پک حرفه ای متخصص دیتاساینس

فهرست سرفصل‌های دوره‌های آموزشی

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AWS

Getting Organized and Platform Introduction

- Welcome to the Course!
- Quick Platform Introduction
- Understanding Content Flow
- Suggested Study Plan For Best Outcomes

Introduction to Cloud Computing

- Comparing On-premises Data Centers vs. Cloud
- Private, Public, and Hybrid Cloud
- Cloud Services (Offering) - IaaS , PaaS, SaaS, XaaS

AWS Services Part I

- AWS Global Infrastructure
- Creating an AWS Account
- AWS Management Console Walkthrough
- Exploring the AWS Free Tier - Services you can use for free in AWS
- AWS Identity and Access Management (IAM) 101
- AWS VPC Components - Internet Gateway and Virtual Private Gateway
- Introduction to AWS Virtual Private Cloud (VPC) Part I
- AWS VPC - Public vs. Private Subnets & Hybrid Connectivity 101

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AWS Services Part II

- Introduction to Elastic Compute Cloud (EC2) - The AWS Compute Service
- Private, Public, and Elastic IP Addresses
- Understanding Security Groups
- Understanding Network Access Control Lists (Network ACLs)
- Encryption 101
- AWS Key Management Service (KMS) 101
- AWS Simple Storage Service 101
- AWS IAM Access Keys and AWS CLI
- AWS IAM Elements, IAM Policies and IAM Roles.
- Amazon Simple Queue Service (SQS) & Simple Notification Service (SNS)
- Amazon CloudFront 101
- Amazon Route 53 - The DNS Service 101
- Amazon Relational Database Service (RDS) 101

Key Architecture Pillars and AWS Management and Governance 101

- Understanding Monolithic vs. Microservices Application Architecture
- High Availability, Fault Tolerance, and Elastic Load Balancing (ELB)
- Amazon CloudWatch 101
- Amazon CloudTrail
- Disaster Recovery (DR) & DR Approaches in AWS

AWS Virtual Private Cloud (VPC) & Hybrid Cloud Networking

- NAT Instance and NAT Gateway
- Bastion Hosts
- VPC Peering & Transit Gateway
- VPC Endpoints
- IPV6 Egress-Only Internet Gateway
- VPC FlowLogs
- AWS Managed Virtual Private Networks (VPNs)
- Amazon Direct Connect & Direct Connect Gateway

Elastic Compute Cloud (EC2) & Elastic Block Store (EBS)

- EC2 Instance Types and Instance Lifecycle
- EC2 instance Metadata and User Data
- EC2 Instance Launch Type (Purchase Options)
- EC2 Instance Placement Groups
- EC2 Instance Monitoring
- Elastic Block Store Types
- EBS Snapshots Operations and Encryption
- EBS RAID and AWS Batch
- AWS Lightsail
- AWS Outposts
- VMware Cloud on AWS

Elastic Load Balancing (ELB) & Auto Scaling

Elastic Load Balancing - Target Groups, Listeners, and Health Check
ELB Cross Zone Load Balancing and ELB Design for High Availability
ELB and Security Groups
ELB and Digital Certificates - Encryption In-Transit

- ELB Client IP, Monitoring, Scaling and PFS Support
- Application Load Balancer - Specific Features
- ALB Desync Mitigation
- Network Load Balancer (NLB) and Endpoint Services
- Auto Scaling
- Auto Scaling - Launch Templates and Scaling Policies
- Auto Scaling - Lifecycle Hooks and Timers

Relational Database Services (RDS) , Aurora, and Redshift

- RDS - Multi AZ and Backups (Automated and Manual)
- RDS Scaling and Read Replicas & RDS Snapshot Operations and Security
- Amazon RDS Cross Region Automated Backups
- RDS Custom for Oracle and MS SQL
- Amazon RDS-multi-AZ DB cluster Deployment MySQL and PostgreSQL
- Amazon RDS Proxy
- Amazon Aurora
- Aurora and RDS Proxy
- Amazon Aurora Serverless
- Aurora Machine Learning
- Amazon Redshift

NoSQL Database Services (DynamoDB, ElastiCache, DocumentDB, and Neptune)

- NoSQL and Introduction to DynamoDB
- Amazon DynamoDB-Capacity Modes Auto Scaling and Table Class
- DynamoDB - Advanced Features
- Database Transaction Models - ACID vs. BASE
- ElastiCache
- ElastiCache - Caching Strategies
- Amazon DocumentDB and Neptune (GraphDB)

