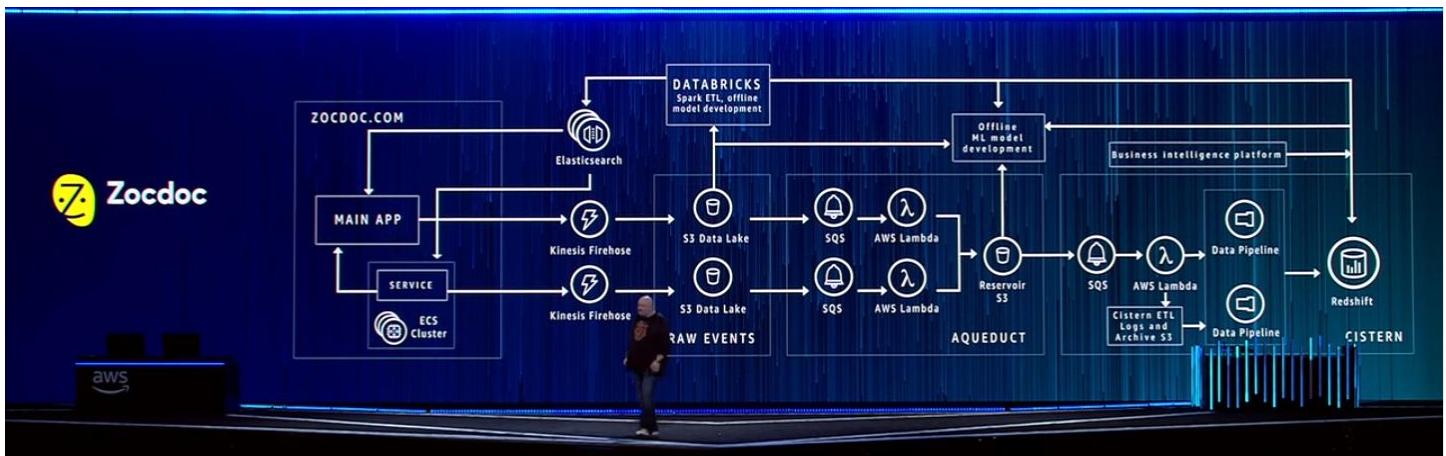


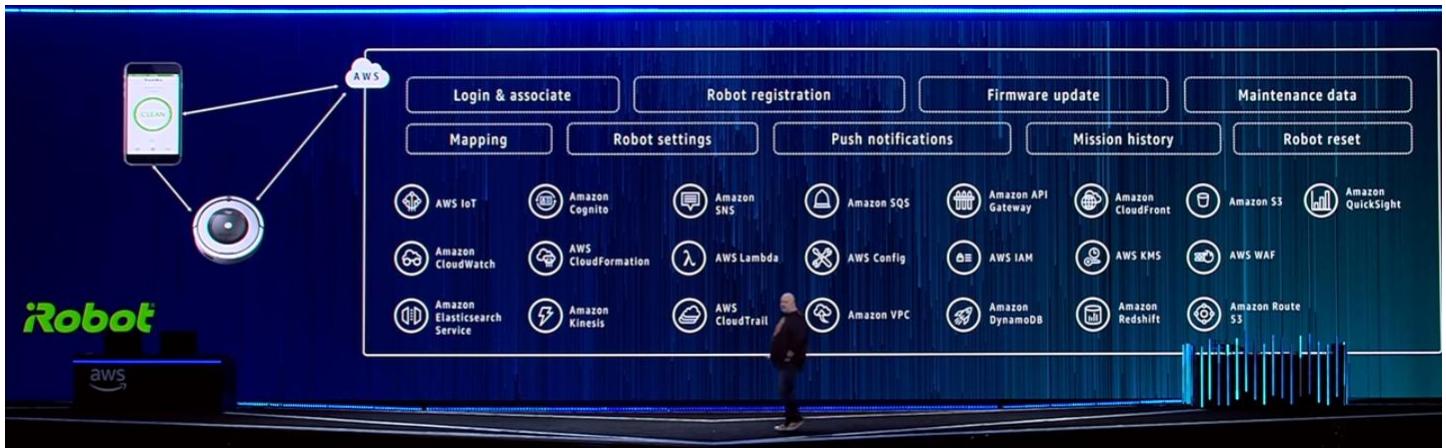


# BENEFITS OF SERVERLESS APPLICATIONS

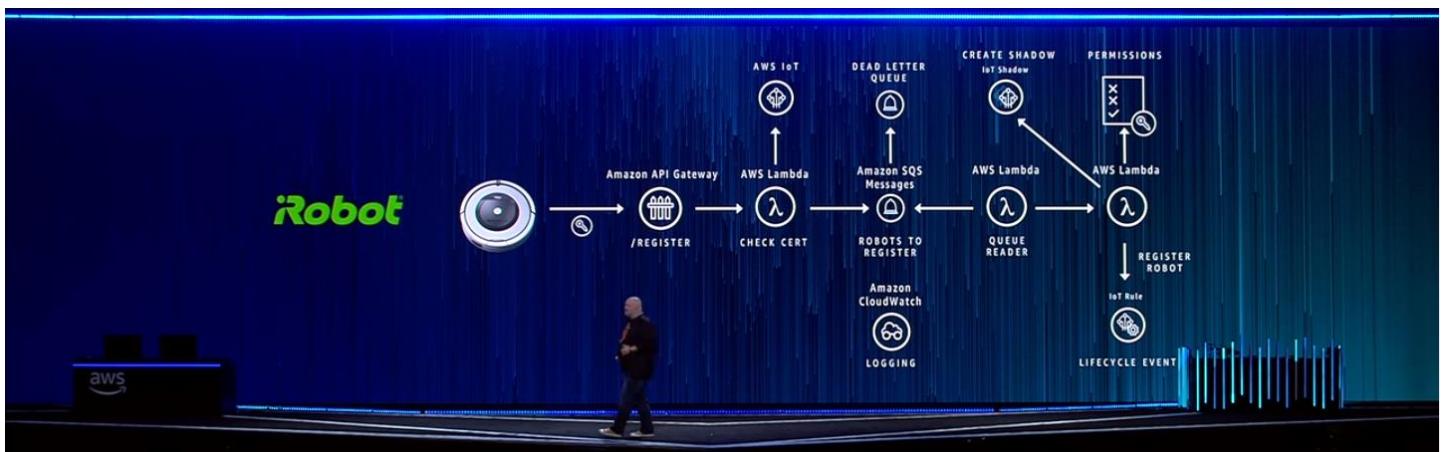
- No server management
- Flexible scaling
- High availability
- No idle capacity



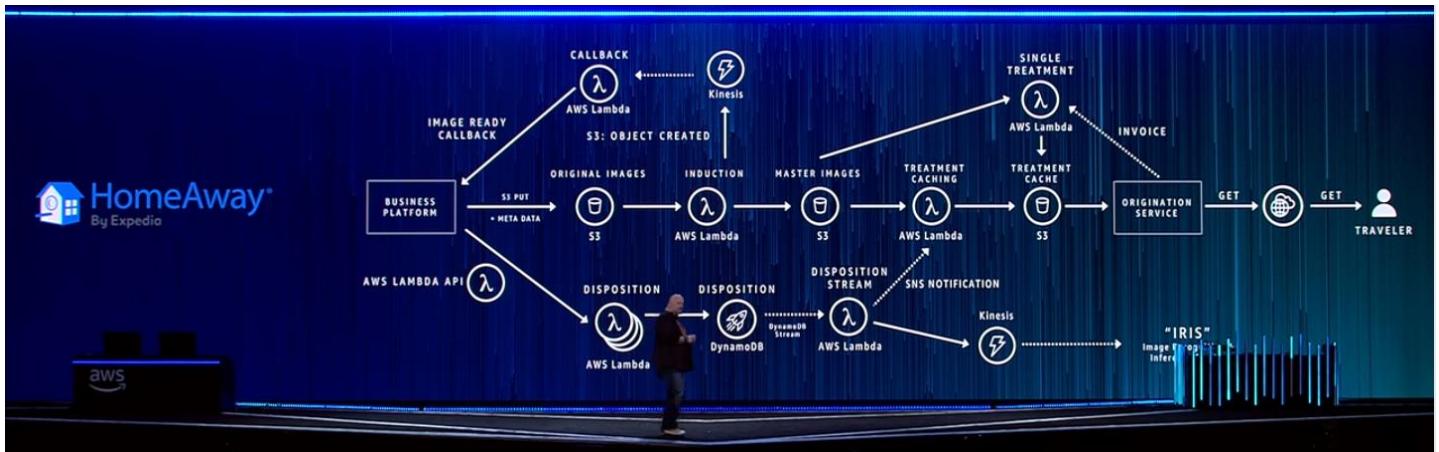
AWS Lambda is a crucial part of the ZocDoc architecture, there are no servers.



All iRobots code is serverless



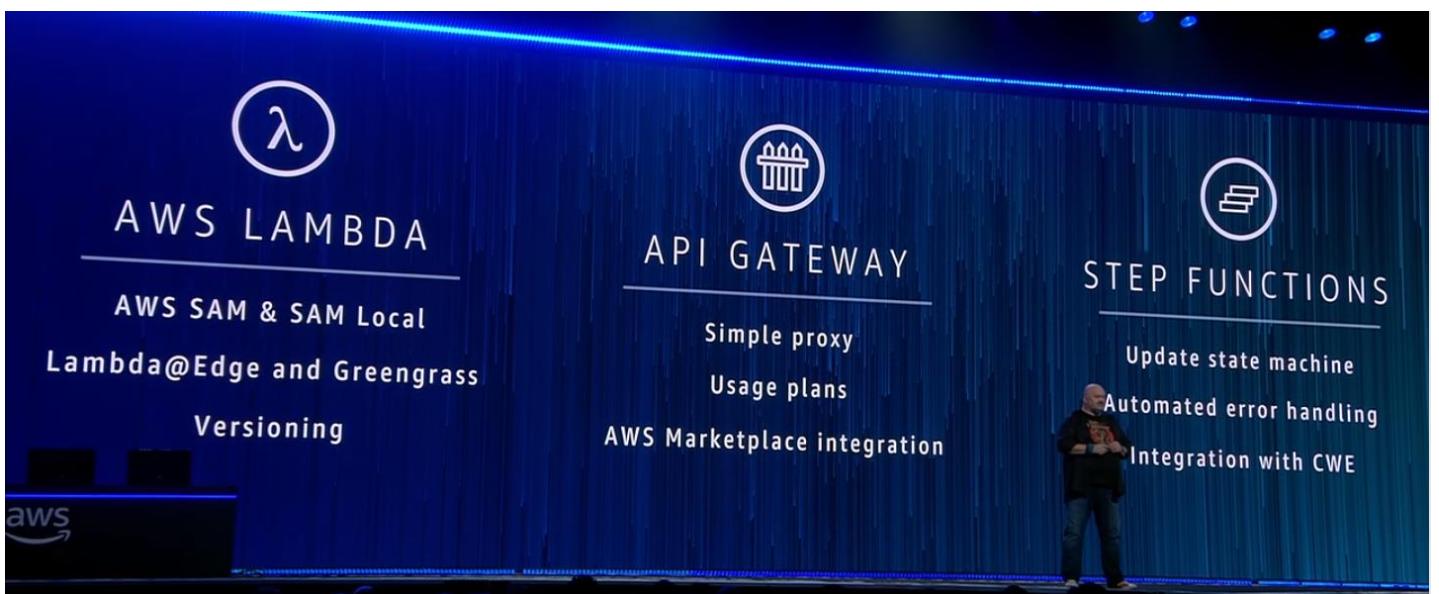
Agero also runs serverless with everything on Lambdas, their queues, ML prediction engines, data functionalities, etc.



