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Point of Sale Software and System Integration

An OpenEdge Developer Getting Started with Modulus and MongoDB

Prepared especially for: **PUG CHALLENGE EXCHANGE AMERICAS**

8 June 2015

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Agenda

- Background
- The Integration Challenge
- Implementing our Integration Platform
- Our Learning Experience
- Conclusion

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QSR Business Ops

Competitive Landscape

- Tablet and mobile POS
- "Free" POS

- Low barrier to entry

- Source: http://blog.laptopmag.com/astro-turns-any-ipad-or-iphone-into-a-feature-filled-pos-system
- Source: http://www.zdnet.com/article/harbortouch-gives-away-pos-systems-to-capture-transaction-fees/

Changing Markets, Declining Sales

- Source: http://www.wsj.com/articles/mcdonalds-ceo-steps-down-1422485574
- Source: http://www.huffingtonpost.com/news/casual-dining/
- Source: http://www.foodworldnews.com/articles/8422/20141110/decline-fastfoods-america-fastfood-sales-slump-americans-become-wise-eaters.htm

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The Tsunami of Regulations*

- Labor

- ObamaCare

* In the United States, in recent years

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Key Industry Trends

Mobile Order

Secure Payments

Automation

- Source: http://www.verifone.com/
- Source: http://new.abb.com/products/robotics/yumi/
- Source: http://www.momentummachines.com/

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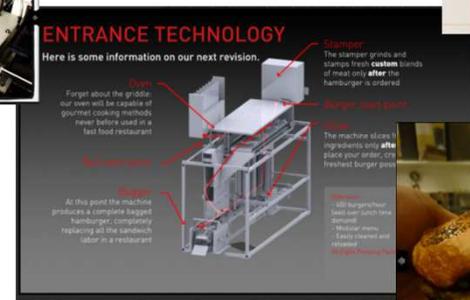
The Integration Challenge:
POS is no longer an island

