

**NAME**

dvisvgm – converts DVI files to the XML-based SVG format

**SYNOPSIS**

**dvisvgm** [ *options* ] *file* [.dvi]

**DESCRIPTION**

The command-line utility **dvisvgm** converts DVI files, as generated by TeX/LaTeX, to the XML-based scalable vector graphics format SVG. Since the current SVG standard 1.1 doesn't specify multi-page graphics, **dvisvgm** creates separate SVG files for each DVI page. Because of compatibility reasons, only the first page is converted by default. In order to select a different page or arbitrary page sequences, use option **-p** which is described below.

**dvisvgm** should properly convert all pages that are made up of fonts and rules only. However, the utility also supports a couple of DVI extensions defined in terms of *DVI specials*. For a more detailed overview, see section **support of specials** below.

As SVG is a vector based graphics format, **dvisvgm** tries to convert the glyph outlines of all used fonts into scalable path descriptions. The fastest way to do that is to extract the path information from PFB (PostScript Type 1) files. So, if **dvisvgm** is able to find a PFB file for a required font, it will read the necessary information from this file.

TeX's main source for font descriptions is Metafont though, which produces bitmap output. That's why not all obtainable TeX fonts are available in PFB format. In these cases **dvisvgm** tries to vectorize Metafont's output (GF fonts) by tracing the glyph bitmaps. The results are not as perfect as most (manually optimized) PFB outlines but are nonetheless really nice in most cases.

**OPTIONS**

**-a, --trace-all**=[*retrace*]

This option forces dvisvgm to trace not only the actually needed glyphs but all glyphs of all bitmap fonts used in the DVI file. Since the tracing results are stored in the font cache, all following DVI conversions (without option **--trace-all**) where these fonts are involved, will be much faster. By default, dvisvgm traces only the actually needed glyphs and adds them to the cache. The boolean option *retrace* determines how to handle glyphs already stored in the cache. By default, these glyphs are skipped. Setting argument *retrace* to *yes* or *true* forces dvisvgm to trace the corresponding bitmaps again.

**Note**

This option only takes affect if font caching is active. Thus, **--trace-all** cannot be combined with option **--cache=none**.

**-b, --bbox**=*fnt*

Sets the bounding box of the generated graphic to the specified format. The parameter *fnt* takes either one of the format specifiers listed below, or a sequence of four comma- or whitespace-separated length values *x1*, *y1*, *x2* and *y2*. The latter define two diagonal corners of the bounding box. Each length value consists of a floating point number and an optional length unit (pt, bp, cm, mm, in, or pc). If the unit is omitted, TeX points (pt) are assumed.

It's also possible to give only one length value *l*. In this case the minimal bounding box is computed and enlarged by adding  $(-l, -l)$  to the upper left and  $(l, l)$  to the lower right corner.

Alternatively, the following format specifiers are supported:

### International DIN/ISO paper sizes

$A_n$ ,  $B_n$ ,  $C_n$ ,  $D_n$ , where  $n$  is a non-negative integer, e.g. A4 or a4 for DIN/ISO A4 format (210mm × 297mm).

### North American paper sizes

invoice, executive, legal, letter, ledger

### Special bounding box sizes

<b>dvi</b>	page size stored in the DVI file
<b>min</b>	computes the minimal/tightest bounding box
<b>none</b>	no bounding box is assigned

### Page orientation

The default page orientation for DIN/ISO and American paper sizes is *portrait*, i.e.  $width < height$ . Appending **–landscape** or simply **–l** to the format string switches to *landscape* mode ( $width > height$ ). For symmetry reasons you can also explicitly add **–portrait** or **–p** to indicate the default portrait format. Note that these suffixes are part of the size string and not separate options. Thus, they must directly follow the size specifier without additional blanks. Furthermore, the orientation suffixes can't be used with **dvi**, **min**, and **none**.

#### Note

Option **–b**, **–bbox** only affects the bounding box and does not transform the page content. Hence, if you choose a landscape format, the page won't be rotated.

### **–c, –scale=** $s_x[,s_y]$

Scales the page content horizontally by  $s_x$  and vertically by  $s_y$ . This option is equivalent to **–TS** $s_x,s_y$ .

