



low hanging fruit

vs.



micro-optimization

Creative Techniques for Loading Web Pages Faster

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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
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Community portal
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Toolbox
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Languages
Simple English

Trevor Parscal My talk My preferences My watchlist My contributions Log out

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

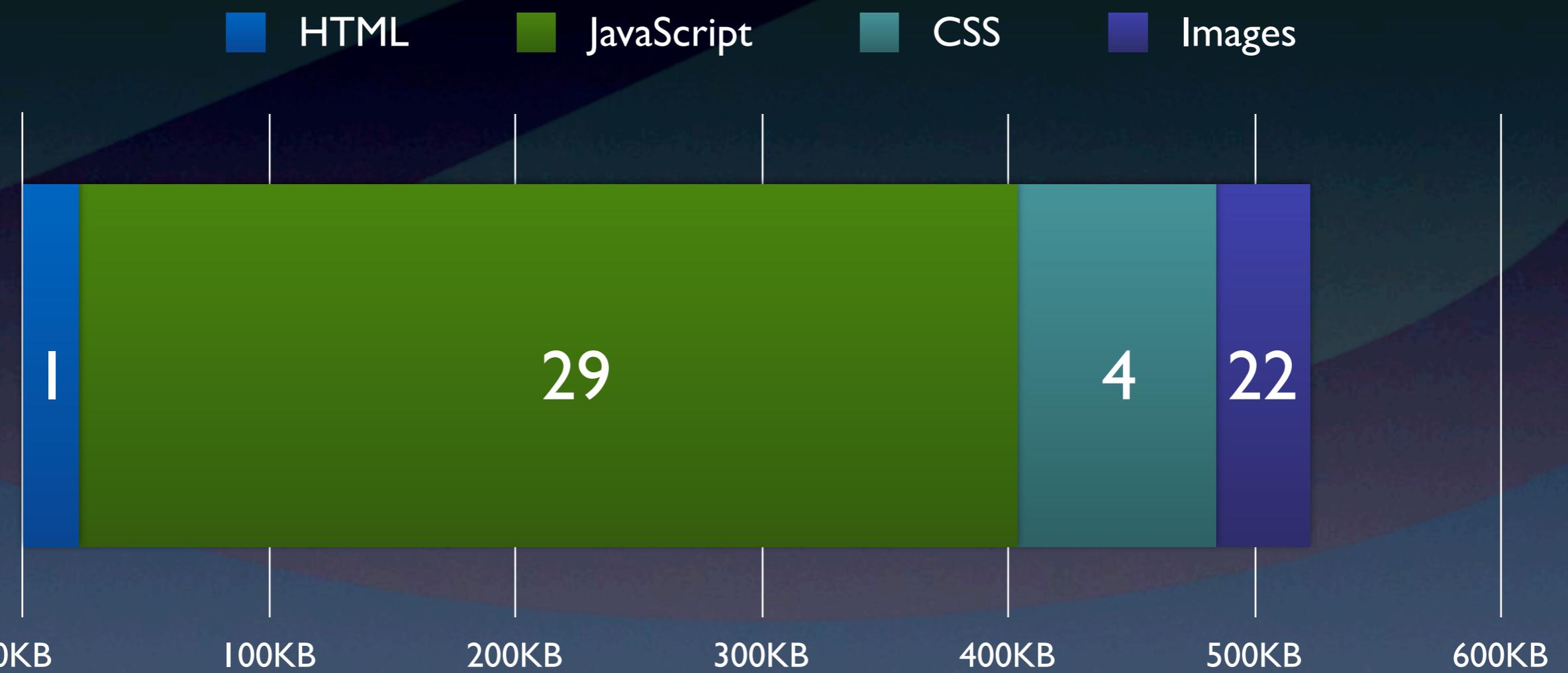
worked with his brother, [Sam Warner](#), to procure the technology for the film industry's first talking picture. Although Warner was feared by many of his employees and inspired ridicule with his uneven attempts at humor, he earned respect for his shrewd instincts and toughmindedness. He recruited 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();

WIKIMEDIA

Optimizations



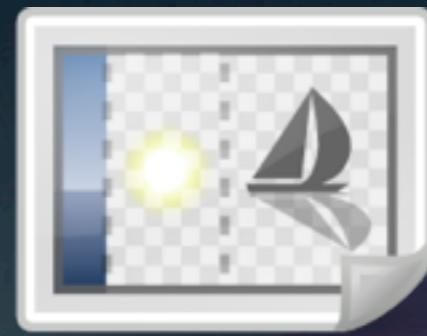
Minification

whitespace removal



Combination

file concatenation



Sprites

multi-graphic images

Caching



Versioning

one version for everything

Query String versions in the html



Purging

wait for cache expiry



Being a developer sucked



Creating good luck!

