WSA | Forward looking IT finishing school

MEAN Stack

Introduction

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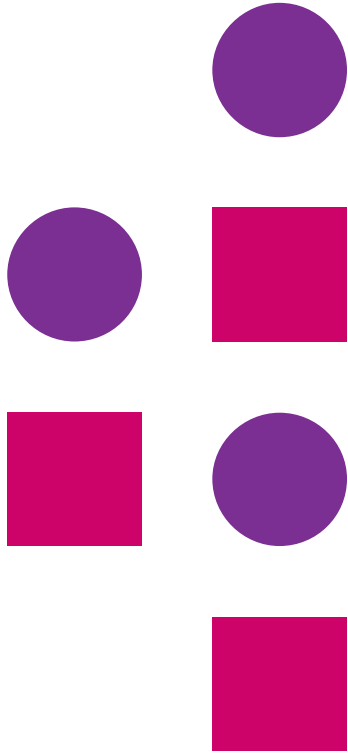

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- Node.js
- Express Framework
- MongoDB
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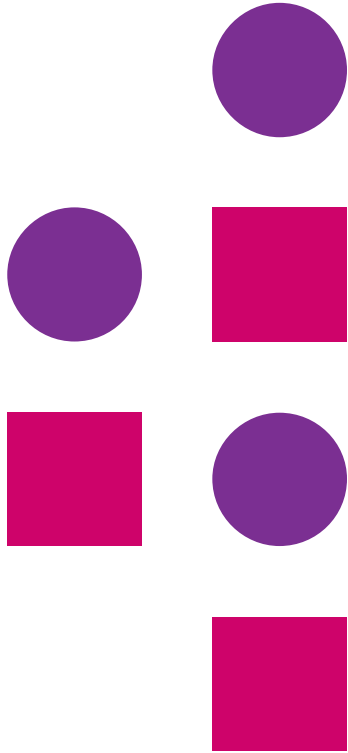


Web Application

Background

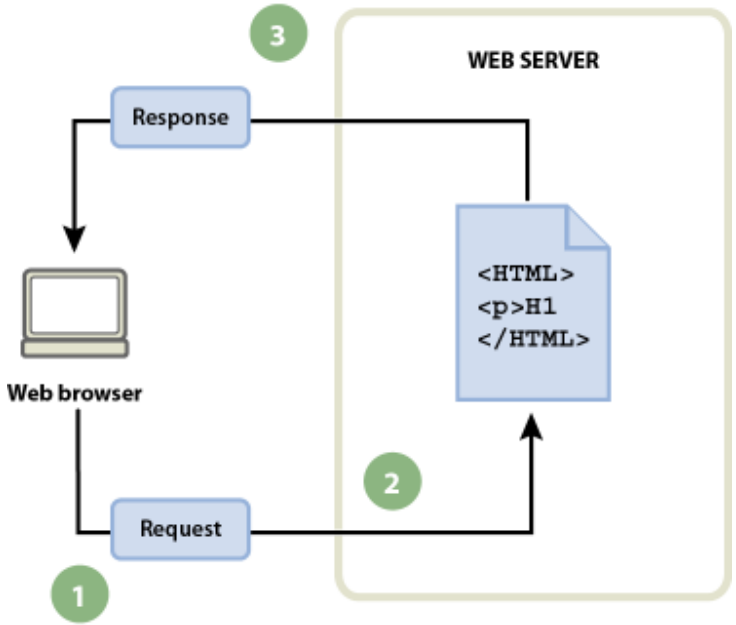
Web Application

“In computing, a web application or web app is a client–server computer program which the client (including the user interface and client-side logic) runs in a web browser.”