### **–C, –cache[=dir]**

To speed up the conversion process of bitmap fonts, **dvisvgm** saves intermediate conversion information in cache files. By default, these files are stored in  $\$HOME/.dvisvgm/cache$ . If you prefer a different location, use option **–cache** to overwrite the default. Furthermore, it is also possible to disable the font caching mechanism completely with option **–cache=none**. If argument *dir* is omitted, dvisvgm prints the path of the default cache directory and some information about the stored fonts. Additionally, outdated and corrupted cache files are removed.

### **–color**

Enables colorization of messages printed during the conversion process.

### **–e, –exact**

If this option is given, dvisvgm computes the precise bounding box of each character. By default, the values stored in the font's TFM file are used to determine a glyph's extent. As these values are intended to realize optimal character placements and are not designed to represent the exact dimensions, they don't necessarily correspond with the bounds of the visual glyphs. Thus, width and/or height of some glyphs may be larger than the respective TFM values. As a result, this can lead to clipped characters at the bounds of the SVG graphic. With option **–exact**, dvisvgm analyzes the actual shape of each character and derives a usually tight bounding box.

**-h, --help**

Prints a short summary of all available command-line options.

**--libgs=filename**

This option is only available if the Ghostscript library is not directly linked to dvisvgm and PostScript support was not completely disabled during compilation. In this case, dvisvgm tries to load the shared GS library dynamically during runtime. By default, it expects the library's name to be libgs.so (on Unix-like systems) or gsdll32.dll (Windows). Option **--libgs** can be used to give a different name. Alternatively, the GS library name can also be set by the environment variable **LIBGS**. The latter has less precedence than the command-line option.

**-l, --list-specials**

Prints a list of registered special handlers and exits. Each handler processes a set of special statements belonging to the same category. The categories are usually identified by the prefix of the special statements. It's usually a leading word separated from the rest of the statement by a colon or a blank, e.g. *color* or *ps*.

**--keep**

Disables the removal of temporary files as created by Metafont (usually .gf, .tfm, and .log files).

**-m, --map-file=file**

Sets the map file used to look up font names and encodings. **dvisvgm** does not provide its own map file but tries to use available ones coming with **dvips** or **dvipdfm**. If option **-m** is not given, **dvisvgm** looks for ps2pk.map, dvipdfm.map, and psfonts.map (in this order). Without further options, the file specified by option **-m** will be used instead of the default maps. If you want **dvisvgm** to load the given file additionally to the default maps, add a leading + to the file/path, e.g. **--map-file=+myfonts.map**. For further information about the file format, see the manuals of **dvips** and **dvipdfm**.

**-M, --mag=factor**

Sets the magnification factor applied in conjunction with Metafont calls prior tracing the glyphs. The larger this value the better the tracing results. Nevertheless, large magnification values can cause Metafont arithmetic errors due to number overflows. So, use this option with care. The default setting usually produces nice results.

**-n, --no-fonts[=variant]**

If this option is given, **dvisvgm** doesn't create SVG font elements but uses paths instead. The resulting SVG files tends to be larger but concurrently more compatible with most applications that don't support SVG fonts yet. The optional argument *variant* selects the method how to substitute fonts by paths. Variant 0 creates *path* and *use* elements. Variant 1 creates *path* elements only. Option **--no-fonts** implies **--no-styles**.

**-S, --no-specials[=names]**

Disable processing of special commands embedded in the DVI file. If no further parameter is given, all specials are ignored. To selectively disable sets of specials, an optional comma-separated list of names can be appended to this option. A *name* is the unique identifier referencing the intended special handler. Option **--list-specials** lists all currently available handlers and their names. All unsupported special statements are silently ignored.

**--no-styles**

By default, **dvisvgm** uses CSS styles and class attributes to reference fonts because it's more

compact than repeatedly set the complete font information in each text element. However, if you prefer direct font references, the default behavior can be disabled with option

**--no-styles.**

**--no-mktexmf**

Suppresses the generation of missing font files. If **dvisvgm** can't find a font file through the kpathsea lookup mechanism, it calls the external tools mktexfm or mktexmf by. This option disables these calls.

**-o, --output=pattern**

Sets the name pattern of the output file. Parameter *pattern* is a string that may contain the variables **%f** and **%p**. **%f** stands for the base name of the DVI file, i.e. the DVI filename without suffix, and **%p** is the current page number. By default, the pattern is **%f-%p.svg** if the DVI file consists of more than one page, and **%f.svg** otherwise. That means, a DVI file *foo.dvi* is converted to *foo.svg* if *foo.dvi* is a single-page document. Otherwise, multiple SVG files *foo-01.svg*, *foo-02.svg*, etc. are produced. In Windows environments, the percent sign indicates dereferenced environment variables, and must therefore be protected by a second percent sign, e.g. **--output=% %f-% %p**.

