

# 云计算与大数据应用开发

## 第七章：云计算应用开发（二）

丁烨

[dingye@dgut.edu.cn](mailto:dingye@dgut.edu.cn)

计算机科学与技术学院

2024-05-20



東莞理工學院  
DONGGUAN UNIVERSITY OF TECHNOLOGY

1

前端技术概述

2

Vue.js

3

连接 UI 和 API

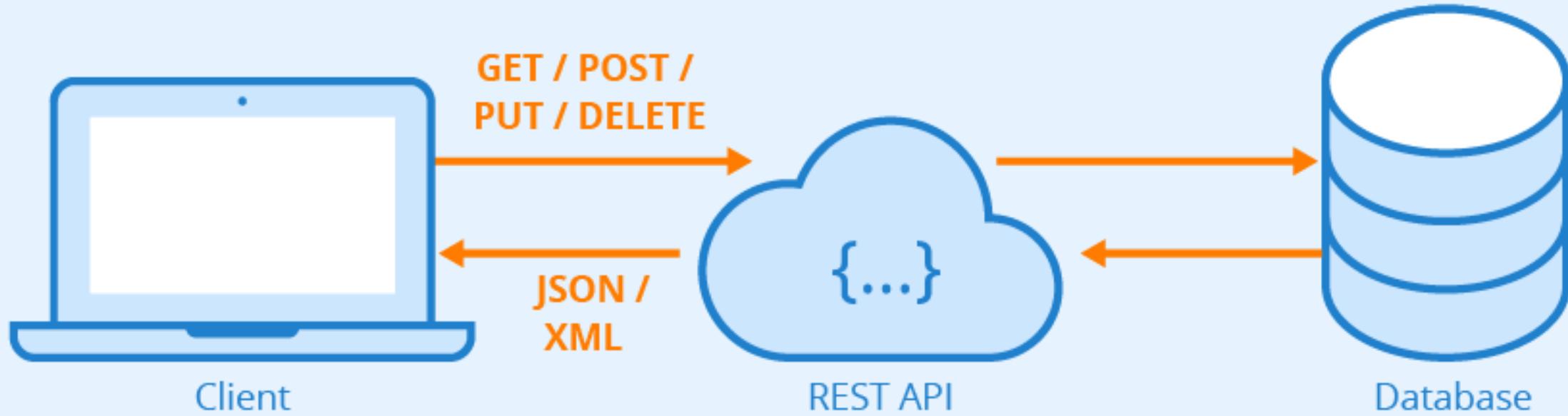
4

常见的 UI 组件库

- ❖ 表现层状态转换 (Representational State Transfer, REST)
- ❖ 由 Roy Thomas Fielding 于 2000 年提出来的一种互联网应用程序架构
- ❖ 目的是便于不同应用程序在互联网中互相传递信息
- ❖ 允许客户端发出统一的、无状态的资源标识符访问和操作网络资源
- ❖ 相对于其它种类的互联网应用程序架构，例如 SOAP (Simple Object Access Protocol) ， REST 的无状态特性降低了多平台应用程序的开发强度
- ❖ REST 是目前 SaaS 的主流技术架构

