

AWS Cloud DevOps Training



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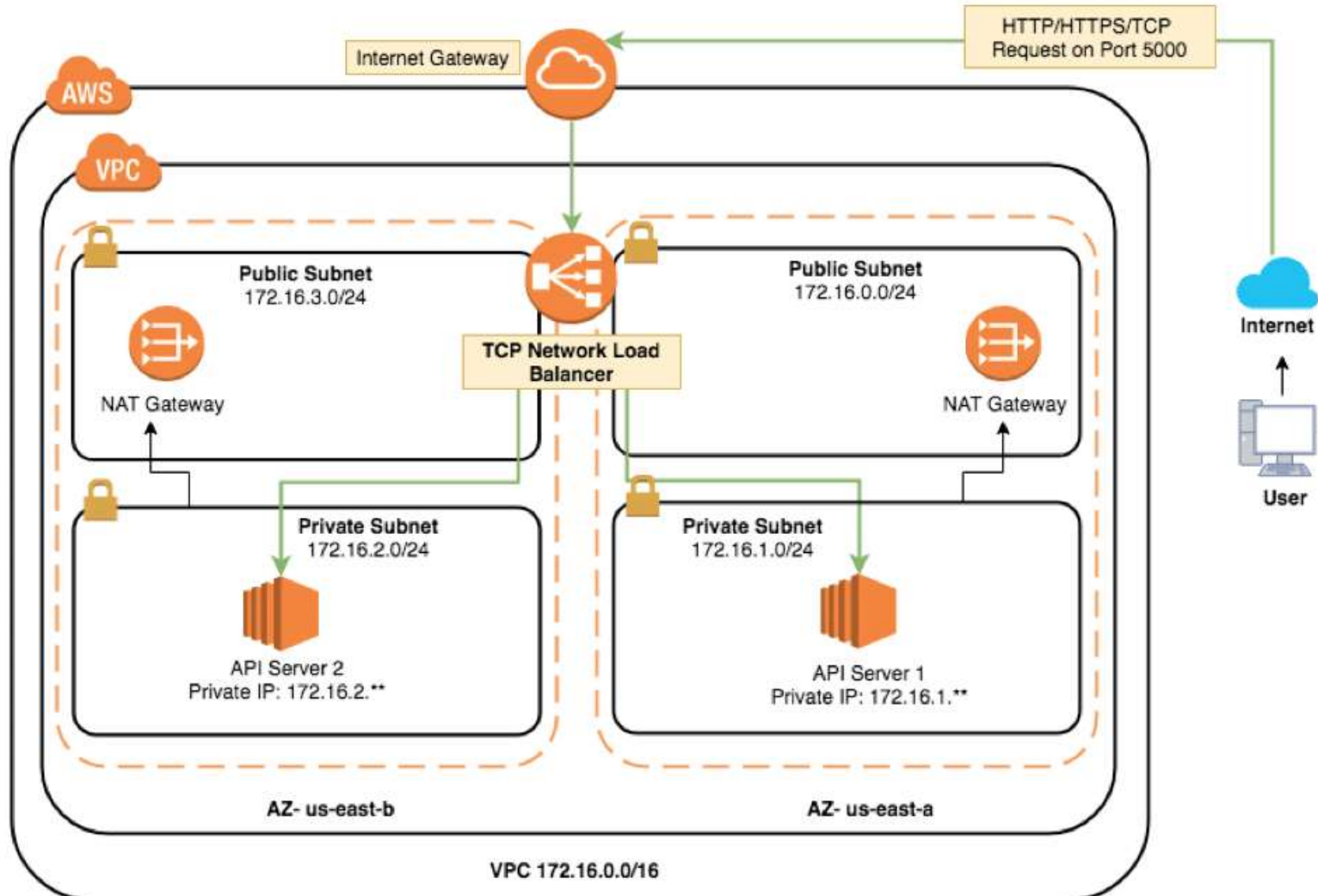
Cost Explorer

- ✓ AWS Cost Explorer has an easy-to-use interface that lets you visualize, understand, and manage your AWS costs and usage over time.
- ✓ Using [this procedure](#) on the Billing and Cost Management console, you can enable Cost Explorer for your account.
- ✓ You can't enable Cost Explorer using the API. After enabling Cost Explorer, AWS prepares the data about your current month and the last 12 months' costs, then calculate the forecast for the next 12 months.

Identity & Access Management

- ✓ With AWS Identity and Access Management (IAM), you can specify who or what can access services and resources in AWS, centrally manage fine-grained permissions, and analyze access to refine permissions across AWS.
- ✓ Create granular permissions based on user attributes—such as department, job role, and team name—by using attribute-based access control.
- ✓ Use IAM to manage and scale workload and workforce access securely supporting your agility and innovation in AWS.

