# Welcome to Week 4
# Cloud Accelerator Program
## CDK, RDS, and DynamoDB

**Develop**Intelligence

A PLURALSIGHT COMPANY

# Hello

## HELLO
### my name is
## Allen Sanders
with DevelopIntelligence, a Pluralsight Company.

## About me...

- 26+ years in the industry

- 21+ years in teaching

- Certified Cloud architect

- Passionate about learning

- Also, passionate about Reese's Cups!

# Why study these subjects?

In modern software engineering, our ability to quickly deploy incremental innovation, ensure its quality, and scale to meet customer demand proves critical to our success

- Cloud is everywhere and it's not going away

- As with many topics in technology, there are multiple options and multiple dimensions to those options

- Building a deeper understanding of Cloud and its offerings helps prepare you for modern IT

- Exploring additional options for sophisticated IaC, including management of persistent data stores buttresses one of the cornerstones of modern digital transformation

# My pledge to you

## I will...

- Make this interactive

- Ask you questions

- Ensure everyone can speak

- Use an on-screen timer

# Agenda

- Cloud Development Kit (CDK) – another IaC alternative in AWS

- Managed relational databases using RDS (Relational Database Service)

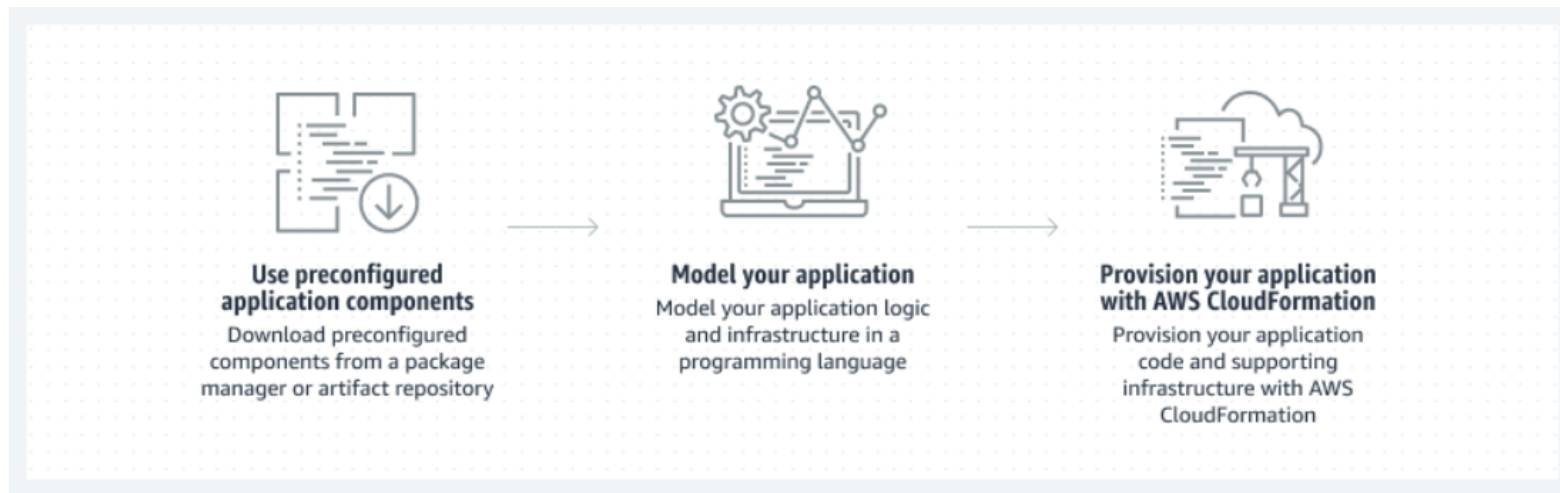- Managed NoSQL databases using DynamoDB

# How we're going to work together

- Slides and words to highlight key concepts

- Demos to bring those concepts "to life"

- Lab work (which will take place in sandboxes provided by "A Cloud Guru") for hands-on reinforcement

- NOTE: I welcome being interrupted – if you need more info, or clarification, or anything else, just break in and ask. I am here to help you.

