# 2000

20,000

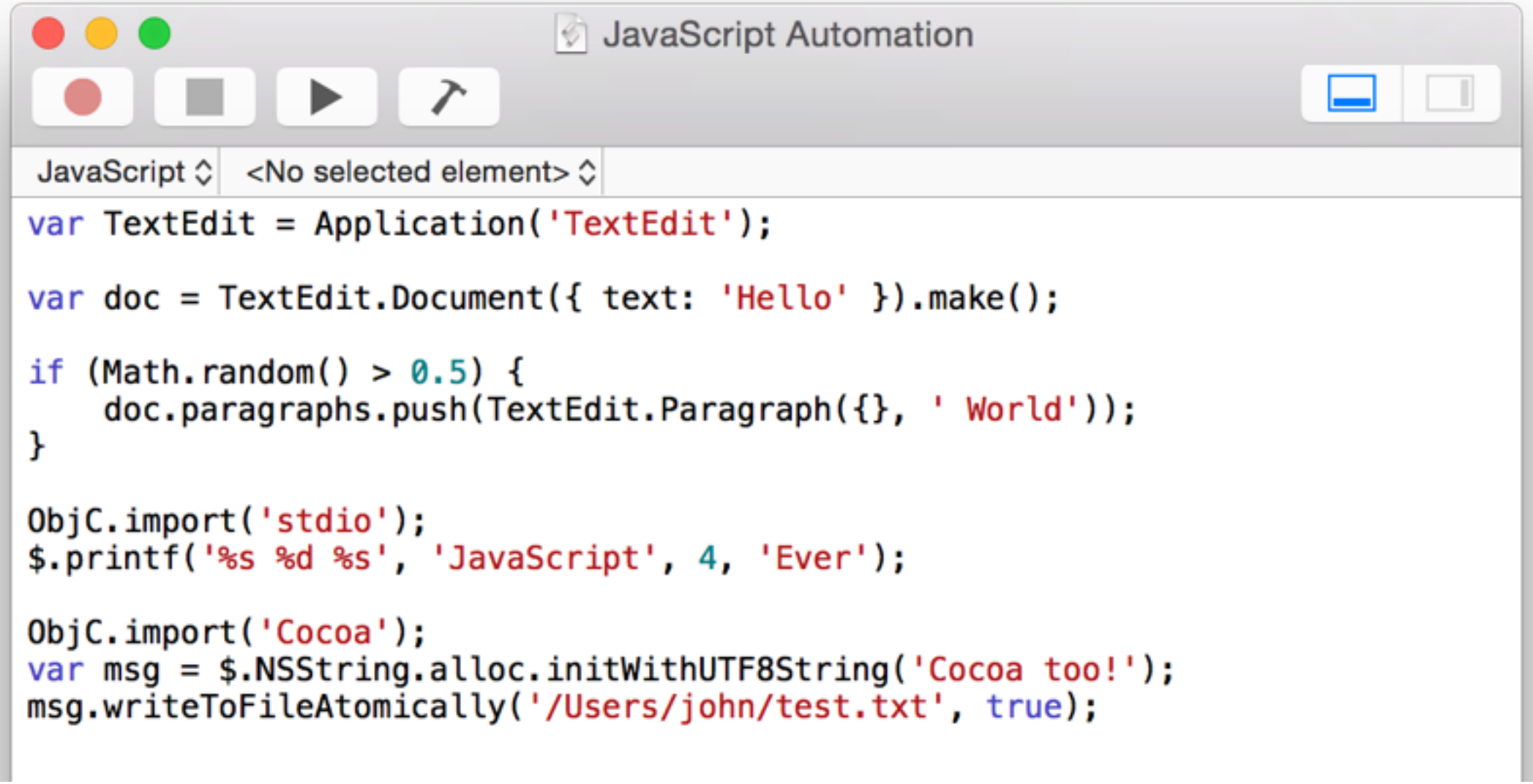
JavaOne

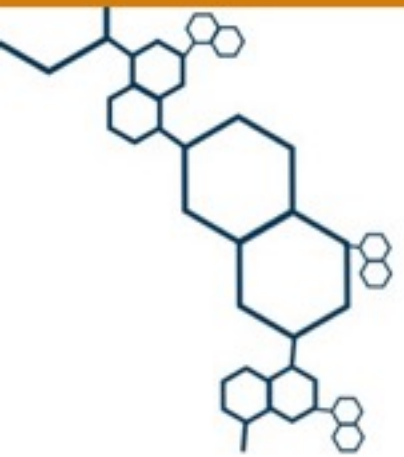
JavaOne

UBIQUITY

# 2014

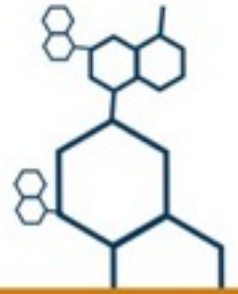
ANGULARJS


JavaScript Automation
JavaScript
<No selected element>
var TextEdit = Application('TextEdit');
var doc = TextEdit.Document({ text: 'Hello' }).make();
if (Math.random() > 0.5) {
doc.paragraphs.push(TextEdit.Paragraph({}, ' World'));
}
ObjC.import('stdio');
$.printf('%s %d %s', 'JavaScript', 4, 'Ever');
ObjC.import('Cocoa');
var msg = $.NSString.alloc.initWithUTF8String('Cocoa too!');
msg.writeToFileAtomically('/Users/john/test.txt', true);



# eLab bionode JS

**October 21, 2014**



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# Welcome to the first eLab bionode event

- Goals
- Introductions
- Agenda
- Sponsors
- Why bio? – why node?

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# Goals

- Learn more about node.js (beginning or advanced)
- Discover applications of node.js outside your domain
- Network with other JavaScript developers
- Establish a community of resources in the Tennessee Valley

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# Introductions

- Richard Williams (Director of Product Development)
- Ryan Carmichael (Director of Engineering)
- Jack Basiago (Senior Developer)
- Chris Case (Developer)
- Jason Carter (Developer)
- Rob Lurie (VP, CTO and Co-founder)

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# Agenda

