

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

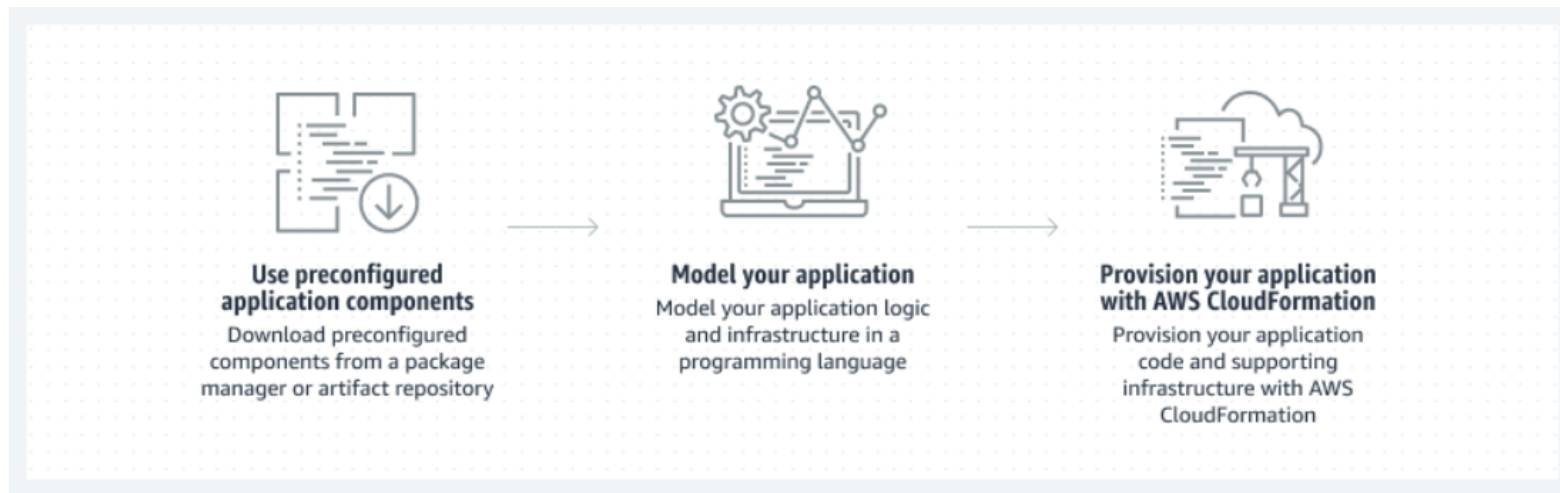


How we're going to work together

- 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



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

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

