Critical Rendering Path

Velocidade também é uma funcionalidade

João Lucas P Santana
jlucasps@gmail.com

DEVDAY 2014 BELOHORIZONTE

Patrocínio diamente
CI&T DTI SISTEMAS Google Developers

Patrocínio Ouro
PayPal + Braintree Developer AvenueCode

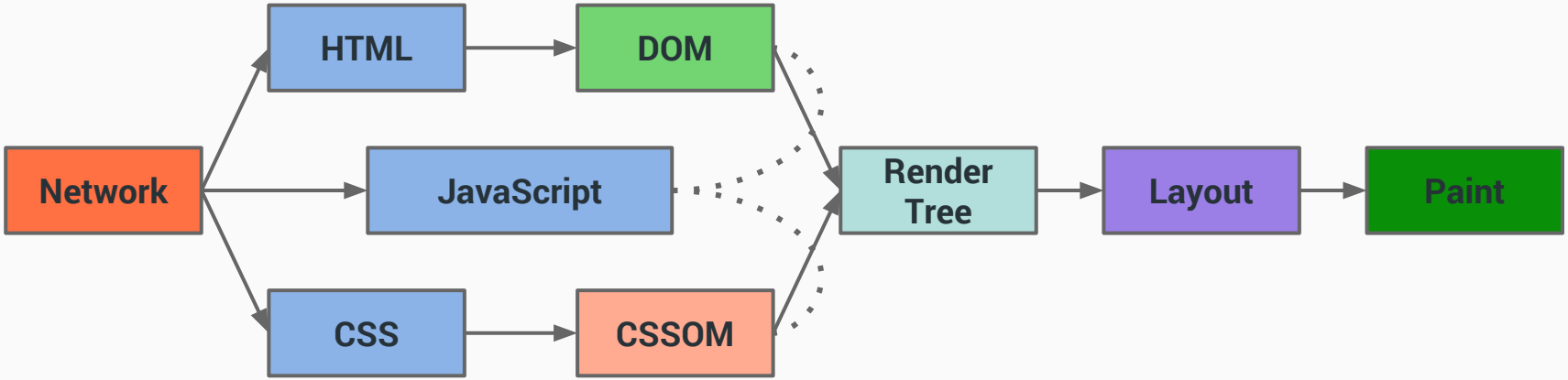
Patrocínio Prata
siteware FRAMEWORK

Patrocínio Bronze
GitHub ThoughtWorks DEV ISLAND

Percepção de velocidade

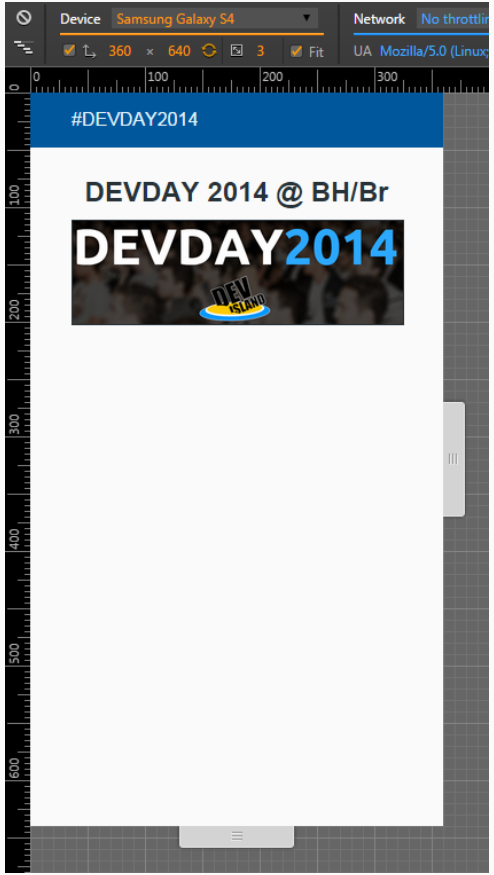
http://goo.gl/JPG1WP, http://goo.gl/WYF7j

