

# Cloud Architecture



Worked as a senior analyst at Avanade France, I have developed my skills in data analysis (MSBI, Power BI, R, Python) by working on innovative projects and proofs of concept in the energy industry.

ESAPI  
Student

2013 - 2016

ESAPI  
Teacher

2016 - x

Avanade  
Sr Anls, Data Engineering

2016 - 2019

Freelance  
Data Analyst & Data Architect

2019 - x



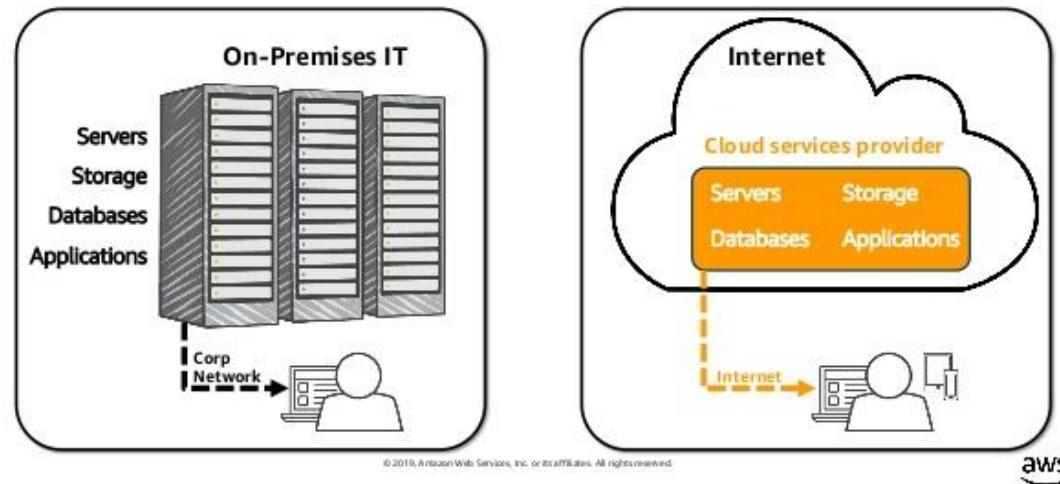
[in](https://fr.linkedin.com/in/alexandrebergere) <https://fr.linkedin.com/in/alexandrebergere>

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# What is Cloud Computing?

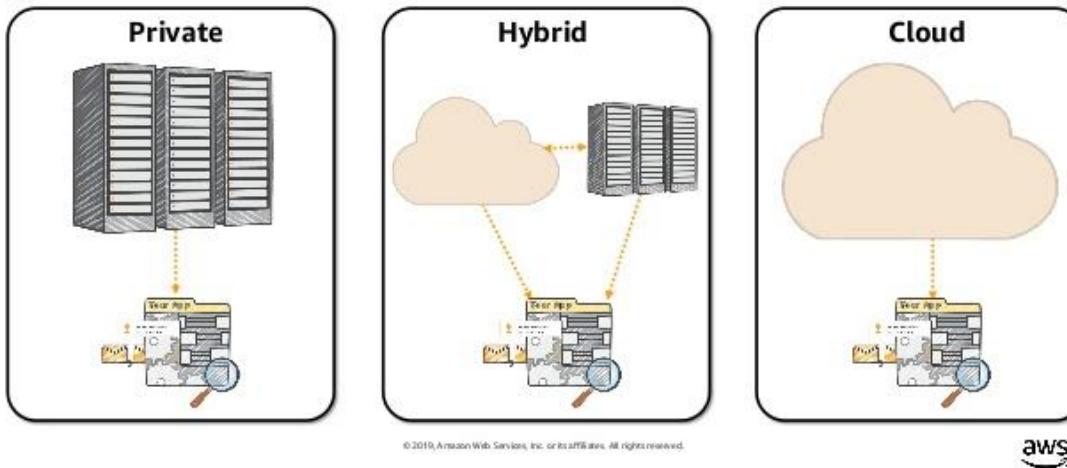
Cloud computing is the on-demand delivery of compute power, database storage, applications, and other IT resources through a cloud services platform via the internet with pay-as-you-go pricing.



[https://aws.amazon.com/what-is-cloud-computing/?nc1=h\\_ls](https://aws.amazon.com/what-is-cloud-computing/?nc1=h_ls)

# Cloud Computing Models

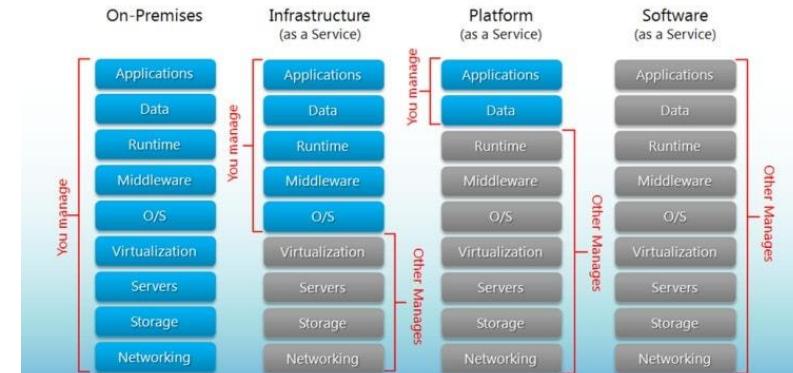
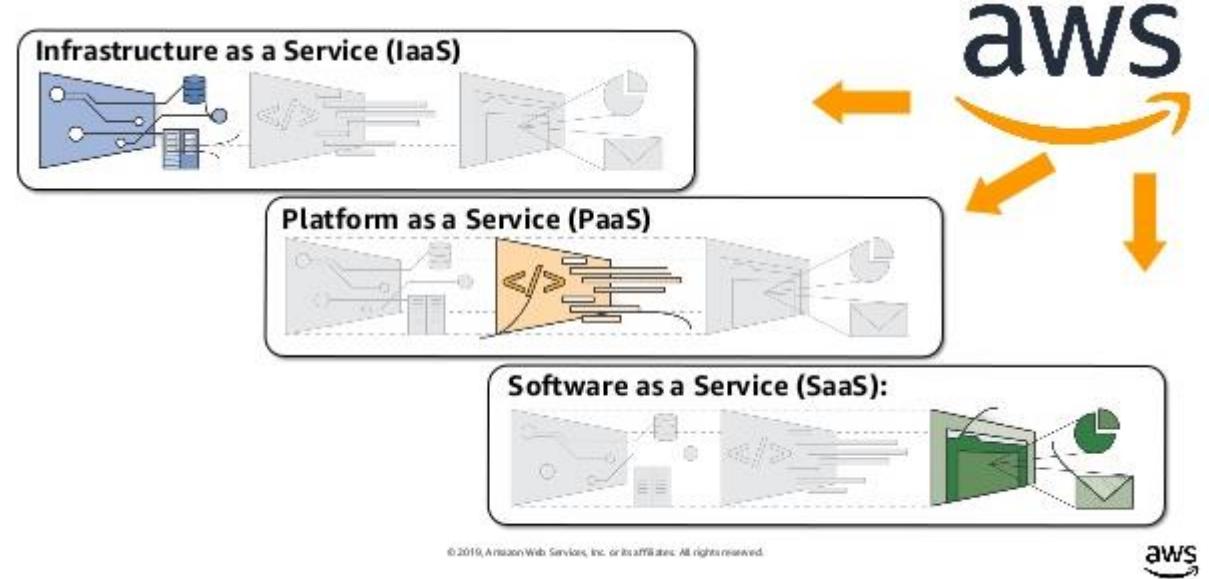
## Cloud Deployment Models



IaaS: cloud-based services, pay-as-you-go for services such as storage, networking, and virtualization.

