

API Gateway

- What is an API?
- What is the Amazon API Gateway?
- Amazon API Gateway Architecture & Key Concepts
- Features of Amazon API Gateway
- Amazon API Gateway endpoint types
- Types of Amazon API Gateway

What is an API?

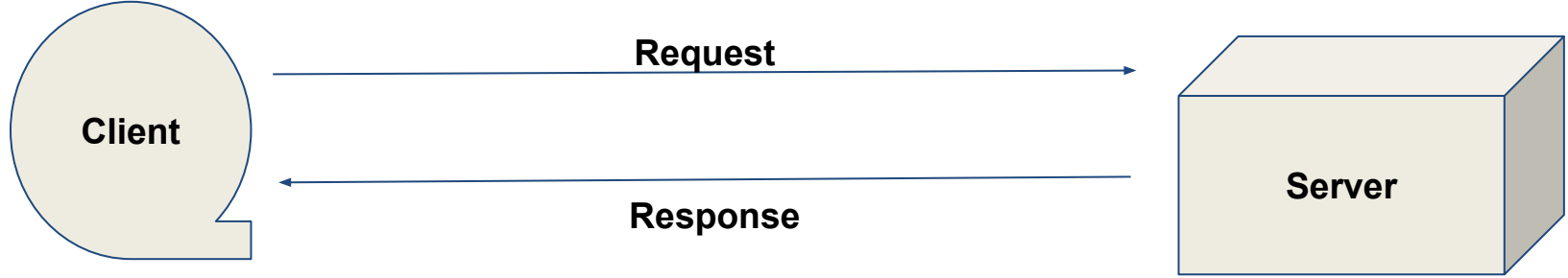
- API stands for Application Programming Interface, that allows two applications to talk to each other.
- In most of the common apps like Social Media Platforms, or sending an instant message, or checking weather in Mobile, an API call is made to the server, where retrieves some data, interprets the data, performs the necessary actions and sends it back as result.
- The Request and Response of some data passed between two applications, client/server happens via API.

What is an API?

The client uses following HTTP methods to communicate with the server:

- GET (to read)
- POST (to insert data)
- PUT (to update data)
- DELETE (to delete data)

Client Server Communication

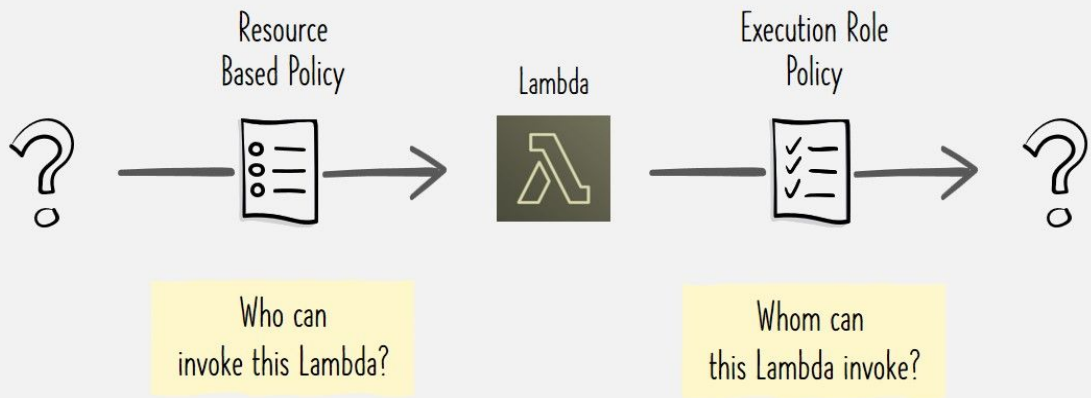


Lambda Invoke Scenarios

- An **API Gateway** is a serverless service from AWS which allows us to create **REST(Representational State Transfer) APIs** that are going to be public and accessible to the clients. So, the client will talk to the API Gateway.
- The API Gateway will then proxy the request to our lambda function. We use an API Gateway because it provides us more than just an HTTP endpoint to connect to other services. It provides us a lot of features such as Authentication, Development stages, etc.

Lambda Invoke Scenarios

AWS Lambda - Permissions Model



Which service is allowed to invoke a Lambda function?

Once invoked, which service is a Lambda function in turn allowed to invoke?



