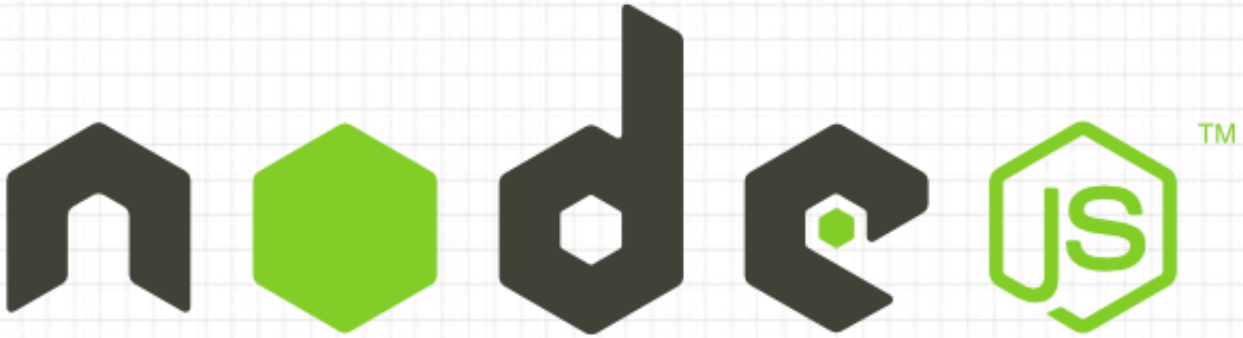
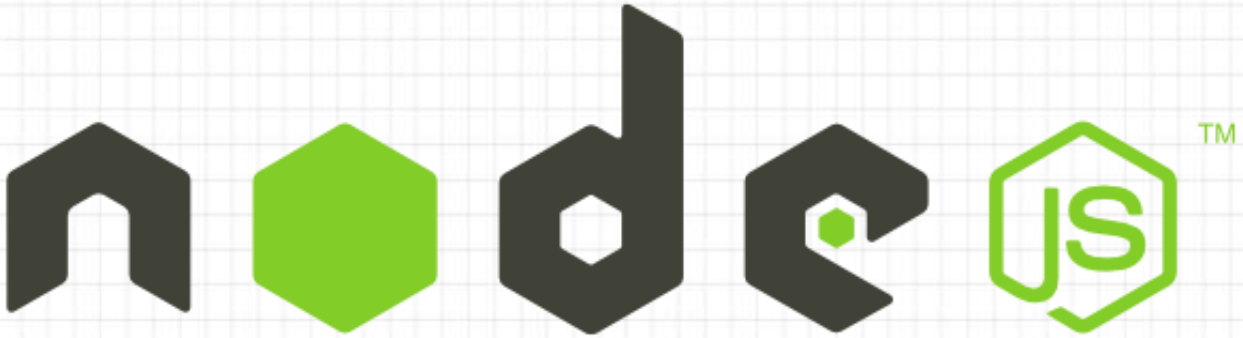


Node.JS Overview

Eyal Vardi
Microsoft MVP ASP.NET
blog: eyalvardi.wordpress.com



"Everything that can be written in JavaScript will eventually be written in JavaScript".

(Atwood's law)