**-p, --page=ranges**

This option sets the pages to be processed. Parameter *ranges* consists of a comma-separated list of single page numbers and/or page ranges. A page range is a pair of numbers separated by a hyphen, e.g. 5–12. Thus, a page sequence might look like this: 2–4,6,9–12,15. It doesn't matter if a page is given more than once or if page ranges overlap. **dvisvgm** always extracts the page numbers in ascending order and converts them only once. In order to stay compatible with previous versions, the default page sequence is 1. **dvisvgm** therefore converts only the first page and not the whole document in case option **--page** is not given. Usually, page ranges consist of two numbers denoting the first and last page to be converted. If the conversion is to be started at page 1, or if it should continue up to the last DVI page, the first or second range number can be omitted, respectively. Example: **--page=--10** converts all pages up to page 10, **--page=10–** converts all pages starting with page 10. Please consider that the page values don't refer to the page numbers printed on the page. Instead, the physical page count is expected, where the first page always gets number 1.

**-P, --progress[=delay]**

Enables a simple progress indicator shown when time-consuming operations like PostScript specials are processed. The indicator doesn't appear before the given delay (in seconds) has elapsed. The default delay value is 0.5 seconds.

**-r, --rotate=angle**

Rotates the page content clockwise by *angle* degrees around the page center. This option is equivalent to **-TRangle**.

**-s, --stdout**

Don't write the SVG output to a file but redirect it to **stdout**.

**-t, --translate=tx[,ty]**

Translates (moves) the page content in direction of vector (*tx,ty*). This option is equivalent to **-TTtx,ty**.

**-T, --transform=commands**

Applies a sequence of transformations to the SVG content. Each transformation is described by a *command* beginning with a capital letter followed by a list of comma-separated

parameters. Following transformation commands are supported:

**T**  $tx[,ty]$

Translates (moves) the page in direction of vector  $(tx,ty)$ . If  $ty$  is omitted,  $ty=0$  is assumed. The expected unit length of  $tx$  and  $ty$  are TeX points (1pt = 1/72.27in). However, there are several constants defined to simplify the unit conversion (see below).

**S**  $sx[,sy]$

Scales the page horizontally by  $sx$  and vertically by  $sy$ . If  $sy$  is omitted,  $sy=sx$  is assumed.

**R**  $angle[,x,y]$

Rotates the page clockwise by  $angle$  degrees around point  $(x,y)$ . If the optional arguments  $x$  and  $y$  are omitted, the page will be rotated around its center depending on the chosen page format. When option **-bnone** is given, the rotation center is origin  $(0,0)$ .

**KX**  $angle$

Skews the page along the  $x$ -axis by  $angle$  degrees. Argument  $angle$  can take any value except  $90+180k$ , where  $k$  is an integer.

**KY**  $angle$

Skews the page along the  $y$ -axis by  $angle$  degrees. Argument  $angle$  can take any value except  $90+180k$ , where  $k$  is an integer.

**FH**  $[y]$

Mirrors (flips) the page at the horizontal line through point  $(0,y)$ . Omitting the optional argument leads to  $y=h/2$ , where  $h$  denotes the page height (see *pre-defined constants* below).

**FV**  $[x]$

Mirrors (flips) the page at the vertical line through point  $(x,0)$ . Omitting the optional argument leads to  $x=w/2$ , where  $w$  denotes the page width (see *pre-defined constants* below).

**M**  $m1,...,m6$

Applies a transformation described by the  $3\times 3$  matrix  $((m1,m2,m3),(m4,m5,m6),(0,0,1))$ , where the inner triples denote the rows.

**Note**

All transformation commands of option **-T**, **--transform** are applied in the order of their appearance. Multiple commands can optionally be separated by spaces. In this case the whole transformation string has to be enclosed in double quotes. All parameters are expressions of floating point type. You can either give plain numbers or arithmetic terms combined by the operators  $+$  (addition),  $-$  (subtraction),  $*$  (multiplication),  $/$  (division) or  $\%$  (modulo) with common associativity and precedence rules. Parentheses may be used as well.

