Bits & Bites
Node.js

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Onderwerpen

- Wie ben ik?
- Wat is Node.js?
- Waarom Node.js?
- Node & NPM
- Node & Express
- Node & MongoDB
- Node – pros/cons
- JavaScript voorbeeld
- Workshop – inhoud
- Start your engines!

Wie ben ik?

- Milco Numan, Hoofddorp
- Fysische Chemie (UvA, 1993)
- IT sinds 1996:
  - RijkscomputerCentrum (Borland Delphi 1.0)
  - Serac (BaaN)
  - Oracle, Ciber, Qualogy (Oracle Applications, DB 8i-11g & FMW 11g/12c)
  - SynTouch (2016) – Oracle Fusion Middleware
- Ervaring met Node.js:
  - PoC @ Rabobank, API Platform Cloud Service (2015/6)
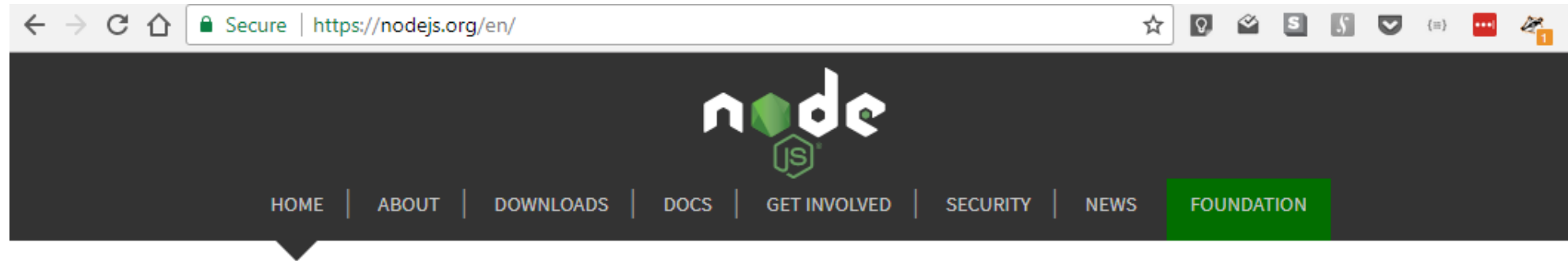 - AWS/Serverless (2017/2018)

Wat is Node.js?

- JavaScript (Netscape Navigator, 1995)
- ECMAScript (JavaScript, Jscript)
- JavaScript – scripting taal
- Chromium/Chrome: Google V8 Engine (2008)
- Node.js (2009) – server side JS runtime op V8

- DEMO:
  - Node REPL
  - Node/Chromium debug
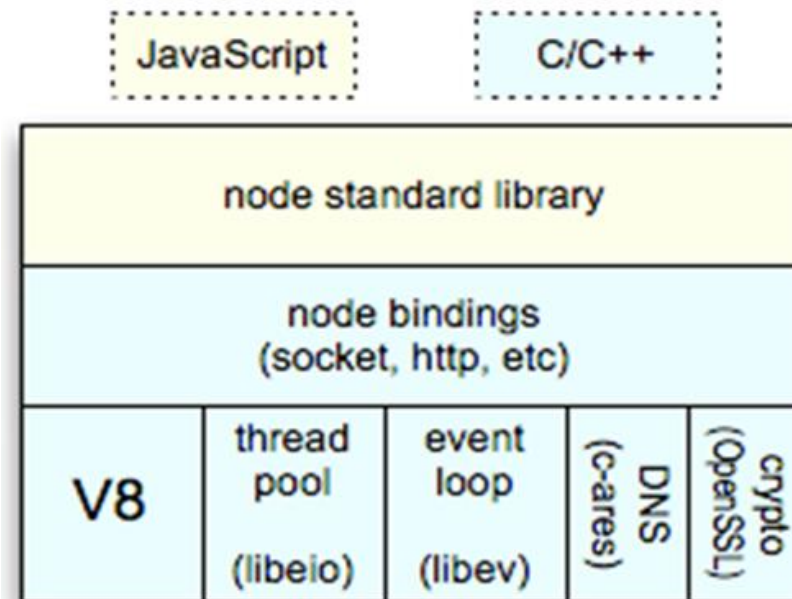
Waarom Node.js?

