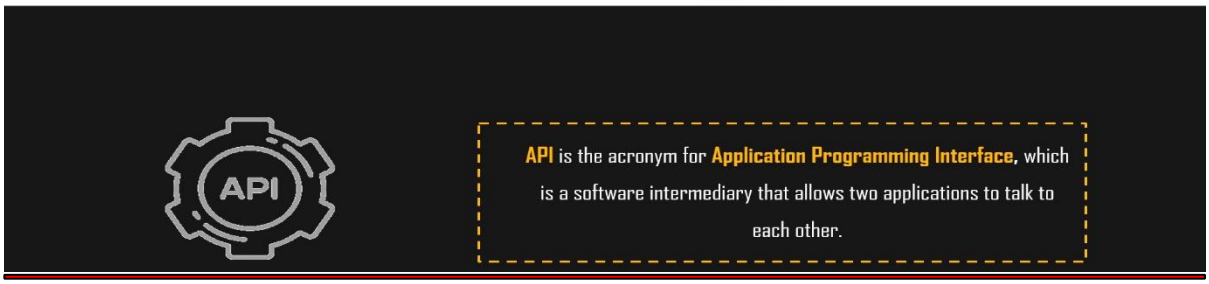
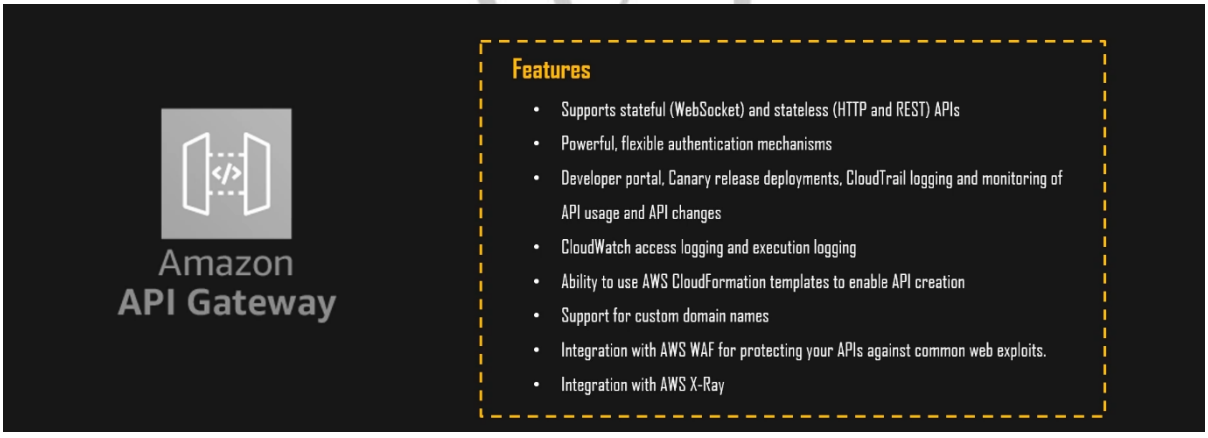
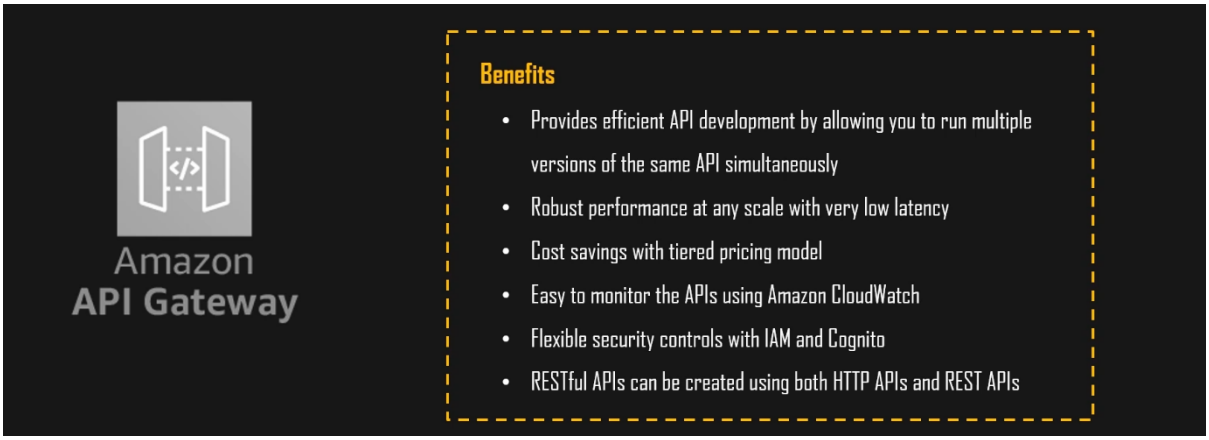
API Gateway

