

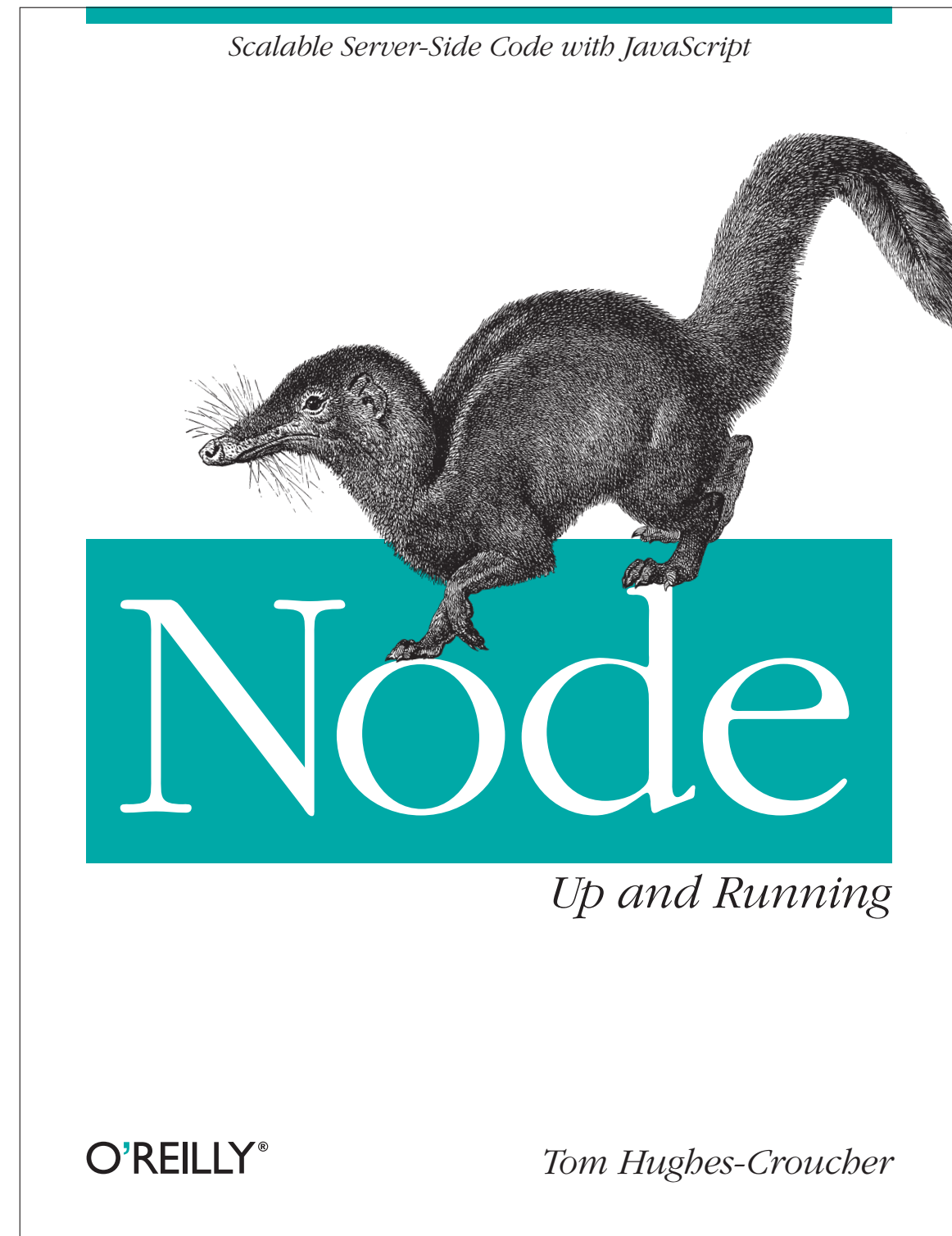
# Using Node.js to improve the performance of Mobile apps and Mobile web

Tom Hughes-Croucher

@sh1mmer

# Who is Tom?

- Wrote W3C Standards
- 10+ years in the web industry
- Worked on projects for: Tesco, NASA, Walmart, MySpace, etc
- ~5 years at Yahoo! including .com
- Node team at Joyent

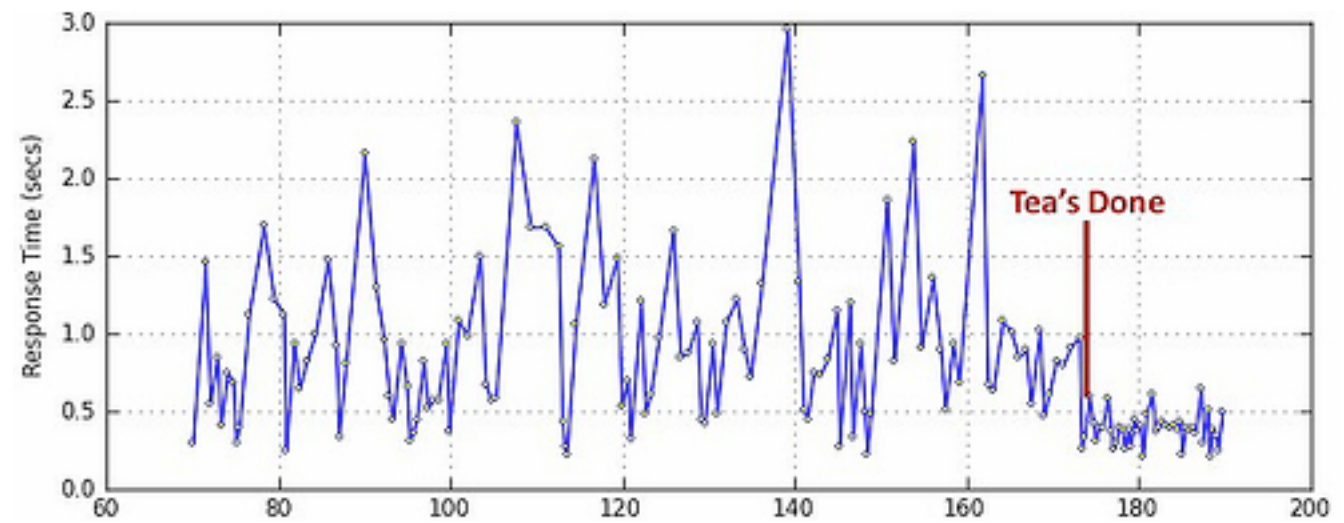
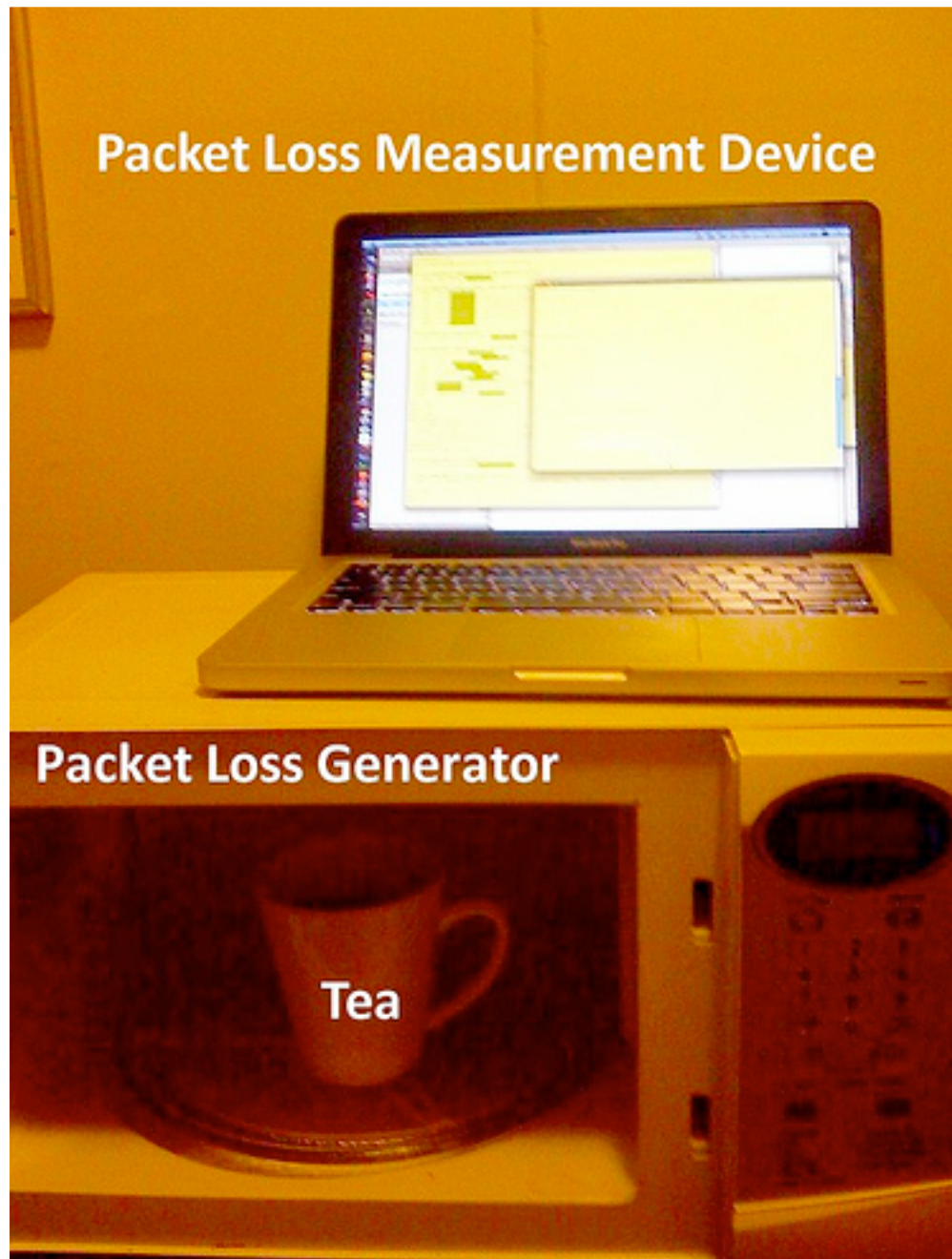


**This is a talk about why  
cell phones suck.**



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**Radio waves suck**  
(at least compared to fibre or copper)



[http://developer.yahoo.com/blogs/ydn/posts/2009/10/a\\_engineers\\_gui/](http://developer.yahoo.com/blogs/ydn/posts/2009/10/a_engineers_gui/)