Relatieve I/O snelheden

Uit Ryan Dahl's originelel Node presentatie (JSConf, 2009)
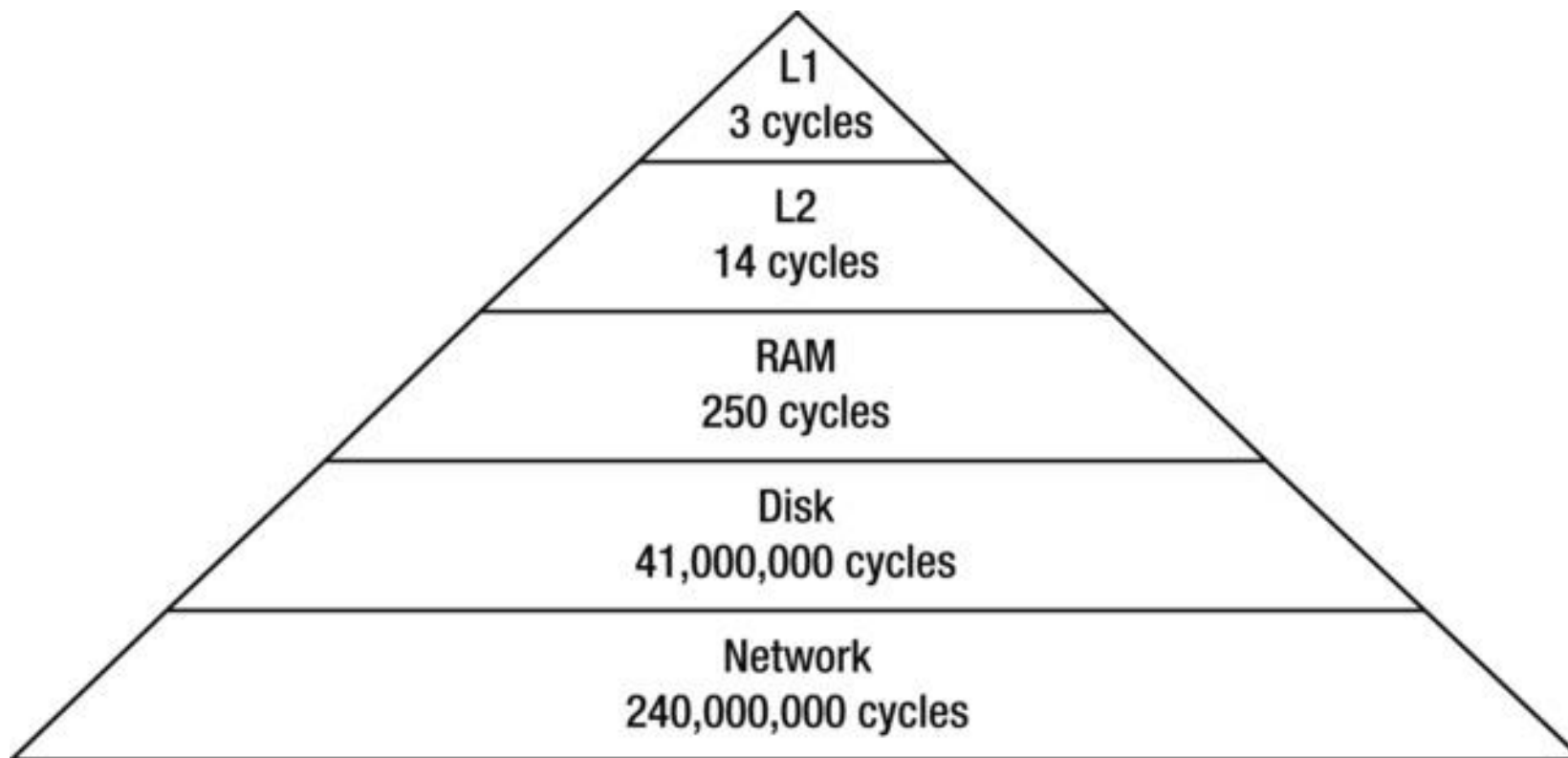
Blocking/non-blocking

- Demo: twee implementaties

```js
JS syCustomer.js ●
1  var sync = require('./lib/doSyncStuff');
2
3  function p(data) {
4      console.log(JSON.stringify(data));
5  }
6
7  // retrieve two customers from DB and show
8  p(sync.doSyncStuff('Brouwerij Het Uiltje'));
9  p(sync.doSyncStuff('Raboboerenleenbank'));
10
11 console.log('Today is ' + new Date());
```
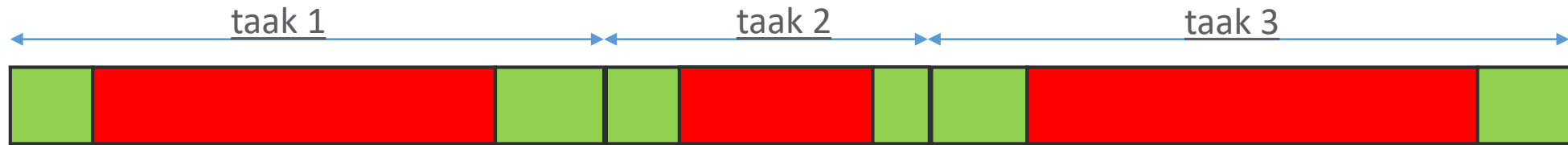
```js
JS asCustomer.js ●
1  var async = require('./lib/doAsyncStuff');
2
3  function p(data) {
4      console.log(JSON.stringify(data));
5  }
6
7  // retrieve two customers from DB and show
8  async.doAsyncStuff('Janssen & Tilanus', p);
9  async.doAsyncStuff('Schmidt Zeevis', p);
10
11 console.log('Today is ' + new Date());
```

