Engenharia de Software para Nuvem - Aula 2

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Pós-graduação em Engenharia de Software para Modernização de Sistemas

BIOPARK EDUCAÇÃO

Agenda

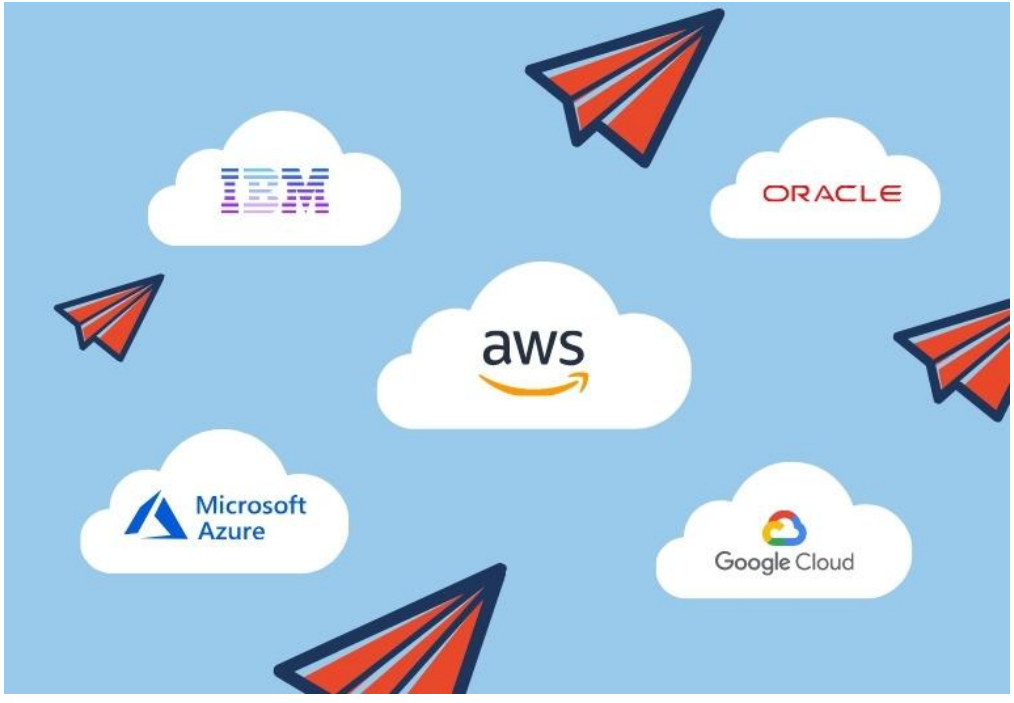
- Provedores de Serviços de Nuvem

Provedores de Serviços de Nuvem (Cloud Service Provider)

Já abordamos

- Infraestrutura de TI
  - On Premise
  - Cloud
  - Híbrida
- Crescimento e causas
- Modelos (IaaS, PaaS e SaaS)
- Tipos (Pública, Privada e Híbrida)

