

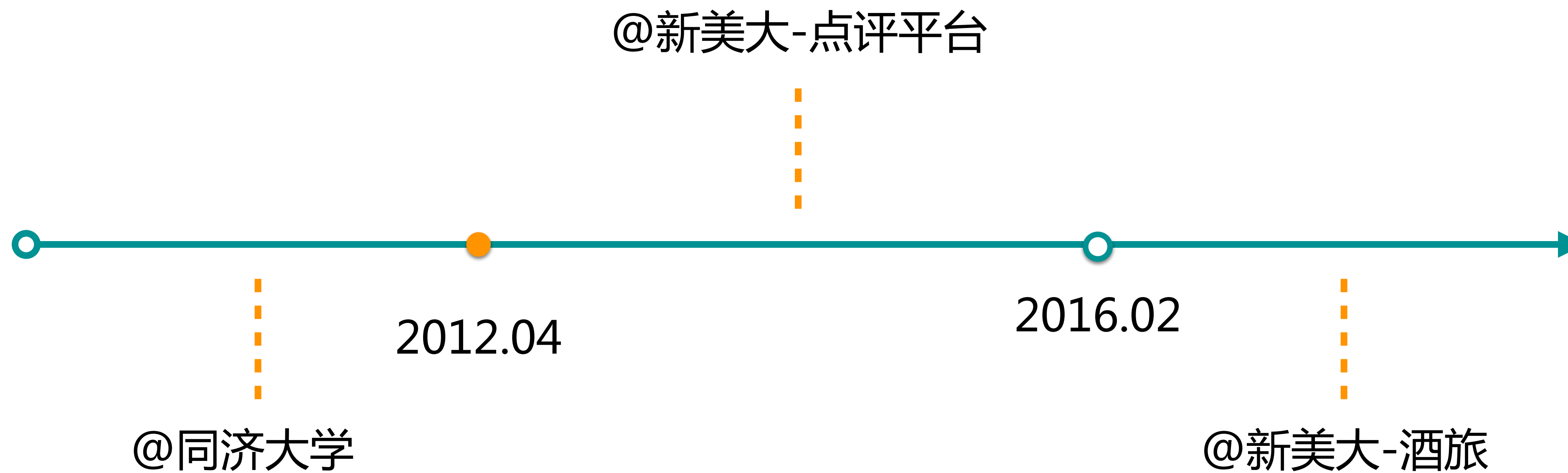
境外业务性能优化实践

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个人简介



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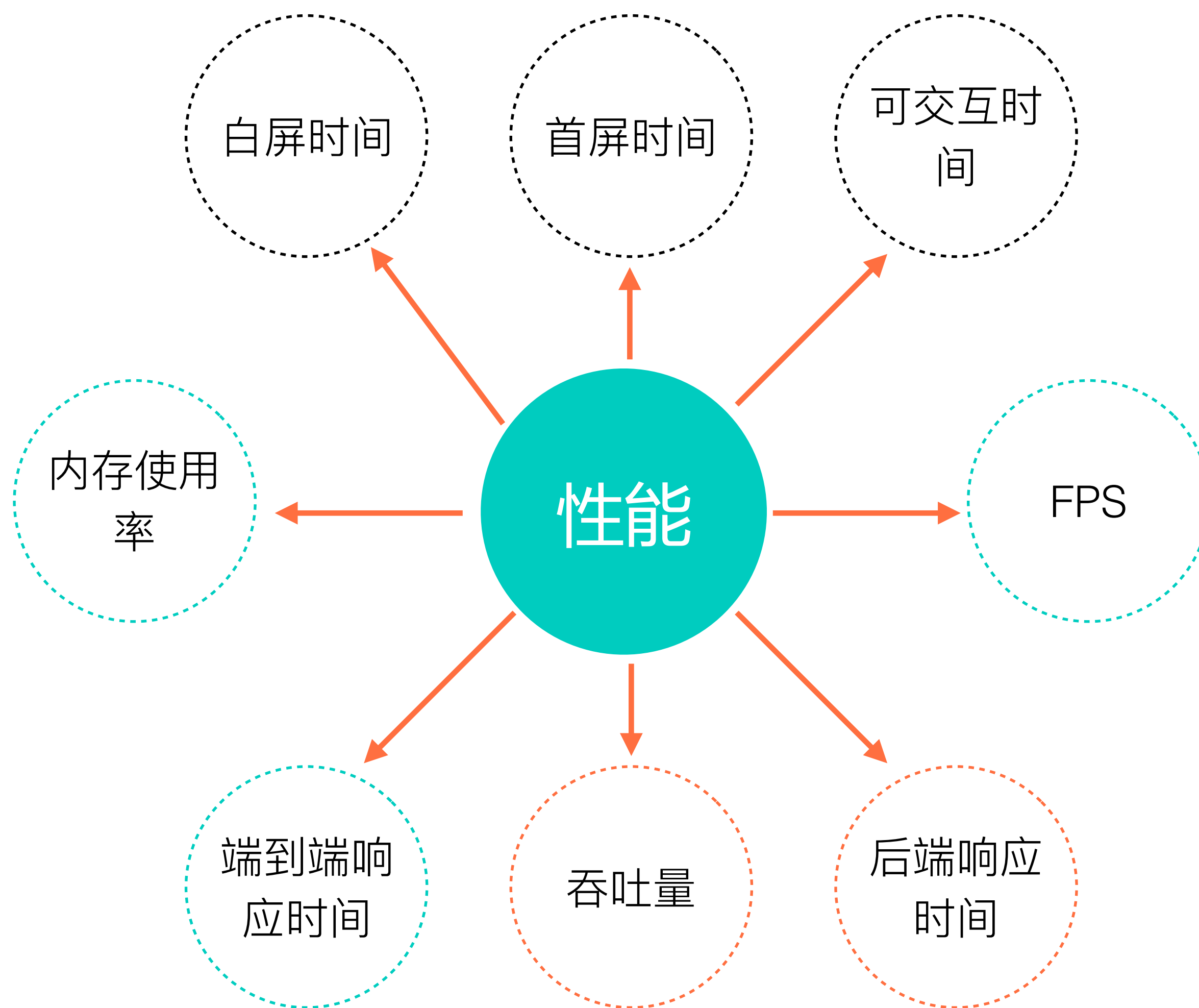
性能指什么



- 如果3s后，网页还未加载完毕，**57%**的用户会放弃。
- Amazon加载时间延长**1s**，一年减少**16亿**美金营收



性能指什么



影响性能的因素

PC、移动
(Web Web App/Native APP)

服务器及云环境
(运维、硬件、系统、日志)

产品逻辑及用户行为
(设计、结构、内容、交互)

基础网络
(IDC、CDN、BGP、GSLB)

代码及应用
(开发语言、研发功底、三方依赖)



性能监控工具

Web端监控

(请求量、完全加载时间、白屏时间、ajax...)

APP端到端监控

(网络成功率、包大小、加载时间、运营商...)

业务指标监控

(业务核心指标监控：订单、支付、退款、验券)

应用层监控

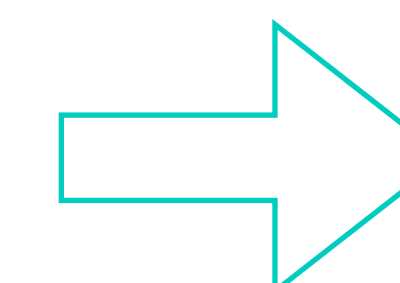
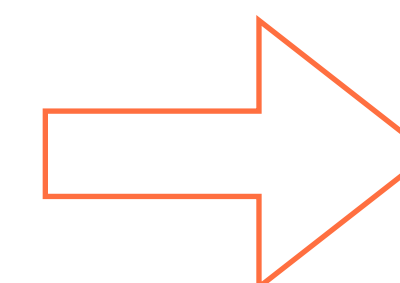
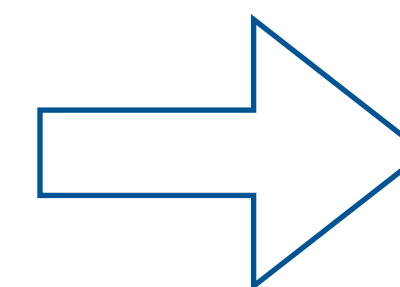
(api、service、sql、qps、Cache命中率...)

系统层监控(物理机、虚拟机)

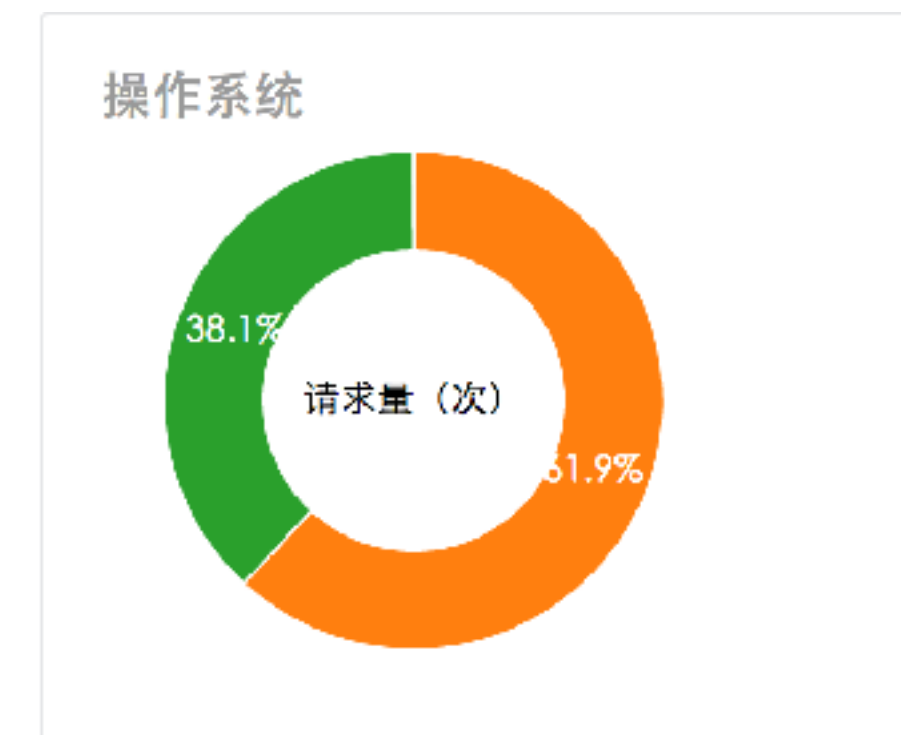
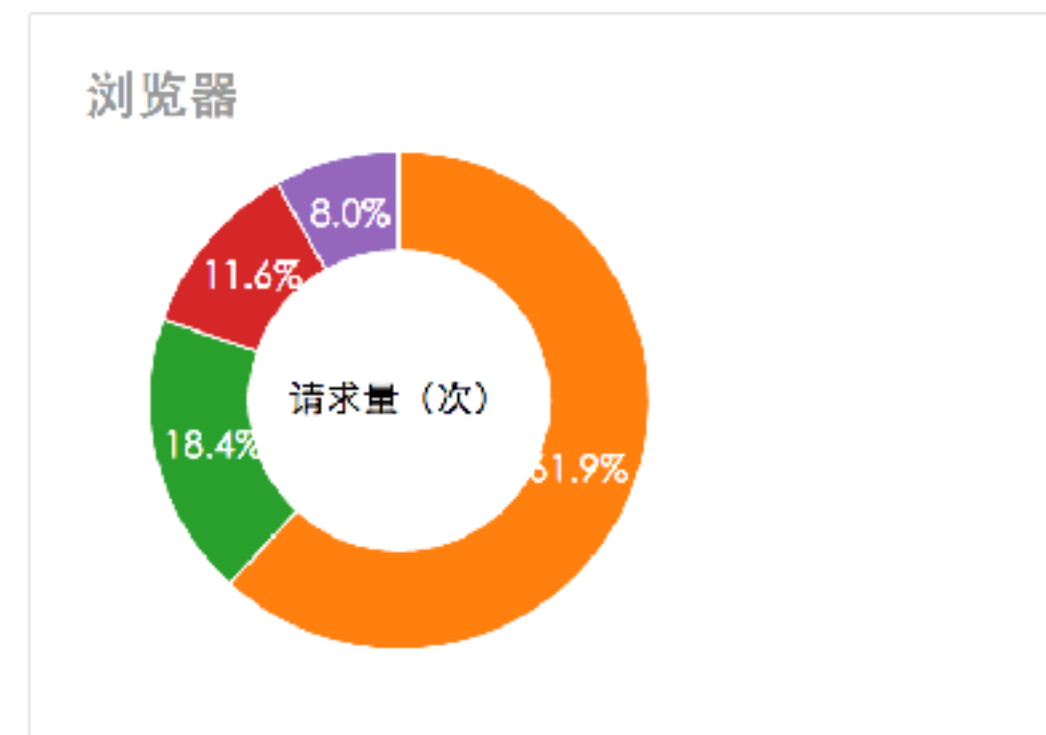
(cpu、memory、network、disk...)

基础设施监控 (网络、交换机等)

(网络流量、丢包、错包、连接数等)



Web监控-Performance



2016-10-01 00:00 - 2016-12-26 17:30 时间粒度: 1d 3d 7d

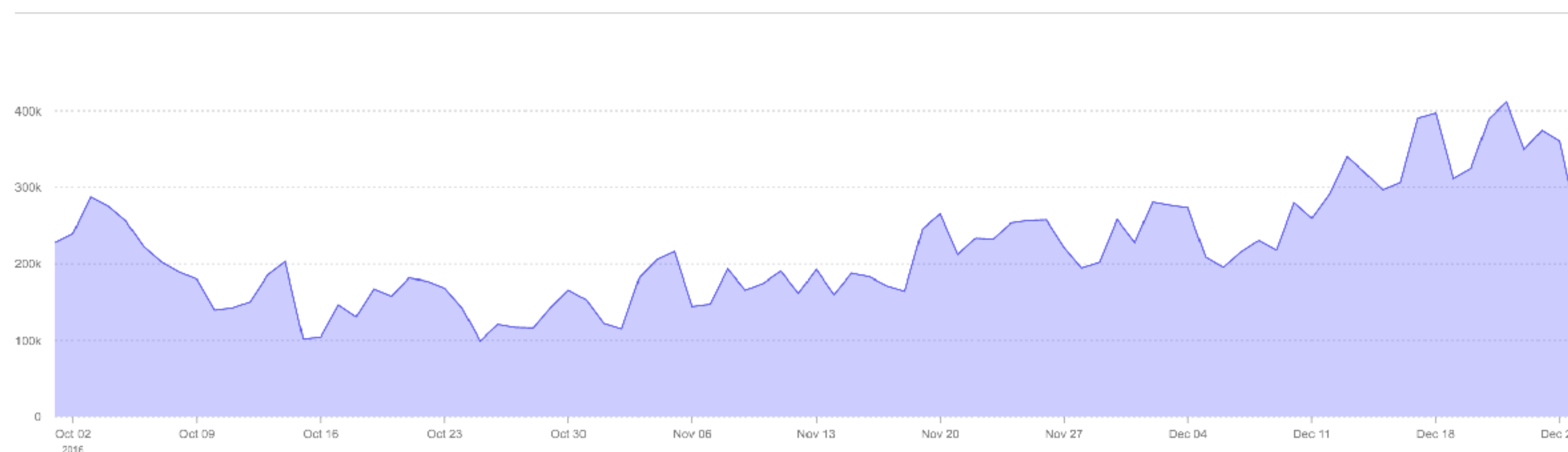
请求量 (次) 搜索...

