Serverless

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No server is easier to manage than "no server".

Dr. Werner Vogels
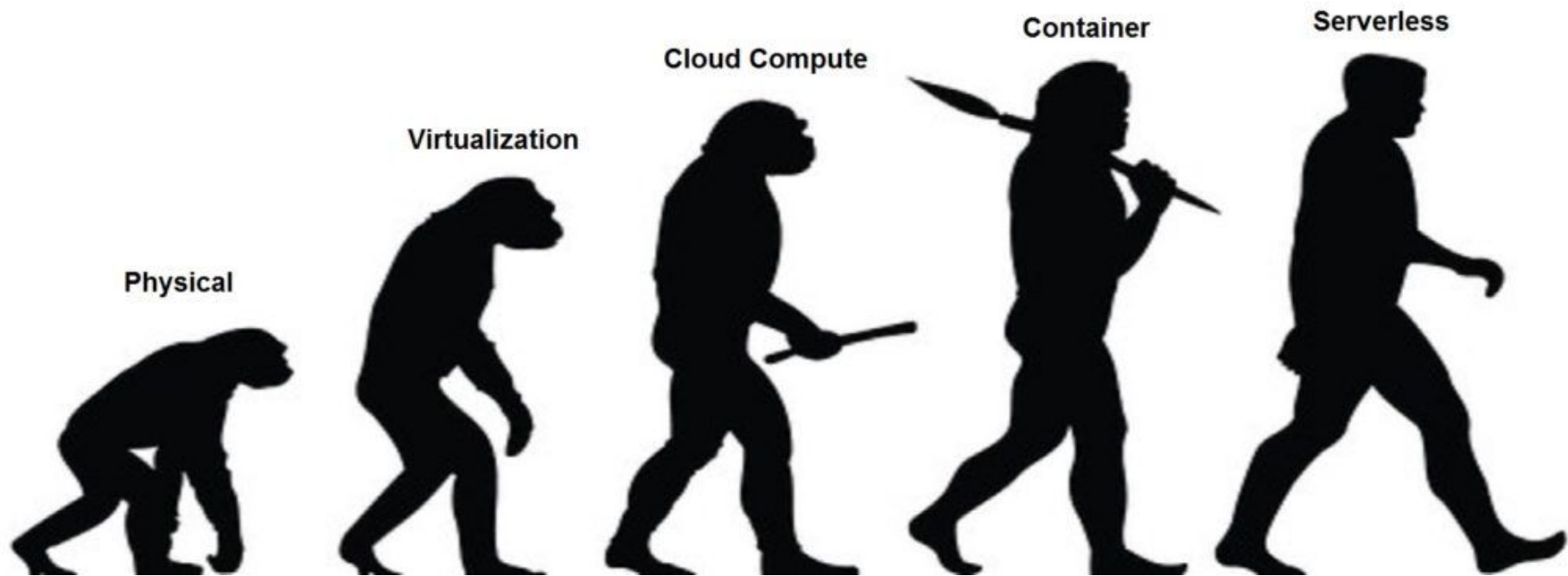Amazon CTO

SO WHAT DOES THE FUTURE LOOK LIKE?

ALL THE CODE YOU EVER WRITE IS BUSINESS LOGIC

Physical → Virtualization → Cloud Compute → Container → Serverless

WHERE WE'RE GOING

WE WON'T NEED SERVERS

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Lower Operating Expenditure/Cost

