CLOUD & SERVERLESS:
HOW TO RUN APPLICATIONS IN CLOUD WITH A FEW CLICKS WITHOUT MANAGING SERVERS

Sereno Balestra
Cloud & Serverless

SORINT lab

INTRODUCTION

- I've attended ITIS P Paleocapa (Bergamo)
- Sorintian since late 2019.
- I've always liked technologies and music. Ever since my childhood I've been writing programs and exploring the computer world. At school I learned C++ and PHP. At Sorint I've had the chance to learn Cloud technologies and become a cloud operator with a 365-degree view on applications/infrastructure.
- In my free time I enjoy visiting nice places with friends and riding my motorbike, when I'm not coding :)

AGENDA

Today we will see:

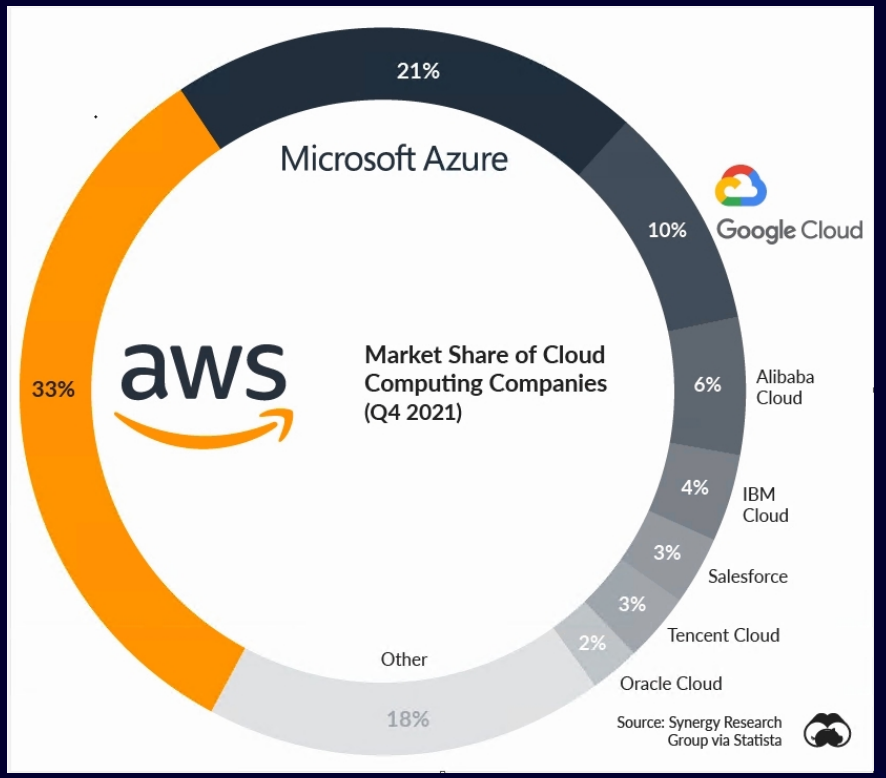
- Cloud services definition and models
- What is serverless?
- Serverless application demo on AWS
- Next steps... (event driven architecture)

WHAT IS CLOUD?

Cloud means delivery of IT services via internet.

Most of the time, while talking about cloud we mean public cloud, this includes providers like Amazon AWS, Microsoft Azure,Google Cloud Platform...

Providers offer a whole variety of services (applications,network,storage...) that can be consumed by end customers but are hosted on the provider infrastructure.