CDK Application

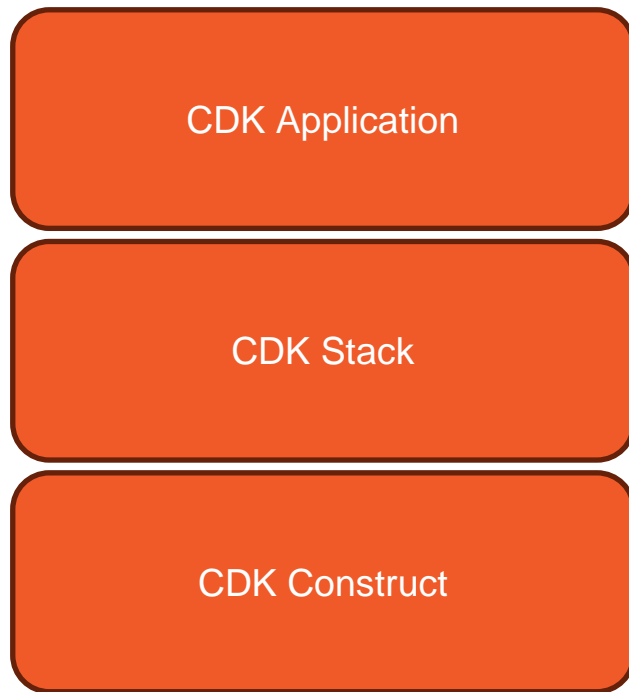
CDK Stack

CDK Construct

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

CDK – Key Concepts

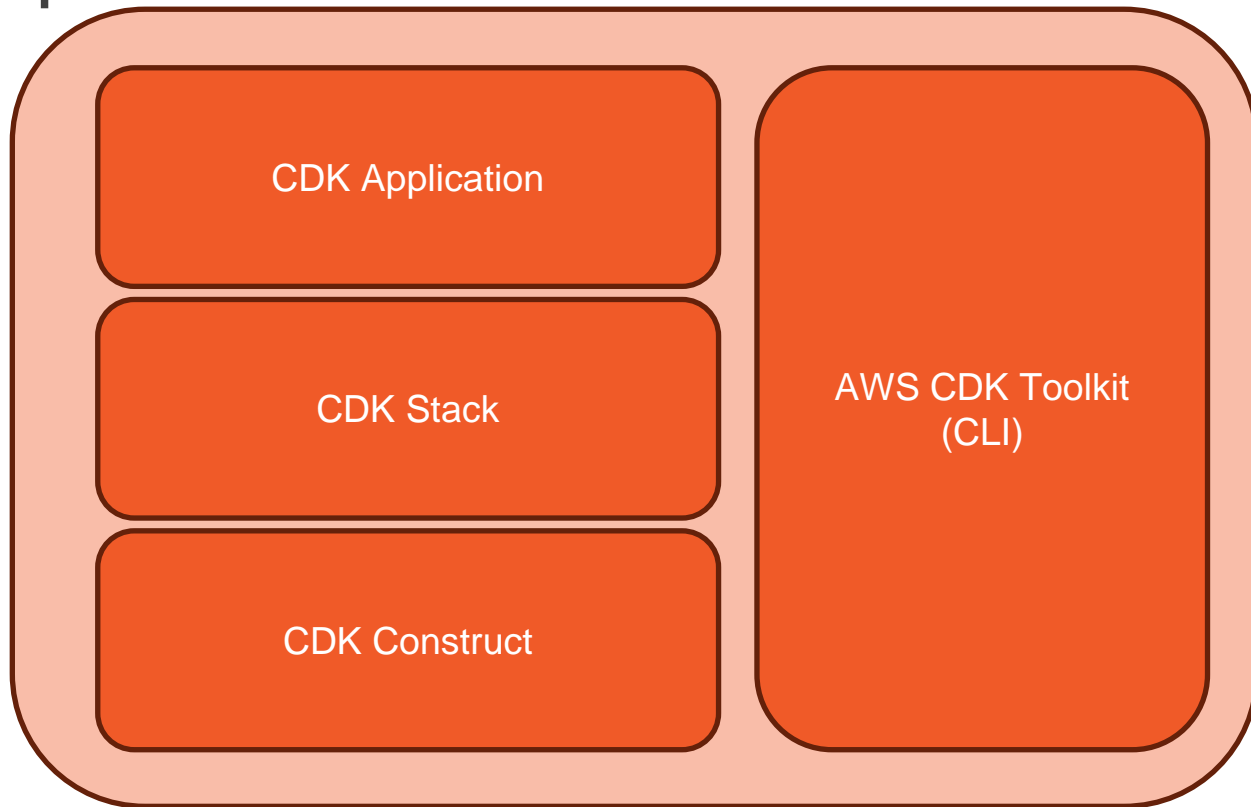
Representation of one or more Cloud resources categorized into multiple “levels”