What is an API?



What is AWS API Gateway?





Who Uses API Gateway?

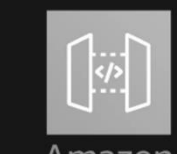
API Gateway is basically used by two types of developers that is the API developers and the app developers.

An API developer is someone who creates and deploys APIs to enable the required functionality in an API Gateway.

An app developer builds a functioning application to call AWS services by invoking a WebSocket or REST API created by an API developer in the API Gateway.

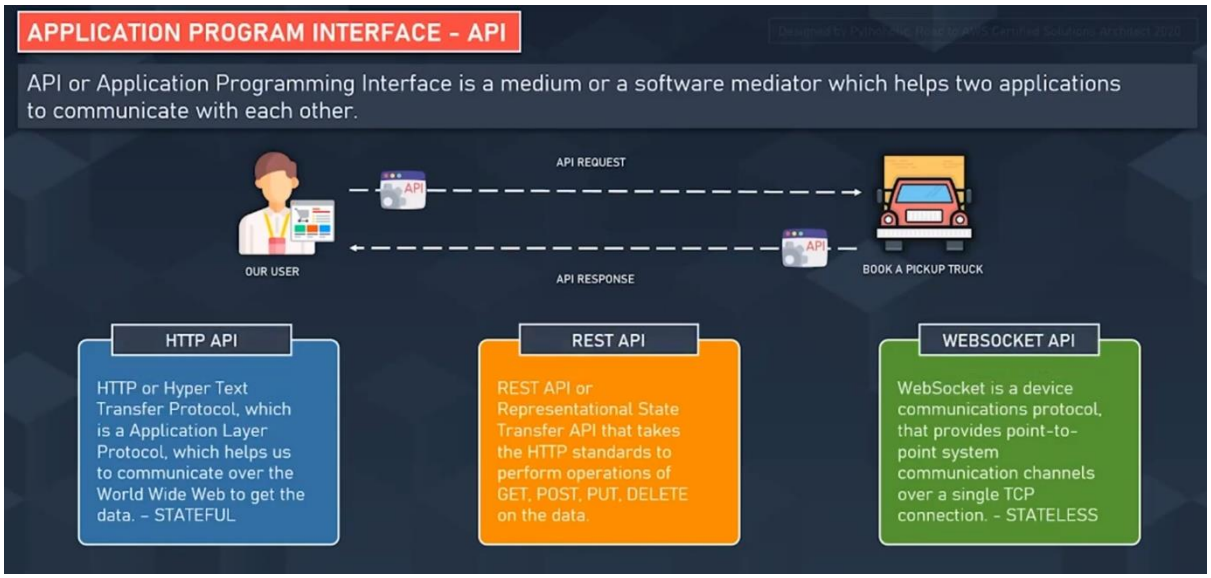
Pricing

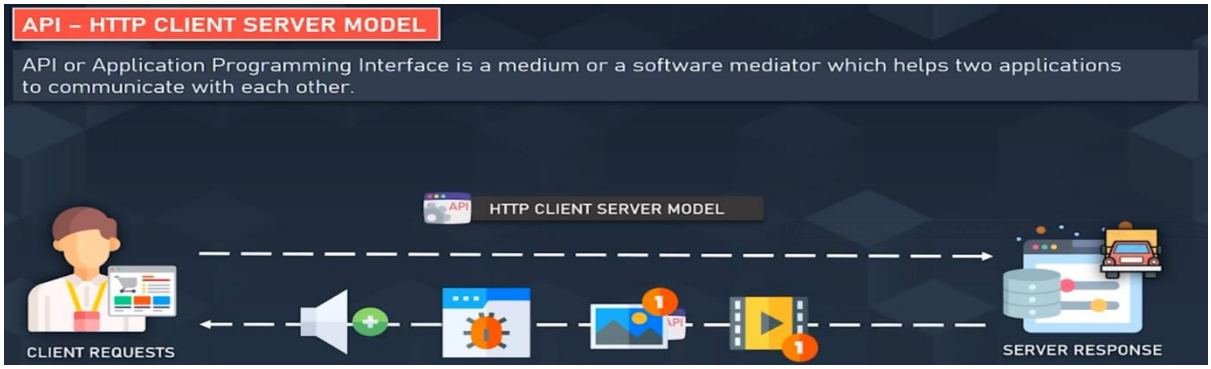
With Amazon API Gateway, you only pay when your APIs are in use. There are no minimum fees or upfront commitments. For HTTP APIs and REST APIs, you pay only for the API calls you receive and the amount of data transferred out.

