



21.02.2016

Fatih Şimşek - Software Infrastructure



NodeJs

Open Source, cross platform

Huge community

Ryan Dahl, Joyent

Developed in 2009

Published in 2011 (Linux + Windows)

Similar design to systems like Ruby's Event Machine or Python's Twisted



Who is using NodeJs?

The New York Times



Cloud9 IDE
Great code requires great tools



Walmart



YAHOO!

PayPal



Microsoft

NETFLIX

codenvy

Medium



ebay

LinkedIn

yammer

DOW JONES

Turner
A Time Warner Company

GROUPON



Success Stories

Yahoo: Node services handle around 1.680.000 – 2.000.000 requests/minute. Biggest Win: speed & ease of development

Netflix: The team decided to use Node.js to achieve lightweight, modular and fast application. As a result, the startup time of their new app has been reduced by 70%

Linkedin: When compared with the previous Ruby on Rails based version, the new mobile app is up to 20 times faster

Walmart: %55 of all traffic on Black Friday went to Node servers. Not a single Node server went down



Success Stories

PayPal: Build a Node version of a Java app in half the time with fewer developers. Node version of the app doubled the number of requests/second. Request time dropped 35%

Groupon: In comparison with earlier Ruby on Rails platform, web pages got faster by about 50% and are able to serve much higher traffic

GoDaddy: 10x fewer servers to host our customer websites and we reduced the Time To First Byte (TTFB) considerably from ~60ms to something around ~12ms



Github

nodejs / node

Watch 2,054 Star 30,484 Fork 5,512

Code Issues 687 Pull requests 336 Projects 4 Wiki Pulse Graphs

Node.js JavaScript runtime 🌟🐢🚀🌟 <https://nodejs.org>

15,976 commits 130 branches 406 releases 1,218 contributors

December 8, 2016 – January 8, 2017

Period: 1 month ▾

Overview

133 Active Pull Requests

217 Active Issues

46

Merged Pull Requests

87

Proposed Pull Requests

139

Closed Issues

78

New Issues



NodeJs

Built on Chrome's Javascript Runtime (**V8**)