No More Servers

Pay Per Use Pricing Model vs CapEx Up-Front

Support Flexible Architecture / Innovations
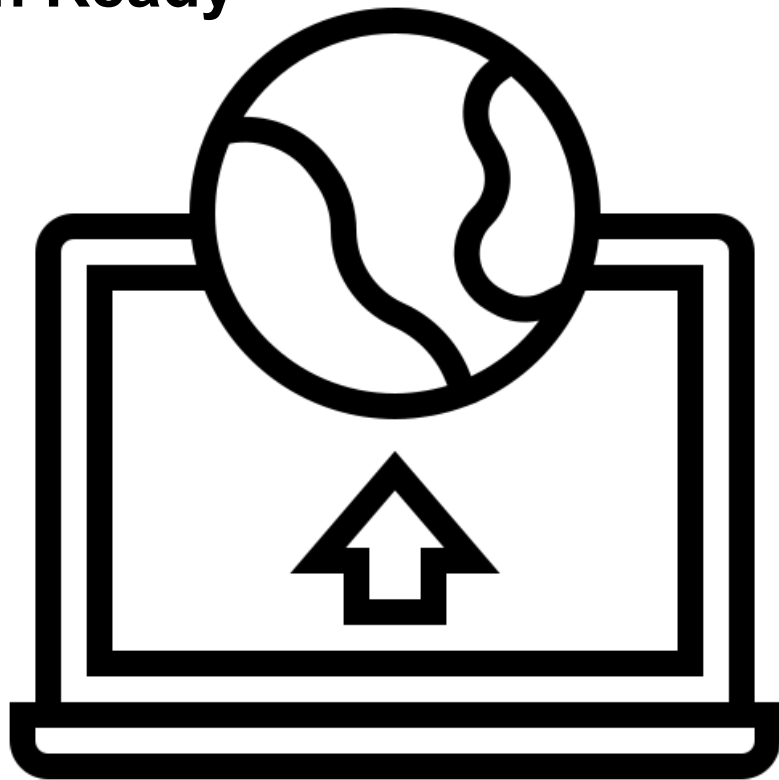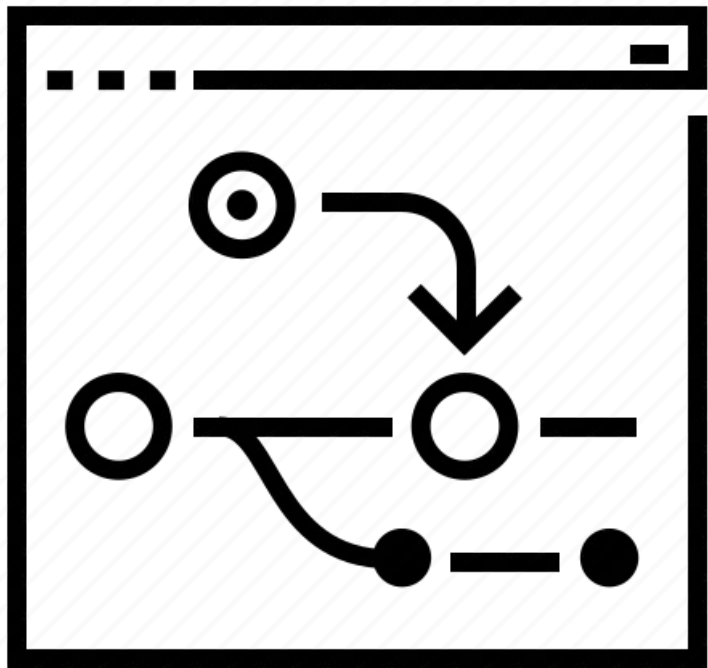
Focus only on business solutions

Reduce Time To Market

Pay Per Value

Code and Deploy Immediately, Cloud Scale, Production Ready

Managed Services

Software As A Service

AWS Lambda, or is it?

AWS Serverless Offering

Compute

AWS Lambda

AWS Lambda is an event-driven, pay-as-you-go compute service that lets you run code without provisioning or managing servers.

AWS Fargate

AWS Fargate is a serverless compute engine that works with Amazon Elastic Container Service (ECS) and Amazon Elastic Kubernetes Service (EKS).

AWS Serverless Offering

Application integration

Amazon EventBridge

Amazon EventBridge is a serverless event bus that lets you build event-driven applications at scale across AWS and existing systems.

AWS Step Functions

AWS Step Functions is a visual workflow orchestrator that makes it easy to sequence multiple AWS services into business-critical applications.