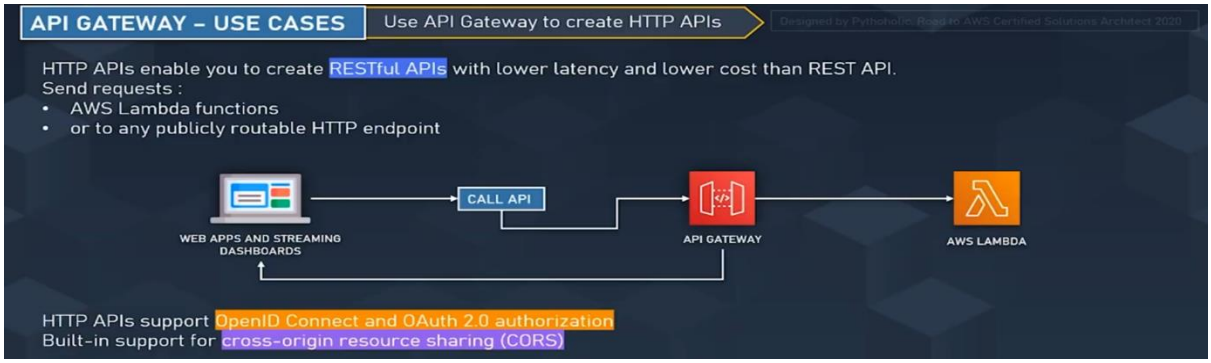


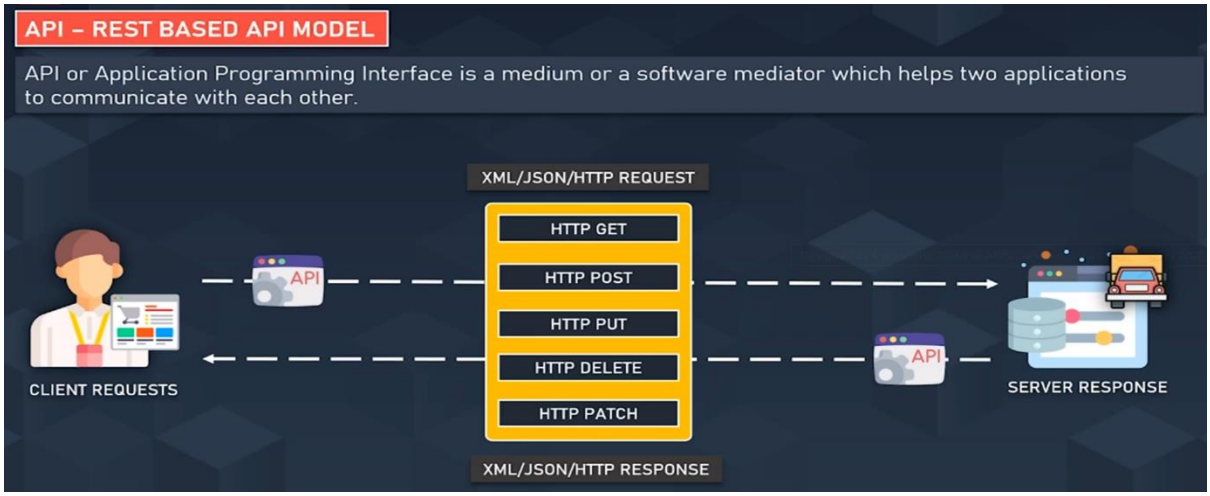
Prerequisites

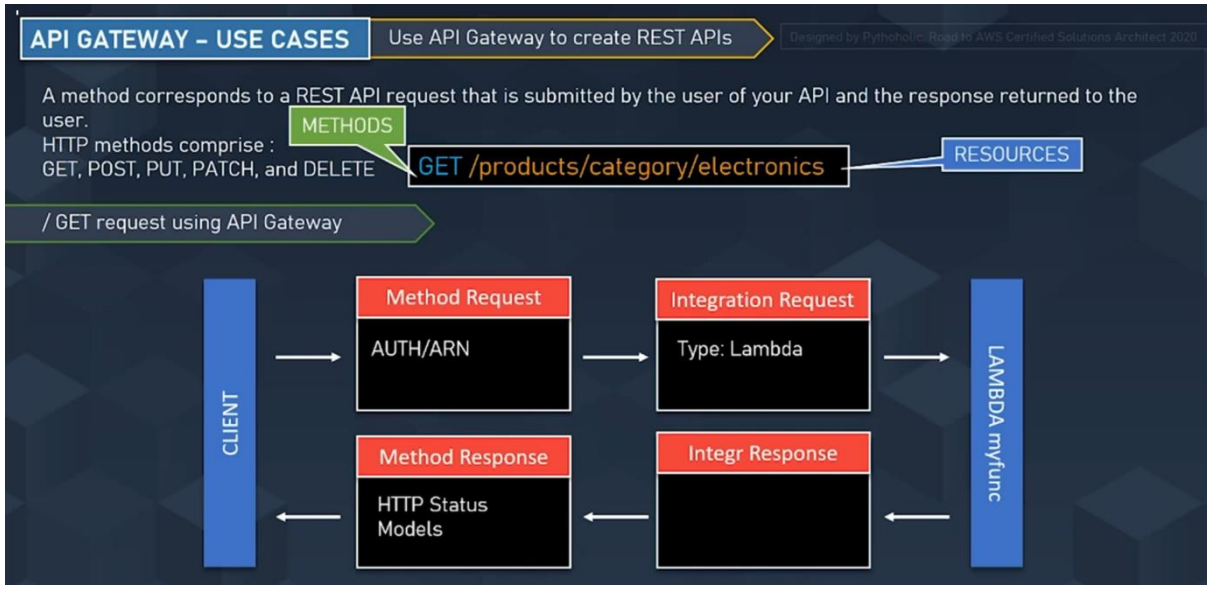
Before using Amazon API Gateway for the first time, you must have an AWS account. Therefore, you will have to sign up for an AWS account. Once your account has been created, you should also create an AWS Identity and Access Management (IAM) user with administrator permissions.




API – HTTP CLIENT SERVER MODEL
API or Application Programming Interface is a medium or a software mediator which helps two applications to communicate with each other.
HTTP CLIENT SERVER MODEL
CLIENT REQUESTS
SERVER RESPONSE

