

# Node.js Realtime Application

Week 1

# Node.js, JavaScript, V8

Platform:	Node.js	<i>JRE / Java EE</i>
Language:	JavaScript	<i>Java</i>
VM:	V8	<i>Java Virtual Machine (JVM)</i>

# Node.js Advantages

- Node.js uses JavaScript language

JavaScript is very easy to learn & use.

*“A lot of people already know JavaScript, even people who do not claim to be programmers. It is arguably the most popular programming language.”*

# Node.js Advantages

- Node.js is cross platform  
write once, run everywhere.

# Node.js Advantages

- Node.js is asynchronous

high performance I/O. suitable for realtime applications.

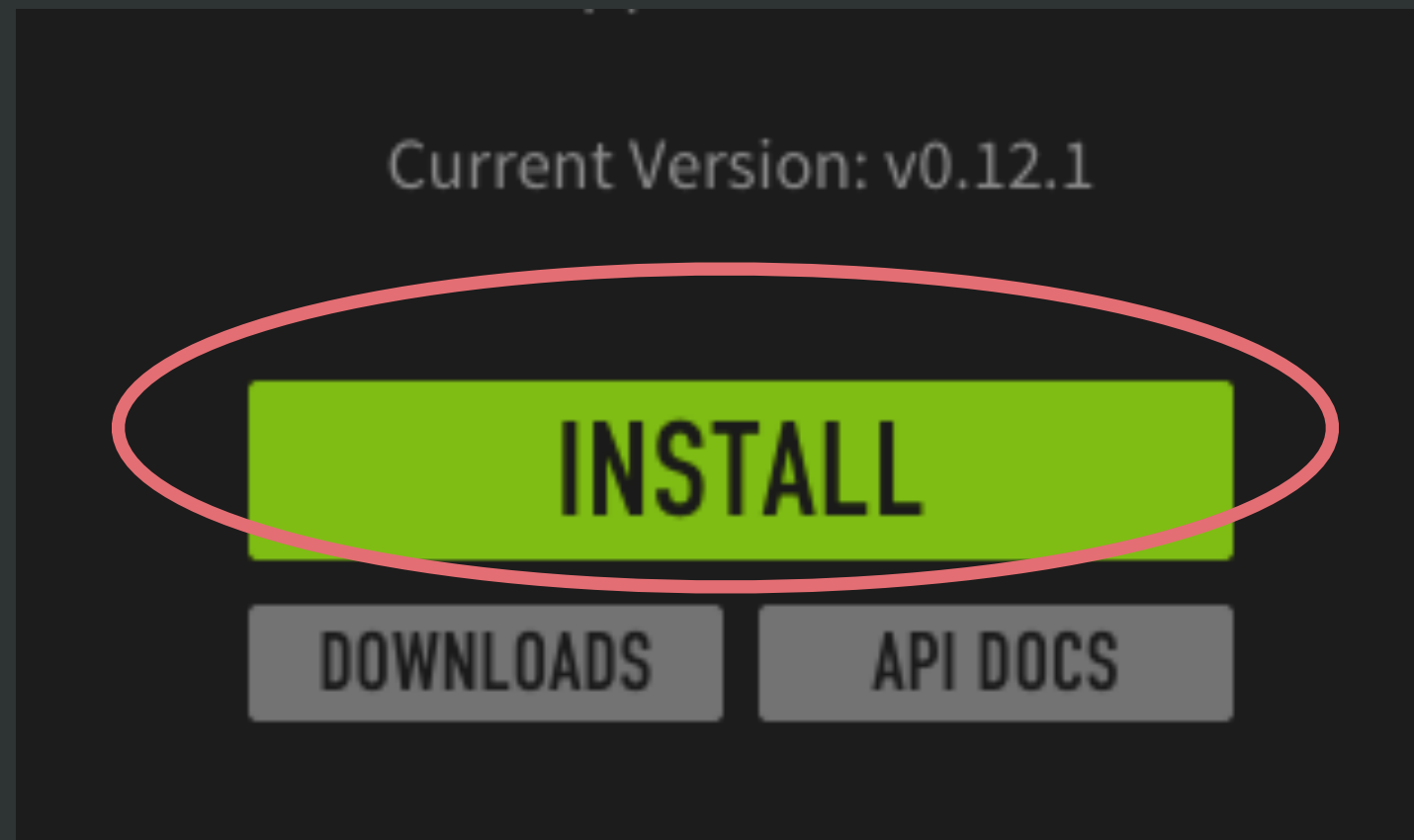
# Node.js Advantages

- Single thread

no synchronization, no deadlock.

