PDFDevice Performance

There is one area during PDF generation that can dramatically effect performance. Images! PDFDevice has a number of options that deal with image handling that have an influence on performance.

The biggest known performance killer, besides printing many large high resolution images, is adding large background pictures on every page with the option kDevPdfImgConvBest enabled. Currently, PDFDevice does not maintain information so it knows if the background picture for subsequent pages is the same as that on previous pages. As a consequence it has to do it the hard way by comparing the image data after it chooses the best compression.

kDevImgConvBest

This option causes PDFDevice to choose between run-length encoding or JPEG compression for each individual image. Run-length encoding is very efficient for images with many repeating pixels, such as computer screen images of windows. In fact, run-length encoding can be as much as 900% more efficient with some images without any loss of quality. For more complex images, JPEG compression will yield better results.

Enabling this option has an immediate impact on performance. In order to determine the best compression for an image, PDFDevice has to compress each image twice and compare the resulting size. Needless to say, this will pretty much double the time it takes to deal with each image.

If performance is your primary concern, turn this option off, but make sure you enable kDevPdfConvJPEG.

To produce good quality images balanced with a good compression ratio using JPEG compression, we have established that setting the image quality (kDevPdfJPEGQuality) to 75 yields the overall best results.

kDevPdfImgStripDup

This option causes PDFDevice to include data of duplicate images only once, substantially reducing the final size of the PDF file. If your document contains many duplicate images, or background images, we recommend that you turn on this option.

Enabling this option may effect performance a little in the first pass, as PDFDevice has to compare the data with that of previous images that have identical checksums. But this is usually well compensated by having to write much less data to the final PDF file.

We recommend to always turn this option on, unless you know that your documents do not or very rarely contain duplicate images.

kDevPdfBkgImgOn

This option causes PDFDevice to include a background image for each page that is produced.

Turning on this option can dramatically effect performance. It will depend on the size of the background image and the options kDevPdfImgConvBest and kDevPdfImgStripDup.

For now, if performance is of utmost importance, consider not including a background image or just include it for the first page. We will look at background images and performance in the near future.

Performance comparison table

In order to highlight the impact the different settings can have on performance we have included a performance comparison table. We have used Studio 5.0 and PDFDevice 2.5.0 on Macintosh 10.5.8.

We have chosen the OWrite group of documents from the Document Manager example, printing most of the chapters, totaling 77 pages. Besides the Brainy Data background image, this document contains a number of small images that are duplicated numerous times. The options we have included in the comparison are kDevPdfConvJPEG, kDevPdfBkgImgOn, kDevPdfImgConvBest and kDevPdfImgStripDup.

ConvJPEG	BkgImgOn	ImgConvBest	ImgStripDup	time (sec.)	size (kb)
yes	yes	yes	yes	27.34	512
yes	yes	yes	no	27.67	2500
yes	yes	no	yes	10.52	520
yes	no	yes	yes	2.72	480
yes	no	no	yes	2.57	488
yes	no	no	no	2.57	528
no*	yes	n/a	yes	24.66	760
no*	yes	n/a	no	24.56	21000
no*	no	n/a	yes	2.69	480
no*	no	n/a	no	2.66	512

*if kDevPdfConvJPEG is disabled, run-length encoding is used

As one can see from the results, there is nothing gained by turning off kDevPdfImgStripDup, other than a bigger file size. Whereas turning off kDevPdfImgConvBest and/or kDevPdfBkgImgOn can increase performance substantially.