横向对比 历史叠加 百分比

/app/app-overseas-peon/detail.html	104,116次
/app/app-overseas-peon/list.html	49,116次
/app/app-overseas-peon/channel.html	49,116次
/app/app-overseas-peon/unionpay/coupondetail.html	6,116次
/app/app-overseas-peon/unionpay/getcouponresul...	6,116次
/os/order/createOrder	4,116次
/app/app-overseas-peon/unionpay/shopping.html	3,116次
/app/app-overseas-peon/city.html	3,116次
/app/app-overseas-peon/unionpay/mycoupondetail...	3,116次
/os/order/detail	3,116次
/app/app-overseas-peon/unionpay/mycouponlist.h...	5,117次

全部

请求量 (次)



完全加载时间 (毫秒)

应用层监控-Cat

CAT (Central Application Tracking)
Application
Mobile
Frontend
Configs
Documents
需求收集
Star
登录

CAT (Central Application Tracking)
Application
Mobile
Frontend
Configs
Documents
需求收集

Dashboard 2017-08-15 18:00 to 2017-08-15 18:59 常用 【切到历史】 [-7d] [-1d] [-1h] [+1h] [+1d]

支持多个字符串查询, 例如sql|url|task, 查询结果为包含任一sql、url、task的列。

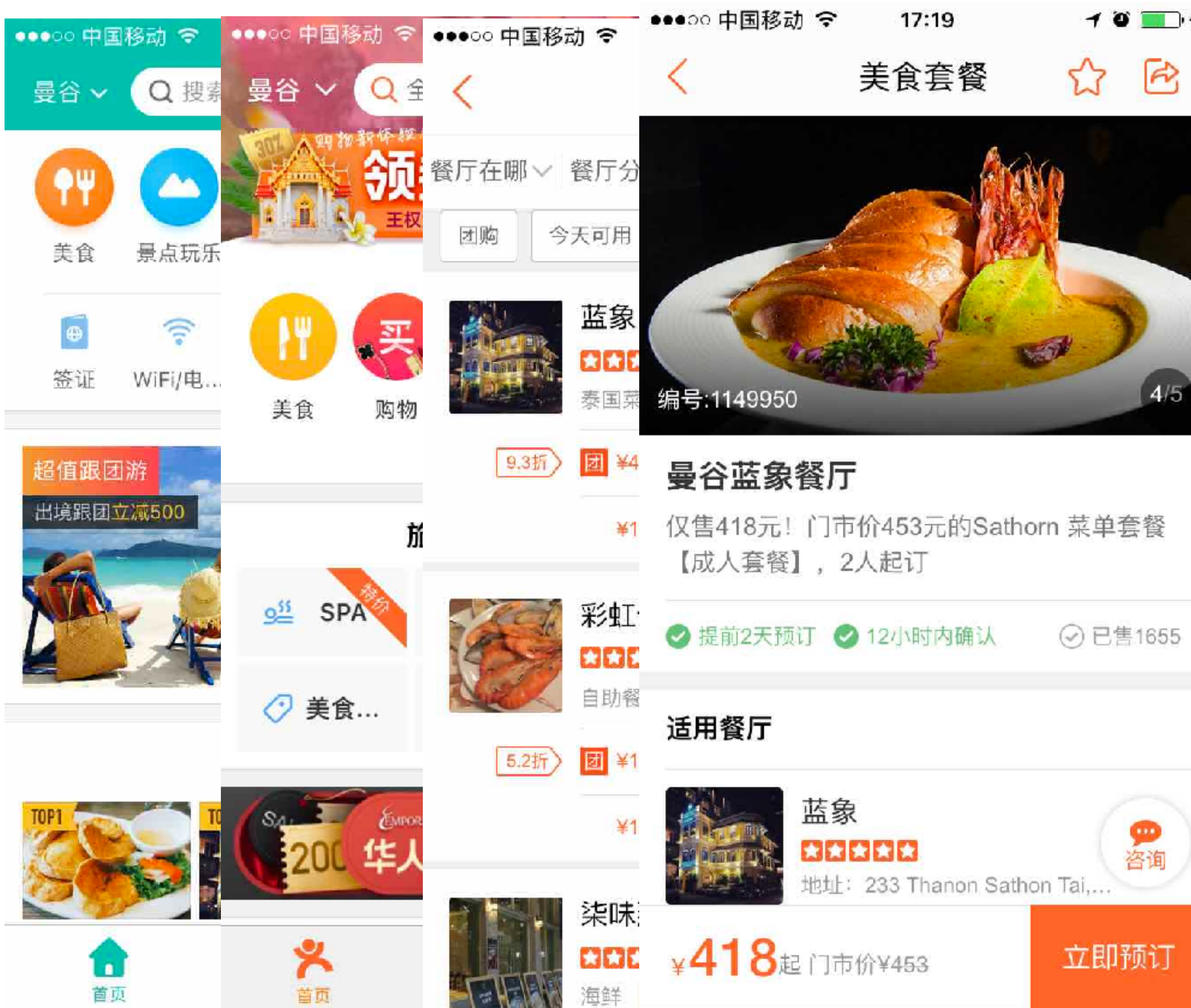
[: show ::] Name	Total	Failure	Failure%	Sample	Max	Avg	95Line	99Line	99.9Line
TOTAL	1,014.7	17	0.0112%	Log View	23.6	-	-	-	-
[: show ::] /city/parse/ajax/convert	81.1	0	0.0000%	Log View	526.1	6.2	7.5	9.0	81.1
[: show ::] /osdeal/detail/ajax/review	365.2	1	0.0044%	Log View	1,014.7	22.6	40.0	71.2	365.2
[: show ::] /osdeal/detail/ajax/op	75.1	0	0.0000%	Log View	250.4	37.8	40.0	62.5	75.1
[: show ::] /osdeal/detail/ajax/rec	83.6	0	0.0000%	Log View	120.4	38.5	50.0	58.7	83.6
[: show ::] /osdeal/list/ajax/v2/list	131.4	9	0.0696%	Log View	531.2	52.6	71.2	102.5	131.4
[: show ::] /osdeal/list/ajax/v2/filter	249.7	1	0.0082%	Log View	504	38.1	55.0	68.8	249.7
[: show ::] /osdeal/detail/ajax/basicInfo	190.0	5	0.0502%	Log View	536.6	30.4	40.0	58.7	190.0
[: show ::] /osdeal/list/ajax/v2/op	83.8	1	0.0113%	Log View	503.4	4.9	6.0	7.0	83.8
[: show ::] /osdeal/shop/ajax/general	1.0	0	0.0000%	Log View	1.8	0.6	1.0	1.0	1.0
[: show ::] /city/parse/ajax/list	246.9	0	0.0000%	Log View	415.1	10.2	12.0	13.8	246.9
[: show ::] /osdeal/shop/ajax/aggre	1.0	0	0.0000%	Log View	1.5	0.6	1.0	1.0	1.0
[: show ::] /city/parse/ajax/cityInfo	78.7	0	0.0000%	Log View	223.4	4.5	6.0	7.6	78.7

境外业务

50%用户
境外访问

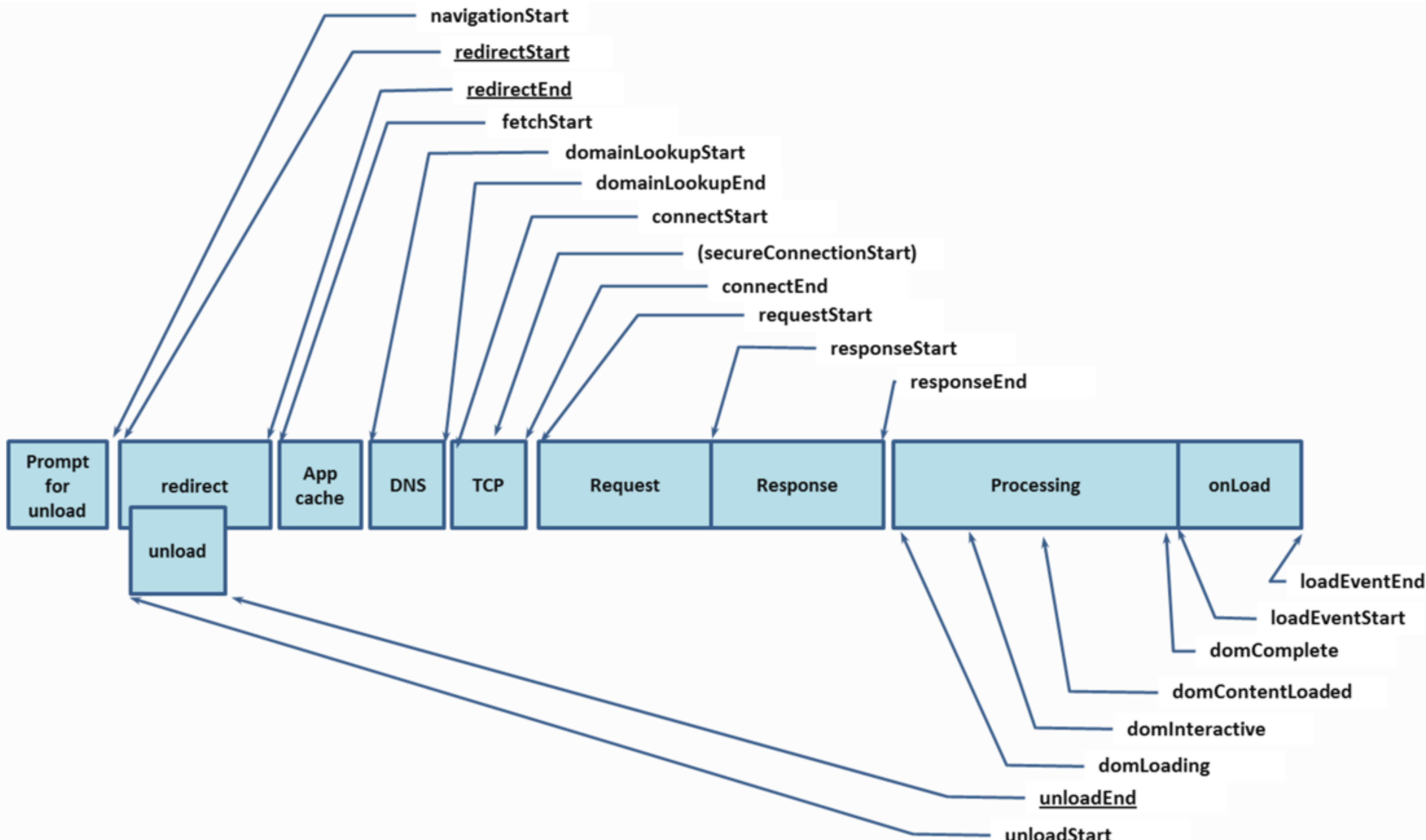
Hybrid架构

境外
商家对接



网络优化

网络优化



网络优化

Performance Scores

PageSpeed Score
A (98%) ^

PageSpeed

YSlow

Waterfall Chart ?

全部美食

Request	Status	Host	Size	Time
GET list	200 OK	osm.dianping.com		
GET list-dp.css	200 OK	dpfile.com		
GET neuron.js	200 OK	dpfile.com		
GET ~mod~app~overs	200 OK	dpfile.com		
GET nugget-mobile.js	200 OK	dpfile.com		
GET web.js	200 OK	analytics.meituan.net	11 KB	5.35s
GET loggingconfig?pac	200 OK	nugget.dianping.com	511 B	941ms
GET category?k1=[0]&	200 OK	osm.dianping.com	470 B	405ms
GET hippo.gif?_hlt=w	200 OK	hls.dianping.com	43 B	982ms
http://hls.dianping.com/hippo.gif?_hlt=www.dianping.com&_ppp=1490013&_had={}&force=1473218769239&_hsc=24bit&_hlh=http://osm.dianping.com/osd				
GET filter?token=&cat	200 OK	osm.dianping.com	684 B	374ms
GET list?pageCityId=n	200 OK	osm.dianping.com	2.1 KB	457ms
GET hippo.gif?_hlt=w	200 OK	hls.dianping.com	43 B	356ms
GET sprite-list.png	200 OK	dpfile.com	17.3 KB	468ms
GET 1471249048977-	200 OK	osp.meituan.net	8.2 KB	515ms
GET 14712521648011	200 OK	osp.meituan.net	7 KB	500ms
GET 1471247788953-	200 OK	osp.meituan.net	6.1 KB	509ms
GET 1471248959759-	200 OK	osp.meituan.net	8.2 KB	519ms
GET 1471317976735o	200 OK	osp.meituan.net	47.7 KB	507ms
GET 1471277552364-	200 OK	osp.meituan.net	15 KB	519ms
GET 14712599033706	200 OK	osp.meituan.net	10.5 KB	522ms

21 Requests 249.4 KB 8.35s (onload: 8.48s)

GET web.js 200 OK analytics.me 11 KB

Headers Response

Response Headers

```

Content-Type application/javascript
Transfer-Encoding chunked
Connection keep-alive
X-Cached-From BYPASS
Date Thu, 08 Sep 2016 10:25:12 GMT
Cache-Control max-age=3600
Access-Control-Allow-Origin *
Last-Modified Tue, 09 Aug 2016 11:35:52 GMT
Content-Encoding gzip
Age 3600
Expires Thu, 08 Sep 2016 11:25:12 GMT
Server Tengine
CC_CACHE TCP_MISS
    
```

Request Headers

```

Host analytics.meituan.net
User-Agent Mozilla/5.0 (X11; Linux x86_64; rv:47.0) Gecko/20100101 Firefox/47.0
Accept */*
Accept-Language en-US,en;q=0.5
Accept-Encoding gzip, deflate
Referer http://osm.dianping.com/app/app-overseas-neon/detail.html?skuId=395
    
```