Critical Rendering Path



Construindo o DOM

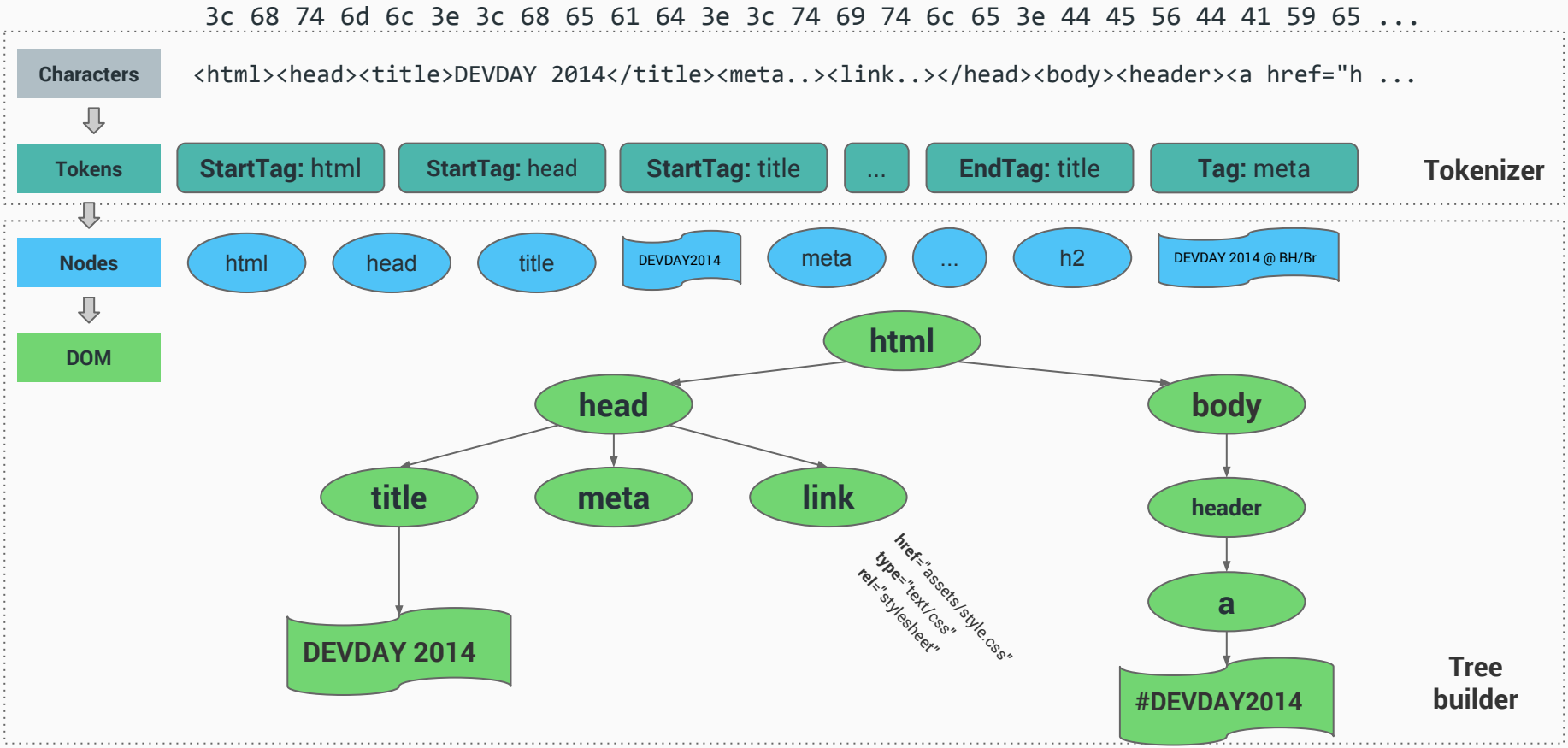
```
vagrant@precise32:~$ curl 10.0.2.2:3000
<html>
<head>
   <title>DEVDAY 2014</title>
   <meta name="viewport" content="width=device-width">
   <link rel="stylesheet" type="text/css" href="assets/style.css">
</head>
<body>
   <header>
        <a href="http://devday.devisland.com" target="_blank">#DEVDAY2014</a>
   </header>
   <section>
        <h2>DEVDAY 2014 @ BH/Br</h2>
        <img src="assets/devday2013.png">
        <h3>Critical Rendering Path</h3>
   </section>
</body>
</html>
vagrant@precise32:~$
```




```
<html>
<head>
   <title>DEVDAY 2014</title>
   <meta name="viewport" content="width=device-width">
   <link rel="stylesheet" type="text/css" href="assets/style.css">
</head>
<body>
   <header>
        <a href="http://devday.devisland.com" target="_blank">#DEVDAY2014</a>
   </header>
   <section>
        <h2>DEVDAY 2014 @ BH/Br</h2>
        <img src="assets/devday2013.png">
        <h3>Critical Rendering Path</h3>
   </section>
</body>
</html>
```