L1, L2, and L3

CDK – Key Concepts

Supports application
bootstrapping,
application
synthesis, and
deployment



CDK – Languages Supported

TypeScript / JavaScript

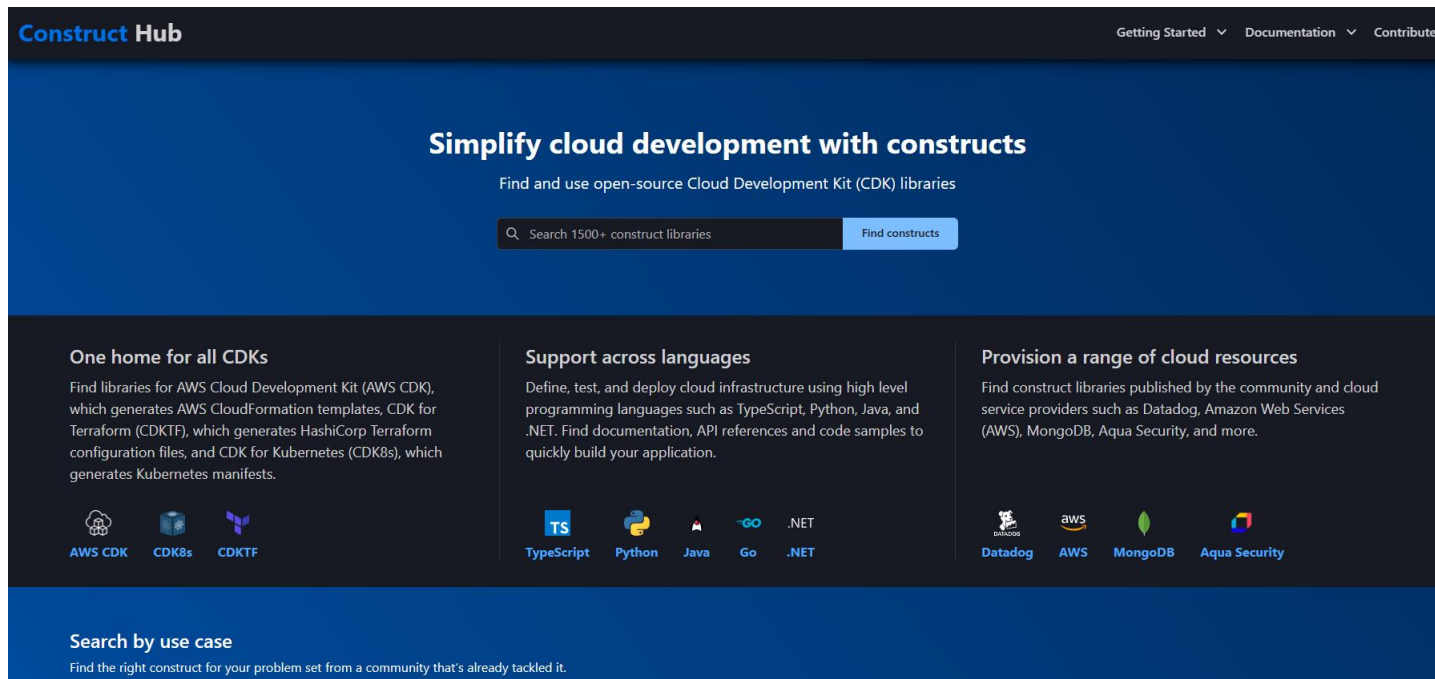
Java

Python

C#

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

CDK – Construct Hub



The screenshot shows the Construct Hub website with a dark blue header and a main content area. The header includes the 'Construct Hub' logo and navigation links for 'Getting Started', 'Documentation', and 'Contribute'. The main content area features a large blue banner with the title 'Simplify cloud development with constructs' and a subtitle 'Find and use open-source Cloud Development Kit (CDK) libraries'. Below the banner is a search bar with the placeholder text 'Search 1500+ construct libraries' and a 'Find constructs' button. The main content is divided into three columns: 'One home for all CDKs', 'Support across languages', and 'Provision a range of cloud resources'. Each column contains a description and a row of logos for various CDKs, programming languages, and cloud services.

Construct Hub Getting Started ▾ Documentation ▾ Contribute




Simplify cloud development with constructs

Find and use open-source Cloud Development Kit (CDK) libraries

🔍 Search 1500+ construct libraries Find constructs






One home for all CDKs

Find libraries for AWS Cloud Development Kit (AWS CDK), which generates AWS CloudFormation templates, CDK for Terraform (CDKTF), which generates HashiCorp Terraform configuration files, and CDK for Kubernetes (CDK8s), which generates Kubernetes manifests.

 **AWS CDK** **CDK8s** **CDKTF**





Support across languages

Define, test, and deploy cloud infrastructure using high level programming languages such as TypeScript, Python, Java, and .NET. Find documentation, API references and code samples to quickly build your application.

 **TypeScript** **Python** **Java** **Go** **.NET**

Provision a range of cloud resources

Find construct libraries published by the community and cloud service providers such as Datadog, Amazon Web Services (AWS), MongoDB, Aqua Security, and more.

 **Datadog** **AWS** **MongoDB** **Aqua Security**

Search by use case
Find the right construct for your problem set from a community that's already tackled it.

