Understanding HTTP & Web Performance

Collide Halifax
October 22, 2015

RED space™

Welcome.

Who are these guys?



Luke DeWitt

Web Team Lead



Mike Rudolph

DEFINITELY NOT A COP

SONY PICTURES

MTV

nickelodeon

CARTOON NETWORK

Bravo

Harper Collins

epix

FOX

IBM

ULTRAVIOLET

Immediacy of Now


100%
9:41
Tuesday, September 9
100%
9:41
Tuesday, September 9
100%
9:41
Tuesday, September 9


100%
9:41
Tuesday, September 9
100%
9:41
Tuesday, September 9
100%
9:41
Tuesday, September 9





Immediacy of Now

Response Times

- Jakob Nielsen
  - “Instantaneous Reaction”
    - 1/10th of a second
  - “Uninterrupted Flow of Thought”
    - 1 second
  - “Users Attention”
    - 10 seconds

- 1993 study
- source: http://www.nngroup.com/articles/response-times-3-important-limits/


SQUIRREL!!!

Show of hands…

What a slow site means…

- KISSMetrics
  - 47% of users expect your site to load in 2 seconds or less
  - 40% of users abandon a site at 3 seconds
  - 7% reduction in conversions for every additional second of load time

- sources: https://blog.kissmetrics.com/loading-time/, https://blog.kissmetrics.com/speed-is-a-killer/

Let’s Do It!