http://goo.gl/6ptLCJ

Construindo o DOM



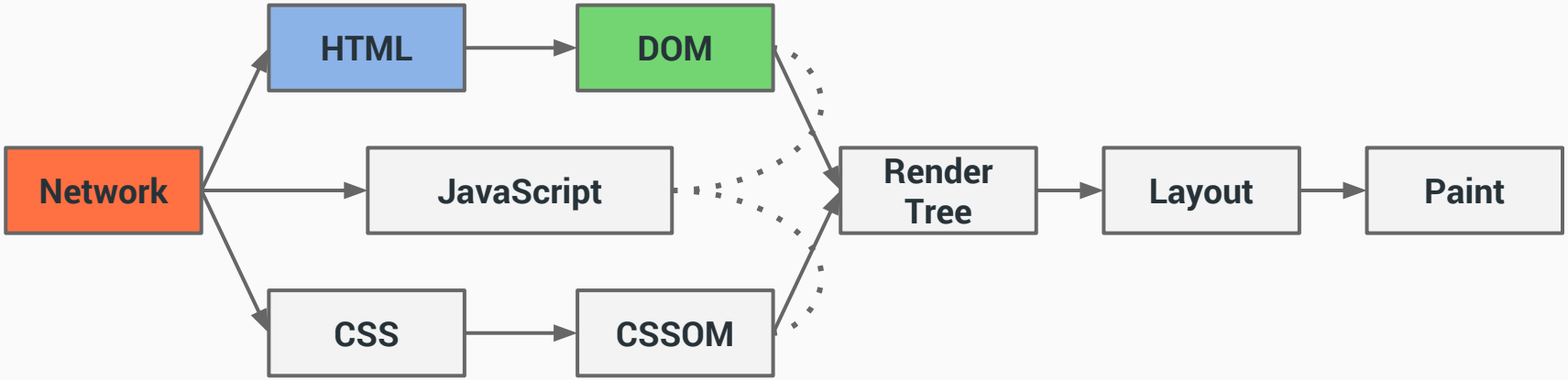
DOM - Document Object Model

parsing **incremental**

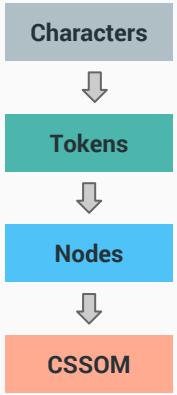
inicia-se ao receber os primeiros bytes

conteúdo, propriedades e relacionamento entre os nodes

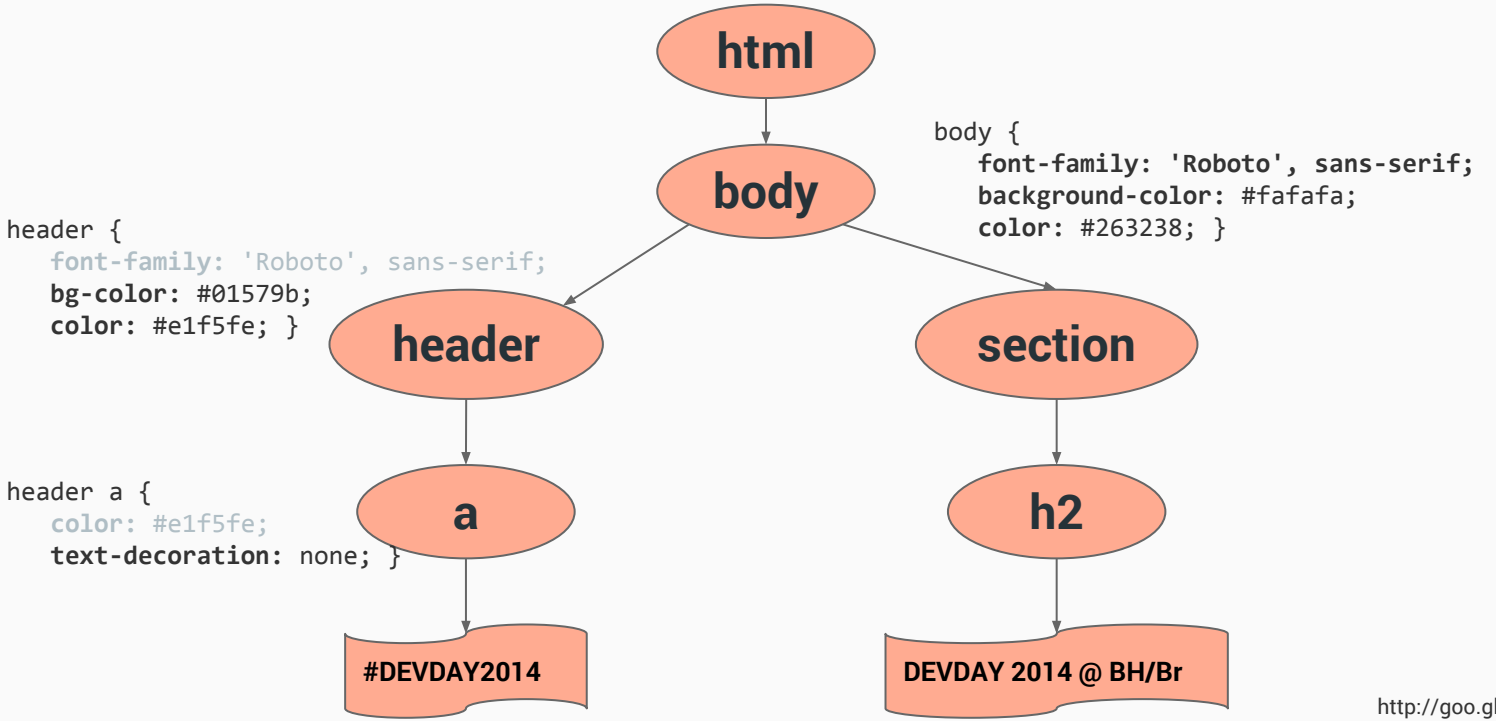
Critical Rendering Path



Construindo o CSSOM




```
20 62 6f 64 79 20 7b 20 20 20 20 20 66 6f 6e 74 2d 66 61 6d 69 6c 79 3a 20 5c 27 ...
body{font-family:Roboto,sans-serif;background-color:#fafafa;color:#263238}article, ...
```



http://goo.gl/6ptLCJ

Construindo o CSSOM

```
<link href="style.css"    rel="stylesheet">
<link href="print.css"    rel="stylesheet" media="print">
<link href="other.css"    rel="stylesheet" media="(min-width: 400px)">
<link href="portrait.css" rel="stylesheet" media="orientation:portrait">
<link href="landscape.css"rel="stylesheet" media="(orientation: landscape)">

@media (min-width: 500px) and (max-width: 600px) {
   /* styles here */
}
```