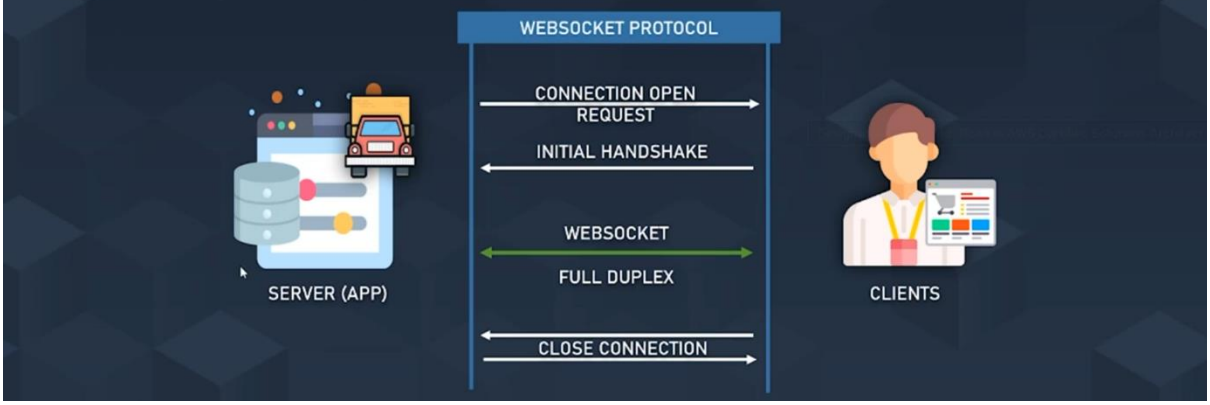

API GATEWAY – USE CASES
Use API Gateway to create HTTP APIs
HTTP APIs enable you to create RESTful APIs with lower latency and lower cost than REST API.
Send requests :
• AWS Lambda functions
• or to any publicly routable HTTP endpoint
WEB APPS AND STREAMING DASHBOARDS
CALL API
API GATEWAY
AWS LAMBDA
HTTP APIs support OpenID Connect and OAuth 2.0 authorization
Built-in support for cross-origin resource sharing (CORS)


API – REST BASED API MODEL
API or Application Programming Interface is a medium or a software mediator which helps two applications to communicate with each other.
XML/JSON/HTTP REQUEST
HTTP GET
HTTP POST
HTTP PUT
HTTP DELETE
HTTP PATCH
XML/JSON/HTTP RESPONSE
CLIENT REQUESTS
SERVER RESPONSE


API GATEWAY – USE CASES
Use API Gateway to create REST APIs
A method corresponds to a REST API request that is submitted by the user of your API and the response returned to the user.
HTTP methods comprise :
GET, POST, PUT, PATCH, and DELETE
METHODS
GET /products/category/electronics
RESOURCES
/ GET request using API Gateway
CLIENT
Method Request
AUTH/ARN
Integration Request
Type: Lambda
LAMBDA myfunc
Method Response
HTTP Status Models
Integr Response

API – WEBSOCKET PROTOCOL

API or Application Programming Interface is a medium or a software mediator which helps two applications to communicate with each other.



API GATEWAY – USE CASES

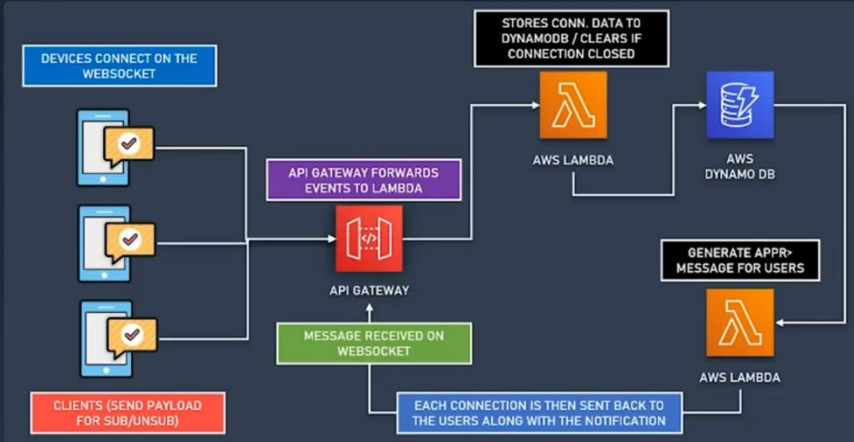
Use API Gateway to create WebSocket APIs

The client and the server can both send messages to each other at any time.

- Build a serverless application using an API Gateway WebSocket API and AWS Lambda to send and receive messages to and from individual users or groups of users in a chat room
- Chat applications
- Real-time dashboards such as stock tickers
- Real-time alerts and notifications

WebSocket API management:

- Monitoring and throttling of connections and messages.
- Using AWS X-Ray to trace messages as they travel through the APIs to backend services.
- Easy integration with HTTP/HTTPS endpoints.



