

MEAN Stack - An Overview



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JS Meetup #6 (Saturday, Sep 24, 2016)

Agenda

- Evolution of Web Development
- Traditional Web Development
- Full-Stack Development
- Introducing MEAN Stack
- Node
- Express
- Angular
- MongoDB
- Q & A

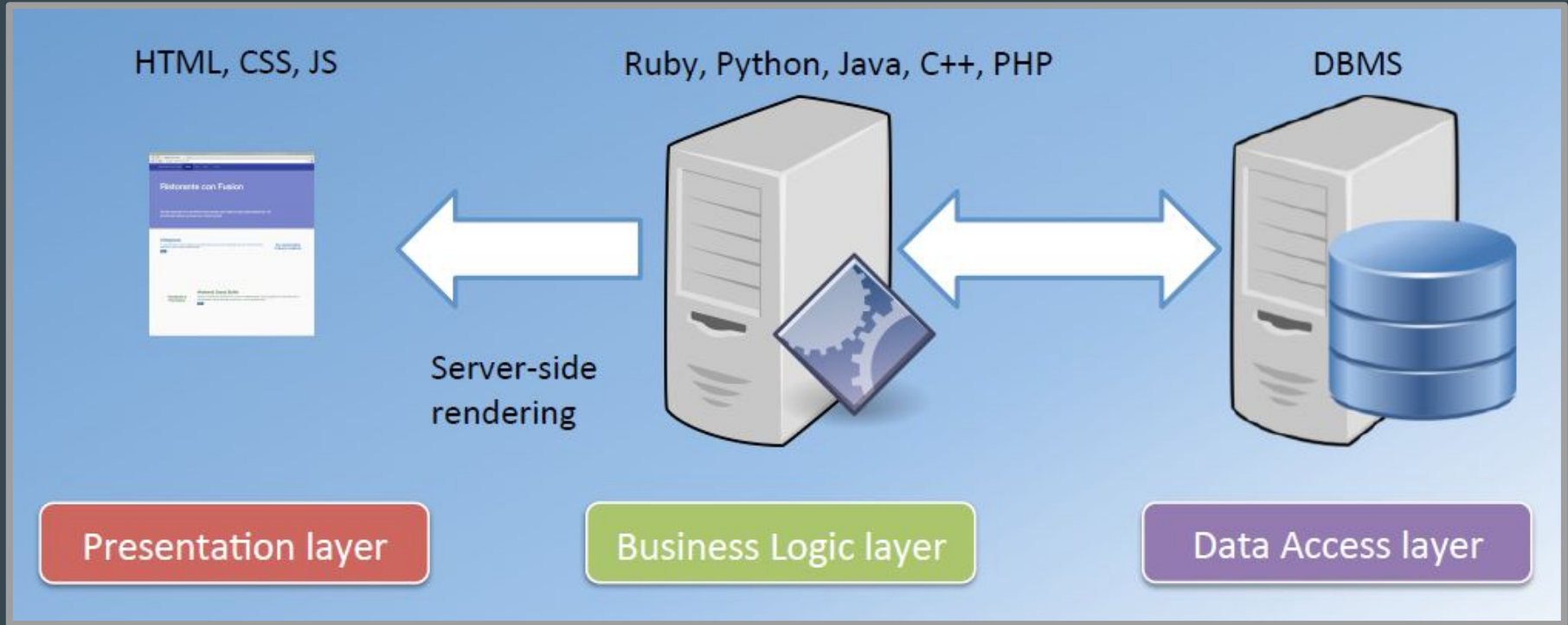
Evolution of Web Development

- Low expectations of web sites
- Perl and HTML - “Web Developer”
- Use of Internet increased with time
- Online presence increased
- Browsers became more powerful
- Front-end development - focus on building a good user experience
- Back-end development - focus on mechanics behind the scenes

