



Application Programming Interface (API)



Quote of The Day

The value of an idea lies in the using of it

- Thomas A. Edison





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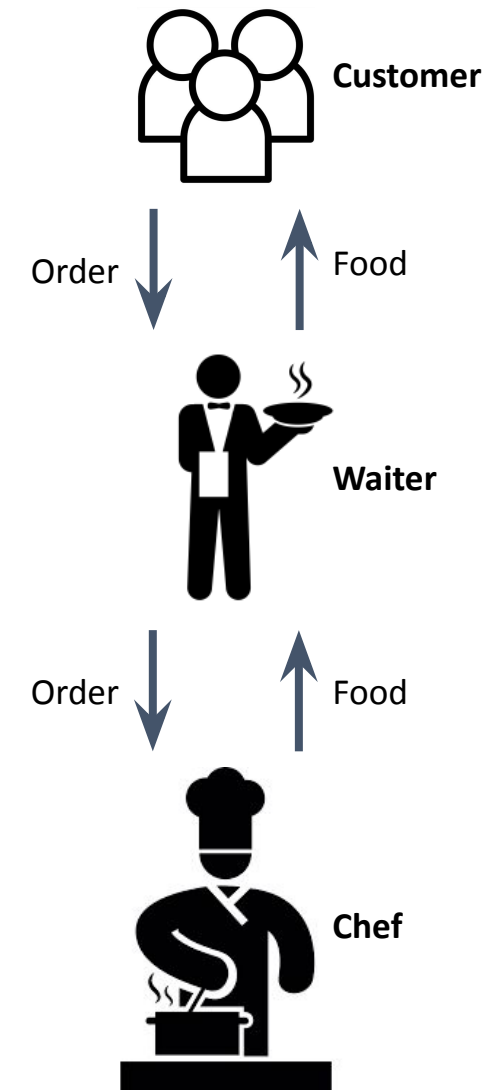


Let's Imagine...

Imagine you are sitting in a restaurant's table with a menu of choices to order from. And a kitchen which will prepare your order. One thing is missing, who will receive your order and how the food will be delivered to you?

That's where the waiter comes in. The waiter is a messenger of your order and delivers your request to the kitchen. When the your favorite food is ready, waiter sends it back to you.

This situation exactly the same as how API works.



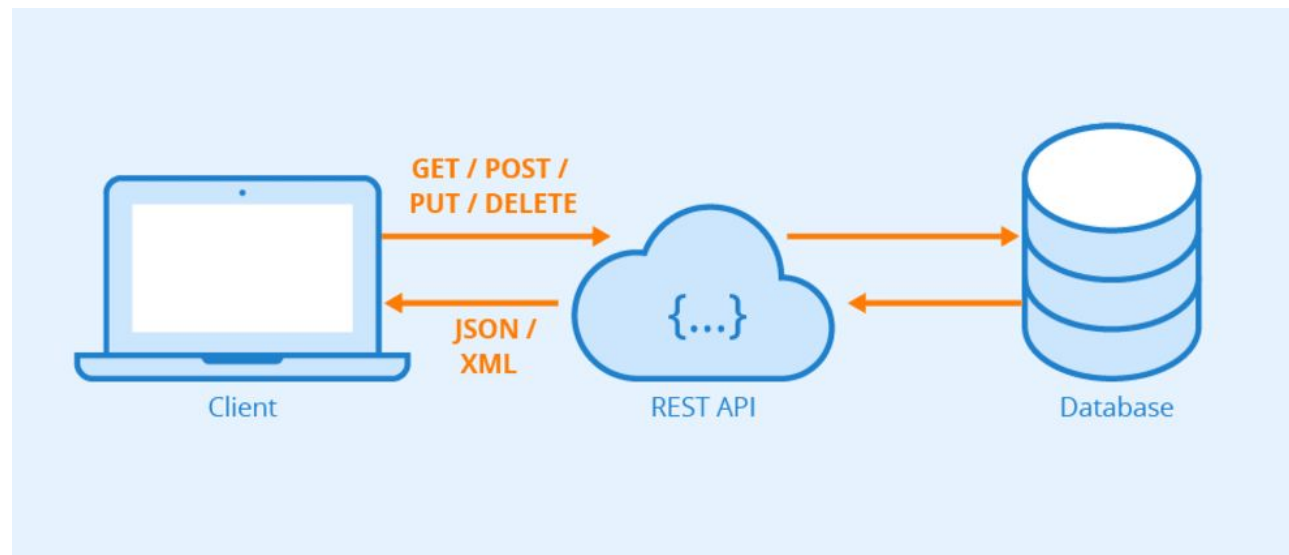


What is API?

API is the acronym for **Application Programming Interface**, which is a software intermediary that allows two applications to talk to each other.

An API is a messenger that takes request and tells a system what you want to do, and then return the response back to you.

Each time you use an app like LinkedIn, send an instant message, or check the weather on your phone, you're using an API.





