Responsive Design

Introduction

- **Responsive design**
  - Flexible design
    - No assumptions about display media and properties (e.g screen size, etc.)
    - Responding to device orientation (portrait, landscape) and media limitations
    - Optimized viewing experience across a wide range of devices

  - Inspiration and definition
    - Proposed by Ethan Marcotte in 2010
    - Inspired from idea of responsive building architectures adjusting to the occupancy situations

Ref: Kirill Grouchnikov, Android, Google Inc. (http://www.slideshare.net/kirillcool/responsive-mobile-design)

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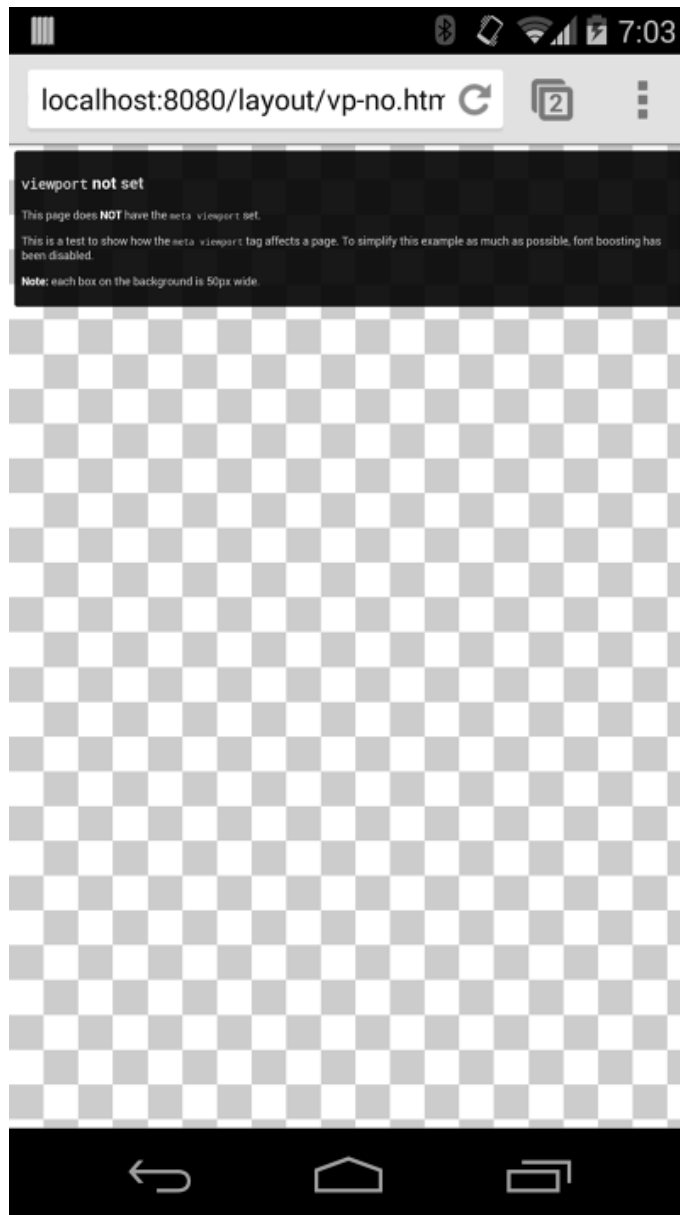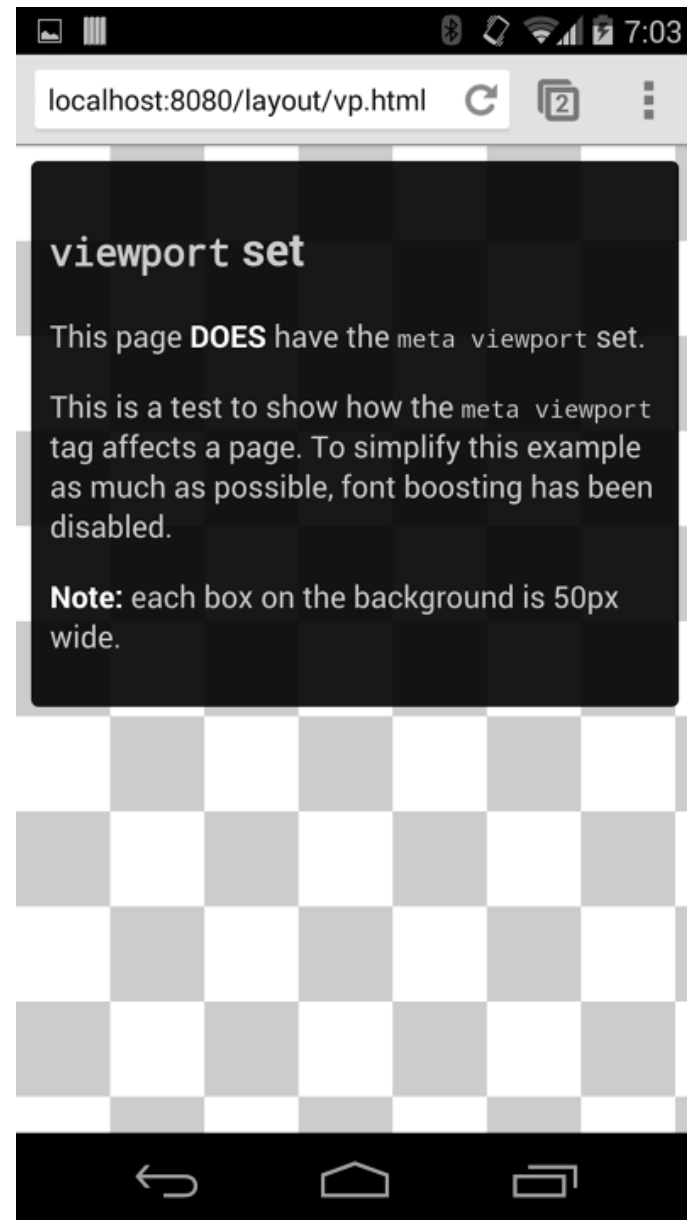
Responsive Web Techniques