Single thread, event oriented

Event-Driven with Non-blocking I/O

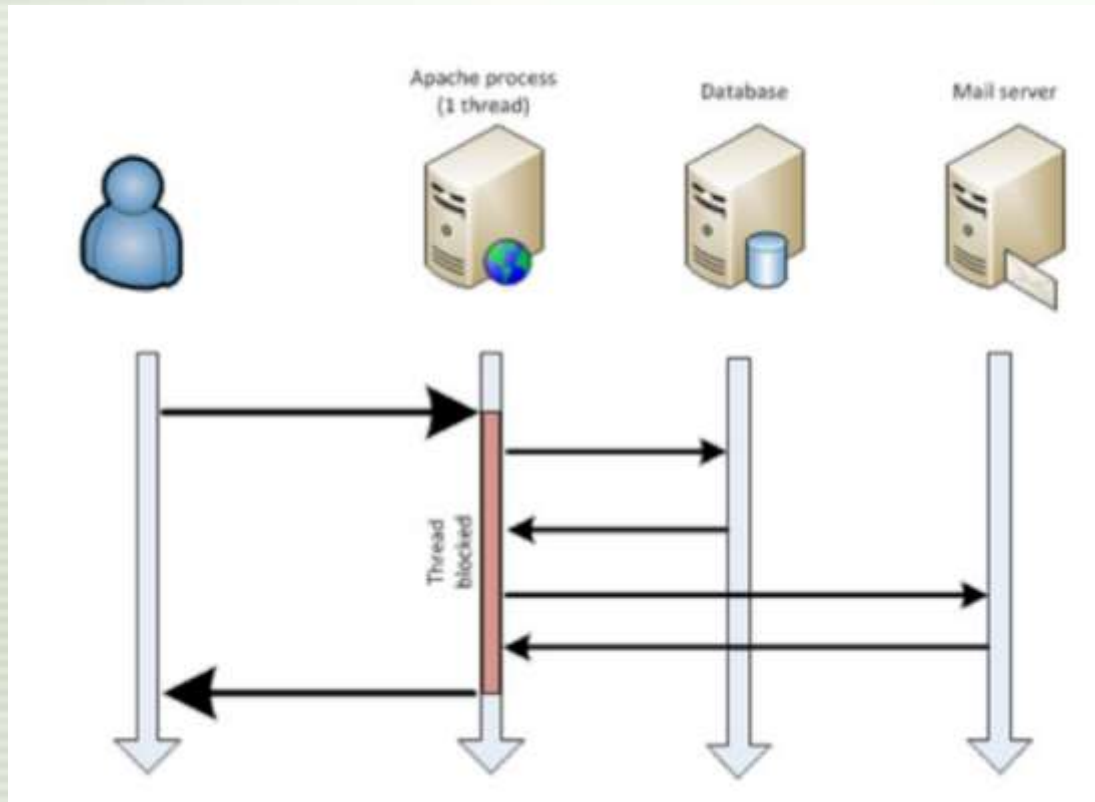
Use a Event Loop for Non-blocking I/O

Can handle thousands of concurrent connections with minimal overhead (CPU/Memory)

40% JS and 60% C++



Traditional Server



New thread **per request**

The **thread is blocked** during IO operations



Thesis

The cost of I/O

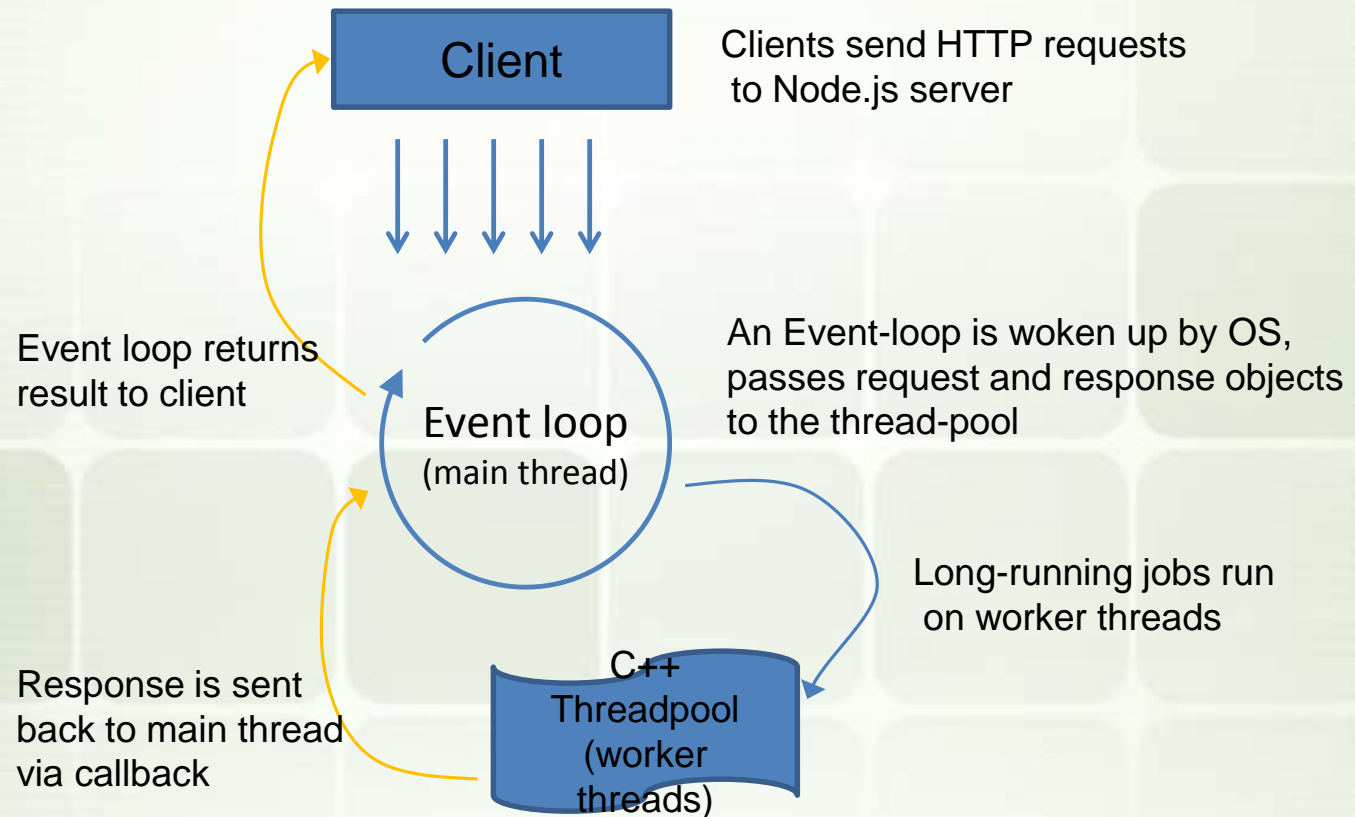
L1-cache	3 cycles
L2-cache	14 cycles
RAM	250 cycles
Disk	41 000 000 cycles
Network	240 000 000 cycles

