

Architecting on AWS

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Course Resources

Module 1:

Common serverless use cases and patterns

- [Scenarios in the Serverless Application Lens of the AWS Well-Architected Framework](#) (AWS documentation)
- [Customer use cases that use serverless](#) (Blog)
- [AWS re:Invent 2019: Serverless Architectural Patterns and Best Practices](#) (Video)
- [Lambda reference architectures](#) (Github repository)
- [Wild Rydes serverless workshops](#) (Github repository)
- [AWS serverless Airline Booking application](#) (Github repository)

Scoping applications and services

- [Implementing Microservices on AWS](#) (AWS Whitepaper)
- [Domain-Driven Design Community: Learning DDD](#) (Community)
- [AWS re:Invent 2018: Databases on AWS: The Right Tool for the Right Job](#) (Video)
- [Designing Cloud Native Microservices on AWS](#) (Github repository)

Modern application development and event-driven design

- [Enterprise Integration Patterns: Messaging Patterns Overview](#) (Blog)
 - [Werner Vogels' All Things Distributed Blog: Modern Applications at AWS](#)
 - [AWS Well-Architected Tool](#)
 - [AWS Well-Architected Tool - Review Workloads against best practices](#)
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Module 2:

Principals and Identities

- [What is IAM?](#)
- [IAM users](#)
- [IAM roles](#)
- [Least privilege permissions](#)
- [Identity federation in AWS](#)

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Security policies

- [Access policies](#)
- [Access policy boundaries](#)
- [Policy evaluation logic](#)
- [Policies and permissions in IAM](#)
- [IAM JSON policy elements reference](#)
- [Policy evaluation logic](#)
- [Use customer managed policies instead of inline policies](#)
- [Viewing last accessed information for IAM](#)
- [Using AWS Identity and Access Management Access Analyzer](#)
- [Permissions boundaries for IAM entities](#)
- [Identity-based policies and resource-based policies](#)

Managing multiple accounts

- [Inheritance for service control policies](#)
- [How to Use Service Control Policies in AWS Organizations](#)
- [Inheritance for service control policies](#)

Module 3:

Networking Fundamentals

- [AWS Networking Fundamentals](#) (Video)

IP Addressing

- [VPCs and Subnets](#) (AWS documentation)
- [IPv4 CIDR block association restrictions](#) (AWS documentation)
- [How to modify the IPv4 address range of an Amazon VPC?](#) (AWS documentation)
- [Bring Your Own IP Address to the Cloud](#) (video)

VPC Fundamentals

- [VPC Fundamentals and Connectivity Options](#) (video)
- [One to Many: Evolving VPC Design](#) (AWS Architecture Blog)
- [VPC sharing: key considerations and best practices](#) (AWS Networking and Content Delivery)
- [Field Notes: Launch Amazon EMR with a Static Private IP in a Private Subnet](#) (AWS Architecture Blog)

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- [Advanced VPC design and new capabilities for Amazon VPC](#) (video, AWS re:Invent 2020)
- [Secure your workloads with NAT Gateway](#) (video)

VPC Traffic Security

- [VPC Traffic Mirroring - Capture & Inspect Network Traffic](#) (AWS News Blog)
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Module 4:

High Performance Computing

- [AWS re:Invent 2020: HPC on AWS: Innovating without infrastructure constraints \(23min. 58sec\)](#) (Video)
- [FORMULA 1 transfers race car data into AWS using AWS DataSync](#) (Blog)
- [Enabling job accounting for HPC with AWS ParallelCluster and Amazon RDS](#) (Blog)
- [Orchestrating an application process with AWS Batch using AWS CloudFormation](#) (Blog)

AWS Lambda

- [AWS re:Invent 2019: Serverless architectural patterns and best practices \(1hr. 3min. 35sec\)](#) (Video)
 - [Issues to Avoid When Implementing Serverless Architecture with AWS Lambda](#) (Blog)
 - [Introducing Amazon S3 Object Lambda - Use Your Code to Process Data as it is Being Retrieved from S3](#) (Blog)
 - [Building microservices with AWS Lambda \(57min. 34sec\)](#) (Video)
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Module 5:

Storage services

- [AWS Storage Day 2020 \(20min. 7sec\)](#) (Video)
- [AWS Storage - EBS vs S3 vs EFS \(1min. 06sec.\)](#) (Video)
- [Comparing your on-premises storage patterns with AWS Storage Services](#) (Blog)
- [Storage options and designs for VMware Cloud on AWS - Direct Attached Storage](#) (Blog)