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:

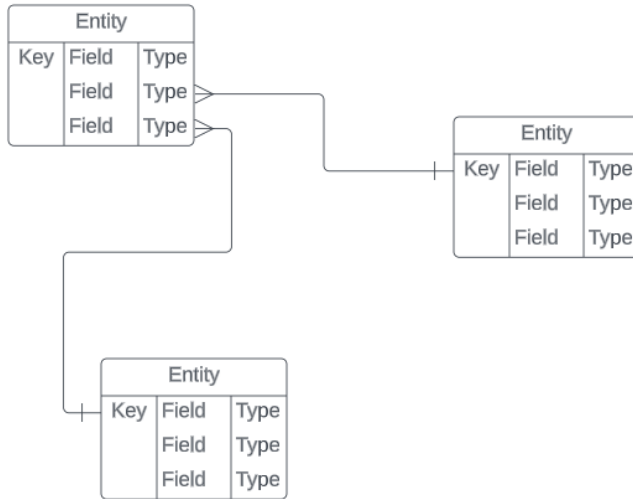
CDK – Serverless Part 2

Execute the tutorial available at

https://docs.aws.amazon.com/cdk/v2/guide/serverless_example.html

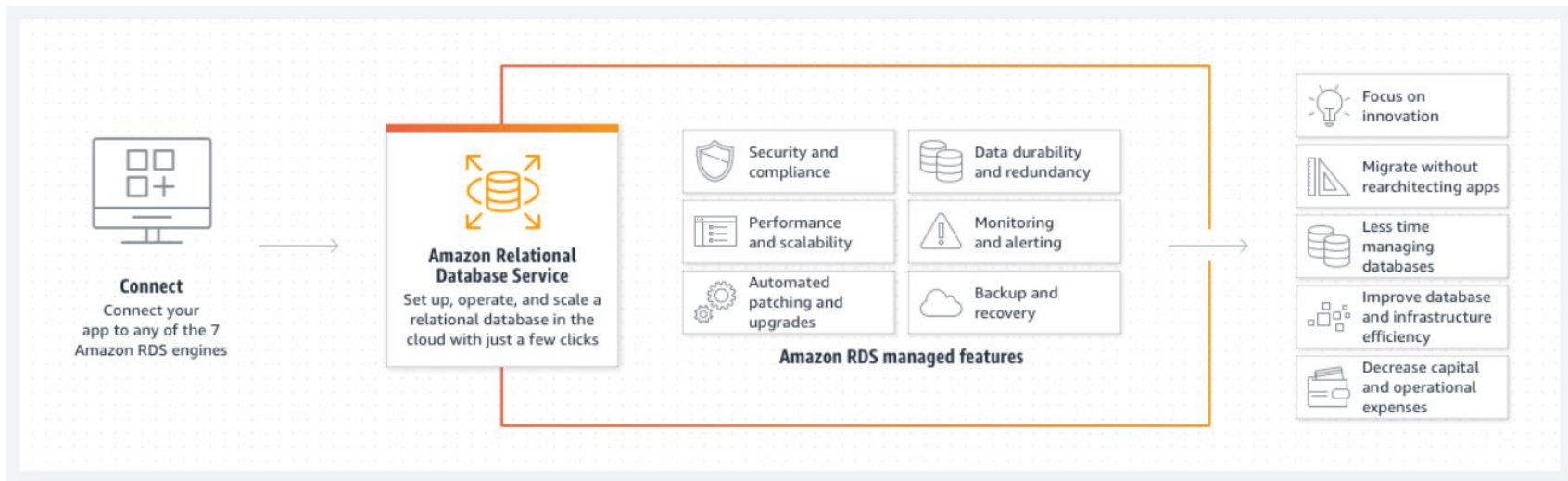
Relational Database Service (RDS)

