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SVG Advanced Gradient Requirements

W3C Working Draft 25 February 2011

This version:
> http://www.w3.org/TR/2007/WD-SVGAdvancedGradientReqs-[DATE]/

Latest version:
> http://www.w3.org/TR/SVGAdvancedGradientReqs/

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Abstract

This document lists the design principles and requirements for the creation of an SVG specification related to Advanced Gradients.

Status of this Document

This is a W3C Working Draft for review by W3C Members and other interested parties. It is a draft document and may be updated, replaced or made obsolete by other documents at any time. It is inappropriate to use W3C Working Drafts as reference material or to cite them as other than "work in progress". A list of current W3C Recommendations and other technical documents, including Working Drafts and Notes, can be found at http://www.w3.org/TR/.

This is the first release of the SVG Advanced Gradient Requirements. It is expected that this document will progress through a number of working drafts, including "Last Call", before being published in final form.

This document was developed by the Scalable Vector Graphics (SVG) working group as part of the W3C Graphics Activity. The authors of this document are the SVG Working Group members.

Feedback on this document should be sent to the public mailing list of the SVG Working Group (list archives). To subscribe, send an email to www-svg-request@w3.org with the word subscribe in the subject line.

The latest information regarding patent disclosures related to this document is available on the Web. As of this publication, the SVG Working Group are not aware of any royalty-bearing patents they believe to be essential to SVG.

This section represents the status of this document at the time this version was published. It will become outdated if and when a new version is published. The latest status is maintained at the W3C.

Contents

1 Introduction

The SVG specification is a W3C recommendation that describes two-dimensional graphics in XML. There are currently two core SVG Recommendations; SVG 1.1 and SVG Tiny 1.2. SVG 1.1 was intially designed as a document format for print and web content publication, and as such supports many common graphical features for print and screen display. Similarly, SVG Tiny 1.2 was designed primarily for display of content for the web on mobile devices, and as such supports a smaller subset of graphical features. Industry, developer and community feedback has suggested a desire to extend some of the fetures available in SVG, in particular the gradient paint servers available to authors.

Currently the SVG 1.1 specification defines two types of gradient paint servers; Linear and Radial. Both gradient types allow a content author to define colour stops along a single gradient vector which produces a blend fill that may be used to paint graphical objects and text. Such gradients whilst being able to produce vibrant colours, are limited to a straight line and are thus unable to produce complex gradient effects. There exsits a need to define a gradient fill that allows designers to produce more complex life-like blends.

In response, the SVG Working Group has begun an investigation to develop a module to extend the gradient fill capabilities currently available in SVG. The current feeling within the SVG Working Group is that the advanced gradients will be a set of content requirements and conformance criteria that allow new gradient types to be defined to fill an object. It is very likely that there will be a set of new language features proposed which are required for the module. It is expected then, that some of these new features will be become part of the core SVG language and other modules that are built from SVG.

2 Terminology

The following key words and phrases used throughout this document are defined here for clarity. The terms Must, Should, and May are used to specify the extent to which an item is a requirement for the SVG working group in defining SVG. These recommendations should not be mistaken as a guide to implementors.

1. **'Must'** means that the item is an absolute requirement.
2. **'Should'** means that there may exist valid reasons in particular circumstances to

    ignore the item, but the full implications must be understood and carefully weighed before choosing a different course.

3. **'May'** means that item will be considered, but further examination is needed to determine if the item should be treated as a requirement.
4. **'SVG'** refers to SVG in general without reference to any version or profile.
5. **'SVG 1.0'** refers to the original SVG specification.
6. **'SVG 1.1'** refers to the 2nd edition version of the specification following the original version of SVG 1.0.
7. **'SVG 2'** refers to the next core release of SVG.
8. **'SVG Advanced Gradients'** refers to SVG Advanced Gradients, an SVG specification for Advanced Gradients.

3 Usage Scenarios

Advanced gradients specify colour variation in an image which blends smoothly to colours defined either along a curved path or at points distributed over two dimensions. The following usage scenarios illustrate some of the ways in which SVG Advanced Gradients might be used for various applications.

Pseudo 3D Advanced gradients could be used to produce advanced lighting effects that follow odd shaped surfaces produce pseudo 3D effects.

