Scalable Vector Graphics (SVG): The World Wide Web Consortium's Recommendation for High Quality Web Graphics.

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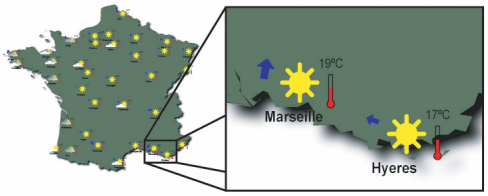
Scalable Vector Graphics (SVG) is a language for representing two-dimensional graphics. It was developed by the World Wide Web Consortium (W3C) to be the open standard format for both static and animated vector graphics on Web appliances, from desktop machines to mobile devices. The SVG 1.0 specification, whose authors include representatives from Adobe, Microsoft, Sun, Kodak, Corel, Macromedia, IBM and Apple, became a W3C Recommendation in September 2001. SVG is rapidly becoming the open standard of choice for graphics on the Web, and the many SVG implementations already in existence ensure that SVG documents can be viewed on a wide range of platforms.

The imaging model of SVG is based on industry standards, such as PostScript and PDF, with a number of Web-specific enhancements. The base features of SVG include shapes and Bézier paths, control over an object's stroke and fill, the ability to render multi-lingual text in the same manner as any other SVG shape with comprehensive font facilities, support for raster images with ICC profiles, complex fill patterns and gradients, clipping, masking, affine transformations and object transparency (using an alpha channel). More importantly, it was designed for the Web and as such includes hyperlinking into and out of the document and is encoded in XML, the core technology for current and future Web development.



A weather map demonstrating a user ability to zoom (image courtesy ILOG)

While the majority of users currently browse the Web using a desktop machine with a fairly high resolution and color-depth, it is expected that in the near future the number of mobile browsing devices will increase significantly. SVG caters specifically to the limited resolution and processing power of these devices. The W3C has developed profiles of SVG that allow the same content to render across the wide range of Web platforms, constantly scaling to provide the best visual result.

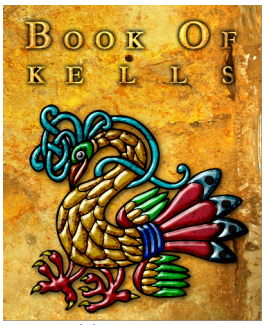
The Web is interactive. SVG was designed from the ground up to fully integrate the user into this interactive Web environment while providing excellent quality graphics and performance. Animation is a fundamental part of SVG and is provided by SMIL, the W3C Recommendation for Multimedia. Nearly every graphical property (such as an object's shape, position, fill or stroke) can be declaratively animated in SVG, using either interpolated time-based animation, which provides the smoothest performance regardless of processing capabilities, or frame-based animation. Furthermore, the rendering tree of an SVG document has a comprehensive object model, allowing embedded scripts in languages such as Javascript to programmatically modify any aspect of rendering, or create objects on the fly. We are beginning to see application user interfaces being designed and implemented purely in SVG. The combination of declarative animation, scripting and the complex event model make SVG images a nearly limitless interactive environment.

The interactive Adobe Building Search (left - courtesy Adobe). Lighting Effects and Drop Shadows creating a button-like appearance for SVG text (right)

A unique feature of SVG is its support for a large range of filter effects. These can be applied, independently of resolution, to the vector and raster graphics within the document. This allows the author to declaratively define effects such as drop shadows, convolution, lighting effects and image enhancement, and furthermore allow the user to control those effects through scripting and animation. With filters, SVG replaces the need for the many images on the Web that are rasterizations of text, such as page titles with drop shadows. In this case the equivalent SVG image is smaller in size, scales to provide the best representation given the requested output size, and retains the text content, ensuring it can still be selected as text (e.g. copy, cut and paste).

SVG images have benefits beyond their rendering. Accessibility is a core requirement of all W3C technologies and SVG has excellent accessibility support through metadata and the ability to provide graphical element descriptions. Also, the SVG format is fully internationalized as it uses Unicode and has built-in support for various international scripts. As a text based encoding, SVG content is available to anyone and is easily indexed by Web search engines. Many organizations are choosing SVG as their data visualization format, since it is an open format and its XML core integrates easily into their existing workflow. They can also add their own metadata to the graphics to produce a customized SVG format for their application.

Importantly, SVG seamlessly integrates with other Web technologies – it is designed to be embedded inline within an XHTML page and all graphical elements can be styled with CSS. Given the many benefits of the format and the enthusiastic community support, the popularity of SVG as the two-dimensional Web graphics standard is set to rapidly increase.



Filter effects in SVG artwork (image courtesy of Apache Organization)

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See also:
http://www.w3.org/Graphics/SVG
and http://www.w3.org/Talks/2002/svg-siggraph/