



low hanging fruit

vs.



micro-optimization

## Creative Techniques for Loading Web Pages Faster

Trevor Parscal - @trevorparscal  
Roan Kattouw - @catrope

# People



**Roan**

robot



**Trevor**

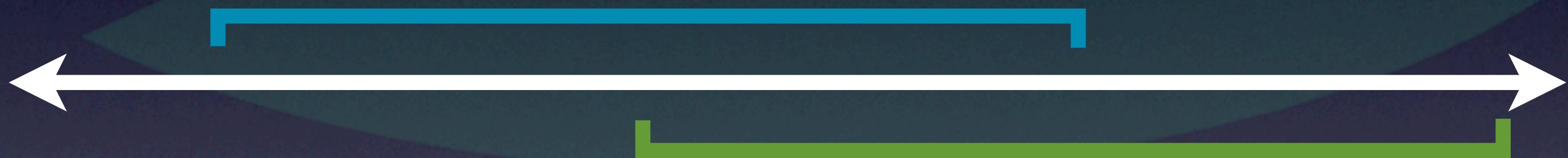
human

# People



Back-end

Front-end



# Software



MediaWiki

platform



Wikipedia

project





WIKIPEDIA  
The Free Encyclopedia

- Main page
- Contents
- Featured content
- Current events
- Random article
- Donate to Wikipedia

- Interaction
  - Help
  - About Wikipedia
  - Community portal
  - Recent changes
  - Contact Wikipedia

- Toolbox
- Print/export

- Languages
  - Simple English

Main Page

Discussion

Read

Edit

View history



Search



## Welcome to Wikipedia,

the free encyclopedia that anyone can edit.

3,694,628 articles in English

- Arts
- History
- Society
- Biography
- Mathematics
- Technology
- Geography
- Science
- All portals

### Today's featured article



**Jack Warner** (1892–1978) was a Canadian-born American film executive who was the president and driving force behind the **Warner Bros. Studios in Hollywood, Los Angeles, California**. Warner's 45-year career was longer than that of any other traditional Hollywood studio mogul. He

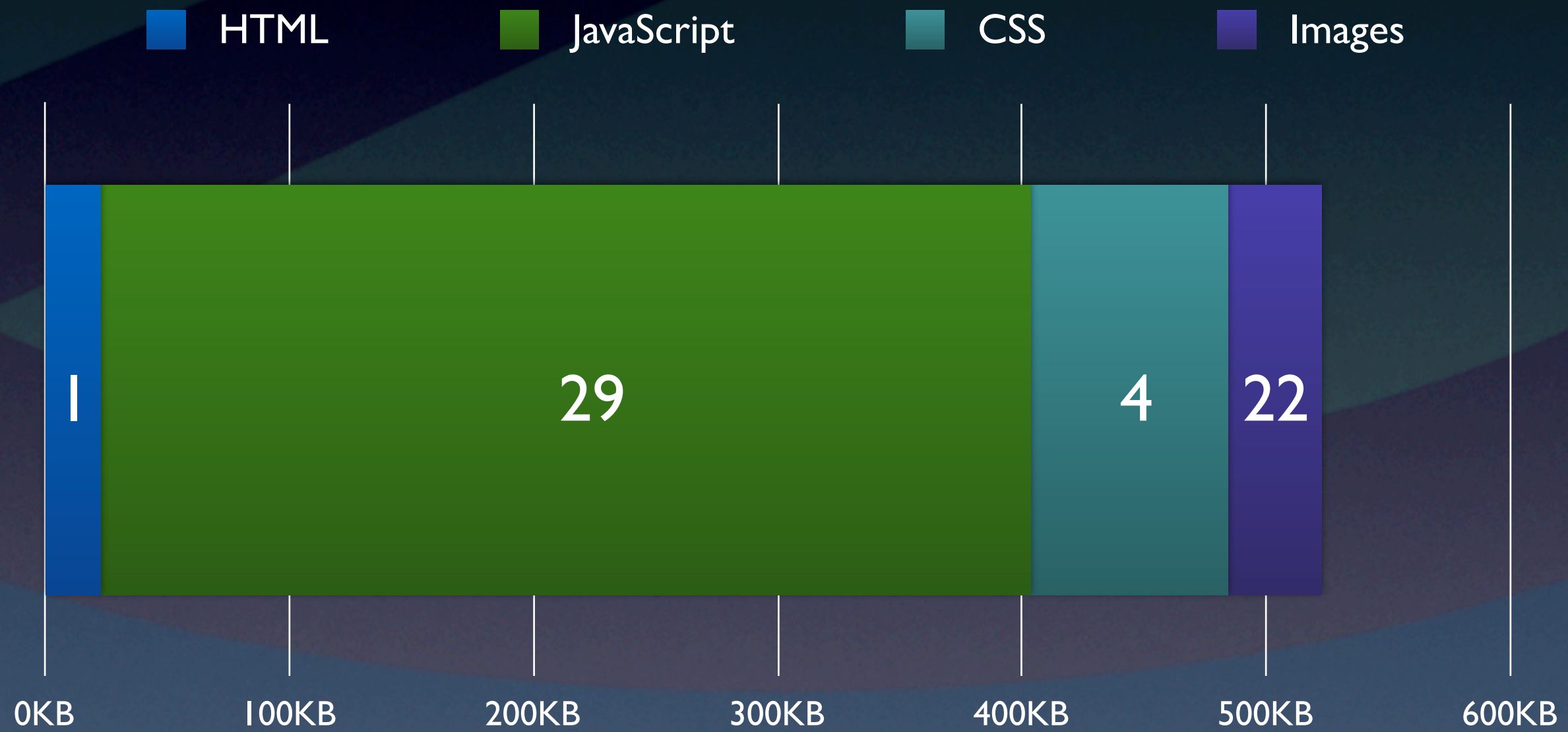
worked with his brother, **Sam Warner**, to procure the technology for the film industry's first talking picture. Although Warner was feared by many of his employees and inspired ridicule with his uneven attempts at humor, he earned respect for his shrewd instincts and toughmindedness. He recruited many of Warner Bros.' top stars and promoted the hard-edged social dramas for which the studio became known. Although he was a