Traditional Web Development

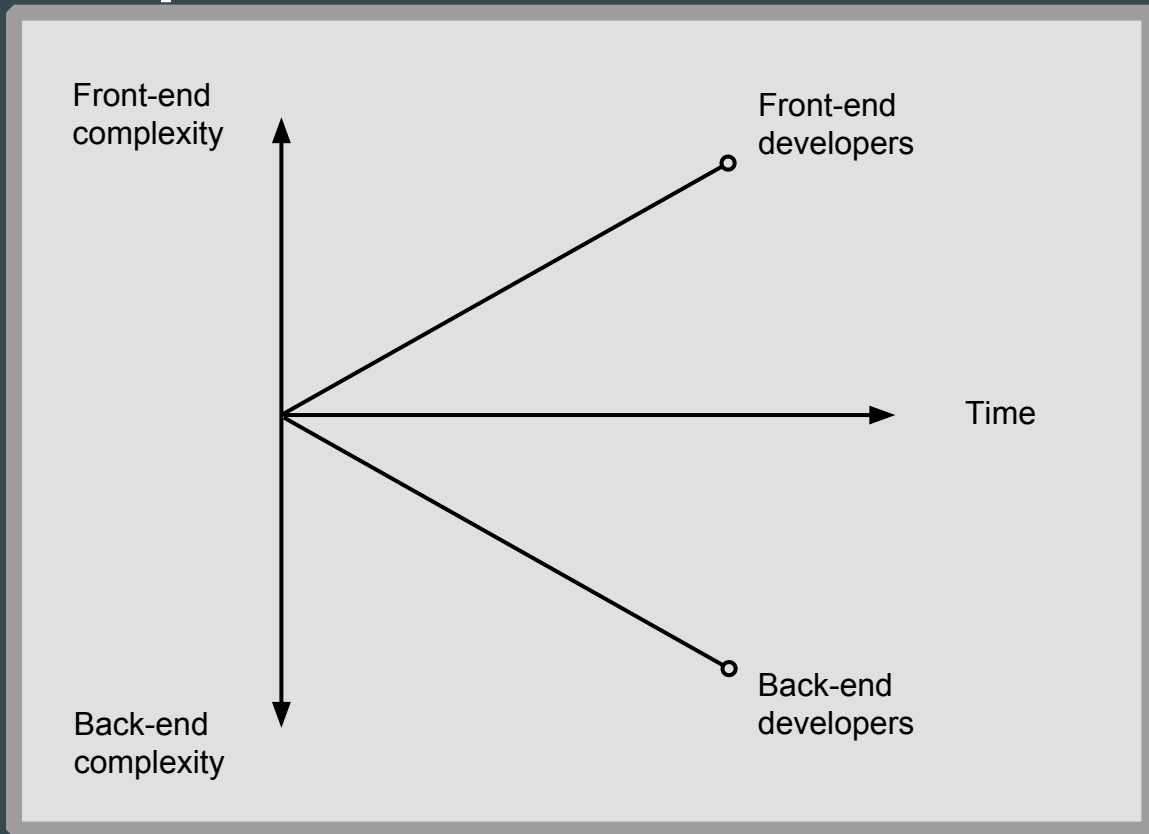
- Followed Three-Tier architecture
 - Presentation Layer - UI design and development
 - Business Logic Layer - Data validation, data processing, application logic
 - Data Access Layer - Data persistence, data access through API
- Traditional web application technologies
 - Client-side - HTML, CSS and JavaScript
 - Server-side - C#, Java, PHP, ASP.NET, Ruby, Python
 - Database - SQL Server, MySQL, Oracle
 - Web Server - IIS, Apache, Tomcat

