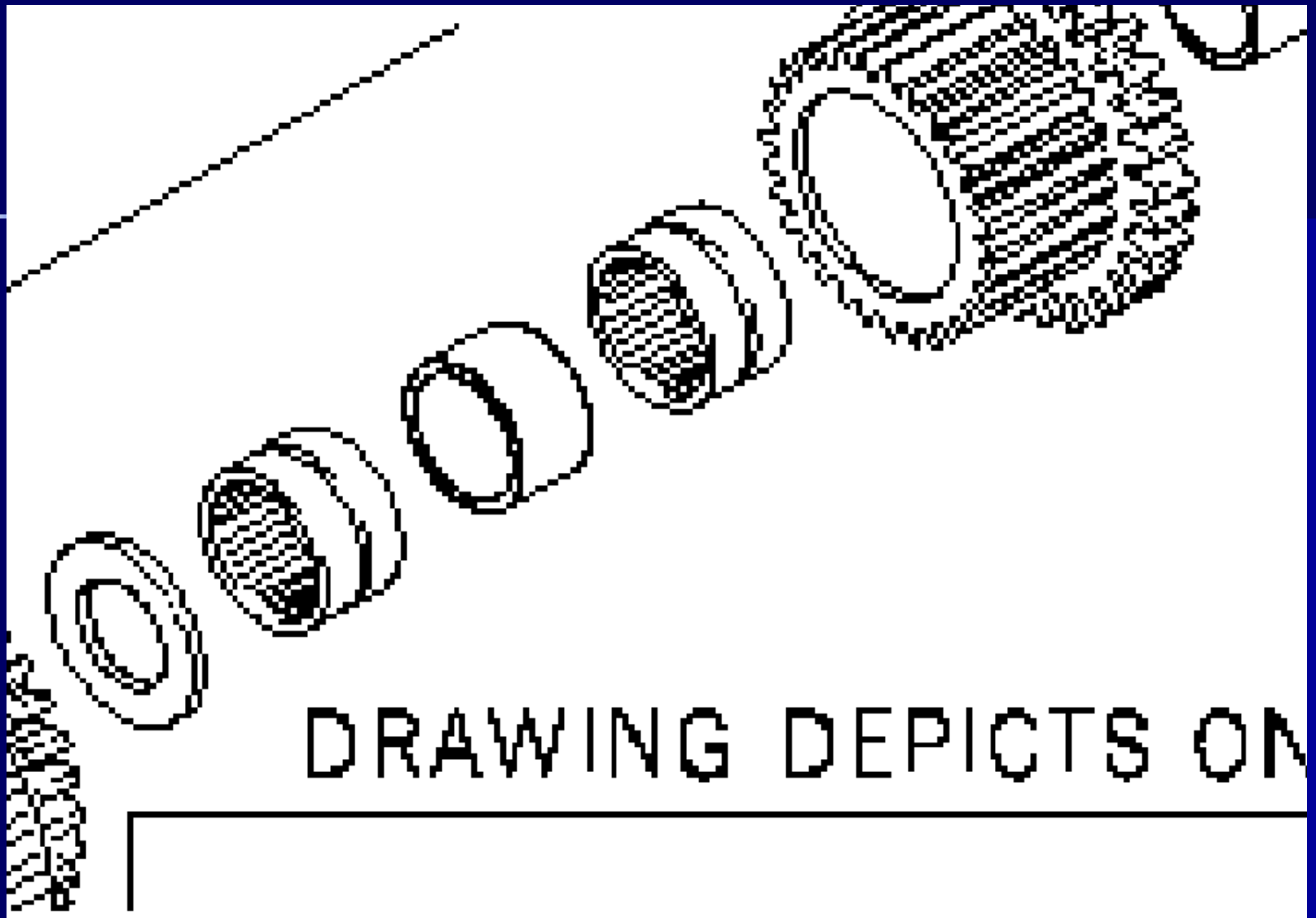# Web Vector Graphics CGM and SVG

Presented by Sharon Kadlec
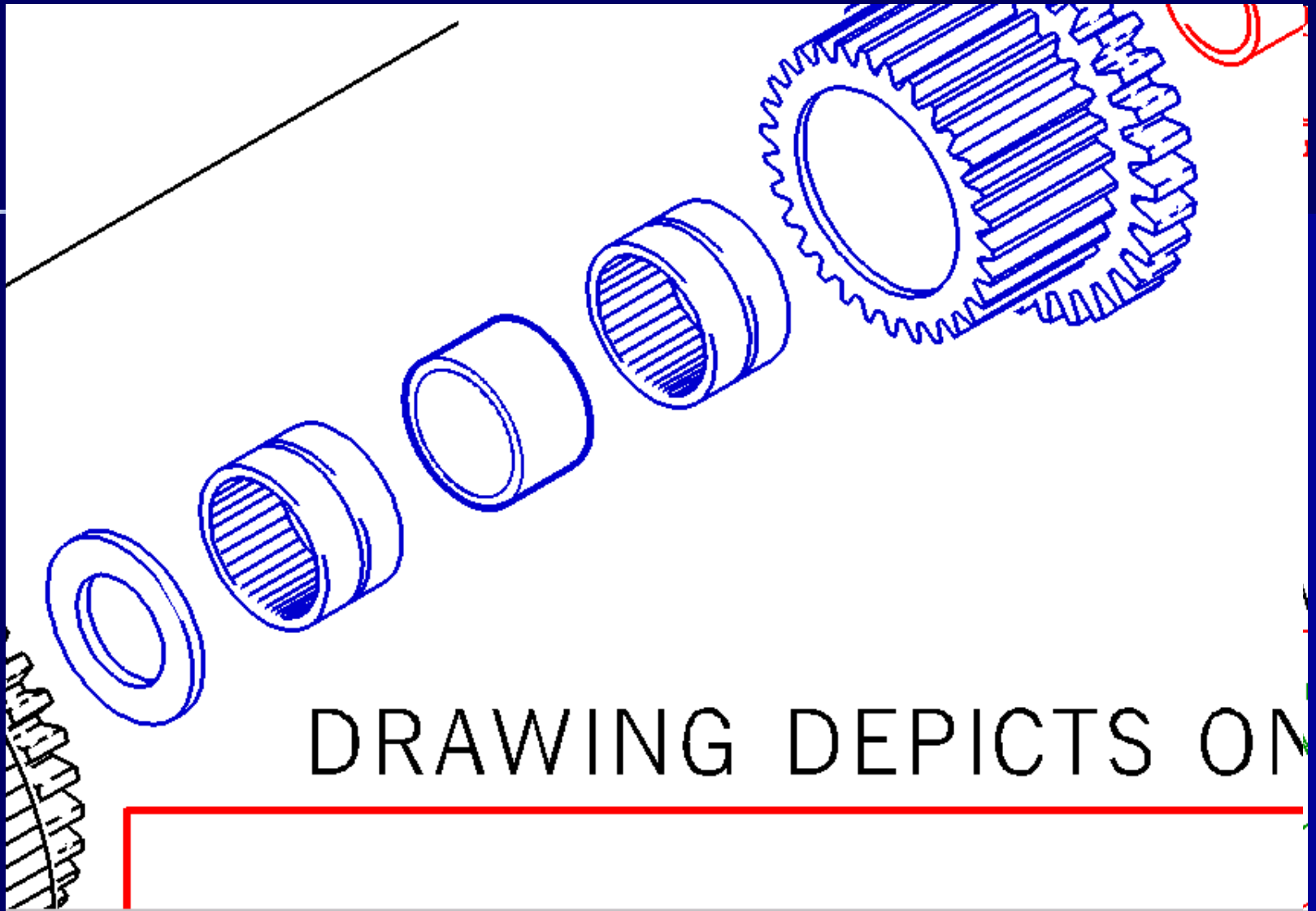
Formerly with Northwest Airlines, Publishing & Graphics Dev Support

Working Member of the ATA TICC, OTA, ebXML

Chair of TICC Graphic Style Standand

DRAWING DEPICTS ON

A real challenge for GIF and JPEG

DRAWING DEPICTS ON

A better way was needed - now there is one.

