Cloud Services I Introduction

Amazon Web Services

AWS: an introduction

Intro

Cursus los gebaseerd op AWS Certified Cloud Practitioner certificate.

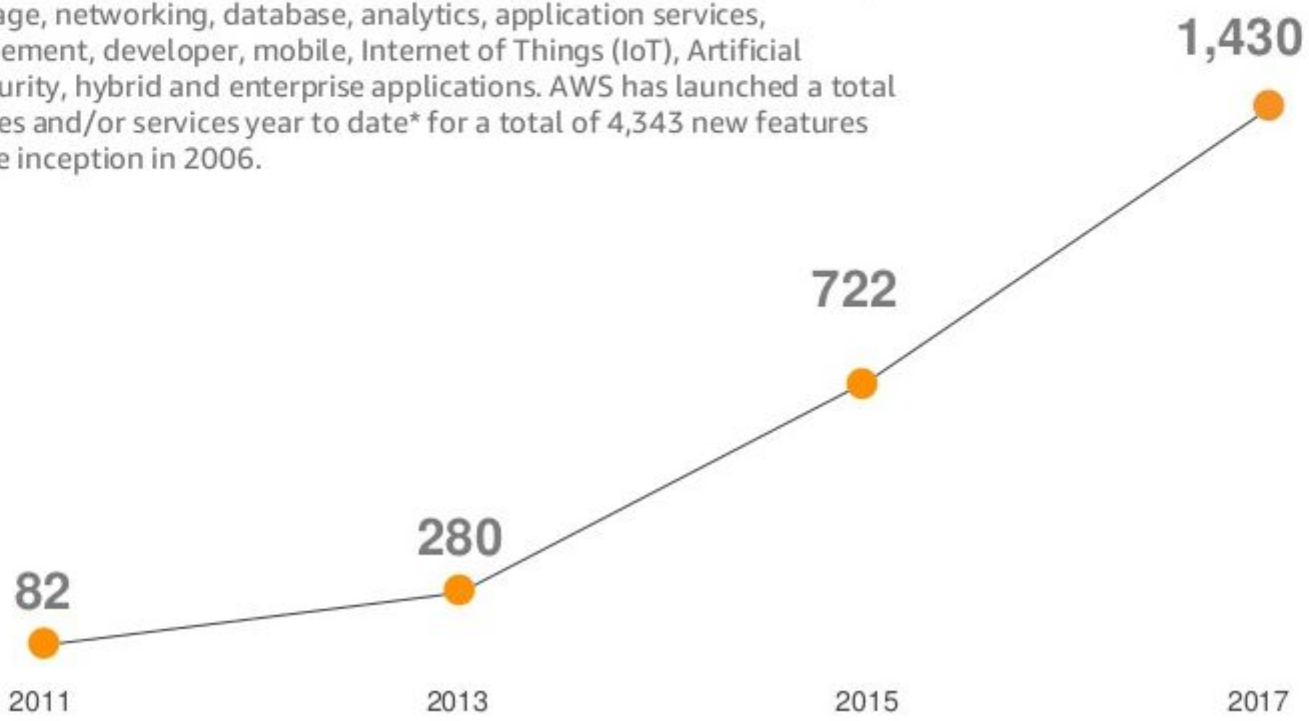
Sommige topics uitgediept, anderen komen minder aan bod.

Voor volledige inhoud certificatie zie:

- AWS Training
- Pluralsight

AWS Pace of Innovation

AWS has been continually expanding its services to support virtually any cloud workload, and it now has more than 90 services that range from compute, storage, networking, database, analytics, application services, deployment, management, developer, mobile, Internet of Things (IoT), Artificial Intelligence (AI), security, hybrid and enterprise applications. AWS has launched a total of 1,430 new features and/or services year to date* for a total of 4,343 new features and/or services since inception in 2006.



AWS Batch
Schema Conversion Tool
AWS Storage Gateway
AWS Certificate Manager
AWS Snowmobile
AWS OpsWorks
AWS CodeDeploy
Amazon ElastiCache
Amazon Cognito
AWS Organizations
AWS Config
AWS Shield
Amazon EFS
AWS CodePipeline
Amazon Lex
Amazon Lumberyard
AWS CodeCommit
Amazon AppStream 2.0
AWS Elastic Beanstalk
AWS Managed Services
Amazon Inspector
Amazon Lightsail
Amazon Route 53
Amazon Redshift
Lambda
Amazon Kinesis Firehose
AWS Glue
Amazon Pinpoint
AWS X-Ray

5,089

Amazon DynamoDB
AWS CodeBuild
AWS Snowball
Amazon Athena
AWS Snowball Edge
Amazon RDS for Aurora
Amazon WorkMail
AWS WAF
AWS OpsWorks for Chef Automate
Amazon Machine Learning
Amazon Rekognition
AWS Mobile Hub
AWS IoT
Device Farm
Amazon Polly
WorkSpaces
AWS IoT Greengrass
WorkDocs
Amazon QuickSight
CloudWatch Logs
Mobile Analytics
AWS Personal Health Dashboard
Amazon EC2 Systems Manager
AWS Direct Connect
Amazon Inspector
AWS Discovery Services
AWS Service Catalog
AWS Import/Export
AWS Step Functions

