携程大前端框架 - NFES

魏晓军

目录

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1 现有问题

2 设计思路

3 框架细节

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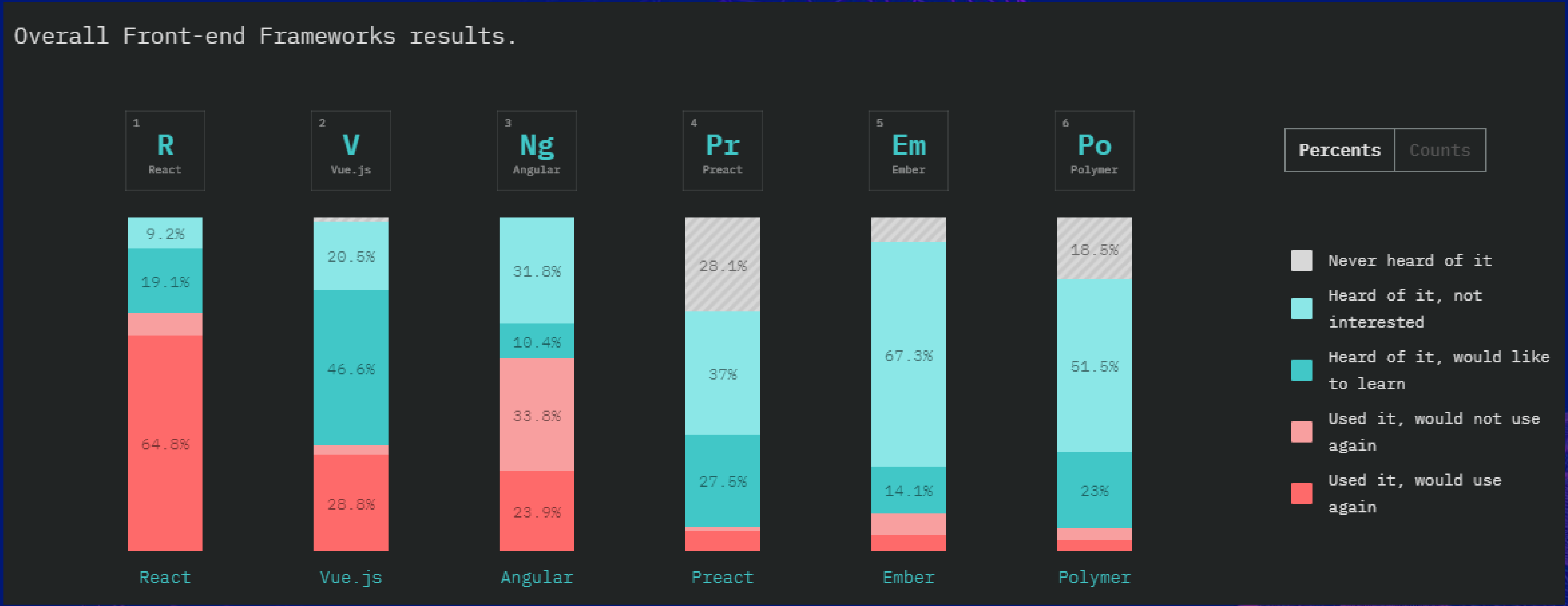
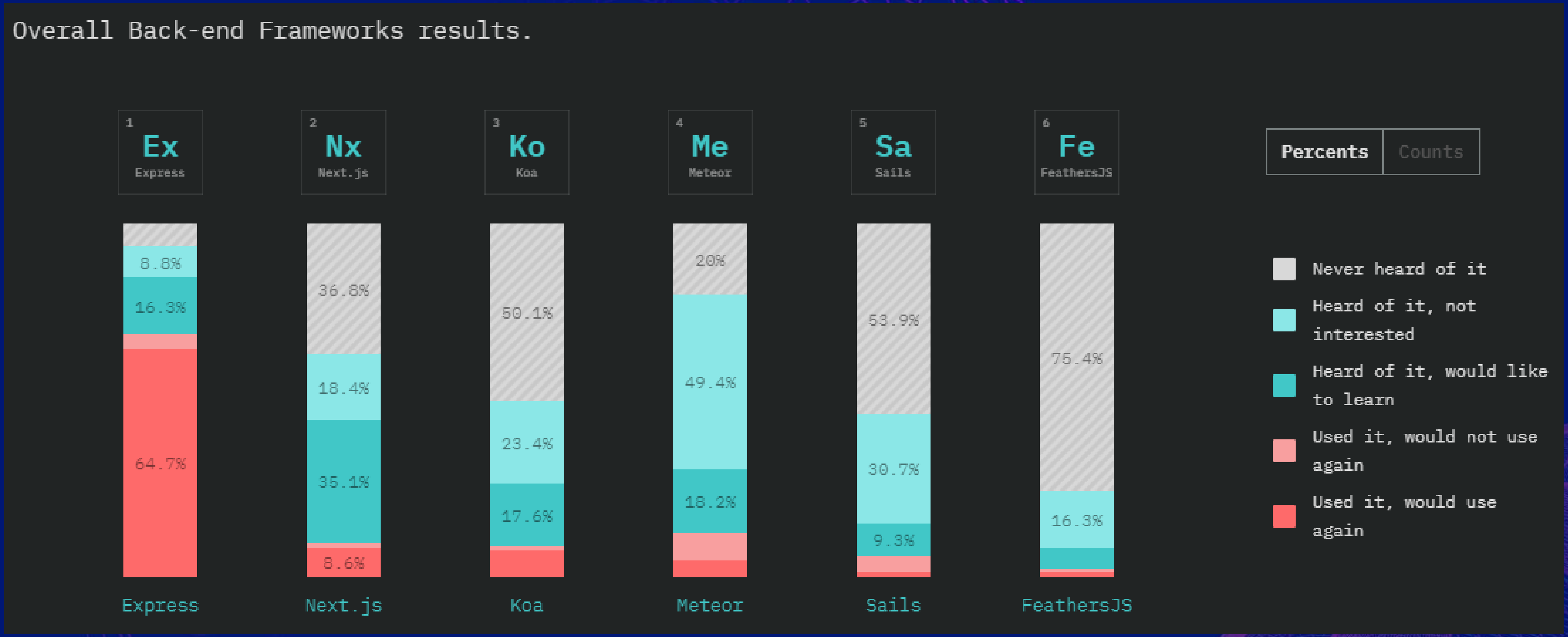
业界现状



Overall Front-end Frameworks results.

图片来源于2018.stateofjs.com

业界现状

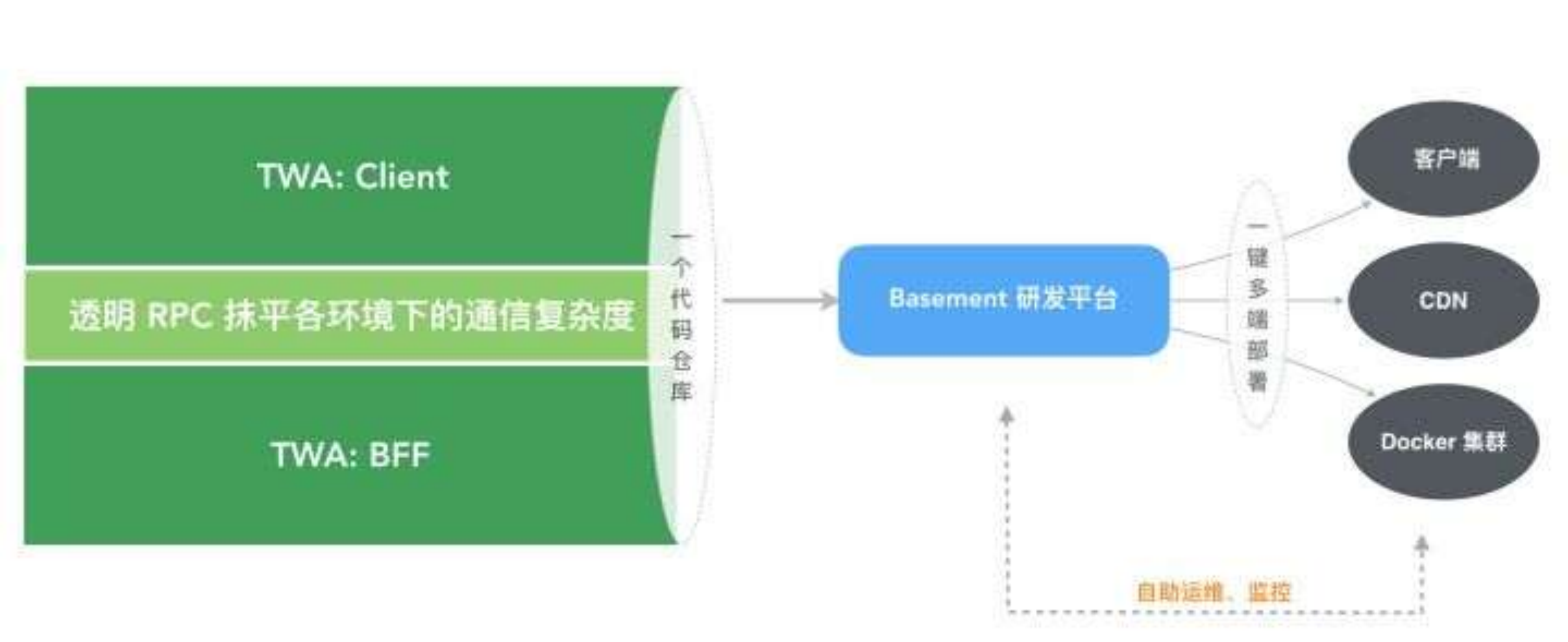


Overall Back-end Frameworks results.

图片来源于2018.stateofjs.com

业界现状

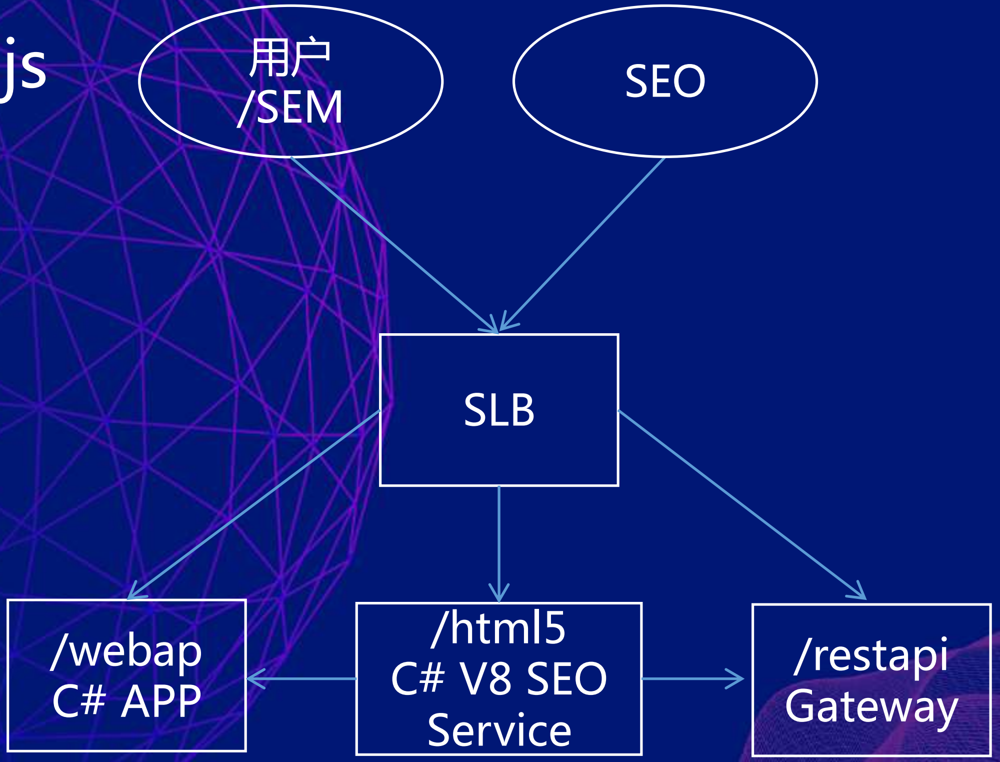
- TWA（Techless Web Application）



图片来源于蚂蚁金服体验科技

内部面临问题

- JS技术栈陈旧： Backbone.js+Require.js
- SSR方案分散：imvc/knr/igt
- SEO架构： .Net+V8
- SPA模式首屏性能问题
- 原Hybrid容器性能问题