Traditional Web Development



Traditional Web Development

Divergence of front-end and back-end developers over time



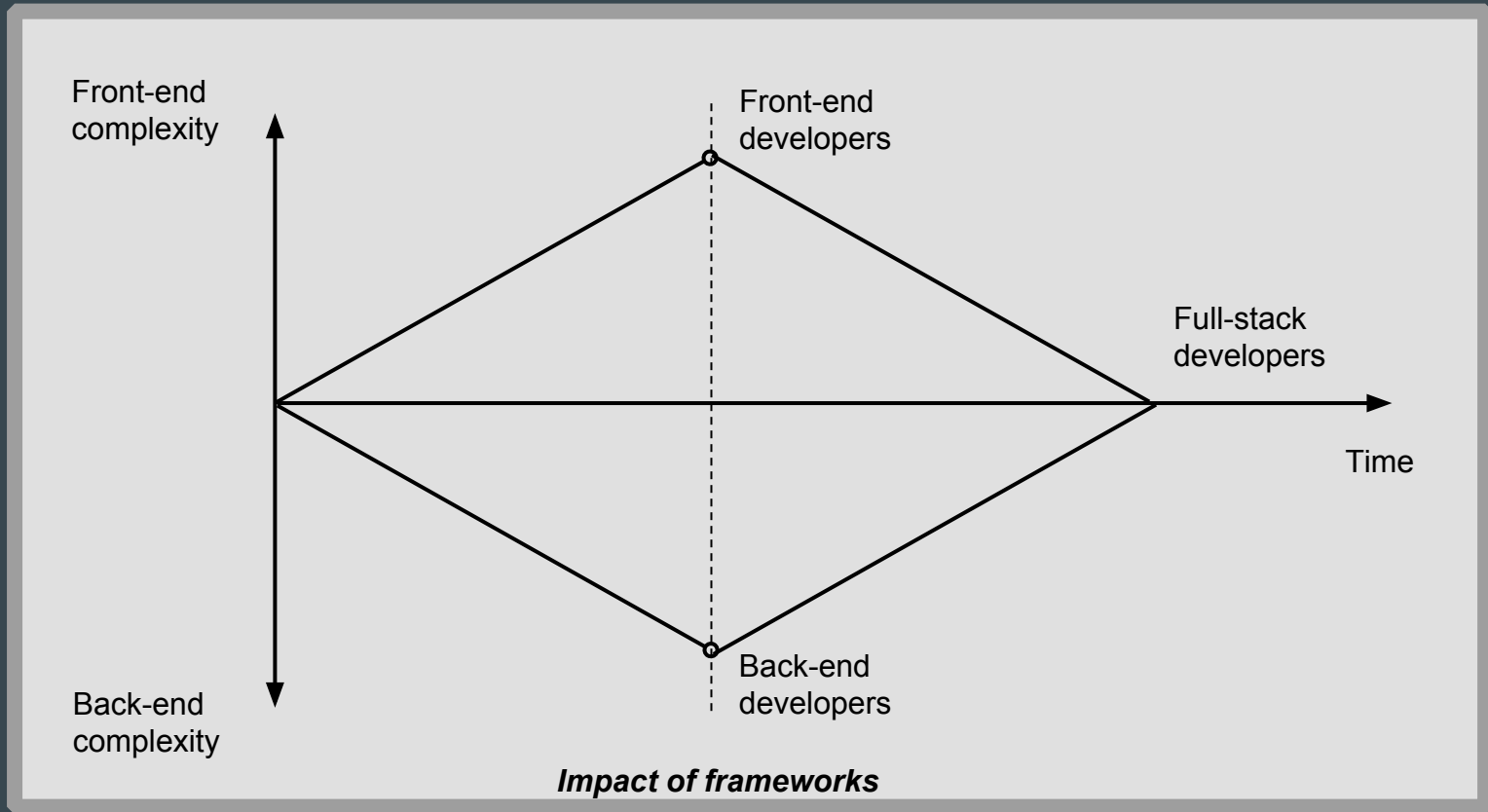
Full-Stack Development

- During the 2000s, libraries and frameworks started to become popular and prevalent
- A Library or Framework
 - Abstracts complexities of development
 - Increases developer productivity
 - Requires less in-depth expertise
- Resurgence of full-stack developers
- Moving the application code forward in the stack
 - Reduces server load, thus reducing cost
 - Crowd-sourcing of computational power

Full-Stack Development - Benefits

- Provide greater value to your clients
 - More skills, services and capabilities
- Build applications end-to-end, no dependency
- Have a better view of the bigger picture of an application
- Understand how different components fit together
- Better overall control
- Team members can move around more freely (Agile teams)
- Learning new technologies
- Rewarding and satisfying experience