Enterprise Applications

- Virtual Desktops
- Collaboration and Sharing

Platform Services

Databases	Analytics	App Services	Deployment & Management	Mobile Services
Relational	Hadoop	Queuing	Containers	Identity
No SQL	Real-time	Orchestration	Dev/ops Tools	Sync
Caching	Data Warehouse	App Streaming	Resource Templates	Mobile Analytics
	Data Workflows	Transcoding	Usage Tracking	Notifications
		Email	Monitoring and Logs	
		Search		

Foundation Services

- Compute (VMs, Auto-scaling and Load Balancing)
- Storage (Object, Block and Archive)
- Security & Access Control
- Networking

Infrastructure

- Regions
- Availability Zones
- CDN Points of Presence

AWS Foundation Services (1 of 2)

Compute

- Amazon EC2
- Amazon ECR
- Amazon ECS
- Amazon EKS
- Amazon Lightsail
- AWS Batch
- AWS Elastic Beanstalk
- AWS Fargate
- AWS Lambda
- AWS Serverless Application Repository
- Elastic Load Balancing
- VMware Cloud on AWS

Storage

- Amazon S3
- AWS Snowmobile
- AWS Storage Gateway
- Amazon EFS
- AWS Snowball
- AWS Snowball Edge
- Amazon Glacier
- Amazon EBS
- Amazon FSx for Lustre
- Amazon FSx for Windows File Server
- AWS Backup

AWS Snowmobile and AWS Snowball & Snowcone

- 100 PB Storage
- 1 Tb/s Transfer Rate

- 50 & 80 TB Storage
- 10Gb/s Transfer

- 8TB Storage
- Wired & Wifi

AWS Foundation Services (2 of 2)

Network & Content Delivery

- Amazon VPC
- Amazon Route 53
- AWS App Mesh
- AWS Cloud Map
- Amazon API Gateway
- AWS PrivateLink
- AWS Global Accelerator
- AWS Transit Gateway
- AWS Direct Connect
- Amazon CloudFront
- AWS VPN

Security, Identity & Compliance

- AWS IAM
- AWS Directory Service
- Amazon GuardDuty
- Amazon Cognito
- Amazon Inspector
- Amazon Cloud Directory
- AWS Artifact
- AWS Certificate Manager
- AWS CloudHSM
- AWS Firewall Manager
- AWS WAF
- AWS Security Hub
- AWS KMS
- AWS Secrets Manager
- AWS Shield
- AWS SSO
- AWS Organizations
- Amazon Macie

Selecting a region

Determine the right region for your services, applications, and data based on these factors

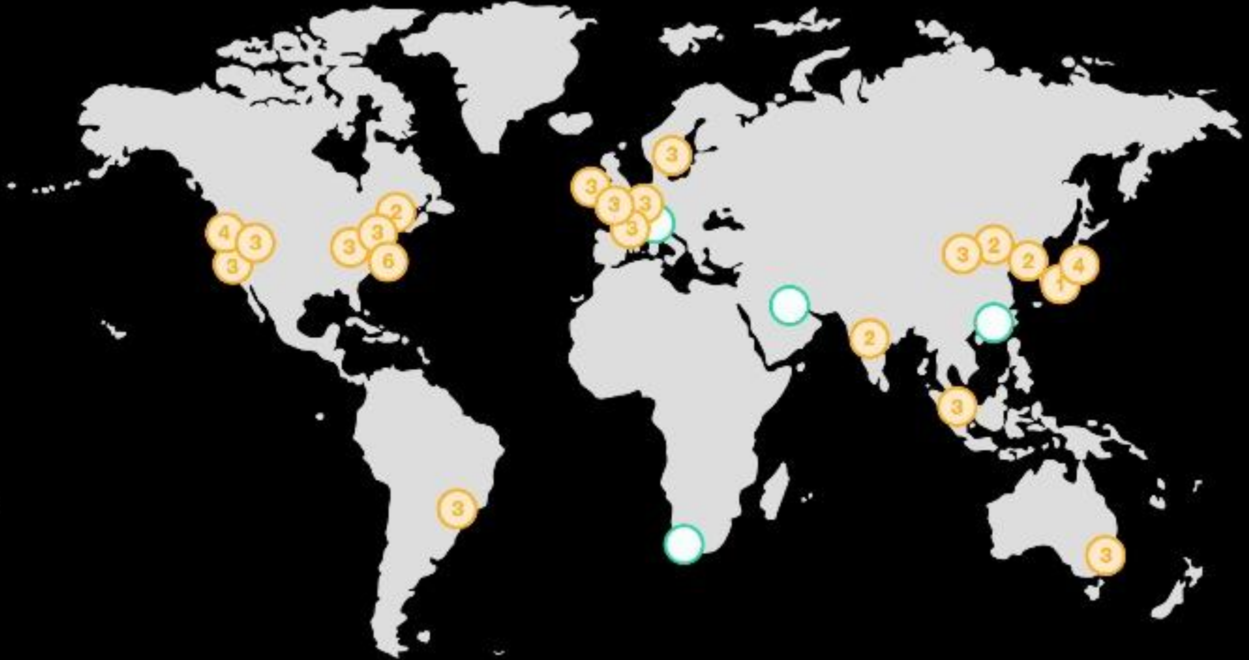
- Data governance, legal requirements
- Proximity to customers (latency)
- Services available within the region
- Costs (vary by region)