Amazon SQS

Amazon Simple Queue Service (SQS) is a message queuing service enabling you to decouple and scale microservices, distributed systems, and serverless applications.

Amazon SNS

Amazon Simple Notification Service (SNS) is a fully managed messaging service for both application-to-application (A2A) and application-to-person (A2P) communication.

Amazon API Gateway

Amazon API Gateway is a fully managed service that makes it easy to create and publish APIs at any scale.

AWS AppSync

AWS AppSync is a fully managed service that accelerates application development with scalable GraphQL APIs.

AWS Serverless Offering

Data store

Amazon S3

Amazon Simple Storage Service (Amazon S3) is an object storage service designed to store and protect any amount of data.

Amazon DynamoDB

Amazon DynamoDB is a key-value and document database service, delivering single-digit millisecond performance at any scale.

Amazon RDS Proxy

Amazon RDS Proxy is a managed database proxy for Amazon Relational Database Service (RDS) that makes applications more scalable and secure.

Amazon Aurora Serverless

Amazon Aurora Serverless is a MySQL and PostgreSQL-compatible relational database that automatically scales capacity based on your application's needs.

AWS Managed Database Offering

Database type	Use cases	AWS service
Relational	Traditional applications, enterprise resource planning (ERP), customer relationship management (CRM), ecommerce	Amazon Aurora Amazon RDS Amazon Redshift
Key-value	High-traffic web applications, ecommerce systems, gaming applications	Amazon DynamoDB
In-memory	Caching, session management, gaming leaderboards, geospatial applications	Amazon ElastiCache Amazon MemoryDB for Redis
Document	Content management, catalogs, user profiles	Amazon DocumentDB (with MongoDB compatibility)
Wide column	High-scale industrial apps for equipment maintenance, fleet management, and route optimization	Amazon Keyspaces
Graph	Fraud detection, social networking, recommendation engines	Amazon Neptune
Time series	Internet of Things (IoT) applications, DevOps, industrial telemetry	Amazon Timestream
Ledger	Systems of record, supply chain, registrations, banking transactions	Amazon Ledger Database Services (QLDB)

AWS Streaming Data Offering

Amazon Kinesis Data Streams

Amazon Kinesis Data Streams enables you to build your own custom applications that process or analyze streaming data for specialized needs. It can continuously capture and store terabytes of data per hour from hundreds of thousands of sources. You can then build applications that consume the data from Amazon Kinesis Data Streams to power real-time dashboards, generate alerts, implement dynamic pricing and advertising, and more. Amazon Kinesis Data Streams supports your choice of stream processing framework including Kinesis Client Library (KCL), Apache Storm, and Apache Spark Streaming.

Learn more about Amazon Kinesis Data Streams »

Amazon Kinesis Data Firehose

Amazon Kinesis Data Firehose is the easiest way to load streaming data into AWS. It can capture and automatically load streaming data into Amazon S3 and Amazon Redshift, enabling near real-time analytics with existing business intelligence tools and dashboards you're already using today. It enables you to quickly implement an ELT approach, and gain benefits from streaming data quickly.

Learn more about Amazon Kinesis Data Firehose »

Amazon Managed Streaming for Apache Kafka (Amazon MSK)

Amazon MSK is a fully managed service that makes it easy for you to build and run applications that use Apache Kafka to process streaming data. Apache Kafka is an open-source platform for building real-time streaming data pipelines and applications. With Amazon MSK, you can use native Apache Kafka APIs to populate data lakes, stream changes to and from databases, and power machine learning and analytics applications.

Learn more about Amazon MSK »

Other streaming solutions on Amazon EC2

You can install streaming data platforms of your choice on Amazon EC2 and Amazon EMR, and build your own stream storage and processing layers. By building your streaming data solution on Amazon EC2 and Amazon EMR, you can avoid the friction of infrastructure provisioning, and gain access to a variety of stream storage and processing frameworks. Options for streaming data storage layer include Amazon MSK and Apache Flume. Options for stream processing layer Apache Spark Streaming and Apache Storm.

