



Consuming HTTP at Scale

Node Summit, Jan 24, 2012

Hello, I'm

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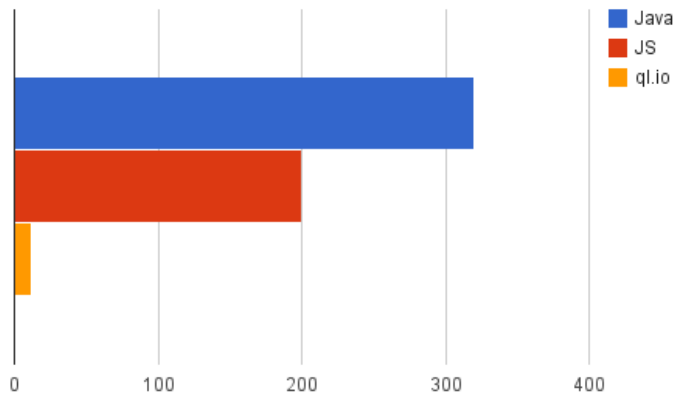
ebay eBay's platform engineering

github
SOCIAL CODING <https://github.com/ql-io/ql.io>
Open source (Apache 2)

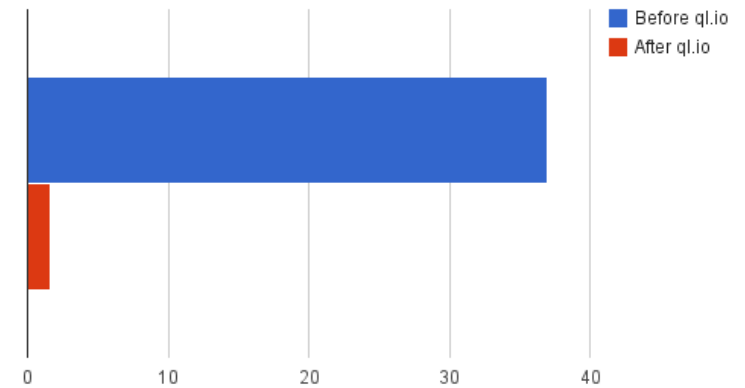
A **DSL** for HTTP
An HTTP **gateway**
Built on **node.js**

Make HTTP APIs **easy**
and **fast** to consume

Lines of code for API calls



Data size (k)



before

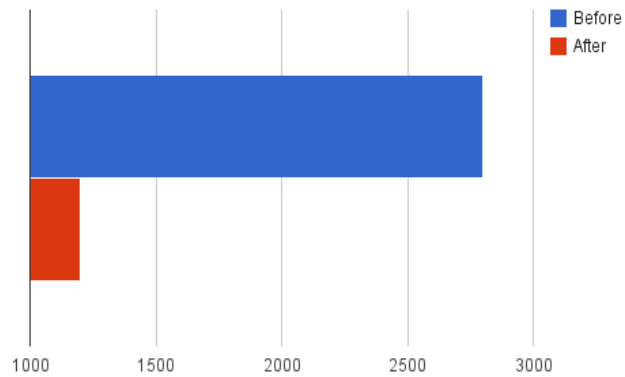
GET http://open.api.ebay.com/shopping?calln	200 OK	3724 265 msec	
GET http://open.api.ebay.com/shopping?calln	200 OK	912 219 msec	
GET http://open.api.ebay.com/shopping?calln	200 OK	743 237 msec	
GET http://open.api.ebay.com/shopping?calln	200 OK	1010 234 msec	
GET http://open.api.ebay.com/shopping?calln	200 OK	730 230 msec	
GET http://open.api.ebay.com/shopping?calln	200 OK	1120 182 msec	
GET http://open.api.ebay.com/shopping?calln	200 OK	5871 490 msec	
GET http://open.api.ebay.com/shopping?calln	200 OK	2230 470 msec	
GET http://open.api.ebay.com/shopping?calln	200 OK	7913 540 msec	
GET http://open.api.ebay.com/shopping?calln	200 OK	3883 562 msec	
GET http://open.api.ebay.com/shopping?calln	200 OK	9196 557 msec	