### In the news

- Asteroid **2010 TK7** is confirmed as the first Earth trojan asteroid discovered.
- Truong Tan Sang** becomes the new President of Vietnam and nominates Nguyen Tan Dung to another term as Prime Minister.
- In cycling, **Cadel Evans** (*pictured*) wins the **2011 Tour de France**, becoming the first Australian Tour de France winner.
- Protests** against rising house prices in Israel continue, with thousands gathering in Tel Aviv and Jerusalem.
- Thousands of protesters encounter



# Resources



# Resources



Scripts

javascript



Styles

css



Translations

json

# Origins



## Core

skins & common stuff



## Extensions

most everything else



## Users

`Math.random();`



# Optimizations



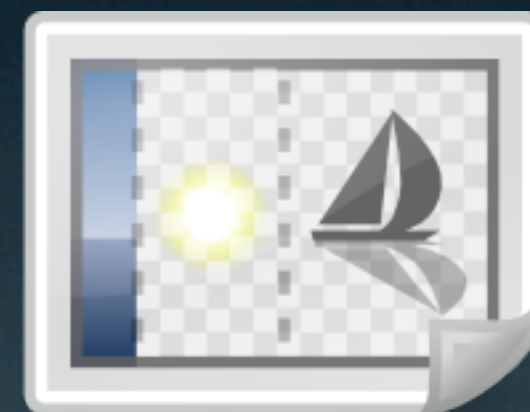
## Minification

whitespace removal



## Combination

file concatenation



## Sprites

multi-graphic images



# Being a developer sucked



Creating

good luck!