“程序员遇到了一个问题。他想，我明白，用线程就好了。现他有在个两题了问。@delphij”

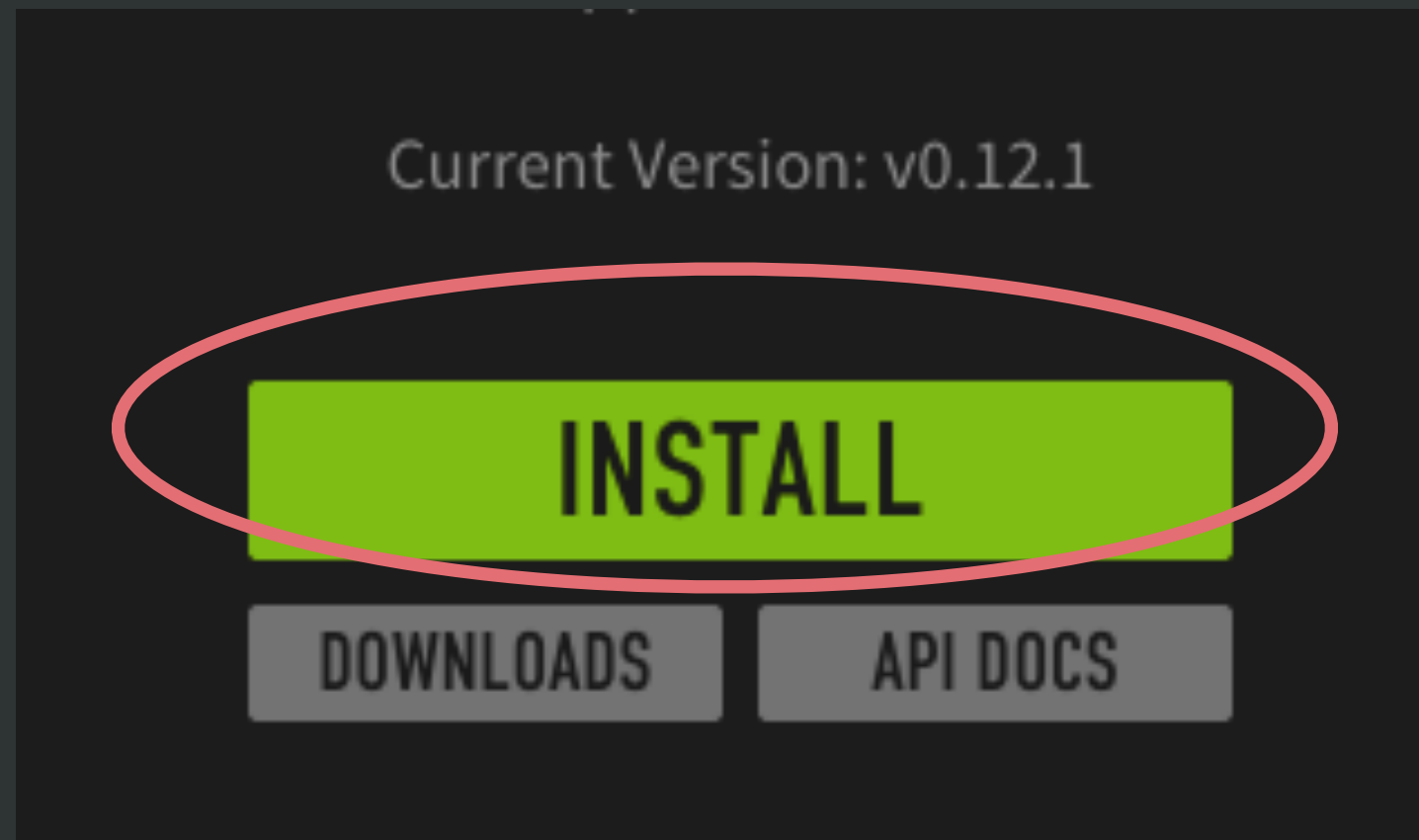
# Installing Node.js on Windows



<https://nodejs.org/>

Download, Next, Next, Next, .....

