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TEKsystems Global Services

Full Stack Developers

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Agenda

- Who is a Full Stack Developer?
- A little history lesson
- Client-Server Model
- Qualities & Responsibilities of a Full Stack Developer
- Monolithic Architecture
- Microservices Architecture
- Evolution of a Full Stack Developer
- Why should I become a Full Stack Developer?
- The Unspoken Stack
- Full Stack Vs Single Stack Developer
- How to become a Full Stack Developer?
- Choosing Your Tech. Stack
- Where to Start?
- Conclusion
- Q&A Time

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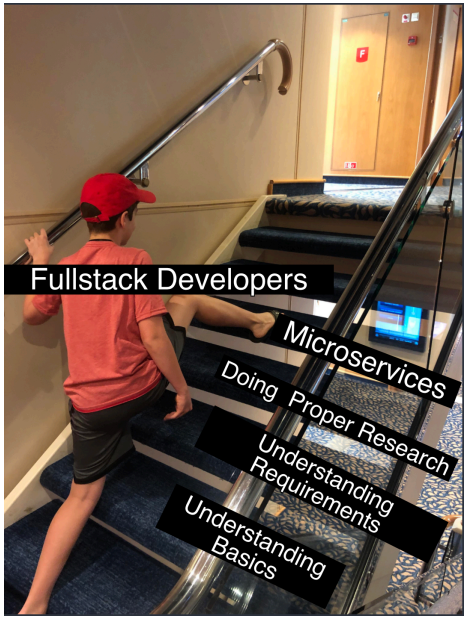
Key Terminologies

Understand these first…

- **API (**Application Program Interface**) –** Software use this to access data from other software or databases.
- **Technology Stack -** collection of the programs which are used together to produce a specific result.
- **Client-Server Model -** distributed application structure that partitions tasks or workloads between the providers of a resource or service, called servers, and service requesters, called clients.



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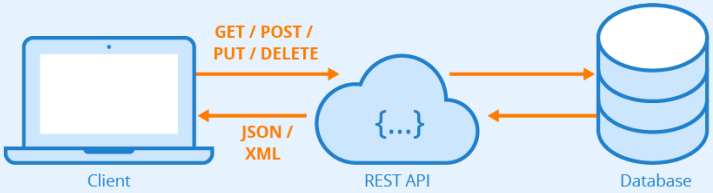
Application **P**rogram **I**nterface (API)

- When you use an application on your mobile phone, the application connects to the Internet and sends data to a server.
- The server then retrieves that data, interprets it, performs the necessary actions and sends it back to your phone.
- The application then interprets that data and presents you with the information you wanted in a readable way.



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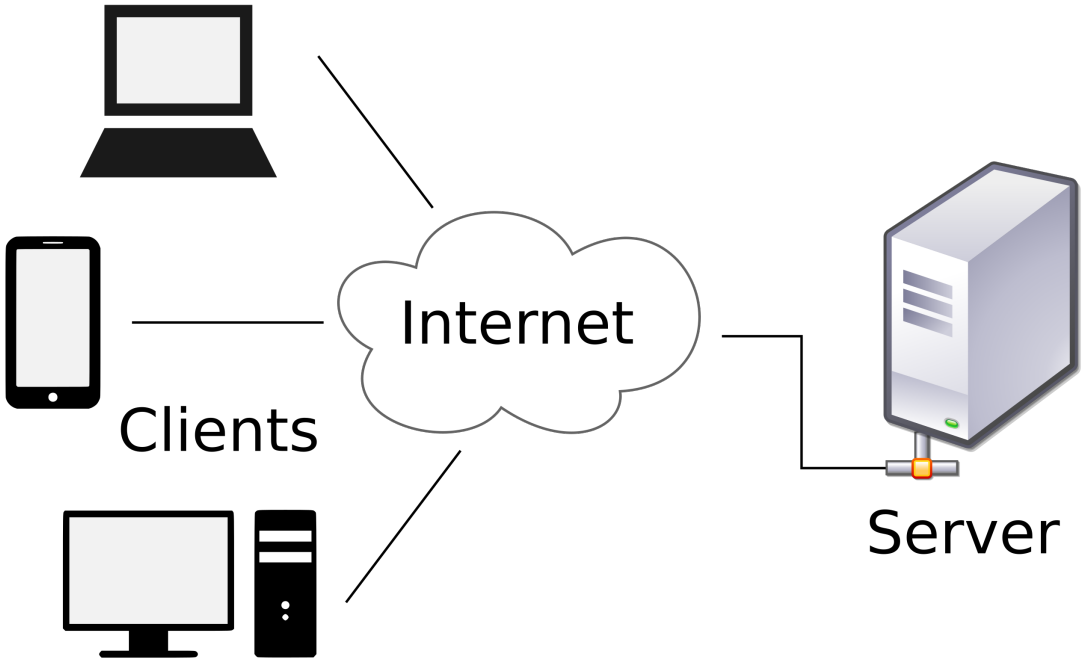
Client-Server Model/Architecture