原 H5/SEO 架构

可借鉴的解决方案

- Uber-Fusion.js、 Alipay-umi.js、 Alibaba-beidou、 Nuxt-Nuxt.js ...
- Zeit-Next.js （Github Star 31.7k）

  A framework for static and server-rendered applications

- Koajs-koa、Alibaba-egg
- Expressjs-Expressjs （Github Star 41.2k）

  the fast, unopinionated, minimalist web framework for node

新框架设计目标

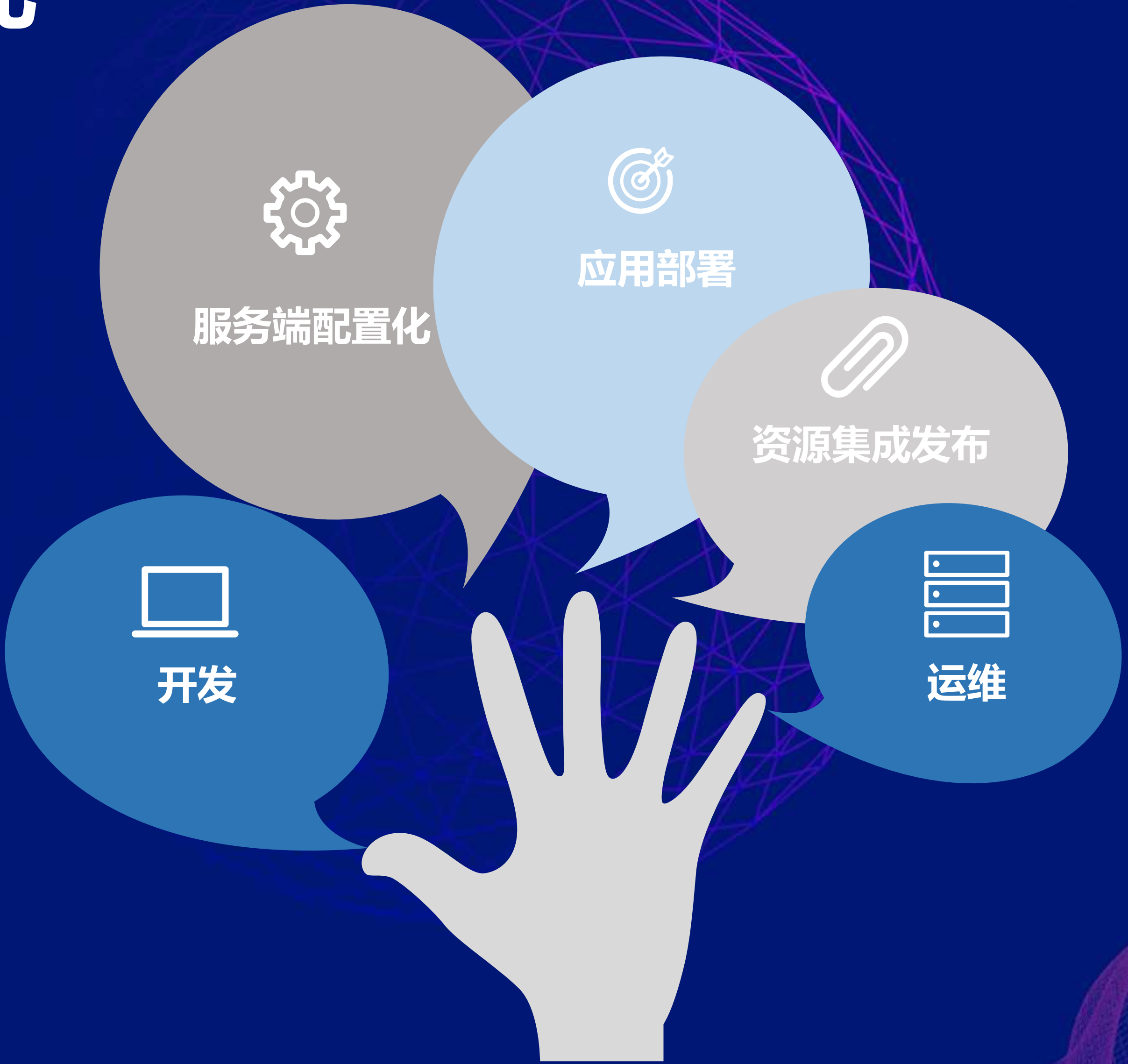
- 提供统一的Web开发框架
- 提供统一的SSR解决方案
- 与现有无线研发支撑平台打通
- 方便应对技术出海场景

NFES（Next Front-End Solution）

NFES设计思路

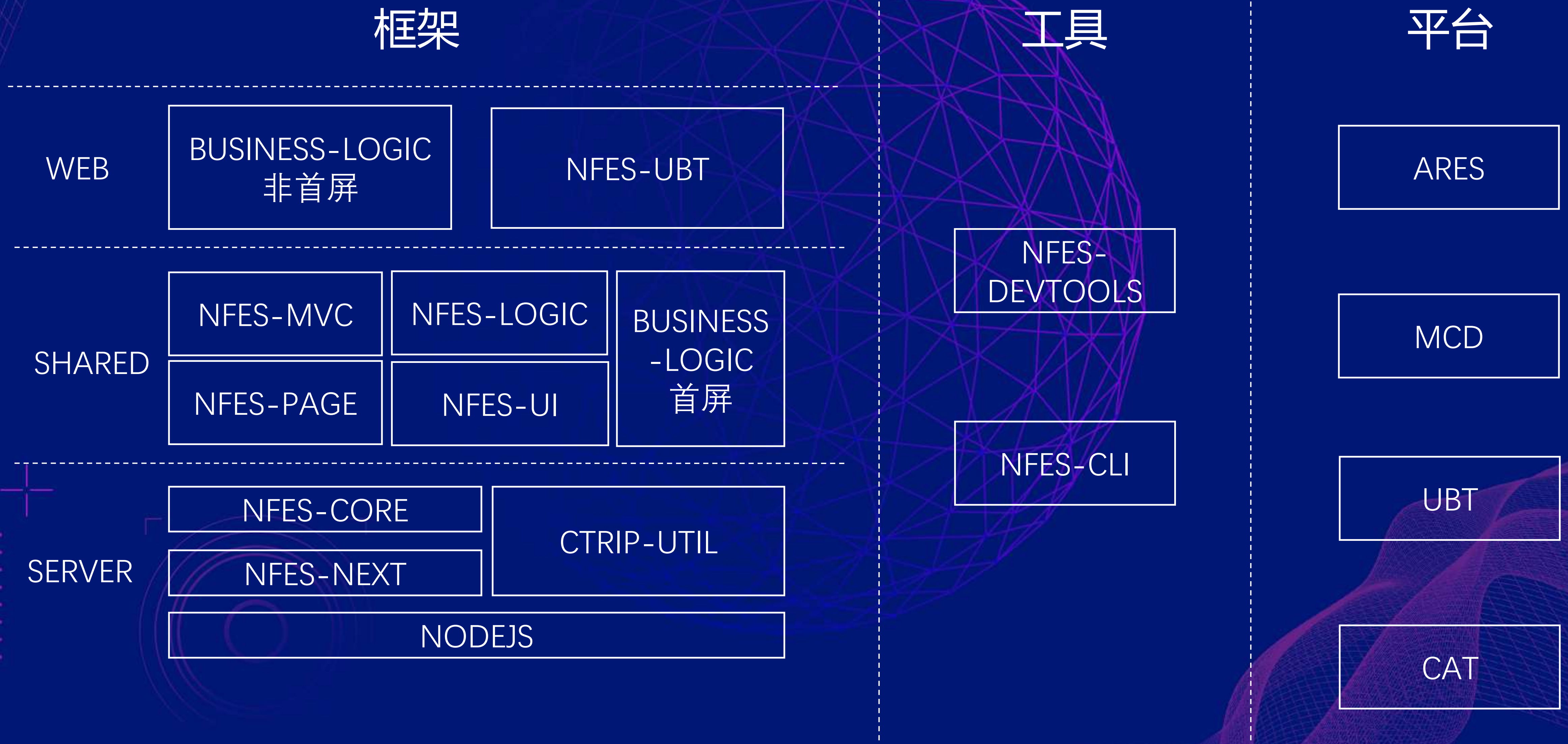
- 新MVC设计，基于React/iMVC
- 新UI和Business组件
- 支持SSR+CSR混合场景
- 新Hybrid容器
- 插件化架构，支持按需使用
- 工具和平台，提供研发生命周期支持

实现前端工程化



开发阶段

架构图



框架

WEB

BUSINESS-LOGIC 非首屏

NFES-UBT

SHARED

NFES-MVC

NFES-LOGIC

BUSINESS -LOGIC 首屏

NFES-PAGE

NFES-UI

SERVER

NFES-CORE

CTRIP-UTIL

NFES-NEXT

NODEJS

工具

NFES-DEVTOOLS

NFES-CLI

平台

ARES

MCD

UBT

CAT

完善Next.js功能

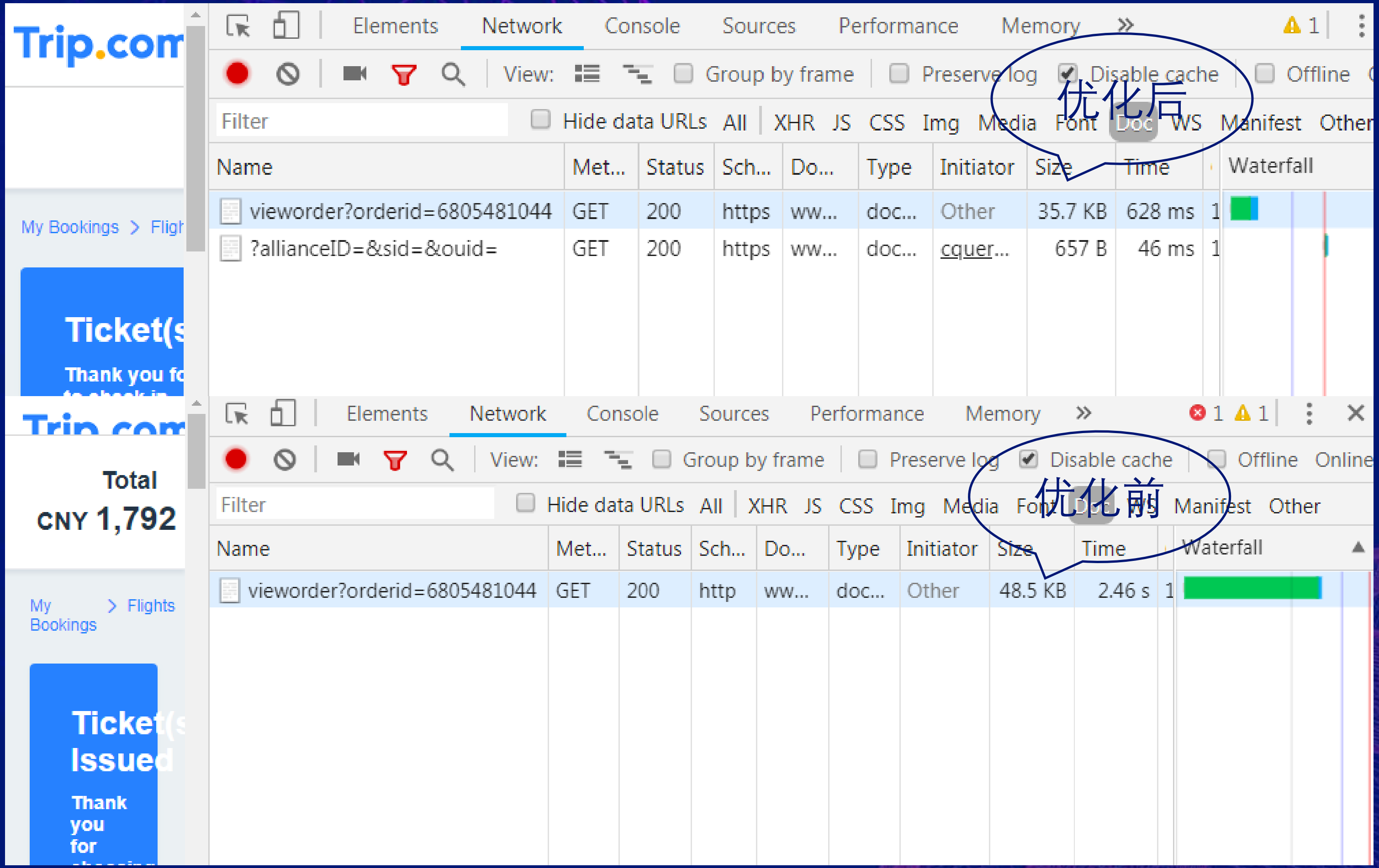
- 封装Require的context
- 添加服务端容错机制
- 完善埋点信息
- 提供Stream的返回方式

```
//抛出模块之外的变量
let dirtyData = null;
export default class IndexPage extends Page {
        async getInitialState (ctx) {
                if(!dirtyData){
                      //跟访问相关的数据
                      dirtyData = ctx.req &&
                       ctx.req.query('dirtyData');
                  }
                  ……
                  return {     dirtyData    }
        }
}
```

