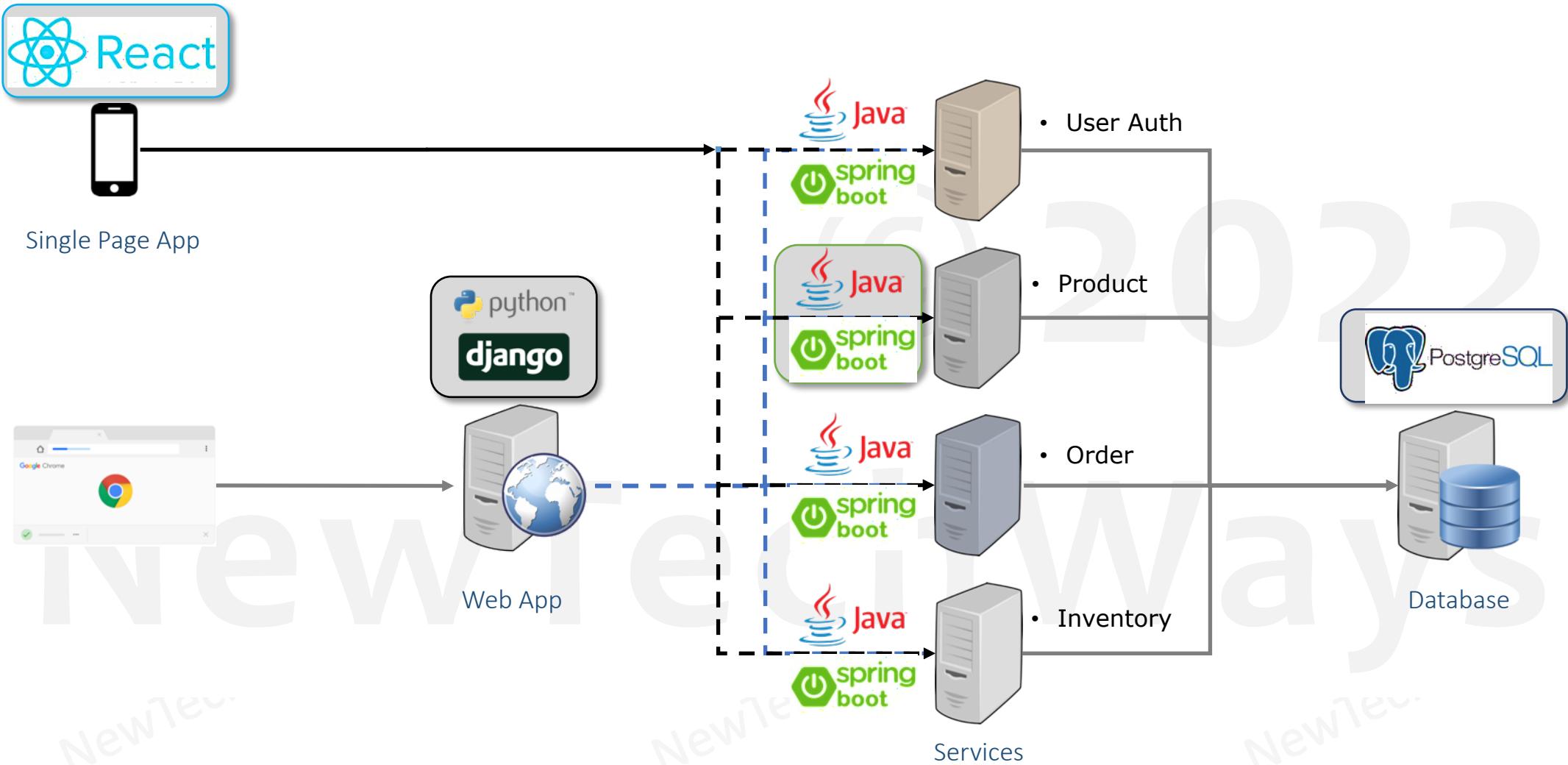
