

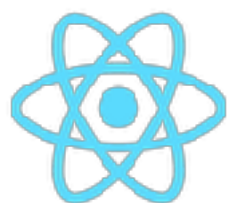
# 前端异常监控

stefanzan@Fundebug

2018.06.09

# 为什么需要？

- 单页面应用的流行



- 体验至上



- 敏捷开发



# 思维方式的转变

## 机械思维

初始条件确定未来结果  
经典力学

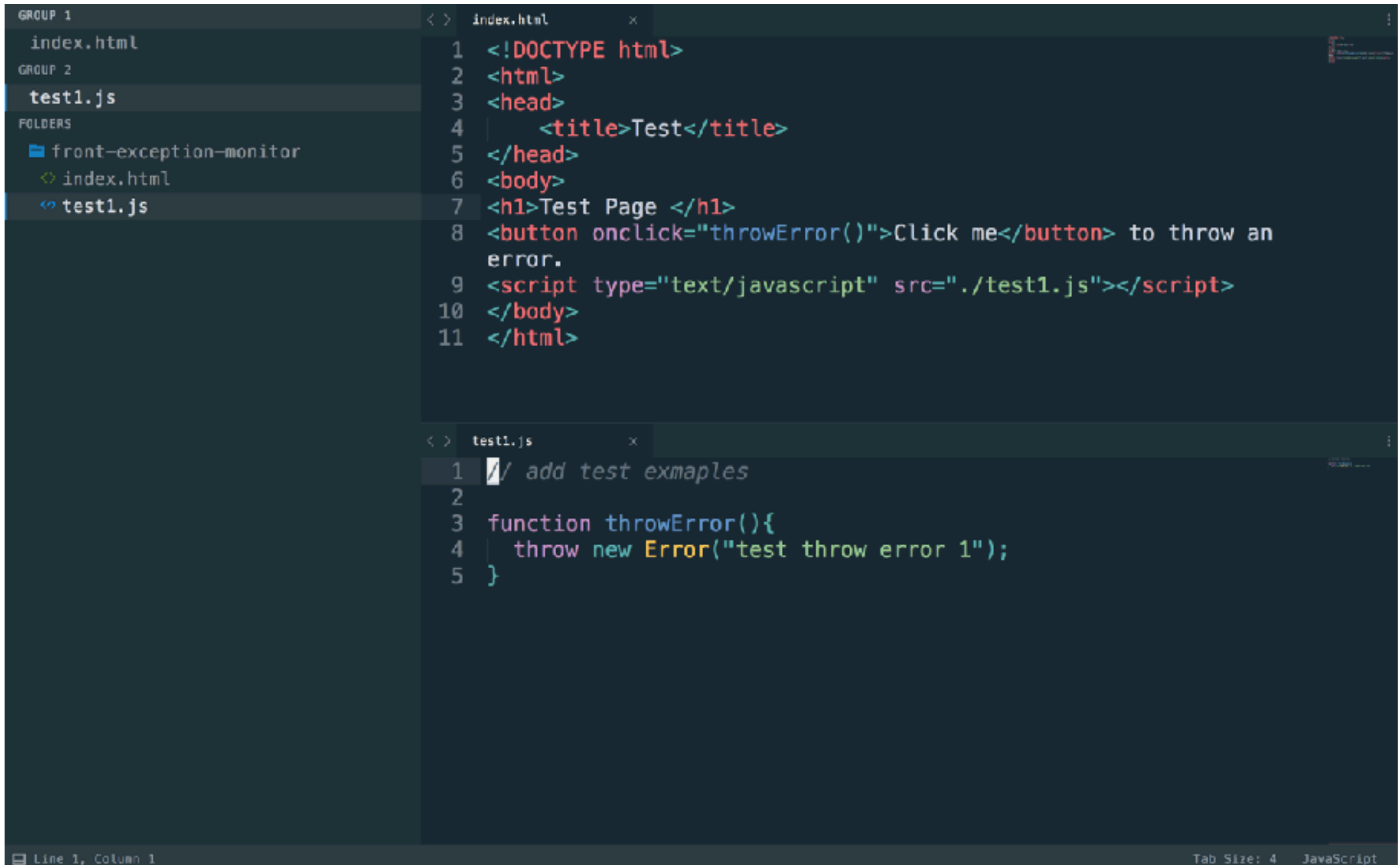
## 控制论思维

根据反馈不断调整  
制导系统



# Bug-driven Software Development

# 简单例子



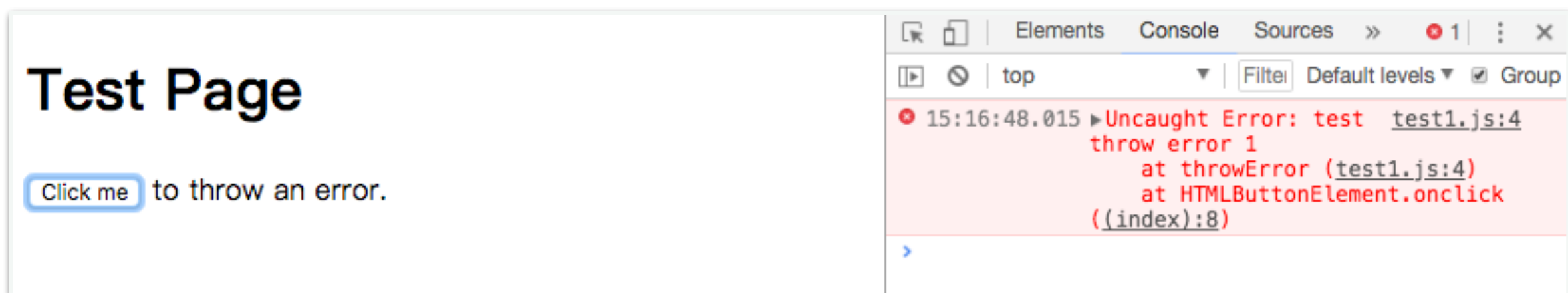
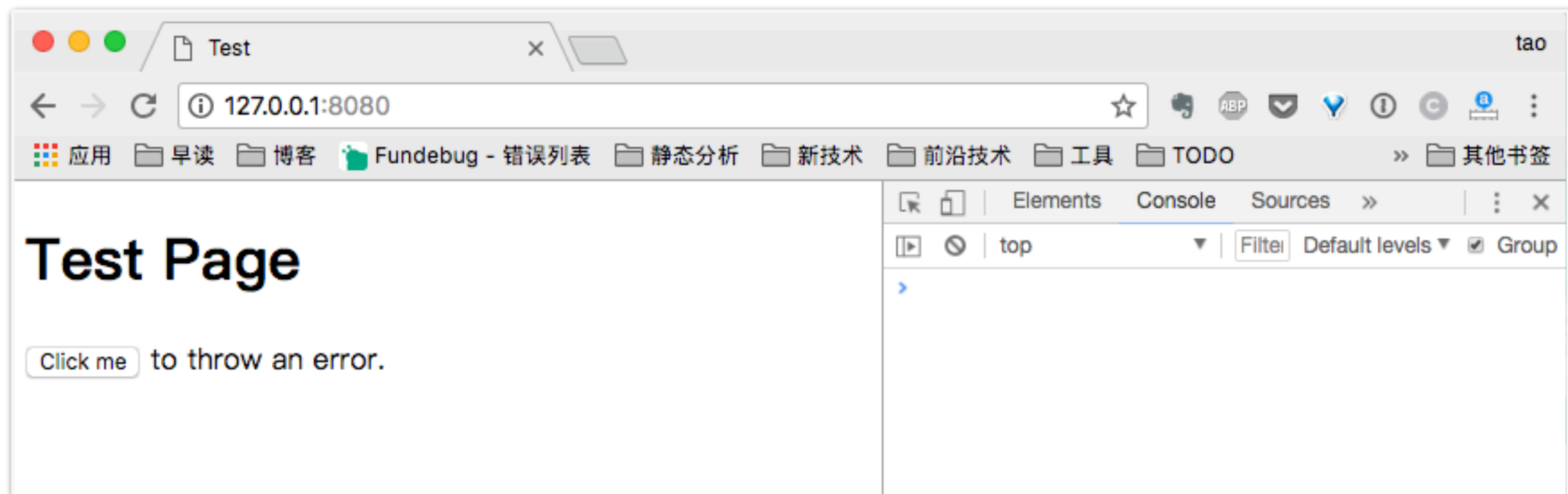
```
GROUP 1
index.html
GROUP 2
test1.js
FOLDERS
front-exception-monitor
index.html
test1.js

1 <!DOCTYPE html>
2 <html>
3 <head>
4   <title>Test</title>
5 </head>
6 <body>
7   <h1>Test Page </h1>
8   <button onclick="throwError()">Click me</button> to throw an
  error.
9   <script type="text/javascript" src="./test1.js"></script>
10 </body>
11 </html>

1 // add test exmaples
2
3 function throwError(){
4   throw new Error("test throw error 1");
5 }
```