Critical Path CSS

```
<!DOCTYPE html>
<html lang="en-US" prefix="og: http://ogp.me/ns#">
<head>
  <title>Smashing Magazine &mdash; For Professional Web Designers and Developers</title>
  <meta charset="UTF-8"><script type="text/javascript">window.NREUM||(NREUM={}),__nr_require=function(e,n,t){function r(t){if(!n[t]){var o=n[t]={exports:{}};e[t][0].call(
    o.exports,function(n){var o=e[t][1][n];return r(o?o:n)},o,o.exports)}return n[t].exports}if("function"==typeof __nr_require)return __nr_require;for(var o=0;o<t.length
    ;o++)r(t[o]);return r}({QJf3ax:[function(e,n){function t(e){function n(n,t,a){e&&e(n,t,a),a||(a={});for(var u=c(n),f=u.length,s=i(a,o,r),p=0;f>p;p++)u[p].apply(s,t);
    return s}function a(e,n){f[e]=c(e).concat(n)}function c(e){return f[e]||[]}function u(){return t(n)}var f={};return{on:a,emit:n,create:u,listeners:c,_events:f}}
    function r(){return{}}var o="nr@context",i=e("gos");n.exports=t()},{gos:"7eSDFh"}],ee:[function(e,n){n.exports=e("QJf3ax")},{}],3:[function(e,n){function t(e){return
    function(){r(e,[(new Date).getTime()].concat(i(arguments)))}}var r=e("handle"),o=e(1),i=e(2);"undefined"==typeof window.newrelic&&(newrelic=window.NREUM);var a=["
    setPageViewName","addPageAction","setCustomAttribute","finished","addToTrace","inlineHit","noticeError"];o(a,function(e,n){window.NREUM[n]=t("api-"+n)}),n.exports=
    window.NREUM},{1:12,2:13,handle:"D5DuLP"}],gos:[function(e,n){n.exports=e("7eSDFh")},{}],"7eSDFh":[function(e,n){function t(e,n,t){if(r.call(e,n))return e[n];var o=t(
    );if(Object.defineProperty&&Object.keys)try{return Object.defineProperty(e,n,{value:o,writable:!0,enumerable:!0}),o}catch(i){}return e[n]=o,o}var r=Object.prototype.
    hasOwnProperty;n.exports=t},{}],D5DuLP:[function(e,n){function t(e,n,t){return r.listeners(e).length?r.emit(e,n,t):void(r.q&&(r.q[e]||(r.q[e]=[]),r.q[e].push(n)))}var
     r=e("ee").create();n.exports=t,t.ee=r,r.q={}},{ee:"QJf3ax"}],handle:[function(e,n){n.exports=e("D5DuLP")},{}],XL7HBI:[function(e,n){function t(e){var n=typeof e;
    return!e||"object"!==n&&"function"!==n?-1:e===window?0:i(e,o,function(){return r++})}var r=1,o="nr@id",i=e("gos");n.exports=t},{gos:"7eSDFh"}],id:[function(e,n){n.
    exports=e("XL7HBI")},{}],G9z0Bl:[function(e,n){function t(){var e=d.info=NREUM.info,n=f.getElementsByTagName("script")[0];if(e&&e.licenseKey&&e.applicationID&&n){c(p,
    function(n,t){n in e||(e[n]=t)});var t="https"===s.split(":")[0]||e.sslForHttp;d.proto=t?"https://":"http://",a("mark",["onload",i()]);var r=f.createElement("script")
    ;r.src=d.proto+e.agent,n.parentNode.insertBefore(r,n)}}function r(){"complete"===f.readyState&&o()}function o(){a("mark",["domContent",i()])}function i(){return(new
    Date).getTime()}var a=e("handle"),c=e(1),u=window,f=u.document;e(2);var s=(""+location).split("?")[0],p={beacon:"bam.nr-data.net",errorBeacon:"bam.nr-data.net",agent:
    "js-agent.newrelic.com/nr-686.min.js"},d=n.exports={offset:i(),origin:s,features:{}};f.addEventListener?(f.addEventListener("DOMContentLoaded",o,!1),u.
    addEventListener("load",t,!1)):(f.attachEvent("onreadystatechange",r),u.attachEvent("onload",t)),a("mark",["firstbyte",i()])},{1:12,2:3,handle:"D5DuLP"}],loader:[
    function(e,n){n.exports=e("G9z0Bl")},{}],12:[function(e,n){function t(e,n){var t=[],o="",i=0;for(o in e)r.call(e,o)&&(t[i]=n(o,e[o]),i+=1);return t}var r=Object.proto
    type.hasOwnProperty;n.exports=t},{}],13:[function(e,n){function t(e,n,t){n||(n=0),"undefined"==typeof t&&(t=e?e.length:0);for(var r=-1,o=t-n||0,i=Array(0>o?0:o);++r<o
    ;)i[r]=e[n+r];return i}n.exports=t},{}]},{},["G9z0Bl"]);</script>
  <style id="smash-above-the-fold-css">body,svg:not(:root){overflow:hidden}.cahe,.ntb,h4{text-transform:uppercase}.bobo08{border-bottom:.08em solid rgba(0,0,0,.1)}.bo08{
    border:.08em solid rgba(0,0,0,.1)}article,aside,body,div,figcaption,figure,form,h1,h2,h3,h4,html,img,label,li,nav,p,span,strong,ul{font-size:100%;vertical-align:
    baseline;margin:0;padding:0;outline:0;border:0;background:0 0}html{overflow-y:scroll;overflow-x:hidden}body{line-height:1.46;max-width:2000px;color:#333;background-
    image:url(http://media.smashingmagazine.netdna-cdn.com/wp-content/themes/smashing-magazine/assets/images/smbg.png)}a{font-size:100%;text-decoration:none;vertical-
    align:baseline;margin:0;padding:0;background:0 0;color:#41b7d8}a:active{color:#fff;background-color:#e53b2c}.pap a,li a,p a{border-bottom:.08em solid rgba(0,0,0,.1);
    padding-bottom:.08em}br+em a,figcaption a{border-bottom:.09em solid rgba(0,0,0,.1);padding-bottom:.09em}.pmd a,nav a{padding-bottom:0;border:0}img{max-width:100%;
    height:auto;border:0}ul{list-style:none}ol{list-style:decimal}article ul{list-style:disc}article li ol,article li ul{margin:0 1.5em}article ol,article ul{margin:.5em
    1.5em}article li{padding:.25em 0}input{vertical-align:middle}button,input[type=submit],label{cursor:pointer}button,input{margin:0}button,input[type=text]{font-size:1
    em;outline:0;-webkit-transition:border-color .3s;transition:border-color .3s}button{vertical-align:top;overflow:visible;padding:.75em 2em;border:.08em solid #c73a11;
    color:#fff;background-color:#e95c33;background:-webkit-linear-gradient(top,#e85c33 0,#e53a2b 100%);background:linear-gradient(to bottom,#e85c33 0,#e53a2b 100%);border
    -radius:.5em}.sr,.stb{overflow:hidden;white-space:nowrap}input[type=text]:placeholder{color:#777}input[type=text]{line-height:1.5;margin-bottom:1em;padding:.5em;color
    :#777;border:.08em solid rgba(0,0,0,.1);background-color:#fff;border-radius:.5em 0 0 .5em}@-ms-viewport{width:device-width}body,button,input,label{font-family:"
    Proxima Nova Regular","Segoe UI",Roboto,"Droid Sans","Helvetica Neue",Arial,sans-serif;font-style:normal;font-weight:400}.cahe,.cat h3,.category .cat h2,.ntb,h4,
    strong{font-family:'Proxima Nova Bold',"Segoe UI",Roboto,"Droid Sans","Helvetica Neue",Arial,sans-serif;font-style:normal;font-weight:700}.ed+p,.pmd .a,.pmd+p{font-
    family:"Skolar Regular","Roboto Slab","Droid Serif",Cambria,Georgia,"Times New Roman",Times,serif;font-weight:400;font-style:normal}.ed+p em,.pmd+p em{font-family:'
    Skolar Italic',"Roboto Slab","Droid Serif",Cambria,Georgia,"Times New Roman",Times,serif;font-weight:400;font-style:italic}.ed+p strong,.pmd+p strong,h2,h3{font-
    weight:700;font-style:normal}.ed+p strong,.pmd+p strong{font-family:'Skolar Bold',"Roboto Slab","Droid Serif",Cambria,Georgia,"Times New Roman",Times,serif}h2,h3{font
    -family:"Skolar Bold","Segoe UI Bold","Roboto Slab","Droid Serif",AvenirNext-Bold,"Avenir Bold",Georgia,"Times New Roman",Times,serif}.clearfix::after,.clearfix::
    before{content:" ";display:table}.clearfix::after{clear:both}.sr{text-indent:200%;height:.008em;width:.008em}.ch,.mise,.mn ul,.mnc,.ms form,.msc,.nw,.po,.sb,.short,.
    sn{display:none}.ad .declare,.cahe,.long,.pmd li,.sr,article,figure,label,nav{display:block}.lt a,.poptag a,.tags a,h3 .hsl,h4 .hsl{display:inline-block}.declare,.pt
    img{float:left}.awithus,.gra,.ntb,.stb{float:right}.mn,.mnb,.ms,.pt,.sr{position:absolute}.h,.h .awithus,.poptag a,.pt img,aside,button,div,form,h3 .hsl,h4 .hsl,li,ul
    {position:relative}.avatar{border-radius:50%}.pt img{border-radius:.3125em}.h{z-index:80;width:38.2%;margin-left:5.5%;padding:1.25em 0}.ntb,.stb{padding:.4em}.mnb{top
    :1.5em;right:1.5em;z-index:90}.ntb,.stb{box-sizing:border-box;border:.08em solid #c73a11;border-radius:.25em;box-shadow:0 .08em .08em rgba(0,0,0,.25)}.ntb{margin-left
    :1em;color:#fff;background:#e95c33}.stb{text-indent:150%;width:2.9375em;background:url(http://media.smashingmagazine.netdna-cdn.com/wp-content/themes/smashing-
    magazine/assets/images/search-icon.svg) 50% 50% no-repeat,#e95c33;background-size:1.875em auto;-webkit-background-size:1.875em}.mn,.ms{width:100%;height:0;max-height:
    0;padding-top:0;opacity:0;-webkit-transition:none;transition:none}.cc,.post{margin-bottom:2em}.fluid{padding-bottom:1.5em;background-color:#fff;box-shadow:0 0 .625em
    .08em rgba(0,0,0,.05)}.grid{margin-top:1.25em}.post{padding:.5em 5.5% 4em;border-bottom:.3125em solid #41b7d8}h2{font-size:2em;line-height:1.1}h2 a{color:#333}.cahe{
```