Node: asynchronous, non-blocking I/O

- Synchroon (sequentieel)

taak 1　　　　　　　　　　taak 2　　　　　　　　　taak 3

- Asynchroon (callbacks):

taak 1 + 2 + 3

Applicatie code

Externe I/O
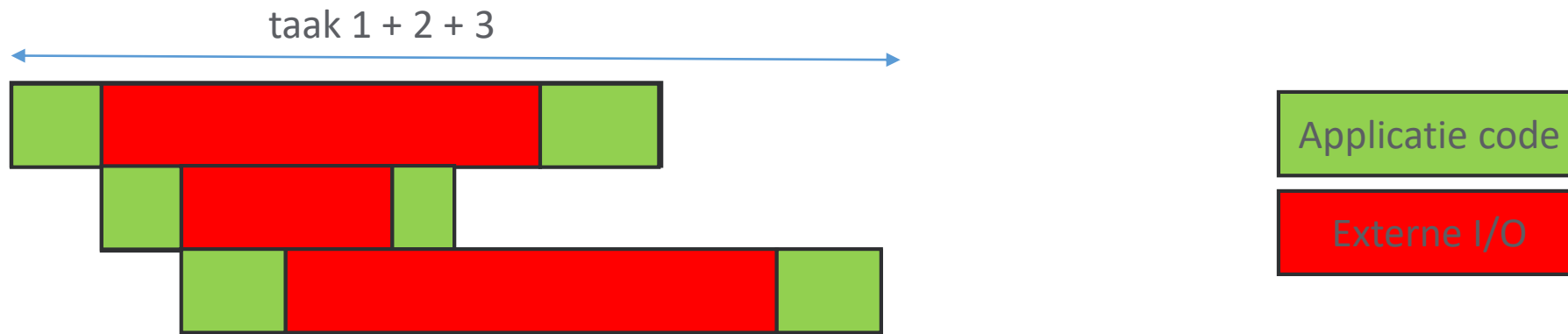
Wat is het effect?

Klassiek (Apache, multi-threading) of asynchroon, non-blocking I/O?
C10K challenge – 10.000 requests/s

The hurrier I go,
the behinder I get.