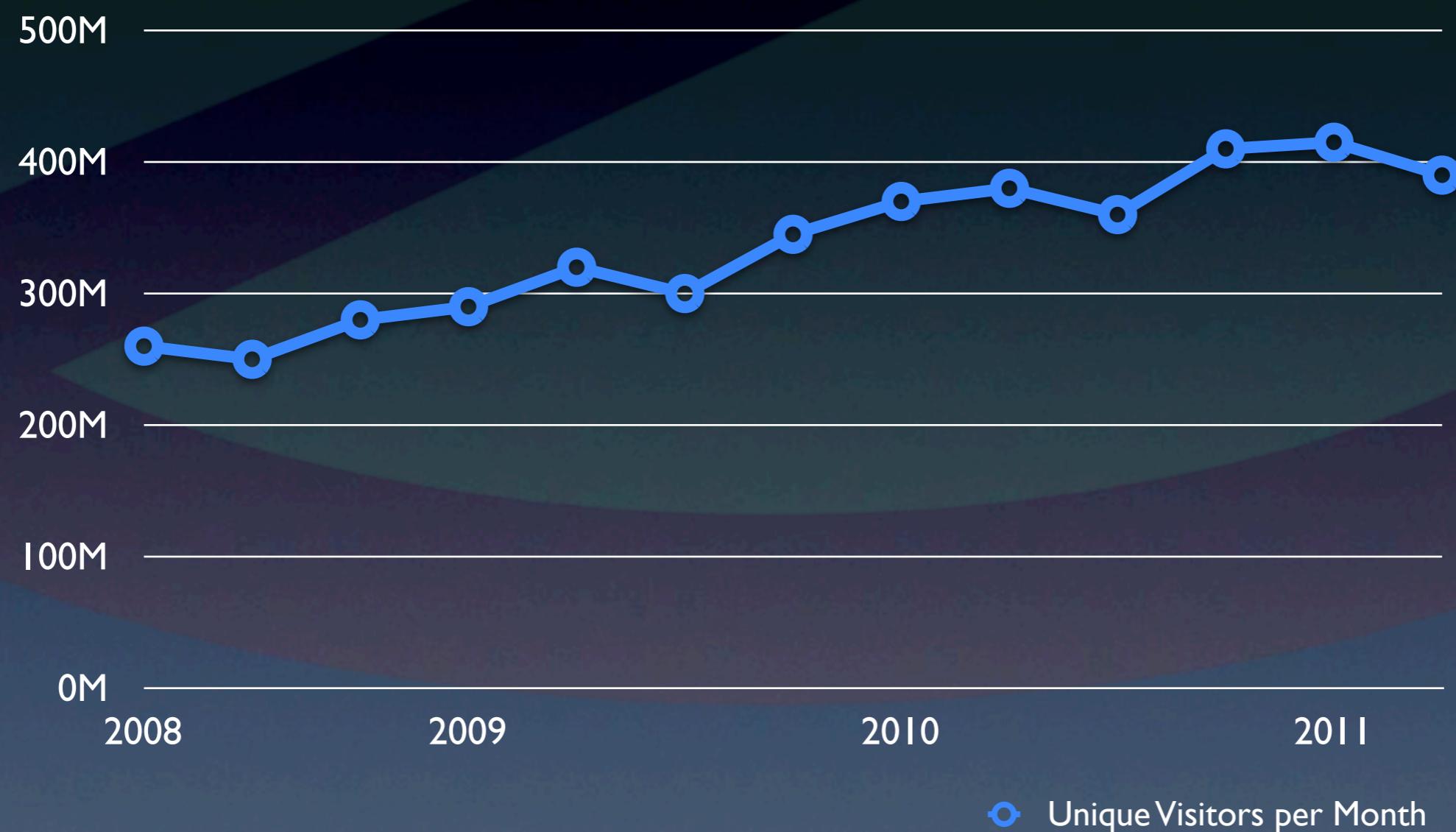


Maintaining messy and boring



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



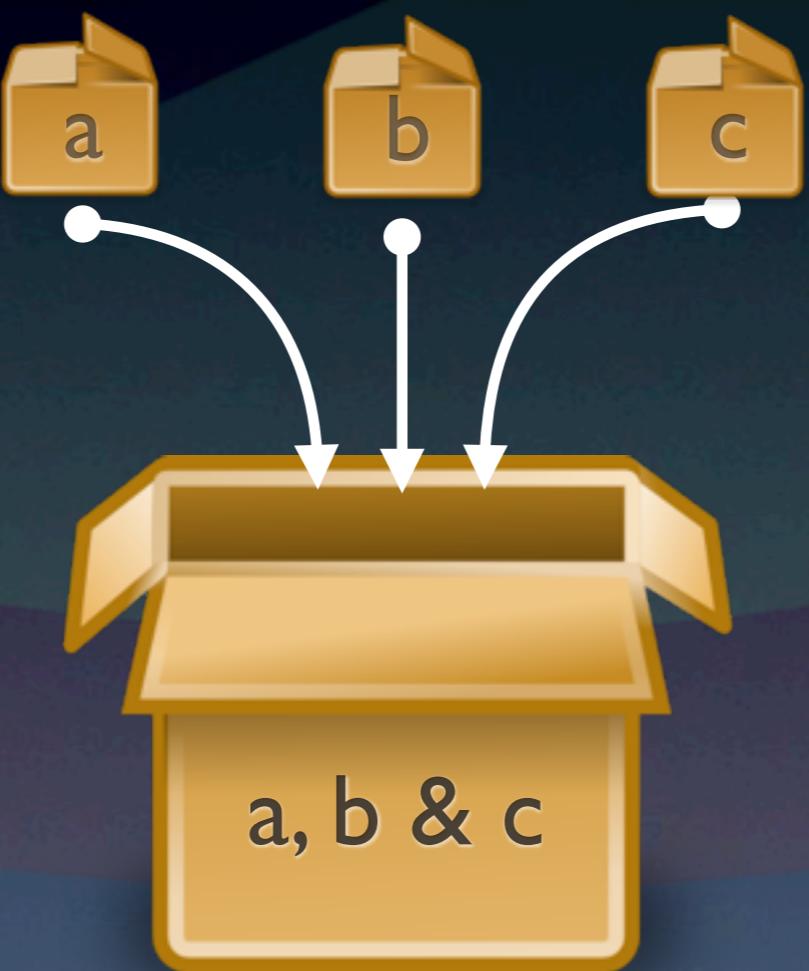
Ease of Use

developers use this stuff

Modules



Modules



Scripts



Wrapping
delayed execution



Minification
whitespace removal



Conditions
debug, skin or language

Styles



Embedding data uri sweetness



Remapping relative urls still work



Flipping free rtl support

Styles



Bundling

one request



Minification

whitespace removal



Conditions