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Agenda

- JavaScript History
- Node Has Arrived
- Node Global Objects
- Modules System

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JavaScript History

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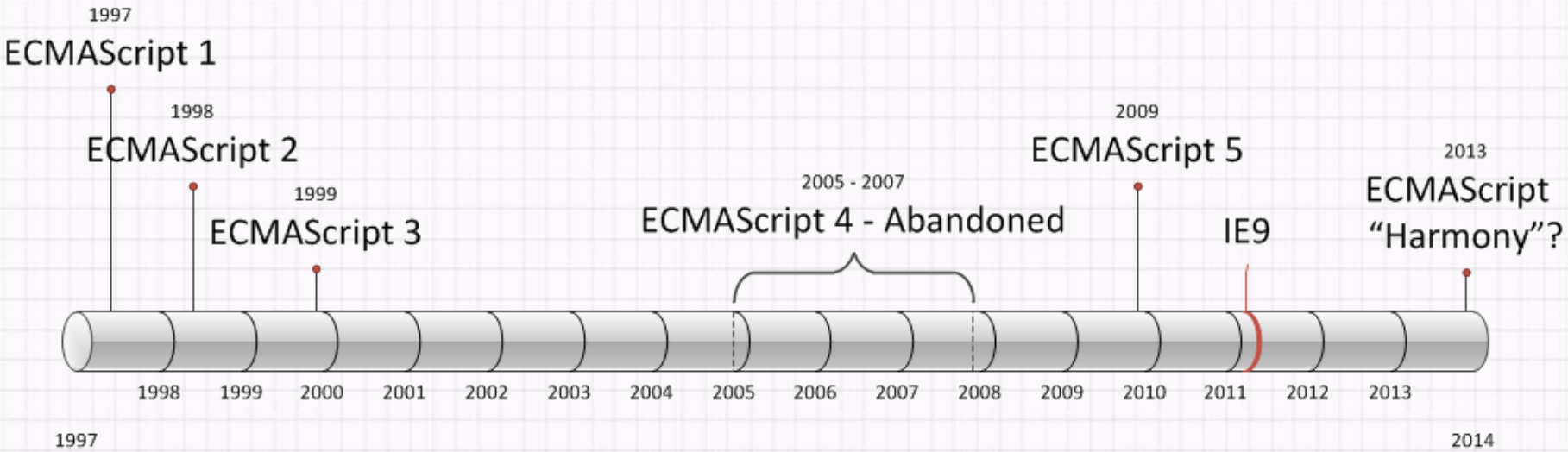
ECMAScript Versions



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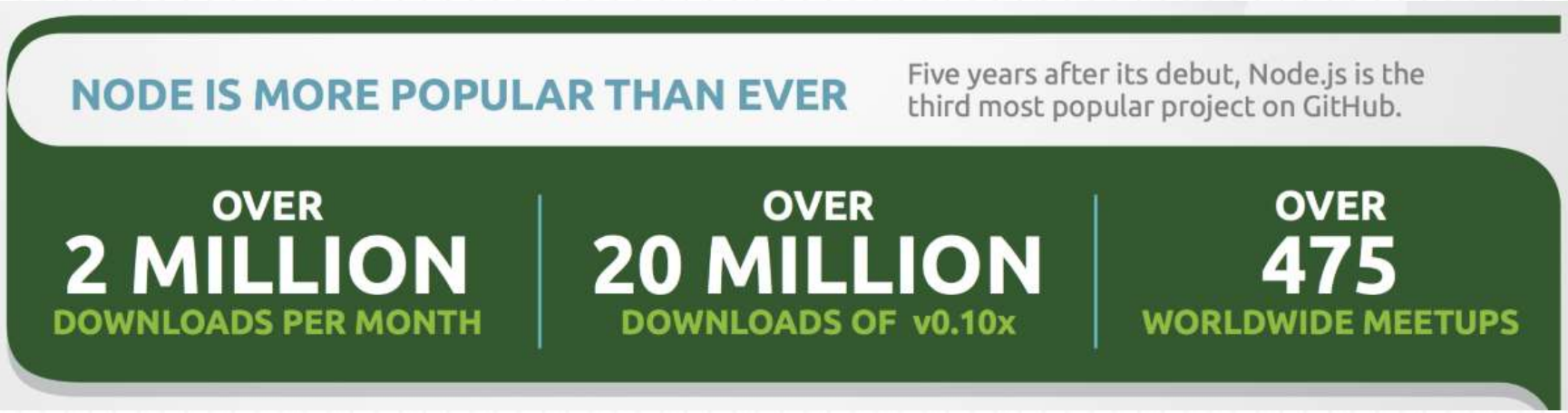
Node Has Arrived



