



A FEW WAYS TO SOLVE ANIMATION PROBLEM WITH THE HELP OF SVG AND CSS

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For studying the model was chosen the way of solving this problem using:

- HTML – the language of hypertext marking;
- CSS – cascade style sheets;
- Java Script (ECMAScript) – is a high-level, dynamic, untyped, and interpreted programming language;
- SVG (Scalable Vector Graphics) – is an XML-based vector image format for two-dimensional graphics with support for interactivity and animation.

The set is a standard tool for any WEB developing except SVG – which is a basic for graphic implementation.

What makes it specific?

Scalable Vector Graphics (SVG) – is an XML-based vector image format for two-dimensional graphics with support for interactivity and animation. The SVG specification is an open standard developed by the World Wide Web Consortium (W3C) since 1999.

SVG images and their behaviors are defined in XML text files. This means that they can be searched, indexed, scripted, and compressed. As XML files, SVG images can be created and edited with any text editor, but are more often created with drawing software.

Since the language is a particular set of mathematical description of paths and geometrical shapes, it makes a perfect tool for linking between WEB-designer and WEB-developer.

This link makes opportunity of exporting from vector editors such as Adobe Illustrator, to interpret any 2D (two-dimension) graphic into mathematical concept of XML format.

Since SVG is a subset of extensive language of XML making, its syntax is quite similar to HTML, from which some tags were borrowed. Due to similarity of these formats appear the ways of interaction between SVG and CSS & JavaScript.

Advantages of using SVG over other image formats (like JPEG and GIF) are:

- SVG images can be created and edited with any text editor;
- SVG images can be searched, indexed, scripted, and compressed;
- SVG images are scalable;
- SVG images can be printed with high quality at any resolution;
- SVG images are zoomable (and the image can be zoomed without degradation);
- SVG is an open standard;
- SVG files are pure XML.



The main competitor to SVG is Flash. The biggest advantage SVG has over Flash is the compliance with other standards (e.g. XSL and the DOM). Flash relies on proprietary technology that is not open source.

SVG animation can be implemented in different ways, as the native language of SMIL (Synchronized Multimedia Integration Language), and CSS or JavaScript. A script may change value of any attribute in the document and to change the relative positioning of the elements to each other and the whole structure of the document. Since every object in the SVG-document is an XML-element and any element can be accessed through the DOM, thanks to this you can determine how and where each of the elements have to move and to respond to any event.

SVG can be stored in a separate file with an extension .svg, in that case it must be connected by an attribute "src", or it can be placed directly in the HTML.

```
<svg version="1.1" id="Layer_1" xmlns="http://www.w3.org/2000/svg"
xmlns:xlink="http://www.w3.org/1999/xlink" >
  <line class="mainLine" x1="11.3" y1="82.4" x2="32" y2="82.4"/>
  <polyline id="secondLine" points="504.5,19.2 525.2,19.2 525.2,347.6 65.1,347.6
65.1,212.9 18.4,212.9 "/>
</svg>
```

As you can see, the main function in the SVG tag performs the same name tag. Inside the main tag is the description of each shape or contour separately: path, line, polyline, circle etc.

Each shape can have an ID tag (class and id) like in HTML, which allows access to a shape through CSS or JavaScript and allows you to change the properties of the attributes of the tag. In addition, SVG supports the same tag <style>, by means of which can be described similarly as the styles in HTML.

Perhaps the most simple way for creating a simple animation – is the use of CSS. Description of SVG animation objects through CSS is not completely different from anything the description of any HTML element except for some specific properties that are characteristic of SVG, such as: stroke, fill-stroke, stroke-opacity, stroke-width, etc. Perhaps special attention deserves stroke-dasharray property. This property controls the look of dashed stroke. It can be specified in units of length or percentage.

In a similar way, you can use properties such as opacity or fill. A more sophisticated way - is SVG and JavaScript. This option opens up many more opportunities and allows almost complete control over the behavior of SVG objects, making it possible to create virtually any interactive objects, such as a site menu.

The developer does not have to deal with formats (JPEG or PNG) that take up a lot of space, the designer enough to save the image of any vector editor to SVG format and a developer could easily adjust it in the process of development.

Bibliography

1. SVG Animation guest author . – Access mode: www / URL : <https://css-tricks.com/guide-svg-animations-smil/> – 08.04.2016. – Title from screen.