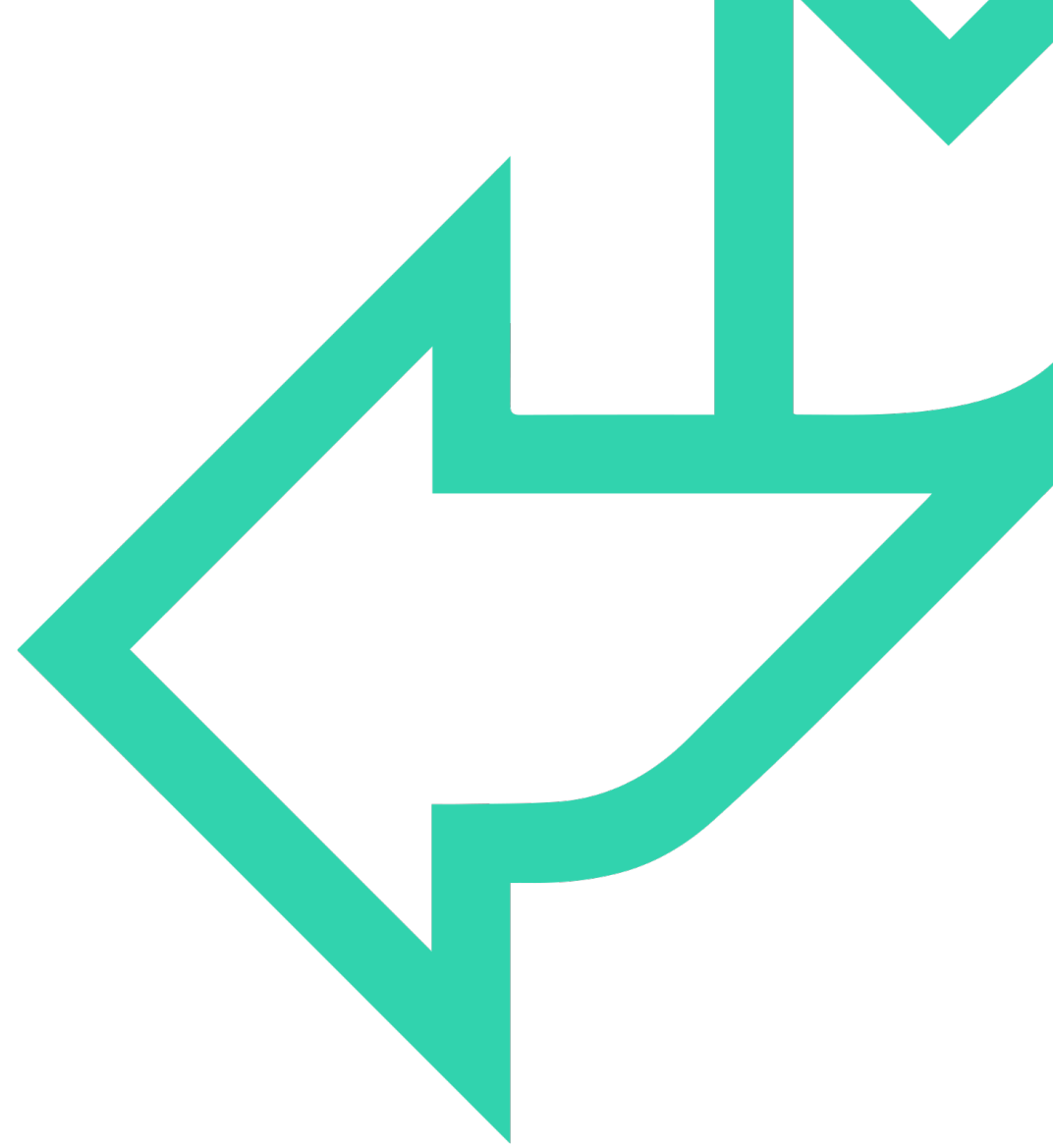




Working in the Cloud



QA What is the cloud?