Public & Private Subnets with EC2



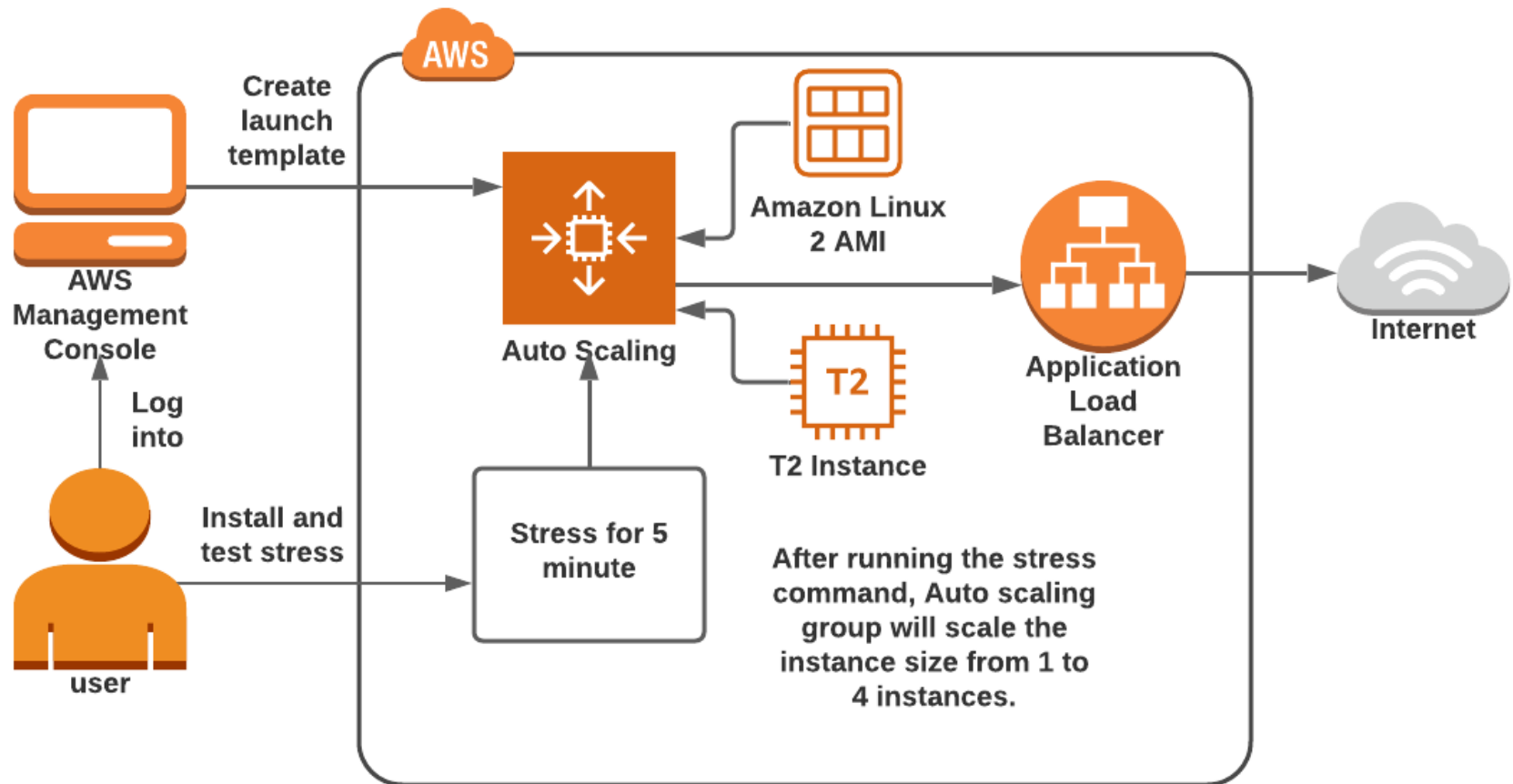
Virtual Private Cloud

- ✓ Amazon Virtual Private Cloud (Amazon VPC) enables you to launch AWS resources into a virtual network that you've defined.
- ✓ This virtual network closely resembles a traditional network that you'd operate in your own data center, with the benefits of using the scalable infrastructure of AWS.
- ✓ A VPC is a virtual network that resembles a traditional network you'd operate in your own data center.

Elastic Compute Cloud

- ✓ Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides secure, resizable compute capacity in the cloud.
- ✓ Access reliable, scalable infrastructure on demand. Scale capacity within minutes with SLA commitment of 99.99% availability.
- ✓ Optimize performance and cost with flexible options like AWS Graviton-based instances, Amazon EC2 Spot instances, and AWS Savings Plans.