+1.97s Request start time since the beginning

Request phases start and elapsed time relative to the request start:

```

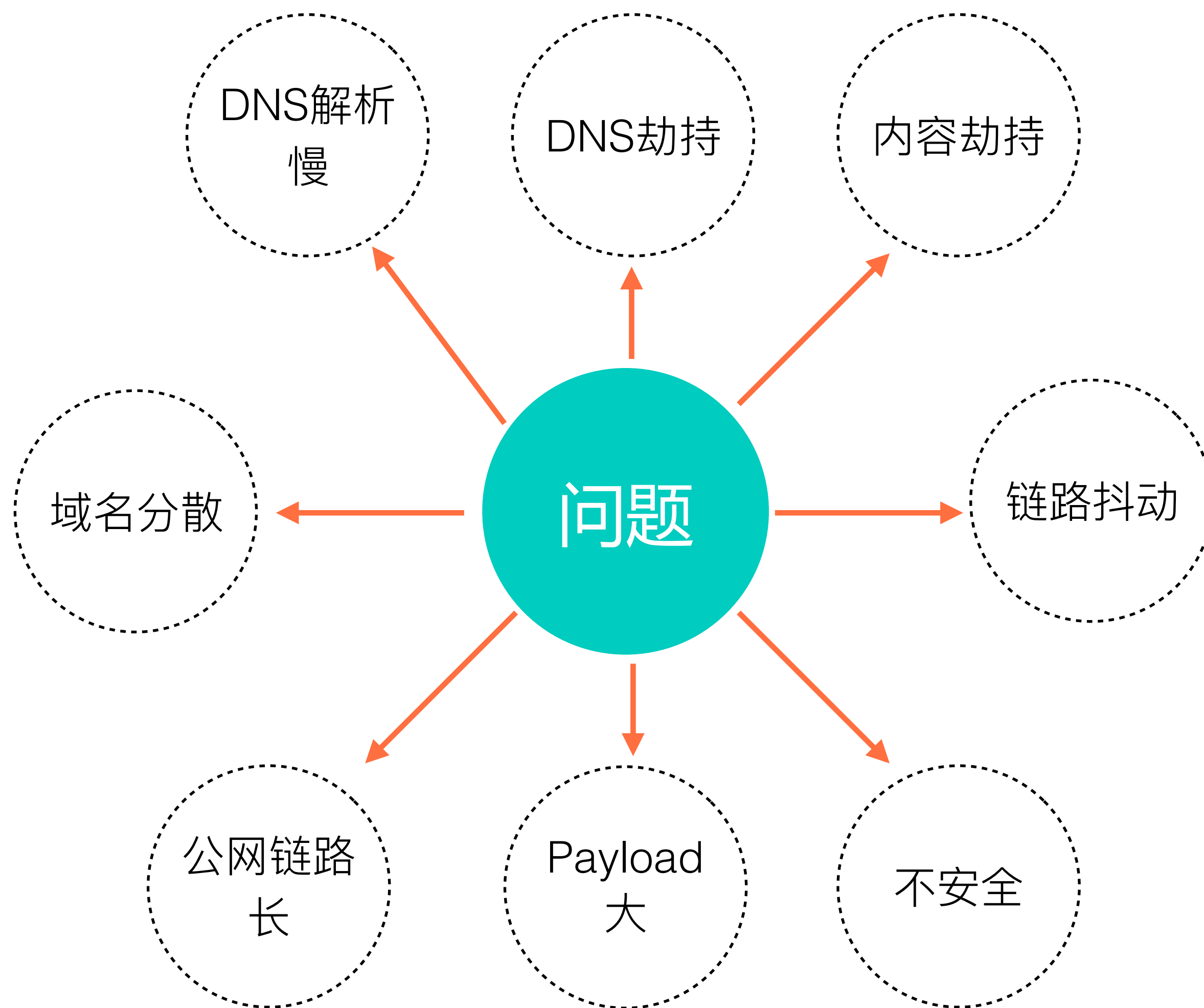
0ms 0ms Blocking
0ms 2.36s DNS Lookup
+2.36s 202ms Connecting
+2.56s 0ms Sending
+2.56s 259ms Waiting
+2.82s 0ms Receiving
    
```

Event timing relative to the request start:

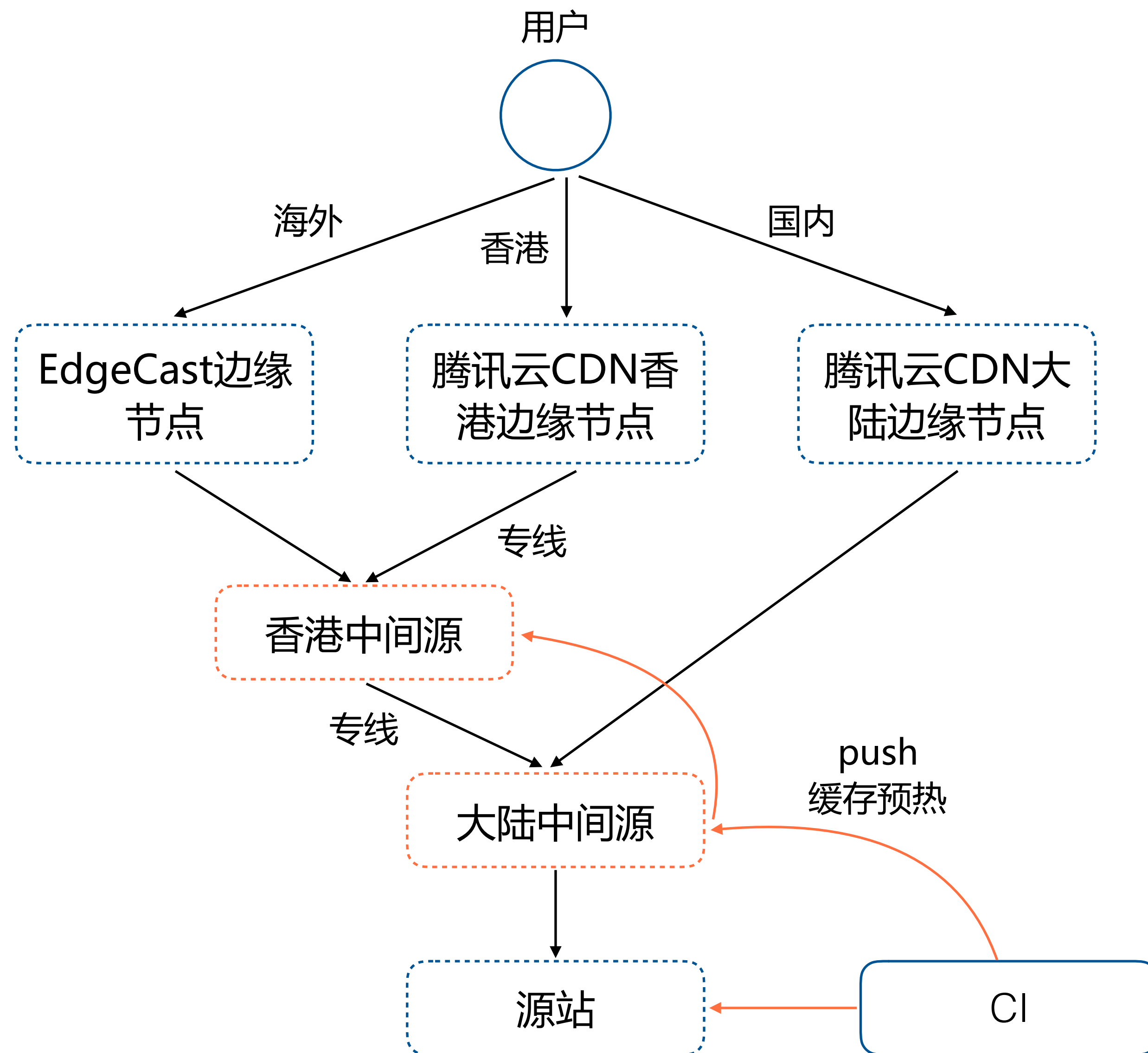
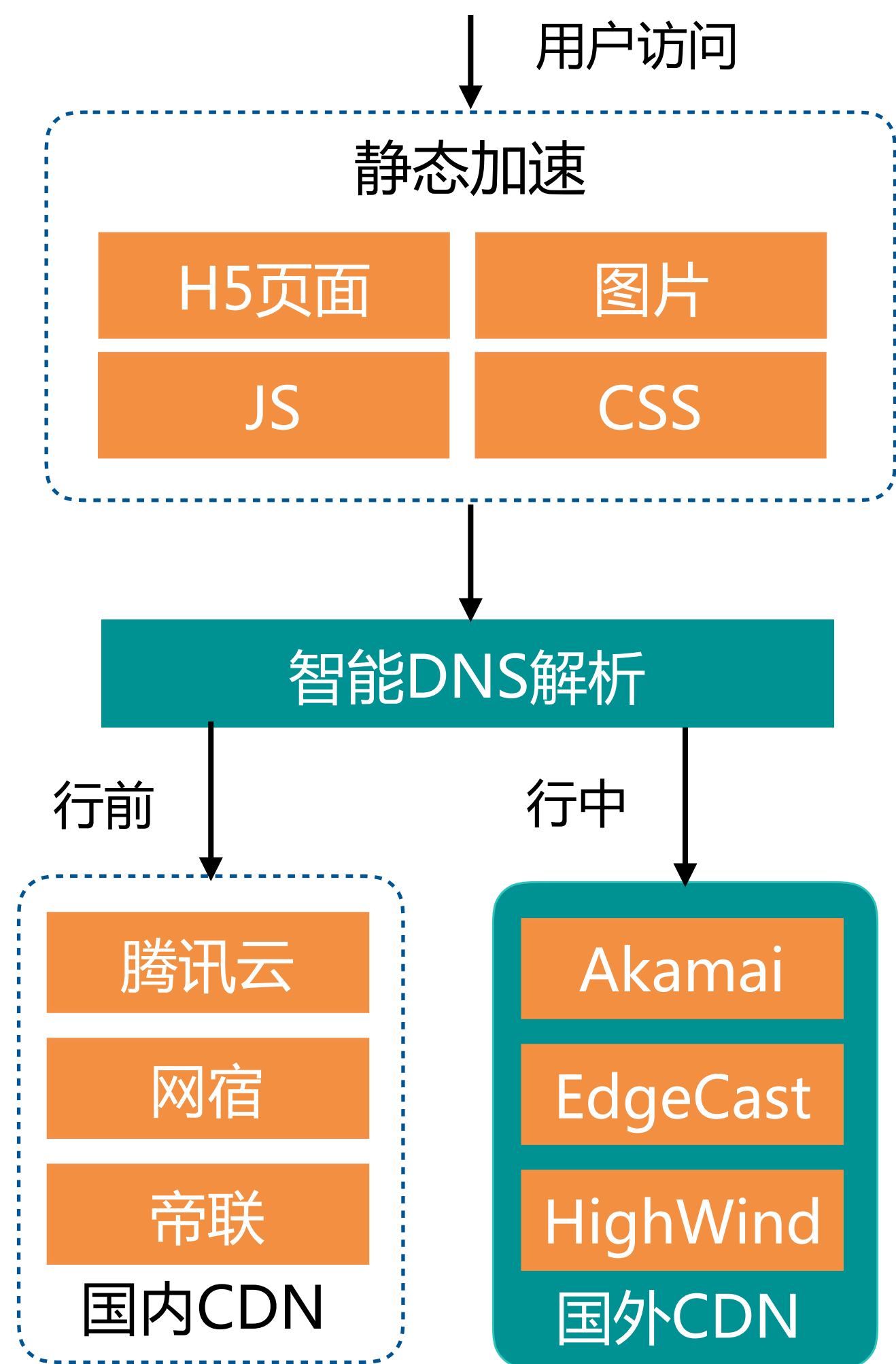
```

+145ms DOM Loaded
+2.85s Page Loaded
    
```