There's no server in the Image Ingestion Engine for HomeAway, it is only serverless functionality. This is all managed services.



For serverless applications. You think only of tables and not databases anymore



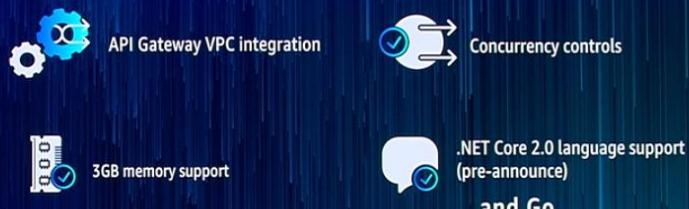
## AWS LAMBDA WHAT ARE CUSTOMERS ASKING FOR?



NEW!

## Building for the future

4 new powerful features  
for AWS Lambda



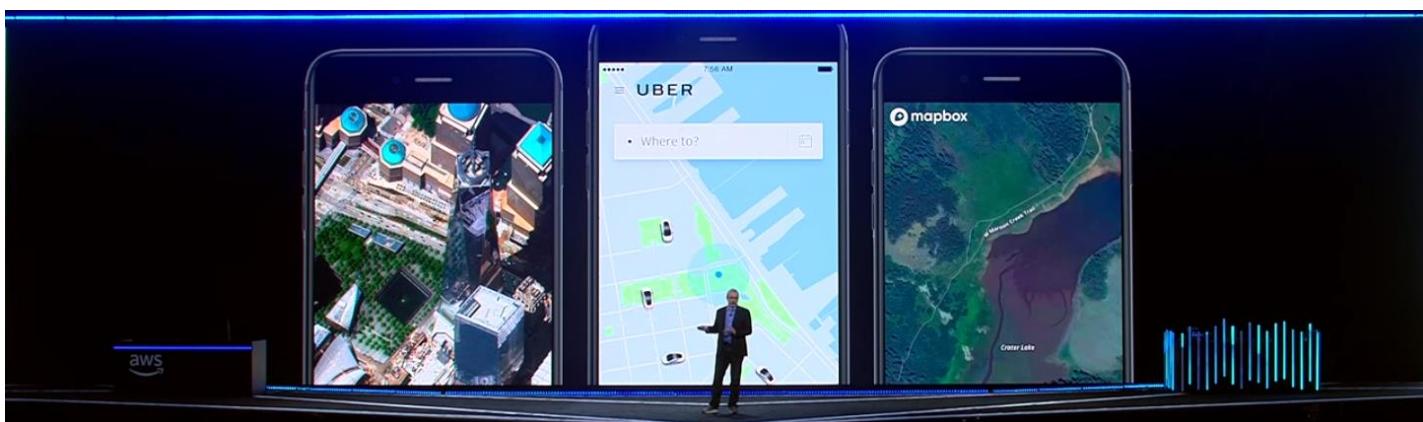
## MAKING SERVERLESS EVEN MORE “LESS”

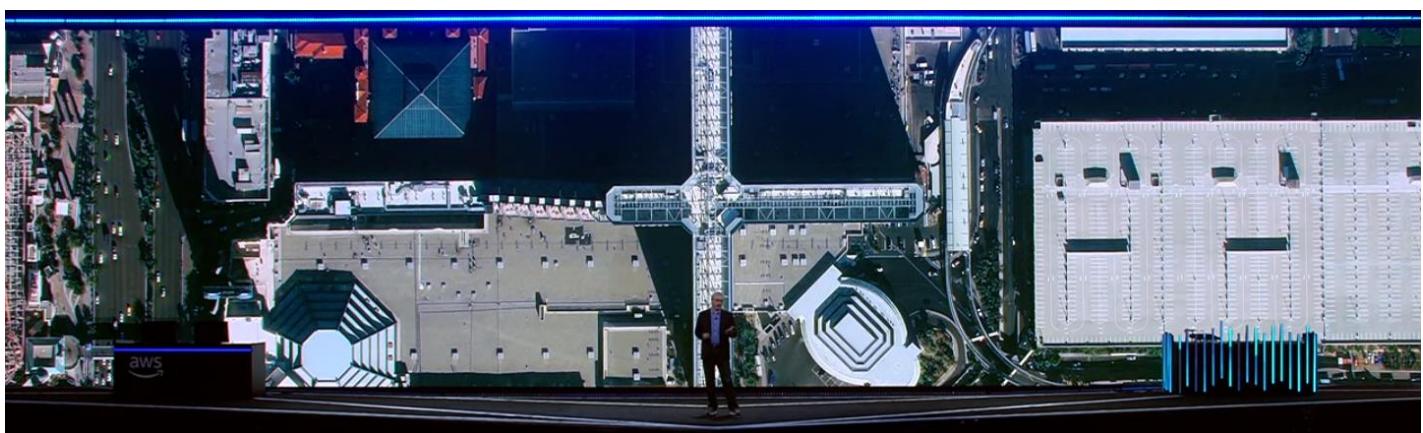


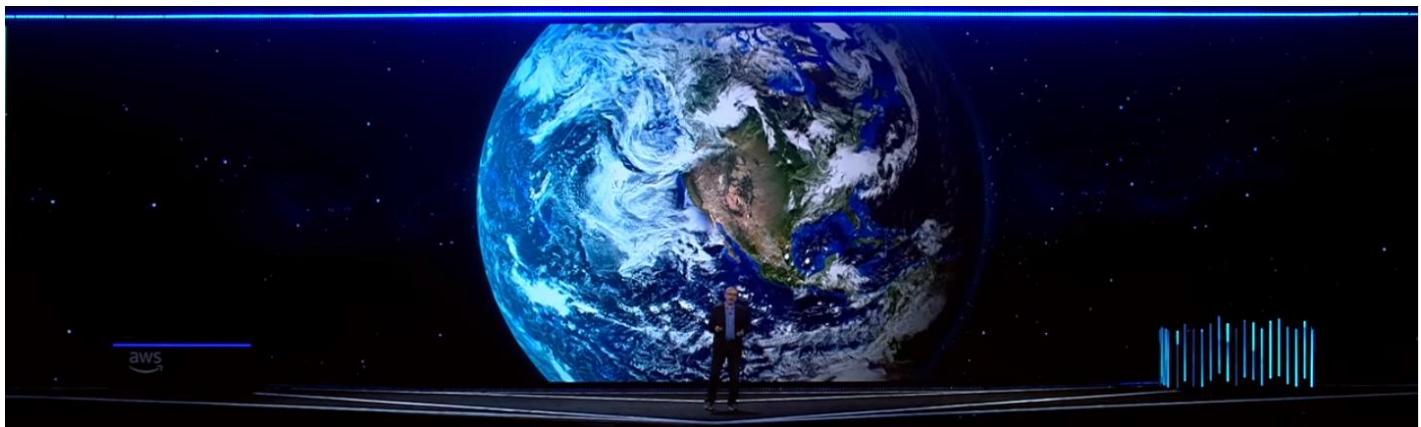
## AWS Serverless Application Repository