AWS Global Infrastructure

20 geographic Regions
A Region is a physical location in the world where we have multiple Availability Zones

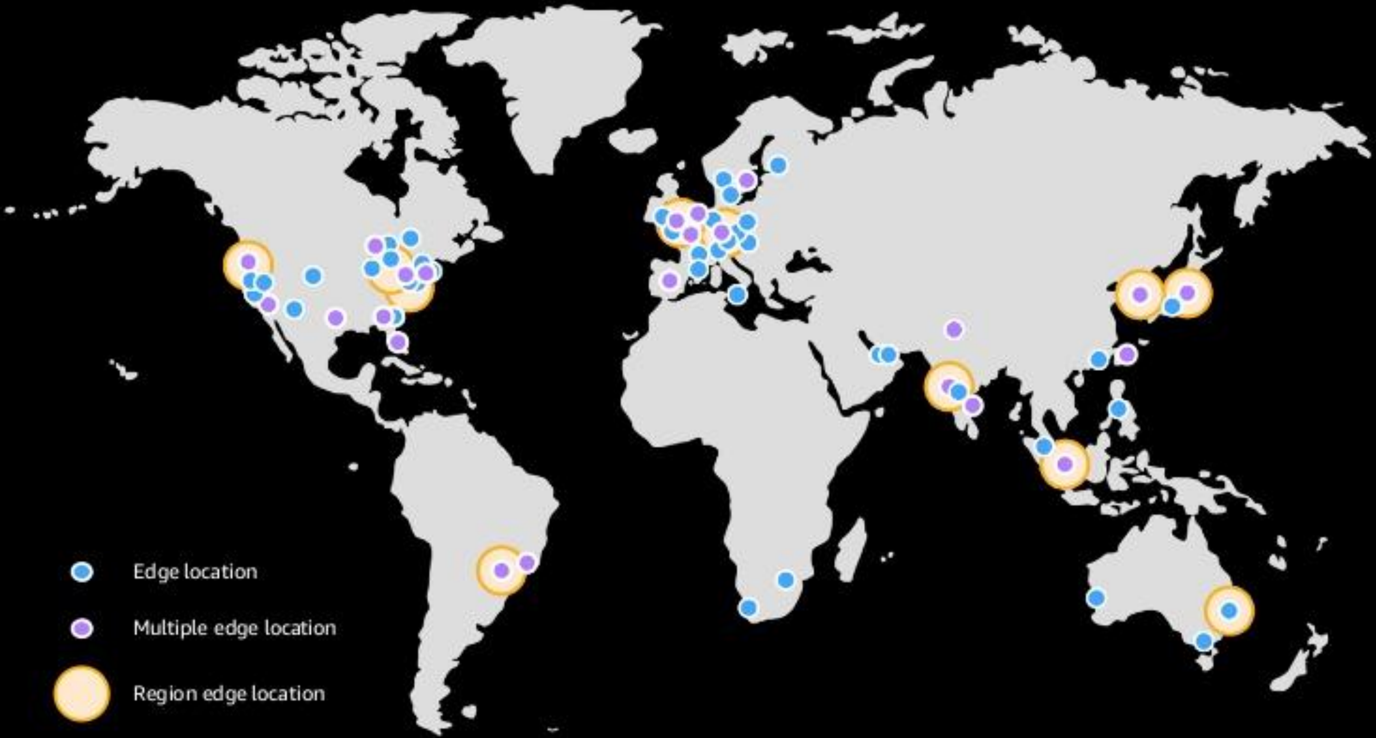
62 Availability Zones
Distinct locations that are engineered to be insulated from failures in other Availability Zones