Front-End?

- Whatever an end user interacts with is the “User Interface”, or referred to as “UI”.
- UI is everywhere, be it a website, a mobile application…everything.
- Front-End Development consists of developing the user interfaces.
- Front-End Developers are responsible for implementing all the visual elements.
- Proficient in HTML, CSS, Bootstrap, Angular, JavaScript etc.

Back-End?

- Back-End development ensures the proper functioning of the application.
- Back-End developers spend a lot of time working with Databases, APIs & Code behinds.
- Needs to be proficient in technical domains.
- Understanding of how client & servers work is a **MUST**.
- Experienced with SQL/NoSQL (Databases), various programming languages like C#, Python, PHP, Java etc. and debugging knowledge is most important.

Full Stack Developer

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Full Stack Developer?

- Developer who handles both, Client-Side and Server-Side.
- Developer who works on both, Front-End and Back-End.
- Typically handles working with User Interfaces, Database Servers, building Restful Services etc.
- Some popular stacks:
  - **LAMP Stack** – Linux, Apache, MySQL, PHP
  - **MEAN Stack** – MongoDB, Express.js, Angular, Node.js
  - **LEMP** – Linux, Nginx, MySQL, PHP
- Has a 360 degree view into different components that make a software product successful.

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How did “Full Stack Developer” Come Into Existence?

- The term “Full Stack Developer” was coined by Facebook in their earlier days (around 2010).
- Facebook (allegedly) used to hire Full Stack Developer initially.
- But, things were much more simpler back then.
- Stacks are much more complex now. It’s not just about designing the UI & making APIs.
- Over the time, various technical stacks have emerged and things have been changing drastically.
- In 2010, a Full Stack Developer referred to a developer who could design websites and back-end.
- In 2020, much more things are expected from a Full Stack Developer, like designing UI, building API, handling security of the applications, managing CI/CD cycles, looking through the deployment phases etc.
- Technology has advanced in last decade, multiple frameworks have come out and as a result, the expectations from a Full Stack Developer have also increased significantly.

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Full Stack Developer Skills

- Crystal clear understanding of Client-Server architecture.
- Familiarity with at least 1 front end technology.
- Familiarity with at least 2-3 back end technologies.
- Understanding/Experience with Cloud Services is a **PLUS**!
- At least 1 Scripting language in an added **BONUS**.
- Should know databases like the back of the hand.
- Debugging skills will help you much more than your knowledge about programming languages.
- Always ready learn and adapt attitude.
- **GOD LEVEL GOOGLE-ing SKILLS.**

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Full Stack Developer Responsibilities?

- Developing front end website architecture.
- Designing user interactions on web pages.
- Developing back end website applications.
- Creating servers and databases for functionality.
- Working alongside graphic designers for web/mobile application design features.
- Seeing through a project from a mere concept to a finished product.
- Designing and developing APIs.
- Meeting both technical and consumer needs.