PaaS: hardware and software tools available over the internet.

SaaS: software that's available via a third-party over the internet

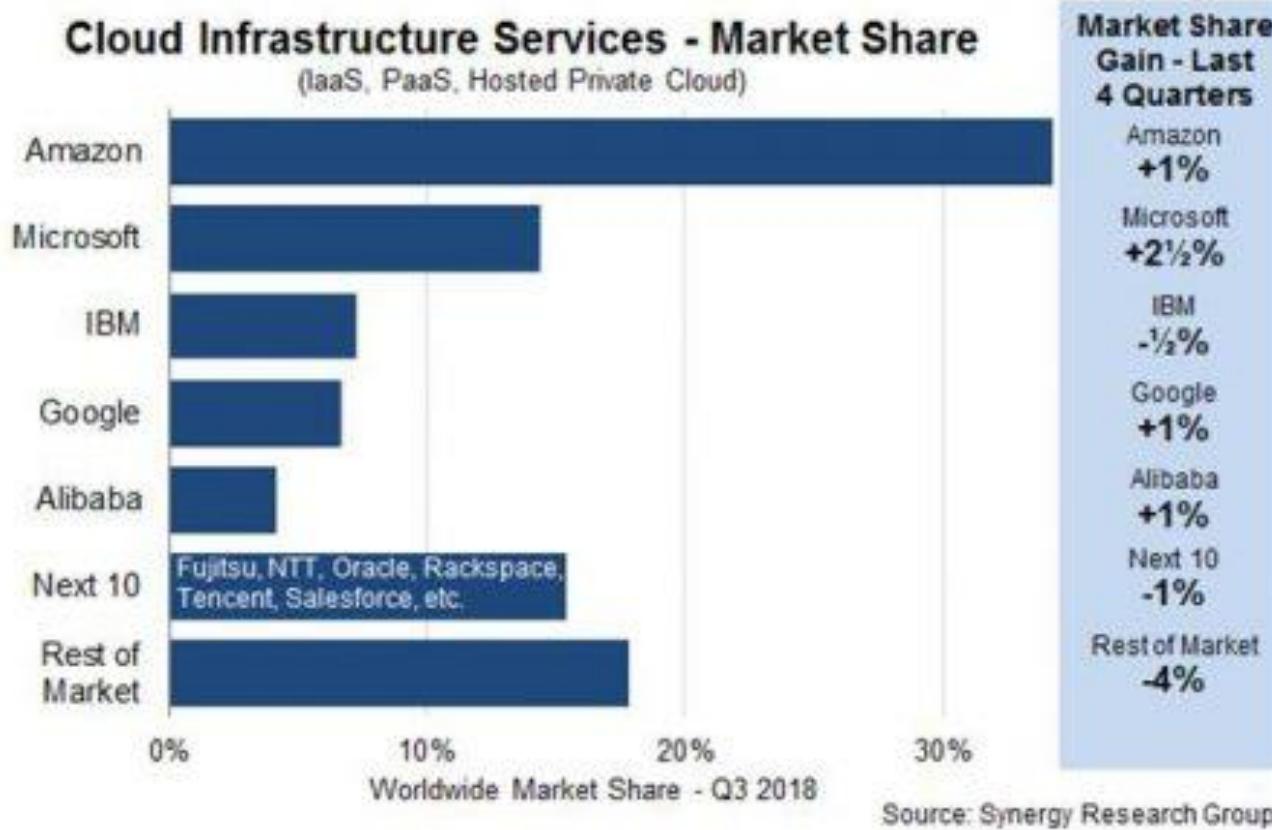


# Why cloud computing

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- Pay only for the amount you consume (stop guessing capacity)
- Increase speed and agility (minutes to waiting ressources)
- Stop spending money on running and maintaining data centers
- Go global in minutes

# Market leader



# Market leader



**IBM Cloud**



Google Cloud Platform



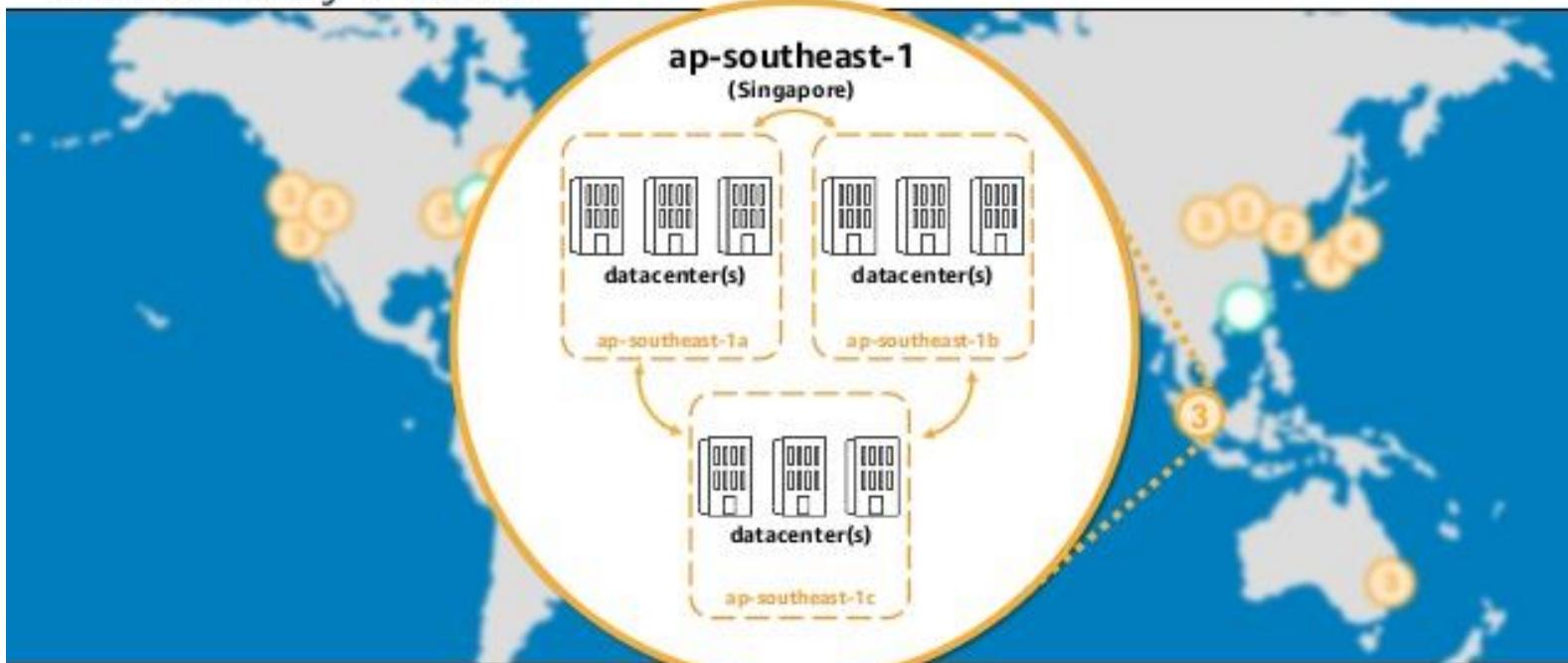
# Choose your location

## Choose Your Location



# Avaibility zones

## Availability Zones



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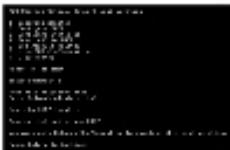
# Interact with AWS