SLA of **99.99%** availability



aws SUMMIT

AWS edge network locations



aws SUMMIT

AWS Global Infrastructure - edge locations

150+ AWS edge locations

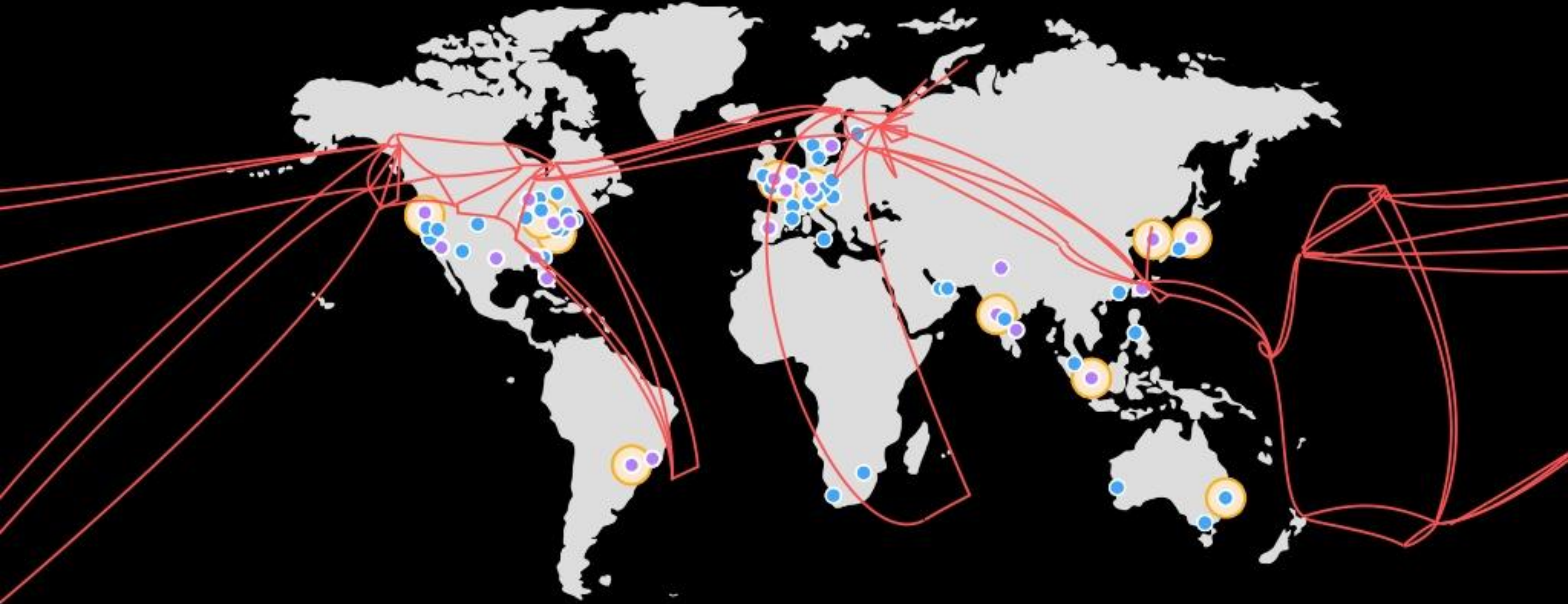
Local points of presence support AWS services like:

Amazon Route 53

Amazon CloudFront

AWS WAF

AWS Shield



aws SUMMIT

Why have a backbone network?

