[Introduction to Amazon Simple Storage Service (S3)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2FSPL-TF-100-STESS3-2%3AsFwNxq8AS4Bb7kU3Lce7s8/en-US)

This lab demonstrates how to use an Amazon S3 bucket and manage files, or object, that are stored in the bucket. You will practice how to create a bucket, add an object, view an object, move an object, and delete an object and bucket in the AWS Management Console.

**Duration:**1 hour 30 minutes

[Introduction to Amazon DynamoDB](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-71%3Af94oJXCTxxrjnG1d4G9JuV/en-US)

This lab teaches you about Amazon DynamoDB by walking you through how to create, query, view and delete a table in the AWS Management Console.

**Duration:**40 minutes

[Introduction to AWS Identity and Access Management (IAM)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-66%3A4GBGDP7UkicdWEhpKvmGjP/en-US)

This lab shows you how to manage access and permissions to your AWS services using AWS Identity and Access Management (IAM). Practice the steps to add users to groups, manage passwords, log in with IAM-created users, and see the effects of IAM policies on access to specific services.

**Duration:**45 minutes

[Introduction to AWS Lambda](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-88%3AnnNE2KvPzmF3T69mtHeF12/en-US)

This lab will give you the basic understanding of AWS Lambda. It will demonstrate the basic steps required to get started to create and deploy a Lambda function in an event-driven environment.

**Duration:**45 minutes

[Introduction to Amazon API Gateway](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-58%3A3s4BQNdurHUVPkumk1wUkk/en-US)

In this lab, you will create a simple FAQ microservice. The microservice will return a JSON object containing a random question and answer pair using an API Gateway endpoint that invokes a Lambda function. Prerequisites: students should take the lab "Introduction to AWS Lambda" before taking this lab.

**Duration:**55 minutes

[Introduction to AWS Device Farm](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-27%3A7atH3LyrdoMxxQvKuFX5ex/en-US)

This lab provides the basic hands-on experience of AWS Device Farm Service, which provides a test harness for mobile app developers. It will demonstrate the basic steps required to load an example Android app and run a series of tests, using several common mobile device platforms from Samsung, LG, Amazon, and others.

**Duration:**40 minutes

[Introduction to Amazon CloudFront](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-85%3ArLVofbSE87b1EaWVeZZRhq/en-US)

This lab introduces you to AWS CloudFront, a content delivery web service. In this lab you will create an Amazon CloudFront distribution that will use a CloudFront domain name in the url to distribute a publicly accessible image file stored in an Amazon S3 bucket.

**Duration:**55 minutes

[Introduction to AWS Key Management Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-87%3A3KJDggoUx4tEQVuq3E3nv/en-US)

This lab provides a basic understanding and hands-on experience of AWS Key Management Service. It will demonstrate the basic steps required to get started with Key Management Service, creating keys, assigning management and usage permissions for the keys, encrypting data and monitoring the access and usage of keys. For the lab to function as written, please DO NOT change the auto assigned region.

**Duration:**50 minutes

[Introduction to Amazon EC2 Auto Scaling](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-29%3A7PSdrPcxPrnqToKxXdoqQM/en-US)

This lab shows you how to use Auto Scaling to automatically launch Amazon EC2 instances in response to conditions that you specify. You will then test Auto Scaling by terminating a running instance and watching while Auto Scaling automatically creates a replacement instance.

**Duration:**40 minutes

[Introduction to Amazon Elastic Container Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-61%3AcddQLR9osYq4eoUU2wctCD/en-US)

Amazon EC2 Container Service (Amazon ECS) is a highly scalable, fast, container management service that makes it easy to run, stop, and manage Docker containers on a cluster of Amazon EC2 instances. This introductory lab leads you through the steps to create task definitions from Docker containers, deploy tasks to the cluster and update task definitions.

**Duration:**50 minutes

[Automating AWS Services with Scripting and the AWS CLI](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-46%3A8z4zssJGUDf4XqG5zX7JrP/en-US)

This lab demonstrates how to access and manage AWS services in three ways: through the AWS Management Console, the AWS Command Line Interface (CLI), and the AWS Software Development Kit (SDK). You will use one or more of these three options to access Amazon S3, Amazon EBS, Amazon EC2 and Amazon CloudWatch.

**Duration:**1 hour 15 minutes

[Serverless Architectures using Amazon CloudWatch Events and Scheduled Events with AWS Lambda](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-119%3AbfH1HpCoPYfYqQ3vPUp5rx/en-US)

This is a two part lab. In part one of the lab, you will learn how to use a Lambda function with CloudWatch events to monitor the creation of an EC2 instance, using a Lambda function you create manually. In part two of the lab, you will create a Lambda function from a blueprint to alert you to a CloudWatch alarm, with notification through an Amazon SNS topic. Prerequisites: To successfully complete this lab, you should be familiar with basic CloudWatch and SNS concepts. Node.js and Python programming are required, although full solution code is provided. You should have at a minimum taken the “Introduction to AWS Lambda” lab.

**Duration:**1 hour 15 minutes

[Launching and Managing a Web Application with AWS CloudFormation](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-10%3AqPZTF8A27pjmw4y1g5dqN6/en-US)

This lab covers how to use AWS CloudFormation to provision a web application with a number of supporting AWS products and services, including Auto Scaling Groups, Amazon EC2 Instances, Elastic Load Balancers, and more. It also covers how to use AWS CloudFormation to manage infrastructure and reconfigure Auto Scaling Groups.

**Duration:**1 hour 50 minutes

[Using AWS Lambda with Amazon CloudWatch and SNS to Implement a Slack Chat Bot](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-115%3Av5eLYM91fALU2znw16c863/en-US)

In this lab you will build a chat bot for Slack, using a Lambda blueprint. Chat bots have the ability to interact with teams and users, respond to commands, and post notifications, giving all conversation participants visibility into team activities. You will build a bot that posts CloudWatch alarms to your Slack channel. Prerequisites: To successfully complete this lab, you should be familiar with AWS Lambda and Amazon CloudWatch through taking the introductory labs. You will need to have or create an account with the online service Slack to complete this lab-- instructions are provided. Familiarity with Slack is helpful, though not required.

**Duration:**55 minutes

[Monitoring Security Groups with Amazon CloudWatch Events](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-138%3AdxfzGWQSRtmqs9fs7Nhsxt/en-US)

In this lab you will learn how to use AWS CloudWatch events with a Lambda function to detect changes to the ingress permissions of an EC2 security group. In an different lab, Monitoring Security Groups with AWS Config, you will do something similar but with different services. Both of these labs illustrate techniques that could be used to provide additional layers of protection to infrastructure controls. Prerequisites: To successfully complete this lab, you should be familiar with EC2 security groups. Python programming skills are helpful, although full solution code is provided. It would be helpful to have taken the Introduction to AWS Lambda lab.

**Duration:**1 hour

[Monitoring Security Groups with AWS Config](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-137%3AwMswWG8Q53D2JPkPpjmD4w/en-US)

In this lab you will learn how to use AWS Config with a Lambda function to detect changes to the ingress permissions of an EC2 security group and automatically reverse changes that are made. In an different lab, Monitoring Security Groups with Amazon CloudWatch Events, you will do something similar but with different services. Both of these labs illustrate techniques that could be used to provide additional layers of protection to infrastructure controls. Prerequisites: To successfully complete this lab, you should be familiar with EC2 security groups. Python programming skills are helpful, although full solution code is provided. It would be helpful to have taken the Introduction to AWS Lambda lab.

**Duration:**1 hour

[Deploy an End-to-End IoT Application](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-168%3AaHATBaC4TDUSQU6ZFuhvdz/en-US)

In this lab, you will connect virtual things using AWS IoT, publish messages and visualize real-time data using a serverless web application leveraging AWS Lambda, Amazon API Gateway and Amazon S3.

**Duration:**1 hour 30 minutes

[Creating an Amazon Virtual Private Cloud (VPC) with AWS CloudFormation](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-15%3AiqmGq6Ktv2kzdWfrPB4PH7/en-US)

This lab will demonstrate how to create an Amazon Virtual Private Cloud (VPC) network using AWS CloudFormation. Note: This lab is a more of a walkthrough of a template rather than "learn how to build it". You will walk through the sections of an AWS CloudFormation template and get explanations for each step. You will then launch the AWS CloudFormation template to create a four-subnet Amazon VPC that spans two Availability Zones and a NAT that allows servers in the private subnets to communicate with the Internet in order to download packages and updates.

**Duration:**1 hour

[Introduction to Amazon Virtual Private Cloud (VPC)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-84%3AeQxdQtSuqf11Nqxd33EB7D/en-US)

This lab introduces you to Amazon Virtual Private Cloud (Amazon VPC). In this lab you will use the Amazon VPC wizard to create a VPC, attach an Internet Gateway, add a subnet and then define routing for the VPC so that traffic can flow between the subnet and the Internet gateway.