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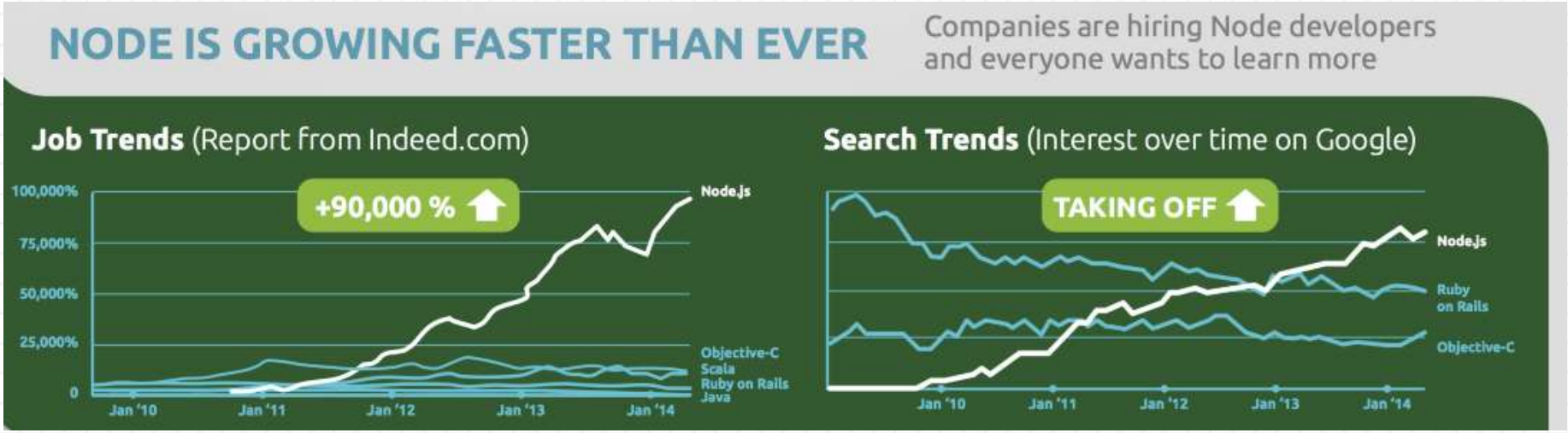

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Node Has Arrived

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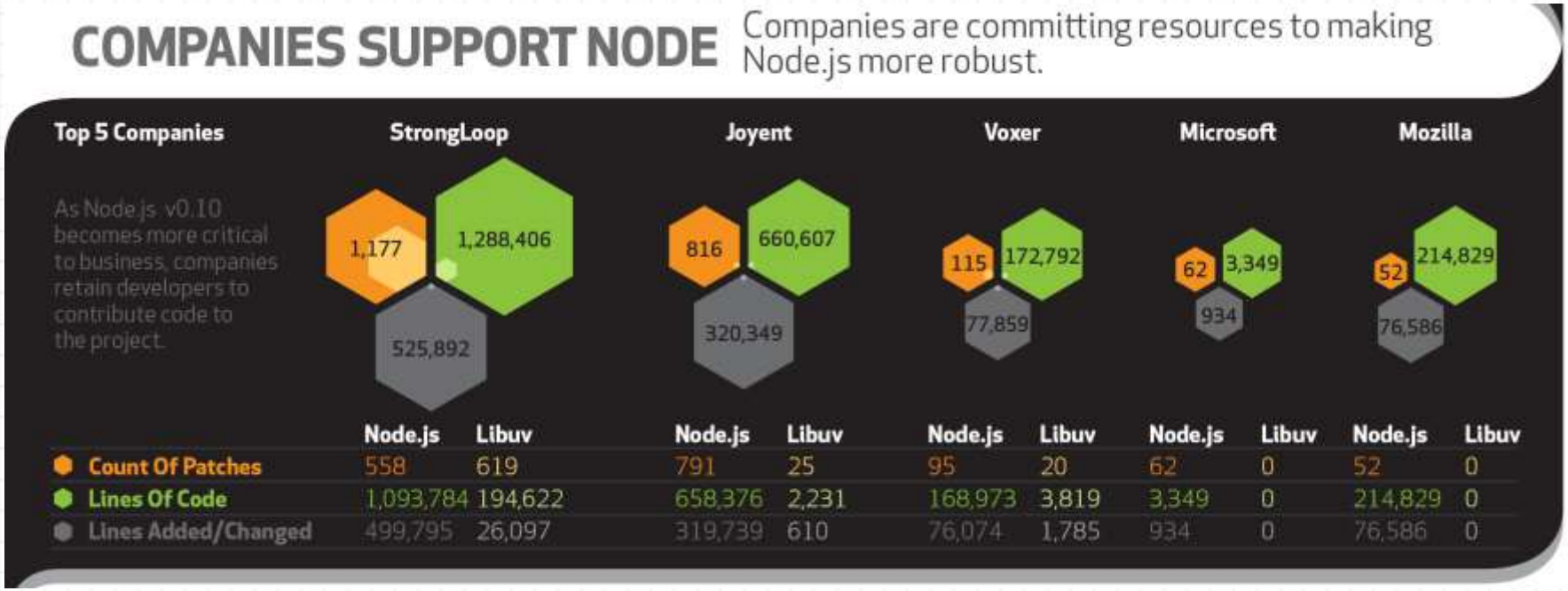
Node Has Arrived