# Cloud Development Kit (CDK)

# CDK – Key Concepts

**Use preconfigured application components**
Download preconfigured components from a package manager or artifact repository

**Model your application**
Model your application logic and infrastructure in a programming language

**Provision your application with AWS CloudFormation**
Provision your application code and supporting infrastructure with AWS CloudFormation

Source: https://aws.amazon.com/cdk/

# CDK – Key Concepts

CDK Application

CDK Stack

CDK Construct

# CDK – Key Concepts

Describes the infrastructure to be built using a programming language

CDK Application

Built using TypeScript/JavaScript, Python, Java, C#, or Go

CDK Stack

CDK Construct

# CDK – Key Concepts

CDK Application

Equivalent to a CloudFormation stack – a collection of related resources to be deployed

CDK Stack

A process called "synthesis" is used to convert CDK stacks to CloudFormation templates

CDK Construct

# CDK – Key Concepts

Representation of one or more Cloud resources categorized into multiple "levels"

CDK Application

CDK Stack

CDK Construct
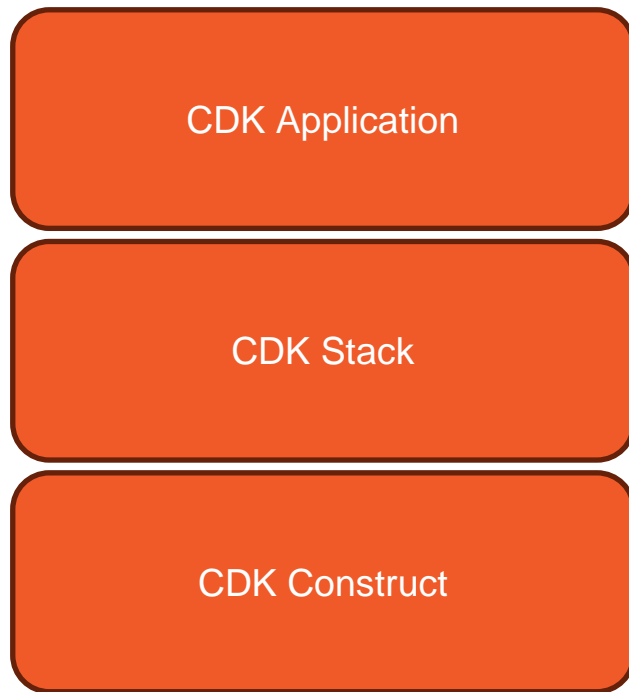
L1, L2, and L3

# CDK – Key Concepts

Supports application bootstrapping, application synthesis, and deployment

CDK Application

CDK Stack

CDK Construct

AWS CDK Toolkit (CLI)
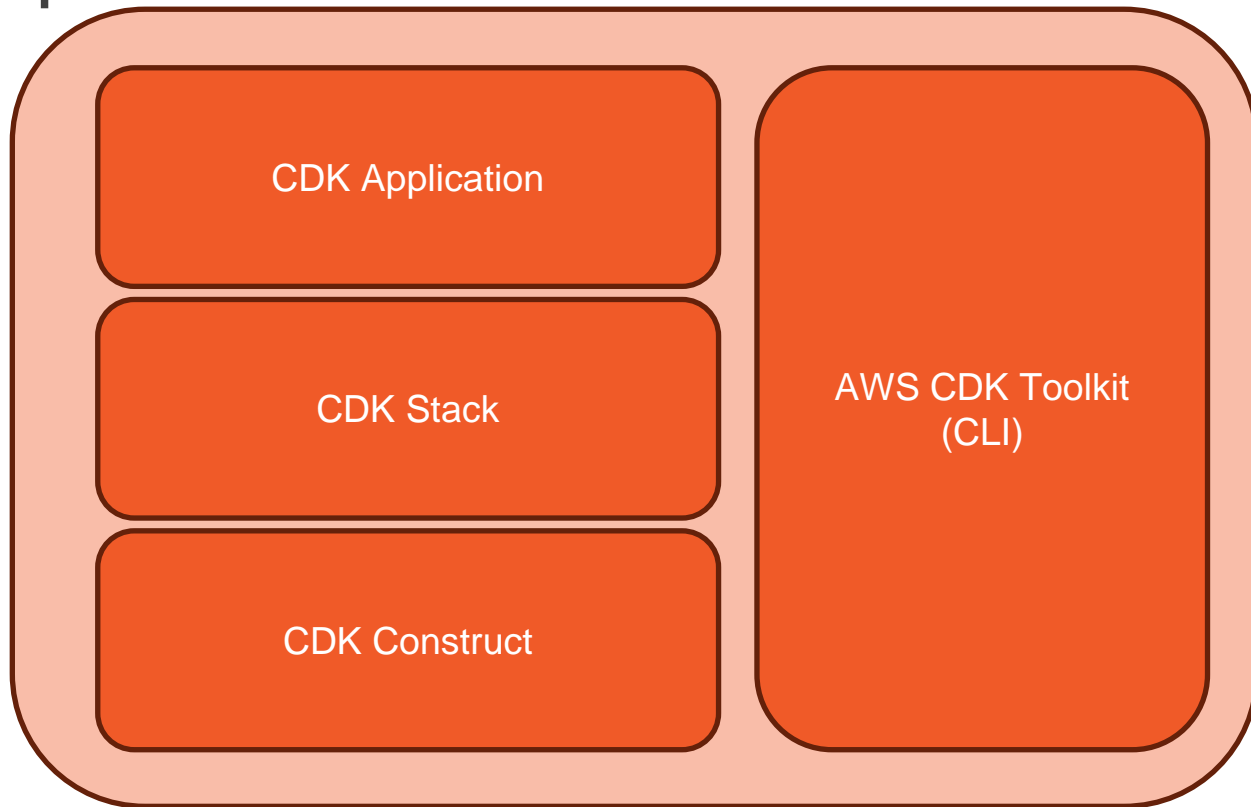
# CDK – Languages Supported