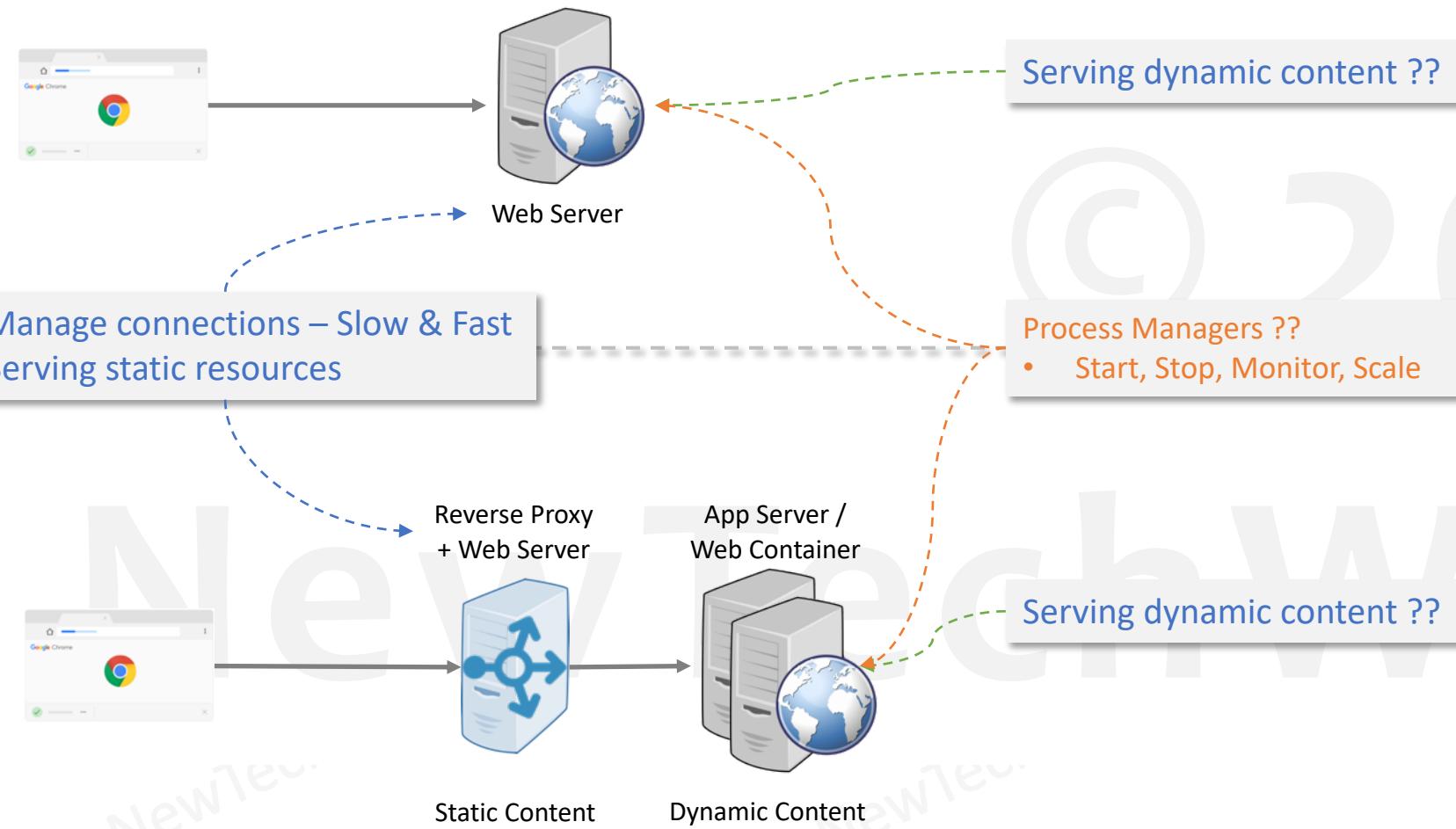


