API Workshop

William & Mary ACM

2/6/2025

Agenda

01 **Announcements**

02 **Intro to APIs**

03 **Interactive API Demo**

&Hacks

Committee chair applications are open!
Due 2/8/2025

- Sponsorship Committee
- Finance Committee
- Marketing Committee
- Outreach Committee
- Technical Committee
- Logistics Committee

Hackathon Trips

Hackathon (n.) An event where people come together to make cool things fast, or just to learn!

We work to organize transportation and teams to build projects together!

Register for HooHacks today!
March 29th-30th
https://www.hoohacks.io/

Upcoming Events

CS Banquet
February 13, 7:30pm - 9:30pm in Sadler Tidewater AB

CS Department Townhall
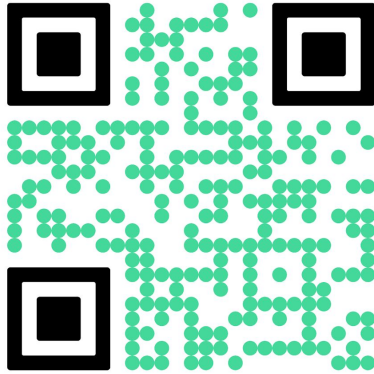February 28, 12pm - 1pm in McGlothlin St Hall, Room 020.

If you have any topics you'd like to see discussed at the town hall, please submit them through the form below by February 10th!
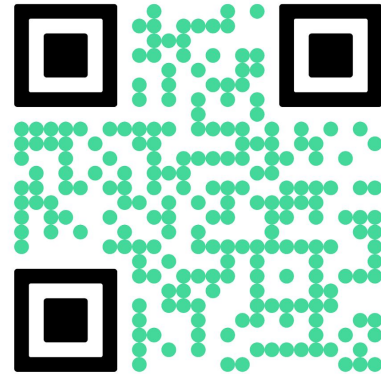
https://go.wm.edu/K2n8cc

Socials

Join our Groupme!

Follow us on Instagram!

Dues

For $15, get access to:
- ACM Alumni Network
- ACM Dues-only member group chat and social events
- ACM T-shirt
- Other cool stuff

Talk to Lorenzo if you are interested!

What is an API?

An application programming interface (API) is a connection between computers or between computer programs.

Essentially, API's serve as an intermediary between you the programmer, you and some web server, where you ask the API for some data, and it will return it to you typically in json format.

End User *with Browser* — API — Server *Back-end System*

Request
Response

Make the Order
Delivery of order

Take the Order
Bringing from Kitchen

Customer — Waiter — Chef

Quick Example

https://www.restcountries.com/#rest-countries

https://www.alphavantage.co/documentation/
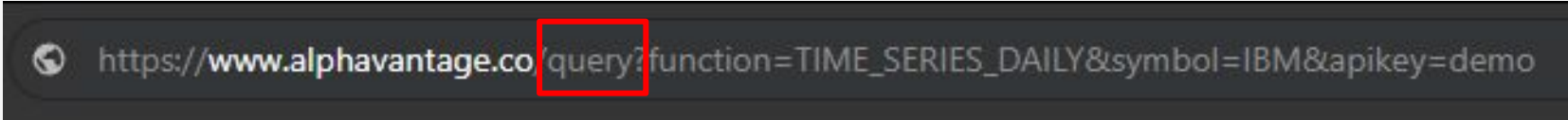
Breakdown

https://**www.alphavantage.co**/query?function=TIME_SERIES_DAILY&symbol=IBM&apikey=demo

Base URL
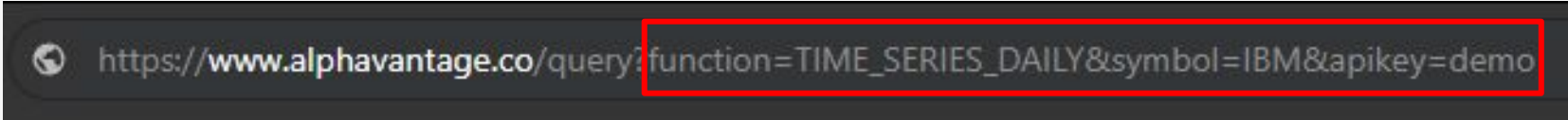Where the API requests are sent.