## Three Ways to Interact with AWS



### AWS Management Console

Easy-to-use graphical interface



### Command Line Interface (AWS CLI)

Access to services via discrete command



### Software Development Kits (SDKs)

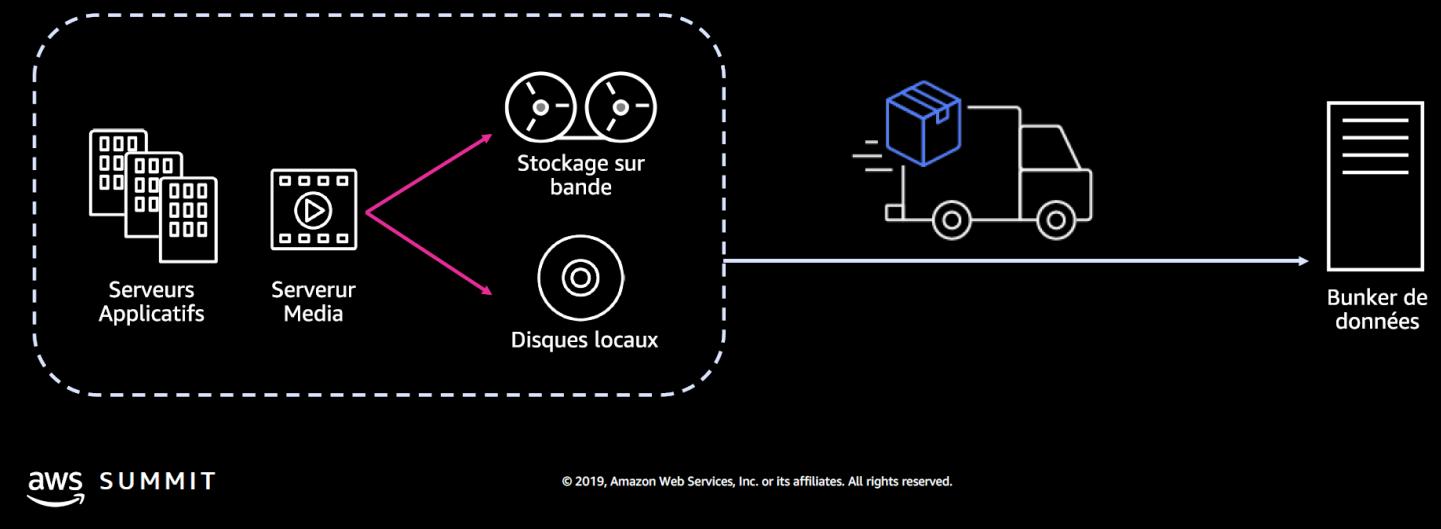
Access services in your code

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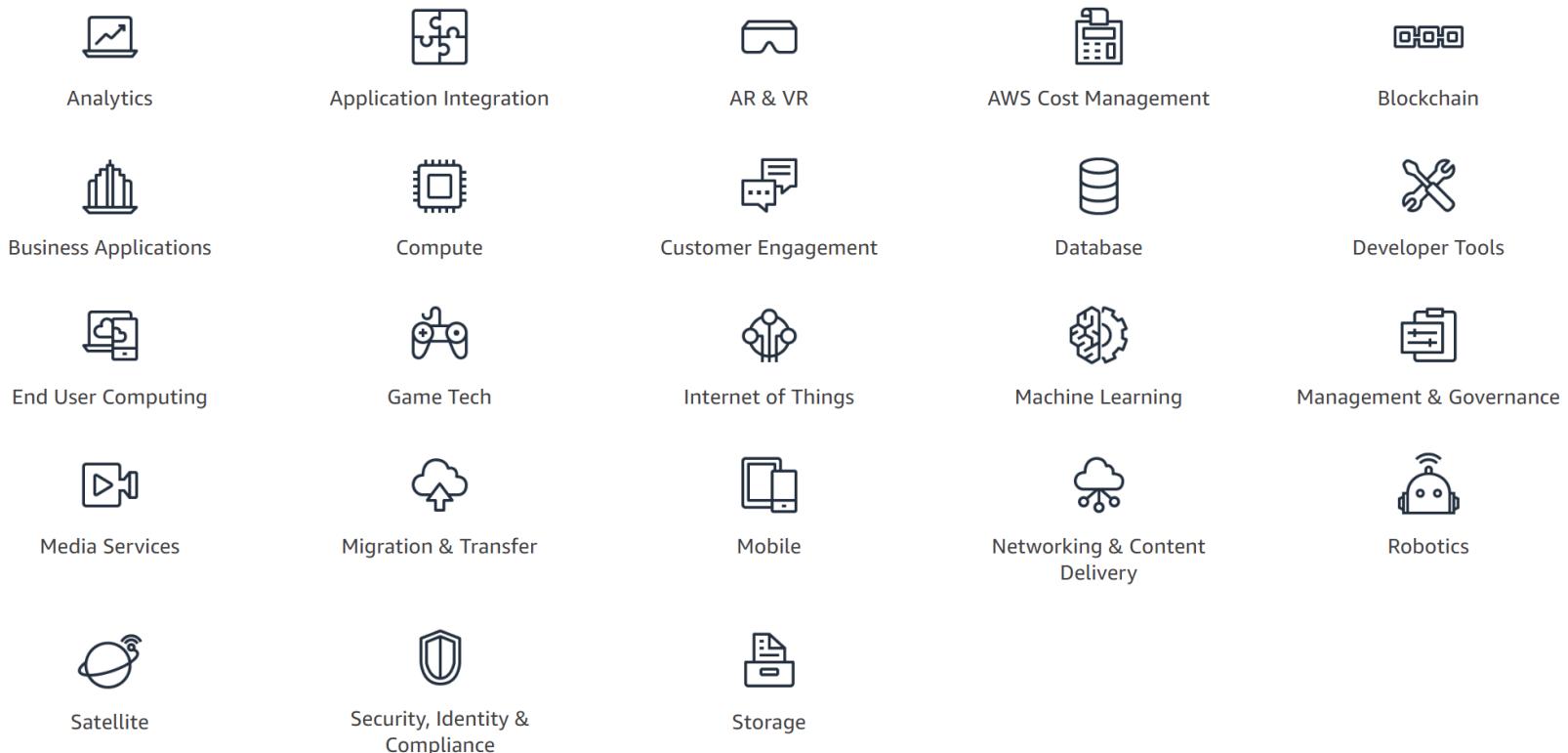


# Interact with AWS

Sauvegarde / restauration : connecteurs Cloud  
La sauvegarde/restauration *avant* le Cloud AWS



# AWS Services



# The 5 Pillars of the AWS Well-Architected Framework

## Operational excellence

The ability to run and monitor systems to deliver business value and to continually improve supporting processes and procedures

## Security

The security pillar includes the ability to protect information, systems, and assets while delivering business value through risk assessments and mitigation strategies.