Discover, deploy, and publish serverless apps

Available in preview today







Our satellites 80TB of map data every day and downlink it for processing



**100**  
PETABYTES

All-in on **a**WS

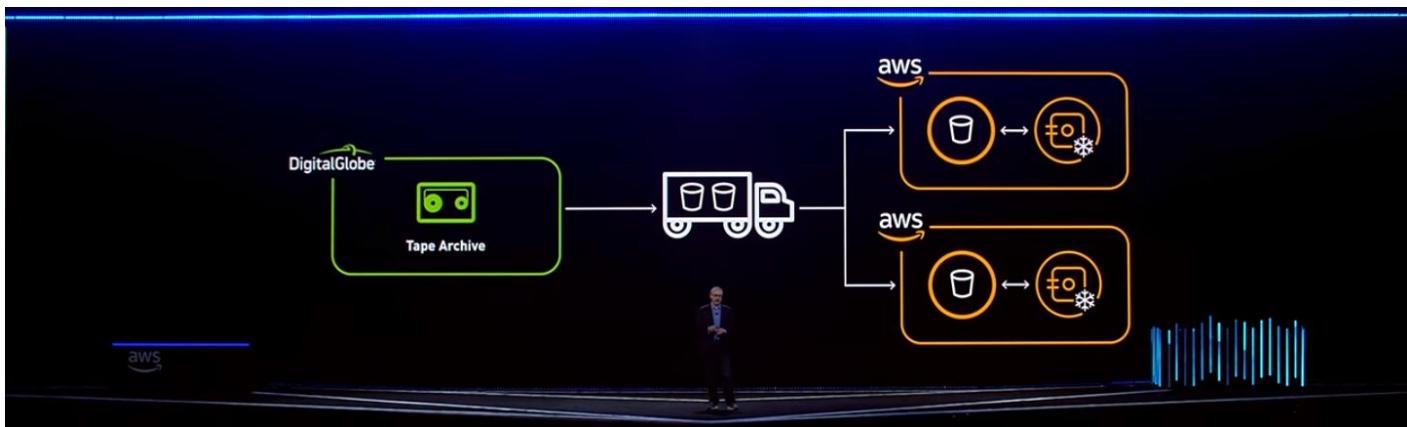
DATA OUT OF JAIL



aws



aws

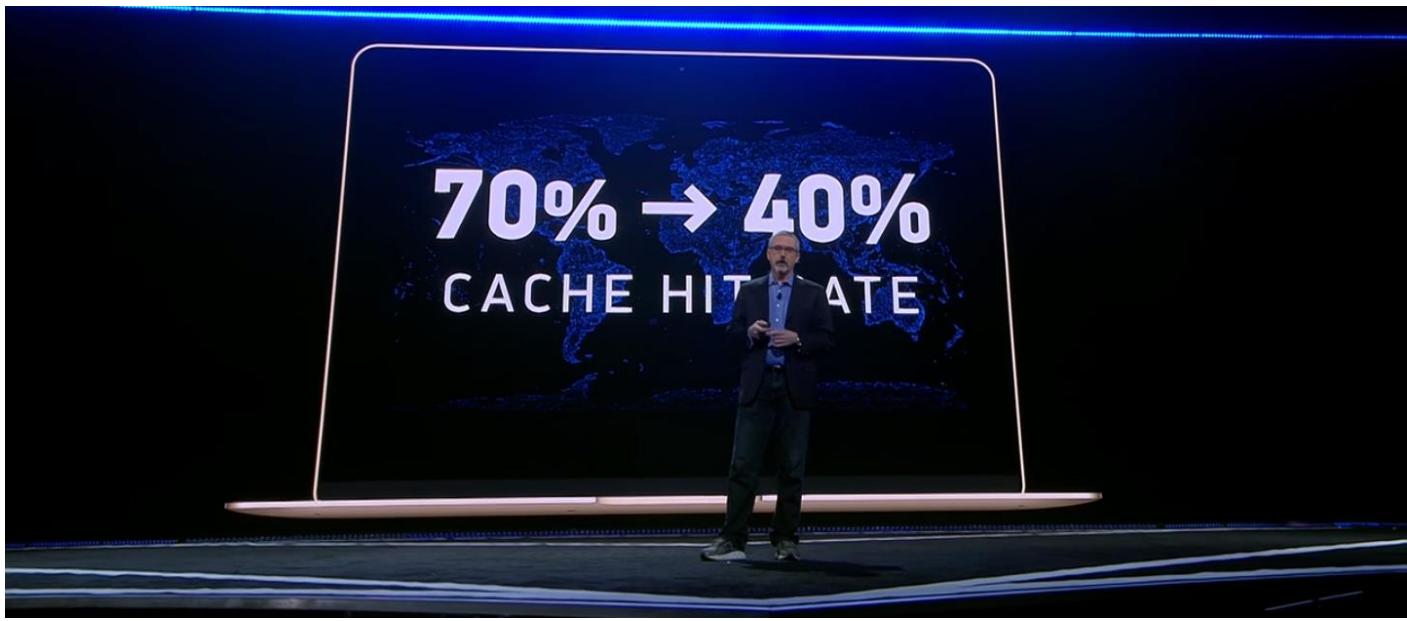


**DigitalGlobe** moved 17 years' worth of data into 2 Glacier regions in AWS.



## All-in on **aws**

DATA OUT OF JAIL  
ON-DEMAND ACCESS WHILE MANAGING AWS SPEND



Amazon Sage Maker is the **Machine Learning** as a Service offering

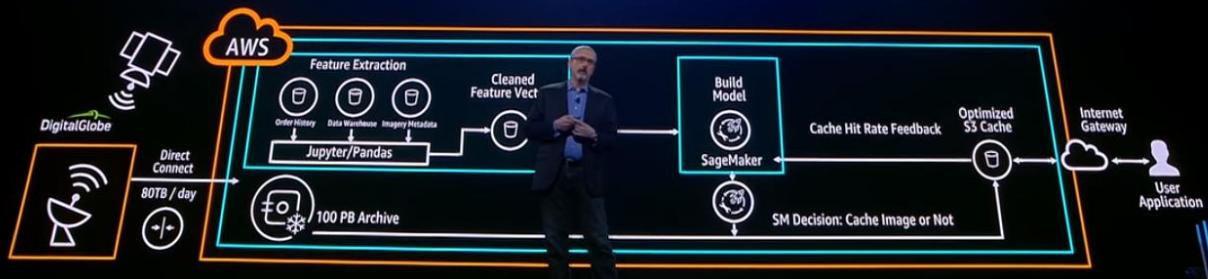


We need to train the caching algorithm to find relevance in customer access patterns in each image strips,



Are people looking for something in the same image or in images nearby? Can we predict based on the usage patterns where the next access is likely to be? And preload that image from Glacier before its even needed. Yes, and this increased our cache hit rate from 40% to 70% using Sage Maker

## USING SAGEMAKER TO MORE THAN DOUBLE THE CACHE HIT RATE



# All-in on aws

DATA OUT OF JAIL  
ON-DEMAND ACCESS WHILE MANAGING AWS SPEND  
EXTRACTION & ANALYSIS AT SCALE

aws



aws

**80 TB/DAY =**  
ONE HUMAN FOR 85 YEARS  
PER FEATURE TYPE EXTRACTED

aws

# GBDX

**DigitalGlobe** build a product called **GBDX**, Goespatial Data as a service that helps to convert unstructured images into structured and analyzed data and pulling out different types of features from each image.

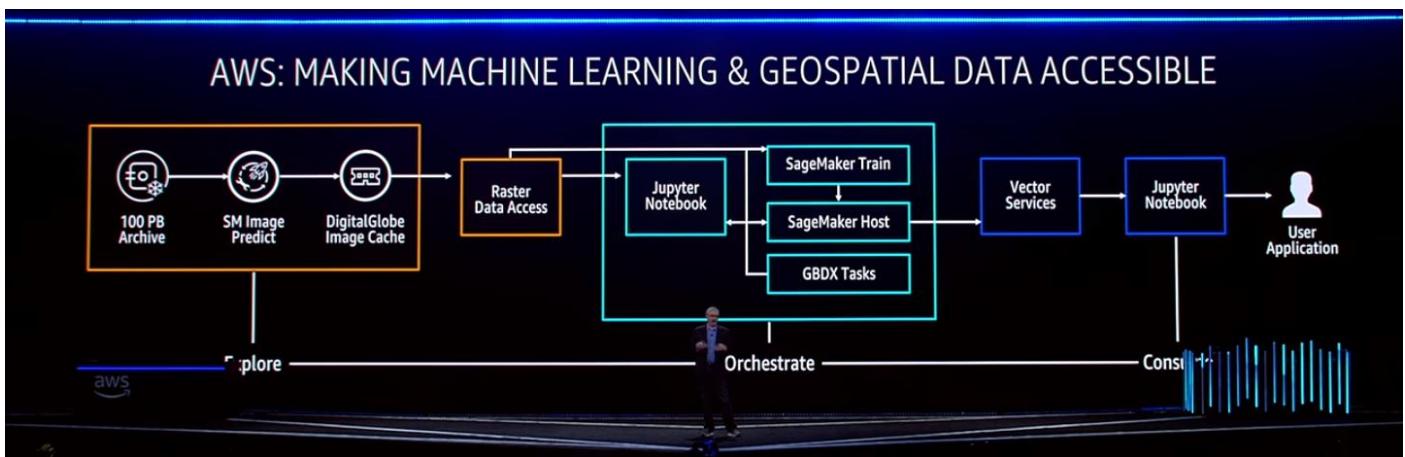




To allow developers write code for **GBDX**, the **GBDX Notebook** is built on top of the **jupyter notebooks**.



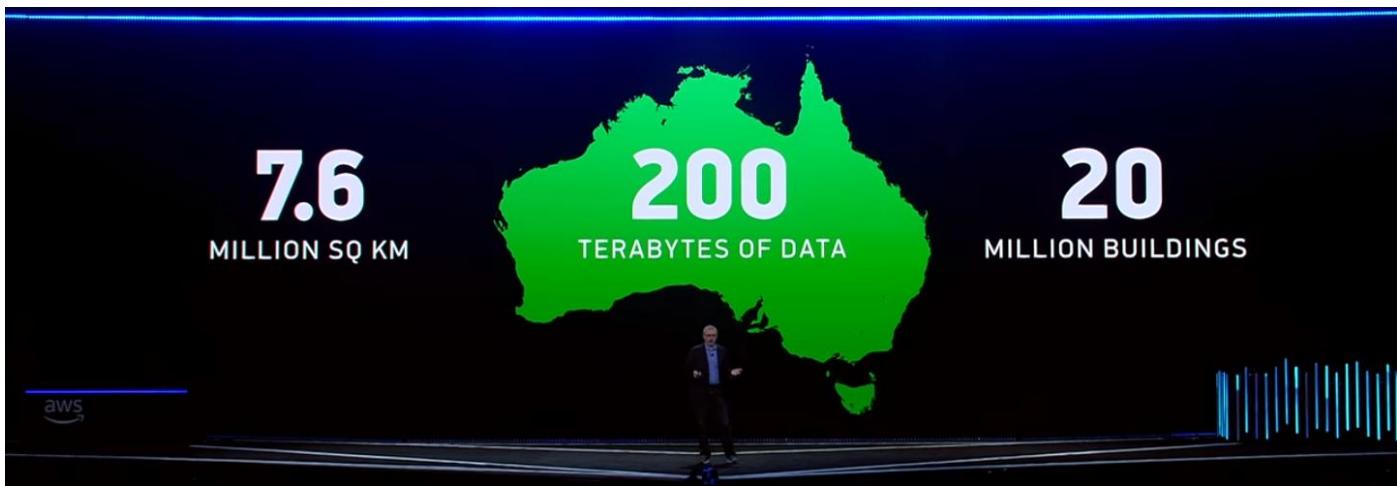
It provides access to a number of machine learning patterns that might be useful, ability to modify code, select a data that you want to operate on, train your models, optimize your models and operate your model at scale by leveraging the tools underneath SageMaker.



AWS allows us to solve 3 hard problems, satellite imagery, machine learning, and operate at scale.



If you wanted to map Australia using traditional techniques at the level of detail needed in the modern digital world, it will be totally unaffordable even when done every 5 years. But we have to offer this as an updated service.



We then worked with our partners in Australia to create GeoScape, a continuously updated service of the buildings, roads, roofs, roof heights, solar panels, swimming pools, tree canopies, the height of the tree canopies. It's the world made digital





This **GeoScape service** is being used by telecoms providers when trying to deploy 5G service. A tree map is critical for tower placement without guesswork

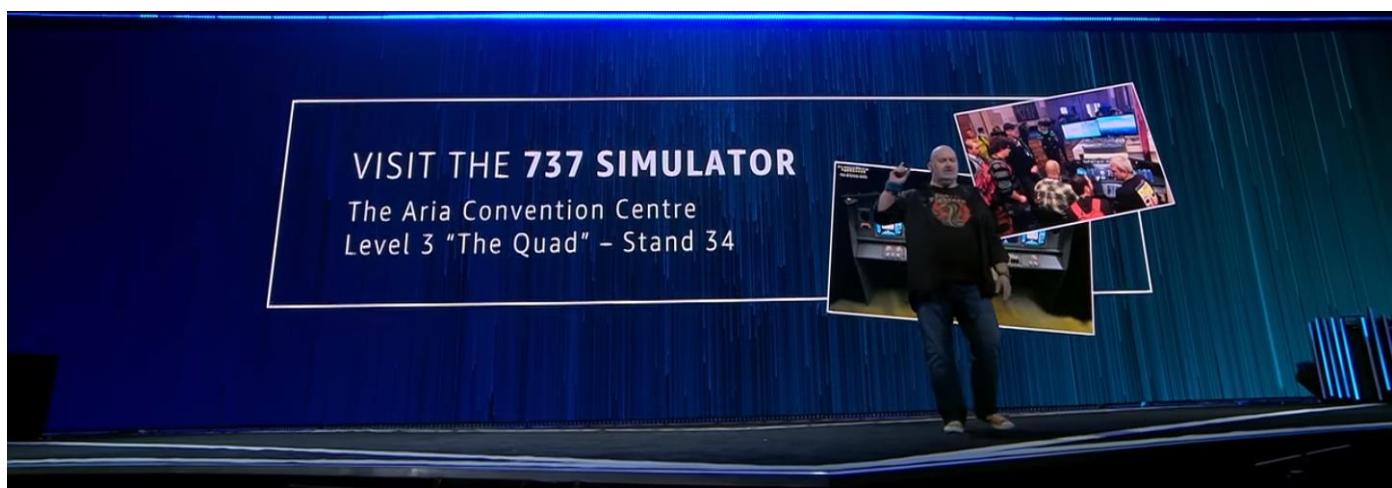
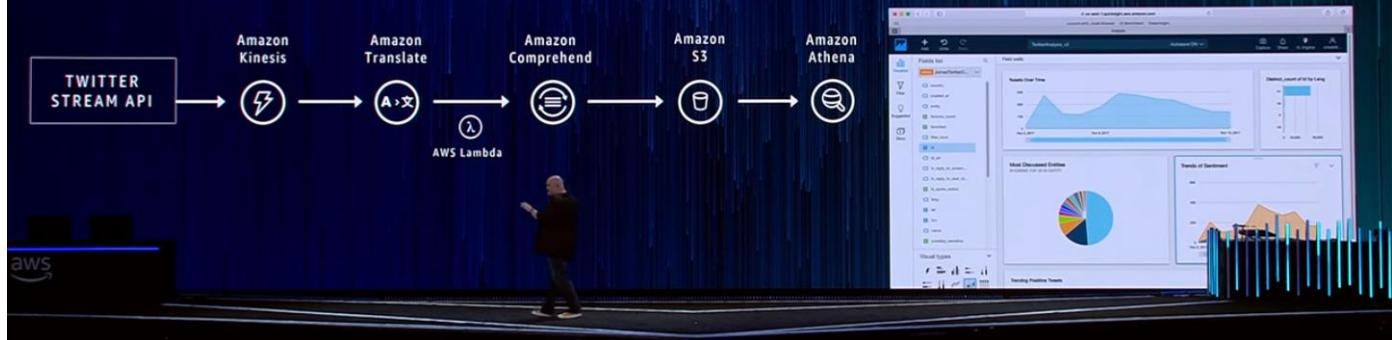