# Radio vs. buildings



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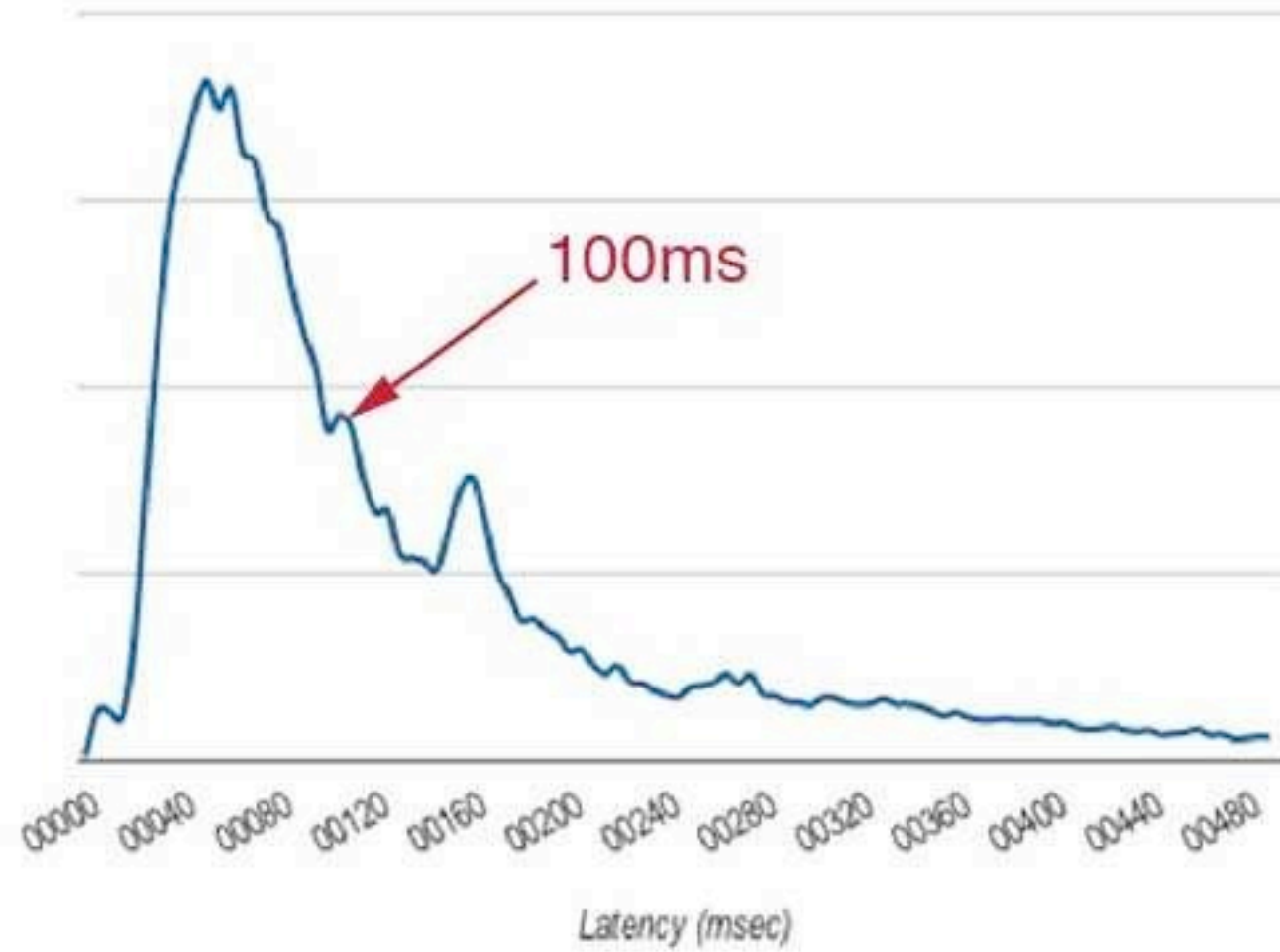
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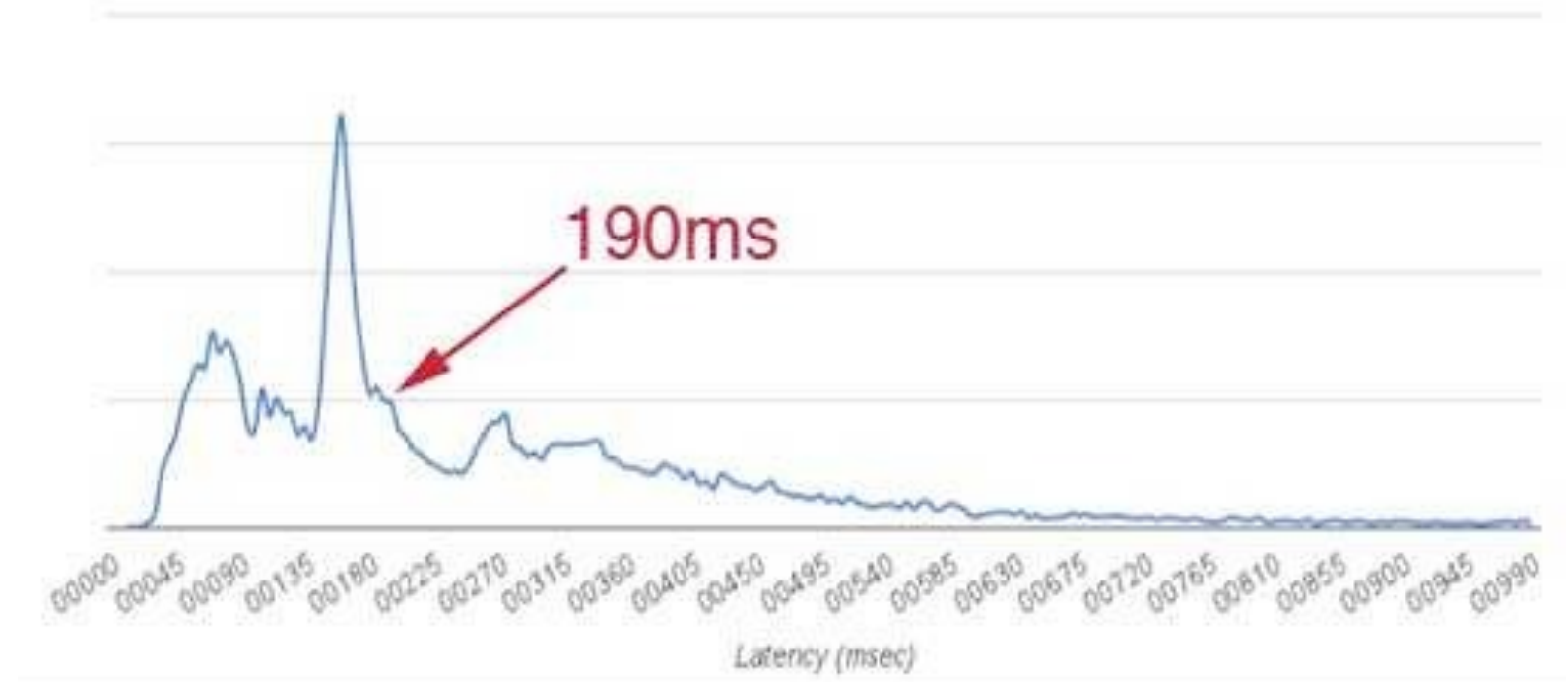
# Desktop

Latency Per Visit



# Mobile

Latency per Mobile Browser



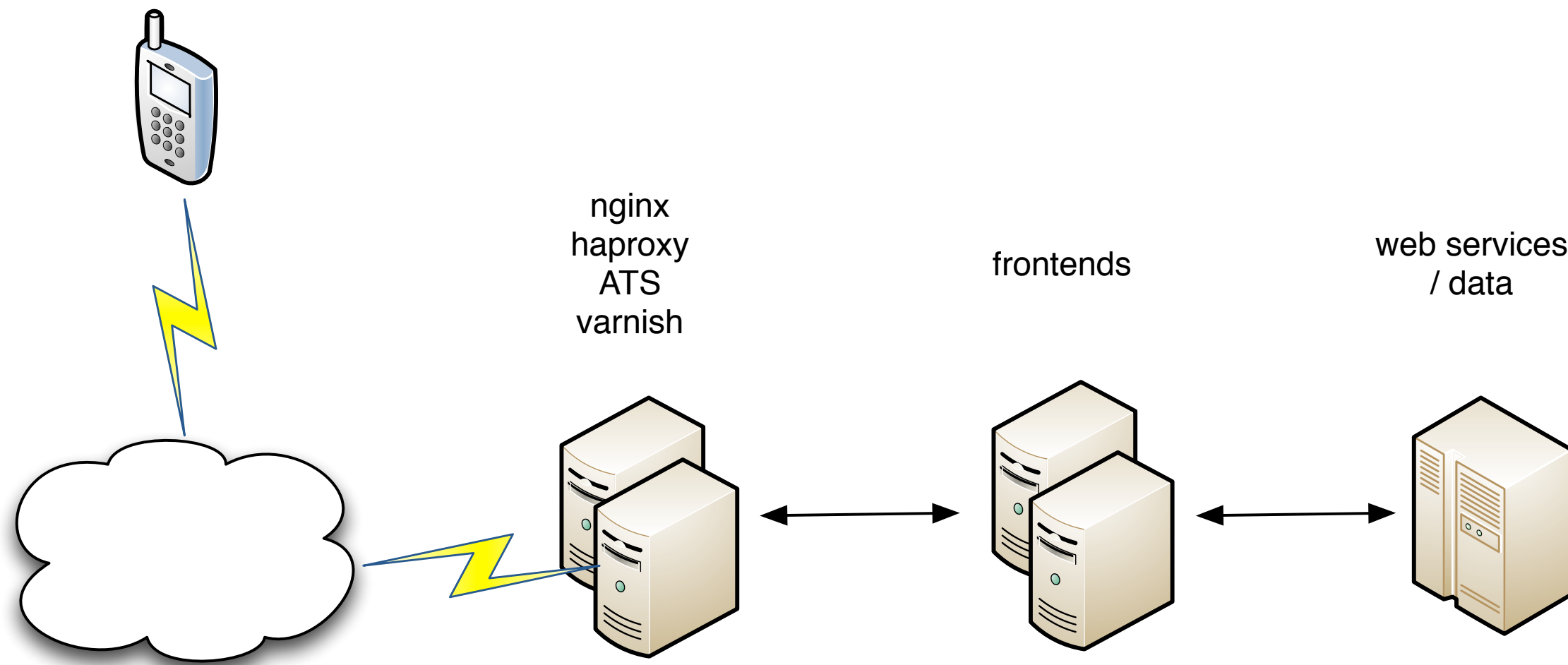
<http://www.webperformancetoday.com/2012/04/02/mobile-versus-desktop-latency/>

Country	Average RTT	Average Downlink Throughput	Average Uplink Throughput
South Korea	278 ms	1.8 Mbps	723 Kbps
Vietnam	305 ms	1.9 Mbps	543 Kbps
US	344 ms	1.6 Mbps	658 Kbps
UK	372 ms	1.4 Mbps	782 Kbps
Russia	518 ms	1.1 Mbps	439 Kbps
India	654 ms	1.2 Mbps	633 Kbps
Nigeria	892 ms	541 Kbps	298 Kbps

# Effect of latency on servers

# Shielding Frontends





```
var client = net.connect(80, domain, function() {
  client.write("GET / HTTP/1.1\r\n");
  t1 = (new Date()).getTime();
});

client.on('end', function() {
  t2 = (new Date()).getTime();
  output.write(domain + ' ' + ((t2-t1)/1000) + 's\n');
});
```

## Sample of Alexa 5000

macupdate.com	442.3
uzai.com	403.658
wired.jp	238.848
facilisimo.com	205.159
mycokerewards.com	202.757
rbc.cn	192.354
moviesmobile.net	183.157
stop55.com	145.927
dir.bg	137.982
carrefour.fr	112.789
sifyitest.com	111.171