全局变量污染

最佳实践

- State的正确使用姿势
- 首屏、非首屏逻辑分离
- 样式组件化



Trip.com

My Bookings > Fligh

Ticket(s

Thank you fo

优化后

Elements Network Console Sources Performance Memory

View: □ Group by frame □ Preserve log ☑ Disable cache □ Offline

Filter □ Hide data URLs All XHR JS CSS Img Media Font Doc WS Manifest Other

Name	Met...	Status	Sch...	Do...	Type	Initiator	Size	Time		Waterfall
vieworder?orderid=6805481044	GET	200	https	ww...	doc...	Other	35.7 KB	628 ms	1	
?allianceID=&sid=&ouid=	GET	200	https	ww...	doc...	cquer...	657 B	46 ms	1	

Trip.com

Total
CNY 1,792

My Bookings > Flights

Ticket(s
Issued

Thank you for

优化前

Elements Network Console Sources Performance Memory

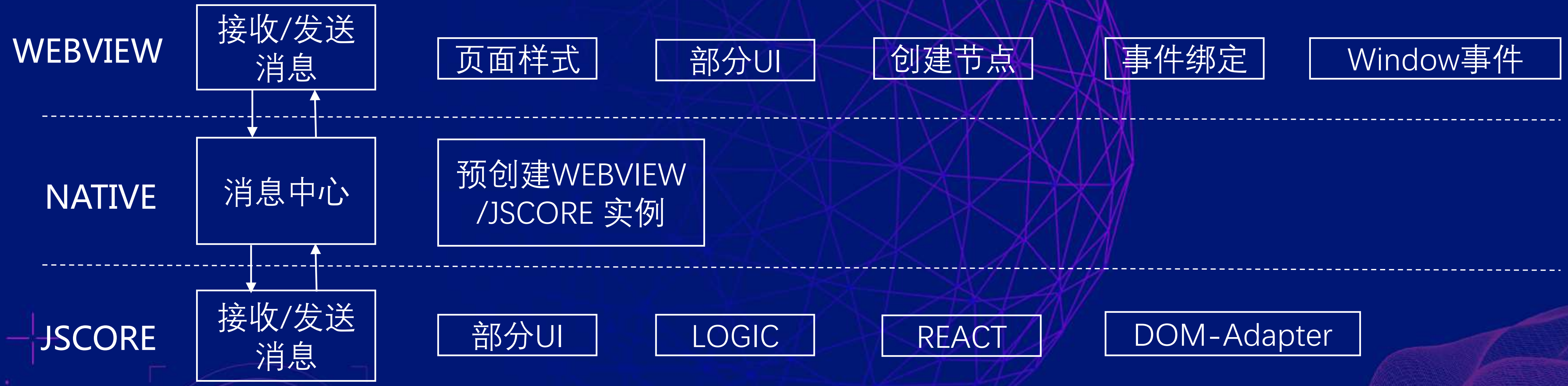
View: □ Group by frame □ Preserve log ☑ Disable cache □ Offline Online

Filter □ Hide data URLs All XHR JS CSS Img Media Font Doc WS Manifest Other

Name	Met...	Status	Sch...	Do...	Type	Initiator	Size	Time		Waterfall
vieworder?orderid=6805481044	GET	200	http	ww...	doc...	Other	48.5 KB	2.46 s	1	

