INTRO TO NODEJS

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What change in the last decade…

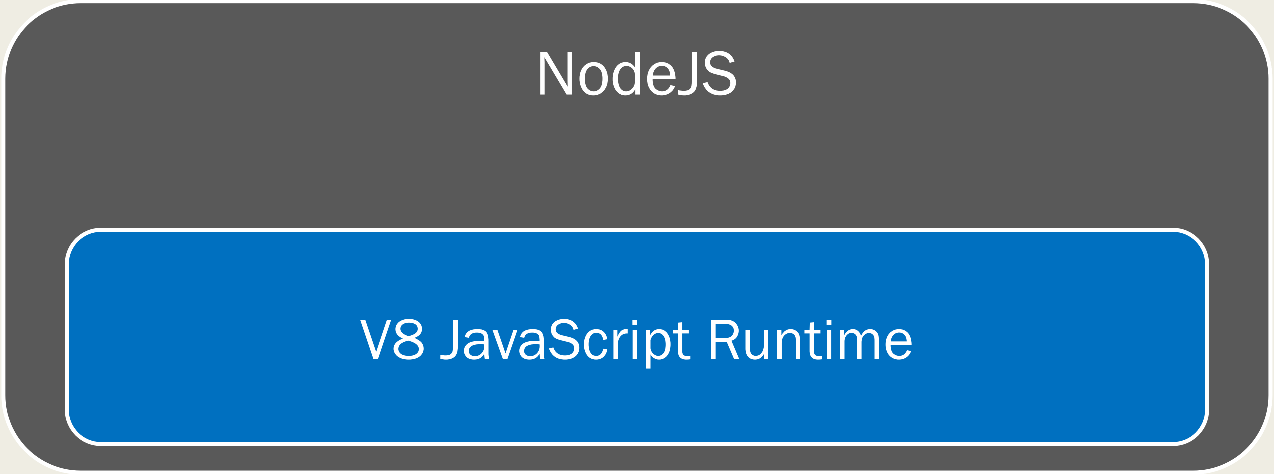
- RUP && UML
- C# || Java
- SQL || Oracle
- Hyper-V || Vmware
- Out-sourcing
- SOA

- Agile && Scrum
- JavaScript || Python
- NoSql
- Docker
- Cloud
- Micro services

What is NodeJS

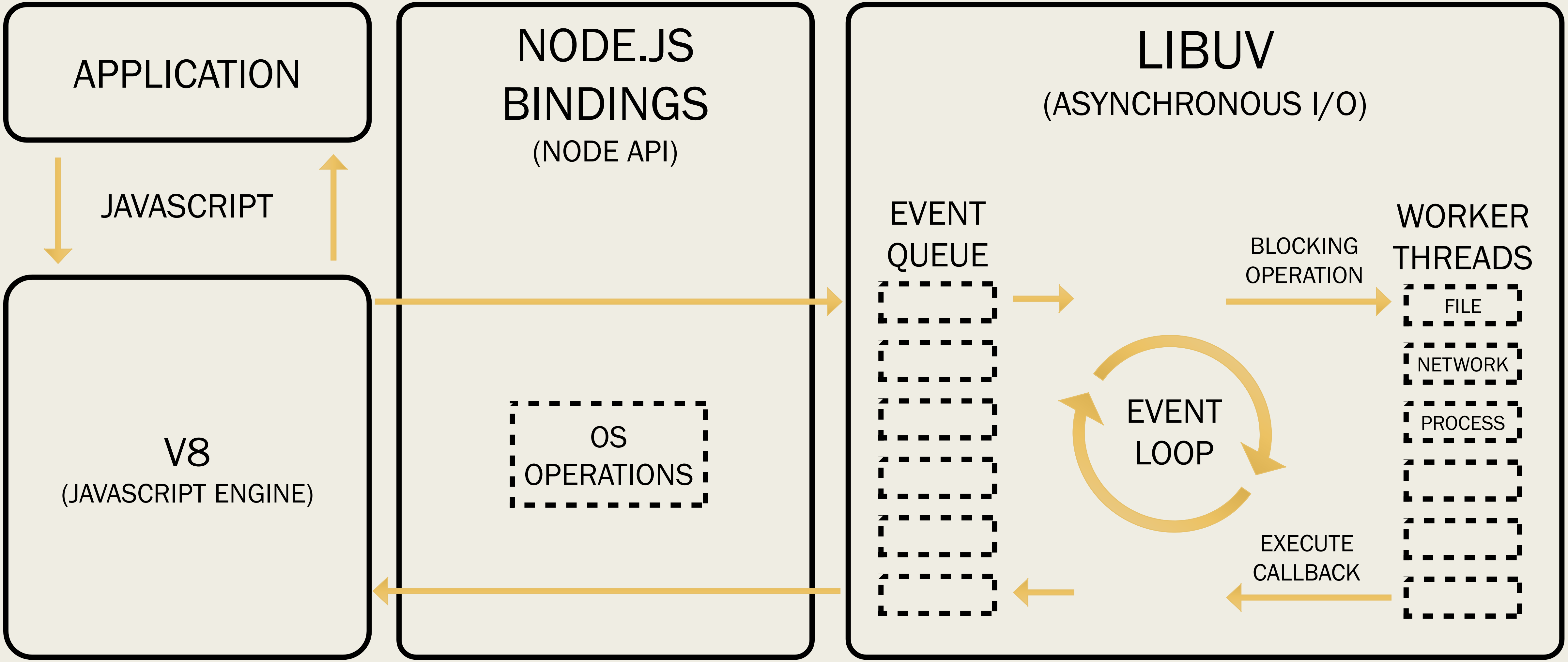
- Allow you to build scalable network applications using JavaScript on the server-side.