# Event-driven Frontends

Client → Server

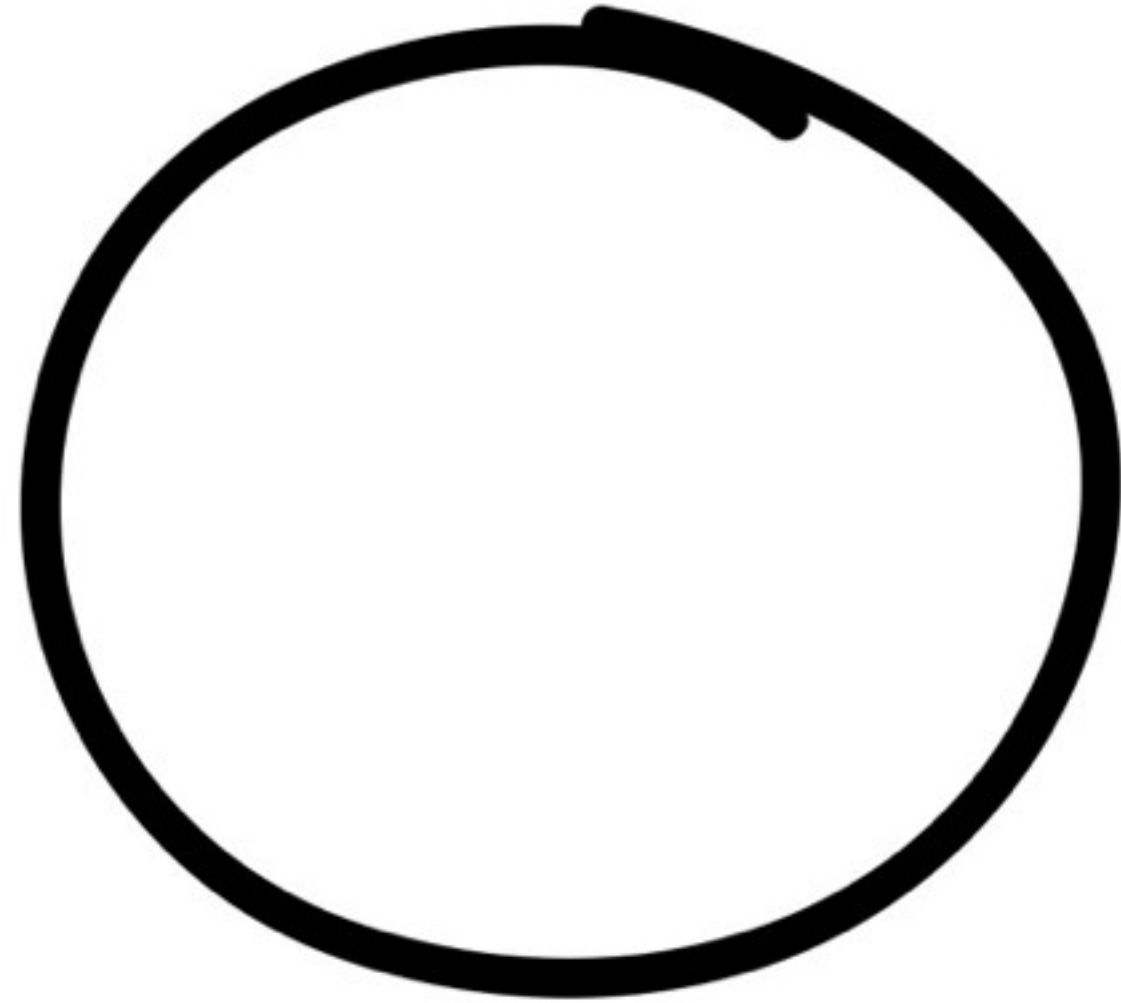
Server → DB



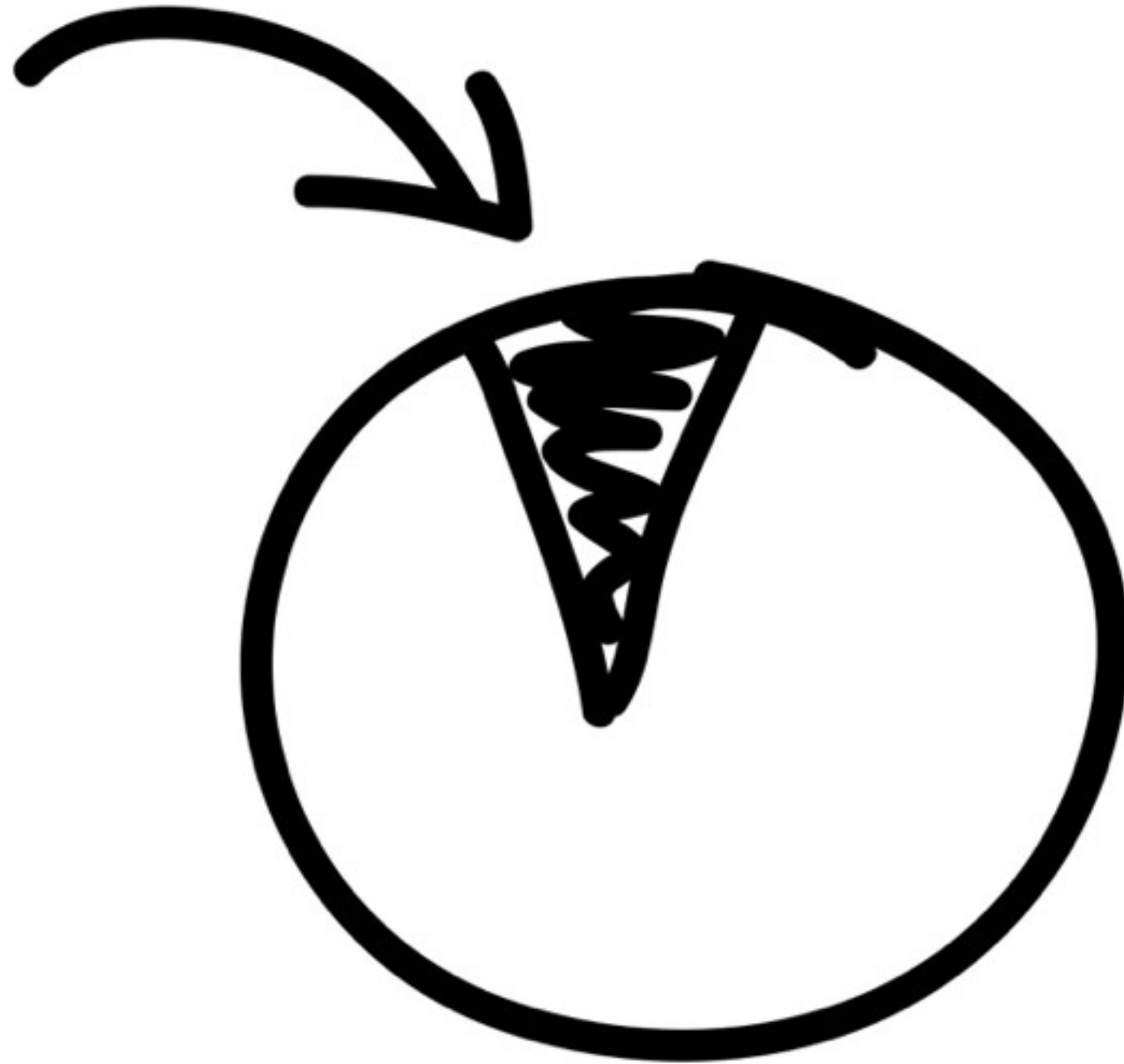
Computation

Computation

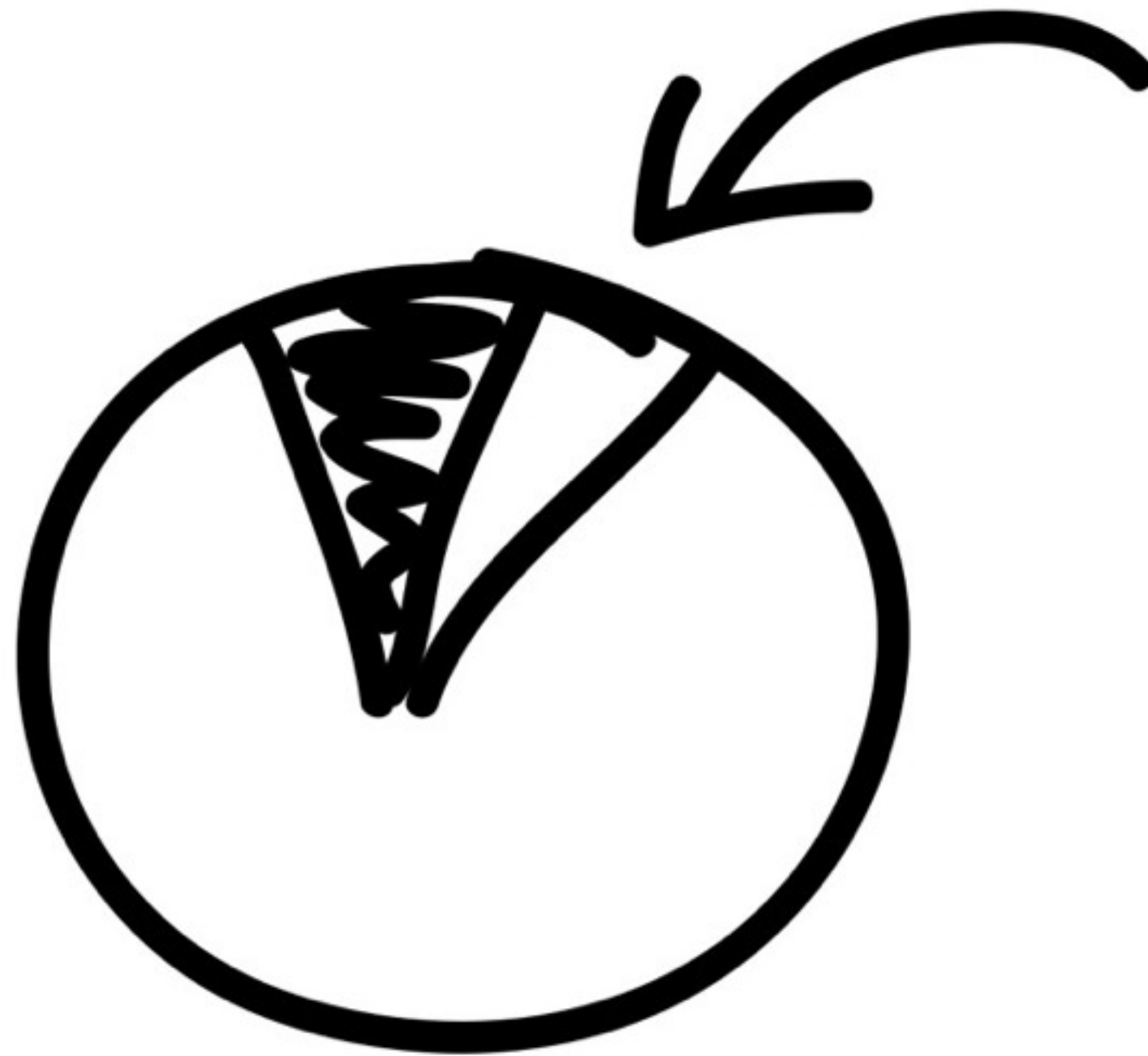
**Not an event frontend**



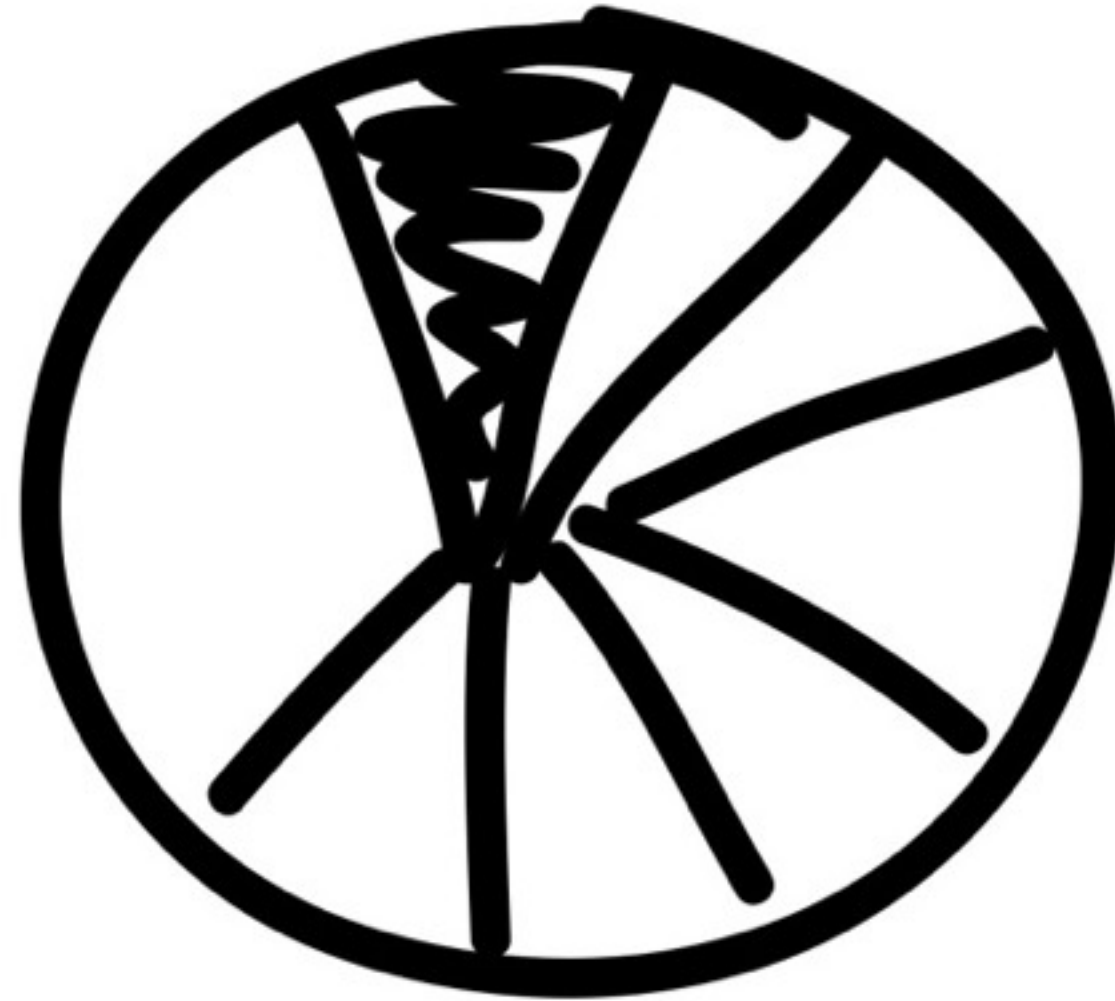
Server



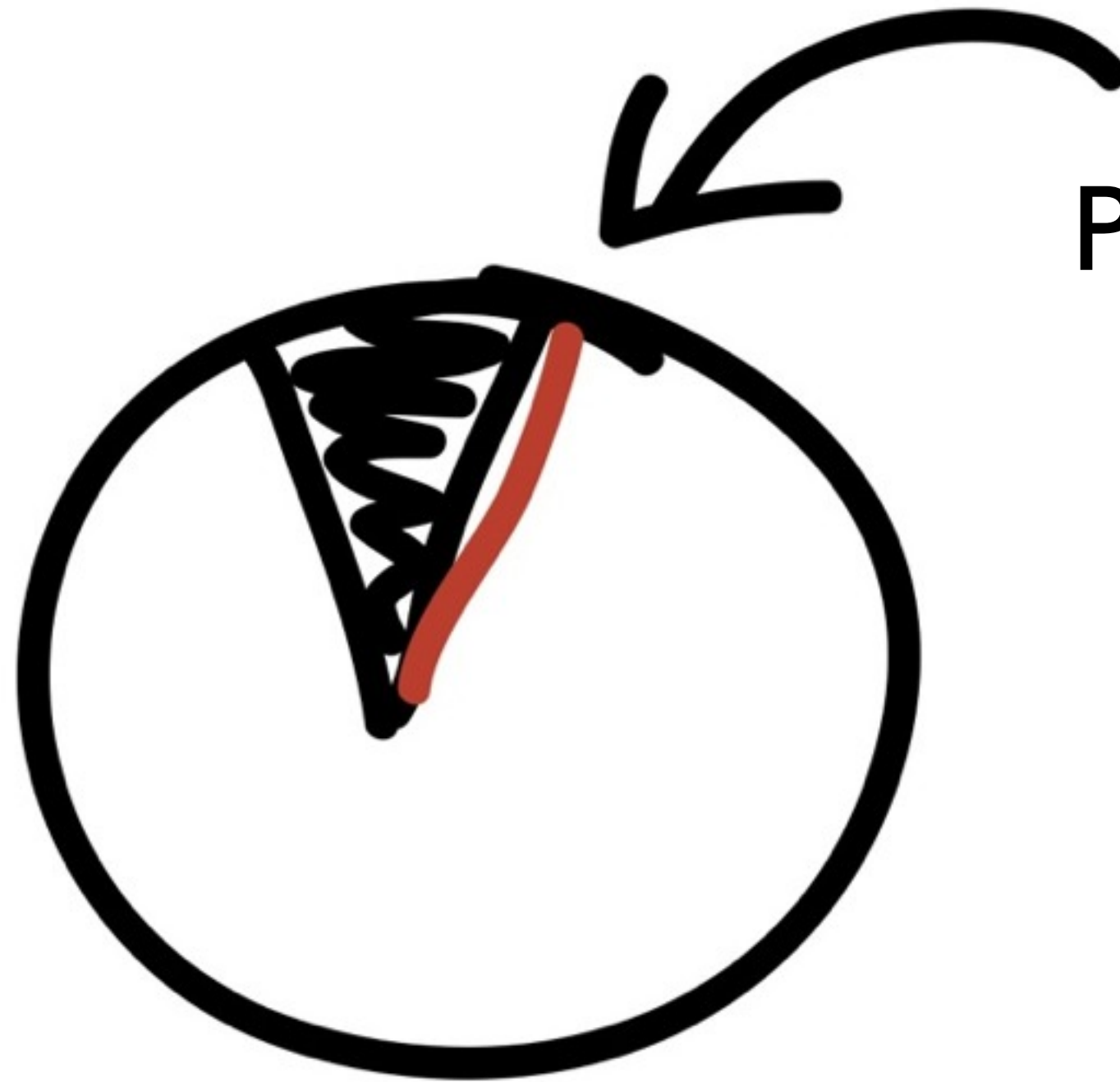