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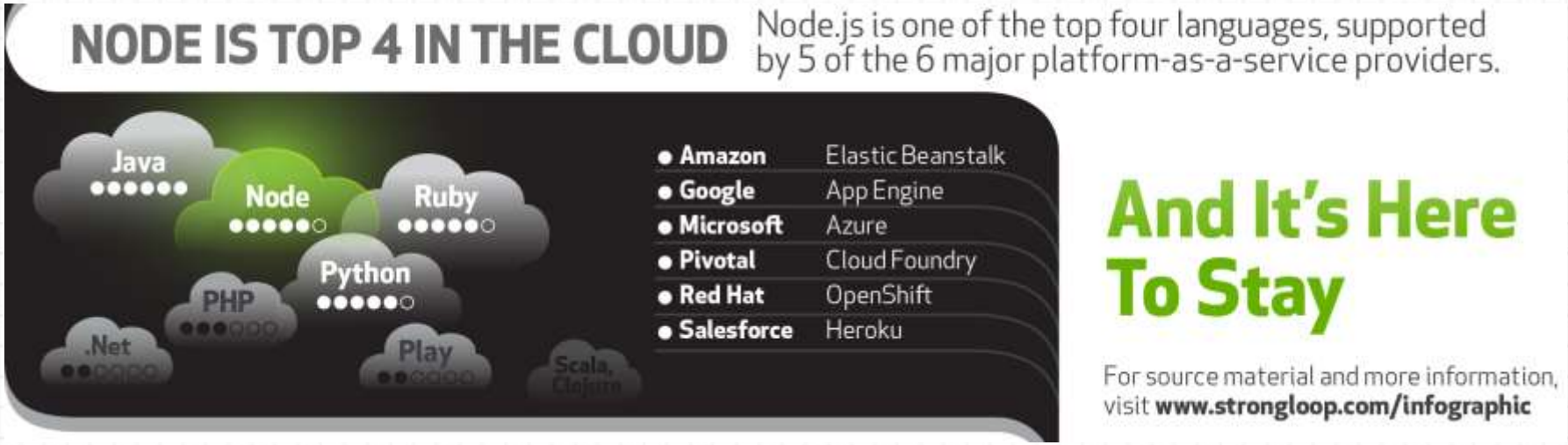
Node Has Arrived



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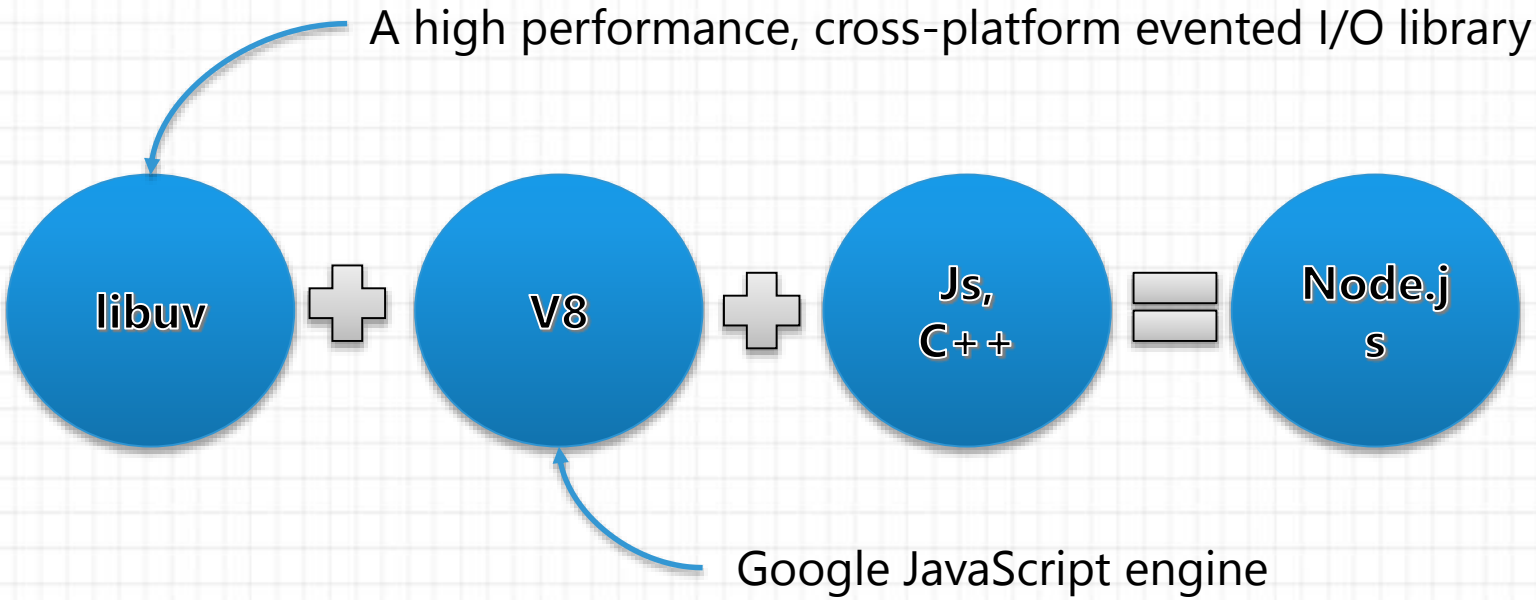
Node.js Building Blocks