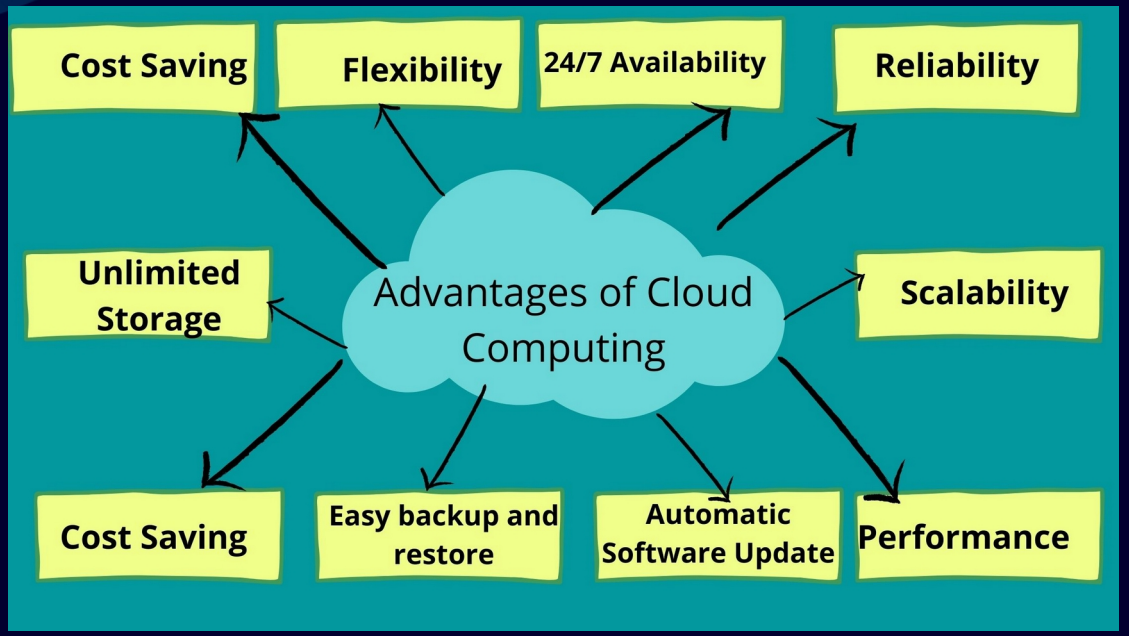
CLOUD PROS

Cloud adoption offers many advantages to businesses

Cloud offers the opportunity to quickly build secure,highly available IT systems by leveraging many available services.

There’s no upfront expense. The pay-as-you-go model makes sure you pay only for what you use, when you use it.

Cloud providers take care of physical infrastructures



PUBLIC CLOUD SERVICE MODELS

Different cloud service models based on cloud provider/end users responsibilities

- IAAS = Infrastructure As A Service
- PAAS= Platform As A Service
- SAAS= Software As A Service

SERVERLESS: WHERE ARE MY SERVERS?!

Where did the servers go? Did they disappear? Are they running on clouds?

Of course they’re not. :)

ServerLESS means “with no servers”, meaning that everything related to servers and application environment is managed by the provider and you don’t have to worry about that.

The provider allows you to customize your code runtime evironment, your resources (cpu,memory,network) and it also makes sure they’re secured and highly available.

All you have to do is provide your code, and you pay only when you run it!

TRADITIONAL

VS

SERVERLESS (AWS LAMBDA FUNCTIONS)

- 1) Buy servers
- 2) Connect servers/configure them (in a datacenter it can take weeks)
- 3) Install/configure application runtime
- 4) Deploy application code
- 5) Set up monitoring solutions

