

# Node.js开发运维常见问题 与解决方案

Tencent server web专解

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Tencent server web 核心开发



# Tencent Server Web

<https://github.com/Tencent/TSW>

<https://tswjs.org>



Tencent Server Web

# 常见问题

开发过程

体验测试

运维监控

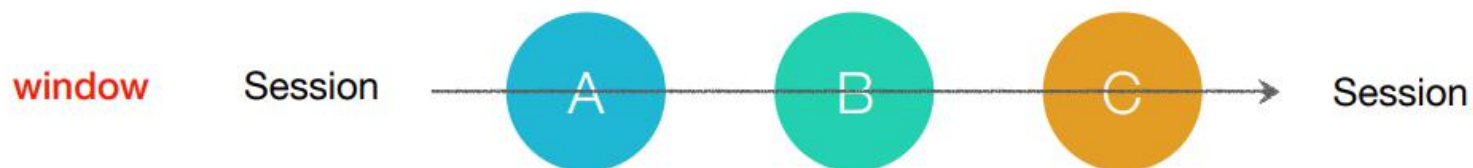
问题定位

# 开发过程

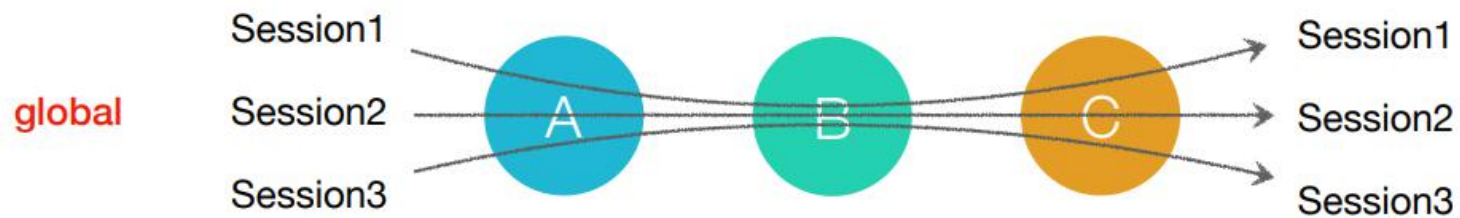
Web跟node的开发习惯迁移，上下文与异常处理

# 开发习惯

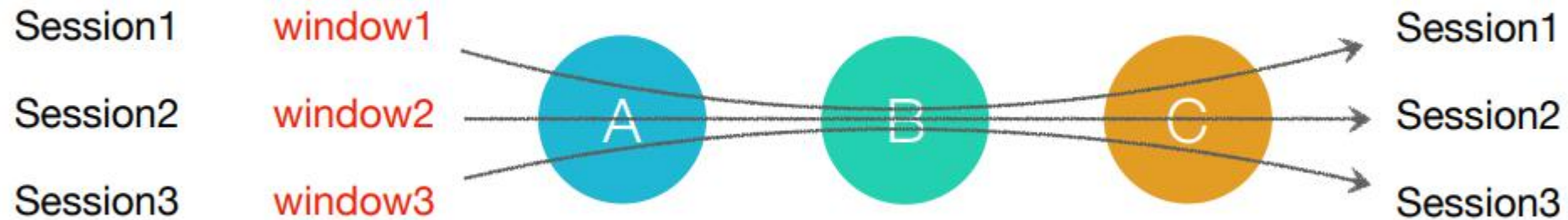
浏览器端：



Node.js端：



# 习惯迁移，上下文



# 举个栗子

```
const printDebugLog = msg => {  
  const uid = window.request.cookies['uid'];  
  if (alpha.isTest(uid)) {  
    logger.info(msg);  
  } else {  
    logger.debug(msg);  
  }  
};
```



# Domain

```
const d = domain.create();  
d.add(req);  
d.add(res);  
d.currentContext = new Context();  
d.currentContext.log = {};  
d.currentContext.SN = ++process.SN;  
d.currentContext.window = new Window();  
d.currentContext.window.request = req;  
d.currentContext.window.response = res;  
d.run(() => {  
    doRoute(req, res);  
});
```

# window

```
this.currentContext = function() {  
    return (process.domain && process.domain.currentContext) || new Context();  
};  
if (!global.context) {  
    Object.defineProperty(global, 'context', {  
        get: function() {  
            return module.exports.currentContext();  
        }  
    });  
    Object.defineProperty(global, 'window', {  
        get: function() {  
            if (global.windowHasDisabled) {  
                return undefined;  
            }  
            const curr = module.exports.currentContext();  
  
            if (!curr.window) {  
                curr.window = new Window();  
            }  
            return curr.window;  
        }  
    });  
}
```

# 异常处理

已发生异常的用户，返回错误页

不影响其他用户访问

异常内容反馈给开发

# 异常捕获

```
domain.on( 'error' , e => {})
```

```
process.on( 'uncaughtException' , e => {});
```

```
process.on( 'warning' , e => {});
```

```
process.on( 'unhandledRejection' , (errorOrReason, curPromise) => {  
    curPromise.domain.run(_ => {sendMail();});  
});
```

# 脚本报错告警



个人主页

应用详情

全息日志

测试环境

实时监控

Runtime



Robinzz(RobinzZH)

退出

Memory 内存超限告警

2018-11-03 23:59:51.618

[IP聚集自动拉黑周知][30%]

2018-11-03 23:59:14.342

Memory 内存超限告警

2018-11-03 23:59:10.168

Error Cannot read property 'findFromMap' of undefined

2018-11-03 23:49:51.127

Error: incorrect header check

2018-11-03 23:32:26.189

# 报错堆栈

Error: require field not exist, tag:0

2018-11-07 23:58:01.687

Error: require field not exist, tag:0

## stack

```
Error: require field not exist, tag:0
    at Taf.JoeInputStream._skipToTag (/data/services/TSW-1.0/bin/deps/taf-stream/libjoe.js:788:24)
    at Taf.JoeInputStream.readInt32 (/data/services/TSW-1.0/bin/deps/taf-stream/libjoe.js:822:14)
    at Function.NS_VipReminderSvrProto.GetReminderRsp._readFrom (s:658:19)
    at Function.NS_VipReminderSvrProto.GetReminderRsp.create (700:50)
    at Object.JoePacker.unpack (/data/services/TSW-1.0/bin/tencent/qzone/webapp/wup/JoeSinglePacker.js:40:43)
    at Object.success (/data/services/TSW-1.0/bin/tencent/qzone/webapp/WebApp.js:434:38)
    at Socket.<anonymous> (/data/services/TSW-1.0/bin/tencent/qzone/webapp/sender/Sender.js:53:40)
    at Socket.emit (events.js:182:13)
    at Socket.EventEmitter.emit (domain.js:460:23)
    at addChunk (_stream_readable.js:283:12)
```