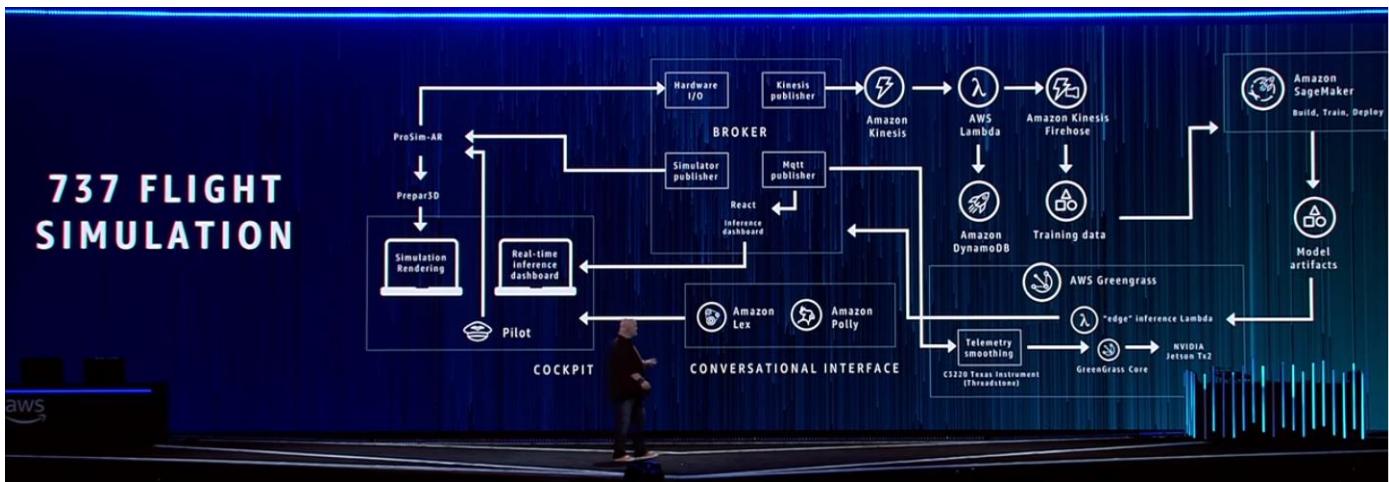
In the Australian outback, we can use this for wildfire operations and evacuating people and structures to be secured.



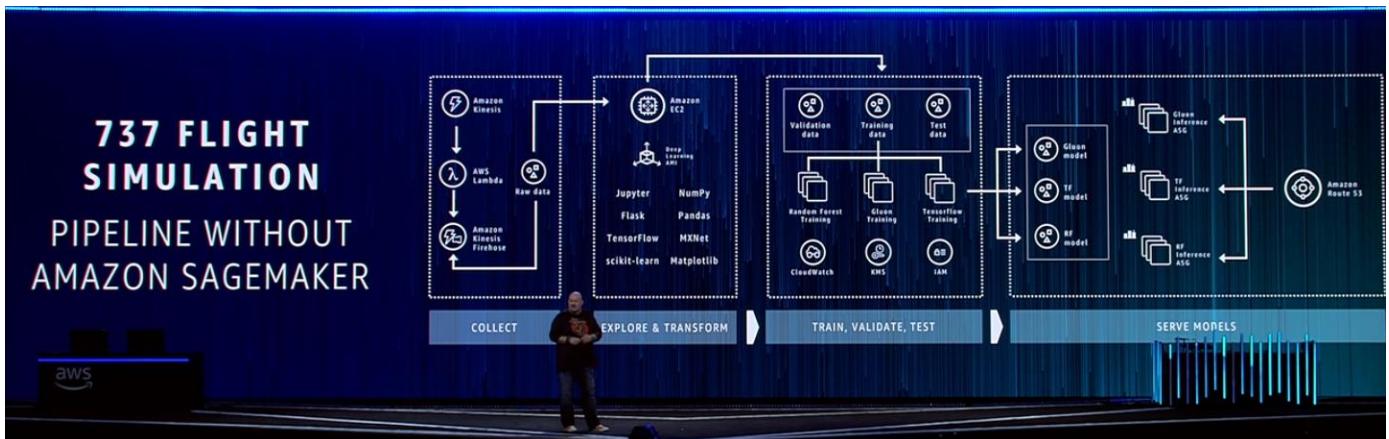
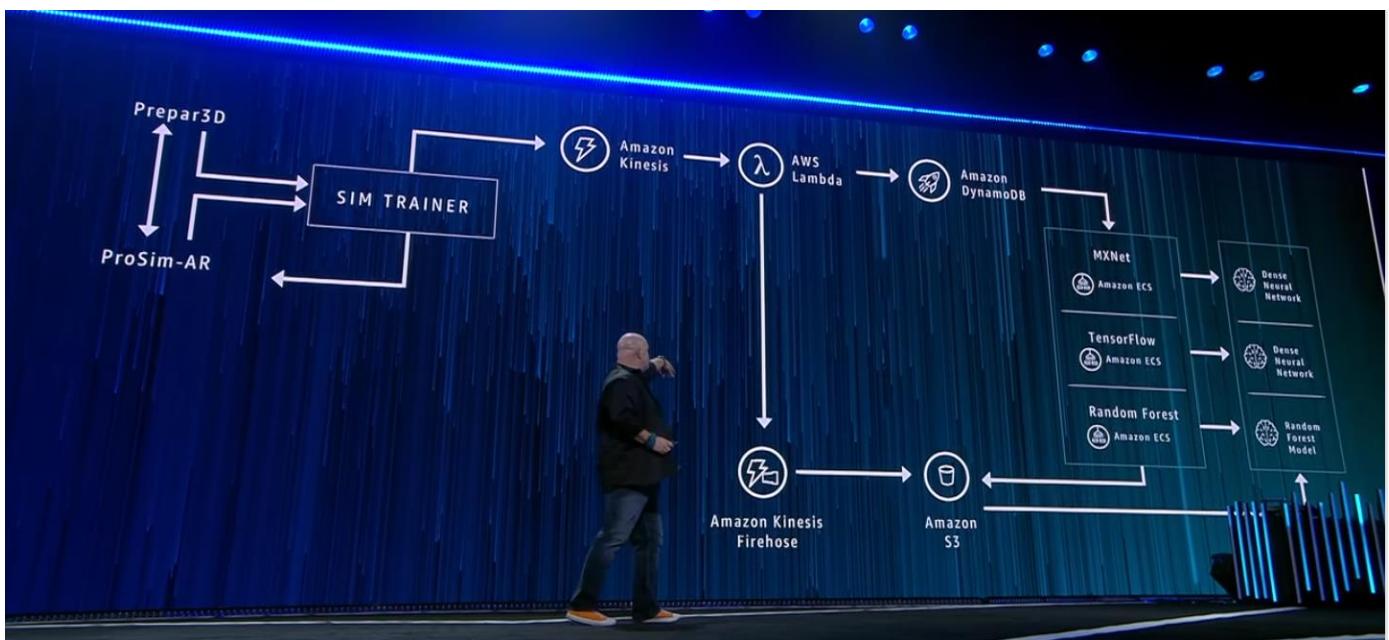


## MULTI-LINGUAL SOCIAL ANALYTICS





The right side is all machine learning where Amazon Lex and Amazon Polly are used to talk to the pilots. Machine learning is actually being used to give the pilot advice about the best actions to take.