Maintaining

messy and boring

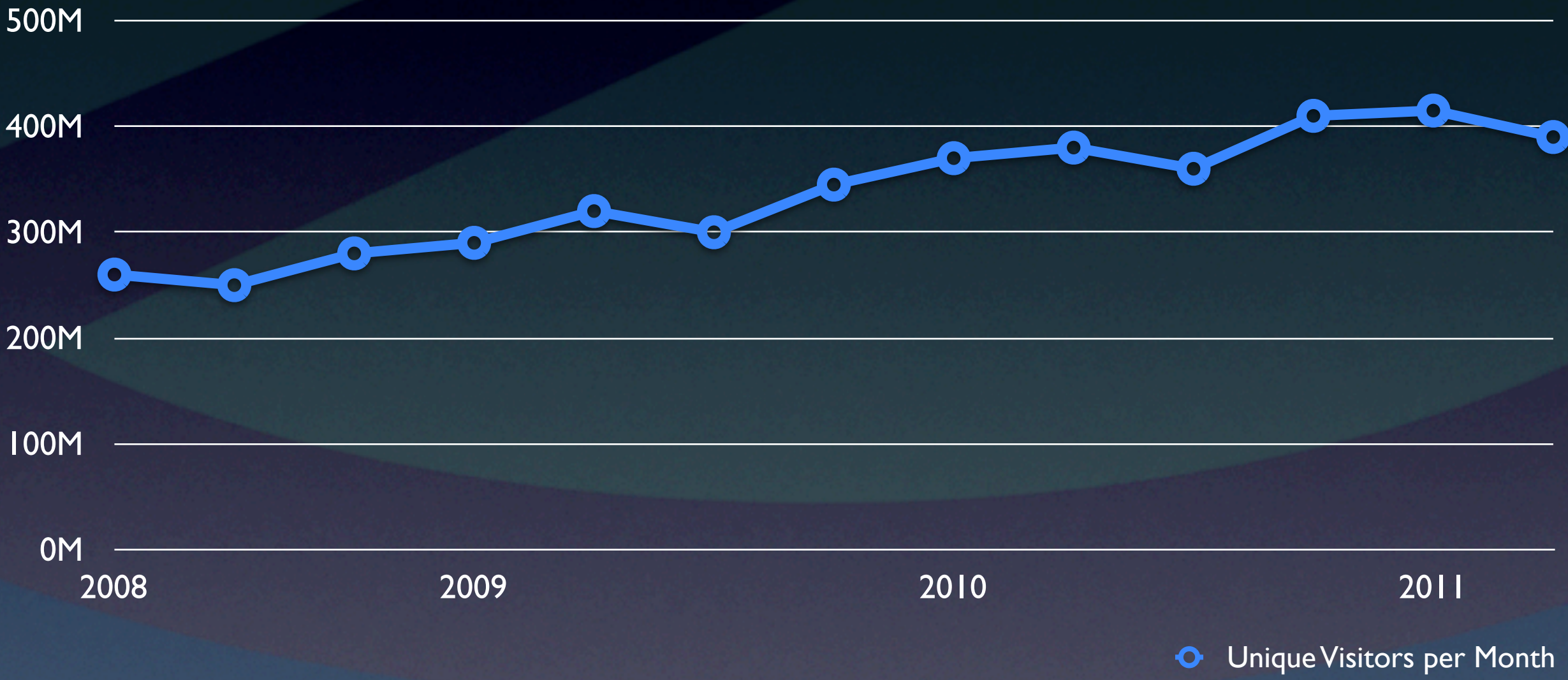


Using

clunky and slow



# Traffic



# Cache Invalidation



**Users**

user-specific resources



**Admins**

site-wide resources



**Translators**

site-wide messages



# Approach



## Easy Gains

no micro-optimization



## Client Focus

it's where the magic is

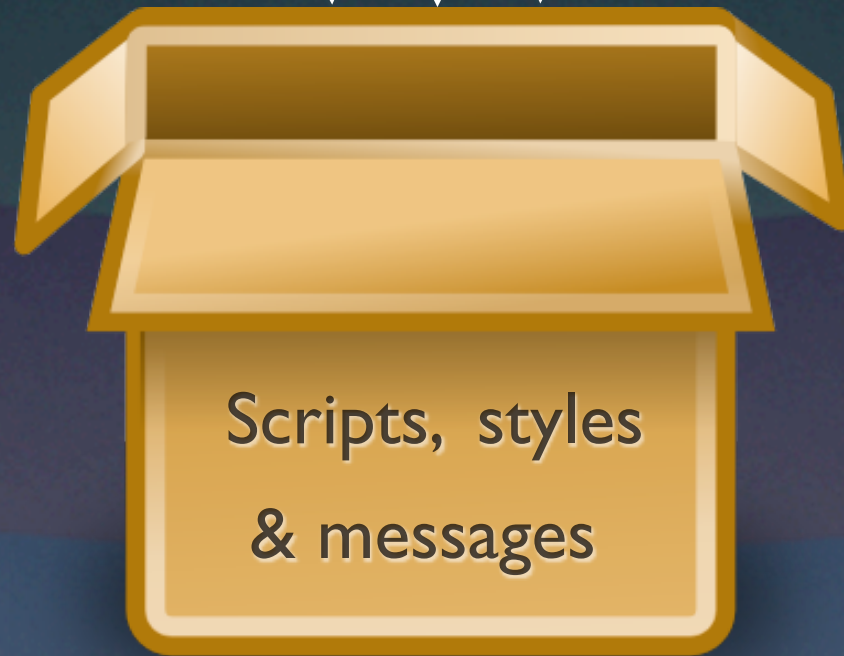
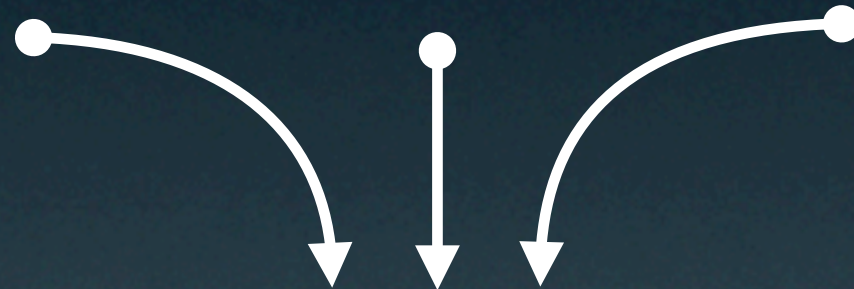