网络问题



CDN优化



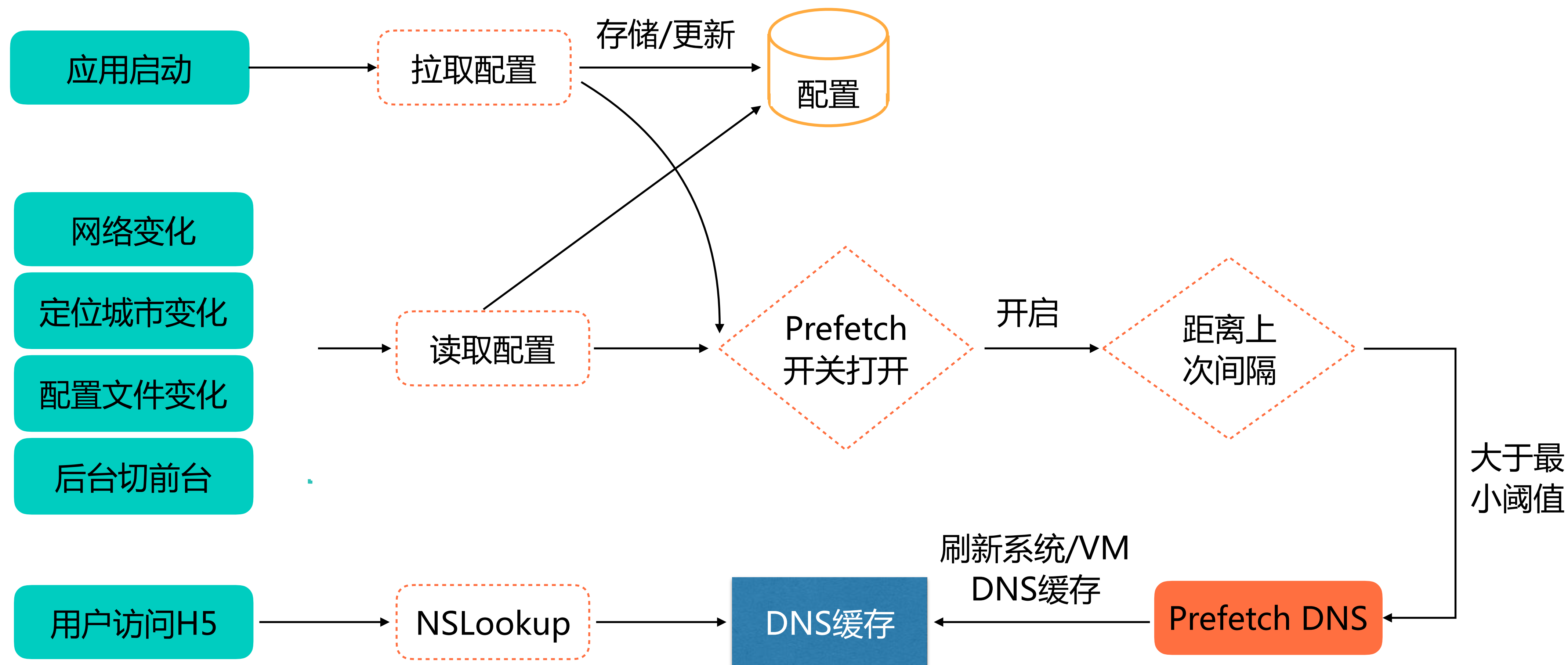
DNS Prefetch背景



DNS问题

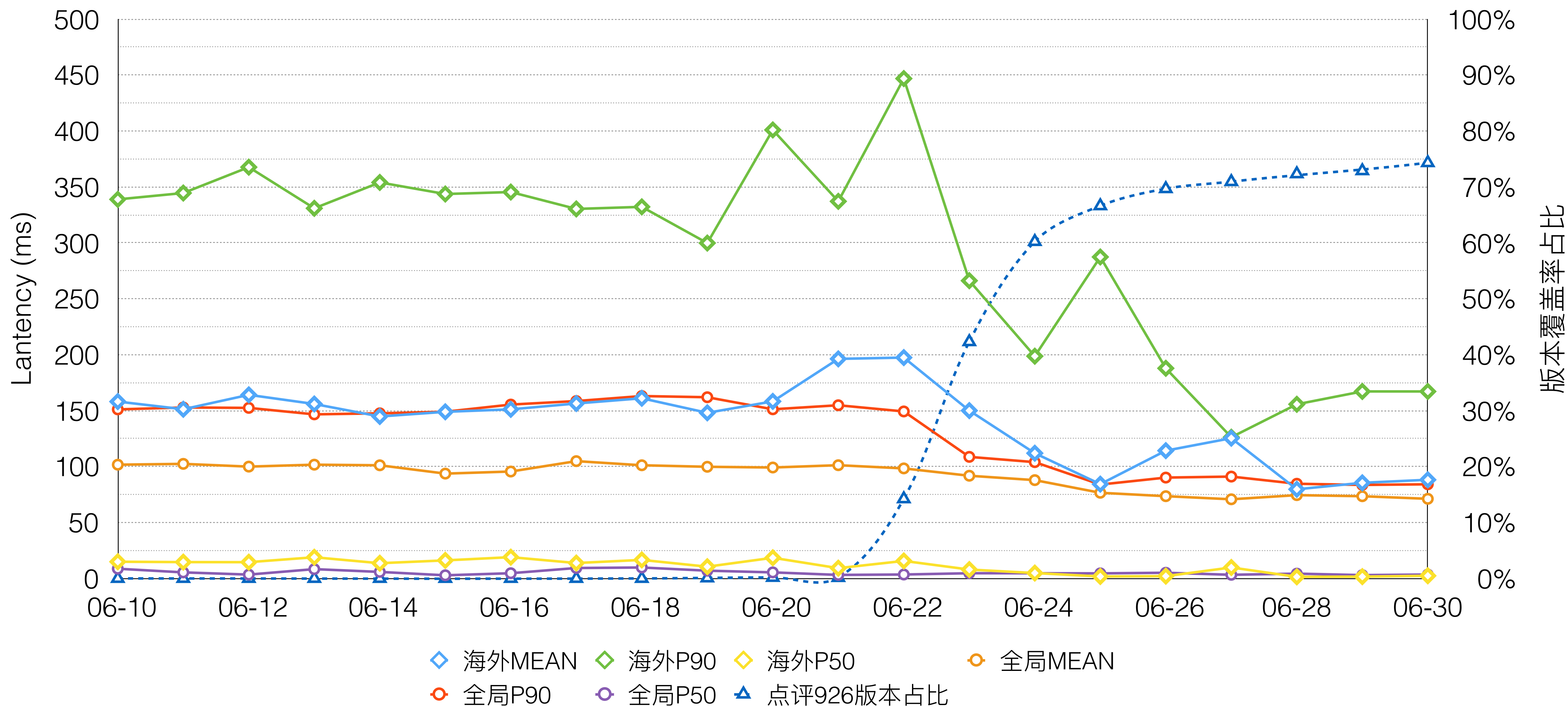
- DNS耗时长（主因），国外avg:150ms
- 域名缓存（影响流量调度）
- 内容劫持，内容缓存、联盟广告
- 解析转发，导致gslb失效，用户跨网访问

DNS Prefetch方案

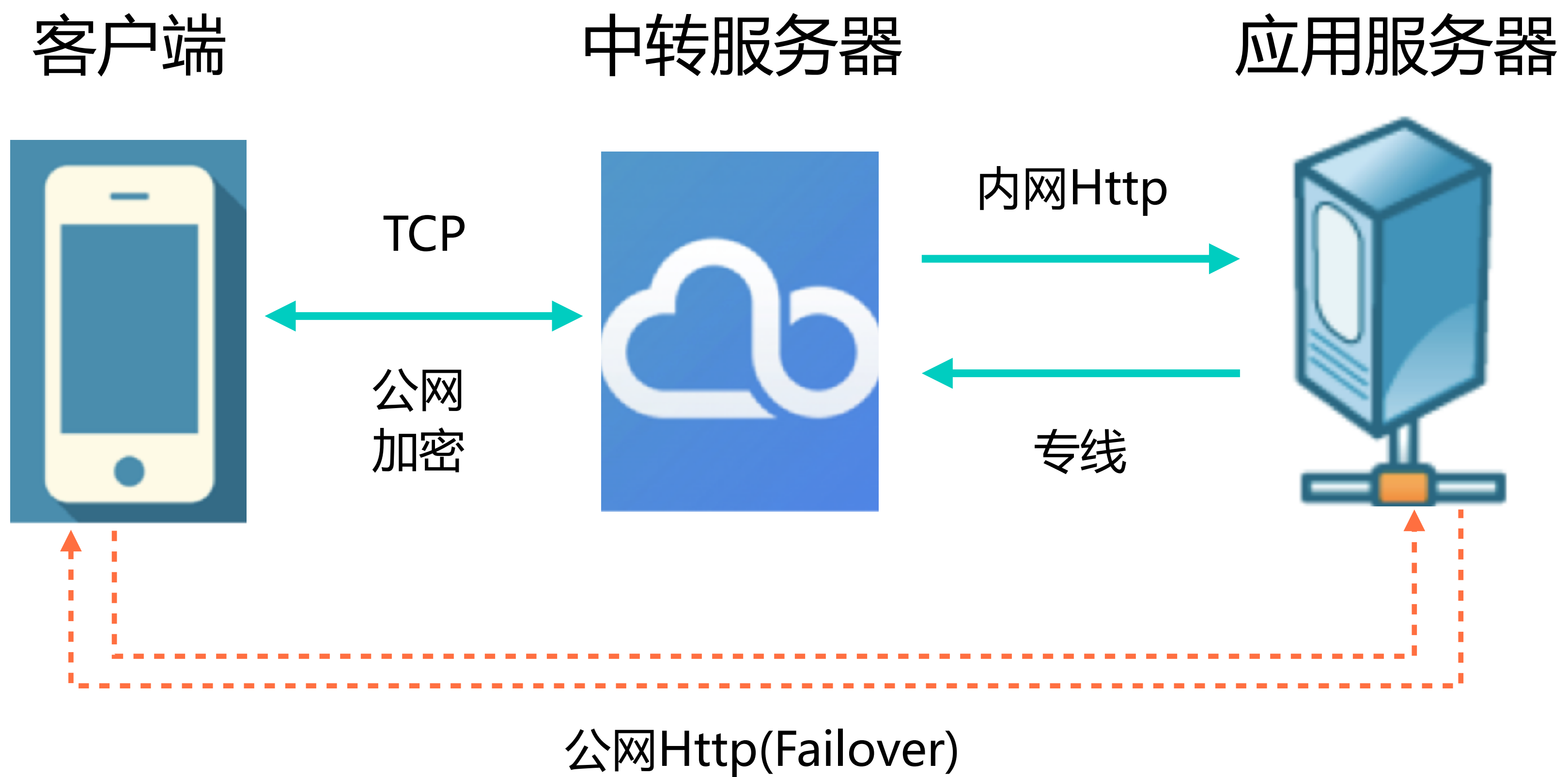


DNS Prefetch效果

从6.22开始随着点评9.2.6版本发版，DNS时间显著下降



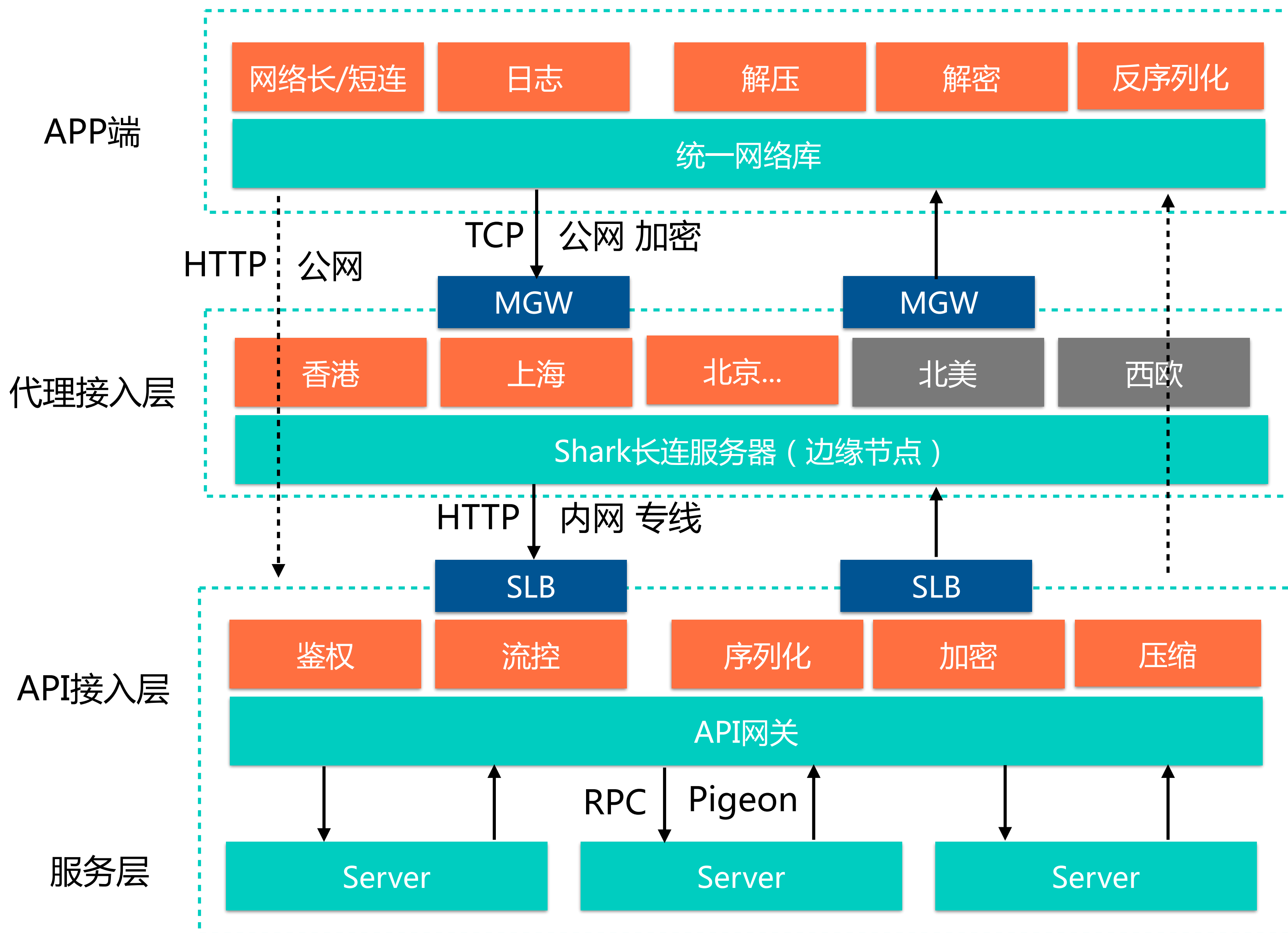
Shark长连



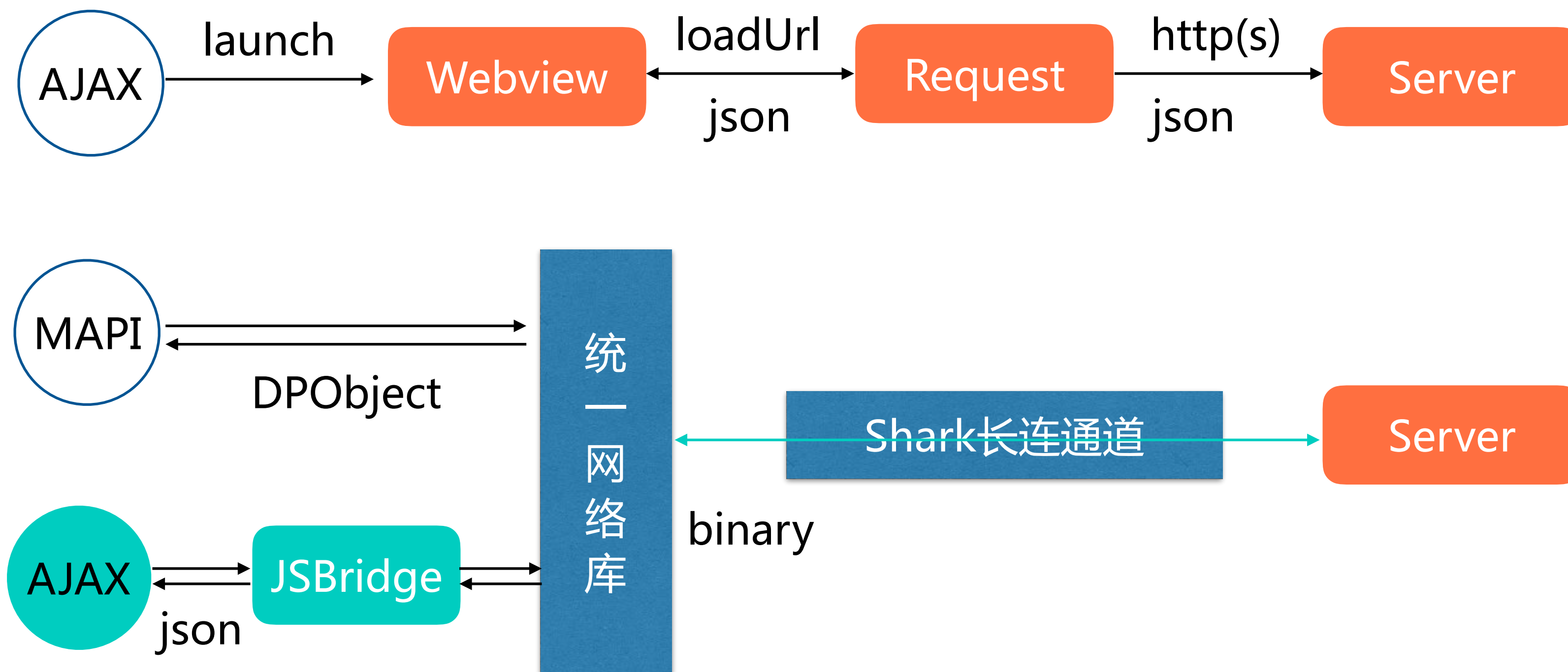
优势

- 代理长连模式
- 无需外网DNS
- 专线链路优化
- 全国多接入点

MAPI

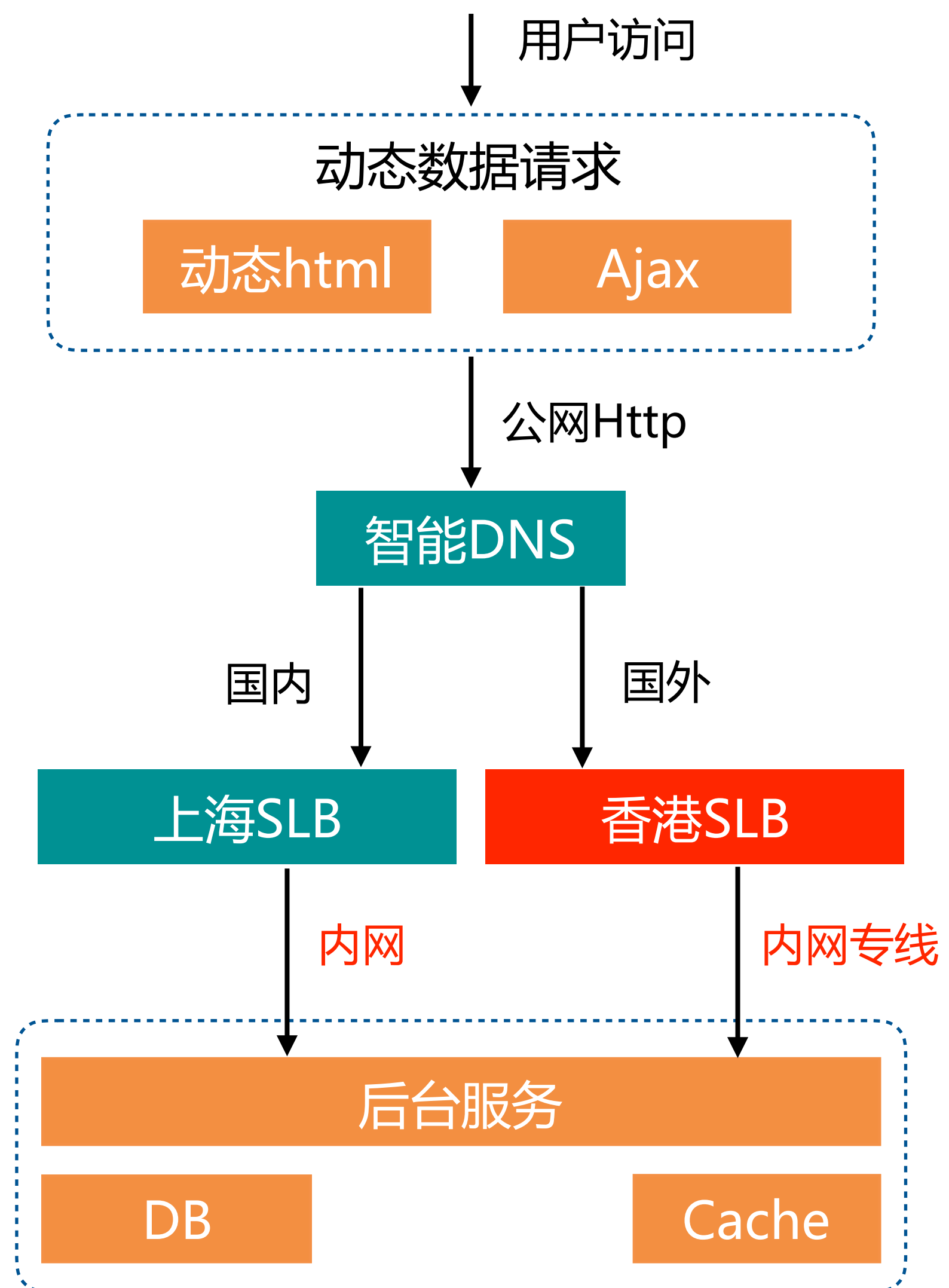


Ajax接长连 (测试优化中)