{ REST }

- ❖ 接口统一
- ❖ 客户端和服务端通常为 **JSON** 或 **XML**
- ❖ 服务端和数据库通常为 **ORM**
  
- ❖ 无状态
- ❖ 如有需要，客户端每次服务请求都需要携带验证信息
- ❖ 服务端每次数据请求都需要携带验证信息

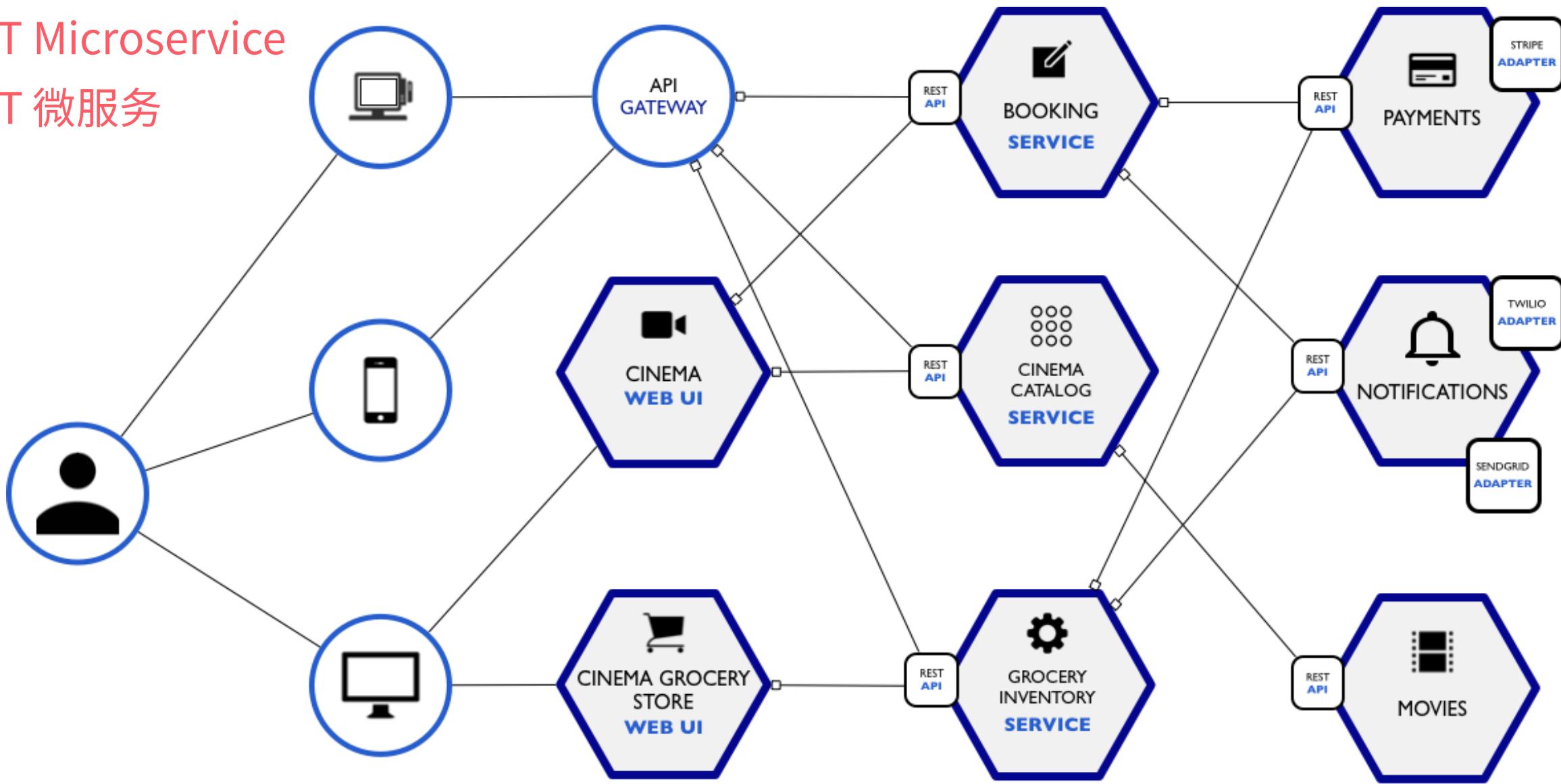


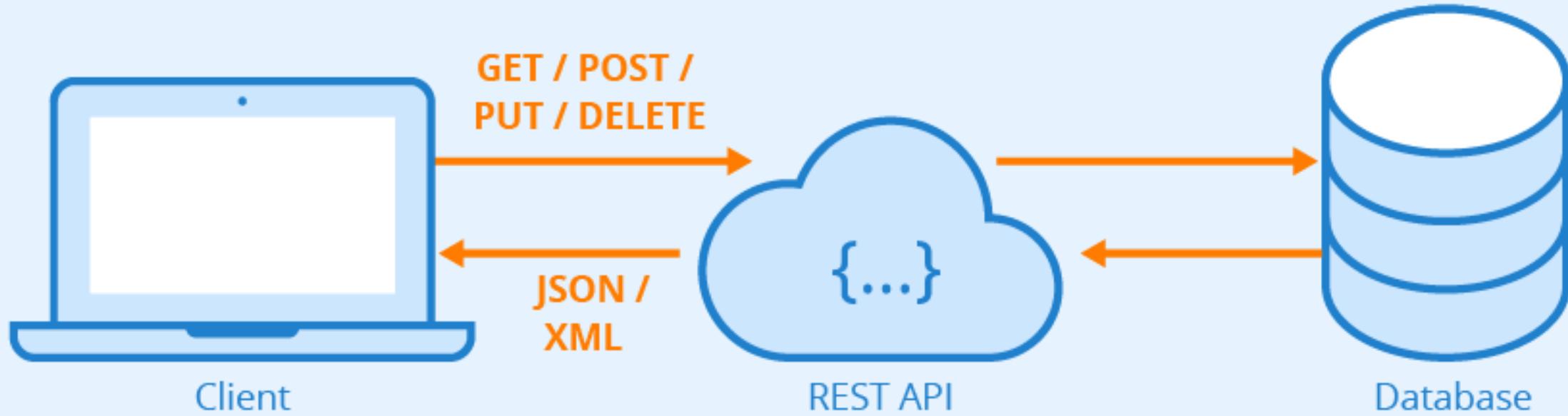
- ❖ REST 的优势
- ❖ 客户端、服务端、数据库可以任选架构，只要接口统一即可
- ❖ 客户端包括：PC 网页端、移动网页端，Windows / Mac / Linux 桌面应用程序、Android / iOS 移动端应用程序、微信小程序等
- ❖ 数据库包括：RDBMS 数据库，如 SQLite、MySQL、PostgreSQL、Oracle 等；NoSQL 数据库，如 Redis、MongoDB、Impala、Cassandra、HBase 等
- ❖ 服务端：即“应用程序接口”
  
- ❖ 不同的组件可以选择不同的运行环境，包括操作系统和硬件
- ❖ 不同的组件可以同时运行（例如，一个用户可以同时使用手机和电脑登陆“微信”）
- ❖ 只要接口统一即可

- ❖ REST 的优势
- ❖ REST 架构非常适合云计算时代的互联网应用
- ❖ 为了适应用户需求，大部分应用程序都包含不止一个终端
- ❖ REST 架构使得应用开发完全分离：前端工程师、后端工程师、数据库工程师
- ❖ Docker 为 REST 架构提供了非常方便的部署方案
- ❖ 在 REST 架构中，每个组件都可以非常方便的扩大服务规模（Scale Up）或减小服务规模（Scale Down）

## REST 应用程序架构

- ❖ REST Microservice
- ❖ REST 微服务





- ❖ 互联网应用前端 (User Interface, UI)
- ❖ 又称 “客户端”
- ❖ 与用户交互，并将用户操作转换为 API 请求
- ❖ 通过 API 与服务器通信，并取得用户希望获取的数据
- ❖ 通过丰富的客户端引擎将冰冷的数据展示为互联网应用
- ❖ UI 和 API 的统一接口通常为 JSON 或 XML

# 前端技术概述

## REST UI

The screenshot illustrates the process of inspecting a REST API response using browser developer tools. A red arrow points from the top-left towards the browser's address bar, which displays the URL <https://baike.baidu.com/item/猫/22261#hotspotmining>. Another red arrow points from the top-right towards the developer tools interface, specifically the Network tab. The Network tab shows a list of requests and their responses. A third red arrow points from the bottom-left towards the detailed view of a selected API call, which is expanded to show its Headers, Request, Response, Initiator, Timing, and Cookies. The response body is displayed as JSON, showing fields like `list`, `list[0]`, `list[0].shareLemmaTitle`, and `list[0].bjhArticleId`.

Address Bar: 猫 (猫科猫属动物) \_百度百科

Network Tab Headers:

- Name
- Headers
- Request
- Response
- Initiator
- Timing
- Cookies

Network Tab Requests (All):

- login?msg=1&\_=1588432857...
- lemmasecond?lemmald=22261
- sharecounter?lemmald=2226...
- getdiscussioncount?lemmald...
- getxueshpapers?lemmald=2...
- gettashuolist?lemmald=22261...
- zhixinmap?lemmald=22261
- lempav?id=bbf9b41cf39809...
- getasp?word=%E7%8C%AB&...
- bkclick?type=pc\_guesslike\_re...
- guesslike?url=https%3A%2F%...
- sharecounter?lemmald=2226...
- login?\_=1588432857263
- getlemmaconfig?r=0.0649708...
- getsquirrels?lemmald=22261...

Network Tab Response (Selected Request):

```
{  
  "list": [  
    {"shareLemmaId": 22261, "shareLemmaTitle": "猫", "playTi...  
    "bjhArticleId": "1654542559239630953"  
    "coverPic": {"src": "d01373f082025aa5532ba04f5edab64024...  
    "imageShareUrl": "https://bkimg.cdn.bcebos.com/pic/d...  
    "imageUrl": "https://bkimg.cdn.bcebos.com/pic/d01373...  
    "src": "d01373f082025aa5532ba04f5edab64024f1af9"  
    "verticalSrc": ""  
    "verticalUrl": ""  
    "createUid": 4180411582  
    "createUk": "MIigTrmGjSL9nstwolICrw"  
    "createUserName": "秒懂动物园"  
    "extData": false  
    "goodNum": 1068  
  ]  
}
```

- ❖ 客户端引擎
- ❖ 不同的操作系统提供了不同的可视化客户端（GUI）引擎
- ❖ 移动互联网时代之前，跨平台需求并未得到重视
- ❖ 移动互联网时代之后，平台多样性明显改变：
  - ❖ PC 网页端、移动网页端
  - ❖ Windows / Mac / Linux 桌面应用程序
  - ❖ Android / iOS 移动端应用程序
- ❖ 为每个不同平台开发应用程序的需求和成本急速上升

- ❖ 可视化模块：将 API 传递的数据可视化并展示给最终用户，提供交互能力
- ❖ 用户界面（UI, User Interface）
- ❖ 三大最主流互联网 UI 框架：



- ❖ Electron
- ❖ <https://www.electronjs.org/>
- ❖ GitHub 开发的一个开源框架
- ❖ 使用 Node.js（作为后端）和 Chromium（作为前端）完成桌面 GUI 应用程序的开发
- ❖ Electron 现已被多个开源 Web 应用程序用于前端与后端的开发
- ❖ 著名项目包括 GitHub 的 Atom 和微软的 Visual Studio Code
- ❖ 针对：*Windows / Mac / Linux 桌面应用程序*





Build cross-platform desktop apps with JavaScript, HTML, and CSS

- ❖ Apache Cordova
- ❖ <https://cordova.apache.org/>
- ❖ 隶属于 Adobe 旗下的的一个移动端开源框架
- ❖ 由 Apache 基金会和 Adobe 共同管理
- ❖ 允许用户跨平台使用同一套代码部署移动端应用程序
- ❖ 支持的平台：iOS、Android
- ❖ 曾经支持的平台：Windows Phone、BlackBerry、Symbian 等
- ❖ 针对：Android / iOS 移动端应用程序



APACHE  
CORDOVA™



# APACHE CORDOVA™

Mobile apps with **HTML, CSS & JS**

Target multiple platforms with **one code base**

Free and **open source**



[GET STARTED](#)

[DOCUMENTATION](#)



# Express

4.17.1

Fast, unopinionated, minimalist  
web framework for [Node.js](#)

# 前端技术概述

## 从 UI 到全栈技术

web前端开发 [深圳湾] 09:01发布



10k-20k 经验应届毕业生 / 本科

前端开发

XMind

移动互联网 / 不需要融资 / 50-150人



“行业标杆、965、remote办公”

web前端开发工程师 [罗湖区] 2天前发布



12k-15k 经验应届毕业生 / 本科

前端开发

HTML5

阿卡索外教网

教育,移动互联网 / C轮 / 2000人以上



“五险一金，双休，错峰上班”

前端开发工程师 [坂田] 1天前发布



15k-30k 经验应届毕业生 / 本科

HTML5

Javascript

Node.js

Web前端

通力互联

软件开发 / 不需要融资 / 2000人以上



“大项目，薪资福利丰厚”

# 前端技术概述

## 从 UI 到全栈技术

高级 Node.js 全栈工程师 [南山区] 23:31发布 

25k-35k 经验5-10年 / 本科

电商 企业服务 后端 全栈 Javascript Node.js

AfterShip 

电商 / 不需要融资 / 50-150人



“全球项目、高薪资、高福利、国际团队”

全栈工程师 [南山区] 23:48发布 

15k-30k 经验3-5年 / 本科

GO 后端 Shell 前端开发

即构科技 

移动互联网,企业服务 / B轮 / 150-500人

ZEGO 即构

“牛人团队,产品牛,市场大”