## Ease of Use

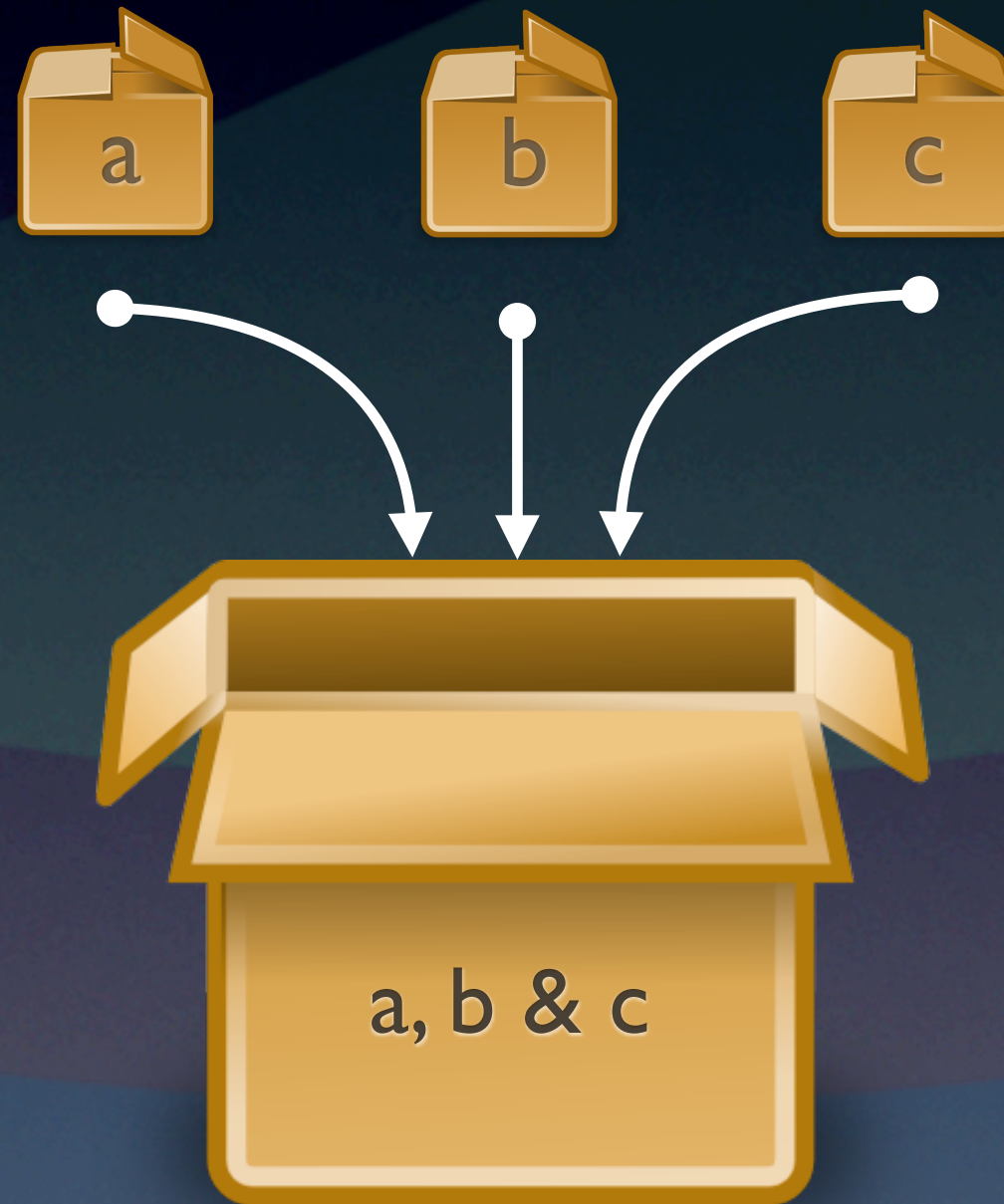
developers use this stuff



# Modules



# Modules











# Messages



**Bundling**  
one request



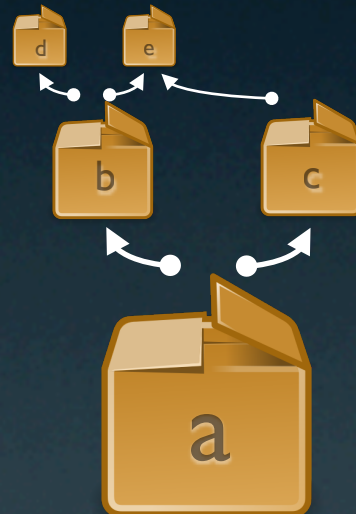
**Conditions**  
language

# Startup Module



Sanity check

`if ( IE5 ) { giveUp(); }`



Dependencies

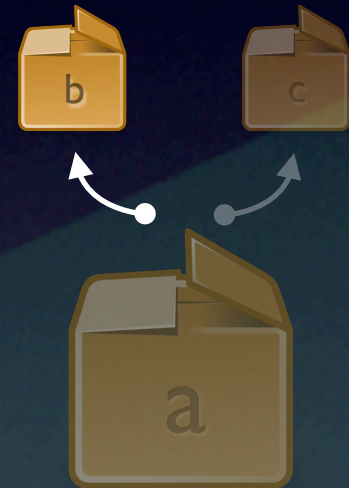
module manifest