Line 1, Column 1 Tab Size: 4 JavaScript

```
stefanzan@stefanzan-Macbook ~/Desktop/temp/front-exception-monitor http-server
Starting up http-server, serving ./
Available on:
  http://127.0.0.1:8080
  http://10.11.7.129:8080
  http://192.168.59.1:8080
```



# window.onerror

`error` 事件的`事件处理程序`。针对各种目标的不同类型的错误触发了 Error 事件：

- 当JavaScript运行时错误（包括语法错误）发生时，`window`会触发一个`ErrorEvent`接口的`error`事件，并执行`window.onerror()`。
- 当一项资源（如`<img>`或`<script>`）加载失败，加载资源的元素会触发一个`Event`接口的`error`事件，并执行该元素上的`onerror()`处理函数。这些error事件不会向上冒泡到window，不过（至少在Firefox中）能被单一的`window.addEventListener`捕获。

加载一个全局的`error`事件处理函数可用于自动收集错误报告。

# window.onerror

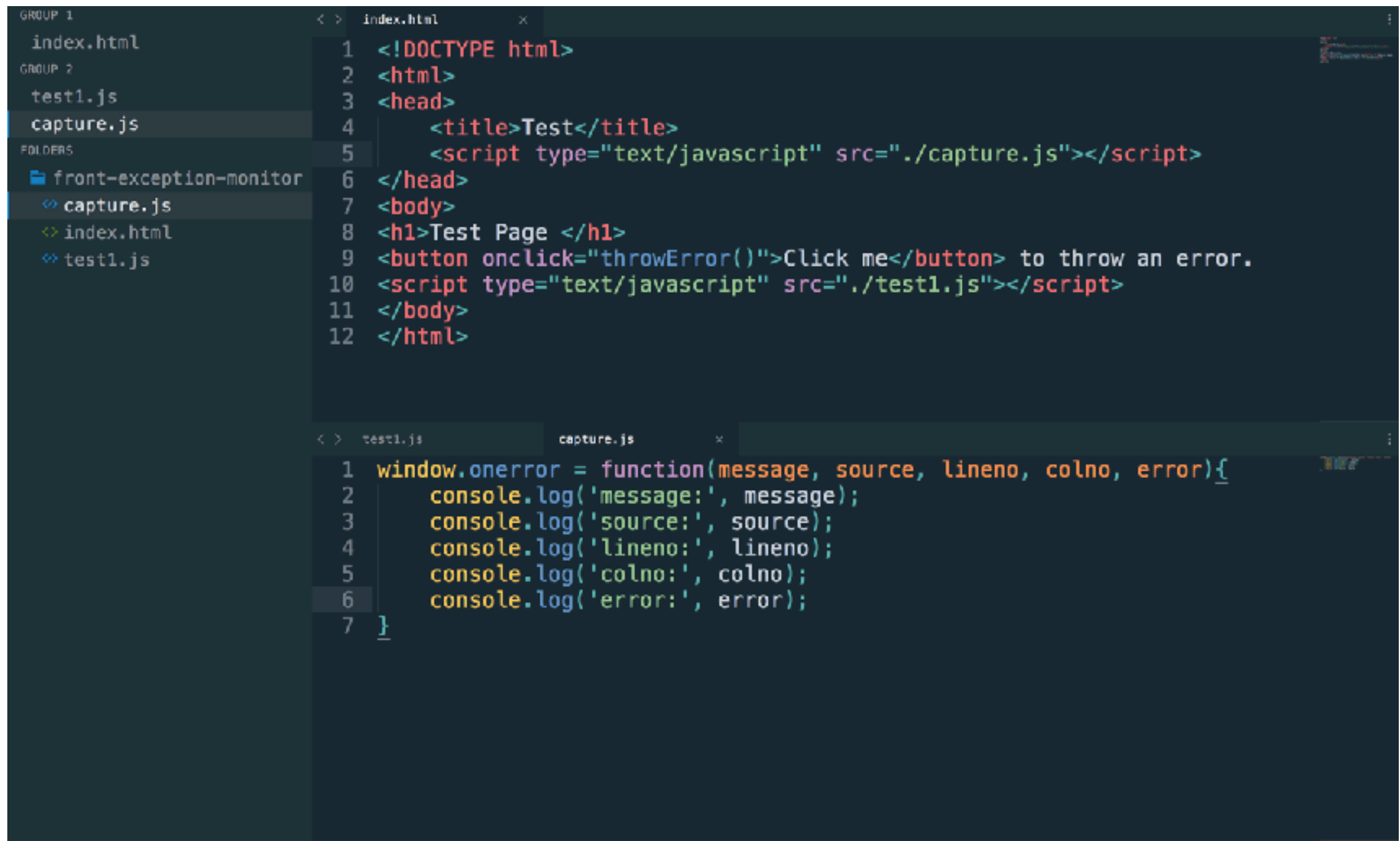
```
1 | window.onerror = function(message, source, lineno, colno, error) { ... }
```