- Amazon KeySpaces
- Amazon Quantum Ledger DB
- Amazon Teamstream
- ElastiCache for Redis-Sorted Sets and Global Data Stores

Identity & Access Management - Intermediate

- Introduction To The Second Half Of The Course
- IAM - Identity-based Policies
- IAM - Security Token Service (STS) and IAM Roles
- Cross Account Access with External ID
- IAM - Resource-based Policies, Permissions Boundary & Evaluation Logic

Simple Storage Service (S3) - Deep Dive

- S3 Overview and Data Consistency Model
- S3 Tiered Storage Classes
- S3 Storage Classes- Lifecycle Policies
- S3 Intelligent- Tiering Class
- S3 Glacier- Archiving Classes
- S3 Multi-Part Upload
- S3 Encryption At Rest and In-Transit
- S3 Server-Side Encryption SSE-S3
- S3 Server-Side Encryption SSE-KMS
- S3 SSE - Customer Provided Keys SSE- C
- S3 Buckets - Default Encryption
- S3 Versioning and Cross (and Same) Region Replication [CRR and SRR]
- S3 Object and Glacier Vault Lock
- S3 Static Website Hosting
- S3 Features : Pre-Signed URLs, Transfer Acceleration and Requester Pays

- Understanding S3 Access Management and Object Ownership
- S3 Bucket Policy Examples
- S3 Cross Origin Resource Sharing (CORS)
- S3 & Glacier SELECT, Performance Considerations, and AWS Transfer Family
- Sec 10 S3 Monitoring Notification and Server Access Logs
- S3 Additional Features

CloudFront, Route53, and Global Accelerator

- CloudFront Deep Dive
- CloudFront - Serving Private Content using CloudFront
- CloudFront Geo Restriction (GeoBlocking)
- CloudFront Caching Layers
- CloudFront - Monitoring , Logs , Access , Classes and Pricing
- Amazon Route 53 - The AWS DNS Service
- Route 53 Routing Policies (cont.) & Route 53 Resolver
- IP-Based Routing For Route53
- Global Accelerator

Serverless Computing in AWS

- AWS Lambda
- AWS Lambda- Concurrent Execution
- AWS Lambda- Function URL
- S3 Object Lambda
- Lambda@Edge>
- API Gateway
- Serverless Application Repository

Storage Services (EFS, FSx, Storage Gateway, Snow Family, Backup and DataSync)

- Elastic File System (EFS)
- EFS Storage Classes
- EFS Additional Features
- Amazon FSx
- Storage Gateway
- FSx File Gateway
- Snow Family
- AWS Backup and Datasync

Container Services in AWS (ECS, ECR, EKS)

- Introduction to Containers and Amazon Elastic Container Service (ECS)
- Amazon ECS - Features and Use Cases
- Amazon AppRunner
- ECS Anywhere
- Amazon Elastic Kubernetes Service (EKS)
- EKS Distro
- EKS Anywhere
- AWS Porton

Notifications, Application Integration, and Messaging Services in AWS

- Amazon Simple Queue Service - Deep Dive
- SQS Temporary Queues
- Amazon Simple Notification Service (SNS) - Deep Dive
- Amazon MQ and Step Functions
- Amazon AppFlow

Management and Monitoring in AWS (CloudWatch, CloudWatch Logs, and EventBridge)

- CloudWatch and CloudWatch Alarms
- CloudWatch Logs
- Amazon EventBridge (The Successor of CloudWatch Events)

Governance, Deployment Automation, and Operations in AWS

- AWS Organizations
- AWS Control Tower
- AWS CloudFormation
- Elastic Beanstalk
- AWS OpsWorks
- Systems Manager (SSM) and Parameter Store
- Secrets Manager
- AWS Config
- Trusted Advisor
- AWS Health Dashboard and AWS Service Health Dashboard
- Compute Optimizer
- License Manager
- AWS Service Catalog
- Service Quotas
- Amazon Managed Service For Prometheus AMP

Security, Identity, and Compliance Services

- AWS CloudHSM (Hardware Security Module)
- AWS Shield (Standard and Advanced) for DDoS Protection in AWS
- AWS Web Application Firewall (WAF)
- Amazon GuardDuty

- Amazon Inspector
- Amazon Macie
- Amazon Cognito
- AWS Directory Services
- IAM Identity Center (Formerly - AWS Single Sign-On (SSO))
- AWS Audit Manager
- AWS Certificate Manager
- Amazon Detective
- AWS Security Hub
- AWS Firewall Manager
- AWS Network Firewall
- AWS and Defence In-Depth
- KMS Multi-Region Keys

