

The background features a complex network of thin grey lines and dots, forming a web-like structure. Scattered throughout are various triangles of different sizes and orientations, some with solid grey dots at their vertices. The overall aesthetic is technical and modern, suggesting a digital or network theme.

Ecosistemas de Machine Learning en la nube

Esther Aguilar Hervás

INTRODUCCIÓN

01

**AMAZON WEB
SERVICE**

02

GOOGLE CLOUD

03

ÍNDICE

AZURE

04

**AWS vs Google Cloud
vs Azure**

05

Objetivos

- Conocer las ventajas del cloud en el campo del ML
- Conocer diferentes ecosistemas de Machine Learning en la nube
- Realizar un modelo de regresión completo, poniendo en práctica lo aprendido a lo largo del módulo

01

Introducción



Introducción



Introducción





02

Amazon Web Service

AMAZON





AWS MACHINE LEARNING

Workflow Services



Amazon SageMaker



Deep Learning AMI



Deep Learning Containers



AWS Batch



AWS ParallelCluster



Elastic Kubernetes Service



Elastic Container Service



Amazon EMR

Frameworks



TensorFlow

PyTorch



mxnet



Keras



GLUON



Horovod

Compute, Networking, and Storage



EC2 P4 instances



EC2 P3 instances



EC2 G4 instances



EC2 Inf1 instances



Elastic Inference



AWS Outposts



Elastic Fabric Adapter



Amazon S3



Amazon EBS



Amazon FSx



Amazon EFS

AMAZON SAGEMAKER



- Cientos de notebooks de ejemplo
- Algoritmos de alto rendimiento embebidos o propios
- Entrenamiento con un click
- Optimización de modelos
- Despliegue con un click
- Inferencia e interoperabilidad



AMAZON SAGEMAKER

Amazon SageMaker

Prepare →

SageMaker Ground Truth
Label training data for machine learning

SageMaker Data Wrangler **NEW**
Aggregate and prepare data for machine learning

SageMaker Processing
Built-in Python, BYO R/Spark

SageMaker Feature Store **NEW**
Store, update, retrieve, and share features

SageMaker Clarify **NEW**
Detect bias and understand model predictions

Build →

SageMaker Studio Notebooks
Jupyter notebooks with elastic compute and sharing

Built-in and Bring-your-own Algorithms
Dozens of optimized algorithms or bring your own

Local Mode
Test and prototype on your local machine

SageMaker Autopilot
Automatically create machine learning models with full visibility