skin specific styles

Messages



Bundling

one request



Conditions

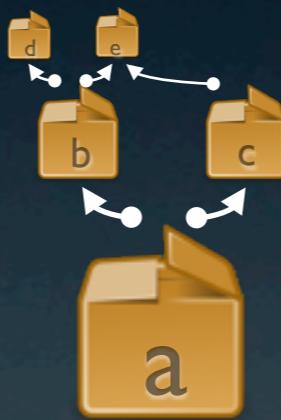
language

Startup Module



Sanity check

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



Dependencies

module manifest



Configuration

site-wide settings

Client-side Loader



Resolution
calculate dependencies

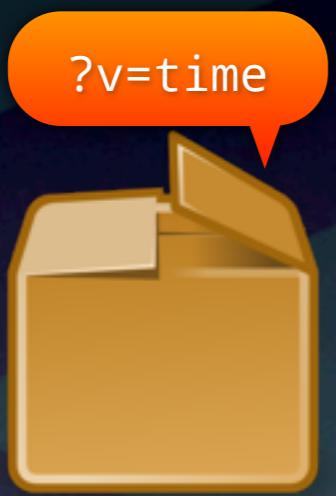


Batching
give it to me all at once



Execution
run in correct order

Caching



?v=time



Versioning per-module

Startup Module

5 minutes



31

So, it turns out...