Integration Broker

Adapter

Adapter

Order
Entry

Finance

CRM

ERP

SCM

CRM

SCM

Tracking
Service

Enterprise

Partner
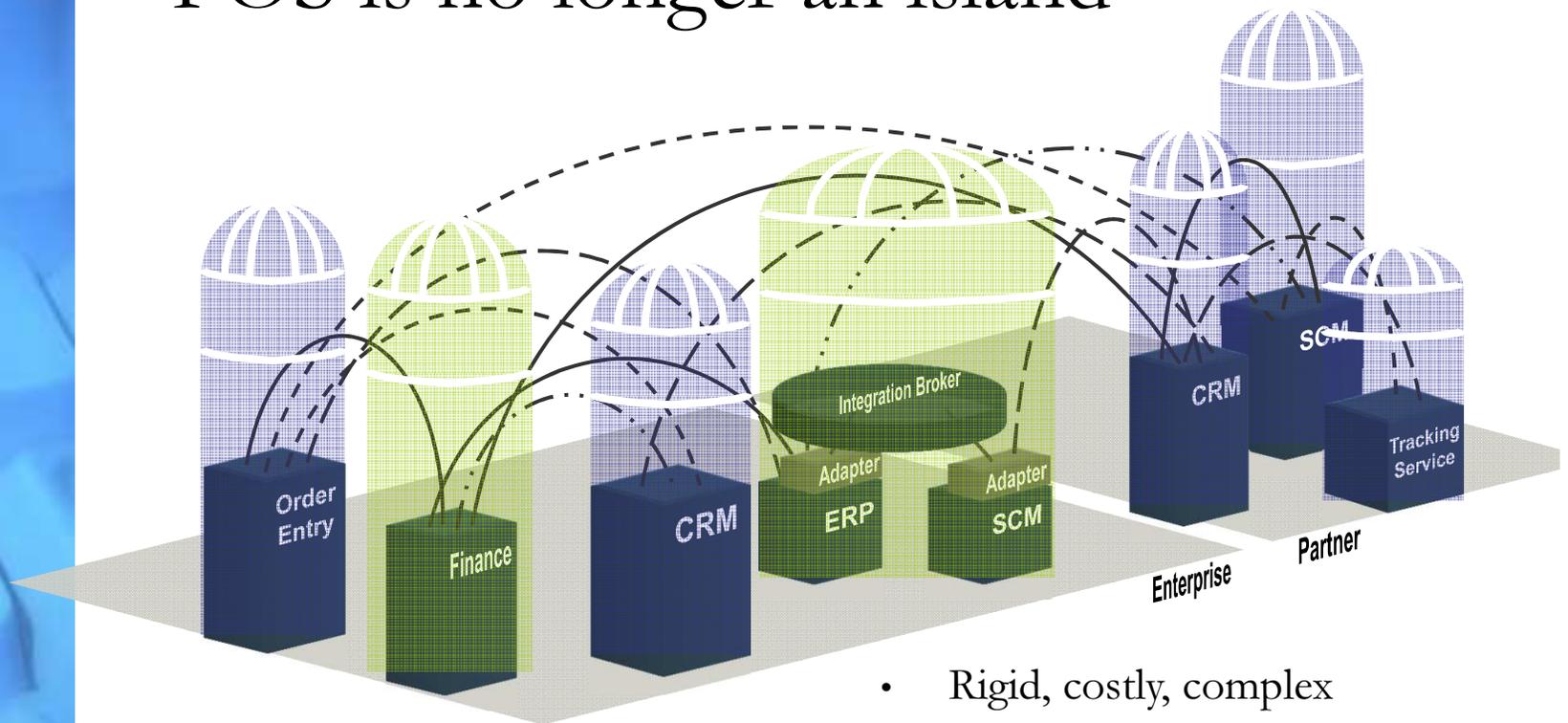
- Rigid, costly, complex
- Nightmare to update
- Security risks: 3P access to POS
- Fragmented install bases

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StatBridge™ QSR Operations System

Every Store ▪ Every Transaction ▪ Real Time

Franchisor

Franchisee

General real time data services

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Price Change
Menu Update
File Maintenance
Sales Reports

Third Party Data Analytics

HQ Sales Reports
Menu Update
Auto Transfer of Franchisee Fees

Email

Web / Mobile Order

Credit/Debit

Integration Platform

FTI

FTI POS

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Building the Integration Platform