AWS Managed AI Offering

Advanced text analytics

Use natural language processing to extract insights and relationships from unstructured text

Amazon Comprehend »

Automated code reviews

Automate code reviews and identify your most expensive lines of code

Amazon CodeGuru »

Chatbots

Easily build conversational agents to improve customer service and increase contact center efficiency

Amazon Lex »

Demand forecasting

Build accurate forecasting models based on the same machine learning forecasting technology used by Amazon.com

Amazon Forecast »

Document analysis

Automatically extract text and data from millions of documents in just hours, reducing manual efforts

Amazon Textract »

Enterprise search

Add natural language search capabilities to your apps so users can find the information they need more easily

Amazon Kendra »

AWS Managed AI Offering

Fraud prevention

Identify potentially fraudulent online activities based on the same technology used at Amazon.com

Amazon Fraud Detector »

Image and video analysis

Add image and video analysis to your applications to catalog assets, automate media workflows, and extract meaning

Amazon Rekognition »

Personalized recommendations

Personalize experiences for your customers using machine learning technology perfected from years of use on Amazon.com

Amazon Personalize »

Real-time translation

Expand your reach through efficient and cost-effective translation to reach audiences in multiple languages

Amazon Translate »

Text to speech

Turn text into life-like speech to give voice to your applications

Amazon Polly »

Transcription

Easily add high-quality speech-to-text capabilities to your applications and workflows

Amazon Transcribe »

AWS Authentication Offering

AWS Identity and Access Management (IAM)
Apply fine-grained permissions to AWS services and resources

Get started with IAM

AWS Identity and Access Management (IAM) provides fine-grained access control across all of AWS. With IAM, you can specify who can access which services and resources, and under which conditions. With IAM policies, you manage permissions to your workforce and systems to ensure least-privilege permissions.

IAM is an AWS service that is offered at no additional charge. To get started using IAM or if you have already registered with AWS, go to the IAM console.

AWS Authentication Offering

Amazon Cognito
Simple and Secure User Sign-Up, Sign-In, and Access Control

Sign up now

Amazon Cognito lets you add user sign-up, sign-in, and access control to your web and mobile apps quickly and easily. Amazon Cognito scales to millions of users and supports sign-in with social identity providers, such as Apple, Facebook, Google, and Amazon, and enterprise identity providers via SAML 2.0 and OpenID Connect.

AWS Monitoring and Observability Offering

Amazon CloudWatch

CloudWatch collects monitoring and operational data in the form of logs, metrics, and events, providing you with data and actionable insights to monitor your applications, respond to system-wide performance changes, and optimize resource utilization.

AWS X-Ray

Perform distributed tracing across multiple applications and systems to help find latency in a system and target it for improvement.

Amazon CodeGuru Profiler

Spot the most CPU-intensive code paths in an application using flame graphs, and optimize your code to improve performance and reduce infrastructure costs.

Amazon DevOps Guru

Automatically ingests operational data from your AWS applications and applies machine learning models informed by years of Amazon.com and AWS operational excellence to identify anomalous application behavior and surface critical issues before they cause outages or service disruptions.

AWS Monitoring and Observability Offering

AWS Distro for OpenTelemetry

A secure, production-ready, AWS-supported distribution of the OpenTelemetry project. Use it to instrument your applications just once to send correlated metrics and traces to multiple AWS and partner monitoring solutions.

Amazon Managed Service for Prometheus

A managed monitoring service based on and compatible with Prometheus, the popular open source monitoring and alerting solution optimized for container environments. Use the Prometheus query language (PromQL) to monitor the performance of containerized workloads.

Amazon Managed Grafana

A fully managed service based on Grafana, the popular open source analytics platform. Query, visualize, alert on, and understand metrics no matter where they are stored. Create, explore, and share observability dashboards.