**Duration:**40 minutes

[Visualizing Security Groups with Amazon Elasticsearch Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-150%3AxmqVU8WrFnAdLNKrd5Uxp5/en-US)

In this lab you will learn how to use VPC Flow Logs and the Amazon Elasticsearch Service to track the port, protocol, and IP addresses of traffic passing through your VPC. You will then configure Kibana to visualize the VPC Flow data.

**Duration:**1 hour

[Serverless Web Apps using Amazon DynamoDB - Part 1](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-132%3A2BMGHDqasE7yE9kLL8arip/en-US)

This is part one of a three-part lab which teaches you how to create a serverless web app with an Amazon DynamoDB backend data store. In this first part of the lab, you will build the infrastructure you will need in subsequent labs. You will create a DynamoDB table and add data, then build the necessary IAM roles and polices. To successfully complete this lab, you should be familiar with DynamoDB and IAM through taking those introductory labs.

**Duration:**55 minutes

[Serverless Web Apps using Amazon DynamoDB - Part 2](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-133%3Ac6CRVCdAQM8PXL4ETbpDWw/en-US)

This is part two of a three-part lab which teaches you how to create a "serverless" web app with an Amazon DynamoDB backend data store. In this second part of the lab, you will build upon the infrastructure created in part one. You will go on to create Lambda functions that interact with the DynamoDB table and add data, then build the necessary IAM roles and polices to support access to the functions and database via API Gateway. To successfully complete this lab, you should be familiar with DynamoDB, API Gateway, and IAM.

**Duration:**1 hour

[Serverless Web Apps using Amazon DynamoDB - Part 3](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-134%3A6Kv6Cu5of9XCcWuFXy87tF/en-US)

This is part three of a three-part lab which teaches you how to create a serverless web app with an Amazon DynamoDB backend data store. In this lab you will configure an API using Amazon API Gateway and set up a public website to retrieve information from your DynamoDB table via Lambda functions, using what you learned in all three labs. To successfully complete this lab, you should be familiar with DynamoDB and API Gateway through taking those introductory labs.

**Duration:**55 minutes

[Serverless Architectures with Amazon DynamoDB and Amazon Kinesis Streams with AWS Lambda](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-51%3ApNv86EK9zP4f4fhP6CiGwj/en-US)

This is a two part lab. In part one of the lab, you will create a Lambda function from a blueprint, create an Amazon Kinesis Stream, then trigger the function with data from your stream and monitor the process with Amazon CloudWatch. In part two of the lab, you will learn the basics of event-driven programming using Amazon DynamoDB, its Streams feature, and AWS Lambda. You will walk through the process of building a real-world application using AWS Triggers, which combines DynamoDB Streams and Lambda. Prerequisites: To successfully complete this lab, you should be familiar with DynamoDB and Kinesis through taking those introductory labs. Node.js and Python programming are required, although full solution code is provided. You should have at a minimum taken the Introduction to AWS Lambda lab.

**Duration:**1 hour

[Update Security Groups Automatically Using AWS Lambda](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-149%3Ag7NxeJXtZaA4hwnF94m17d/en-US)

Security is a top priority for Amazon Web Services (AWS). AWS provides many tools and services to meet your unique security needs. This lab will present a solution, among many, to enhance your security. This lab walks through a method to automatically update your Virtual Private Cloud (VPC) Security Groups to only allow access from Amazon CloudFront and AWS Web Application Firewall (WAF). Defining Security Groups rules this way prevents malicious requests from by-passing AWS WAF security rules and accessing your EC2 instances directly.

**Duration:**1 hour

[Using Open Data with Amazon S3](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-60%3Aw4v9roRvJyZcDzT5qSjNNE/en-US)

This lab demonstrates how to upload data to Amazon S3 and make it available for anyone to access via a web browser. You will learn how to create an Amazon S3 bucket, configure it to host a website, upload objects to it, and use JavaScript to display those objects on a web page. Along the way, you’ll learn some best practices for creating open data. At the end of this lab you will have deployed a simple web site that makes data easy to access and provides basic documentation of the data.

**Duration:**40 minutes

[Auditing Your Security with AWS Trusted Advisor](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-75%3AeN4F37NBY6HLW2v4RbovpZ/en-US)

This lab demonstrates the steps to audit your AWS resources with Trusted Advisor to ensure your configuration complies with basic security best practices. The topics covered will also include working with security groups, multifactor authentication (MFA), and AWS Identity and Access Management (IAM).

**Duration:**1 hour 25 minutes

[Caching Static Files with Amazon CloudFront](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-36%3AhEfZ7qtazgB2nJBsuzWmmz/en-US)

This lab demonstrates how to start distributing your web content with Amazon CloudFront by taking a simple static website in Amazon S3 and integrating it with Amazon CloudFront to deliver your website content from AWS edge locations. The majority of this lab will focus on creating an Amazon CloudFront distribution with the AWS Management Console, and then adapting the existing web pages to use Amazon CloudFront.

**Duration:**1 hour 55 minutes

[S3: Multi-region Storage Backup with Cross-Region Replication](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-205%3AvCefvq6CcF7LrfqkKyNb2A/en-US)

This lab walks you through the process of enabling Cross-Region Replication on an S3 bucket. You will create source and destination buckets, enable versioning, then create varius replication policies to demonstrate different methods of replicating objects.

**Duration:**1 hour

[Working with Amazon CloudFront for Dynamic Content Acceleration](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-34%3A8a6Uun8rTZ6TagLFHbGeGf/en-US)

This lab demonstrates how to distribute a dynamic website using Amazon CloudFront's global network of edge locations. You will run a dynamic forum website using BitNami phpBB on Amazon EC2. Then you will create a CloudFront web distribution to deliver and receive your static and dynamic content from AWS edge locations. The majority of this lab will focus on creating a CloudFront distribution with the AWS Management Console, and then will examine the features of CloudFront that enable different types of dynamic content to be accelerated to the end user.

**Duration:**1 hour 20 minutes

[Introduction to Amazon EC2](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-200%3A6P4UfwcVViiN93q1fBb7B3/en-US)

This lab provides you with a basic overview of launching, resizing, managing, and monitoring an Amazon EC2 instance.

**Duration:**1 hour

[Introduction to Amazon Elastic Block Store (EBS)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-67%3Adf3L6CLVk3kdkxnEpRLLkr/en-US)

This lab takes you through how to create an Amazon Elastic Block Store (EBS) volume, attach it to an Amazon EC2 instance, create a file system on the volume, take a snapshot of the volume, and increase the size and IOPS.

**Duration:**45 minutes

[Introduction to Amazon ElastiCache with Windows Server](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-24%3Avwr9TtHpX352ortH5p5bzy/en-US)

In this lab you will create an Amazon ElastiCache Redis node and connect to it from an Amazon EC2 instance to run commands. You will then clean up your resources by deleting the stack. <br><br> For the lab to function as written, please DO NOT change the auto assigned region.

**Duration:**45 minutes

[Maintaining High Availability with Auto Scaling (for Linux)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-04%3AaymdkyEGPDRHDjBVrg7eun/en-US)

This lab introduces the basics of Auto Scaling, highlighting multiple Auto Scaling use cases and the command-line tools used for Auto Scaling configuration. After completing this lab you will have configured and tested an elastic web farm which automatically scales capacity to accommodate load. In addition you will have explored a steady state use case in which Auto Scaling is used to maintain high availability of critical resources.

**Duration:**1 hour 55 minutes

[Introduction to Elastic Load Balancing](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-68%3AnWzCXfktKYtFc6aNZXZaYH/en-US)

This lab provides you with an introduction to Elastic Load Balancer. It covers creating and testing a Network Elastic Load Balancer. When the lab is launched you are provided with two web servers in two different Availability Zones. In the lab you will create a Network Elastic Load Balancer and use the two Web Servers as targets. You will then test the functionality of the load balancer in different scenarios.

**Duration:**50 minutes

[Programming Amazon SQS and Amazon SNS with .NET](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-106%3Aj4Cnc5AWFxtDefbL2hf95Z/en-US)

This lab will provide a basic understanding of using the AWS Toolkit for .NET. It will demonstrate the basic steps required to install Visual Studio Community Edition and the AWS Toolkit for Visual Studio and to run a simple console application in C# using the AWS SDK for .NET. To successfully complete this lab, you should be familiar with Visual Studio for C# and have a basic knowledge of launching and connecting to Windows systems in AWS.

**Duration:**1 hour 40 minutes

[Introduction to AWS CloudFormation](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-81%3AaZVfndtnsSh9uEJ9pUjwrP/en-US)

This lab teaches you about AWS CloudFormation and walks you through how to launch Wordpress on Amazon Web Services using an AWS CloudFormation template.

**Duration:**45 minutes

[Introduction to Amazon ElastiCache](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-80%3Ac5MwU9FfHmt2sTGqyFTHbY/en-US)

In this lab you will create an Amazon ElastiCache Redis node and connect to it from an Amazon EC2 instance to run commands. You will then clean up your resources by deleting the stack.

