SVG in GIS and Webmapping
Categories and examples

• **Spatial Databases**  Postgis, SpatiaLite

• **Desktop-GIS**  Quantum-GIS, GRASS, Autodesk Map3D, ESRI ArcGIS

• **Converters**  MapViewSVG, FME, gdal,

• **Commercial Webmap Services**  Google Maps

• **OS Webmap Services**  Mapserver, Geoserver, RIM/TimeMapperWMS

• **Smaller Webmapping projects**  Yosemite, Geofotos, etc.

• **Virtual Globes**  Google-Earth
AsSVG(): export of “raw” geometries:

d-attribute output for
• Polygon/Multipolygon
• Linestring/Multilinestring

circle (cx/cy) or use (x/y) output for
• Point/Multipolygon

semicolon separator for
• GeometryCollection
Spatial Databases: PostGIS

Optional:
- Relative path notation
- Nr of digits (accuracy reduction)

Can be combined with all other Postgis-Operators (e.g. Simplification, clipping, buffering, etc.)

see

http://postgis.refractions.net/documentation/manual-1.4/ST_AsSVG.html
Spatial Databases: SpatiaLite

- Spatial Extension for SQLite
- Same functionality as AsSVG() in Postgis

see: http://www.gaia-gis.it/spatialite/spatialite-sql-2.3.1.html
Desktop-GIS : Quantum-GIS

- SVG for definition of point-symbols
- SVG for importing graphics into map layouts (e.g. logos, map legends, north arrows, etc.); restricted to SVG tiny
- SVG for exporting map layouts (no clipping)
- Python-Plugins: SVG through qt and/or Webkit
Desktop-GIS : Quantum-GIS
Planned:

- SVG pattern support for polygon fills
- QGIS SVG Mapserver (will work with carto.net navigation tools and network requests): SVG layers or layer groups using symbolization from QGIS project files.
v.out.svg

exports GRASS vector data to SVG, incl. attributes

• converts to `<path/>` (line, boundary, area) and `<circle/>` (point, centroid) elements

• control of coordinate precision

Maybe Planned:

• Styling of the output

see http://grass.itc.it/grass64/manuals/html64_user/v.out.svg.html
or http://svg.cc/grass/index.html
Desktop-GIS: Autodesk Map3D

SVG “under the hood”, used in the storage of the display model for definition of:

- point symbols
- line symbols

mixed with other proprietary markup
Desktop-GIS : Autodesk Map3D

<Graphics>
<Path>
  <Geometry>M -471.333,-0.000 A 471.333,471.333 0 1 1 471.333,-0.000 A 471.333,471.333 0 1 1 -471.333,-0.000</Geometry>
  <FillColor>%COLORBYLAYERPFAW%</FillColor>
</Path>
<Path>
  <Geometry>M 471.333,-0.000 A 471.333,471.333 0 0 1 -471.333,-0.000 A 471.333,471.333 0 0 1 471.333,-0.000</Geometry>
  <LineColor>%COLORBYLAYERPFAW%</LineColor>
  <LineWeight>%LWBYLAYERBAW15%</LineWeight>
</Path>
<Path>
  <LineColor>ff000000</LineColor>
  <LineWeight>%LWBYLAYERBAW15%</LineWeight>
</Path>
</Graphics>
High-end commercial GIS system, part of large suite (ArcGIS) by ESRI

SVG (only) as output format for maps and graphs

SVG output has been present since v 8.1, not changed much since. Future unclear, ESRI does not publish development plans/roadmaps
Desktop-GIS: ArcMAP

• Quite good for the purpose it's for: static maps on webpages
  – maps are always exported as 'graphics' files, no geographic coordinates, just paper coordinates, no attributes, no interactivity

• SVG not very interoperable: things work/look different in different SVG viewers
Desktop-GIS : ArcMAP

• Font embedding ONLY works for label fonts. Fonts used in scale-bar, legends, etc. are NOT embedded automatically.

• Font-based marker symbols (common in ArcMap) do NOT work: Although the font IS embedded, the symbols are not correctly shown; Alternative option 'convert marker symbols to polygons', is good for most cases.
Convertors: MapViewSVG

- An extension for ESRI ArcMAP
  - commercial product from uisMedia
  - exports ArcGIS 8/9 data to SVG interactive websites via wizard interface
  - active development: just upgraded under new name Mappetizer (based on Dojo, also Silverlight export)
MapViewSVG

Limitations in ArcGIS - SVG conversion:

- not all datatypes
  - files and webservice (WMS, ArcIMS), NO ArcSDE and other DB connections
  - raster limited (imagery OK, discrete raster data limited)
- lots, but not all symbology/visualisations supported
- the output is a \textit{client-side} GIS-viewer, \textbf{not} a WebGIS!
  - limits possible data amounts
  - (spatial) data is stored client-side
Convertors: FME

- Mature and powerful (converts any format)
- Supports preservation of ids
- Supports embedding of attributes (no check for XML validity)
- Supports grouping/layering
- Supports mouse-events
- Supports styling and CSS
- Template support
- Supports gzip compression

http://docs.safe.com/fme/html/Readers Writers/ReadersWriters.htm#svg.htm
Convertors : shp2svg, gdal

- powerful, flexible (conversion from shp)
- supports preservation of ids
- supports embedding of attributes
- supports grouping/layering
- supports mouse-events
- supports styling and CSS
- supports absolute/relative coordinates
- supports viewBoxSCALE
- will be replaced by gdal/ogr (any format)

Commercial Webmap Services: Google Maps and Microsoft Virtual Earth
OS Webmap Services: Geoserver

- OS software server written in Java, publishes data from any major spatial data source using OGC open standards
- SVG is output for its Web Map Service:
  - static non-interactive maps from standardised service request GetMap
  - two renderers available:
    - fast & simple (only limited styling)
      → not so useful, low quality
    - full-featured & slower (uses Batik)
      → very complete implementation
    - both can compress (.svgz format)
OS Webmap Services: Mapserver

• OS software server written in C, publishes data from any major spatial data source using OGC open standards

• SVG is output for its Web Map Service:
  – static non-interactive maps from standardised service request GetMap
  – As of version 4.5, MapServer can output maps in SVG 1.1, as well as goSVG (an expanded SVG Tiny profile, part of the Japanese G-XML standard)
symbolisation somewhat limited:

- Linetype layers are drawn without symbols - only line thickness changes
- Polygon patterns not supported
- Only TRUETYPE fonts are supported

- can eliminate duplicate points and collinear lines when outputting SVG
- can compress (.svgz format)
both Geoserver & MapServer

• Pro: part of OGC service: SVG as output to numerous data sources and processes in a standardised, interoperable setup

• Con: SVG is limited to pure WMS 'picture only'
  → can be different: see Time/RIMapperWMS

• development takes place in open community
Smaller Webmapping projects

- Yosemite
- Geophotos
Virtual Globes : Google-Earth

• SVG in Information Bubbles (through Webkit (<iframe/>)
• Supports HTML/SVG/Canvas, etc. on the same level that Webkit supports SVG
• Supports SMIL animation and interactivity

Potential Improvements (not implemented):
• Support of SVG for Placemark Icons