11 requests, Total request 0 bytes, Total response 37332 bytes

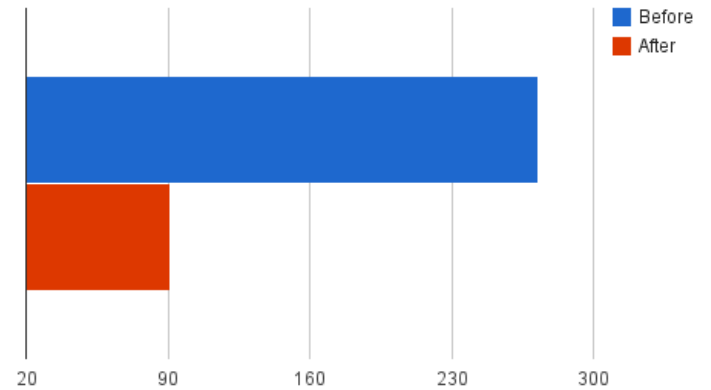
after

Name	Method	Status	Type	Size	Time	Timeline
Path		Text		Transfer	Latency	
myapi	GET	200 OK	applica...	600B 1.64KB	856ms 854ms	214ms 321ms 428ms 535ms 642ms 749ms 856ms

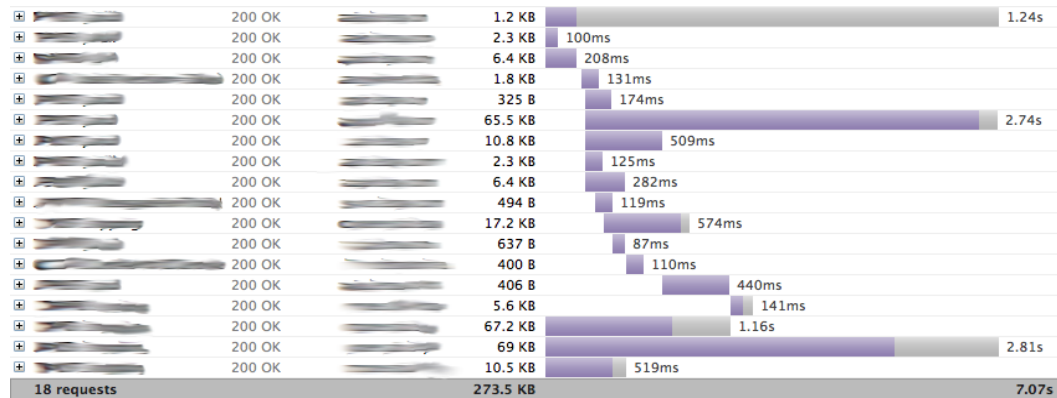
Lines of code for API calls



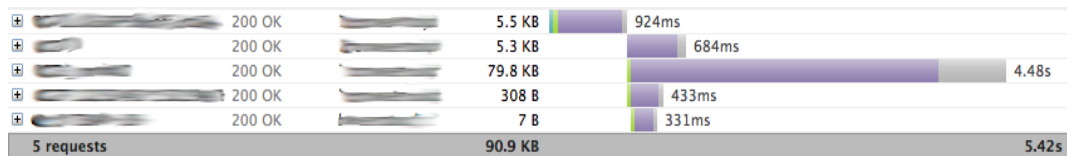
Data size (k)



before



after



Home Come?


```
// HTTP and network coding is already easy
//
var http = require('http');
var client = http.request({
  method : 'GET',
  host : 'my host',
  path : 'my path'}, function(res) {
  res.on('data', function(chunk) { ... });
  res.on('end', function() { ... });
});
client.end();
```