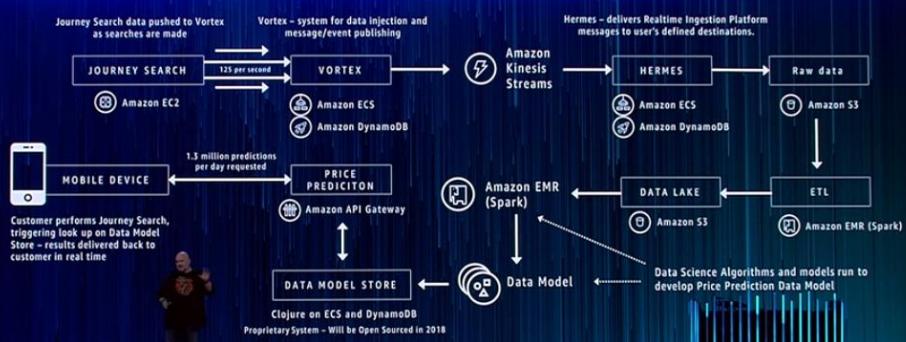


## 737 FLIGHT SIMULATION PIPELINE WITH AMAZON SAGEMAKER



aws

## trainline PRICE PREDICTION



aws

MATI KOCHAVI  
FOUNDER,  
AGT INTERNATIONAL & HEED

HE  
ED  
ACT  
international

91.9528

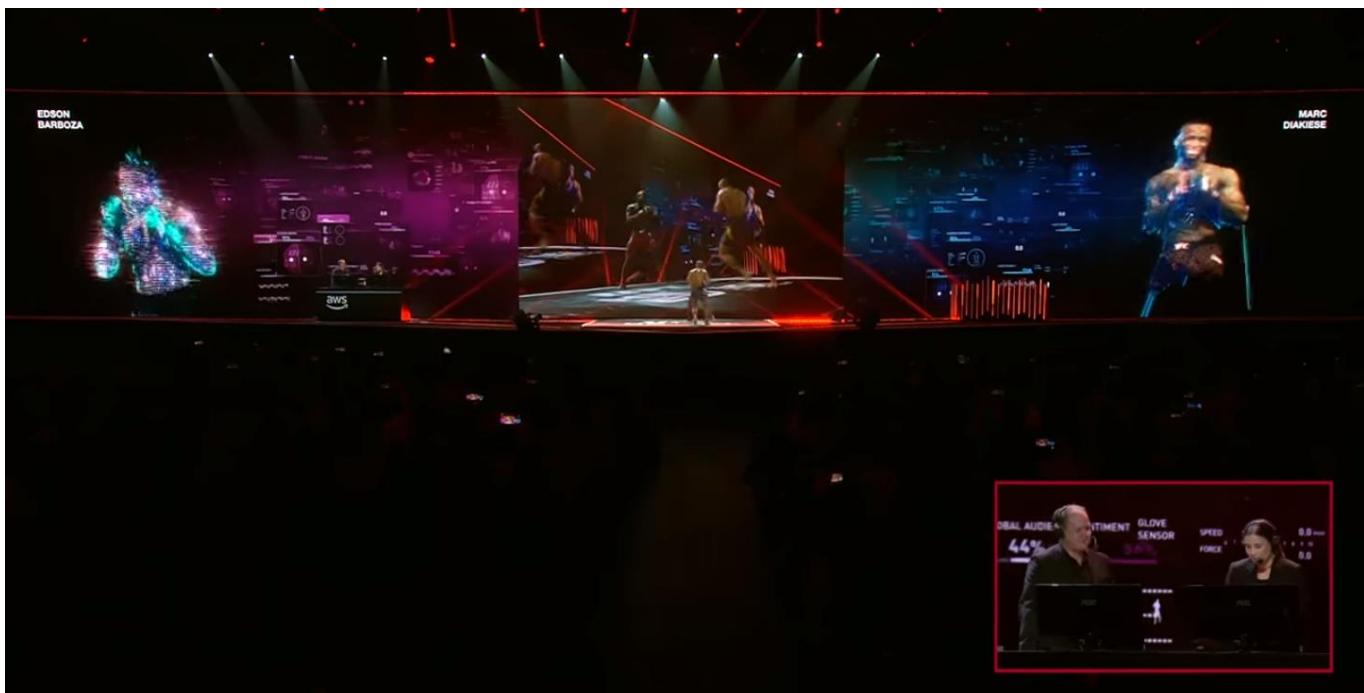
# THIS IS SPORTS TODAY

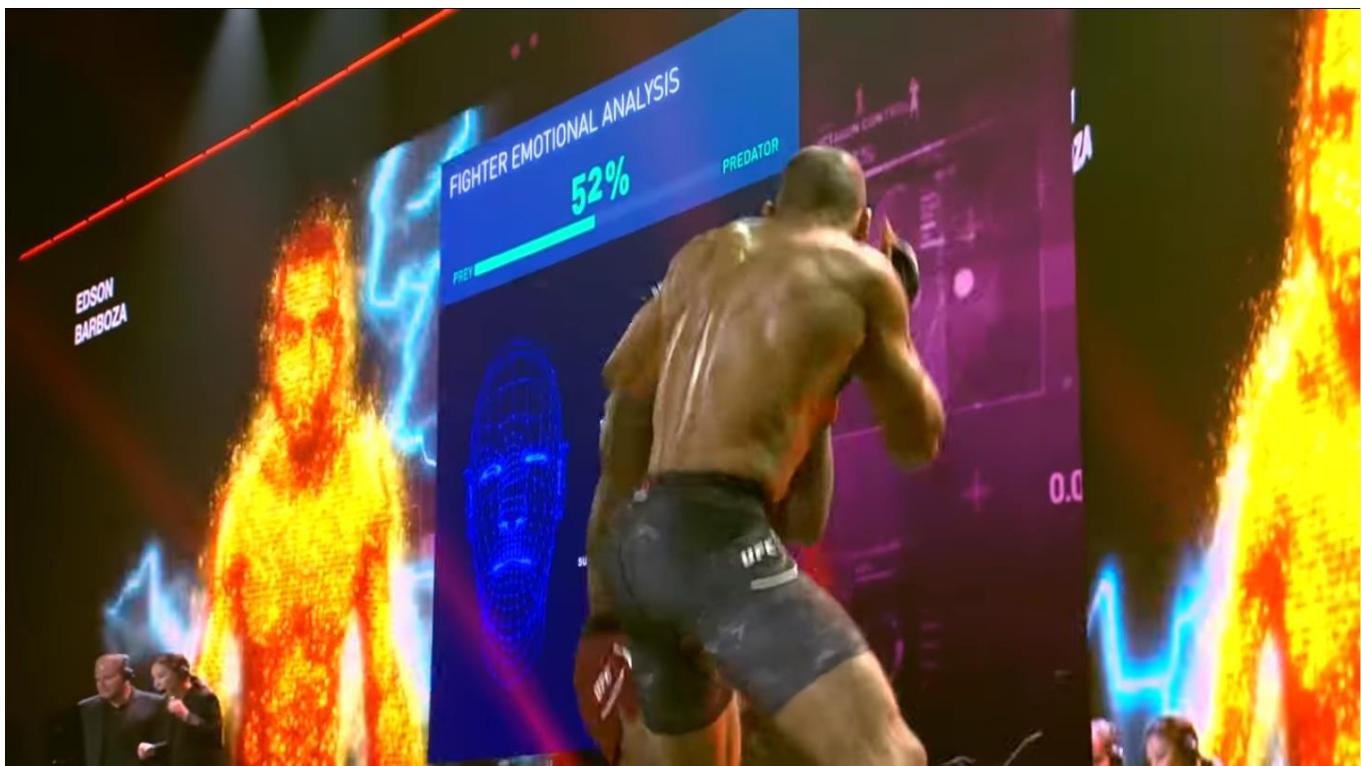
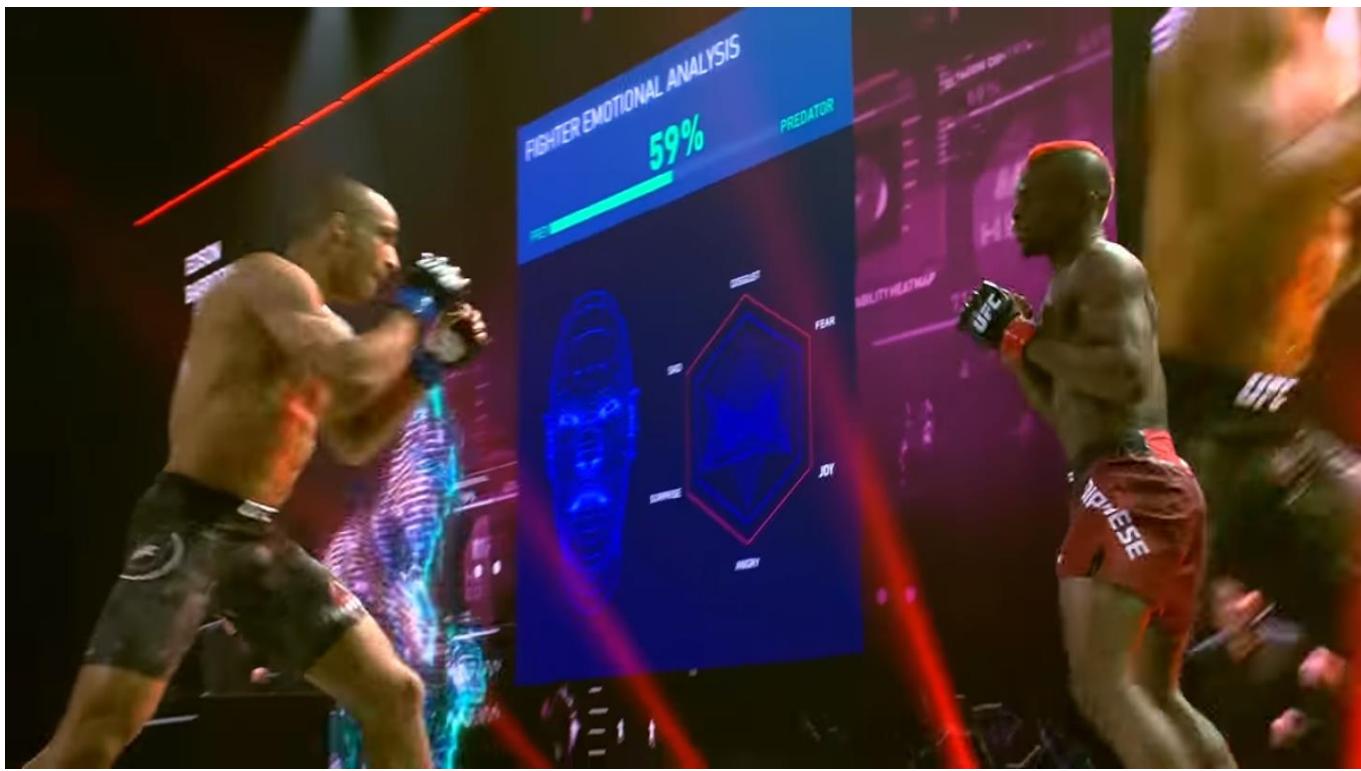