## Reliability

The reliability pillar includes the ability of a system to recover from infrastructure or service disruptions, dynamically acquire computing resources to meet demand, and mitigate disruptions

## Performance Efficiency

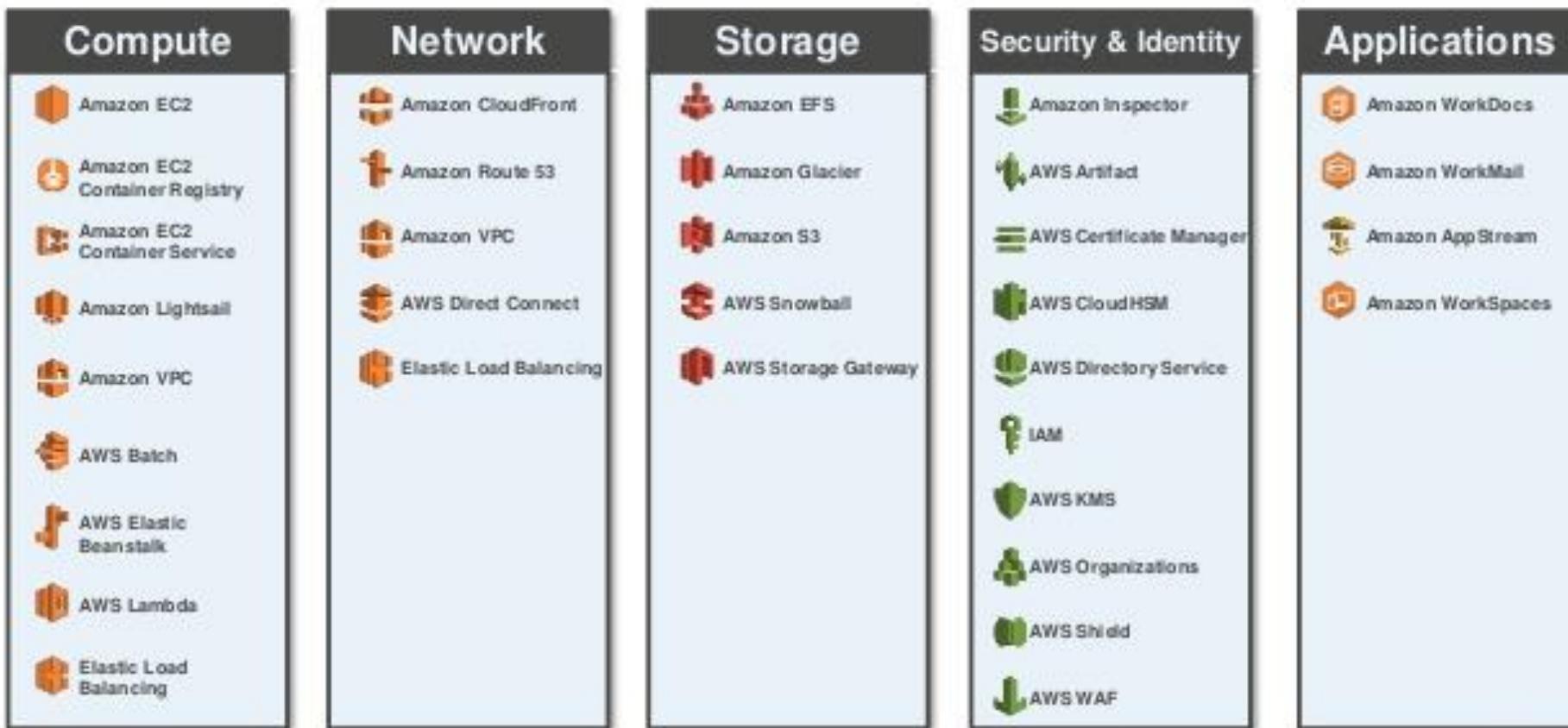
The performance efficiency pillar includes the ability to use computing resources efficiently to meet system requirements and to maintain that efficiency as demand changes and technologies evolve.

## Cost Optimization

The cost optimization pillar includes the ability to avoid or eliminate unneeded cost or suboptimal resources.



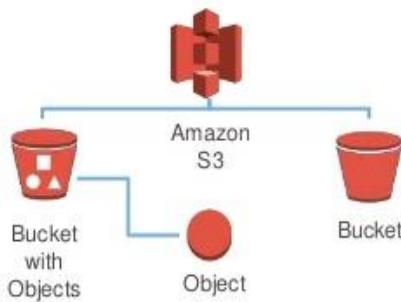
# AWS Foundation Services



# Storage

## AWS S3

### Amazon S3 Concepts



- Amazon S3 stores data as objects within **buckets**
- An object is composed of a file and optionally any **metadata** that describes that file
- You can have **up to 100 buckets** in each account
- You can **control access** to the bucket and its objects

An object key is the unique identifier for an object in a bucket.



# Storage



Amazon Block Storage  
(Amazon EBS)



Amazon Simple Storage Services  
(Amazon S3)



Amazon S3 Glacier



Amazon Elastic File System  
(Amazon EFS)

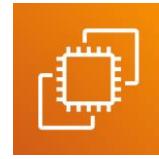
- A block storage
- You need an EC2 instance to attach it to

- An object store
- Great for storing logs

- Long term archive storage
- Extremely cheap to store
- Potentially very expensive to retrieve
- Takes up to 4 hours to "read back" your data

- Network filesystem
- expensive compared to EBS

# Compute



**Amazon EC2**

(Amazon Elastic Compute Cloud)

web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers.



**AWS Lambda**

AWS Lambda lets you run code without provisioning or managing servers. You pay only for the compute time you consume - there is no charge when your code is not running.

# Network - Security

## CDN



Amazon CloudFront

Amazon CloudFront is a fast content delivery network (CDN) service that securely delivers data, videos, applications, and APIs to customers globally with low latency, high transfer speeds, all within a developer-friendly environment.

## DNS



Amazon Route 53

Amazon Route 53 is a highly available and scalable cloud Domain Name System (DNS) web service.

## Firewall



AWS WAF

AWS WAF is a web application firewall that helps protect your web applications from common web exploits that could affect application availability, compromise security, or consume excessive resources.

## DDOS



AWS Shield

AWS Shield is a managed Distributed Denial of Service (DDoS) protection service that safeguards applications running on AWS.

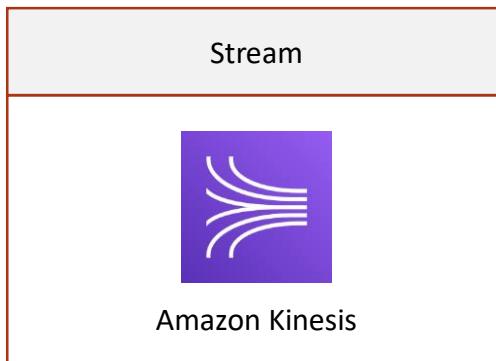
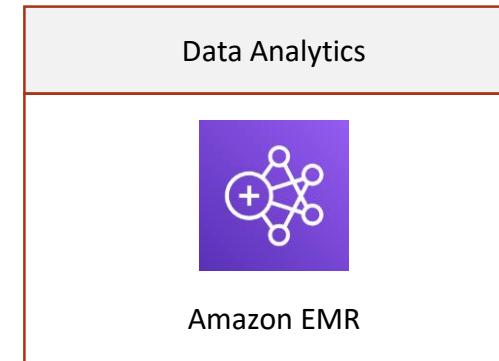
# AWS Foundation Services