“Cloud computing is the on-demand delivery of IT resources over the Internet with pay-as-you-go pricing. Instead of buying, owning, and maintaining physical data centres and servers, you can access technology services, such as computing power, storage, and databases, on an as-needed basis from a cloud provider like Amazon Web Services (AWS)”



Gartner 'Magic Quadrant'

Cloud Infrastructure and Platform Providers





OVERVIEW

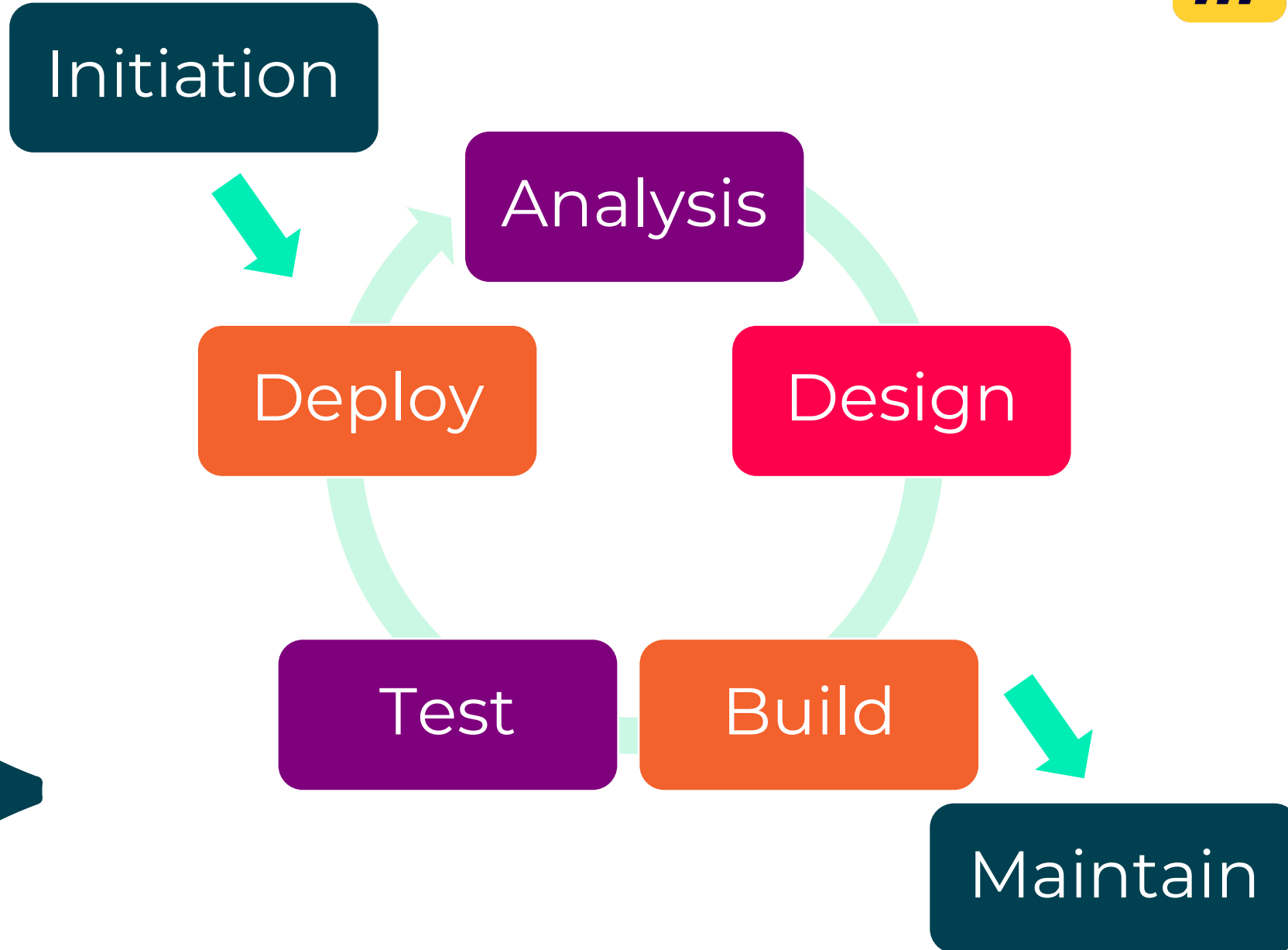
When transitioning local data architecture processes to Cloud we would consider:

- functional differences in cloud computing
- compute, storage choices
- user role configuration
- testing and visibility