# Installing Node.js on OS X



One way: <https://nodejs.org/>



# Installing Node.js on OS X

Another way: Homebrew (recommended)

```
$ brew install node
```

# Installing Node.js on Linux

Installing Node.js via Package Manager

<https://github.com/joyent/node/wiki/Installing-Node.js-via-package-manager>

# IDE? Editors are enough

Recommended:

- atom  
(open-source, free, slow, large, *written in Node.js*)  
<https://atom.io/>
- Sublime Text  
(not open-source, not free, fast, small)  
<http://www.sublimetext.com/>



# What happens when...

you visit the link in Chrome:

<http://www.tongji.edu.cn/students/index.html>

# 1. HSTS check (\*)

HSTS = HTTP Strict Transport Security

从浏览器内置列表和缓存中，检查该地址是否需要从 http 升级到 https（加密连接）

## 2. DNS lookup

从 DNS 服务器处发送 UDP（或 TCP）查询，获得  
域名 www.tongji.edu.cn 的 IP 地址：

如 192.168.248.14

### 3. Establish TCP connection

建立向 192.168.248.14 地址上 80 端口的 TCP 连接  
(80 端口是 http: 协议的默认端口)

## 4. Send Request

GET /students/index.html HTTP/1.1

Host: www.tongji.edu.cn

Accept: text/html...

User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS  
X 10\_10\_2) AppleWebKit/537.36...

Accept-Encoding: gzip, deflate, sdch

[Other...]



# 5. Receive Response

HTTP/1.1 200 OK

Date: Sun, 29 Mar 2015 10:13:28 GMT

Content-Type: text/html

Vary: Accept-Encoding

Transfer-Encoding: chunked

<!DOCTYPE html...>

<html...>

<head>

...

## 6. Parse Response

浏览器根据 Response 中的 Content-Type 进行处理  
对于 Content-Type=text/html: 按照 HTML 文档进行解析



# 7. Close Connection

# JavaScript

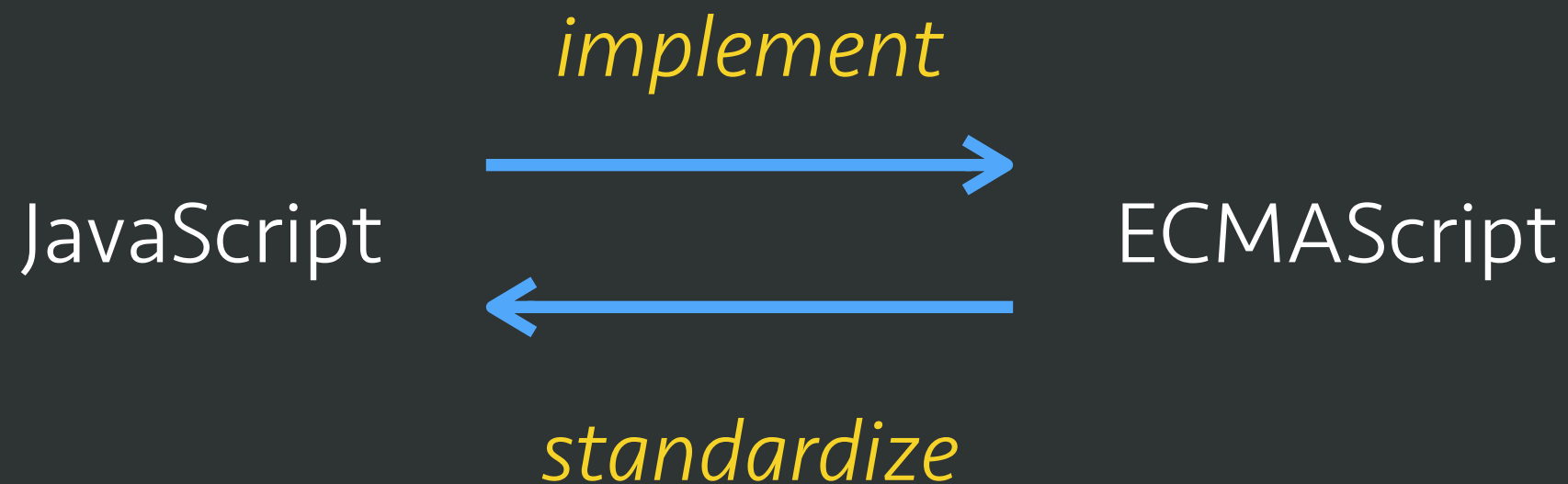
- Object-Oriented
- Scripting Language
- No Standalone Executing Environment  
*(via Web Browser, NodeJS, ... )*



