

Scalable Vector Graphics in SAS® 9.2

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Contents

- ✓ Vector and raster graphics
- ✓ Scalable Vector Graphics (SVG)
- ✓ SVG in SAS® 9.2
- ✓ Pros and cons

Vector and raster graphics

Introduction

- ✓ Two ways of describing computer graphics
- ✓ SVG is a vector graphic format
- ✓ When does using SVG make sense?

Vector and raster graphics

Raster graphics

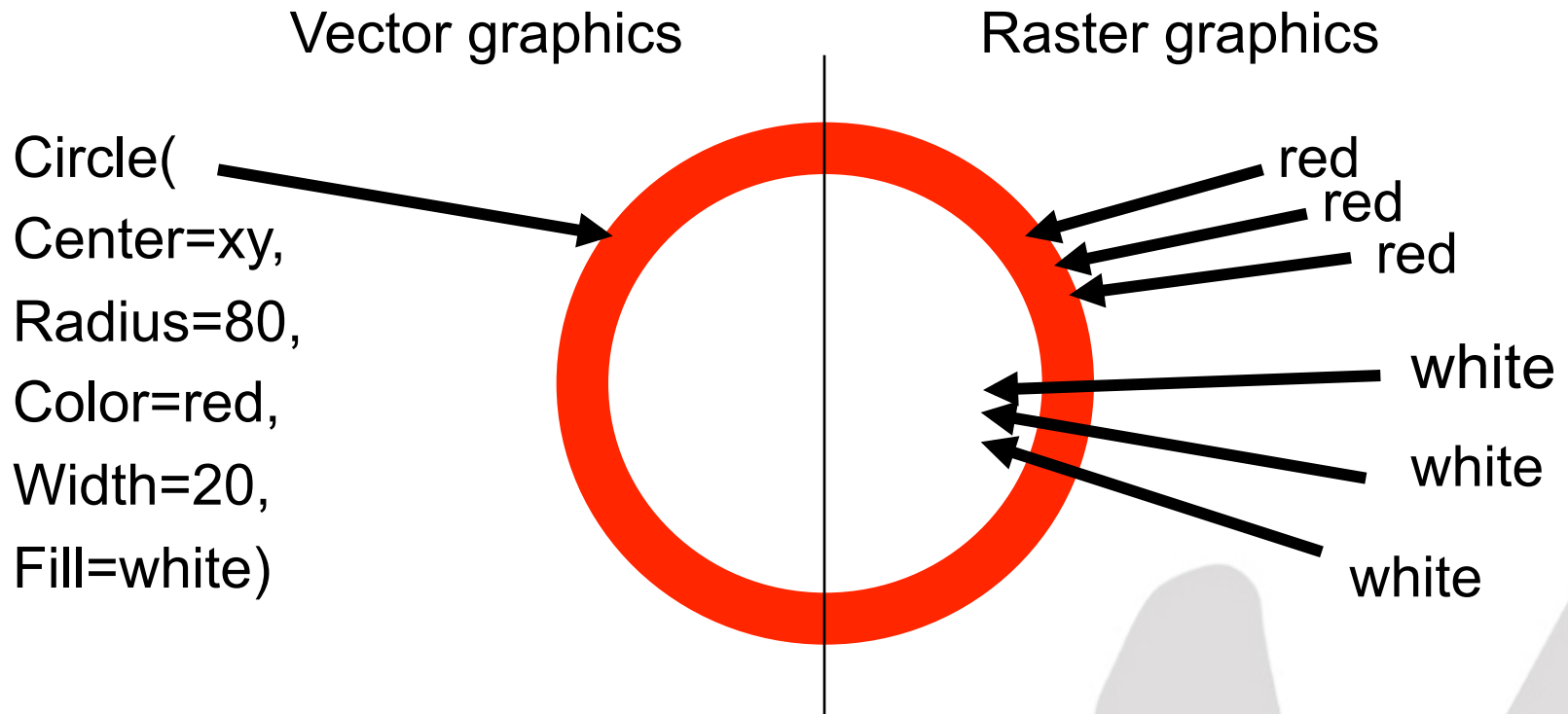
- ✓ Array of pixels
- ✓ Each pixel has a distinct color
- ✓ Same concept: Computer monitor
- ✓ Formats: JPEG, Bitmap and GIF

Vector and raster graphics

Vector graphics

- ✓ Based on geometric primitives (Circle, ...)
- ✓ Each primitive has multiple attributes (Center, ...)
- ✓ An interpreter is needed to display the graphic
- ✓ Formats: EPS, Macromedia Flash and SVG