- 无需外网DNS
- 专线链路优化
- Payload减小
- 全国多接入点

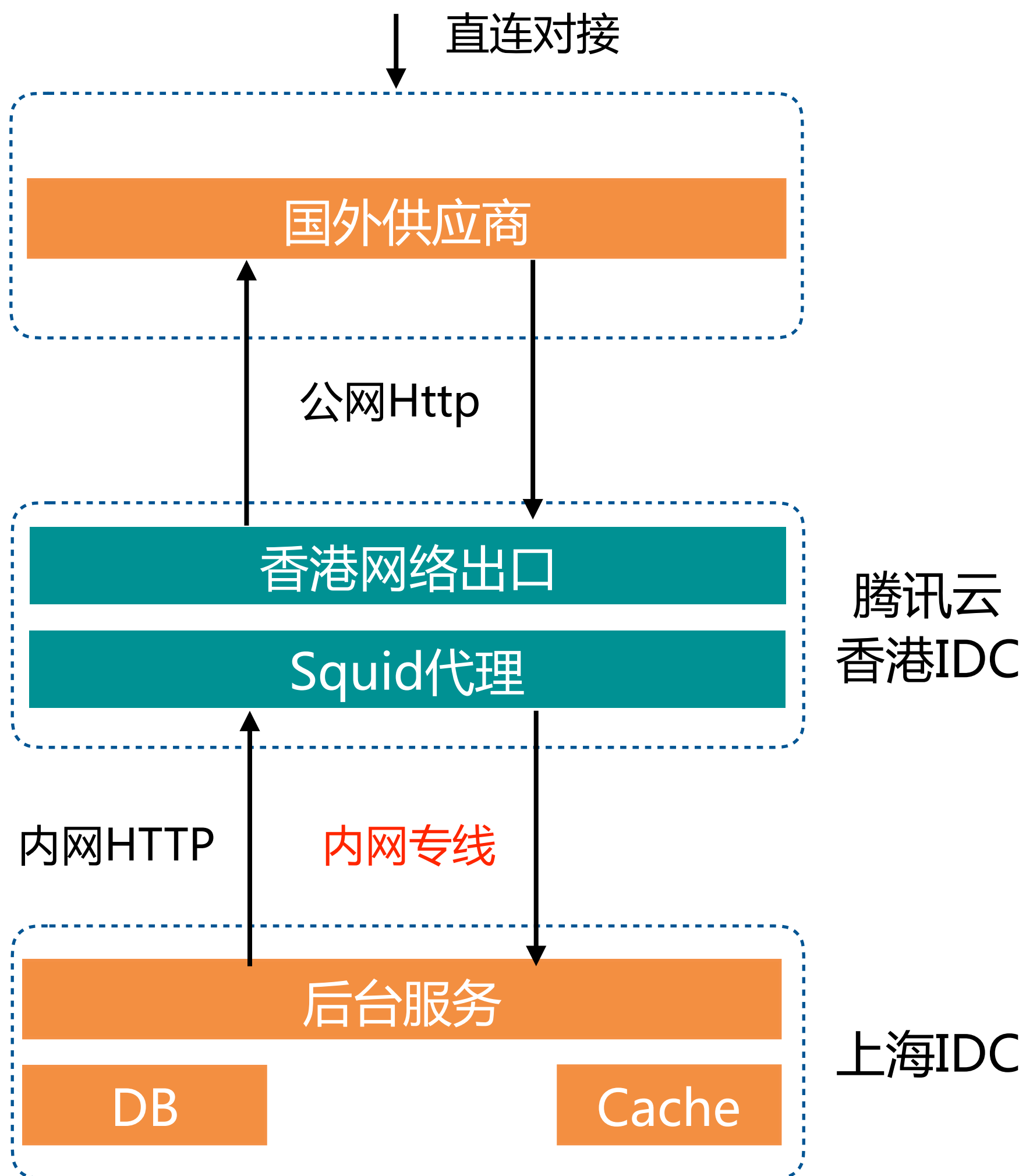
Ajax优化



成果

- 无需外网DNS
- 专线链路优化
- Payload减小
- 全国多接入点
- 延时降低40%

直连对接优化



南汇桂桥机房ping google:

```

[root@nas02 scripts]# ping www.google.com
PING www.google.com (216.58.203.4) 56(84) bytes of data:
64 bytes from hkg12s09-in-f4.1e100.net (216.58.203.4): icmp_seq=1 ttl=41 time=101 ms
64 bytes from hkg12s09-in-f4.1e100.net (216.58.203.4): icmp_seq=2 ttl=41 time=100 ms
64 bytes from hkg12s09-in-f4.1e100.net (216.58.203.4): icmp_seq=3 ttl=41 time=100 ms
64 bytes from hkg12s09-in-f4.1e100.net (216.58.203.4): icmp_seq=4 ttl=41 time=99.4 ms
64 bytes from hkg12s09-in-f4.1e100.net (216.58.203.4): icmp_seq=5 ttl=41 time=99.7 ms
64 bytes from hkg12s09-in-f4.1e100.net (216.58.203.4): icmp_seq=6 ttl=41 time=99.2 ms
64 bytes from hkg12s09-in-f4.1e100.net (216.58.203.4): icmp_seq=7 ttl=41 time=99.7 ms
    
```

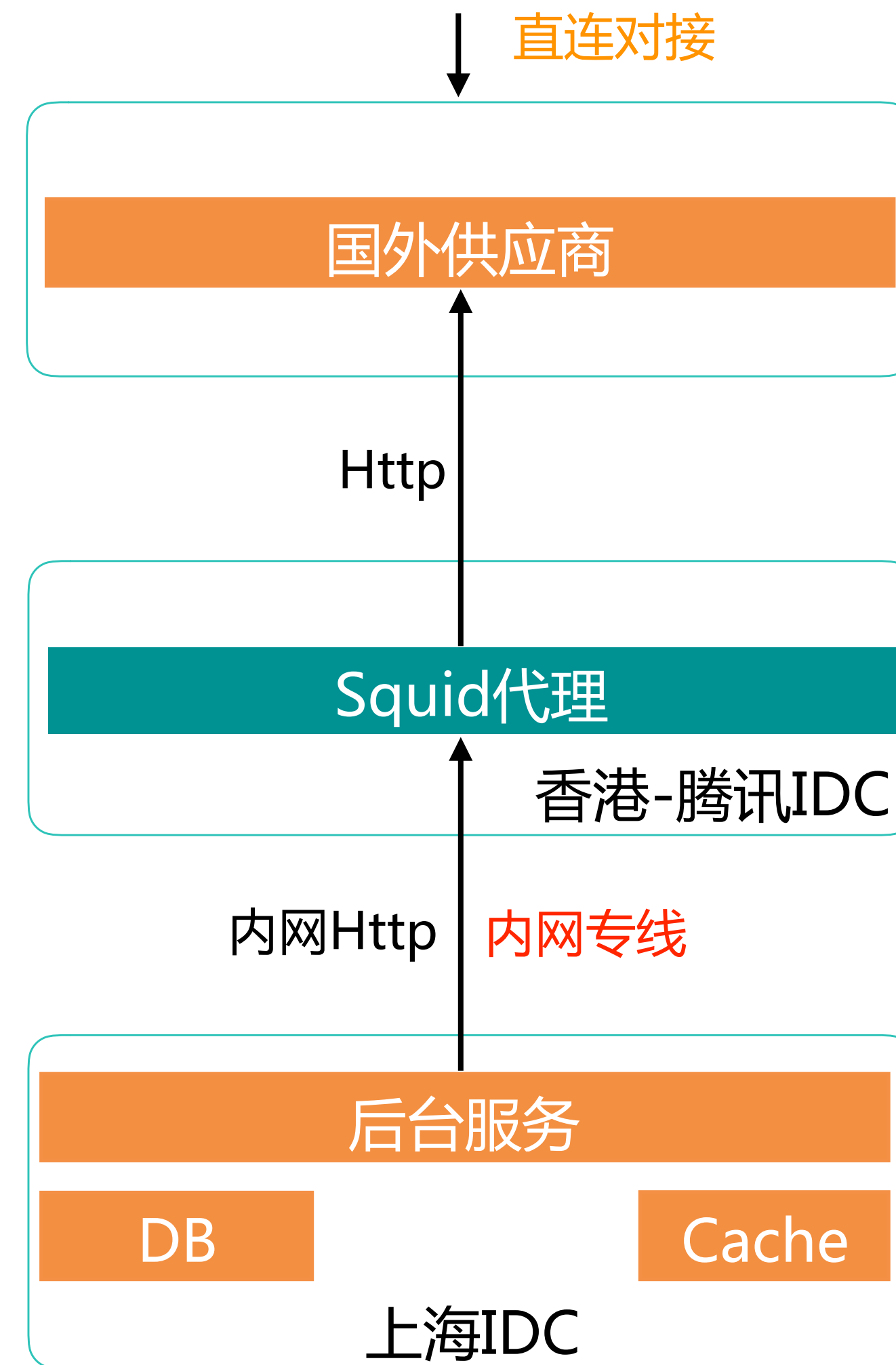
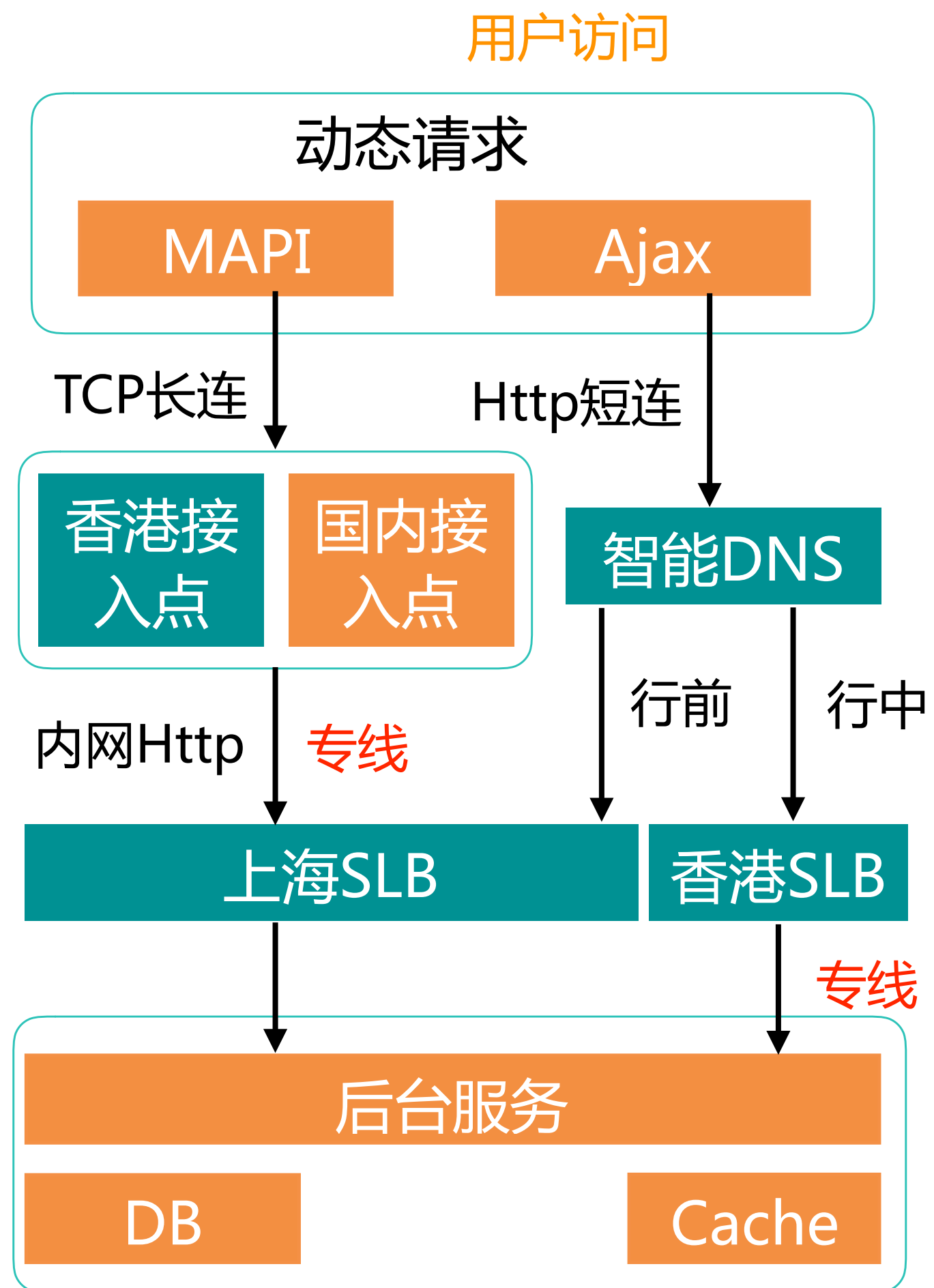
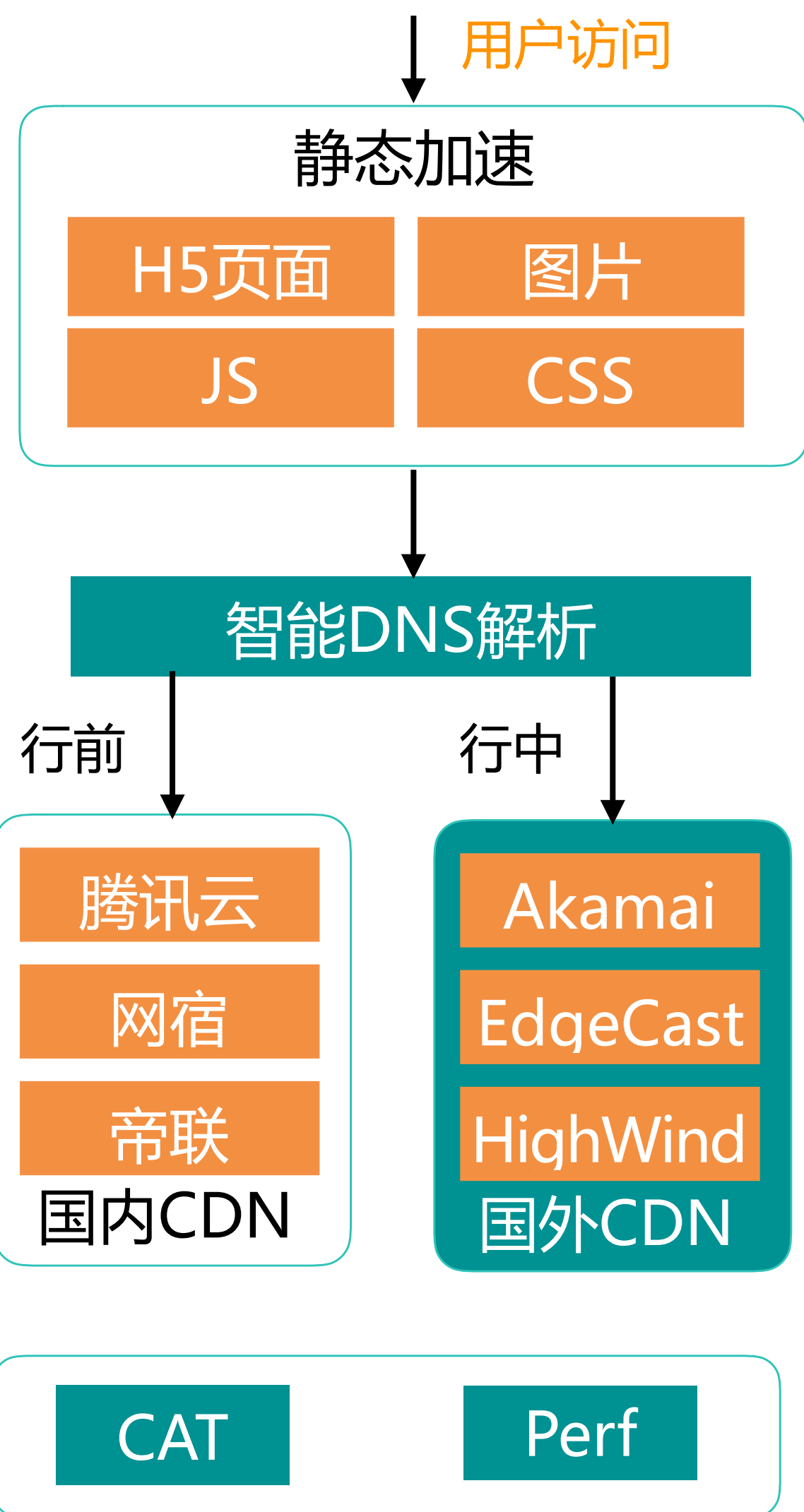
腾讯云香港机房ping google:

```

[root@hotel-overseaota-server01 ~]# ping www.google.com
PING www.google.com (216.58.199.100) 56(84) bytes of data:
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=1 ttl=56 time=1.48 ms
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=2 ttl=56 time=1.34 ms
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=3 ttl=56 time=1.29 ms
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=4 ttl=56 time=1.20 ms
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=5 ttl=56 time=1.29 ms
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=6 ttl=56 time=1.23 ms
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=7 ttl=56 time=1.43 ms
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=8 ttl=56 time=1.41 ms
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=9 ttl=56 time=1.28 ms
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=10 ttl=56 time=1.41 ms
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=11 ttl=56 time=1.29 ms
64 bytes from hkg07s22-in-f4.1e100.net (216.58.199.100): icmp_seq=12 ttl=56 time=1.35 ms
    
```