**Duration:**50 minutes

[Introduction to AWS CloudFormation Designer](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-59%3AtdKUsnTEob8wvP2m5MJbp3/en-US)

This lab introduces the AWS CloudFormation Designer, which provides a visual tool for creating and modifying CloudFormation templates. Prerequisites: This lab assumes that you have an introductory-level knowledge of Amazon Elastic Compute Cloud (Amazon EC2) and AWS CloudFormation. Students should have taken the Introductory-level labs for each of these Services before taking this lab.

**Duration:**40 minutes

[Working with Elastic Load Balancing](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-03%3ApCKU8jm9LZ1eZ4Xg68cp5P/en-US)

This lab introduces the concept of Elastic Load Balancing (ELB). In this lab you will use ELB to load balance a set of web servers in an Availability Zone. You will launch a pair of Amazon EC2 instances, bootstrap them to install web servers and content, and then access the instances independently using Amazon EC2 DNS records. Next, you will set up ELB, add your instances to the ELB, and then access the ELB DNS record to watch your requests load balance between servers. Finally, you will look at ELB metrics in CloudWatch. To successfully complete this lab, you should be familiar with the AWS Management Console.

**Duration:**55 minutes

[Hosting WordPress Using Amazon S3](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-39%3AoyA4nyigETkgeZ1kyzyp6h/en-US)

This lab demonstrates how to host a Wordpress blog using Amazon S3. In order to successfully complete this exercise, you should be familiar with basic website concepts. This lab will cover creating and partially managing a WordPress blog on AWS; using the AWS Management Console; and creating and manipulating an Amazon S3 static website.

**Duration:**50 minutes

[Building a Media Sharing Website - Part 1: Media Upload](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-11%3A2ppibcFN8siFzCBHhRkzgt/en-US)

This lab will demonstrate how to deploy a photo sharing website with a web interface for users to browse and store images. The application, written in Ruby on Rails, will use Amazon S3 for storage, Amazon DynamoDB for the database, and Amazon EC2 to host the web application.

**Duration:**55 minutes

[Managing IoT Sensor Data with Amazon ElastiCache for Redis](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-142%3Aomu7MuHsFrYoetgN8Fjq5h/en-US)

In this lab, you will see how AWS IoT makes it easy to use AWS services like AWS Lambda and Amazon ElastiCache Service to build IoT applications that gather, process, and analyze data generated by connected devices (in this case an emulator), without having to manage any infrastructure. The goal of capturing time series data from IoT devices such as sensors is to learn from observations and apply that learning or analytics to improve upon some experience or to help predict the next event, given previous observations. Here we'll simulate temperature sensor readings and capture, then ingest and analyze that data with Amazon ElastiCache for Redis. Prerequisites: To successfully complete this lab, you should be familiar with the basics of Elasticache and AWS Internet-Of-Things from taking the Introduction to Amazon Elasticache lab and the Introduction to Internet-Of-Things lab. Further experience with SQL and command-line operations will also be useful. For the lab to function as written, please DO NOT change the auto assigned region.

**Duration:**1 hour 30 minutes

[Introduction to AWS Internet of Things (IoT)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-55%3Ajf5WMALBBQpetxJrEqbAqm/en-US)

In this lab, you will run a simple IoT device simulator on Amazon EC2. The device simulator will generate and publish sample sensor data to an AWS device gateway. You will then build a simple rule that will publish a notification to an AWS SNS topic when the temperature of the device is within a defined threshold. By connecting your email address with the SNS topic, you will receive an email notification when the threshold is met. Finally, you will update the device shadow, instructing the device to “turn on the air conditioning”, resulting in lowering temperatures.

**Duration:**1 hour 30 minutes

[IoT Command and Control](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-222%3A4txqGyTx1DWwJzLNn67uqN/en-US)

This lab will give you the basic understanding to control IoT devices through sending commands and receiving acknowledgments

**Duration:**1 hour 30 minutes

[Building Search into your Applications with Amazon CloudSearch](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-74%3Aa5TfK9QW4zFbWtNWeKw2d9/en-US)

This lab will demonstrate the basics of search engines and Amazon CloudSerach. It will cover how to create a search domain, how to configure it, how to upload data, how to build queries, and how to tune your ranking. You will explore the features of the AWS Management Console and learn how easy it is to get started with Amazon CloudSearch.

**Duration:**1 hour 55 minutes

[Introduction to AWS CodeDeploy](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-82%3Av8o4ArQr73gLoJwscMnrvQ/en-US)

This lab introduces you to AWS CodeDeploy. In this lab you will use AWS CodeDeploy to deploy an application to an Amazon EC2 instance.

**Duration:**1 hour 20 minutes

[Working with AWS CodeCommit](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-33%3A7zKGodKsfLDZR8vwR4wDPB/en-US)

In this lab, you will learn how to create a code repository in AWS CodeCommit. Then you create a local repository using git on a Linux instance running in EC2, add files to it, and commit changes to the AWS CodeCommit repository. Prior to running this lab, it is assumed the student understands the principles of source code repositories, and has some prior development experience. Students should be comfortable with making ssh connections to instances running in Amazon EC2, and using Linux commands and editors from the command line in Linux. The student should have taken at a minimum Introduction to Amazon Elastic Compute Cloud (EC2) prior to taking this lab.

**Duration:**1 hour

[Working with AWS CodeCommit on Windows](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-112%3AxjJN9H2W2rHk67M3Ao4Qxj/en-US)

This hands-on lab gives you practice with AWS CodeCommit working from a Microsoft Windows development environment (Visual Studio Code) on an instance running in EC2. You will create a code repository in AWS CodeCommit. You’ll then create a local repository on the Windows instance and make some changes to it. Then you will synchronize (commit) your changes to the AWS CodeCommit repository.

**Duration:**1 hour 10 minutes

[Introduction to AWS OpsWorks](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-83%3AjdNNxikJuHxvDDDxRJPi6c/en-US)

This lab introduces you to AWS OpsWorks. In this lab you will create a simple PHP application server stack and deploy a PHP application to it.

**Duration:**55 minutes

[Blue/Green Deployment Pattern with AWS Elastic Beanstalk](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-47%3AqPqnRqSxijvUAJ19bVwuB6/en-US)

AWS Elastic Beanstalk provides a quick and easy way to deploy your web applications to the AWS cloud without requiring knowledge of the individual pieces that make up the infrastructure. This lab demonstrates the common steps of developing a web application and deploying it to production on AWS, using the EB command line interface. In this lab you will learn how to deploy a simple web application continuously using the Elastic Beanstalk Command Line Interface (EB CLI) in two ways, Rolling Deployment and Blue/Green Deployment. The lab also demonstrates many interesting command line tools to interact with, monitor, scale, and ssh into your running Elastic Beanstalk deployment completely from the command line. Prerequisites: for success with this lab, you should be familiar with systems administration of Linux servers, have comfort with Unix/Linux text editors, and should have at least taken the lab "Introduction to AWS Elastic Beanstalk".

**Duration:**1 hour 45 minutes

[Performing a Basic Audit of your AWS Environment](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-73%3Av3Hdhk5W5R9Tc5Z8mZJJTd/en-US)

This lab leads you through the steps to perform basic audits of core AWS resources. You will use the AWS Management Console to understand how to audit the use of multiple AWS services, Amazon EC2, Amazon VPC, Amazon IAM, Amazon Security Groups, AWS CloudTrail and AWS CloudWatch. This lab will help you understand how you can extend your existing auditing objectives related to organizational Governance, Asset Configuration, Logical Access Controls, Operating Systems, Databases and Applications security configurations within AWS. The skills learned will help provide visibility; testability and automated audit evidence gather capabilities.

**Duration:**55 minutes

[Automated Video Editing with YOU as the Star!](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-202%3AmdnYGKjUTecHkpXt9BZEq/en-US)

In this lab, you will learn how to combine the capabilities of Amazon Rekognition Video and Amazon Elastic Transcoder to automatically convert a long video into a highlight video showing all footage of a given person.

**Duration:**45 minutes

[Working with Amazon Elastic Container Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-50%3Atqpfuvr24fwh1PzHNU8sib/en-US)

Amazon Elastic Container Service (Amazon ECS) is a highly scalable, fast, container management service that makes it easy to run, stop, and manage Docker containers on a cluster of Amazon EC2 instances. This lab leads you through the steps to create Task Definitions from Docker containers, populate an ECS Cluster with Load Balanced EC2 Instances, deploy Tasks to the Cluster, make revisions, and scale up the Cluster.

**Duration:**55 minutes

[Centralized Log Processing with Amazon Elasticsearch Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-237%3Ai2TMa147vE2yfQhPbCTRBH/en-US)

Applications captures large amount of data that—when analyzed in real time—provides significant insight into your applications. Real-time log analysis can be used to ensure security compliance, troubleshoot operation events, identify application usage patterns, and much more. Let's take a look at an use case: You have several AWS accounts all collecting logs and shipping them to a central account for processing. You have a team of developers who are looking for stack traces from their code, and you got business and product owner wanting to know the events that took place in yesterday. The security team just pinged you that they just got abuse notifications from AWS. Your course of action is to quickly identify what the problem is remedy the situation. This lab will provide you on how to build a scalable centralized log processing solution and inspect various security related threats and how to respond on those.