Lambda Invocation Modes



Push Mode

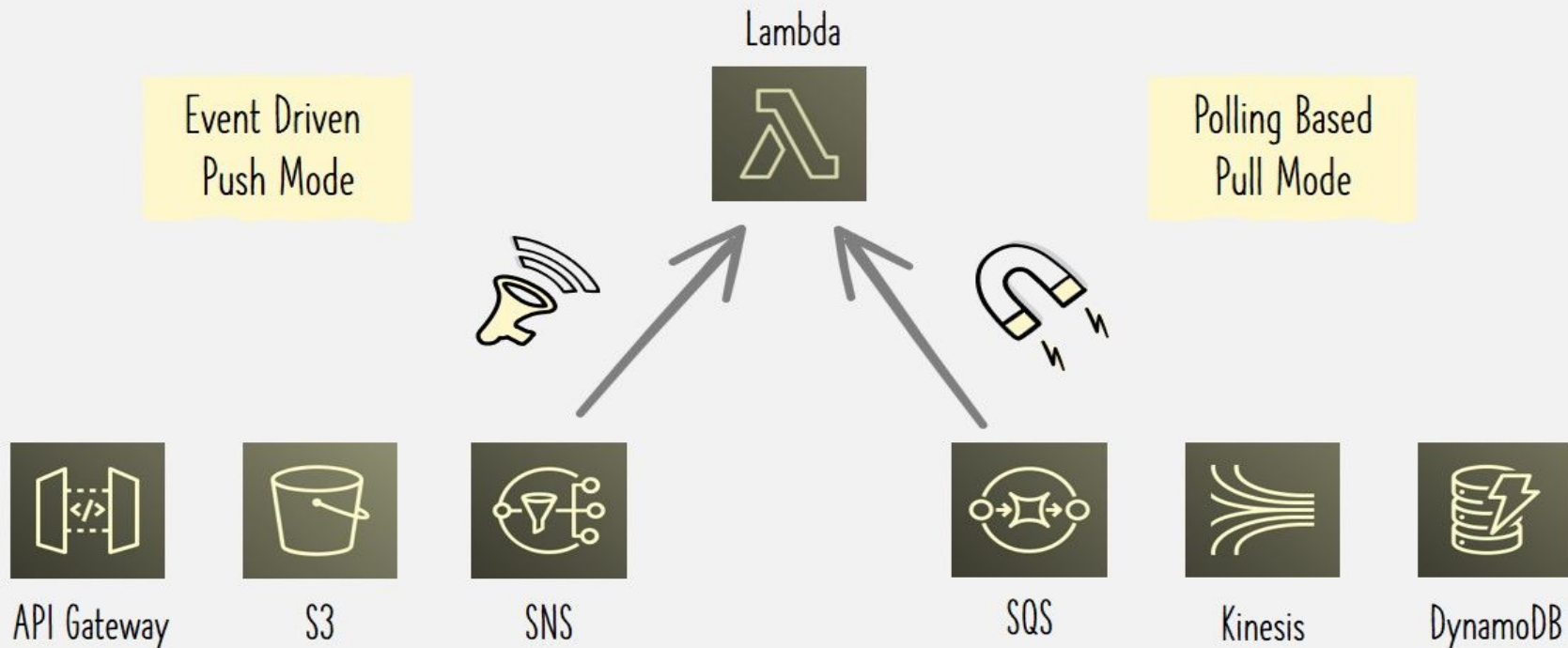
- an external service pushes an event into Lambda and triggers the function.
- This event could originate due to some action in an another service or a user initiated web request. e.g **S3 Event Notification to trigger Lambda Function.**
- the service that's the source of the event requires rights to invoke the Lambda function.

Pull Mode

- Services like SQS and Kinesis that do not push events directly to invoke Lambda. For these event sources, Lambda as a service polls them for events and invokes the Lambda function i.e. the function doesn't gets invoked by an external service.

Lambda Invocation Modes

AWS Lambda - Invocation Modes



What is the Amazon API Gateway?

- An **API Gateway** is a serverless service from AWS which allows us to create **REST APIs** that are going to be public and accessible to the clients. So, the client will talk to the API Gateway.
- The API Gateway will then proxy the request to a lambda function. We can use an API Gateway because it provides an HTTP endpoint, Authentication, Development stages etc.

Amazon API Gateway Architecture and Concepts

- Client (Mobile, Web or any other service)
- Types of API based on endpoints (Edge Optimized, Regional & Private)
- Integration

API endpoint:

- API endpoint is the hostname of the API.
- It will be in the form **<<api-id>>execute-api.<<region>>.amazonaws.com**

The types of API endpoints are

- Edge-optimized API endpoint
- Private API endpoint
- Regional API endpoint



Amazon API Gateway Architecture and Concepts

Integration:

The key component of the API Gateway is the Integration which connects the route to backend resources.

API Gateway supports the following as integrations

Lambda Function - Can connect via proxy or direct integration

HTTP - Connect to an HTTP endpoint either inside or outside of AWS

AWS Services - Can connect to 100+ endpoints inside AWS such as DynamoDB or Kinesis

VPC Link - Connect to ELB via the given VPC link privately.

Features of Amazon API Gateway

- It supports both stateful (WebSocket) and stateless (HTTP and REST) APIs.
- It has powerful authentication mechanism through AWS IAM Roles and Policies, Amazon Cognito User pools and Custom authorizer
- Canary release development to roll out the changes without affecting the functionalities.
- Monitoring of API Usage through Cloud Trail.
- Monitoring of logs through CloudWatch and can also set alarms.
- Integrated with WAF (Web Application Firewall)
- Integrated with AWS X-Ray



Amazon API Gateway endpoint types

Edge-optimized (default)

This is for your global clients, so this means that your API Gateway is going to be accessible from anywhere in the world and the requests are going to be routed through all the CloudFront Edge locations, which will improve the latency.

Regional

This is used when we expect all of our users to be within the same region where we created our API Gateway

Private

A private API Gateway can only be accessed from within our VPC, and it will use interface VPC endpoints for our ENIs. And to define access for an API Gateway, we can use a resource policy.



Amazon API Gateway endpoint types

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