SageMaker JumpStart **NEW**
Pre-built solutions for common use cases

Train & tune →

One-click Training
Distributed infrastructure management

SageMaker Experiments
Capture, organize, and compare every step

Automatic Model Tuning
Hyperparameter optimization

Distributed Training Libraries **NEW**
Training for large datasets and models

SageMaker Debugger **NEW**
Debug and profile training runs

Managed Spot Training
Reduce training cost by 90%

Deploy & manage →

One-click Deployment
Fully managed, ultra low latency, high throughput

Kubernetes & KubeFlow Integration
Simplify Kubernetes-based machine learning

Multi-Model Endpoints
Reduce cost by hosting multiple models per instance

SageMaker Model Monitor
Maintain accuracy of deployed models

SageMaker Edge Manager **NEW**
Manage and monitor models on edge devices

SageMaker Pipelines **NEW**
Workflow orchestration and automation

SageMaker Studio

Integrated development environment (IDE) for ML



AMAZON GROUND TRUTH

PREPARE

BUILD

TRAIN & TUNE

DEPLOY &
MANAGE



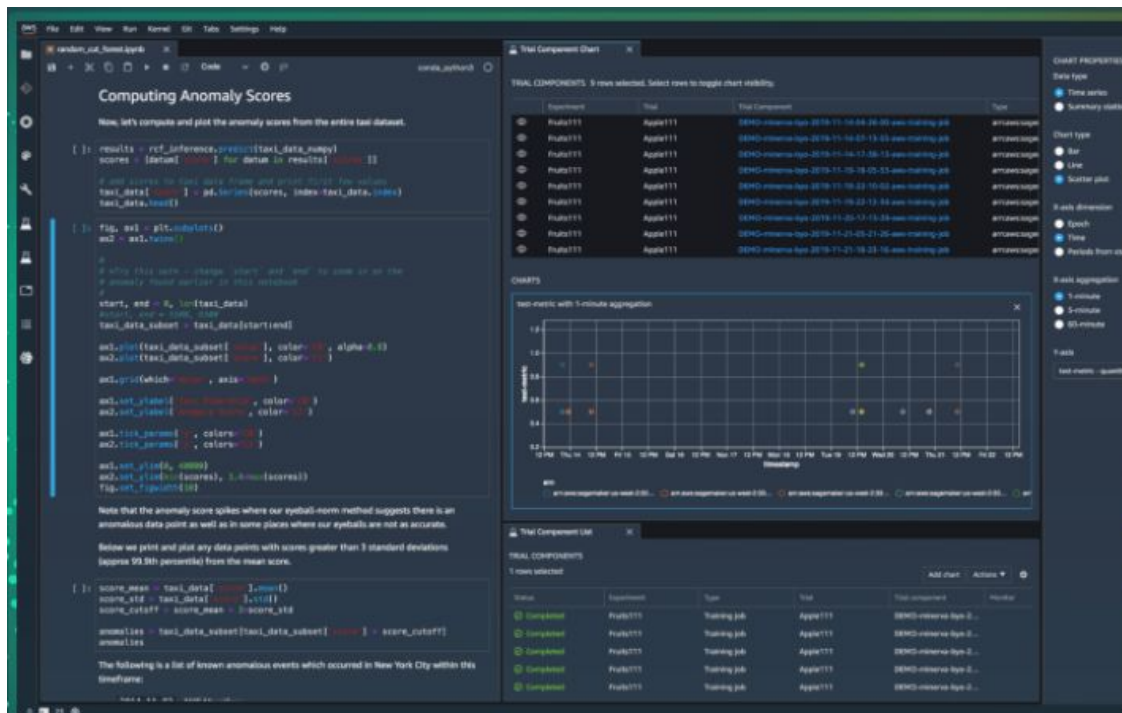
SAGEMAKER STUDIO

PREPARE

BUILD

TRAIN & TUNE

DEPLOY & MANAGE

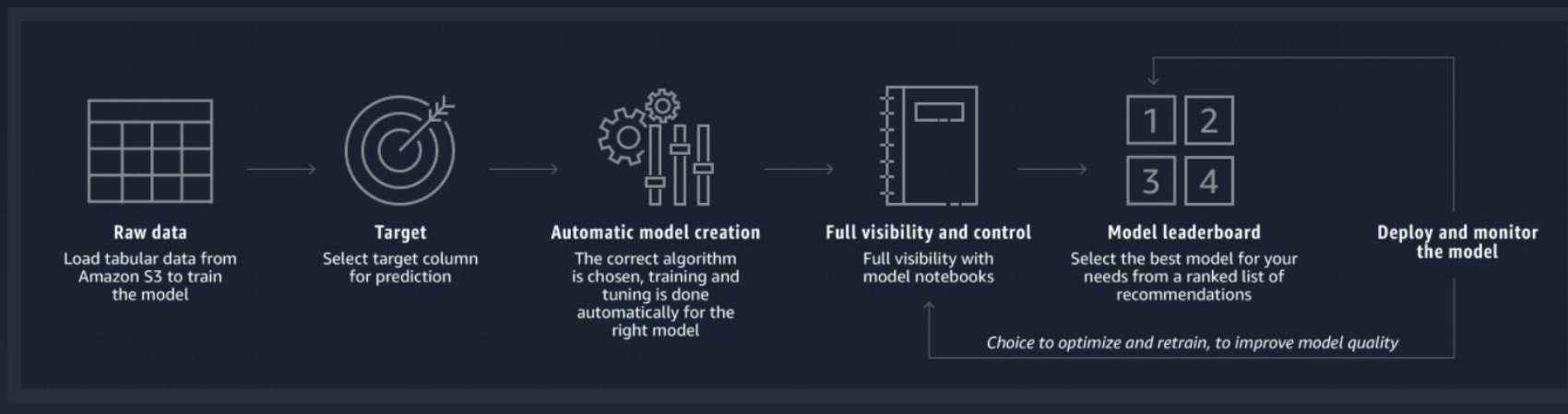




SAGEMAKER AUTOPILOT



Funcionamiento





SAGEMAKER DEBUGGER



Amazon SageMaker Studio