Order matters

```
!DOCTYPE html
html
head
  script src="all.js?version=123"
  /script
/head
body
  p  Page content  /p
/body
/html
```

```
!DOCTYPE html
html
head
script src="startup"
var registry = { /* manifest of all modules */ };
document.write('<script src="all.js?v=' + version + '"></script>');
/script
/head
body
p Page content /p
/body
/html
```

```
!DOCTYPE html
html
head
/head
body

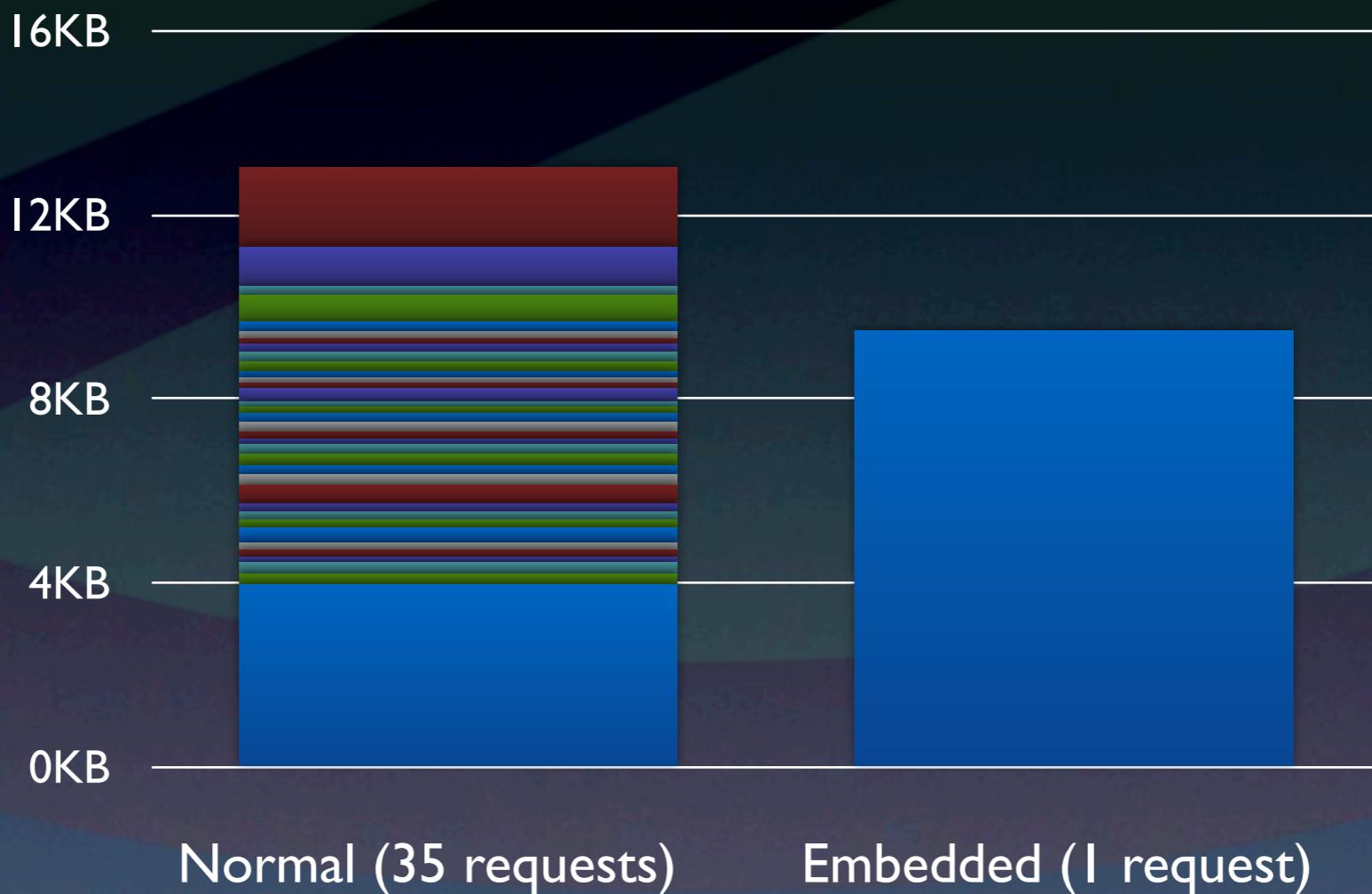

Page content


<script src="startup">
var registry = { /* manifest of all modules */ };
document.write('<script src="all.js?v=' + version + '"></script>');
</script>
</body>
</html>
```

```
!DOCTYPE html
html
head
script src="startup"
var registry = { /* manifest of all modules */ };
document.write('<script src="base.js?v=' + version + '"></script>');
/script
/head
body
p Page content /p
script
mw.loader.load(['extras']); // uses document.write
/script
/body
/html
```