The Requirements

- Scalable
- Efficient
- Capable of being revised
- Object-addressable
- Able to be integrated with other Web content

Addressing the Need

- CGM Open Consortium

- SVG Working Group of W3C

Scalable Vector Graphics

- Designed for the Web by participants in W3C
- XML language with the ability to use styles (CSS and XSL), integrated with and dependent on various other XML standards
- Creative vector graphics that can include raster graphics
- Integrated, dynamic and animated web sites
- SVG Test Suite 3rd release Sept 2001

CompuGraphics Metafile for the Web

- Collaborative effort…
  - Requirements from W3C 1998
  - Technical work by CGM specialists
- Based on ATA profile GREXCHANGE 2.4
  - Remove unneeded, overly complex elements
- Changes and extensions for web usage
  - Additional definition of meta data
- Strict interoperability & conformance constraints

WebCGM Overview

- Format for vector & raster elements
- Fully developed and structured format
- Compact binary encoding for complex technical graphics
- Supported by CGM Open (www.cgmopen.org)
- Existing validation tools and conformance test suite

Status of WebCGM

- W3C recommendation since Jan. '99
- WebCGM 1.0 Second Release, Dec. 2001
- Several products have been released
- Interoperability demo (2nd) at XML 2001
- Ongoing development in CGMO
  - DOM
  - WebCGM 2.0

Status SVG

- Recommendation 4 September 2001
- Over twenty organizations, including Sun Microsystems, Adobe, Apple, IBM, and Kodak, have been involved in defining SVG.
- Many products released:-
  - Viewers, generators, editors
  - http://www.xml.com/pub/a/2001/11/21/svgtools.html

WebCGM & SVG Common Geometry

- Lines, polylines, polygons
- Rectangles, circles, ellipses, arcs
- Graphical text
- Closed figures and compound lines
- Polysymbols/Markers
- Smooth curves -- Piece-wise Bézier
- Raster images -- PNG, JPEG
- Clipping

WebCGM and SVG: Simple geometry

SVG:

```
<svg width="400" height="400">
  <g style="fill:none; stroke:green">
    <line x1="100" y1="300" x2="300" y2="100"
          style="stroke-width:5" />
  </g>
</svg>
```

CGM (text encoded):

```
BEGMF 'sample.cgm';
…
 BEGPIC 'Picture 1';
VDCEXT 0,400 400,0;
 …
 BEGPICBODY;
…
   LINECOLR 5;LINEWIDTH 0.5;LINETYPE 1;
   LINE 100,300 300,100;
 ENDPIC;
ENDMF;
```

What are the advantages?

Data-Driven Graphics

- Reduced maintenance costs
- Reduced development time

- Scalable server solutions
- Easily updated

Personalized Graphics

- One source, customized appearances
- Internationalization, localization
- Utilizing existing standards
- Tools support
- Color Specification

Interactive Graphics

- Improved end user experience
- Text is text, not a raster image of text
- CGM and SVG can create CGM and SVG, respectively

WebCGM & SVG Text

- All text is Unicode
- Graphical text
- Non-graphical text, e.g. screentips

Font descriptors
- WebCGM: basic 13 PostScript fonts
- other fonts with font properties allowed
- SVG: no predefined font, can download fonts or define SVG fonts

Vector Text Wrap

- This element <text:wrap> has four attributes
  - X coordinate
  - Y coordinate
  - Width
  - Style