TypeScript / JavaScript
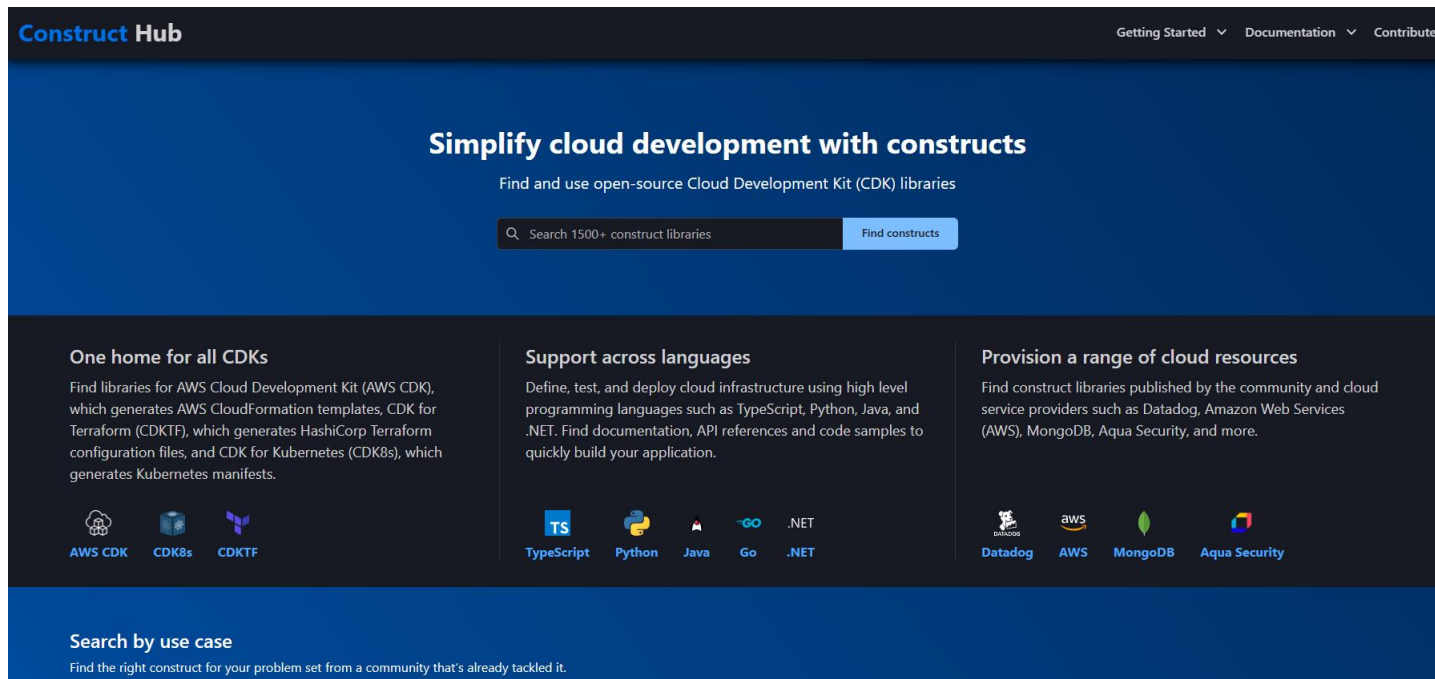
Java

Python

C#

See https://docs.aws.amazon.com/cdk/v2/guide/getting_started.html for more info

# CDK – Construct Hub



See https://constructs.dev/ for more info

# LAB:

CDK – Creating a New Stack

Execute the tutorial available at
https://learn.acloud.guru/handson/af3de00d-c096-4df1-94a6-6ffbe772b601

**LAB:**

CDK – Serverless

Execute the tutorial available at
https://learn.acloud.guru/handson/6b13d4a5-f418-4a29-a0a9-0adff3170ec7

**LAB:**

CDK – Serverless Part 2

Execute the tutorial available at
https://docs.aws.amazon.com/cdk/v2/guide/serverless_example.html

# Relational Database Service (RDS)

# Relational Databases
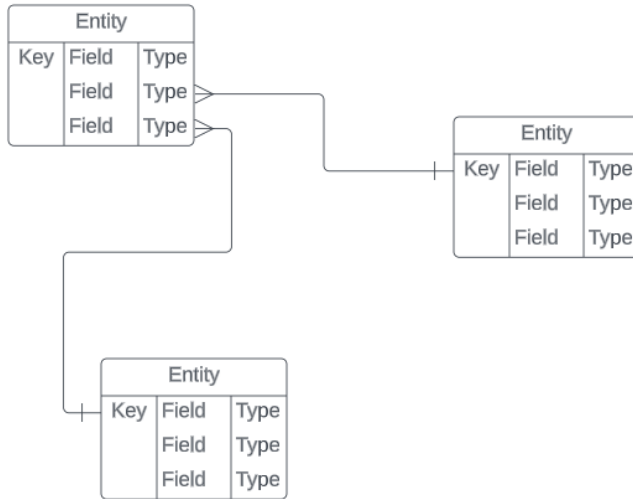


- Collection of related tables (representing entities) and fields (representing entity attributes)
- Supports identification of keys that can be used to quickly locate and uniquely identify entities
- Normalized relationships used to create hierarchies of connected entities and minimize data duplication
- Strict data design (schema)