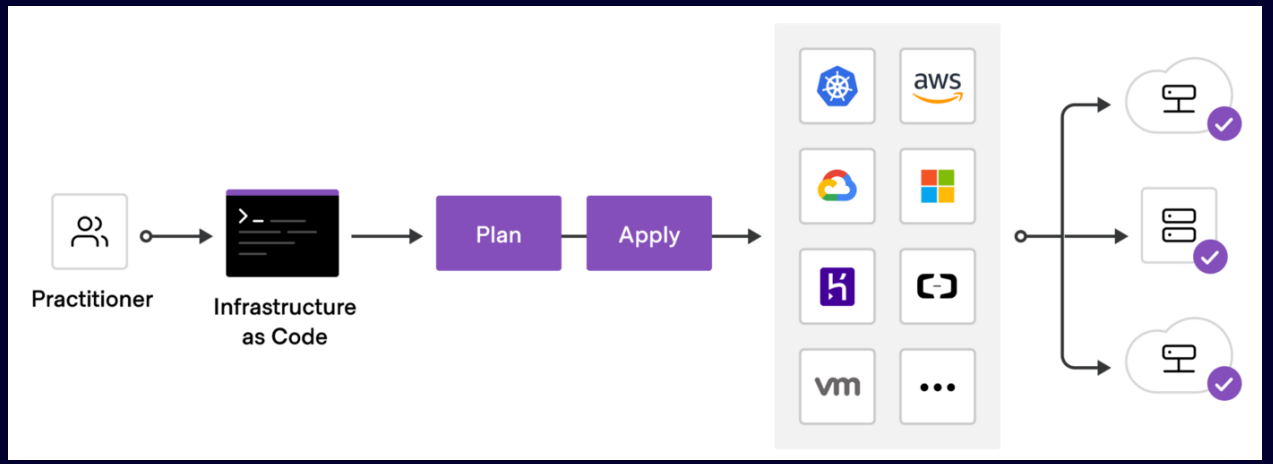
- 1) Create Lambda (takes a few clicks)
- 2) Deploy application to Lambda

AWS already takes care of the execution environment, it also provides out-of-the-box metrics and logs to monitor our application

INFRASTRUCTURE AS CODE (IAC) - TERRAFORM

Cloud resources are defined as simple declarative code which can be versioned and reused.

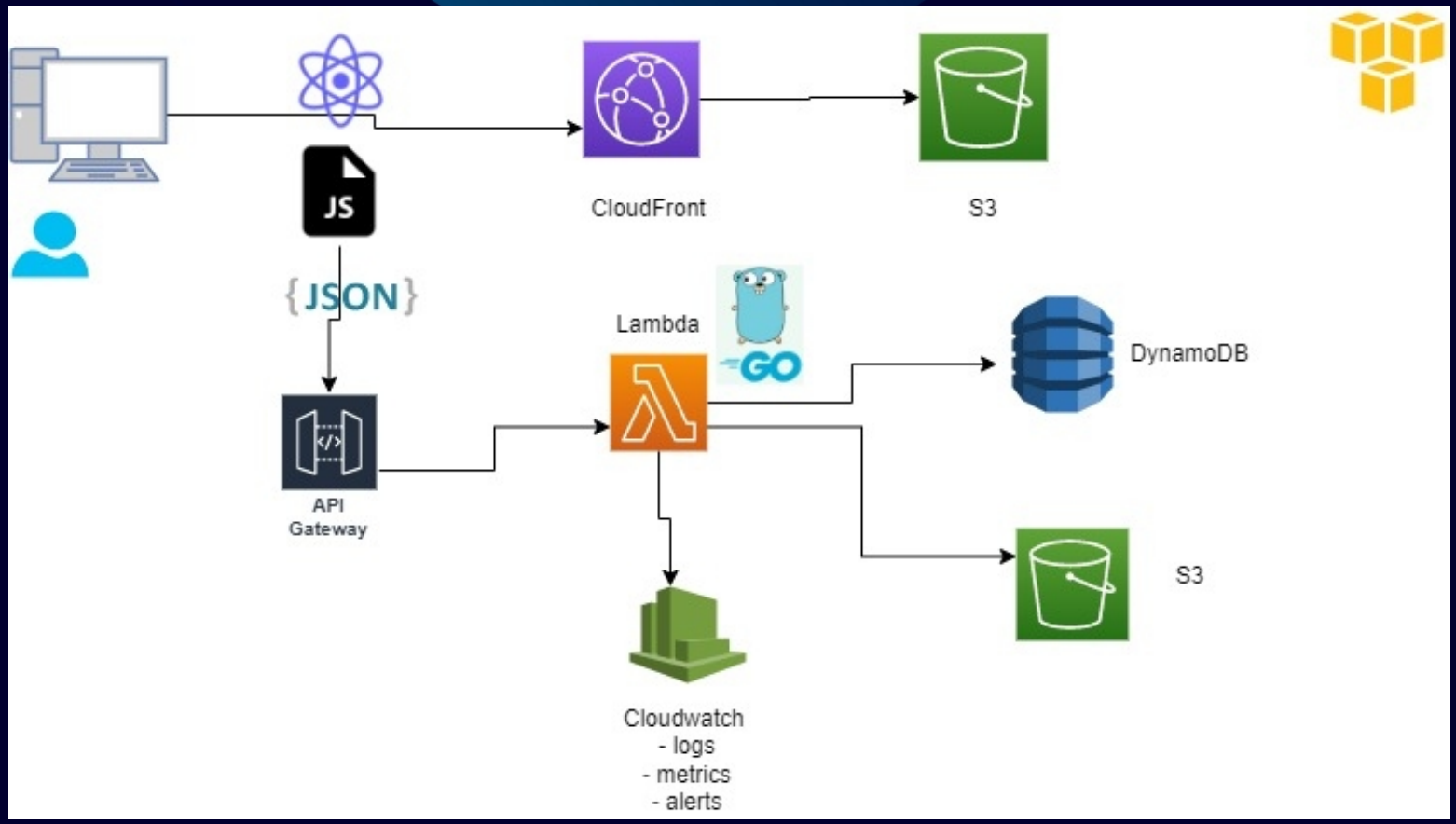
```
resource "aws_lambda_function" "sample-api" {
  function_name    = "sample-api"
  runtime          = "go1.x"
  handler          = "main"
  role             = aws_iam_role.sample-api-lambda.arn

  timeout = 15

  filename         = "./files/sample_api_lambda.zip"
  source_code_hash = filebase64sha256("./files/sample_api_lambda.zip")
  environment {
    variables = {
      S3_BUCKET = aws_s3_bucket.sample_app_bucket.id
      S3_DIR = "/user_uploads"
      DYNAMO_TABLE = aws_dynamodb_table.sampleapi-table.name
    }
  }
}
```