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Node.JS Advantages

Architecture

- Single Thread
- App == Server
- Middleware

Deployment

- XCopy
- Run Everywhere

Community

- 53,228 Packages
- 2.5M Download in day.

Tools


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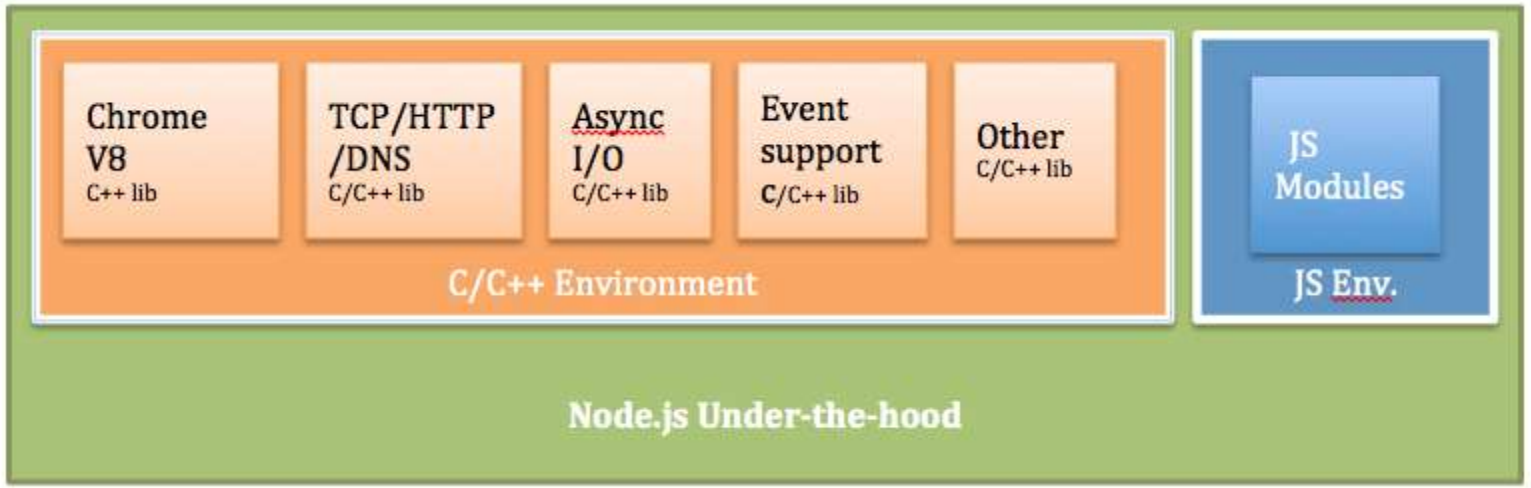
Node.js Under The Hood



(source: Future-proofing Your Apps: Cloud Foundry and Node.js)