It is fast because its mostly C code

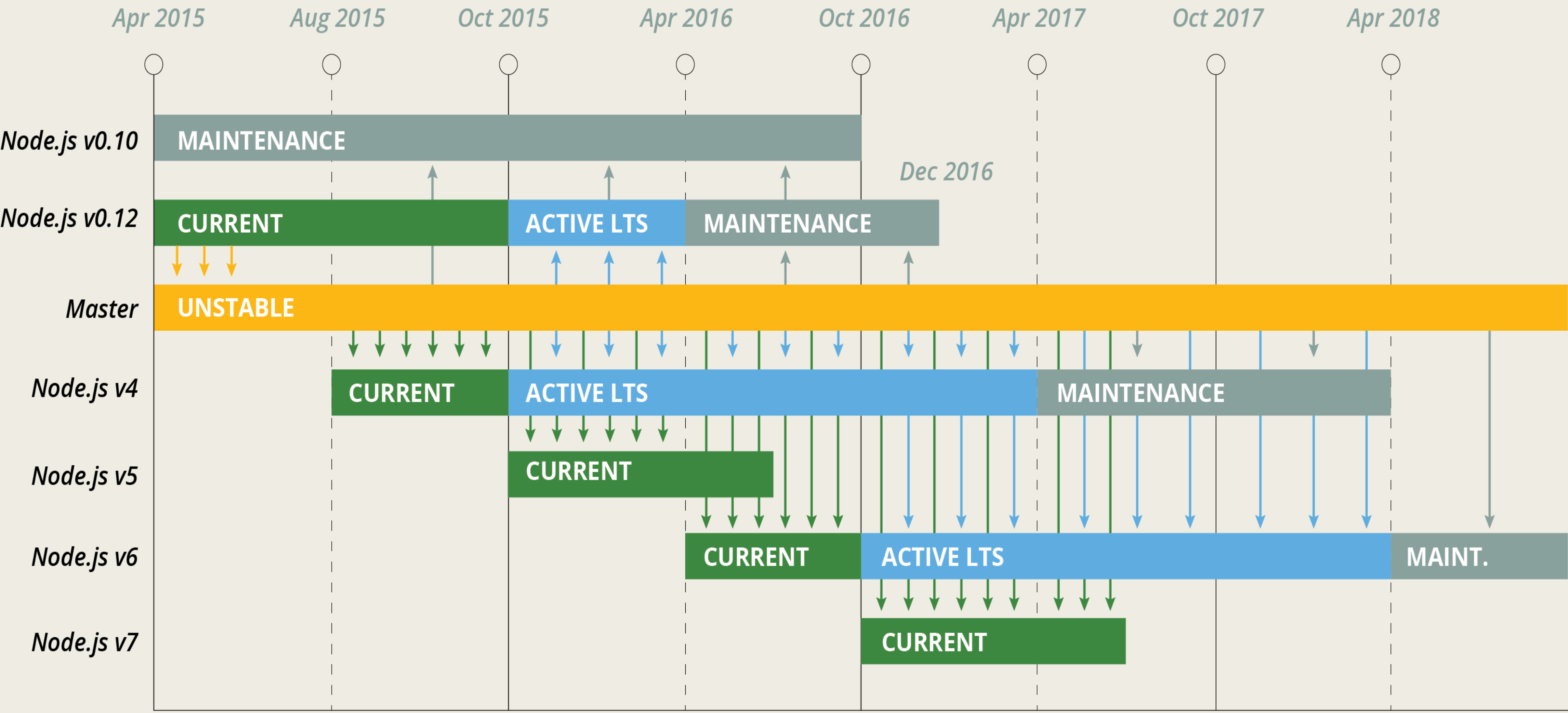


What we can build?

