Introduction

Today, more workloads are using AWS Lambda to achieve scalability, performance, and cost efficiency, without managing the underlying infrastructure. These workloads scale to thousands of concurrent requests per second, making AWS Lambda one of the many important services that is offered by AWS today. AWS Lambda is used by hundreds of thousands of AWS customers to serve trillions of requests every month.

A broad variety of customers, from media and entertainment to financial services and other regulated industries, are taking notice of AWS Lambda. These customers are more interested in decreasing time to market, optimizing costs, and improving agility by focusing on what they do best: running their business. Lambda has become the obvious choice for mission critical applications in many industries.

The *managed runtime environment* model of AWS Lambda intentionally hides many implementation details from the user, making some of the existing best practices for cloud security irrelevant, and creating the need for new best practices. This paper presents those best practices, including information on the underpinnings of Lambda, providing a detailed view to developers, security analysts, compliance teams, and other stakeholders.

About AWS Lambda

AWS Lambda is an event-driven, serverless compute service that extends other AWS services with custom logic, or creates other backend services that operate with scale, performance, and security. Lambda can automatically run code in response to multiple events, such as HTTP requests through Amazon API Gateway, modifications to objects in Amazon S3 buckets, table updates in Amazon DynamoDB, and state transitions in AWS Step Functions. You can also run code directly from any web or mobile app. Lambda runs code on a highly available compute infrastructure, and performs all of the administration of the underlying platform, including server and operating system maintenance, capacity provisioning and automatic scaling, patching, code monitoring, and logging.

With Lambda, you can just upload your code and configure when to invoke it; Lambda takes care of everything else required to run your code with high availability. Lambda integrates with many other AWS services and enables you to create serverless applications or backend services, ranging from periodically triggered, simple automation tasks to full-fledged microservices applications.

Lambda can also be configured to access resources within your Amazon Virtual Private Cloud, and by extension, your on-premises resources.

You can easily wrap up Lambda with a strong security posture using AWS Identity and Access Management (IAM), and other techniques discussed in this whitepaper, to maintain a high level of security and auditing, and to meet your compliance needs.

Benefits of Lambda

Customers who want to unleash the creativity and speed of their development organizations, without compromising their IT team's ability to provide a scalable, cost-effective, and manageable infrastructure, find that AWS Lambda lets them trade operational complexity for agility and better pricing, without compromising on scale or reliability.

Lambda offers many benefits, including the following.

No Servers to Manage

Lambda runs your code on highly available, fault-tolerant infrastructure spread across multiple Availability Zones in a single region, seamlessly deploying code, and providing all the administration, maintenance, and patches of the infrastructure. Lambda also provides built-in logging and monitoring, including integration with Amazon CloudWatch, CloudWatch Logs, and AWS CloudTrail.

Continuous Scaling

Lambda precisely manages scaling of your functions (or application) by running event triggered code in parallel, and processing each event individually.

Subsecond Metering

With AWS Lambda, you are charged for every 100 ms your code executes and the number of times your code is triggered. You pay for consistent throughput or execution duration, instead of by server unit.

Increases Innovation

Lambda frees up your programming resources by taking over the infrastructure management, allowing them to focus more on innovation and development of business logic.

Modernize your Applications

Lambda enables you to use functions with pre-trained machine learning models to inject artificial intelligence into applications easily. A single API request can classify images, analyze videos, convert speech to text, perform natural language processing, and more.

Rich Ecosystem

Lambda provides a rich ecosystem, supporting developers through AWS Serverless Application Repository for discovering, deploying and publishing serverless applications, AWS Serverless Application Model for building serverless applications and integrations with various IDEs like AWS Cloud9, AWS Toolkit for Visual Studio, AWS Tools for Visual Studio Team Services, and several others. Along with this, Lambda is integrated with additional AWS services to provide you a rich ecosystem for building serverless applications.

Cost for Running Lambda-Based Applications

Lambda offers a granular, pay-as-you-go pricing model. With this model, you are charged based on the number of function invocations and their duration (the time it takes for the code to execute). In addition to this flexible pricing model, Lambda also offers 1 million perpetually free requests per month, allowing many customers to automate their process without any costs.