http://goo.gl/m6QlkF, http://goo.gl/FCAK6A

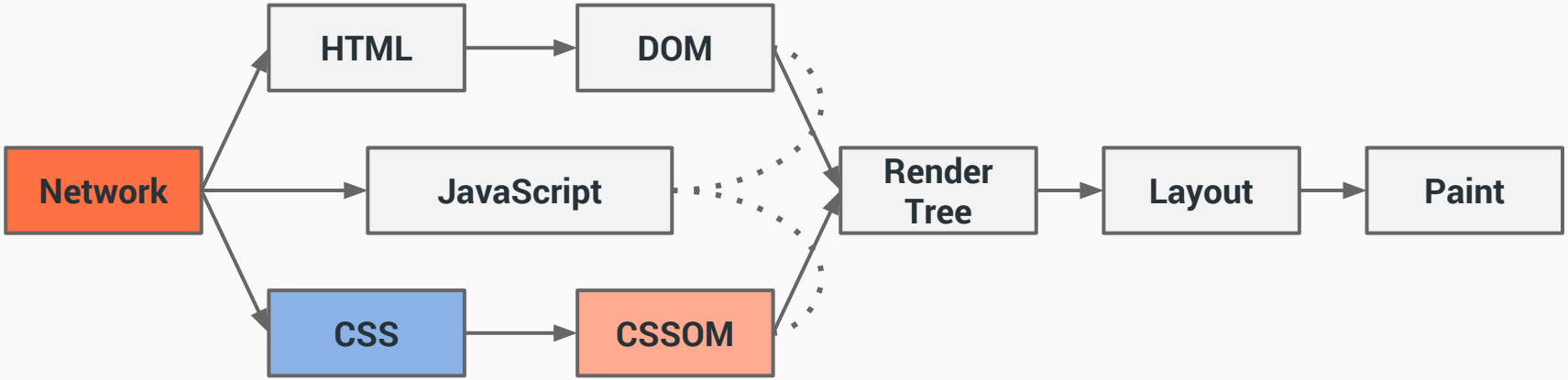
CSSOM - CSS Object Model

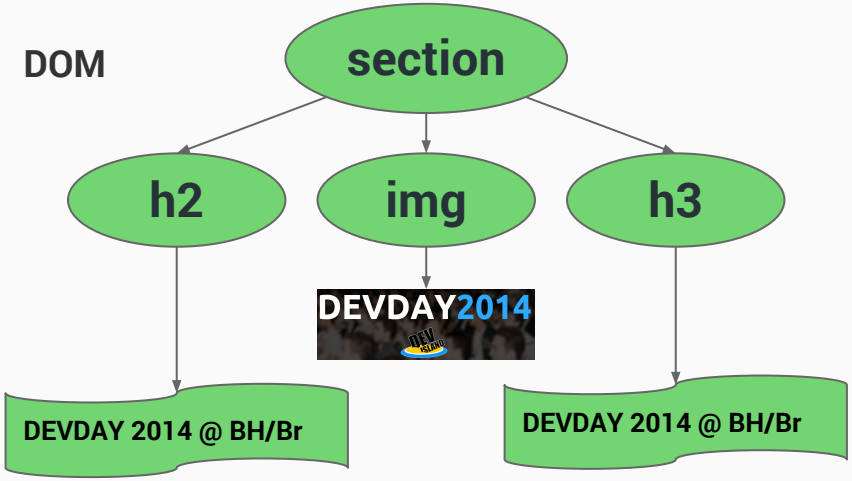
***parsing* não incremental**

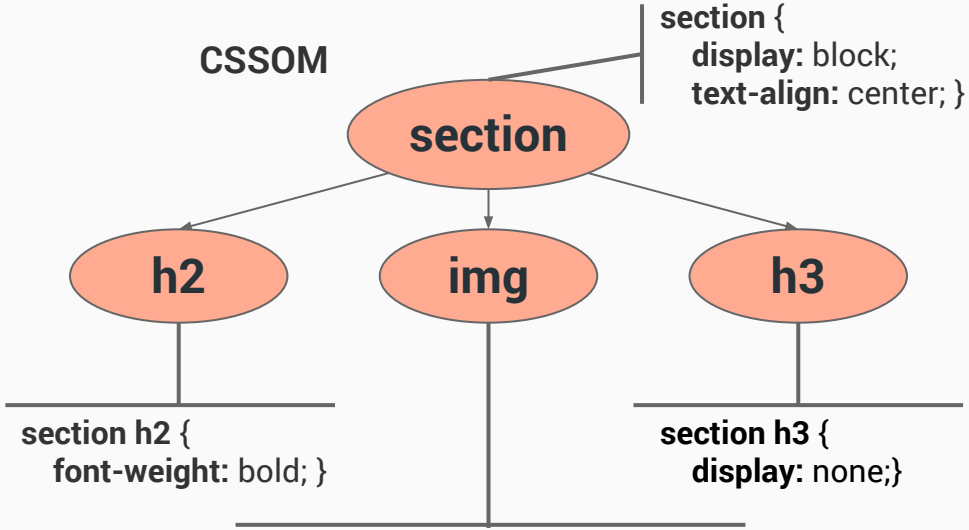
render blocking

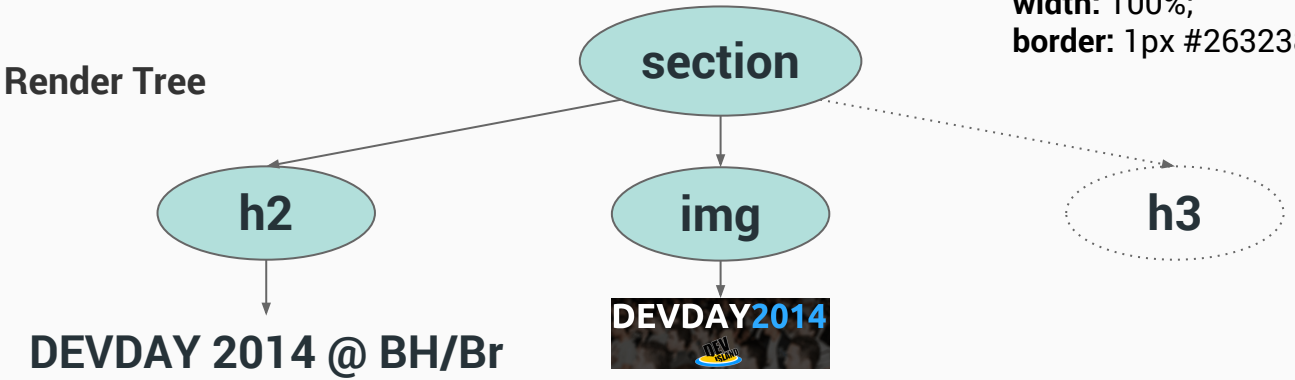
recalculate styles

Critical Rendering Path