Full-Stack Development



Introducing MEAN Stack

MongoDB - the database

- *Has been around since 2007*
- *By MongoDB Inc. (10gen)*
- *NoSQL, Document database*
- *JSON like documents, dynamic schemas*

Express - the web framework

- *First released in 2009*
- *Web application framework*
- *Minimal, flexible, extensible*
- *Build web applications and API*

Angular - the front-end framework

- *Has been around since 2010*
- *Maintained by Google*
- *Front-end, SPA framework*
- *Build highly interactive, responsive and dynamic web applications*

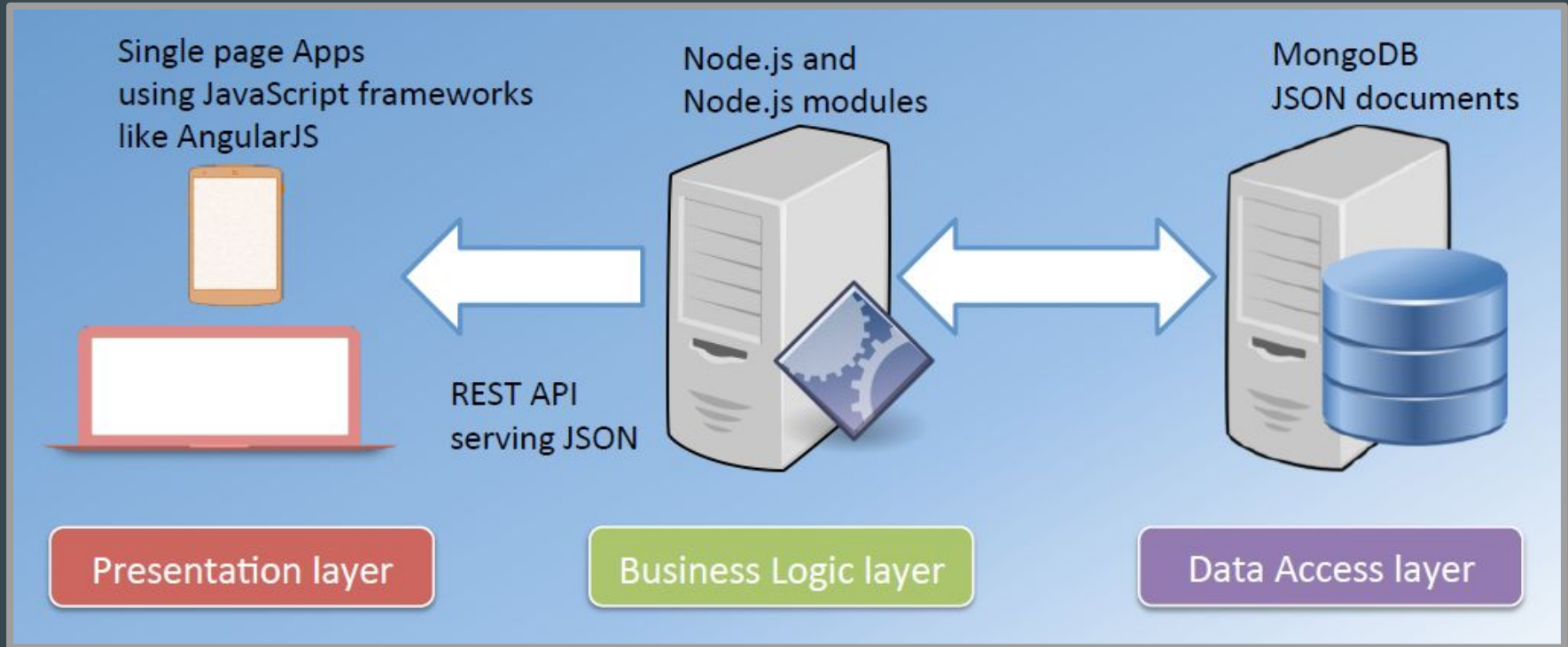
Node - the platform

- *Created in 2009 by Ryan Dahl*
- *Sponsored by Joyent*
- *It is a platform, neither a language nor a web server*
- *Uses Google's Chrome V8 JavaScript engine at its core*