OpenEdge
Database
of Record
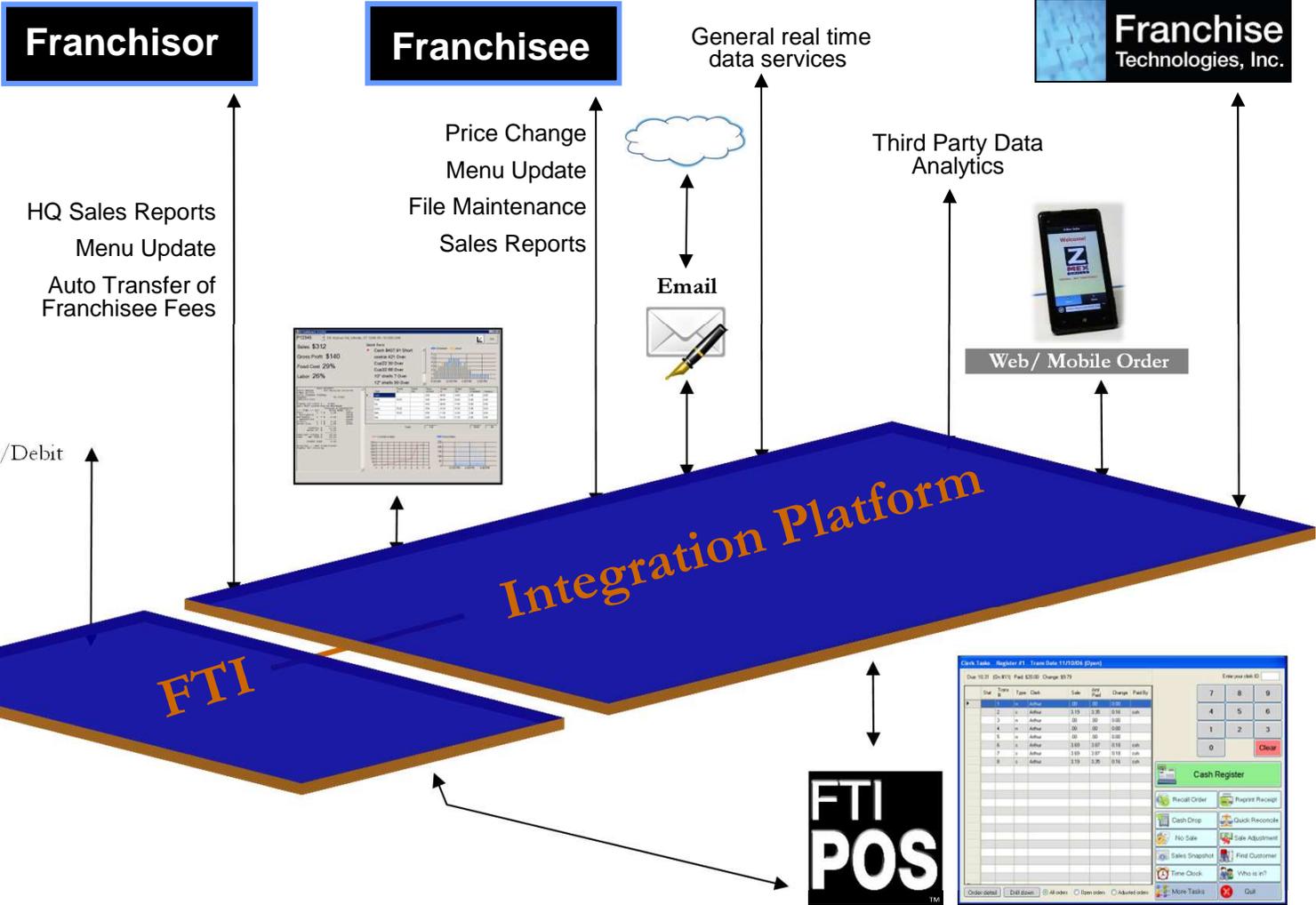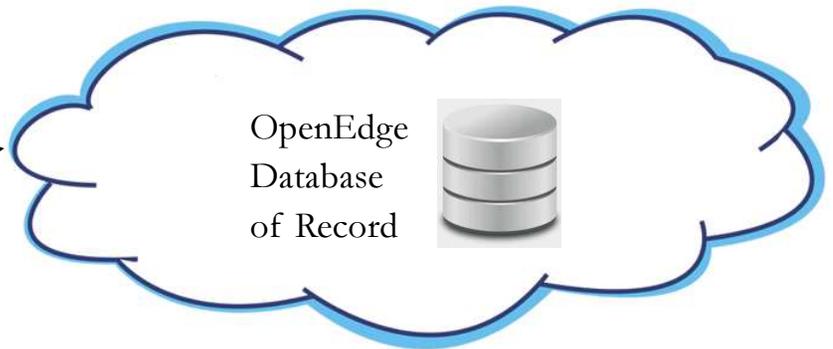
Building the Integration Platform

- SonicMQ

- AWS

- Modulus

- AWS Lambda

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Building the Integration Platform with Node.js