服务器IP:

进程名字: TSW/worker/3

进程ID: 7987

测试环境: 否

是否考核: 否

发送间隔: 600s

请求头:

```
GET /?__biz=0.5260809502114794&g_tk=1602964281&uin=&zoneId=7&sQua=V1_AND_SQ_7.8.8_942_YVB_D&ui=&format=json&inCl
host: h5.qzone.qq.com
x-client-proto: https
x-client-proto-ver: HTTP
x-real-ip:
x-forwarded-for:
accept: application/json
x-requested-with: XMLHttpRequest
user-agent: Mozilla/5.0 (Linux; Android 6.0; Pixel V67A Build/MBAREK; wv) AppleWebKit/537.36 (KHTML, like Gecko) Version/4.0 Chrome/57.0.2987.132 Mobile Safari/5.0 TRS/044306 M-
```

# 体验与测试

如何让用户（产品/测试等）了解开发环境，测试环境，生产环境差别

# 体验、测试

让产品下个fiddler配个host

安装下HTTPS证书

手机怎么办



# 体验、测试

到开发工位体验测试吧,手把手教!

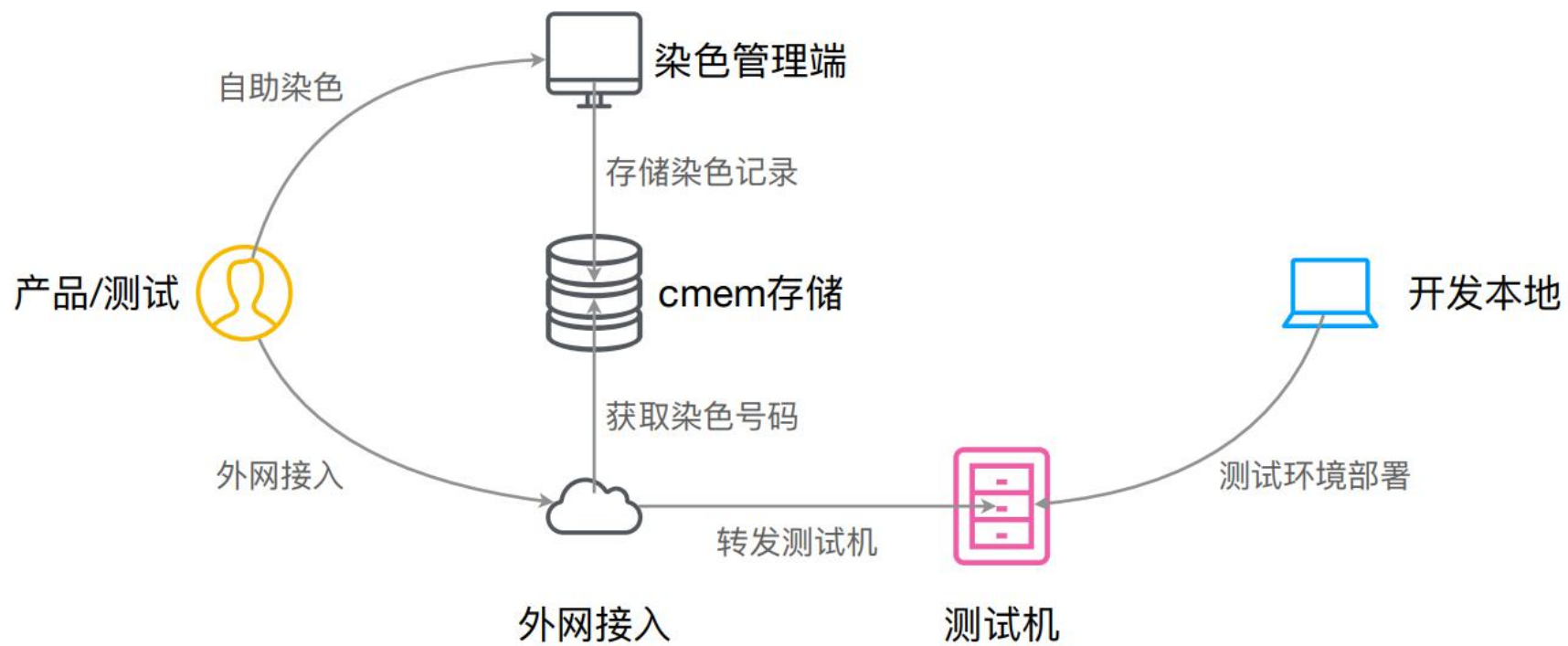
# 理想的运行环境

完成功能模块开发，部署至测试环境，本地继续开发

产品/测试/老板可自行选择外网环境切换到测试环境

体验完成后可退出测试环境

# TSW测试环境



# 染色系统

收到用户端请求

获取用户身份ID

根据染色列表判断用户身份

标注用户身份

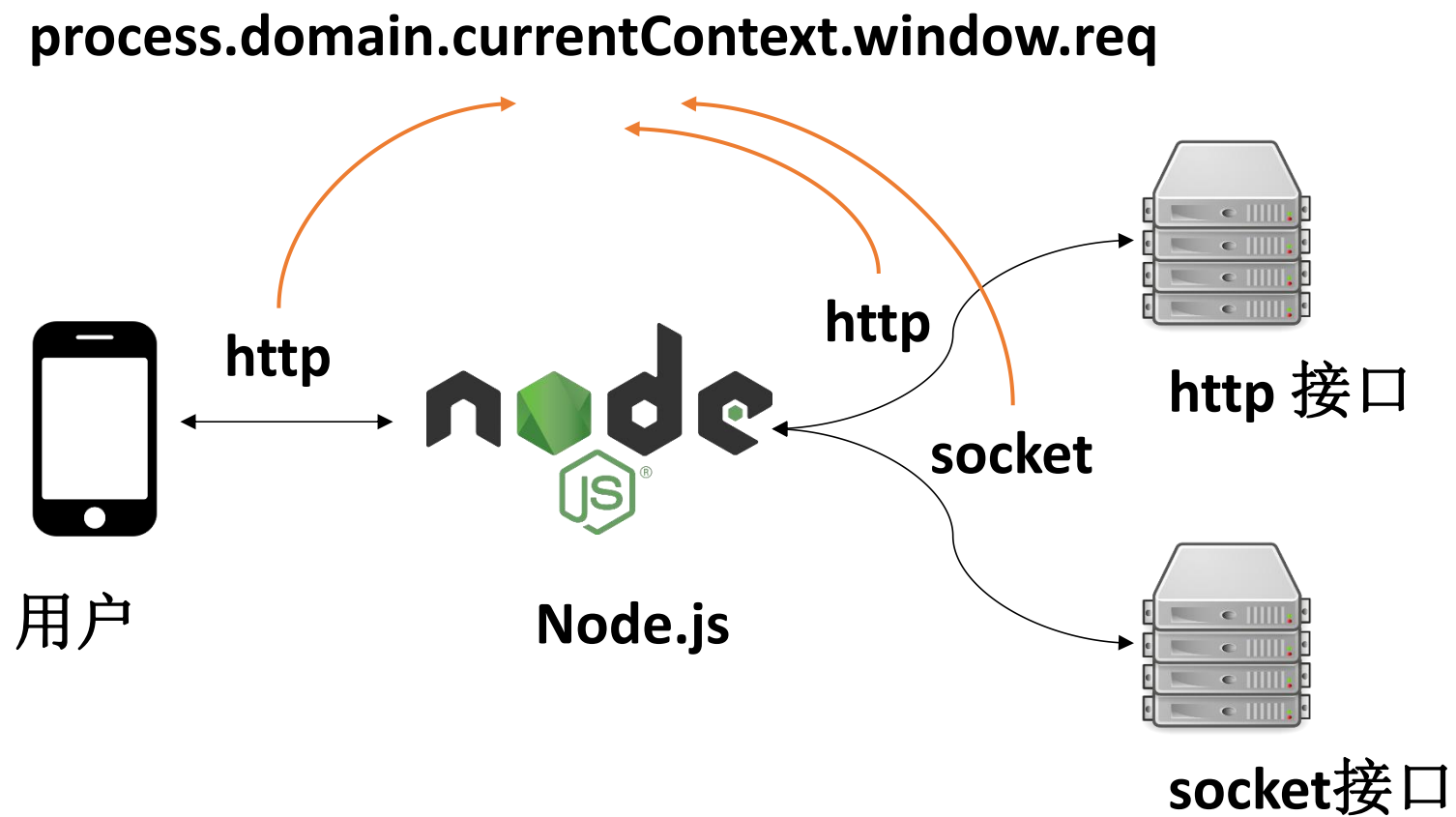
路由到具体业务逻辑

# 染色系统

1. `const d = domain.create()`
2. `d.currentContext = {window: {req: request}};`
3. `d.run(() => {doRoute();})`

1. `global.window = get window() {return process.domain.currentContext.window};`
2. `const request = window.req;`

# 染色系统



# 线上配置

[个人主页](#)[应用详情](#)[全息日志](#)[测试环境](#)[实时监控](#)[Runtime](#)

Robinz(RobinzZH)

[退出](#)

## #1 选择测试环境

[微视前端](#)[QQ空间游戏](#)[QQ空间营收](#)[QQ空间web前端](#)[企鹅FM](#)[预发布](#)[临时染色](#)[alpha](#)[人在家中坐，包从天上来](#)[我是2号，pick me](#)[情侣&小游戏，负责人：](#)[我是3号，pick me](#)[不知道写什么好~。~，负责人：](#)[我是6号，pick me](#)[我是4号，pick me](#)[我是5号，pick me](#)

## #2 输入用户id (支持批量，换行即可)

[添加](#)[删除](#)

