Drawing on the Web
CSCI-UA 380

SVG
Scalable Vector Graphics
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Scalable Vector Graphics

SVG is a language for describing two-dimensional graphics in XML.

SVG allows for three types of graphic objects: vector graphic shapes, images, and text.

SVG drawings can be interactive, dynamic, and animated.
To be scalable means to increase or decrease uniformly

In terms of graphics, means not being limited to a single, fixed, pixel size

On the Web, scalable means that a particular technology can grow

SVG is scalable in both senses of the word

Scalable Vector Graphics (SVG) 1.1 Concepts
http://www.w3.org/TR/SVG/concepts.html
SVG

Vector

Vector graphics contain geometric objects such as lines and curves

This gives greater flexibility compared to raster-only formats

Since all modern displays are raster-oriented, the difference between raster-only and vector graphics comes down to where they are rasterized

Vector graphics are rasterized client side; raster graphics are, by nature, already rasterized on the server

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SVG Graphics

Most existing XML grammars represent either textual information or raw data.

They typically provide only rudimentary graphical capabilities.

SVG provides a rich, structured description of vector and mixed vector/raster graphics.

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SVG

Advantages

SVG images can be created and edited with any text editor

SVG images can be searched, indexed, scripted, and compressed

SVG images are scalable, can be printed at any resolution, and are zoomable without degradation

SVG is an open standard

SVG files are pure XML

SVG Introduction

http://www.w3schools.com/svg/svg_intro.asp
XML stands for Extensible Markup Language

XML is a markup language much like HTML

XML was designed to carry data, not to display data

XML tags are not predefined. You must define your own tags

XML is designed to be self-descriptive

SVG is written in XML

Introduction to XML
http://www.w3schools.com/xml/xml_whatis.asp
The advantages of style sheets are now generally accepted, certainly for use with text.

SVG extends this control to the realm of graphics.

It allows for script-based manipulation of the document tree and the style sheet.

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SVG supports the ability to change vector graphics over time.

Using SVG’s animation elements, you can define motion paths, fade-in or fade-out effects, and objects that grow, shrink, spin or change color.

SVG has been designed to allow SMIL to use animated or static SVG content as media components.

Support for SMIL animation may be waning in favor of CSS animation.
SVG
On the Web

There are a variety of ways in which SVG content can be included within a Web page

• A stand-alone SVG Web page

• Embedding by reference, using the HTML ‘img’ element

• Embedding inline

• External link, using the HTML ‘a’ element

• Referenced from a CSS property

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The `<path>` element is foundational to drawing with SVG; it allows you to create all kinds of shapes.

The shape of a `<path>` element is defined by one attribute: `d`.

The `d` attribute contains a series of commands and parameters used by those commands.

All of the commands also come in two variants: an uppercase letter specifies absolute coordinates; a lowercase letter specifies relative coordinates.
SVG
Path Commands

- **M** moveto
- **L** lineto
- **H** horizontal lineto
- **V** vertical lineto
- **C** curveto
- **S** smooth curveto
- **Q** quadratic Bézier curve
- **T** smooth quadratic Bézier curveto
- **A** elliptical arc
- **Z** closepath
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