函数参数：

- `message`：错误信息（字符串）。可用于HTML `onerror=""` 处理程序中的 `event`。
- `source`：发生错误的脚本URL（字符串）
- `lineno`：发生错误的行号（数字）
- `colno`：发生错误的列号（数字）
- `error`：Error对象（对象）



# 自定义onerror



The screenshot shows a code editor with two files open: `index.html` and `test1.js`. The `index.html` file contains a basic HTML structure with a title "Test" and a button that calls `throwError()` when clicked. The `test1.js` file defines a custom `onerror` handler for the window object, which logs error details to the console.

```
GROUP 1
index.html
GROUP 2
test1.js
capture.js
FOLDERS
front-exception-monitor
capture.js
index.html
test1.js

1 <!DOCTYPE html>
2 <html>
3 <head>
4   <title>Test</title>
5   <script type="text/javascript" src="./capture.js"></script>
6 </head>
7 <body>
8 <h1>Test Page </h1>
9 <button onclick="throwError()">Click me</button> to throw an error.
10 <script type="text/javascript" src="./test1.js"></script>
11 </body>
12 </html>

test1.js
capture.js

1 window.onerror = function(message, source, lineno, colno, error){
2   console.log('message:', message);
3   console.log('source:', source);
4   console.log('lineno:', lineno);
5   console.log('colno:', colno);
6   console.log('error:', error);
7 }
```

# 测试

## Test Page

Click me to throw an error.

Elements Console Sources Network Performance Memory » 1

top Filter Default levels Group similar

15:26:06.817 message: Uncaught Error: test throw error 1 capture.js:2

15:26:06.820 source: http://127.0.0.1:8080/test1.js capture.js:3

15:26:06.820 lineno: 4 capture.js:4

15:26:06.821 colno: 9 capture.js:5

15:26:06.821 error: Error: test throw error 1 capture.js:6  
at throwError (test1.js:4)  
at HTMLButtonElement.onclick ((index):9)

15:26:06.824 Uncaught Error: test throw error 1 test1.js:4  
at throwError (test1.js:4)  
at HTMLButtonElement.onclick ((index):9)

> |

# 数据打包

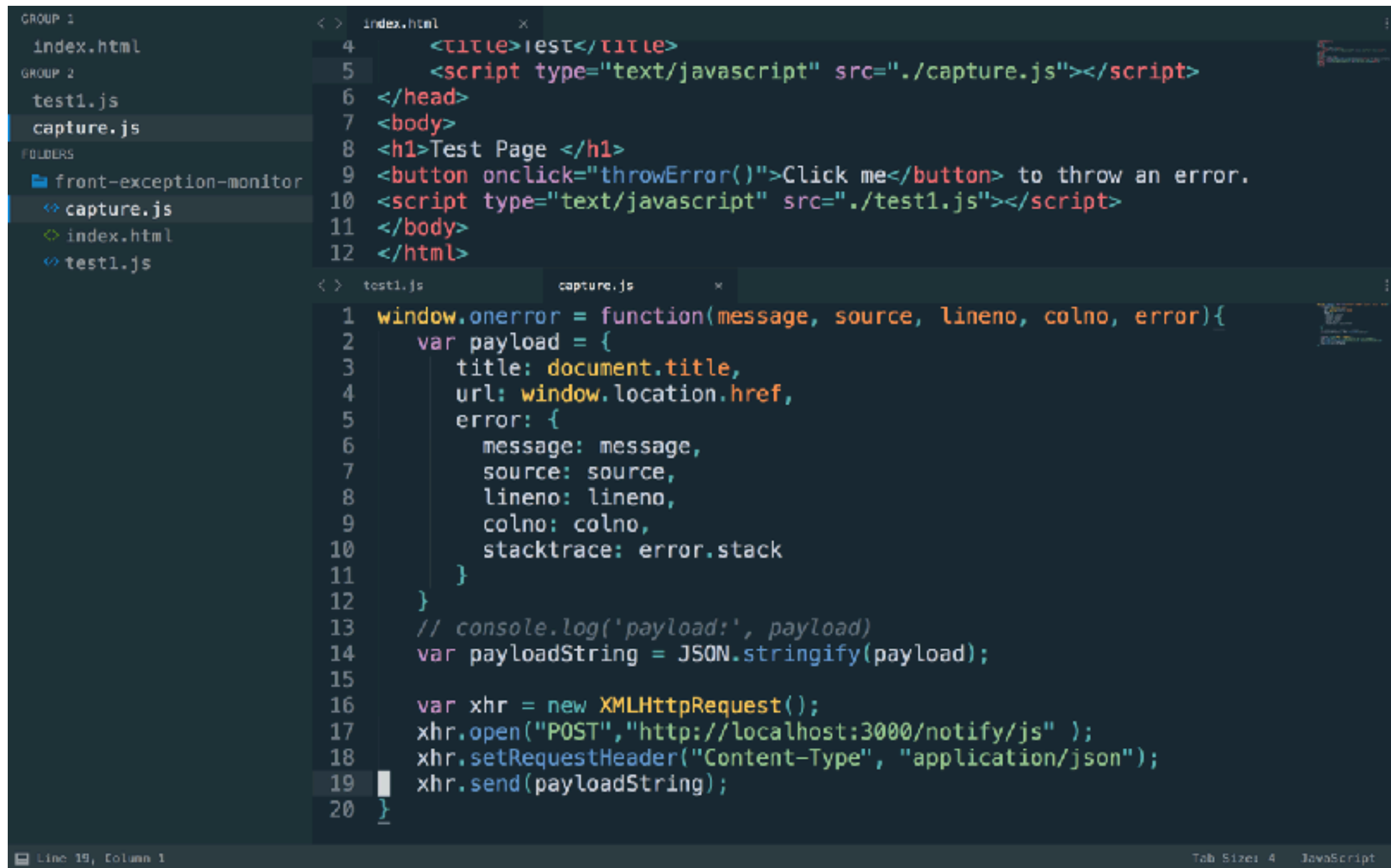
```
GROUP 1
index.html
GROUP 2
test1.js
capture.js
FOLDERS
front-exception-monitor
  capture.js
  index.html
  test1.js

1 <!DOCTYPE html>
2 <html>
3 <head>
4   <title>Test</title>
5   <script type="text/javascript" src="./capture.js"></script>
6 </head>
7 <body>
8 <h1>Test Page </h1>
9 <button onclick="throwError()">Click me</button> to throw an error.
10 <script type="text/javascript" src="./test1.js"></script>
11 </body>
12 </html>

test1.js
capture.js

1 window.onerror = function(message, source, lineno, colno, error){
2   var payload = {
3     title: document.title,
4     url: window.location.href,
5     error: {
6       message: message,
7       source: source,
8       lineno: lineno,
9       colno: colno,
10      stacktrace: error.stack
11    }
12  }
13  console.log('payload:', payload)
14 }
```