**Duration:**2 hours

[Working with Amazon Redshift](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-17%3AwtF9h1is1VqezgcQTJ9aCp/en-US)

The lab demonstrates how to use Amazon RedShift to create a cluster, load data, run queries and monitor performance. Note: Students will download a free SQL client as part of this lab.

**Duration:**1 hour 55 minutes

[Introduction to Amazon Relational Database Service (RDS) (Windows)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-69%3AdpXWdBrqUMhgDXs99HTgAh/en-US)

This lab takes you through the steps of creating a MySQL database using the Amazon Relational Database Service using the AWS Management Console, and then connecting to the database in AWS using a SQL client running on a Microsoft Windows server, also provided in the lab environment.

**Duration:**50 minutes

[Introduction to Amazon Relational Database Service (RDS) (Linux)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-76%3Ac29jCTesxhSBdvM6FjvUSs/en-US)

This lab takes you through the steps of creating a MySQL database using the Amazon Relational Database Service using the AWS Management Console, and then connecting to the database in AWS using the MySQL client running on an Amazon Linux instance, which the student also creates during the lab.

**Duration:**50 minutes

[Introduction to Amazon Redshift](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-86%3AbMTxz9AeYvu2umLN1iWZB8/en-US)

The lab will give you the basic understanding of Amazon Redshift data warehouse service. It will demonstrate the basic steps required to get started with Redshift: creating a cluster, loading data and performing queries against that data.

**Duration:**1 hour 15 minutes

[Using Tableau Desktop with Amazon Redshift](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-114%3AeSJFCQjZjHE9Ng5L3cEsmN/en-US)

In this hands-on lab, you'll learn how to load data from Amazon S3 into an Amazon Redshift cluster and use Tableau Desktop for creating visualizations from that dataset. Note: registration and providing your personal contact information to Tableau is required for access to the trial version of Tableau Desktop needed for this lab. You may be contacted by Tableau as per their license agreements, which are provided during installation.

**Duration:**1 hour 10 minutes

[Introduction to Amazon Relational Database Service (RDS) - SQL Server](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-145%3A35L5yqp1zZSYfmEmNe9Uy2/en-US)

This lab takes you through the steps of creating a SQLServer database using the Amazon Relational Database Service and the AWS Management Console. You will then connect to the database engine in AWS using Microsoft SQL Server Management Studio running on a Microsoft Windows server, also provided in the lab environment. Note: this lab has a longer startup time of 20 minutes to allow the RDS instance to fully launch and initialize.

**Duration:**1 hour 10 minutes

[Creating Models with Amazon SageMaker](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-212%3Ap3Rqj3aJiNxNpExgdDwzaW/en-US)

Losing customers is costly for any business. Identifying unhappy customers early on gives you a chance to offer them incentives to stay. This notebook describes using machine learning (ML) for the automated identification of unhappy customers, also known as customer churn prediction. ML models rarely give perfect predictions though, so this notebook is also about how to incorporate the relative costs of prediction mistakes when determining the financial outcome of using ML. We use an example of churn that is familiar to all of us–leaving a mobile phone operator. Seems like I can always find fault with my provider du jour! And if my provider knows that I’m thinking of leaving, it can offer timely incentives–I can always use a phone upgrade or perhaps have a new feature activated–and I might just stick around. Incentives are often much more cost effective than losing and reacquiring a customer.

**Duration:**2 hours

[Applied Machine Learning: Building Models for an Amazon Use Case](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-214%3ApYN5oeBBMNvyiVgKws3akj/en-US)

In this lab you will clean data, conduct feature engineering, compare algorithms, and get a firsthand look at how Amazon employees working with machine learning approach ML pipelines.

**Duration:**4 hours

[Introduction to Amazon Aurora](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-32%3AeK3BnwG5qA47MRRPcz5jy3/en-US)

This lab will give you a basic understanding of using Amazon Aurora. You will be shown the basic steps to create an Amazon Aurora instance and then connect to the Amazon Aurora instance. To successfully complete this lab, you should have experience connecting to Microsoft Windows instances using RDP and have a basic knowledge of AWS.

**Duration:**1 hour

Advanced Networking – Specialty

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| [Introduction to Amazon CloudFront](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-85%3ArLVofbSE87b1EaWVeZZRhq/en-US)  This lab introduces you to AWS CloudFront, a content delivery web service. In this lab you will create an Amazon CloudFront distribution that will use a CloudFront domain name in the url to distribute a publicly accessible image file stored in an Amazon S3 bucket.  **Duration:**55 minutes |
| [Creating an Amazon Virtual Private Cloud (VPC) with AWS CloudFormation](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-15%3AiqmGq6Ktv2kzdWfrPB4PH7/en-US)  This lab will demonstrate how to create an Amazon Virtual Private Cloud (VPC) network using AWS CloudFormation. Note: This lab is a more of a walkthrough of a template rather than "learn how to build it". You will walk through the sections of an AWS CloudFormation template and get explanations for each step. You will then launch the AWS CloudFormation template to create a four-subnet Amazon VPC that spans two Availability Zones and a NAT that allows servers in the private subnets to communicate with the Internet in order to download packages and updates.  **Duration:**1 hour |
| [Introduction to Amazon Virtual Private Cloud (VPC)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-84%3AeQxdQtSuqf11Nqxd33EB7D/en-US)  This lab introduces you to Amazon Virtual Private Cloud (Amazon VPC). In this lab you will use the Amazon VPC wizard to create a VPC, attach an Internet Gateway, add a subnet and then define routing for the VPC so that traffic can flow between the subnet and the Internet gateway.  **Duration:**40 minutes |
| [Caching Static Files with Amazon CloudFront](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-36%3AhEfZ7qtazgB2nJBsuzWmmz/en-US)  This lab demonstrates how to start distributing your web content with Amazon CloudFront by taking a simple static website in Amazon S3 and integrating it with Amazon CloudFront to deliver your website content from AWS edge locations. The majority of this lab will focus on creating an Amazon CloudFront distribution with the AWS Management Console, and then adapting the existing web pages to use Amazon CloudFront.  **Duration:**1 hour 55 minutes |
| [Working with Amazon CloudFront for Dynamic Content Acceleration](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-34%3A8a6Uun8rTZ6TagLFHbGeGf/en-US)  This lab demonstrates how to distribute a dynamic website using Amazon CloudFront's global network of edge locations. You will run a dynamic forum website using BitNami phpBB on Amazon EC2. Then you will create a CloudFront web distribution to deliver and receive your static and dynamic content from AWS edge locations. The majority of this lab will focus on creating a CloudFront distribution with the AWS Management Console, and then will examine the features of CloudFront that enable different types of dynamic content to be accelerated to the end user.  **Duration:**1 hour 20 minutes |
| [Introduction to Elastic Load Balancing](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-68%3AnWzCXfktKYtFc6aNZXZaYH/en-US)  This lab provides you with an introduction to Elastic Load Balancer. It covers creating and testing a Network Elastic Load Balancer. When the lab is launched you are provided with two web servers in two different Availability Zones. In the lab you will create a Network Elastic Load Balancer and use the two Web Servers as targets. You will then test the functionality of the load balancer in different scenarios.  **Duration:**50 minutes |
| [Working with Elastic Load Balancing](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-03%3ApCKU8jm9LZ1eZ4Xg68cp5P/en-US)  This lab introduces the concept of Elastic Load Balancing (ELB). In this lab you will use ELB to load balance a set of web servers in an Availability Zone. You will launch a pair of Amazon EC2 instances, bootstrap them to install web servers and content, and then access the instances independently using Amazon EC2 DNS records. Next, you will set up ELB, add your instances to the ELB, and then access the ELB DNS record to watch your requests load balance between servers. Finally, you will look at ELB metrics in CloudWatch. To successfully complete this lab, you should be familiar with the AWS Management Console. |

**Duration:** 55 minutes

Cloud Practitioner

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| [Introduction to Amazon Simple Storage Service (S3)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2FSPL-TF-100-STESS3-2%3AsFwNxq8AS4Bb7kU3Lce7s8/en-US)  This lab demonstrates how to use an Amazon S3 bucket and manage files, or object, that are stored in the bucket. You will practice how to create a bucket, add an object, view an object, move an object, and delete an object and bucket in the AWS Management Console.  **Duration:**1 hour 30 minutes |
| [Introduction to AWS Identity and Access Management (IAM)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-66%3A4GBGDP7UkicdWEhpKvmGjP/en-US)  This lab shows you how to manage access and permissions to your AWS services using AWS Identity and Access Management (IAM). Practice the steps to add users to groups, manage passwords, log in with IAM-created users, and see the effects of IAM policies on access to specific services.  **Duration:**45 minutes |
| [Introduction to Amazon Virtual Private Cloud (VPC)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-84%3AeQxdQtSuqf11Nqxd33EB7D/en-US)  This lab introduces you to Amazon Virtual Private Cloud (Amazon VPC). In this lab you will use the Amazon VPC wizard to create a VPC, attach an Internet Gateway, add a subnet and then define routing for the VPC so that traffic can flow between the subnet and the Internet gateway.  **Duration:**40 minutes |
| [Introduction to Amazon EC2](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-200%3A6P4UfwcVViiN93q1fBb7B3/en-US)  This lab provides you with a basic overview of launching, resizing, managing, and monitoring an Amazon EC2 instance.  **Duration:**1 hour |
| [Introduction to Amazon Elastic Block Store (EBS)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-67%3Adf3L6CLVk3kdkxnEpRLLkr/en-US)  This lab takes you through how to create an Amazon Elastic Block Store (EBS) volume, attach it to an Amazon EC2 instance, create a file system on the volume, take a snapshot of the volume, and increase the size and IOPS.  **Duration:**45 minutes |