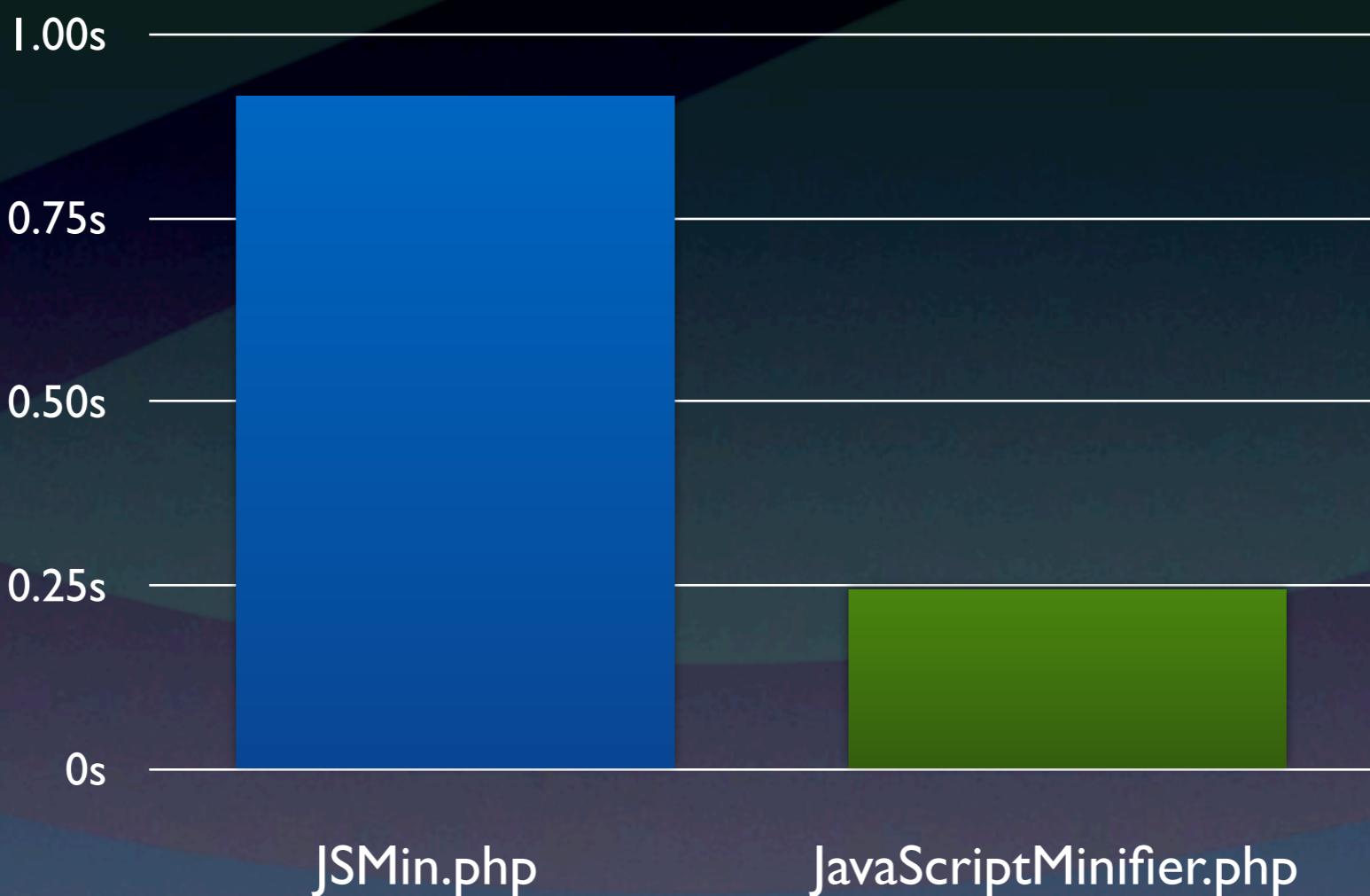
```
!DOCTYPE html
html
head
script src="startup"
var registry = { /* manifest of all modules */ };
document.write('<script src="base.js?v=' + version + '"></script>');
/script
script
mw.loader.load(['top']); // adds to head using document.write
/script
/head
body
p Page content /p
script
mw.loader.load(['bottom']); // adds to head using DOM methods
/script
/body
/html
```