Example of API

The screenshot displays a LinkedIn profile for Jacob Hill, Chief Marketing Officer at FILTPod. The interface includes a top navigation bar with icons for Home, My Network, Jobs, Messaging, Notifications, and Me. The main content area shows a post by the Department of Education & Training, Victoria, congratulating Craig Robertson. The right sidebar contains sections for LinkedIn News and Today's top courses.

Navigation Bar: Home, My Network, Jobs, Messaging, Notifications, Me, Work, Post a job for free

Profile Header: Jacob Hill, Chief Marketing Officer at FILTPod

Post: Department of Education & Training, Victoria (55,610 followers) congratulating Craig Robertson, who has been appointed as founding Chief Executive Officer of the new Victorian Skills Authority (VSA).

LinkedIn News:

- The Boomers dare to dream of gold (8h ago • 104 readers)
- Don't judge colleagues too quickly (3d ago • 16,584 readers)
- Qantas stands down 2,500 staff (8h ago • 2,158 readers)
- Crown boss exits in scandal fallout (9h ago • 182 readers)
- Thanks or no thanks? Sending a note (2d ago • 24,721 readers)

Today's top courses:

- Customer Service: Problem Solving an... (Noah Fleming)
- Unconscious Bias (Stacey Gordon)
- Communicating with Confidence (Jeff Ansell)



Example of API

traveloka

Promos Partner with Us Saved My Booking IDR Pay Log In Register

Transports Accommodations Things to Do Bills & Top-ups Travel Add-ons

See more promos

Flights
Hotels
Flight + Hotel
Eats
Trains
JR Pass
Bus & Shuttle
Airport Transfer
Xperience
Car Rental

Recently Viewed Hotels

City, destination, or hotel name
City, hotel, place to go

Check-in Sun, 21 Feb 2021 Duration 1 night Check-out Mon, 22 Feb 2021

Guests and Rooms
1 Adult(s), 0 Child, 1 Room

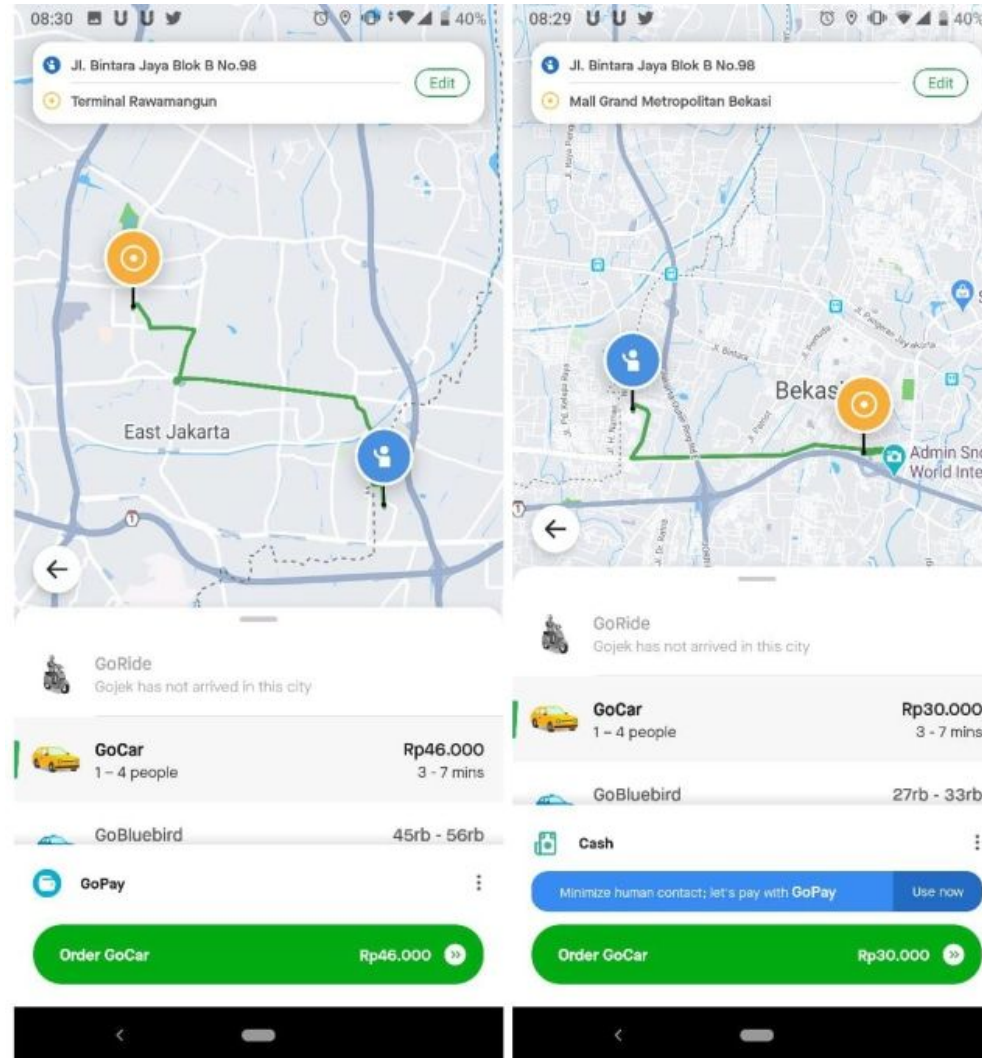
Search Hotels

Going on a business trip ?
Pay upon Check-in Traveloka Best Price Guarantee

Need help?