	请求次数	失败次数	失败率	Min(ms)	Max(ms)	Avg(ms)	95线	99线
上海	32	0	0.0%	2506.8	37302.6	9255.4	9343.8	9343.8
香港	35	0	0.0%	1691.6	17026.9	2450.8	2342.9	2342.9

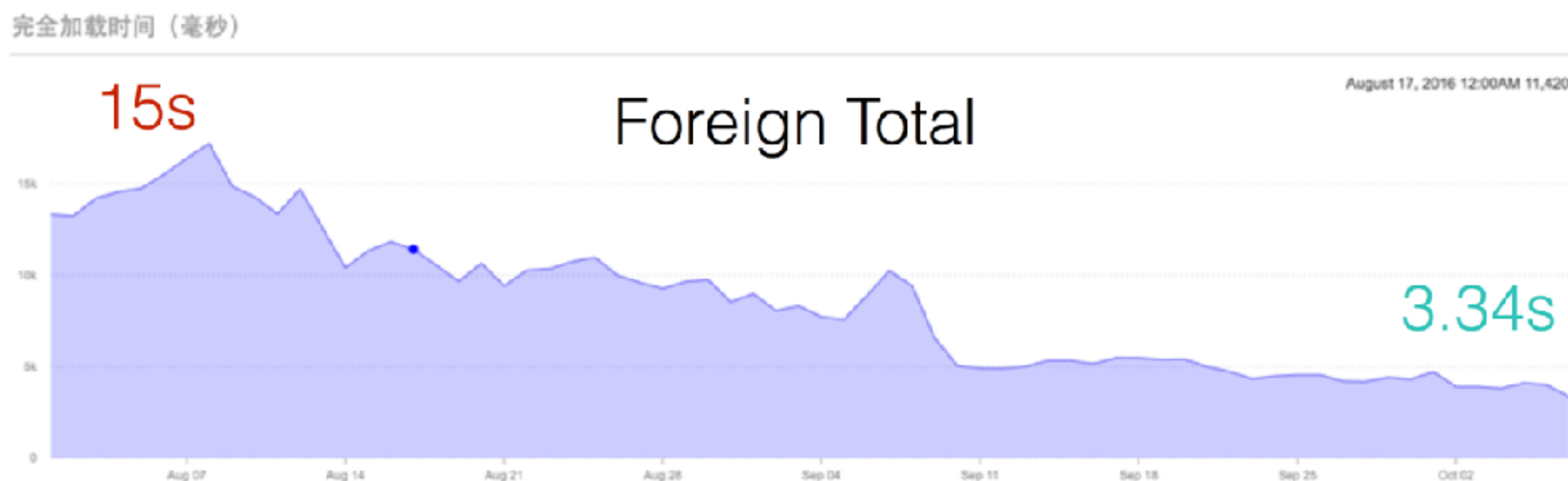
网络优化



网络优化-阶段成果



- 推动公司基础系统完善：
 - 香港slb
 - cat国外分地域端到端统计
 - perf ajax按地域统计
 - shark增加香港接入点
- 页面加载时间 **15s** -> **3.34s**
- 香港迪士尼对接 **10s** -> **2s**
- 经验输出：
 - 住宿海外酒店团队
 - 国际机票团队



Pigeon Call响应时间（下单与查询接口）：

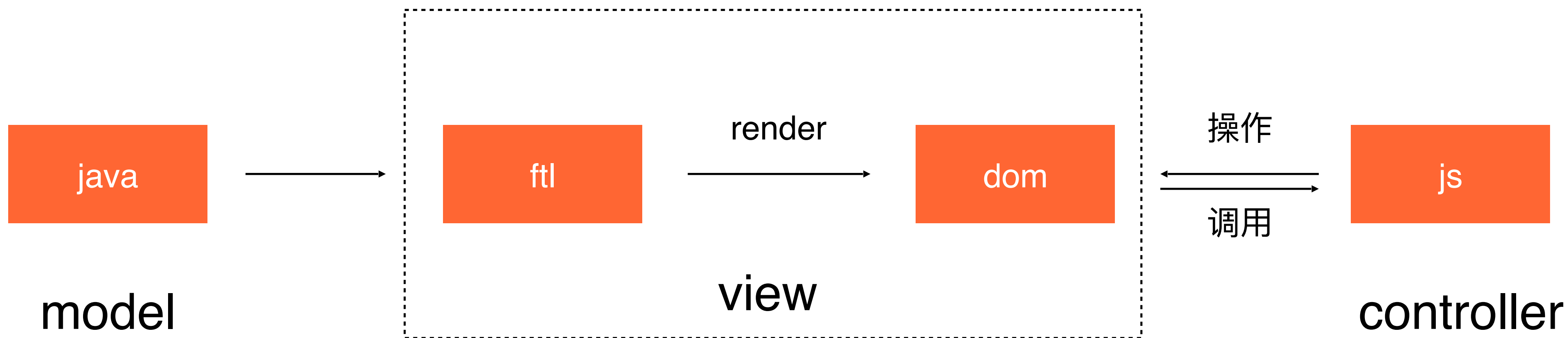
	请求次数	失败次数	失败率	Min(ms)	Max (ms)	Avg(ms)	95线	99线
上海	34	0	0.0%	2509	37306	9319.1	9411.8	9411.8
香港	39	0	0.0%	978	17029	2368.6	2276.9	2276.9

前端优化

前端优化



前后端分离

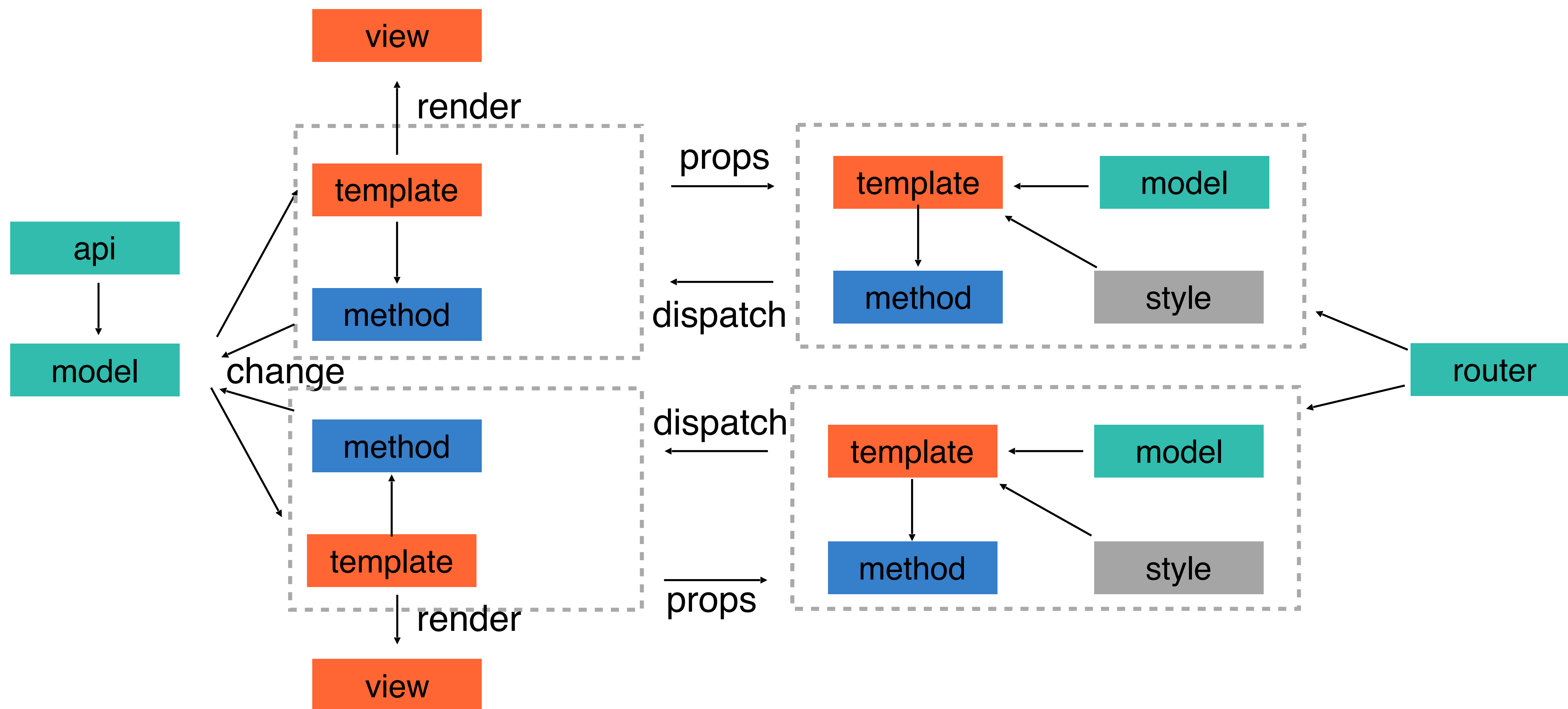


耦合度高

依赖后端

判断复杂

前后端分离



前后端分离

组件化

数据流

图片优化

Action

- 迁美团云
- 屏幕尺寸自适应
- 独立域名、DNS优化
- 图片压缩webp
- 懒加载

Name	Status	Type	Initiator	Size	Time	Waterfall	10.00 s	15.00
	OK		Script		0 ms			
data:image/png;base...	200	png	detail.is:7962	(from me...	0 ms			
star-dp.5fd7c90723989e916170565deb452443.png	200	png	detail.is:7962	6.6 KB	153 ms			
osx.dpfile.com/app/app-overseas-peon/static/img	OK		Script	6.2 KB	144 ms			
airhotel.ef005250655dcfad326693e0f63442ec.png	200	png	detail.is:7962	7.1 KB	373 ms			
osx.dpfile.com/app/app-overseas-peon/static/img	OK		Script	6.7 KB	335 ms			
1471285539916127484229osdeal14712855398805.jpg.webp@960w_1l	200	webp	Other	18.7 KB	255 ms			
osp.meituan.net/overseas	OK			18.3 KB	196 ms			
1471285539288182607712osdeal14712855392415.jpg.webp@960w_1l	200	webp	Other	30.5 KB	292 ms			
osp.meituan.net/overseas	OK			30.1 KB	256 ms			
14712855395991533711933osdeal14712855395570.jpg.webp@960w_1l	200	webp	Other	43.3 KB	351 ms			
osp.meituan.net/overseas	OK			42.9 KB	277 ms			

15 / 34 requests | 293 KB / 600 KB transferred | Finish: 39.55 s | DOMContentLoaded: 358 ms | Load: 408 ms