Acceptor

MongoDB

Filter

Decrypt

Central Router

Other

Other

RTD

DOR

Rollbase

DVS

Analytics

Finished

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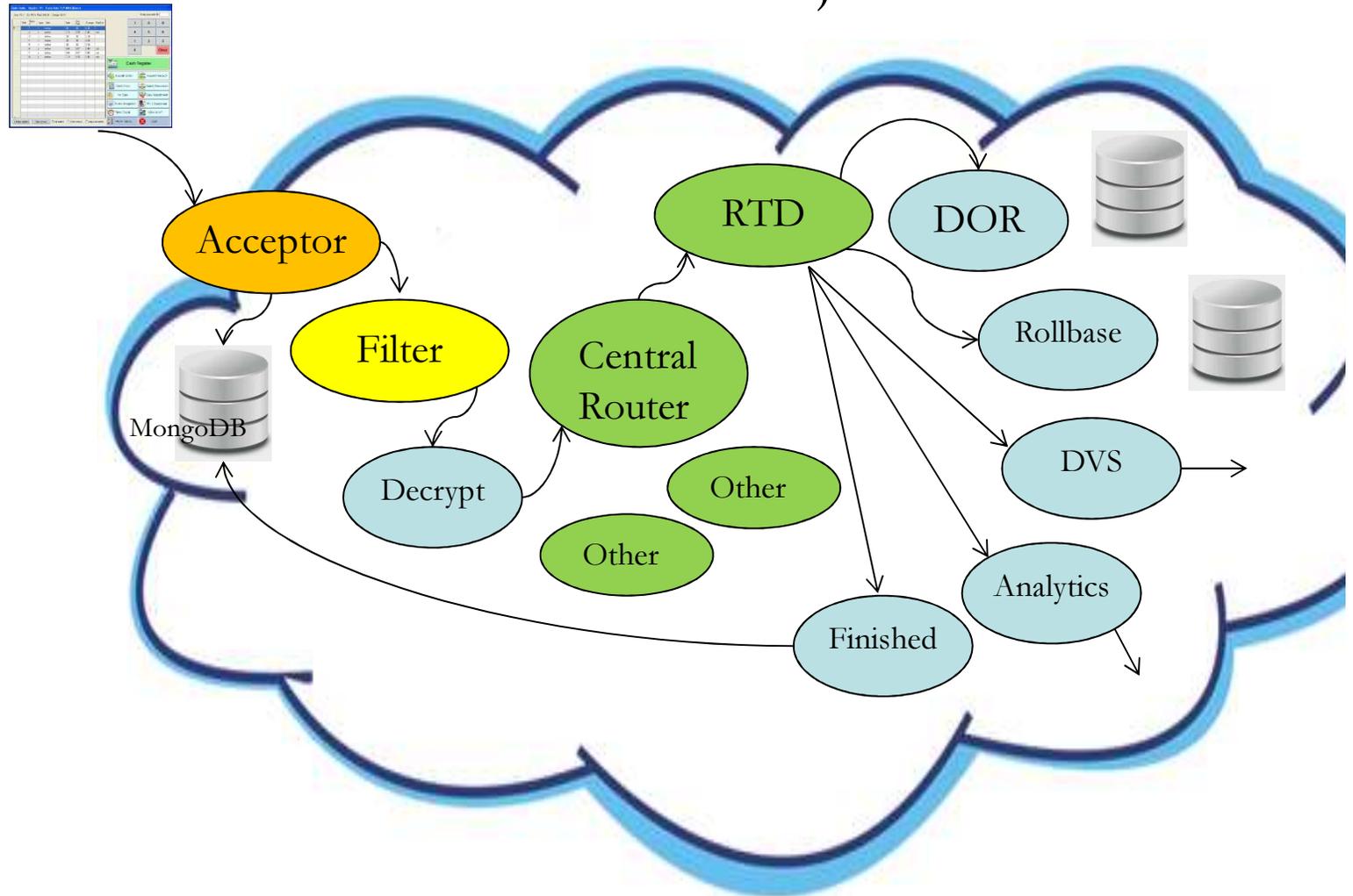
Node-Based Routing