WebCGM and SVG Hyperlinking

- ## Simple hyperlinks

- ```
  BEGAPS 'myID1' 'grobject' STLIST;
    APSATTR 'name' "14 1 'myObj1'";
    APSATTR 'linkuri' "14 3 'sample.cgm#id(myObj)' 'Click to
  display obj1' ''";
  BEGAPSBODY;
    POLYGON 30,50 70,50 70,15 30,15 30,50;
  ENDAPS;
  ```

- ```
  <g class='myObj1'>
    <title>'Click to display obj1'</title>
  ```
- ```
  <a id='myID1'
  xlink:href='sample.svg#xpointer(id(myObj))'>
    <polygon points='30,50 70,50 70,15 30,15 30,50'/>
  </a>
  </g>
  ```

- ## Link to view context

WebCGM & SVG Dynamics

- WebCGM
  - none (yet)
  - A lightweight DOM is being added
- SVG
  - rich declarative animation (SMIL)
  - comprehensive & fully functional DOM

WebCGM & SVG Other Links

- Link to symbols
- Link to gradients, filters, fonts, animation in SVG
- Location-independent naming
- Bidirectional links (essential to single sourcing)
- Links that can be specified and managed outside of documents to which they apply
- N-ary hyperlinks (e.g., rings, multiple windows)
- Aggregate links (multiple sources)
- Transclusion (the link target document appears to be part of the link source document)
- Attributes on links (link types)

Three Drawing Elements

- Within the <svg> element, there can be three basic types of drawing elements:
  - Text
  - Shapes
  - Paths

SVG Outermost Element

```
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE svg PUBLIC "-//W3C//DTD SVG
    20000303 Stylable//EN"
"http://www.w3.org/TR/2000/03/WD-SVG-
    20000303/DTD/svg-20000303-stylable.dtd">
<svg xml:space="preserve" width="5.5in"
    height=".5in">

...

</svg>
```

WebCGM & SVG compared

- WebCGM:
  - Profile of an established ISO standard
  - Communication and exchange in existing customer networks
  - Binary encoding, completely defined, "self contained"
  - No proprietary data

WebCGM & SVG compared

- SVG:
  - Complete new concept, from "scratch"
  - Creative graphics and design
  - Integrated, dynamic, animated web pages
  - xml-coded, stylable, dependent on other files, e.g. style sheets
  - Inclusion of any proprietary extensions possible in a different namespace

Comparison:

- Overlap in functionality
  - WebCGM $\Rightarrow$ SVG, conversion (almost) without losses
  - SVG $\Rightarrow$ WebCGM, potentially very lossy
- Archive CAD formats, not just drawings

Do SVG & WebCGM compete**?**

No.

Why not?

- SVG is suitable for high quality, creative graphics
  - Color requirements
  - Text / font requirements
  - Animation
  - Filter effects

Why not?

- WebCGM is suitable for technical graphics with long life cycle
  - Complexity / size requirements
  - Re-authoring capabilities
  - Interoperability requirements (lots of data exchange)
  - Alignment with industry standards (ATA, CALS)

So what?

- For a lot of files, SVG will be the better solution
- For a lot of files, WebCGM will be the better solution
- Expectations:
  - Both formats will coexist and complement each other

Things to watch out for

- Before you convert all of your files to SVG and/or WebCGM:
  - Check implementations for conformance
  - Watch out for restrictions when using files in current web browsers
  - This is not a Holy war, it is accepting diversity

Best of Breed or Best of Both?

- Spend time understanding your own needs
- There rarely is only one answer
- Don't turn off your critical faculties because something's a "standard"
- Pick and choose what suits your needs and that may mean there are two or three answers
- Don't tie standards into the core of your systems – allow the unique to exist on your turf
- Reserve the option to change your mind later

Here are some sites...

- www.xml.com

- www.cgmopen.com

- www.adobe.com/svg/overview

- wwws.sun.com/software/xml/developers/svg/

- http://lists.w3.org/Archives/Public/www-svg/2002May/0042.html

- http://www.kevlindev.com/tutorials/index.htm

THANK YOU FOR LISTENING