EC2 with ASG & ALB



Load Balancer

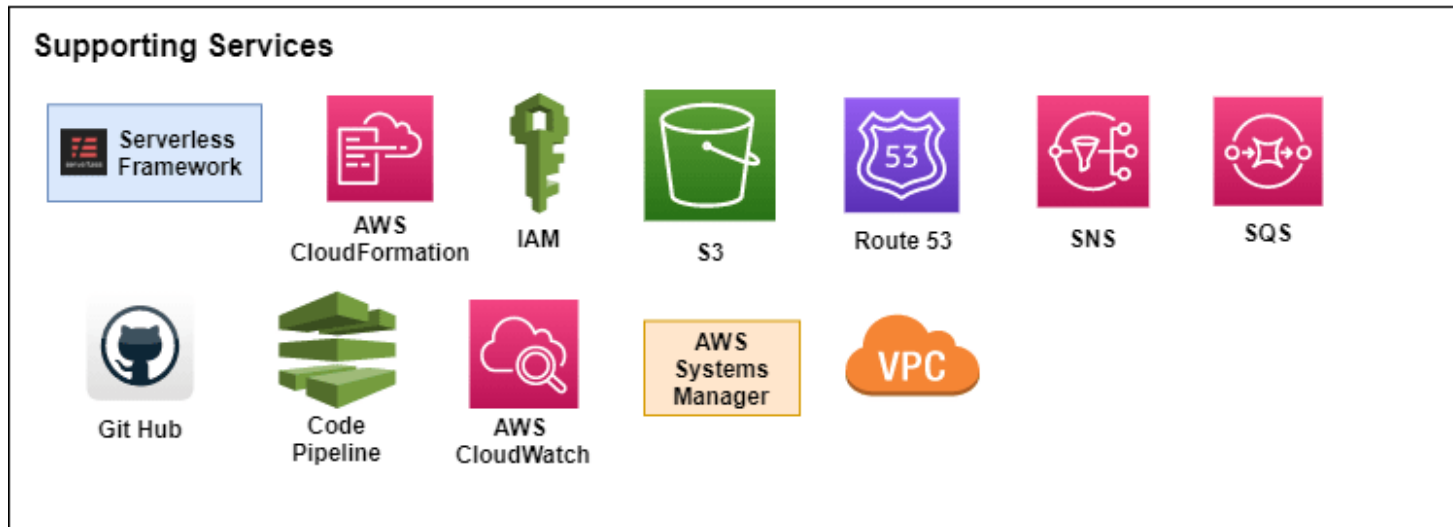
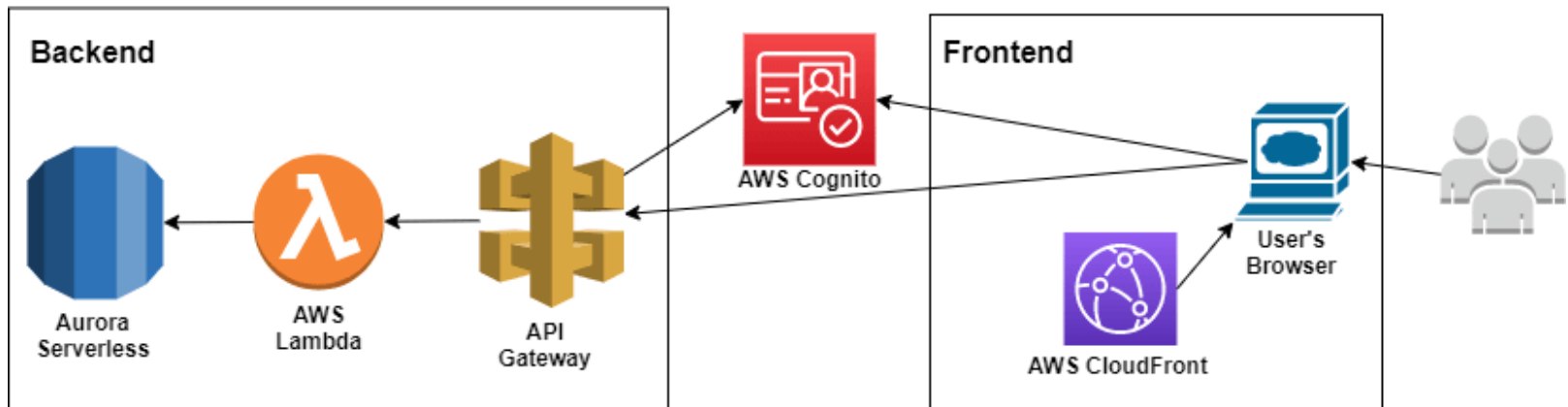
- ✓ Elastic Load Balancing (ELB) automatically distributes incoming application traffic across multiple targets and virtual appliances in one or more Availability Zones (AZs).
- ✓ Types of Load Balancers (ELB):
 - ✓ Application Load Balancer
 - ✓ Network Load Balancer
 - ✓ Gateway Load Balancer
- ✓ Load balance across AWS and on-premises resources using a single load balancer.

EC2 - Auto Scaling

- ✓ Add or remove compute capacity to meet changing demand.
- ✓ Improve fault tolerance through automatic detection and replacement of unhealthy instances.
- ✓ Increase availability with predictive or dynamic scaling policies with the right amount of compute capacity.
- ✓ Optimize workload performance and cost by combining purchase options and instance types.
- ✓ Reduce the complexity of configuration changes and application deployments with instance refresh.

Serverless Architecture Reference

AWS Serverless Architecture



Simple Storage Service

- ✓ Amazon S3 is an object storage service that offers industry-leading scalability, data availability, security, and performance.
- ✓ Store and protect any amount of data for a range of use cases, such as data lakes, websites, cloud-native applications, backups, archive, machine learning, and analytics.
- ✓ Amazon S3 is designed for 99.999999999% (11 9's) of durability, and stores data for millions of customers all around the world.

Lambda Function

- ✓ Run code without provisioning or managing infrastructure. Simply write and upload the code as a .zip file or container image.
- ✓ Automatically respond to code execution requests at any scale, from a dozen events per day to hundreds of thousands per second.
- ✓ Optimize code execution time and performance with the right function memory size. Respond to high demand in double-digit milliseconds with Provisioned Concurrency.

CloudWatch

- ✓ Observe and monitor resources and applications on AWS, on premises, and on other clouds.
- ✓ Collect, access, and analyze your resource and application data using powerful visualization tools.
- ✓ Seamlessly integrate with more than 70 AWS services for simplified monitoring and scalability.
- ✓ Troubleshoot operational problems with actionable insights derived from logs and metrics in your CloudWatch dashboards.

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.
- ✓ APIs act as the "front door" for applications to access data, business logic, or functionality from your backend services.
- ✓ Using API Gateway, you can create RESTful APIs and WebSocket APIs that enable real-time two-way communication applications. API Gateway supports containerized and serverless workloads, as well as web applications.

Simple Notification Service

- ✓ Amazon Simple Notification Service (SNS) sends notifications two ways, A2A and A2P. A2A provides high-throughput, push-based, many-to-many messaging between distributed systems, microservices, and event-driven serverless applications.
- ✓ These applications include Amazon Simple Queue Service (SQS), Amazon Kinesis Data Firehose, AWS Lambda, and other HTTPS endpoints. A2P functionality lets you send messages to your customers with SMS texts, push notifications, and email.