域名收敛/减少请求

背景

- 公司其余部门的脚本部署缺乏海外CDN支持
- DNS解析成本高
- 并发请求数有限

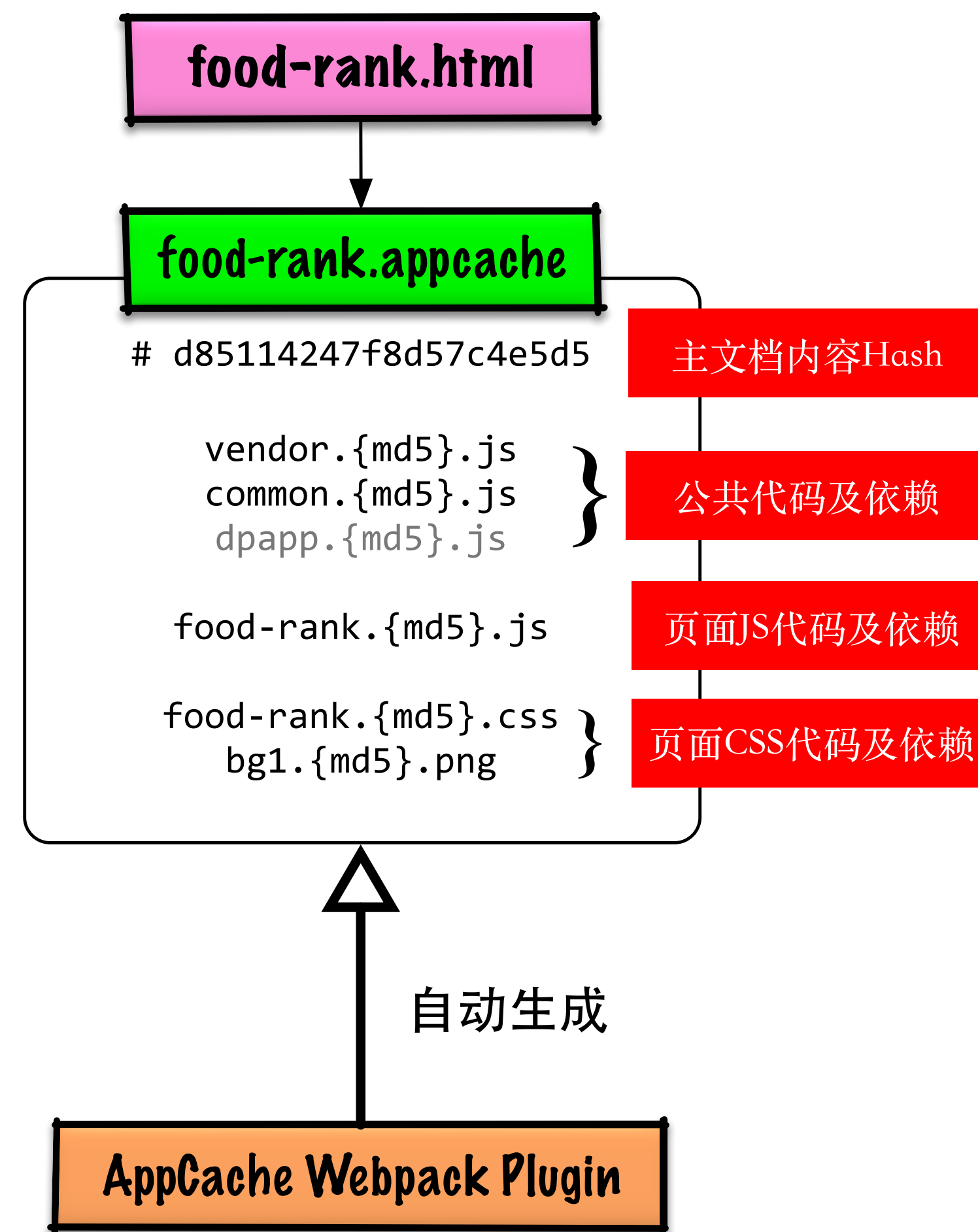
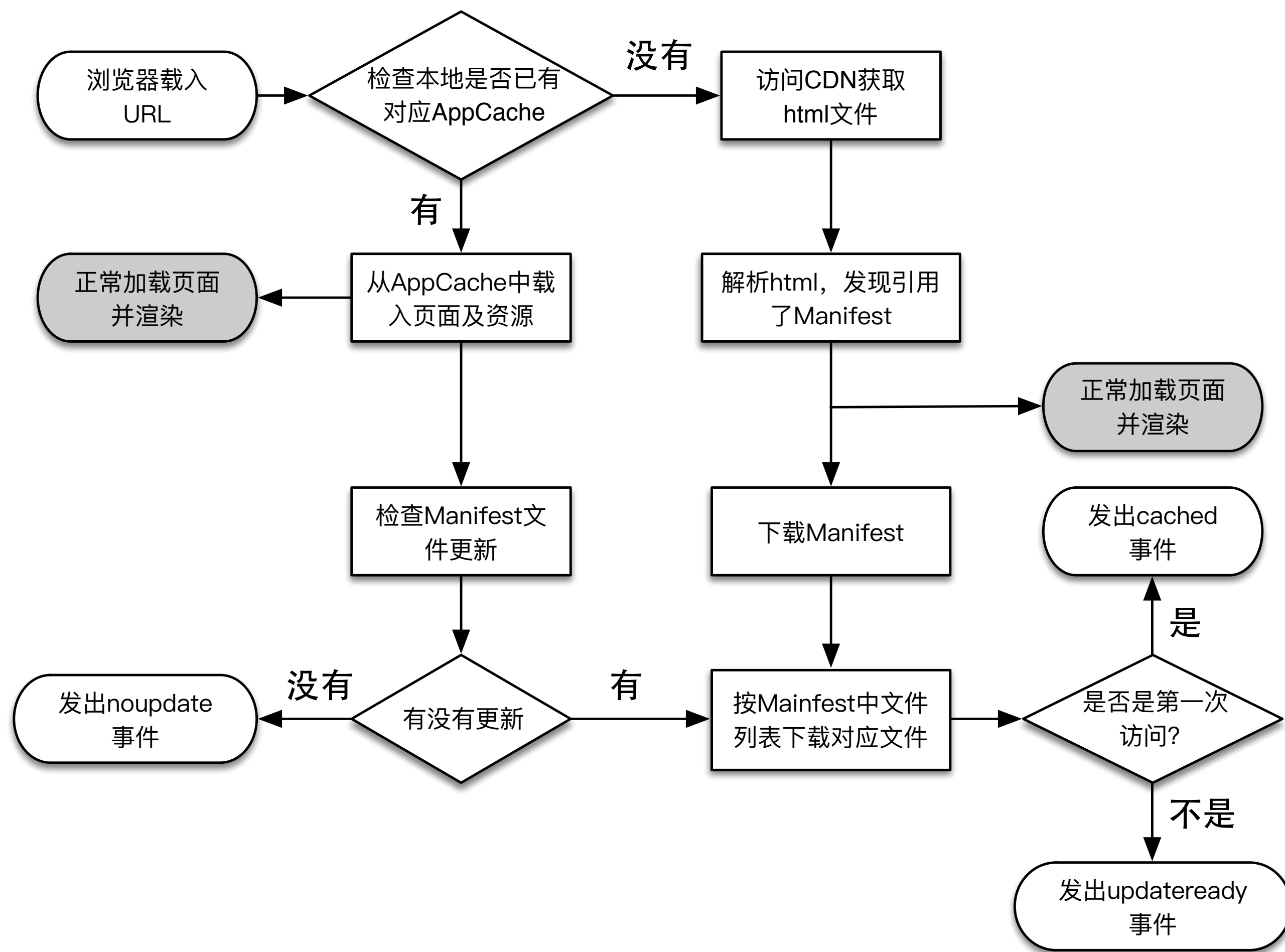
Action