- Websocket Server
- Fast File Upload Client
- Ad Server
- Any Real-Time Data Apps


APPLICATION
JAVASCRIPT
V8
(JAVASCRIPT ENGINE)
NODE.JS
BINDINGS
(NODE API)
OS
OPERATIONS
LIBUV
(ASYNCHRONOUS I/O)
EVENT
QUEUE
EVENT
LOOP
BLOCKING
OPERATION
WORKER
THREADS
FILE
NETWORK
PROCESS
EXECUTE
CALLBACK

Node.js Long Term Support Release Schedule



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Google
GROUPON
nearForm

Ryan Dahl – Why JS

- JavaScript has certain characteristics that make it very different that other dynamic languages, namely that it has no concept of threads. Its model of concurrency is completely based around events.

JavaScript value and types

- Primitive values
  - *Boolean*
  - *Number*
  - *String*
  - *Null*
  - *Undefined*

- Objects
  - *Date*
  - *Structured data*
  - *Collections*
  - *Functions*
- Classes (ES6)

DEMO JAVASCRIPTS

ex1

JavaScript variables and blocks

- Function scope:
  - *var a = 42;*
- Block scope:
  - *let b = 16;*
- Const:
  - *const AGE = 7;*

JavaScript operators

- EQUAL

  a = 1;

  a = a + 2; *a += 2;*

- EQUALITY

  a == b *a != b*

  a === b *a !== b*

- FALSE VALUES:
  - *0* *-0*
  - *””*
  - *false*
  - *null*
  - *undefined*
- if(){}

Callbacks...

Blocking and Non - Blocking

Blocking code

- Read file from filesystem, set equal to “contents”
- Print contents
- Do something else

Non – Blocking code

- Read file from filesystem
- Do something else
- Print contents

What is callback function?

- In JavaScript, functions are first-class objects. Functions are type Object and they can be used in a first-class manner like any other object (String, Array, Number, etc.). Because functions are first-class objects, we can pass a function as an argument in another function and later execute that passed-in function or even return it to be executed later.

```
function some_function(arg1, arg2, callback) {
  var my_number = Math.ceil(Math.random() * (arg1 - arg2) + arg2);

  callback(my_number);
}

some_function(5, 15, function(num) {
  console.log("callback called! " + num);
});
```

Callback function

DEMO JAVASCRIPTS

ex2.0, ex2.1

NodeJS Module Patterns

- NodeJS has a simple module loading system. In NodeJS, files and modules are in one-to-one correspondence (each file is treated as a separate module).

```
//file square.js
module.exports = (width) => {
  return {
    area: () => width * width
  };
}

//file export.js
const square = require('./square.js');
var mySquare = square(2);
console.log(`The area of my square is ${mySquare.area()}`);
```

Module Pattern in NodeJS

DEMO NODEJS MODULE

ex3

Node Package Manager (NPM)

- NPM is the default package manager for the JavaScript runtime environment Node.js and allows users to consume and distribute JavaScript modules that are available on the registry.

NPM console

- npm init
- npm install {package} [{package}]
- npm install {package} --save
- npm install {package} --save-dev
- npm publish

DEMO NPM

ex2.2

ExpressJS package

- Express is a minimal and flexible Node.js web application framework that provides a robust set of features to develop web and mobile applications. It facilitates the rapid development of Node based Web applications.

What is REST?

- Use HTTP/HTTPS
- Use Verbs - GET, POST, PUT, DELETE
- Use Status codes - 200, 201, 400, 403, 404
- Caller dictates formats – Content-Type & Accept

DEMO EXPRESSJS

ex4

Unit testing

- Mocha – JavaScript test framework
- Chai – assertion library
- Request – created request to APIs

The TDD (Test-Driven Development) method is the most commonly used approach when testing node applications.

DEMO UNIT TEST

ex5