# 数据发送



The image shows a code editor with two files open: `index.html` and `test1.js`. The `index.html` file contains a simple HTML structure with a title "Test", a script to load `capture.js`, a body with a heading "Test Page", a button that calls `throwError()` on click, and another script to load `test1.js`. The `test1.js` file contains a JavaScript function `window.onerror` that captures error details (message, source, lineno, colno, error) and sends them via an XMLHttpRequest to `http://localhost:3000/notify/js` with a JSON payload. The status bar at the bottom indicates "Line 19, Column 1" and "JavaScript".

```
GROUP 1
index.html
GROUP 2
test1.js
capture.js
FOLDERS
front-exception-monitor
capture.js
index.html
test1.js

< > index.html x
4 <title>Test</title>
5 <script type="text/javascript" src="./capture.js"></script>
6 </head>
7 <body>
8 <h1>Test Page </h1>
9 <button onclick="throwError()">Click me</button> to throw an error.
10 <script type="text/javascript" src="./test1.js"></script>
11 </body>
12 </html>

< > test1.js capture.js x
1 window.onerror = function(message, source, lineno, colno, error){
2   var payload = {
3     title: document.title,
4     url: window.location.href,
5     error: {
6       message: message,
7       source: source,
8       lineno: lineno,
9       colno: colno,
10      stacktrace: error.stack
11    }
12  }
13  // console.log('payload:', payload)
14  var payloadString = JSON.stringify(payload);
15
16  var xhr = new XMLHttpRequest();
17  xhr.open("POST", "http://localhost:3000/notify/js" );
18  xhr.setRequestHeader("Content-Type", "application/json");
19  xhr.send(payloadString);
20 }
```

Line 19, Column 1 Tab Size: 4 JavaScript

# 打造一个简单的服务器

```
OPEN FILES
index.js
FOLDERS
  excep-server
  node_modules
  index.js
  package-lock.json
  package.json

1 var express = require('express')
2 var app = express()
3 var bodyParser = require('body-parser')
4
5 app.use(bodyParser.json())
6 app.use(function(req, res, next)
7 {
8   res.header("Access-Control-Allow-Origin", "*");
9   res.header("Access-Control-Allow-Headers", "Content-Type");
10  res.header("Access-Control-Allow-Methods", "GET, POST, PUT, DELETE");
11  next();
12 });
13
14 app.post('/notify/js', function (req, res) {
15   console.log(req.body);
16   res.status(200).send();
17 })
18
19 app.listen(3000, () => console.log('listening on port 3000!'))
```

```
stefanzan@stefanzan-Macbook ~/Desktop/temp/excep-server$ node index.js
Listening on port 3000!
{ title: 'Test',
  url: 'http://127.0.0.1:8080/',
  error:
   { message: 'Uncaught Error: test throw error 1',
     source: 'http://127.0.0.1:8080/test1.js',
     lineno: 4,
     colno: 9,
     stacktrace: 'Error: test throw error 1\n    at throwError (http://127.0.0.1:8080/test1.js:4:9)\n    at HTMLButtonElement.onclick (http://127.0.0.1:8080/:9:32)' } }
```

就这么简单？

# 继续

- 兼容性
- Promise Error
- 跨域
- 压缩代码报错看不懂

# 兼容性

- 新旧版本问题
  - 老版本的Firefox木有columnNumber 和error参数
  - 老版本的IE木有JSON对象
- 浏览器众多
  - 同一个属性名在不同浏览器的含义不同
  - 同一个属性在不同浏览器的名称不同
- 报错内容不同: can not find variable xxx与xxx is not defined

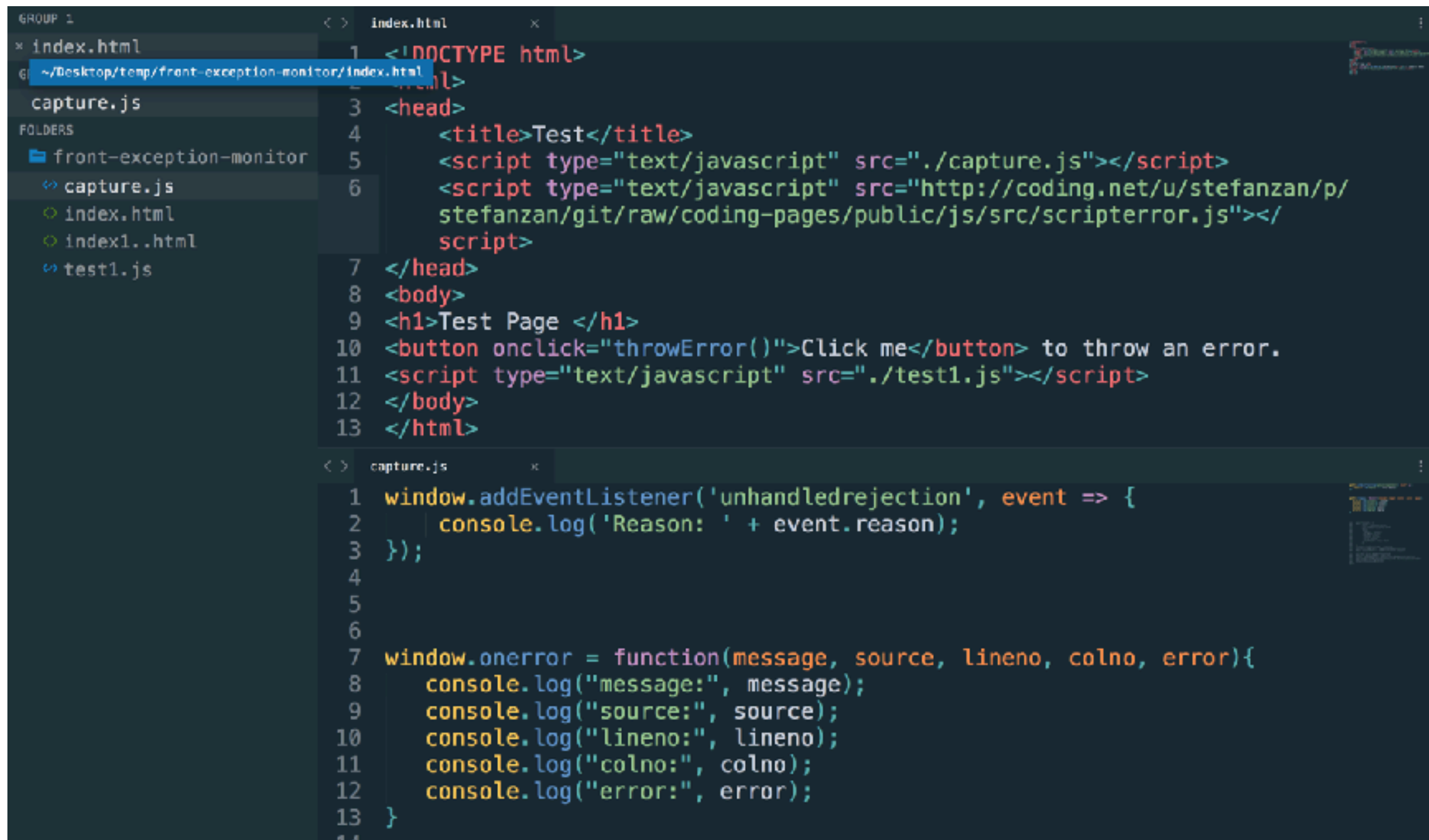


# Promise

`Promise.then().catch()`

```
window.addEventListener('unhandledrejection', event => {  
  console.log('Reason: ' + event.reason);  
});
```

