1

Basic Technologies

- Hypertext Markup Language
- Cascading Style Sheets

2

Interactive Web

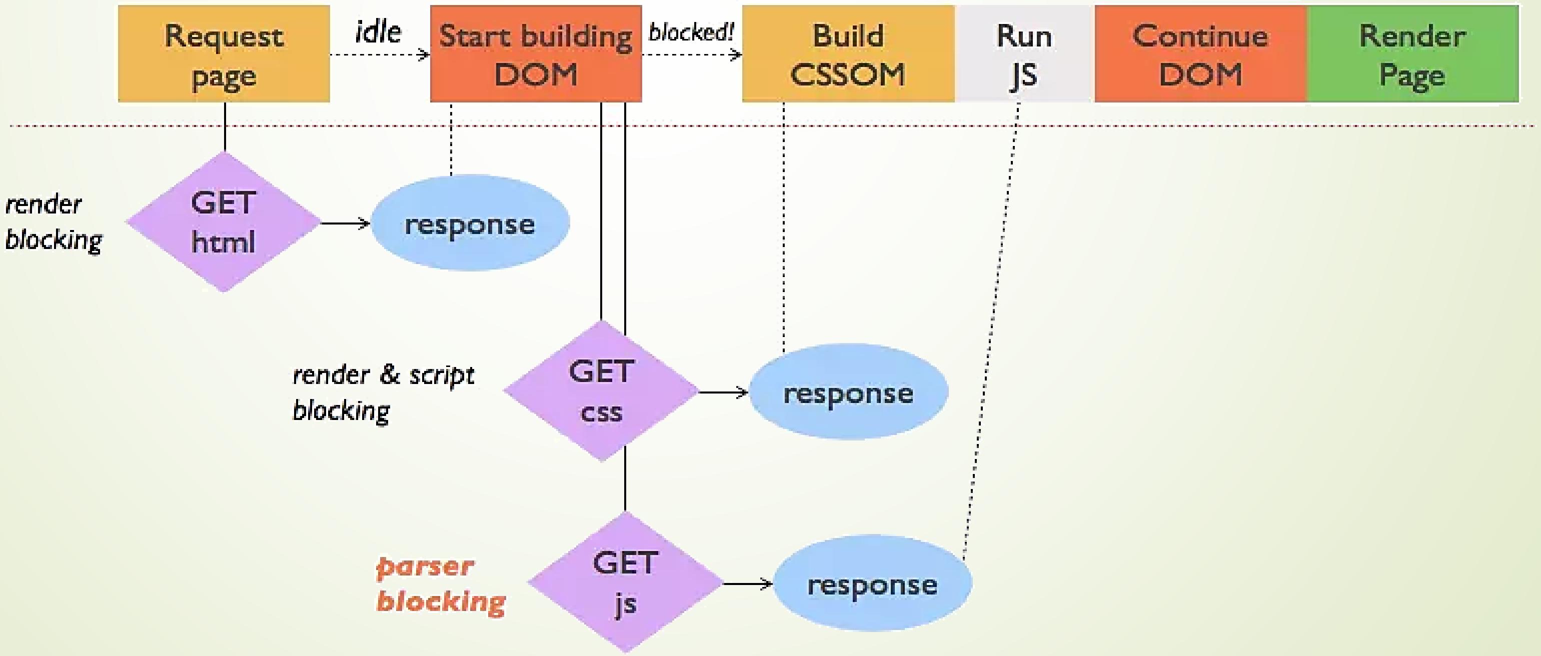
- JavaScript
- Critical Rendering Path
- Json & Ajax
- jQuery
- React

II.2

Critical Rendering Path

Critical Rendering Path

- steps to turn "the code and resources required to render the initial view of a web page" into actual pixels on the screen