How Web Apps Work

- Web applications are usually coded in browser-supported language such as JavaScript and HTML as these languages rely on the browser to render the program executable.
- Some of the applications are dynamic, requiring server-side processing. Others are completely static with no processing required at the server

Static Webpages



1. Web browser requests static page.
2. Web server finds page.
3. Web server sends page to requesting browser.

Dynamic Web Applications

How Web Apps Work

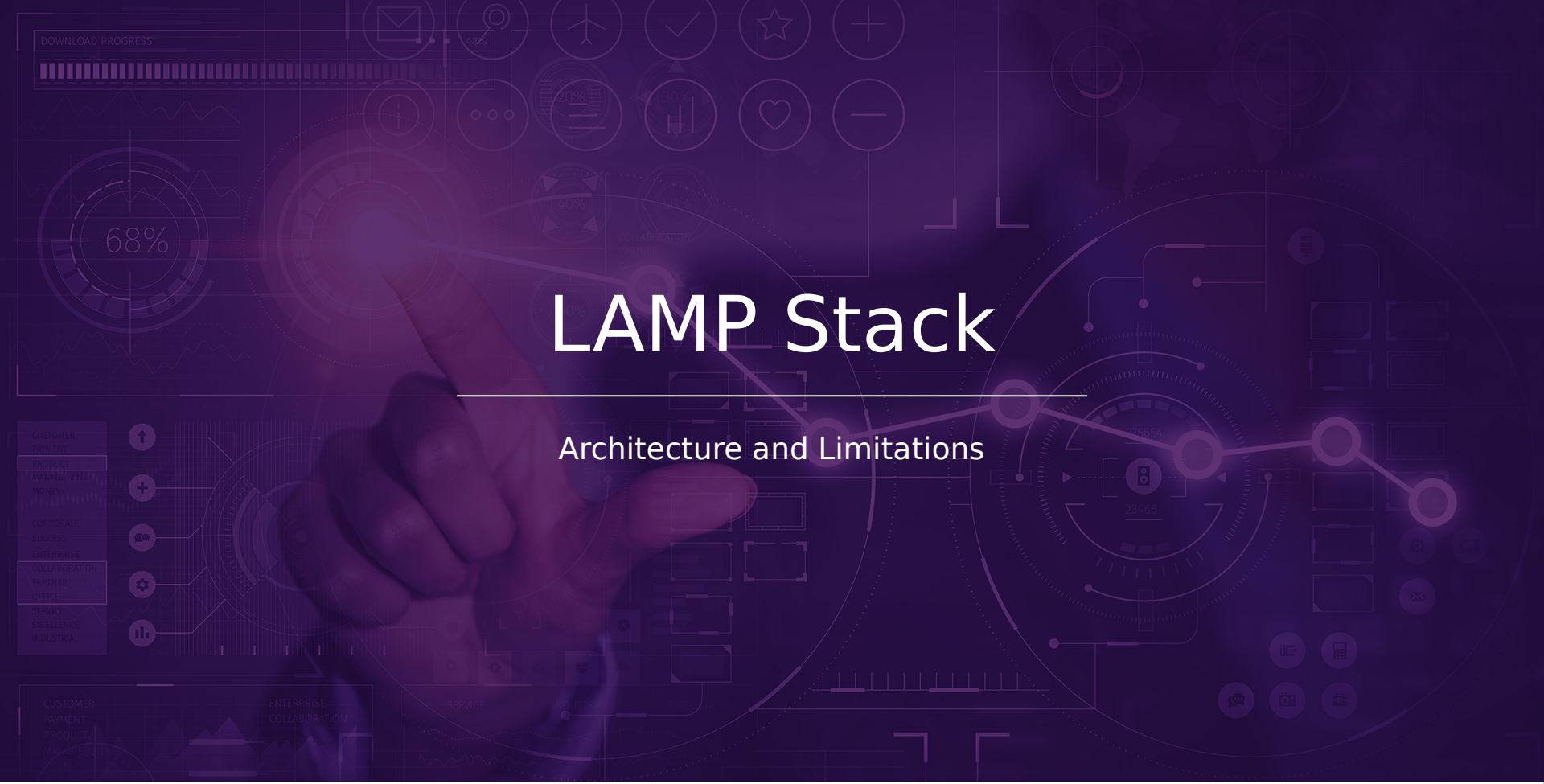
- The web application requires
  - A web server to manage requests from the client
  - An application server to perform the tasks requested, and, sometimes
  - A database to store the information.
  - Application server technology ranges from ASP.NET, ASP and ColdFusion, to LAMP, ROL and JSP.