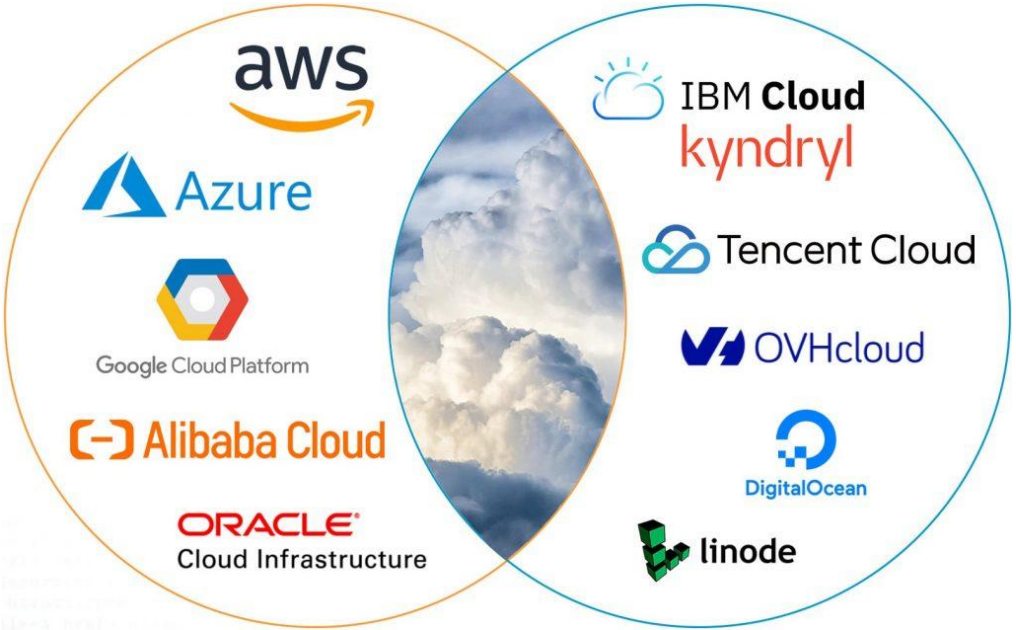
Alguns Fornecedores



Cloud Service Provider

Um CSP (provedor de serviços de nuvem) é uma empresa terceirizada que fornece recursos de computação escalonáveis que as empresas podem acessar sob demanda em uma rede, incluindo computação baseada em nuvem, armazenamento, plataforma e serviços de aplicativos.

Cloud Service Provider



Cloud Service Provider

Por que é interessante misturar e combinar serviços em nuvem de diferentes CSPs?

- para atender a diferentes requisitos
- selecionar os melhores recursos de nuvem para os casos de uso específicos
  - análise de dados e serviços de IA
  - suporte para ambientes legados
  - opções de computação mais amplas.
- Reduzir custos

Cloud Service Provider

Figure 1: Magic Quadrant for Cloud Infrastructure and Platform Services

Cloud On-Premise

- IaaS
  - Red Hat OpenStack Platform
    - https://www.redhat.com/pt-br/technologies/linux-platforms/openstack-platform
  - Apache CloudStack
    - https://cloudstack.apache.org/
- PaaS
  - Red Hat OpenShift
    - https://www.redhat.com/pt-br/technologies/cloud-computing/openshift
  - Dokku
    - https://dokku.com/

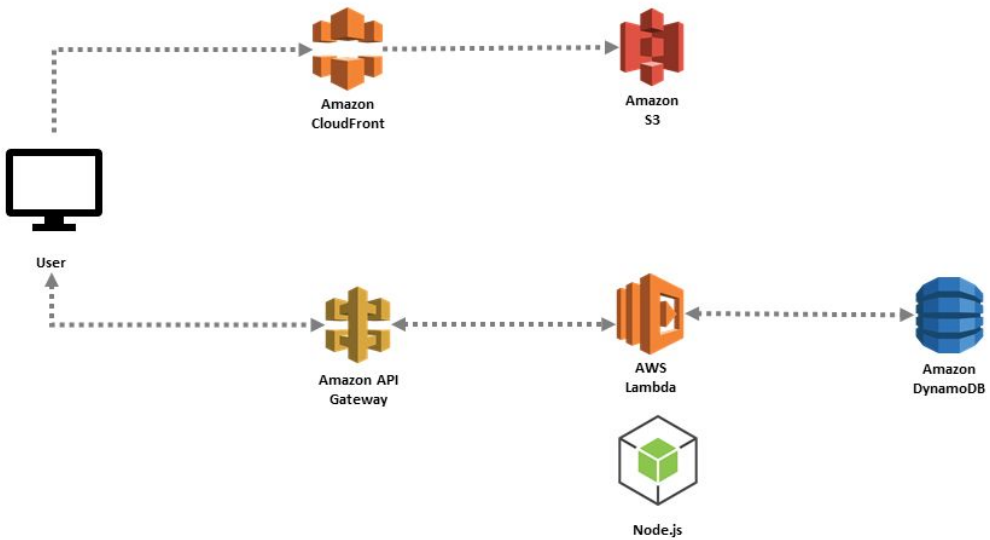
Serverless Computing

Serverless é um modelo de desenvolvimento nativo em nuvem para criação e execução de aplicações sem o gerenciamento de servidores.