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Amazon S3

- [Best Practices for Amazon S3 \(55min. 23sec.\)](#) (Video)
- [S3 Encryption & Networking with S3 PrivateLink & S3 Bucket Keys \(23min. 21sec.\)](#) (Video)
- [Amazon S3 Block Public Access - Another Layer of Protection for Your Accounts and Buckets](#) (Blog)
- [Changing your Amazon S3 encryption from S3-Managed to AWS KMS](#) (Blog)

Shared File Systems

- [Amazon FSx for Windows File Server \(14min. 22sec.\)](#) (Video)
 - [Get Started Using Amazon FSx File Gateway for Fast, Cached Access to File Server Data in the Cloud](#) (Blog)
 - [What's New with Amazon FSx \(27min. 40sec.\)](#) (Video)
 - [High-Performance HDD Storage for Amazon FSx for Lustre File Systems](#) (Blog)
 - [Windows home directories made easy with Amazon FSx](#) (Blog)
 - [Using Microsoft Windows file shares](#) (Blog)
 - [Creating and activating File Gateway on VMware](#) (Blog)
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Module 6:

Amazon RDS

- [Amazon Relational Database Service \(Amazon RDS\)](#) (Video: 1hr. 3min. 17sec)
- [Implementing a disaster recovery strategy with Amazon RDS](#) (Blog)

Amazon DynamoDB

- [AWS re:Invent 2019: Data modeling with Amazon DynamoDB](#) (Video: 39min. 47sec.)
- [Building with Amazon DynamoDB | S1 E1 - Intro to Amazon DynamoDB](#) (Video: 53min. 27sec.)

Database Caching

- [Heimdall Data: Query Caching Without Code Changes](#) (Video: 3min. 36sec.)
- [Automated query caching into Amazon ElastiCache for Amazon RDS, Amazon Aurora and Amazon Redshift](#) (Blog)
- [Caching for performance with Amazon DocumentDB and Amazon ElastiCache](#) (Blog)

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Database Migration Tools

- [AWS Database Migration Service \(AWS DMS\)](#) (Video: 1hr. 00min. 50sec.)
 - [Top 10 Data Migration Best Practices](#) (Video: 32min. 13sec.)
 - [Standardizing Database Migrations with AWS DMS and AWS Service Catalog](#) (Blog)
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Module 7:

CloudWatch Monitoring

- [Monitoring with CloudWatch Dashboards](#) (Video 1hr. 26min. 17sec.)
- [How Amazon CloudWatch works](#) (User guide)
- [Amazon CloudWatch Concepts - Metrics, Alarms, and Statistics](#) (User guide)
- [Creating Metrics From Log Events Using Filters](#) (User guide)
- [Monitor Resource Changes with Amazon CloudWatch Events](#) (Video: 5min. 38sec.)

Load Balancers

- [Simplify Your Infrastructure Management Using AWS CloudFormation](#) (Video: 7min. 47sec.)
- [Get the most from Elastic Load Balancing for different workloads](#) (Video: 53min. 59sec.)
- [Building with AWS PrivateLink, Gateway Load Balancer, and AWS Partners](#) (Video: 29min. 34sec.)

Auto Scaling

- [Capacity management with Amazon EC2 Auto Scaling](#) (Video: 52min. 50sec.)
 - [Scaling up to your first 10 million users](#) (Video: 56min. 19sec.)
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Module 8:

AWS Elastic Beanstalk

- [AWS re:Invent 2019: Deploy your code, scale your application, and lower cloud costs using Elastic Beanstalk](#) (Video: 56min. 25sec.)
- [Introducing a new generation of AWS Elastic Beanstalk platforms](#) (Blog)
- [Optimizing the cost of running AWS Elastic Beanstalk Workloads](#) (Blog)

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AWS CloudFormation

- [Simplify Your Infrastructure Management Using AWS CloudFormation](#) (Video: 7min. 46sec.)
- [AWS Container Day - Amazon EKS and AWS Fargate: Better Together](#) (Video: 21min. 49sec.)