File Edit View Run Kernel Git Tabs Settings Help

Launcher Amazon SageMaker Studio Debug [pt-train-pt-2020-11-...]

less than 20 seconds ago

SageMaker Debugger

Monitor and profile your training jobs in real time.

Monitoring

Profiling

Configure profiling

Stop training

Download report

Overview

Nodes

Training job summary

Time spent in phases of training

Total training time: 23m 47s

Initialization: 3m 17s 94ms

Training loop: 20m 30s 36ms

Finalization: 130ms

Training job details

Start time	2020-10-19 13:43:12:579
End time	2020-10-19 14:06:59:580
Job duration	1427.000 seconds
Training loop start	2020-10-19 13:46:29:674
Training loop end	2020-10-19 14:06:59:711
Training loop duration	1230.036 seconds
Initialization	197.095 seconds
Finalization	0.131 seconds
Initialization (%)	13.81%
Training loop (%)	86.20%
Finalization (%)	0.01%

Insights

The following list shows a summary of the training job. Expand the following items to view additional details, such as the rule parameters, and the training job performance.

Showing 8 suggestions

GPU Memory Increase

Choose a larger instance memory (or apply memory leak) or apply memory management.

Number of times the rule was triggered: 7

Number of violations: 7

Number of datapoints: 2

Rule parameters:

increase: 5%

patience: 1000

Imagen: AWS

SAGEMAKER NEO

PREPARE

BUILD

TRAIN & TUNE

DEPLOY &
MANAGE

Funcionamiento

Apache MXNet

TensorFlow

PyTorch

XGBoost

Build a ML model with the
framework of your choice



Train and tune the model
using Amazon SageMaker



Choose target
hardware platform



**Amazon
SageMaker Neo**

SageMaker Neo will optimize
the trained model for the
target hardware platform



You can then deploy your
models on the cloud
or at the edge



03

Google Cloud Platform

GOOGLE



Búsqueda



Maps



Traductor



Chrome



YouTube



YouTube Music



Google TV



Chromecast



Gmail



Mensajes



Google Duo



Google Chat



Fotos



Contactos



Keep

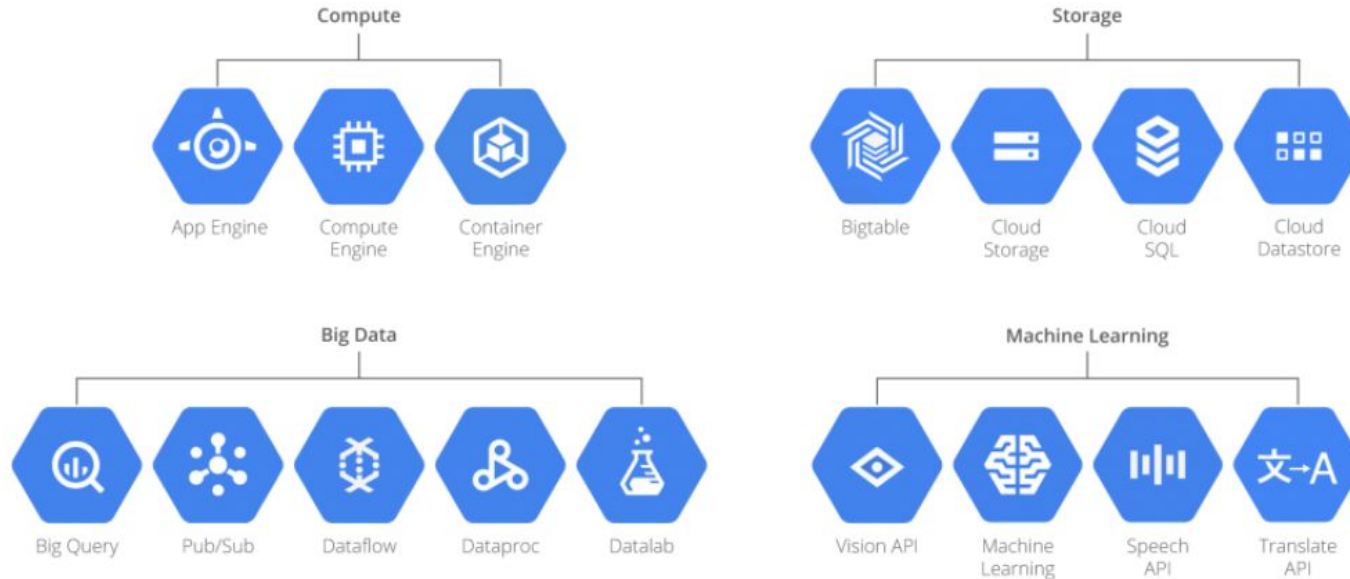


Calendar



GOOGLE CLOUD PLATFORM

Google Cloud Platform





CLOUD MACHINE LEARNING ENGINE



TensorFlow



Vision API



Speech API



Natural Language API



Translate API



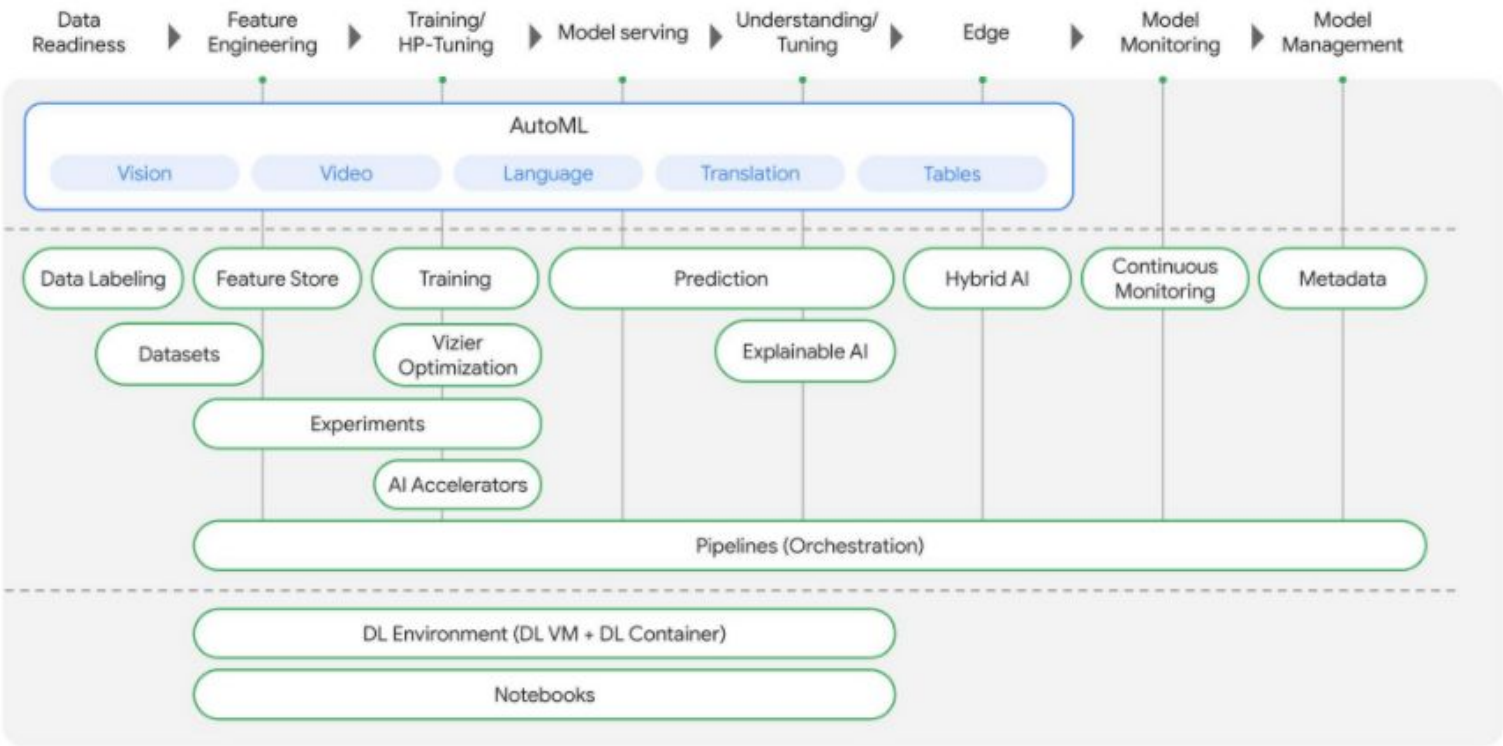
VERTEX AI



- Un flujo de trabajo de aprendizaje automático unificado
- API previamente capacitadas
- Integración perfecta de datos a IA
- Soporte para todos los marcos de código abierto



VERTEX AI





VERTEX AI

Vertex AI Workbench	Vertex AI Data Labeling	AutoML
Vertex AI Edge Manager	Vertex AI Matching Engine	Vertex AI Feature Store
Vertex AI Model Monitoring	Vertex AI Neural Architecture Search	Vertex AI Pipelines
Vertex AI Tensorboard	Vertex AI Training	Vertex AI Vizier
Vertex AI Deep Learning Containers	Vertex ML Metadata	Vertex AI Prediction

04

Microsoft Azure





MICROSOFT





AZURE





SERVICIOS AZURE



IaaS- Infrastructure As a Service



PaaS – Platform As a Service



SaaS – Software As a Service



AZURE MACHINE LEARNING



Azure Machine Learning

- Desarrollo de modelos rápido y preciso
- Operaciones de aprendizaje automático (MLOps)
- Soluciones de aprendizaje automático responsable
- Plataforma híbrida segura y conforme