Real code (randomized)

```
1 RbozAS1 XCJY1 6sh0eatZ0bMNgXQdIK3
2 1
3 SRbs52PA2G0JtwkHKKj no0SHN5AMVA6
4 Vlws1iZz BR7Ai0mag
5 |
6 lPMsyj q58wYIhJrVQATA7
7 eZ0w66J QWdqDBkkS
8 m416Mcu RiJAKVF
9
10 qaSdpH zZ8Ka74telRxCiIyUtUeBKMtW9l0ErKgihnprzP WAL
11 7
12 071n1cDPyQH Z crP
13 IW2xiJEd 0 uHuee9ZEwmQw
14 C
15
16 u67M nM7Zv
17 Y
18 xNoCaN BgFqLJAyOxhsfMV 7 scmgK31eaLIAnwqSkUNdFSxFM0ZGKAxPkA0l6F
19
20 sp bExI0mtpNnLRPB0UerdnZoy9DSHL
21 71V7eYA6clHROIm Q 7RbmIel7VPgzCrJ 8 vb9tmHLrILN9A4
22
23 TR R70W6tS7LiKQxqlxKAGB5ybAp2iev
24 oe1SvY0KEgbCwn7 f bUxl8dD0aCHge7L M OEIfNzuYITexK7t
25
26
27
28 I9HS4JrrBnNDI 5tmkYHffV0Qaat 6 0Zr L5x0Z5bnZPG62YAZN ZW1dLvmeXXszh1yrQ T
29 OubeETVx2 uKNZ7f AiqT JR4SSgBbjN0iozYyhCJmxr611nrVQeUm WF7goUa7z x
30 IZiWBcliwbc wf gBfds
31 A5Xpb2Z8QBd8mRc2rccGoKGu9yQ82xZbBlxdT5JSbrhdyvrCIpMtDnQUvRjehBlX4
32 4
33 ZZN
34 w446Fy28diUB8oINKky 2 t7IzQPQmi
35 h2veXhG0T2MdXdhbdGXoAy8gCbEE0S i 7DI0cgEc50F1dgXT
36 Yr9Riu50CBesdFZAR9YSCiNd
37 b
38
39
40 eObHpS9nvssQ109 hr1a0ti1UPD6 9HqTd1Gc t PNrWU
```

```

41 n7cejlhPnA8twkd GcGCytRu6GvLAUdK RUAQroSY1V5E z AMJXQ
42
43 CXhU XYwLpgg5L5jouqasGptY8pv08 ZAGqsZMh
44 9
45 1y aBe957rY eT 3Kwv06UGNf24JFiurIBp3
46 o
47 di FS6xxEkMC3m nngXoCiiztuBzt00AFqwFpnjSpQfmJ7dX7aj 6SSJT4X7eF1eor06pEtXd0gFBm3ZclEnQJvFRsyKQUB s7woVXNXskPorVKsv0Hp73B
48 B6s7yzYHByj 4 Aft4x
49 rA6yIonU08bnl0Yj12hSuVmC6D0lsgLs8lMX
50 Aqgy5QJ
51 C
52
53 IS
54 5C VJEVgZrMTqmv1Av7MUv9W0jU32E3ENSb oT zcXbH7q K7gtGy SV 9tT yic9
55
56 yha3K3wC V etd UAnoHrpM9QpGtep Kr8ukNQKGb5Ekmz
57 fc834upT04D1 w UoO zf9adPqN1UKYs6w oWd3LUgdTmA1FG0nkwb
58
59 jLVvy9 ADq4cV 2 FTc03bT05Gc7eYpF
60
61 ze1u44xGIfo GPIQjsUM m BOPuwE1PFLH0AJaFg2QQrRJjwgr05
62 xs VyTkuaERPQMtNgmyBAaae5d DH Gzwt8cD55mTxfzXqnsxlhsxBTCijBC0
63 L
64 lHaZzN 8HRET1rtKZ w ul7iVILL4dvHyhoBRz5Kg2YXLMile2AioD7JbXFivgc9bPFV
65 Rjw5wG WEpidyH x aEhzB3fIVbJiCqeEQlKv8u5L6BR
66
67 oa 7i 0dBdY sE B jrn6mtkfJCM Da wI7 UP8FP gKdf 3bP tMBGUZCr kGFZ x1Vk3R 80Xkr6H35 idDxiqI 0s 3
68 jHE akYrHr1l D F1
69 T4 h dD12Qi42sw9m8h2A0iCW 6c hTK9S
70 W
71 1fqN5qeg 4 l8LplornkV7cGoJaqE2WBZrCZCEh6GwNoye4Fs0
72 u
73
74 Dp gMuKyn J3t aU1Pp BnUIammuGinDfHv7 FY1 5hDmqnMg wauM5 pk su1 Oi PLO kmh8pD u4arJ0Vakwh5xz 7C4T7728 b6KKG
75 rz 1dU RKTC 8fLbJP Rm F9 SBD PCCMipl HN Ds qu91S 1Jy ikQm0Gp C7 iq8N 3l uT WyPr yawEhaSPNRma G1GpjhRd
76 be k0Uzf 4lX KSDCvOof
77 F9 N28PXGLppqfDDCnUswNdKczJ5JFg0Ex m WNr 0
78 m
79 QCLNcpcU V tZ
80 P

```

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l

FZ asPyaqhKFo

B

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K

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qq PrnBxqR7 Pe Js2AR

a

hBE0DMJdqsYIVas1zAqLqtXRJyvXWD5rFyKniSlPSTGD4RCEQOTvh0S42DRqhFWNLvMq82QH1 OAA8vd1 BSb0ADUShJISe0XpPYm02IHs9EQI

I

q

o1pP

J

oJ Qp1 VA AKDt znx 6hpTg

gokDxm czRiigu R 04K1UxF66hPrmYXpah3wuPdEMANZrvXKTlWUwgDGJmPJl4V8BKlPFkoZ8PWUyV9lUmRNupgZ3GoyA3AH4Eb10