Embedding is sweet



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

JSMIn.php is slow



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

CSS Janus is Awesome



Ported
from python



\$humans--;
seriously, go robots!

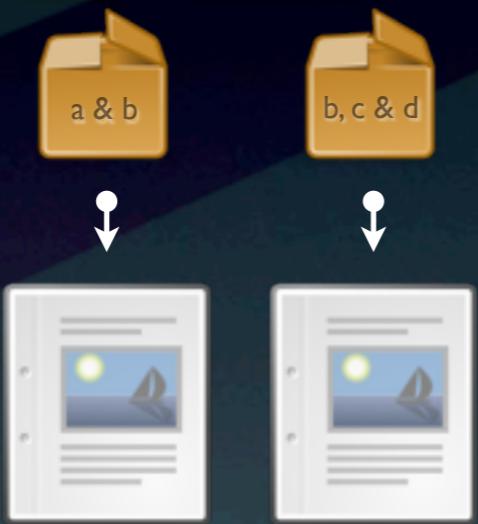
CSSJanus: <http://tinyurl.com/CSSJanus>



LCA 2012

WIKIMEDIA The Wikimedia logo, which is a green and blue circular icon featuring a stylized white "M".

Balance is important

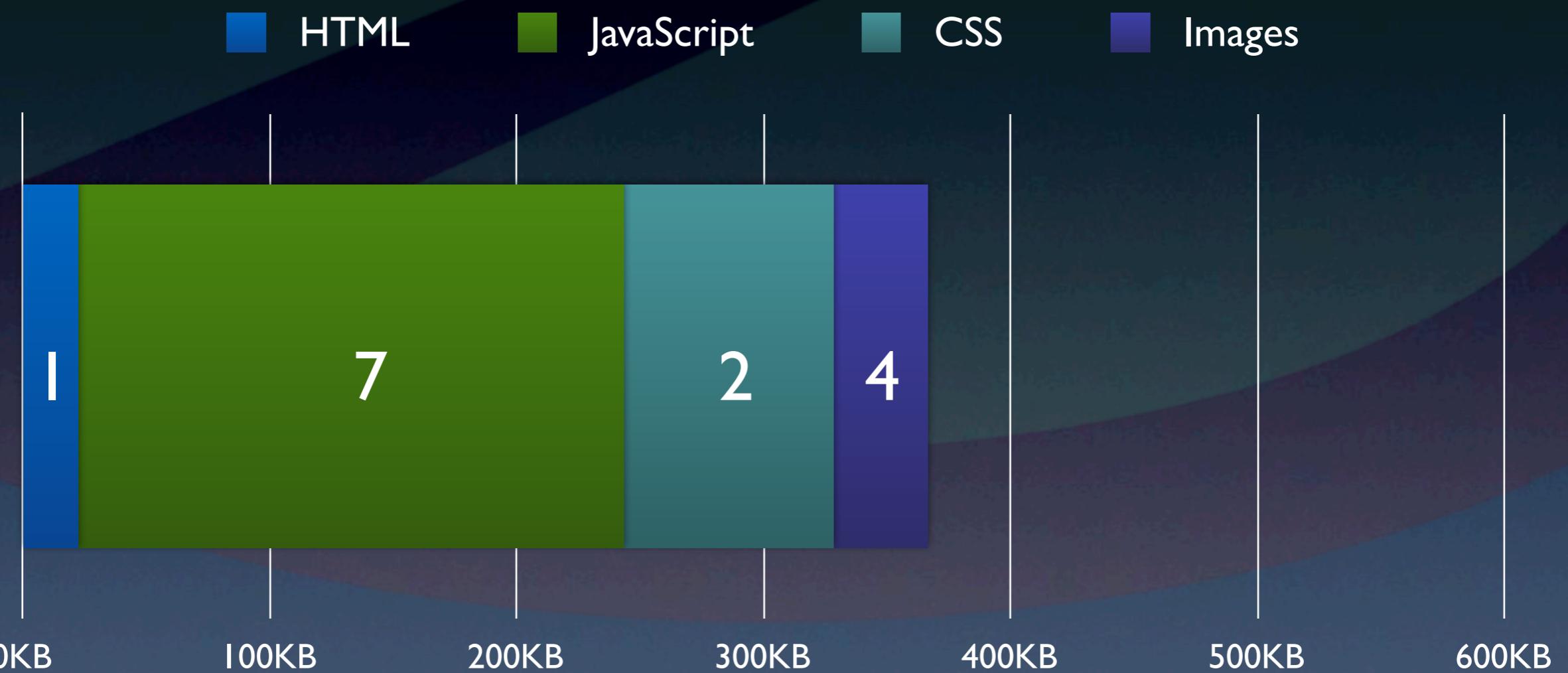


Batching
duplicate data may be sent