Additionally, some pre-defined constants are provided:

**ux** horizontal position of upper left page corner in TeX point units

- uy** vertical position of upper left page corner in TeX point units
- h** page height in TeX point units (0 in case of **-bnone**)
- w** page width in TeX point units (0 in case of **-bnone**)

Furthermore, you can use the length constants **pt**, **mm**, **cm** and **in**, e.g. 2cm or 1.6in. Thus, option **-TT1in,0R45** moves the page content 1 inch to the right and rotates it by 45 degrees around the page center afterwards.

For single transformations you can also use options **-c**, **-t** and **-r**. Note that the order in which these options are given is not significant, i.e. you can't use them to describe transformation sequences. They are simply independent shorthand options for common transformations.

## SUPPORT OF SPECIALS

**dvisvgm** supports several sets of *special commands* that can be used to enrich DVI files with additional features, like color, graphics or hyperlinks. The evaluation of special commands is delegated to various handlers. Each handler is responsible for all special statements of the same command set, i.e. commands beginning with the same prefix. To get a list of actually provided special handlers, use option **--list-specials** (see above).

### bgcolor

Special statement for changing the background/page color. Since SVG 1.1 doesn't support background colors, **dvisvgm** inserts a rectangle of the chosen color. In the current version, this rectangle always gets the size of the minimal bounding box. This command is part of the color special set but is handled separately in order to let the user turn it off. For an overview of the command syntax, see the documentation of **dvips**, for instance.

### color

Statements of this command set provide instructions to change the text/paint color. For an overview of the exact syntax, see the documentation of **dvips**, for instance.

### dvisvgm

**dvisvgm** offers its own small set of specials. The following list gives a brief overview.

#### **dvisvgm:raw** *text*

Adds an arbitrary sequence of characters to the SVG output. **dvisvgm** does not perform any validation here, thus the user has to ensure that the resulting SVG is still valid. Parameter *text* may contain the macros **{?x}**, **{?y}**, and **{?color}** that are expanded to the current *x* or *y* coordinate and the current color, respectively. Also, macro **{?nl}** expands to a newline character.

#### **dvisvgm:img** *width height file*

Creates an image element at the current graphic position referencing the given file. JPEG, PNG, and SVG images can be used here. However, **dvisvgm** does not check the file format or the file name suffix. The lengths *width* and *height* must be given as plain floating point numbers in TeX point units (1in = 72.27pt).

#### **dvisvgm:bbox** *n[ew] name*

Defines or resets a local bounding box called *name*. The name may consist of letters

and digits. While processing a DVI page, dvisvgm continuously updates the (global) bounding box of the current page in order to determine the minimal rectangle containing all visible page components (characters, images, drawing elements etc.) Additionally to the global bounding box, the user can request an arbitrary number of named local bounding boxes. Once defined, these boxes are updated together with the global bounding box starting with the first character that follows the definition. Thus, the local boxes can be used to compute the extent of parts of the page. This is useful for scenarios where the generated SVG file is post-processed. In conjunction with special `dvisvgm:raw`, the macro `{?bbox name}` expands to the four values  $x$ ,  $y$ ,  $w$ , and  $h$  (separated by spaces) specifying the coordinates of the upper left corner, width, and height of the local box *name*. If box *name* wasn't previously defined, all four values equal zero.

**dvisvgm:bbox** *width height [depth]*

Updates the bounding box of the current page by embedding a virtual rectangle ( $x$ ,  $y$ , *width*, *height*) where the lower left corner is located at the current DVI drawing position ( $x$ ,  $y$ ). If the optional parameter *depth* is specified, dvisvgm embeds a second rectangle ( $x$ ,  $y$ , *width*,  $-depth$ ). The lengths *width*, *height* and *depth* must be given as plain floating point numbers in TeX point units (1in = 72.27pt). Depending on size and position of the virtual rectangle, this command either enlarges the overall bounding box or leaves it as is. It's not possible to reduce its extent. This special should be used in conjunction with **dvisvgm:raw** in order to update the viewport of the page properly.

**dvisvgm:bbox** a[bs]  $x1\ y1\ x2\ y2$

This variant of the `bbox` special updates the bounding box by embedding a virtual rectangle ( $x1, y1, x2, y2$ ). The points ( $x1, y1$ ) and ( $x2, y2$ ) denote two diagonal corners of the rectangle given in TeX point units.