**WILL THE
DALC ALTER
ONCE IN THE
CLOUD?**





FUNCTIONAL DIFFERENCES



A NEW COST MODEL

Operationally consume resources

- ✓ Variable instead of fixed OpEx model
- ✓ Scalability
- ✓ Disposability



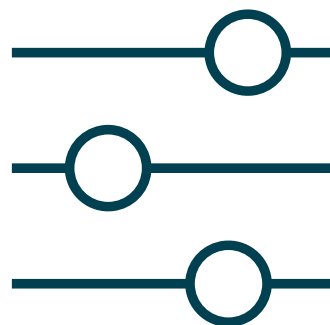


TWEAKING AND OPTIMIZING



Continuous resource management

- ✓ Options to restore or replace
- ✓ Servers provisioned on demand for batch processing



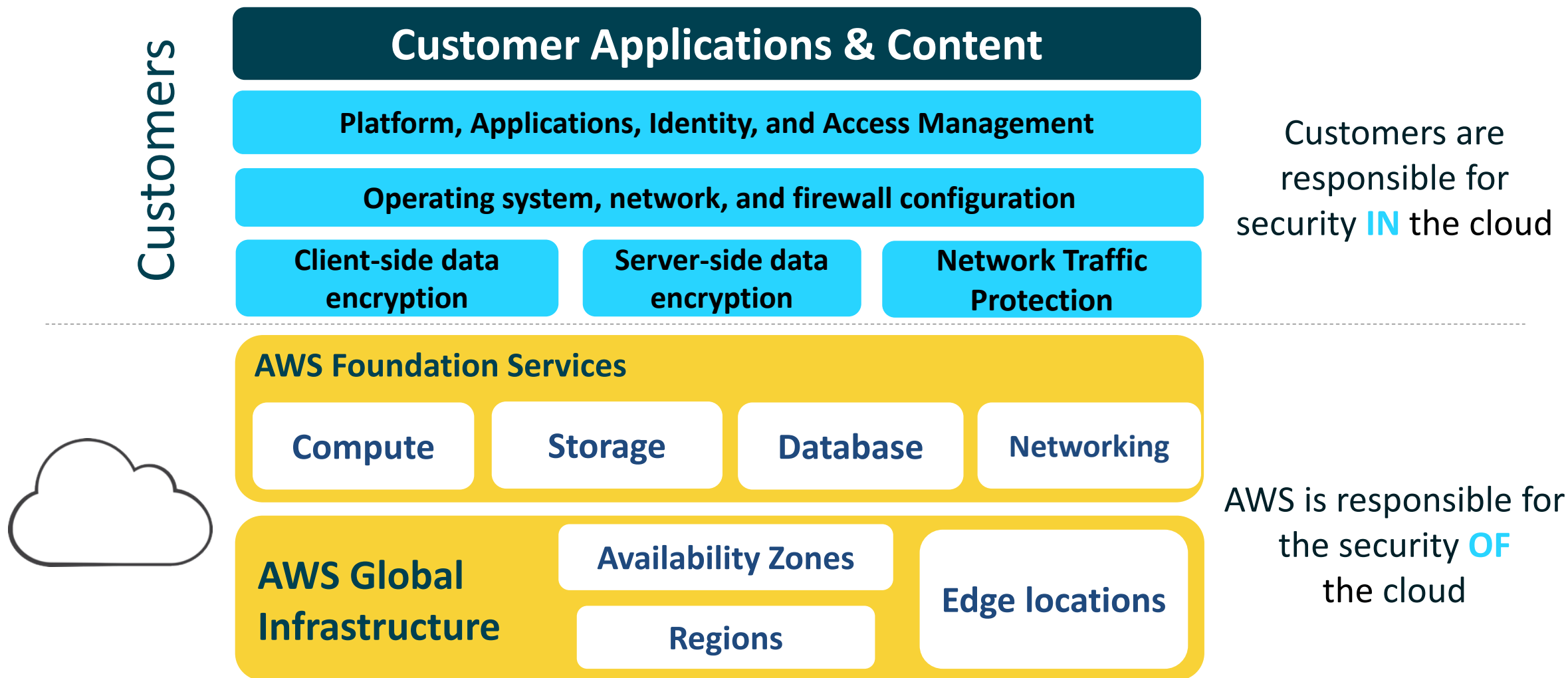


**BUT....
WHERE IN
THE WORLD
IS IT?**



image credited to : <https://aws.amazon.com/about-aws/global-infrastructure/>

QA Shared Responsibility Model





IaaS

PaaS

SaaS

On Premises	Infrastructure (as a Service)	Platform (as a Service)	Software (as a Service)	
Applications	Applications	Applications	Applications	
Data	Data	Data	Data	
Runtime	Runtime	Runtime	Runtime	
Middleware	Middleware	Middleware	Middleware	
O/S	O/S	O/S	O/S	You Manage
Virtualisation	Virtualisation	Virtualisation	Virtualisation	Vendor Manages
Servers	Servers	Servers	Servers	
Storage	Storage	Storage	Storage	
Networking	Networking	Networking	Networking	



NETWORKING

- No Access to physical infrastructure
- Presented as a virtual layer
- Virtual private cloud 'bubble' (VPC)





CONTROL AND CONFIG



Cloud Providers give access via:

API

CLI (command line)

Console Dashboard

Command line access via:

- ✓ PowerShell / CMD / Bash
- ✓ Bastion Host / Managed Service
- ✓ Cloud based shell



aws

Services

Search [Option+S]

EC2

VPC

S3

IAM

CloudFormation

CloudWatch

RDS

Lambda

Route 53

AWS Organizations

CloudShell

Loading CloudShell

Waiting for the environment to run...

29%

AWS CloudShell

eu-west-1

Welcome to AWS CloudShell

AWS CloudShell is a browser-based shell that gives you command-line access to your AWS resources in the selected AWS region. AWS CloudShell comes pre-installed with popular tools for resource management and creation. You have the same credentials as you used to log in to the console. [Learn more](#)

Pre-installed tools

AWS CLI, Python, Node.js and more

Storage included