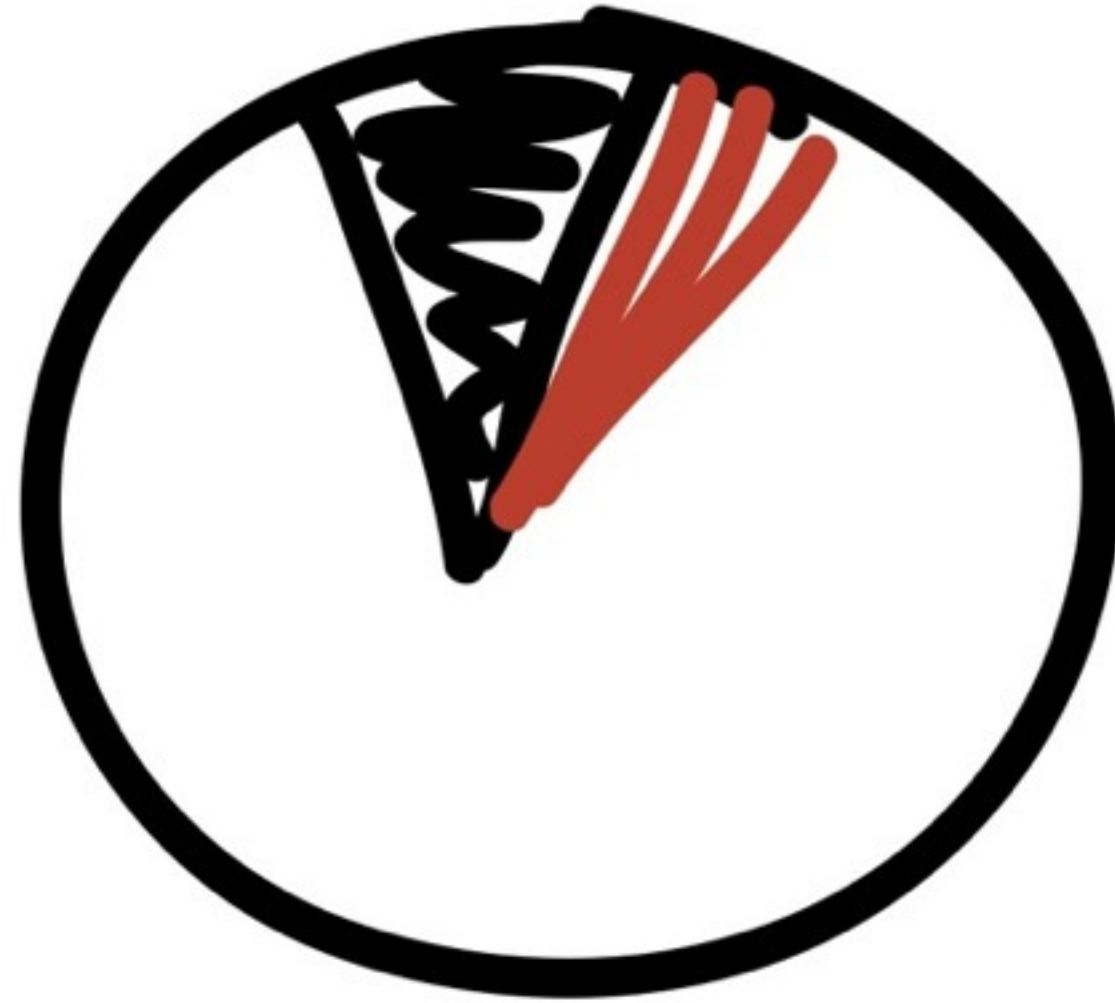
Request



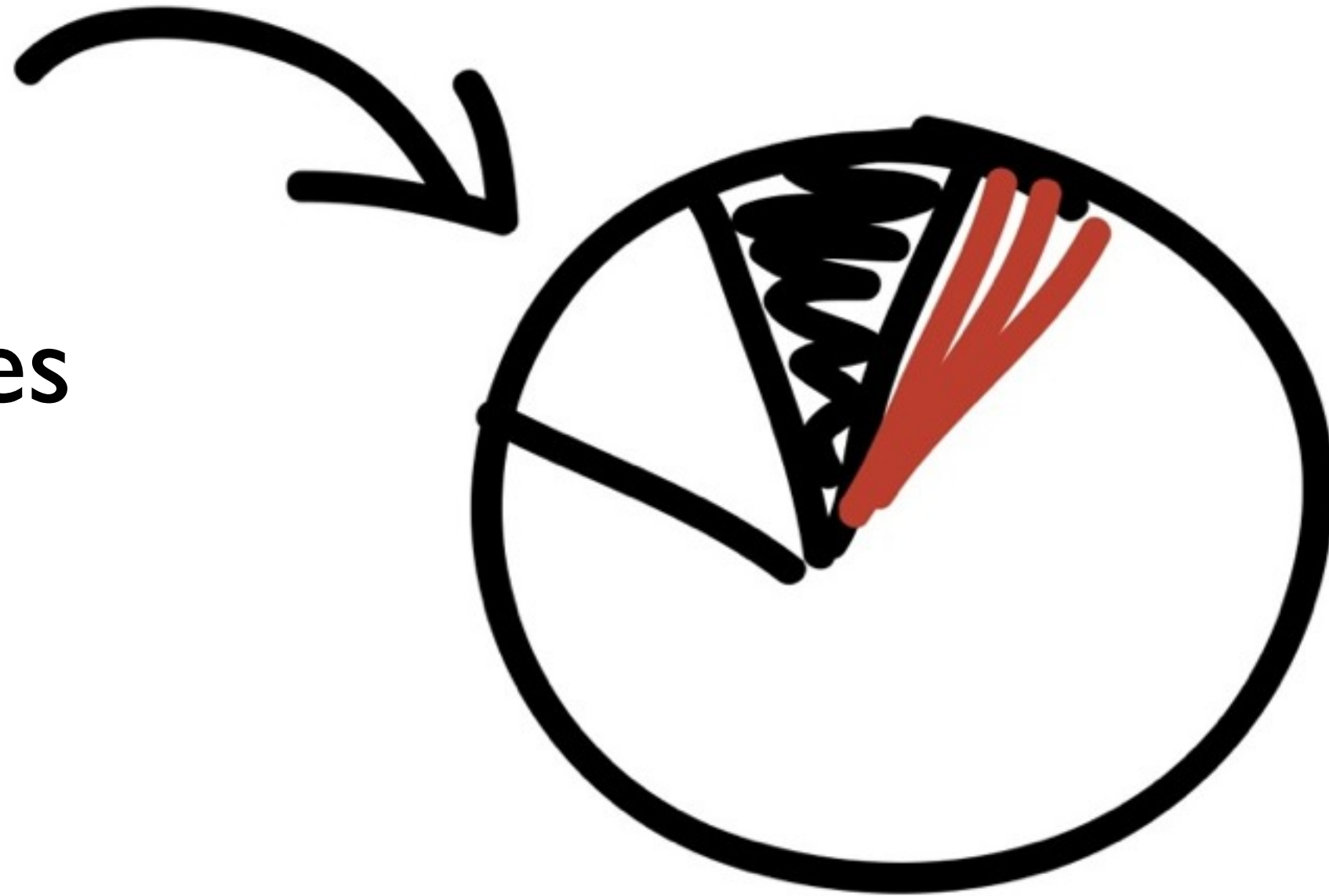
# Event-driven frontend



Place-holder



Shared  
Work  
Resources



# Memory operations

```
var x = "I am a string"
```

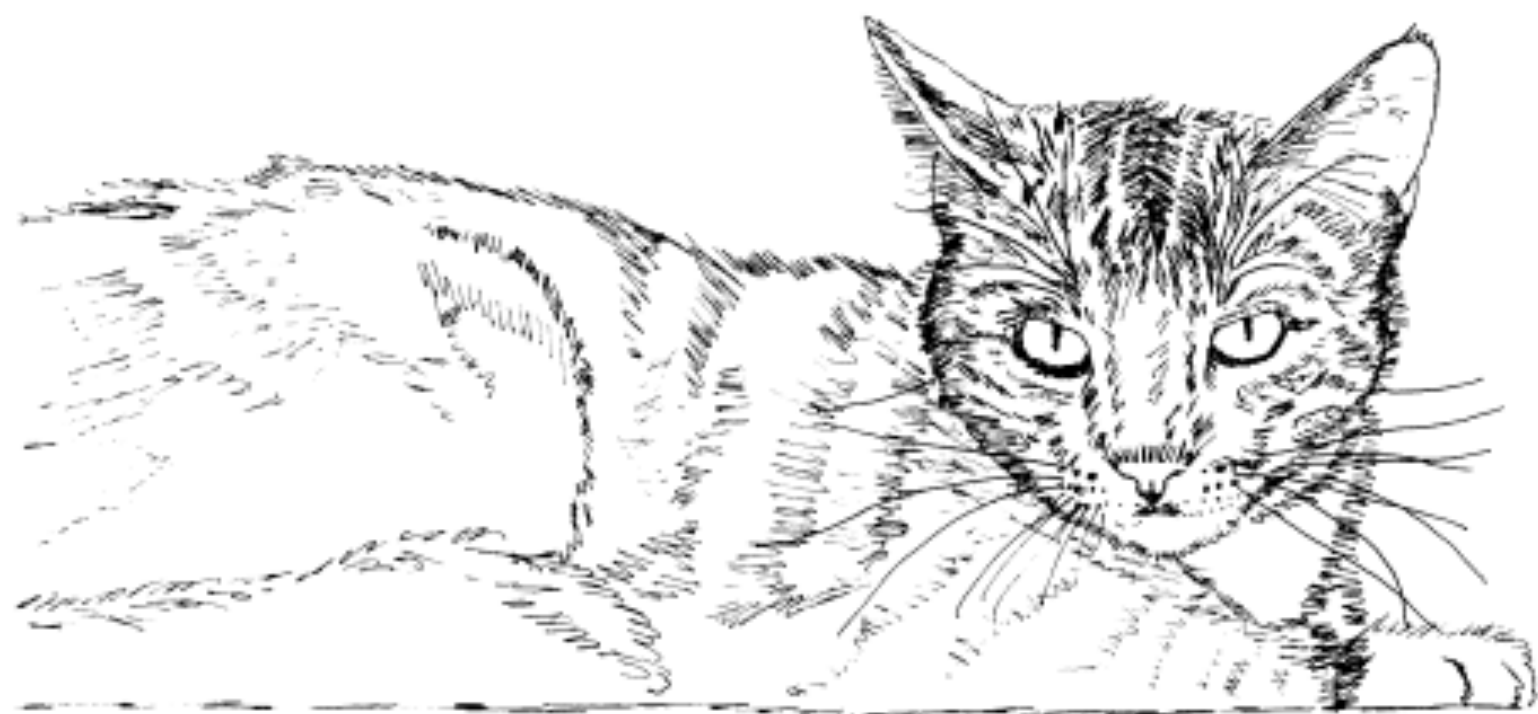
~1ns Running 1 instruction

2ns Data from l1 cpu cache

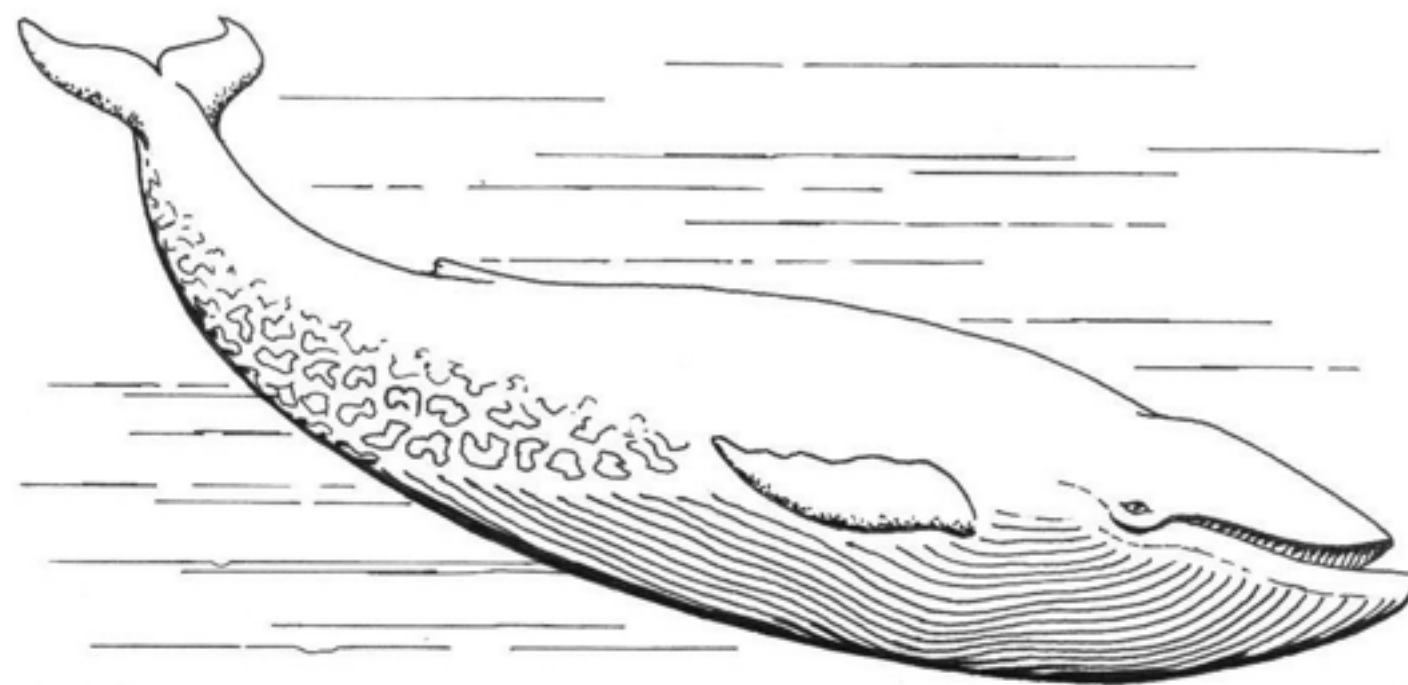