# 测试环境服务器标记



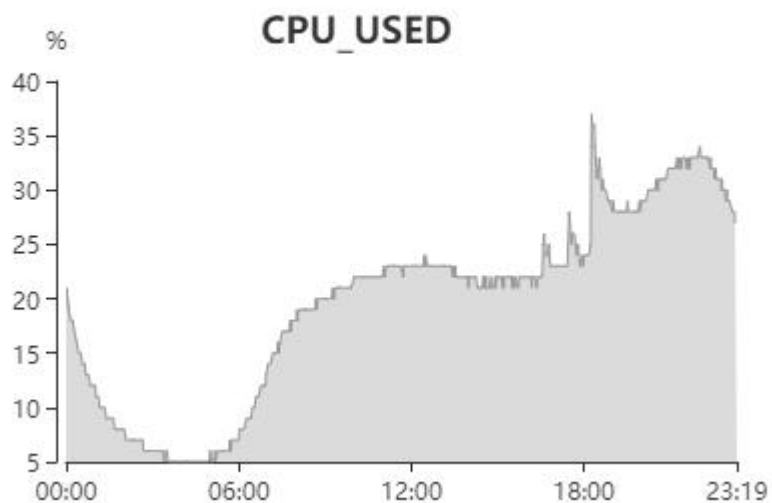


# 上线后运维和监控

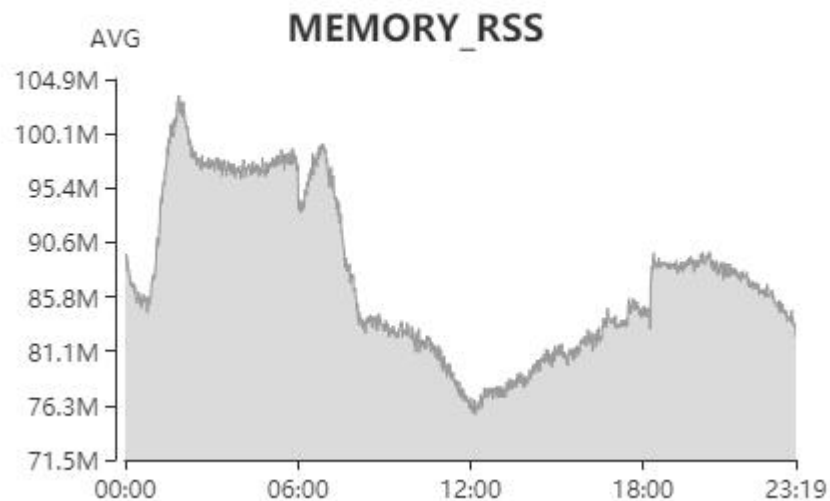
除了运维人员，开发也需要了解应用上线后情况

# 外网运维 - 实时查询服务器状态

CPU

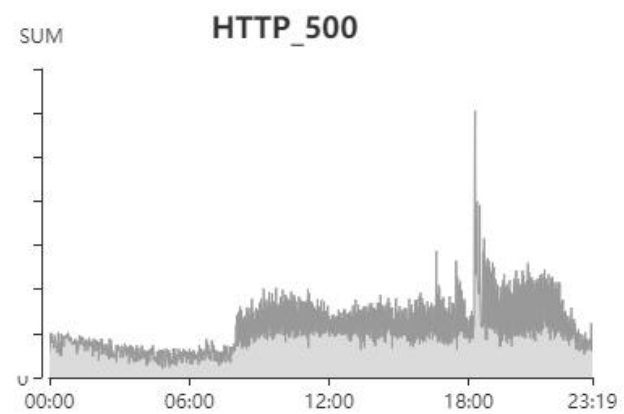
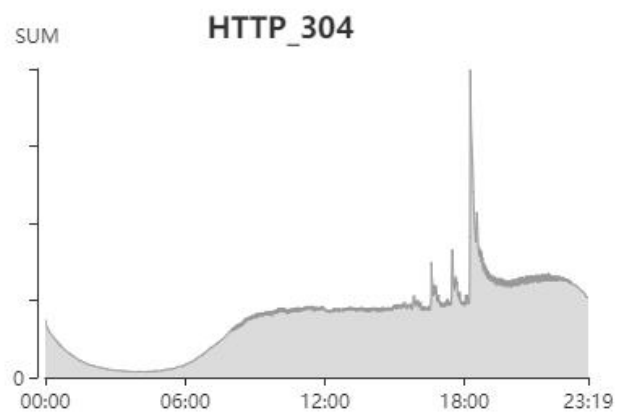
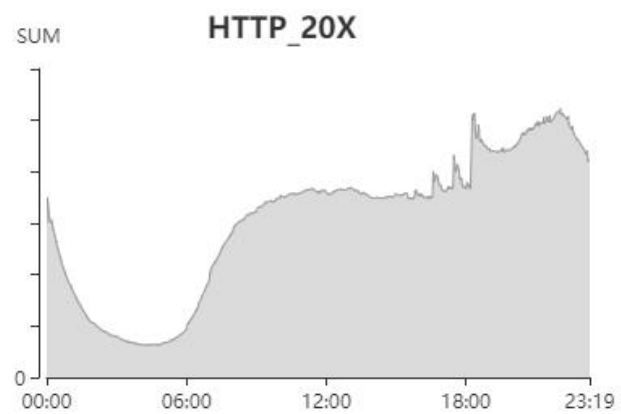