Naturalistic Images Advanced gradients could be used to produce a compact representation of realistic images such as skin tone.

Artistic Effects Advanced gradients could be used to produce fills that follow curved contours.

Compact representation A key reason for using advanced gradient technologies is to produce an increased range of gradient effects, where the file size of an image containing those gradient effects is much smaller than the file size of a similar bitmap image.

4 Special Considerations for Advanced Gradients

Memory and processor requirements Due to the complex effects that advanced gradients can produce, the feature may require significant memory and processing resources.

Implementation commitments Advanced gradients will provide the ability for the author to produce colour rich complex gradient fills. To support advanced gradients, implementations may need to add new algorithms to produce the correct gradient results. It is expected that specific details of the rendering algorithm will need to be defined; this may include the necessary steps an implementation will need to perform to implement the algorithm. Advanced gradients must be consistent with SVG's rendering and animation model to allow ease of integration with existing SVG implementations.

Ease of authoring To ensure consistency with SVG, advanced gradients should consider adopting existing SVG gradient features where applicable and extending the existing SVG gradient syntax where applicable. Additionally, the syntax structure of

advanced gradients should be defined such that the content can be read and hand-authored with relative ease.

5 Requirements

1. **General**
   1. SVG Advanced Gradients **must** be a separate module to the core profiles SVG Tiny 1.2 and SVG Full 1.1.
   2. Conformance criteria for SVG Advanced Gradients **must** be produced. The criteria **should** be separated into sections relevant to particular application types (eg. SVG files/document fragments, SVG generators, SVG viewers, etc.)
   3. Software or documents **must** pass the relevant criteria to be able to claim conformance to the particular application type.
   4. A conformance test suite **must** be developed for SVG Advanced Gradients. The test suite must be made publicly available. Conformance test suites for other uses of SVG Advanced Gradients (e.g. prepress guidelines) **may** be developed.
   5. A specification referencing SVG Advanced Gradients **must** declare if animations applies when an 'advanced gradient' chain is in its scope.
   6. The SVG Advanced Gradients alorgithm **must** be suitable for implementation in both software and hardware.

2. **Designer**
   1. SVG Advanced Gradients **must** allow the ability to contol how far the colour diffuses or spreads out.
   2. SVG Advanced Gradients **must** allow the ability to define colour stops and their position of intermediat colours in the blend.
   3. SVG Advanced Gradients **must** allow the ability to contol colour transparency in the same way colour can be controlled.
   4. SVG Advanced Gradients **should** use edges as the visual representation for authoring, for efficency of graphical editing operations by designers.
   5. If edges comprise SVG Advanced Gradients, SVG Advanced Gradients **must** be able to control the sharpness of the side of an edge.

3. **Scripting**
   1. A dynamic SVG Advanced Gradient viewer **must** support the SVG Advanced Gradient scripting feature set.

4. **Animation**
   1. A dynamic SVG Advanced Gradient viewer **must** support animation of all properties listed as animatable.

5. **Syntax**
   1. SVG Advanced Gradients **must** use a syntax that is compact.
   2. SVG Advanced Gradients **must** use a syntax that can be easily authored by hand.
   3. SVG Advanced Gradients **must** extend the existing SVG Gradient syntax where applicable.

6. Existing Specifications

1. SVG Advanced Gradients **must** make use of existing SVG Gradient features where applicable.
2. SVG Advanced Gradients **must** strive to achieve and maintain CSS compatibility where possible.

6 References

SVG 1.1

Scalable Vector Graphics (SVG) 1.1 Specification, Jon Ferraiolo, Jun Fujisawa, Dean Jackson, editors, W3C, 14 January 2003 (Recommendation). See http://www.w3.org/TR/SVG11/

SVG 1.1/1.2/2 Requirements

SVG 1.1/1.2/2.0 Requirements Document, Dean Jackson, editor, W3C, 22 April 2002. See http://www.w3.org/TR/SVG2Reqs/

Mobile SVG Profiles

Mobile SVG Profiles: SVG Tiny and SVG Basic, Tolga Capin, editor, W3C, 14 January 2003 (Recommendation). See http://www.w3.org/TR/SVGMobile

7 Author List

The authors of this specification are the participants of the W3C SVG Working Group.