Node – Event Loop
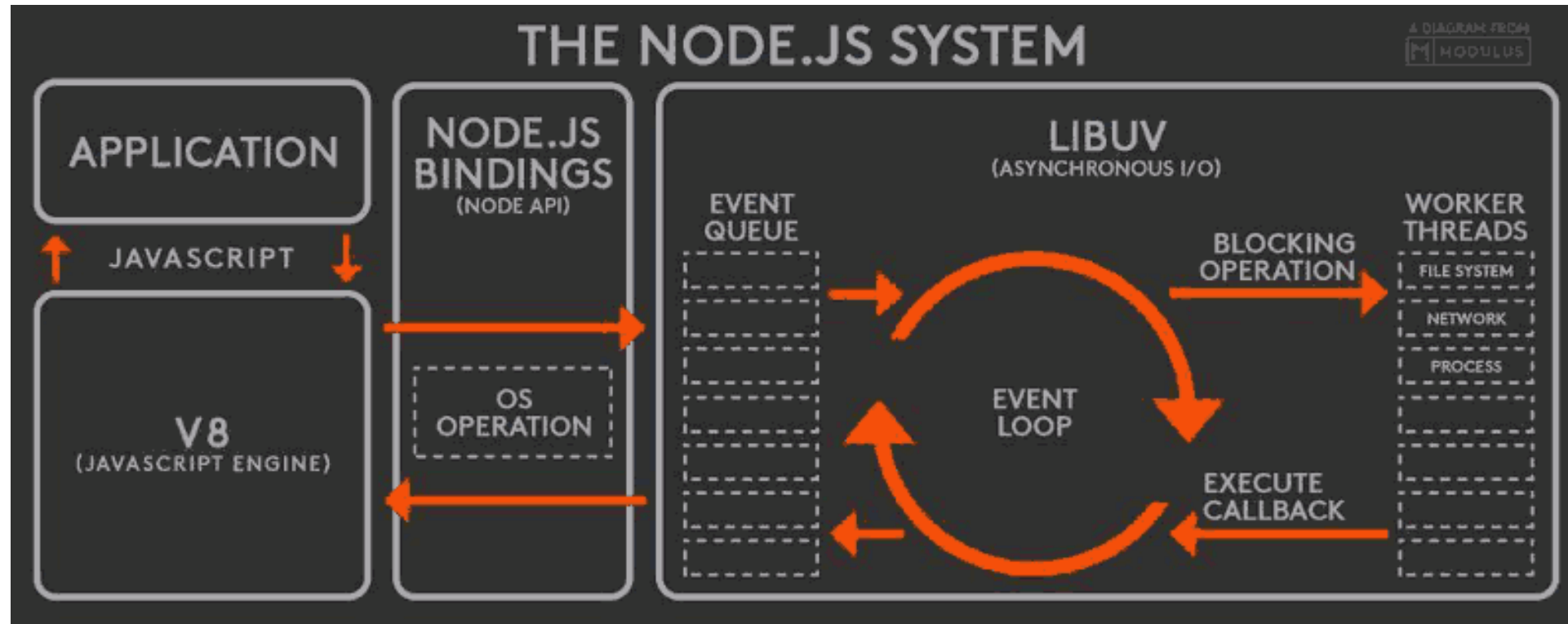
Node & Cloud

Node Populariteit

- [Stack Overflow 2018 Developer Survey](#) – Most popular …
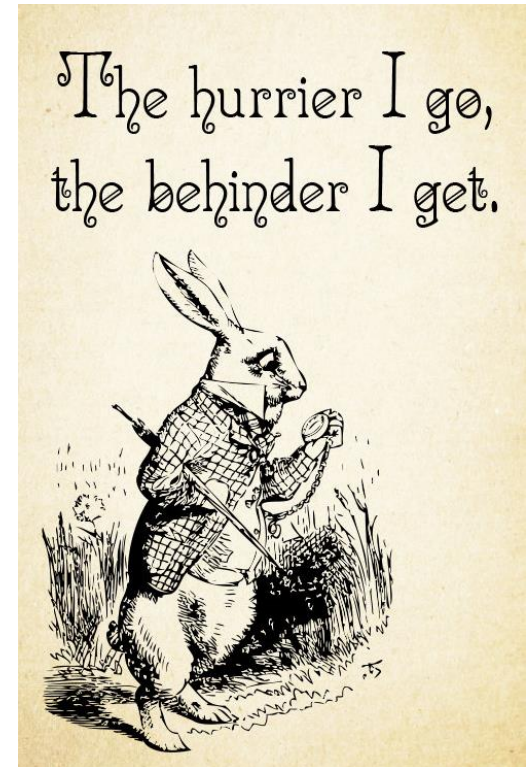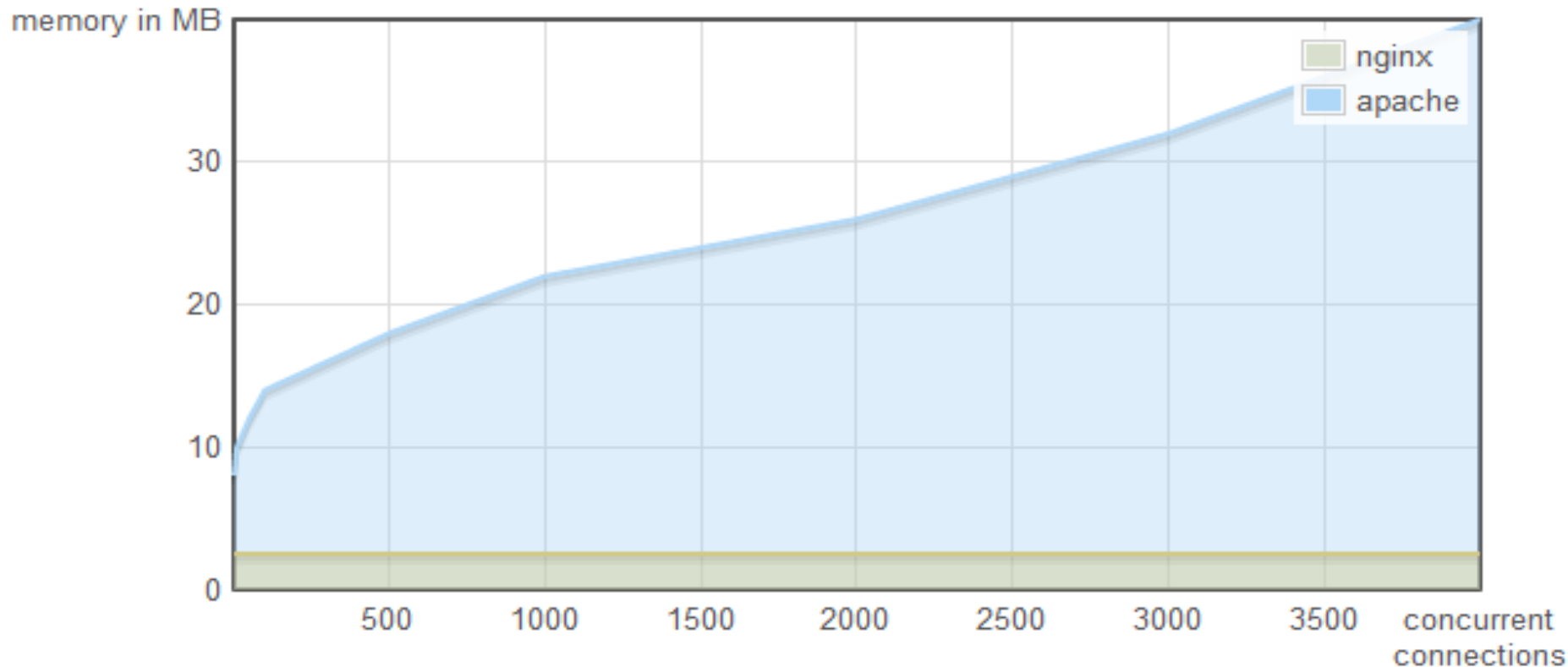
Programming, Scripting, and Markup Languages