AWS Systems Manager

- [AWS Systems Manager: Gain operational insights and take action on AWS resources](#) (Video: 48min. 44sec.)
 - [AWS Systems Manager Operational Capabilities](#) (White Paper)
 - [Getting started with AWS Systems Manager](#) (AWS Documentation)
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Module 9:

Microservices

- [Moving from Monolith to Microservices with Amazon ECS](#) (Video: 14min. 14sec.)
- [Migrating Applications from Monolithic to Microservice on AWS](#) (Blog)
- [Application Modernization Using Microservices Architecture with VMware Cloud on AWS](#) (Blog)

Containers

- [AWS Fargate: Are serverless containers right for you?](#) (Video: 31min. 25sec.)
 - [Getting Started with Amazon ECS Anywhere](#) (Blog)
 - [AWS Container Day - Amazon EKS and AWS Fargate: Better Together](#) (Video: 21min. 49sec.)
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Module 10:

VPC Endpoints

- [What is an Interface VPC Endpoint, and how can I create an Interface endpoint for my VPC](#) (Video: 5min. 7 sec.)
- [Centralize access using VPC interface endpoints to access AWS services across multiple VPCs](#) (Blog)

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Transit Gateway

- [Back to Basics: Building a Global Network with AWS Transit Gateway](#) (Video: 6min. 5sec.)
- [Common Use Cases for Transit Gateways](#) (Documentation)

Hybrid Networking

- [AWS re:Invent 2019: Connectivity to AWS and hybrid AWS network architectures](#) (Video: 49min. 37sec.)
- [Adding MACsec security to AWS Direct Connect connections](#) (Blog)
- [AWS Direct Connect Integration with VMware Cloud on AWS](#) (Blog)
- [AWS App Mesh - Application-Level Networking for Cloud Applications](#) (Blog)
- [Setup routing AWS Direct Connect private virtual interfaces to access VPC resources](#) (Video: 7min. 21sec.)
- [What's the difference between a hosted virtual interface \(VIF\) and a hosted connection?](#) (Video: 5min. 8sec.)

Route 53

- [AWS re:Invent 2020: Global traffic management with Amazon Route 53](#) (Video: 30min. 37sec.)
- [Using Route 53 Private Hosted Zones for Cross-account Multi-region Architectures](#) (Blog)
- [Creating Amazon Route 53 health checks and configuring DNS failover](#) (Blog)

Module 11:

Amazon API Gateway

- [Interconnecting Amazon VPCs across AWS Regions using AWS Transit Gateway](#) (Video: 27min. 48sec.)
- [Introducing Amazon API Gateway service integration for AWS Step Functions](#) (Blog)
- [Best Practices for Building Enterprise Grade APIs with Amazon API Gateway](#) (Video: 40min. 01sec.)
- [How do I restrict access to my API Gateway via API Gateway resource policies](#) (Video: 3min. 01sec.)
- [API Gateway Types: I didn't know Amazon API Gateway did that?](#) (Video: 56min. 24sec.)

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Amazon Simple Queue Service

- [AWS on Air 2020: AWS Next ft. Amazon MQ for RabbitMQ](#) (Video: 27min. 12sec.)
- [New Rabbit MQ Message Broker Service](#) (Blog)

Simple Notification Service

- [AWS re:Invent 2020: Scalable serverless event-driven architectures with SNS, SQS & Lambda](#) (Video: 32min. 48sec.)
- [Application Integration Using Queues and Messages](#) (Blog)
- [Simple Two-way Messaging using the Amazon SQS Temporary Queue Client](#) (Blog)

Amazon Kinesis

- [Amazon Kinesis Data Streams Fundamentals](#) (Video: 5min. 19sec.)
- [Stream data to an HTTP endpoint with Amazon Kinesis Data Firehose](#) (Blog)
- [Under the hood: Scaling your Kinesis data streams](#) (Blog)

AWS Step Functions

- [AWS re:Invent 2020: Getting started with AWS Step Functions for service orchestration](#) (Video: 29min. 11sec.)
- [Manage a Batch Job \(AWS Batch, Amazon SNS\) using Step Functions](#) (AWS documentation)



Module 12:

Edge Fundamentals

- [Computing at the Edge: Choose the Best Option for Your Application](#) (Video: 49min. 14sec.)
- [The extended cloud: AWS powers edge-to-cloud applications](#) (Video: 42min. 30sec.)
- [AWS Wavelength - Edge Computing for 5G Networks](#) (Video: 2min. 09sec.)

CloudFront

- [Optimizing the performance in Amazon CloudFront](#) (Video: 51min. 35sec.)