Introducing MEAN Stack

- “Best-of-Breed” modern web technologies
- Very powerful and flexible stack
- Uses JavaScript throughout

Introducing MEAN Stack



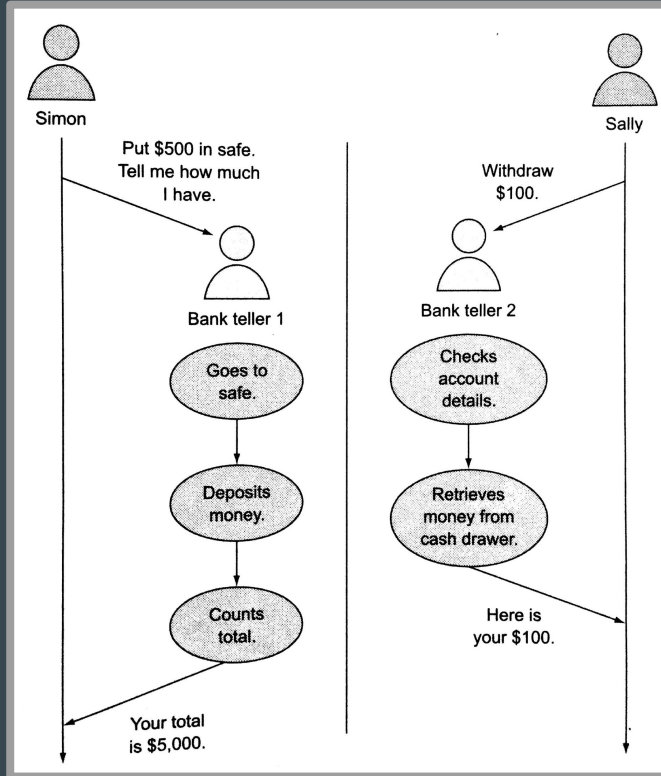
Node

- Foundation of MEAN stack
- A software platform
 - Create your own web server
 - Build web applications on top of it
- Built on Google Chrome's V8 JavaScript engine
- Single-threaded
- Event driven architecture
- Non-blocking I/O model
- Asynchronous execution

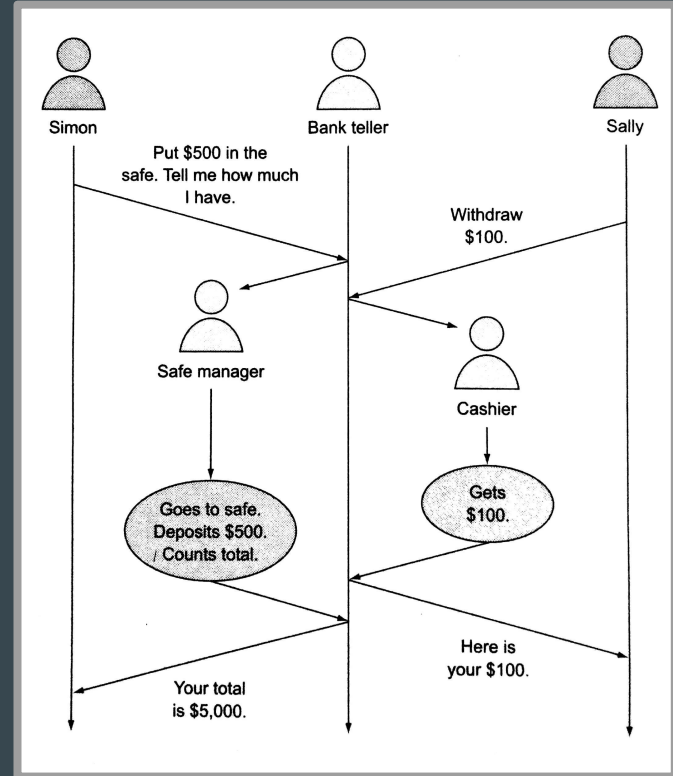
Benefits

- Code it in JavaScript
- Extremely fast and lightweight
- Very efficient use of system resources
- No need to run a separate web server
- Gives you greater control over your app logic and environment
- Serve more users on fewer server resources