# Amazon RDS



Source: https://aws.amazon.com/rds/
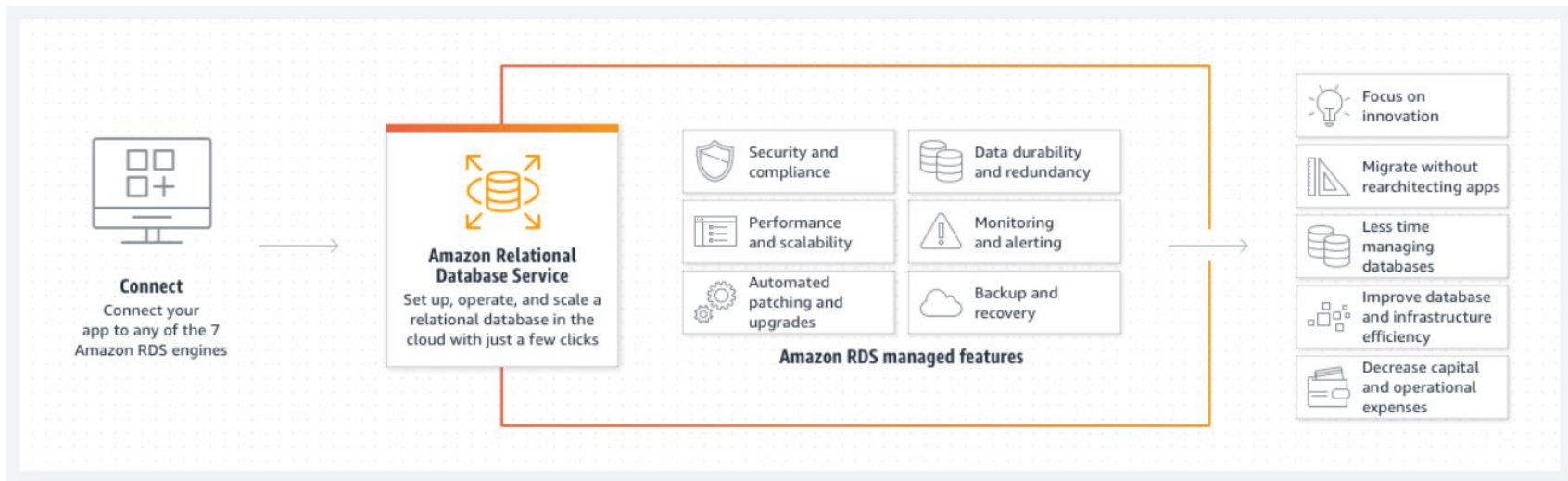
# Amazon RDS Custom



Source: https://aws.amazon.com/rds/
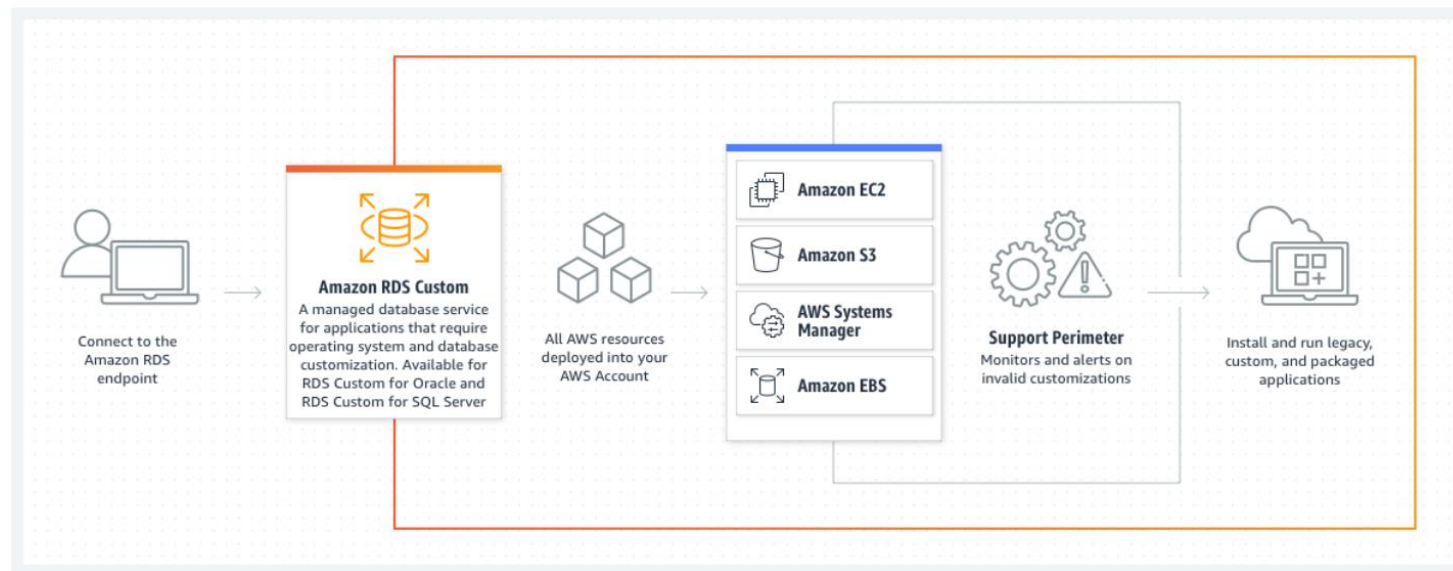
# Amazon RDS – Supported Database Engines

