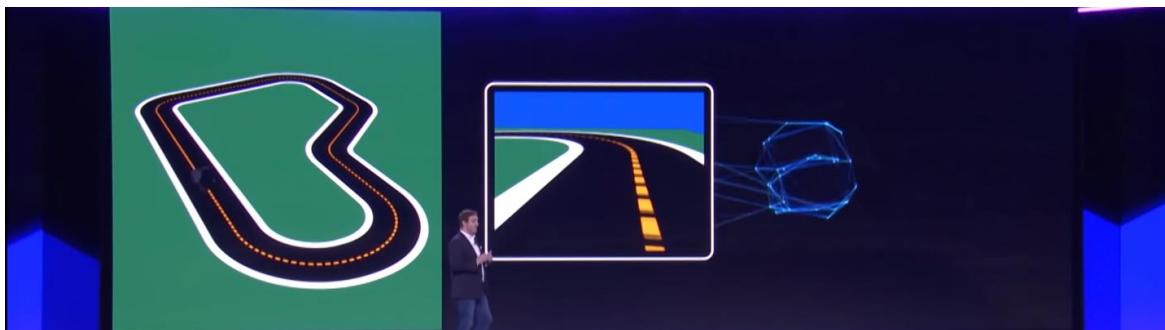
Rewards

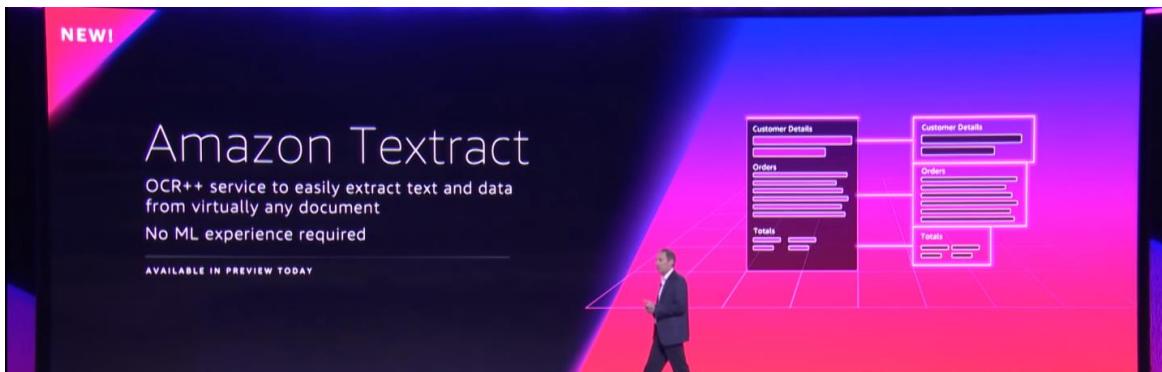
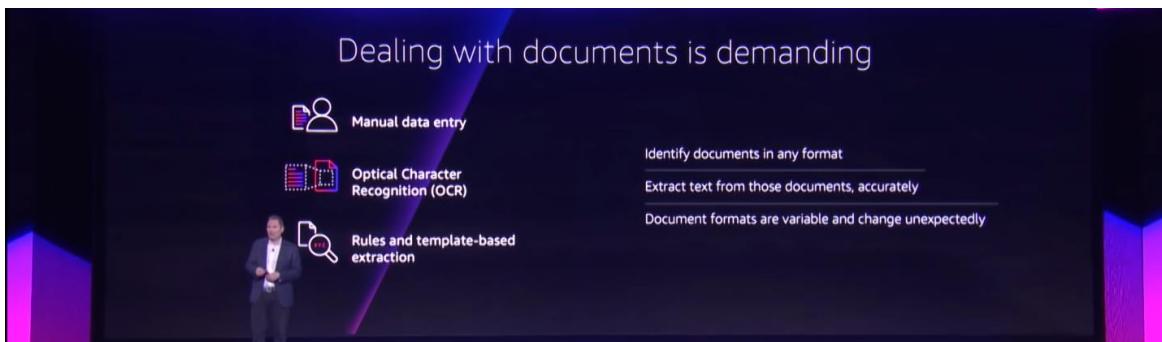
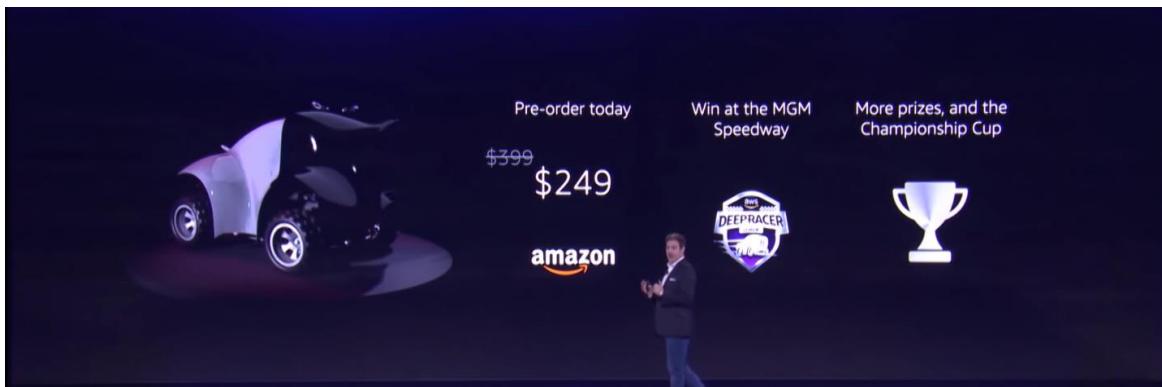