# System Components

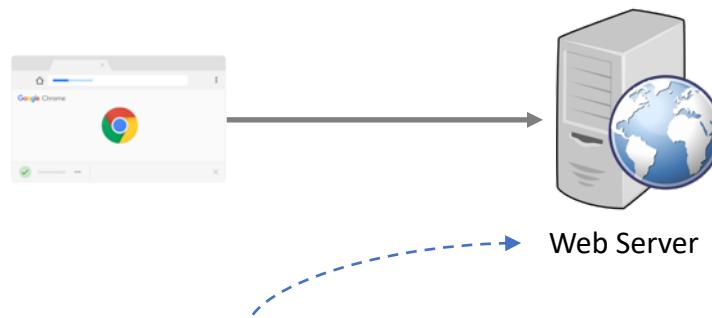
# Minisys Components



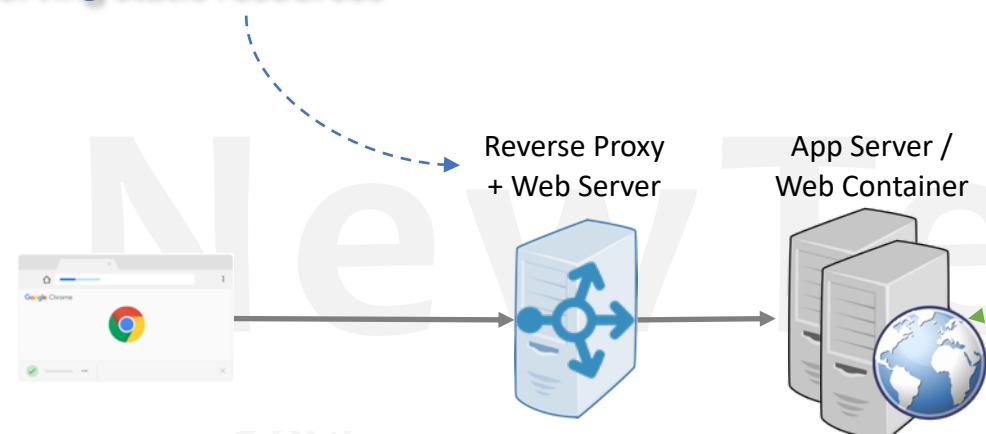
# Web Application Deployment Architecture



# Web Application Frameworks



- Manage connections – Slow & Fast
- Serving static resources



- Apache
  - Nginx
- Unicorn
  - Passenger
  - Gunicorn
  - Tomcat

## Serving dynamic content with Web Server modules

- Apache Web Server
  - mod\_cgi, mod\_php, mod\_ruby, mod\_python
- Apache or Nginx with Passenger
  - Ruby, Python, Node.js

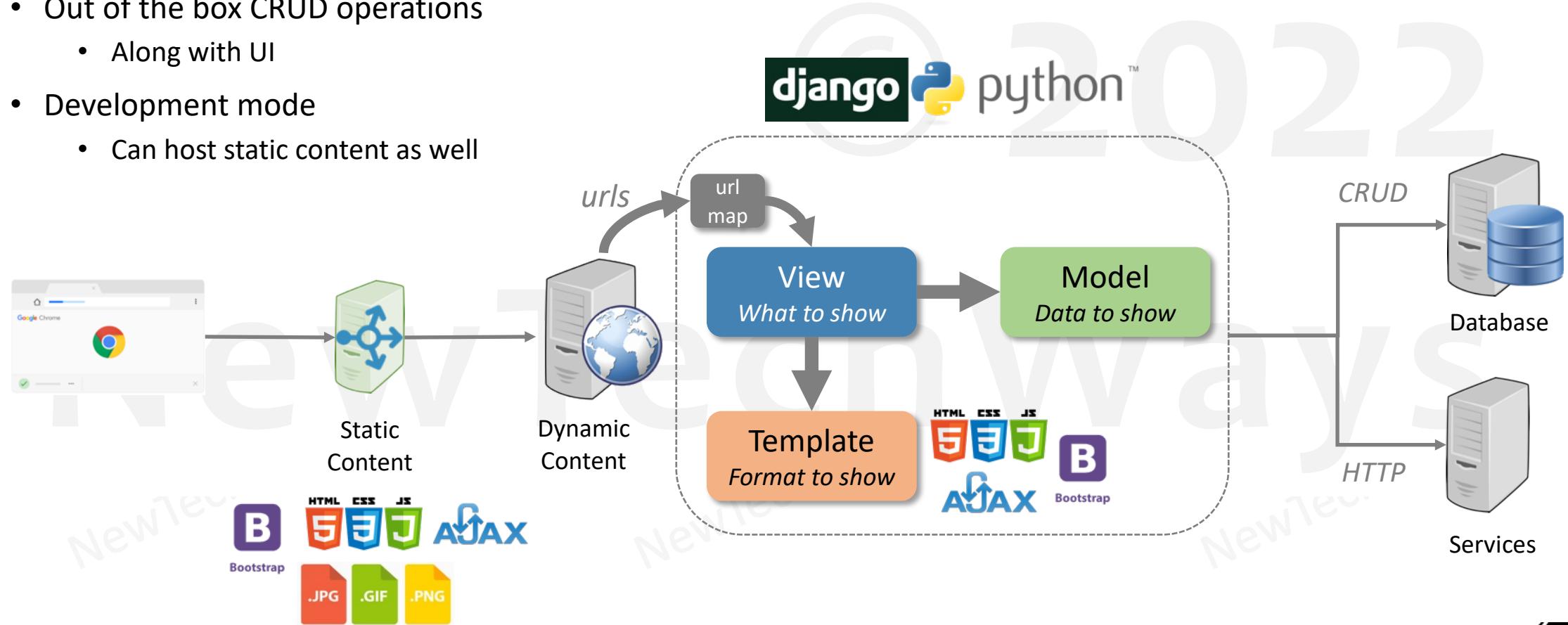
## Serving dynamic content with Web Frameworks on App Server