5ns Data from l2 cpu cache

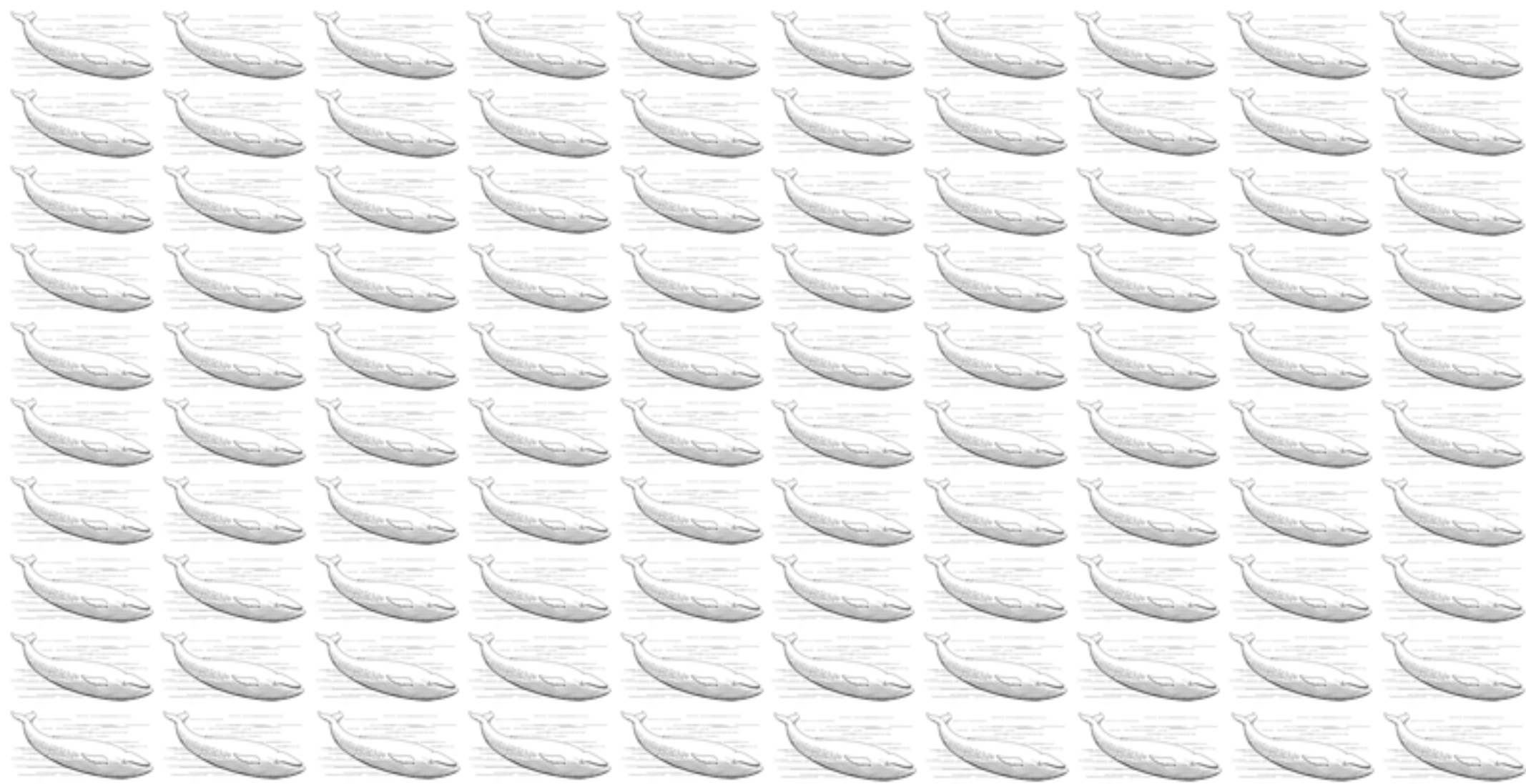
80ns Data from ram





# Mobile latency





100 Blue Whales

Cat →

*"They went from running 15 servers with 15 instances (virtual servers) on each physical machine, to just four instances that can handle double the traffic."*