Amazon OpenSearch Service

Amazon OpenSearch Service makes it easy for you to perform interactive log analytics, real-time application monitoring, website search, and more. OpenSearch is an open source, distributed search and analytics suite derived from Elasticsearch. Amazon OpenSearch Service offers the latest versions of OpenSearch, support for 19 versions of Elasticsearch (1.5 to 7.10 versions), and visualization capabilities powered by OpenSearch Dashboards and Kibana (1.5 to 7.10 versions).

AWS Business Intelligence Offering

Amazon QuickSight

The most popular cloud-native, serverless BI service

Get started with a free trial

Request a proof-of-concept

AWS Business Intelligence Offering

QuickSight powers millions of dashboard views weekly for customers, allowing their end-users to make better data-driven decisions.

AWS Business Intelligence Offering

Connect and scale all of your data

- Connect to all your data in AWS, 3rd party clouds, or on-premises

- SPICE in-memory storage to scale data exploration to thousands of users

- Combine data from multiple sources and create complex data models for governed data sharing

Build customizable dashboards

- Pixel-perfect dashboard design for customized, use-case specific dashboards

- Deliver personalized email reports and alerts for end-users

- On-the-go access using QuickSight's iOS, Android, or mobile web access

Leverage ML integrations for insights

- Anomaly Detection to continuously analyze all of your data for anomalies and variations

- Forecast business metrics and perform interactive what-if analysis with point-and-click

- Auto-Narratives that can be customized and woven into dashboards for deeper context for users

AWS Business Intelligence Offering

Enable true self-service BI for everyone

- Q enables end-users to dive deep into data through simple questions without BI training
- Easy visual analysis of data using QuickSight's 100% web-based authoring interface
- Embed QuickSight capabilities in applications for data-driven user experiences

Native AWS services integrations

- Private VPC connectivity for secure AWS access to Amazon Redshift, Snowflake, Exasol, Amazon RDS and more
- Native IAM permissions for Amazon S3 and Amazon Athena with fine-grained access control for serverless data exploration
- Amazon SageMaker integration allows easy integration of sophisticated ML models without complex data pipelines

No servers to manage, pay by usage

- Serverless architecture auto-scales to hundreds of thousands of users with high availability; no need to over-provision for peak usage
- SPICE in-memory engine auto-scales to provide consistent fast response times for end-users and analysts; no need to scale databases for high workloads
- Pay-per-session optimizes costs by only paying for actual usage; no need to buy thousands of end-user licenses for large-scale BI or embedded analytics