Configuration

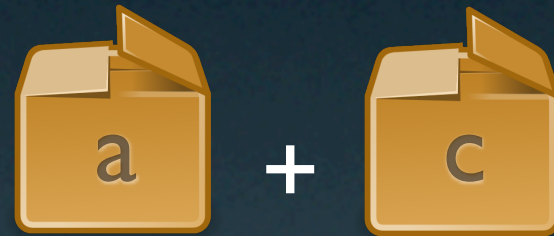
site-wide settings

# Client-side Loader



## Resolution

calculate dependencies



## Batching

give it to me all at once



## Execution

run in correct order

# Caching

?v=time



Versioning

per-module



Startup Module

5 minutes



Resources

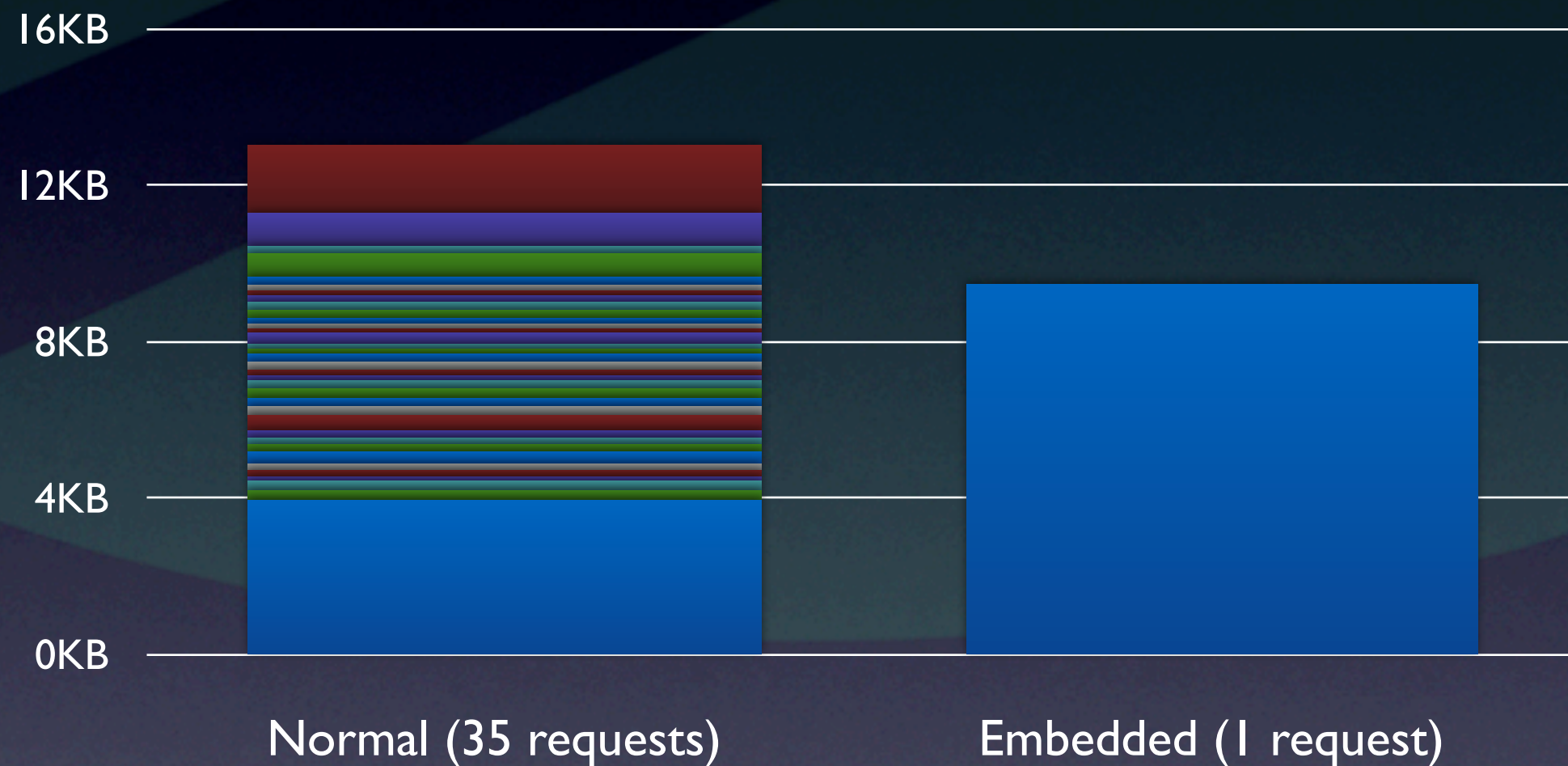
30 days

So, it turns out...