**Not just simple applications**

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Who's Viewed Your Profile?

5 Your profile has been viewed by 5 people in the past 3 days.

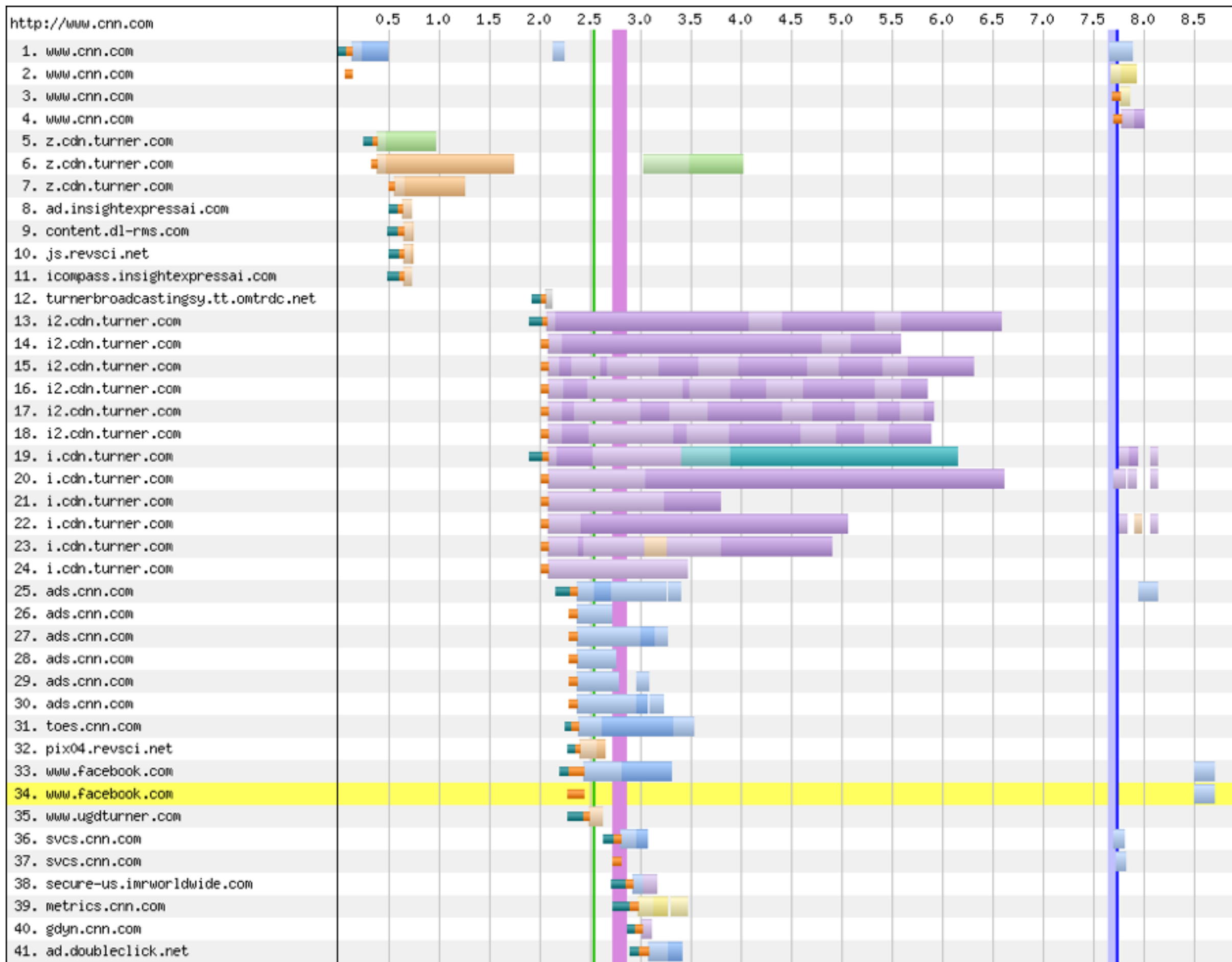
11 You have shown up in search results



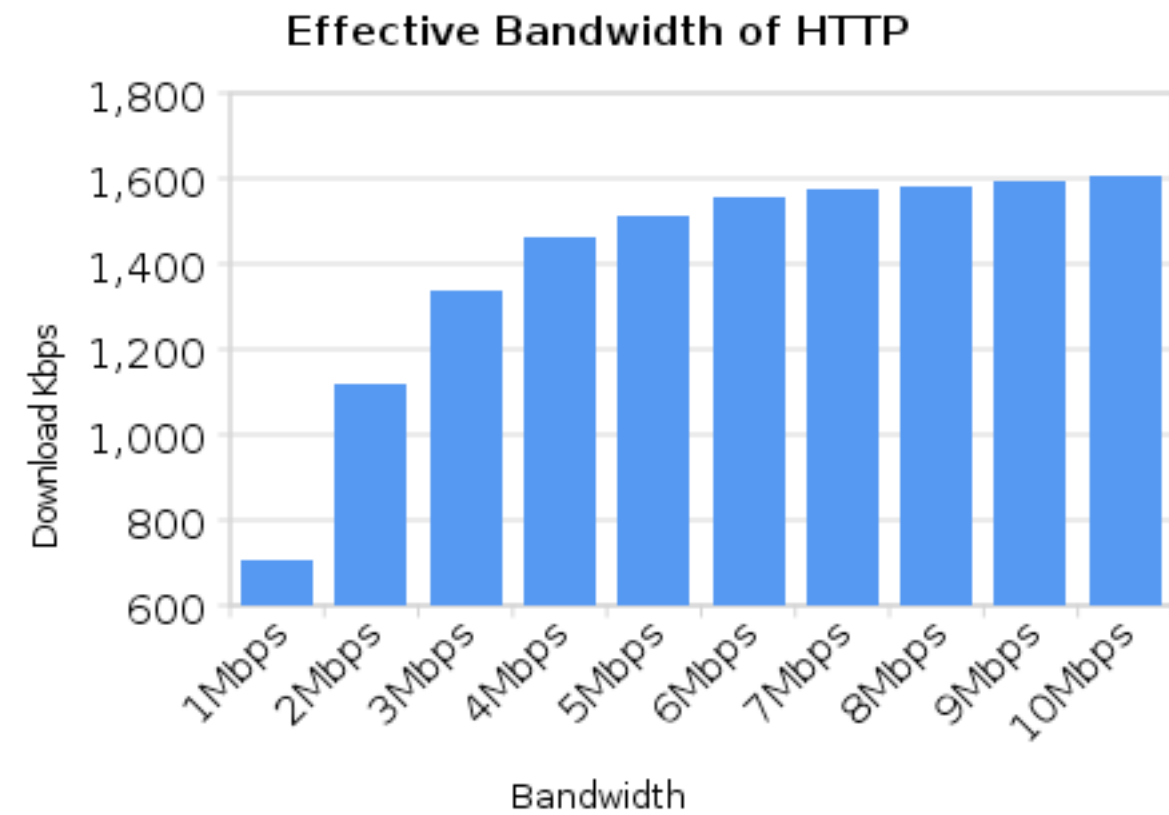
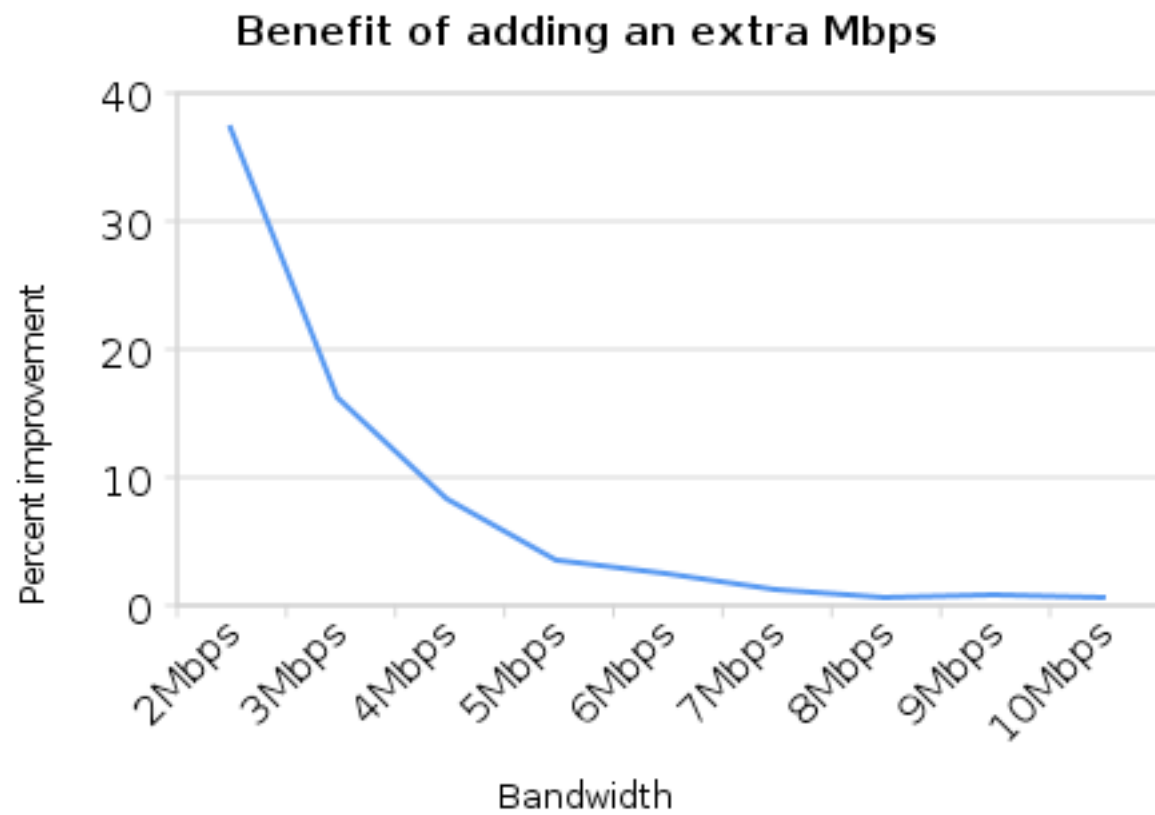
# First page load vs. Client MVC

