PostScript Antialiasing

Overview

Antialiasing is a configurable feature that enhances Post-Script images by rendering them at high resolutions to improve the appearance of text and vector graphics in the final printed image. By smoothing the edges of text and vector graphics, antialiasing makes the printed output appear to have better than the 300 dots-per-inch resolution of the printer. Antialiasing is configurable on a per-user basis. Users may choose the level of antialiasing according to their image quality and print speed requirements.

PostScript Rendering

PostScript is an image format that stores image data as a set of drawing commands in which the graphics and text are mathematically described. This form of image coding is known as "vector graphics". When printing a PostScript image, the printer first interprets the drawing commands by drawing or "rendering" the image in memory at the desired resolution. This converts the image to dots or "pixels" of varying intensities and colors. The pixel data is then transferred to output hardcopy. The software that performs the rendering operation is known as a "RIP" (Raster Image Processor) engine, and it is part of the PostScript interpreter built into the printer.

PostScript produces excellent image quality since it allows images to be scaled up or down to any size with perfect precision. However, PostScript is limited by the printer's physical resolution. Even at 300 dpi, lines and text drawn on the printer will have noticeable jaggies or "aliasing" because the image had to be pixelized prior to printing. As a result, edges will not appear perfectly smooth in print.

PostScript and Antialiasing

To correct for the jagged edges in text and vector graphics, the printer performs a process known as "antialiasing". This is done by rendering the image in memory at several times the printer resolution. PostScript allows this to be done with perfect precision. The rendered image is then reduced to 300 dpi using a special antialiasing algorithm. This helps retain more of the original image information than would normally be included if rendered directly at 300 dpi. The result is that jagged edges are replaced by smoother edges containing pixels of various intensities. The results can be dramatic. Even though the image is still printed on a 300 dpi printer, the antialiased text and vector graphics give the impression that the printer resolution is much greater.

Note that PostScript can also contain pixel-mapped components. This data is not mathematically described and may or may not be improved by antialiasing. The deciding factors are how big the original pixel map is and the final size of the image on the printed page. High resolution pixel maps, such as those with greater than 600 dpi, will often be enhanced by antialiasing.

Antialiasing Levels

The printer offers a choice of antialiasing levels: None, Better and Best. These are discussed below:

1. **None**
    This setting turns off antialiasing so that raw PostScript output is printed. Since no antialiasing is performed, this setting results in the fastest print times. Edges of text and vector graphics will be somewhat jagged due to the 300 dpi resolution of the printer.

2. **Better**
    This setting provides a trade-off between performance and print speed. It produces excellent output that is visually equivalent to 600 dpi and requires moderate processing time. This is the default setting on the printer.

3. **Best**
    This setting produces superior output that is visually equivalent to 1200 dpi. The "best" setting also requires the greatest processing time. This setting is suggested for high quality, final hardcopy.

Specifying the Antialiasing Level

The printer antialiasing level can be specified in two ways. First, the printer default level may be set using the printer's front panel. Secondly, users may set their individual antialiasing preferences on the printer by sending a text file to Logical Device 0. These two methods are summarized below.

1. Setting Printer Default Antialiasing Level

Setting the antialiasing level through the printer's front panel specifies the **printer default level**. This default level is used for any users who have not stored a personal settings file on the printer. The level is entered into the printer as follows:

With the front panel displaying the READY message, press the **SETUP** button. Press the **<down-arrow>** button

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until the IMAGE menu is displayed, and then press **SETUP**. Again cycle through the selections until the ANTIALIAS item is displayed and press **SETUP**. Using the **<up-arrow>** and **<down-arrow>** keys, select the desired antialiasing level, either NONE, BETTER or BEST, and then press **SETUP**. Finally, cycle through the menu items until EXIT is displayed, and press **SETUP**. Finally, cycle through the menu items until EXIT is displayed and press **SETUP**.

The front panel menu hierarchy just described is summarized below:

READY → IMAGE → ANTIALIAS → *default_level*

Where *default_level* is one of the available antialiasing levels described above.

2. Setting Personal Antialiasing Preference

Users may store a file on the printer specifying their personal image processing preferences. The file must be a plain text file. To specify the antialiasing level, first create a file with the following text:

ANTIALIAS *level*

Where *level* is one of the following: **NONE**, **BETTER** or

BEST. Then, send the text file to Logical Device 0 of the printer using the FTP or LPR programs. The user must be logged-in under his/her own user-id for LPR and must use their own user-id and binary transfer mode when using FTP. For discussion of Logical Devices, FTP and LPR, see the applicable Technical Briefs.

Querying Printer Status

The printer default antialiasing level can be determined by querying the front panel as described in the previous section. The printer default and user-specific antialiasing levels can also be determined using the **stat** command from a telnet session. Users that are familiar with telnet can log into the printer as follows:

1. telnet to printer's **hostname** or **IP Address**

2. login as **root**

3. at prompt, type **stat *user-id***

The **stat** command displays a page of useful information about the printer status. All of the image processing options for both root (printer default options) and the specific user-id are displayed.

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