Security

Traffic traverses our infrastructure rather than the Internet

Availability

Controlling scaling and redundancy

Reliable performance

Controlling paths customer traffic traverses

Connecting closer to customers

Avoiding internet “hot spots” or sub-optimal external connectivity

All Region to Region traffic traverses the backbone*

* except within the People’s Republic of China

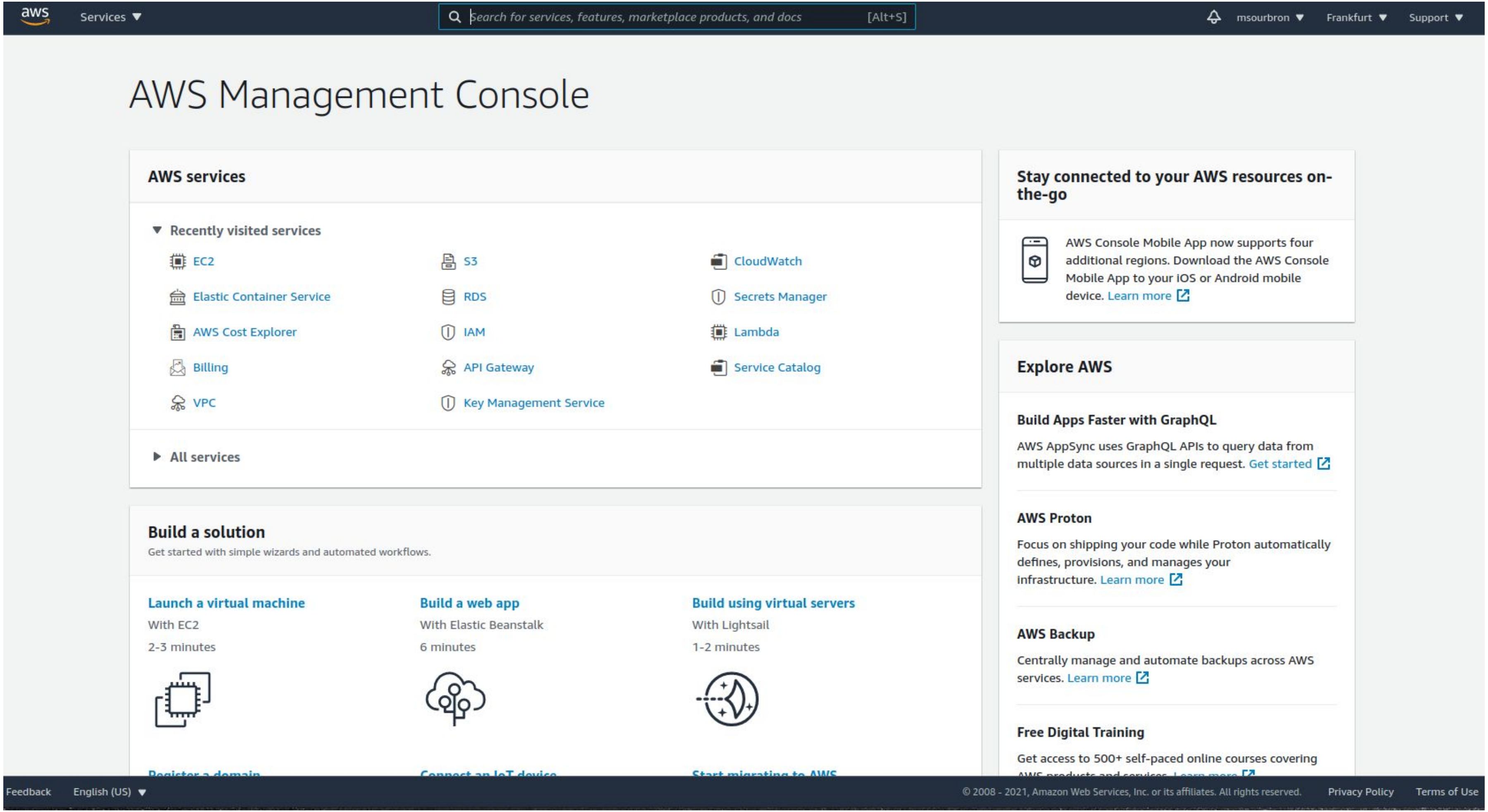
Hands-on introduction

AWS Management Console

- Website GUI
- Visuele interface
  - Overweldigend
- Point-and-click

AWS Commandline Interface

- API-base cli + SDK
- Text interface
  - Arcane commando’s
- To-The-Point


aws
Services ▼
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AWS Management Console

AWS services

▼ Recently visited services

- EC2
- Elastic Container Service
- AWS Cost Explorer
- Billing
- VPC
- S3
- RDS
- IAM
- API Gateway
- Key Management Service
- CloudWatch
- Secrets Manager
- Lambda
- Service Catalog

▶ All services

Build a solution

Get started with simple wizards and automated workflows.

Launch a virtual machine
With EC2
2-3 minutes

Build a web app
With Elastic Beanstalk
6 minutes

Build using virtual servers
With Lightsail
1-2 minutes

Register a domain

Connect an IoT device

Start migrating to AWS

Stay connected to your AWS resources on-the-go

AWS Console Mobile App now supports four additional regions. Download the AWS Console Mobile App to your iOS or Android mobile device. Learn more

Explore AWS

Build Apps Faster with GraphQL

AWS AppSync uses GraphQL APIs to query data from multiple data sources in a single request. Get started

AWS Proton

Focus on shipping your code while Proton automatically defines, provisions, and manages your infrastructure. Learn more

AWS Backup

Centrally manage and automate backups across AWS services. Learn more

Free Digital Training

Get access to 500+ self-paced online courses covering AWS products and services. Learn more

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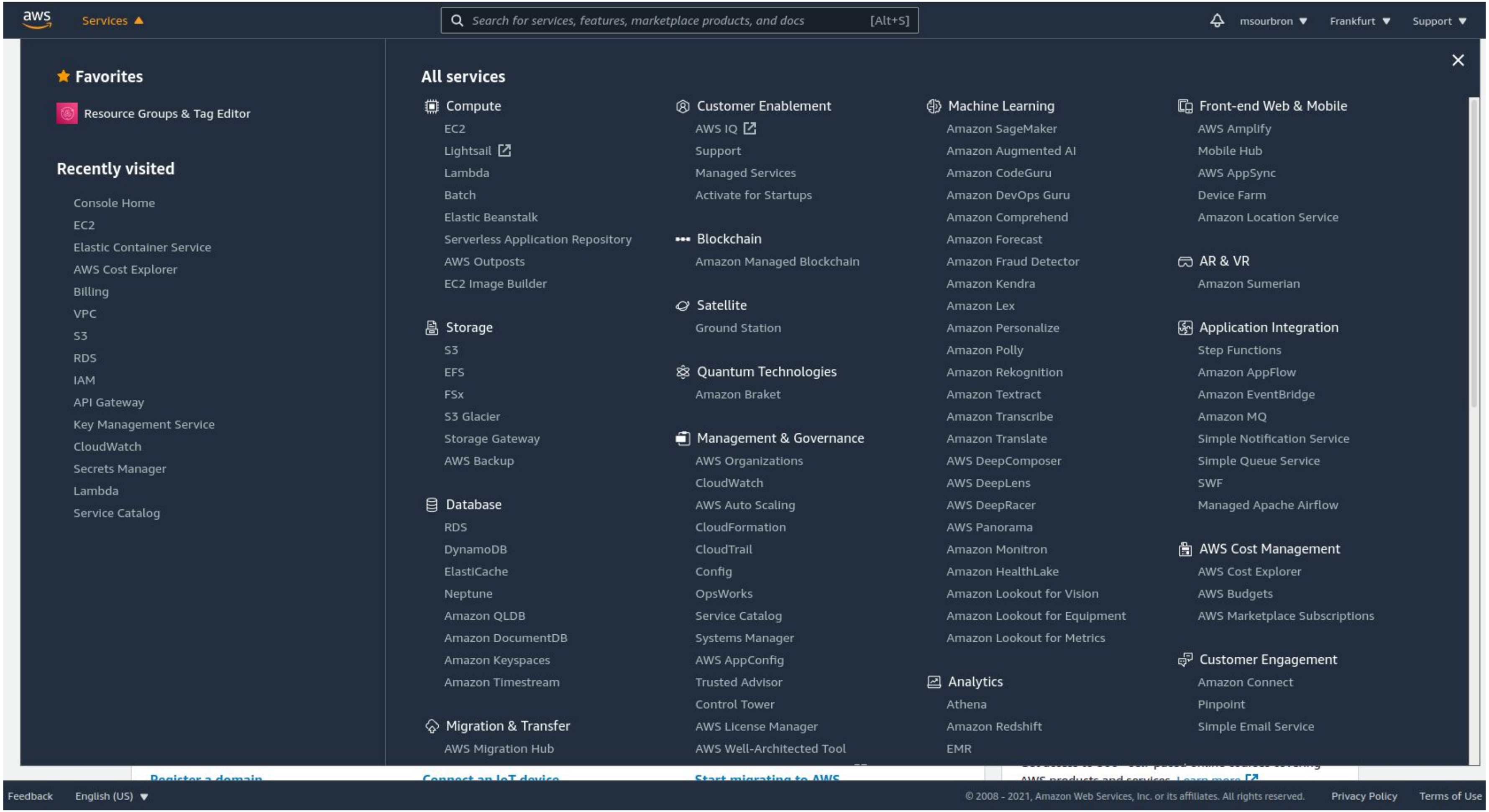