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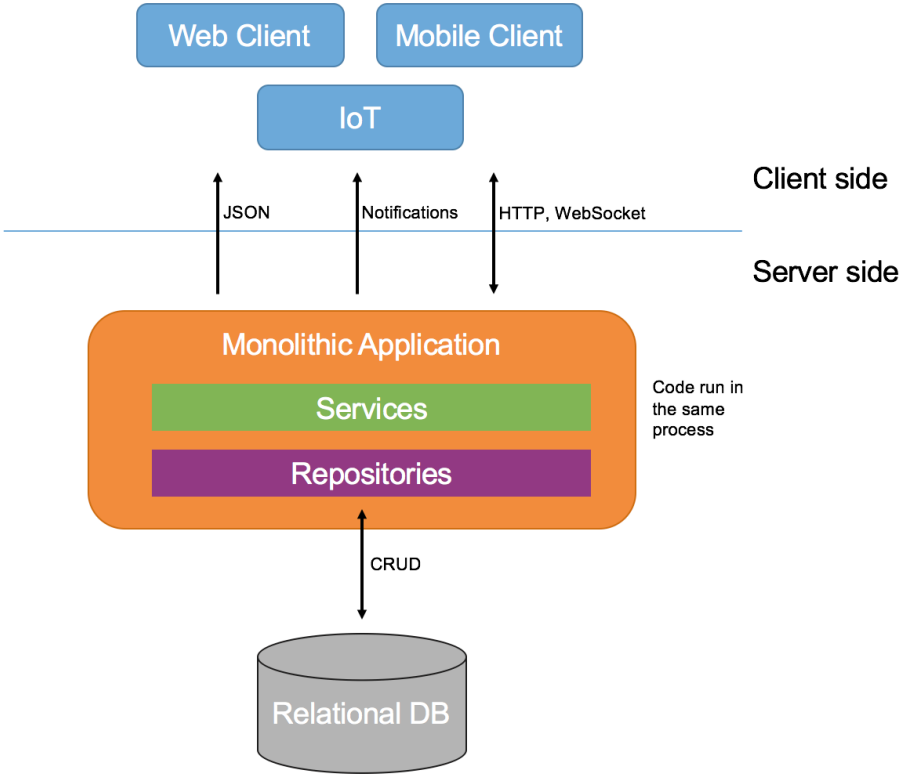
Monolithic Architecture

- Consists of 3 parts:
  - Database
  - Client-Side UI
  - Server-Side Application
- Defined in same massive codebase.
- Tightly coupled. If 1 thing fails, everything falls apart.



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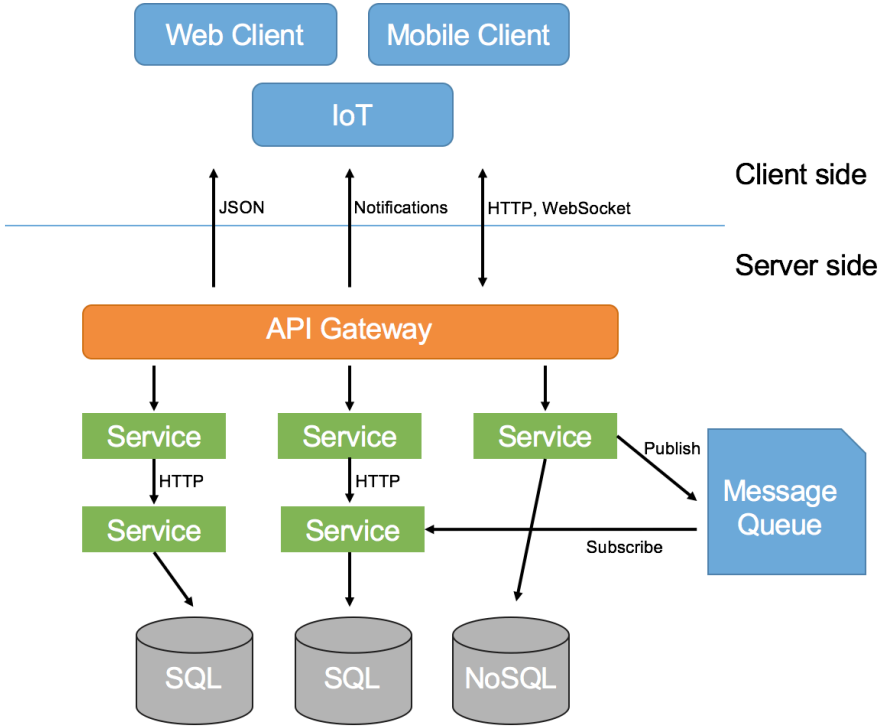
Microservices Architecture

- Developing a single application as a suite of small services.
- Each service runs in its own process and communicates with other services with lightweight mechanisms (Mostly via APIs).
- Independently deployed.
- Loosely Coupled, if something fails, everything still manages to work.