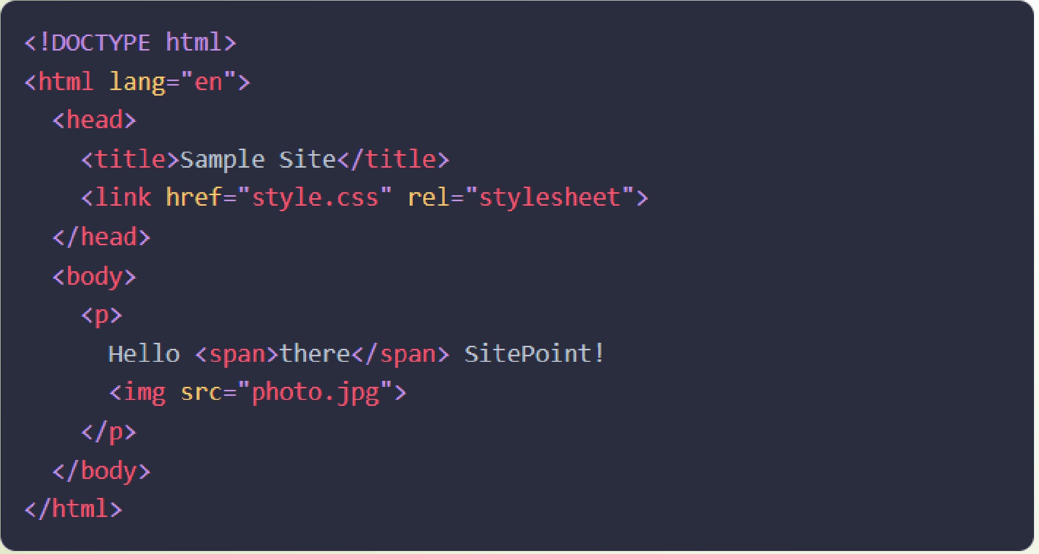
https://www.sitepoint.com/optimizing-critical-rendering-path/

II.2

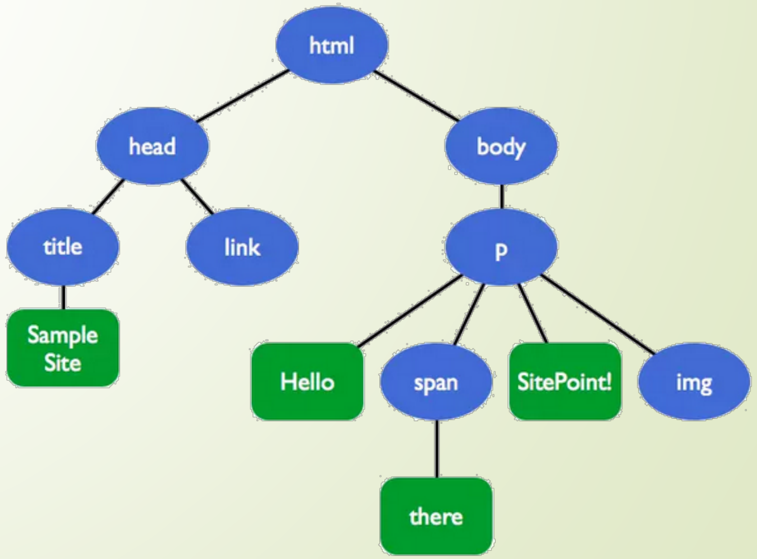
Critical Rendering Path

Critical Rendering Path

1. browser sends HTTP-request
2. browser receives HTML-response
3. browser parses stream of bytes into DOM-tree incrementally



```html
<!DOCTYPE html>
<html lang="en">
  <head>
    <title>Sample Site</title>
    <link href="style.css" rel="stylesheet">
  </head>
  <body>
    <p>
      Hello <span>there</span> SitePoint!
      <img src="photo.jpg">
    </p>
  </body>
</html>
```