# Script error.



The image shows a code editor with two files open: `index.html` and `capture.js`. The `index.html` file contains an HTML document with a title "Test", a button that calls `throwError()` on click, and a script that loads `test1.js`. The `capture.js` file contains JavaScript code to listen for unhandled rejections and errors, logging their details to the console.

```
GROUP 1
< > index.html x
x index.html
G ~/Desktop/temp/front-exception-monitor/index.html
capture.js
FOLDERS
  front-exception-monitor
    capture.js
    index.html
    index1..html
    test1.js

1 <!DOCTYPE html>
2 <html>
3 <head>
4   <title>Test</title>
5   <script type="text/javascript" src="./capture.js"></script>
6   <script type="text/javascript" src="http://coding.net/u/stefanzan/p/
  stefanzan/git/raw/coding-pages/public/js/src/scripterror.js"></
  script>
7 </head>
8 <body>
9 <h1>Test Page </h1>
10 <button onclick="throwError()">Click me</button> to throw an error.
11 <script type="text/javascript" src="./test1.js"></script>
12 </body>
13 </html>

< > capture.js x
1 window.addEventListener('unhandledrejection', event => {
2   console.log('Reason: ' + event.reason);
3 });
4
5
6
7 window.onerror = function(message, source, lineno, colno, error){
8   console.log("message:", message);
9   console.log("source:", source);
10  console.log("lineno:", lineno);
11  console.log("colno:", colno);
12  console.log("error:", error);
13 }
14
```

# Script error.

## Test Page

[Click me](#) to throw an error.

🔍 📄 Elements Console Sources Network Performance Memory Application Security Audits AdBlock Plus 1 🔍 ✕

📄 🕒 top ▼ Filter Default levels ▾ 📁 Group similar ⚙️

20:15:05.308 message: Script error.	<a href="#">capture.js:8</a>
20:15:05.312 source:	<a href="#">capture.js:9</a>
20:15:05.312 lineno: 0	<a href="#">capture.js:10</a>
20:15:05.313 colno: 0	<a href="#">capture.js:11</a>
20:15:05.313 error: null	<a href="#">capture.js:12</a>

# 同源策略

- 同源策略 (Same origin policy)

“两个页面具有相同的**协议**、**端口**和**域名**”

给定https://fundebug.com/app.js:

网址	是否同源	原因
https://fundebug.com/vendor.js	是	
http://fundebug.com/vendor.js	否	协议不同
https://fundebug.com:8001/app.js	否	端口不同
https://docs.fundebug.com/nav.js	否	子域名不同
https://kiwenlau.com/totop.js	否	域名不同

- 为啥要有同源策略?

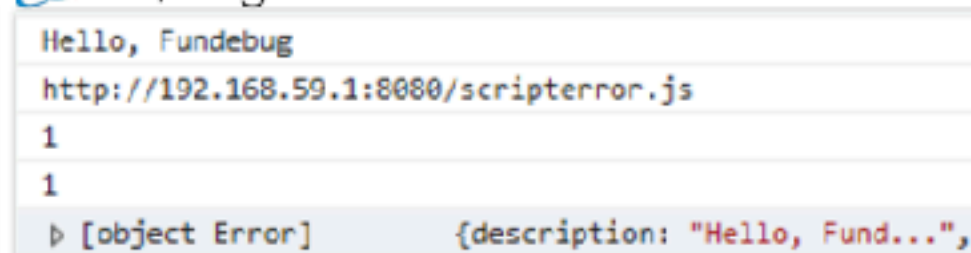
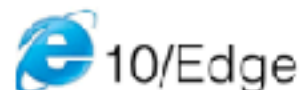
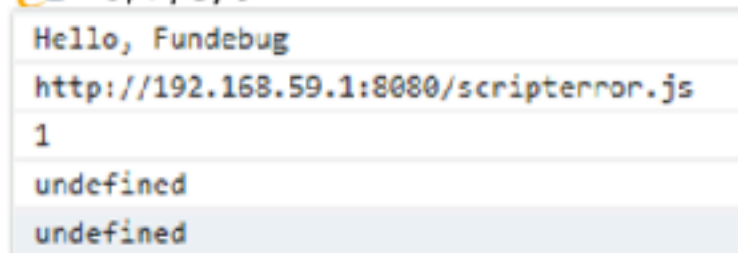
如果没有同源策略，不同网站之间数据能获取，危险！

# 为啥出现Script error.

```
bool ScriptExecutionContext::dispatchErrorEvent(const String& errorMessage,
int lineNumber,
const String& sourceURL)
{
    EventTarget* target = errorEventTarget();
    if (!target)
        return false;
    ...
    if (securityOrigin()->canRequest(targetUrl)) {
        message = errorMessage;
        line = lineNumber;
        sourceName = sourceURL;
    } else {
        message = "Script error.";
        sourceName = String();
        line = 0;
    }
    ...
}
```

# 测试

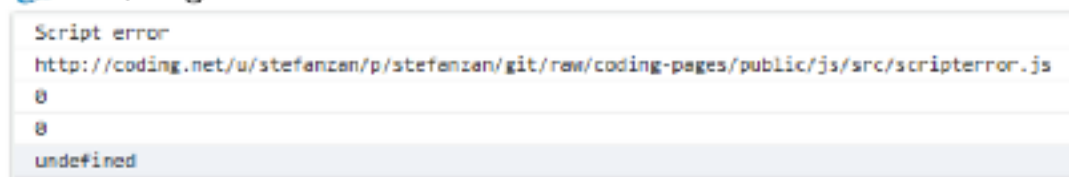
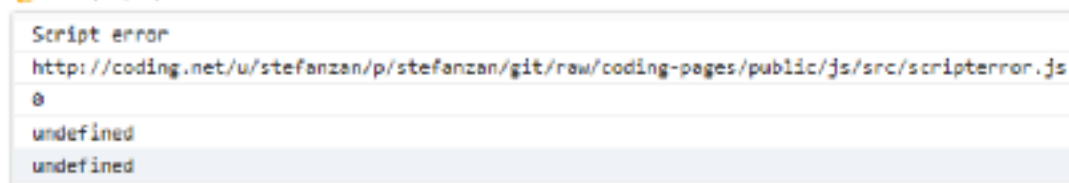
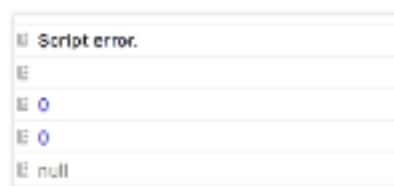
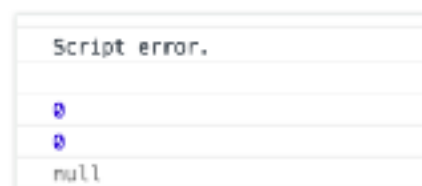
- 本地直接打开



