

Architecting on AWS – Key Concepts



Module 0 (Core Concepts)

Six advantages and benefits
Cloud Adoption Framework (CAF)

Module 1 (Core Knowledge)

Global Infrastructure
Data Center
Availability Zone
Region
Edge Location
Regional Edge Cache
Unmanaged vs. Managed Services
Shared Responsibility Model

Module 2 (Core Services)

VPC
EC2
AMI
Instance Type
Pricing
On-Demand
Spot
Hibernation
Reserved
Dedicated Hosts
Storage
S3
Bucket
Object
S3 Standard
S3 Standard - IA
EBS
Volume Type
EFS
Glacier
Lifecycle
Database
RDS
DynamoDB
Global Table
On-Demand Backup
Provisioned Throughput
RCU
strongly consistent
eventually consistent
WCU
IAM
Types of Security Credentials
User
Group
Policy
Role
MFA
CloudTrail
Config

Module 3 (Design Environment)

How to choose a region?
Multi-AZ
Multi-VPC vs. Multi-Account
VPC endpoint (S3, DynamoDB)
CIDR
Subnet
Public
Private
Route Table

Security Group
Security Group Chaining
Network ACL
Internet Gateway
NAT Gateway vs. NAT Instance
VPC Flow Logs
Connecting VPCs
VPC Peering
VPN
VGW
CGW
Direct Connect
Default VPC, Default Subnets

Module 4 (High Available Environment)

High Availability
RTO, RPO
Multi-AZ
Inherently HA Services
ELB
Products
Application Load Balancer
Network Load Balancer
Classic Load Balancer
Features
Cross-zone load balancing
Connection draining
Sticky sessions
EIP
Route53
ELB-Alias Queries
Routing
Weighted round robin
Latency-based routing
Geolocation routing
Connection Redundancy
VPN
Direct Connect

Module 5 (Event-Driven Scaling)

Scalability
Vertical
Horizontal
CloudWatch
Metrics
Custom Metrics
Alarm
Logs
Auto Scaling
Launch Configuration
Auto Scaling Group
Min
Max
Desired
ELB
Auto Scaling Policy
Scheduled Action
Warm-up period / Cooldown period
EC2 Auto Recovery
Scaling Data Store
RDS
Sharding
Cache
Read Replica
DynamoDB
Auto-Scaling RCU/WCU
Lambda and Event-Driven Scaling

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Module 6 (Automating Infrastructure)

- Infrastructure as Code
- CloudFormation
 - Description
 - Metadata
 - Parameters
 - Mappings
 - Conditions
 - Resources
 - DependsOn
 - WaitCondition
 - CreationPolicy
 - Outputs
- Elastic Beanstalk
 - Blue-Green Deployment
- OpsWorks
- EC2 System Manager
 - Run Command

Module 7 (Decoupling Infrastructure)

- Loose Coupling Strategies
 - Microservices
- SQS
 - Types
 - Standard
 - FIFO
 - Asynchronous processing
 - Visibility Timeout
 - Dead Letter Queue (DLQ)
- SNS
 - Vs. SQS
 - Fan-out
- Amazon MQ
- DynamoDB
- API Gateway
- Lambda
 - Limitation
 - Free tier

Module 8 (Designing Web-Scale Storage)

- S3
 - Data consistency model
 - read-after-write for PUTS
 - eventual consistency for overwrite PUTS, DELETES
 - Object naming scheme
 - hex hash prefix
 - secondary index
- CloudFront
 - Static & Dynamic
 - Distribution
 - cache control header
 - expire contents
 - TTL
 - Change object name
 - Invalidate object
- DynamoDB
 - strongly or eventually consistent read
 - Global Table
 - On-demand backup
- RDS
 - Aurora

Module 9 (Well-Architected Framework)

- Well-Architected Framework
 - Operational Excellence
 - Security
 - Reliability
 - Performance Efficiency
 - Cost Optimization

Module 10 (Operational Excellence)

Module 11 (Security)

- DDoS
- Inspector
- Shield
 - Standard
 - Advanced
- GuardDuty
 - CloudTrail Events
 - VPC Flow Logs
 - DNS Query Logs
- CloudFront
 - signed-URL
 - OAI (origin access identity)
- KMS
 - Vs. CloudHSM
- Directory Service
 - AWS Directory Service
 - AD Connector
 - Simple AD
- STS
 - assumeRole
 - assumeRoleWithSAML
 - assumeRoleWithWebIdentity

Module 12 (Reliability)

- Disaster Recovery (RTO, RPO)
- WorkSpaces

Module 13 (Performance Efficiency)

- ElastiCache
 - Memcached, Redis
- Kinesis

Module 14 (Cost Optimization)

- TAG
- Free Tier
- Trusted Advisor
- Caching
- Simple Monthly Calculator
- TCO Calculator

Module 15 (Troubleshooting)

- EBS-optimized instance type

Module 16 (Sample Architecture)

- EMR
- RedShift
- Kinesis
 - Kinesis Data Streams
 - Kinesis Data Firehose
 - Kinesis Data Analytics
- Elastic Transcoder