| Time | Description | Presenter |
|---|---|---|
| *9:00 – 9:20* | *Introduction to eLab bionode* | *Richard Williams (eLab)* |
| *9:20 – 9:30* | *Who is eLab?* | *Rob Lurie (eLab)* |
| *9:30 – 10:00* | *Getting Started* | *Richard Williams (eLab)* |
| *10:00 – 12:00* | *Workshop – Part 1* | *All* |
| *12:00 – 1:30* | *Lunch and Mingle* | *All* |
| *1:30 – 3:30* | *Workshop – Part 2* | *All* |
| *3:30 – 4:00* | *Angular Application on IOS using Ionic* | *Jack Basiago (eLab)* |
| *4:00 – 4:30* | *Node.js deployment to Heroku* | *Joe Kutner (Heroku)* |
| *4:30 – 5:00* | *Feedback, Prizes, and Drinks* | *All* |

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# Sponsors

- eLab Solutions (eLab University)
- Heroku
- Jet Brains
- Strong Loop
- O'Reilly Books
- Manning Books
- Pragmatic Programmers

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# User Groups

- North Alabama Web Developers - http://www.meetup.com/web-99/
- NSHuntsville - http://www.meetup.com/NSHuntsville/
- Huntsville MongoDB User Group - http://www.meetup.com/Huntsville-MongoDB-User-Group/
- hsv.rb - http://www.meetup.com/hsv-rb/
- Huntsville Independent Game Developers - http://www.meetup.com/huntsville-independent-game-developers/
- NashJS - http://www.meetup.com/nashjs/

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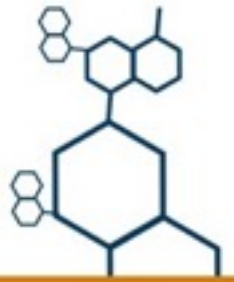
# Why bio?
# Why node?



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# Why bio?