Databases	Analytics	Application Services	Management Tools	Developer Tools	Mobile Services	Internet of Things
 Amazon DynamoDB	 Amazon Athena	 Amazon API Gateway	 Amazon CloudWatch	 AWS CodeBuild	 Amazon API Gateway	 AWS IoT
 Amazon ElastiCache	 Amazon CloudSearch	 Amazon AppStream 2.0	 AWS CloudFormation	 AWS CodeCommit	 Amazon Cognito	 AWS Greengrass
 Amazon RDS	 Amazon EMR	 Amazon Elastic Transcoder	 AWS CloudTrail	 AWS Config	 Amazon Mobile Analytics	
 Amazon Redshift	 Amazon ES	 Amazon SWF	 AWS Step Functions	 AWS Managed Services	 Amazon Pinpoint	
	 Amazon Kinesis		 AWS OpsWorks	 AWS Service Catalog	 AWS Device Farm	
	 Amazon QuickSight		 AWS Trusted Advisor	 AWS X-Ray	 AWS Mobile Hub	
	 Amazon Redshift					

# Data storage

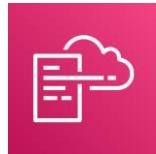
Relational	Key-value Document	Document	In Memory	Graph	Search	Time-series	Ledger
							
Amazon RDS	Amazon DynamoDB	Amazon DocumentDB	Amazon ElastiCache	Amazon Neptune	Amazon Elasticsearch Service	Amazon Timestream	Amazon Quantum Ledger Database
							

# Analytics



# Management Tool

## Firewall



### AWS CloudFormation

AWS CloudFormation provides a common language for you to describe and provision all the infrastructure resources in your cloud environment.

## Monitoring



### Amazon CloudWatch

Amazon CloudWatch is a monitoring and management service built for developers, system operators, site reliability engineers (SRE), and IT managers.

# Web

## APIs at any scale



Amazon API Gateway

Amazon API Gateway is a fully managed service that makes it easy for developers to create, publish, maintain, monitor, and secure APIs at any scale.

## Authentification



Amazon Cognito

Amazon Cognito lets you add user sign-up, sign-in, and access control to your web and mobile apps quickly and easily.

## build mobile and web apps that scale



AWS Amplify

AWS Amplify makes it easy to create, configure, and implement scalable mobile and web apps powered by AWS.

## Microservice



Amazon SQS  
(Simple Queue Service)

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

# Ressources

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# AWS – Architecture blog

AWS Architecture Blog

## Category: Analytics



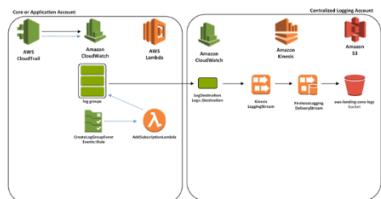
### This is My Architecture

#### This Is My Architecture: Mobile Cryptocurrency Mining

by Annik Stahl | on 27 MAR 2019 | in Amazon API Gateway, Amazon Athena, Amazon DynamoDB, Architecture, AWS Lambda, AWS WAF, Blockchain, Innovation And Reinvention | Permalink | Comments | Share

In North America, approximately 95% of adults over the age of 25 have a bank account. In the developing world, that number is only about 52%. Cryptocurrencies can provide a platform for millions of unbanked people in the world to achieve financial freedom on a more level financial playing field. Electroneum, a cryptocurrency company located [...]

[Read More](#)

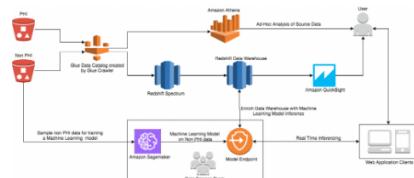


#### Stream Amazon CloudWatch Logs to a Centralized Account for Audit and Analysis

by David Bailey | on 03 DEC 2018 | in Amazon CloudWatch, Amazon Kinesis, Architecture, AWS Identity And Access Management (IAM), AWS Lambda, AWS SDK For Python, How-To | Permalink | Share

A key component of enterprise multi-account environments is logging. Centralized logging provides a single point of access to all salient logs generated across accounts and regions, and is critical for auditing, security and compliance. While some customers use the built-in ability to push Amazon CloudWatch Logs directly into Amazon Elasticsearch Service for analysis, others would [...]

[Read More](#)



#### Store, Protect, Optimize Your Healthcare Data with AWS: Part 2

by Stephen Jepsen | on 04 OCT 2018 | in Amazon Athena, Amazon QuickSight, Amazon Redshift, Analytics, Architecture, Artificial Intelligence, AWS Glue, SageMaker | Permalink | Share

Leveraging Analytics and Machine Learning Tools for Readmissions Prediction This blog post was co-authored by Ujjwal Ratan, a senior AI/ML solutions architect on the global life sciences team. In Part 1, we looked at various options to ingest and store sensitive healthcare data using AWS. The post described our shared responsibility model and provided a [...]

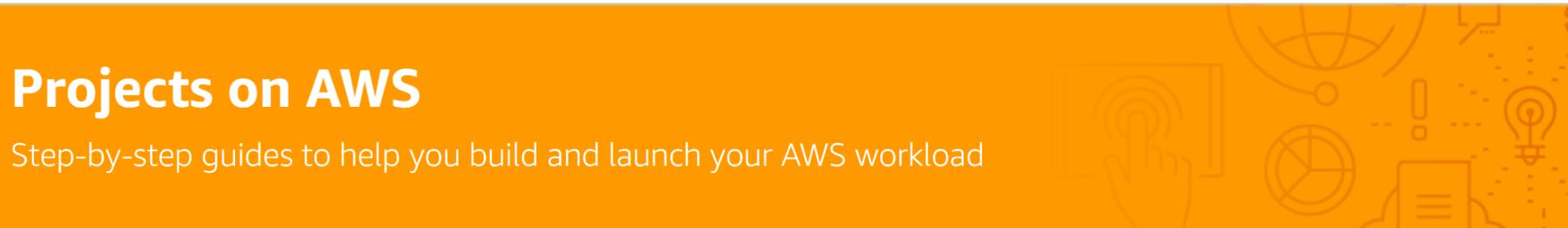
[Read More](#)



# Getting start on AWS

## Projects on AWS

Step-by-step guides to help you build and launch your AWS workload



Filter by	Clear all	WEBSITES & WEB APPS	WEBSITES & WEB APPS	DEVOPS
<b>▼ Use Cases</b>		<b>Project</b> <a href="#">Host a Static Website</a> Host your personal or simple marketing website on AWS.	<b>Project</b> <a href="#">Deploy a Node.js Web App</a> Launch and run a highly available Node.js web application on AWS.	<b>Project</b> <a href="#">Set up a CI/CD Pipeline on AWS</a> Automate your software delivery using continuous integration and delivery (CI/CD) pipelines.
		30 Minutes	1 Hour	1.5 Hours



# AWS - training



## Advanced Analytics with Amazon SageMaker

ADVANCED ⏱ 25 MINUTES

This course is presented in two parts and provides an in-depth exploration of Amazon SageMaker, its features, and its benefits when ...



## Advanced Architecting on AWS

ADVANCED ⏱ 3 DAYS

Building on concepts introduced in Architecting on AWS, Advanced Architecting on AWS is intended for individuals who are ...



## Amazon API Gateway for Serverless Applications

FUNDAMENTAL ⏱ 75 MINUTES

This course introduces Amazon API Gateway and teaches you the basics of how to create and deploy APIs. You will learn about options ...



## Amazon DynamoDB for Serverless Architectures

FUNDAMENTAL ⏱ 2 HOURS

This digital course provides an in-depth and hands-on introduction to Amazon DynamoDB and how it is leveraged in building a serverless ...



## Amazon Elastic Container Service (ECS) Primer

30 MINUTES

This course goes beyond the basic concepts and benefits of containerization and teaches you more about the Amazon Elastic Container ...