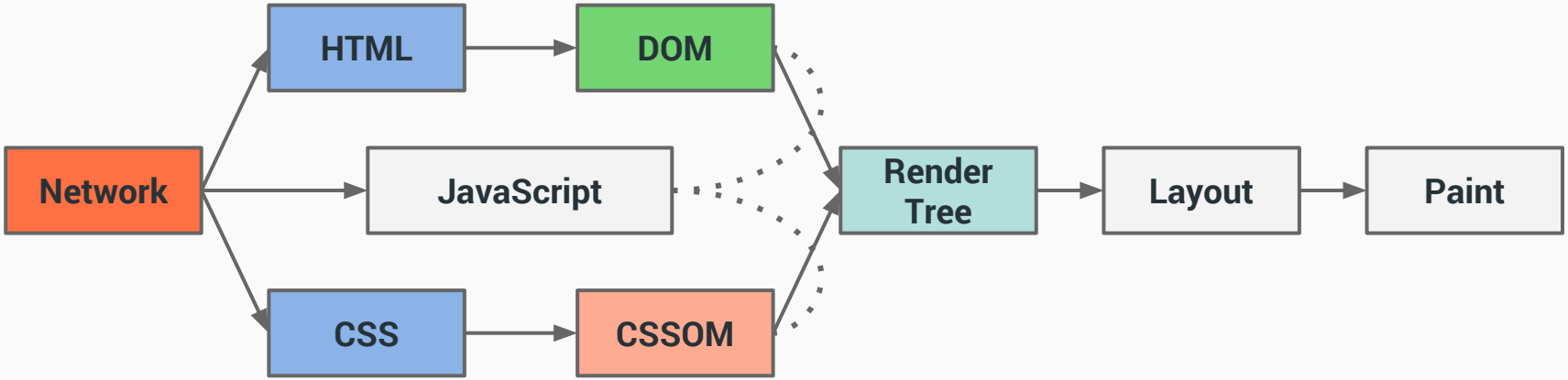
http://goo.gl/ouzsUr

Render Tree

DOM e CSSOM formam Render Tree

Somente *nodes* visíveis na página

Critical Rendering Path

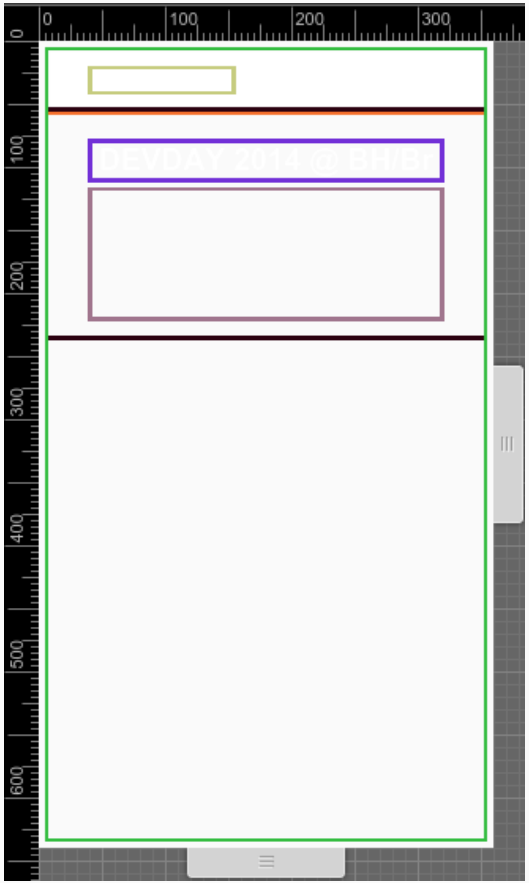


Layout

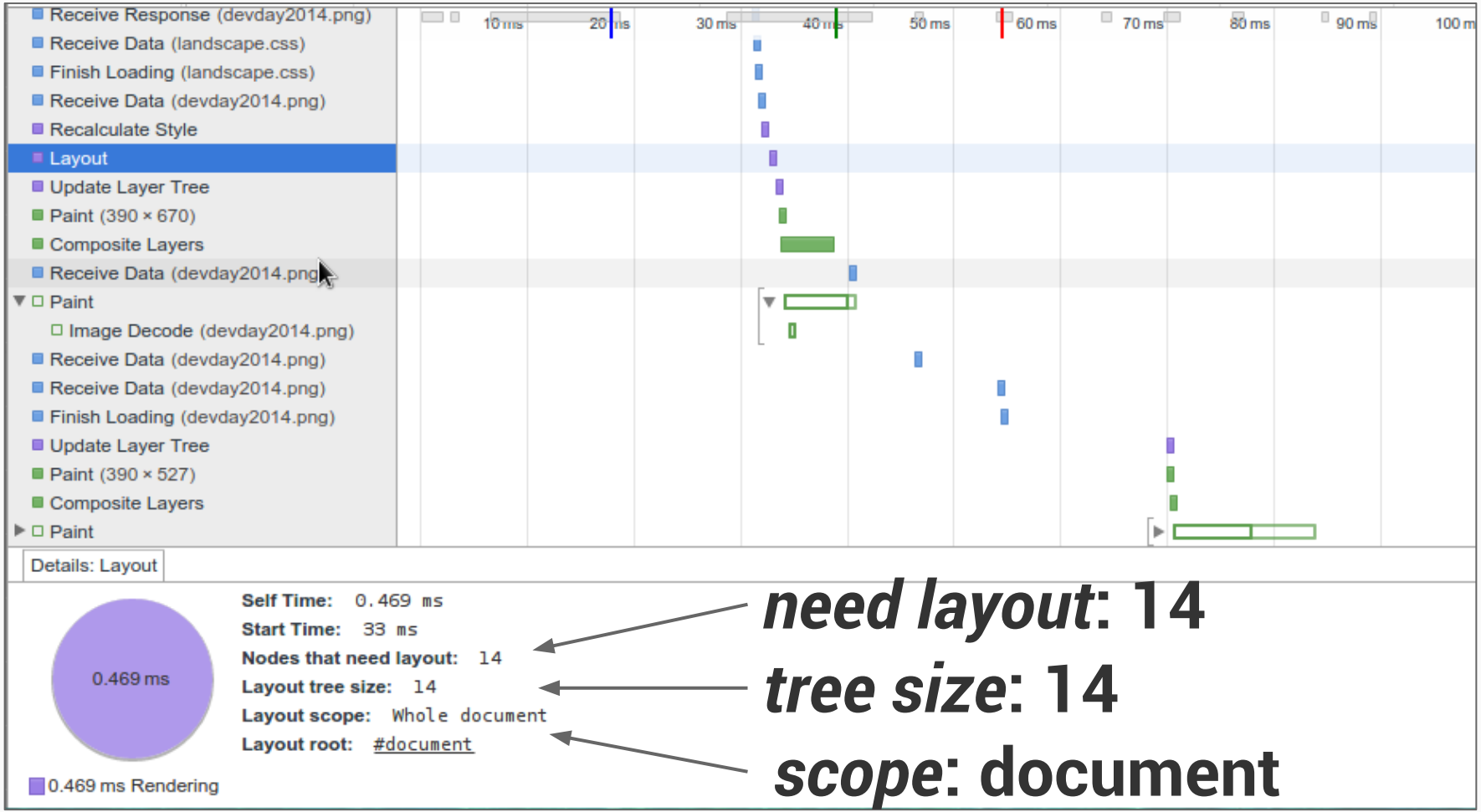
onde e **como** os elementos serão posicionados na tela