# JavaScript & Java?

## 雷峰塔 & 雷锋

# JavaScript & ECMAScript?



Find out more:

[https://developer.mozilla.org/zh-CN/docs/Web/JavaScript/Guide/JavaScript\\_Overview](https://developer.mozilla.org/zh-CN/docs/Web/JavaScript/Guide/JavaScript_Overview)

# Comments

```
// Single line comment
```

```
/*  
this is a  
multi-line  
comment  
*/
```

# Data Types

## Primitive:

Number: 5, 16.5, ...

Boolean: true, false

String: "hello"

Null: null

Undefined: undefined

Object: { x:1, y:2 }

[https://developer.mozilla.org/zh-CN/docs/Web/JavaScript/Data\\_structures](https://developer.mozilla.org/zh-CN/docs/Web/JavaScript/Data_structures)



# Define Variables

```
var answer = 0;  
answer = 0x14CC27;  
answer = "Hello\nWorld";  
answer = 'Hello"World';  
answer = true;  
answer = null;  
answer = undefined;  
  
var answer2;  
// answer2 is equal to undefined
```

# Compare

```
1 == "1" //true  
1 != "1" //false
```

Recommended:

```
1 === "1" //false  
1 !== "1" //true
```

Equality Table:

<https://dorey.github.io/JavaScript-Equality-Table/>

# Operators

```
var hw = "Hello" + " ";  
hw += 'World';  
hw += ' ';  
hw += 0x14CC27;  
hw += ' ';  
hw += 0x14CC27.toString(16).toUpperCase();  
//hw === "Hello World 1362983 14CC27"
```

```
var b1 = "1" + "2";  
// b1 === "12"
```

```
var b2 = parseInt("1.1") + parseFloat("2.5")  
// b2 === 3.5
```

# Operators

```
var a1 = true && true;    // t && t returns true
var a2 = true && false;   // t && f returns false
var a3 = false && true;   // f && t returns false
var a4 = false && (3 == 4); // f && f returns false
var a5 = "Cat" && "Dog";  // t && t returns Dog
var a6 = false && "Cat";  // f && t returns false
var a7 = "Cat" && false;  // t && f returns false
```

```
var o1 = true || true;   // t || t returns true
var o2 = false || true;  // f || t returns true
var o3 = true || false;  // t || f returns true
var o4 = false || (3 == 4); // f || f returns false
var o5 = "Cat" || "Dog";  // t || t returns Cat
var o6 = false || "Cat";  // f || t returns Cat
var o7 = "Cat" || false;  // t || f returns Cat
```

# Objects

```
var staff = {  
  name: "Wenxuan Shi",  
  age: 19.2,  
  education: [  
    { begin: 2013, end: 2017, name: "Tongji University"},  
    { begin: 2010, end: 2013, name: "4C" }  
  ]  
};
```

```
staff.education[0].current = true;  
staff['education'][1].current = false;
```

# Assignments

JavaScript 基础练习

<https://node.breeswish.org/week/1>