Data Analytics – Specialty

[Building Search into your Applications with Amazon CloudSearch](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-74%3Aa5TfK9QW4zFbWtNWeKw2d9/en-US)

This lab will demonstrate the basics of search engines and Amazon CloudSerach. It will cover how to create a search domain, how to configure it, how to upload data, how to build queries, and how to tune your ranking. You will explore the features of the AWS Management Console and learn how easy it is to get started with Amazon CloudSearch.

**Duration:**1 hour 55 minutes

Database – Specialty

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| [Introduction to Amazon DynamoDB](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-71%3Af94oJXCTxxrjnG1d4G9JuV/en-US)  This lab teaches you about Amazon DynamoDB by walking you through how to create, query, view and delete a table in the AWS Management Console.  **Duration:**40 minutes |
| [Serverless Architectures with Amazon DynamoDB and Amazon Kinesis Streams with AWS Lambda](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-51%3ApNv86EK9zP4f4fhP6CiGwj/en-US)  This is a two part lab. In part one of the lab, you will create a Lambda function from a blueprint, create an Amazon Kinesis Stream, then trigger the function with data from your stream and monitor the process with Amazon CloudWatch. In part two of the lab, you will learn the basics of event-driven programming using Amazon DynamoDB, its Streams feature, and AWS Lambda. You will walk through the process of building a real-world application using AWS Triggers, which combines DynamoDB Streams and Lambda. Prerequisites: To successfully complete this lab, you should be familiar with DynamoDB and Kinesis through taking those introductory labs. Node.js and Python programming are required, although full solution code is provided. You should have at a minimum taken the Introduction to AWS Lambda lab.  **Duration:**1 hour |
| [Introduction to Amazon ElastiCache with Windows Server](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-24%3Avwr9TtHpX352ortH5p5bzy/en-US)  In this lab you will create an Amazon ElastiCache Redis node and connect to it from an Amazon EC2 instance to run commands. You will then clean up your resources by deleting the stack. <br><br> For the lab to function as written, please DO NOT change the auto assigned region.  **Duration:**45 minutes |
| [Introduction to Amazon ElastiCache](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-80%3Ac5MwU9FfHmt2sTGqyFTHbY/en-US)  In this lab you will create an Amazon ElastiCache Redis node and connect to it from an Amazon EC2 instance to run commands. You will then clean up your resources by deleting the stack.  **Duration:**50 minutes |
| [Working with Amazon Redshift](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-17%3AwtF9h1is1VqezgcQTJ9aCp/en-US)  The lab demonstrates how to use Amazon RedShift to create a cluster, load data, run queries and monitor performance. Note: Students will download a free SQL client as part of this lab.  **Duration:**1 hour 55 minutes |
| [Introduction to Amazon Relational Database Service (RDS) (Windows)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-69%3AdpXWdBrqUMhgDXs99HTgAh/en-US)  This lab takes you through the steps of creating a MySQL database using the Amazon Relational Database Service using the AWS Management Console, and then connecting to the database in AWS using a SQL client running on a Microsoft Windows server, also provided in the lab environment.  **Duration:**50 minutes |
| [Introduction to Amazon Relational Database Service (RDS) (Linux)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-76%3Ac29jCTesxhSBdvM6FjvUSs/en-US)  This lab takes you through the steps of creating a MySQL database using the Amazon Relational Database Service using the AWS Management Console, and then connecting to the database in AWS using the MySQL client running on an Amazon Linux instance, which the student also creates during the lab.  **Duration:**50 minutes |
| [Introduction to Amazon Redshift](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-86%3AbMTxz9AeYvu2umLN1iWZB8/en-US)  The lab will give you the basic understanding of Amazon Redshift data warehouse service. It will demonstrate the basic steps required to get started with Redshift: creating a cluster, loading data and performing queries against that data.  **Duration:**1 hour 15 minutes |
| [Introduction to Amazon Relational Database Service (RDS) - SQL Server](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-145%3A35L5yqp1zZSYfmEmNe9Uy2/en-US)  This lab takes you through the steps of creating a SQLServer database using the Amazon Relational Database Service and the AWS Management Console. You will then connect to the database engine in AWS using Microsoft SQL Server Management Studio running on a Microsoft Windows server, also provided in the lab environment. Note: this lab has a longer startup time of 20 minutes to allow the RDS instance to fully launch and initialize.  **Duration:**1 hour 10 minutes |
| [Introduction to Amazon Aurora](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-32%3AeK3BnwG5qA47MRRPcz5jy3/en-US)  This lab will give you a basic understanding of using Amazon Aurora. You will be shown the basic steps to create an Amazon Aurora instance and then connect to the Amazon Aurora instance. To successfully complete this lab, you should have experience connecting to Microsoft Windows instances using RDP and have a basic knowledge of AWS.  **Duration:**1 hour |

DevOps Engineer – Professional

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| [Introduction to AWS CodeDeploy](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-82%3Av8o4ArQr73gLoJwscMnrvQ/en-US)  This lab introduces you to AWS CodeDeploy. In this lab you will use AWS CodeDeploy to deploy an application to an Amazon EC2 instance.  **Duration:**1 hour 20 minutes |
| [Working with AWS CodeCommit](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-33%3A7zKGodKsfLDZR8vwR4wDPB/en-US)  In this lab, you will learn how to create a code repository in AWS CodeCommit. Then you create a local repository using git on a Linux instance running in EC2, add files to it, and commit changes to the AWS CodeCommit repository. Prior to running this lab, it is assumed the student understands the principles of source code repositories, and has some prior development experience. Students should be comfortable with making ssh connections to instances running in Amazon EC2, and using Linux commands and editors from the command line in Linux. The student should have taken at a minimum Introduction to Amazon Elastic Compute Cloud (EC2) prior to taking this lab.  **Duration:**1 hour |
| [Working with AWS CodeCommit on Windows](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-112%3AxjJN9H2W2rHk67M3Ao4Qxj/en-US)  This hands-on lab gives you practice with AWS CodeCommit working from a Microsoft Windows development environment (Visual Studio Code) on an instance running in EC2. You will create a code repository in AWS CodeCommit. You’ll then create a local repository on the Windows instance and make some changes to it. Then you will synchronize (commit) your changes to the AWS CodeCommit repository.  **Duration:**1 hour 10 minutes |
| [Introduction to AWS OpsWorks](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-83%3AjdNNxikJuHxvDDDxRJPi6c/en-US)  This lab introduces you to AWS OpsWorks. In this lab you will create a simple PHP application server stack and deploy a PHP application to it.  **Duration:**55 minutes |
| [Blue/Green Deployment Pattern with AWS Elastic Beanstalk](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-47%3AqPqnRqSxijvUAJ19bVwuB6/en-US)  AWS Elastic Beanstalk provides a quick and easy way to deploy your web applications to the AWS cloud without requiring knowledge of the individual pieces that make up the infrastructure. This lab demonstrates the common steps of developing a web application and deploying it to production on AWS, using the EB command line interface. In this lab you will learn how to deploy a simple web application continuously using the Elastic Beanstalk Command Line Interface (EB CLI) in two ways, Rolling Deployment and Blue/Green Deployment. The lab also demonstrates many interesting command line tools to interact with, monitor, scale, and ssh into your running Elastic Beanstalk deployment completely from the command line. Prerequisites: for success with this lab, you should be familiar with systems administration of Linux servers, have comfort with Unix/Linux text editors, and should have at least taken the lab "Introduction to AWS Elastic Beanstalk".  **Duration:**1 hour 45 minutes |