All Respondents	**Professional Developers**

JavaScript	71.5%
HTML	69.4%
CSS	66.2%
SQL	58.5%
Java	45.4%
Bash/Shell	40.4%
Python	37.9%
C#	35.3%
PHP	31.4%
C++	24.6%
C	22.1%
TypeScript	18.3%
Ruby	10.3%
Swift	8.3%
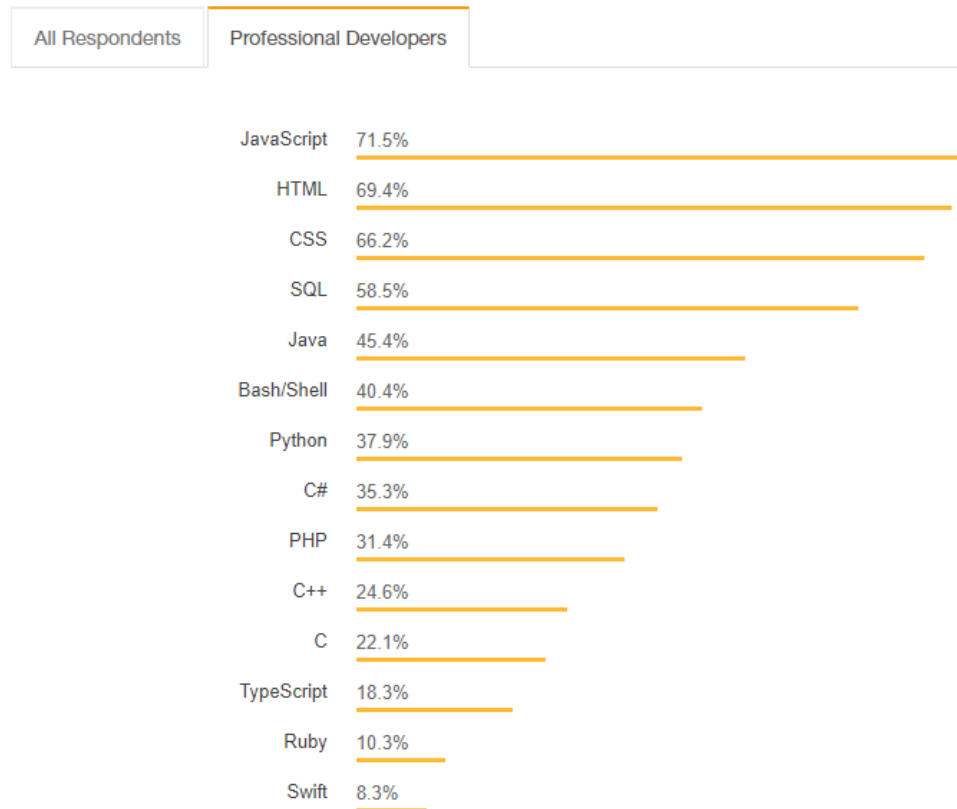
Frameworks, Libraries, and Tools