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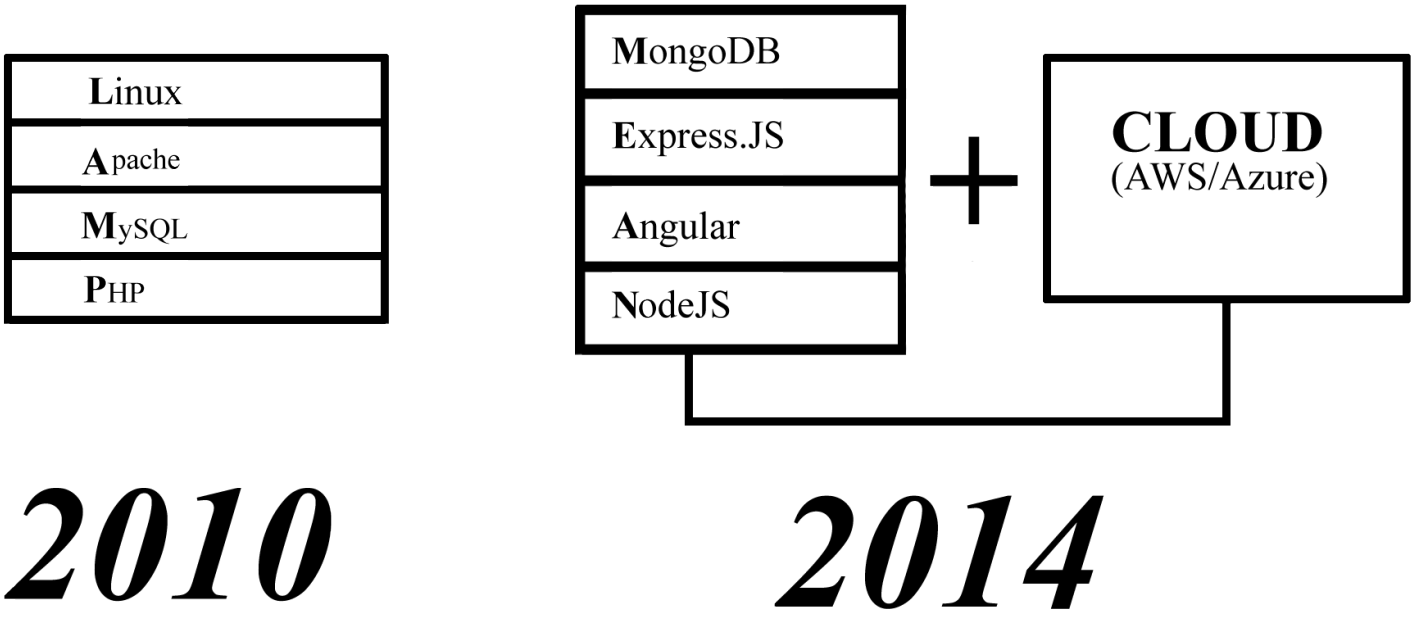
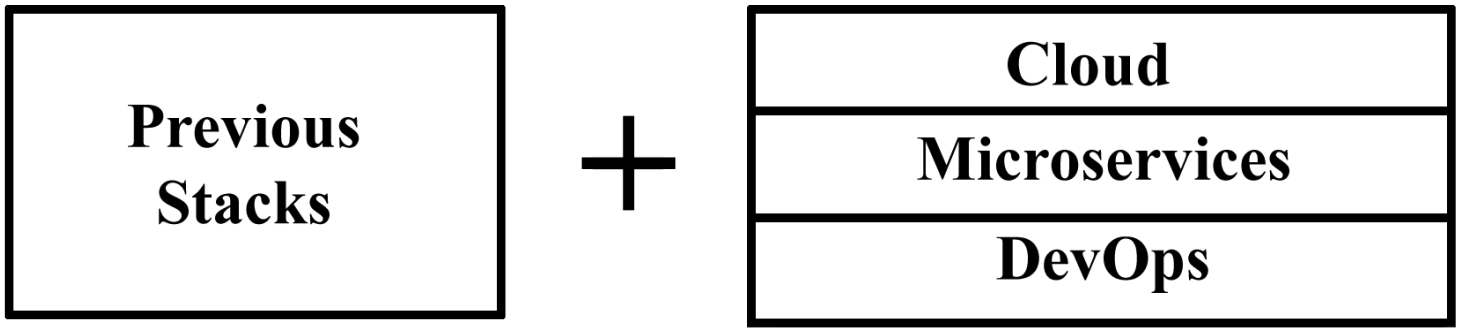
Full Stack: Evolution…



Full Stack: Evolution…



2020

But, how would I learn and understand all this?