- Viewport
    - Represents the browser area where a web page is rendered
    - Virtual window
        - Size varies with device
        - Physical size is smaller on mobiles than desktops
        - Logical size by default is same as desktops - to support simple (non-responsive) web pages
        - Mobile browser scales down the content to fit in the viewport
    - Responsive pages create 1:1 correspondence between device width and viewport
        - Using meta viewport tag
- Fluid Grid layout
    - Adjustable multi-column layout
    - Fluid / Relative dimension units (e.g. percentage, em, etc)
- Media queries
    - Simple query to learn about device features
    - CSS rules apply only if the device fulfills the stated features required
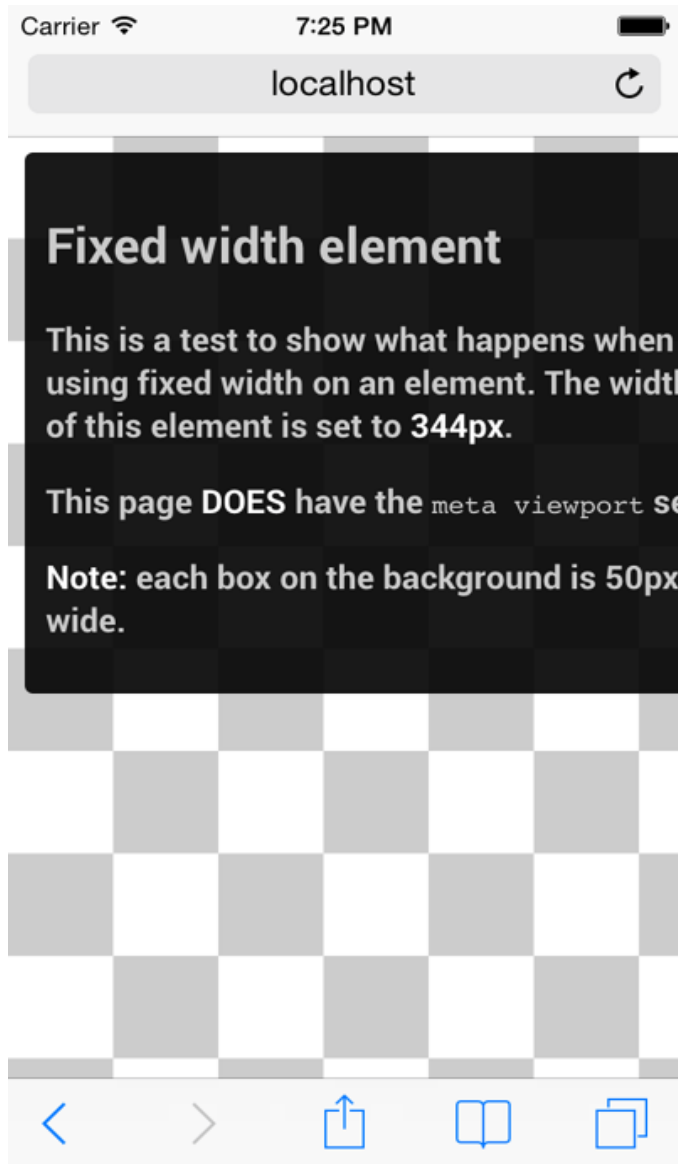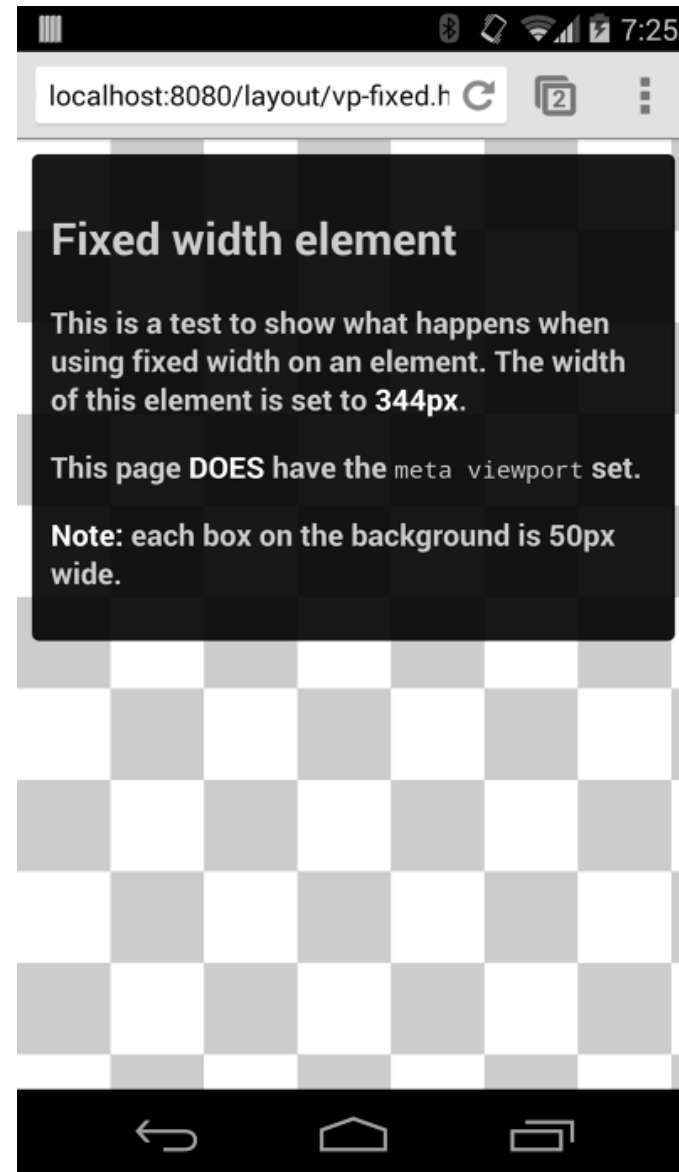   - Allows different CSS styles for a single page depending upon the media