aws Services ▲

Search for services, features, marketplace products, and docs [Alt+S]

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✕

★ Favorites

- Resource Groups & Tag Editor

Recently visited

- Console Home
- EC2
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- AWS Cost Explorer
- Billing
- VPC
- S3
- RDS
- IAM
- API Gateway
- Key Management Service
- CloudWatch
- Secrets Manager
- Lambda
- Service Catalog

All services

Compute

- EC2
- Lightsail
- Lambda
- Batch
- Elastic Beanstalk
- Serverless Application Repository
- AWS Outposts
- EC2 Image Builder

Storage

- S3
- EFS
- FSx
- S3 Glacier
- Storage Gateway
- AWS Backup

Database

- RDS
- DynamoDB
- ElastiCache
- Neptune
- Amazon QLDB
- Amazon DocumentDB
- Amazon Keyspaces
- Amazon Timestream

Migration & Transfer

- AWS Migration Hub

Customer Enablement

- AWS IQ
- Support
- Managed Services
- Activate for Startups

Blockchain

- Amazon Managed Blockchain

Satellite

- Ground Station

Quantum Technologies

- Amazon Braket

Management & Governance

- AWS Organizations
- CloudWatch
- AWS Auto Scaling
- CloudFormation
- CloudTrail
- Config
- OpsWorks
- Service Catalog
- Systems Manager
- AWS AppConfig
- Trusted Advisor
- Control Tower
- AWS License Manager
- AWS Well-Architected Tool

Machine Learning

- Amazon SageMaker
- Amazon Augmented AI
- Amazon CodeGuru
- Amazon DevOps Guru
- Amazon Comprehend
- Amazon Forecast
- Amazon Fraud Detector
- Amazon Kendra
- Amazon Lex
- Amazon Personalize
- Amazon Polly
- Amazon Rekognition
- Amazon Textract
- Amazon Transcribe
- Amazon Translate
- AWS DeepComposer
- AWS DeepLens
- AWS DeepRacer
- AWS Panorama
- Amazon Monitron
- Amazon HealthLake
- Amazon Lookout for Vision
- Amazon Lookout for Equipment
- Amazon Lookout for Metrics

Analytics

- Athena
- Amazon Redshift
- EMR

Front-end Web & Mobile

- AWS Amplify
- Mobile Hub
- AWS AppSync
- Device Farm
- Amazon Location Service

AR & VR

- Amazon Sumerian

Application Integration

- Step Functions
- Amazon AppFlow
- Amazon EventBridge
- Amazon MQ
- Simple Notification Service
- Simple Queue Service
- SWF
- Managed Apache Airflow

AWS Cost Management

- AWS Cost Explorer
- AWS Budgets
- AWS Marketplace Subscriptions

Customer Engagement

- Amazon Connect
- Pinpoint
- Simple Email Service

Register a domain Connect an IoT device Start migrating to AWS AWS products and services. Learn more

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AWS CLI

- The AWS Command Line Interface (CLI) is a unified tool to manage AWS services.
- With just one tool
  - control multiple AWS services
  - automate them through scripts
  - manage aws resources programmatically
  - ...

AWS CLI

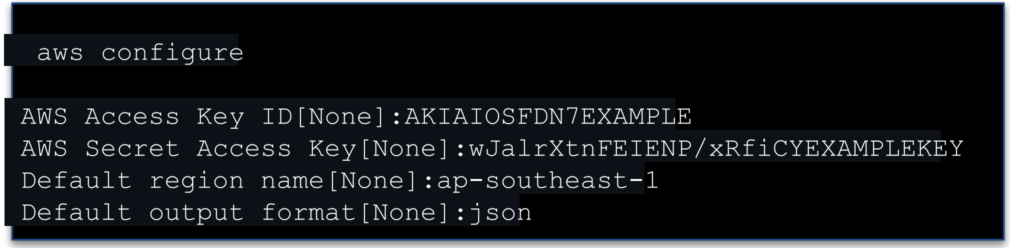
- Easy to install
  - control AWS resources using AWS API
  - only python as dependency
- No other complicated setup is required
  - if you have AWS account and have aws_access_key and aws_secret_key you can run AWS cli against your AWS environment

- AWS (CLI)Supported Platforms
  - Windows, Linux, macOS, Unix
- AWS (CLI) Dependencies
  - Python 2 v2.6.5+ or Python 3 v3.3+
- AWS (CLI) Components
  - aws-cli
  - aws-shell

AWS CLI

Installatie gids: https://docs.aws.amazon.com/cli/latest/userguide/install-cliv2.html

Daarna:



```
 aws configure

AWS Access Key ID[None]:AKIAIOSFDN7EXAMPLE
AWS Secret Access Key[None]:wJalrXtnFEIENP/xRfiCYEXAMPLEKEY
Default region name[None]:ap-southeast-1
Default output format[None]:json
```

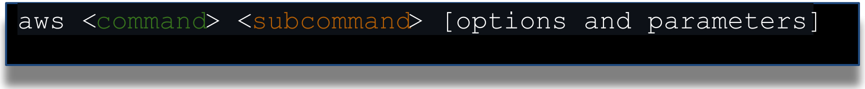
Vergeet je niet om **MANUEEL** je session token ook nog toe te voegen aan je credentials file!

