Initial Investigations of SVG (Scalable Vector Graphics) at the Met Office

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Outline

- Vector Graphics History at the Met Office
- Current situation
- SVG Overview
- SVG and CGM
- Examples
- Current plans
- Future
- Some Issues
- Questions

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Vector Graphics History at the Met Office: Hardware

- 1970s: vector devices: IBM 2250, Calcomp paper & microfilm plotters
- 1980s: vector & raster devices: IBM 5080, IBM 3179G, Dec
- 1990s: Horace on HP Unix, Nimbus on WinNT
- Late 1990s: Web raster graphics: Gif, PNG, JPeg

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Vector Graphics History at the Met Office: Software

1970s:

- Unified Calcomp packages into one API
- MO plotter storage/interchange format

1980s:

- IBM 5080/Calcomp interface, Picturefile format,
- GKS API & CGM storage/interchange format introduced

1990s:

- GKS & CGM widespread in production

Late 1990s:

- Web mess

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Current situation

- Lots of vector graphics applications, products, expertise, systems
- Legacy software: Calcomp, GKS & CGM
- Industry support for GKS & CGM declining
- Web products raster based (Gif, PNG, Jpeg)
- Industry support for Web and XML increasing
- WebCGM too late, not a success

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CGM features

- Not well integrated with Web:
  - Plug-ins
  - Browser support
- Limited font support
- Hyperlinks only just supported
- Not XML
- Not ‘styleable’ in practice
- Complex, but unsophisticated, graphics
- Machine efficient

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SVG Overview (1)

- 2D graphics
- Integrated into Web
- XML based
- Full Unicode support (e.g. UTF-8)
- Good font support (fallbacks, embeddable & external)
- Hyperlinks
- Text is searchable, 'cut & paste'-able
- Human readable
- SMIL integrates multimedia (audio, video, animation)
- Retained primitives & structures (Dom) allows processing e.g.
  - Scripting (EcmaScript) Embedded or External
  - Style sheets (CSS1&2 example, XSLT example)
  - Validation against a schema (XSD)
- Zipped version defined (.svgz)

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SVG Overview (2)

- Open, published, vendor neutral, standard
- W3C Recommendation V1.0: 4 Sept 2001
- V1.1: 14 Jan 2003 modularises and adds profiles:
  - Full
  - Basic for PDA s
  - Tiny for phones
- V1.2 under development:
  - Sophisticated text flow
  - RCC: arbitrary XML -> SVG support

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SVG vs CGM

- ✓ Intersperse script and content
- ✓ Server or client processing
- ✓ Style sheets
- ✓ Very thin client
- ✗ Un-zoom on transform sometimes
- ✓ Plug-in support good (Adobe, Corel)
- ✓ Native browser and tools support developing
- ✓ SVG similar size to Clear Text CGM
- ✓ Zipped SVG similar size to Binary CGM

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What did we do (1)?

- Hand edited a Clear Text CGM into SVG
  - ASXX/FSXX
- Wrote a Perl script to do the same
- Tested script on completely different CGM s :
  - SIGWX chart
  - NCAR graphic (flat structure)
  - Plotted chart
- Lessons:
  - keep structure in metafile (e.g. coast polyline distinguished from isopleth polyline)
  - Pre-parse CGM into canonical form (e.g. UPPER case, Int./Real, white space)

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What did we do (2)?

- Put some structure back into operational CGM s
- Experimented with:
  - Style sheet styling
  - full range of Unicode
- Converted Daily Weather Report for Royal Meteorological Society
- Developed product for oil industry
  - Still converted to PNG
  - Can change product with style sheet

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Other Examples

- Simple: see the W3C Spec
- Met examples from O'Reilly textbook (XML & XLST)
- With JavaScript / EcmaScript
- With style sheets (CSS)
- With XSLT
- Developers Newsgroup http://groups.yahoo.com/group/svg-developers
- KNMI radar loop demo

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Current plans

- Do nothing?
- Re-engineer production chain
  - Incremental or big bang?
  - CGM / Perl conversion?
  - Native generation from Fortran/C/Visual Basic ?
  - Develop XML data streams for XSLT processing?

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Future

- Microsoft/Macromedia/ESRI attitude
- Niches:
  - Phones: √√
  - Unix/Linux: √
  - GIS √
  - Mac: ?
  - Win: ?? ‘Longhorn’ / ‘Avalon’ / XAML
- SVG V1.2 RCC: support for arbitrary XML -> SVG
- Adobe Plug-in V6 for SVG 1.2
- AOL? Corel?
- London SVG User Group 24 Nov, 18:00 (in a pub)

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Some Issues

- Industry support?
- Simple declarative graphics vs. scripting?
- Declarative vs. Procedural programming?
- Will XSD/XSLT based processing be good enough?

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¿ Questions ?

Thank you

Xie xie

Domo arigato

Merci

Danke

Gracias

Grazie

Ενχαριστώ

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