AWS Business Intelligence Offering

## Built-in security, governance, and compliance

- End-to-end data encryption for data, and encryption at rest for data in SPICE

- Row and Column level security with API support for user or group level control

- Rapid deployment for regulated workloads with compliance for HIPAA, HITRUST CSF, GDPR, SOC, PCI, ISO 27001, FedRAMP (High) and more
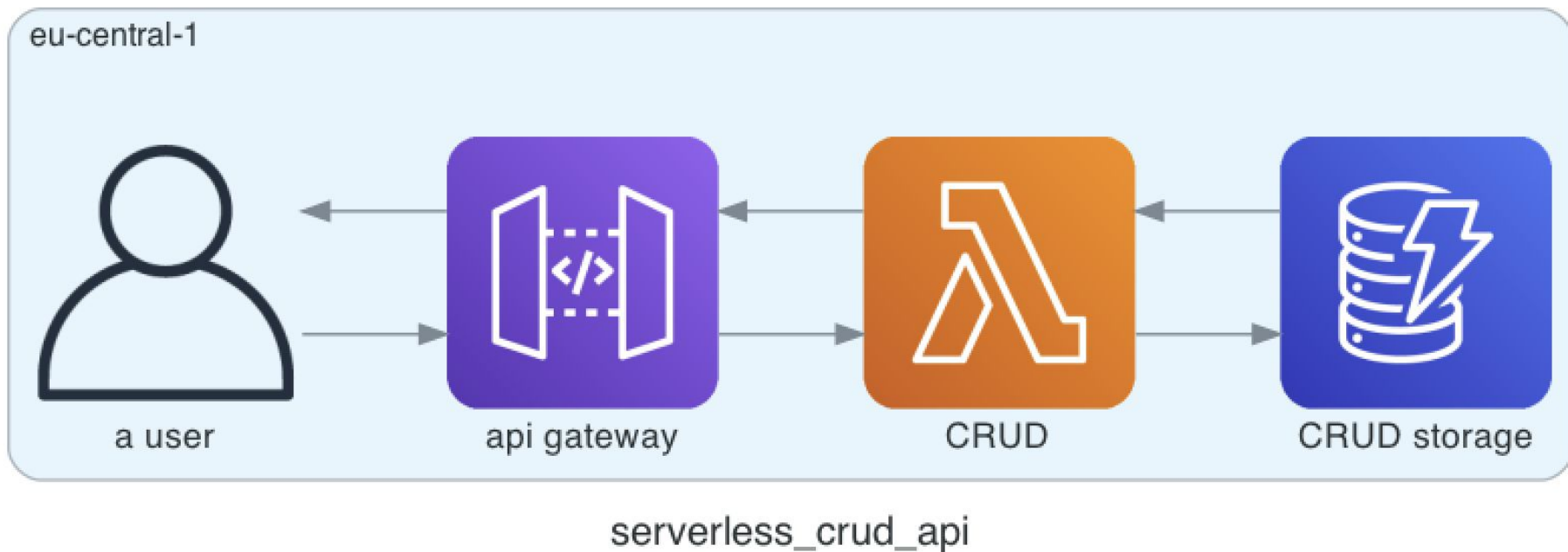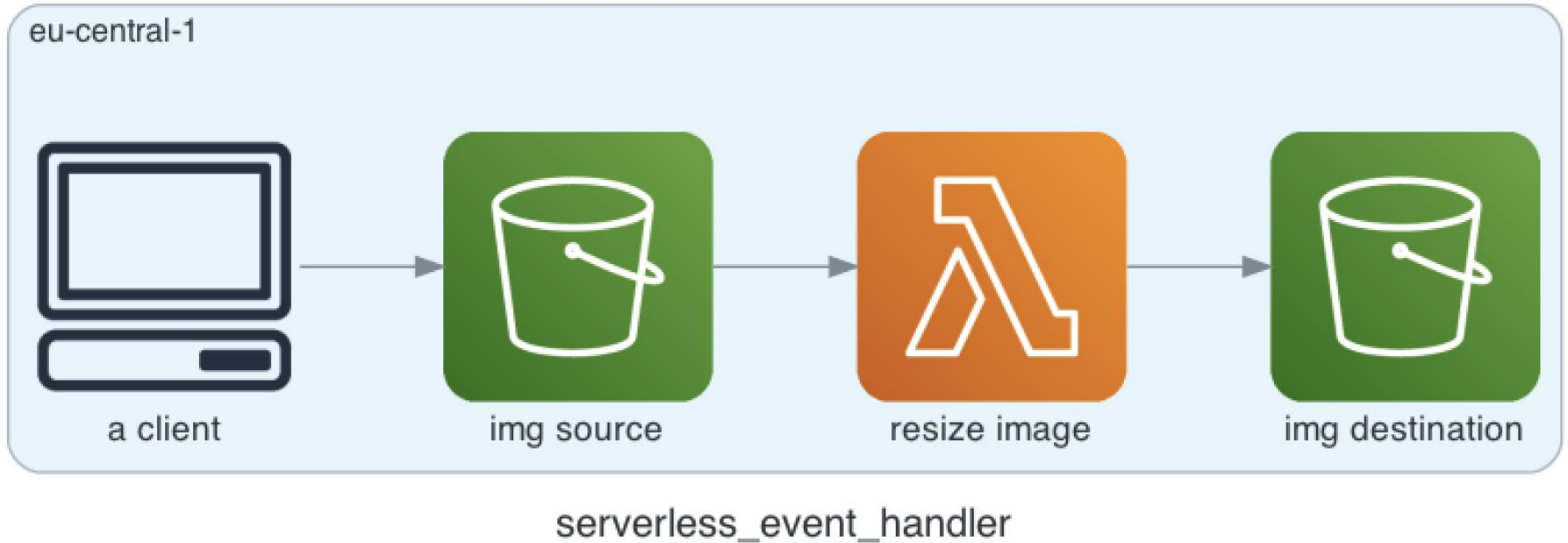
AWS Services, the list goes on and on..