↑ tamanho ou complexidade do DOM/CSSOM

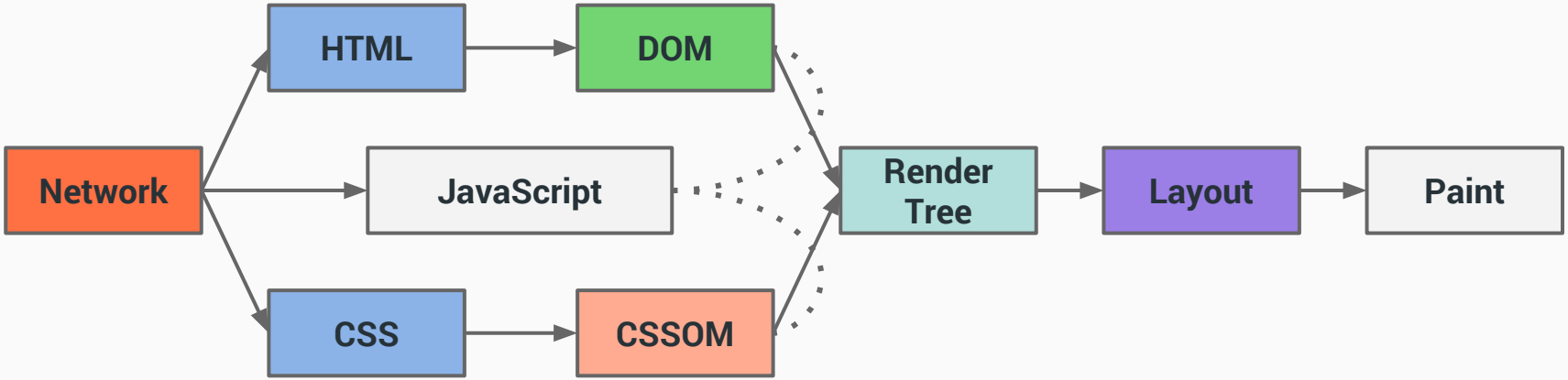
↑ tempo em Layout



http://goo.gl/0L9usy

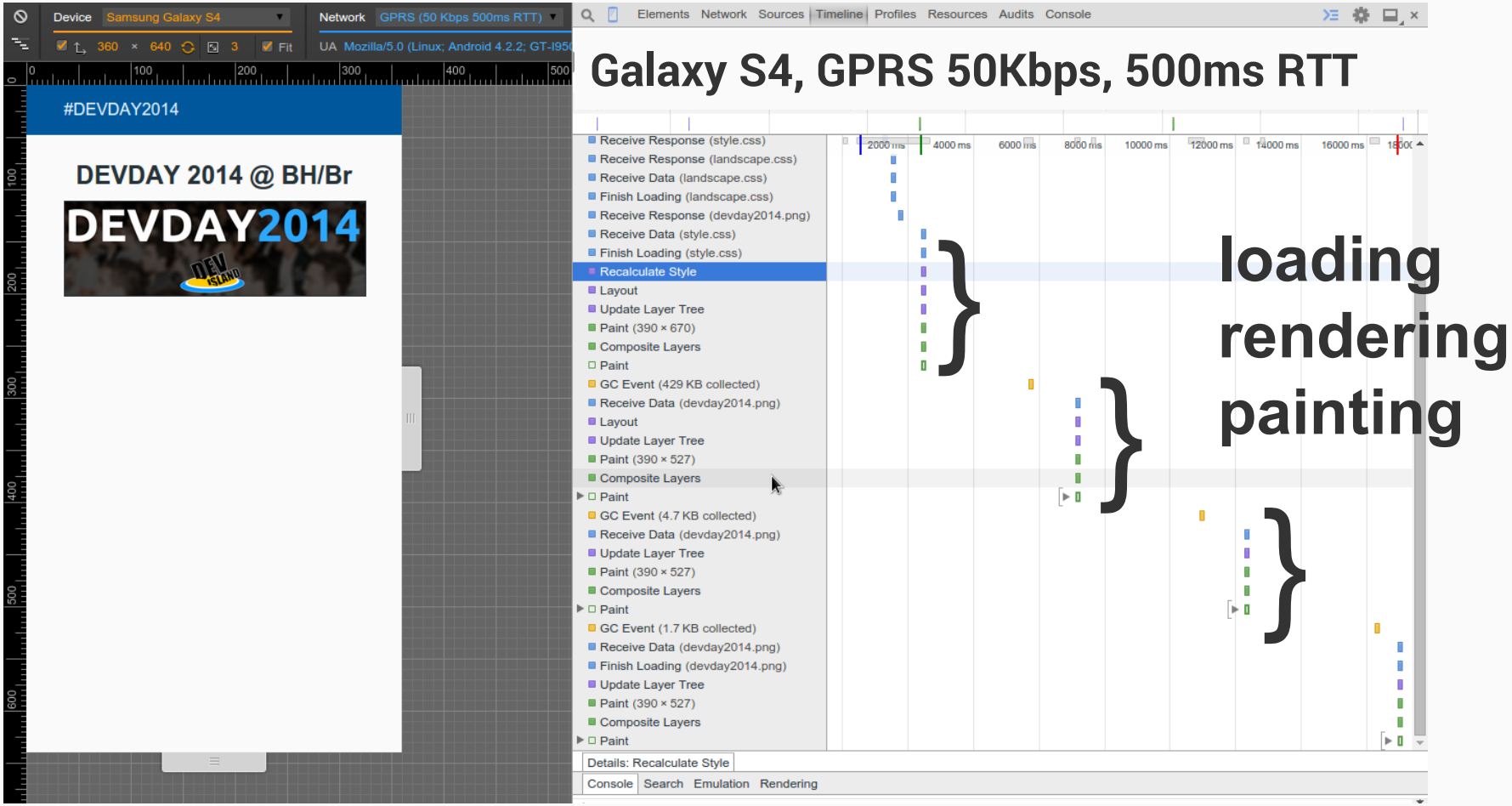

Receive Response (devday2014.png)
Receive Data (landscape.css)
Finish Loading (landscape.css)
Receive Data (devday2014.png)
Recalculate Style
Layout
Update Layer Tree
Paint (390 × 670)
Composite Layers
Receive Data (devday2014.png)
Paint
Image Decode (devday2014.png)
Receive Data (devday2014.png)
Receive Data (devday2014.png)
Finish Loading (devday2014.png)
Update Layer Tree
Paint (390 × 527)
Composite Layers
Paint
10 ms
20 ms
30 ms
40 ms
50 ms
60 ms
70 ms
80 ms
90 ms
100 m
Details: Layout
0.469 ms
Self Time: 0.469 ms
Start Time: 33 ms
Nodes that need layout: 14
Layout tree size: 14
Layout scope: Whole document
Layout root: #document
0.469 ms Rendering
need layout: 14
tree size: 14
scope: document