MariaDB

Microsoft SQL Server

MySQL

Oracle

PostgreSQL

# Amazon Aurora



Source: https://aws.amazon.com/rds/aurora/
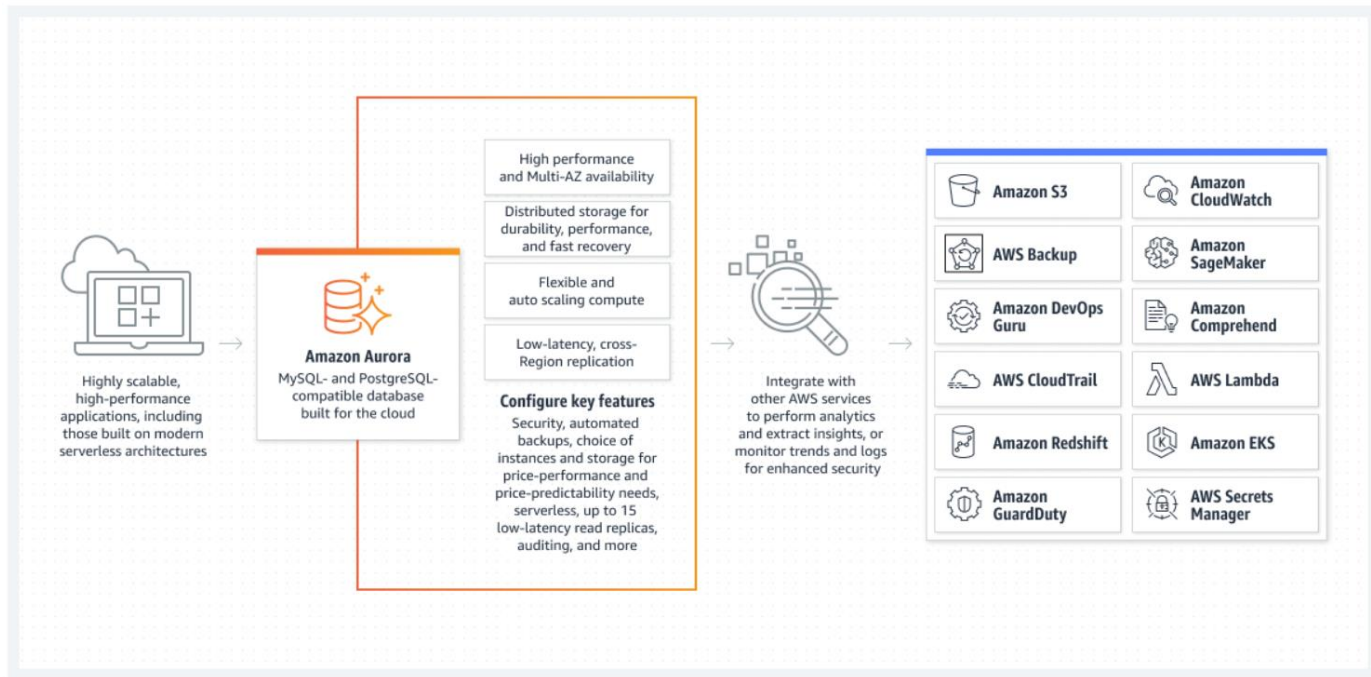
**LAB:**

RDS – Secure Multi-AZ RDS Instance

Execute the tutorial available at
https://learn.acloud.guru/handson/3570b351-5fa0-470e-9ce9-9987520f4267

# LAB:

RDS – MySQL to Amazon Aurora

Execute the tutorial available at
https://learn.acloud.guru/handson/68b15e5a-6295-4e22-a1c6-fbe7aa23918f

**LAB:**

RDS – Aurora with Lambda

Execute the tutorial available at
https://learn.acloud.guru/handson/cdc003fa-1484-4707-bba4-0ea1e9039339