内存

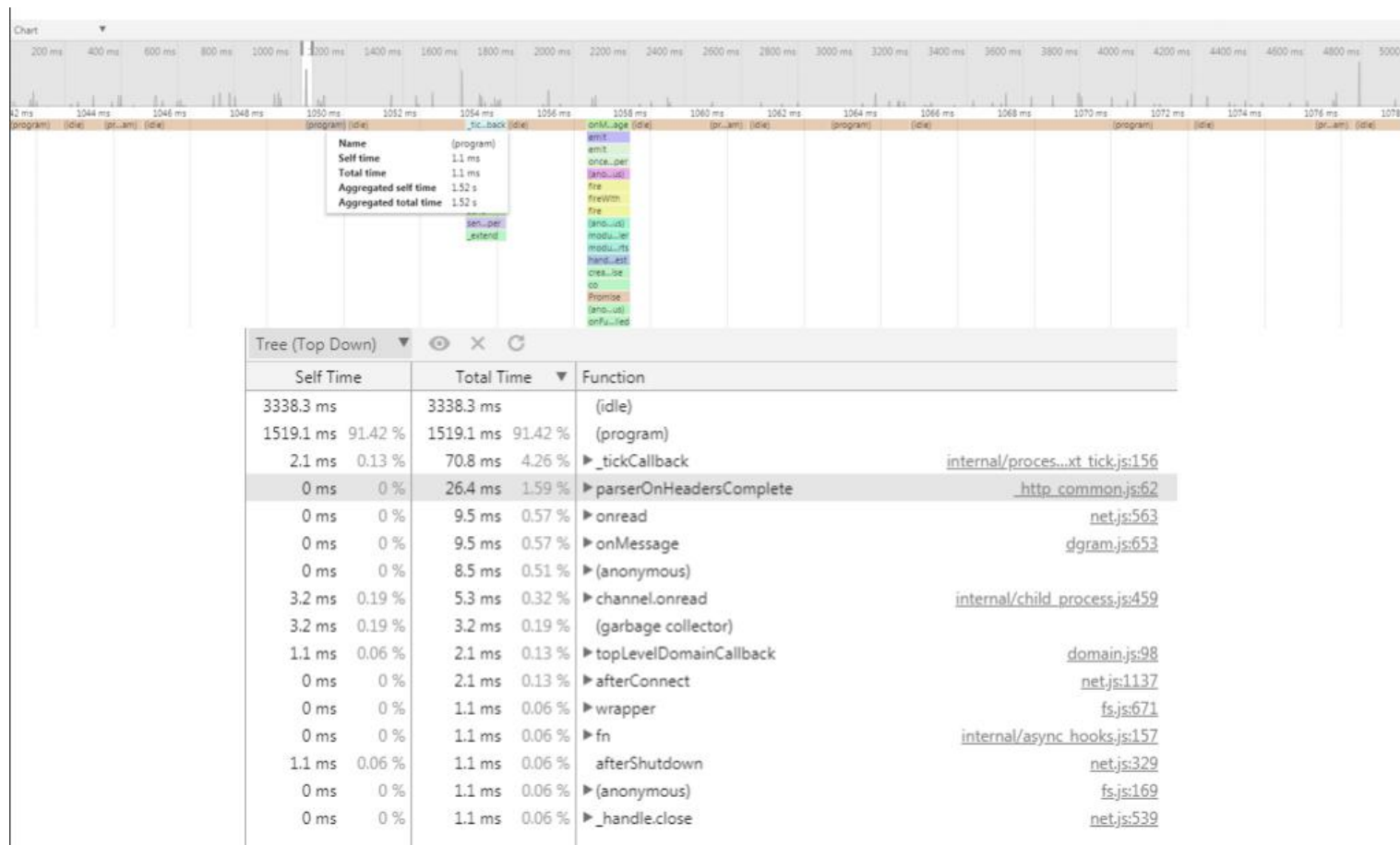


# 返回码状态

HTTP



# 外网运维-CPU Profiler ( ./dump.cpu.sh )



# 外网运维-Heap Dump (./dump.heap.sh)

Summary		Class Filter		All objects					
Profiles	Constructor	Distance	Objects Count	Shallow Size	Retained Size				
HEAP SNAPSHOTS	*global	1	4 0 %	136 0 %	465 692 864 100 %				
ipad.1533932450800	*Object	2	550 442 18 %	29 690 168 0 %	454 690 862 97 %				
445 MB	Show 100 before Show all 190 Show 100 after								
*@545117						16		128 0 %	21 910 0 %
+lastResult :: Array @5331883						17		32 0 %	672 0 %
+data :: @545067						17		40 0 %	496 0 %
+responseBuffer :: UInt8Array @5331873						17		72 0 %	274 0 %
+header :: @545081						17		32 0 %	224 0 %
+responseData :: @545089						17		66 0 %	200 0 %
+map :: system / Map @33445						10		88 0 %	184 0 %
+requestBuffer :: Buffer @545119						17		72 0 %	168 0 %
+error :: error() @545089						17		64 0 %	104 0 %
+success :: success() @545095						17		64 0 %	104 0 %
+formatCode :: formatCode() @545163						17		64 0 %	64 0 %
+properties :: system @545121						17		64 0 %	64 0 %
+T5pp :: @46545						6		56 0 %	56 0 %
+__proto__ :: @51863						3		56 0 %	56 0 %
+dcopy :: @545185						17		48 0 %	48 0 %
+output :: system / Outbel @65						3		48 0 %	48 0 %
+cndName :: "FileUpload" @19825						5		40 0 %	40 0 %
+desc :: "16,166,16,1" @40531						7		40 0 %	40 0 %
+ip :: "192.168.16.16" @40531						14		40 0 %	40 0 %
+packers :: Array @46535						6		32 0 %	32 0 %
*@5451823						13		128 0 %	21 903 0 %
*@19747						2		32 0 %	21 864 0 %
*@19749						3		24 0 %	21 832 0 %
*@2963493						8		56 0 %	21 732 0 %
*@4761803						13		128 0 %	21 744 0 %
*@3862719						13		128 0 %	21 737 0 %
*@2450931						5		56 0 %	21 696 0 %
*@76219						5		56 0 %	21 672 0 %
*@423497						13		128 0 %	21 574 0 %
*@1173871						13		128 0 %	21 574 0 %
*@1621823						13		128 0 %	21 574 0 %
*@1811679						13		128 0 %	21 574 0 %
*@1813809						13		128 0 %	21 574 0 %
Retainers						Distance	Shallow Size	Retained Size	
Object									
*obj in system / Context @545141						15	128 0 %	22 230 0 %	
+context in fe() @598253						14	56 0 %	22 296 0 %	
+ [4522] in Array @5389527						13	32 0 %	9 630 248 2 %	
+ arr in @5389521						12	56 0 %	9 630 484 2 %	
+ log in Context @5389513						11	24 0 %	9 630 764 2 %	
+ currentContext in Domain @290895						10	72 0 %	9 631 260 2 %	
+ domain in WebSocket @5389405						9	240 0 %	9 660 060 2 %	
+ 31 in [] @2945401						8	880 0 %	9 660 742 2 %	
+ value in Set @2963295						7	32 0 %	9 660 775 2 %	
+ clients in WebSocketServer @2963289						6	296 0 %	9 660 879 2 %	
+ this in system / Context @2963241						5	56 0 %	56 0 %	
+ context in [] @77688						4	56 0 %	56 0 %	
+ upgrade in @43237						3	24 0 %	616 0 %	
+ _events in Server @43233						2	144 0 %	3 592 0 %	
+ T5K_HTTP_SOCKET in global @531						1	40 0 %	465 692 864 100 %	
+ value in system / PropertyCell @3394263						3	40 0 %	40 0 %	
+ owner in @43241						3	56 0 %	512 0 %	
+ 2 in system @2968253						4	40 0 %	40 0 %	
+ this in system / Context @43221						4	56 0 %	56 0 %	
+ server in system / Context @5889						5	312 0 %	18 624 0 %	
+ server in WebSocketServer @2963289						6	296 0 %	9 660 879 2 %	
+ server in @2963287						7	112 0 %	1 400 0 %	
+ ee in Ultron @2963283						7	40 0 %	40 0 %	
+ _server in Socket @5389335						10	248 0 %	2 088 0 %	
+ server in Socket @5389335						10	248 0 %	2 088 0 %	

# 外网运维-Top 100请求 (./top100.sh)

```
278 taotao.qq.com/
101 g.qzone.qq.com/cgi-bin/
54 gameapp.qq.com/proxy/domain/qzonestyle.gtimg.cn/qzone/hybrid/lib/pow/worker/pow.js^M
53 gameapp.qq.com/proxy/domain/qzonestyle.gtimg.cn/qzone/hybrid/lib/pow/worker/index.js^M
52 gameapp.qq.com/
51 gameapp.qq.com/proxy/domain/qzonestyle.gtimg.cn/qzone/hybrid/lib/pow/worker/sha.js^M
49 gameapp.qq.com/proxy/domain/qzonestyle.gtimg.cn/qzone/hybrid/lib/pow/worker/RunFlow.js^M
30 gameapp.qq.com/
29 g.qzone.qq.com/
29 gameapp.qq.com/favicon.ico^M
```