Critical Rendering Path



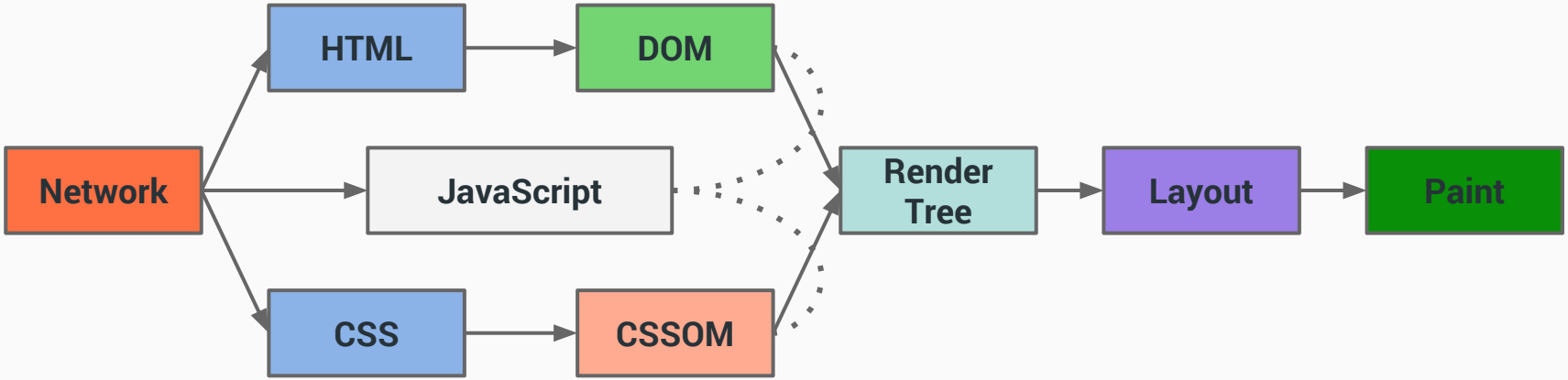
Painting

tamanho da área
formato (bordas)
sombras
transparências
background-images



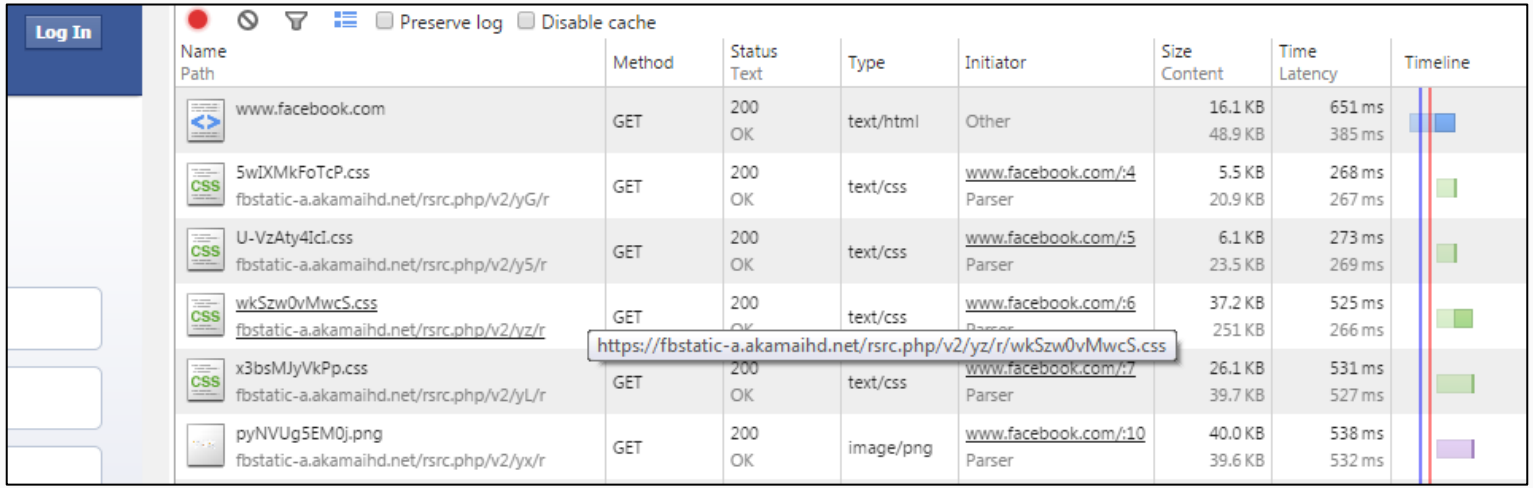
http://goo.gl/xjZAiJ

Critical Rendering Path



Otimizando o DOM

minify, compress, cache



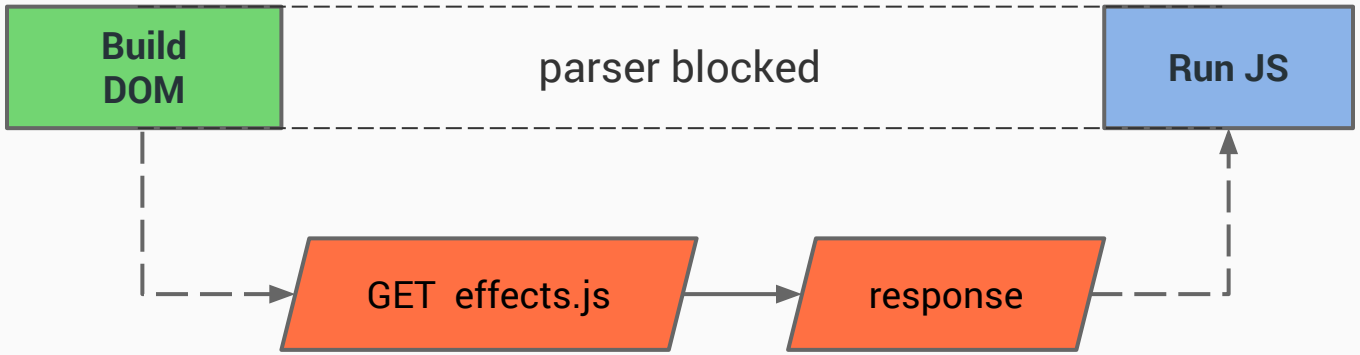
http://goo.gl/hPLUqB, http://goo.gl/CW7HJC, http://goo.gl/wxIXkU