Typical Web App Flow

1. User triggers a request to the web server over the Internet, either through a web browser or the application's user interface
2. Web server forwards this request to the appropriate web application server
3. Web application server performs the requested task – such as querying the database or processing the data – then generates the results of the requested data
4. Web application server sends results to the web server with the requested information or processed data
5. Web server responds back to the client with the requested information that then appears on the user's display

Example of Web App Stacks

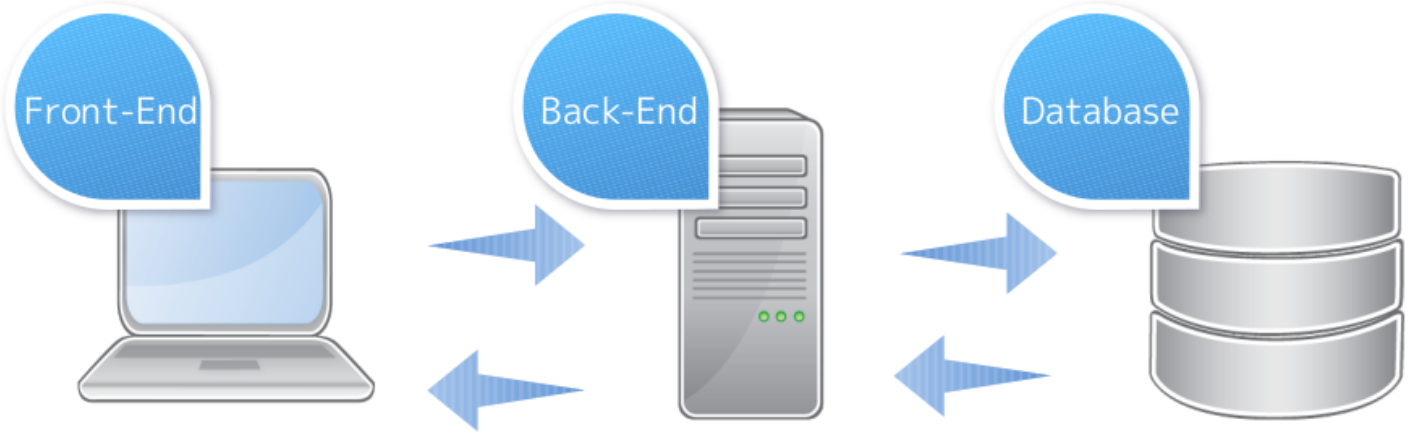
Server Stack/Technology	Programming Language	Database
LAMP	Php/Perl/Python	MySQL
.NET/IIS	ASP.NET	MSSQL