- University of Illinois at Chicago indicates that **50,000 more health informatics workers** will be needed within the next 5-7 years. The university expects a **21% increase** in these jobs between 2010 and 2020.
- The US Department of Labor's Bureau of Labor Statistics projects a **22% growth in jobs for medical records and health information technicians** between 2012 and 2022.
- The global bioinformatics market, which reached the mark of around US$ 3 Billion in 2010, will expand at a CAGR of around **25% during 2012-2015** as the declining cost of human genome sequencing and increasing public and private sector investment will give a significant boost to the industry.(Reportlinker.com)
- Increased awareness of the need to develop **rapid response to biological threats** using computer-designed drugs, modeling the spread of biological agents, and tracking contacts for quarantines

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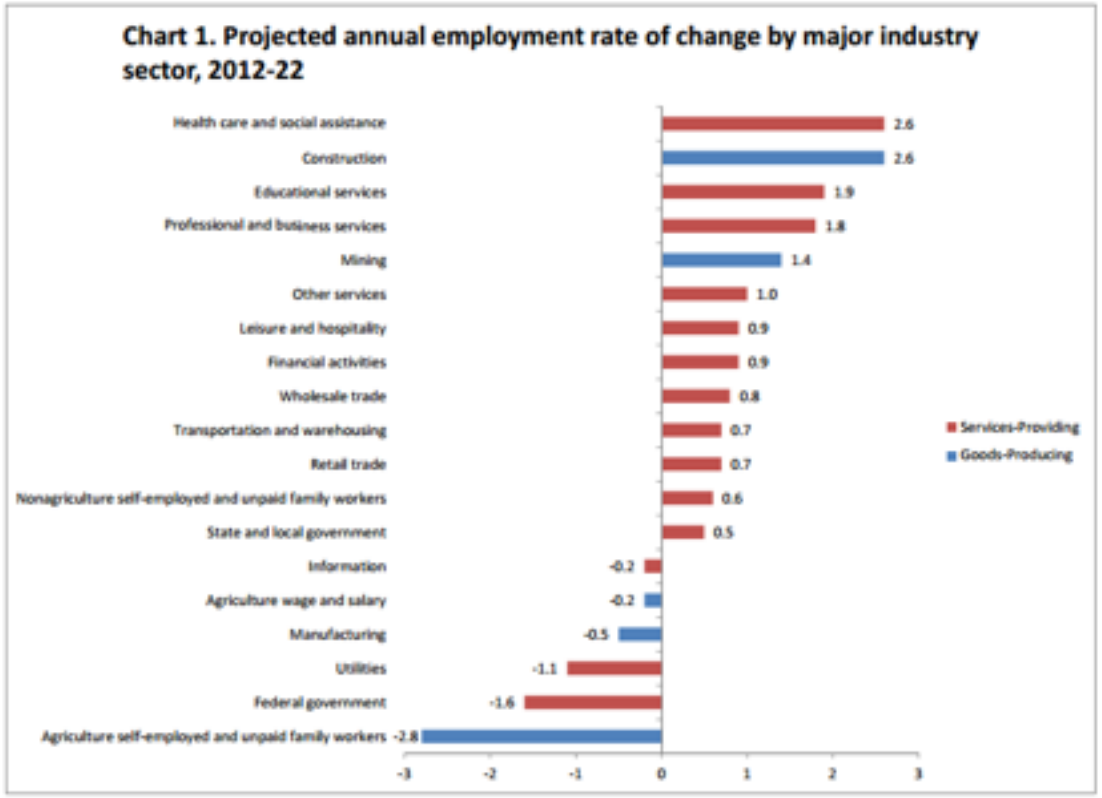
# Why biotech?