高级SRE工程师 [南山区] 23:31发布 

25k-45k 经验5-10年 / 本科

运维 MongoDB DevOps 自动化运维

AfterShip 

电商 / 不需要融资 / 50-150人



“全球项目、高薪资、高福利、国际团队”

1

前端技术概述

2

Vue.js

3

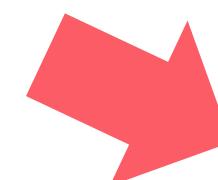
连接 UI 和 API

4

常见的 UI 组件库



- ❖ Vue.js
- ❖ <https://vuejs.org/>
- ❖ 简称 Vue，是一个基于 JavaScript / TypeScript 的开源 UI 框架
- ❖ 也是一个创建单页应用的互联网应用程序框架
- ❖ 在 GitHub 上目前排名前 10，最高曾超过 React 排名第 3



## Github Ranking

### Top 100 Stars

Ranking	Project Name	Stars	Forks	Language	Open Issues	Description	Last Commit
1	<a href="#">freeCodeCamp</a>	364269	31646	TypeScript	141	freeCodeCamp.org's open-source codebase and curriculum. Learn to code for free.	2023-04-10T23:46:23Z
2	<a href="#">free-programming-books</a>	275490	54685	None	26	Freely available programming books	2023-04-09T21:57:47Z
3	<a href="#">996.ICU</a>	265522	21428	None	0	Repo for counting stars and contributing. Press F to pay respect to glorious developers.	2022-12-26T03:57:50Z
4	<a href="#">coding-interview-university</a>	254163	67018	None	44	A complete computer science study plan to become a software engineer.	2023-04-03T15:47:07Z
5	<a href="#">awesome</a>	248618	25386	None	25	Awesome lists about all kinds of interesting topics	2023-04-10T08:13:23Z
6	<a href="#">developer-roadmap</a>	236429	33607	Astro	228	Interactive roadmaps, guides and other educational content to help developers grow in their careers.	2023-04-10T22:28:10Z
7	<a href="#">public-apis</a>	235504	26747	Python	42	A collective list of free APIs	2023-04-10T12:03:18Z
8	<a href="#">system-design-primer</a>	217278	38624	Python	175	Learn how to design large-scale systems. Prep for the system design interview. Includes Anki flashcards.	2023-04-10T01:01:51Z
9	<a href="#">react</a>	205592	42824	JavaScript	959	The library for web and native user interfaces	2023-04-11T02:45:44Z
10	<a href="#">vue</a>	203121	33568	TypeScript	365	This is the repo for Vue 2. For Vue 3, go to <a href="https://github.com/vuejs/core">https://github.com/vuejs/core</a>	2023-04-06T14:05:35Z

- ❖ Node.js
- ❖ <https://nodejs.org/>



- ❖ 一个能够在服务器端运行 JavaScript 的开源、跨平台运行环境
- ❖ 由 OpenJS Foundation 维护，亦为 Linux 基金会的项目
- ❖ 采用 Google 开发的 V8 运行代码，使用事件驱动、非阻塞和异步输入输出模型等技术来提高性能，可优化应用程序的传输量和规模
- ❖ 在 Node.js 出现之前，JavaScript 通常作为客户端程序设计语言使用，以 JavaScript 编写的程序通常在用户的浏览器上运行
- ❖ Node.js 的出现使得 JavaScript 也能用于服务端编程
- ❖ 目前几乎所有的互联网公司都使用了 Node.js 及其相关技术

- ❖ 安装 Node.js
- ❖ <https://nodejs.org/en/download/>

### Downloads

Latest LTS Version: 18.15.0 (includes npm 9.5.0)

Download the Node.js source code or pre-built installer for your platform, and start developing today.

LTS

Recommended For Most Users

Current

Latest Features



Windows Installer

node-v18.15.0-x64.msi



macOS Installer

node-v18.15.0.pkg



Source Code

node-v18.15.0.tar.gz

- ❖ 使用 APT 在 Ubuntu 22.04 上安装 Node.js
- ❖ <https://github.com/nodesource/distributions>
- ❖ curl -fsSL https://deb.nodesource.com/setup\_18.x | sudo -E bash -
- ❖ sudo apt install nodejs

```
~ » node -v  
v16.15.0
```

```
~ » npm -v  
8.5.5
```

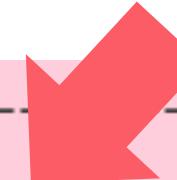


- ❖ NPM
- ❖ <https://www.npmjs.com/>
- ❖ Node.js 的一个软件包管理器
- ❖ 2020 年 4 月被 GitHub 收购
- ❖ 截止到 2016 年 7 月，NPM 的 Registry 上已经注册了超过 280,000 个模块
- ❖ NPM 是 Node.js 的默认软件包管理器，安装 Node.js 通常会一并安装 NPM



- ❖ 阿里云 NPM 镜像
- ❖ <http://www.npmmirror.com/>
  
- ❖ 配置阿里云 NPM 镜像：
- ❖ `npm install -g cnpm --registry=https://registry.npmmirror.com`
  
- ❖ 配置完毕之后可以使用 `cnpm` 替换 `npm`，例如：
- ❖ `cnpm i -g @vue/cli`

- ❖ Vue CLI
- ❖ <https://cli.vuejs.org/>
- ❖ Vue.js 的 CLI (命令行用户界面, Command Line Interface)
  
- ❖ 安装 Vue CLI
- ❖ `npm i -g @vue/cli`

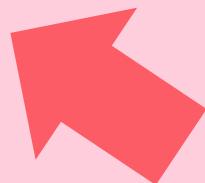
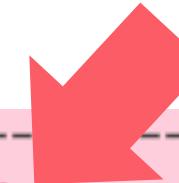


```
~ » vue -V  
@vue/cli 4.5.11
```

❖ 使用 Vue CLI 创建一个新的 Vue 项目

❖ vue create hello-world

```
~/Workspace/course » vue create hello-world
? Your connection to the default npm registry seems to be slow.
  Use https://registry.npm.taobao.org for faster installation? Yes
```



Vue CLI v4.3.1

```
? Please pick a preset: default (babel, eslint)
```

Vue CLI v4.3.1

```
* Creating project in /mnt/e/Workspace/course/hello-world.
* Initializing git repository...
* Installing CLI plugins. This might take a while...
```

43 packages are looking for funding  
run `npm fund` for details

- 📝 Invoking generators...
- 📦 Installing additional dependencies...

added 53 packages from 36 contributors in 9.664s

46 packages are looking for funding  
run `npm fund` for details

- +. Running completion hooks...

- 📄 Generating README.md...



- 🎉 Successfully created project `hello-world`.
- 👉 Get started with the following commands:

```
$ cd hello-world  
$ npm run serve
```