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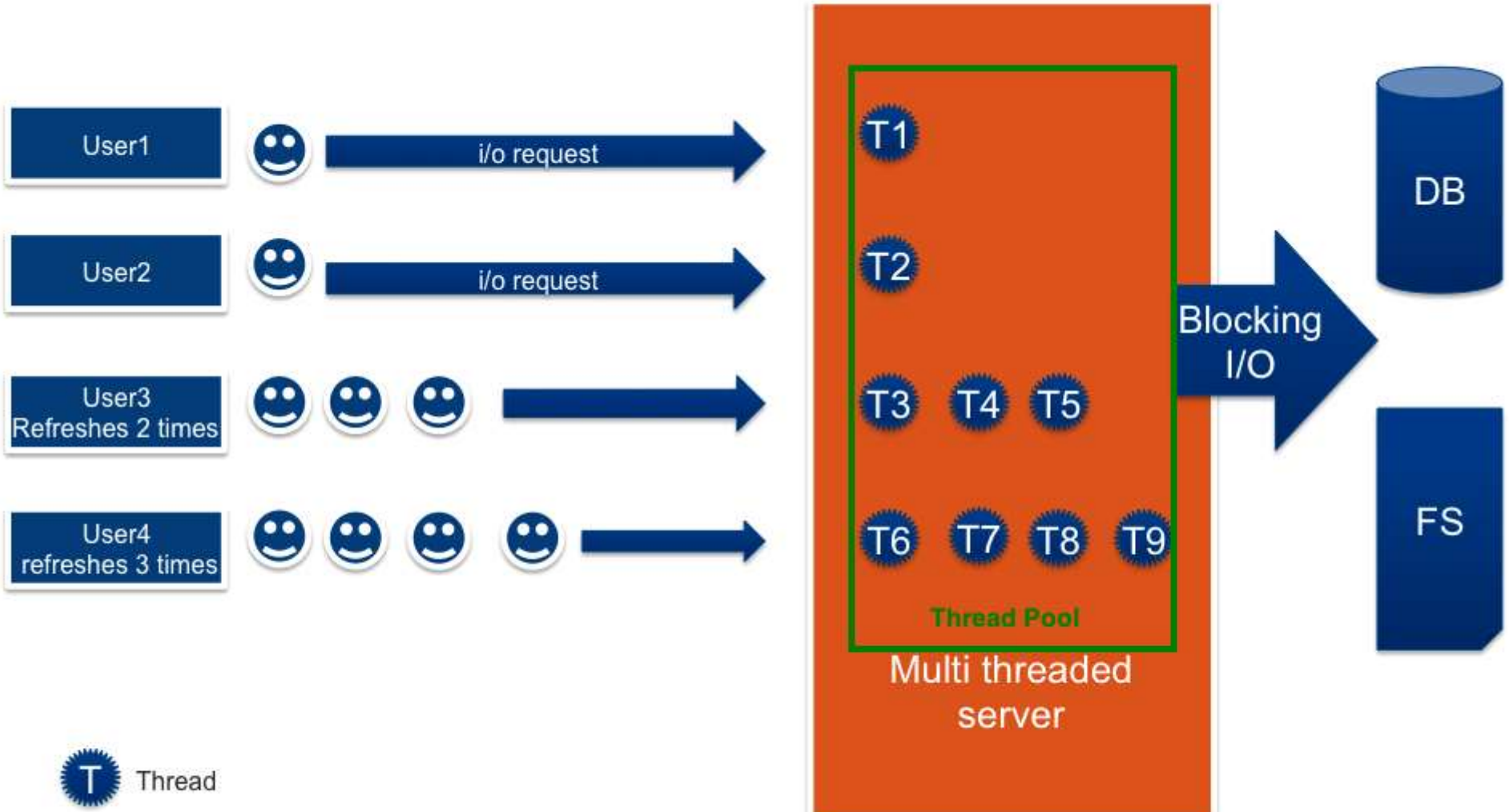
Multi-threaded HTTP Server Using Blocking I/O



Blocking I/O + direct interface to clients leads to thread-pools w/ larger number threads and more memory requirements

(source: Future-proofing Your Apps: Cloud Foundry and Node.js)