All Respondents	**Professional Developers**

Node.js	49.9%
Angular	37.6%
React	28.3%
.NET Core	27.2%
Spring	17.8%
Django	12.8%
Cordova	8.6%
TensorFlow	7.6%
Xamarin	7.4%
Spark	4.8%
Hadoop	4.7%
Torch/PyTorch	1.6%
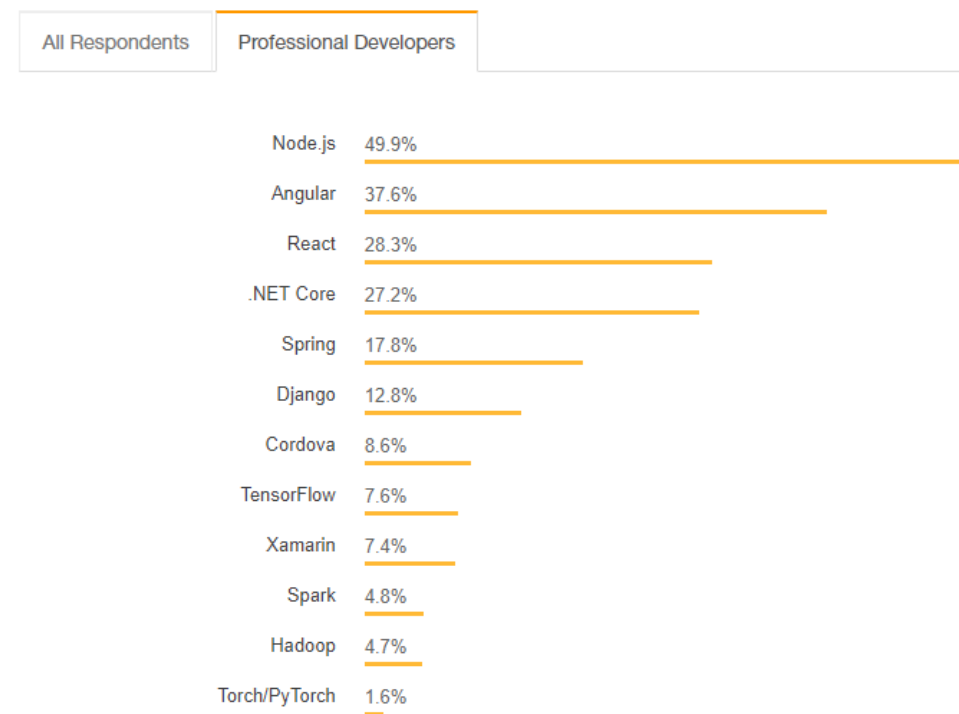
Node Gebruikers
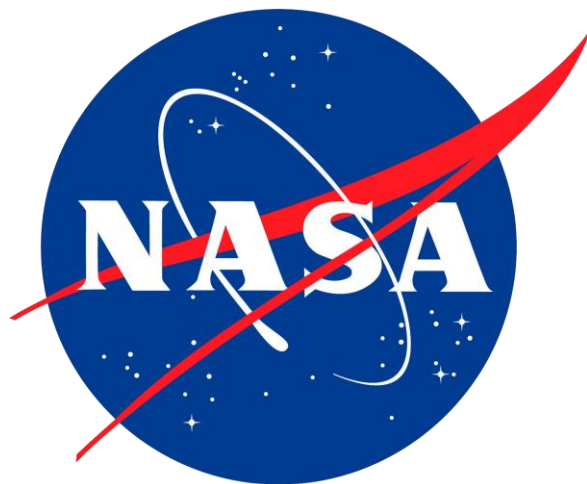
Node & NPM

npm is the package manager for javascript

Popular libraries

lodash
request
chalk
async
express
react
bluebird
commander
debug
moment
underscore
react-dom

Discover packages

IoT
mobile
front end
backend
robotics
css
testing
cli
documentation
math
coverage
frameworks

By the numbers

Packages

677,177

Downloads · Last Day

249,985,361

Downloads · Last Week

4,531,721,267

Downloads · Last Month

19,157,909,360

Node & NPM

- Demo:
  - npm init
  - npm install
  - package.json

```
node@node-VirtualBox:~/hoppeta$ more package.json
{
  "name": "hoppeta",
  "version": "1.0.0",
  "description": "Demo npm",
  "main": "app.js",
  "scripts": {
    "test": "test-me-please"
  },
  "keywords": [
    "Hello",
    "World"
  ],
  "author": "Milco Numan",
  "license": "ISC",
  "dependencies": {
    "express": "^4.16.3"
  },
  "devDependencies": {
    "chai": "^4.1.2",
    "mocha": "^5.1.0"
  }
}
node@node-VirtualBox:~/hoppeta$
```

MEAN

- MEAN – fullstack JS development

mongoDB

MongoDB is the leading NoSQL database, empowering businesses to be more agile and scalable.

express

Express is a minimal and flexible node.js web application framework, providing a robust set of features for building single and multi-page, and hybrid web applications.

ANGULARJS by Google

AngularJS lets you extend HTML vocabulary for your application. The resulting environment is extraordinarily expressive, readable, and quick to develop.

node JS

Node.js is a platform built on Chrome's JavaScript runtime for easily building fast, scalable network applications.