1 GB of storage free per AWS region

Saved files and settings

Files saved in your home directory are available in future sessions for the same AWS region

☐ Do not show again

Close



INITIALISING



WHAT KIND OF SERVER IS NEEDED?



Example : EC2

Compute optimised
or
Memory optimised
or
Storage optimised





COMPUTE



Computational resources needed to do any task in the cloud

- ✓ Processing power
- ✓ Temporary memory



For example, a machine learning application with 3d graphics will consume CPUs, RAM, and Graphic processing units to complete the task





EC2 FAMILY TYPES



General Purpose:

M5, T3

Compute-Optimized:

C5

Memory-Optimized:

R5 z1d, High Memory

GPU Intensive:

P2/P3, G3, F1

Storage

H1, I3, D2

Optimized:

H1, I3, D2



INSTANCE SIZES



	vCPUs	Memory (GiB)	Network (Gbps)
large	2	5.25	Up to 25
xlarge	4	10.5	Up to 25
2xlarge	8	21	Up to 25
4xlarge	16	42	Up to 25
9xlarge	36	96	50
18xlarge	72	192	100



OTHER AWS SERVICES



Favorites

★ QuickSight [↗](#)

Fast, easy to use business analytics

★ RDS

Managed Relational Database Service

★ EC2

Virtual Servers in the Cloud

★ S3

Scalable Storage in the Cloud

★ Batch

Fully managed batch processing at any scale

★ Amazon DocumentDB

Fully-managed MongoDB-compatible database service

★ DynamoDB

Managed NoSQL Database



GETTING DATA INTO THE CLOUD





CATEGORIES OF STORAGE



AWS storage services

Object, file, and block storage



Amazon Simple Storage Service (S3)

Object storage with industry-leading scalability, availability, and security for you to store and retrieve any amount of data from anywhere.



Amazon Elastic File System (EFS)

A simple, serverless, elastic, set-and-forget file system for you to share file data without managing storage.

FSx

Amazon FSx

Fully managed, cost-effective file storage offering the capabilities and performance of popular commercial and open-source file systems.



Amazon Elastic Block Store (EBS)

Easy to use, high-performance block storage service for both throughput and transaction-intensive workloads at any scale.