- ❖ 启动 Vue 服务
- ❖ cd hello-world && npm run serve

DONE Compiled successfully in 11837ms

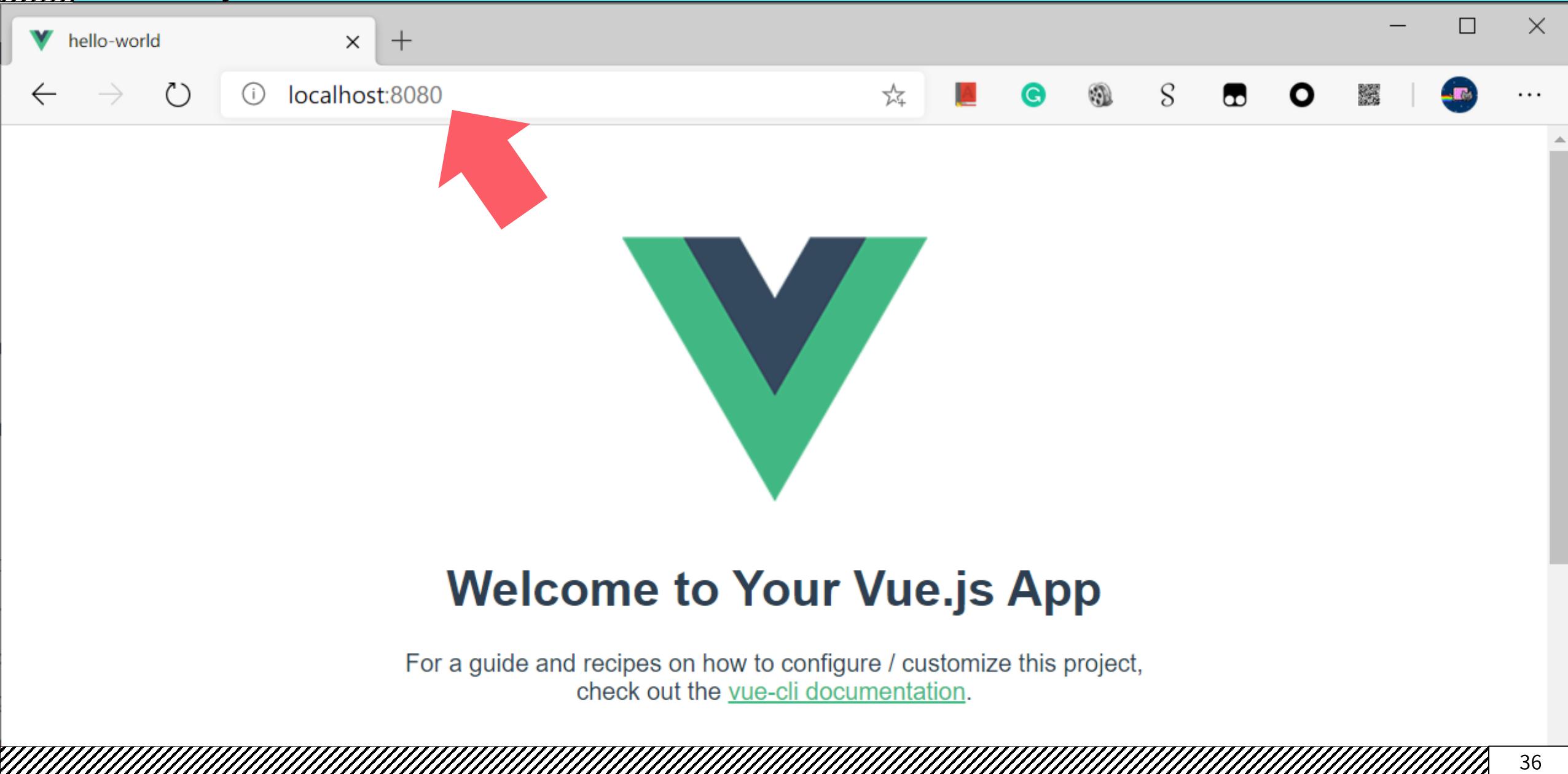
App running at:

- Local: <http://localhost:8080/>
- Network: <http://172.20.254.114:8080/>



Note that the development build is not optimized.  
To create a production build, run `npm run build`.

## 使用 Vue.js



A screenshot of a web browser window displaying a Vue.js application. The browser's title bar shows the project name "hello-world". The address bar displays the URL "localhost:8080". A red arrow points from the top-left towards the address bar. The main content area of the browser shows the Vue.js logo (a large green and blue 'V') and the text "Welcome to Your Vue.js App". Below this, there is a descriptive message and a link to the "vue-cli documentation".

localhost:8080

Welcome to Your Vue.js App

For a guide and recipes on how to configure / customize this project,  
check out the [vue-cli documentation](#).

The screenshot shows the WebStorm IDE interface with a Vue.js project open. The top navigation bar includes File, Edit, View, Navigate, Code, Refactor, Run, Tools, VCS, Window, Help, and a tab for 'hello-world - App.vue - WebStorm'. The left sidebar has sections for Project, Structure, Favorites, and Scratches and Consoles. The main area displays the file structure of 'hello-world' with 'App.vue' selected. A large red arrow points from the 'components' folder in the Project view down to 'HelloWorld.vue' in the file tree. Another red arrow points from the 'HelloWorld.vue' file in the file tree up to the 'HelloWorld' component import in the 'App.vue' code editor. A third red arrow points from the 'HelloWorld' component import in the code editor up to the 'HelloWorld' component definition in the 'App.vue' template.

```
<template>
  <div id="app">
    
    <HelloWorld msg="Welcome to Your Vue.js App"/>
  </div>
</template>
<script>
import HelloWorld from './components/HelloWorld.vue'

export default {
  name: 'App',
  components: {
    HelloWorld
  }
}
</script>
<style>
#app {
  font-family: Avenir, Helvetica, Arial, sans-serif;
  -webkit-font-smoothing: antialiased;
  -moz-osx-font-smoothing: grayscale;
  text-align: center;
  color: #2c3e50;
}
```

File Edit View Navigate Code Refactor Run Tools VCS Window Help hello-world - HelloWorld.vue - WebStorm

hello-world > src > components > HelloWorld.vue >

Project

hello-world E:\Workspace\course\hello-world

- node\_modules library root
- public
- src
  - assets
  - components
    - HelloWorld.vue

App.vue x HelloWorld.vue x

```
<template>
  <div class="hello">
    <h1>{{ msg }}</h1>
    <p...>
    <h3>Installed CLI Plugins</h3>
    <ul...>
    <h3>Essential Links</h3>
    <ul...>
    <h3>Ecosystem</h3>
    <ul...>
  </div>
</template>
<script>
export default {
  name: 'HelloWorld',
  props: {
    msg: String
  }
}
</script>
<!-- Add "scoped" attribute to limit CSS to this component only -->
<style scoped>
  h3 {
```

ADD CONFIGURATION... ▶ ⚙️ ⚡ 🌐

Project Structure

Favorites

Git Terminal TODO

59:1 LF UTF-8 2 spaces\* master M

WS File Edit View Navigate Code Refactor Run Tools VCS Window Help hello-world - User.vue - WebStorm

hello-world > src > components > User.vue >

Project ▾ hello-world E:\Workspace\course\hello-world > node\_modules library root > public > src > assets > components > HelloWorld.vue > User.vue > App.vue > HelloWorl

ADD CONFIGURATION... ▶ ⚙️ ⚡ Git: M

Project Structure

File Structure

Favorites

Scratches and Consoles

Git Terminal TODO

10:21 CRLF UTF-8 4 spaces master M

```
<template>
  <div>
    <label for="username">User Name:</label>
    <input id="username"/>
  </div>
</template>

<script>
  export default {
    name: "User"
  }
</script>

<style scoped>
</style>
```

WS File Edit View Navigate Code Refactor Run Tools VCS Window Help hello-world - App.vue - WebStorm

hello-world > src > App.vue >

Project Structure ADD CONFIGURATION ▶ ⚙️ ⚡ Git: M

File tree:

- Project
- hello-world E:\Workspace\course\hello-world
  - node\_modules library root
  - public
  - src
    - assets
    - components
      - HelloWorld.vue
      - User.vue
    - App.vue

Code editor (App.vue):

```
<template>
  <div id="app">
    <User/>
  </div>
</template>

<script>
  import User from './components/User.vue'

  export default {
    name: 'App',
    components: {
      User
    }
  }
</script>

<style>
  #app {
    font-family: Avenir, Helvetica, Arial, sans-serif;
    -webkit-font-smoothing: antialiased;
    -moz-osx-font-smoothing: grayscale;
    text-align: center;
    color: #2c3e50;
    margin-top: 60px;
  }
</style>
```