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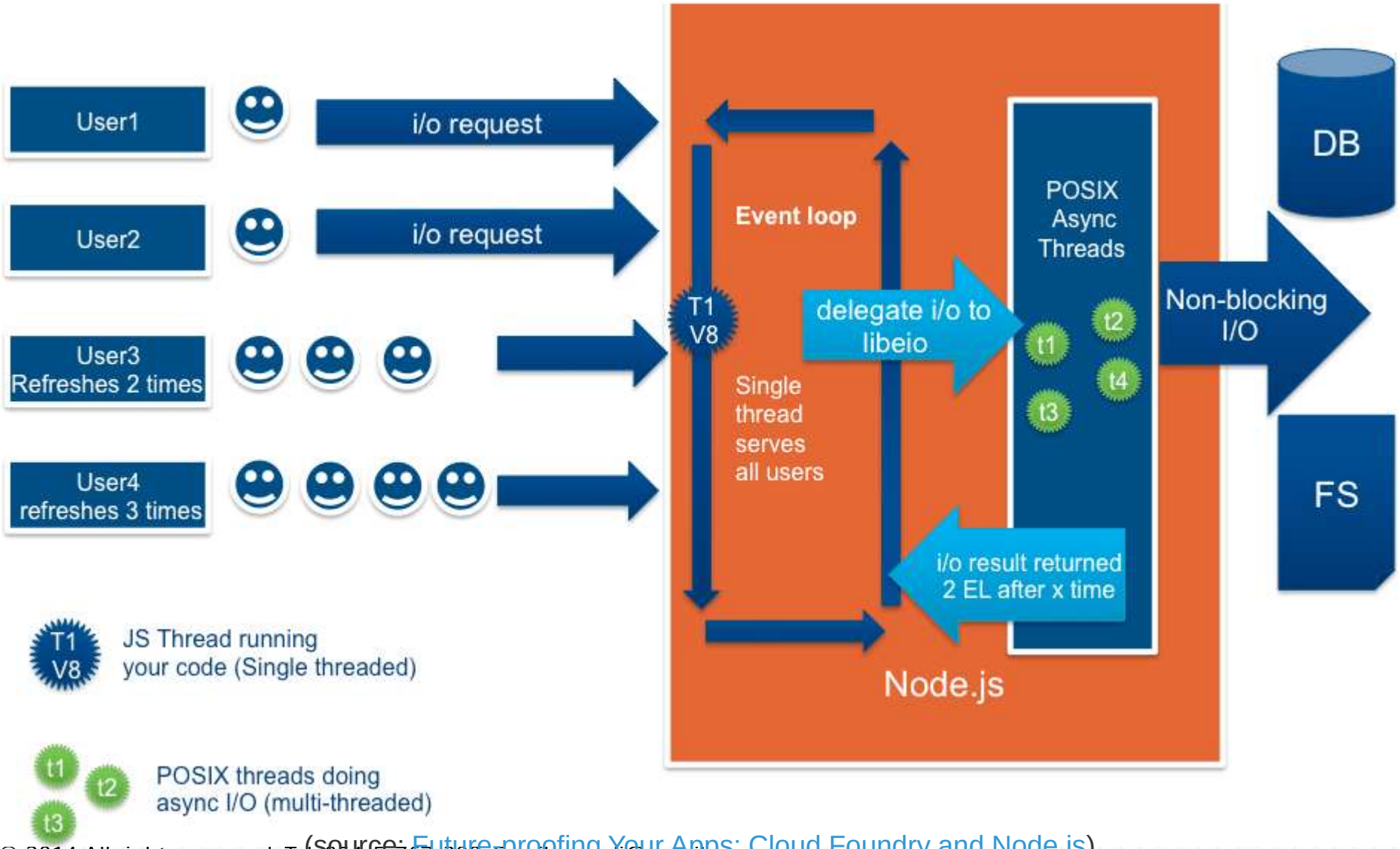
Event-driven, Non-Blocking I/O



(source: Future-proofing Your Apps: Cloud Foundry and Node.js)

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demo

Node.js Hello World

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Global Objects

- These objects are available in **all modules**. Some of these objects aren't actually in the **global scope but in the module scope.**

Objects:

- `global`
- `process`
- `Console`
- `module`
- `exports`

functions:

- `Buffer`
- `require()`
- `setTimeout(cb,ms) , clearTimeout(t)`
- `setInterval(cb,ms) , clearInterval(t)`

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Modules System

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Modules

- Node has a simple module loading system.
  - Files and modules are in one-to-one correspondence.

foo.js

```
var circle = require('./circle.js');
console.log('The area of radius 4: '+ circle.area(4));
```

circle.js

```
var PI = Math.PI;
exports.area = function (r) {return PI * r * r;};
exports.circumference = function (r) {return 2 * PI * r;};
```

The variable **PI** is **private** to circle.js

exports === module.exports

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The `module` Object

- In each module, the **module** free variable is a reference to the object representing the current module.
  - For convenience, **module.exports** is also accessible via the **exports** module-global.