Developer – Associate

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| [Introduction to AWS Identity and Access Management (IAM)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-66%3A4GBGDP7UkicdWEhpKvmGjP/en-US)  This lab shows you how to manage access and permissions to your AWS services using AWS Identity and Access Management (IAM). Practice the steps to add users to groups, manage passwords, log in with IAM-created users, and see the effects of IAM policies on access to specific services.  **Duration:**45 minutes |
| [Introduction to AWS Lambda](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-88%3AnnNE2KvPzmF3T69mtHeF12/en-US)  This lab will give you the basic understanding of AWS Lambda. It will demonstrate the basic steps required to get started to create and deploy a Lambda function in an event-driven environment.  **Duration:**45 minutes |
| [Introduction to Amazon API Gateway](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-58%3A3s4BQNdurHUVPkumk1wUkk/en-US)  In this lab, you will create a simple FAQ microservice. The microservice will return a JSON object containing a random question and answer pair using an API Gateway endpoint that invokes a Lambda function. Prerequisites: students should take the lab "Introduction to AWS Lambda" before taking this lab.  **Duration:**55 minutes |
| [Introduction to AWS Key Management Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-87%3A3KJDggoUx4tEQVuq3E3nv/en-US)  This lab provides a basic understanding and hands-on experience of AWS Key Management Service. It will demonstrate the basic steps required to get started with Key Management Service, creating keys, assigning management and usage permissions for the keys, encrypting data and monitoring the access and usage of keys. For the lab to function as written, please DO NOT change the auto assigned region.  **Duration:**50 minutes |
| [Introduction to Amazon Elastic Container Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-61%3AcddQLR9osYq4eoUU2wctCD/en-US)  Amazon EC2 Container Service (Amazon ECS) is a highly scalable, fast, container management service that makes it easy to run, stop, and manage Docker containers on a cluster of Amazon EC2 instances. This introductory lab leads you through the steps to create task definitions from Docker containers, deploy tasks to the cluster and update task definitions.  **Duration:**50 minutes |
| [Automating AWS Services with Scripting and the AWS CLI](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-46%3A8z4zssJGUDf4XqG5zX7JrP/en-US)  This lab demonstrates how to access and manage AWS services in three ways: through the AWS Management Console, the AWS Command Line Interface (CLI), and the AWS Software Development Kit (SDK). You will use one or more of these three options to access Amazon S3, Amazon EBS, Amazon EC2 and Amazon CloudWatch.  **Duration:**1 hour 15 minutes |
| [Serverless Architectures using Amazon CloudWatch Events and Scheduled Events with AWS Lambda](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-119%3AbfH1HpCoPYfYqQ3vPUp5rx/en-US)  This is a two part lab. In part one of the lab, you will learn how to use a Lambda function with CloudWatch events to monitor the creation of an EC2 instance, using a Lambda function you create manually. In part two of the lab, you will create a Lambda function from a blueprint to alert you to a CloudWatch alarm, with notification through an Amazon SNS topic. Prerequisites: To successfully complete this lab, you should be familiar with basic CloudWatch and SNS concepts. Node.js and Python programming are required, although full solution code is provided. You should have at a minimum taken the “Introduction to AWS Lambda” lab.  **Duration:**1 hour 15 minutes |
| [Launching and Managing a Web Application with AWS CloudFormation](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-10%3AqPZTF8A27pjmw4y1g5dqN6/en-US)  This lab covers how to use AWS CloudFormation to provision a web application with a number of supporting AWS products and services, including Auto Scaling Groups, Amazon EC2 Instances, Elastic Load Balancers, and more. It also covers how to use AWS CloudFormation to manage infrastructure and reconfigure Auto Scaling Groups.  **Duration:**1 hour 50 minutes |
| [Using AWS Lambda with Amazon CloudWatch and SNS to Implement a Slack Chat Bot](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-115%3Av5eLYM91fALU2znw16c863/en-US)  In this lab you will build a chat bot for Slack, using a Lambda blueprint. Chat bots have the ability to interact with teams and users, respond to commands, and post notifications, giving all conversation participants visibility into team activities. You will build a bot that posts CloudWatch alarms to your Slack channel. Prerequisites: To successfully complete this lab, you should be familiar with AWS Lambda and Amazon CloudWatch through taking the introductory labs. You will need to have or create an account with the online service Slack to complete this lab-- instructions are provided. Familiarity with Slack is helpful, though not required.  **Duration:**55 minutes |
| [Serverless Web Apps using Amazon DynamoDB - Part 1](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-132%3A2BMGHDqasE7yE9kLL8arip/en-US)  This is part one of a three-part lab which teaches you how to create a serverless web app with an Amazon DynamoDB backend data store. In this first part of the lab, you will build the infrastructure you will need in subsequent labs. You will create a DynamoDB table and add data, then build the necessary IAM roles and polices. To successfully complete this lab, you should be familiar with DynamoDB and IAM through taking those introductory labs.  **Duration:**55 minutes |
| [Serverless Web Apps using Amazon DynamoDB - Part 2](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-133%3Ac6CRVCdAQM8PXL4ETbpDWw/en-US)  This is part two of a three-part lab which teaches you how to create a "serverless" web app with an Amazon DynamoDB backend data store. In this second part of the lab, you will build upon the infrastructure created in part one. You will go on to create Lambda functions that interact with the DynamoDB table and add data, then build the necessary IAM roles and polices to support access to the functions and database via API Gateway. To successfully complete this lab, you should be familiar with DynamoDB, API Gateway, and IAM.  **Duration:**1 hour |
| [Serverless Web Apps using Amazon DynamoDB - Part 3](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-134%3A6Kv6Cu5of9XCcWuFXy87tF/en-US)  This is part three of a three-part lab which teaches you how to create a serverless web app with an Amazon DynamoDB backend data store. In this lab you will configure an API using Amazon API Gateway and set up a public website to retrieve information from your DynamoDB table via Lambda functions, using what you learned in all three labs. To successfully complete this lab, you should be familiar with DynamoDB and API Gateway through taking those introductory labs.  **Duration:**55 minutes |

Machine Learning – Specialty

[Creating Models with Amazon SageMaker](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-212%3Ap3Rqj3aJiNxNpExgdDwzaW/en-US)

Losing customers is costly for any business. Identifying unhappy customers early on gives you a chance to offer them incentives to stay. This notebook describes using machine learning (ML) for the automated identification of unhappy customers, also known as customer churn prediction. ML models rarely give perfect predictions though, so this notebook is also about how to incorporate the relative costs of prediction mistakes when determining the financial outcome of using ML. We use an example of churn that is familiar to all of us–leaving a mobile phone operator. Seems like I can always find fault with my provider du jour! And if my provider knows that I’m thinking of leaving, it can offer timely incentives–I can always use a phone upgrade or perhaps have a new feature activated–and I might just stick around. Incentives are often much more cost effective than losing and reacquiring a customer.

**Duration:**2 hours

Security – Specialty

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| [Introduction to AWS Identity and Access Management (IAM)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-66%3A4GBGDP7UkicdWEhpKvmGjP/en-US)  This lab shows you how to manage access and permissions to your AWS services using AWS Identity and Access Management (IAM). Practice the steps to add users to groups, manage passwords, log in with IAM-created users, and see the effects of IAM policies on access to specific services.  **Duration:**45 minutes |
| [Introduction to AWS Key Management Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-87%3A3KJDggoUx4tEQVuq3E3nv/en-US)  This lab provides a basic understanding and hands-on experience of AWS Key Management Service. It will demonstrate the basic steps required to get started with Key Management Service, creating keys, assigning management and usage permissions for the keys, encrypting data and monitoring the access and usage of keys. For the lab to function as written, please DO NOT change the auto assigned region.  **Duration:**50 minutes |
| [Monitoring Security Groups with Amazon CloudWatch Events](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-138%3AdxfzGWQSRtmqs9fs7Nhsxt/en-US)  In this lab you will learn how to use AWS CloudWatch events with a Lambda function to detect changes to the ingress permissions of an EC2 security group. In an different lab, Monitoring Security Groups with AWS Config, you will do something similar but with different services. Both of these labs illustrate techniques that could be used to provide additional layers of protection to infrastructure controls. Prerequisites: To successfully complete this lab, you should be familiar with EC2 security groups. Python programming skills are helpful, although full solution code is provided. It would be helpful to have taken the Introduction to AWS Lambda lab.  **Duration:**1 hour |
| [Monitoring Security Groups with AWS Config](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-137%3AwMswWG8Q53D2JPkPpjmD4w/en-US)  In this lab you will learn how to use AWS Config with a Lambda function to detect changes to the ingress permissions of an EC2 security group and automatically reverse changes that are made. In an different lab, Monitoring Security Groups with Amazon CloudWatch Events, you will do something similar but with different services. Both of these labs illustrate techniques that could be used to provide additional layers of protection to infrastructure controls. Prerequisites: To successfully complete this lab, you should be familiar with EC2 security groups. Python programming skills are helpful, although full solution code is provided. It would be helpful to have taken the Introduction to AWS Lambda lab.  **Duration:**1 hour |
| [Introduction to Amazon Virtual Private Cloud (VPC)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-84%3AeQxdQtSuqf11Nqxd33EB7D/en-US)  This lab introduces you to Amazon Virtual Private Cloud (Amazon VPC). In this lab you will use the Amazon VPC wizard to create a VPC, attach an Internet Gateway, add a subnet and then define routing for the VPC so that traffic can flow between the subnet and the Internet gateway.  **Duration:**40 minutes |
| [Update Security Groups Automatically Using AWS Lambda](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-149%3Ag7NxeJXtZaA4hwnF94m17d/en-US)  Security is a top priority for Amazon Web Services (AWS). AWS provides many tools and services to meet your unique security needs. This lab will present a solution, among many, to enhance your security. This lab walks through a method to automatically update your Virtual Private Cloud (VPC) Security Groups to only allow access from Amazon CloudFront and AWS Web Application Firewall (WAF). Defining Security Groups rules this way prevents malicious requests from by-passing AWS WAF security rules and accessing your EC2 instances directly.  **Duration:**1 hour |
| [Auditing Your Security with AWS Trusted Advisor](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-75%3AeN4F37NBY6HLW2v4RbovpZ/en-US)  This lab demonstrates the steps to audit your AWS resources with Trusted Advisor to ensure your configuration complies with basic security best practices. The topics covered will also include working with security groups, multifactor authentication (MFA), and AWS Identity and Access Management (IAM).  **Duration:**1 hour 25 minutes |