Why become a Full Stack Developer?

- Diverse growth options.
- You can master all the techniques involved in a development project.
- You can reduce the cost of the project.
- You can reduce the time used for team communication.
- You can switch between front and back end development based on requirements & interest.
- You can understand all aspects of new technologies easily.

The Unspoken Stack – Application/Cyber Security

Most important thing…. That nobody talks about…

- On an average, around **30,000** new websites are hacked… **DAILY**.
- Mobile apps hacked on a daily basis. Patched APKs and Jailbroken iOS Apps are some examples.
- Games are cracked on daily basis.
- There is a separate division for security concerns, but, it's a developer's job to avoid the basic hacks.
- Some common website hacking involves "**SQL Injection**" and "**XSS** (Cross-Site Scripting)".

Which one is better? Full Stack VS Single Stack

Why doesn't everybody become a FSD? It's better, right?

- Understanding and handling everything is not everyone's cup of tea.
- It takes years to become an actual Full Stack Developer. Impatience gets the best of us.
- There's a lot to take in, as an FSD. Too many things to understand and work with.
- You might not like working with Databases or you might not enjoy working with HTML/CSS.
- Do you really want to fix bugs in both, UI and Back-End? Seriously though…. It gets hectic sometimes.
- It depends on your preference. It may seem like it takes a lot of work to become an FSD… and that's true. But, it's not impossible.

Some Common Mistakes We All Do

How do I become a FULL STACK DEVELOPER??!!

Tell me already!

- First things first…. Understand the basics of Client-Server Model.
- Get familiar with HTML, CSS, Bootstrap.
- Learn & master JavaScript.
- Grasp knowledge of database(s) like MySQL, MongoDB etc.
- Build POCs with the knowledge you have.
- Grasp a back-end scripting language like NodeJS, Python, Ruby On Rails, PHP etc.
- Work with APIs.
- Build new POCs or update the previous POCs from the new knowledge you have.
- Practice, Practice & practice.

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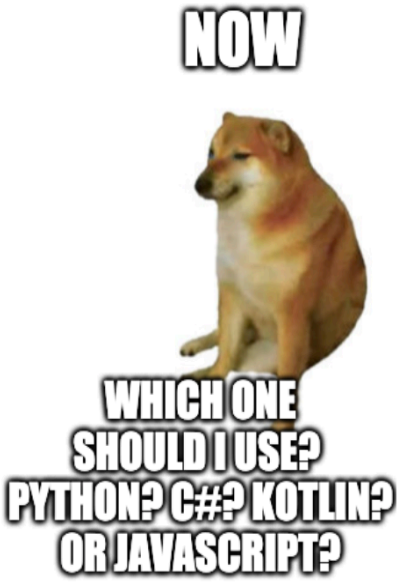
Python **Vs** Java **Vs** C# **Vs** JavaScript

And the list goes on…

- Answer to this is not THAT simple.
- It depends on the requirements.
- Some languages/frameworks are better than others
- These days you can use any language (for the mos part) anywhere and do wherever you want.
- But, it'll be like shooting yourself in the foot.



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Python

- Good for ML/AI/Deep Learning areas.
- Good for scripting.
- Very handy for Data Science & Research.
- Decent option for creating back-end APIs.
- Not a good option for building mobile applications (Kivy).
- Definitely not good for memory intensive tasks. Due to the flexibility of the data-types, Python's memory consumption is also high.
- Database Access. Python’s DB access layer isn’t as smooth and complex as JDBC/ODBC.

Java

- Multithreading is a life saver in a lot of scenarios.
- Distributed computing (It helps in developing applications on networks that can contribute to both data and application functionality).
- Memory allocation is much better than python.
- Is still used to develop android applications.
- Being used at some legacy systems as well.
- Not a good option for Data Science/ML/AI etc. Not many libraries are there and you'll have to build from scratch.

JavaScript

- Good for developing websites, back-end APIs.
- Can also be used for developing mobile applications (Ionic, React Native).
- If you need to build something, there's a **VERY HIGH** chance that a JS Framework exist for it, like **Angular** (Websites Front-End), **NodeJS** (Back-End), **Cross-Platform Apps** (Ionic), **Web Forms** (RxJS), **Web Server** (Apache Cordova) etc.
- Comparatively Lightweight and has lower server load.
- Problem is… too many JavaScript frameworks. This causes confusion from time to time while choosing the tech stack.
- Leaves big holes in Client-Side Security.
- Single Inheritance.
- Debugging is **HELL**.