- Module object properties:
  - id
  - filename
  - loaded
  - parent
  - children

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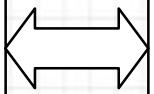
Module Cycles

a.js

```
console.log('a starting');
exports.done = false;
var b = require('./b.js');
console.log('in a,b.done= %j', b.done);
exports.done = true;
console.log('a done');
```



b.js

```
console.log('b starting');
exports.done = false;
var a = require('./a.js');
console.log('in b,a.done= %j', a.done);
exports.done = true;
console.log('b done');
```

main.js

```
console.log('main starting');
var a = require('./a.js');
var b = require('./b.js');
console.log('in main, a.done=%j, b.done=%j', a.done, b.done);
```

b.js tries to load **a.js**. In order to prevent an infinite loop an **unfinished copy** of the a.js exports object is returned to the b.js module.

Output

```
main starting
a starting
b starting
in b, a.done = false
b done
in a, b.done = true
a done
in main, a.done=true, b.done=true
```

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Core Modules

- Node has several modules **compiled** into the **binary**.
- The core modules are defined in node's source in the **lib/** folder.
- Core modules name:
  - Assert
  - Buffer
  - child_process
  - Cluster
  - Crypto
  - Dgram
  - Dns
  - Events
  - Fs
  - http
  - https
  - Net
  - Os
  - Path
  - Punycode
  - Querystring
  - Readline
  - Repl
  - string_decoder
  - Tls
  - Tty
  - url
  - Util
  - Vm
  - zlib

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File Modules

- If the exact filename is **not found**, then node will attempt to load the required filename with the added extension of **.js, .json, and then .node**.

- A module prefixed:
  - '/' is an absolute path to the file.
  - './' is relative to the file calling require().
  - Without a leading '/' or './' to indicate a file, the module is either a "**core module**" or is loaded from a **node_modules** folder.

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Folders as Modules

- There are two ways in which a folder may be passed to require() as an argument.

  - Create a **package.json** file in the root of the folder, which specifies a **main module**.

  - If there is no package.json file present in the directory, then node will attempt to load an **index.js or index.node** file out of that directory.

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Module Caching

- Modules are cached after the first time they are loaded.
- Multiple calls to require() may **not** cause the module code to be **executed multiple times**.
- Modules are cached based on their resolved filename.
  - Since modules may resolve to a different filename based on the location of the calling module, it is not a guarantee that require() will always return the exact same object, if it would resolve to different files.

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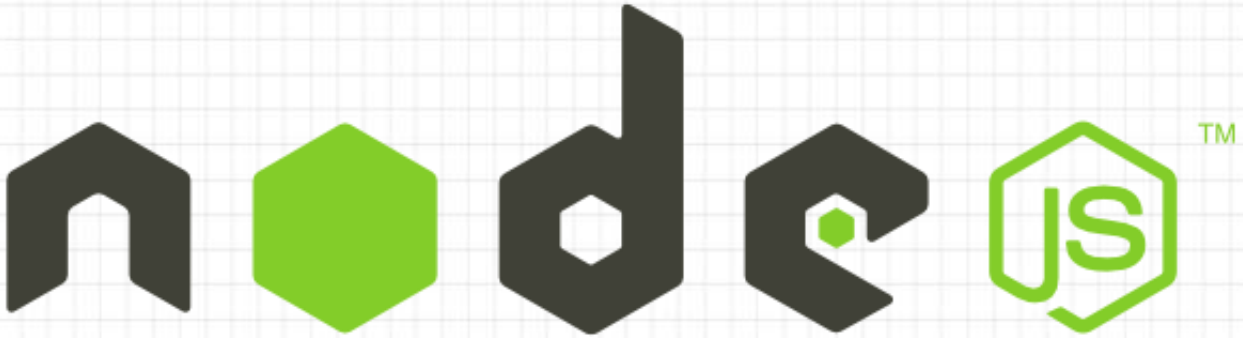

Thanks

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