### Language, Web Framework on App Server/Web Container

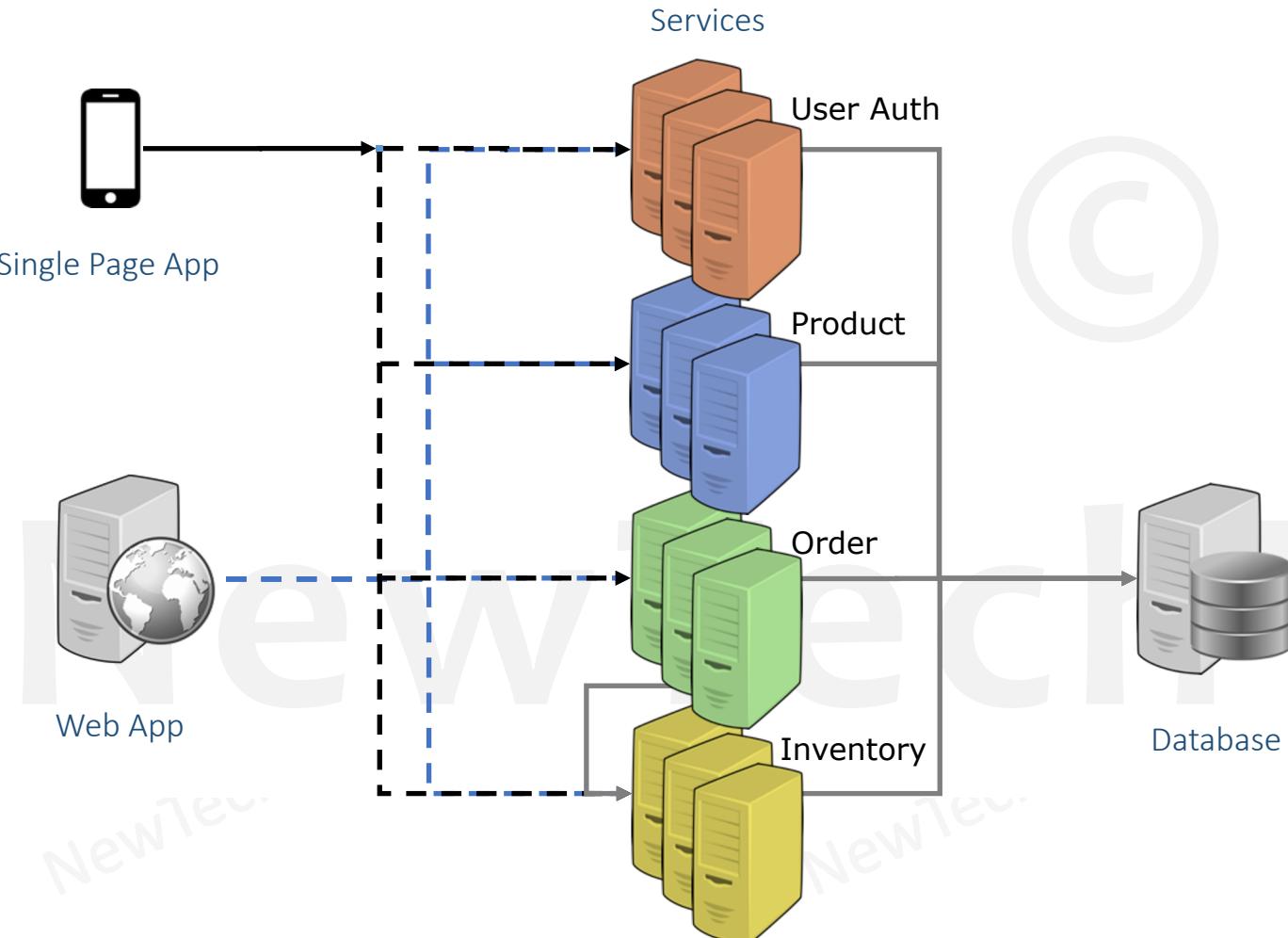
- PHP + Laravel/CodeIgniter on PHP-FPM (*quick dev, easy to learn*)
- Ruby + Rails on Puma/Unicorn/Thin (*quick dev*)
- JS + Express.js on Node.js (*large no of clients with low latency response*)
- Python + Django/Flask on Gunicorn (*quick dev, large sized apps*)
- Java + Spring Framework on Tomcat/Jetty (*large sized apps*)
- ASP.net core on Kestrel (*for Microsoft developers*)