Loading tom.croucher@gmail.com...



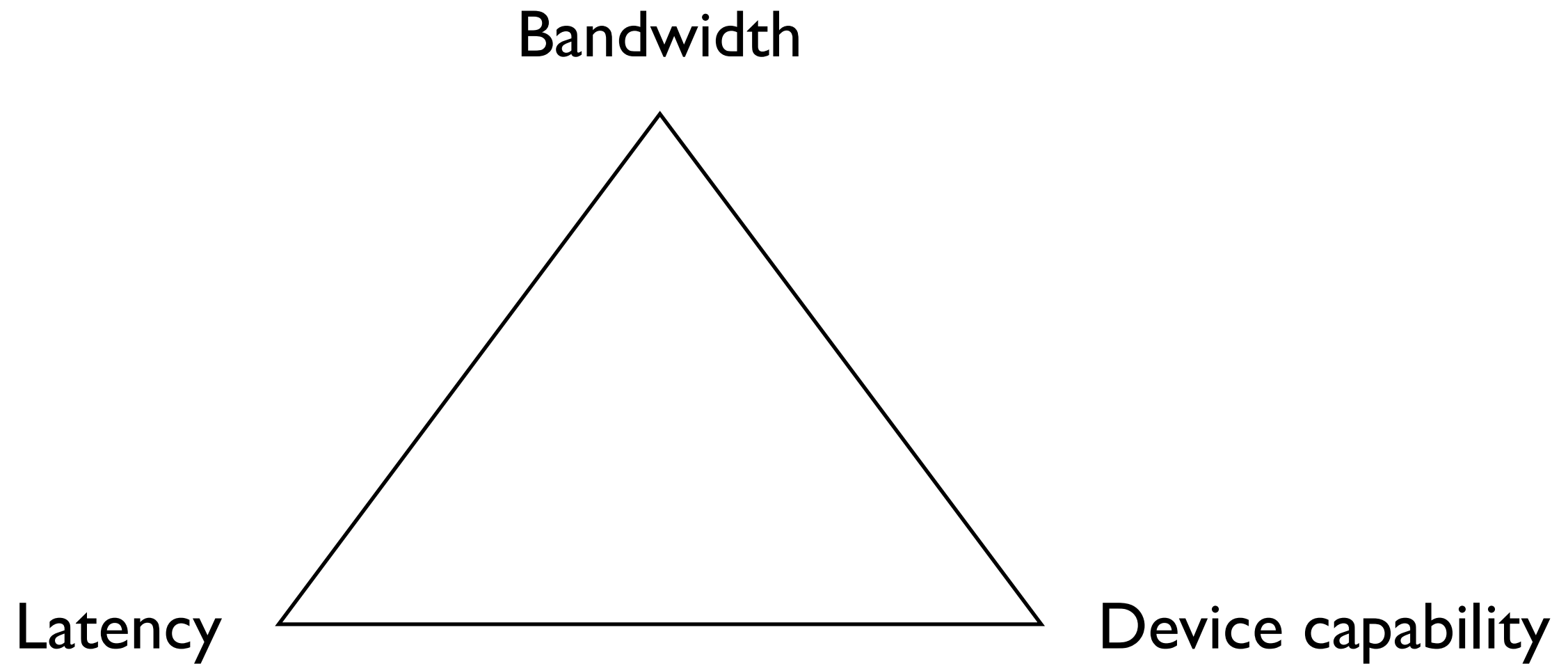


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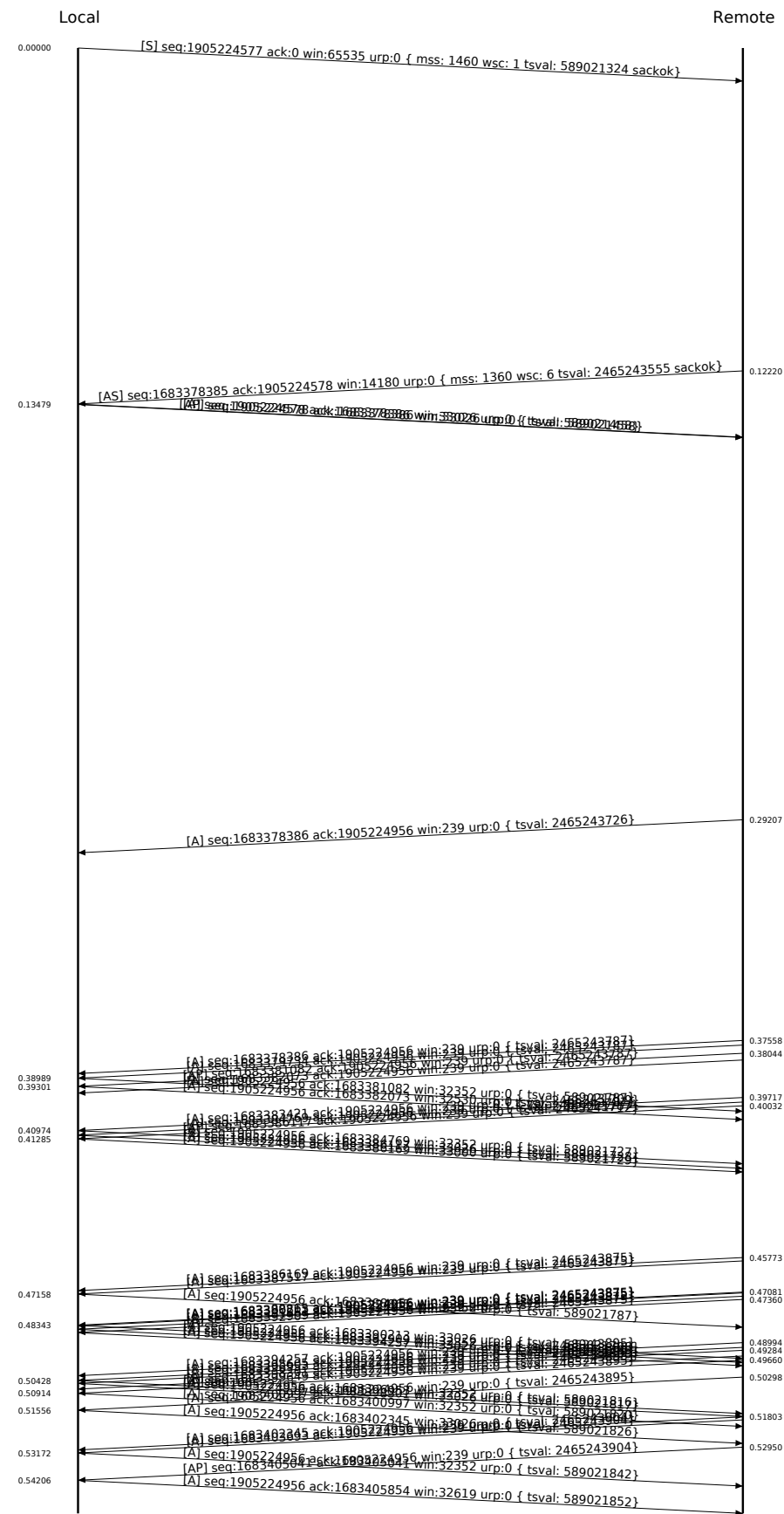