Solutions Architect – Associate

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| [Introduction to Amazon Simple Storage Service (S3)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2FSPL-TF-100-STESS3-2%3AsFwNxq8AS4Bb7kU3Lce7s8/en-US)  This lab demonstrates how to use an Amazon S3 bucket and manage files, or object, that are stored in the bucket. You will practice how to create a bucket, add an object, view an object, move an object, and delete an object and bucket in the AWS Management Console.  **Duration:**1 hour 30 minutes |
| [Introduction to Amazon DynamoDB](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-71%3Af94oJXCTxxrjnG1d4G9JuV/en-US)  This lab teaches you about Amazon DynamoDB by walking you through how to create, query, view and delete a table in the AWS Management Console.  **Duration:**40 minutes |
| [Introduction to AWS Identity and Access Management (IAM)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-66%3A4GBGDP7UkicdWEhpKvmGjP/en-US)  This lab shows you how to manage access and permissions to your AWS services using AWS Identity and Access Management (IAM). Practice the steps to add users to groups, manage passwords, log in with IAM-created users, and see the effects of IAM policies on access to specific services.  **Duration:**45 minutes |
| [Introduction to AWS Lambda](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-88%3AnnNE2KvPzmF3T69mtHeF12/en-US)  This lab will give you the basic understanding of AWS Lambda. It will demonstrate the basic steps required to get started to create and deploy a Lambda function in an event-driven environment.  **Duration:**45 minutes |
| [Introduction to Amazon CloudFront](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-85%3ArLVofbSE87b1EaWVeZZRhq/en-US)  This lab introduces you to AWS CloudFront, a content delivery web service. In this lab you will create an Amazon CloudFront distribution that will use a CloudFront domain name in the url to distribute a publicly accessible image file stored in an Amazon S3 bucket.  **Duration:**55 minutes |
| [Introduction to AWS Key Management Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-87%3A3KJDggoUx4tEQVuq3E3nv/en-US)  This lab provides a basic understanding and hands-on experience of AWS Key Management Service. It will demonstrate the basic steps required to get started with Key Management Service, creating keys, assigning management and usage permissions for the keys, encrypting data and monitoring the access and usage of keys. For the lab to function as written, please DO NOT change the auto assigned region.  **Duration:**50 minutes |
| [Introduction to Amazon EC2 Auto Scaling](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-29%3A7PSdrPcxPrnqToKxXdoqQM/en-US)  This lab shows you how to use Auto Scaling to automatically launch Amazon EC2 instances in response to conditions that you specify. You will then test Auto Scaling by terminating a running instance and watching while Auto Scaling automatically creates a replacement instance.  **Duration:**40 minutes |
| [Introduction to Amazon Elastic Container Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-61%3AcddQLR9osYq4eoUU2wctCD/en-US)  Amazon EC2 Container Service (Amazon ECS) is a highly scalable, fast, container management service that makes it easy to run, stop, and manage Docker containers on a cluster of Amazon EC2 instances. This introductory lab leads you through the steps to create task definitions from Docker containers, deploy tasks to the cluster and update task definitions.  **Duration:**50 minutes |
| [Creating an Amazon Virtual Private Cloud (VPC) with AWS CloudFormation](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-15%3AiqmGq6Ktv2kzdWfrPB4PH7/en-US)  This lab will demonstrate how to create an Amazon Virtual Private Cloud (VPC) network using AWS CloudFormation. Note: This lab is a more of a walkthrough of a template rather than "learn how to build it". You will walk through the sections of an AWS CloudFormation template and get explanations for each step. You will then launch the AWS CloudFormation template to create a four-subnet Amazon VPC that spans two Availability Zones and a NAT that allows servers in the private subnets to communicate with the Internet in order to download packages and updates.  **Duration:**1 hour |
| [Introduction to Amazon Virtual Private Cloud (VPC)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-84%3AeQxdQtSuqf11Nqxd33EB7D/en-US)  This lab introduces you to Amazon Virtual Private Cloud (Amazon VPC). In this lab you will use the Amazon VPC wizard to create a VPC, attach an Internet Gateway, add a subnet and then define routing for the VPC so that traffic can flow between the subnet and the Internet gateway.  **Duration:**40 minutes |
| [Auditing Your Security with AWS Trusted Advisor](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-75%3AeN4F37NBY6HLW2v4RbovpZ/en-US)  This lab demonstrates the steps to audit your AWS resources with Trusted Advisor to ensure your configuration complies with basic security best practices. The topics covered will also include working with security groups, multifactor authentication (MFA), and AWS Identity and Access Management (IAM).  **Duration:**1 hour 25 minutes |
| [S3: Multi-region Storage Backup with Cross-Region Replication](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-205%3AvCefvq6CcF7LrfqkKyNb2A/en-US)  This lab walks you through the process of enabling Cross-Region Replication on an S3 bucket. You will create source and destination buckets, enable versioning, then create varius replication policies to demonstrate different methods of replicating objects.  **Duration:**1 hour |
| [Introduction to Amazon EC2](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-200%3A6P4UfwcVViiN93q1fBb7B3/en-US)  This lab provides you with a basic overview of launching, resizing, managing, and monitoring an Amazon EC2 instance.  **Duration:**1 hour |
| [Introduction to Amazon Elastic Block Store (EBS)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-67%3Adf3L6CLVk3kdkxnEpRLLkr/en-US)  This lab takes you through how to create an Amazon Elastic Block Store (EBS) volume, attach it to an Amazon EC2 instance, create a file system on the volume, take a snapshot of the volume, and increase the size and IOPS.  **Duration:**45 minutes |
| [Working with Elastic Load Balancing](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-03%3ApCKU8jm9LZ1eZ4Xg68cp5P/en-US)  This lab introduces the concept of Elastic Load Balancing (ELB). In this lab you will use ELB to load balance a set of web servers in an Availability Zone. You will launch a pair of Amazon EC2 instances, bootstrap them to install web servers and content, and then access the instances independently using Amazon EC2 DNS records. Next, you will set up ELB, add your instances to the ELB, and then access the ELB DNS record to watch your requests load balance between servers. Finally, you will look at ELB metrics in CloudWatch. To successfully complete this lab, you should be familiar with the AWS Management Console.  **Duration:**55 minutes |