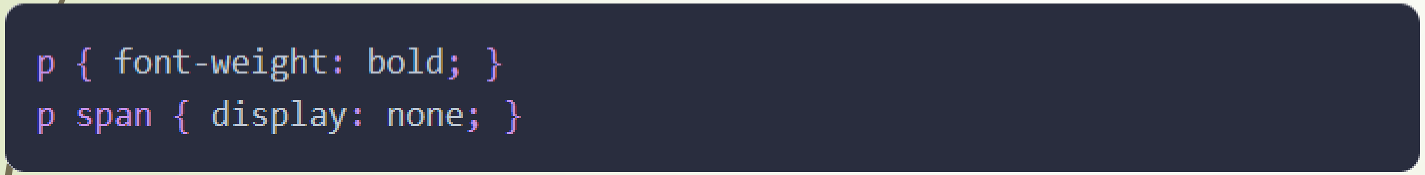
II.2

Critical Rendering Path

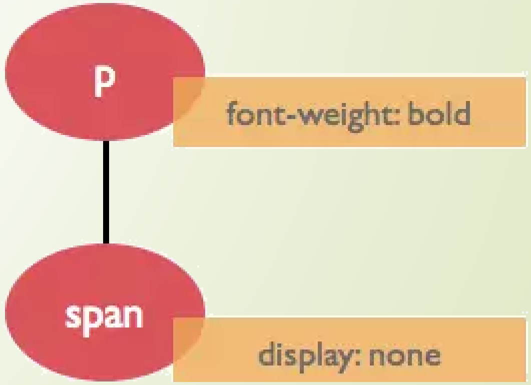
Critical Rendering Path

1. browser downloads CSS-files
2. CSS file is then parsed into the CSS Object Model, or CSSOM

CSS is render blocking!



```
p { font-weight: bold; }
p span { display: none; }
```

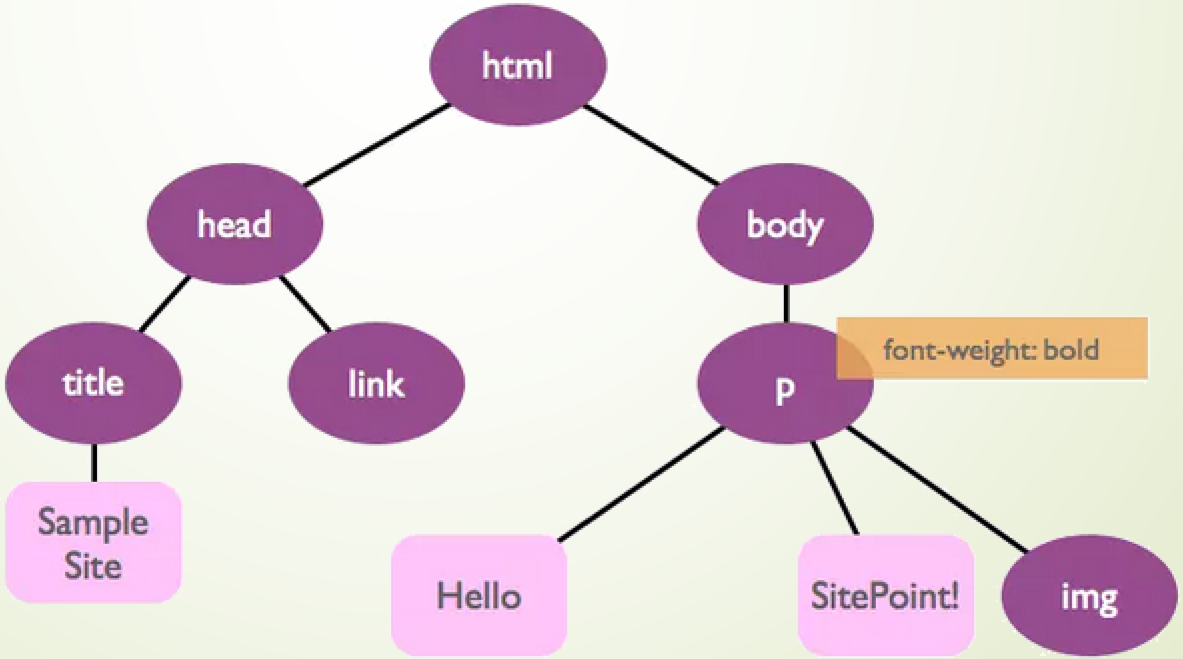


II.2

Critical Rendering Path

Critical Rendering Path

1. browser builds a render tree
   structure combines DOM and CSSOM while only capturing visible elements