AZURE MACHINE LEARNING



Etiquetado
de datos



Preparación
de los datos



Cuadernos de
colaboración



Aprendizaje
automático



Reforzar el
aprendizaje



Aprendizaje
automático
responsable



Experimentación



Registro de
modelos y
pista de
auditoría



Git y GitHub



Puntos de
conexión
administrados



Escalabilidad
automática



Integración con
otros servicios
de Azure



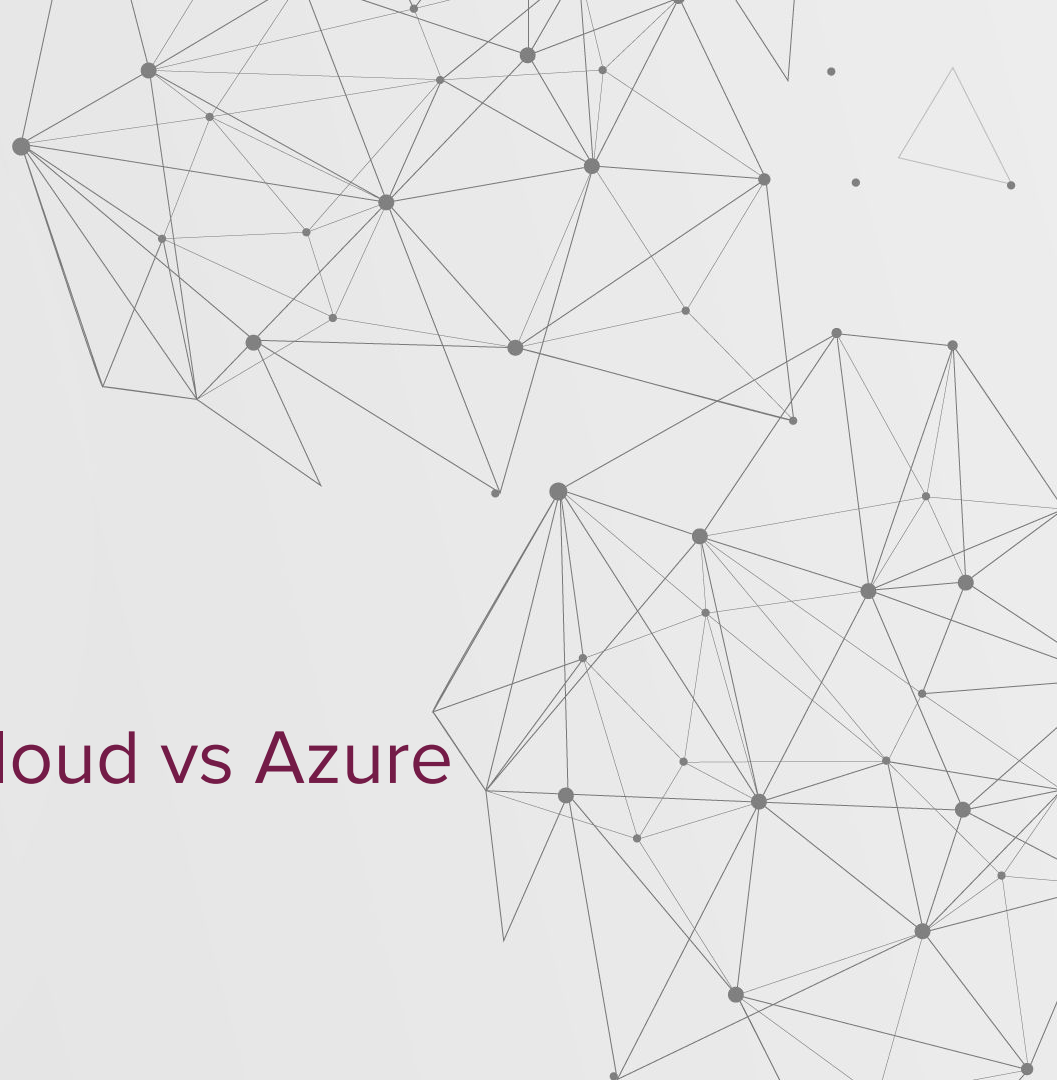
Compatibilidad
con entornos
híbridos y
multinube



Seguridad

05




AWS vs Google Cloud vs Azure



AWS vs GCP vs Azure

		
Flexibilidad y facilidad de uso	Open Source	Flexibilidad
Rentabilidad	Pago por uso	Modelos licenciamiento
Velocidad de organización	Velocidad	Premise y cloud
Escalabilidad y elasticidad	Innovación	Multi-cloud
Seguridad	Seguridad	Seguridad

AWS vs GCP vs Azure

			
Servicio Gestionado para ML	Sage Maker Studio	Vertex AI	Azure ML Studio
Reconocimiento de voz	Amazon Lex	DialogFlow	Bing Speech API
Texto a voz	Amazon Polly	Text-to-Speech	Bing Speech API
Vision	Amazon Recognition	Cloud Vision	Computer Vision
NLP	Amazon Comprehend	Cloud Natural Language	LUIS
Traducción	Amazon Translate	Cloud Translation	Translator Text
Video	Amazon Recognition Video	Cloud Video Intelligence	Video API

The background of the slide features a complex, abstract geometric pattern. It consists of numerous thin, light gray lines that connect various points, creating a network-like structure. Some of these points are represented by small, solid dark gray circles. The overall effect is a modern, tech-inspired aesthetic. The text is centered in the middle of the slide, with a horizontal line above it and another below it.

¡Gracias!

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