Analytics Services in AWS

- Amazon Redshift Spectrum
- Amazon Elastic Map Reduce (EMR)
- Amazon Athena
- AWS Glue
- Amazon Kinesis Data Streams
- Amazon Kinesis Data Firehose & Data Analytics
- Amazon QuickSight
- AWS Data Pipeline
- Amazon MSK (Managed Streaming For Apache Kafka)
- AWS Lake Formation
- AWS Data Exchange

Machine Learning Services in AWS

- Machine Learning
- AWS Forecast
- Amazon Sagemaker
- Amazon Rekognition
- Amazon Polly
- Amazon Lex
- Amazon Connect
- Amazon Transcribe
- Amazon Comprehend & Amazon Comprehend Medical
- Amazon Translate
- Amazon Alexa
- Amazon Kendra
- Amazon Textract
- Amazon Personalize
- Amazon Fraud Detector

Mobile and Web Services

- AWS Device Farm
- AWS Amplify
- AWS AppSync
- Amazon Pinpoint

Migration and DR Services

- Amazon Application Discovery Service
- Elastic Disaster Recovery Service(AWS DRS)
- Application Migration Service(MGN) (CloudEndure migration)
- AWS Database Migration Service (DMS)

- AWS Server Migration (SMS)
- AWS Migration Hub
- AWS Migration Strategies - The 7R's

AWS - The Well Architected Framework

The Well Architected Framework

Additional Services

- Amazon OpenSearch
- Elastic Transcoder
- Amazon AppSync
- Amazon WorkSpaces
- Amazon WorkDocs
- AWS X-Ray
- AWS Resource Access Manager (RAM)
- AWS Cost Explorer
- Cost Management
- AWS Budgets
- AWS Artifact

PostgreSQL

Introduction and Installing PostgreSQL

- Understanding PostgreSQL's history and advantages
- Installation methods: Docker/Direct Install
- Connecting to PostgreSQL: Dbeaver/PgAdmin

Entity-Relationship (ER) Design

- Basics of ER modeling and database design
- Using PgAdmin ERD Tool

SQL Fundamentals

- Data Definition Language (DDL): Keys, attribute types, constraints
- Data Manipulation Language (DML): INSERT, UPDATE, DELETE, transactions
- SELECT Query Fundamentals: Structure, operators, conditions, sorting, grouping, and aggregations

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Advanced SQL Techniques

- Joins and CTE: Complex joins and Common Table Expressions
- Subqueries and CASE WHEN: Advanced query construction

Mastering SQL in PostgreSQL:

Window Functions and Advanced Queries

- Window Functions: Analytic, aggregate, and ranking functions
- Practical Queries (Exercise): Real-world query scenarios

Working With Data Types

- Working With JSON Data: Storing and querying JSON data
- Recursive Queries for Tree Structures/Arrays: Handling hierarchical data
- Popular SQL/PG Functions: String manipulation, date/time functions, statistics

Database Optimization Techniques

- Analyzing query plans with EXPLAIN and monitoring queries with pg_stat_statements
- Index Types and Usage Guide: Understanding and optimizing index usage
- Views and Materialized Views: Creating efficient views and optimizing with materialized views

Backup, Recovery, and Security

• Backup and Recovery Strategies: Point-in-time recovery, restore procedures
• Log Management and Replication: Managing logs, setting up replication
• User Access Management: Creating and managing users, roles, and privileges
• Security and Encryption: Implementing security measures and data encryption

Specialized PostgreSQL Topics:

Advanced Programming in PostgreSQL

• Writing PL/PgSQL Code: IF, FOR, WHILE loops, and conditional constructs
• Functions and Stored Procedures: Using built-in and creating user-defined functions
• Triggers: Implementing triggers for data auditing

Database Internals and Advanced Concepts

• Lateral Join and Flattening: Understanding lateral joins and data flattening
• Internal PostgreSQL Tables: Exploring internal system tables
• Foreign Data Wrappers and Cross-Database Queries: Integrating external data sources
• Postgres Extensions and PostGIS: Overview, installation, and usage of useful extensions

Performance Optimization and Scalability

- Distributed PG Using Citus: Scaling horizontally with Citus
- High Availability: Ensuring continuous availability and Consistency levels
- Query Parallelism: Configuring and optimizing parallel execution
- Managing Large Databases: Partitioning, tablespaces, and disk space management
- Modern Online PG Tools: Exploring tools like SupaBase, CockroachDB, TimescaleDB, Grafana
- Dashboards, CDC Tools and so on