Where To Begin?

- Google
- YouTube
- Udemy
- Pluralsight

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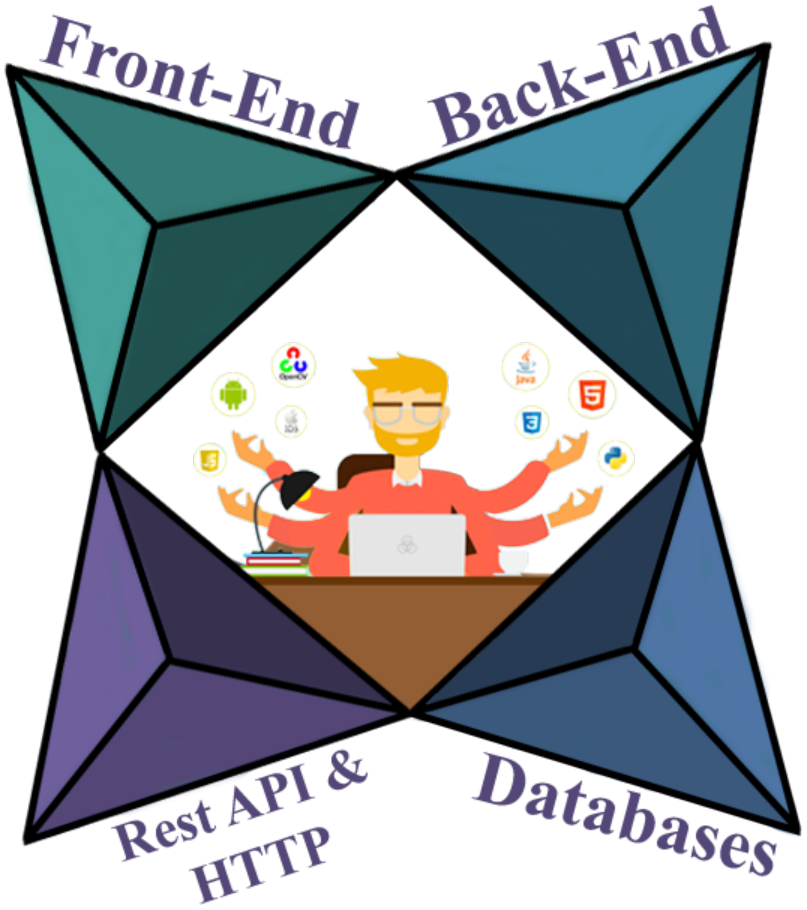
Takeaways From The Session



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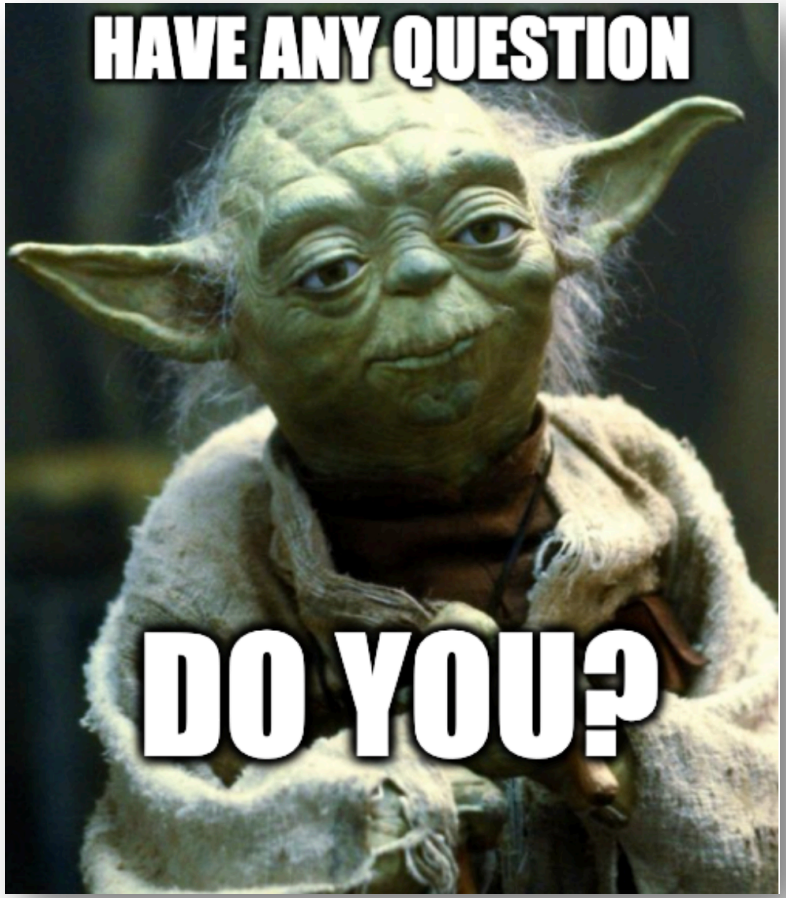
HAVE ANY QUESTION
DO YOU?