2v 8z3bv9Bh Oa Zs4WZ

8

TtMfPugl5bATEjMurqYF N P0Z 5o1TfqTLKYZMPciRkt

q10pZhrLoiwWD4qyIgVEc20gXFWpxveupo9Jj64HAQsqBAef433tGXhXPcnQ527gmwwsP6jx6 GHVdjVNX nKayuSWdlr8dqDab0go13YC1R0l

o

R

Z

QSgx

R

kuynWS7Nnb8 q e2T9t

K

3

LbnM5JVLX0x2oQDqCm807qEj2PYzbT6i9HIM

ZH R8qM5TaiiJiv QhHti70CyyIgDQIwuo0sAf2MDMJVlxm vzTcvFaCEXWftr0ED

0

e7

The same in ql.io (randomized)

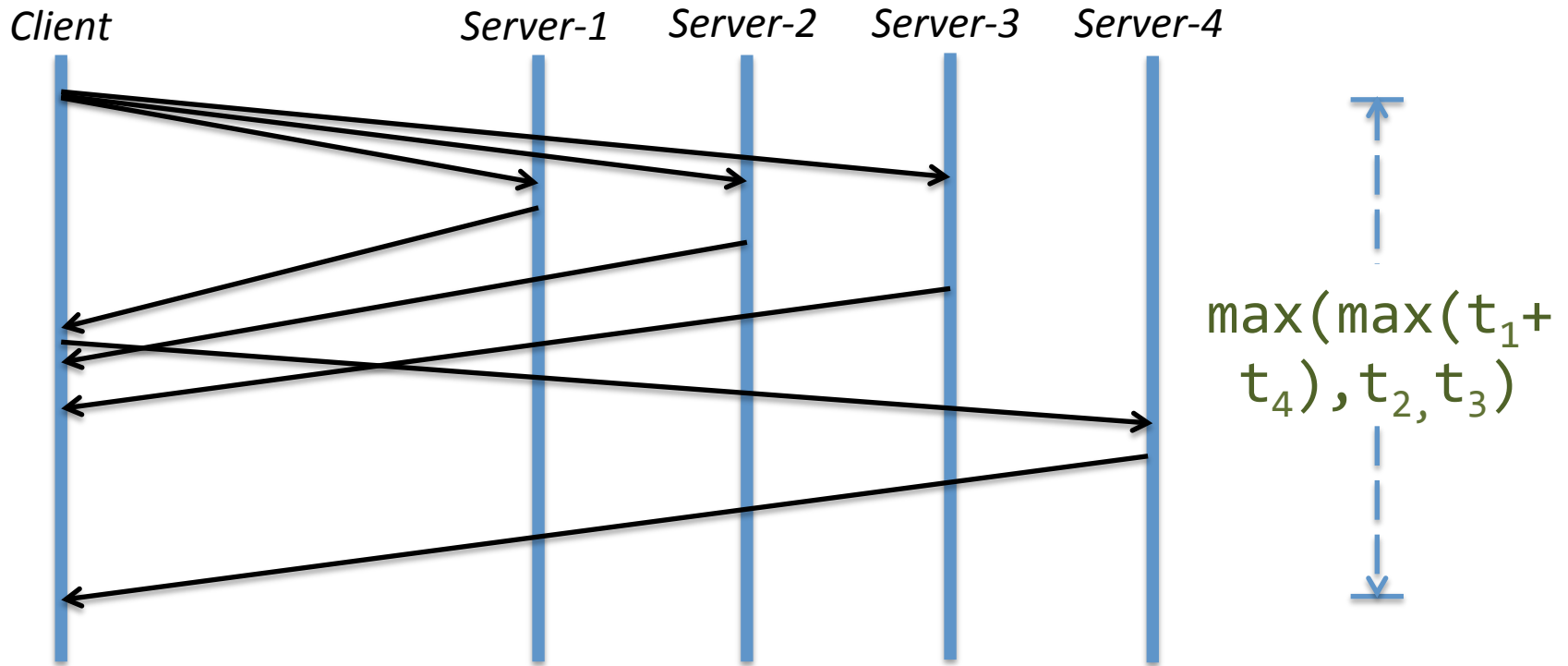
HFRwni G NlXGNS TSMeB7 A9On vtwZ
93TbEBy6 Q ocpBxgpH3 Pu4ju fi
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tUH 8i4fwR S Hut69mnCHAO
ufyx w CZLOtN 9 PvTU sPd2lMVDV42tRAfIoPM56H1hE tGz5s
kmekNeyrai5Sk1C 5 TstTKDhFb
OLy 5KQ5oz A MiZzQJSCbEv
aLr068KLleE X q8cwPm 5 nZpH 3jpeWcIpkTTIjGsZovq7 fR4Hn
dz3Lhl o MfdTDqpFVdh
aiPOsj2fO9 w fWD3mv p ORHX Bq4xIMvLGjMrgnC6JpBw1S5
HDwoI CwhI09 z 742rMEqx626
ZH0qwtN g boU4fU W QYKf F24BKGrFfg0sfhkc8U4aZfL4bn
kUNmG vm6odt 6 YaC6b0Ff4gG
Ox4Jh0 6
aXtsEg G LULJL3k2O
WeRAMe d 9GlF1XJM8
9oicQwaHnMp7n U Pjnojj5kdhD0sZzh
Pz3HHpnBy L OlVQMpHAILCH
RF3vwaFHarZR Q i2Ofa38U9ylvve
cE