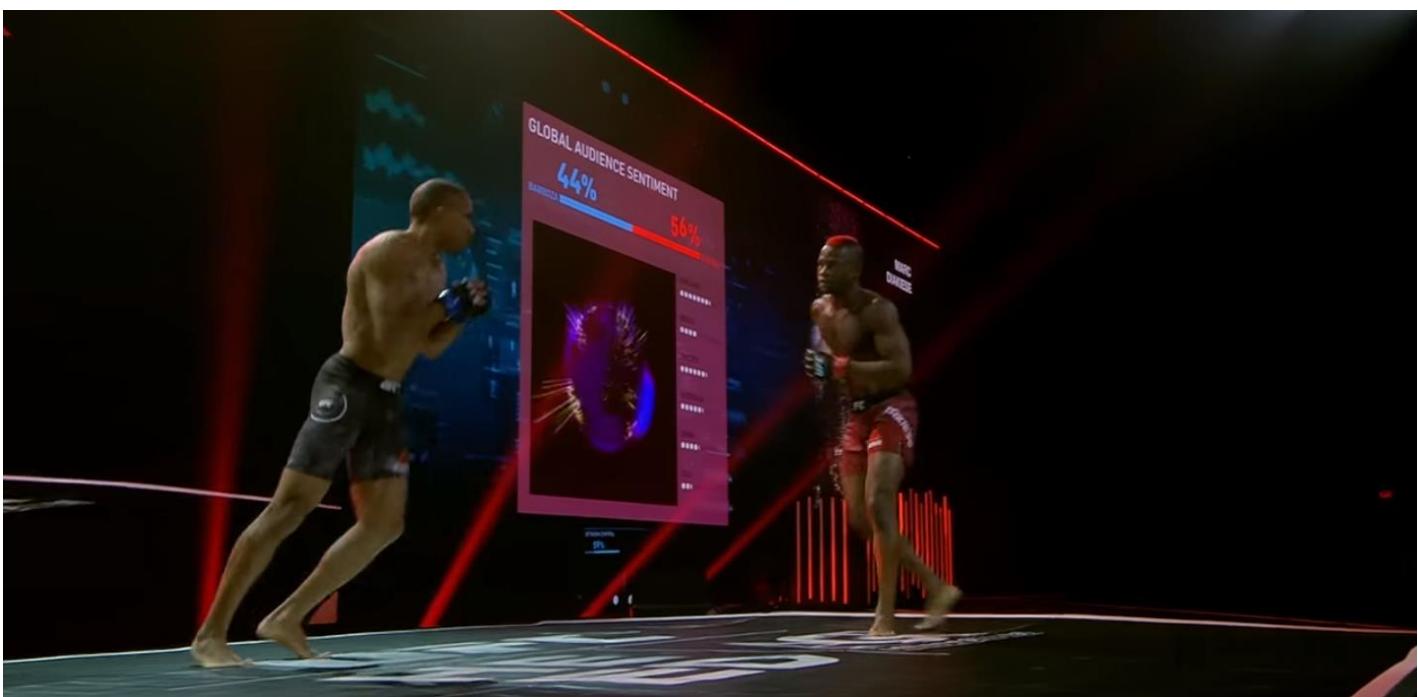
# THIS IS SPORTS TOMORROW





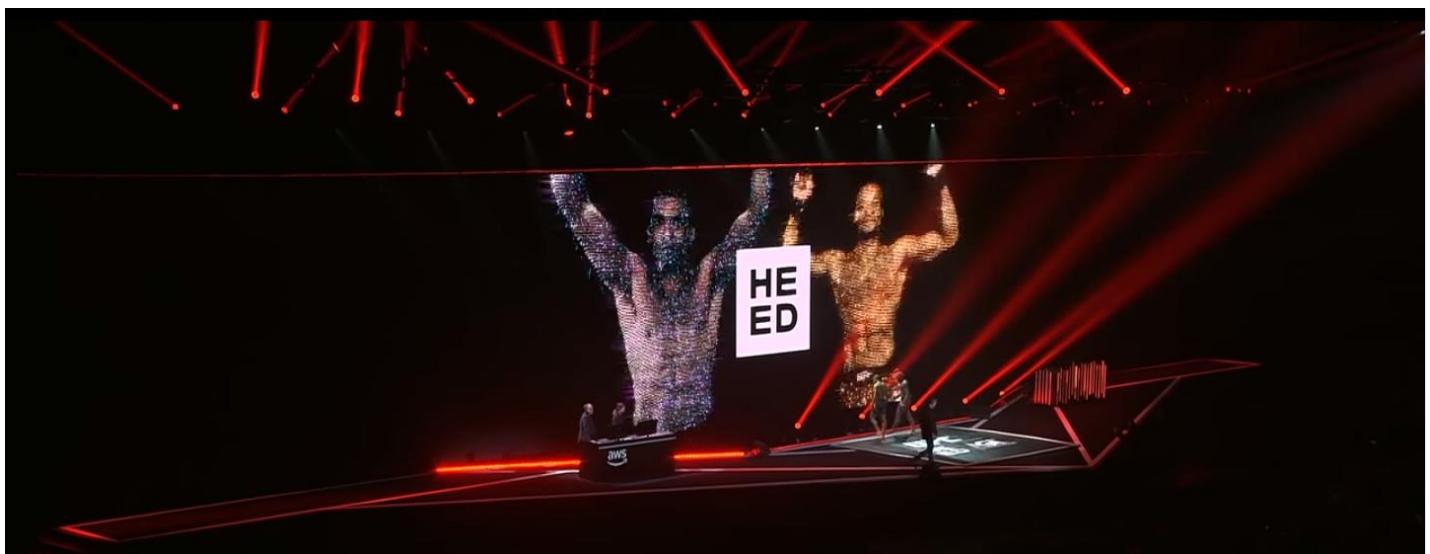




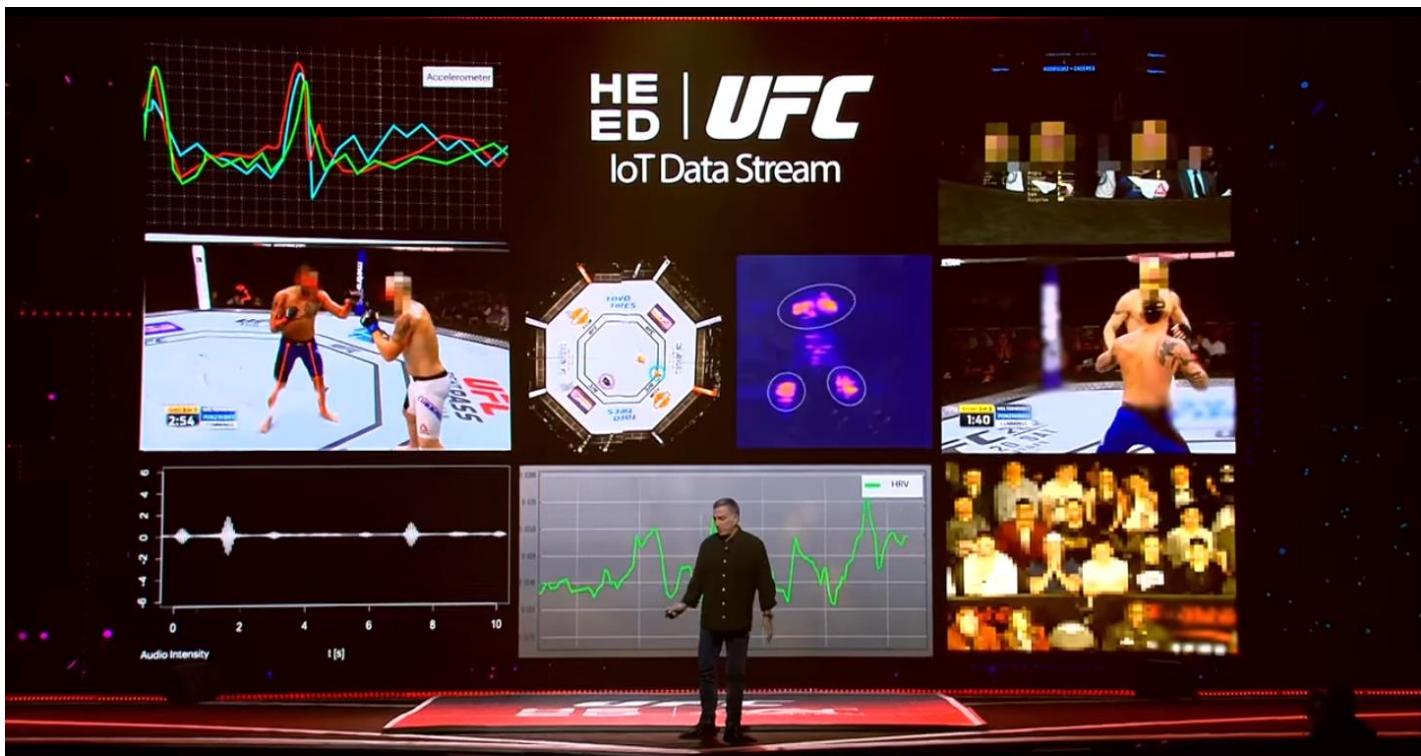








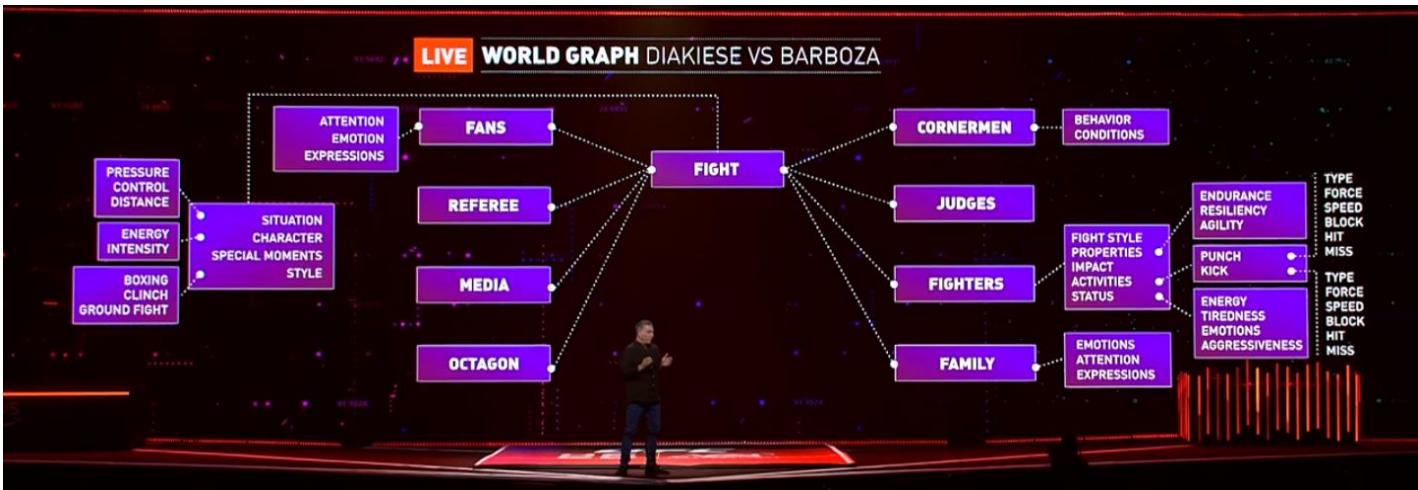
70 new data insights were introduced in the fight covering strategy, resilient, power, etc. HEED is trying to revolutionalize the way sports and live events broadcasting and entertainment will be done using the IoT in the future.



Data are collected from sensors and cameras, and smart mats connected together



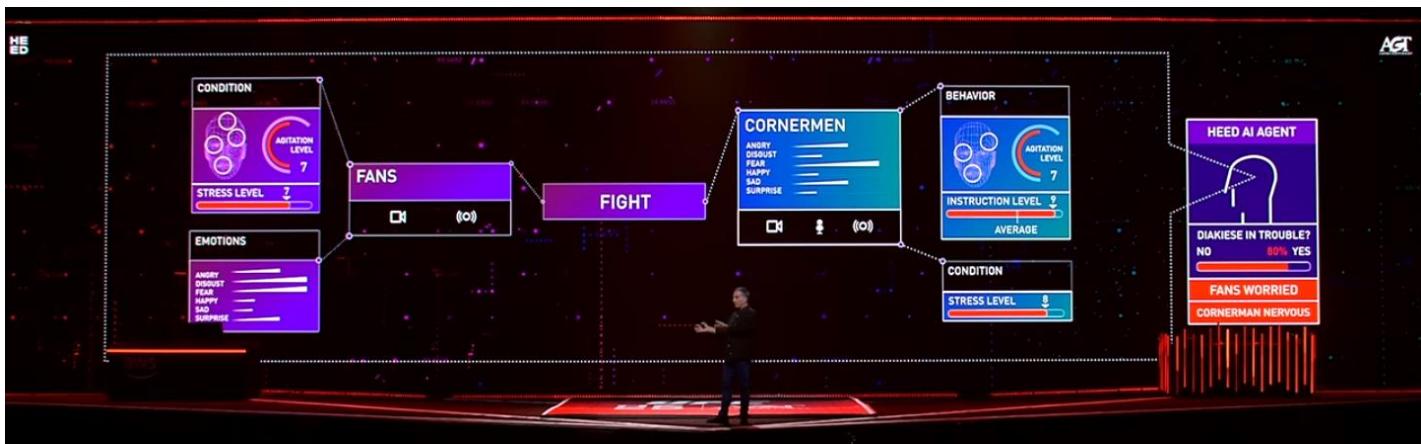
Smart gloves connected to ML can create up to 12 new data insights being analyzed also



The sensors are sending data into the word graph architecture shown above, the world graph is the semantic representation of the physical world and the entities that are visible in it like the 2 fighters and cornermen, referee, the octagon ring, and the fight itself. The world graph knows everything about the entities, their pose, dynamics, complex behaviors, their relationships, the structural behavior of the fighters in real-time.

The A.I Agent sits on top of the world graph; its mission is to provide different insights to the user. The A.I agent is looking at the world graph and asking questions, what is interesting? Important? Fun? So that it can provide this information to viewers like the emotional and information aspects of the graph





Physiological, audio and video analytics are being combined in real-time

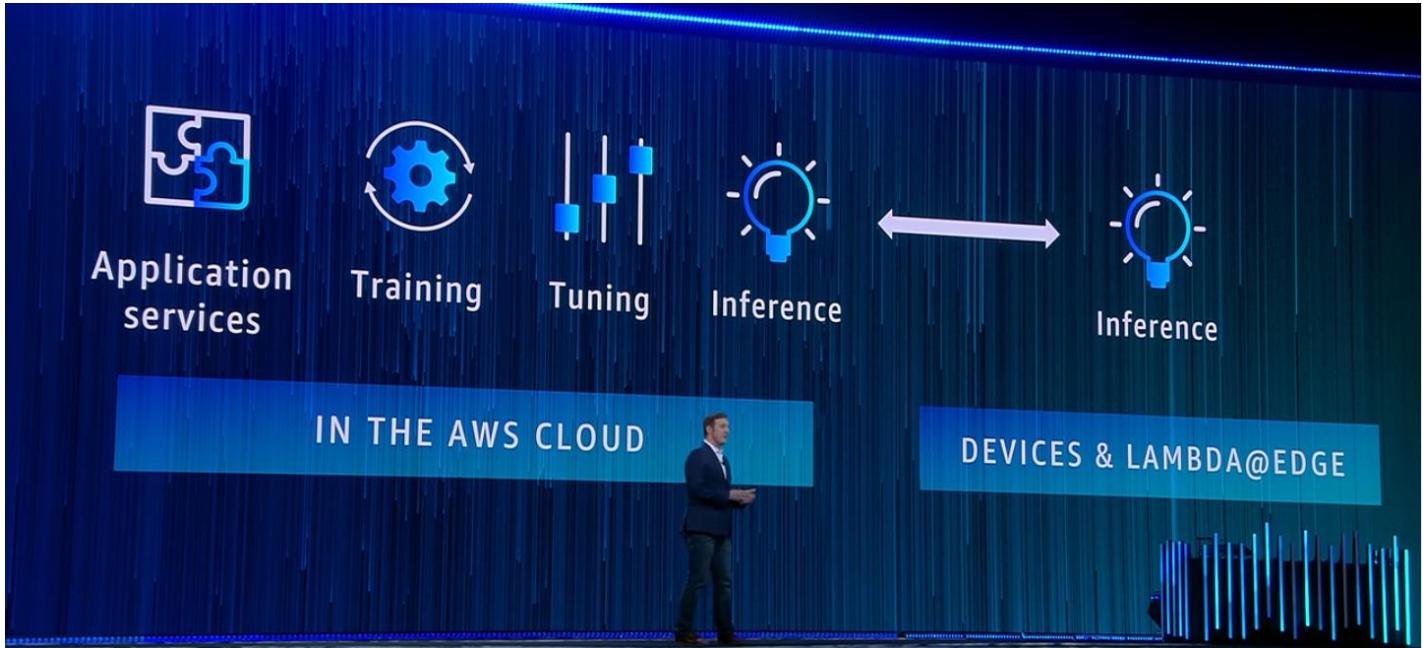


Avatars is the best way to take data and visualize it in real-time, avatars are connected to the data analytics



The NBA of Europe is now connected to our IoT grid.