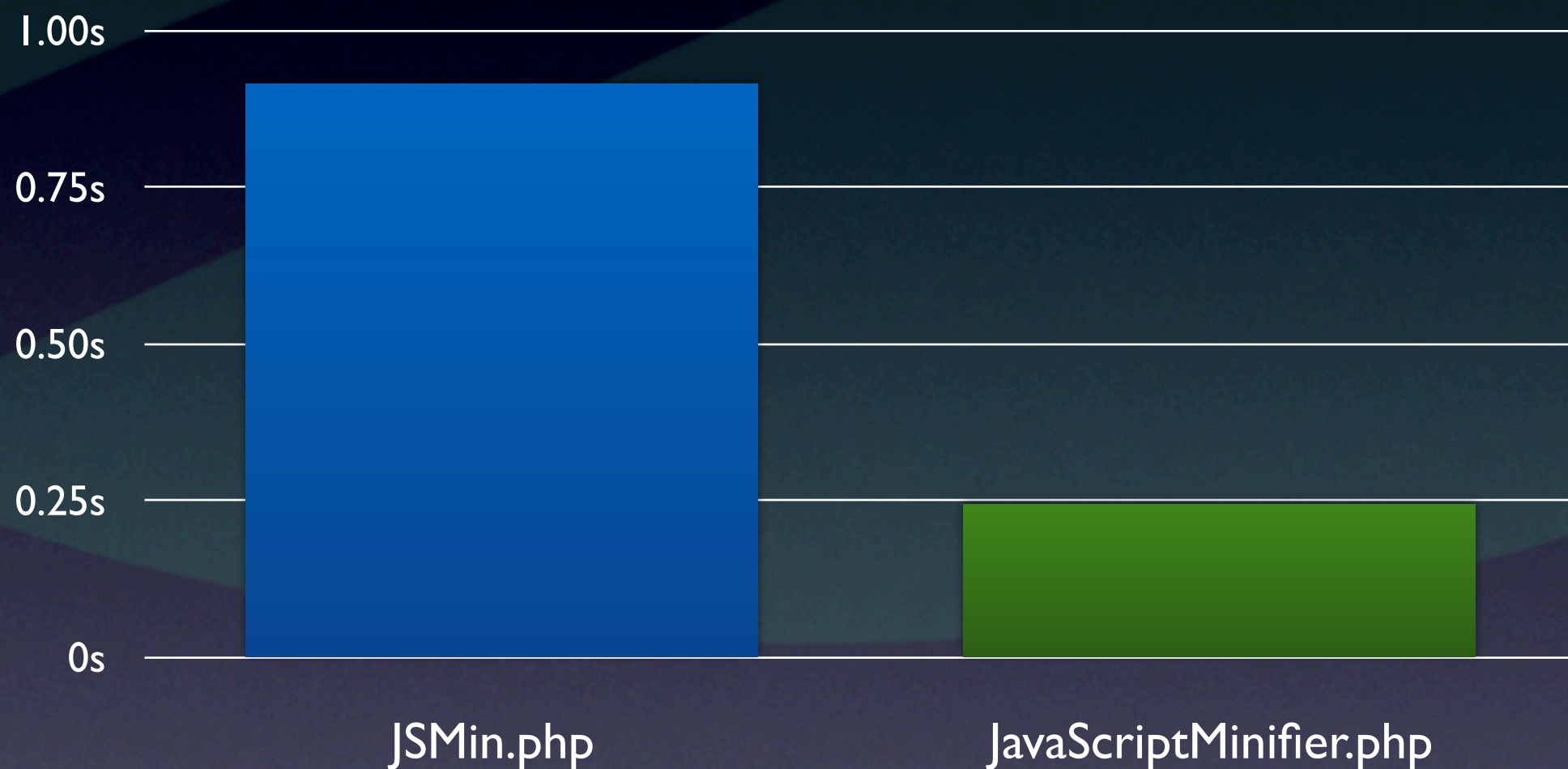
# Embedding is sweet



*Test: embedding images in the Vector skin, 27.3% reduction in total size after compression, 97.2% reduction in requests*

CSSMin: <http://tinyurl.com/CSSMin-php>

# JMin.php is slow



*Test: minifying jQuery development distribution, 160KB of uncompressed code; 0.5% larger size than JMin output after compression*

JavaScriptMinifier: <http://tinyurl.com/JavaScriptMinifier>

# CSS Janus is Awesome



Ported  
from python



\$humans--;  
seriously, go robots!