LAMP Stack

Architecture and Limitations

LAMP Stack



Javascript

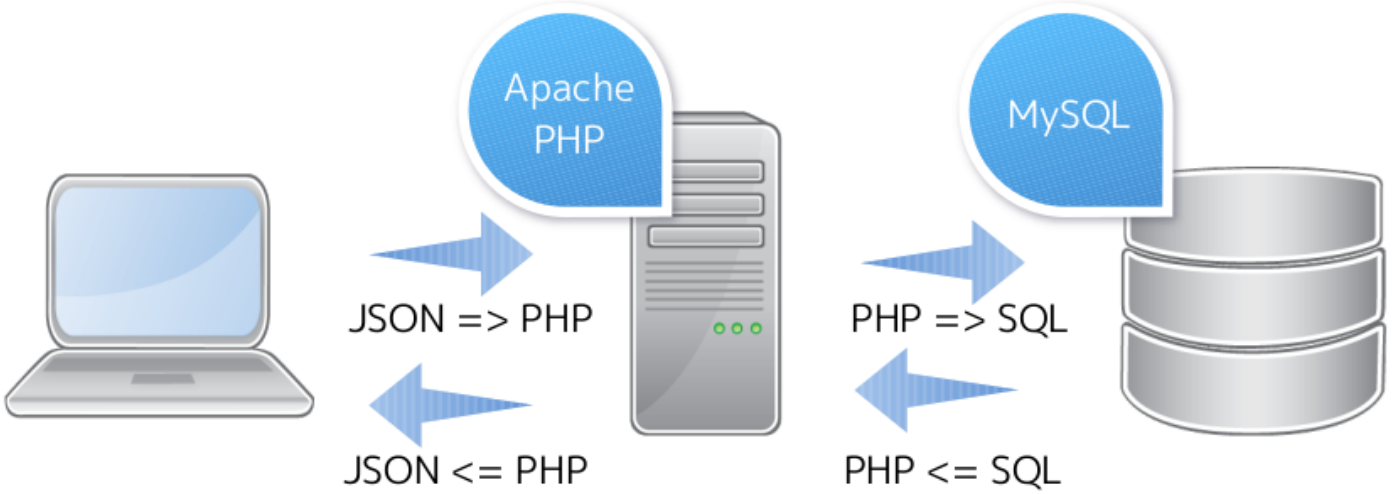
Linux

Apache

Perl, PHP, Python

MySQL

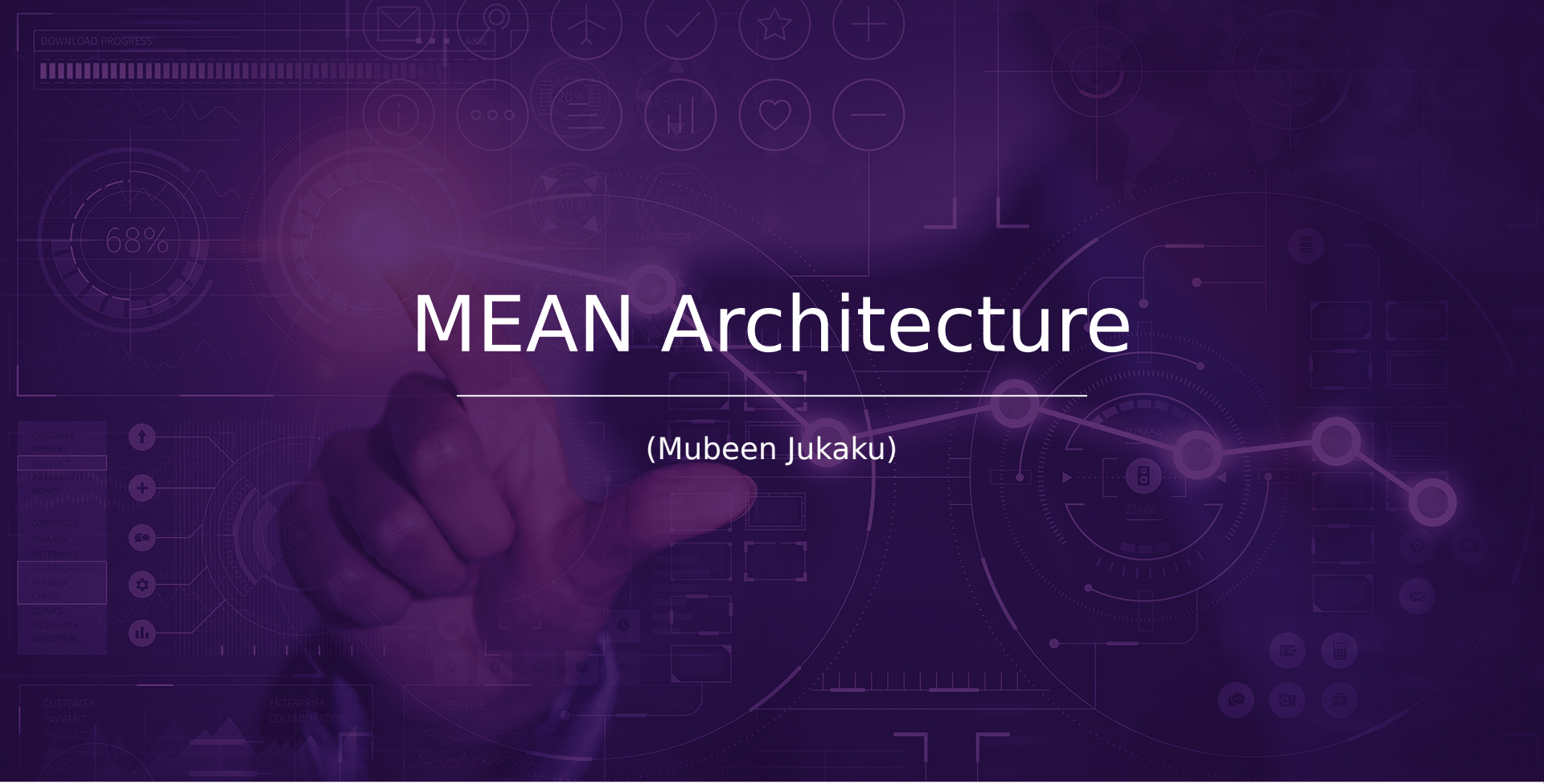