USERS + ROLES



USER DATABASE OPTIONS

Cloud Providers require a user database

- Hosted within the cloud
 - Users with access to the Cloud Services
 - Users with access to cloud hosted applications
- Users from On-Premise – federated
 - Active Directory
 - Other IdP (Facebook, Gmail...)





IDENTITY ACCESS MANAGEMENT



Can integrate with federated access

Made up of IAM Entities:

Users

Groups

Roles

Policy based access control





USERS GROUPS AND ROLES



Users

Console access – username/password

Programmatic access – Key / Secret

Key/secret may be used by human with the CLI

Key/Secret may be used with application/service making

API calls

Groups

Used to organise users by similar need, requirement or access

Roles

A temporary identity that uses a memory resident key/secret

Role may be used by a user to change their security context

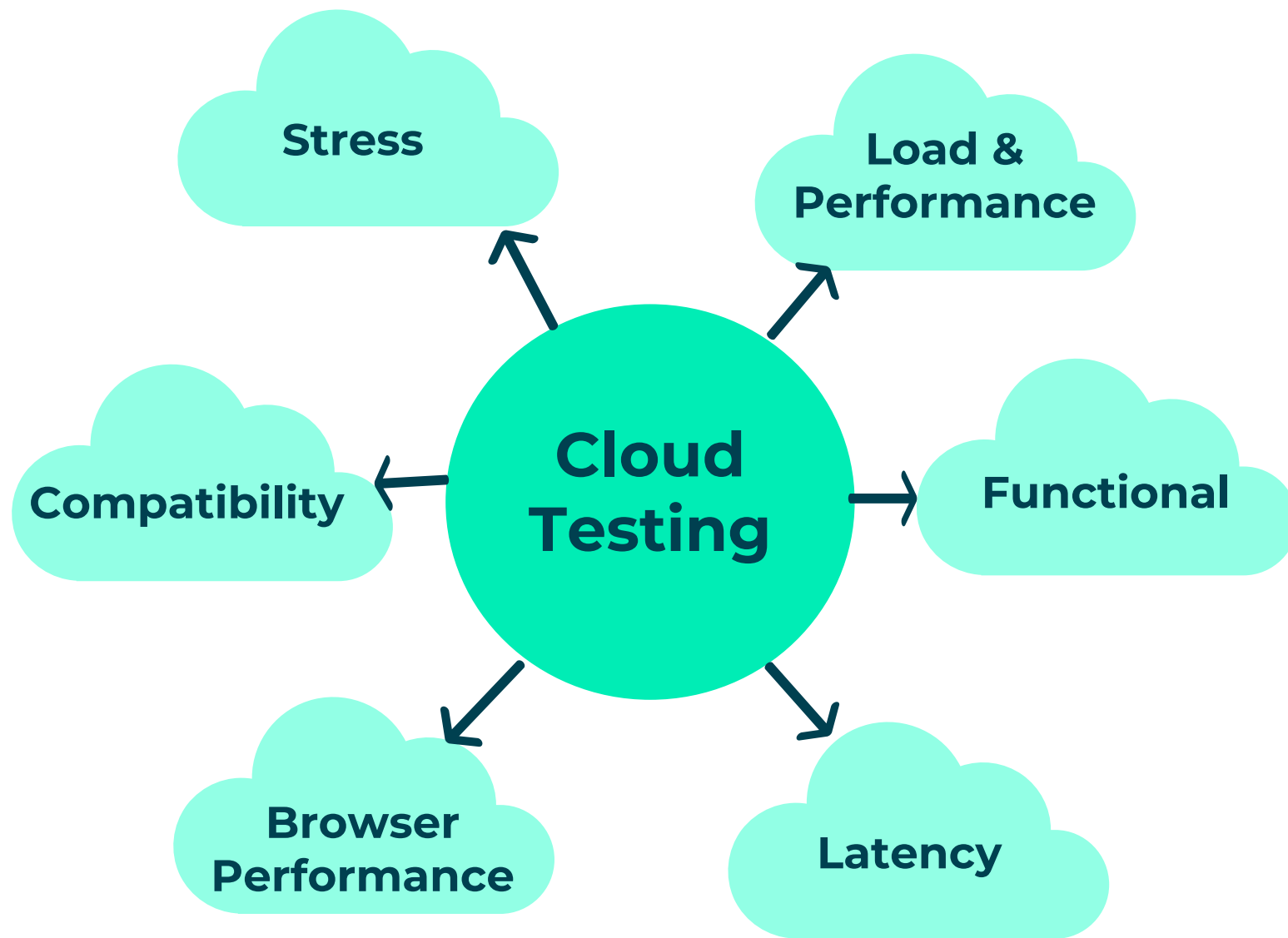
A Role may be used by a Service to provide an Execution Context





ONGOING VISIBILITY

TESTING





VALIDATION VS VERIFICATION



Verification

The process of checking that the system has been built according to specification.