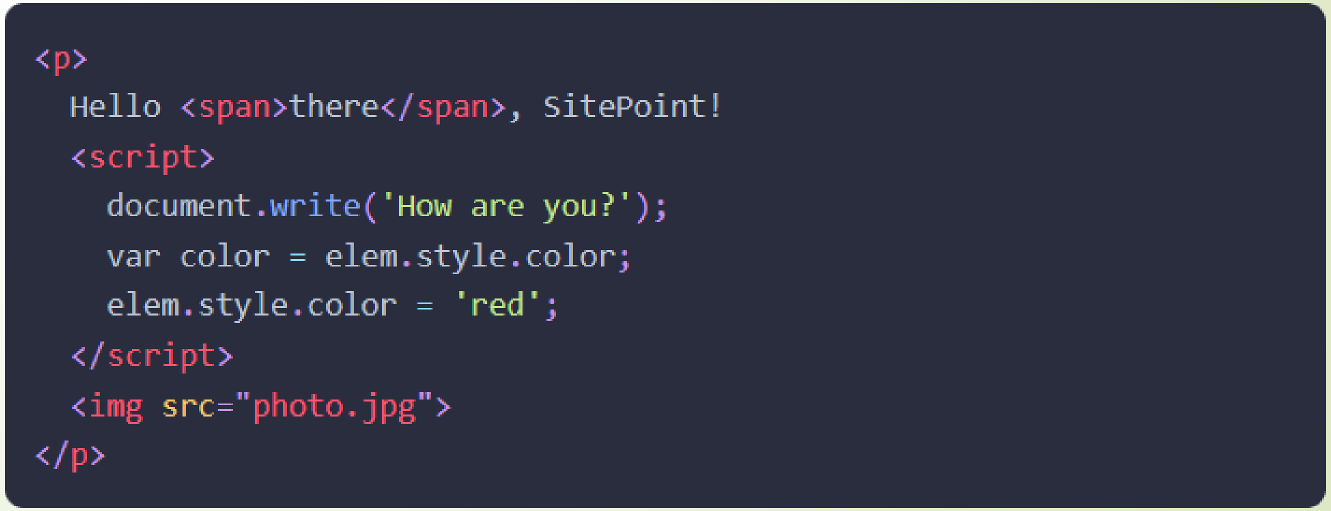


II.2

Critical Rendering Path

Critical Rendering Path

- JavaScript has a huge impact on the critical path
- scripts can both query and change the DOM as well as the CSSOM
  - JavaScript is parser blocking
  - CSS is also script blocking



```
<p>
  Hello <span>there</span>, SitePoint!
  <script>
    document.write('How are you?');
    var color = elem.style.color;
    elem.style.color = 'red';
  </script>
  <img src="photo.jpg">
</p>
```

Critical Rendering Path

Optimizing Critical Rendering Path

- minimize the bytes
  - minify, compress, and cache the assets as well as the HTML

CSS Minification Tools	JavaScript Minification Tools
▪ CSSnano ▪ CSSO ▪ UNCSS ▪ CSS-Minifier	▪ Closure Compiler ▪ UglifyJS2 ▪ YUI Compressor ▪ JS Compress

- minimize render blocking CSS
  - get CSS to the user as soon and as fast as possible
  - provide media information

II.2

Critical Rendering Path

Critical Rendering Path – Summary

- the notion of page speed has shifted from simple page loading to page rendering
- Critical Rendering Path comprises all steps to turn critical resources into a visible browser output: DOM and CSSOM, JavaScript, render tree, layout and paint phase
- HTML is render blocking, but the DOM can be built incrementally
- CSS is render and script blocking, treat it carefully and optimize it with inline styles or media queries
- JS is parser blocking, use it sparingly during the initial page load, defer execution or try to load it asynchronously
- don’t forget that size still matters and minify, compress, cache