- Forward processing

- Node roles
  - Sentry
  - Filter
  - Router
  - Task
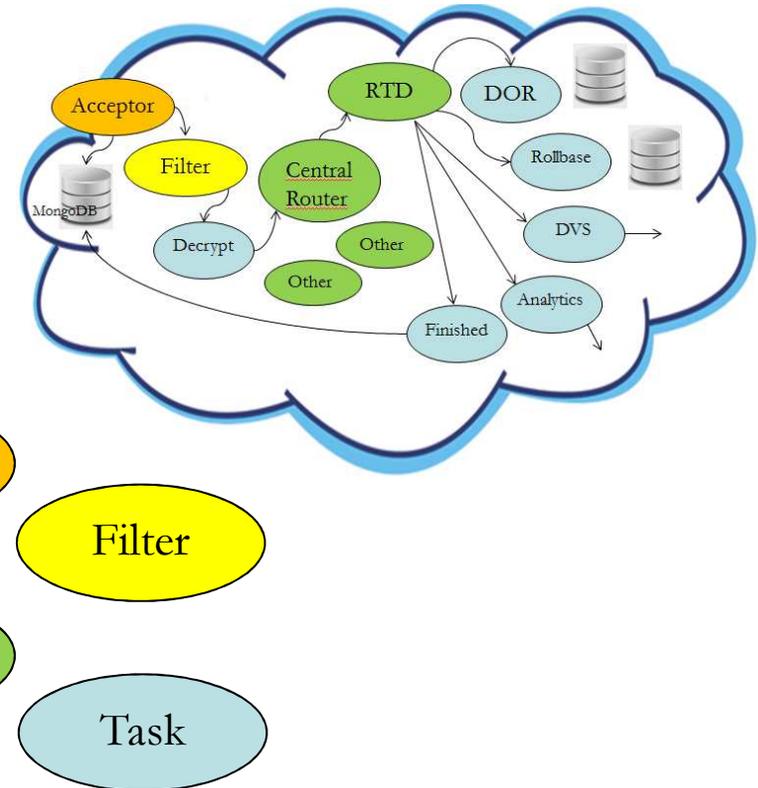
Designing the API

- URI: mydomain.com/api/pf/pr/mt/ver/br/do/lo/de
  - Protocol family (pf)
  - Protocol (pr)
  - Message Type (mt)
  - Version (ver)
  - Brand (br)
  - Domain (do)
  - Location (lo)
  - Device (de)

- Example
  - …/api/fti/pos/rtd/2015-02-15/peppersCafe/pcOfBoston/123/reg1

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Benefits

- Extreme…
  - Flexibility and customization
  - Scalability and elasticity
  - Agility
  - Roadmap

- Minimal cloud resource utilization

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# Our Learning Experience: Why Modulus?

- It's part of Progress
- Enterprises are betting on node.js
- Auto scaling elasticity and load balancer
- Help with security
- Node plus integrated MongoDB
- More options as we grow
  - More powerful Servos
  - Enterprise Class
- Innovativeness
  - Docker; Servers for Java, PHP, Meteor, etc.

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What's Node Good For?

APIs
The "glue" that connects devices and browsers to data and services

Mobile
Backends and full-stack JavaScript hybrid apps

Web
Servers and single-page apps

Internet of Things
Network connected embedded devices and sensors

- Source: https://strongloop.com/wp-content/uploads/2015/02/final-node-infographic-2-10-15v3.pdf

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Node is Good for Your Career

According to indeed.com Node jobs are growing faster than other languages.

% Growth

Node

java
ruby
objective-c

2006   2014

- Source: https://strongloop.com/wp-content/uploads/2015/02/final-node-infographic-2-10-15v3.pdf