I/O is **expensive**

Thread per connection
is memory expensive

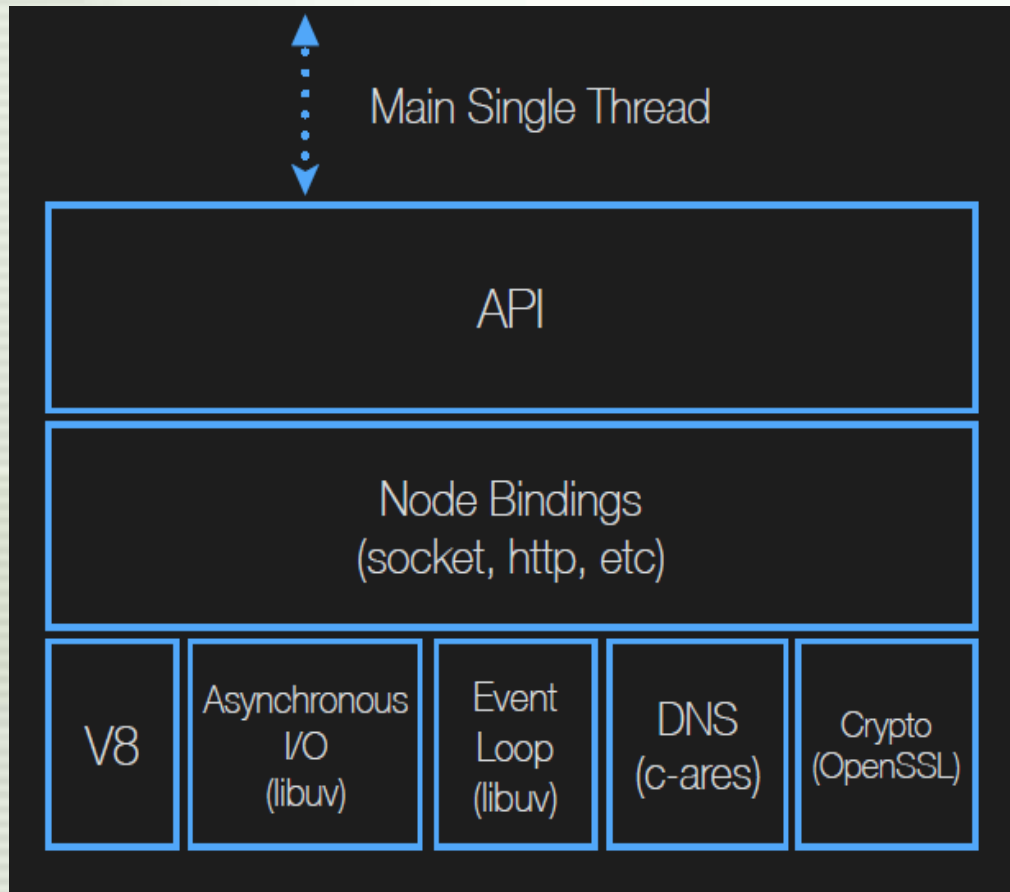


Architecture





Architecture



API in Javascript

Relies on **Google's V8** runtime engine

Node Bindings allow for server operations (IO, network)

Libuv responsible for both asynchronous I/O & event loop



When to use NodeJs?