优化前后对比

Hybrid架构



WEBVIEW

接收/发送消息

页面样式

部分UI

创建节点

事件绑定

Window事件

NATIVE

消息中心

预创建WEBVIEW /JSCORE 实例

JSCORE

接收/发送消息

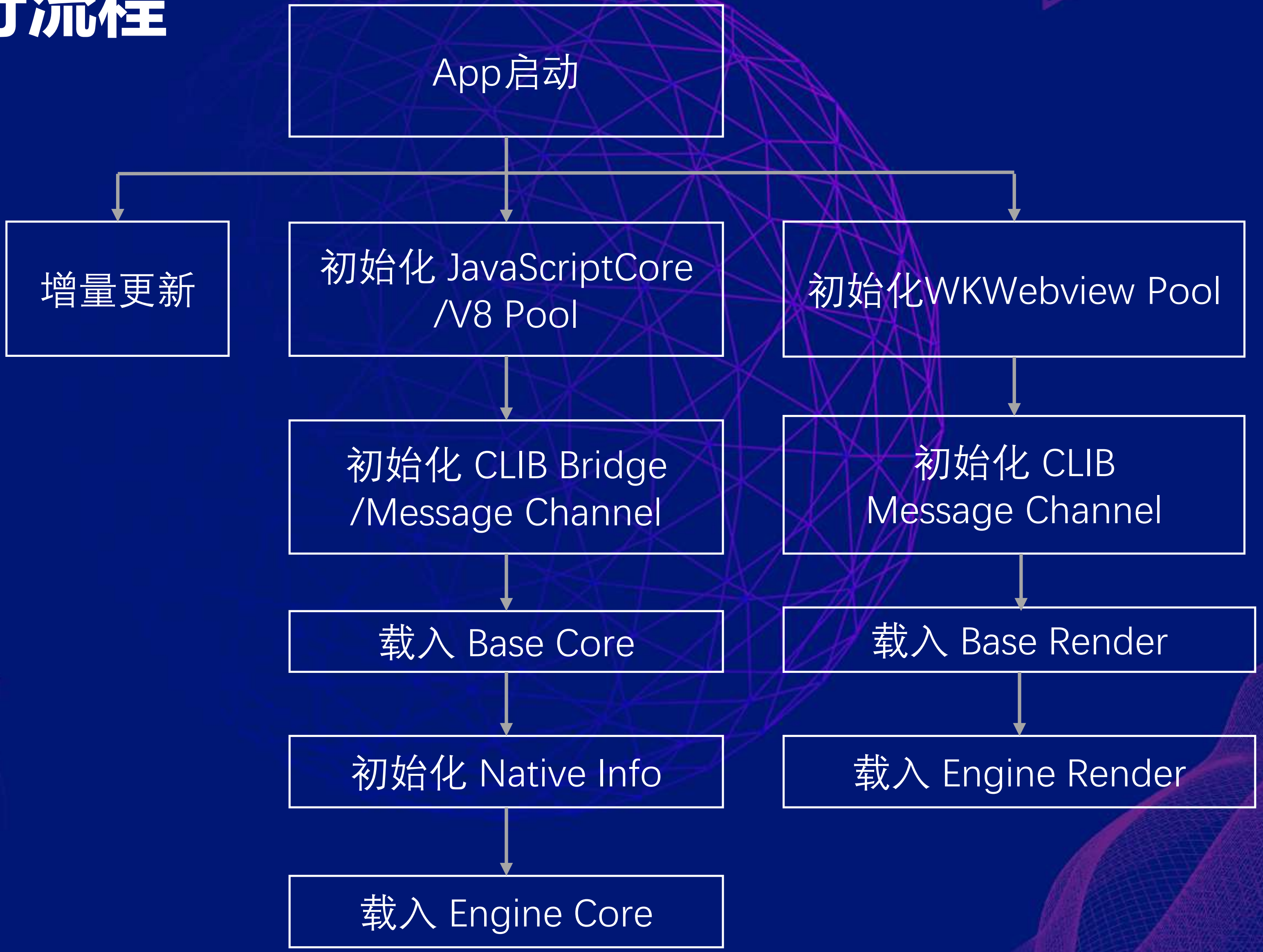
部分UI

LOGIC

REACT

DOM-Adapter

Hybrid运行流程



App启动

增量更新

初始化 JavaScriptCore /V8 Pool

初始化WKWebview Pool

初始化 CLIB Bridge /Message Channel

初始化 CLIB Message Channel

载入 Base Core

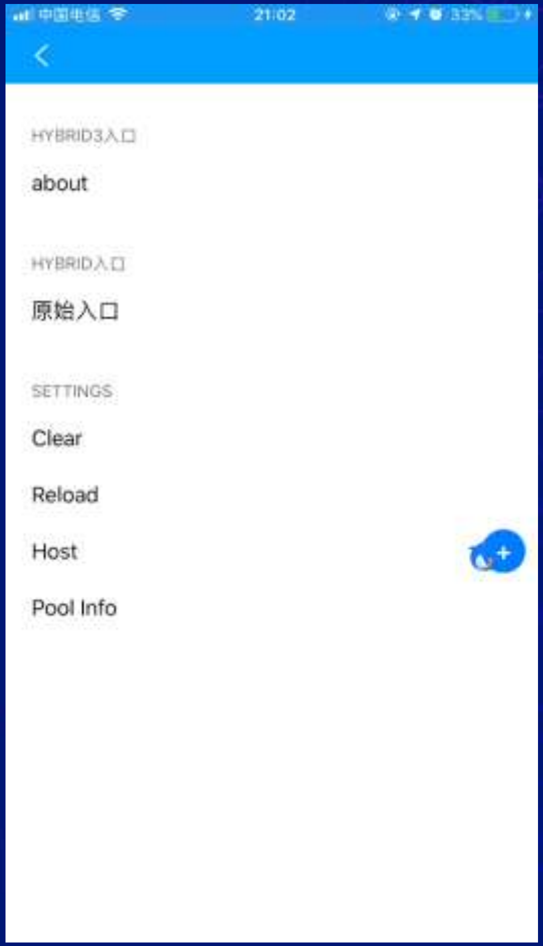
载入 Base Render

初始化 Native Info

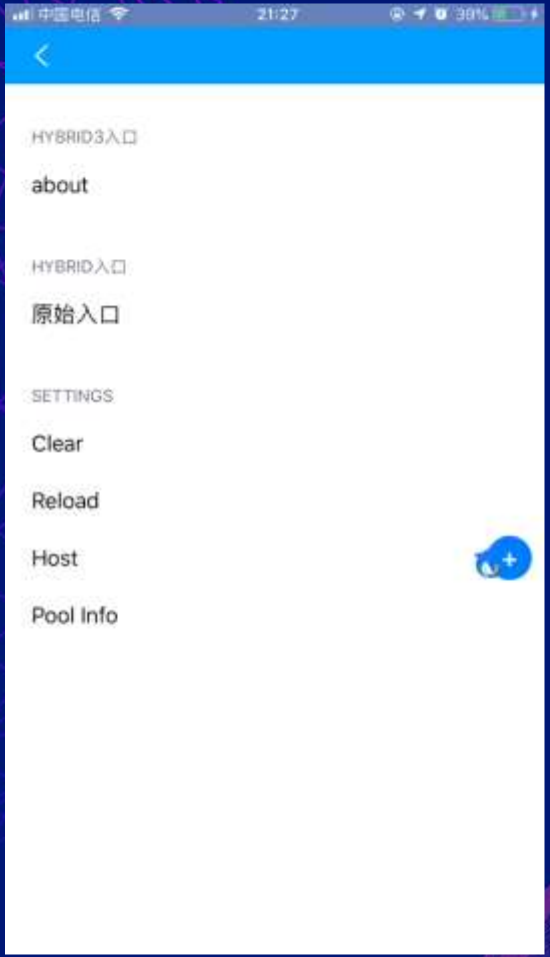
载入 Engine Render

载入 Engine Core

Hybrid效果展示



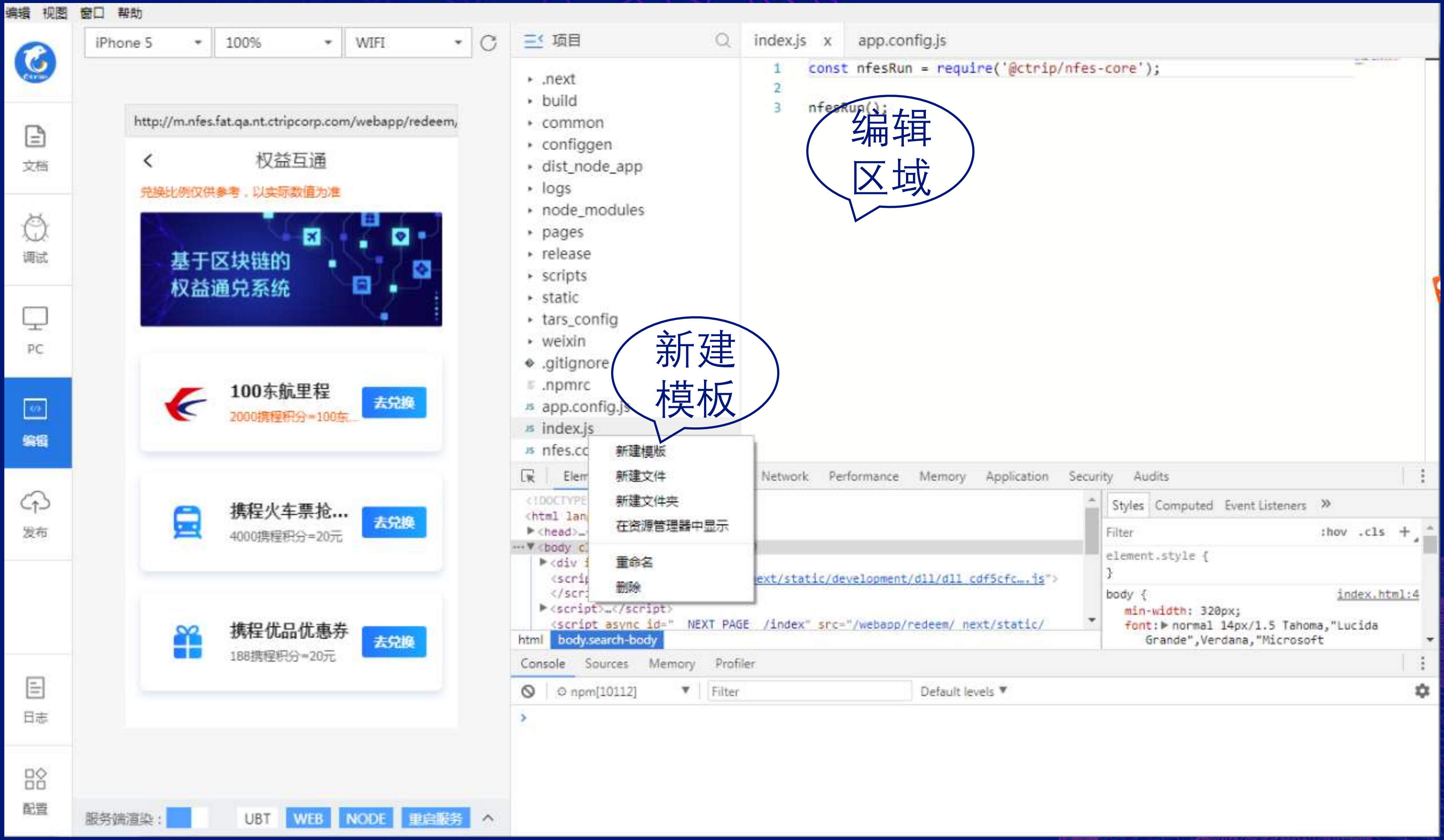
VS



优化前后对比

开发工具 - 开发

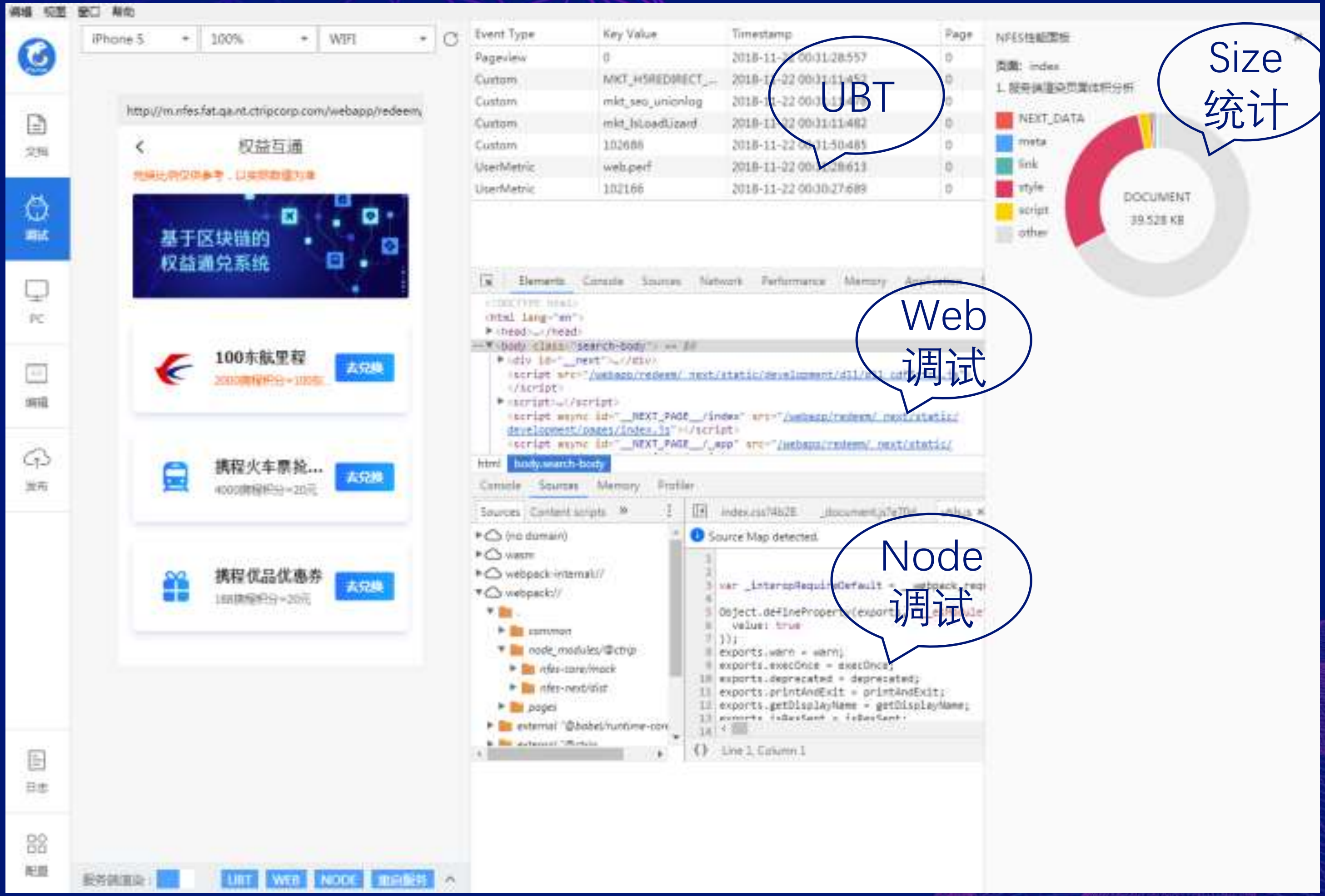
- 环境搭建
- 项目生成
- 模板生成



```
const nfesRun = require('@ctrip/nfes-core');

nfesRun();
```

开发工具 - 调试

- WEB调试
- Node.js调试
- 埋点数据调试
- 性能查看



http://m.nfes.fat.qa.nt.ctripcorp.com/webapp/redeem

Event Type	Key Value	Timestamp	Page
Pageview	0	2018-11-2 00:31:28.557	0
Custom	MKT_H5REDIRECT_...	2018-1 -22 00:31:11.452	0
Custom	mkt_seo_unionlog	2018-1 -22 00: 1:11.47	0
Custom	mkt_IsLoadLizard	2018-11- 2 00:31:11.482	0
Custom	102688	2018-11-22 0 :31:50.485	0
UserMetric	web.perf	2018-11-22 00: 1:28.613	0
UserMetric	102166	2018-11-22 00:30:27.689	0

```
<!DOCTYPE html>
<html lang="en">
▶<head>…</head>
▼<body class="search-body"> == $0
  ▶<div id="__next">…</div>
    <script src="/webapp/redeem/_next/static/development/dll/dll_c...
    </script>
  ▶<script>…</script>
    <script async id="__NEXT_PAGE__/index" src="/webapp/redeem/_next/static/development/pages/index.js"></script>
    <script async id="__NEXT_PAGE__/_app" src="/webapp/redeem/_next/static/
```

html body.search-body

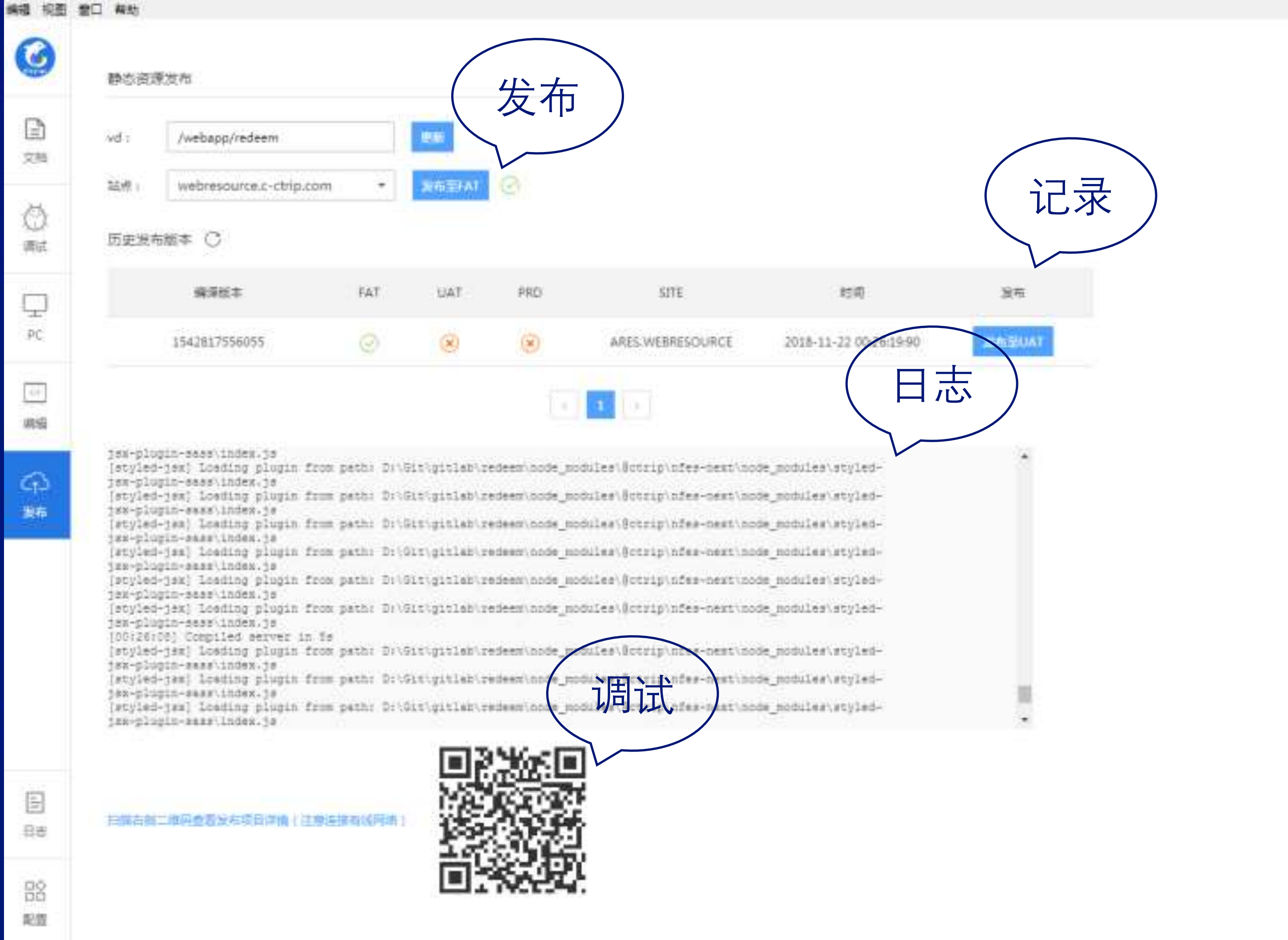
Source Map detected.

```
var _interopRequireDefault = __webpack_requ

Object.defineProperty(exports, "__esModule"
  value: true
});
exports.warn = warn;
exports.execOnce = execOnce;
exports.deprecated = deprecated;
exports.printAndExit = printAndExit;
exports.getDisplayName = getDisplayName;
exports.isResSent = isResSent;
```