<http://www.belshe.com/2010/05/24/more-bandwidth-doesnt-matter-much/>

@sh1mmer



**Barfing data at 3G**



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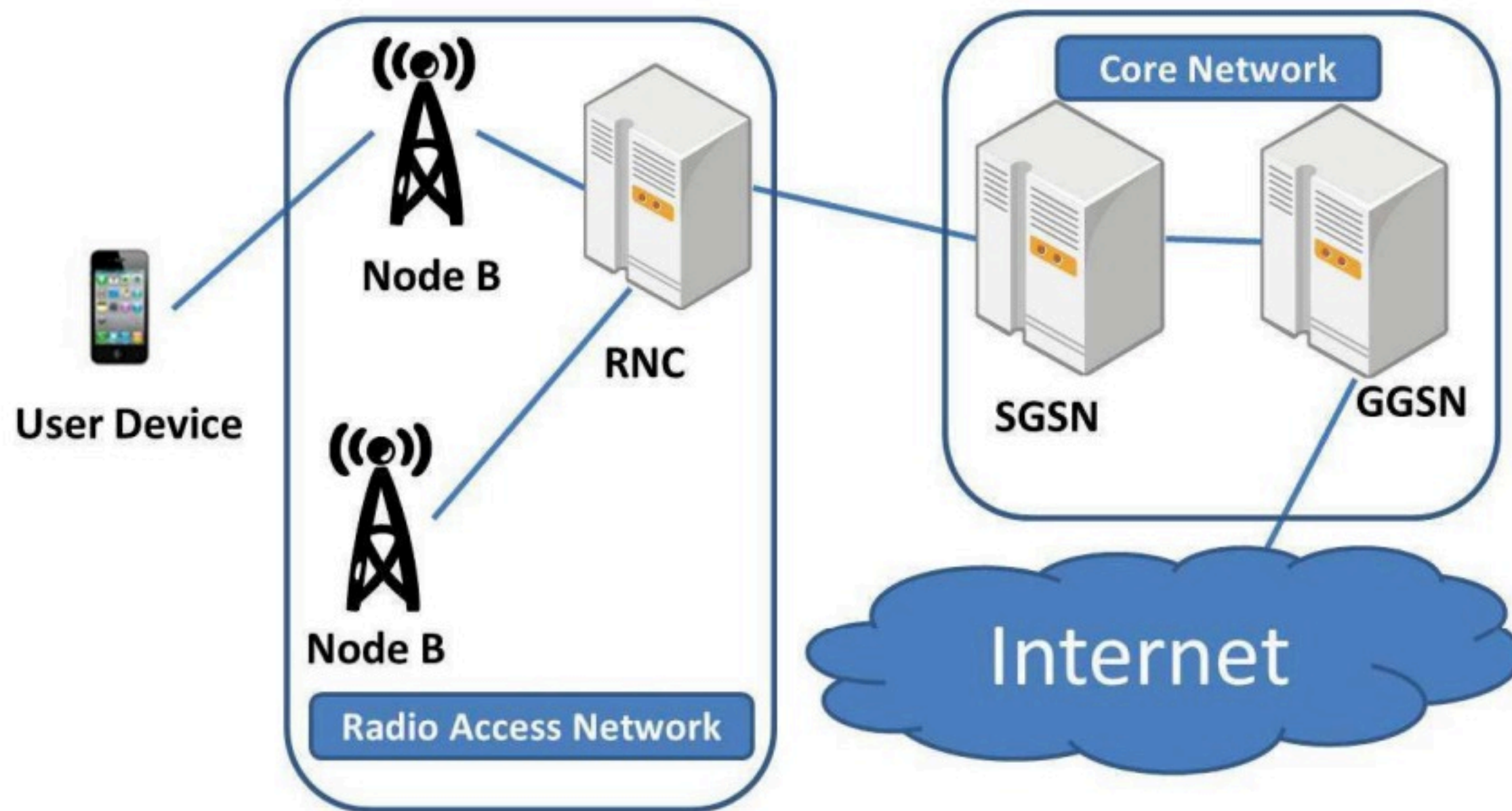
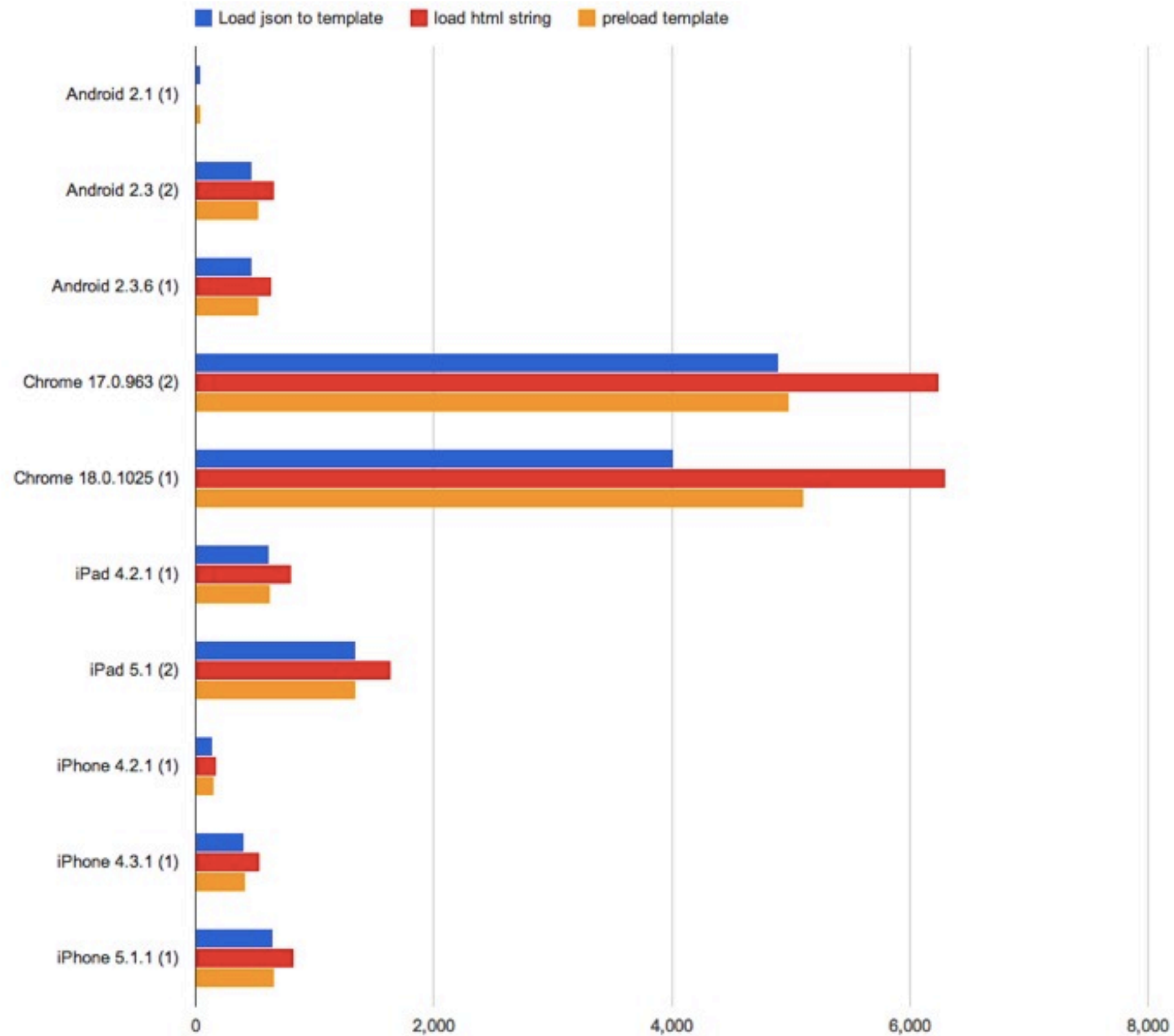


Fig. 1. Simplified 3G architecture



# Clientside templating



Node.js allows you to tune rendering between client and server based on the network.

HTML

JSON



More bandwidth

Less bandwidth

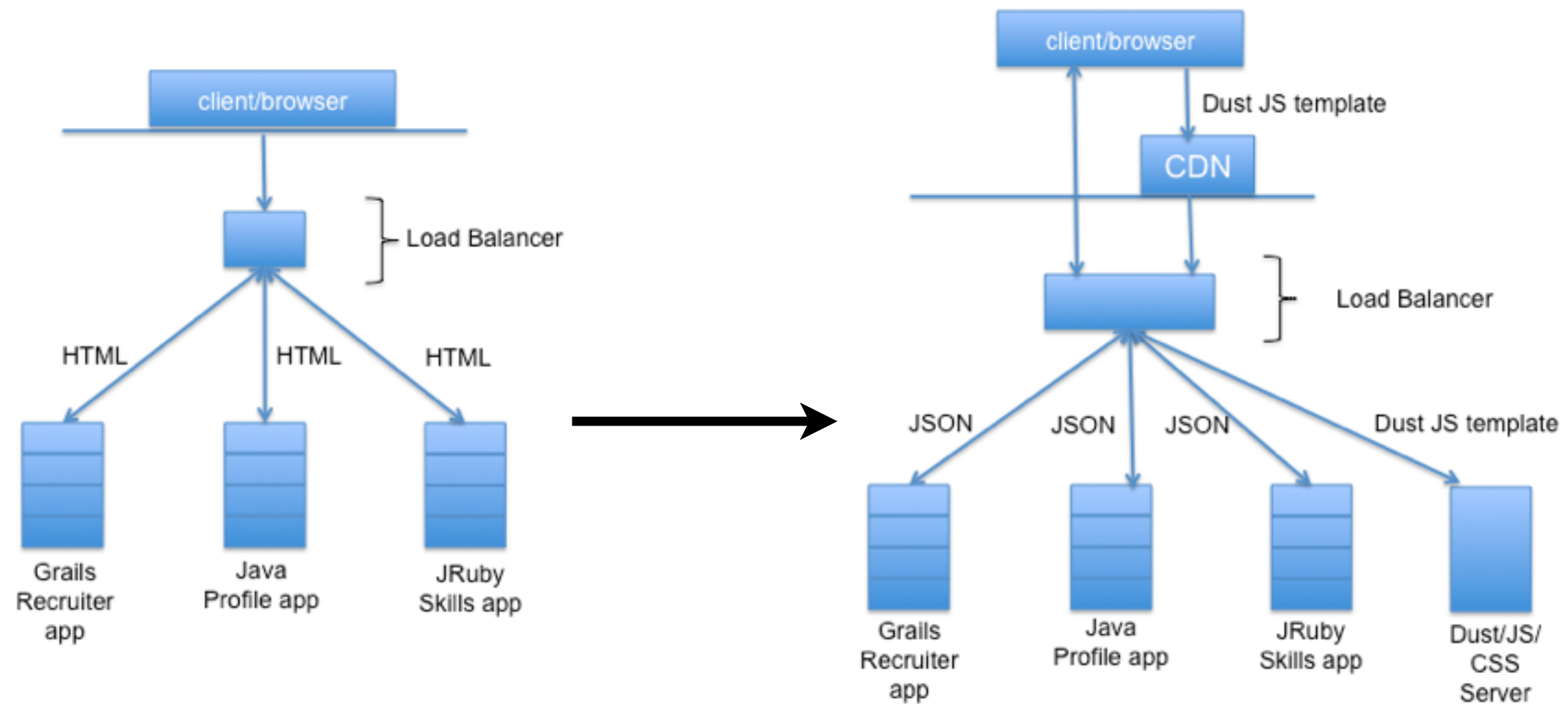
Less client processing

More client processing

Battery friendly

Cheaper for you bandwidth/server

Cheaper for them bandwidth



<http://engineering.linkedin.com/frontend/leaving-jsp-dust-moving-linkedin-dustjs-client-side-templates>

<http://engineering.linkedin.com/frontend/client-side-templating-throwdown-mustache-handlebars-dustjs-and-more>

# Challenges

- JSON - fast object / slow render
- HTML - fast render / slow objects
- If we use HTML where do we manage our model?
- If we use JSON does rendering matter?

# Identifying use cases

- "Client-side apps" - read/write data on client
- "Render-only apps" - mostly read data on client

# Summary

- Node.js allows you to:
  - Manage resources with unreliable mobile data connections
  - Choose where to apply rendering
  - Pick the right rendering solution for the right scenario



**Demo time.**

# Questions

@sh1mmer