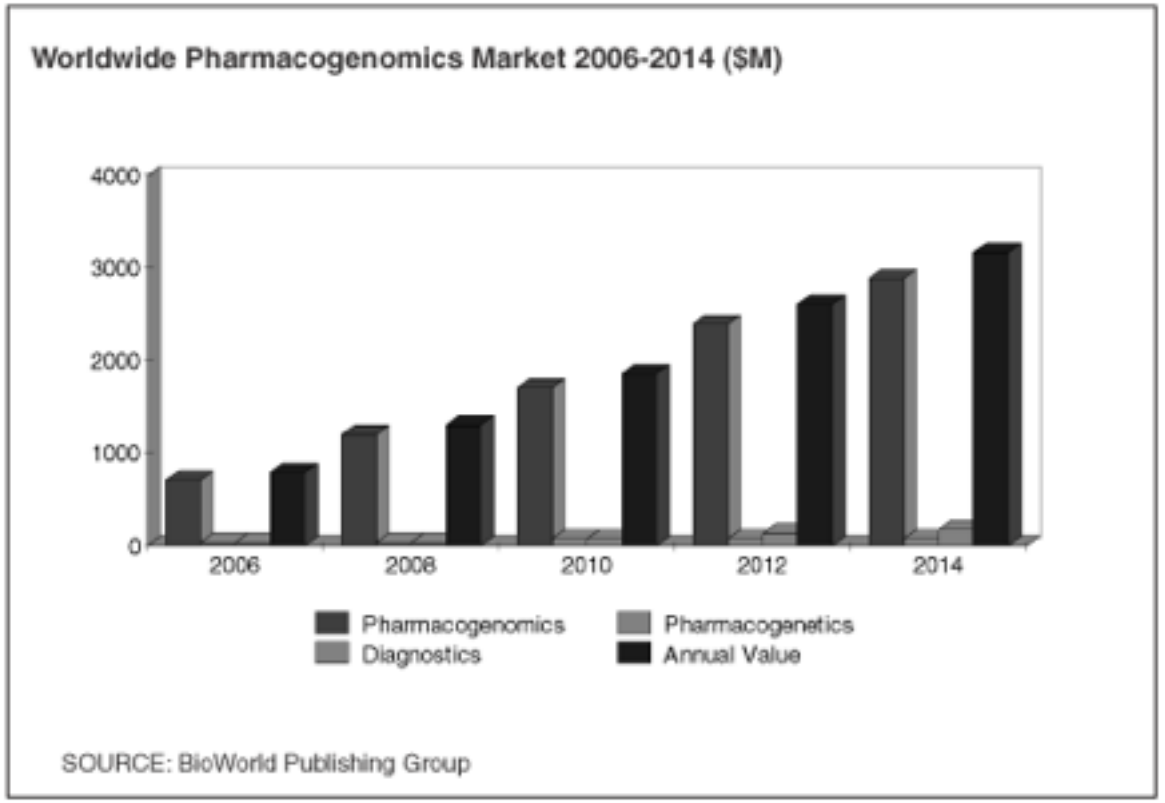




*Image Source: http://www.bls.gov/news.release/pdf/ecopro.pdf*

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# Development Landscape

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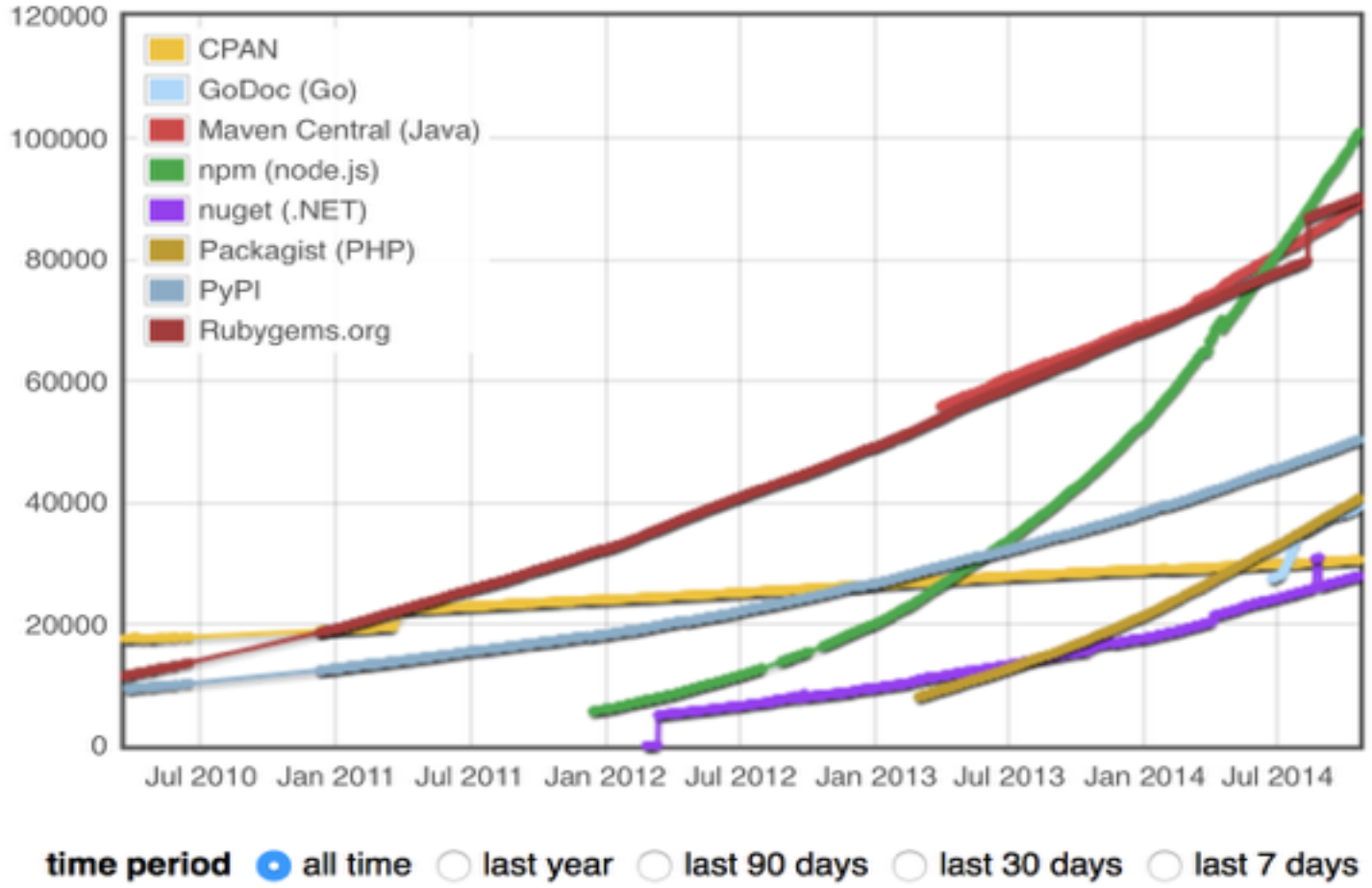
# Why node?

Source: http://www.modulecounts.com




**Include**

- [ ] Bower (JS)
- [ ] Clojars (Clojure)
- [x] CPAN
- [ ] CPAN (search)
- [ ] CRAN (R)
- [x] GoDoc (Go)
- [ ] Hackage (Haskell)
- [ ] Hex.pm (Elixir/Erlang)
- [x] Maven Central (Java)
- [ ] MELPA (Emacs)
- [x] npm (node.js)
- [x] nuget (.NET)
- [x] Packagist (PHP)
- [ ] Pear (PHP)
- [x] PyPI
- [x] Rubygems.org