LAB DEMO

Let’s now deploy with a few clicks a Drive-like simple website on AWS cloud.
It consists of a React JS frontend on S3 and a REST api backend with Lambda,written in Golang.
Uploaded files are stored in S3, while file data are stored in DynamoDB.
All the cloud resources will be created with Terraform code.

LAR SOLUTION OVERVIEW



In this demo only managed services (SAAS) are used.

- Cloudfront → CDN(Content Delivery Network) service to reach users anywhere in the world by caching contents in a location close to them.

- S3 → fully managed,durable object(files) storage

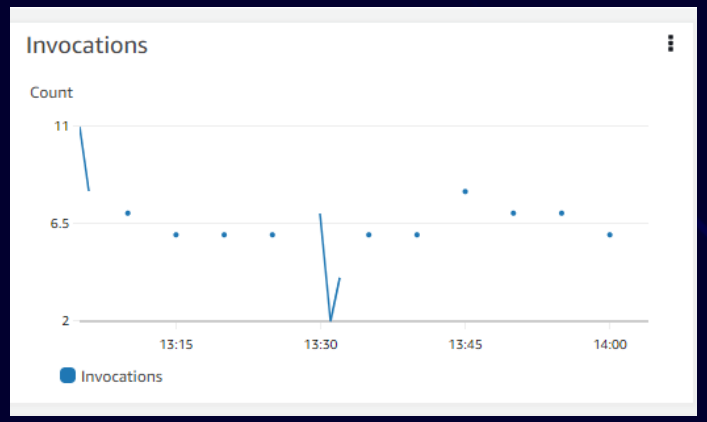
- Api Gateway → service which allows API creation to connect systems with HTTP protocol. In our case it gives us an internet HTTP endpoint to call our lambda function via REST APIs.