Line 1, Column 1

开发工具 - 发布

- 静态资源多环境发布
- Node.js应用发布
- 版本管理
- 真机调试



静态资源发布

vd：/webapp/redeem

站点：webresource.c-ctrip.com

历史发布版本

编译版本	FAT	UAT	PRD	SITE	时间	发布
1542817556055	✓	☒	☒	ARES.WEBRESOURCE	2018-11-22 00:26:19:90	发布至UAT

```
jsx-plugin-sass\index.js
[styled-jsx] Loading plugin from path: D:\Git\gitlab\redeem\node_modules\@ctrip\nfes-next\node_modules\styled-
jsx-plugin-sass\index.js
[styled-jsx] Loading plugin from path: D:\Git\gitlab\redeem\node_modules\@ctrip\nfes-next\node_modules\styled-
jsx-plugin-sass\index.js
[styled-jsx] Loading plugin from path: D:\Git\gitlab\redeem\node_modules\@ctrip\nfes-next\node_modules\styled-
jsx-plugin-sass\index.js
[styled-jsx] Loading plugin from path: D:\Git\gitlab\redeem\node_modules\@ctrip\nfes-next\node_modules\styled-
jsx-plugin-sass\index.js
[styled-jsx] Loading plugin from path: D:\Git\gitlab\redeem\node_modules\@ctrip\nfes-next\node_modules\styled-
jsx-plugin-sass\index.js
[styled-jsx] Loading plugin from path: D:\Git\gitlab\redeem\node_modules\@ctrip\nfes-next\node_modules\styled-
jsx-plugin-sass\index.js
[00:26:08] Compiled server in 5s
[styled-jsx] Loading plugin from path: D:\Git\gitlab\redeem\node_modules\@ctrip\nfes-next\node_modules\styled-
jsx-plugin-sass\index.js
[styled-jsx] Loading plugin from path: D:\Git\gitlab\redeem\node_modules\@ctrip\nfes-next\node_modules\styled-
jsx-plugin-sass\index.js
[styled-jsx] Loading plugin from path: D:\Git\gitlab\redeem\node_modules\@ctrip\nfes-next\node_modules\styled-
jsx-plugin-sass\index.js
```

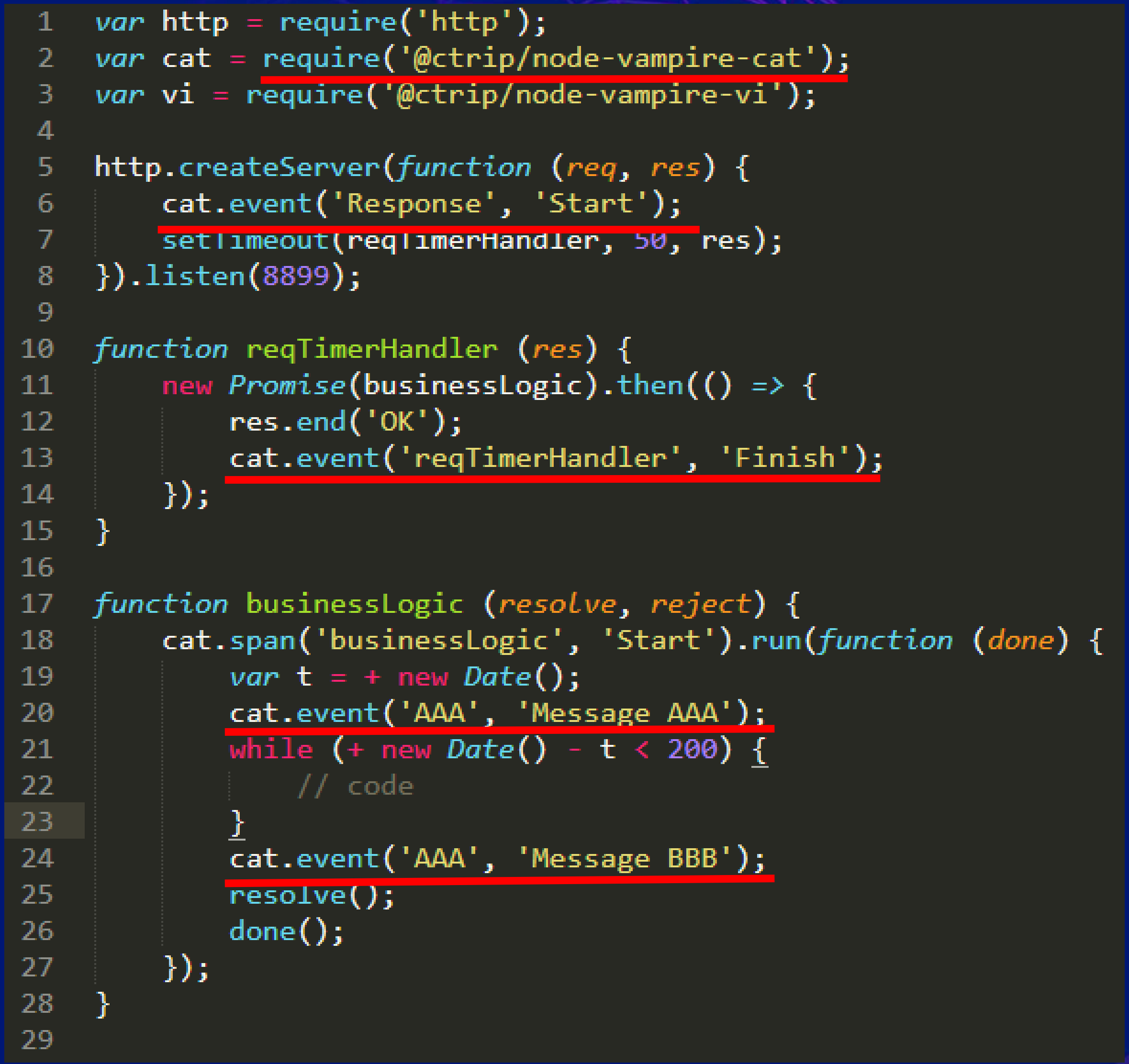
扫描右侧二维码查看发布项目详情（注意连接有线网络）

运维阶段

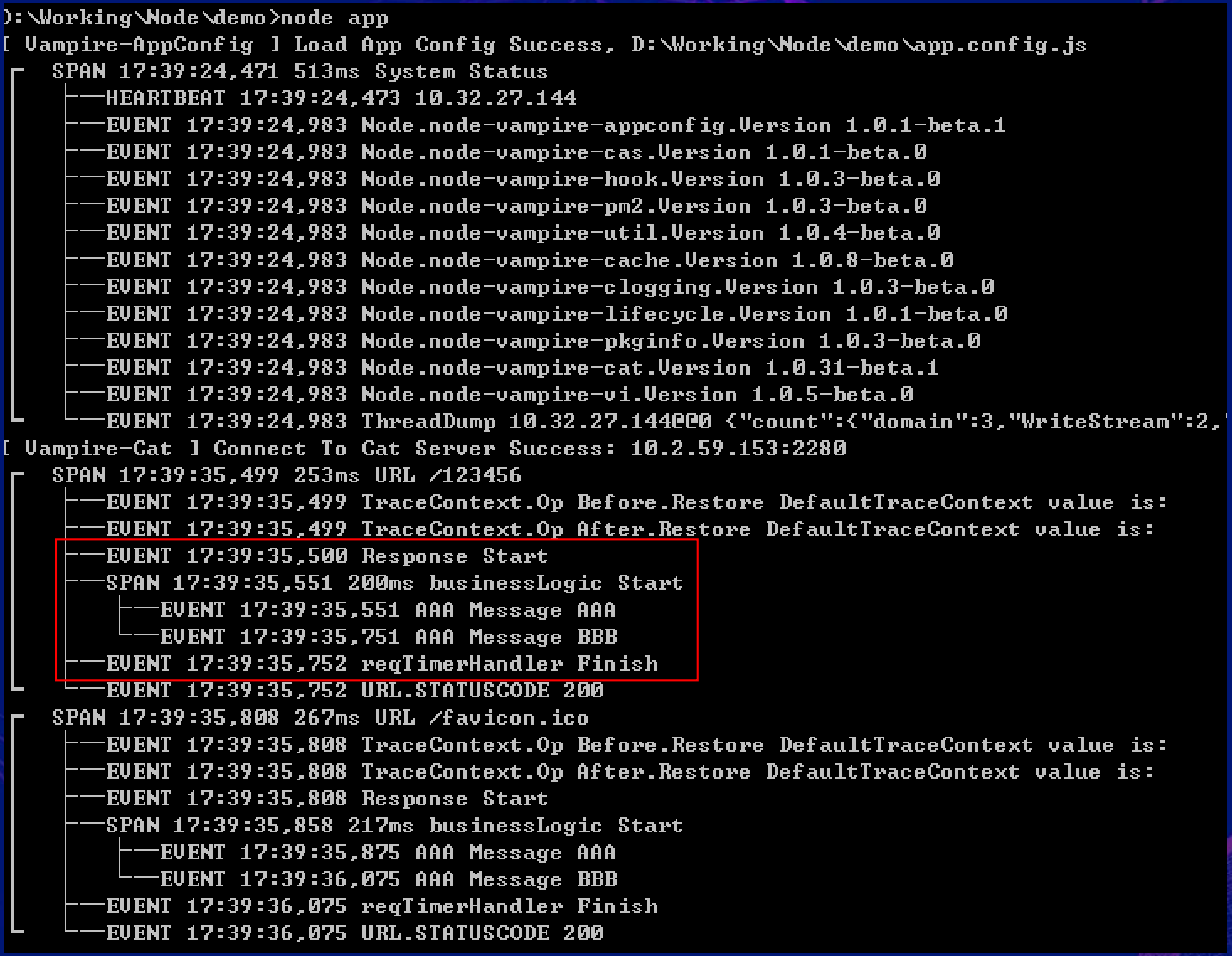
监控维度 - Web

- NFES.AjaxReady、NFES.AjaxMessageSize
- NFES.DomReady、NFES.Onload
- NFES.TemplateRender
- NFES.GeoRequest
- NFES.firstMeaningfulPaint