Validation

The process of checking that the systems meets the customer's needs.





WHAT IS BEING TESTED?



Functional Requirements

(The 'what')

- What the system must do
- Inputs
- Outputs
- Reports
- Business rules
- Compliance
- Calculations
- Transformations
- Translations

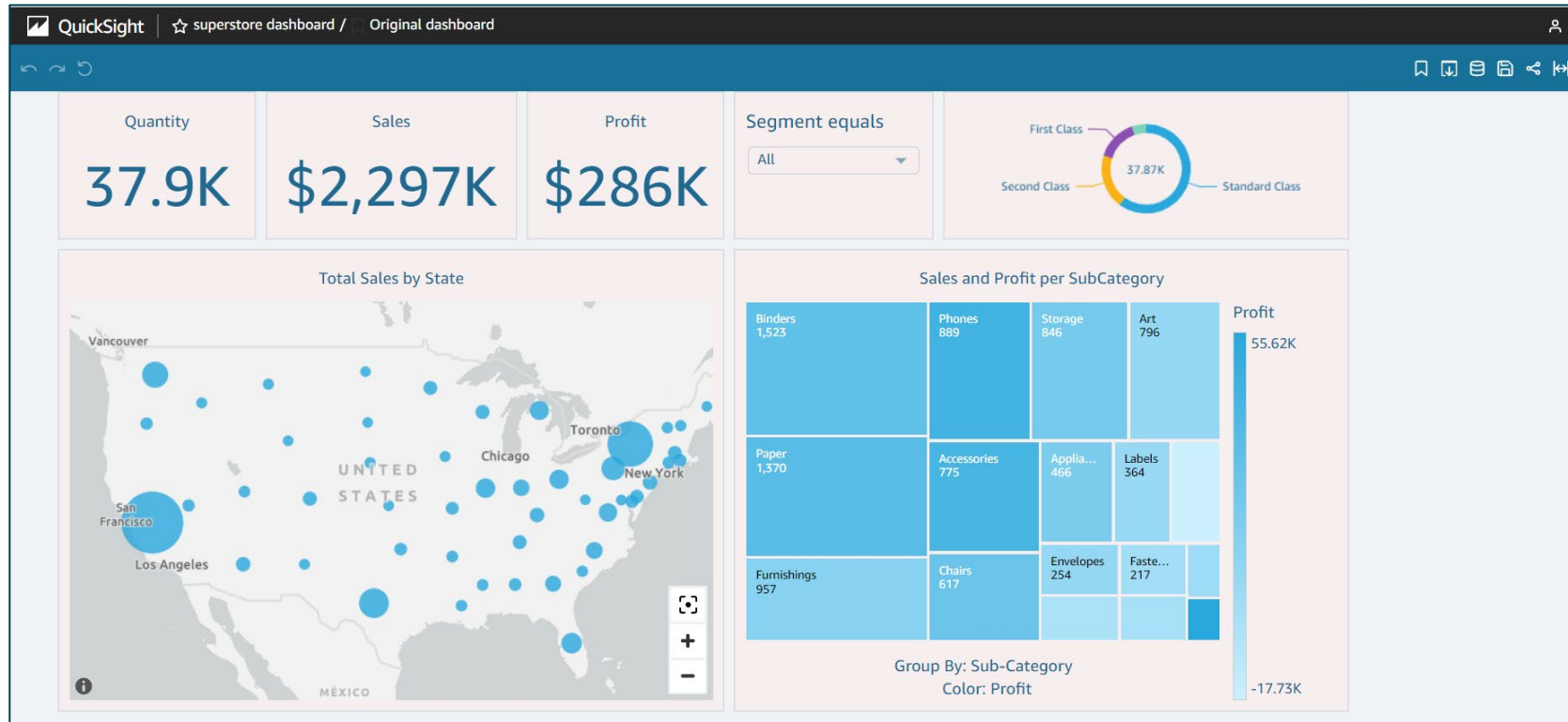
Non-functional Requirements

(The 'how')

