

AWS Lambda + nodeJs Hands-On Training

(4 Days)

Course Description & High Level Contents

AWS Lambda is changing the way that we build systems in the cloud. This new compute service in the cloud runs your code in response to events, automatically managing the compute resources for you. This makes it dead simple to create applications that respond quickly to new information. Lambda is the backbone of Serverless Computing with AWS.

This is a comprehensive course that will teach you how to write, deploy, scale and manage lambda functions. Armed with this knowledge you'll be able to architect solutions from tiny composable microservices that scale massively and respond almost in real time.

In this course we'll take you through the entire Lambda journey. From setting up your local environment, writing your first Lambda function, to deploying interesting and unique lambda functions that will help you massively scale your operations.

The hands on labs will show you how to write Lambda functions that:

- Run when files change in S3 (eg. image thumbnail generation, metadata extraction, indexing etc)
- Run when tables are updated in DynamoDB (eg. analytics/trend detection, auditing, etc)
- Run when kinesis messages are received (eg. notification generation, message filtering, etc)

AWS Lambda – 2 Days

An Introduction To Lambda

Serverless

Why Lambda

How Lambda Works

Example Workflow

AWS Lambda Core Concepts

Lambda Essentials

Event-driven Fundamentals

Understanding Lambda Limits

Creating Our First Lambda Function

Toolbar Setup

Blueprints and Handlers
Using The Console
Create The Function
Testing And Logging

AWS Lambda Hands-on

Creating a Node.js Lambda Function
Creating Lambda Functions With The CLI
Managing Push Events And Permissions With The CLI
Testing Functions With The CLI
Managing Pull Events And Event Source Mappings With The CLI
Retrieving Lambda CloudWatch Logs From The CLI
Testing Node.js Functions Locally
Invoking Functions With HTTP Calls Via Amazon API Gateway
Daily EBS Snapshots With Scheduled Events
Better Development Workflow With Versions And Aliases
Versions And Aliases With The Command Line Interface
Using CloudFormation With Lambda
Live Lab: Creating EBS Snapshots with Lambda

Expanding Our Knowledge with Lambda & S3

Install The AWS Command Line Tool
Create An S3 Bucket
Creating A Function And Trigger
Updating Lambda Functions With The AWS CLI
Testing And Function Invocation
Function Versions And Qualifiers
Function Outputs And Timeouts

Create Image Thumbnails On Upload To S3

Resizing Lambda Function Walkthrough
Using CloudFormation To Create Our AWS Environment
S3 Upload With Node.js Application Walkthrough
Wrapping Up And Customizing

Send Notifications To Slack On Newsletter Registration With API Gateway, Lambda, and S3

Creating A Slack Webhook And Lambda Function Walkthrough
Testing And Uploading The Lambda Function
Setting Up API Gateway To Invoke The Lambda Function
Creating a Static S3 Website and Mapping it to API Gateway

Wrapping Up and Customizing

Serverless Newsletter Registration With DynamoDB, API Gateway, Lambda, and S3

DynamoDB Table and Lambda Function Creation
Deploying an API With Amazon API Gateway
Application Walkthrough and Creating an S3 Static Site
Wrapping Up and Customizing

Reacting to Event Streams with Lambda & Kinesis

Introduction To Kinesis
Create A Stream And Function Trigger
Test The Function
End To End Testing With Kinesis Event

Creating Data-Driven Apps with Lambda & DynamoDB

Introduction To DynamoDB
About Function Triggers And Tables
Create And Test The Function
Testing With Live Data

HandsOn - Use Case 1

HandsOn - Use Case 2

Node Js – 2 Days

1. The Node Environment

Installing Node
Saying Hello to the World with Node
A Basic Hello World Application
Hello World, Tweaked
Node Command-Line Options
Node Hosting Environments
The Node LTS and Upgrading Node
Node, V8, and ES6
Advanced: Node C/C++ Add-ons

2. Node Building Blocks: Global Objects, Events, and Node's Asynchronous Nature

The global and process Objects
The global Object

The process Object
Buffers, Typed Arrays, and Strings
Buffer, JSON, StringDecoder, and UTF-8 Strings
Buffer Manipulation
Node's Callback and Asynchronous Event Handling
The Event Queue (Loop)
Creating an Asynchronous Callback Function
EventEmitter
The Node Event Loop and Timers
Nested Callbacks and Exception Handling

3. Basics of Node Modules and Node Package Manager (npm)

An Overview of the Node Module System
How Node Finds and Loads a Module
Sandboxing and the VM Module
An In-Depth Exploration of NPM
Creating and Publishing Your Own Node Module

Creating a Module

Packaging an Entire Directory
Preparing Your Module for Publication
Publishing the Module
Discovering Node Modules and Three Must-Have Modules
Better Callback Management with Async
Command-Line Magic with Commander
The Ubiquitous Underscore

4. Interactive Node with REPL and More on the Console

REPL: First Looks and Undefined Expressions
Benefits of REPL: Getting a Closer Understanding of JavaScript Under the Hood
Multiline and More Complex JavaScript
REPL Commands
REPL and rlwrap
Custom REPL
Stuff Happens—Save Often
The Necessity of the Console
Console Message Types, Console Class, and Blocking
Formatting the Message, with Help from util.format() and util.inspect()
Providing Richer Feedback with console and a Timer

5. Node and the Web

The HTTP Module: Server and Client

What's Involved in Creating a Static Web Server
Using Apache to Proxy a Node Application
Parsing the Query with Query String
DNS Resolution

1. Making a Web Server

Introduction
Setting up a router
Serving static files
Caching content in memory for immediate delivery
Optimizing performance with streaming
Securing against filesystem hacking exploits

2. Exploring the HTTP Object

Introduction
Processing POST data
Handling file uploads
Using Node as an HTTP client
Implementing download throttling

3. Working with Data Serialization

Introduction
Converting an object to JSON and back
Converting an object to XML and back
Browser-server transmission via AJAX
Working with real data – fetching trending tweets

4. Interfacing with Databases

Introduction
Writing to a CSV file
Connecting and sending SQL to a MySQL server
Storing and retrieving data with MongoDB
Storing data to CouchDB with Cradle
Retrieving data from CouchDB with Cradle
Accessing the CouchDB changes stream with Cradle
Storing and retrieving data with Redis
Implementing PubSub with Redis

5. Employing Streams

Introduction
Consuming streams
Playing with pipes
Making stream interfaces
Streaming across Node processes

6. Going Real Time

Introduction
Creating a WebSocket server
Cross-browser real-time logic with Socket.IO
Remote Procedure Calls with Socket.IO
Creating a real-time widget

8. Implementing Security, Encryption, and Authentication

Introduction
Implementing Basic Authentication
Hashing passwords
Implementing Digest Authentication
Setting up an HTTPS web server
Preventing cross-site request forgery

9. Integrating Network Paradigms

6. Node and the Local System

Exploring the Operating System
Streams and Pipes
A Formal Introduction to the File System
The fs.Stats Class
The File System Watcher
File Read and Write
Compression/Decompression with ZLib
Pipes and ReadLine

7. Networking, Sockets, and Security

Servers, Streams, and Sockets
Sockets and Streams
TCP Sockets and Servers
UDP/Datagram Socket
Guards at the Gate
Setting Up TLS/SSL
Working with HTTPS
The Crypto Module