`<meta name='viewport' content="width=device-width, initial-scale=1" >`

Without viewport declaration

With viewport declaration

Ref: Responsive Web Design Basics, Google Web Developers
https://developers.google.com/web/fundamentals/design-and-ui/responsive/fundamentals/?hl=en

Fixed dimensions

Fluid dimensions

New York, NY

Tuesday, April 15th
Overcast

58 °F

Precipitation: 100%
Humidity: 97%
Wind: 4 mph SW
Pollen Count: 36

Today		68° 36°	Pollen 36
Wednesday		50° 39°	Pollen 36
Thursday		55° 39°	Pollen 36
Friday		54° 43°	Pollen 36
Saturday		64° 46°	Pollen 36
Sunday		64° 50°	Pollen 36
Monday		61° 50°	Pollen 36

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Pollen 36	Pollen 36	Pollen 36	Pollen 36	Pollen 36	Pollen 36	Pollen 36

Small screen
(Mobile)

Wide screen
(Desktop)

```html
<html>
 <head>
  <meta name="viewport" content="width=device-width, initial-scale=1">

  <link rel="stylesheet" href="weather.css">
  <link rel="stylesheet" media="(max-width:600px)" href="weather-2-small.css">
  <link rel="stylesheet" media="(min-width:601px)" href="weather-2-large.css">

 </head>
 <body>
  <div class="weather-forecast" role="main">
   <div class="location">New York, NY</div>
   <div class="date">Tuesday, April 15th</div>
   <div class="desc">Overcast</div>

    <!-- other content …  -->

   <div class="seven-day">
    <div class="seven-day-fc">
     <div class="date">Today</div>
     <div class="icon thunder"></div>
     <div class="seven-day-temp">
      <div class="temp-high">68&deg;</div>
      <div class="temp-low">36&deg;</div>
     </div>
     <div class="pcount">36</div>
    </div>

    <!-- continues …  -->

   </div>
  </div>

 </body>
</html>
```

Viewport declaration

Media Queries

```css
.weather-forecast {
  width: 100%;
}

.seven-day-fc {
  border-top: 1px solid rgba(0,0,0,0.2);
}

.seven-day-fc:last-of-type {
  border-bottom: 1px solid rgba(0,0,0,0.2);
}

.seven-day-fc .date {
  width: 30%;
}

.seven-day-fc .seven-day-temp {
  width: 30%;
}

.seven-day-fc .pcount {
  width: 16%;
}
```