Image Optimizations

SVGs - Scalable Vector Graphics

Image Compression



1.7MB tiny png 305.9kb

-82%

Responsive Images



```
<img
  srcset="dog/detail/large.jpg  1920w,
          dog/detail/medium.jpg  960w,
          dog/detail/small.jpg   480w"
  src="dog/detail/medium.jpg"
  alt="Look at that dog, he crazy!">
```

Font Caching

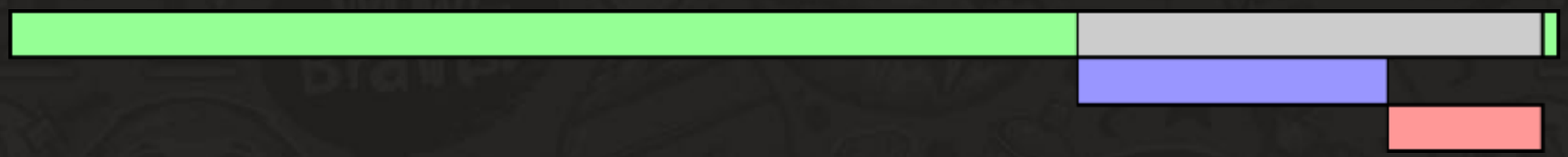
Javascript Optimizations

Render Blocking

Loaded in <head>



Loaded before </body>



Minify / Concatenate



- Fewer requests
- Less bandwidth

Content Delivery Network

DNS Prefetch

```
<!DOCTYPE html>
<html lang="en-US">
  <head>
    <meta charset="utf-8">
    <title>REDspace</title>
    <link rel="dns-prefetch" href="https://cdn.redspace.com">
```

Wrapping up…

Thank You



@whatadewitt



@mikerudolph_

RED space™



Questions