3 Language & DT Problem



Javascript

PHP / Apache
Java / Tomcat
.NET / IIS
Ruby / Passenger

SQL



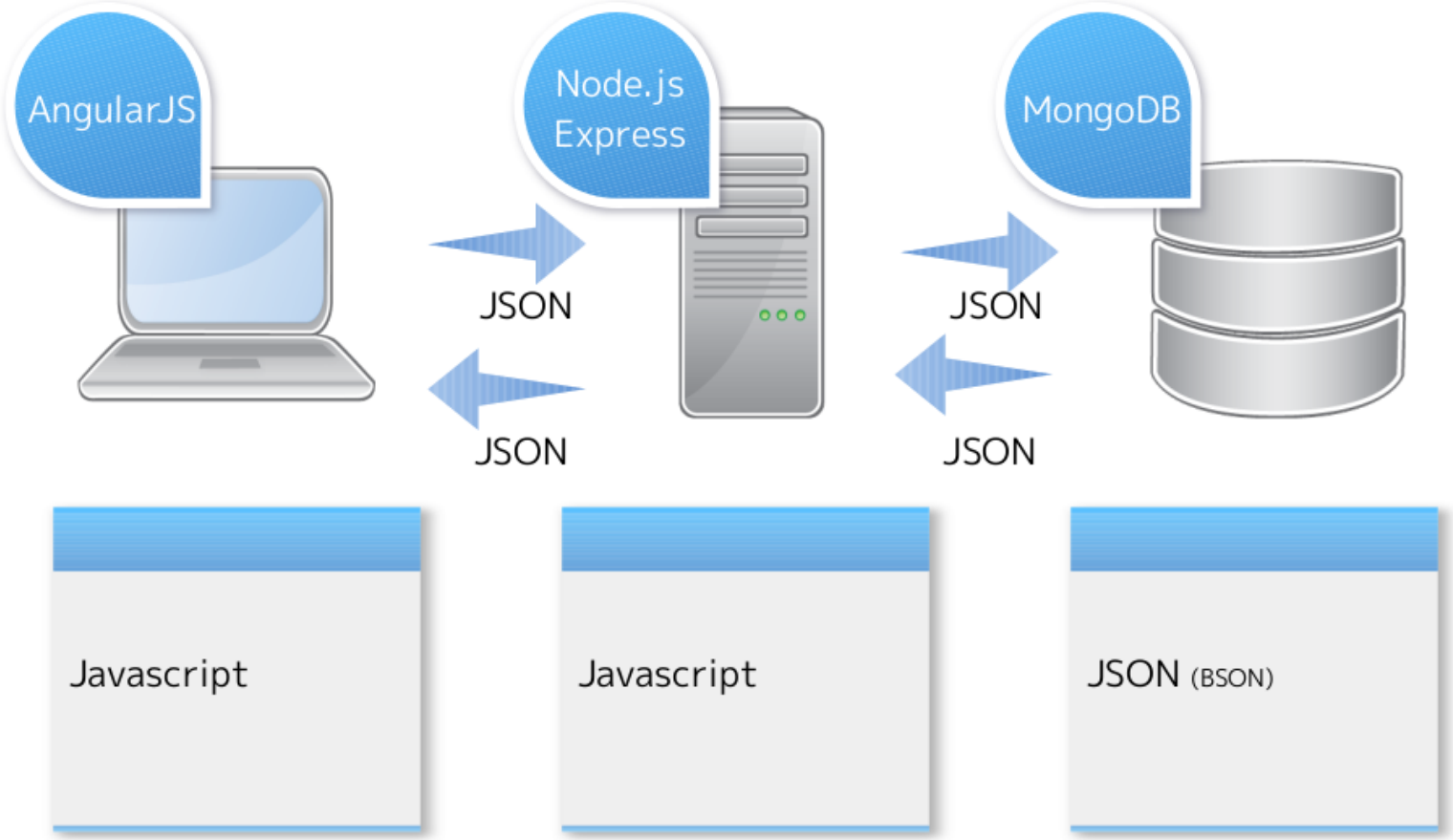
MEAN Architecture

(Mubeen Jukaku)

What is MEAN?