# Django WebApp Architecture

- MTV (MVC) framework
  - Separation of concerns
- Out of the box CRUD operations
  - Along with UI
- Development mode
  - Can host static content as well



# Services Architecture



## INTEROPERABLE

- RPC
  - SOAP, IIOP, gRPC, Thrift
- REST
  - No RPC Stubs
  - Suitable for both apps and browser

## INDEPENDENT

- SOA
  - Common interface schema - XSD
  - Common DB schema
- Microservices
  - Completely independent

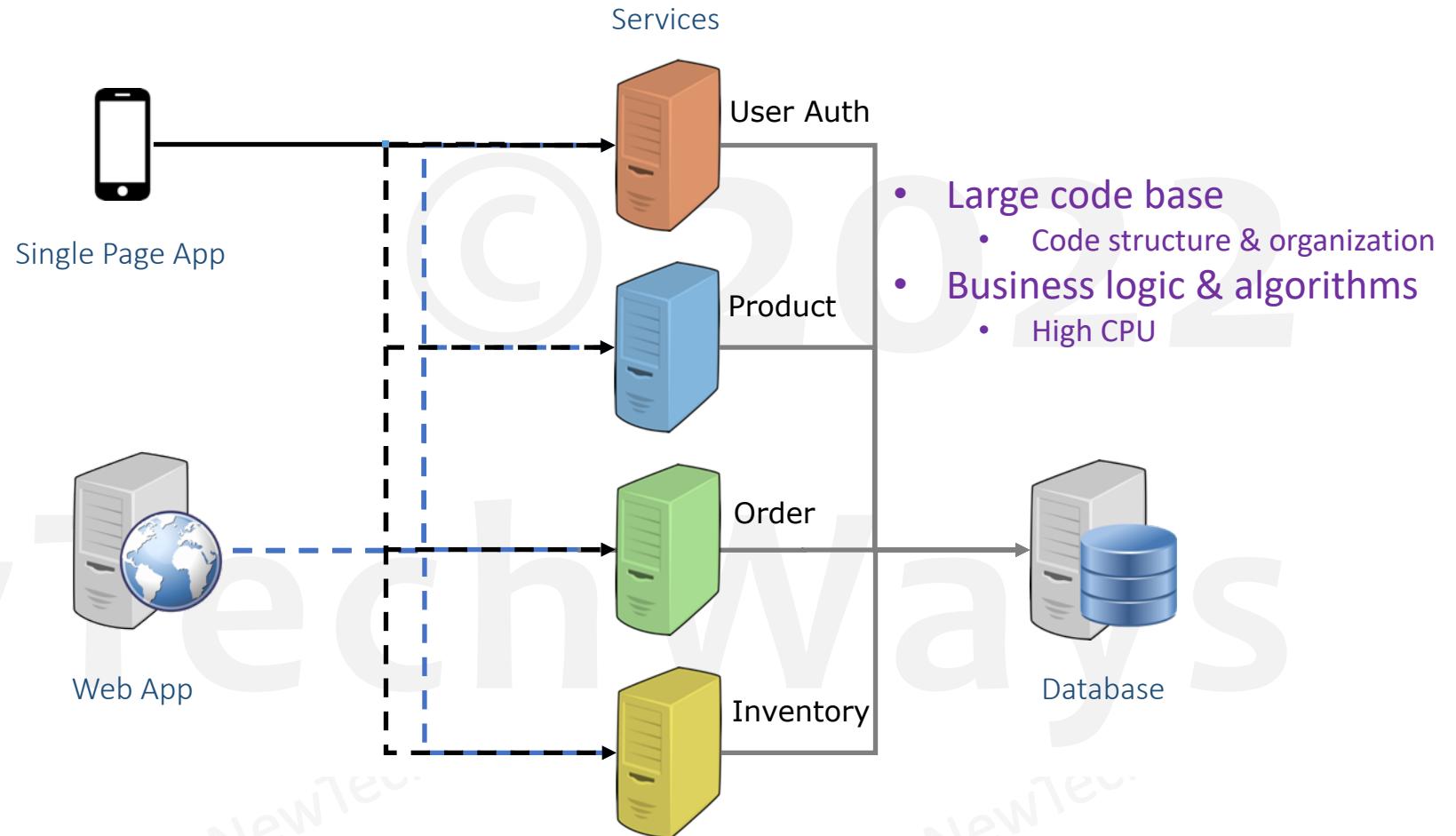
## SCALABLE

- Stateless
  - No app state
  - No client state

# Services – Languages & Frameworks

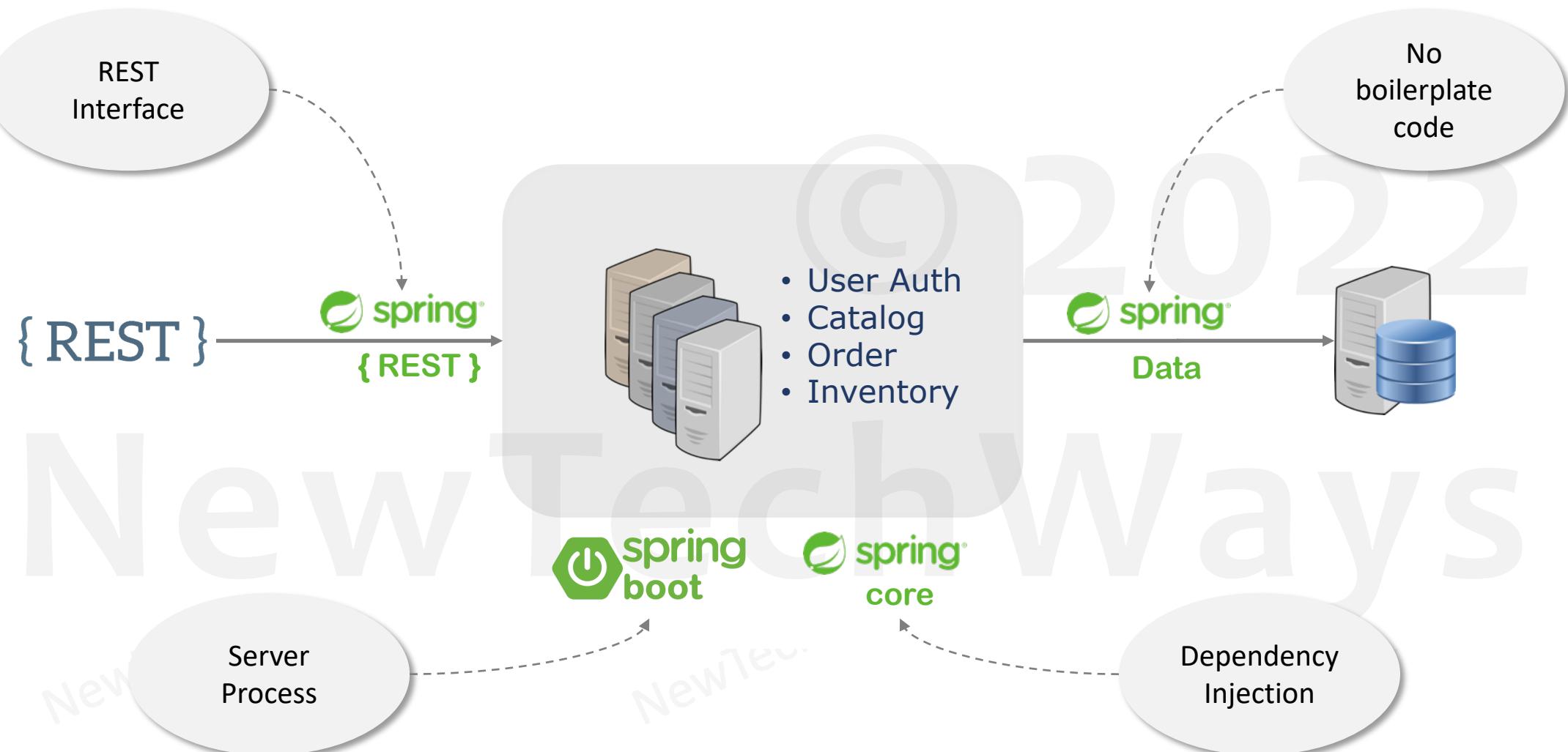
- Python – Django/Flask
- JavaScript – Node.js
- Java – Spring Boot