# 测试

- JS代码托管到七牛云

```
<script type="text/javascript" src="https://og6593g2z.qnssl.com/scripterror.js"></script>
```



Error: Hello, Fundebug

"http://coding.net/u/stefanzan/p/stefanzan/git/raw/coding-pages/public/js/src/scripterror.js"

1

7

Error: Hello, Fundebug

堆栈跟踪:

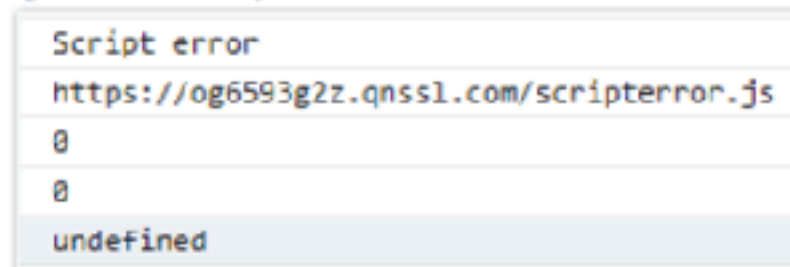
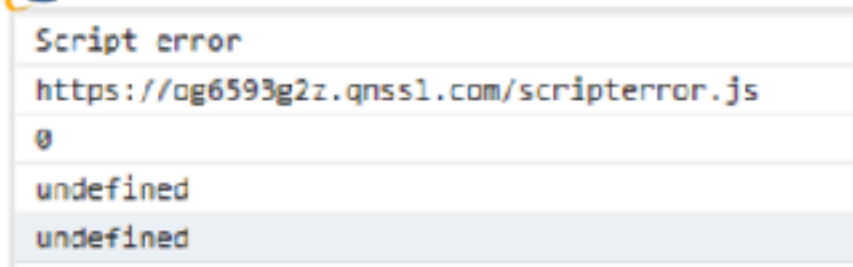
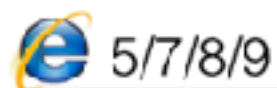
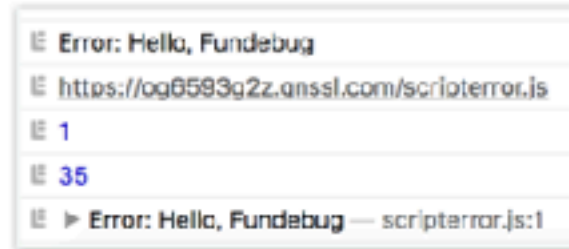
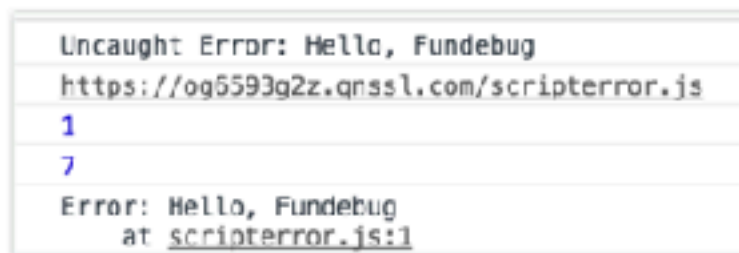
@http://coding.net/u/stefanzan/p/stefanzan/git/raw/coding-pages/public/js/src/scripterror.js:1:7



# 测试

- JS代码托管到七牛云

```
<script type="text/javascript" src="https://og6593g2z.qnssl.com/scripterror.js" crossorigin="anonymous"></script>
```





# Script error.解法

## 1. 添加 crossorigin="anonymous" 到script标签

```
<script src="https://xxx.com/xxx.js" crossorigin="anonymous"></script>
```

## 2. 返回header添加支持跨域访问的设置

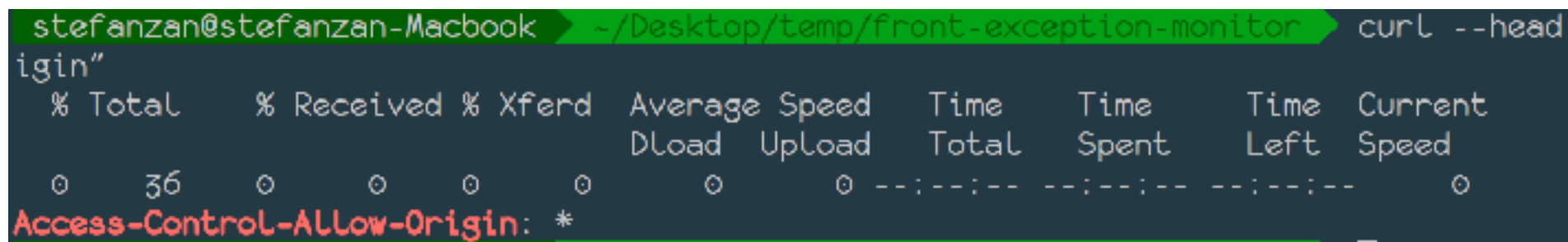
Access-Control-Allow-Origin: \*

### 2.1 Express配置

```
app.use(function(req, res, next)
{
  res.header("Access-Control-Allow-Origin", "*");
  res.header("Access-Control-Allow-Methods", "GET, POST, PUT, DELETE");
  next();
});
```

### 2.2 七牛云默认已经配置

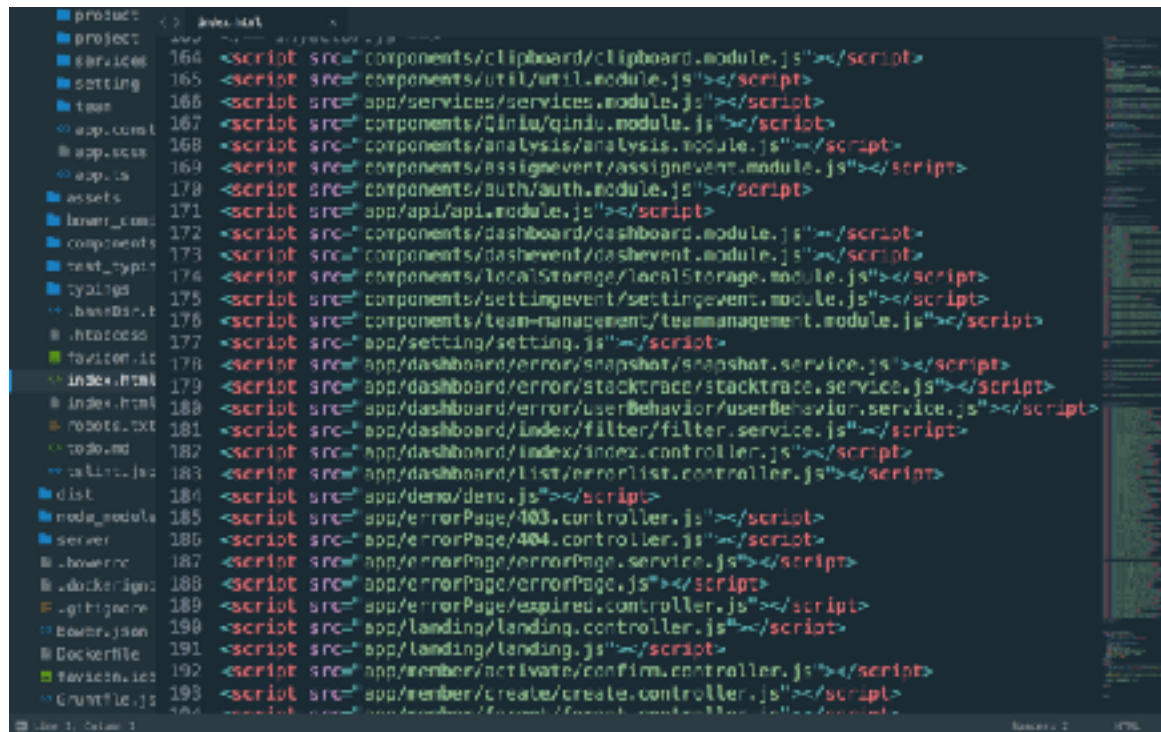
```
curl --head https://og6593g2z.qnssl.com/scripterror.js | grep "Access-Control-Allow-Origin"
```