Simple Queue Service

- ✓ Amazon Simple Queue Service (SQS) lets you send, store, and receive messages between software components at any volume, without losing messages or requiring other services to be available.
- ✓ Eliminate overhead with no upfront costs and without needing to manage software or maintain infrastructure.
- ✓ Reliably deliver large volumes of data, at any level of throughput, without losing messages or needing other services to be available for **Asynchronous data processing** logic.

AWS DB Services

Database

Relational

Key-value & Document

In-memory

Wide-column & Graph

Time series & Ledger

Data Migration



Amazon Aurora



Amazon DynamoDB



Amazon ElastiCache



Amazon Keyspaces
(for Apache Cassandra)



Amazon Timestream



AWS Database Migration
Service (AWS DMS)



Amazon RDS



Amazon DocumentDB
(with MongoDB compatibility)



ElastiCache
for Redis



Amazon Neptune



Amazon Quantum Ledger
Database (Amazon QLDB)



Amazon Redshift

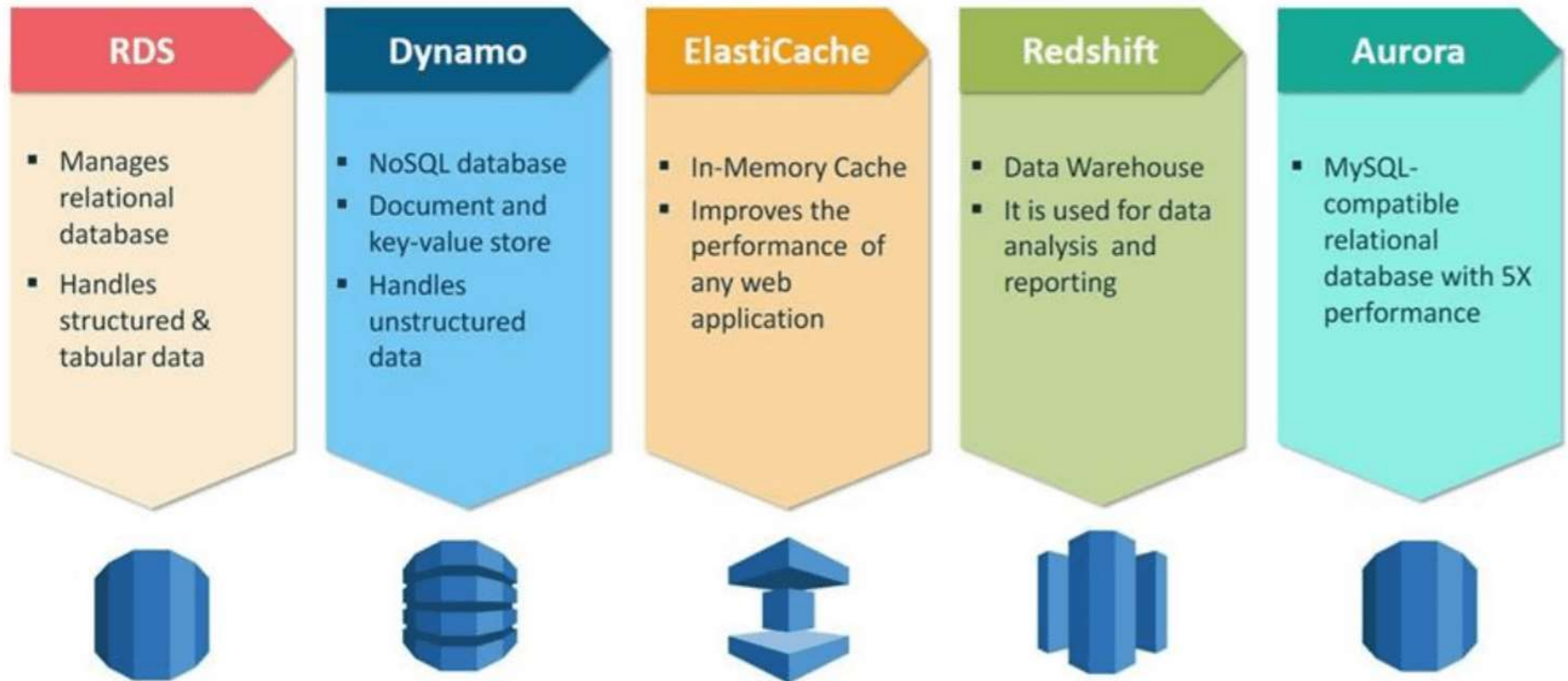


ElastiCache for
Memcached



Amazon RDS on
VMware

AWS DB Services Overview



Relational Database Service

- ✓ Amazon RDS is a managed relational database service for MySQL, PostgreSQL, MariaDB, Oracle BYOL, or SQL Server.
- ✓ Support growing apps with high availability, throughput, and storage scalability.
- ✓ Take advantage of flexible pay-per-use pricing to suit various application usage patterns.
- ✓ Innovate and build new apps with Amazon RDS instead of worrying about self-managing your databases, which can be time consuming, complex, and expensive.

DynamoDB

- ✓ A serverless database for applications that need high performance at any scale for NoSQL data structure.
- ✓ Amazon DynamoDB is a fully managed, serverless, key-value NoSQL database designed to run high-performance applications at any scale.
- ✓ DynamoDB offers built-in security, continuous backups, automated multi-Region replication, in-memory caching, and data import and export tools.