As soon as the Echo device hears the wake word like 'Alexa', the device starts to stream audio back to the cloud where sophisticated models are being run. This is the approach that was taken also in Amazon deepLens product where we are able to run sophisticated models on the device and integrate it with more models running in the cloud

LET'S TAKE A **CLOSER LOOK...**

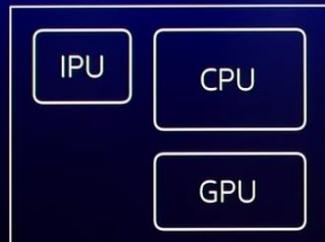
aws



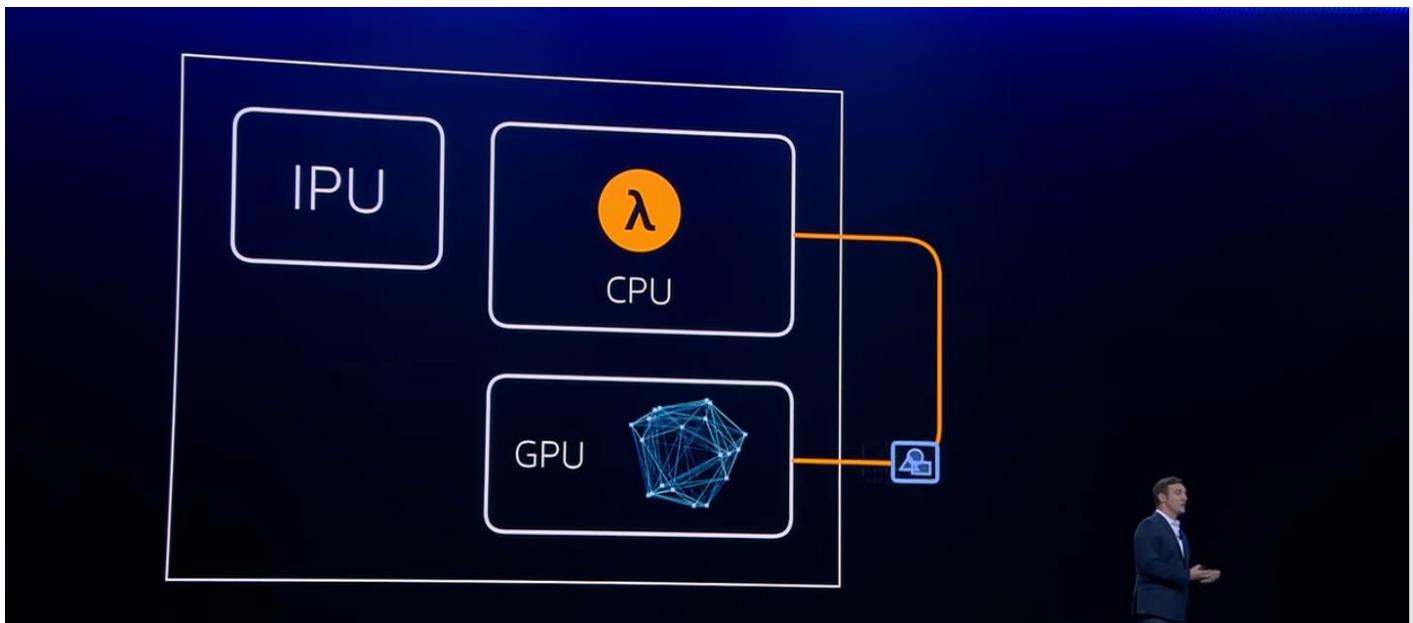
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**Amazon DeepLens** is the world's first deep learning enabled wireless video camera for developers, its main task is to help developers hone their ML skills. Under the hood, DeepLens is actually an integration of models running on the device and more models running in the cloud.

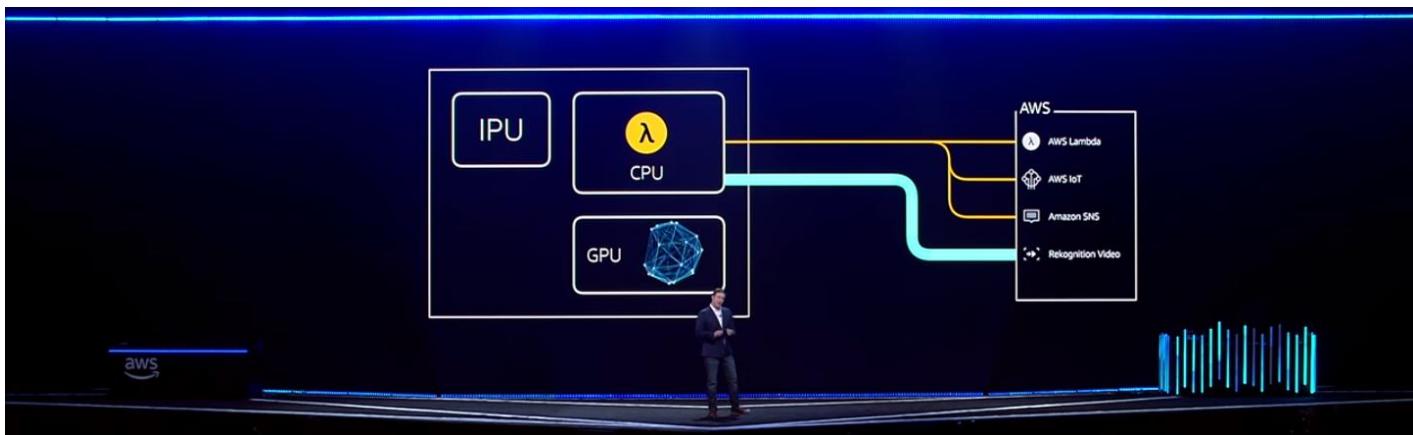
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There are 3 components inside the device, Image Processing Unit, CPU and GPU



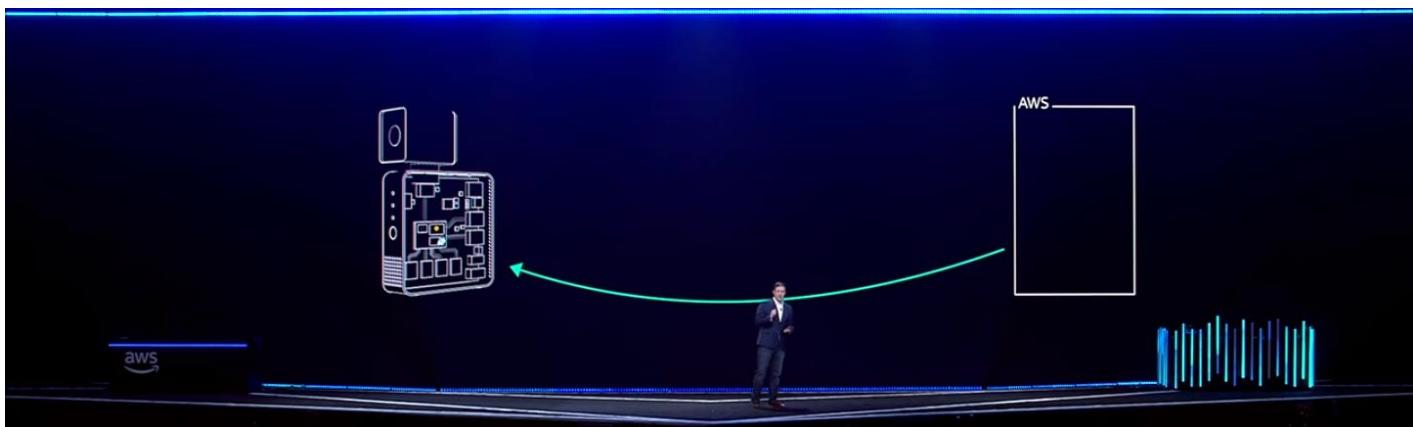
With a single line of code, lambda can pass on the image to the model running in the GPU in real-time, the GPU does the analysis, then passes results back to lambda to do anything with it



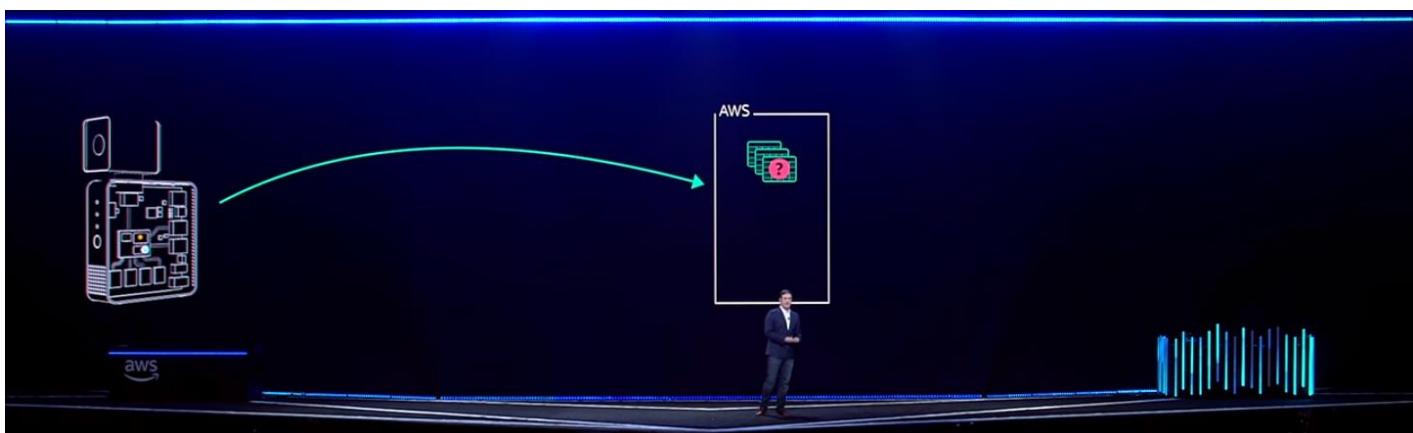
*DeepLens* can also emit real-time video feeds back to the cloud to the **Rekognition Video service** for video analysis.