JavaScript

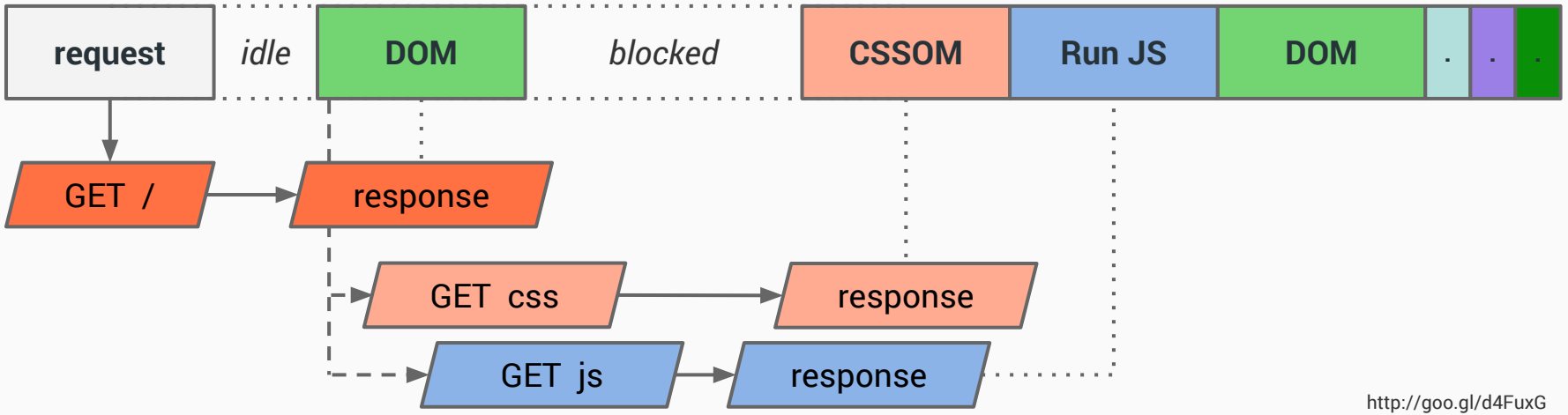
```
<section>
    <h2>DEVDAY 2014 @ BH/Br</h2>
    <img src="assets/devday2014.png">
    <h3>Critical Rendering Path</h3>
</section>
<script type="text/javascript">
    var section = document.getElementsByTagName('section')[0],
        span = document.createElement('span');

    span.innerText = "#crp #wpo #perfmatters #devday2014";
    span.style.fontWeight = "bold";
    section.appendChild( span );
</script>
```

```
        ... .. ... ..
        <h3>Critical Rendering Path</h3>
    </section>
    <script type="text/javascript" src="assets/effects.js"></script>
</body>
```



```
<head>
   <meta name="viewport" content="width=device-width, initial-scale=1">
   <link rel="stylesheet" type="text/css" href="assets/style.css">
</head>
<body>
   <header> .. </header>
   <section> ... <h2>DEVDAY 2014 @ BH/Br</h2> ... </section>
   <script type="text/javascript" src="assets/effects.js"></script>
</body>
```



http://goo.gl/d4FuxG

JavaScript

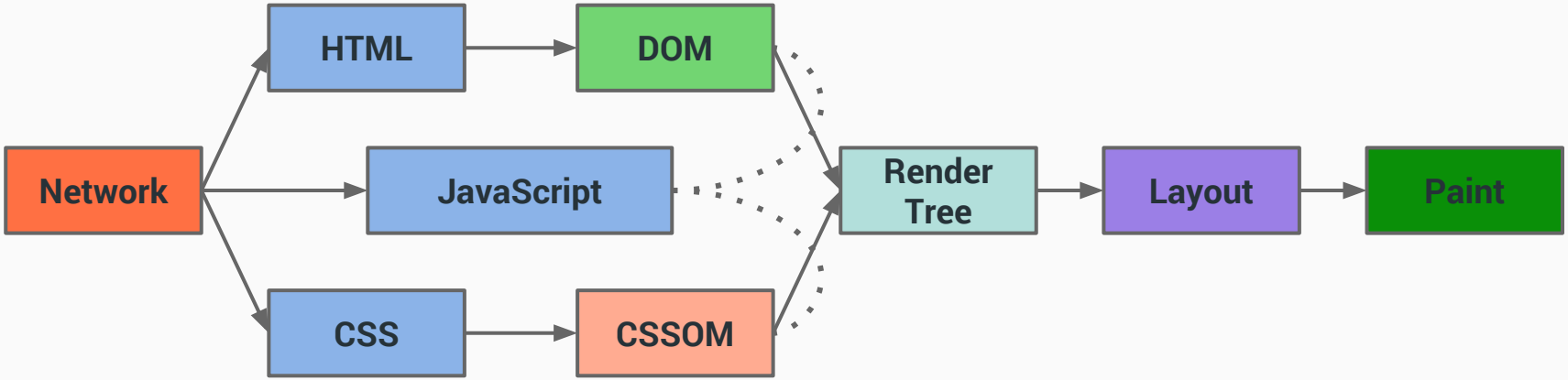
consultar e modificar DOM/CSSOM

bloqueado durante CSSOM

bloqueia construção do DOM

```
<script src="assets/effects.js" async></script>
```

Critical Rendering Path



Otimizar o Critical Rendering Path

Minimizar dados

***minify*, *compress* e *cache*: HTML, JS e CSS**

Reduzir *blocking resources*

***media queries* para CSS, async/onload para JS**

Minimizar tamanho do CRP

número e ordem dos *resources*

http://goo.gl/BJqIvR

Otimizar o Critical Rendering Path

Evitar redirects

Melhorar *response time*

Browser *cache*

Content Delivery Network (CDN)

Priorizar conteúdos visíveis

Referências

github.com/davidsonfellipe/awesome-wpo

Docs, Blogs, Articles, Talks, Analyzers, Benchmark, CDN, Image Optimizers, Loaders, Minifiers, Sprite Generators, Web Performance Meetup Groups

Ilya Grigorik, Crash Course on Web Performance

Bandwidth, latency, and radio performance - http://goo.gl/IiLJTf
Optimizing networking performance (and HTTP 2.0) - http://goo.gl/SiJ6DI
Critical rendering path - http://goo.gl/Hs5Jx2
Delivering 60 FPS in the browser - http://goo.gl/uZly5u

Critical Rendering Path

Velocidade também é uma funcionalidade

Obrigado!

João Lucas P Santana
jlucasps@gmail.com

DEVDAY 2014 BELOHORIZONTE

Patrocínio diamente
CI&T
DTI SISTEMAS
Google Developers

Patrocínio Ouro
PayPal + Braintree Developer
AvenueCode

Patrocínio Prata
siteware
FRAMEWORK

Patrocínio Bronze
GitHub
ThoughtWorks
DEV ISLAND