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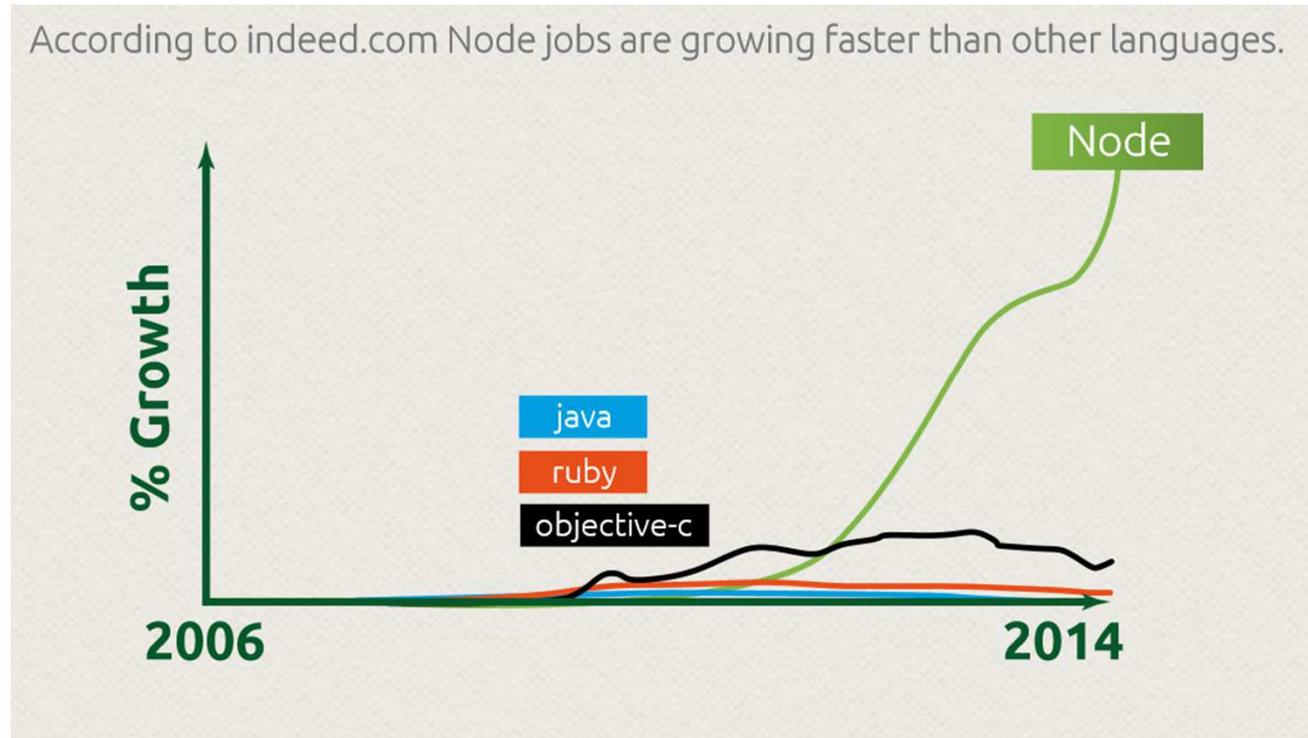
Learning JavaScript

A Smarter Way to Learn JavaScript

The new tech-assisted approach that requires half the effort

1 Read a 10-minute chapter of this book to get each concept.

2 Make the knowledge stick. Do the chapter's free interactive exercises at ASmarterWayToLearn.com.

**Mark Myers**

- Source: http://asmarterwaytolearn.com
- Source: http://visibone.com

- JavaScript (as a second language)

- Extend by using lodash or underscore

- Promises, promises

- Visibone

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Learning Node

- Download from nodejs.org

- Modulus tutorials on blog.modulus.io
  - The absolute beginner's guide to node.js (20 Aug 13)
  - Build your first HTTP server in node.js (20 Jan 15)
  - Express video tutorial: express in a nutshell (30 Jan 15)
  - Learning Express 4.0 (27 May 14)
  - Top 10 Reasons to use Node.js (10 Sep 14)
  - Using MongoDB with Node.js (3 Mar 15)