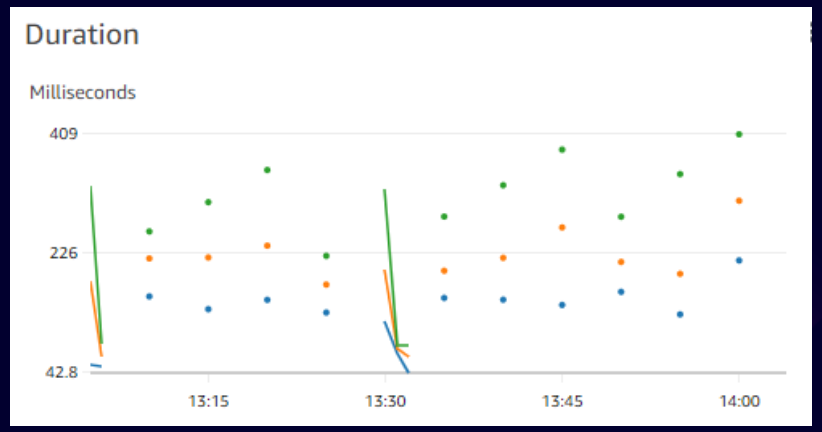
- Lambda → fully managed,scalable solution to run your code in a serverless environment

- DynamoDB → fully managed NoSQL database

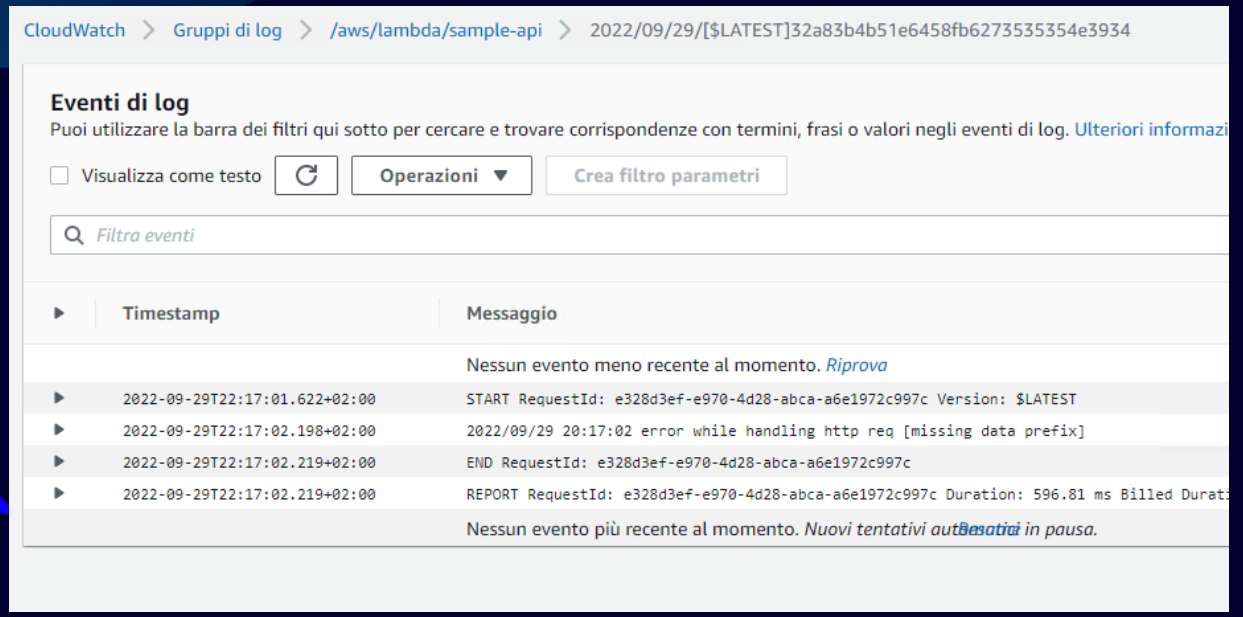
OBSERVABILITY → HOW TO MONITOR OUR APPLICATIONS

Metrics





Application Logs

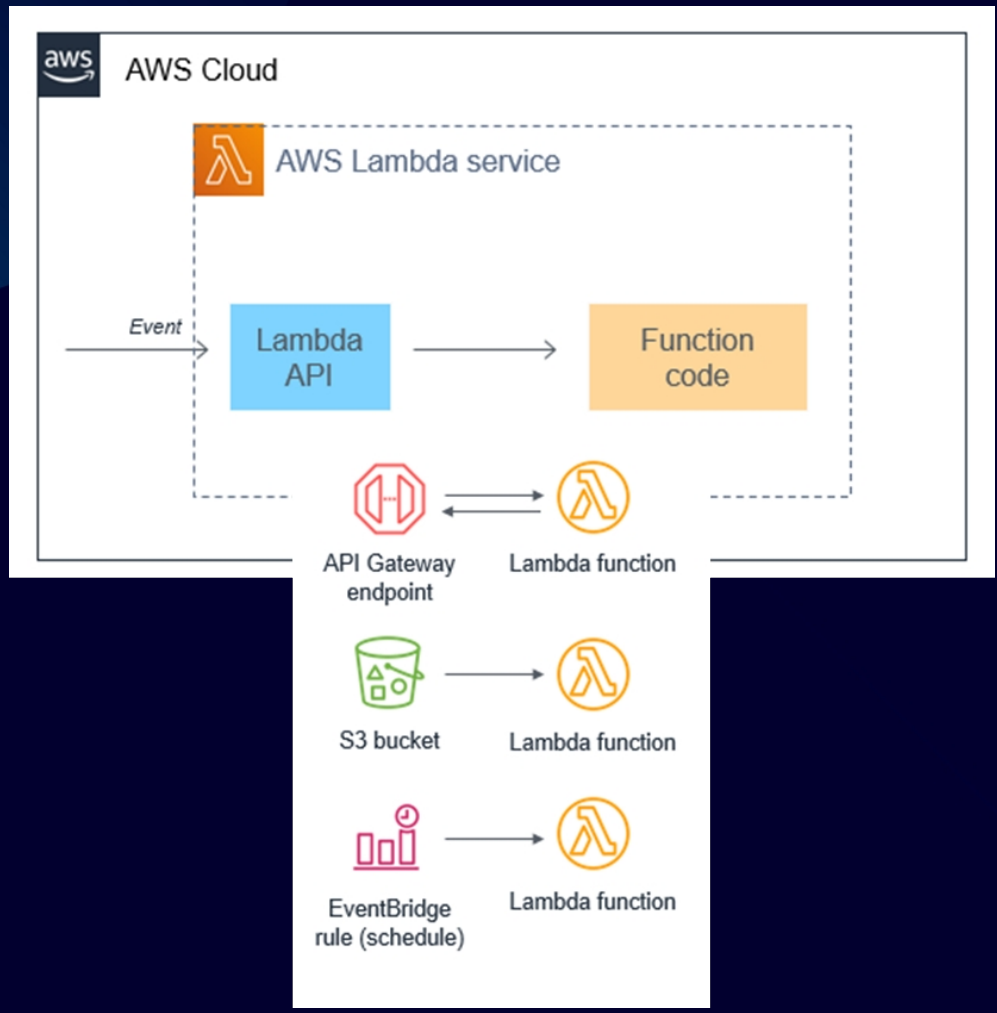


EVENT DRIVEN ARCHITECTURE

Event driven architecture allows application decoupling with asynchronous notifications

An event can be triggered by AWS from many services, a lambda function can react to that event, retries in case of failure are also handled.

Examples: an event can be triggered when a file is uploaded to S3, when a VM is turned on/off and many many others



HACKERSGEN
GENERATION: HACKERS

Q&A time

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CODE REPOSITORY

https://github.com/balefr1/serverless-lambda-sample

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THANKS!

sbalestra@sorint.it
(+39) 340 953 8237

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