Mobile and front-end

5+

requests per UI paint

[Jan 2011 ad hoc testing on an iPhone] Bing – 4, Google - 13, Mint – 26, Netflix – 13, Amazon – 2, LinkedIn 5, Facebook - 9



Fork/join dance

I/O

Parallellizing
Sequencing
Joining
Normalizing

Writing such code once or twice is fun – writing tens of times is not.

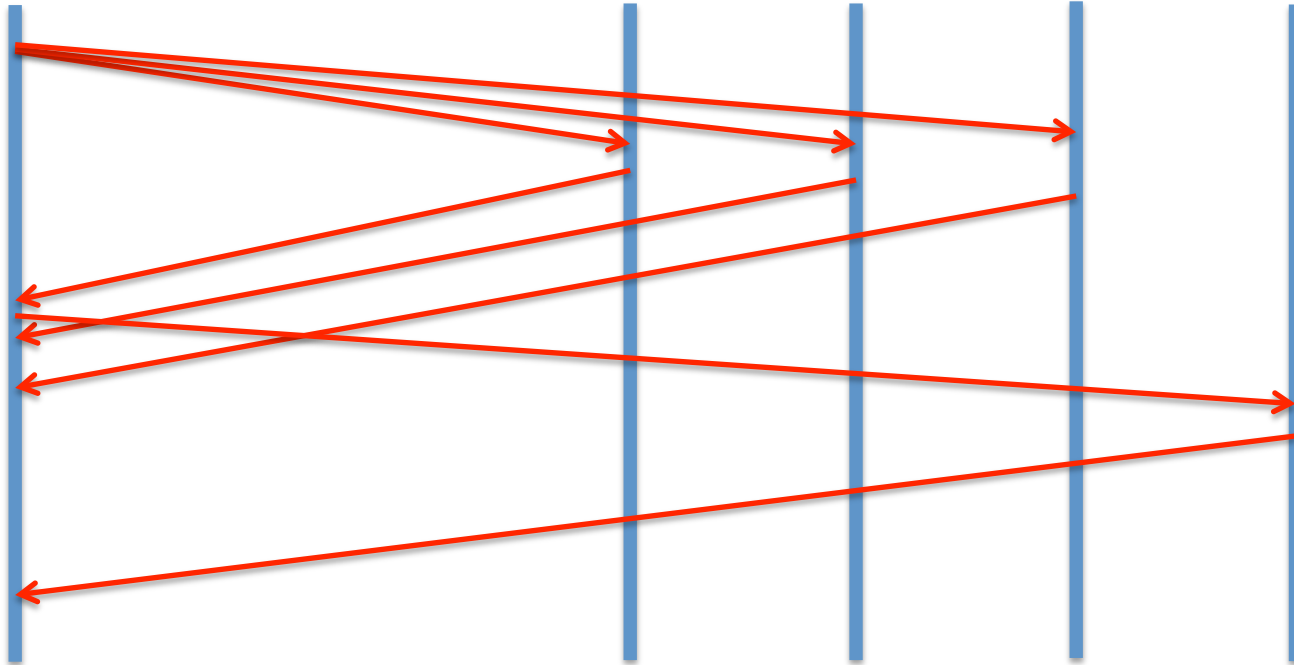
*Native, mobile
Single page apps*

Server-1

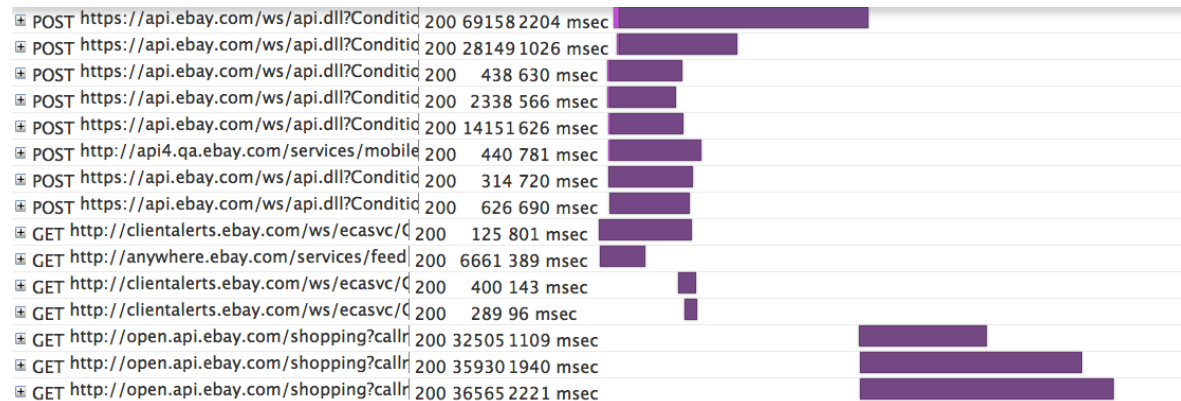
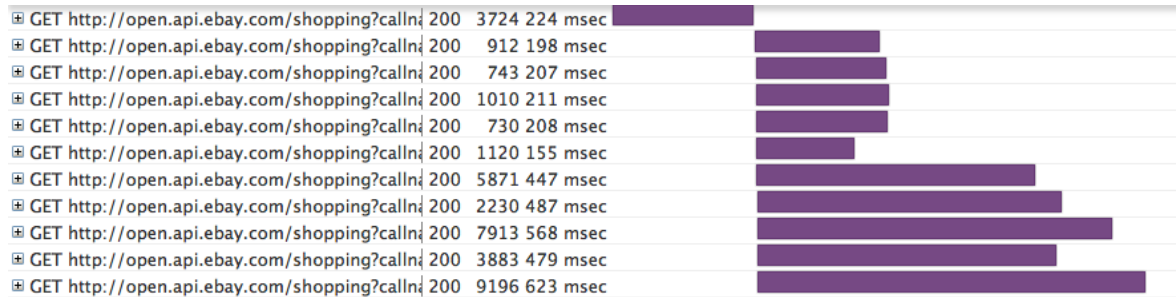
Server-2

Server-3

Server-4



Bad for far-away clients



Many requests and connections, high bandwidth use, high latency, low reliability

Easy Button

HTTP CRUD to SQLish CRUD

- create table for each resource
- select to read
- insert into to add or create
- update to update
- delete to delete

HTTP requests with one line of code

```
select long_url from bitly.shorten  
  where shortUrl = 'http://bit.ly/uZIvmY'
```

```
select Url from bing.soap.search  
  where q = "ql.io"
```

Designed for the lazy

```
// GET on a resource bound to SELECT
create table bing.search
  on select get from 'http://api.bing.net/xml.aspx?
Appid={appid}&query={q}&sources=web'
  using defaults appid = '{config.bing.appid}'
  resultset
'SearchResponse.web:Web.web:Results.web:WebResult';

// POST on a resource bound to SELECT
create table bing.soap.search
  on select post to 'http://api.bing.net/soap.asmx'
  using defaults appid = '{config.bing.appid}'
  using bodyTemplate 'bing.soap.xml.mu'
  type 'application/xml'
  resultset
'soapenv:Envelope.soapenv:Body.SearchResponse.parameters.
Web.Results.WebResult';
```

No Async Mind-Bending

```
# Sequential
minis = select * from finditems where
    keywords = 'mini cooper' limit 10;
return select PictureURL from details where
    itemId = "{minis.itemId}";

# Or parallel
keyword = "ql.io";
web = select * from bing.search where q = "{keyword}";
tweets = select id as id, from_user_name as user_name,
    text as text from twitter.search where q = "ql.io";

return {
    "keyword": "{keyword}",
    "web": "{web}",
    "tweets": "{tweets}"
}
```