RedShift

- ✓ Amazon Redshift uses SQL to analyze structured and semi-structured data across data warehouses, operational databases, and data lakes, using AWS-designed hardware and machine learning to deliver the best price performance at any scale.
- ✓ Tens of thousands of customers today rely on Amazon Redshift to analyze exabytes of data and run complex analytical queries, making it a widely used cloud data warehouse.
- ✓ Run and scale analytics in seconds on all your data without having to manage your data warehouse infrastructure.

Aurora (As a part of RDS)

- ✓ Designed for unparalleled high performance and availability at global scale with full MySQL and PostgreSQL compatibility.
- ✓ Amazon Aurora provides built-in security, continuous backups, serverless compute, up to 15 read replicas, automated multi-Region replication, and integrations with other AWS services.
- ✓ Amazon Aurora is a relational database management system (RDBMS) built for the cloud with full MySQL and PostgreSQL compatibility. Aurora gives you the performance and availability of commercial-grade databases at

Neptune

- ✓ Amazon Neptune is a fully managed database service built for the cloud that makes it easier to build and run graph applications.
- ✓ Neptune provides built-in security, continuous backups, serverless compute, and integrations with other AWS services.
- ✓ Build graph queries for near real-time fraud pattern detection by modeling relationships between people, places, and transactions to discover relationships that might not be obvious.

AWS Security Services

- Identity and Access Management



IAM



AWS-STS



MFA token



AWS Organizations

- Detective Controls



AWS Config



AWS CloudTrail



Amazon CloudWatch

- Infrastructure Protection



Amazon CloudFront



Amazon VPC



AWS Shield



AWS WAF



Amazon Inspector

- Data Protection:



KMS



S3



Elastic Load Balancing (ELB)



Amazon EBS



Amazon RDS

- Incident Response



IAM



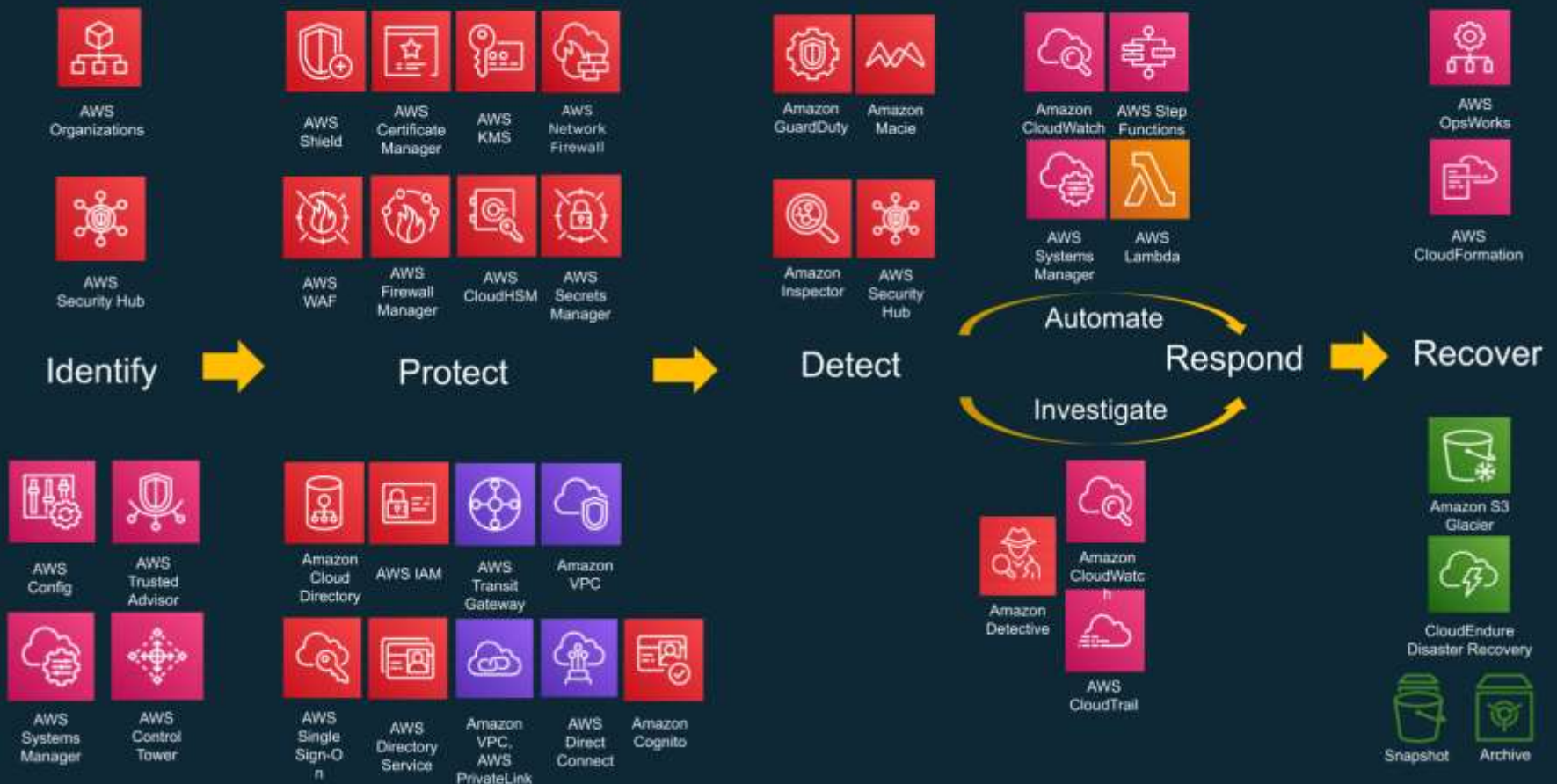
AWS CloudFormation



Amazon CloudWatch Events

AWS Security Best Practices

AWS foundational and layered security services



Secrets Manager

- ✓ AWS Secrets Manager helps you manage, retrieve, and rotate database credentials, API keys, and other secrets throughout their lifecycles.
- ✓ AWS Secrets Manager helps you manage access to your applications, services, and IT resources.
- ✓ Centrally store and manage credentials, API keys, and other secrets.
- ✓ Use AWS Identity and Access Management (IAM) permissions policies to manage access to your secrets.