Vector and raster graphics



Vector and raster graphics

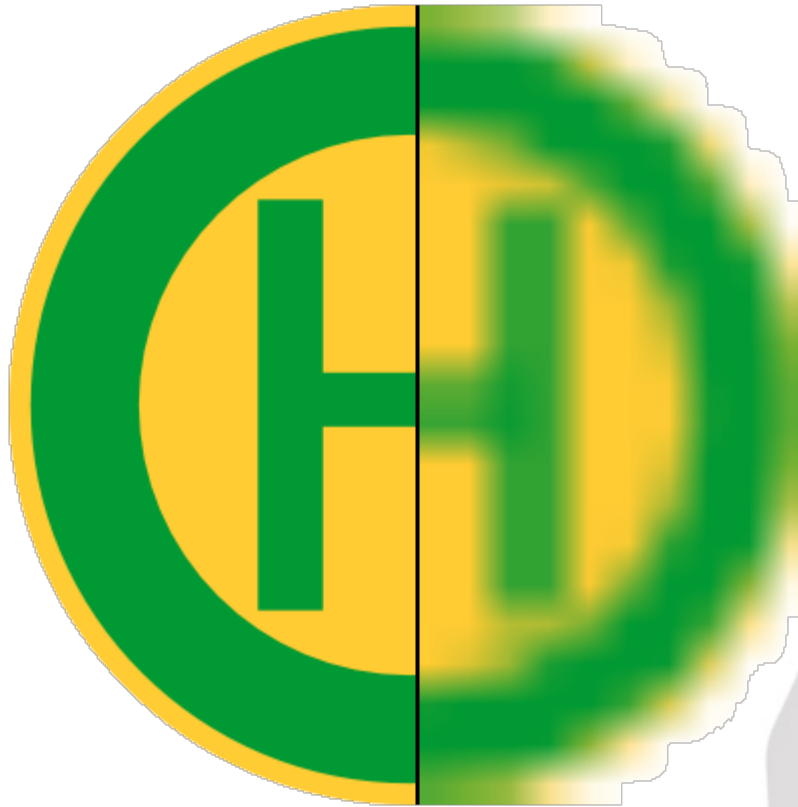
Scalability

- ✓ Scaling down: raster graphics lose information
- ✓ Scaling up: raster graphics duplicate pixels
- ✓ Scaling has no effect on vector graphics

Vector and raster graphics

Vector graphics

Raster graphics



Vector and raster graphics scaled up from 20x20 to
400x400 pixels

Vector and raster graphics

Summary

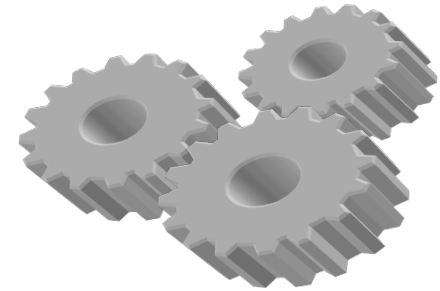
- ✓ Vector graphics
 - ✓ Better scalability
 - ✓ Less need for disk space
 - ✓ Simplistic graphics
- ✓ Raster graphics
 - ✓ Best choice for photo-realistic graphics

Scalable Vector Graphics (SVG)

General information

- ✓ W3C recommendation for 2D-vector graphics
- ✓ SVG was developed by Adobe Systems
- ✓ Most recent version is SVG 1.1

Scalable Vector Graphics (SVG)



Technical implementation

- ✓ SVG is XML-based
- ✓ Editable with any text editor
- ✓ SVG allows three types of graphic objects:
 - ✓ Vector graphics (<PATH>, <RECT>, <CIRCLE>, <ELLIPSE>, <LINE>, <POLYLINE> and <POLYGON>)
 - ✓ Raster graphics (<IMAGE>)
 - ✓ Text (<TEXT>)

Scalable Vector Graphics (SVG)

```
<svg xmlns="http://www.w3.org/2000/svg" version="1.1" width="500" height="400">
```

```
<rect x="0" y="210" width="300" height="240" fill="blue" />
```

```
<ellipse cx="280" cy="230" rx="190" ry="120" fill="yellow"/>
```