Node & Express

- *"Express is an unopinionated, minimalistic framework on top of Node's web server functionality, simplifying its API and adding new features"*
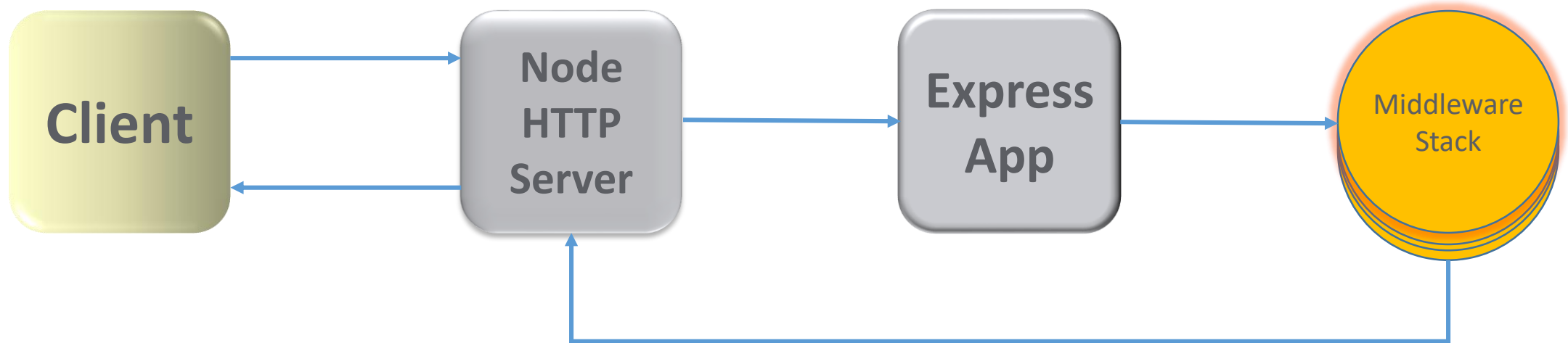
Express Demo

```
JS app.js    ✕

1   const express = require("express");
2   const logger = require("morgan");
3   const app = express();
4   const MORGAN_FORMAT = "dev";
5   const LISTEN_PORT = 3000 || process.env.PORT;
6   function reneFrogger(req,res){
7     res.status(200).send(`Just say: hello ${(req.params.name) ? req.params.name : 'world'}!`);
8   }
9   // add logging middleware
10  app.use(logger(MORGAN_FORMAT));
11  app.get("/hello", reneFrogger);
12  app.get("/hello/:name", reneFrogger);
13  app.listen(LISTEN_PORT);
```

Node & MongoDB

- MongoDB is dé document-oriented NoSQL database
- JavaScript engine is inmiddels vervangen (vroeger V8!)
- MongoDB worden JSON documenten opgeslagen

SQL Terms / Concepts	MongoDB Terms / Concepts
Database	Database
Tables	Collections
Rows	Documents (BSON)
Columns	Fields
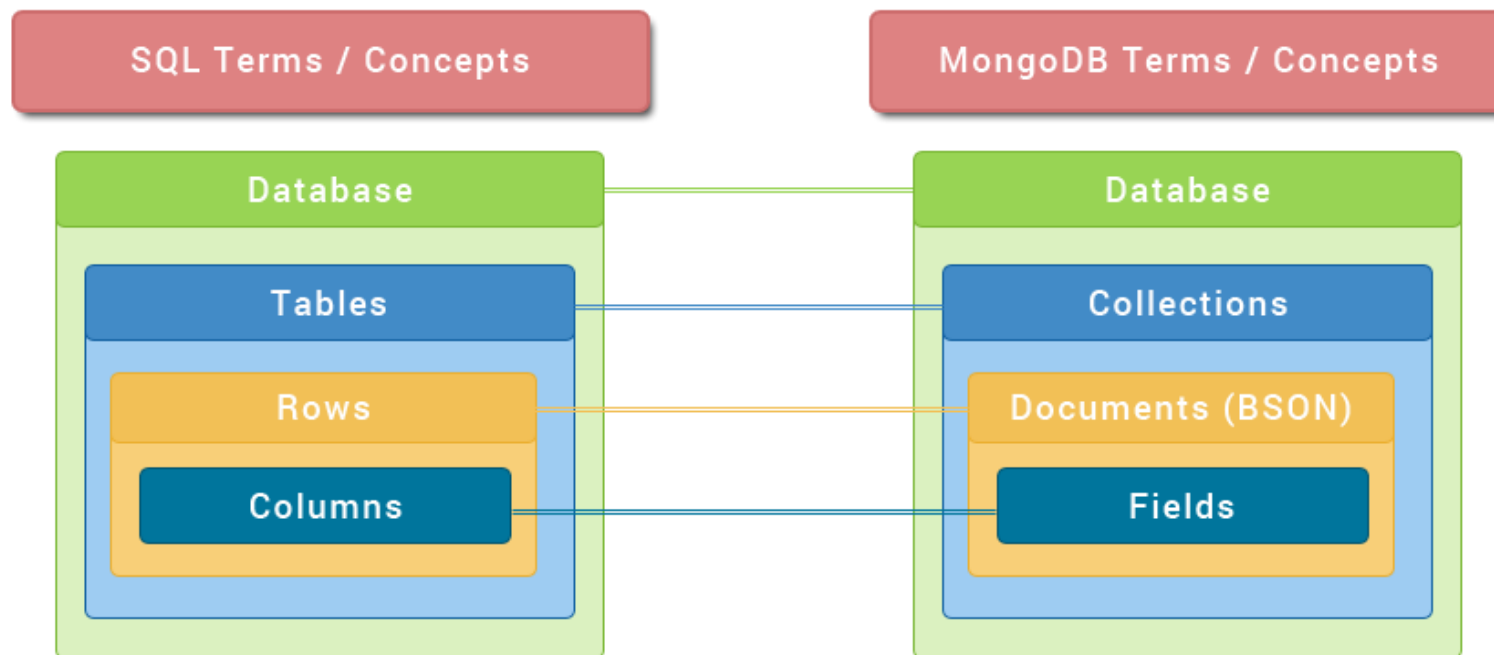
Node – pros