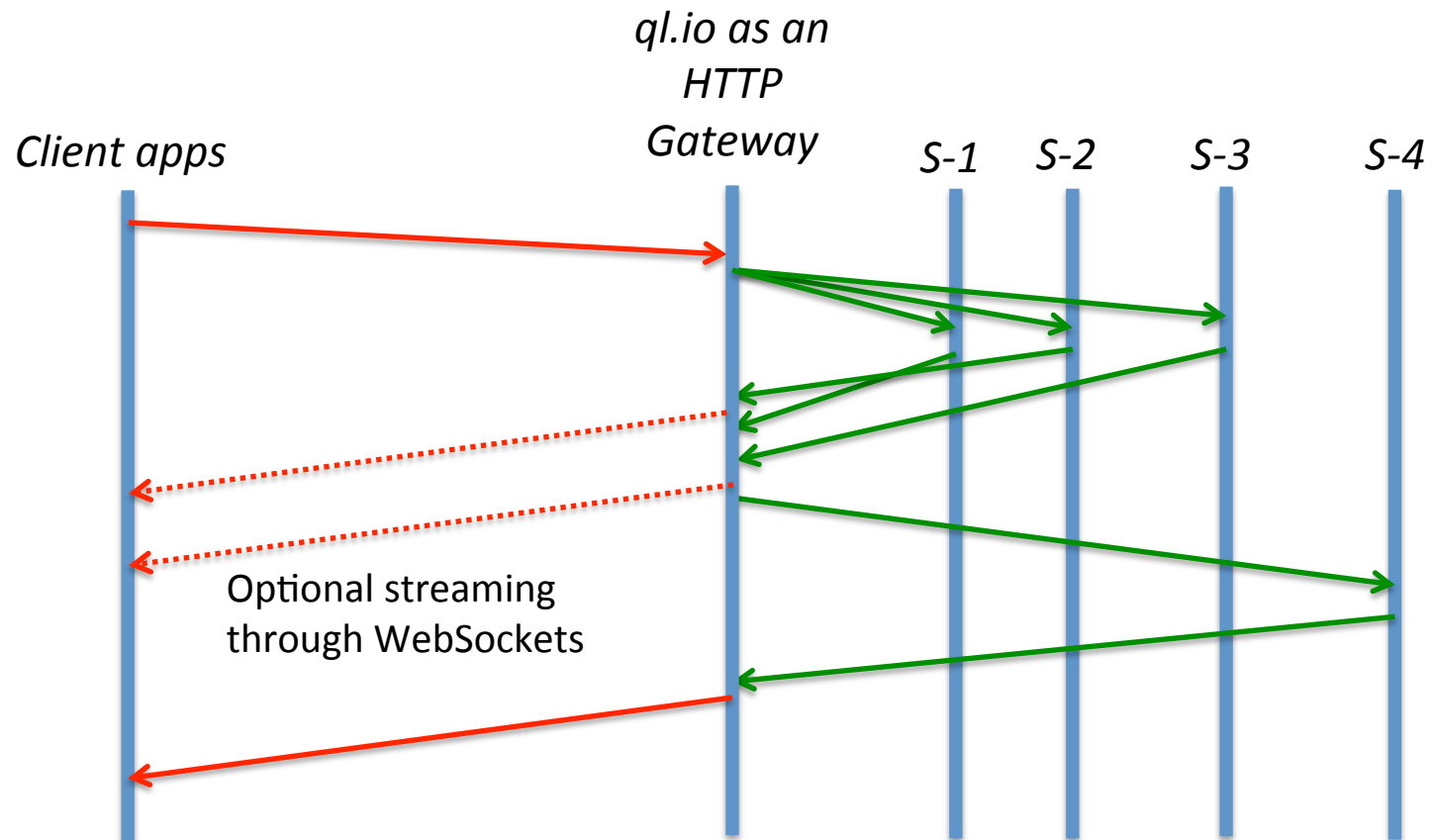
Implicit Fork-Join and Routing

```
prodid = select ProductID[0].Value from eBay.FindProducts
        where QueryKeywords = 'macbook pro';
details = select * from eBay.ProductDetails where
        ProductID in ('{prodid}') and
        ProductType = 'Reference';
reviews = select * from eBay.ProductReviews where
        ProductID in ('{prodid}') and
        ProductType = 'Reference';

return select d.ProductID[0].Value as id,
        d.Title as title, d.ReviewCount as reviewCount,
        r.ReviewDetails.AverageRating as rating
from details as d, reviews as r
where d.ProductID[0].Value = r.ProductID.Value
via route '/myapi' using method get;
```

