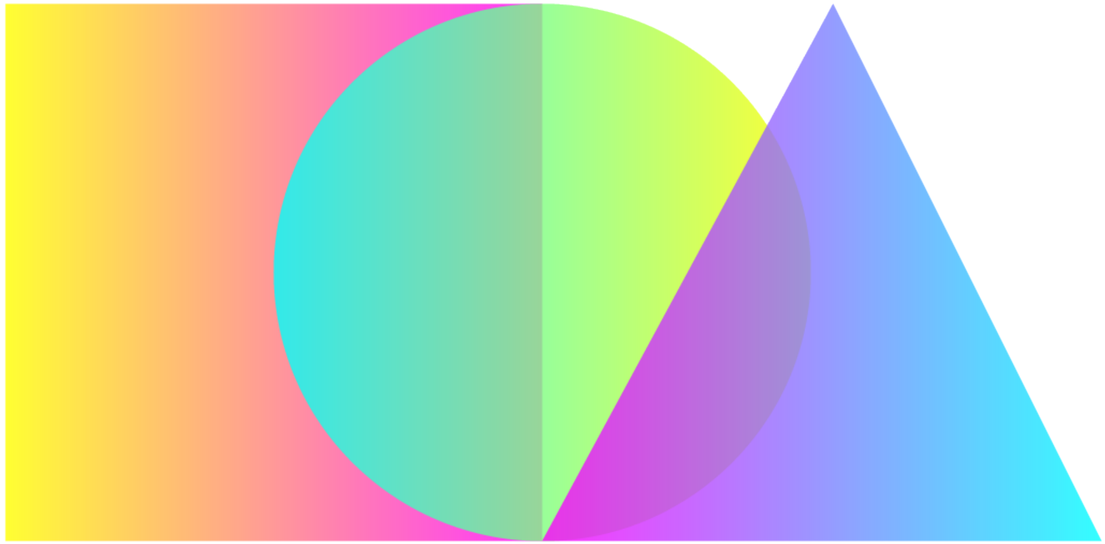
Introduction to Web Design

Vector Graphics



Vector Graphics

Vector Graphics

Vector graphics contain geometric objects, such as lines and curves.

This has advantages 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.

Scalable Vector Graphics

Vector Graphics

Scalable Vector Graphics (SVG) is a markup language for describing two-dimensional graphics.

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

SVG drawings can be interactive and even styled with CSS.

SVG defines vector graphics in XML format.

XML

XML stands for “Extensible Markup Language”

It is a markup language designed to transport and store data.

Whereas HTML is about describing and displaying information, XML is about carrying information.

XML tags are not predefined; they are “extensible.”

Most XML grammars represent either textual information or raw data; they only provide rudimentary graphical capabilities.

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

Scalability

To be scalable means to increase or decrease uniformly.

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

On the web, scalability means that a particular technology can grow over time.

SVG is scalable in both senses of the word.

Advantages of SVG

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 and CSS

Vector Graphics

The advantages of style sheets are generally accepted, certainly for use with text and layout.

SVG extends this control to the realm of graphics.

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

SVG Path Element

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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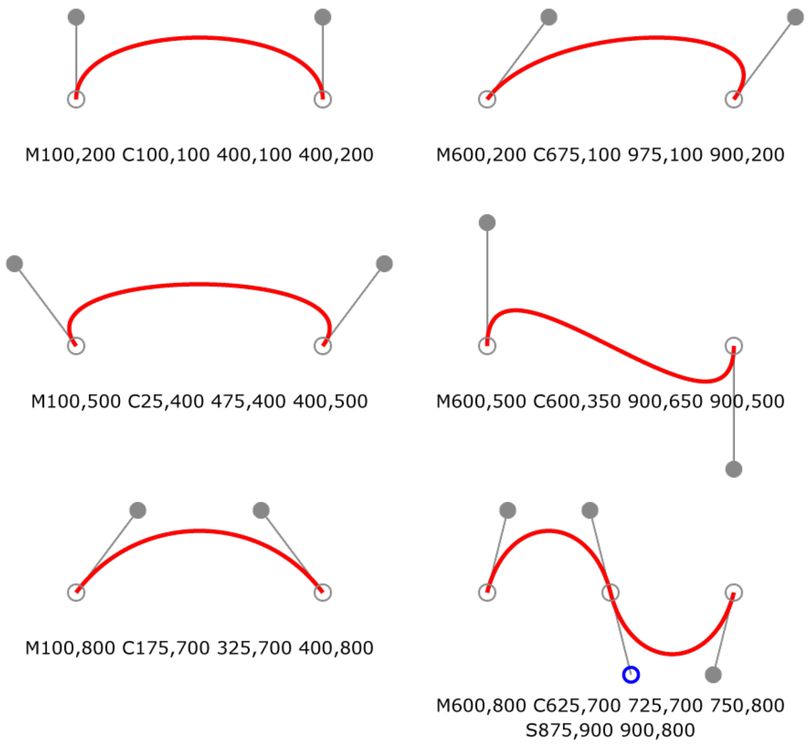

W3C: SVG Paths

SVG on the Web

There are several 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 SVG code inline with HTML
- From an external link, using the HTML <a> element
- Referenced from a CSS property