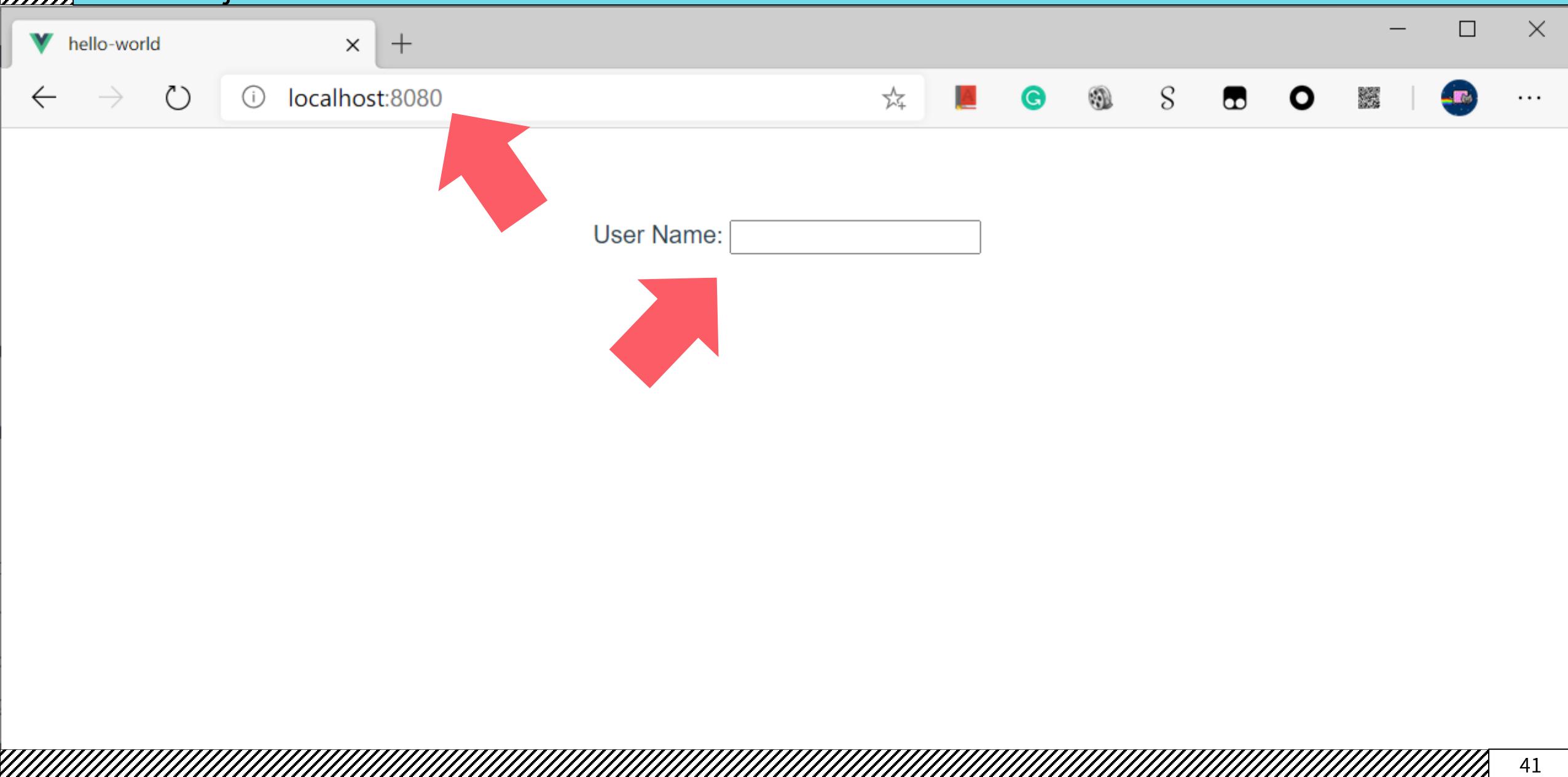
Bottom status bar: 14:4 LF UTF-8 2 spaces\* master M

The screenshot shows the WebStorm IDE interface with the following details:

- File Menu:** File, Edit, View, Navigate, Code, Refactor, Run, Tools, VCS, Window, Help.
- Title Bar:** hello-world - App.vue - WebStorm.
- Toolbar:** ADD CONFIGURATION, navigation icons (▶, ⚙️, ⚡), Git status (M).
- Project Structure:** Shows the project hierarchy: Project, hello-world (E:\Workspace\course\hello-world), node\_modules (library root), public, src (assets, components, App.vue, main.js, .gitignore, babel.config.js, package.json, package-lock.json, README.md), External Libraries, Scratches and Consoles.
- Code Editor (App.vue):** Displays the Vue.js template, script, and style blocks. A red arrow points from the code editor back to the project structure, specifically highlighting the import statement and the components object in the script block.
- Status Bar:** 14:4 LF UTF-8 2 spaces\* master M.

# Vue.js

## 使用 Vue.js



WS File Edit View Navigate Code Refactor Run Tools VCS Window Help hello-world - User.vue - WebStorm

hello-world > src > components > User.vue >

Project ▾

hello-world E:\Workspace\course\hello-world

- > node\_modules library root
- > public
- src
  - > assets
  - components
    - HelloWorld.vue
    - User.vue

App.vue ▾

App.vue ▾

App.vue ▾

```
<template>
  <div>
    <label for="username">User Name: </label>
    <input id="username"
      v-model="user"
      @change="password=Math.random().toString(36).substr(2, 10)">
  </div>
</template>
<script>
  export default {
    name: "User",
    data() {
      return {
        user: "",
        password: ""
      }
    }
  }
</script>
<style scoped>
```

ADD CONFIGURATION... ▶ ⚙️ ⌂ Git: M

Project Structure

Favorites

Scratches and Consoles

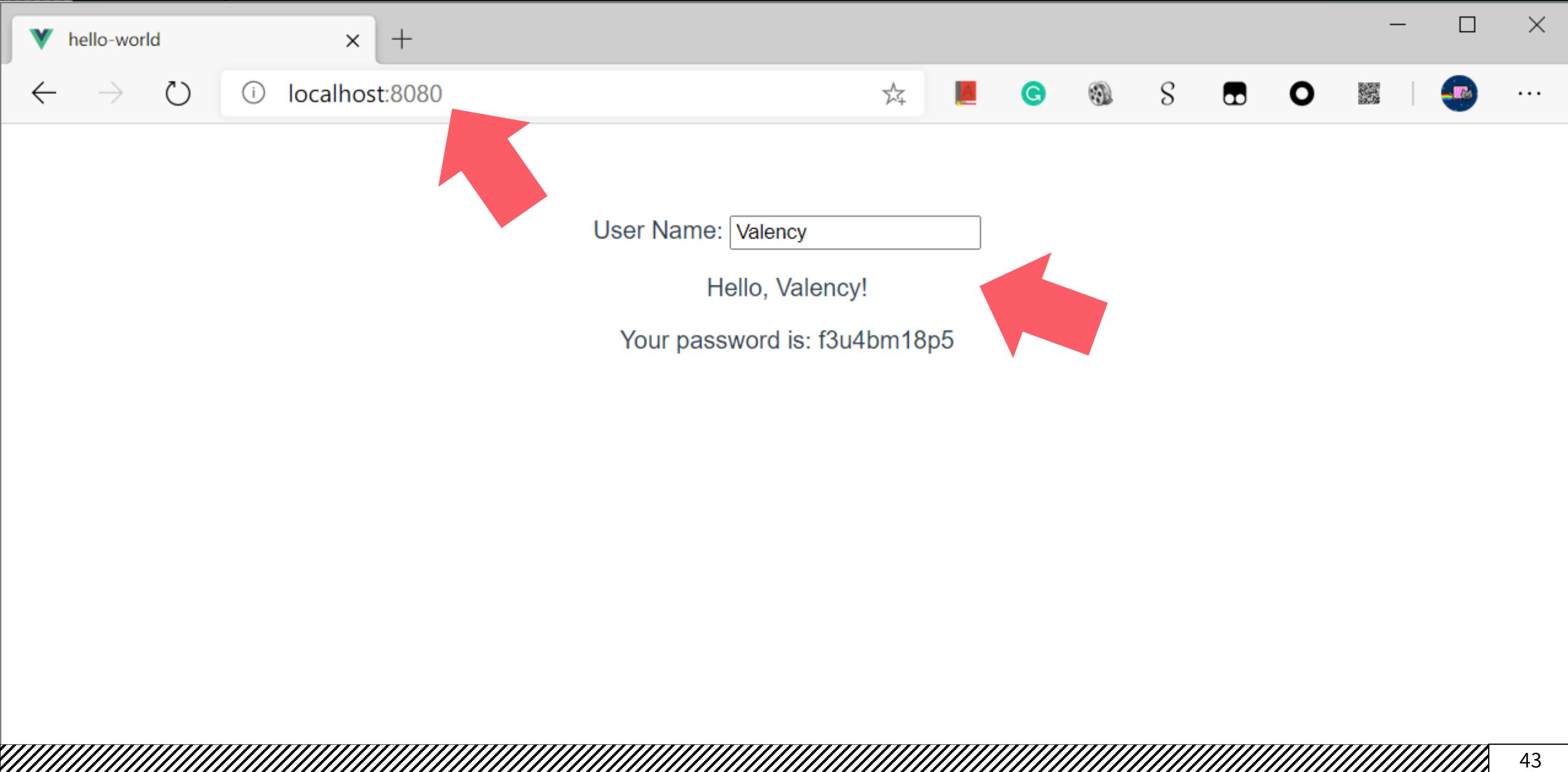
Git Terminal TODO

12:1 CRLF UTF-8 4 spaces master M



# Vue.js

## 使用 Vue.js



- ❖ Vue.js 官方教程：
- ❖ <https://cn.vuejs.org/guide/introduction.html>
  
- ❖ Vue CLI 官方教程：
- ❖ <https://cli.vuejs.org/zh/guide/>

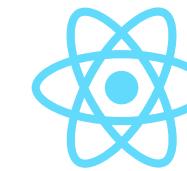


尤雨溪

前端框架Vue.js 作者，独立开源开发者，现居美国新泽西，现在全职开发和维护 Vue.js。

### 本期嘉宾

尤雨溪 (**Evan You**)，前端框架**Vue.js** 作者，独立开源开发者，现居美国新泽西。曾就职于 **Google Creative Labs** 和 **Meteor Development Group**。由于工作中大量接触开源的 **JavaScript** 项目，最后自己也走上了开源之路，现在全职开发和维护 **Vue.js**。



