

# How does AWS lambda work behind the scenes?



ALEX XU  
APR 1, 2022



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**Serverless** is one of the hottest topics in cloud services. How does AWS **Lambda** work behind the scenes?

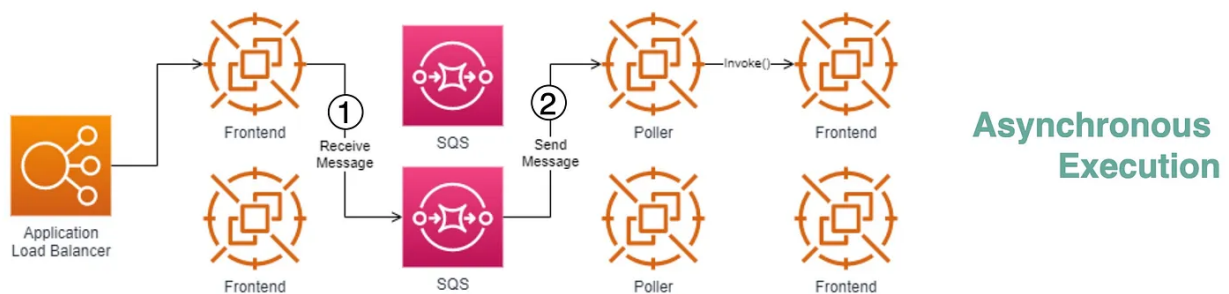
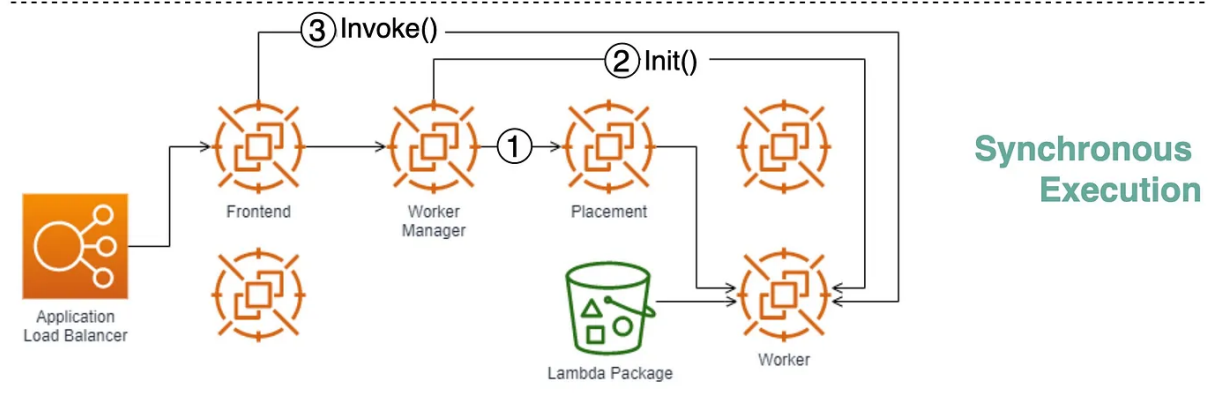
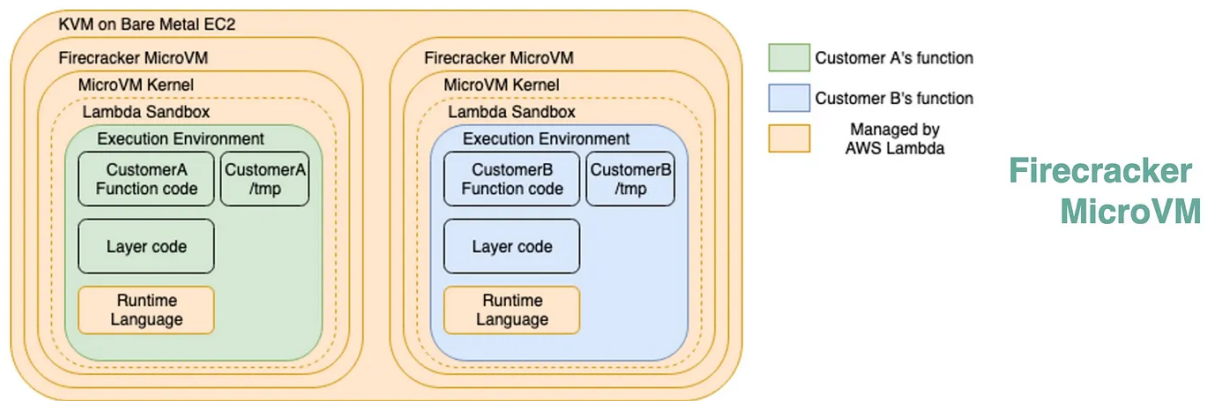
Lambda is a **serverless** computing service provided by Amazon Web Services (AWS), which runs functions in response to events.

## Firecracker MicroVM

Firecracker is the engine powering all of the Lambda functions [1]. It is a virtualization technology developed at Amazon and written in Rust.

The diagram below illustrates the isolation model for AWS Lambda Workers.

# How does AWS Lambda work?



Lambda functions run within a sandbox, which provides a minimal Linux userland, some common libraries and utilities. It creates the Execution environment (worker) on EC2 instances.

How are lambdas initiated and invoked? There are two ways.

## Synchronous execution

Step1: "The Worker Manager communicates with a Placement Service which is responsible to place a workload on a location for the given host (it's provisioning the sandbox) and returns that to the Worker Manager" [2].

Step 2: "The Worker Manager can then call *Init* to initialize the function for execution by downloading the Lambda package from S3 and setting up the Lambda runtime" [2]

Step 3: The Frontend Worker is now able to call *Invoke* [2].

### Asynchronous execution

Step 1: The Application Load Balancer forwards the invocation to an available Frontend which places the event onto an internal queue(SQS).

Step 2: There is "a set of pollers assigned to this internal queue which are responsible for polling it and moving the event onto a Frontend synchronously. After it's been placed onto the Frontend it follows the synchronous invocation call pattern which we covered earlier" [2].

Question: Can you think of any use cases for AWS Lambda?

Sources:

[1] AWS Lambda whitepaper: <https://lnkd.in/gVGjNjZS>

[2] Behind the scenes, Lambda: <https://lnkd.in/gbNNDWFY>

Image source: [1] [2]

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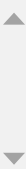


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