Soluções serverless contam com um provedor de nuvem para gerenciar a infraestrutura e a escalabilidade de apps.

Depois da implantação, as aplicações serverless atendem à demanda e aumentam ou diminuem a escala automaticamente de acordo com as necessidades.

Serverless Computing



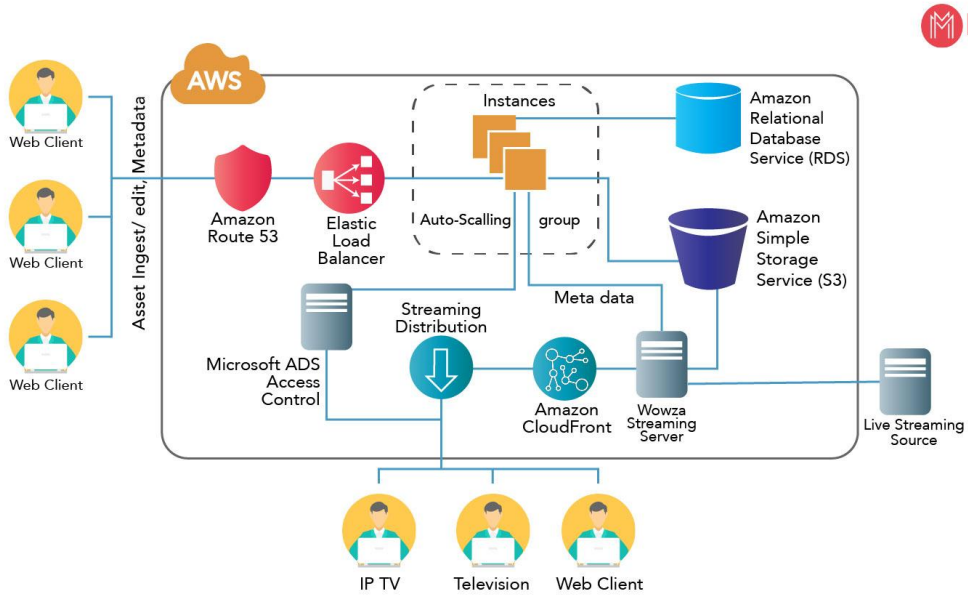
Componentes Base

- Hardware
  - não é possível que todos os componentes sejam 100% virtuais
- Virtualização
  - a tecnologia que separa e disponibiliza para os usuários as funções de TI do hardware
- Armazenamento
  - abstração do espaço de armazenagem dos sistemas do hardware físico, para que seja utilizado em nuvem
- Rede
  - os recursos de computação em nuvem podem ser acessados pelos usuários e serviço por meio de uma rede

Arquitetura baseada em nuvem

- Aplicativo
- Serviço
- Provedor
- Armazenamento
- Infraestrutura
- Gerenciamento
- Segurança

Arquitetura baseada em nuvem



AWS vx Azure vs GCP

AWS vs Azure vs GCP - Overview

	Amazon Web Services	Microsoft Azure	Google Cloud Platform
Launched	2006	2008	2011
Availability points	450+	160+	112+
Strength	Infrastructure-as-a-Service (IaaS)	Platform-as-a-Service (PaaS)	Database-as-a-Service (DaaS)
Services	237+	172+	100+
Pricing	Pay-as-you-go, by product/service	Pay-as-you-go, by product/service	Pay-as-you-go, by product/service

AWS vs Azure vs GCP - Quem usa?