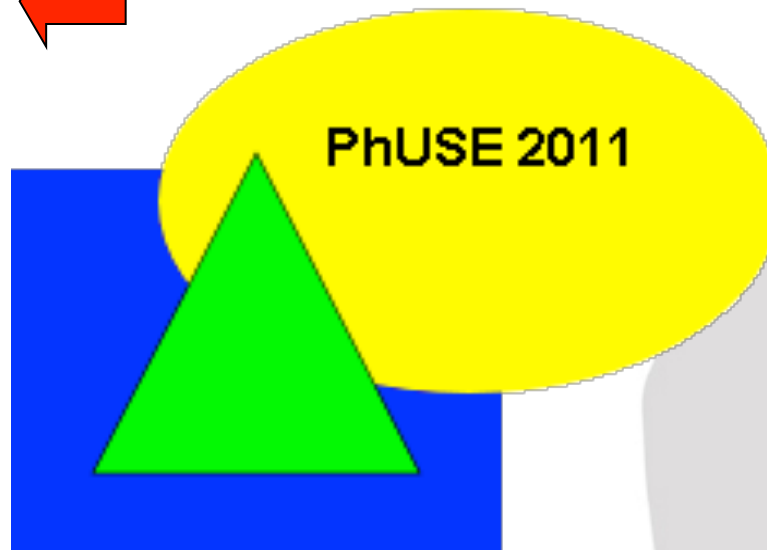
```
<path d="M150 200 L50 400 L250 400 Z" stroke="black" fill="lime" />
```

```
<text x="180" y="240" font-family="Arial" font-size="30">
```

```
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```

```
</text>
```

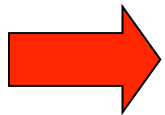
```
</svg>
```



Scalable Vector Graphics (SVG)

Browser support

Browser	SVG 1.1 support
Opera 11.01	95,44 %
Google Chrome 10	89,23 %
Safari 5.0	82,48 %
Mozilla Firefox 4.0	82,30 %
Mozilla Firefox 3.6	61,50 %
Internet Explorer 9	59,64 %
Internet Explorer 8 and older	none



Source and interpretation: <http://www.codedread.com/svg-support.php>

SVG in SAS® 9.2

Creating SVG graphics

- ✓ SVG graphics are device-based
- ✓ ODS Destination
- ✓ SAS/GRAPH procedure call

SVG in SAS® 9.2

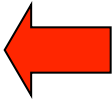
SVG devices

- ✓ SVG: SVG 1.1 graphics
- ✓ SVGT: SVG 1.1 graphics with transparent background
- ✓ SVGView: SVG 1.1 graphics with control buttons
- ✓ SVGZ: Compressed SVG 1.1 graphics

ODS Listing, Printer, HTML and PDF are available

SVG in SAS® 9.2

Example 1 – Multi-page graphics with control buttons

```
FILENAME fname "ae.svg";  
GOPTIONS GSFNAME=fname DEVICE=SVGVIEW;   
  
* Plot pie diagram for each SOC *;  
  
PROC GCHART DATA=ae;  
    PIE3D aename / TYPE=SUM SUMVAR=aecount GROUP=socname   
    PERCENT=INSIDE;  
  
RUN;  
QUIT;
```

SVG in SAS® 9.2

Example 2 – Transparency

```
ODS PRINTER FILE='switzerland.svg' PRINTER='SVGT';
```

```
* Plot transparent map *;
```

```
PROC GMAP DATA=maps.switzerl MAP=maps.switzerl;
```

```
  ID id;
```

```
  CHORO id / COUTLINE=YELLOW DES="";
```

```
RUN; QUIT;
```

```
* Plot transparent chart *;
```

```
PROC GCHART DATA = sashelp.demographics;
```

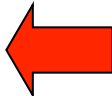
```
  VBAR name / TYPE=SUM SUMVAR=pop DES="";
```

```
  WHERE name IN ("SWITZERLAND" "AUSTRIA");
```

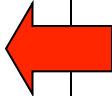
```
RUN; QUIT;
```

SVG in SAS® 9.2

Example 3 – Link and tooltip

GOPTIONS DEVICE=SVG; 

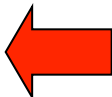
ODS LISTING CLOSE;

ODS HTML **FILE** = "satisfaction.htm" (**TITLE**="Satisfaction"); 

*** Plot barchart as SVG *;**

PROC GCHART **DATA** = svg1;

VBAR3D year / DISCRETE TYPE=SUM SUMVAR=result DES=""

HTML=html_var; 

RUN; QUIT;

ODS HTML CLOSE;

Pros and cons

- ✓ Only limited functionality in SAS® available
- ✓ Poor Internet Explorer support for SVG
- ✓ Support by text processing programs
 - ✓ MS Word ☹
 - ✓ Open Office
 - ✓ PDF
 - ✓ LaTeX
- ✓ Trading „nice to haves“ for essentials

Thank you for your attention!