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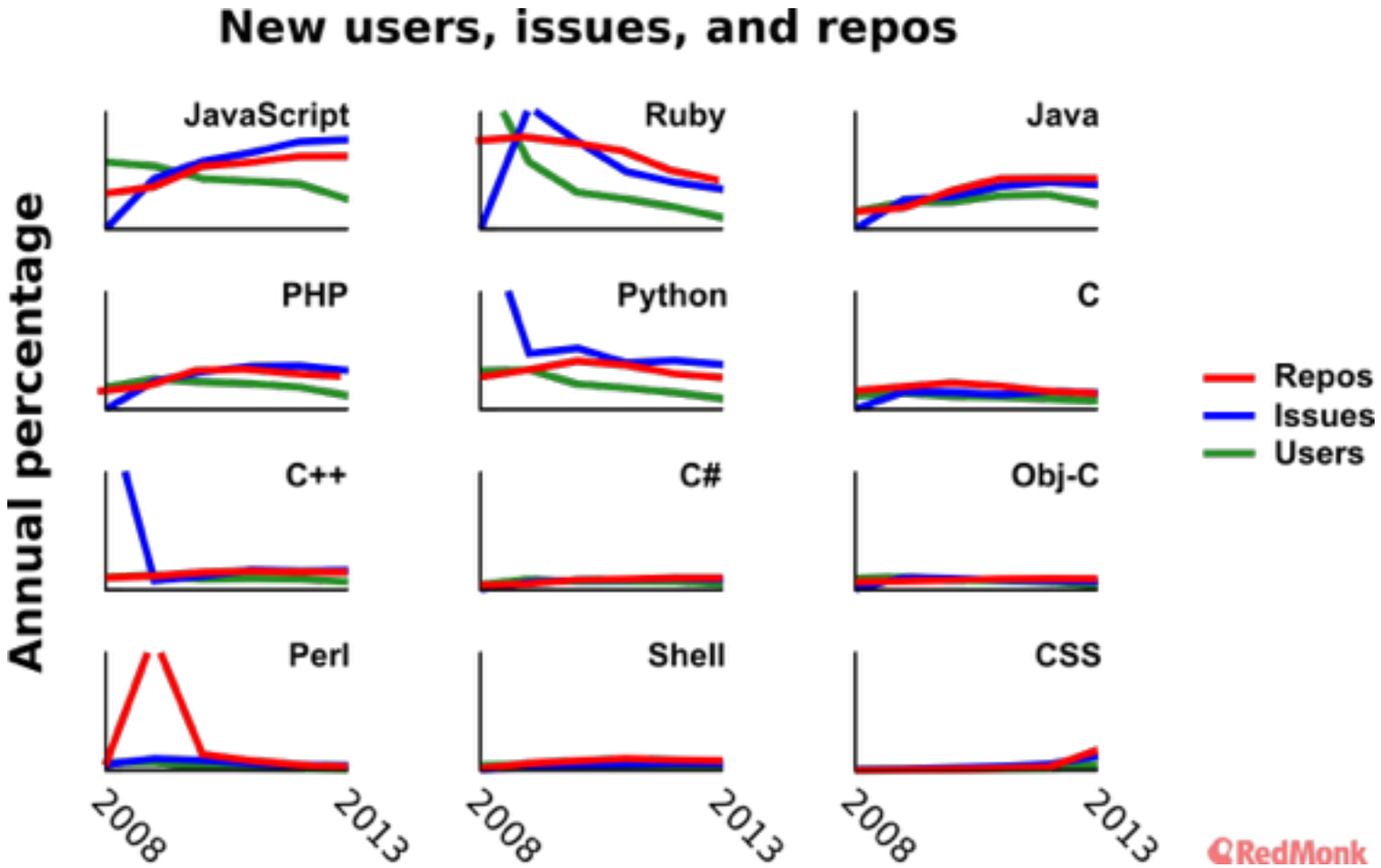
# Why node?

Source: http://redmonk.com/dberkholz/2014/05/02/github-language-trends-and-the-fragmenting-landscape/

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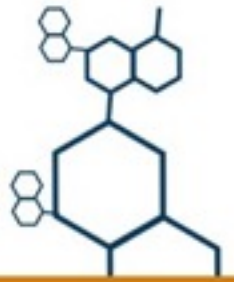
# Why node?

- Full-stack development – Javascript all the way through using MEAN
- Fast – Google V8 Javascript engine compiles and executes Javascript as machine code
- Single-threaded – asynchronous event loop with callbacks - Reading /writing to network connections, filesystems, databases– very fast in Node
- npmjs.org – Modules, package management, and dependency management
- JSON – easy to create and read – ideal for NoSQL databases such as MongoDB
- Excellent stream support using events
- Available as PaaS (Azure, Modulus, Heroku)
- Enterprise support (Joyent, StrongLoop, New Relic, AppDynamics)