AWS

- Coursera
- Expedia
- Netflix
- Coinbase
- Fórmula 1
- Airbnb
- Lyft
- Coca Cola
- BMW
- Samsung

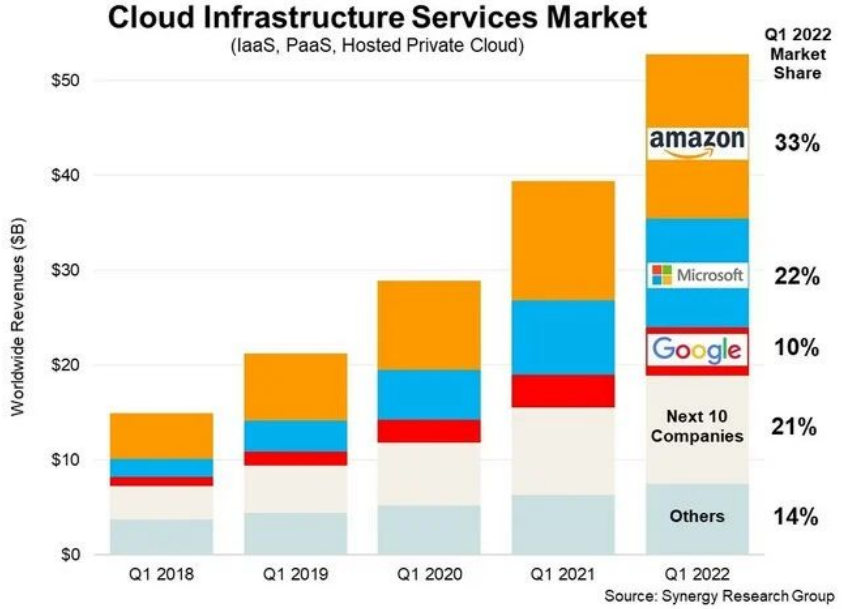
Azure

- Bosch
- Audi
- ASOS
- HSBC
- Starbucks
- 3M
- FedEx
- Walmart
- HP
- Mitsubishi Electric
- Renault

Google Cloud

- Toyota
- Nintendo
- Spotify
- Twitter
- PayPal
- UPS
- Unilever

AWS vs Azure vs GCP - Market Share & Growth Rate



In Q1 2022, AWS revenue grew 36% to $18.44 billion; Microsoft Cloud revenue jumped 32% to $23.4 billion; and Google Cloud revenue jumped 44% to $5.8 billion. After earnings wrapped in April, Synergy said AWS topped the cloud infrastructure services marketplace with 33% share, with Microsoft and Google trailing with 22% and 10% share, respectively.

https://digitalcloud.training/comparison-of-aws-vs-azure-vs-google/

AWS vs Azure vs GCP - Availability Zones

AWS		Azure		GCP	
Region	25	**Regions**	60	**Regions**	24
Availability Zones	80	**Availability Zones**	At least 3 per region	**Zones**	73
Local Zones	5	**NA**	NA	**NA**	NA
Point of Presence (POP)	230	**Point of Presence (POP)**	130	**Network Edge Locations**	144
Countries	245	**Countries**	200	**Countries**	200

AWS vs Azure vs GCP - Key Cloud Tools

Tool	AWS	Azure	Google Cloud
Virtual machines	EC2	Azure Virtual Machines	Compute Engine
Container orchestration	ECS	Azure Kubernetes Service (AKS)	Google Kubernetes Engine (GKE)
Serverless functions	AWS Lambda	Azure Functions	Cloud Functions
Load balancing	Elastic Load Balancer (ELB)	Azure Load Balancer	Network Load Balancer
Content delivery	CloudFront	Azure Content Delivery Network	Cloud CDN
Database services	RDS, DynamoDB, Aurora	Azure SQL Database, Cosmos DB	Cloud SQL, Cloud Datastore, Bigtable
Analytics	Redshift, Kinesis	Azure Synapse Analytics	BigQuery, Cloud Data Fusion
Machine learning	SageMaker, Rekognition	Azure Machine Learning	Cloud AI Platform
Identity and access management	IAM	Azure Active Directory	Cloud Identity, Identity Platform
Monitoring and logging	CloudWatch, X-Ray	Azure Monitor, Log Analytics	Stackdriver