- C# – ASP.net core
- C++ - REST SDK
- ...

- Object Oriented
  - Better code structure
- Compiled Vs Interpreted
  - Better performance
- Garbage Collection
  - No illegal memory access or memory leaks
  - Faster programming



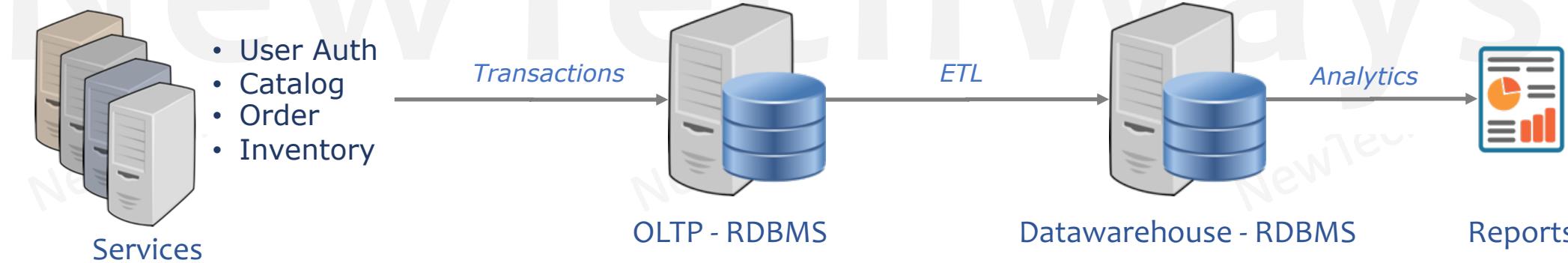
- Large code base
  - Code structure & organization
- Business logic & algorithms
  - High CPU