# 问题定位

开发环境与生产环境定位问题的差异

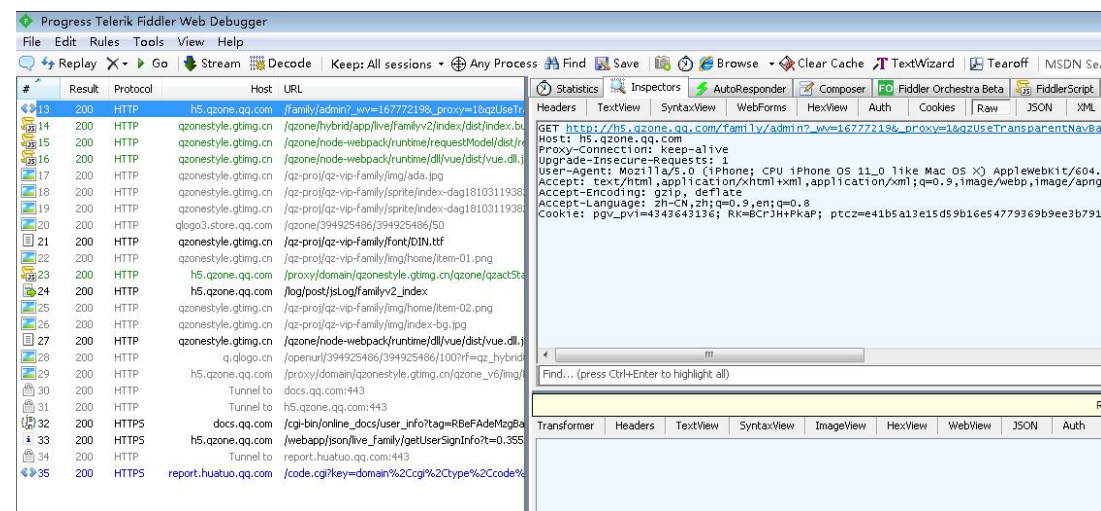
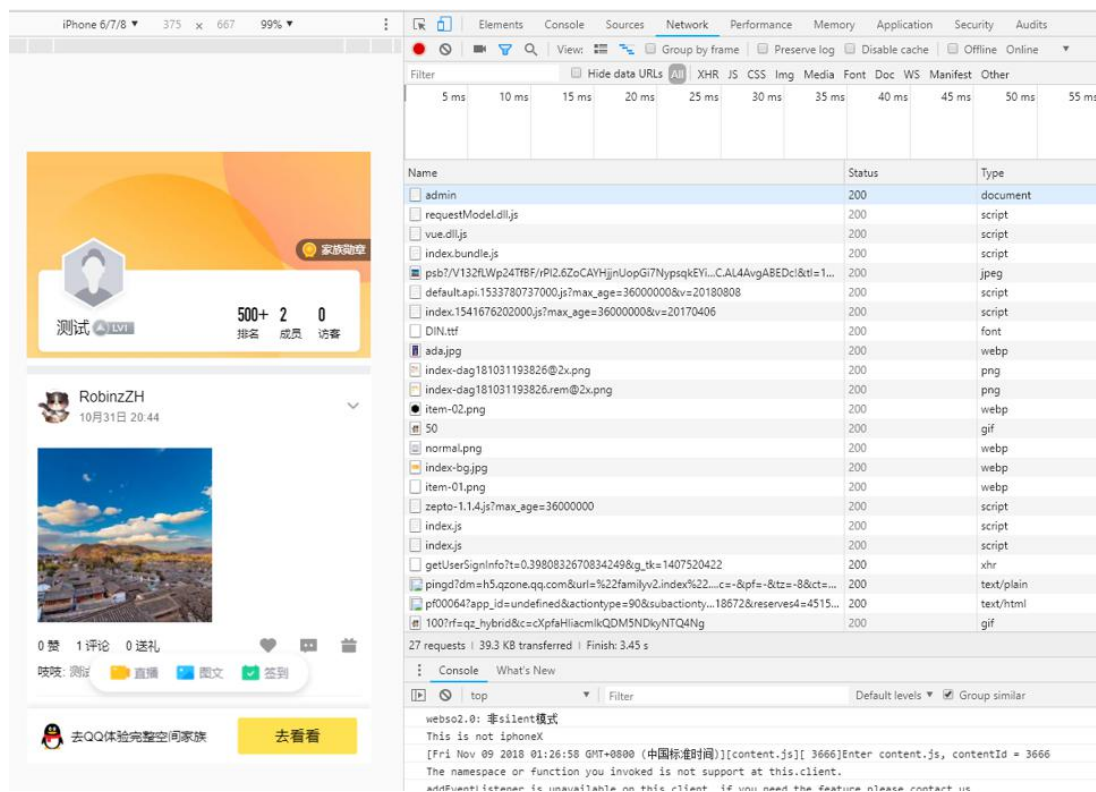
# Web开发定位