API GATEWAY – LET'S START

Create, maintain, and secure APIs at any scale

Amazon API Gateway is a fully managed service that makes it easy for developers to create, publish, maintain, monitor, and secure APIs at any scale.

Using API Gateway create:

- RESTful APIs
- WebSocket APIs that enable real-time two-way communication applications.

API Gateway handles:

- Traffic management
- CORS support
- Authorization and access control
- Throttling
- Monitoring
- API version management

API Gateway has no minimum fees or startup costs.
You pay for the API calls you receive, and the amount of data transferred.

HTTP API

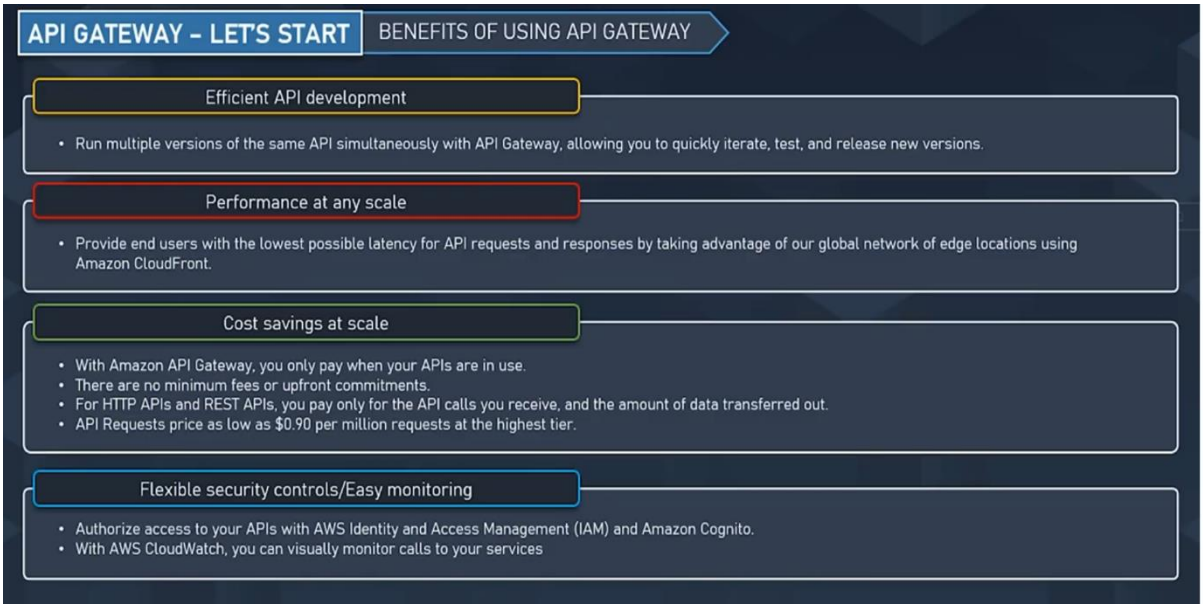
HTTP APIs are the best choice for building APIs that only require API proxy functionality