Relational Databases



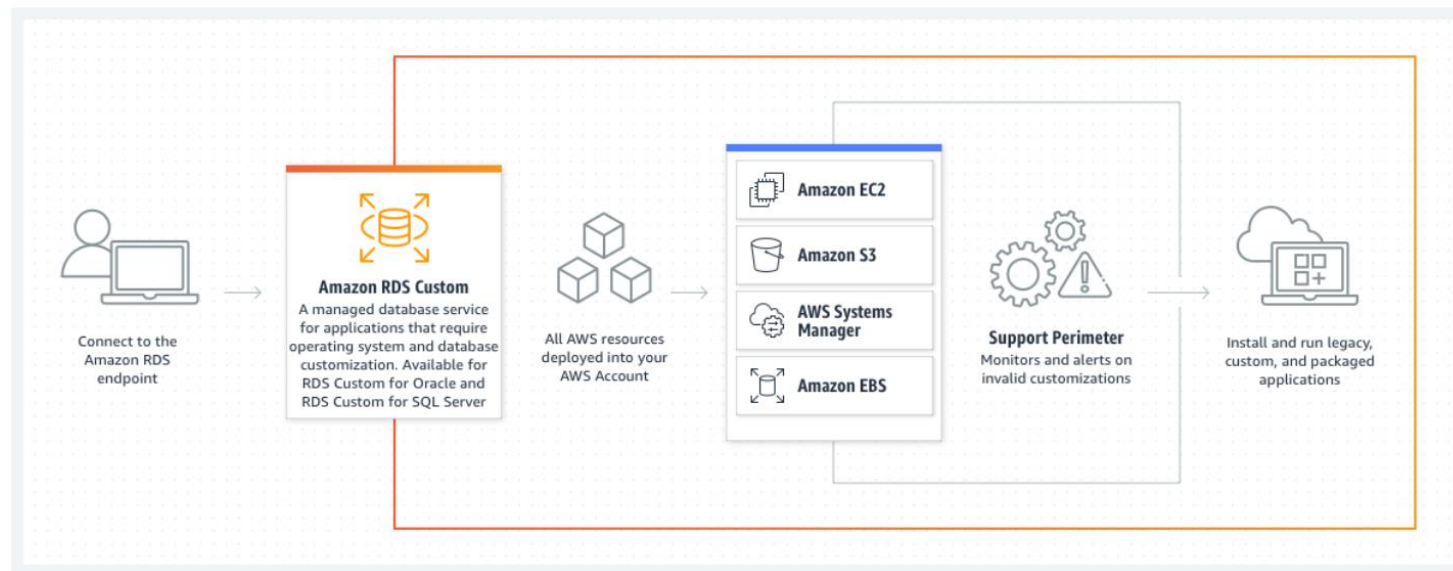
- Collection of related tables (representing entities) and fields (representing entity attributes)
- Supports identification of keys that can be used to quickly locate and uniquely identify entities
- Normalized relationships used to create hierarchies of connected entities and minimize data duplication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