Small CSS

```css
.weather-forecast {
  width: 100%;
  box-shadow: 0 1px 4px rgba(0,0,0,0.2);
}

.seven-day-fc {
  display: inline-block;
  width: 13.5%;
  margin: 0;
  border: none;
  font-size: 0.8em;
}

.seven-day-fc div {
  display: block;
  text-align: center;
}

.seven-day-fc .date {
  text-align: center;
}

.seven-day-fc .temp-low,
.seven-day-fc .temp-high {
  display: inline;
}

.seven-day-fc .seven-day-temp {
  font-size: 1.25em;
}

.seven-day-fc .icon {
  width: 64px;
  height: 64px;
}
```
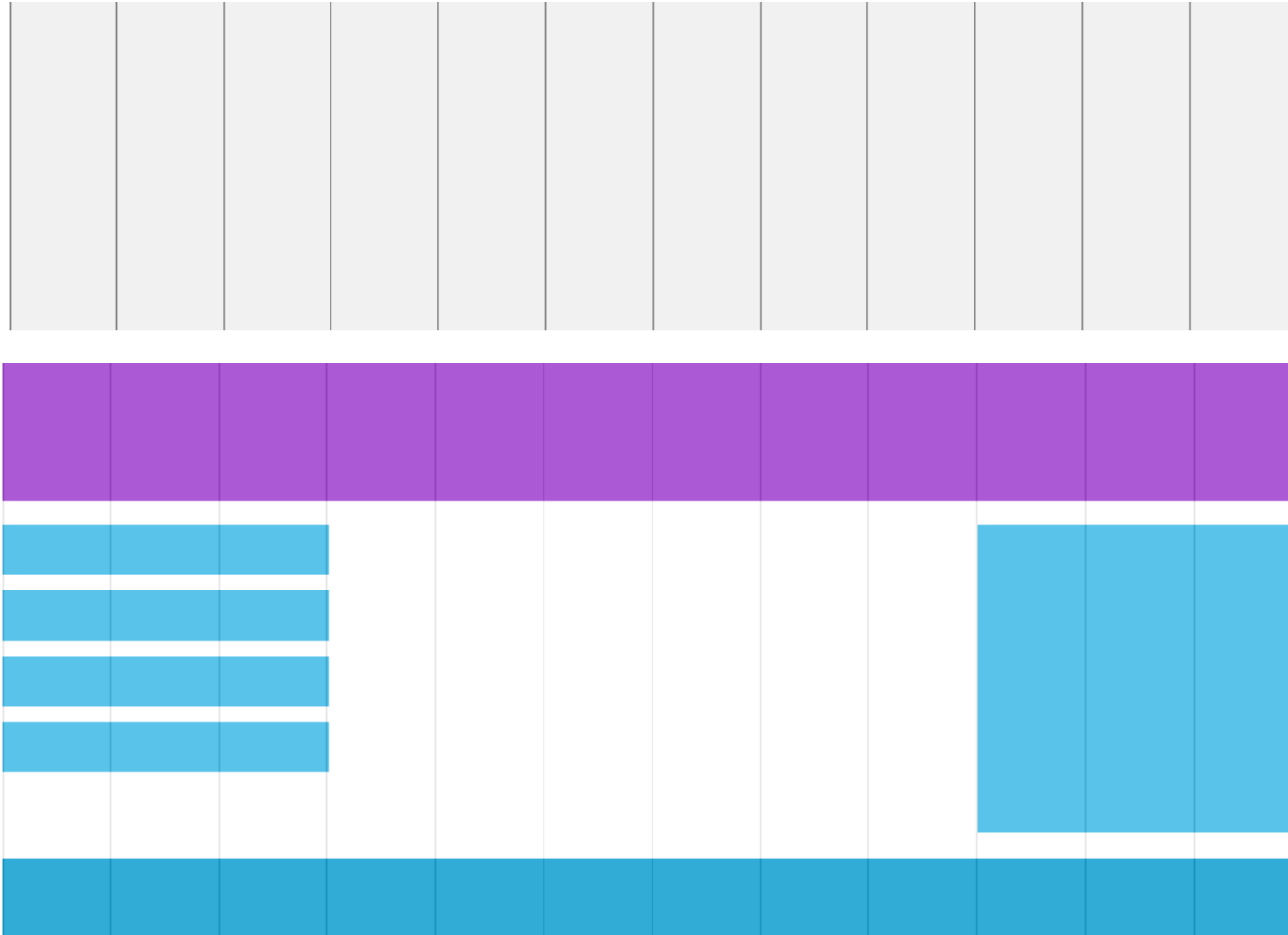
Large CSS

Fluid Grid Layout

```css
.row::after {
    content: "";
    clear: both;
}

.col-1 {width: 8.33%;}
.col-2 {width: 16.66%;}
.col-3 {width: 25%;}
.col-4 {width: 33.33%;}
.col-5 {width: 41.66%;}
.col-6 {width: 50%;}
.col-7 {width: 58.33%;}
.col-8 {width: 66.66%;}
.col-9 {width: 75%;}
.col-10 {width: 83.33%;}
.col-11 {width: 91.66%;}
.col-12 {width: 100%;}

[class*="col-"]{
    float: left;
}
```

```
...

<div class="row">

 <div class="col-3 menu">
  <ul>
    <li> ... </li>
    <li> ... </li>
    <li> ... </li>
    <li> ... </li>
  </ul>
 </div>

 <div class="col-6">
  ...
 </div>

 <div class="col-3">
 ...
 </div>

</div>

...
```

```css
.row::after {
    content: "";
    clear: both;
}

[class*="col-"]{
    float: left;
    width: 100%;
}


@media only screen and (min-
width: 768px) {
 .col-1 {width: 8.33%;}
 .col-2 {width: 16.66%;}
 .col-3 {width: 25%;}
 .col-4 {width: 33.33%;}
 .col-5 {width: 41.66%;}
 .col-6 {width: 50%;}
 .col-7 {width: 58.33%;}
 .col-8 {width: 66.66%;}
 .col-9 {width: 75%;}
 .col-10 {width: 83.33%;}
 .col-11 {width: 91.66%;}
 .col-12 {width: 100%;}
}
```