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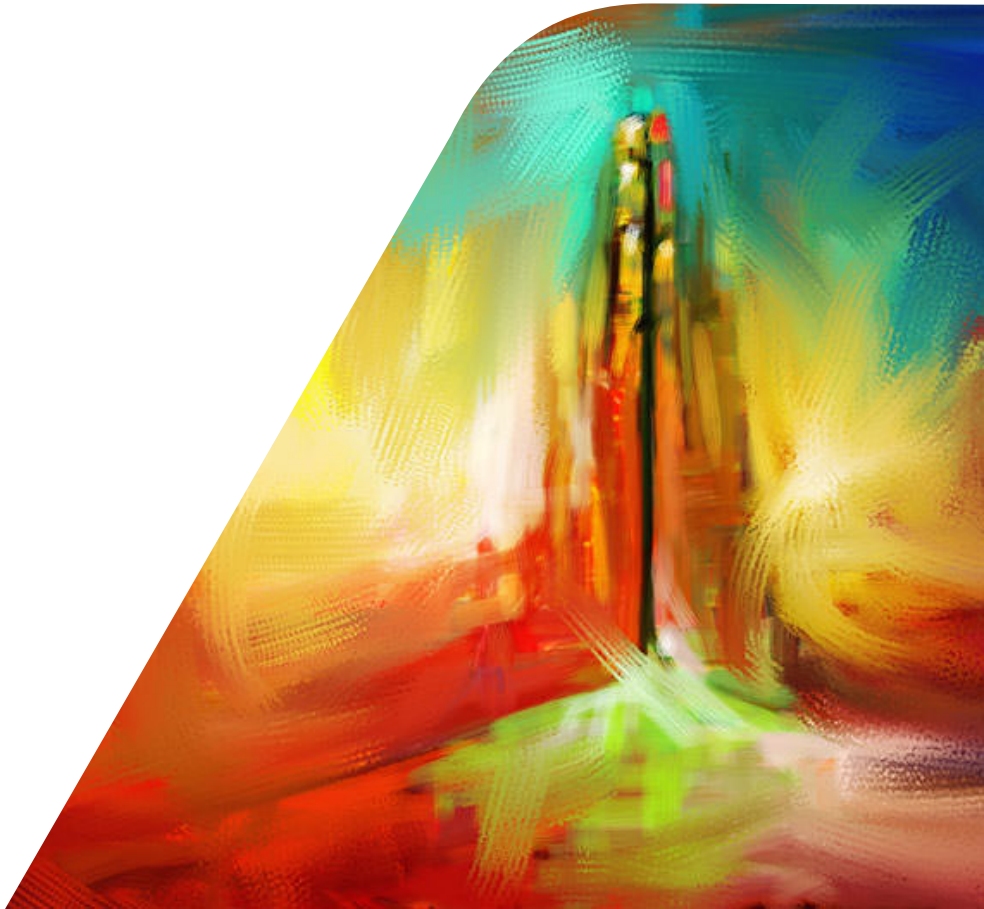
THANK YOU



Links

- https://www.youtube.com/watch?v=OxFhwVXQS3E
- https://www.andyshora.com/full-stack-developers.html
- https://www.leewayhertz.com/full-stack-development/
- https://www.guru99.com/full-stack-developer.html
- https://www.mulesoft.com/resources/api/what-is-an-api
- http://khoadinh.github.io/2015/05/01/microservices-architecture-overview.html