# DynamoDB

# Document Databases

```json
{
    "id": "b01754e8-5108-401d-810d-ff0aa6b9337e",
    "name": {
        "first": "Melissa",
        "last": "Testing"
    },
    "address": {
        "street": "123 Main St",
        "city": "San Francisco",
        "state": "CA",
        "zip": "94105"
    }
}
```
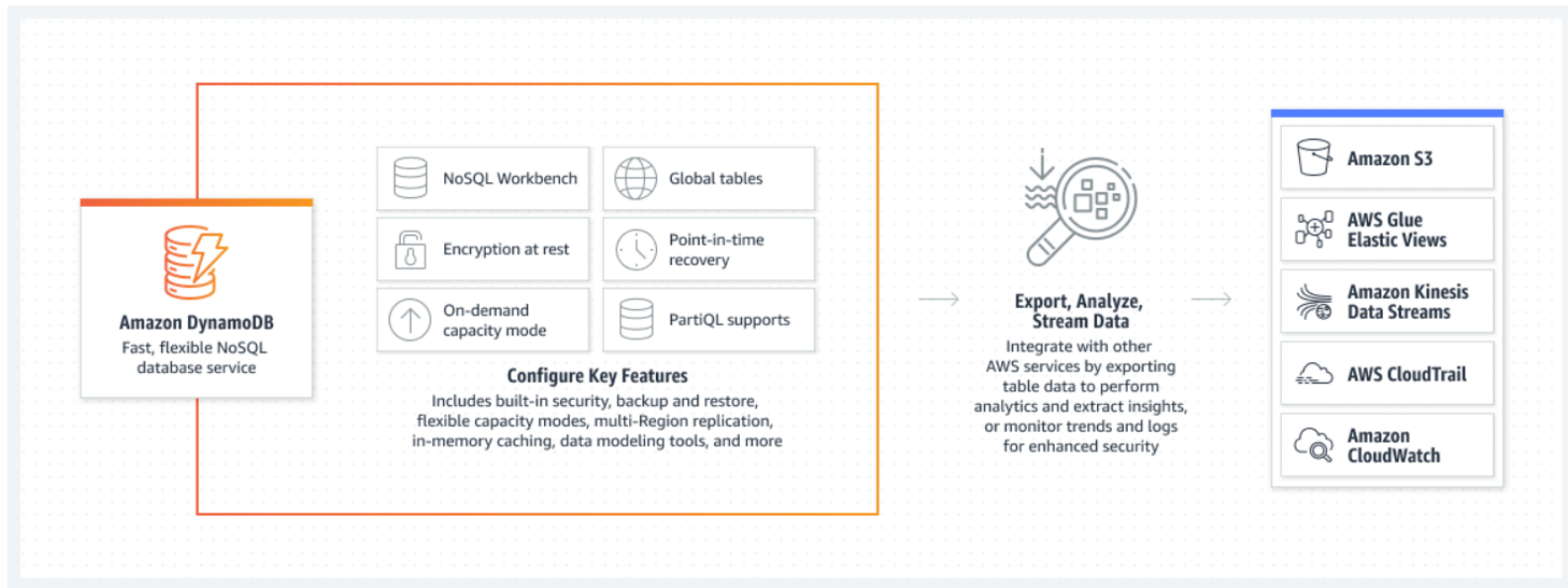
- Data represented as a logical grouping of attributes and relationships
- Captures entire hierarchy (parent and children) used to describe an entity (or "document")
- Data is repeated (rather than normalized), fully encapsulating all detail about an entity in the system
- Fluid data design

# Amazon DynamoDB



Source: https://aws.amazon.com/dynamodb/

## LAB:

DynamoDB – Relational Data Migration

Execute the tutorial available at
https://learn.acloud.guru/handson/3f2be21a-91fd-4872-aa33-58a1ee38e832

**LAB:**

DynamoDB – Microservice

Execute the tutorial available at
https://learn.acloud.guru/handson/ab9e8bda-1f6f-4af8-9465-f8e3e14cc7d1

**DEMO:**

CDK Aspects & Config

https://github.com/KernelGamut32/cloud-accelerator-program-aws-public/tree/main/week04/demos/aspects-and-config

# Thank you!

If you have additional questions,
please reach out to me at:
asanders@gamuttechnologysvcs.com