CSSJanus: <http://tinyurl.com/CSSJanus>



# Balance is important



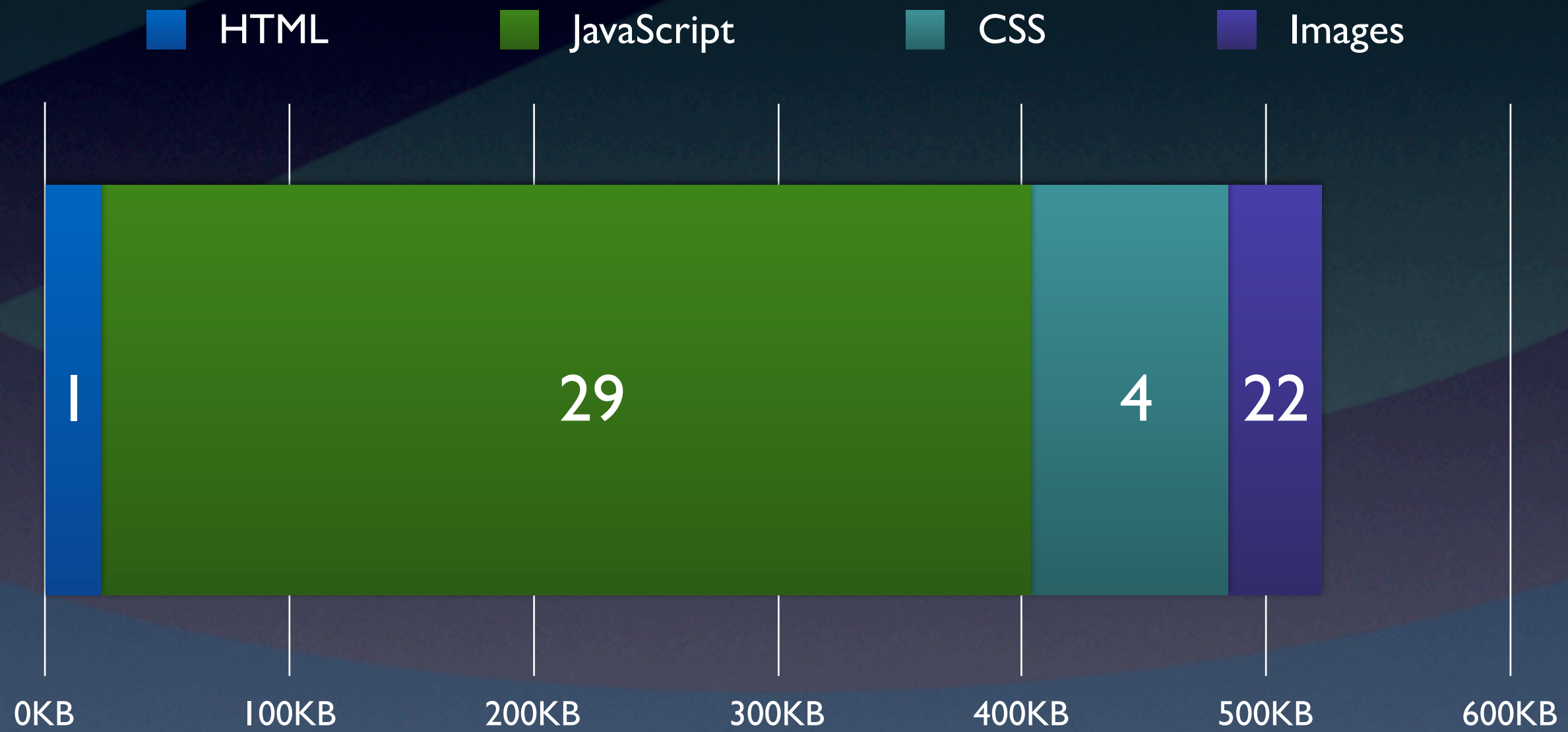
## Batching

duplicate data may be sent

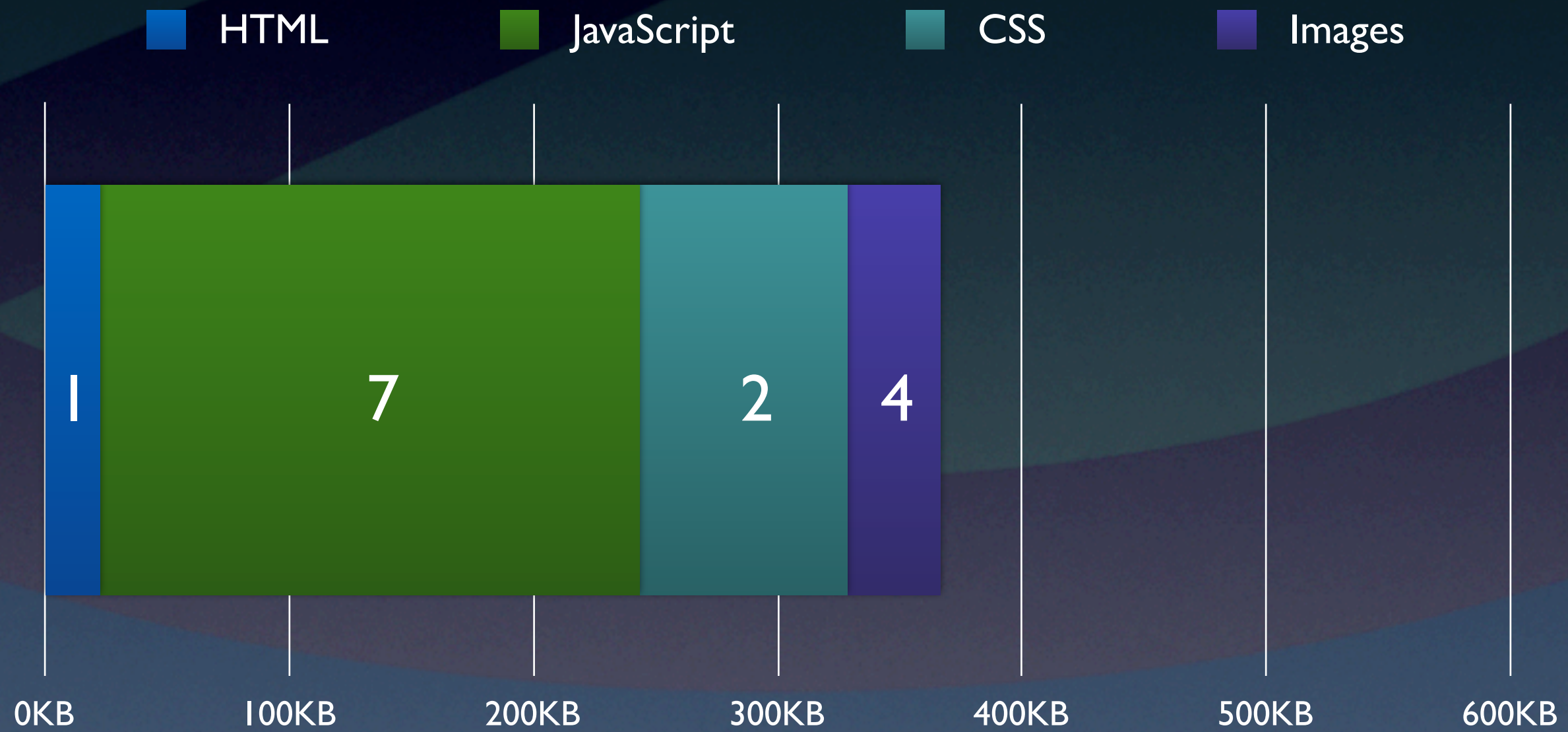
## Groups

controlled fragmentation

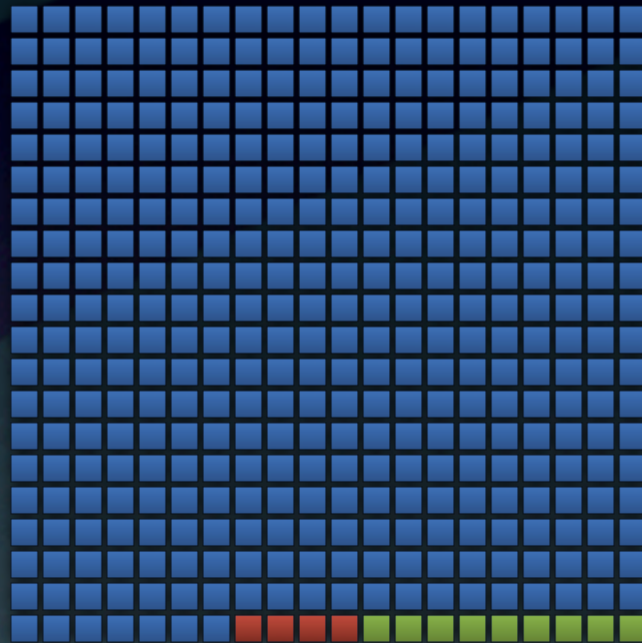
# It Works!



# It Works!

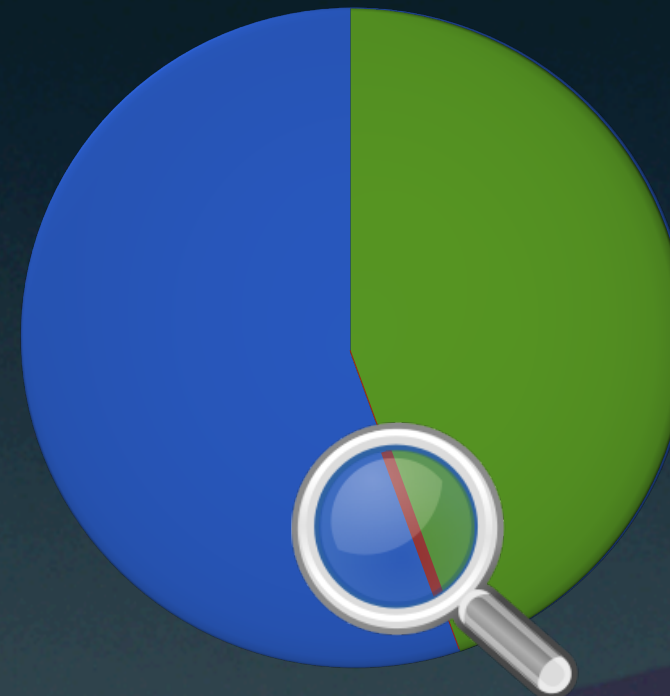


# It's Efficient!



## Servers

~400 servers  
For resources: 4 app, 9 cache



## Requests

90k req/s peak load  
of which 40k are for resources  
and 73 are cache misses  
cache hit rate: 98.2%

# ResourceLoader



**Easy Gains**

no micro-optimization



**Client Focus**

it's where the magic is



**Ease of Use**

developers use this stuff







# Thanks!

<http://wikitech.wikimedia.org/view/Presentations>

<http://www.mediawiki.org/wiki/ResourceLoader>

Trevor Parscal - @trevorparscal  
Roan Kattouw - @catrope



# Work @ Wikimedia



<http://jobs.wikimedia.org>

