

Node.js基础

课程目标

- 了解nodejs特点和应用场景
- 掌握node模块系统使用
- 掌握基础api使用
 - global
 - process
 - path
 - buffer
 - event
 - fs
 - http
- 实战一个cli工具

NodeJS是什么

node.js是一个异步的事件驱动的JavaScript运行时

<https://nodejs.org/en/>

node.js特性其实是JS的特性：

- [非阻塞I/O](#)
- [事件驱动](#)

node历史 — 为性能而生

并发处理

- 多进程 - C Apache
- 多线程 - java
- 异步IO - js
- 协程 - lua openresty go deno- go TS

下一代Node deno

<https://studygolang.com/articles/13101>

与前端的不同

- JS核心语法不变
- 前端 BOM DOM
- 后端 fs http buffer event os
- 运行node程序

```
// 01-run.js
console.log('hello,node.js!');
console.log('run me use: node 01-runnnode!');
```

运行: `node 01-runnnode.js`

每次修改js文件需重新执行才能生效, 安装nodemon可以监视文件改动, 自动重启:

```
npm i -g nodemon
```

- 调试node程序: Debug - Start Debugging

<https://nodejs.org/en/>

模块(module)

- 使用模块(module)
 - node内建模块

```
// 02-useModule.js
// 内建模块直接引入
const os = require('os')
const mem = os.freemem() / os.totalmem() * 100
console.log(`内存占用率${mem.toFixed(2)}%`)
```

- 第三方模块

<https://www.npmjs.com/>

```
// 同级CPU占用率, 先安装
npm i download-git-repo -s
```

```
// 导入并使用
const download = require('download-git-repo')
download('github:su37josephxia/vue-template', 'test', err => {
  console.log(err ? 'Error' : 'Success')
})
```

- 完善代码

```
const download = require('download-git-repo')
const ora = require('ora')
const process = ora(`下载.....项目`)
process.start()
download('github:su37josephxia/vue-template', 'test', err => {
  if(err){
    process.fail()
  }else{
    process.succeed()
  }
})
```

- promisify

如何让异步任务串行化

```
const repo = 'github:su37josephxia/vue-template'
const desc = '../test'
clone(repo, desc)

async function clone(repo, desc) {
  const { promisify } = require('util');
  const download = promisify(require('download-git-repo'));
  const ora = require('ora');
  const process = ora(`下载项目.....`);
  process.start();
  try {
    await download(repo, desc);
  } catch (error) {
    process.fail()
  }
  process.succeed()
}
```

- 自定义模块：代码分割、复用手段

```
module.exports.clone = async function clone(repo, desc) {
  const ora = require('ora');
  const process = ora(`下载项目 ${repo}`);
  process.start();
  const { promisify } = require('util');
  const download = promisify(require('download-git-repo'));
  try {
    await download(repo, desc)
  } catch (error) {
    process.fail()
  }
  process.succeed()
}

// run
const {clone} = require('./download')
clone()
```

导出内容可以是导出对象的属性

```
// download.js
module.exports.clone = async function()

// 01_run
const {clone} = require('./down')
clone()
```

核心API

- fs - 文件系统

```
// 03-fs.js
const fs = require('fs');

// 同步调用
const data = fs.readFileSync('./conf.js'); //代码会阻塞在这里
console.log(data);

// 异步调用
fs.readFile('./conf.js', (err, data) => {
  if (err) throw err;
  console.log(data);
});
console.log('其他操作');

// fs常常搭配path api使用
const path = require('path')
fs.readFile(path.resolve(path.resolve(__dirname, './app.js')), (err, data) => {
  if (err) throw err;
  console.log(data);
});

// promisify
const {promisify} = require('util')
const readFile = promisify(fs.readFile)
readFile('./conf.js').then(data=>console.log(data))

// fs Promises API node v10
const fsp = require("fs").promises;
fsp
  .readFile("./confs.js")
  .then(data => console.log(data))
  .catch(err => console.log(err));

// async/await
(async () => {
  const fs = require('fs')
  const { promisify } = require('util')
  const readFile = promisify(fs.readFile)
  const data = await readFile('./index.html')
  console.log('data',data)
})();

// 引用方式
Buffer.from(data).toString('utf-8')
```

- Buffer - 用于在 TCP 流、文件系统操作、以及其他上下文中与八位字节流进行交互。八位字节组成的数组，可以有效的在JS中存储二进制数据

```
// 04-buffer.js
// 创建一个长度为10字节以0填充的Buffer
const buf1 = Buffer.alloc(10);
console.log(buf1);

// 创建一个Buffer包含ascii.
// ascii 查询 http://ascii.911cha.com/
const buf2 = Buffer.from('a')
console.log(buf2,buf2.toString())

// 创建Buffer包含UTF-8字节
// UTF-8: 一种变长的编码方案, 使用 1~6 个字节来存储;
// UTF-32: 一种固定长度的编码方案, 不管字符编号大小, 始终使用 4 个字节来存储;
// UTF-16: 介于 UTF-8 和 UTF-32 之间, 使用 2 个或者 4 个字节来存储, 长度既固定又可变。
const buf3 = Buffer.from('Buffer创建方法');
console.log(buf3);

// 写入Buffer数据
buf1.write('hello');
console.log(buf1);

// 读取Buffer数据
console.log(buf3.toString());

// 合并Buffer
const buf4 = Buffer.concat([buf1, buf3]);
console.log(buf4.toString());
```