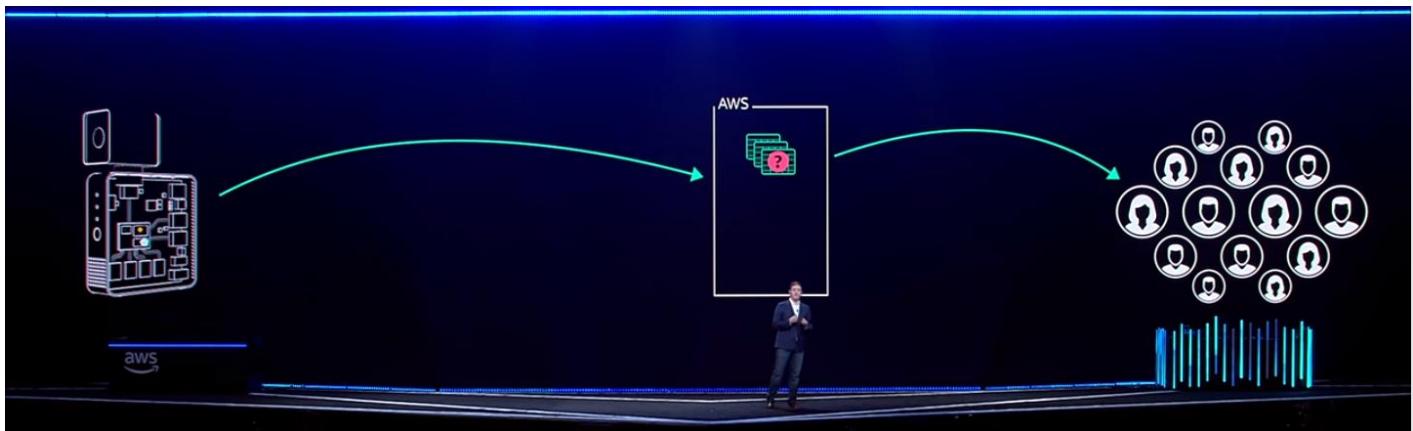


What happens when you want to deploy a new model down onto your DeepLens device? You can use **SageMaker**

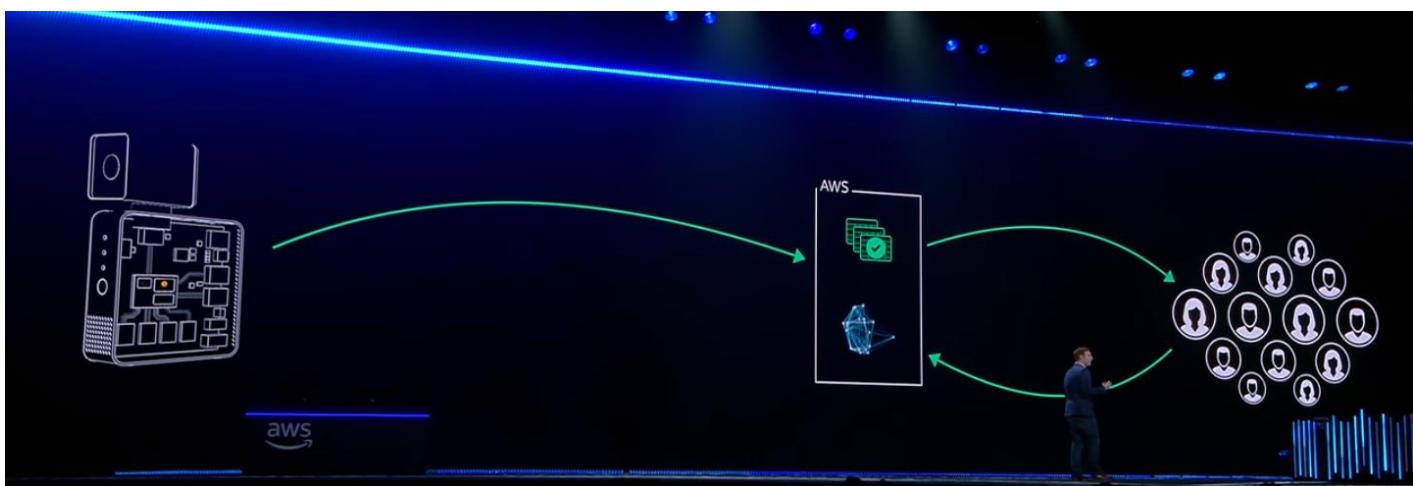
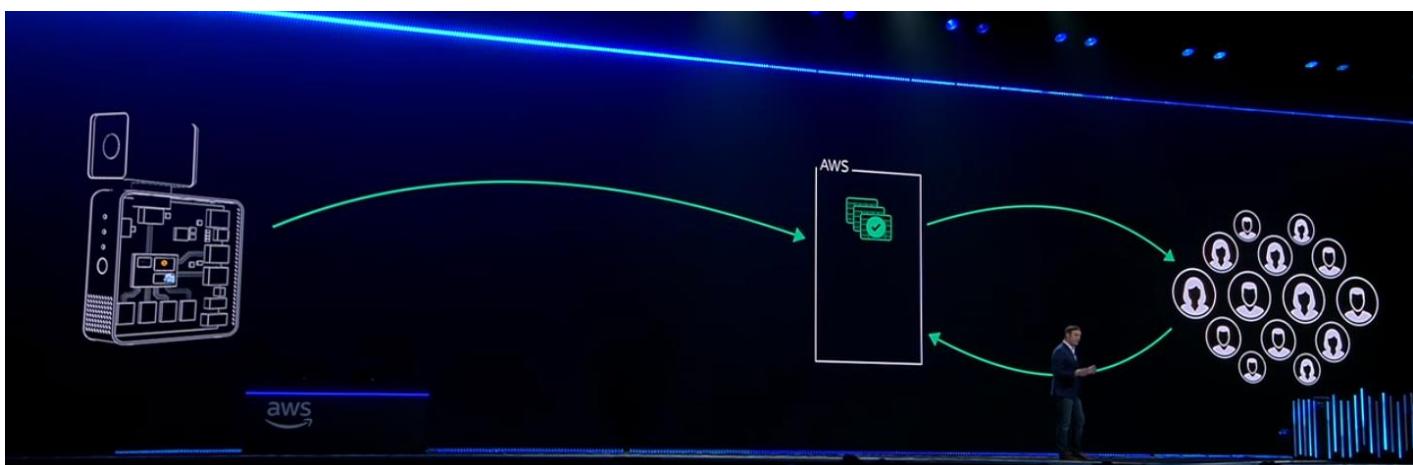


We can do pruning in the cloud before sending the results back to the DeepLens device like sending image from 32bit to 16bit resolution of the image to send to the device and still make sure that the inference engine work and performs as expected. This allows us deploy fast over-the-air to the DeepLens device using **GreenGrass**. This is good for learning and iterating very fast

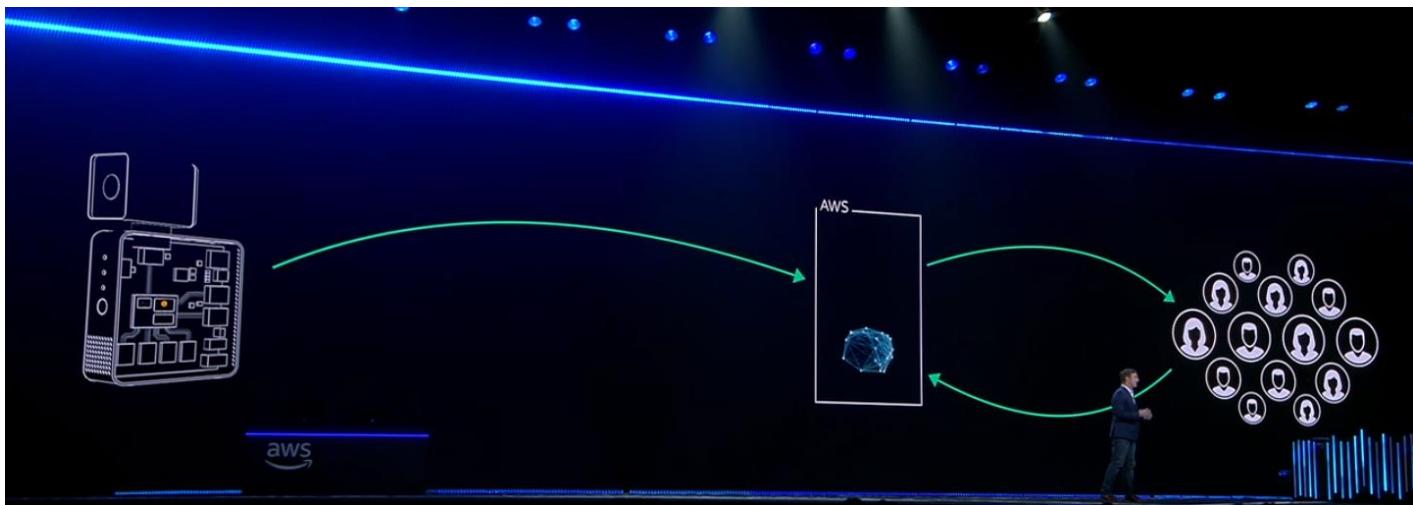




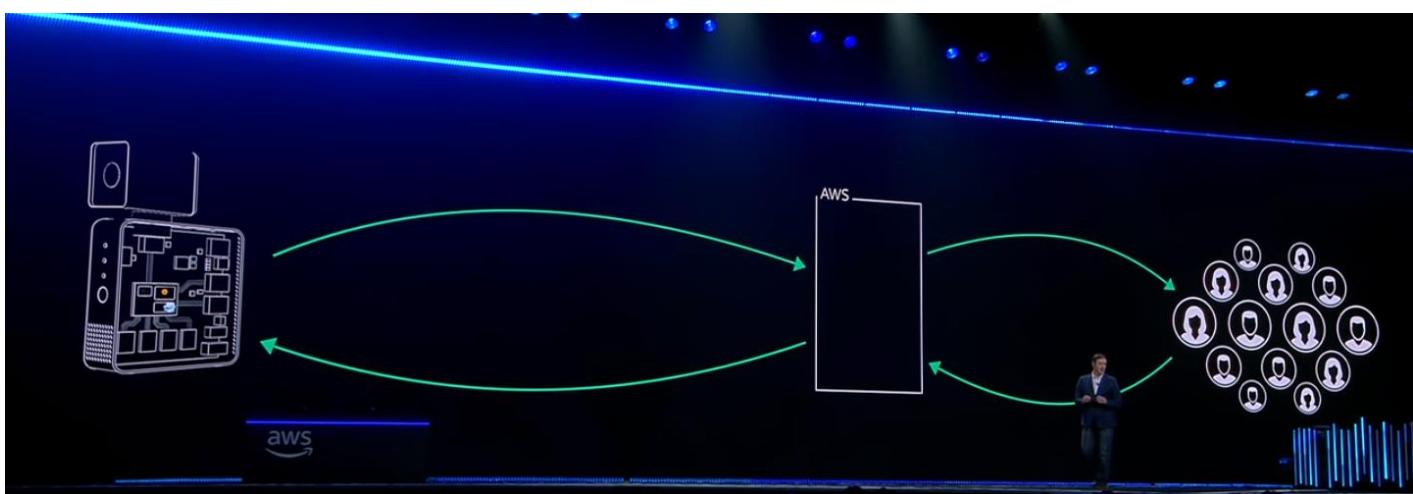
You can also use human in the loop learning to help your model get more accurate. Where you get a low confidence result back from your analysis say trying to identify a cat in an image, you can store the images where your engine is doing poorly in a bucket in **S3** or store them in a table with **DynamoDB**, then you can send this to human users to annotate the data more clearly using our **Mechanical Turk service** or human experts in your company.



You can send this annotated data back to your model for training



Add the model for pruning and optimization before sending back to your device



You can then deploy the improved trained model back to your device





"I mean, if 10 years from now, when you are doing something quick and dirty, you suddenly visualize that I am looking over your shoulders and say to yourself **"Dijkstra would not have liked this"**, well, that would be enough immortality for me."

EDSGER W. DIJKSTRA



ng  
e that  
self  
would

"I mean, if 10 years from now, when you are trying to piecemeal something together instead of just using AWS, you suddenly visualize that I am looking over your shoulders and say to yourself **"Werner would not have liked this"**, well, that would be enough immortality for me."

WERNER VOGELS