Node - Threading



Multithreaded Approach



Single-threaded Approach

Node - npm

- Package manager for JavaScript
- Gets installed with Node.js
- Allows users to consume and distribute JavaScript modules (packages)
- Packages extend the functionality of your application
- Promotes reusability

Examples

- Web App Framework - Express
- ODM - Mongoose
- Helper library - Underscore
- Testing Framework - Mocha, Jasmine

Express

- Node.js web application framework
- Minimal
- Flexible
- Fast
- Extensible
- Provides robust set of features:
 - *Middleware*
 - *Serve static files*
 - *Routing*
 - *Template Engines*
 - *Express Generator*

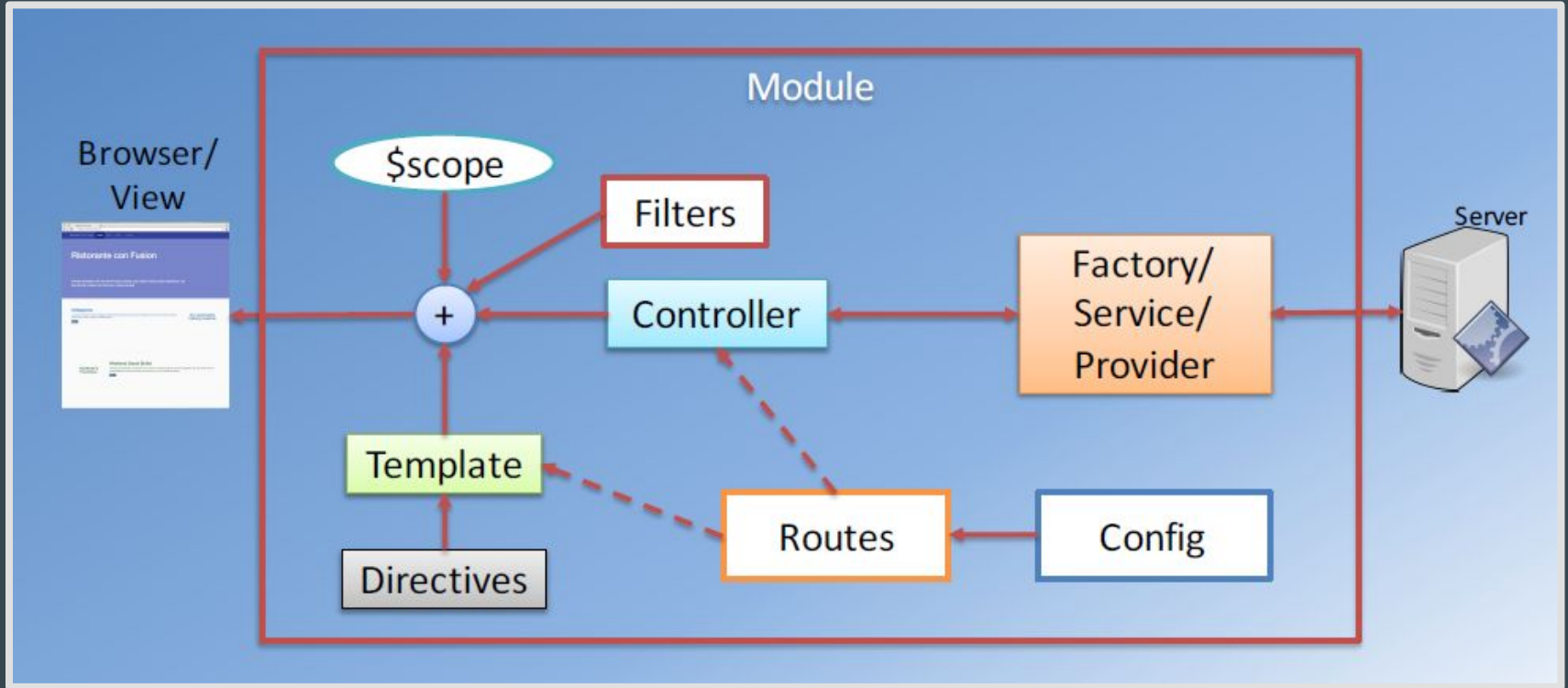
Angular

- Developed in 2009 by Misko Hevery
- JavaScript framework for creating dynamic web applications
- Front-end SPA, RIA framework
- Data-driven applications
- Adds dynamic features to HTML
- Declarative approach