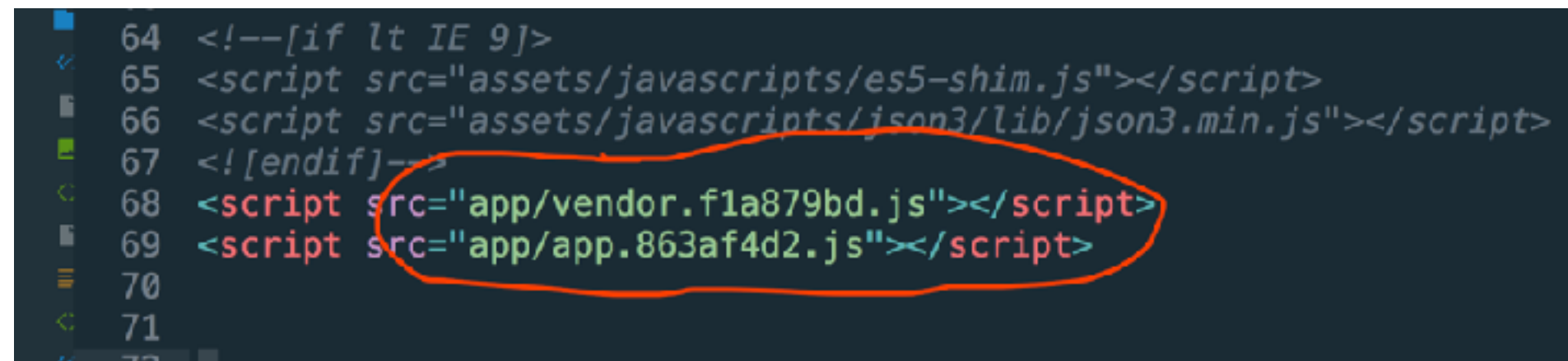
```
stefanzan@stefanzan-Macbook ~/Desktop/temp/front-exception-monitor curl --head
igin"
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           0     36     0     0      0     0      0      0  --:--:-- --:--:-- --:--:--    0
Access-Control-Allow-Origin: *
```

# 模块化与打包

- Grunt, webapck, parcel



```
164 <script src="components/clipboard/clipboard.module.js"></script>
165 <script src="components/util/util.module.js"></script>
166 <script src="app/services/services.module.js"></script>
167 <script src="components/qiniu/qiniu.module.js"></script>
168 <script src="components/analysis/analysis.module.js"></script>
169 <script src="components/assignevent/assignevent.module.js"></script>
170 <script src="components/auth/auth.module.js"></script>
171 <script src="app/api/api.module.js"></script>
172 <script src="components/dashboard/dashboard.module.js"></script>
173 <script src="components/dashevent/dashevent.module.js"></script>
174 <script src="components/localstorage/localstorage.module.js"></script>
175 <script src="components/settingsevent/settingsevent.module.js"></script>
176 <script src="components/teammanagement/teammanagement.module.js"></script>
177 <script src="app/setting/setting.js"></script>
178 <script src="app/dashboard/error/snapshot/snapshot.service.js"></script>
179 <script src="app/dashboard/error/stacktrace/stacktrace.service.js"></script>
180 <script src="app/dashboard/error/userBehavior/userBehavior.service.js"></script>
181 <script src="app/dashboard/index/filter/filter.service.js"></script>
182 <script src="app/dashboard/index/index.controller.js"></script>
183 <script src="app/dashboard/list/errorList.controller.js"></script>
184 <script src="app/demo/demo.js"></script>
185 <script src="app/errorPage/403.controller.js"></script>
186 <script src="app/errorPage/404.controller.js"></script>
187 <script src="app/errorPage/errorPage.service.js"></script>
188 <script src="app/errorPage/errorPage.js"></script>
189 <script src="app/errorPage/expired.controller.js"></script>
190 <script src="app/landing/landing.controller.js"></script>
191 <script src="app/landing/landing.js"></script>
192 <script src="app/member/activate/confirm.controller.js"></script>
193 <script src="app/member/create/create.controller.js"></script>
```



```
64 <!--[if lt IE 9]>
65 <script src="assets/javascripts/es5-shim.js"></script>
66 <script src="assets/javascripts/json3/lib/json3.min.js"></script>
67 <![endif]>
68 <script src="app/vendor.f1a879bd.js"></script>
69 <script src="app/app.863af4d2.js"></script>
70
71
72
```

# 34:19182

堆栈信息



**TypeError** Cannot read property 'getAttribute' of null

at Lc (<https://www.fundebug.com/app/vendor.f1a879bd.js>:34:19182)

```
34      tAttribute(b,c):a[b]=c}function Lc(a,b){return a.getA  
      ttribute?a.getAttribute(b):a[b]}function Mc(a){
```

at gh (<https://www.fundebug.com/app/vendor.f1a879bd.js>:36:4284)

# 压缩代码还原

# 压缩

uglifyjs test1.js -o test1.min.js -c -m --source-map

The screenshot shows a code editor with two panels. The top panel displays the minified JavaScript code in `test1.min.js`, which is a single line of compressed code. The bottom panel displays the generated source map in `test1.min.js.map`, which is a JSON object containing metadata about the original source code. The left sidebar shows the project structure with files like `index.html`, `test1.min.js`, and `test1.min.js.map`.