Highly Event driven & Heavily I/O bound

Chat application

Online game

Collaboration tool

Monitoring Dashboard

Trader's Dashboard



When not to use NodeJs?

Heavy CPU intensive calculations on server-side

Concurrent Task based applications





Install


<https://nodejs.org/en/download/>

LTS
Recommended For Most Users

Current
Latest Features


Windows Installer
node-v6.9.4-x64.msi


Macintosh Installer
node-v6.9.4.pkg


Source Code
node-v6.9.4.tar.gz

Windows Installer (.msi)	32-bit	64-bit	
Windows Binary (.exe)	32-bit	64-bit	
macOS Installer (.pkg)	64-bit		
macOS Binaries (.tar.gz)	64-bit		
Linux Binaries (x86/x64)	32-bit	64-bit	
Linux Binaries (ARM)	ARMv6	ARMv7	ARMv8
Source Code	node-v6.9.4.tar.gz		

`node -v` (Node version)



Developement Environment

Web Storm

Sublime Text

Atom

Nodeclipse

Visual Studio

Visual Studio Code



DEMO



Node Frameworks & Tools

NPM (Package Manager)

Gulp / Grunt

Express.js

Restify

Mongoose

Socket.io



NPM

Package manager for Node

Bundled and installed automatically with the environment

Frequently Usage

- `npm install --save package_name`
- `npm update`

How Does it works?

- Read `package.json`
- Installs the dependencies in the local `node_modules` folder
- In global modes, it make a node module accessible to all



Express.js

Web application framework

Minimal and Flexible

Many Framework based on Express

Features

- MVC
- Routing
- Session Support
- Cookie Parsing
- Middleware (Request-Response Cycle)
- View Engines (Jade, Ejs, Vash)



Vash

Familiar Razor engine experience

No special template syntax to learn

Syntax:

```
<ul id="theBigList">
@foreach(var item in myItems){
    <li class="@ ( i % 2 == 0 ? 'even' : 'odd' )" >@item.name</li>
}
</ul>
```

```
<ul id="theBigList">
@myItems.forEach(function(item){
    <li class="@ ( i % 2 == 0 ? 'even' : 'odd' )" >@item.name</li>
})
</ul>
```