Key Management Service

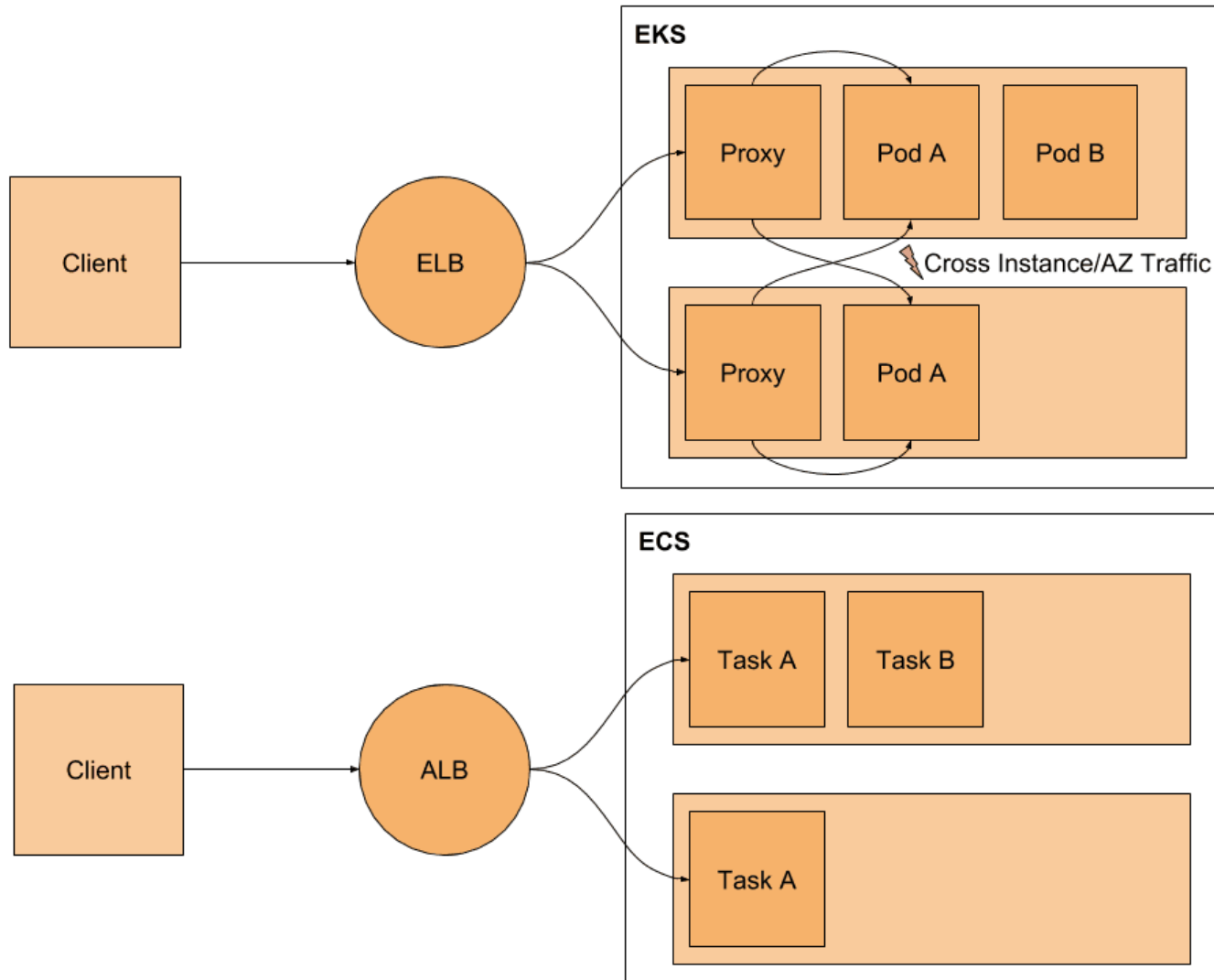
- ✓ AWS Key Management Service (AWS KMS) lets you create, manage, and control cryptographic keys across your applications and AWS services.
- ✓ Use AWS KMS to encrypt data across your AWS workloads, digitally sign data, encrypt within your applications using AWS Encryption SDK, and generate and verify message authentication codes (MACs).
- ✓ Activate server-side encryption with AWS KMS using KMS keys that you control and manage.

AWS Container Services



Technology	AWS-Native	Kubernetes (Open Source)
Container Terminology	Task	Pod
Dedicated ENI Support	Yes	Yes
Container Limit (Per Instance)	Up to 120 tasks	Up to 750 Pods
Pricing- Service Fee	Free	144\$ per Cluster
Deployment Effort	"Out of the box"	Requires expertise
Security (Granular IAM Roles)	IAM Role per task	Not Supported
Multi-Cloud Compatibility	AWS Only	Multi-Cloud\On-Prem

AWS Container Services



Elastic Container Registry

- ✓ Amazon ECR is a fully managed container registry offering high-performance hosting, so you can reliably deploy application images and artifacts anywhere.
- ✓ Meet your image compliance security requirements using the tightly integrated Amazon Inspector vulnerability management service to automate vulnerability assessment scanning and remediation ticket routing.
- ✓ Publish containerized applications with a single command and easily integrate your self-managed environments.