- ❖ React
- ❖ <https://reactjs.org/>
- ❖ 又称 React.js，是基于 JavaScript 的开源 UI 框架
- ❖ React 由 Facebook、Instagram 和社群维护
- ❖ React 当前正在被 Netflix、Imgur、Bleacher Report、Feedly、Airbnb、SeatGeek、HelloSign 等很多企业使用
- ❖ 目前 GitHub 排名第 9，框架类(Framework) 组件排名第 1

## Github Ranking

### Top 100 Stars

Ranking	Project Name	Stars	Forks	Language	Open Issues	Description	Last Commit
1	<a href="#">freeCodeCamp</a>	364269	31646	TypeScript	141	freeCodeCamp.org's open-source codebase and curriculum. Learn to code for free.	2023-04-10T23:46:23Z
2	<a href="#">free-programming-books</a>	275490	54685	None	26	Freely available programming books	2023-04-09T21:57:47Z
3	<a href="#">996.ICU</a>	265522	21428	None	0	Repo for counting stars and contributing. Press F to pay respect to glorious developers.	2022-12-26T03:57:50Z
4	<a href="#">coding-interview-university</a>	254163	67018	None	44	A complete computer science study plan to become a software engineer.	2023-04-03T15:47:07Z
5	<a href="#">awesome</a>	248618	25386	None	25	Awesome lists about all kinds of interesting topics	2023-04-10T08:13:23Z
6	<a href="#">developer-roadmap</a>	236429	33607	Astro	228	Interactive roadmaps, guides and other educational content to help developers grow in their careers.	2023-04-10T22:28:10Z
7	<a href="#">public-apis</a>	235504	26747	Python	42	A collective list of free APIs	2023-04-10T22:28:18Z
8	<a href="#">system-design-primer</a>	217278	38624	Python	175	Learn how to design large-scale systems. Prep for the system design interview. Includes Anki flashcards.	2023-04-01T15:01:51Z
9	<a href="#">react</a>	205592	42824	JavaScript	959	The library for web and native user interfaces	2023-04-11T02:45:44Z
10	<a href="#">vue</a>	203121	33568	TypeScript	365	This is the repo for Vue 2. For Vue 3, go to <a href="https://github.com/vuejs/core">https://github.com/vuejs/core</a>	2023-04-06T14:05:35Z

### An Application

Using `props` and `state`, we can put together a small Todo application. This example uses `state` to track the current list of items as well as the text that the user has entered. Although event handlers appear to be rendered inline, they will be collected and implemented using event delegation.

The screenshot shows a live JSX editor interface. On the left, the **LIVE JSX EDITOR** panel contains the following code:

```
class TodoApp extends React.Component {
  constructor(props) {
    super(props);
    this.state = { items: [], text: '' };
    this.handleChange = this.handleChange.bind(this);
    this.handleSubmit = this.handleSubmit.bind(this);
  }

  render() {
    return (
      <div>
        <h3>TODO</h3>
        <TodoList items={this.state.items} />
        <form onSubmit={this.handleSubmit}>
          <label htmlFor="new-todo">
            What needs to be done?
          </label>
          <input type="text" value={this.state.text} onChange={this.handleChange} />
          <button type="submit">Add #1</button>
        </form>
      </div>
    );
  }
}
```

The **RESULT** panel on the right displays the rendered application. It features a header "TODO" and a form below it. The form has a label "What needs to be done?", an input field, and a button labeled "Add #1".

1

前端技术概述

2

Vue.js

3

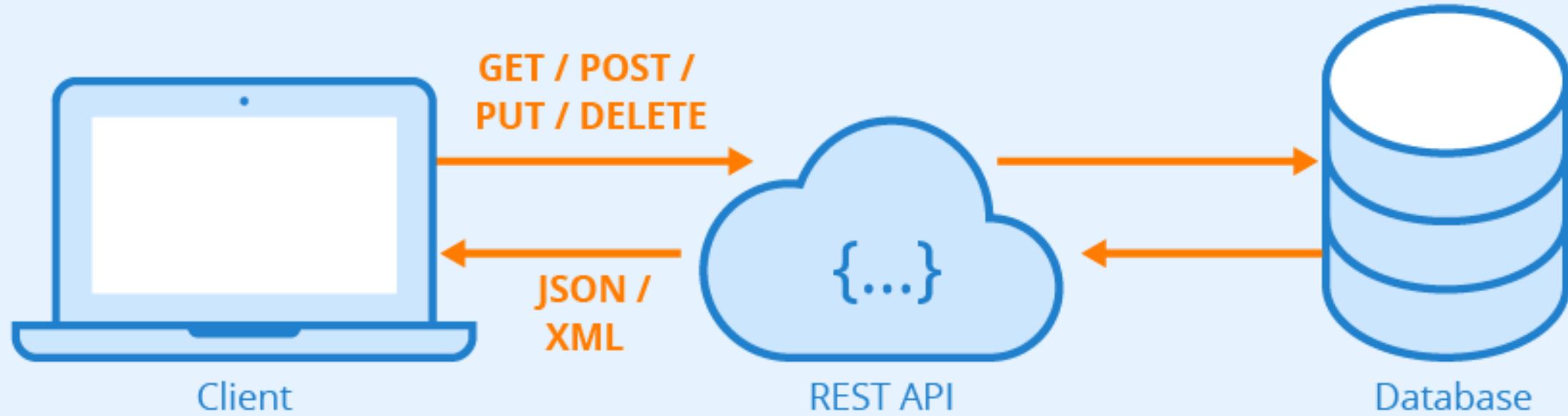
连接 UI 和 API

4

常见的 UI 组件库

# 连接 UI 和 API

## REST API



# 连接 UI 和 API

## REST API

POST ▼ http://localhost:5000/

Params Authorization Headers (8) **Body** ● Pre-request Script Tests Settings

none  form-data  x-www-form-urlencoded  raw  binary  GraphQL

KEY	VALUE	DESCRIPTION
<input checked="" type="checkbox"/> name	valency	
Key	Value	Description

Body Cookies Headers (6) Test Results Status: 200 OK Time:

Pretty Raw Preview **Serialize** JSON ▾

```
1 {  
2   "hello": "valency"  
3 }
```

# 连接 UI 和 API

## REST API



localhost:5000/valency/?t=15886 X



localhost:5000/valency/?t=1588692642



[

{

"id": 3,

"name": "valency"

},

{

"id": 4,

"name": "valency"

}

]

## 安装 Axios

- ❖ Axios
- ❖ <https://github.com/axios/axios>
- ❖ 一个基于 JavaScript 的 REST API 客户端
- ❖ 安装 Axios:
- ❖ `npm i --save axios`