Breakdown

`https://www.alphavantage.co/query?function=TIME_SERIES_DAILY&symbol=IBM&apikey=demo`

Endpoint
The specific path on the server where requests are sent to retrieve data. In this case, query is the general endpoint for fetching different types of financial data

Breakdown

`https://www.alphavantage.co/query?function=TIME_SERIES_DAILY&symbol=IBM&apikey=demo`

Parameters

Key-value pairs appended to the endpoint to modify the behavior of the API or filter the data it returns.

Why use APIs?

Cost efficiency
You don't have to store complex databases on your own server.

Innovation
You can build on top of existing services, creating new tools, applications, or integrations.

Automation/Scalability
You can trigger actions programmatically and offload certain tasks to specialized external services.
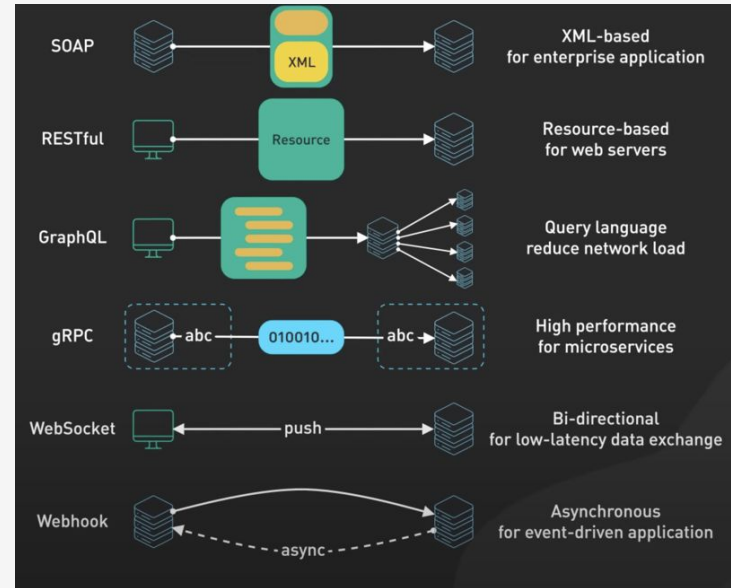
API Architectures

REST COUNTRIES PE

Get information about countries via a RESTful API

Current version: 3.1

API Architectures

- Rest
- SOAP
- GraphQL
- Webhooks

API Architectures

Rest

REST is the most commonly used architectural style for building web services and APIs, and it emphasizes standardized, stateless interactions between clients and servers.

Get
Retrieve data on a server.

Post
Create new data on a server.

Put
Update data on a server

Delete
Remove data on a server.

Real-World Examples

Payment processing
I have a small business and want to handle transactions on my website, but don't want to handle all the messy logic on my own server.

Social media integration
 I want to give users the option to "login with Google" on my own website.

Maps and location services
I want to create my own "Pokemon GO" style game, but don't want to handle all the complex map and location logic myself.

Best Practices

Don't Share Your API Key!
Otherwise people can do bad stuff with it.

Check Rate Limits
Managing an API costs money, so companies will often limit you
or charge you for usage.

Optimize API Calls for Performance
Don't make a gazillion requests a second, and consider caching
responses.

Let's Make a Game!

You will need python and an appropriate IDE installed.

https://github.com/porimol/countryinfo

https://tinyurl.com/WMACM2025

Thanks for coming!

(Feel free to stay if you have any questions)

Next meeting:

Thursday, February 13th, 7pm in ISC 2280

You will learn about web scraping and create a game by web scraping RateMyProfessor, so make sure to be there!