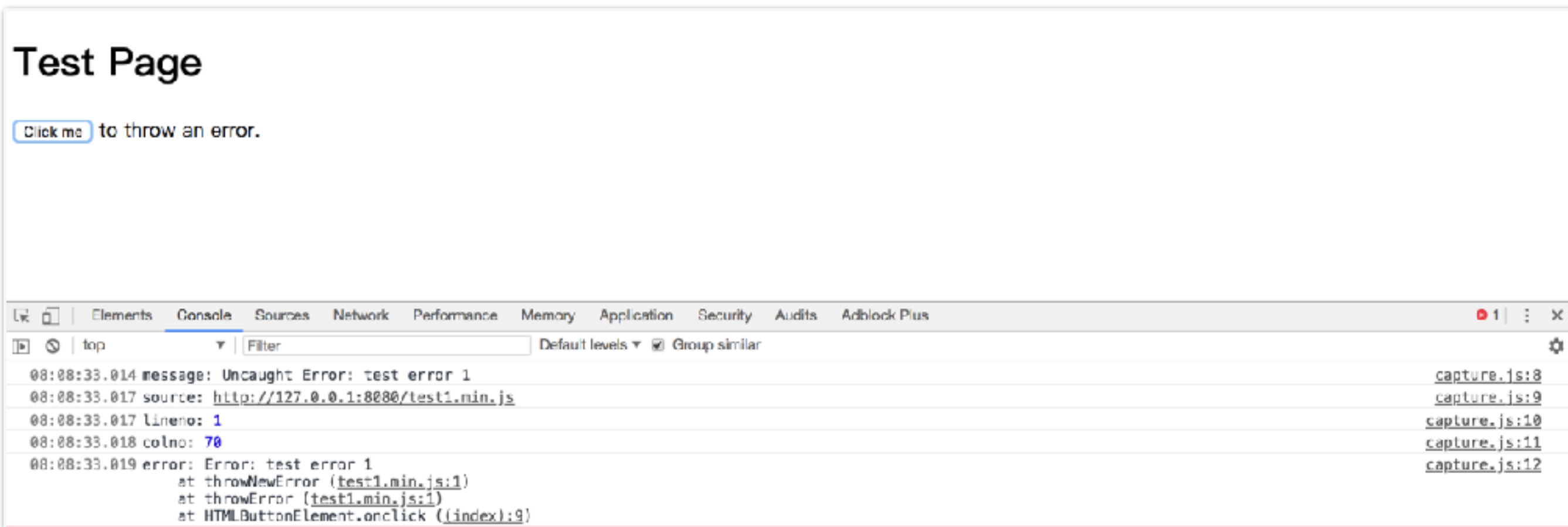
```
GROUP 1
index.html
test1.min.js
GROUP 2
test1.min.js.map
FOLDERS
front-exception-monitor
  capture.js
  index.html
  index1.html
  test1.js
  test1.min.js
  test1.min.js.map

1 function throwError(){throwNewError()}function throwNewError(){throw new
  Error("test error 1")}function foo(){Promise.reject("throw new
  error 2")}

1 {"version":3,"sources":["test1.js"],"names":["throwError","throwNewError",
  "Error","foo","Promise","reject"],"mappings":"AAEA,SAASA,aAELC,gBAIJ,S
  AASA,gBACR,MAAM,IAAIC,MAAM,gBAGjB,SAASC,MACLC,QAAQC,OAAO"}

Line 1, Column 1
Tab Size: 4 Plain Text
```

# 报错效果



# Source-map

## Use on the Web

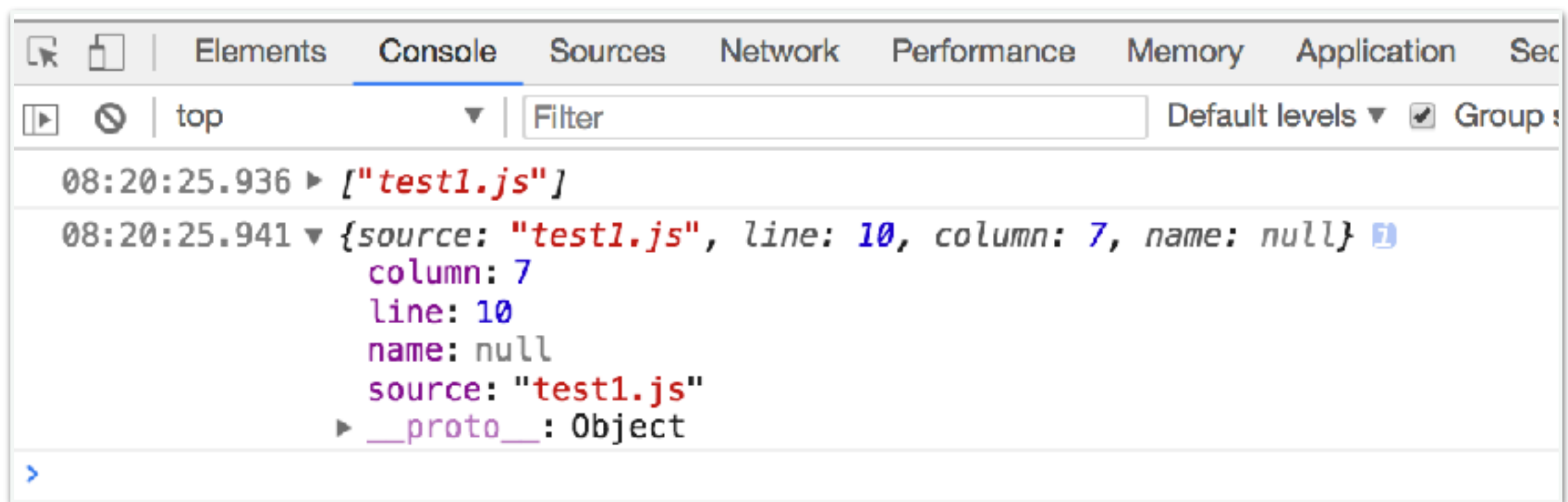
```
<script src="https://unpkg.com/source-map@0.7.3/dist/source-map.js"></script>
<script>
  sourceMap.SourceMapConsumer.initialize({
    "lib/mappings.wasm": "https://unpkg.com/source-map@0.7.3/lib/mappings.wasm"
  });
</script>
```

# 恢复原本位置

```
11 <script src="https://unpkg.com/source-map@0.7.3/dist/source-map.js"></script>
12 <script>
13     sourceMap.SourceMapConsumer.initialize({
14         "lib/mappings.wasm": "https://unpkg.com/source-map@0.7.3/lib/mappings.wasm"
15     });
16 </script>
17 <script type="text/javascript">
18     const rawSourceMap = {
19         "version": 3,
20         "sources": ["test1.js"],
21         "names": ["throwError", "throwNewError", "Error", "foo", "Promise", "reject"],
22         "mappings": "AAEA,SAASA,aAELC,gBAIJ,SAASA,gBACR,MAAM,IAAIC,MAAM,gBAGjB,SAASC,MAC
23         LC,QAAQC,OAAO"
24     };
25     const whatever = sourceMap.SourceMapConsumer.with(rawSourceMap, null, consumer => {
26
27         console.log(consumer.sources);
28         console.log(consumer.originalPositionFor({
29             line: 1,
30             column: 70
31         }));
32         return;
33     });
34 </script>
```



# 执行结果



深化：读取test1.js源代码，结合行号列号，将前后代码连同报错一起展示。

# 回顾

- window.onerror
- Promise Error
- 兼容性
- 跨域
- 压缩代码还原