AWS_SESSION_TOKEN=<session token>

The AWS CLI Command Structure

The AWS Command Line Interface (AWS CLI) uses a multipart structure on the command line that must be specified in this order:

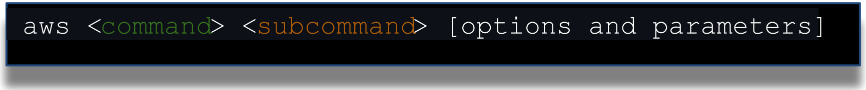
1. The base call to the `aws` program.
2. The top-level *`command`*, which typically corresponds to an AWS service supported by the AWS CLI.
3. The *subcommand* that specifies which operation to perform.
4. General CLI options or parameters required by the operation. You can specify these in any order as long as they follow the first three parts. If an exclusive parameter is specified multiple times, only the *last value* applies.



```
aws <command> <subcommand> [options and parameters]
```

Bron: https://github.com/gabehollombe-aws/aws-cli-devlab

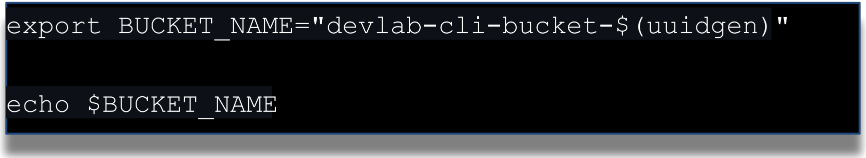
de AWS CLI - een voorbeeld



```
aws <command> <subcommand> [options and parameters]
```

- Werken met S3 Buckets en files

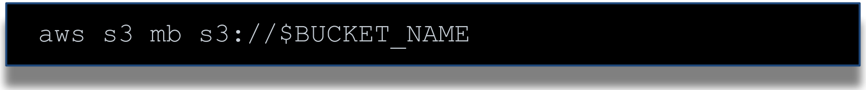
S3 bucket namen zijn uniek, dus laten we een unieke bucketnaam mak en deze in een shell variable steken:



```
export BUCKET_NAME="devlab-cli-bucket-$(uuidgen)"

echo $BUCKET_NAME
```

Daarna maken we de bucket aan:



```
 aws s3 mb s3://$BUCKET_NAME
```

Bron: https://github.com/gabehollombe-aws/aws-cli-devlab

AWS CLI

de AWS CLI - een voorbeeld

```
aws <command> <subcommand> [options and parameters]
```

- Werken met S3 Buckets en files

S3 bucket synchroniseren met een lokale directory en de inhoud bekijken:

```
aws s3 sync /var/www s3://$BUCKET_NAME

aws s3 ls s3://$BUCKET_NAME
```

Daarna verwijderen we de bucket :

```
 aws s3 mb s3://$BUCKET_NAME
```

Bron: https://github.com/gabehollombe-aws/aws-cli-devlab

de AWS CLI - filteren en querying

Wanneer we werken met de CLI willen we soms de output limiteren, hiervoor kunnen we de `--filter` and `--query` flags gebruiken.

- Sommige (niet alle) AWS CLI-opdrachten ondersteunen de `--filter`-vlag om de items die door de server worden geretourneerd te beperken.
  Probeer deze 2 commandos eens en vergelijk de output:

```
aws ec2 describe-images --owners amazon
```

```
aws ec2 describe-images --owners amazon --filters "Name=platform,Values=windows"
"Name=root-device-type,Values=ebs"
```

Bron: https://github.com/gabehollombe-aws/aws-cli-devlab

de AWS CLI - filteren en querying

Bij voorgaand voorbeeld kregen we nog veel te veel info terug, dus misschien moeten we de teruggekregen informatie ook aan de client-zijde nog verder filteren. Dat zouden we kunnen via een pipe en het grep commando, maar er is ook de `--query`-vlag

Probeer dit commando eens en vergelijk de output:

```
aws ec2 describe-images --owners amazon --filters "Name=platform,Values=windows"
"Name=root-device-type,Values=ebs" --query "Images[0:10].{name: Name, id: ImageId}"
```

Bron: https://github.com/gabehollombe-aws/aws-cli-devlab

de AWS CLI - output stijlen

We kunnen de output ook nog stroomlijnen door met verdere parameters te spelen, zoals bvb platte text om door te geven aan andere commandos:

```
aws ec2 describe-images --owners amazon --filters "Name=platform,Values=windows"
"Name=root-device-type,Values=ebs" --query "Images[0:10].{name: Name, id: ImageId}" --output=text | cut -f
2 | sort
```

