

# Lambda

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# Lambda

AWS Lambda is a serverless computing service provided by Amazon Web Services (AWS). It enables you to run code without provisioning or managing servers. You only pay for the compute time used.

# Features of AWS Lambda

- **Serverless:** No need to manage servers; AWS handles infrastructure scaling and maintenance.
- **Event-driven:** Executes in response to events like API Gateway requests, file uploads to S3, or DynamoDB table updates.
- **Auto-scaling:** Automatically scales up or down based on the number of events, ensuring efficient resource use.
- **Pay-per-use:** Charges only for the duration your code runs, measured in milliseconds.
- **Multiple language support:** Compatible with Node.js, Python, Java, Go, Ruby, .NET, and more.

# Features of AWS Lambda contd....

- **Integrations:** Seamlessly integrates with AWS services like S3, DynamoDB, CloudWatch, and API Gateway.
- **Environment Variables:** Simplifies passing configuration data without hardcoding.
- **Concurrency control:** Allows limiting the number of simultaneous executions to avoid overloading downstream systems.
- **Function versioning and Aliases:** Manages multiple versions of a Lambda function and provides stable references for specific versions.
- **IAM roles:** Ensures secure access to AWS resources via fine-grained permissions.

# Use Case: Real-time Image Processing

**Scenario:** A web application allows users to upload images, and these need to be resized or watermarked for display.

## **How Lambda Works Here:**

- When an image is uploaded to an S3 bucket, it triggers a Lambda function.
- The Lambda function processes the image (e.g., resizing or adding a watermark).
- The processed image is then saved to another S3 bucket or sent directly to a content delivery network (CDN).

# Why Lambda?

- Automatically scales to handle a high volume of concurrent uploads.
- Costs incurred only for the processing time, saving money compared to running a server 24/7.
- No need for managing backend infrastructure.