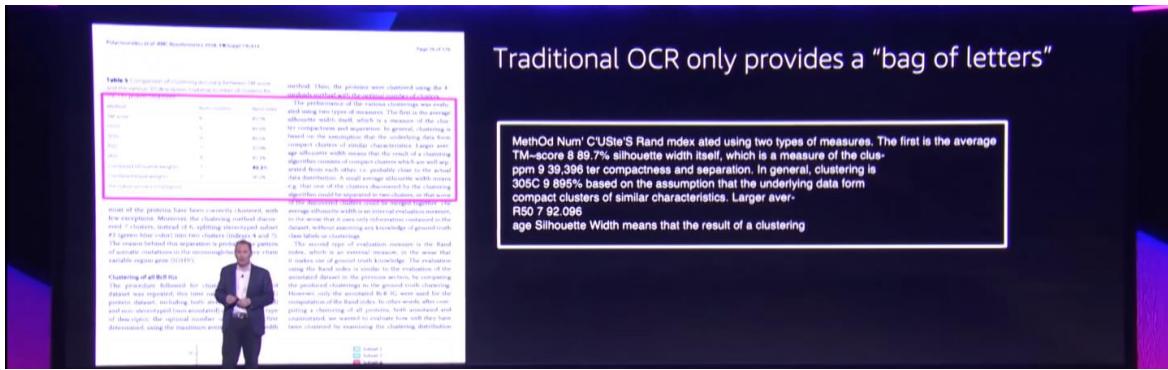
RL algorithm





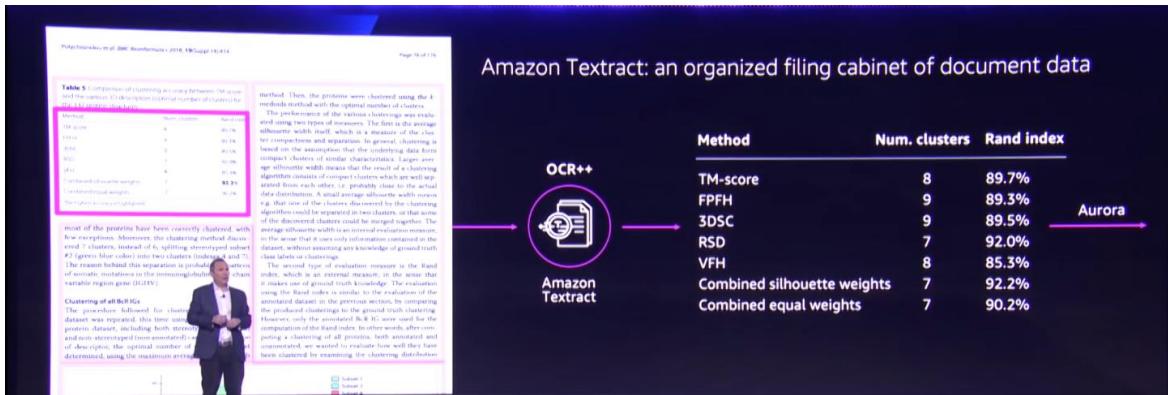






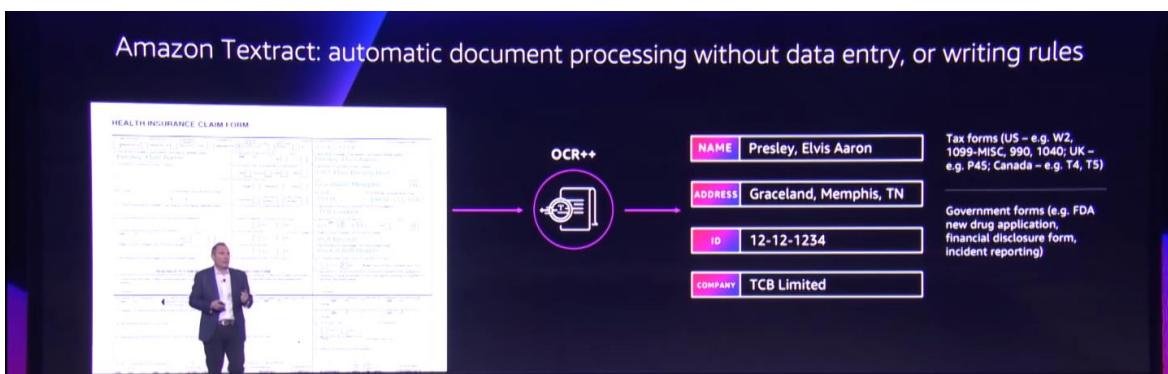
Traditional OCR only provides a "bag of letters"

Method Num: CURE'S Rand index used using two types of measures. The first is the average TM-score = 8.89% silhouette width itself, which is a measure of the