本地开发定位

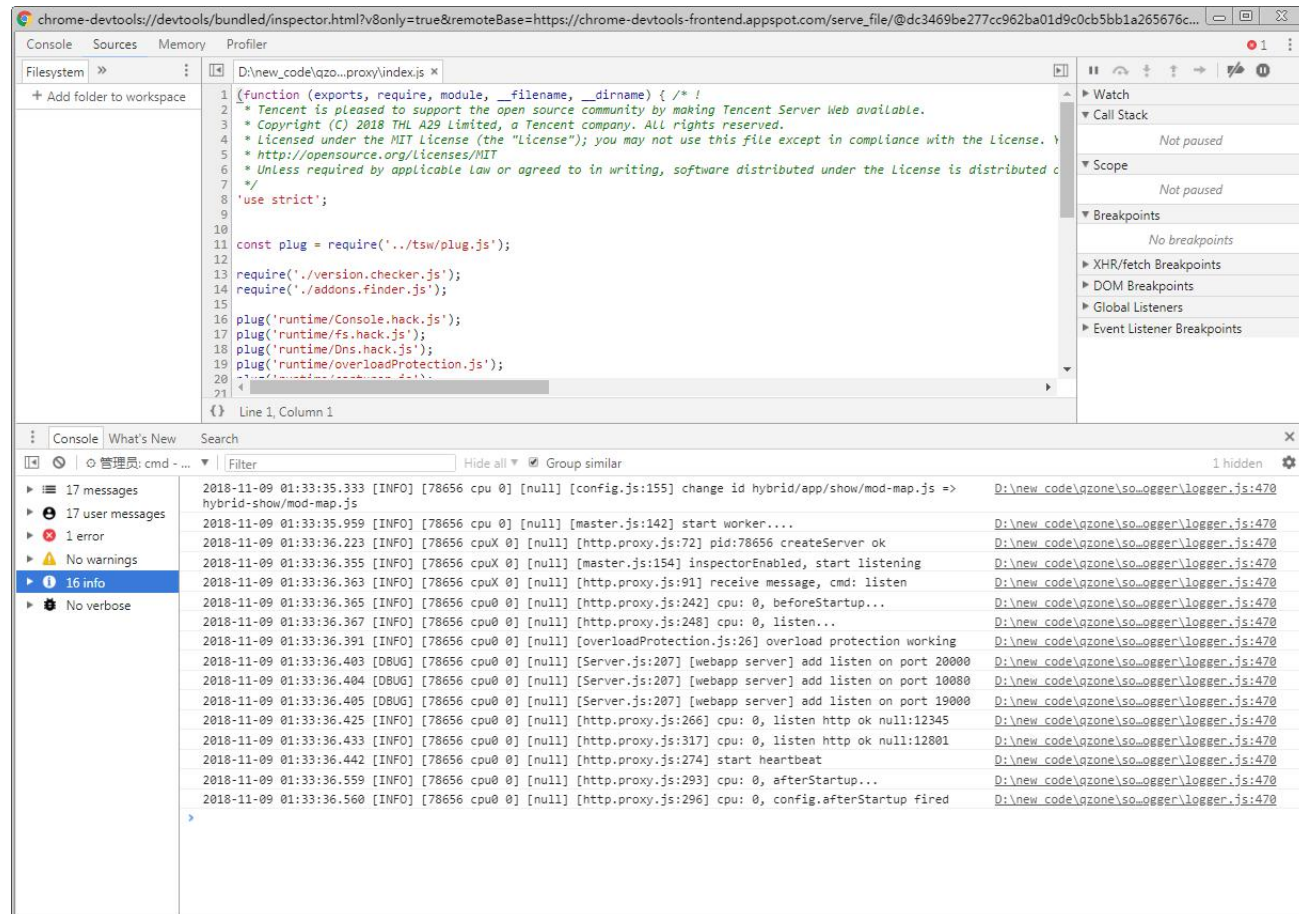
线上问题定位



# Chrome Developer Tools + Fiddler



# Node.js调试 --inspect



# 解决90%问题

在开发环境模拟场景

抓取请求包

收集执行日志

单步调试

# 10%无法重现

有几个用户一直反馈网页进去后转菊花，按钮点击没反应

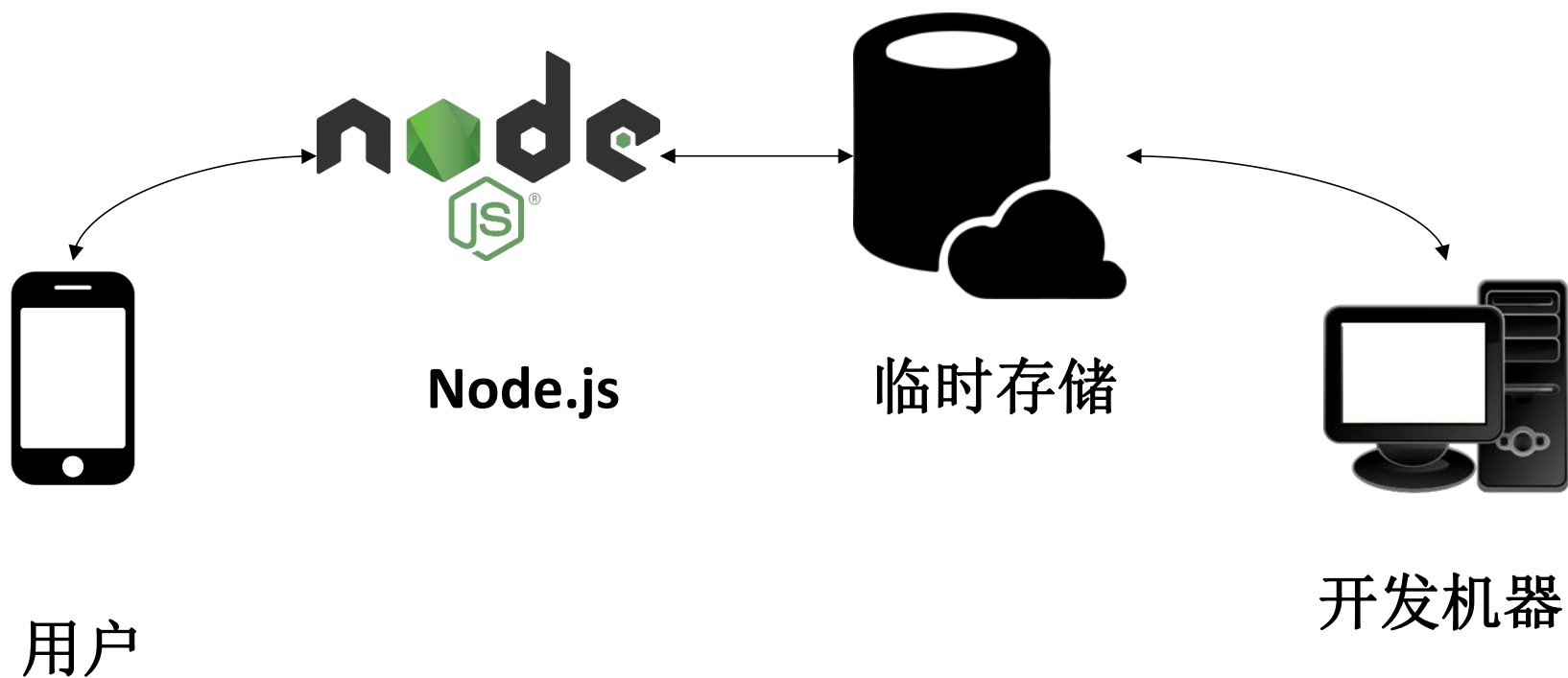
如何能抓取特定用户的请求包

# 抓包新思路

代理本地抓包 ✕

Node.js接入层抓包 ✓

# 抓包新思路



# 抓包

抓取哪些内容

怎么抓取？

# 抓哪些包

## 所有的请求包

- 用户请求及响应包体
- 后端Http调用请求及响应包体
- 后端Socket调用请求及响应包体



# 怎么抓包

## 用户请求及响应包体

- 路由层根据用户身份保存request和response内容

## 后端Http调用请求及响应包体

- Node.js端Ajax组件根据用户身份保存request和response内容

## 后端Socket调用请求及响应包体

- Node.js端Socket组件根据用户身份保存请求和响应二进制内容

# 怎么抓包

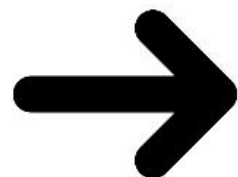
用户请求抓包



关联Http抓包



关联Socket抓包



**Telerik®**  
Develop experiences

# 路由层抓包

```
request.on( "data" , d => {capture(d);})  
response.write = function(d) {capture(d);}  
response.end = function(event) {}
```

# 路由层抓包

```
request.on( "data" , d => {capture(d);})  
response.write = function(d) {capture(d);}  
response.end = function(event) {}
```

# HTTP抓包

```
captureReqHeader(request.headers);  
captureReqBody(request.body)
```

```
client.on("response", client => {  
    captureRspHeader(client.headers)  
})  
client.on("data", d => {captureRspBody(d);})
```

```
client.on("end", () => {captureEnd(d);})
```

# 打包 & 下载

The screenshot shows a web application interface with a dark theme. At the top, there is a navigation bar with several tabs: "仅显示有错误的", "快速显示请求列表", "实时监控", "测试环境", "个人主页", "runtime", "应用详情", and a user ID "7705517/533/1000". On the right side of the navigation bar, there are links for "Whistle下载(mac推荐)" and "Fiddler下载". Below the navigation bar, there is a secondary bar with tabs for different request types: "全部", "html", "XHR", "js", "image", "css", "webapp", "websocket", "tsw", "字体", "h5test", "other", "reportcompass", "reportlog", and "reportmd". The main content area displays a list of network requests. Each request entry includes a status code, a "点击下载" (Download) button, a "云抓包" (Cloud Capture) button, a "在线查看" (View Online) button, and a timestamp. The first three requests are highlighted with red arrows pointing to their "点击下载" buttons. The requests are as follows:

- Request 1: statusCode: 200, 点击下载 云抓包™.saz, 点击下载 云抓包™.har, 在线查看 云抓包™, 1小时24分钟43秒前. 展开 2018-11-09 01:30:23.920 POST https://h5.qzone.qq.com/log/post/hybrid\_ajax\_error?uin=394925486
- Request 2: statusCode: 403, 点击下载 云抓包™.saz, 点击下载 云抓包™.har, 在线查看 云抓包™, 1小时24分钟43秒前. 展开 2018-11-09 01:30:23.824 POST https://h5.qzone.qq.com/webapp/json/live\_family/getUserSignInfo?t=0.35513605182422747&g\_tk=1676463352
- Request 3: statusCode: 200, 点击下载 云抓包™.saz, 点击下载 云抓包™.har, 在线查看 云抓包™, 1小时24分钟44秒前. 展开 2018-11-09 01:30:23.068 GET http://h5.qzone.qq.com/proxy/domain/qzonestyle.gtimg.cn/qzone\_v6/img/favicon.ico?max\_age=31536000
- Request 4: statusCode: 200, 点击下载 云抓包™.saz, 点击下载 云抓包™.har, 在线查看 云抓包™, 1小时24分钟45秒前. 展开 2018-11-09 01:30:22.514 GET https://h5.qzone.qq.com/report/compass/pf00064?app\_id=undefined&actiontype=90&subactiontype=14&reserves=1&reserves2=undefined&uin=394925486&touin=394925486&qua=&app\_version=&platform=ios&page\_type=3&t=154166
- Request 5: statusCode: 200, 点击下载 云抓包™.saz, 点击下载 云抓包™.har, 在线查看 云抓包™, 1小时24分钟45秒前. 展开 2018-11-09 01:30:21.938 POST http://h5.qzone.qq.com/log/post/jsLog/familyv2\_index
- Request 6: statusCode: 200, 点击下载 云抓包™.saz, 点击下载 云抓包™.har, 在线查看 云抓包™, 1小时24分钟46秒前. 展开 2018-11-09 01:30:21.680 GET http://h5.qzone.qq.com/proxy/domain/qzonestyle.gtimg.cn/qzone/qzactStatics/configSystem/data/519/config1.js
- Request 7: statusCode: 200, 点击下载 云抓包™.saz, 点击下载 云抓包™.har, 在线查看 云抓包™, 1小时24分钟46秒前. 展开 2018-11-09 01:30:21.493 GET https://h5.qzone.qq.com/report/compass/pf00064?app\_id=undefined&actiontype=90&subactiontype=18&reserves=1&reserves2=undefined&uin=394925486&touin=394925486&qua=&app\_version=&platform=ios&page\_type=3&t=154166

# 在线查看

Node.js 接入层收到的请求抓包

Node.js请求后台抓包

Result	Method	Protocol	ServerIP	Host	URL	Type	Time
200	GET	HTTPS		taobao.qq.com	/cgi-bin/photo_wall_cgi_list?uin=394925486&g_tk=1294507736&hostUin=25551962&pos=0&num=4&lastfilekey=&lasttime...	text/plain	3000ms
200	GET	HTTP		taobao.qq.com	/cgi-bin/photo_wall_cgi_list?uin=394925486&g_tk=1294507736&hostUin=25551962&pos=0&num=4&lastfilekey=&lasttime...	text/plain	3000ms

**Request**

Query

uin	394925486
g_tk	1294507736
hostUin	25551962
pos	0
num	4
lastfilekey	
lasttime	0
photo_source	1
requester	1

Body

**Response**

Headers Preview TextView JSONView HexView Cookies Raw

```
root: {} 4 keys
  code: 0
  data: {} 4 keys
    next_offset: 0
    total: 0
    uin: 25551962
    uptime: 0
    message: ""
    subcode: 0
```

# 定位问题

content-type: "text/html",  
content-length: "816",  
connection: "keep-alive",  
timing-allow-origin: "\*",  
access-control-allow-origin: "\*" }  
2018-11-08 22:52:59.423 [DEBUG] [15353] cpu3 69343] [plato\_get] [capturer.js:214] [1] end size: 816, receive data cost: 175ms  
2018-11-08 22:52:59.424 [DEBUG] [15353] cpu3 69343] [plato\_get] [ajax.js:933] [1] end: 816, receive data cost: 2ms  
2018-11-08 22:52:59.424 [DEBUG] [15353] cpu3 69343] [plato\_get] [ajax.js:962] [1] done size:816  
2018-11-08 22:52:59.424 [DEBUG] [15353] cpu3 69343] [plato\_get] [L5.api.js:181] ApiRouteResultUpdate 477121 65536, res: 0, ret: 0 76ms  
2018-11-08 22:52:59.425 [ERROR] [15353] cpu3 69343] [plato\_get] [plato/update/index.js:109] load bundler by ajax fail request statusCode : 404  
2018-11-08 22:52:59.437 [DEBUG] [15353] cpu3 69343] [plato\_get] [plato/lib/storage.js:70] redis connection ready  
2018-11-08 22:52:59.504 [DEBUG] [15353] cpu3 69343] [plato\_get] [http.route.js:472] showLineNumber on  
2018-11-08 22:52:59.504 [DEBUG] [15353] cpu3 69343] [plato\_get] [http.js:151] capture ServerResponse body on  
2018-11-08 22:52:59.504 [DEBUG] [15353] cpu3 69343] [plato\_get] [http.route.js:479] response 200  
2018-11-08 22:52:59.557 [DEBUG] [15353] cpu3 69343] [plato\_get] [http.route.js:54] clear called  
2018-11-08 22:52:59.557 [DEBUG] [15353] cpu3 69343] [plato\_get] [http.route.js:322] finish, statusCode: 200, cost: 336ms  
2018-11-08 22:52:59.557 [DEBUG] [15353] cpu3 69343] [plato\_get] [dcapi.js:240] dcapi: 211800060 211100166 111865659 0 200 127.0.0.1 336  
2018-11-08 22:52:59.557 [DEBUG] [15353] cpu3 69343] [plato\_get] [logger.js:154] setKey: 394925486  
2018-11-08 22:52:59.558 [DEBUG] [15353] cpu3 69343] [plato\_get] [logReport.js:640] logType: alpha  
2018-11-08 22:52:59.558 [DEBUG] [15353] cpu3 69343] [plato\_get] [dcapi.js:240] dcapi: 211800056 211006501 111339324 0 127.0.0.1 100  
2018-11-08 22:52:59.558 [DEBUG] [15353] cpu3 69343] [plato\_get] [logReport.js:670]  
GET /plato/get?id=qzone\_familyhome\_debug&pageVersion=0&uid=...&qua=V1\_AND\_SQ\_7.9.0\_0\_RDM\_B&sdkVersion=0.4.1.213&platform=android HTTP/1.1  
connection: Upgrade  
host: h5.qzone.qq.com  
x-real-ip: ...  
x-forwarded-for: ...  
x-client-proto: https  
x-client-proto-ver: HTTP/2.0  
accept-encoding: gzip  
user-agent: okhttp/2.7.6-SNAPSHOT  
tsw-trace-steps: 1  
  
response 200 {  
"connection": "keep-alive",  
"keep-alive": "timeout=10",  
"x-powered-by": "TSW/Node.js",



# 保证服务稳定可用

项目大盘

实时监控

告警分析

具体用户

测试环境

线上抓包

Q & A