Restify / Mongoose



DEMO

Write Your Comment

Comment

Comment

Send

React sunumlarına devam



Angular2 sunumu geliyor



2 comments

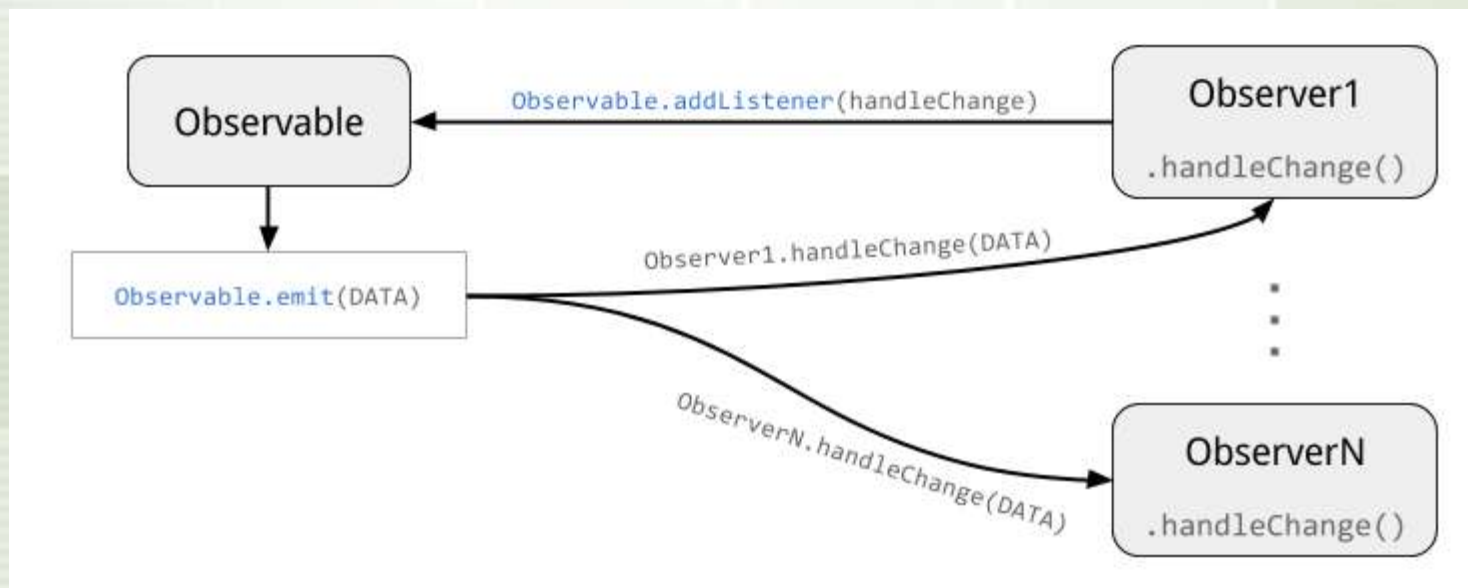




EventEmitter

Most of built-in Node libraries use it

Use Observer Pattern





Socket.io

Realtime application framework

Cross browser (Web socket + fallback)

Bi-directional communication

Automatic compression

IOS, Android, NativeScript support

Two parts

- Client side (run on browser)
- Server side (run on Node)

