

Graphics Optimization

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Internet Tips And Secrets <http://www.internet-tips.net>

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Graphics images on the internet come in three major formats: GIF, JPEG and PNG (and PNG's close relation MNG). Each of these formats has it's associated advantages and disadvantages. It is important that you understand all three formats to make the correct decision as to which to use under what circumstances.

One of the major factors to consider when choosing or using a graphics format is the size of the resultant image file. In addition, you will need to understand how to optimize images in each format to be cognizant of the results that you can gain.

What is image optimization? It is simply defined as finding the correct compression settings to make the image as small as possible with as little loss of resolution as you can get away with. Why is this necessary? Because it take time for images to be loaded (most people are accessing the internet over dialup connections, after all) and optimization reduces that time.

The first and most primitive graphics format is known as BMP, which means bit mapped. These kinds of images may not be compressed as they are simply an exact description of what is to be shown on the screen. Each pixel is represented by 3 bytes (red, blue and green), and each byte contains the color intensity of it's base color. This BMP images can be made up of 16 million colors. BMP files tend to be very large, and you don't see them directly on web pages very often. Where you will find them is in collections of wallpapers (wallpapers in the system directory must be in BMP format), desktop themes and similar things. Because BMP files were much too large for normal web browsing (especially several years ago when virtually every user was not only on a dialup connection, but was lucky to get 4800 or 9600 baud) other formats were invented. Two of these

formats became dominant and are now found just about everywhere. These are the GIF and JPEG images types. The formats are extremely different and have widely separate applications. Your average web site will generally include a mixture of both formats, as each has their use.

GIF was created by CompuServe in 1987 for their online service. GIF images consist of no more than 256 colors, because each pixel is represented by a single 8-bit byte. This means that in order to convert a BMP image to a GIF image you have to discard all but 256 colors at the most!

Each GIF image has a description (known as a header) that defines the colors that will be used in the image. This allows the colors to be assigned to a code which is what actually appears in the image. Thus, the header might say "red is color #47, bluegreen is color #48" and so on. Later in the image, the colors can be represented as "color #47 is used for the next 546 pixels".

Thus the optimization of GIF images is fairly straightforward and is handled by virtually every graphics program on the market. For example, Paint Shop Pro allows you to export an optimized GIF image with a very cool wizard to help you choose exactly the best options. Using the optimizer it is possible to reduce an image file size by 95% or more! This means a 100k image can be reduced to 5k or less by this method of optimization.

On the other hand, JPEG images use an entirely different compression scheme. JPEG was invented in 1991 by the Joint Photographic Experts Group to display photographs and similar type images. JPEG has the advantage of allowing 16 million colors. However, JPEG compresses by throwing away pixels.

For example, suppose you have a photograph that is 1024 pixels wide. JPEG compression might be specified to throw away 10% of the pixels (every 10th one). When the image is decompressed those pixel values are extrapolated from the colors of the surrounding pixels. This implies that JPEG images tend to become "fuzzy" when the optimization values are high.

As it turns out, JPEG is great for photographs and similar things because those types of images tend to have soft edges. In fact, for photographs and art the JPEG format is much preferred.

PNG is an up-and-coming, very new image format which is similar in concept to GIF. PNG images allow for 16 million colors and, unlike JPEG, does not lose colors. PNG compression is handle by most graphics editors, at least those that support PNG.

So how do you optimize your images? First, find the best format for your applications. PNG is very new and is probably not suitable for most web sites (browser support is sporadic so you may lock out some of your users). GIF is great for line drawings and other things with sharp edges and no more than 256 colors. JPEG is perfect for photographs, art, and similar images.

Second, be familiar with the optimization functions of your graphics programs. Save images using the various settings and closely examine the differences. For example, how does that image look in 2 colors, 16 colors and 256 colors? Find the correct setting (the smallest possible file size with the least change in the image quality) and use it. Remember that this setting will be different for every single image.

What do you gain from all of this work? Faster loading times on your web site, which means your visitors are less likely to hit the back key even before your site begins to load.

Additional Information

Graphics Formats - Animated GIFs

<http://www.internet-tips.net/Graphics/animatedgif.htm>

Use animated GIFs to create moving images on your web site. Just remember not to overdo it.

Graphics Formats - GIF

<http://www.internet-tips.net/Graphics/gif.htm>

The GIF format is an excellent format for many types of graphics.

Graphics Formats - JPG

<http://www.internet-tips.net/Graphics/jpg.htm>

JPG is best for images with gradients, blends and inconsistent color variants. It is very efficient but parts of the image are lost by the compression scheme.

Graphics Formats - PNG

<http://www.internet-tips.net/Graphics/png.htm>

The PNG format is a newer, better format than GIF. It may soon be the dominant format on the internet.

Products - GifClean32

<http://www.internet-tips.net/Products/gifclean32.htm>

GifClean32 allows you to remove comments from GIF images. It is a handy little utility to have around.

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