- StackOverflow

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Learning Node
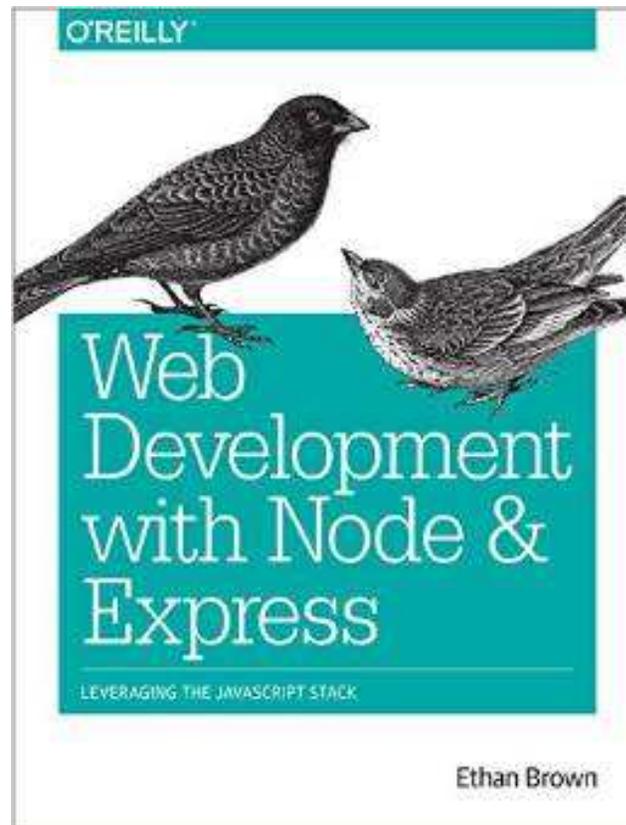
- Features Express 4.0

- Templates instead of frameworks

- REST and security

- Source: http://shop.oreilly.com/product/0636920032977.do

Learning MongoDB

Introduction to MongoDB

Welcome to MongoDB. This document provides a brief introduction to MongoDB and some key concepts. See the installation guides for information on downloading and installing MongoDB.

What is MongoDB

MongoDB is an open-source document database that provides high performance, high availability, and automatic scaling.

Document Database

A record in MongoDB is a document, which is a data structure composed of field and value pairs. MongoDB documents are similar to JSON objects. The values of fields may include other documents, arrays, and arrays of documents.

```
{
    name: "sue",              ←— field: value
    age: 26,                  ←— field: value
    status: "A",              ←— field: value
    groups: [ "news", "sports" ]  ←— field: value
}
```

The advantages of using documents are:

- Documents (i.e. objects) correspond to native data types in many programming languages.
- Embedded documents and arrays reduce need for expensive joins.
- Dynamic schema supports fluent polymorphism.

```
{
    _id: <ObjectId1>,
    username: "123xyz",
    contact: {
            phone: "123-456-7890",      Embedded sub-
            email: "xyz@example.com"    document
        },
    access: {
            level: 5,                    Embedded sub-
            group: "dev"                 document
        }
}
```

- Mongodb.org
  - Esp. Data Modeling Intro
- MongoDB University
- Start with mongoose

- https://www.mongodb.com/lp/white-paper/architecture-guide

- IOT example: http://www.mongodb.com/presentations/webinar-internet-things-bosch-concept-code

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Learning Lambda Functions

Introducing AWS Lambda functions

DevOps

- https://aws.amazon.com/lambda/

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NPM: Intro to Open Source

- NPM packages: npmjs.com
  - express (minimalist web framework)
  - request (simplified HTTP request client)
  - lodash, underscore (programming helper utilities)
  - async (for control flow (series or parallel))
  - mongoose (for easier MongoDB integration)

- How to evaluate modules
  - Identifying Good NPM Modules (blog.modulus.io, 3 Sep 2014)
  - npmsearch.com; npmjs.com "find packages"

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REST and Learning REST API Design

- REST+JSON API Design - Best Practices for Developers (by Stormpath)

  – https://www.youtube.com/watch?v=hdSrT4yjS1g#t=763

- OE "REST out" in 11.5.1.

- SSL Performance in node.js
  – https://www.paypal-engineering.com/2014/04/01/outbound-ssl-performance-in-node-js/

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Conclusion

- Thank you for your time

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