Example of API





Benefit of API

- **Automation:** with APIs, computers rather than people can manage the work. Through APIs, agencies can update work flows to make them quicker and more productive.
- **New data available:** an API allows all of the information generated at the government level to be available to every citizen, not just a select few.
- **Integration:** APIs allow content to be embedded from any site or application more easily. This guarantees more fluid information delivery and an integrated user experience.
- **Personalization:** through APIs any user or company can customize the content and services that they use the most.

API Data Format

JSON

{...}

XML

<...>

JSON

Many new APIs have adopted JSON as a format because it's built on the popular Javascript programming language, which is ubiquitous on the web and usable on both the front- and back-end of a web app or service. JSON is a very simple format that has two pieces: keys and values. Keys represent an attribute about the object being described. A pizza order can be an object. It has attributes (keys), such as crust type, toppings, and order status. These attributes have corresponding values (thick crust, pepperoni, and out-for-delivery).

key *value*

↘ ↙

```
{ "crust": "original" }
```

{ ... }

XML

XML has been around since 1996. With age, it has become a very mature and powerful data format. Like JSON, XML provides a few simple building blocks that API makers use to structure their data. The main block is called a node.

XML always starts with a root node, which in our pizza example is "order." Inside the order are more "child" nodes. The name of each node tells us the attribute of the order (like the key in JSON) and the data inside is the actual detail (like the value in JSON).

node opening tag *value* *node closing tag*

↓ ↓ ↙

`<crust>original</crust>`





API in Python

Python is a powerful language that can create and request API. There are popular python libraries which is made solely for API, for example requests, flask, fastapi, django, etc.

But for this lesson we will not create any API since it needs deeper understanding about how backend works.

We will learn how to get data from API. The library that we are going to use is requests.

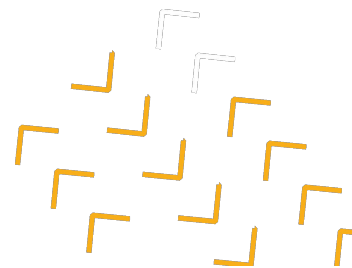


django



The Roles of HTTP, APIs, and REST

- **Application Programming Interface (API)** is a web service that grants access to specific data and methods that other applications can access – and sometimes edit – via standard HTTP protocols, just like a website. This simplicity makes it easy to quickly integrate APIs into a wide variety of applications.
- **REpresentational State Transfer (REST)**, is probably the most popular architectural style of APIs for web services. It consists of a set of guidelines designed to simplify client / server communication. REST APIs make data access much more straightforward and logical.





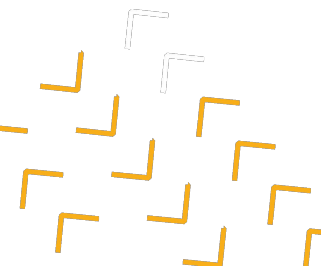
Component of API

Endpoint – The URL that delineates what data you are interacting with. Similar to how a web page URL is tied to a specific page, an endpoint URL is tied to a specific resource within an API.

Data – If you're using a method that involves changing data in a REST API, you'll need to include a data payload with the request that includes all data that will be created or modified.

Headers – Contain any metadata that needs to be included with the request, such as authentication tokens, the content type that should be returned, and any caching policies.

Method – Specifies how you're interacting with the resource located at the provided endpoint. REST APIs can provide methods to enable full Create, Read, Update, and Delete (CRUD) functionality. Common methods are GET, PUT, POST, DELETE





API Statuses

HTTP response status codes indicate whether a specific HTTP request has been successfully completed. Responses are grouped in five classes:

1. Informational responses (`100` – `199`)
2. Successful responses (`200` – `299`)
3. Redirects (`300` – `399`)
4. Client errors (`400` – `499`)
5. Server errors (`500` – `599`)

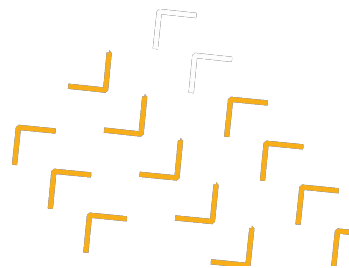
REST API Methods

HTTP Verb	CRUD
POST	Create
GET	Read
PUT	Update/Replace
PATCH	Update/Modify
DELETE	Delete

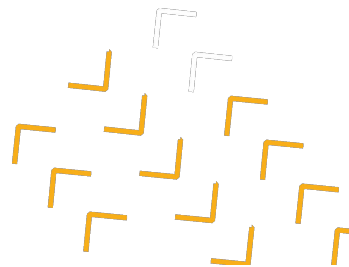


API Data Processing

After getting the data from API, we need to process the data, in order to be useful for our analysis.



Let's code!



**Thank
YOU**