How to Use

As a Gateway

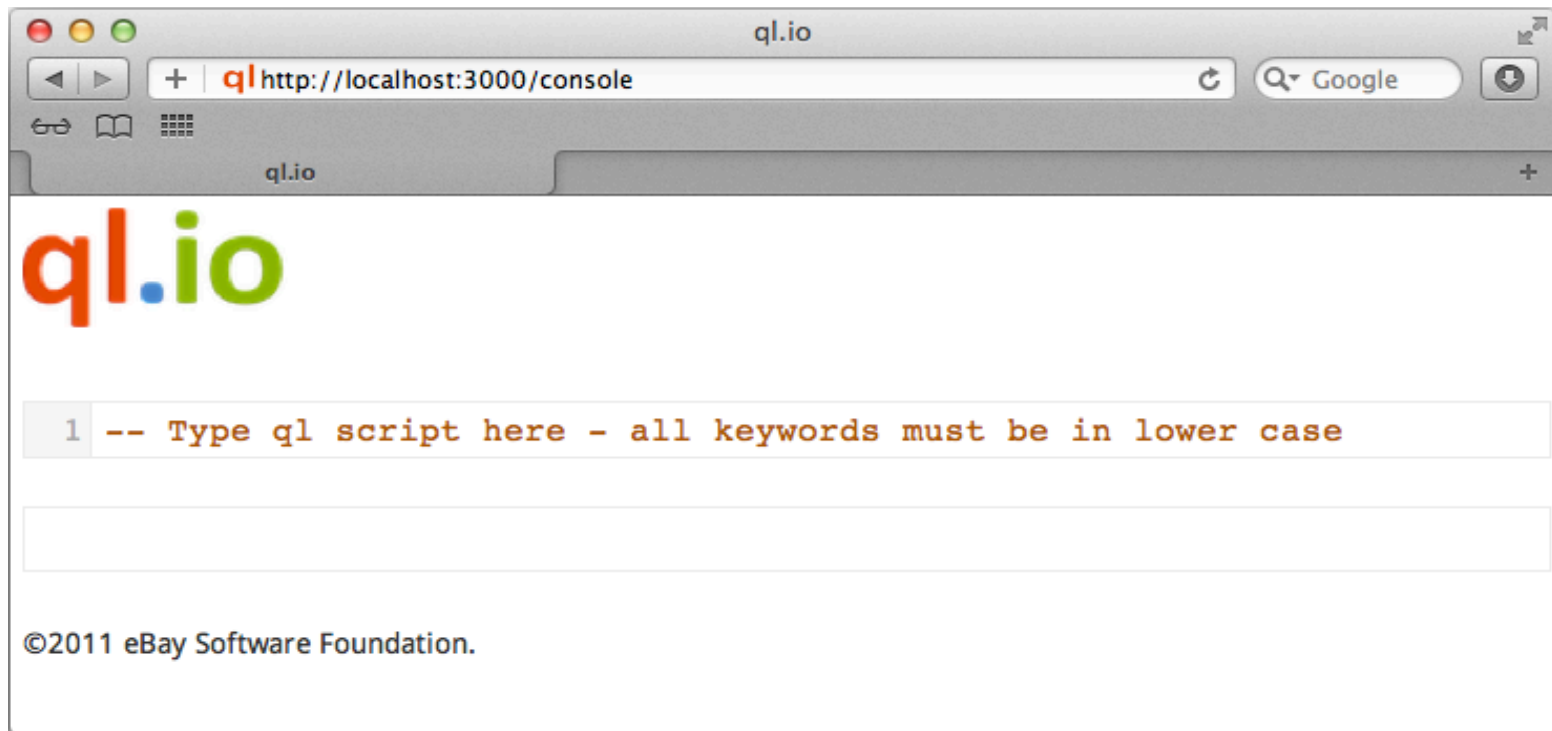


Node.js Module

```
/> npm install ql.io-engine
```

```
var Engine = require('ql.io-engine'), fs = require('fs');
var engine = new Engine({tables : __dirname + '/../tables'});
var script = fs.readFileSync(__dirname + '/myapi.ql', 'UTF-8');
engine.execute(script, function(emitter) {
  emitter.on('prodid', function(data) {
    console.log('found ' + data.length + ' product IDs');
  });
  emitter.on('details', function(data) {
    console.log('found ' + data.length + ' details');
  });
  emitter.on('reviews', function(data) {
    console.log('found ' + data.length + ' reviews');
  });
  emitter.on('end', function(err, result) {
    console.log('Got results');
  });
});
```

```
mkdir myapp  
cd myapp  
curl -L "http://tinyurl.com/7cgglby" | bash  
  
bin/start.sh
```



<http://ql.io>

ql.io