

## 11.3 Scalable Vector

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### Scalable Vector Graphics (SVG)

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### Graphics on the Web

- Pixel based images (gif, png, jpeg, ...)
- Fixed resolution
- Can be very large
- Original "information" is lost
  - difficult to add metadata
  - difficult to adapt to viewing environment
- Limited interaction (except for animated gifs and the like)
- Client/server side image maps for linking
  - clumsy, requires separate authoring tools
- Other, proprietary solutions
  - proprietary authoring tools, players, ...

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### What do we need?

- Vector graphics (i.e., describe geometry, not pixels)
  - resolution independent
  - keeps "content" information
  - but should allow the "inclusion" of, e.g., photographs
- Textual encoding (too)
  - searchable
  - easy to edit, add links, etc.
  - makes "programming by example" easy...
- Based on XML
  - to integrate with the rest of the Web

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### SVG

#### Scalable Vector Graphics (SVG):

- W3C Working Group was created in 1998
- Specification quite stable by 2000, with first implementations
- Updated version in 2001
  - inclusion of "mobile profiles"
- Work is continuing...

"SVG is the HTML for Graphics"

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### The basics are all there



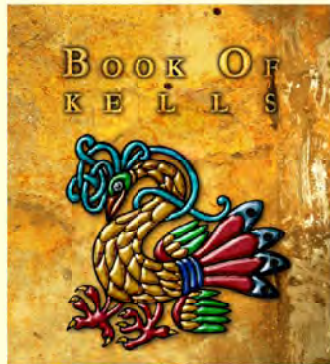
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### This is how you draw a simple duck

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE svg PUBLIC "-//W3C//DTD SVG 20010904//EN"
"http://www.w3.org/TR/2001/REC-SVG-20010904/DTD/svg10.dtd">
<svg width="600" height="300">
  <g transform="translate(10 10)">
    <g stroke="none" fill="lime">
      <path d="M 0.0 112 L 20 124 L 40 129 L 60 126 ...
      ...
    </path>
  </g>
</svg>
```



W3C™ But it may be more complex...



4 (21)

W3C™ ...it can be "animated"...



7 (21)

W3C™ ...and animated again...

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8 (21)

W3C™ ...image processing is available...

Convolution matrix over pixels  
`<filter id="blur">`  
`<feConvolveMatrix order="3" kernelMatrix="3 0 3 0 0 0 3 0 3"/>`  
`</filter>`  
`<image ... filter="url(#blur)">`



blurring matrix =  
 $\begin{bmatrix} 3 & 0 & 3 \\ 0 & 0 & 0 \\ 3 & 0 & 3 \end{bmatrix}$

sharpening matrix =  
 $\begin{bmatrix} -1 & -1 & -1 \\ -1 & 9 & -1 \\ -1 & -1 & -1 \end{bmatrix}$

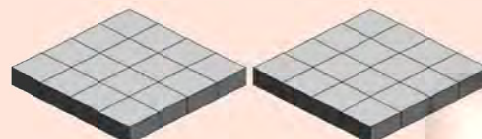
9 (21)

W3C™ ...all this can be animated together...



10 (21)

W3C™ ...and one can interact with it



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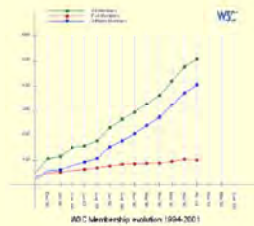
11 (21)

W3C Example: clock



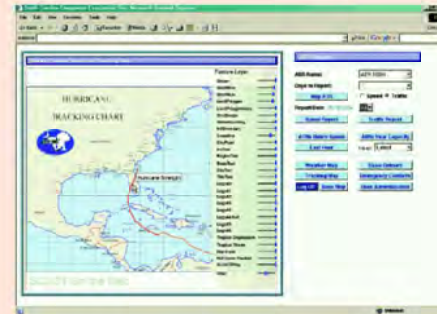
## W3C® Accessibility, Metadata

- Convey the meaning of a figure through text:
  - add *metadata* to the image describing the content
  - let a tool produce some *simple output* using the metadata
  - use a standard metadata formalism
- This can be done as a result of the smooth integration of SVG



## W3C® Real applications also emerge

- Example: South Carolina's Hurricane Evacuation Decision Support



## W3C® SVG on Mobile

- SVG has "smaller" versions: *Basic* and *Tiny*
- Has become *the* vector graphics tool for Mobiles
  - on Windows CE, Symbian, for J2ME...
  - a number of phones come with SVG built-in
  - integration browsers is also happening



## W3C® Lots of tools around

- Adobe's plugin for IE, Firefox, Opera, ...
- Firefox 1.5 has SVG *natively*
- Opera 8 has SVG Tiny *natively*
- Lots implementation of SVG Tiny on phones
  - around 80 different SVG aware mobile phone types
- Graphics editors (Sketsa)
- Drawing tools can often produce SVG (Adobe Illustrator, OpenOffice.org)
  - latest release of Illustrator can generate SVG Tiny, too
- See <http://svg.org/> for further links

## W3C® Thank you...

These slides:

<http://www.w3.org/2005/Talks/1110-Delhi-IH/>

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