Solutions Architect – Professional

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| [Introduction to AWS Identity and Access Management (IAM)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-66%3A4GBGDP7UkicdWEhpKvmGjP/en-US)  This lab shows you how to manage access and permissions to your AWS services using AWS Identity and Access Management (IAM). Practice the steps to add users to groups, manage passwords, log in with IAM-created users, and see the effects of IAM policies on access to specific services.  **Duration:**45 minutes |
| [Introduction to AWS Lambda](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-88%3AnnNE2KvPzmF3T69mtHeF12/en-US)  This lab will give you the basic understanding of AWS Lambda. It will demonstrate the basic steps required to get started to create and deploy a Lambda function in an event-driven environment.  **Duration:**45 minutes |
| [Introduction to Amazon CloudFront](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-85%3ArLVofbSE87b1EaWVeZZRhq/en-US)  This lab introduces you to AWS CloudFront, a content delivery web service. In this lab you will create an Amazon CloudFront distribution that will use a CloudFront domain name in the url to distribute a publicly accessible image file stored in an Amazon S3 bucket.  **Duration:**55 minutes |
| [Introduction to AWS Key Management Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-87%3A3KJDggoUx4tEQVuq3E3nv/en-US)  This lab provides a basic understanding and hands-on experience of AWS Key Management Service. It will demonstrate the basic steps required to get started with Key Management Service, creating keys, assigning management and usage permissions for the keys, encrypting data and monitoring the access and usage of keys. For the lab to function as written, please DO NOT change the auto assigned region.  **Duration:**50 minutes |
| [Introduction to Amazon EC2 Auto Scaling](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-29%3A7PSdrPcxPrnqToKxXdoqQM/en-US)  This lab shows you how to use Auto Scaling to automatically launch Amazon EC2 instances in response to conditions that you specify. You will then test Auto Scaling by terminating a running instance and watching while Auto Scaling automatically creates a replacement instance.  **Duration:**40 minutes |
| [Introduction to Amazon Elastic Container Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-61%3AcddQLR9osYq4eoUU2wctCD/en-US)  Amazon EC2 Container Service (Amazon ECS) is a highly scalable, fast, container management service that makes it easy to run, stop, and manage Docker containers on a cluster of Amazon EC2 instances. This introductory lab leads you through the steps to create task definitions from Docker containers, deploy tasks to the cluster and update task definitions.  **Duration:**50 minutes |
| [Creating an Amazon Virtual Private Cloud (VPC) with AWS CloudFormation](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-15%3AiqmGq6Ktv2kzdWfrPB4PH7/en-US)  This lab will demonstrate how to create an Amazon Virtual Private Cloud (VPC) network using AWS CloudFormation. Note: This lab is a more of a walkthrough of a template rather than "learn how to build it". You will walk through the sections of an AWS CloudFormation template and get explanations for each step. You will then launch the AWS CloudFormation template to create a four-subnet Amazon VPC that spans two Availability Zones and a NAT that allows servers in the private subnets to communicate with the Internet in order to download packages and updates.  **Duration:**1 hour |
| [Introduction to Amazon Virtual Private Cloud (VPC)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-84%3AeQxdQtSuqf11Nqxd33EB7D/en-US)  This lab introduces you to Amazon Virtual Private Cloud (Amazon VPC). In this lab you will use the Amazon VPC wizard to create a VPC, attach an Internet Gateway, add a subnet and then define routing for the VPC so that traffic can flow between the subnet and the Internet gateway.  **Duration:**40 minutes |
| [Auditing Your Security with AWS Trusted Advisor](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-75%3AeN4F37NBY6HLW2v4RbovpZ/en-US)  This lab demonstrates the steps to audit your AWS resources with Trusted Advisor to ensure your configuration complies with basic security best practices. The topics covered will also include working with security groups, multifactor authentication (MFA), and AWS Identity and Access Management (IAM).  **Duration:**1 hour 25 minutes |
| [Working with Elastic Load Balancing](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-03%3ApCKU8jm9LZ1eZ4Xg68cp5P/en-US)  This lab introduces the concept of Elastic Load Balancing (ELB). In this lab you will use ELB to load balance a set of web servers in an Availability Zone. You will launch a pair of Amazon EC2 instances, bootstrap them to install web servers and content, and then access the instances independently using Amazon EC2 DNS records. Next, you will set up ELB, add your instances to the ELB, and then access the ELB DNS record to watch your requests load balance between servers. Finally, you will look at ELB metrics in CloudWatch. To successfully complete this lab, you should be familiar with the AWS Management Console.  **Duration:**55 minutes |
| [Blue/Green Deployment Pattern with AWS Elastic Beanstalk](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-47%3AqPqnRqSxijvUAJ19bVwuB6/en-US)  AWS Elastic Beanstalk provides a quick and easy way to deploy your web applications to the AWS cloud without requiring knowledge of the individual pieces that make up the infrastructure. This lab demonstrates the common steps of developing a web application and deploying it to production on AWS, using the EB command line interface. In this lab you will learn how to deploy a simple web application continuously using the Elastic Beanstalk Command Line Interface (EB CLI) in two ways, Rolling Deployment and Blue/Green Deployment. The lab also demonstrates many interesting command line tools to interact with, monitor, scale, and ssh into your running Elastic Beanstalk deployment completely from the command line. Prerequisites: for success with this lab, you should be familiar with systems administration of Linux servers, have comfort with Unix/Linux text editors, and should have at least taken the lab "Introduction to AWS Elastic Beanstalk".  **Duration:**1 hour 45 minutes |

SysOps Administrator – Associate

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| [Introduction to AWS Identity and Access Management (IAM)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-66%3A4GBGDP7UkicdWEhpKvmGjP/en-US)  This lab shows you how to manage access and permissions to your AWS services using AWS Identity and Access Management (IAM). Practice the steps to add users to groups, manage passwords, log in with IAM-created users, and see the effects of IAM policies on access to specific services.  **Duration:**45 minutes |
| [Introduction to Amazon API Gateway](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-58%3A3s4BQNdurHUVPkumk1wUkk/en-US)  In this lab, you will create a simple FAQ microservice. The microservice will return a JSON object containing a random question and answer pair using an API Gateway endpoint that invokes a Lambda function. Prerequisites: students should take the lab "Introduction to AWS Lambda" before taking this lab.  **Duration:**55 minutes |
| [Introduction to Amazon CloudFront](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-85%3ArLVofbSE87b1EaWVeZZRhq/en-US)  This lab introduces you to AWS CloudFront, a content delivery web service. In this lab you will create an Amazon CloudFront distribution that will use a CloudFront domain name in the url to distribute a publicly accessible image file stored in an Amazon S3 bucket.  **Duration:**55 minutes |
| [Introduction to AWS Key Management Service](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-87%3A3KJDggoUx4tEQVuq3E3nv/en-US)  This lab provides a basic understanding and hands-on experience of AWS Key Management Service. It will demonstrate the basic steps required to get started with Key Management Service, creating keys, assigning management and usage permissions for the keys, encrypting data and monitoring the access and usage of keys. For the lab to function as written, please DO NOT change the auto assigned region.  **Duration:**50 minutes |
| [Introduction to Amazon EC2 Auto Scaling](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-29%3A7PSdrPcxPrnqToKxXdoqQM/en-US)  This lab shows you how to use Auto Scaling to automatically launch Amazon EC2 instances in response to conditions that you specify. You will then test Auto Scaling by terminating a running instance and watching while Auto Scaling automatically creates a replacement instance.  **Duration:**40 minutes |
| [Automating AWS Services with Scripting and the AWS CLI](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-46%3A8z4zssJGUDf4XqG5zX7JrP/en-US)  This lab demonstrates how to access and manage AWS services in three ways: through the AWS Management Console, the AWS Command Line Interface (CLI), and the AWS Software Development Kit (SDK). You will use one or more of these three options to access Amazon S3, Amazon EBS, Amazon EC2 and Amazon CloudWatch.  **Duration:**1 hour 15 minutes |
| [Monitoring Security Groups with Amazon CloudWatch Events](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-138%3AdxfzGWQSRtmqs9fs7Nhsxt/en-US)  In this lab you will learn how to use AWS CloudWatch events with a Lambda function to detect changes to the ingress permissions of an EC2 security group. In an different lab, Monitoring Security Groups with AWS Config, you will do something similar but with different services. Both of these labs illustrate techniques that could be used to provide additional layers of protection to infrastructure controls. Prerequisites: To successfully complete this lab, you should be familiar with EC2 security groups. Python programming skills are helpful, although full solution code is provided. It would be helpful to have taken the Introduction to AWS Lambda lab.  **Duration:**1 hour |
| [Monitoring Security Groups with AWS Config](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-137%3AwMswWG8Q53D2JPkPpjmD4w/en-US)  In this lab you will learn how to use AWS Config with a Lambda function to detect changes to the ingress permissions of an EC2 security group and automatically reverse changes that are made. In an different lab, Monitoring Security Groups with Amazon CloudWatch Events, you will do something similar but with different services. Both of these labs illustrate techniques that could be used to provide additional layers of protection to infrastructure controls. Prerequisites: To successfully complete this lab, you should be familiar with EC2 security groups. Python programming skills are helpful, although full solution code is provided. It would be helpful to have taken the Introduction to AWS Lambda lab.  **Duration:**1 hour |
| [Caching Static Files with Amazon CloudFront](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-36%3AhEfZ7qtazgB2nJBsuzWmmz/en-US)  This lab demonstrates how to start distributing your web content with Amazon CloudFront by taking a simple static website in Amazon S3 and integrating it with Amazon CloudFront to deliver your website content from AWS edge locations. The majority of this lab will focus on creating an Amazon CloudFront distribution with the AWS Management Console, and then adapting the existing web pages to use Amazon CloudFront.  **Duration:**1 hour 55 minutes |
| [Maintaining High Availability with Auto Scaling (for Linux)](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-04%3AaymdkyEGPDRHDjBVrg7eun/en-US)  This lab introduces the basics of Auto Scaling, highlighting multiple Auto Scaling use cases and the command-line tools used for Auto Scaling configuration. After completing this lab you will have configured and tested an elastic web farm which automatically scales capacity to accommodate load. In addition you will have explored a steady state use case in which Auto Scaling is used to maintain high availability of critical resources.  **Duration:**1 hour 55 minutes |
| [Introduction to AWS CloudFormation](https://reinvent.events.training.aws.a2z.com/lab/arn%3Aaws%3Alearningcontent%3Aus-east-1%3A470679935125%3Ablueprintversion%2Fspl-81%3AaZVfndtnsSh9uEJ9pUjwrP/en-US)  This lab teaches you about AWS CloudFormation and walks you through how to launch Wordpress on Amazon Web Services using an AWS CloudFormation template.  **Duration:**45 minutes |