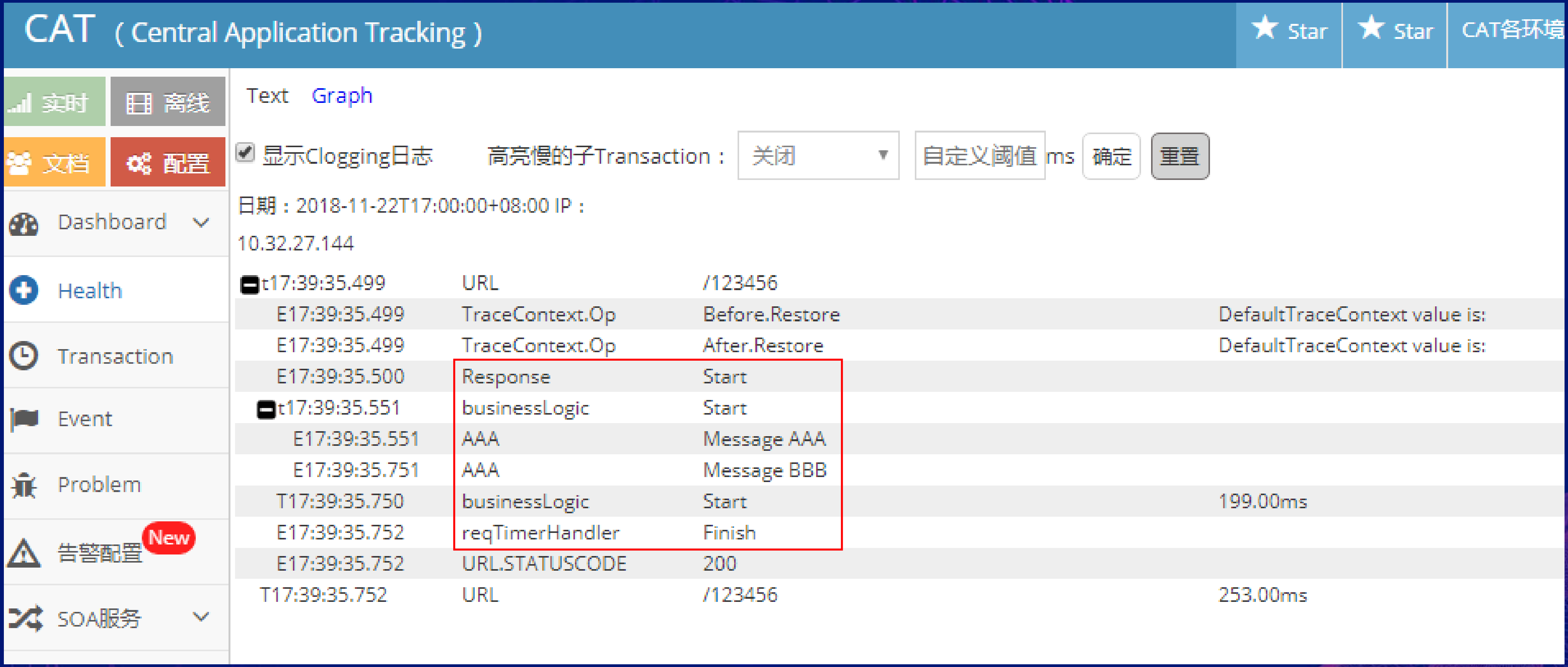
监控维度 - 服务端



```javascript
var http = require('http');
var cat = require('@ctrip/node-vampire-cat');
var vi = require('@ctrip/node-vampire-vi');

http.createServer(function (req, res) {
    cat.event('Response', 'Start');
    setTimeout(reqTimerHandler, 50, res);
}).listen(8899);

function reqTimerHandler (res) {
    new Promise(businessLogic).then(() => {
        res.end('OK');
        cat.event('reqTimerHandler', 'Finish');
    });
}

function businessLogic (resolve, reject) {
    cat.span('businessLogic', 'Start').run(function (done) {
        var t = + new Date();
        cat.event('AAA', 'Message AAA');
        while (+ new Date() - t < 200) {
            // code
        }
        cat.event('AAA', 'Message BBB');
        resolve();
        done();
    });
}

```



```
):\Working\Node\demo>node app
[ Vampire-AppConfig ] Load App Config Success, D:\Working\Node\demo\app.config.js
┌  SPAN 17:39:24,471 513ms System Status
│   ├──HEARTBEAT 17:39:24,473 10.32.27.144
│   ├──EVENT 17:39:24,983 Node.node-vampire-appconfig.Version 1.0.1-beta.1
│   ├──EVENT 17:39:24,983 Node.node-vampire-cas.Version 1.0.1-beta.0
│   ├──EVENT 17:39:24,983 Node.node-vampire-hook.Version 1.0.3-beta.0
│   ├──EVENT 17:39:24,983 Node.node-vampire-pm2.Version 1.0.3-beta.0
│   ├──EVENT 17:39:24,983 Node.node-vampire-util.Version 1.0.4-beta.0
│   ├──EVENT 17:39:24,983 Node.node-vampire-cache.Version 1.0.8-beta.0
│   ├──EVENT 17:39:24,983 Node.node-vampire-clogging.Version 1.0.3-beta.0
│   ├──EVENT 17:39:24,983 Node.node-vampire-lifecycle.Version 1.0.1-beta.0
│   ├──EVENT 17:39:24,983 Node.node-vampire-pkginfo.Version 1.0.3-beta.0
│   ├──EVENT 17:39:24,983 Node.node-vampire-cat.Version 1.0.31-beta.1
│   ├──EVENT 17:39:24,983 Node.node-vampire-vi.Version 1.0.5-beta.0
└   └──EVENT 17:39:24,983 ThreadDump 10.32.27.144@@0 {"count":{"domain":3,"WriteStream":2,'
[ Vampire-Cat ] Connect To Cat Server Success: 10.2.59.153:2280
┌  SPAN 17:39:35,499 253ms URL /123456
│   ├──EVENT 17:39:35,499 TraceContext.Op Before.Restore DefaultTraceContext value is:
│   ├──EVENT 17:39:35,499 TraceContext.Op After.Restore DefaultTraceContext value is:
│   ├──EVENT 17:39:35,500 Response Start
│   ├──SPAN 17:39:35,551 200ms businessLogic Start
│   │   ├──EVENT 17:39:35,551 AAA Message AAA
│   │   └──EVENT 17:39:35,751 AAA Message BBB
│   ├──EVENT 17:39:35,752 reqTimerHandler Finish
└   └──EVENT 17:39:35,752 URL.STATUSCODE 200
┌  SPAN 17:39:35,808 267ms URL /favicon.ico
│   ├──EVENT 17:39:35,808 TraceContext.Op Before.Restore DefaultTraceContext value is:
│   ├──EVENT 17:39:35,808 TraceContext.Op After.Restore DefaultTraceContext value is:
│   ├──EVENT 17:39:35,808 Response Start
│   ├──SPAN 17:39:35,858 217ms businessLogic Start
│   │   ├──EVENT 17:39:35,875 AAA Message AAA
│   │   └──EVENT 17:39:36,075 AAA Message BBB
│   ├──EVENT 17:39:36,075 reqTimerHandler Finish
└   └──EVENT 17:39:36,075 URL.STATUSCODE 200
```



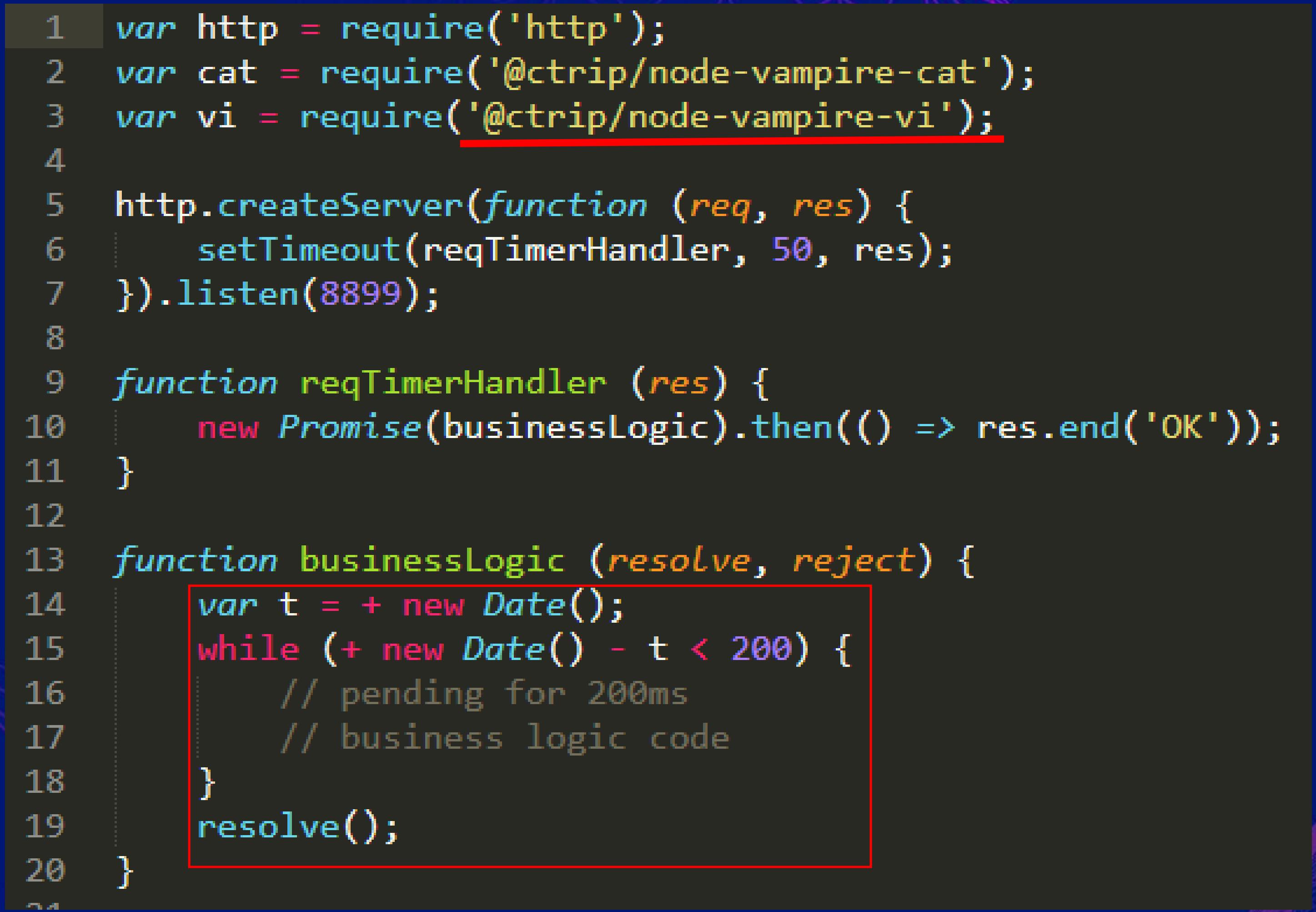
☑ 显示Clogging日志 高亮慢的子Transaction： 关闭 ▾ 自定义阈值 ms