compactness of the clusters; 9.39% ter compactness and separation. In general, clustering is 9.89% based on the assumption that the underlying data form compact clusters of similar characteristics. Larger average silhouette width means that the result of a clustering

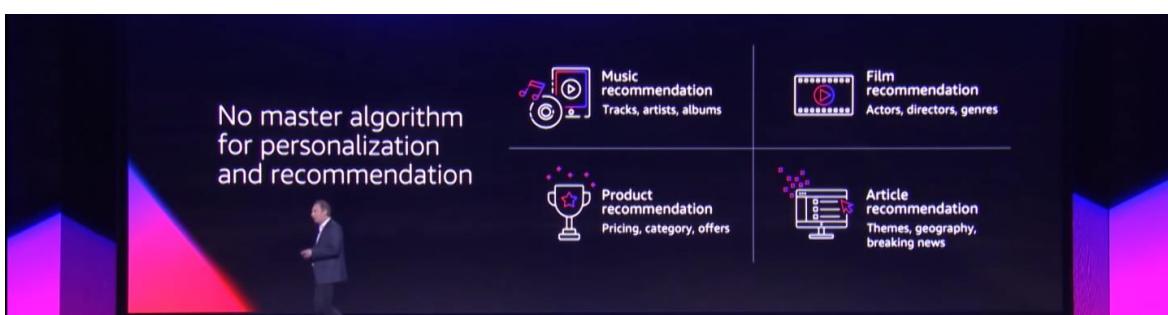
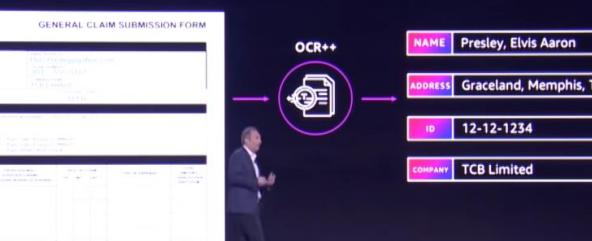