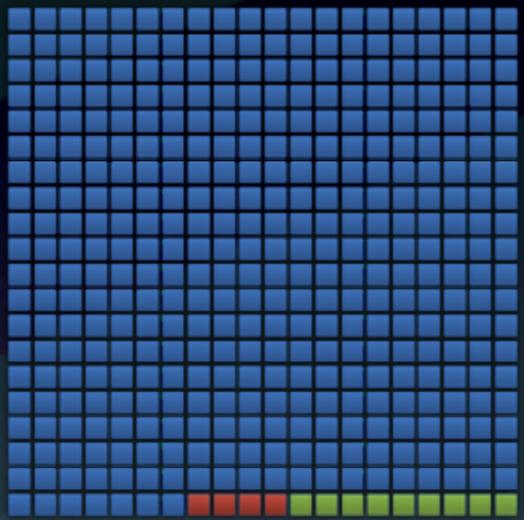


Groups
controlled fragmentation

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

ResourceLoader



Easy to Make happy developers



Lightweight happy servers



Snappy Pages

happy people

Thanks!

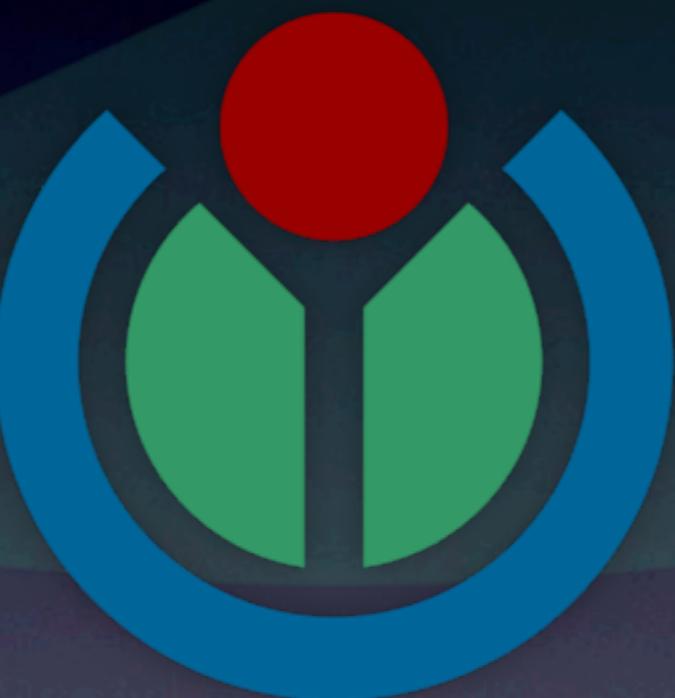
<http://wikitech.wikimedia.org/view/Presentations>

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

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WIKIMEDIA 

Questions?

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