11.3 Scalable Vector

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Scalable Vector Graphics (SVG)

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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"

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, ...

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
But it may be more complex...

...it can be "animated"...

...all this can be animated together...

...and one can interact with it
OK, all this looks great, but is it special?

- After all, there are other technologies that can do that...
- But: SVG is integrated
  - SVG is not a "technology island", but...
  - ...it is an XML application that is well integrated with the Web
- What this means is that:
  - SVG relies on a series of other specifications
  - XML tools (editors, parsers, validators) can be used directly
  - Some of the general XML concerns are valid to SVG, too
- It also has "social" benefits:
  - "Programming by example" becomes possible
    - one can inspect the SVG code directly
  - There is a vibrant SVG community out there!

### Example: Server Side generation

- General XML tools can generate images on the server side
  - If you know how to generate XML on the server...
    - ...you know how to generate SVG
- Example: W3C Organization diagram generated automatically...

### Example: Scripting (the DOM)

- If necessary, dynamic aspects of SVG can also be programmed
  - If you know how to (ECMA)script an HTML page...
    - ...you (almost) know how to script SVG!

### Scripts can be used for lots of things...

- Numerical calculations
- Access to some system resources (e.g., clock)
- Complex animation and/or interaction
  - complicated visual effects
  - need for the state of interaction
- Random features (e.g., random choice among alternatives)
- Client/server type applications
- Managing application data embedded in the SVG content

### Example: clock

```html
<svg onload="Start(event)" ... >
  ...
  function Start(evt)
    var now = new Date();
    clock01.adjustTime(now);
  }
```

### Internationalization

- English: Leading the Way to Full Potential
- Chinese: 引領未來全功率
- Danish: LEDER Vi Trough Mange Forener
- Dutch: Met WM kun je alles, iets hebben... en meer
- Finnish: Videoliittymätekniikkaa Web musta Dailakeväetettä
- French: Un lien vers un template de Web
- Greek: Προηγμένη τεχνολογία Internet
- Hebrew: אתרTomorrow שלאר עניין
- Portuguese: Não é um site, mas o site que pode ser!
- Spanish: PuenteWeb a la web hace personas
- Swedish: till MästarWeb är fullt potentiell
- Finnish: OmenaMiksei koti tuotantoon tässä
- Russian: The universal web for everyone
- Turkish: Bütün dünyayı sizi bekliyor
**Accessibility, Metadata**

- Convey the meaning of a figure through text.
- Add metadata to the image describing the content.
- Set a tool to produce some output using the metadata.
- Use a standard metadata formalism.
- This can be done as a result of the smooth integration of SVG

**Real Applications Also Emerge**

- Example: South Carolina's Hurricane Evacuation Decision Support

**SVG on Mobile**

- SVG has "smaller" versions: Basic and Tiny.
- It 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.

**Lots of Tools Around**

- Adobe's plugin for IE, Firefox, Opera, ...
- Firefox 1.5 has SVG natively.
- Opera 8 has SVG Tiny natively.
- Lots of 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](http://svg.org) for further links.