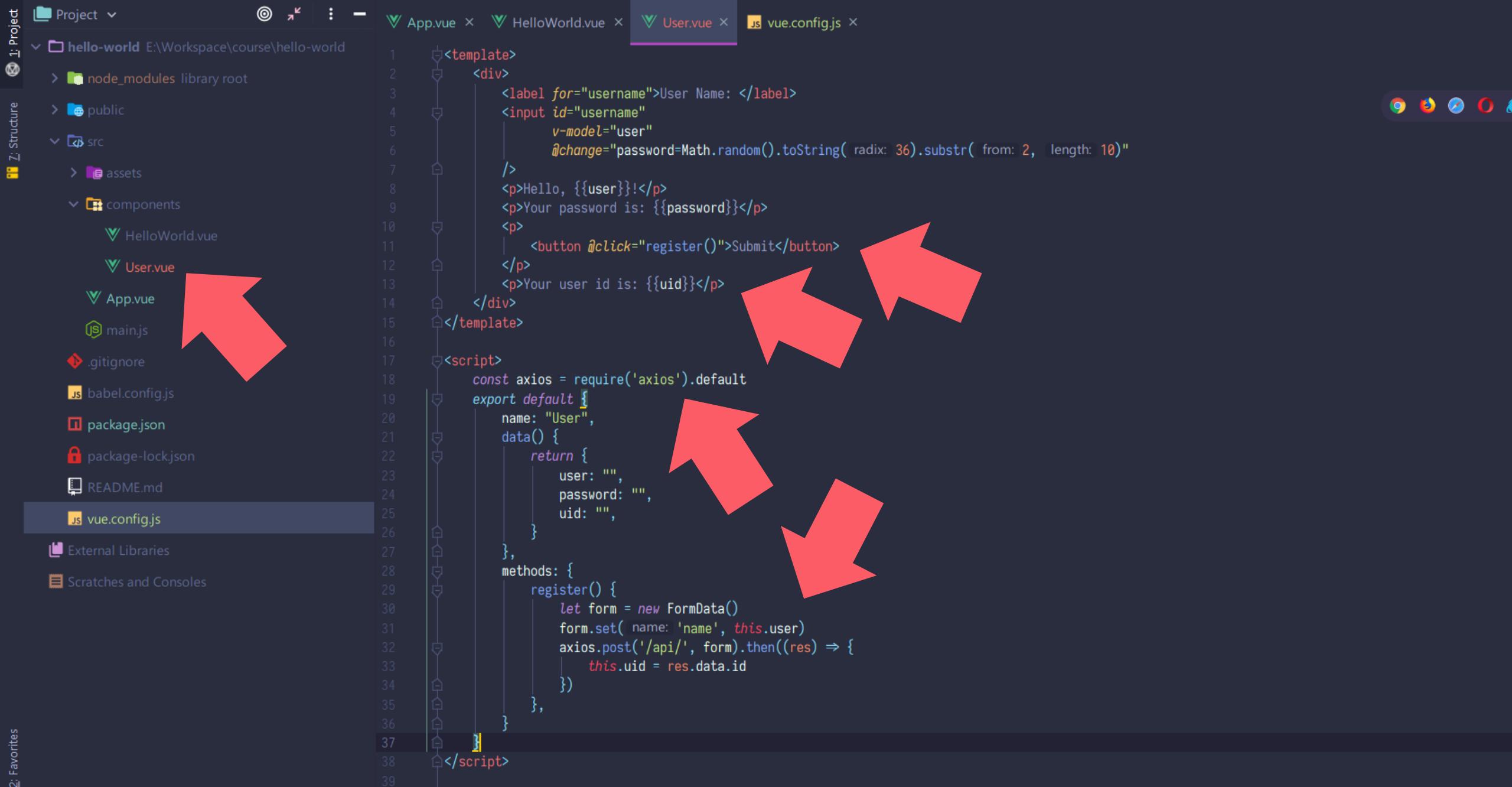
## axios

npm v0.19.2 build passing coverage 94% install size 419 kB download

Promise based HTTP client for the browser and node.js

### Features

- Make XMLHttpRequests from the browser
- Make http requests from node.js
- Supports the Promise API
- Intercept request and response
- Transform request and response data
- Cancel requests
- Automatic transforms for JSON data
- Client side support for protecting against XSRF



- ❖ 跨域资源共享 (Cross-Origin Resource Sharing, CORS)
- ❖ 用于让网页的受限资源能够被其他域名的页面访问的一种机制
- ❖ 通过 CORS 机制，页面能够自由地使用不同源 (Cross-origin) 的资源
- ❖ 一些跨域的请求 (特别是 Ajax) 常常会被同源策略 (Same-origin Policy) 禁止
- ❖ 简单来讲，就是在没有开启 CORS 的情况下，不能用 8080 端口的互联网应用程序去访问 5000 端口的互联网应用程序

```
✖ Access to XMLHttpRequest at 'http://localhost:5000/' from origin 'http://localhost:8080' has been blocked by CORS policy: No 'Access-Control-Allow-Origin' header is present on the requested resource.          localhost/:1
✖ ▶ POST http://localhost:5000/ net::ERR_FAILED                                         xhr.js?a169:178
✖ ▶ Uncaught (in promise) Error: Network Error                                     createError.js?c5b9:16
    at createError (createError.js?c5b9:16)
    at XMLHttpRequest.handleError (xhr.js?a169:83)
```

&gt;

- ❖ CORS 并不安全，一般不建议开启，而应当使用代理 (Proxy) 的方式访问资源

hello-world &gt; js vue.config.js &gt;

Project

Structure

Tool

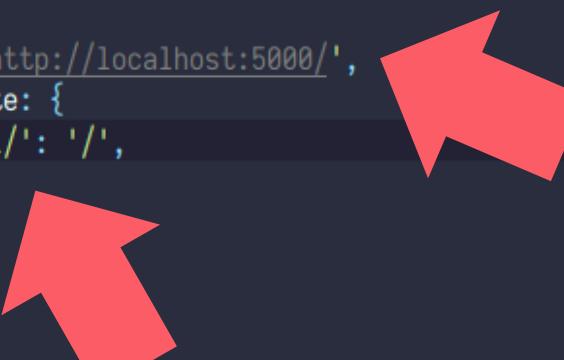
Project

hello-world E:\Workspace\course\hello-world

- node\_modules library root
- public
- src
  - assets
  - components
    - HelloWorld.vue
    - User.vue
  - App.vue
  - main.js
- .gitignore
- babel.config.js
- package.json
- package-lock.json
- README.md
- vue.config.js

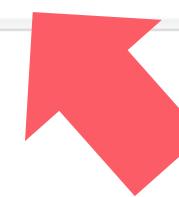
App.vue × HelloWorld.vue × User.vue × js vue.config.js ×

```
1 module.exports = {
2   devServer: {
3     proxy: {
4       '^/api': {
5         target: 'http://localhost:5000/',
6         pathRewrite: {
7           '^/api/': '/',
8         },
9       },
10      },
11    },
12  };
13 }
```



External Libraries

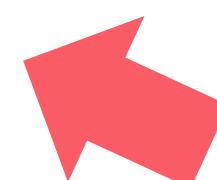
Scratches and Consoles

User Name: 

Hello, valency!

Your password is: 3m34jr5mrg

Your user id is: 6



Elements

Console

Sources

Network

Performance

Memory

Application

Security

Audits

AdBlock

Preserve log  Disable cache 

Online



Filter

 Hide data URLs All | XHR JS CSS Img Media Font Doc WS Manifest Other  Has blocked cookies

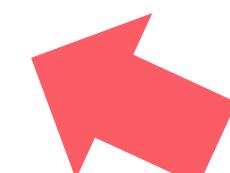
Name

 content.min.css info?t=1589824017459 api/

x Headers Preview Response Initiator Timing Cookies

{id: 6}

id: 6



File Edit View Navigate Code Refactor Run Tools VCS Window Help hello-world - User.vue - WebStorm

ADD CONFIGURATION... ▶ ⚙️ ⌂ Git: 🌐 ➔ ⌂

Project ▾ App.vue ▾ HelloWorld.vue ▾ User.vue ▾ vue.config.js

hello-world > src > components > User.vue

hello-world E:\Workspace\course\hello-world

node\_modules library root

public

src

assets

components

HelloWorld.vue

User.vue

App.vue

main.js

.gitignore

babel.config.js

package.json

package-lock.json

README.md

vue.config.js

External Libraries

Scratches and Consoles

Favorites

```
<input id="username" v-model="user" @change="password=Math.random().toString(radix: 36).substr(from: 2, length: 10)" />
<p>Hello, {{user}}!</p>
<p>Your password is: {{password}}</p>
<p>
    <button @click="register()">Submit</button>
</p>
<p>Your user id is: {{uid}}</p>
<p>
    <button @click="query()">Query</button>
</p>
<p v-for="i in users" :key="i.id">{{i.id}} - {{i.name}}</p>
</div>
</template>
<script>
    const axios = require('axios').default
    export default {
        name: "User",
        data() {
            return {
                user: "",
                password: "",
                uid: "",
                users: []
            }
        },
        methods: {
            register() {...},
            query() {
                axios.get('/api/' + this.user + '?t=' + ~~(new Date().getTime() / 1000)).then((res) => {
                    this.users = res.data
                })
            }
        }
    }
</script>
```

The screenshot shows a Vue.js application structure in WebStorm. The 'User.vue' component is the active file, indicated by its highlighted tab in the top navigation bar. The code itself contains logic for handling user input, displaying their ID, and querying a database via Axios. Several red arrows are overlaid on the image, pointing from the left margin towards the 'User.vue' tab, likely indicating a specific feature or action related to the component.

A screenshot of a web browser window showing a login form and a developer tools Network tab.

The main content area displays a login form with the following fields:

- User Name:
- Hello, valency!
- Your password is: sadu23p7j6
- 

Below the form, the text "Your user id is:" is followed by a list of three items:

- 3 - valency
- 4 - valency
- 6 - valency

Red arrows highlight several elements:

- A red arrow points from the top-left towards the "User Name" input field.
- A red arrow points from the top-right towards the "Hello, valency!" message.
- A red arrow points from the bottom-left towards the "Query" button.
- A red arrow points from the bottom-right towards the list of user IDs.
- A large red arrow points from the bottom-left towards the Network tab in the developer tools.
- A large red arrow points from the bottom-right towards the "Preview" tab in the developer tools Network tab panel.