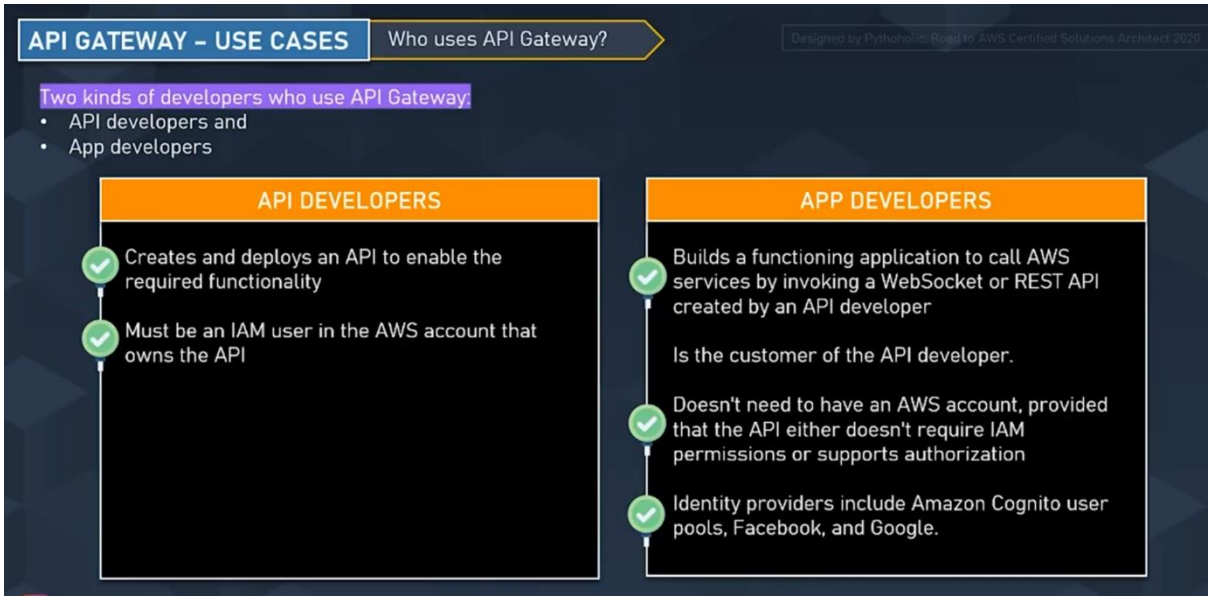
REST API

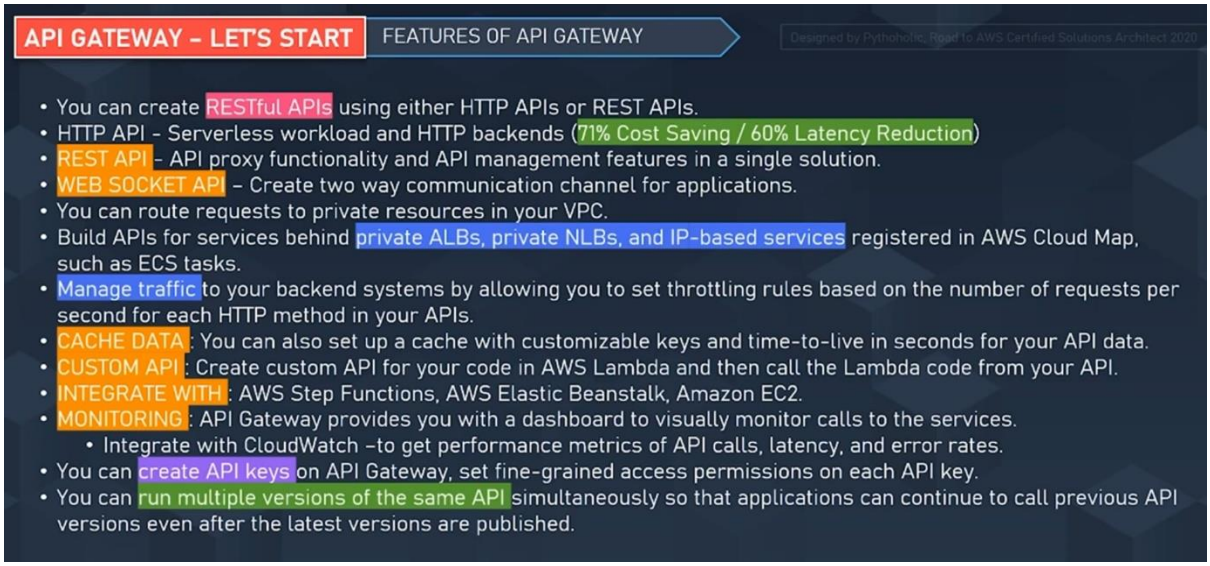
API proxy functionality and API management features in a single solution

WEBSOCKET API

Build real-time two-way communication applications, such as chat apps and streaming dashboards, with WebSocket APIs