- M => Mongo DB
- E => Express
- A => Angular
- N => Node

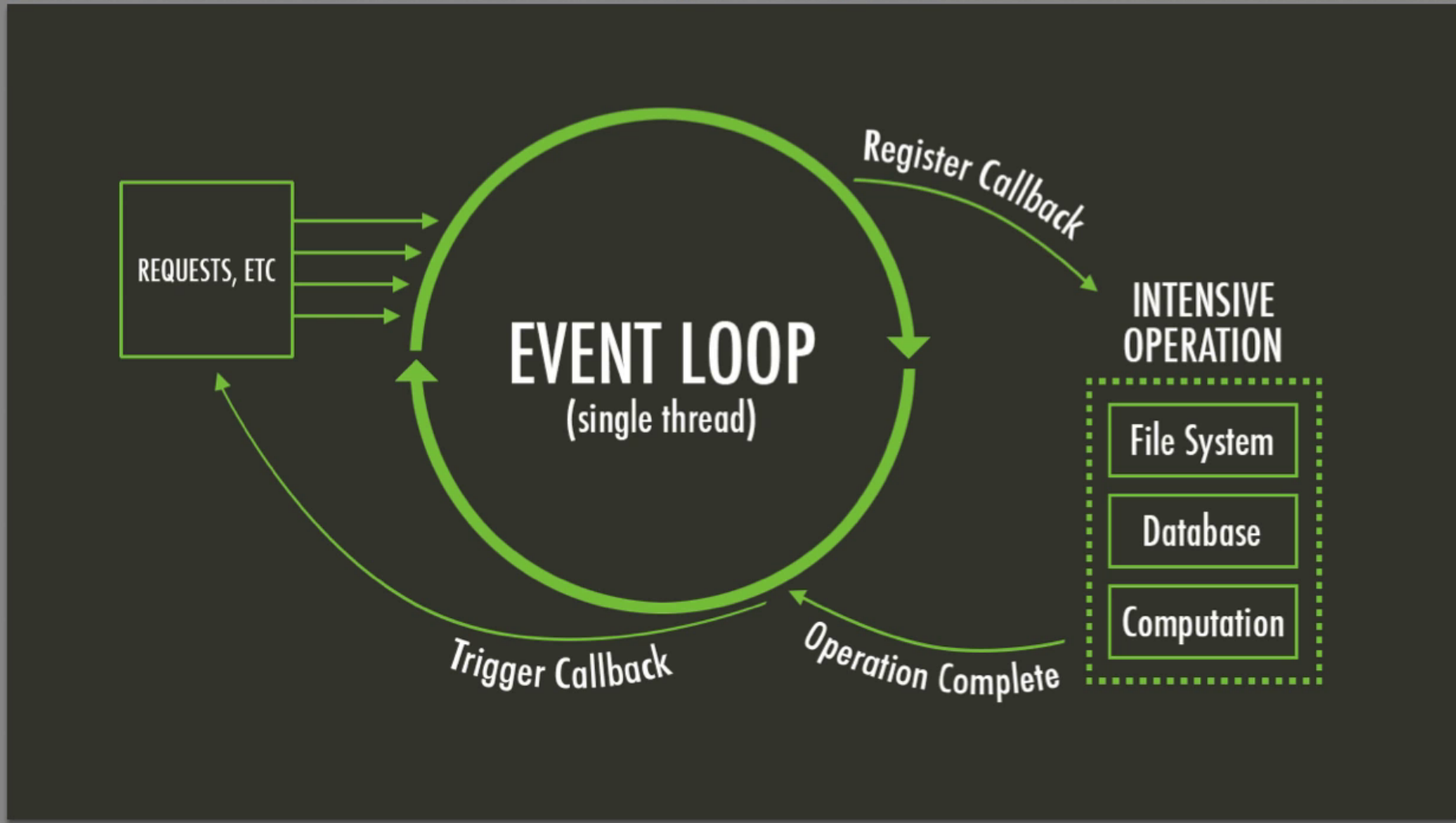
The MEAN way

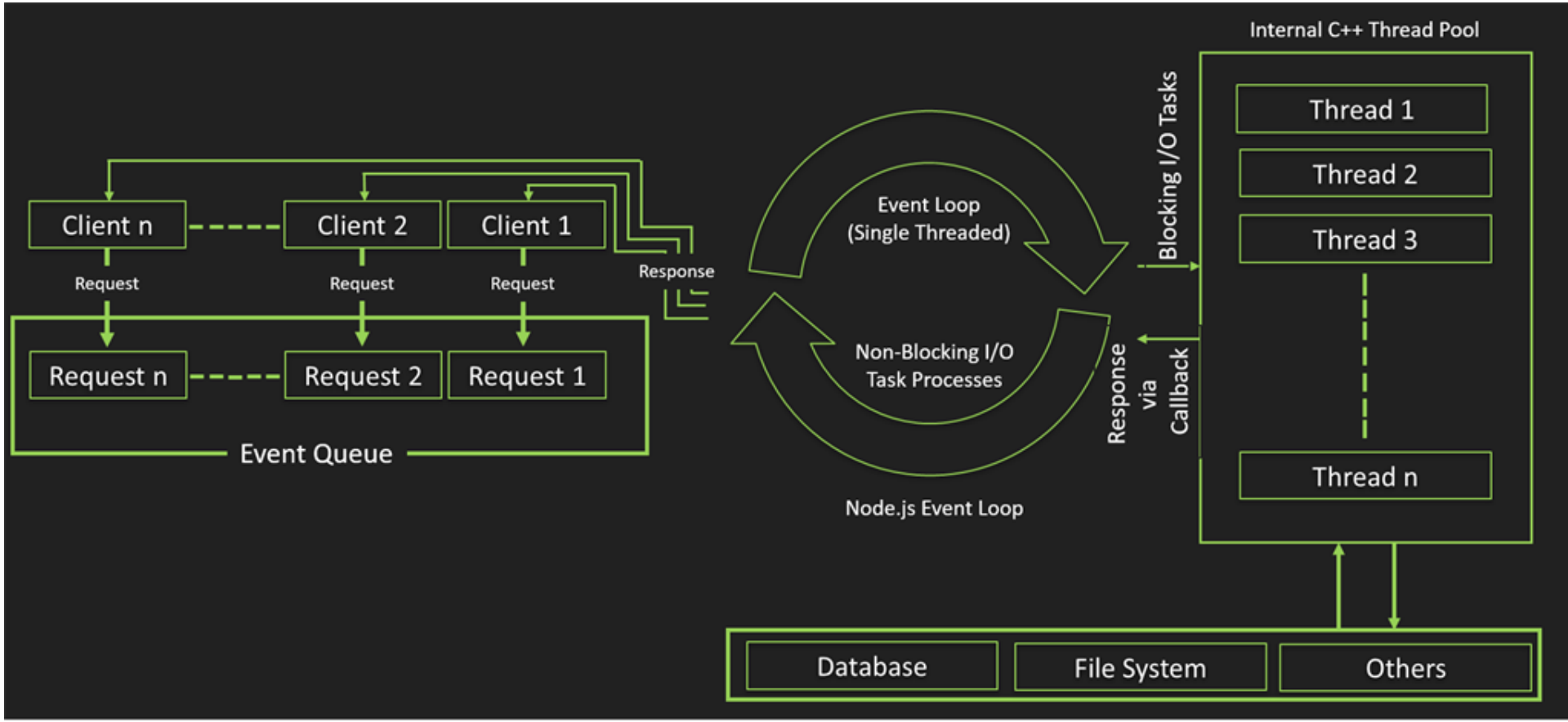

AngularJS
Node.js
Express
MongoDB
JSON
JSON
JSON
JSON
Javascript
Javascript
JSON (BSON)

MEAN

- RTT -35% (-200ms)
- LOC -33%
- Man-Month 1/2
- File -40%

RTT
2-10 times faster


REQUESTS, ETC
EVENT LOOP
(single thread)
Register Callback
INTENSIVE OPERATION
File System
Database
Computation
Trigger Callback
Operation Complete


Internal C++ Thread Pool
Thread 1
Thread 2
Thread 3
Thread n
Blocking I/O Tasks
Event Loop
(Single Threaded)
Non-Blocking I/O
Task Processes
Response
via
Callback
Node.js Event Loop
Client n
Client 2
Client 1
Request
Request
Request
Response
Request n
Request 2
Request 1
Event Queue
Database
File System
Others

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