日期：2018-11-22T17:00:00+08:00 IP：

10.32.27.144

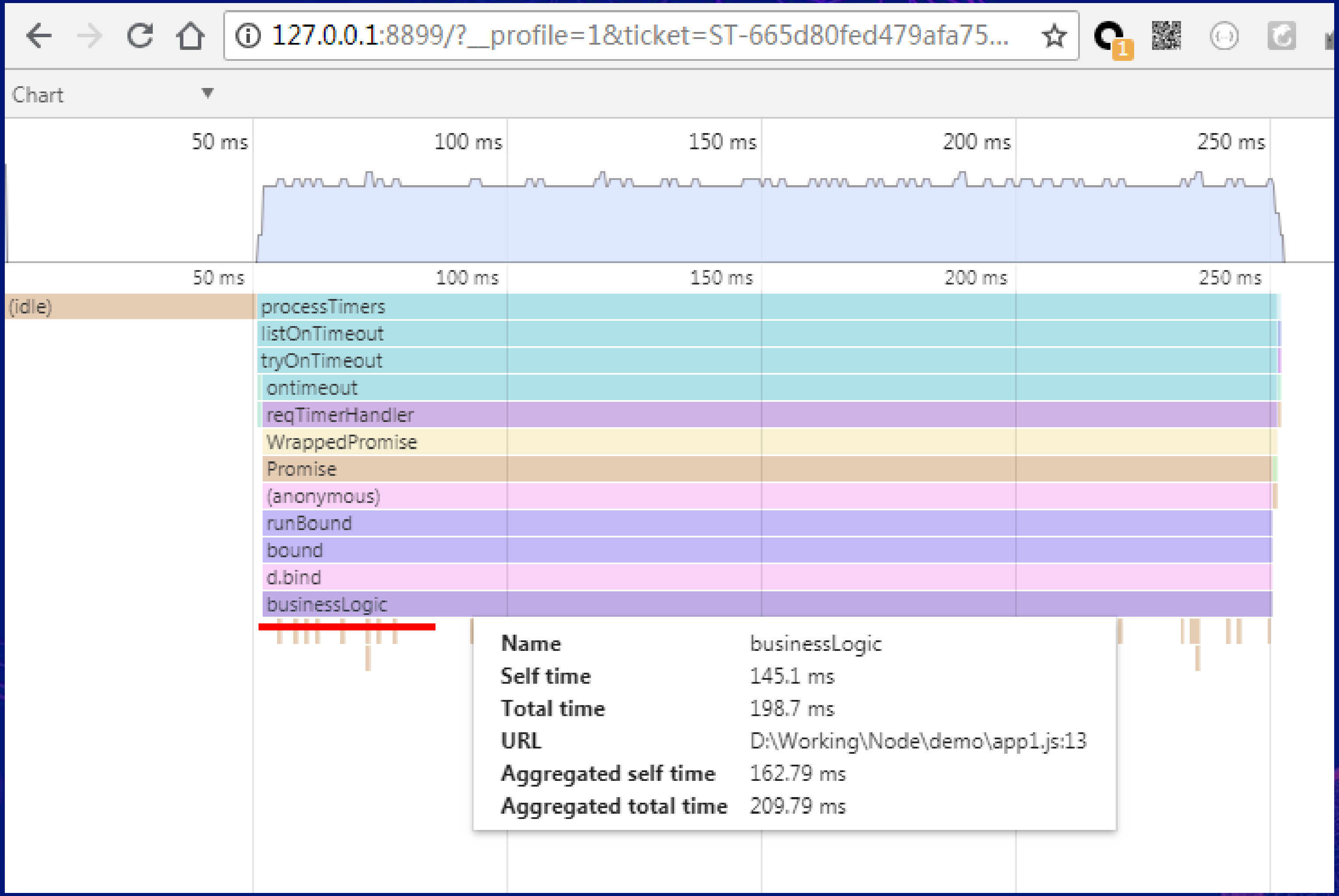
```
⊟t17:39:35.499     URL                 /123456
  E17:39:35.499    TraceContext.Op     Before.Restore                         DefaultTraceContext value is:
  E17:39:35.499    TraceContext.Op     After.Restore                          DefaultTraceContext value is:
  E17:39:35.500    Response            Start
 ⊟t17:39:35.551    businessLogic       Start
    E17:39:35.551  AAA                 Message AAA
    E17:39:35.751  AAA                 Message BBB
  T17:39:35.750    businessLogic       Start                                  199.00ms
  E17:39:35.752    reqTimerHandler     Finish
  E17:39:35.752    URL.STATUSCODE      200
 T17:39:35.752     URL                 /123456                                253.00ms
```

运维 - 代码示例



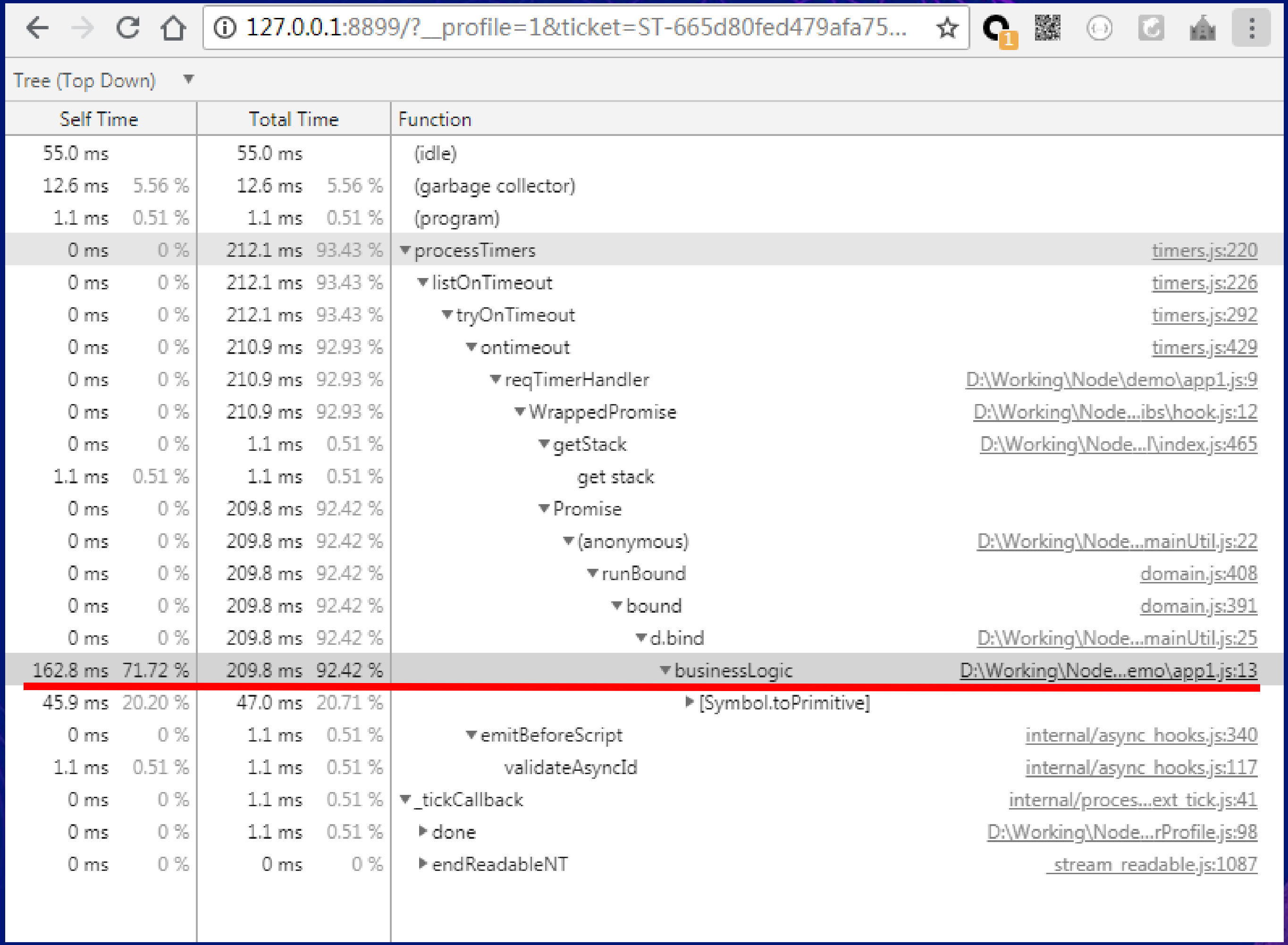
```
var http = require('http');
var cat = require('@ctrip/node-vampire-cat');
var vi = require('@ctrip/node-vampire-vi');

http.createServer(function (req, res) {
    setTimeout(reqTimerHandler, 50, res);
}).listen(8899);

function reqTimerHandler (res) {
    new Promise(businessLogic).then(() => res.end('OK'));
}

function businessLogic (resolve, reject) {
    var t = + new Date();
    while (+ new Date() - t < 200) {
        // pending for 200ms
        // business logic code
    }
    resolve();
}
```

运维 - 调用栈



Name	businessLogic
Self time	145.1 ms
Total time	198.7 ms
URL	D:\Working\Node\demo\app1.js:13
Aggregated self time	162.79 ms
Aggregated total time	209.79 ms

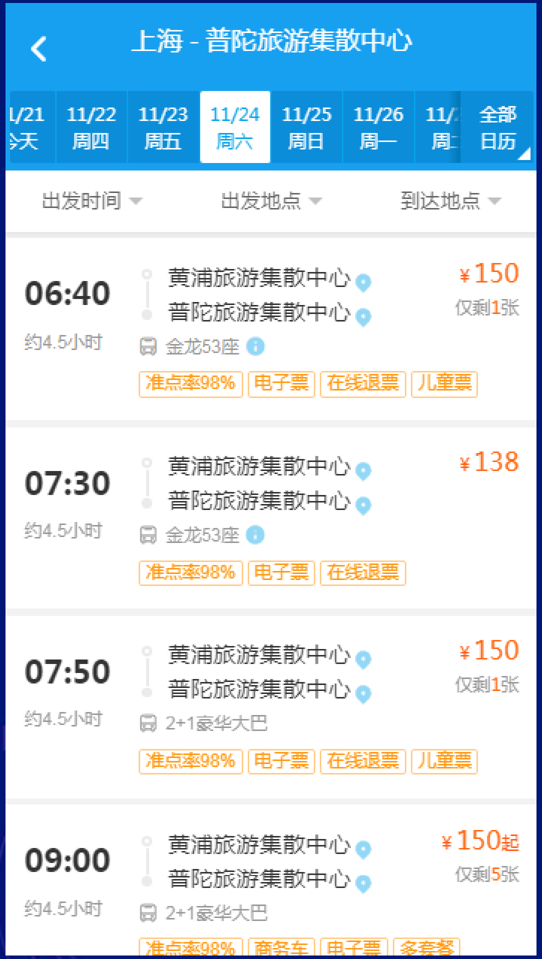
运维 - 视窗



Tree (Top Down) ▼

Self Time		Total Time		Function	
55.0 ms		55.0 ms		(idle)	
12.6 ms	5.56 %	12.6 ms	5.56 %	(garbage collector)	
1.1 ms	0.51 %	1.1 ms	0.51 %	(program)	
0 ms	0 %	212.1 ms	93.43 %	▼processTimers	timers.js:220
0 ms	0 %	212.1 ms	93.43 %	▼listOnTimeout	timers.js:226
0 ms	0 %	212.1 ms	93.43 %	▼tryOnTimeout	timers.js:292
0 ms	0 %	210.9 ms	92.93 %	▼ontimeout	timers.js:429
0 ms	0 %	210.9 ms	92.93 %	▼reqTimerHandler	D:\Working\Node\demo\app1.js:9
0 ms	0 %	210.9 ms	92.93 %	▼WrappedPromise	D:\Working\Node...ibs\hook.js:12
0 ms	0 %	1.1 ms	0.51 %	▼getStack	D:\Working\Node...l\index.js:465
1.1 ms	0.51 %	1.1 ms	0.51 %	get stack	
0 ms	0 %	209.8 ms	92.42 %	▼Promise	
0 ms	0 %	209.8 ms	92.42 %	▼(anonymous)	D:\Working\Node...mainUtil.js:22
0 ms	0 %	209.8 ms	92.42 %	▼runBound	domain.js:408
0 ms	0 %	209.8 ms	92.42 %	▼bound	domain.js:391
0 ms	0 %	209.8 ms	92.42 %	▼d.bind	D:\Working\Node...mainUtil.js:25
162.8 ms	71.72 %	209.8 ms	92.42 %	▼businessLogic	D:\Working\Node...emo\app1.js:13
45.9 ms	20.20 %	47.0 ms	20.71 %	▶[Symbol.toPrimitive]	
0 ms	0 %	1.1 ms	0.51 %	▼emitBeforeScript	internal/async_hooks.js:340
1.1 ms	0.51 %	1.1 ms	0.51 %	validateAsyncId	internal/async_hooks.js:117
0 ms	0 %	1.1 ms	0.51 %	▼_tickCallback	internal/proces...ext_tick.js:41
0 ms	0 %	1.1 ms	0.51 %	▶done	D:\Working\Node...rProfile.js:98
0 ms	0 %	0 ms	0 %	▶endReadableNT	_stream_readable.js:1087