Demo time
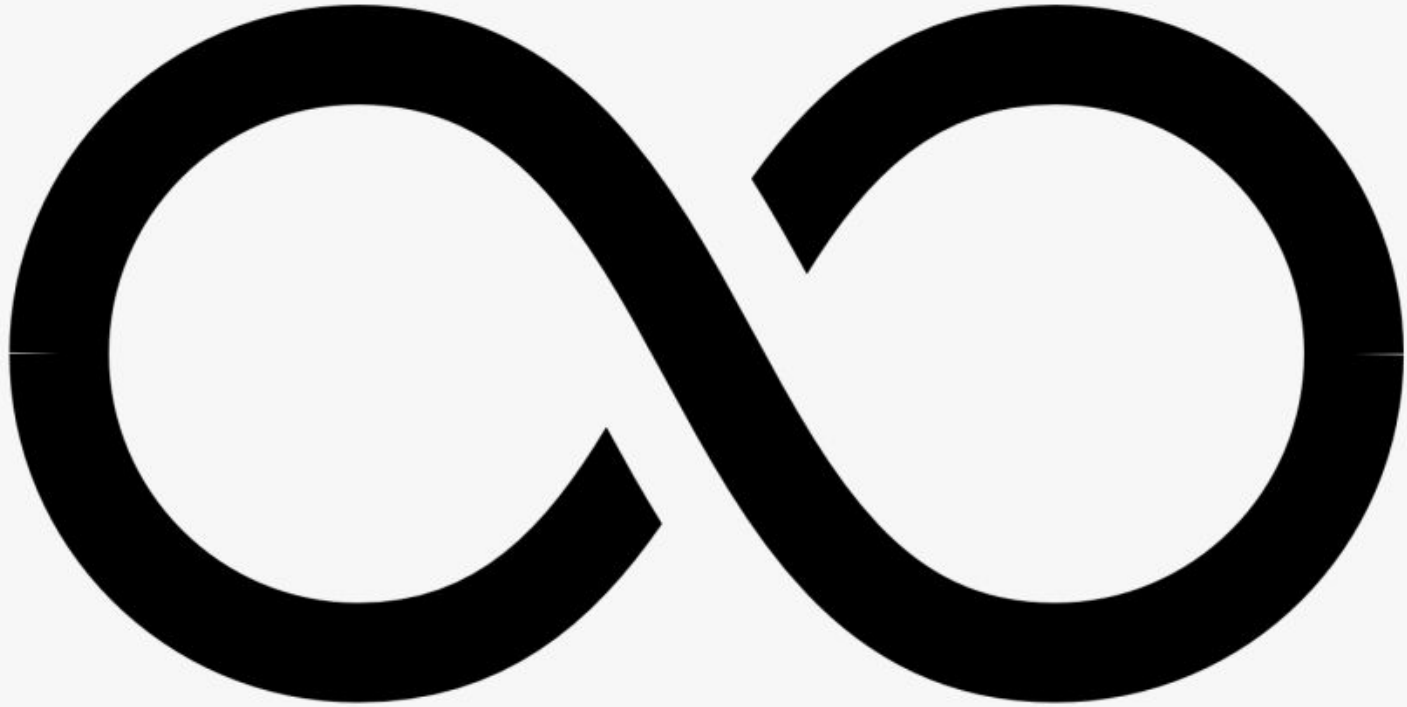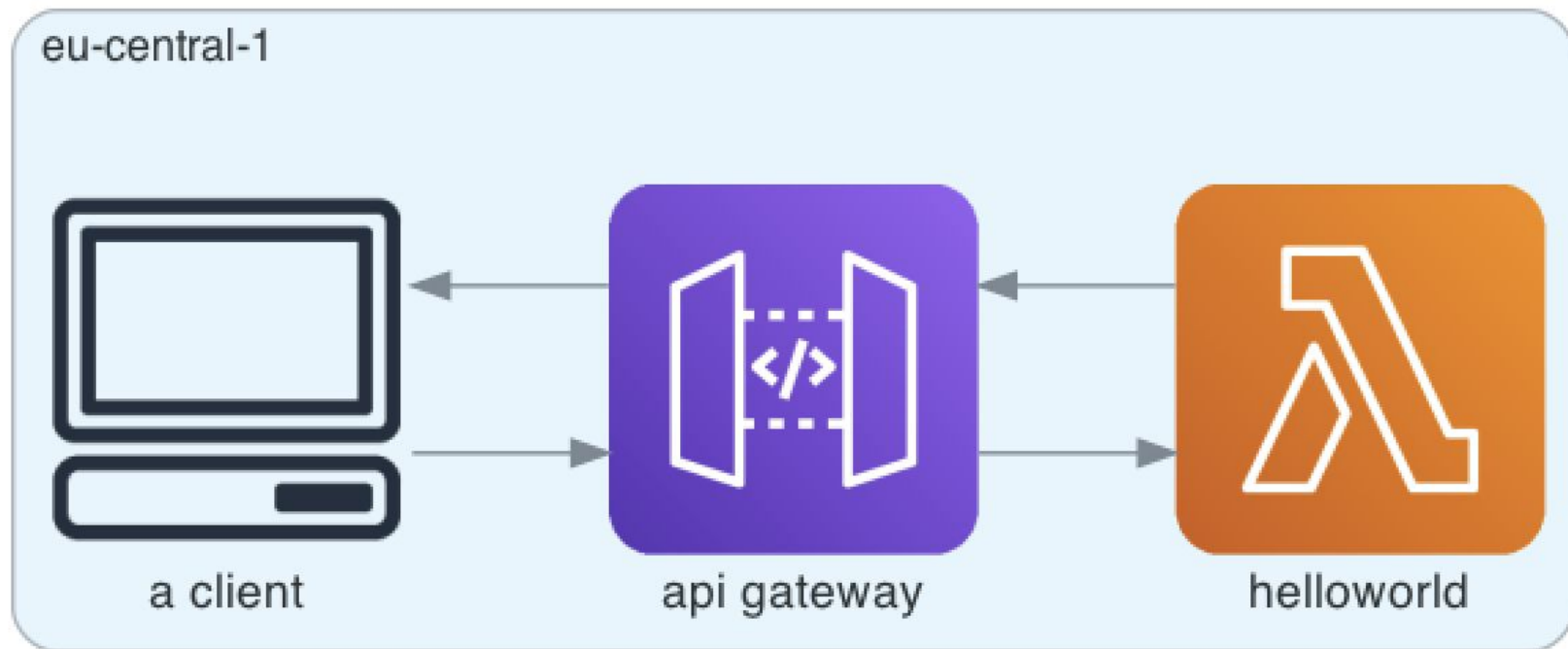
Serverless API

serverless_api_architecture

Serverless CRUD API

serverless_crud_api

Serverless Event Handler

eu-central-1

a client → img source → resize image → img destination

serverless_event_handler

NOW GO BUILD

AMSTERDAM

TRIVENTO

Serverless Sentiment Analysis

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ECS tw.firehose → sns topic → sentiment analysis → sentiment datastore → Business Intelligence

serverless_sentiment_analysis