**dvisvgm:bbox** f[ix]  $x1\ y1\ x2\ y2$

This variant of the `bbox` special assigns an absolute (final) bounding box to the resulting SVG. After executing this command, dvisvgm doesn't further alter the bounding box coordinates, except this special is called again later. The points ( $x1, y1$ ) and ( $x2, y2$ ) denote two diagonal corners of the rectangle given in TeX point units.

The following TeX snippet adds two raw SVG elements to the output and updates the bounding box accordingly:

```
\special{dvisvgm:raw <circle cx='{?x}' cy='{?y}' r='10' stroke='black' fill='red'/>}
\special{dvisvgm:bbox 20 10 10}

\special{dvisvgm:raw <path d='M50 200 L10 250 H100 Z' stroke='black' fill='blue'/>}
\special{dvisvgm:bbox abs 10 200 100 250}
```

**em**

These specials were introduced with the emTeX distribution by Eberhard Mattes. They provide line drawing statements, instructions for embedding MSP, PCX, and BMP image files, as well as two PCL commands. **dvisvgm** supports only the line drawing statements and ignores all other em specials silently. A description of the command syntax can be found in the DVI driver documentation coming with emTeX (see CTAN).

**ps**

The famous DVI driver **dvips** introduced its own set of specials in order to embed PostScript code into DVI files, which greatly improves the capabilities of DVI documents. One aim of **dvisvgm** is to completely evaluate all PostScript snippets and to convert a large amount of it to SVG. However, in contrast to **dvips**, **dvisvgm** uses floating point arithmetics to compute the precise position of each graphic element, i.e. it doesn't round the coordinates. Therefore, the relative locations of the graphic elements may slightly differ from those computed by **dvips**.

Since PostScript is a rather complex language, **dvisvgm** does not try to implement its own PostScript interpreter but relies on Ghostscript instead. If the Ghostscript library was not linked while building dvisvgm, it is looked up and dynamically loaded during runtime. In this case, dvisvgm looks for *libgs.so* on Unix-like systems, and for *gsdll32.dll* on Windows. You can override these default file names with the environment variable LIBGS. The library must be installed and must be reachable through the ld search path (\*nix) or the PATH environment variable (Windows). If it cannot be found, the evaluation of PostScript specials is disabled. Use option **--list-specials** to check whether PS support is available, i.e. the entry *ps* is present.

### tpic

The TPIC special set defines instructions for drawing simple geometric objects. Some LaTeX packages, like eepic and tplot, use these specials to describe graphics.

## EXAMPLES

dvisvgm file

Converts first page of *file.dvi* to *file.svg*.

dvisvgm -z file

Converts first page of *file.dvi* to *file.svgz* with default compression level 9.

dvisvgm -p5 -z3 -ba4-l -onewfile file

Converts fifth page of *file.dvi* to *newfile.svgz* with compression level 3. The bounding box is set to DIN/ISO A4 in landscape format.

dvisvgm --transform="R20,w/3,2h/5 T1cm,1cm S2,3" file

Converts first page of *file.dvi* to *file.svg* where three transformations are applied.

## ENVIRONMENT

**dvisvgm** uses the **kpathsea** library for locating the files that it opens. Hence, the environment variables described in the library's documentation influence the converter.

If dvisvgm was linked without the Ghostscript library, and if PostScript support has not been disabled, the shared Ghostscript library is looked up during runtime. The environment variable LIBGS can be used to specify path and file name of the library.

The pre-compiled Windows version of **dvisvgm** requires a working installation of MiKTeX 2.7 or above. To enable evaluation of PostScript specials, the original Ghostscript DLL must be



present and reachable through the search path.

## FILES

The location of the following files is determined by the kpathsea library. To check the actual kpathsea configuration you can use the **kpsewhich** utility.

<b>*.enc</b>	Font encoding files
<b>*.fgd</b>	Font glyph data files (cache files created by dvisvgm)
<b>*.map</b>	Font map files
<b>*.mf</b>	Metafont input files
<b>*.pfb</b>	PostScript Type 1 font files
<b>*.pro</b>	PostScript header/prologue files
<b>*.tfm</b>	TeX font metric files
<b>*.ttf</b>	TrueType font files
<b>*.vf</b>	Virtual font files

## SEE ALSO

**tex(1)**, **mf(1)**, **mktexmf(1)**, **grodv(1)**, **potrace(1)**, and the **kpathsea library** info documentation.

## RESOURCES

Project home page

<http://dvisvgm.sourceforge.net>

SourceForge project site

<http://sourceforge.net/projects/dvisvgm>

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