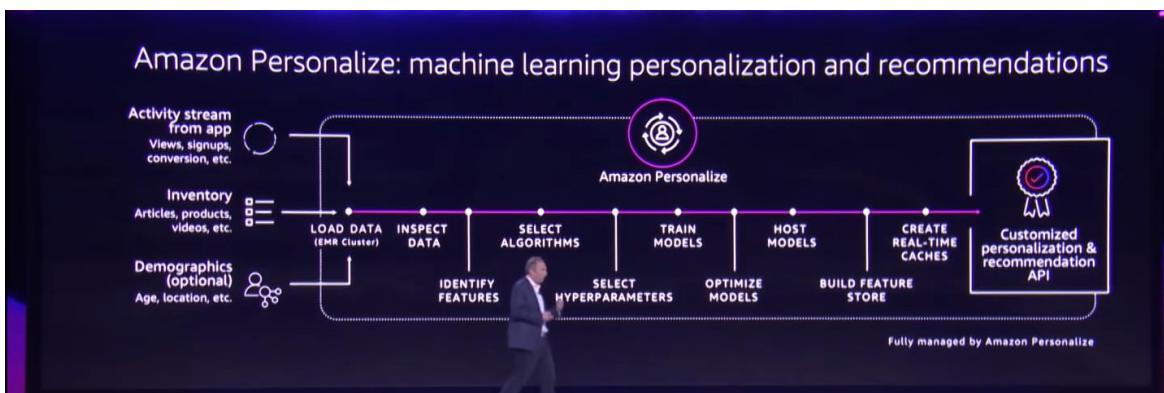
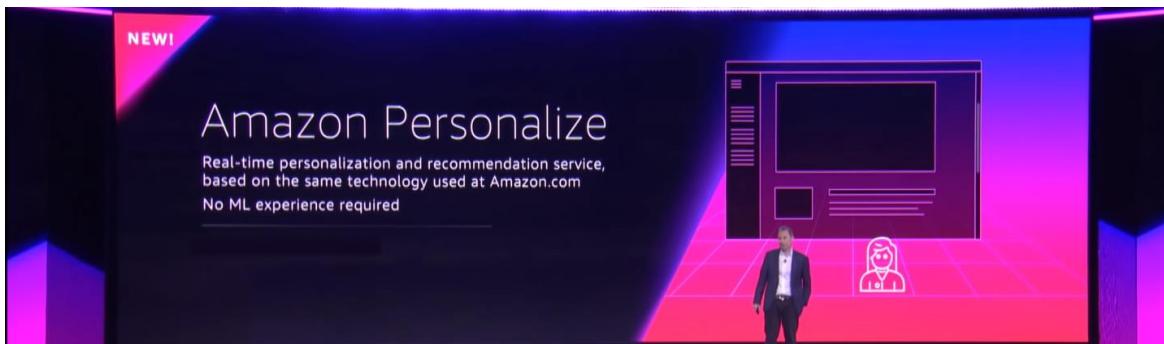
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Method	Num. clusters	Rand index
TM-score	8	89.7%
FPFH	9	89.3%
3DSC	9	89.5%
RSD	7	92.0%
VFH	8	85.3%
Combined silhouette weights	7	92.2%
Combined equal weights	7	90.2%



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Necessity is the mother of invention