AWS vs Azure vs GCP - Services

Service	AWS	Azure	Google Cloud
Compute	EC2, Lambda, Fargate, Elastic Beanstalk	Virtual Machines, Batch, Functions, App Service	Compute Engine, Kubernetes Engine, App Engine, Cloud Functions
Storage	S3, EBS, EFS	Blob Storage, File Storage, Disk Storage	Cloud Storage, Persistent Disk, Cloud Filestore
Databases	RDS, DynamoDB, Aurora, Neptune, ElastiCache	Cosmos DB, SQL Database, MySQL Database, PostgreSQL Database	Cloud Bigtable, Cloud SQL, Cloud Firestore, Cloud Datastore, Cloud Memorystore
Networking	VPC, Direct Connect, Route 53	Virtual Network, Load Balancer, Traffic Manager	Virtual Private Cloud, Cloud Load Balancing, Cloud CDN, Cloud Interconnect
Security	IAM, KMS, GuardDuty, Inspector	Azure Active Directory, Key Vault, Security Center	Identity and Access Management, Cloud Key Management Service, Cloud Security Scanner
Artificial Intelligence	SageMaker, Rekognition, Lex, Polly	Azure Machine Learning, Cognitive Services, Bot Service	Cloud AI Platform, Cloud AutoML, Cloud Natural Language, Cloud Translation
Analytics	Redshift, Kinesis, QuickSight, Athena	Azure Synapse, Data Lake Storage, Power BI, Stream Analytics	BigQuery, Cloud Data Fusion, Cloud Dataproc, Cloud Data Catalog

AWS vs Azure vs GCP - Services

Service	AWS	Azure	Google Cloud
Internet of Things (IoT)	IoT Core, Greengrass	IoT Hub, IoT Central	Cloud IoT Core, Cloud IoT Edge
Developer Tools	CodePipeline, CodeBuild, CodeCommit, CodeDeploy	Azure DevOps, Visual Studio Team Services	Cloud Build, Cloud Code, Cloud Source Repositories, Stackdriver Debugger
Management Tools	CloudWatch, CloudFormation, OpsWorks, Systems Manager	Azure Monitor, Azure Resource Manager, Azure Automation	Cloud Monitoring, Cloud Deployment Manager, Cloud Console, Cloud Shell
Mobile Services	Mobile Hub, Cognito, Pinpoint, Device Farm	Mobile Apps, Notification Hubs, Visual Studio App Center	Firebase, Cloud Functions for Firebase, Cloud Firestore, Cloud Messaging
Game Development	GameLift	Azure PlayFab	Google Play Developer Console
Integration	Step Functions, Simple Queue Service (SQS), Simple Notification Service (SNS)	Logic Apps, Service Bus, Event Grid	Cloud Tasks, Cloud Pub/Sub, Cloud Functions, Cloud Scheduler
Media Services	Elastic Transcoder, MediaConvert, MediaLive, MediaPackage, MediaStore	Azure Media Services, Azure Stream Analytics	Cloud Video Intelligence, Cloud Speech-to-Text, Cloud Text-to-Speech
Blockchain	Managed Blockchain, Quantum Ledger Database (QLDB)	Azure Blockchain	

Hands on

Hands On

- Criar uma conta na AWS
- Explorar IAM
- Explorar componente VPC
- Criar uma máquina virtual EC2 Linux
- Instalar docker
    - https://github.com/jfnandopr/biopark-iac
- Criar containers, exemplo: nginx

Atividade

- Na instância EC2 criada
  - Iniciar a estrutura do Wordpress em container
    - Banco de dados
    - Administrador do banco de dados (adminer)
    - WordPress

Atividade

```
$ docker network create site-net

$ docker volume create site-db

$ docker volume create site-www

$ docker run --name db -d --net site-net -e
MYSQL_DATABASE=wordpress -e MYSQL_ROOT_PASSWORD=123456 -v
site-db:/var/lib/mysql mysql

$ docker run --name site -d -p 80:80 --net site-net -v
site-db:/var/www/html wordpress

$ docker run --name adminer -d -p 8080:8080 --net site-net
adminer
```

Até a próxima