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- [Using CloudFront, AWS WAF, and Lambda@Edge to keep spammers out](#)(Video: 48min. 53sec.)

Global Accelerator

- [What's New with AWS Global Accelerator](#) (Video: 38min. 27sec.)
- [Leveraging AWS Global Accelerator and Amazon GameLift FleetIQ](#) (Blog)

DDoS protection

- [Application Acceleration and Protection with Amazon CloudFront, AWS WAF, and AWS Shield](#) (Video: 49min. 10sec.)
- [High-performance DDoS Protection with AWS](#) (Video: 5min. 29sec.)
- [DDoS Attack Detection at Scale](#) (Video: 40min. 27sec.)
- [Get ahead of the curve with DDoS Response Team escalations](#) (Video: 30min. 56sec.)

Outposts

- [What is AWS Outpost Rack?](#) (Video: 3 min. 58sec.)
- [AWS Outposts: Cloud where you want it](#) (Video: 33min. 29sec.)
- [AWS Outposts: Networking Foundations](#) (Video: 34min. 09sec.)
- [AWS Outposts: Storage Foundations](#) (Video: 26min. 50sec.)
- [AWS Outposts: An in-depth look at hybrid cloud use cases](#) (Video: 34min. 39sec.)
- [AWS Outposts: Extend the AWS experience to on-premises environments](#) (Video: 59min. 56sec.)
- [How to order AWS Outposts in 7 minutes](#) (Video: 07min. 08sec.)
- [Outpost Hardware Maintenance](#) (User Guide)
- [AWS Outposts Support and Maintenance](#) (Support)

AWS Shield

- [Advanced Techniques for Securing Your Web Applications with AWS WAF and AWS Shield](#) (Video: 51min. 1sec.)
- [AWS Shield - Protect your Applications from DDoS Attacks](#) (Blog)
- [Securing Your Web Applications with AWS WAF and AWS Shield](#) (Video: 51min.)

Module 13:

Recovery Strategies

- [Disaster Recovery of Workloads on AWS](#) (Video: 51min. 10sec.)

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- [Plan for Disaster Recovery \(DR\) \(AWS Resources\)](#)
- [AWS Direct Connect Resiliency Recommendations \(Developer Guide\)](#)

AWS Backup

- [AWS Backup Demo: Cross-Account & Cross-Region Backup \(Video: 12min. 01sec.\)](#)
- [Automate and Centralize Data Protection in the AWS Cloud \(Video: 35min. 40sec.\)](#)
- [Point-in-time recovery and continuous backup for Amazon RDS with AWS Backup \(Blog\)](#)
- [Managing backups at scale in your AWS Organizations using AWS Backup \(Blog\)](#)
- [Secure data recovery with cross-account backup and Cross-Region copy using AWS Backup \(Blog\)](#)

Disaster Planning

- [Disaster Recovery of Workloads on AWS | AWS Events \(Video: 51min. 10sec.\)](#)
- [Disaster Recovery \(DR\) Architecture on AWS \(Blog\)](#)
- [Making Application Failover Seamless by Failing Over Your Private Virtual IP Across Availability Zones \(AWS Partner Network Blog\)](#)
- [Field Notes: Choosing a Rehost Migration Tool - CloudEndure on AWS Server Migration Service \(AWS Architecture Blog\)](#)
- [Disaster Recovery of Workloads on AWS: Recovery in the Cloud \(AWS White Paper\)](#)
- [Field Notes: Setting Up Disaster Recovery in a Different Seismic Zone Using AWS Outposts \(Blog\)](#)

High Availability

- [Multi-Region deployment - Part1: Needs, challenges, and approaches \(Video: 24min. 38sec.\)](#)
- [High Availability and Scalability on AWS \(AWS White Paper\)](#)
- [Architecting for high availability on Amazon S3 \(Blog\)](#)
- [Floating IP Pattern for HA Between Active-Standby Stateful Servers \(AWS White Paper\)](#)
- [Load Balancing for Scalability and HA with WebRTC and SIP \(AWS White Paper\)](#)
- [Cross-Region DNS-Based Load Balancing and Failover \(AWS White Paper\)](#)
- [Data Durability and HA with Persistent Storage \(AWS White Paper\)](#)
- [Dynamic Scaling with AWS Lambda, Amazon Route 53, and AWS Auto Scaling \(AWS White Paper\)](#)