Buffer类似数组，所以很多数组方法它都有 GBK 转码 iconv-lite

- http: 用于创建web服务的模块

创建一个http服务器

```
const http = require('http');
const server = http.createServer((request, response) => {
  console.log('there is a request');
  response.end('a response from server');
});
server.listen(3000);
```

```
// 打印原型链
function getPrototypeChain(obj) {
  var protoChain = [];
  while (obj = Object.getPrototypeOf(obj)) { // 返回给定对象的原型。如果没有继承属性，则
    返回 null 。

    protoChain.push(obj);
  }
  protoChain.push(null);
  return protoChain;
}
```

显示一个首页

```
const {url, method} = request;
if (url === '/' && method === 'GET') {
  fs.readFile('index.html', (err, data) => {
    if (err) {
      response.writeHead(500, { 'Content-Type': 'text/plain; charset=utf-8'
    });
      response.end('500, 服务器错误');
      return ;
    }
    response.statusCode = 200;
    response.setHeader('Content-Type', 'text/html');
    response.end(data);
  });
} else {
  response.statusCode = 404;
  response.setHeader('Content-Type', 'text/plain; charset=utf-8');
  response.end('404, 页面没有找到');
}
```

编写一个接口

```
else if (url === '/users' && method === 'GET') {
  response.writeHead(200, { 'Content-Type': 'application/json' });
  response.end(JSON.stringify([{name: 'tom', age: 20}, ...]));
}
```

- stream - 是用于与node中流数据交互的接口

```
// 创建输入输出流, 06-stream.js
const rs = fs.createReadStream('./conf.js')
const ws = fs.createWriteStream('./conf2.js')
rs.pipe(ws);

// 二进制友好, 图片操作, 06-stream.js
const rs2 = fs.createReadStream('./01.jpg')
```

```
const ws2 = fs.createWriteStream('./02.jpg')
rs2.pipe(ws2);

//响应图片请求, 05-http.js
const {url, method, headers} = request;

else if (method === 'GET' && headers.accept.indexOf('image/*') !== -1) {
  fs.createReadStream('.'+url).pipe(response);
}
```

Accept代表发送端（客户端）希望接受的数据类型。比如：Accept: text/xml; 代表客户端希望接受的数据类型是xml类型。

Content-Type代表发送端（客户端|服务器）发送的实体数据的数据类型。比如：Content-Type: text/html; 代表发送端发送的数据格式是html。

二者合起来，Accept:text/xml; Content-Type:text/html，即代表希望接受的数据类型是xml格式，本次请求发送的数据的数据格式是html。

- 工具链

```
mkdir vue-auto-router-cli
cd vue-auto-router-cli
npm init -y
```

```
# bin/kkb
console.log('cli.....')

# package.json
"bin": {
  "kkb": "./bin/kkb"
},
```

```
npm link
```

```
# 删除的情况
ls /usr/local/bin/
rm /usr/local/bin/kkb
```

// 引入commander

kkb文件

```
#!/usr/bin/env node
const program = require('commander')
program.version(require('../package').version, '-v', '--version')
  .command('init <name>', 'init project')
  .command('refresh','refresh routers...')
program.parse(process.argv)
```

kkb-init

```
#!/usr/bin/env node
const program = require('commander')
program
  .action(name => {
    console.log('init ' + name)
  })
program.parse(process.argv)
```

/lib/download.js

```
const {promisify} = require('util')
module.exports.clone = async function(repo,desc) {
  const download = promisify(require('download-git-repo'))
  const ora = require('ora')
  const process = ora(`下载.....${repo}`)
  process.start()
  await download(repo, desc)
  process.succeed()
}
```

kkb-init

```
const {clone} = require('../lib/download')
console.log('🔗创建项目: ' + name)
await clone('github:su37josephxia/vue-template',name)
```

kkb-refresh

```
#!/usr/bin/env node

const program = require('commander')
const symbols = require('log-symbols')
const chalk = require('chalk')
```



```

// console.log(process.argv)
program
  .action(() => {
    console.log('refresh .... ')
  })
program.parse(process.argv)

const fs = require('fs')
const handlebars = require('handlebars')

const list =
  fs.readdirSync('./src/views')
  .filter(v => v !== 'Home.vue')
  .map(v => ({
    name: v.replace('.vue', '').toLowerCase(),
    file: v
  }))

compile({
  list
}, './src/router.js', './template/router.js.hbs')

compile({
  list
}, './src/App.vue', './template/App.vue.hbs')

function compile(meta, filePath, templatePath) {
  if (fs.existsSync(templatePath)) {
    const content = fs.readFileSync(templatePath).toString();
    const result = handlebars.compile(content)(meta);
    fs.writeFileSync(filePath, result);
  }
  console.log(symbols.success, chalk.green(`👉${filePath} 创建成功`))
}

```

- 发布npm

```

#!/usr/bin/env bash
npm config get registry # 检查仓库镜像库
npm config set registry=http://registry.npmjs.org
echo '请进行登录相关操作: '
npm login # 登陆
echo "-----publishing-----"
npm publish # 发布
npm config set registry=https://registry.npm.taobao.org # 设置为淘宝镜像
echo "发布完成"
exit

```