- 去掉直接引用第三方脚本，把脚本直接打包到我们的代码中
- 所有静态资源公用一个域名，与主文档公用一个域名
- 尺寸小的脚本和CSS构建过程中内联到主文档中

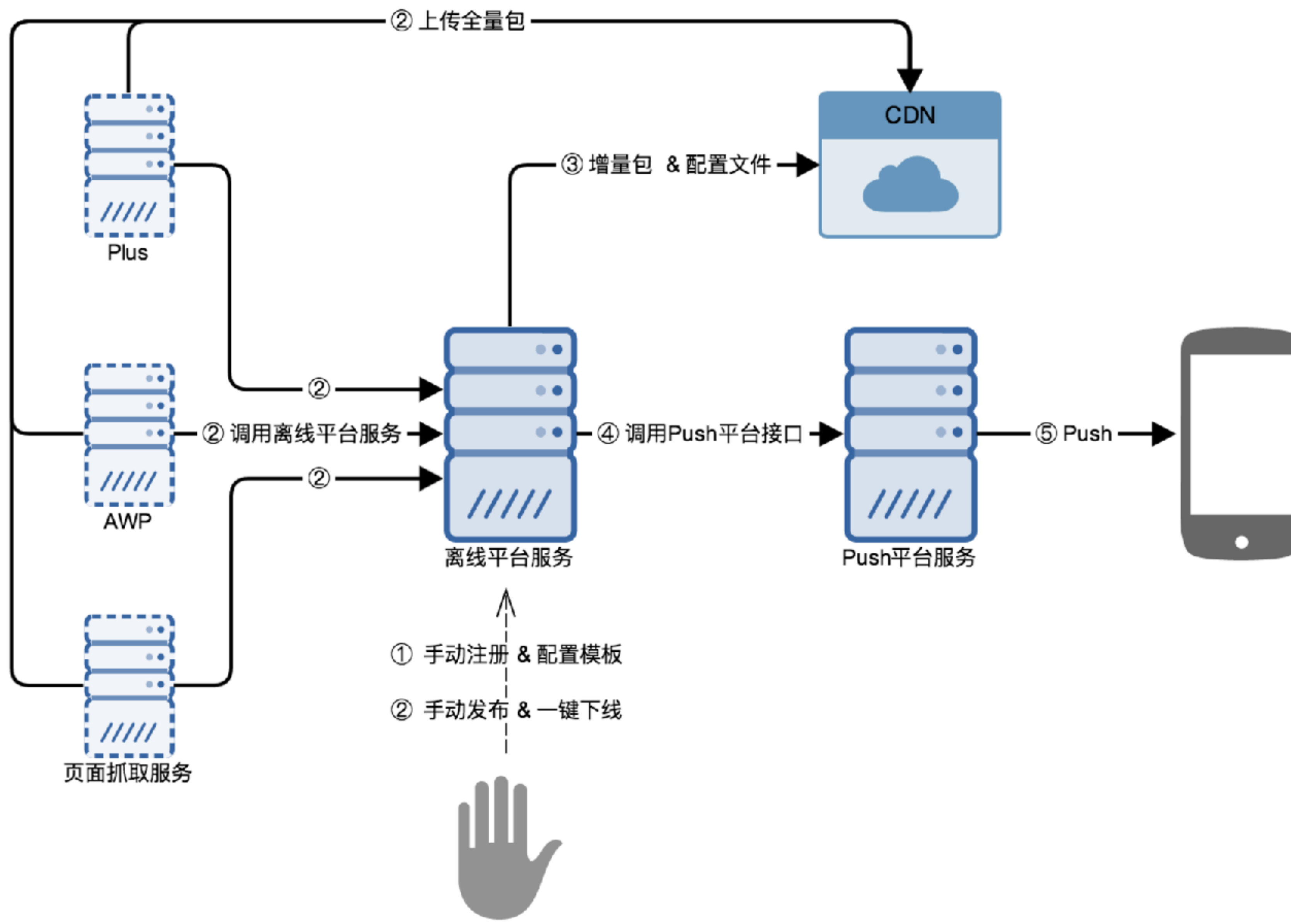
成果

- 页面请求数从8个减少到4个
- 域名数从4个减少到1个
- 完全加载时间下降了约1000ms

AppCache

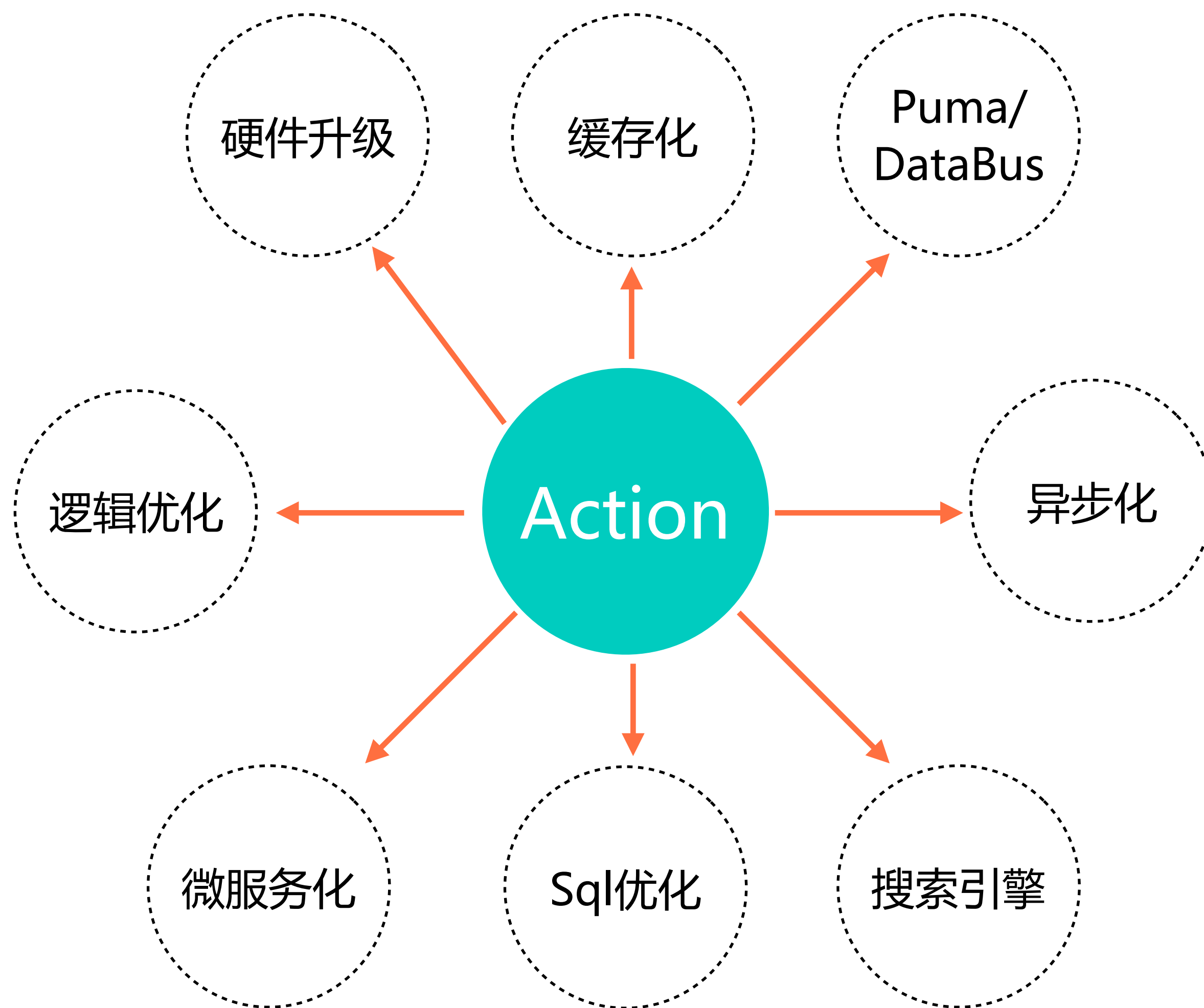


离线包

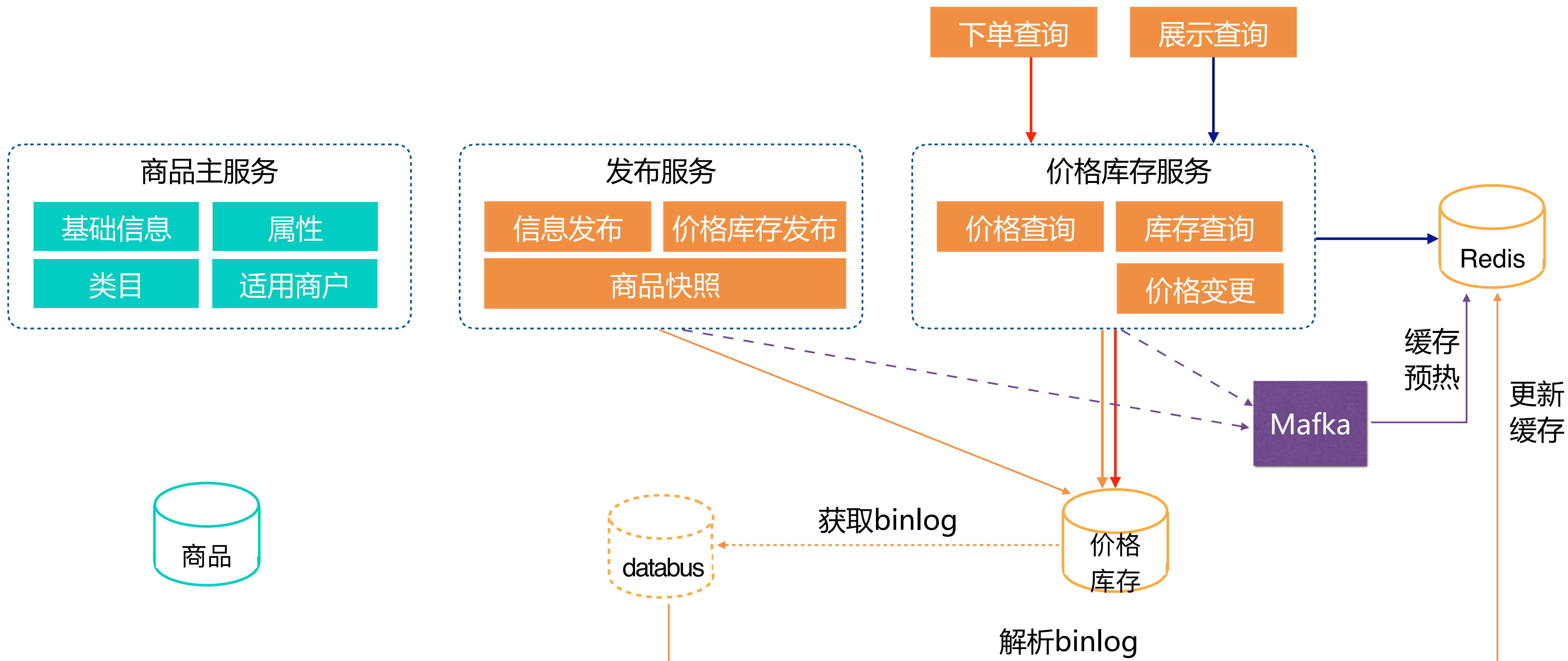


后端优化

后端优化



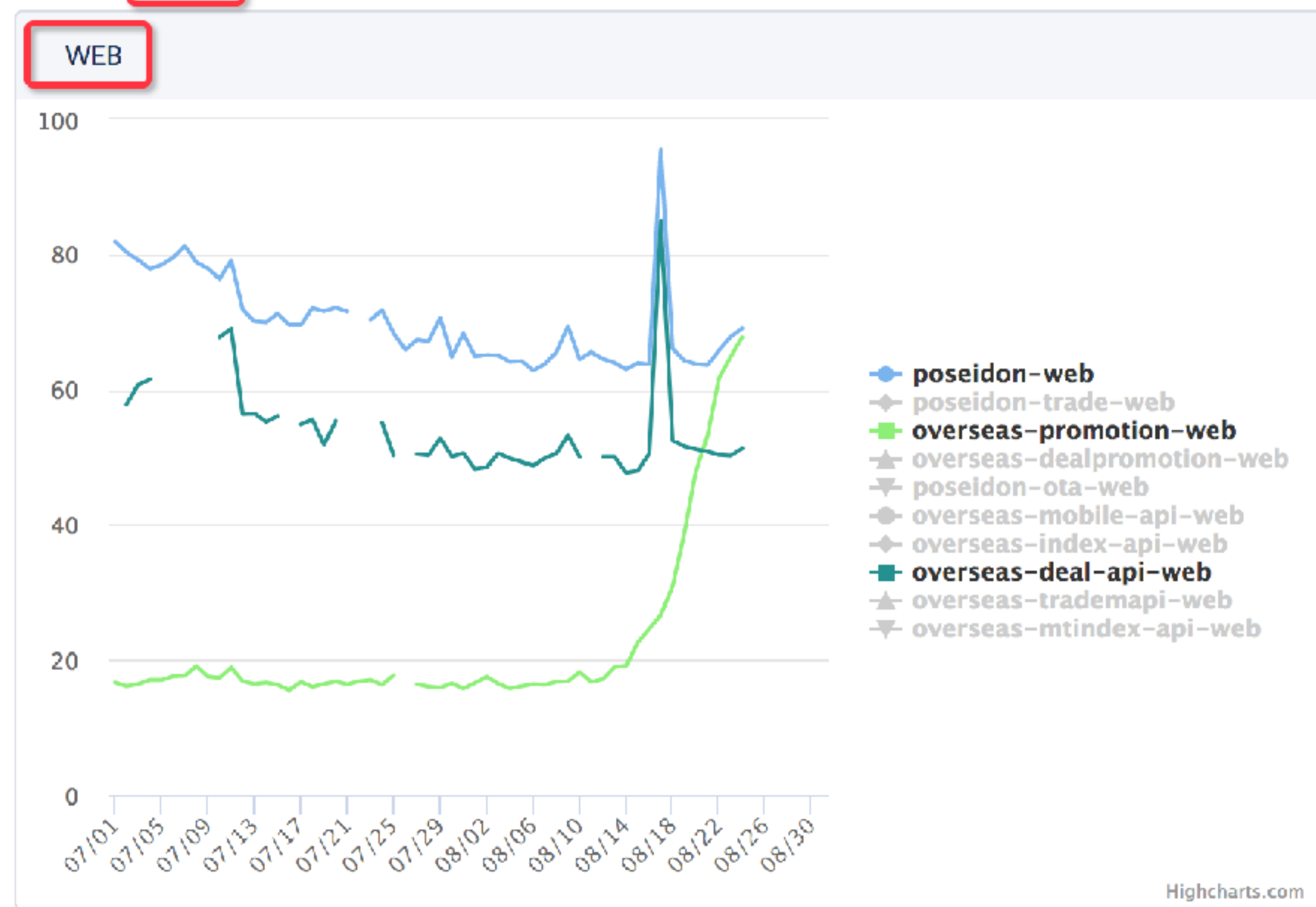
缓存优化



后端优化效果

CAT后端服务响应时间

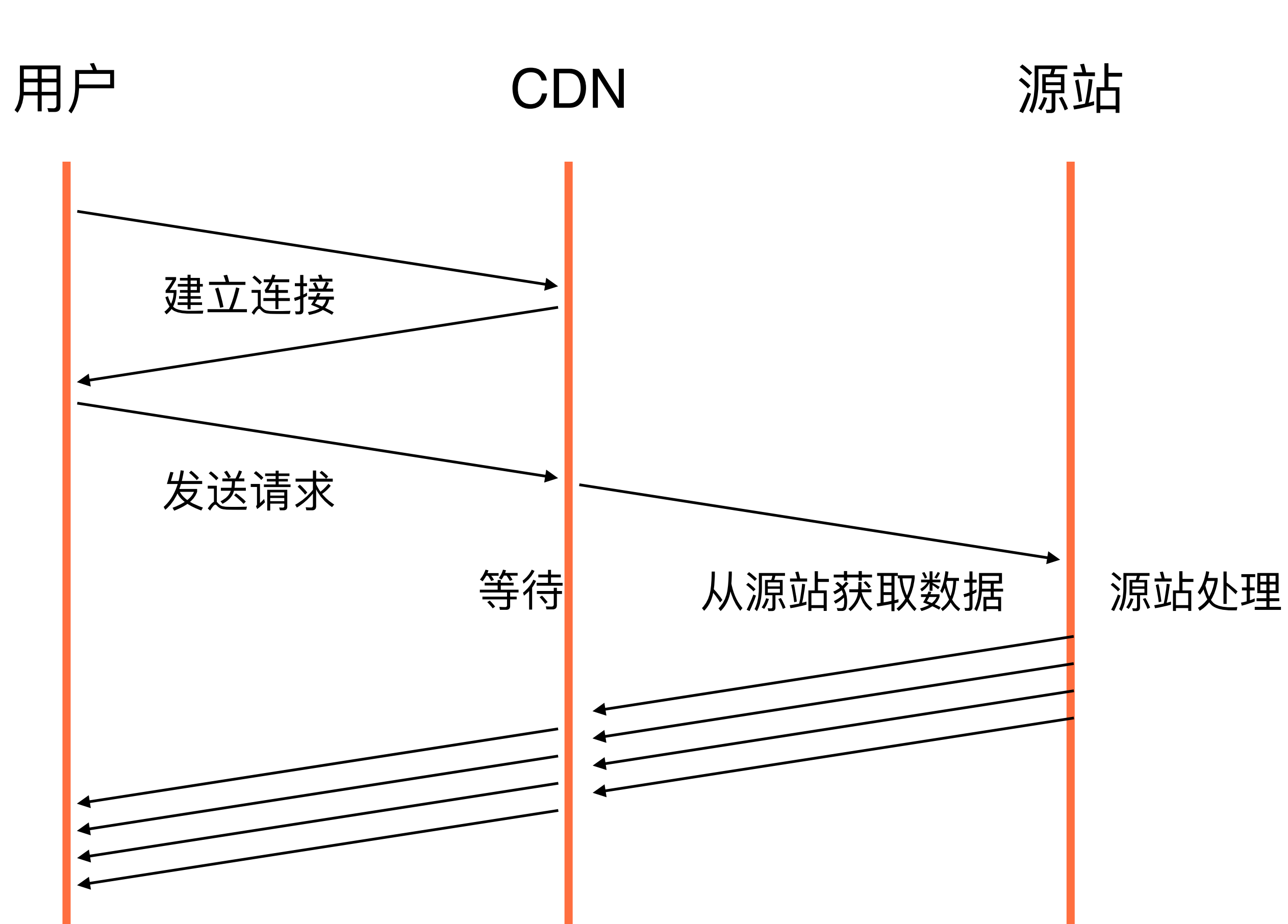
catUpper 99



- API : RT99 < 100ms
- Service : RT99 < 30ms



CDN 动态加速(测试中)

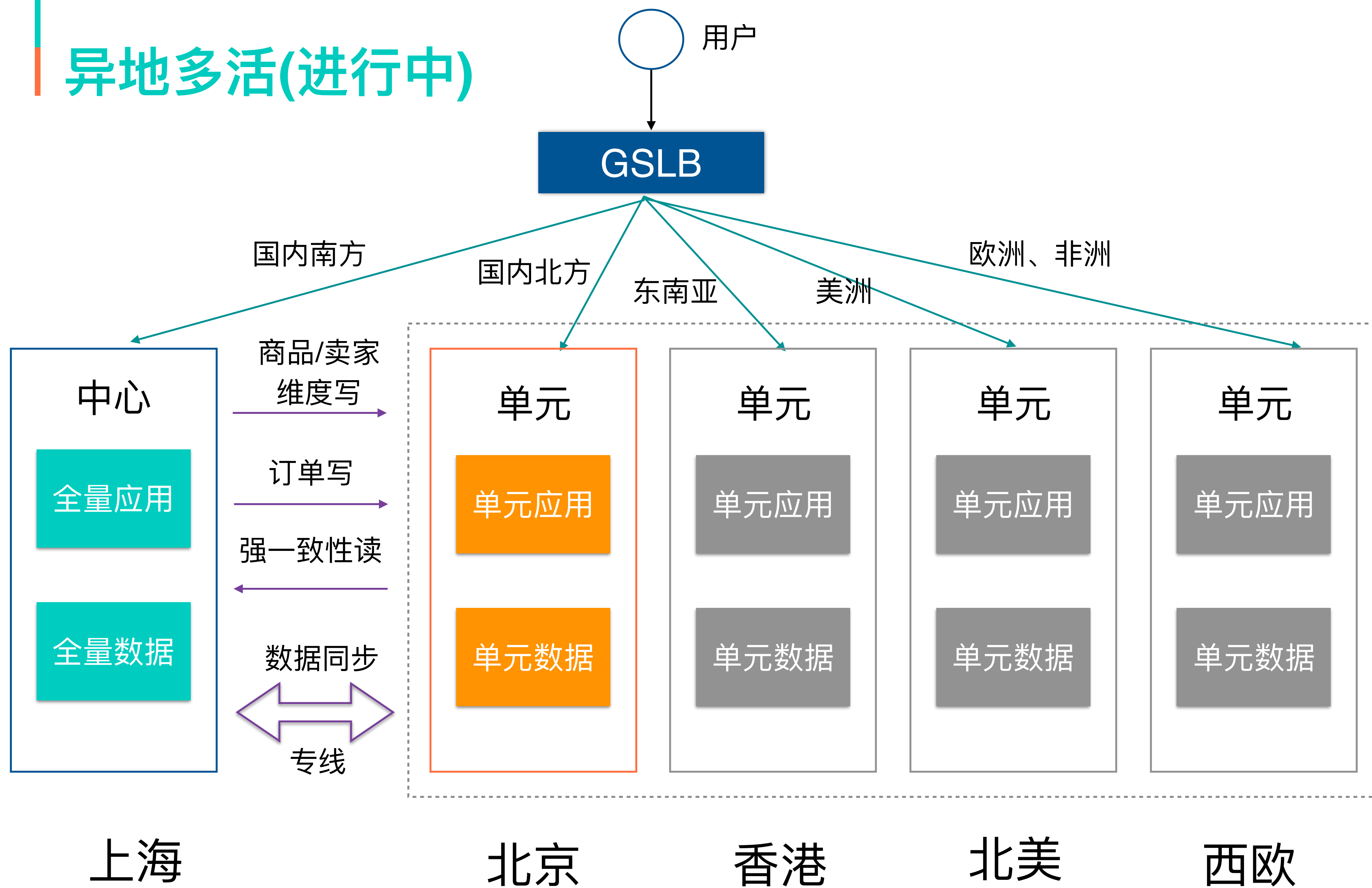


优势

- 连接时间缩短, 网络成功率提升
- 边缘节点与源站连接复用
- 动态路由, 链路优化
- 效果测试中(优化app外动态页面)

用户请求耗时=用户和边缘交互的时间 + 1*RTT(边缘到源站) + 源站处理时间

异地多活(进行中)



- 交易单元化
- 数据多机房冗余/灾备
- 数据/服务访问就近优先
- IDC流量实时调度

Thanks

Eat better, Live better.