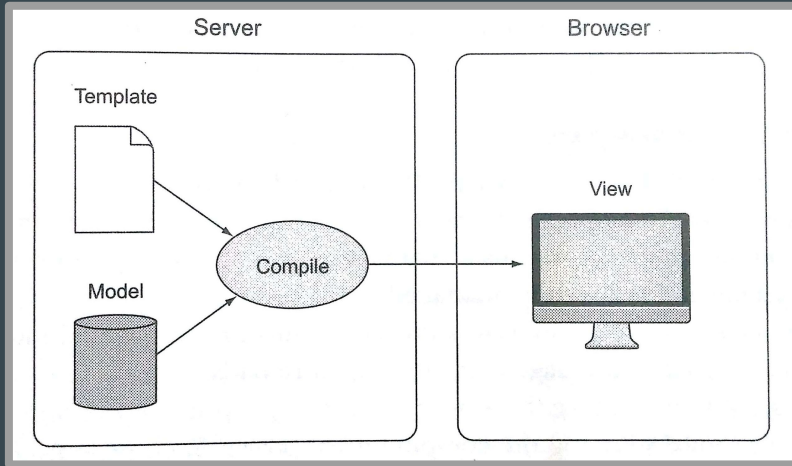
Advantages

- Makes it easy to organize your code
 - Promotes maintenance, collaboration, readability, extension
- Testable code gives peace of mind
- Two-way data binding saves hundreds of lines of code
- Uses HTML for templating
- JavaScript data structures (JSON) eases integration

Angular - Building Blocks



Angular - Binding

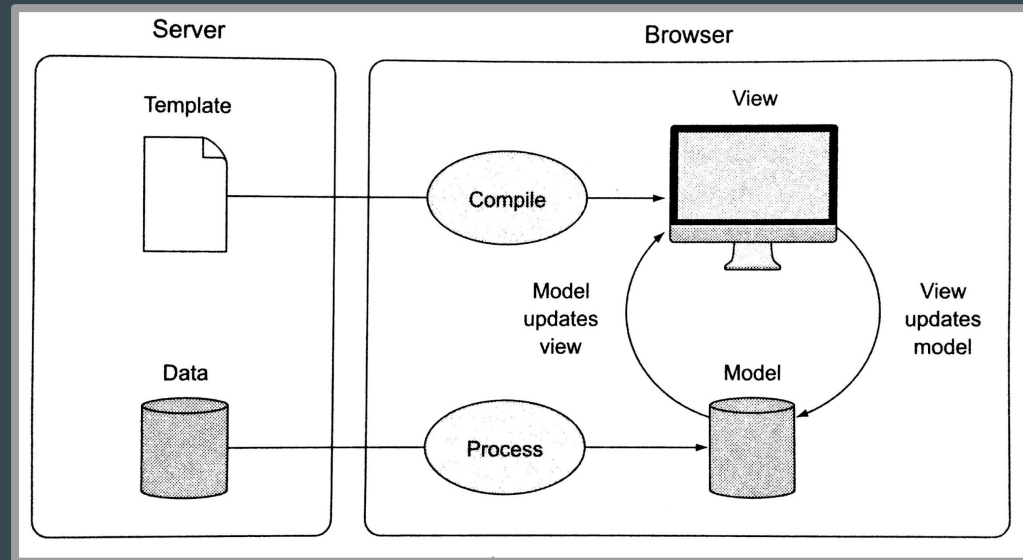


One-way data binding

The template and model are compiled on the server before being sent to the browser

Two-way data binding

The model and the view are processed in the browser and bound together, each instantly updating the other



MongoDB

Q & A

Thank you!