- Asynchrone, non-blocking I/O – goede schaalbaarheid
- UNIX filosofie – do one thing well, extend where needed
- Groot ecosysteem aan uitbreidingen (npm)
- Gebaseerd op JavaScript (eenvoudig te leren)
- Fullstack JavaScript
- Gemakkelijk om mee te prototype
- Breed leveranciersondersteuning in de Cloud (geen C#)
- Verschillende soorten toepassingen:
  - web app
  - API
  - Command line tools
  - Desktop applications (Electron: Visual Studio Code, Atom editor)

Node – cons

- Niet voor rekenintensieve toepassingen
- Gebaseerd op JavaScript:
  - Transpiler (source-to-source): Babel, TypeScript, CoffeeScript)
- Callback hell
- Te weinig dwingend (structuur/richtlijnen)

```
const s = "String value";
const n = 3.1415926;
const b = true;
const a = [1,1,2,3,5,8,13,21,34,55];

const fun = function(){
  for (let arg in arguments){
    console.log(arguments[arg]);
  }
};
const o = { what: "I am an object", why: "Because I can",
functie: fun};

fun(s,n,b,o,a);
```

Workshop - Inhoud

- *"Hergebruik is puik"/"Reuse is reuze"*
  - Materiaal is deels hergebruikt uit een andere Workshop
- Twee tracks:
  - Explorer – ontdekkingstocht langs Node, Express & MongoDB
  - Adventurer – avontuurlijke ontwikkeltocht met dezelfde ingrediënten
- VirtualBox:
  - Ubuntu 17.10 (git, curl)
  - node, npm (globaal: nodemon + JSHint)
  - IDE: Micro$oft Visual Studio Code
  - Editors: vi(m), nano, gedit
  - Postman, Chromium, MongoDB
  Syntax Highlighting VSCode (zie Errata in VirtualBox document)

Workshop - Explorer

- 1 – HelloWorld: introductie JavaScript/Node/NPM
- 2 – HTTP: afhandeling HTTP met core Node
- 3 – Express: HTTP APIs, nu met Express
- 4 – Build your own Spotify API with Express
- 5 – MongoDB & Node
- 6 – Bakje over:
  - Email versturen
  - Generators
  - Promises

Workshop - Adventurer

- Twee 'uitdagingen' (zelf bouwen):
  - BeerAPI – bouw je eigen MEN API op MongoDB met Node/Express
  - CLI – bouw een utility in Node à la UNIX "word count"

Start Your Engines!

- Code (git clone *url-repository*)
  - GitHub - https://github.com/mnuman/syntouch-intro-node-js
  - GitLab - https://gitlab.com/syntouch/intro-node-js.git

- Standaard modules - Node documentatie:
https://nodejs.org/dist/latest-v8.x/docs/api/

- 3rd party modules – npm:
https://www.npmjs.com

- Voor beide tracks geldt: er staat een Word document met instructies in de desbetreffende folder!

Nuttige bronnen

- API documentatie (https://nodejs.org/dist/latest-v8.x/docs/api/)
- Mozilla Developer Network
  https://developer.mozilla.org/en-US/docs/Web/JavaScript
- Eloquent JavaScript (gratis ebook)
  http://eloquentjavascript.net/
- Node.js (https://nodejs.org/), npm (https://www.npmjs.com)
- NodeSchool (Meetups inHaarlem, Amsterdam, Utrecht)
  https://nodeschool.io/
- Udemy (https://www.udemy.com/the-complete-nodejs-developer-course-2)
- Onze onvolprezen SynBookShelf op Confluence!
- FreeCodeCamp (https://www.freecodecamp.org)
- MongoDB University (https://university.mongodb.com)
- https://thenewstack.io/enterprises-embracing-microservices-node-js/

Vragen?

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