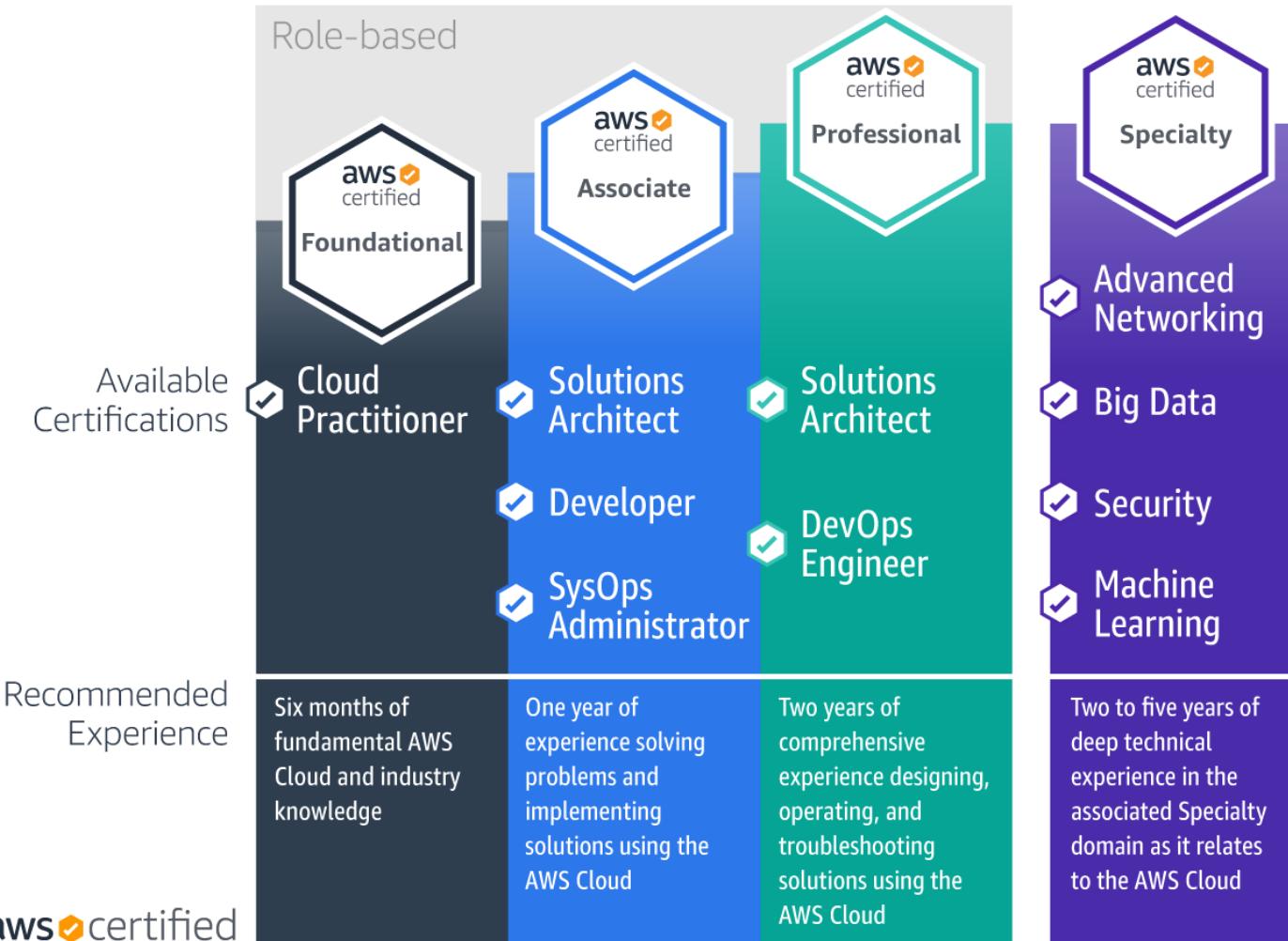
## Amazon Elastic File System (EFS) Primer

FUNDAMENTAL ⏱ 25 MINUTES

This 200-level self-paced course introduces you to Amazon Elastic File System (EFS). You learn what it is and how to get started using it. ...



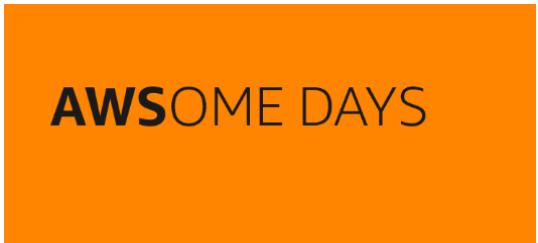
# AWS - certifications



# Event

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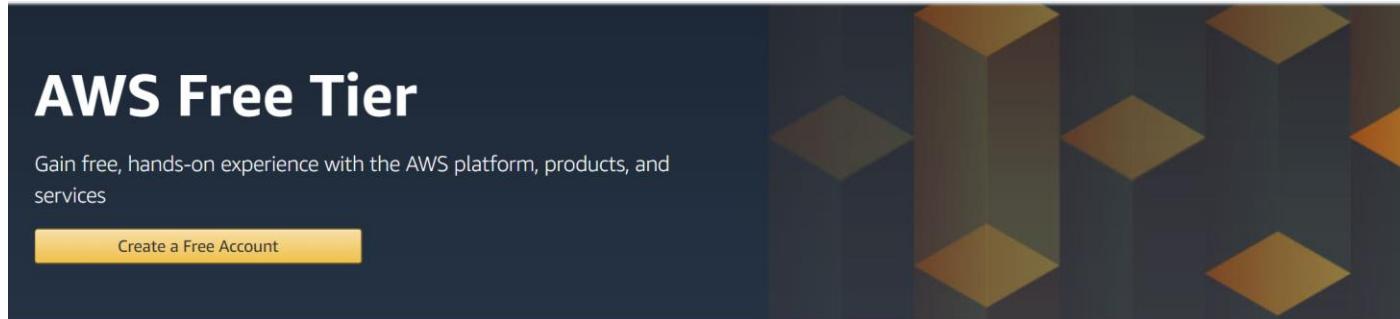
# AWS – Architecture blog



Bordeaux  
Côte d'Azur  
Grenoble  
Lille  
Lyon  
Montpellier  
Nantes  
Paris  
Rennes  
Rouen  
Toulouse



# AWS account



## Types of offers

Explore more than 60 products and start building on AWS using the free tier. Three different types of free offers are available depending on the product used. See below for details on each product.



### Always free

These free tier offers do not expire and are available to all AWS customers



### 12 months free

Enjoy these offers for 12-months following your initial sign-up date to AWS



### Trials

Short-term free trial offers are available through many different software solutions