收益 - 多端适配



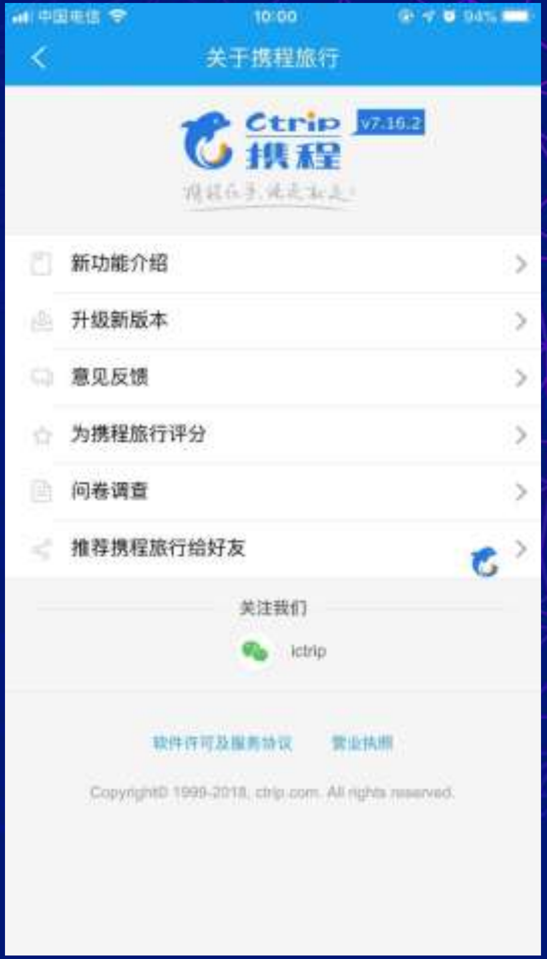
06:40 约4.5小时 黄浦旅游集散中心 普陀旅游集散中心 金龙53座 ¥150 仅剩1张 准点率98% 电子票 在线退票 儿童票

07:30 约4.5小时 黄浦旅游集散中心 普陀旅游集散中心 金龙53座 ¥138 准点率98% 电子票 在线退票

07:50 约4.5小时 黄浦旅游集散中心 普陀旅游集散中心 2+1豪华大巴 ¥150 仅剩1张 准点率98% 电子票 在线退票 儿童票

09:00 约4.5小时 黄浦旅游集散中心 普陀旅游集散中心 2+1豪华大巴 ¥150起 仅剩5张 准点率98% 商务车 电子票 多套餐

H5



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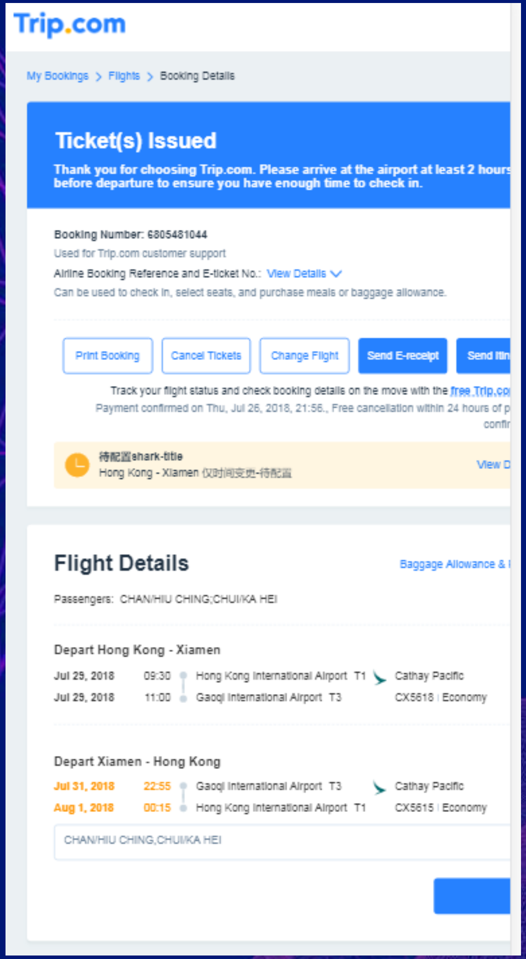
Hybrid



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Hong Kong - Xiamen 仅时间变更-待配置

Flight Details

Passengers: CHAN/HIU CHING;CHUI/KA HEI

Depart Hong Kong - Xiamen

Jul 29, 2018	09:30	Hong Kong International Airport T1	Cathay Pacific
Jul 29, 2018	11:00	Gaoqi International Airport T3	CX5618 | Economy

Depart Xiamen - Hong Kong

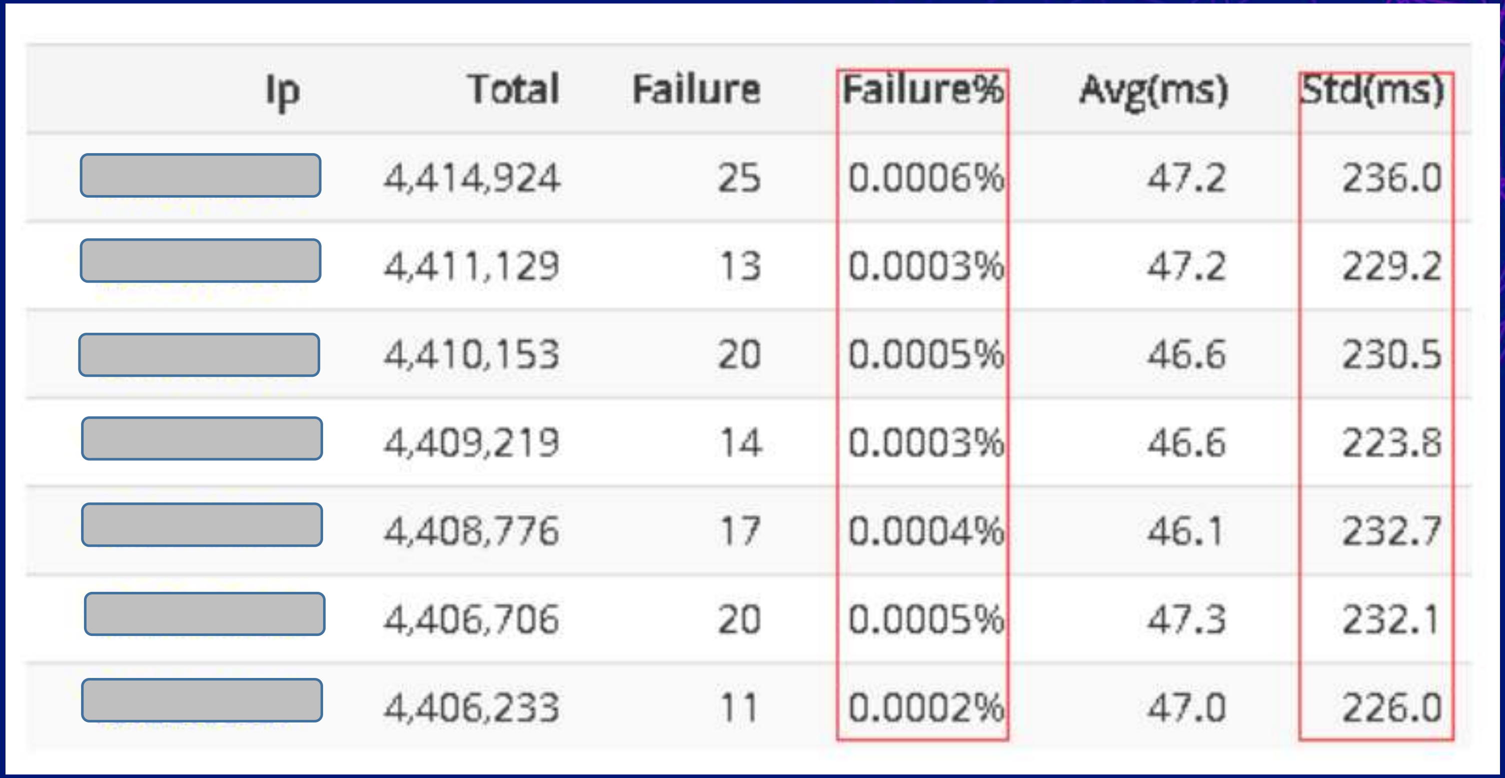
Jul 31, 2018	22:55	Gaoqi International Airport T3	Cathay Pacific
Aug 1, 2018	00:15	Hong Kong International Airport T1	CX5615 | Economy

CHAN/HIU CHING,CHUI/KA HEI

PC

性能优化 - 渲染与响应速度

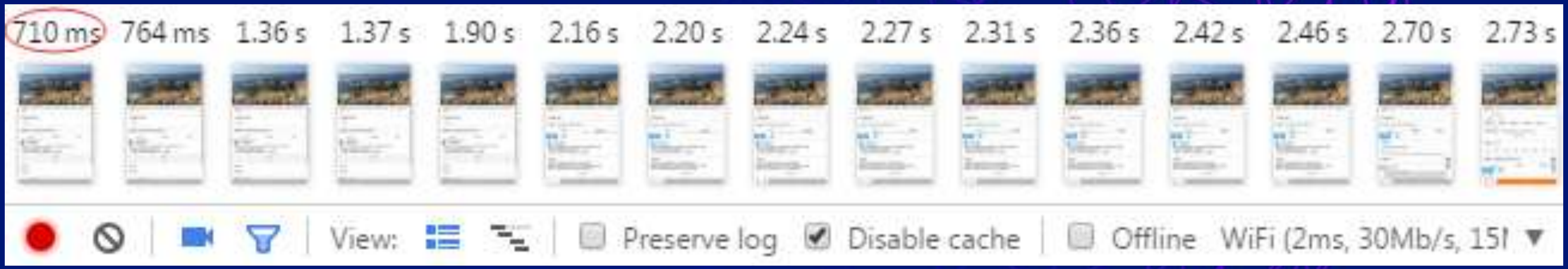
- 平均耗时50ms
- 耗时标准差250ms



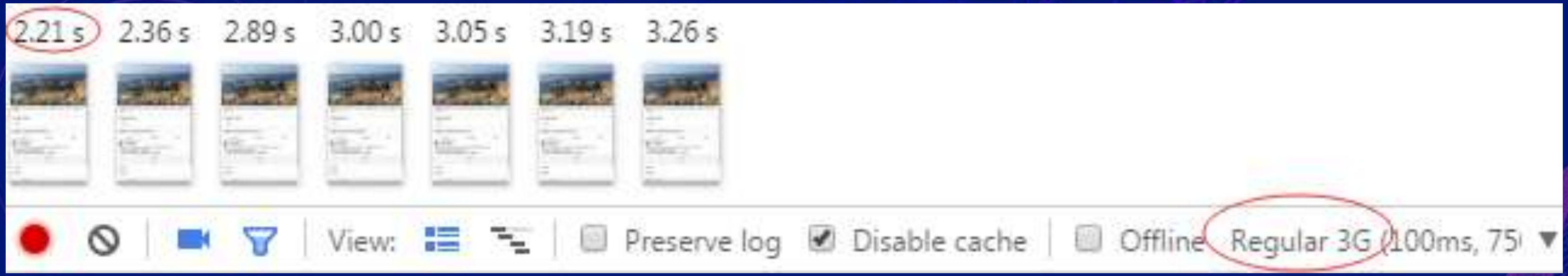
Ip	Total	Failure	Failure%	Avg(ms)	Std(ms)
[redacted]	4,414,924	25	0.0006%	47.2	236.0
[redacted]	4,411,129	13	0.0003%	47.2	229.2
[redacted]	4,410,153	20	0.0005%	46.6	230.5
[redacted]	4,409,219	14	0.0003%	46.6	223.8
[redacted]	4,408,776	17	0.0004%	46.1	232.7
[redacted]	4,406,706	20	0.0005%	47.3	232.1
[redacted]	4,406,233	11	0.0002%	47.0	226.0

性能优化 - 首屏渲染速度

- 在 WIFI/4G 环境下，由原先 3s 降低到 1s以内
- 在 3G 环境下，由 8s 降低到 2.2s



□ Preserve log ☑ Disable cache □ Offline WiFi (2ms, 30Mb/s, 15! ▼



□ Preserve log ☑ Disable cache □ Offline Regular 3G (100ms, 75! ▼

收益 - 提升开发效率

- 新技术栈提升30%的开发效率，10人团队→7人
- 新工具链减少沟通，开发周期可以降低20%
- React + Node.js 新技术栈利于人员招聘

未来探索

- Node 10 Worker Threads 渲染新模型
- SSR应用云端托管
- 海外Web资源域名分区

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