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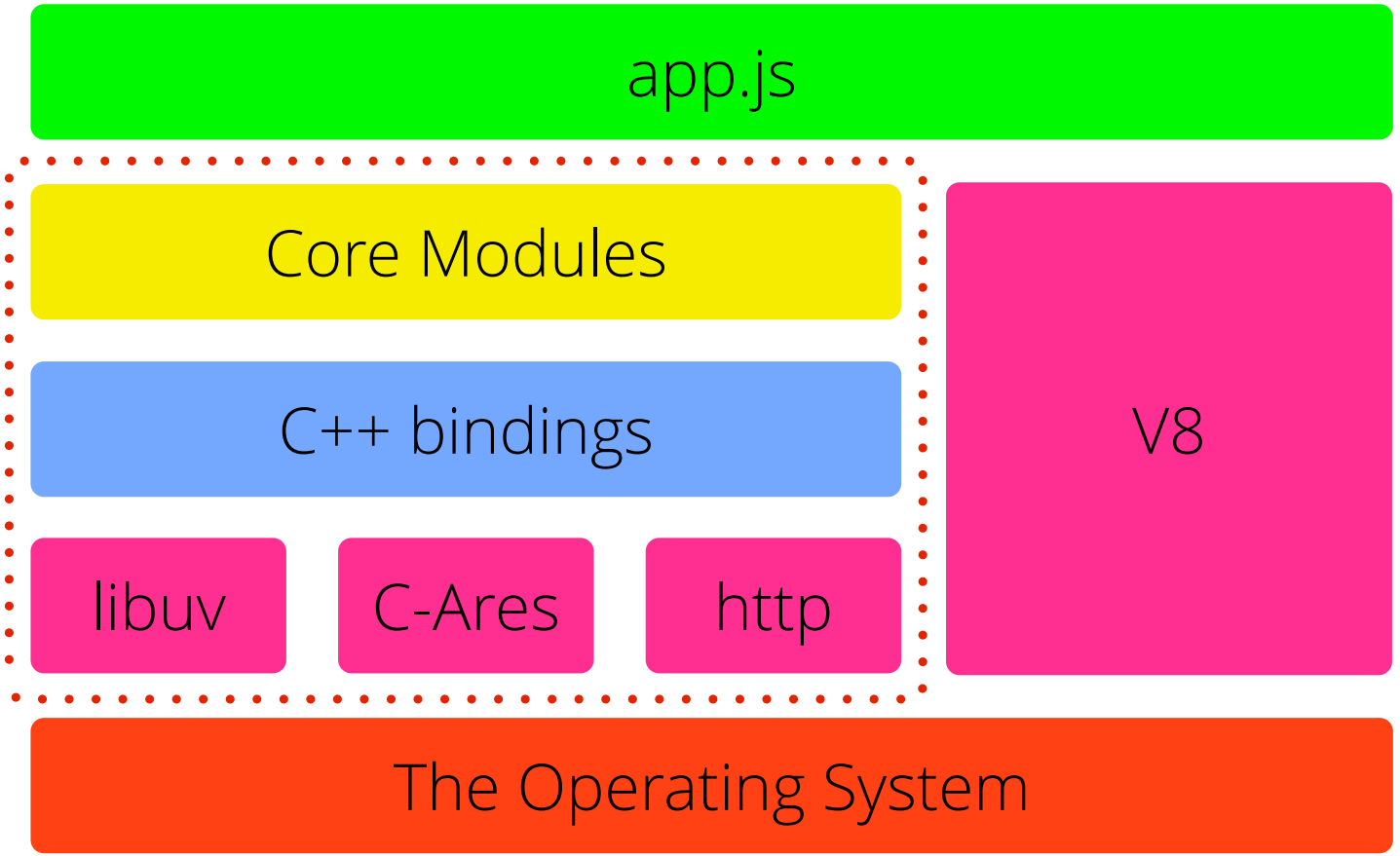
# Node.js Architecture