The developer tools Network tab is open, showing the following details:

- Filter: content.min.css, info?t=15898251, ?t=1589825121
- Headers, Preview, Response, Initiator, Timing, Cookies tabs
- Preview tab content:

```
[{"id": 3, "name": "valency"}, {"id": 4, "name": "valency"}, {"id": 6, "name": "valency"}]
```

  - 0: {id: 3, name: "valency"}
  - 1: {id: 4, name: "valency"}
  - 2: {id: 6, name: "valency"}

- ❖ Axios 官网及教程：  
<https://github.com/axios/axios>
- ❖ Vue CLI 官网关于代理的教程：  
<https://cli.vuejs.org/config/#devserver-proxy>
- ❖ Vue 使用的代理模块 (http-proxy-middleware)：  
<https://github.com/chimurai/http-proxy-middleware>

1

前端技术概述

2

Vue.js

3

连接 UI 和 API

4

常见的 UI 组件库

## Ant Design

- ❖ Ant Design
- ❖ <https://ant.design/>
  
- ❖ Ant Design of Vue
- ❖ <https://www.antdv.com/docs/vue/introduce-cn/>
  
- ❖ 蚂蚁金服（支付宝）的 UI 组件
- ❖ 非常适合 PC 端互联网应用程序

# 常见的 UI 组件库

## Ant Design

下载设计资源

Components(62)

General

Button 按钮

Icon 图标

Layout

Grid 栅格

Layout 布局

Navigation

Affix 固钉

Breadcrumb 面包屑

Dropdown 下拉菜单

### 组件注册

```
import { Button } from 'ant-design-vue';
Vue.use(Button);
```

### 代码演示

Primary Default Dashed  
Danger 按钮 按钮 Link

#### 按钮类型

按钮有五种类型：主按钮、次按钮、虚线按钮、**危险按钮**和链接按钮。主按钮在同一个操作区域最多出现一次。



#### Basic

Cancel OK L M R

L M M R

#### With Icon

< Go back | Go forward > ⏪ ⏩

#### 按钮组合

- ❖ WeUI
- ❖ <https://weui.io/>
- ❖ [https://github.com/Tencent/weui/blob/master/README\\_cn.md](https://github.com/Tencent/weui/blob/master/README_cn.md)
- ❖ 微信官方设计团队为微信内网页和微信小程序量身设计
- ❖ 非常适合移动端互联网应用程序
  
- ❖ VUX
- ❖ <https://vux.li/>
- ❖ WeUI 的非官方 Vue.js 版本

# 常见的 UI 组件库

WeUI

Badge

徽章

新消息提示跟摘要信息后，统一在列表右侧

单行列表

详细信息  >

未读数红点跟在主题信息后，统一在列表左侧



单行列表  >

单行列表  >

详细信息 >

单行列表  >

- ❖ Canvas
- ❖ [https://www.w3schools.com/html/html5\\_canvas.asp](https://www.w3schools.com/html/html5_canvas.asp)
- ❖ HTML 的绘图标签，可以绘制各种矢量图，例如棋盘



The HTML `<canvas>` element is used to draw graphics on a web page.

The graphic to the left is created with `<canvas>`. It shows four elements: a red rectangle, a gradient rectangle, a multicolor rectangle, and a multicolor text.



Google Cloud

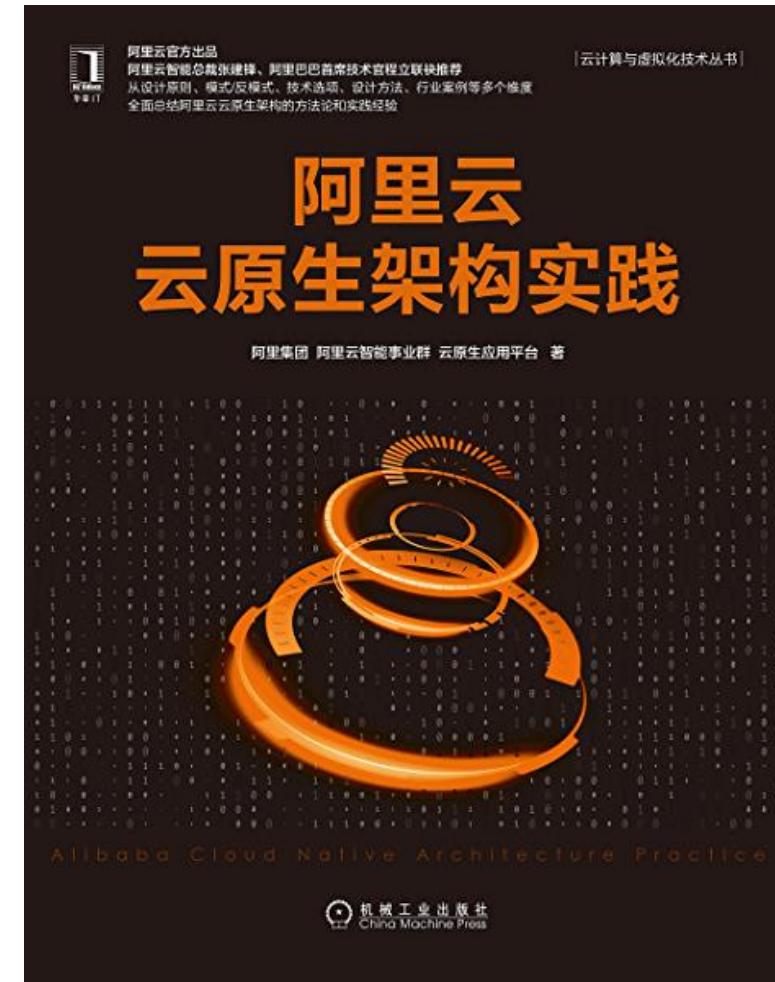
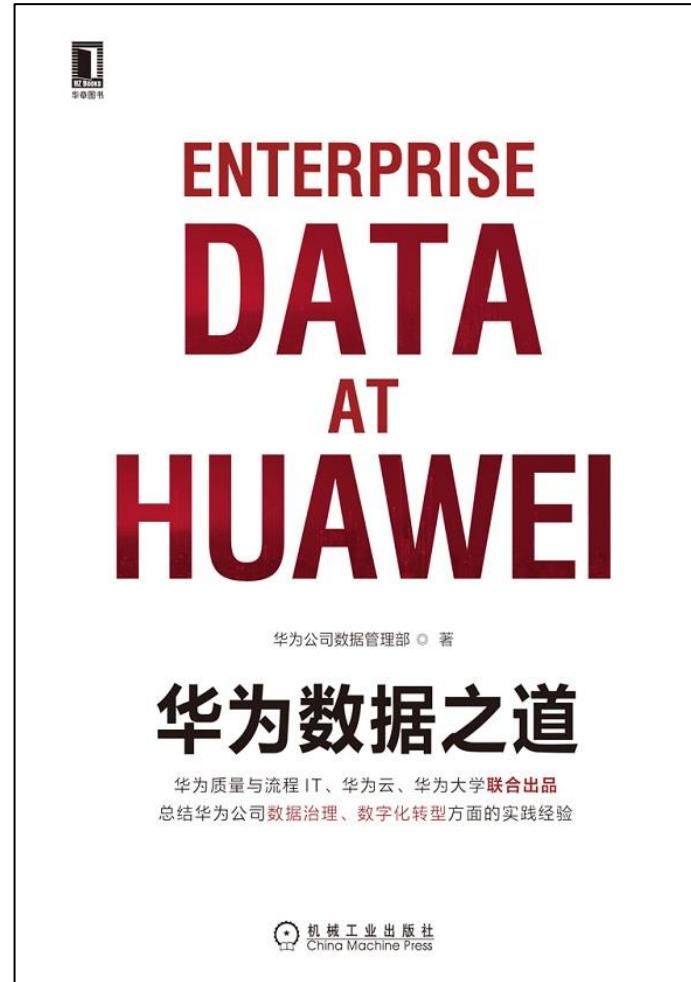
Google Cloud  
[cloud.google.com](http://cloud.google.com)



Amazon Web Services  
[aws.amazon.com](http://aws.amazon.com)



阿里云  
[aliyun.com](http://aliyun.com)



**THANK YOU**