- Performance
- Usability
- Accessibility
- Capacity
- Maintainability
- Reliability
- Scalability
- Availability
- Flexibility
- Security
- Portability
- Interoperability
- Reusability



DATA VISUALISATION IN THE CLOUD





USAGE MONITORING



AWS Pricing Calculator

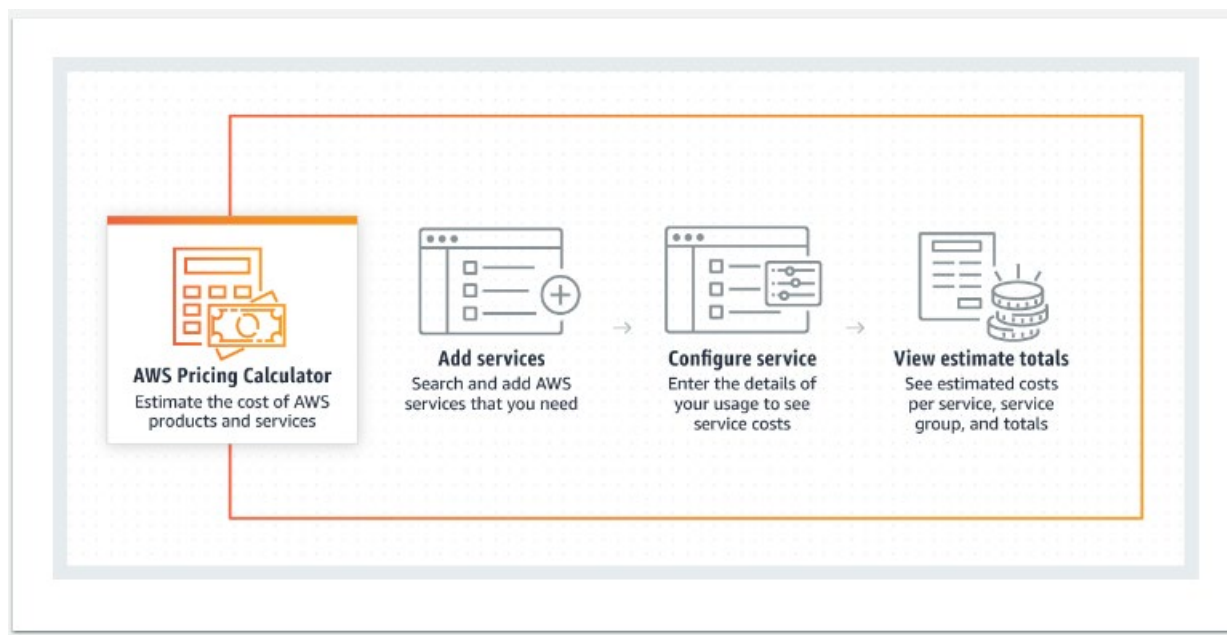
Estimate the cost for your architecture solution.

Configure a cost estimate that fits your unique business or personal needs with AWS products and services.

Create an estimate

Start your estimate with no commitment, and explore AWS services and pricing for your architecture needs.

Create estimate



<https://calculator.aws>



BILLING



AWS Billing Dashboard [Info](#)

Page refresh time: Sunday, 15 January 2023 at 21:06:33 GMT

Unhide

AWS summary [Info](#)

GBP - British Pound

Current month's total forecast USD 10.55 GBP 8.71	Current MTD balance USD 4.92 GBP 4.06	Prior month for the same period with trend USD 4.96 GBP 4.10 ↓ 0.8%
Total number of active services 1	Total number of active AWS accounts 1	Total number of active AWS Regions 2

Highest cost [Info](#)

Viewing highest service spend.

Highest service spend

Service name QuickSight	Trend compared to prior month ↓ 0.8%	Current MTD balance USD 4.92	Prior month for the same period USD 4.96
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