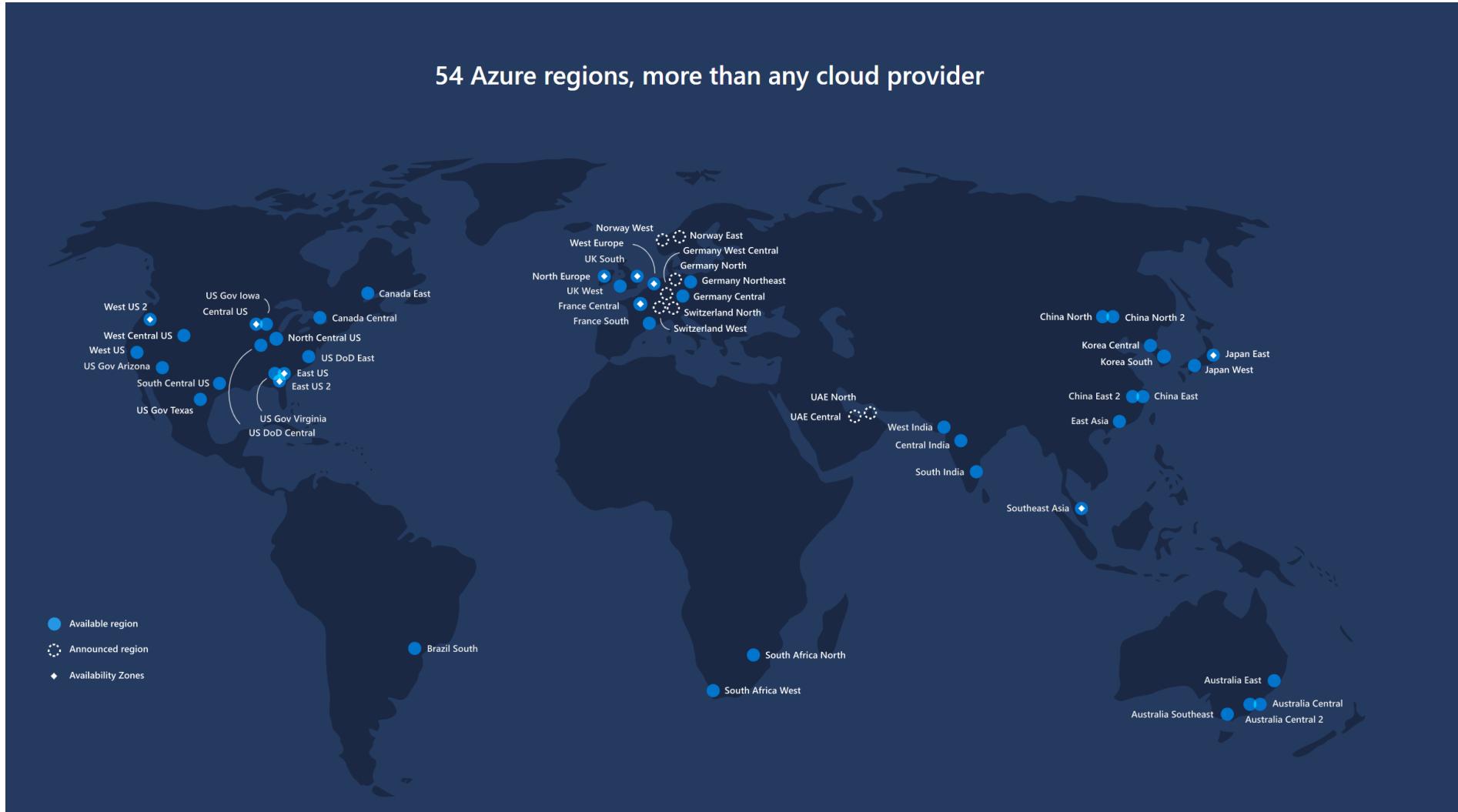




Microsoft  
Azure



# Choose your location



# Azure Services

## Deploy your first solution in 10 minutes or less

Try out these short tutorials on how to use Azure and start building projects right away.



### Launch a Linux virtual machine

Deploy a Linux virtual machine using CLI.



### Launch a Windows virtual machine

Create a Windows virtual machine with PowerShell.



### Build a web app

Deploy a sample .NET, Node.js, Java, PHP, Python or Ruby app.



### Store and transfer data and apps

Access blob, table, and queue storage.



### Build a serverless app

Create a "hello world" function in the Azure portal.



### Build a data-driven app

Create an Azure SQL database in the Azure portal.



# Networking

## Azure Firewall



Native firewalling capabilities with built-in high availability, unrestricted cloud scalability, and zero maintenance

## Azure DDoS Protection



Protect your applications from Distributed Denial of Service (DDoS) attacks

## VPN Gateway



Establish secure, cross-premises connectivity

## Azure DNS



Host your DNS domain in Azure

## ExpressRoute



Dedicated private network fiber connections to Azure

# Compute

## Virtual Machines



Provision Windows and Linux virtual machines in seconds

## Linux Virtual Machines



Provision virtual machines for Ubuntu, Red Hat, and more

## Azure Kubernetes Service (AKS)



Simplify the deployment, management, and operations of Kubernetes

## Azure Functions



Process events with serverless code

# Databases

Azure SQL Database



Managed relational SQL Database  
as a service

Azure Cosmos DB



Globally distributed, multi-model  
database for any scale

Table Storage



NoSQL key-value store using semi-  
structured datasets

Azure Database for MySQL



Managed MySQL database service  
for app developers

Azure Database Migration Service



Simplify on-premises database  
migration to the cloud

# Analytics

Data Factory



Hybrid data integration at enterprise scale, made easy

SQL Data Warehouse



Elastic data warehouse as a service with enterprise-class features

Azure Analysis Services



Enterprise-grade analytics engine as a service

Azure Stream Analytics



Real-time data stream processing from millions of IoT devices

Azure Databricks



Fast, easy, and collaborative Apache Spark-based analytics platform

# Storage

## Blob Storage



REST-based object storage for unstructured data

## Azure Backup



Simplify data protection and protect against ransomware

## Azure Data Lake Storage



Massively scalable, secure data lake functionality built on Azure Blob Storage

# Internet of Things

Azure IoT Hub



Connect, monitor and manage billions of IoT assets

Event Hubs



Receive telemetry from millions of devices

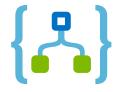
Azure Time Series Insights



Explore and analyze time-series data from IoT devices

# Web

## Logic Apps



Automate business processes

## Web Apps



Quickly create and deploy mission critical web apps at scale

## Mobile Apps



Build mobile apps for any device

# Ressources

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# Azure - training

## Popular Microsoft Azure training

If you're ready to move faster, save money, and integrate on-premises apps and data using Microsoft Azure, you're in the right place. These learning opportunities can help you develop, implement, and architect Azure solutions.

Get two retakes when you take new role-based exams



→

Microsoft Azure	Cloud Application Development	Getting Started with Azure App Service: Web Apps	Architecting Distributed Cloud Applications	Integrating On-Premises Core Infrastructure with Microsoft Azure
				
★★★★★ 25 Beginner	Beginner		Advanced	Advanced
<a href="#">v Brief description</a>	<a href="#">v Brief description</a>	<a href="#">v Brief description</a>	<a href="#">v Brief description</a>	<a href="#">v Brief description</a>



# Azure – cloud workshop

## Microsoft Cloud Workshop library

Use the following filters to search our database of Microsoft Cloud Workshop materials. Each workshop includes presentation decks, trainer and student guides, and hands-on lab guides.

### Workload

- Application Development
- Azure Infrastructure
- Advanced Analytics/Artificial Intelligence (AA/AI)
- Data
- Internet of Things (IoT)

### App modernization

Design a modernization plan to move services from on-premises to the cloud by leveraging cloud, web, and mobile services, secured by Azure Active Directory.

### Azure Stack

Design a hybrid cloud architecture using a combination of the Azure public cloud and Azure Stack. Recommend the appropriate hybrid cloud systems based on customer requirements.

### Big Compute

Set up and configure a scale-out media processing architecture using Azure Batch. Use big compute techniques with less code and accomplish tasks declaratively.

### Big Data and visualization

Build a complete machine learning model in Azure Databricks and deploy a web app for predicting flight delay. Train the model to report data.