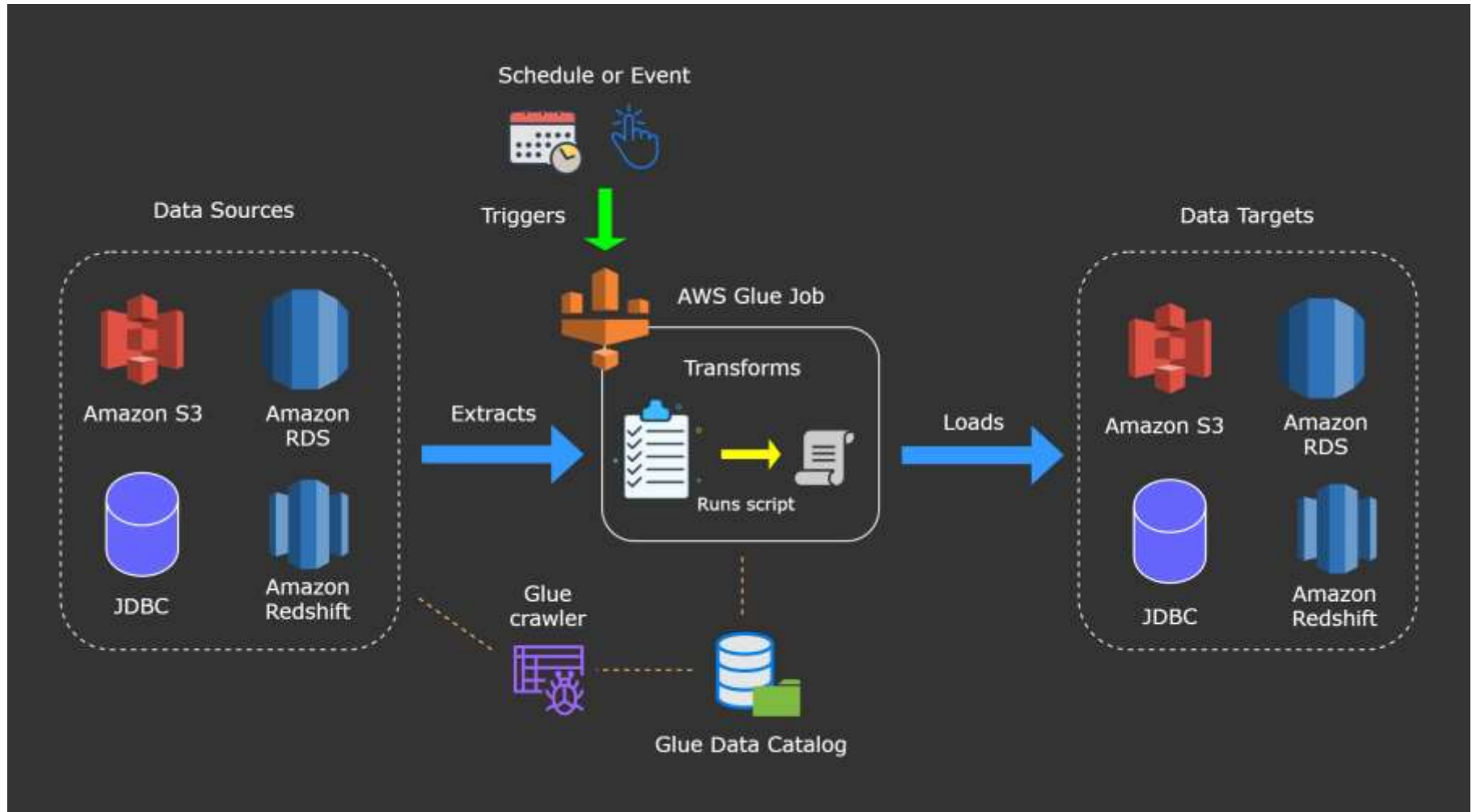
Elastic Container Service

- ✓ Amazon Elastic Container Service (ECS) is a fully managed container orchestration service that simplifies your deployment, management, and scaling of containerized applications.
- ✓ Amazon ECS is a fully managed container orchestration service that helps you to more efficiently deploy, manage, and scale containerized applications.
- ✓ It deeply integrates with the AWS environment to provide an easy-to-use solution for running container workloads in the cloud and on premises.

Elastic Kubernetes Service

- ✓ Amazon EKS is a managed Kubernetes service to run Kubernetes in the AWS cloud and on-premises data centers.
- ✓ In the cloud, Amazon EKS automatically manages the availability and scalability of the Kubernetes control plane nodes responsible for scheduling containers, managing application availability, storing cluster data, and other key tasks.
- ✓ With Amazon EKS, you can take advantage of all the performance, scale, reliability, and availability of AWS infrastructure.