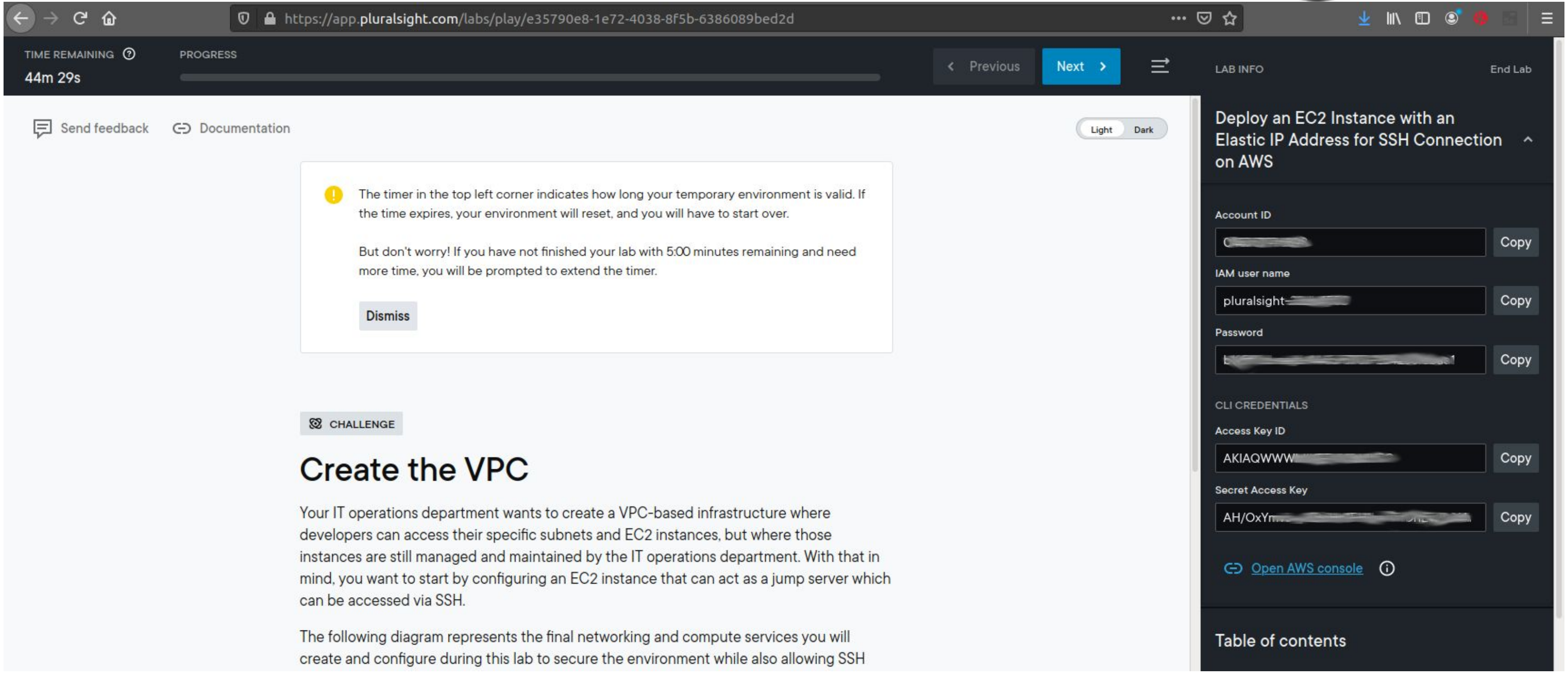
Of als we het visueel leesbaarder willen maken in een tabel:

```
aws ec2 describe-images --owners amazon --filters "Name=platform,Values=windows"
"Name=root-device-type,Values=ebs" --query "Images[0:10].{name: Name, id: ImageId}" --output=table
```

Bron: https://github.com/gabehollombe-aws/aws-cli-devlab

Pluralsight Labs

PXL DIGITAL



https://app.pluralsight.com/labs/play/e35790e8-1e72-4038-8f5b-6386089bed2d

TIME REMAINING 44m 29s

PROGRESS

< Previous Next >

LAB INFO End Lab

Send feedback Documentation

Light Dark

The timer in the top left corner indicates how long your temporary environment is valid. If the time expires, your environment will reset, and you will have to start over.

But don't worry! If you have not finished your lab with 5:00 minutes remaining and need more time, you will be prompted to extend the timer.

Dismiss

CHALLENGE

Create the VPC

Your IT operations department wants to create a VPC-based infrastructure where developers can access their specific subnets and EC2 instances, but where those instances are still managed and maintained by the IT operations department. With that in mind, you want to start by configuring an EC2 instance that can act as a jump server which can be accessed via SSH.

The following diagram represents the final networking and compute services you will create and configure during this lab to secure the environment while also allowing SSH

Deploy an EC2 Instance with an Elastic IP Address for SSH Connection on AWS

Account ID: [redacted] Copy

IAM user name: pluralsight-[redacted] Copy

Password: [redacted] Copy

CLI CREDENTIALS

Access Key ID: AKIAQWWW[redacted] Copy

Secret Access Key: AH/OxY[redacted] Copy

Open AWS console

Table of contents

Introductie labs

- Online lab platform
    - AWSGen
    - Introduction to the CLI to perform operations on AWS