API GATEWAY – LET'S START
BENEFITS OF USING API GATEWAY
Efficient API development
• Run multiple versions of the same API simultaneously with API Gateway, allowing you to quickly iterate, test, and release new versions.
Performance at any scale
• Provide end users with the lowest possible latency for API requests and responses by taking advantage of our global network of edge locations using Amazon CloudFront.
Cost savings at scale
• With Amazon API Gateway, you only pay when your APIs are in use.
• There are no minimum fees or upfront commitments.
• For HTTP APIs and REST APIs, you pay only for the API calls you receive, and the amount of data transferred out.
• API Requests price as low as $0.90 per million requests at the highest tier.
Flexible security controls/Easy monitoring
• Authorize access to your APIs with AWS Identity and Access Management (IAM) and Amazon Cognito.
• With AWS CloudWatch, you can visually monitor calls to your services


API GATEWAY – USE CASES
Who uses API Gateway?
Two kinds of developers who use API Gateway:
• API developers and
• App developers
API DEVELOPERS
Creates and deploys an API to enable the required functionality
Must be an IAM user in the AWS account that owns the API
APP DEVELOPERS
Builds a functioning application to call AWS services by invoking a WebSocket or REST API created by an API developer
Is the customer of the API developer.
Doesn't need to have an AWS account, provided that the API either doesn't require IAM permissions or supports authorization
Identity providers include Amazon Cognito user pools, Facebook, and Google.


API GATEWAY – LET'S START
FEATURES OF API GATEWAY
• You can create RESTful APIs using either HTTP APIs or REST APIs.
• HTTP API - Serverless workload and HTTP backends (71% Cost Saving / 60% Latency Reduction)
• REST API - API proxy functionality and API management features in a single solution.
• WEB SOCKET API – Create two way communication channel for applications.
• You can route requests to private resources in your VPC.
• Build APIs for services behind private ALBs, private NLBs, and IP-based services registered in AWS Cloud Map, such as ECS tasks.
• Manage traffic to your backend systems by allowing you to set throttling rules based on the number of requests per second for each HTTP method in your APIs.
• CACHE DATA : You can also set up a cache with customizable keys and time-to-live in seconds for your API data.
• CUSTOM API : Create custom API for your code in AWS Lambda and then call the Lambda code from your API.
• INTEGRATE WITH : AWS Step Functions, AWS Elastic Beanstalk, Amazon EC2.
• MONITORING : API Gateway provides you with a dashboard to visually monitor calls to the services.
• Integrate with CloudWatch –to get performance metrics of API calls, latency, and error rates.
• You can create API keys on API Gateway, set fine-grained access permissions on each API key.
• You can run multiple versions of the same API simultaneously so that applications can continue to call previous API versions even after the latest versions are published.

API GATEWAY — PRICING FOR API GATEWAY

Includes one million HTTP API calls, one million REST API calls, one million messages, and 750,000 connection minutes per month for up to 12 months

FREE TIER:

- ONE million API calls received for REST APIs
- ONE million API calls received for HTTP APIs
- ONE million messages
- 750,000 connection minutes for WebSocket APIs per month for up to 12 months

	HTTP API CALLS		REST APIs				WebSocket APIs Message Transfer	
Number of Requests (per month)	First 300 million	300+ million	First 333 million	Next 667 million	Next 19 billion	Over 20 billion	First 1 billion	Over 1 billion
Price (per million)	$1.00	$0.90	$3.50	$2.80	$2.38	$1.51	$1.00	$0.80
	Rs 74	Rs 66	Rs 258	Rs 206	Rs 175	Rs 111	Rs 74	Rs 59

API GATEWAY – LET'S START — SECURITY WRT API GATEWAY

- Use multi-factor authentication (MFA) with each account.
- Use SSL/TLS to communicate with AWS resources.
- Set up API and user activity logging with AWS CloudTrail.
- Use AWS encryption solutions, along with all default security controls within AWS services.
- ENCRYPTION AT REST : If you choose to enable caching for a REST API, you can enable cache encryption
- ENCRYPTION AT TRANSIT: API Gateway doesn't support unencrypted (HTTP) endpoints.
- You can create private REST APIs that can be accessed only from your Amazon Virtual Private Cloud (VPC)

- Logging and monitoring:
  - Amazon CloudWatch Logs
  - Amazon CloudWatch Alarms
  - Access Logging to Kinesis Data Firehose
  - AWS CloudTrail
  - AWS X-Ray
  - AWS Config