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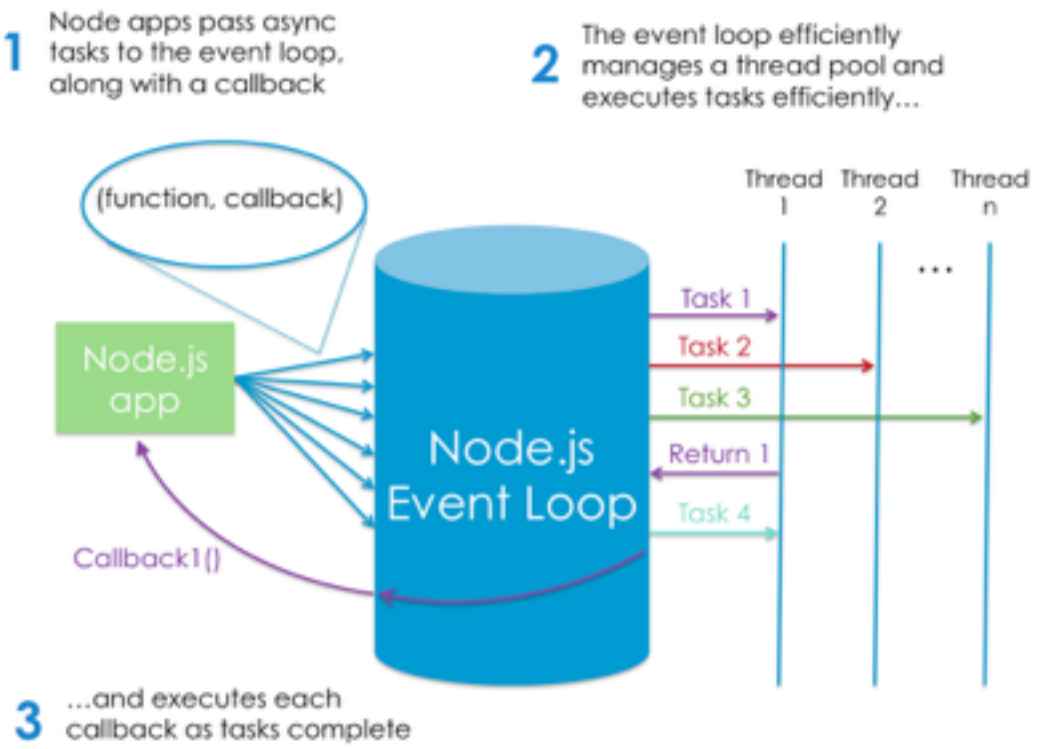
# Node.js Asynchronous Event Loop

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# Areas of Biotechnology

- **Bioinformatics**: Research, development, or application of computational tools and approaches for expanding the use of biological, medical, behavioral or health data, including those to acquire, store, organize, archive, analyze, or visualize such data.
- **Computational Biology**: The development and application of data-analytical and theoretical methods, mathematical modeling and computational simulation techniques to the study of biological, behavioral, and social systems.
- **Health Informatics**: The resources, devices, and methods required to optimize the acquisition, storage, retrieval, and use of information in health and biomedicine

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# Javascript Biotechnology Highlights

## Bioinformatics

- **Dat** - grant funded, open source project housed in the US Open Data Institute. While dat is a general purpose tool the focus is on open science use cases. http://dat-data.com/index.html
- **BioJS** - open-source library of JavaScript components to visualise biological data http://biojs.net (
  - Registry of components - http://registry.biojs.net/client/#/)
  - BioJS Playground - http://edu.biojs.net/categories/playground/index.html

## Computational Biology

- **Geppetto** – multi-algorithm, multi-scale simulation platform engineered to support the simulation of complex biological systems and their surrounding environment http://www.geppetto.org

## Health Informatics

- **Bluebutton.js** – designed to simplify working with health data, so you as a developer can help patients get access to their data and get it to whomever is caring for them. http://www.bluebuttonjs.com

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# Javascript Highlights

- **MongoDB** - open-source document NoSQL database – written in C++ but stores JSON style document – excellent interfaces for node.js
- **Express.js** - Minimal and flexible Node.js web application framework that provides a robust set of features for web and mobile applications. http://expressjs.com
- **Angular.js** – Single-page Application framework from Google https://angularjs.org
- **D3.js** – Data-Driven Documents visualization library (used by biogps.org) http://d3js.org

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# The Future of Javascript

- **ECMAScript 6**– Major changes ahead in Javascript including new class syntax, promises, modules, inheritance, arrow functions, and more!
  https://github.com/nzakas/understandinges6
- **Tessel** – a microcontroller that runs JavaScript, is Node-compatible and has Wifi
  https://tessel.io
- **Angular v2.0** – ECMAScript 6 compatible, more mobile focus, profiling, logging service, increase performance
  http://angularjs.blogspot.com/2014/03/angular-20.html
- **Language Compilers** – other languages compiled to Javascript, CoffeeScript, ClojureScript, TypeScript, Opal (Ruby), Scala.js, etc.
  https://github.com/jashkenas/coffeescript/wiki/list-of-languages-that-compile-to-js

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# eLab Solutions, Inc.

**Introduction**

**Rob Lurie, VP, CTO, Co-founder**

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# eLab Solutions, Inc.
# Career Opportunities

**Send your resume to:**

**richard.williams@elabsolutions.com**

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