# Restful Services using Spring Framework



# Database

- RDBMS
  - MySQL
  - PostgreSQL
- NoSQL
  - MongoDB
  - Cassandra
  - HBase



**FIXED SCHEMA  
FK, JOINS, INDEXES**

**FLEXIBLE SCHEMA  
NO JOINS  
NO FOREIGN KEYS  
LIMITED INDEXING**

**TRANSACTIONS**

**TRANSACTIONS**  
(only on Aggregates)

**ANALYTICS**

**LIMITED ANALYTICS**  
(due to limited indexing)

**LIMITED SCALE**  
(< 1 TB data)

**EXTREME SCALE**

UserAuth	<b>id</b>	name	password	emailId
	<i>PK</i> (id)			

Cart	<b>id</b>
	<i>PK</i> (id)

UserRole	<b>id</b>	role
	<i>PK</i> (id, role)	

### AUTH

Product	<b>id</b>	name	price
	<i>PK</i> (id)		

### PRODUCT

Inventory	<b>productId</b>	Quantity
	<i>PK</i> (productId)	

### INVENTORY

CartLine	<b>cartId</b>	cartLinId	productid	quantity
	<i>PK</i> (cartId, cartLinId)			

### CART

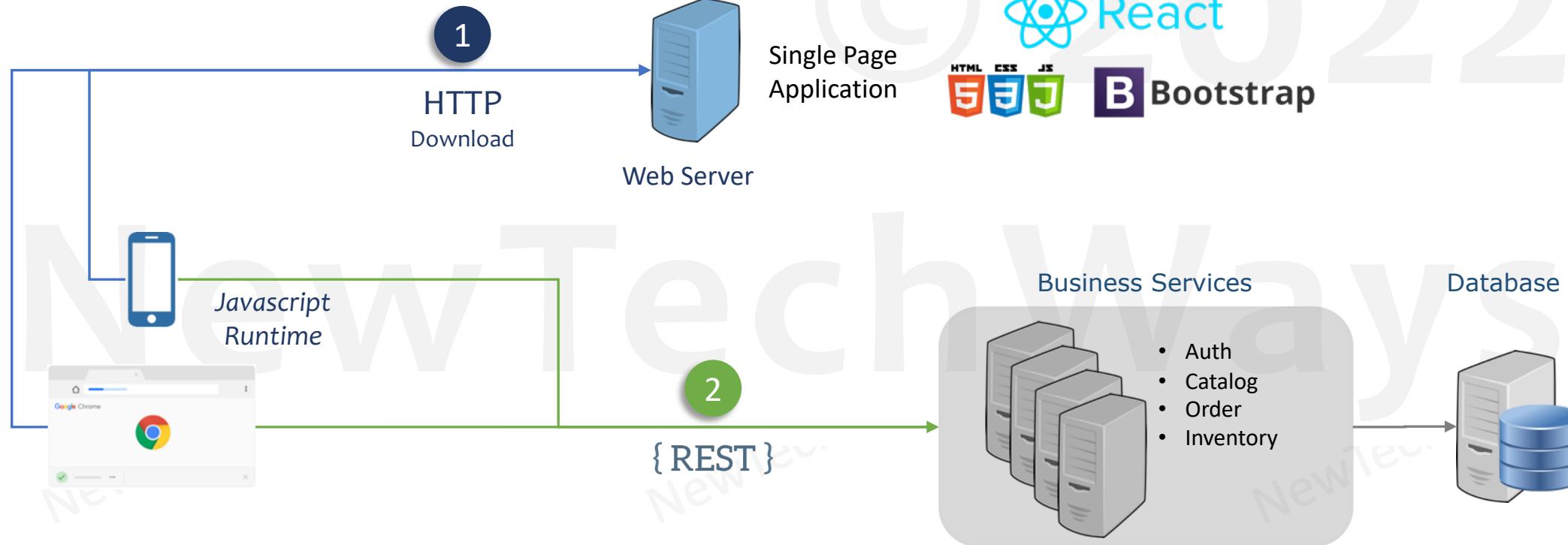
Order	<b>id</b>	userId	date	status
	<i>PK</i> (id)			

### ORDER

OrderLine	<b>orderId</b>	linId	productid	quantity
	<i>PK</i> (orderId, linId)			

# Single Page Application

- AngularJS Framework
  - ReactJS Library
  - VueJS Framework
- Highly interactive UI applications
  - Can be converted into Hybrid Mobile Apps



# React Architecture