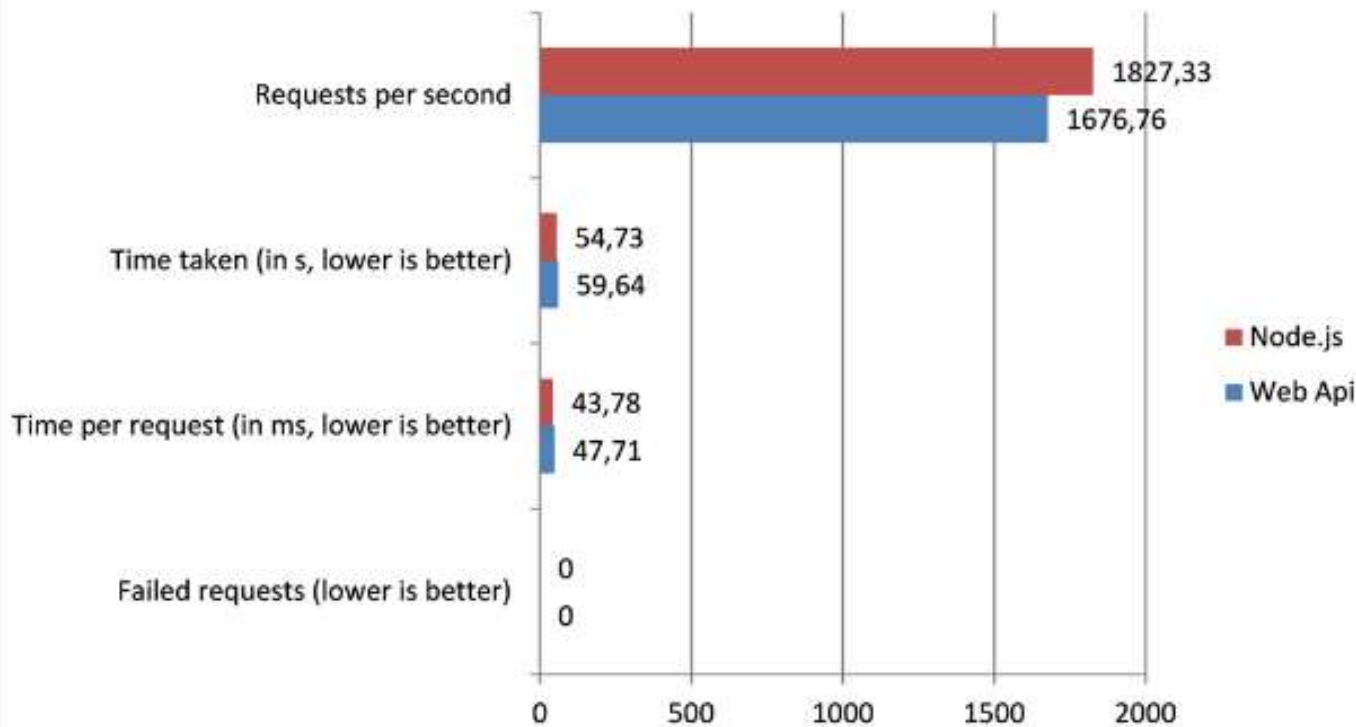


DEMO



Benchmark

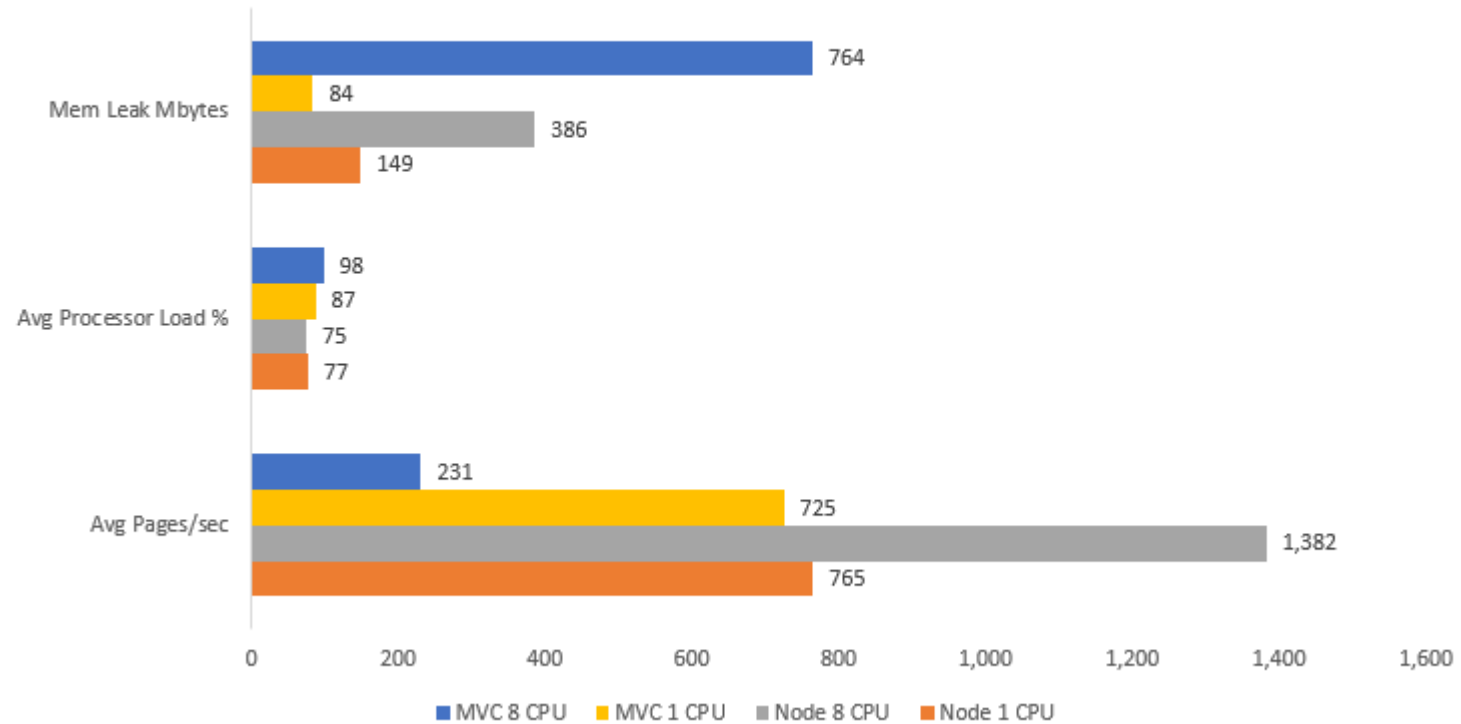
ASP.NET Web Api vs Node.js Benchmark





Benchmark

Node.js V MVC 4



(IBTECH)