AWS Data Engineering Services



Glue (ETL Jobs)

- ✓ AWS Glue is a serverless data integration service that makes it easier to discover, prepare, move, and integrate data from multiple sources for analytics, machine learning (ML), and application development.
- ✓ Preparing your data to obtain quality results is the first step in an analytics or ML project. AWS Glue is a serverless data integration service that makes data preparation simpler, faster, and cheaper.
- ✓ You can discover and connect to over 70 diverse data sources, manage your data in a centralized data catalog, and visually create, run, and

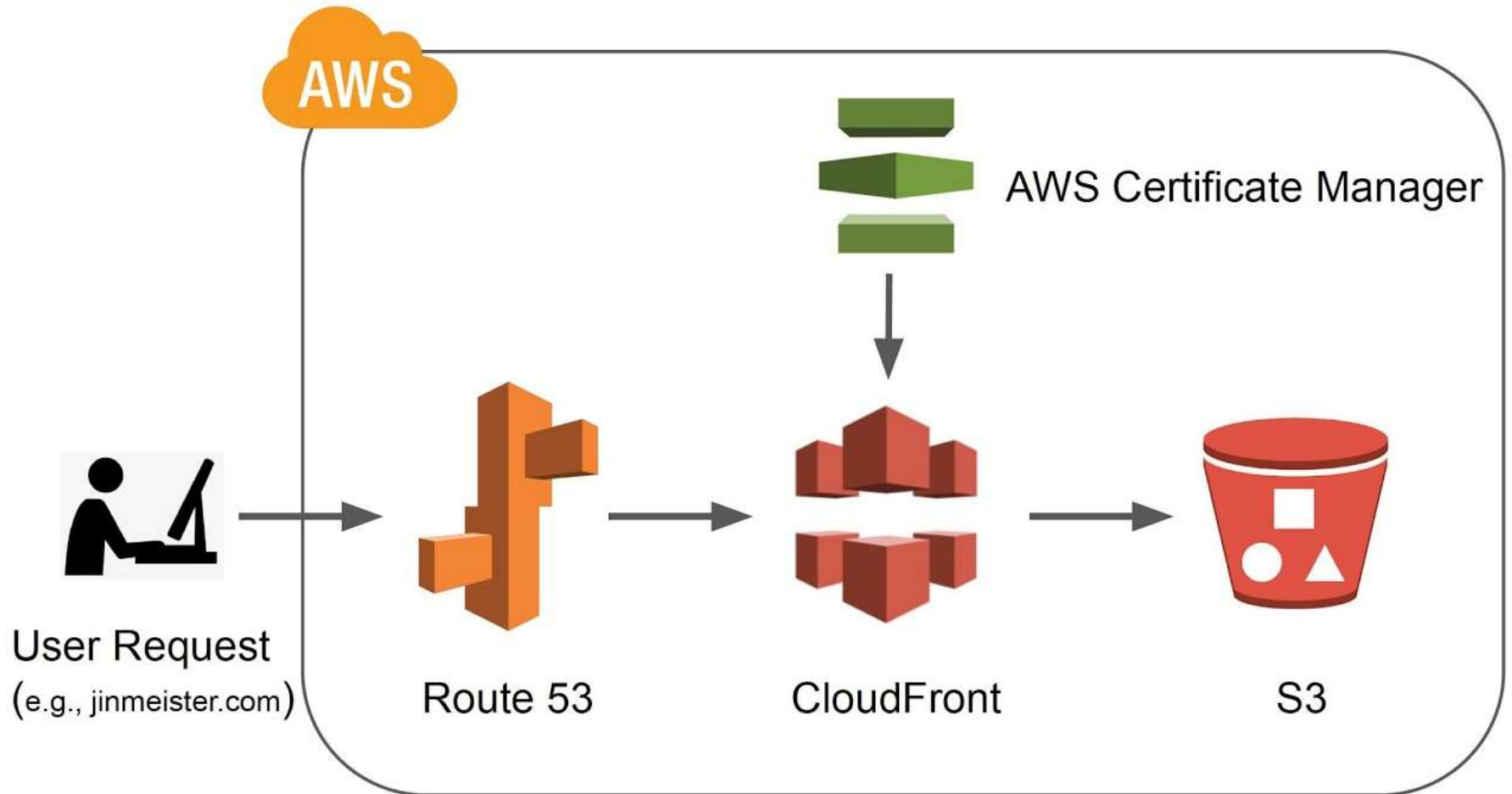
CloudFormation (IaC)

- ✓ AWS CloudFormation lets you model, provision, and manage AWS and third-party resources by treating infrastructure as code.
- ✓ Automate, test, and deploy infrastructure templates with continuous integration and delivery (CI/CD) automations.
- ✓ Run anything from a single Amazon Elastic Compute Cloud (EC2) instance to a complex multi-region application.

CloudTrail

- ✓ AWS CloudTrail monitors and records account activity across your AWS infrastructure, giving you control over storage, analysis, and remediation actions.
- ✓ Monitor, store, and validate activity events for authenticity. Easily generate audit reports required by internal policies and external regulations.
- ✓ Detect unauthorized access using the Who, What, and When information in CloudTrail Events. Respond with rules-based EventBridge alerts and automated workflows.

AWS DNS + CDN Management



CloudFront

- ✓ Amazon CloudFront is a content delivery network (CDN) service built for high performance, security, and developer convenience.
- ✓ Reach viewers across the globe in milliseconds with built-in data compression, edge compute capabilities, and field-level encryption.
- ✓ Optimize dynamic web content delivery with the purpose-built and feature-rich AWS global network infrastructure supporting edge termination and WebSockets.

Route53

- ✓ Amazon Route 53 is a highly available and scalable [Domain Name System \(DNS\)](#) web service. Route 53 connects user requests to internet applications running on AWS or on-premises.
- ✓ Create, visualize, and scale complex routing relationships between records and policies with easy-to-use global DNS features.
- ✓ Set routing policies to pre-determine and automate responses in case of failure, like redirecting traffic to alternative Availability Zones or Regions.

Any questions or queries?

- Reach out to me on Insta, LinkedIn, Email or WhatsApp:

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