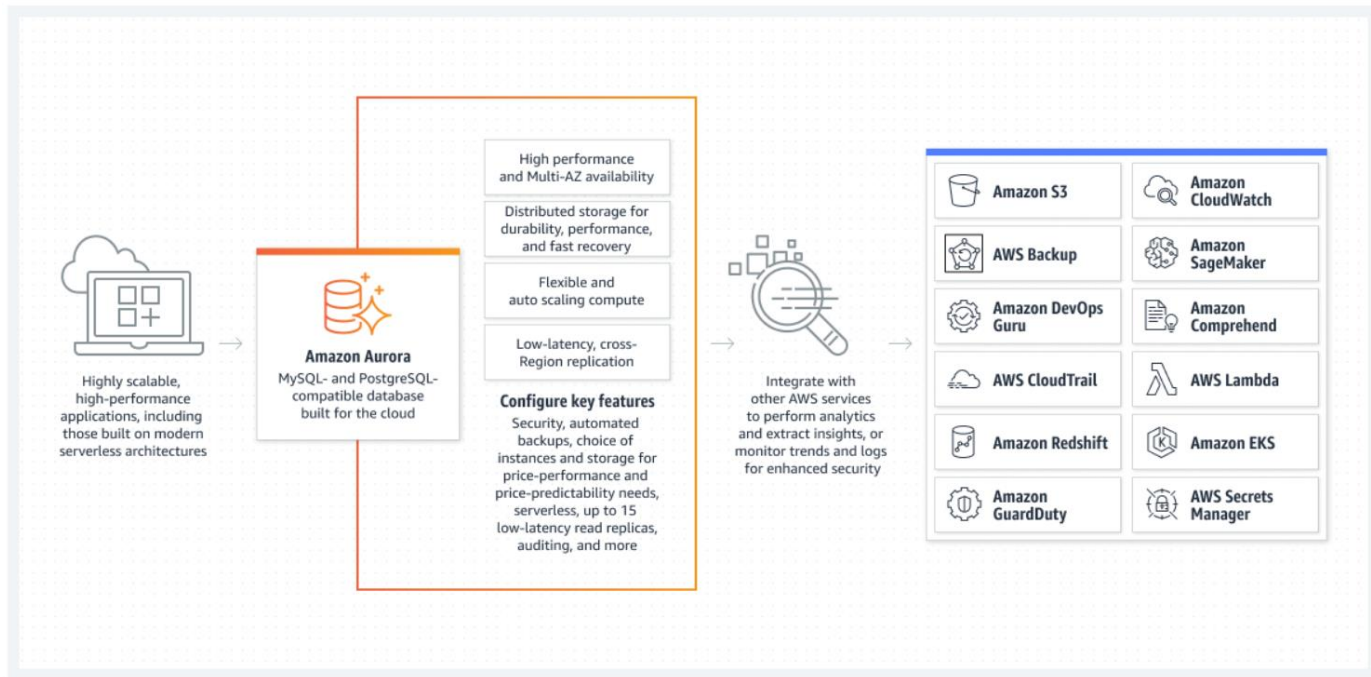
Microsoft SQL Server

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>

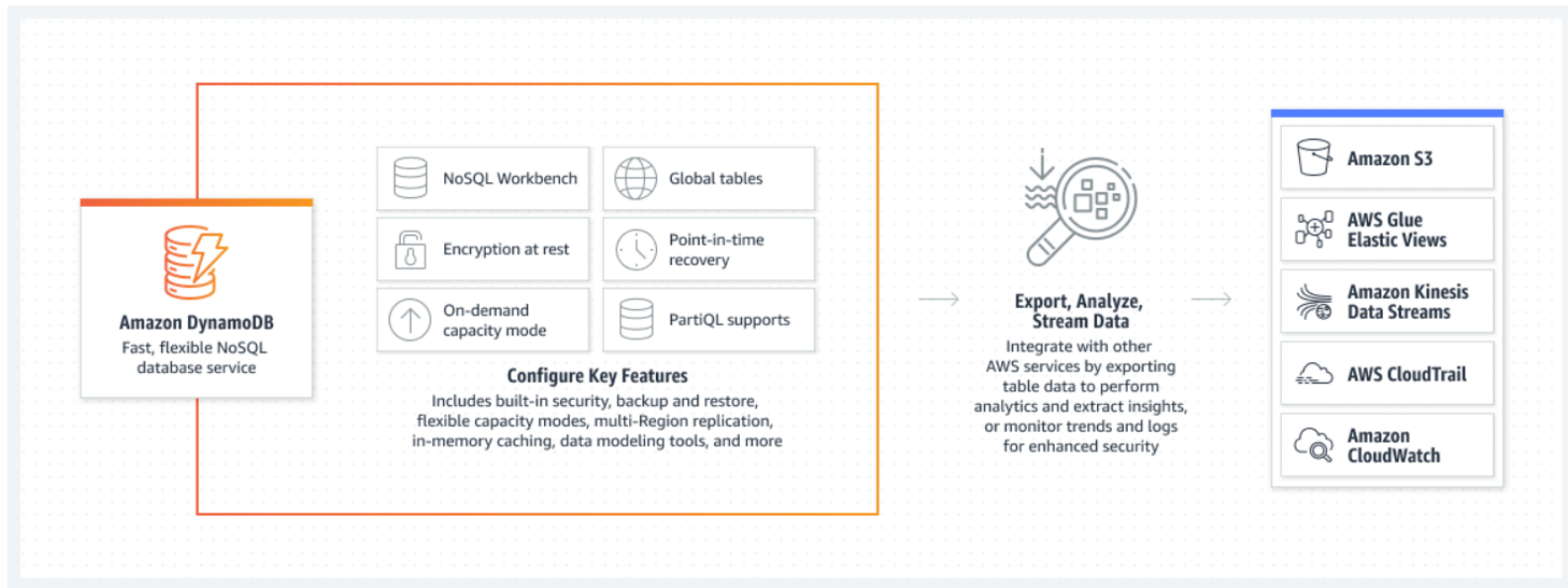
DynamoDB

Document Databases

```
{
  "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