### Related content

- [What the Hack? Challenge-Based Hackathons](#)
- [MTC Azure AI Labs](#)
- [LearnAI](#)
- [Create your own MCW](#)

### Announcements

#### Archive notice

With the release of the new "Line of Business application migration" workshop, both the "Lift and shift/ARM" and "Linux lift and shift" workshops will be archived on June 28. They are no longer being maintained.



# Microsoft – Hands-on Labs

WELCOME TO  
**Self-paced Labs**

Acquire the cloud skills you need, at your own pace. Enjoy hands-on learning on your schedule with our free, self-paced labs, and keep your cloud knowledge fresh.



Job Roles      Audience      Topic      Level      Product

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A day in the life of a Teams admin  
OS00202

Active Directory Deployment and Management Enhancements  
WS00066



# Azure - certifications

Find an Azure certification exam

## AZ-100

Microsoft Azure Infrastructure and Deployment  
(retires May 1, 2019)

## AZ-101

Microsoft Azure Integration and Security  
(retires May 1, 2019)

## AZ-102

Microsoft Azure Administrator Certification Transition  
(retires June 30, 2019)

## AZ-203

Developing Solutions for Microsoft Azure

## AZ-300

Microsoft Azure Architect Technologies

## AZ-301

Microsoft Azure Architect Design

## AZ-302

Microsoft Azure Solutions Architect Certification  
Transition  
(released September 24, 2018; retires June 30, 2019)

## AZ-400

Microsoft Azure DevOps Solutions

## BETA AZ-500

Microsoft Azure Security Technologies  
(released April 1, 2019)

## AZ-900

Microsoft Azure Fundamentals  
(released December 31, 2018)

## 70-473

Designing and Implementing Cloud Data Platform  
Solutions

## 70-475

Designing and Implementing Big Data Analytics  
Solutions

## 70-487

Developing Microsoft Azure and Web Services

## 70-537

Configuring and Operating a Hybrid Cloud with  
Microsoft Azure Stack

## 70-774

Perform Cloud Data Science with Azure Machine  
Learning  
(retires June 30, 2019)

## 70-775

Perform Data Engineering on Microsoft HDInsight  
(retires June 30, 2019)

## 70-776

Engineering Data with Microsoft Cloud Service  
(retires June 30, 2019)



# Azure account

## Qu'est-ce que j'obtiens ?

Avec votre compte gratuit Azure, vous bénéficiez de tous ces éléments et vous n'êtes facturé que si vous effectuez une mise à niveau.

**12 mois**

de services gratuits  
populaires

+

**Crédit de 170 €**

pour découvrir tout  
service Azure pendant 30  
jours

+

**Toujours gratuits**

Plus de 25 services

## Que dois-je savoir d'autre ?

### Dois-je payer quelque chose pour le compte gratuit Azure ?

Non. Vous démarrez gratuitement et vous bénéficiez d'un crédit de 170 € que vous pouvez utiliser dans les 30 jours. Vous n'êtes pas facturé, même si vous commencez à utiliser des services, tant que vous n'avez pas procédé à une mise à niveau.

### Que se passe-t-il un fois que j'ai utilisé mon crédit de 170 € ou que la période de 30 jours est terminée ?

Vous pouvez effectuer une mise à niveau vers un abonnement assorti d'un paiement à l'utilisation pour continuer à accéder aux produits gratuits : certains sont gratuits pendant les 12 premiers mois uniquement, d'autres le sont pour toujours.

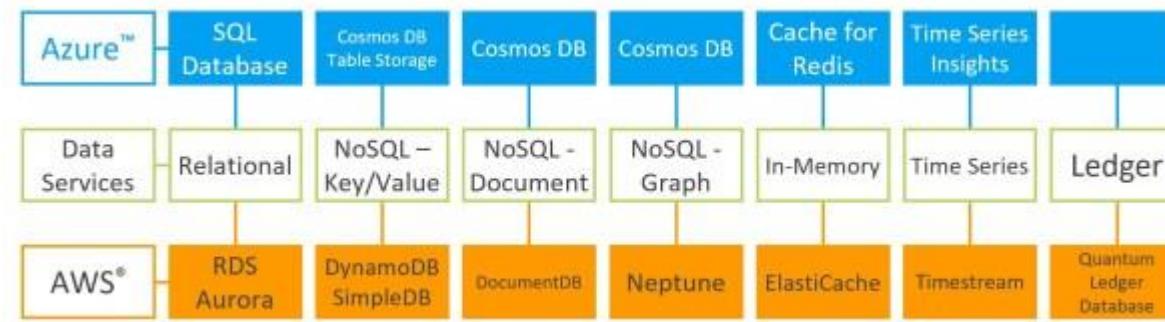
### Que se passe-t-il à la fin des 12 mois de gratuité des produits ?

Pendant les 12 mois qui suivent votre mise à niveau vers un abonnement assorti d'un paiement à l'utilisation, certains produits populaires sont gratuits. À la fin de ces 12 mois, vous serez facturé pour ces produits aux prix du paiement à l'utilisation.

### De quoi ai-je besoin pour m'inscrire ?

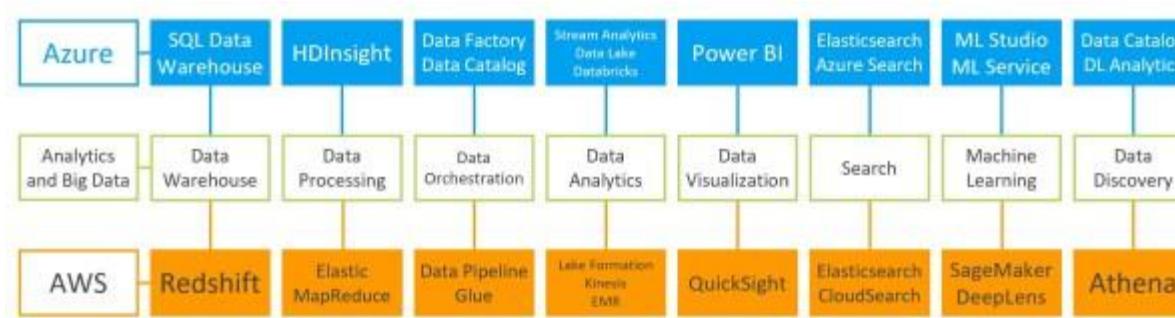
Un numéro de téléphone, une carte bancaire et un nom d'utilisateur de compte Microsoft. Nous utilisons ces informations pour vérifier votre identité. Votre carte de crédit n'est pas débitée, mais il est possible qu'une retenue de vérification d'un dollar apparaisse sur votre compte. Elle sera supprimée dans les trois à cinq jours.

# UPDATED DATA SERVICES COMPARISON: AWS VS. AZURE



[https://thomaslarock.com/2019/05/updated-data-services-comparison-aws-vs-azure/?utm\\_source=feedburner&utm\\_medium=feed&utm\\_campaign=Feed%3A+SQLRockstar+%28SQLRockstar%29](https://thomaslarock.com/2019/05/updated-data-services-comparison-aws-vs-azure/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+SQLRockstar+%28SQLRockstar%29)

# UPDATED ANALYTICS AND BIG DATA COMPARISON: AWS VS. AZURE



[https://thomaslarock.com/2019/05/updated-analytics-and-big-data-comparison-aws-vs-azure/?utm\\_source=feedburner&utm\\_medium=feed&utm\\_campaign=Feed%3A+SQLRockstar+%28SQLRockstar%29](https://thomaslarock.com/2019/05/updated-analytics-and-big-data-comparison-aws-vs-azure/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+SQLRockstar+%28SQLRockstar%29)