

Web Watcher

BY GLENN FLEISHMAN



Look Out, GIF and JPEG

IF YOU'VE USED THE WEB FOR MORE than a few days, you know that virtually every image you encounter there is a GIF or JPEG file. That may be about to change.

A competitor to these two formats has emerged—it's called PNG (pronounced *ping*), or *portable network graphic*. It emerged in late 1997 from a grassroots effort by dedicated Internet developers to create a format with features designed specifically for the Web.

Like GIF, PNG offers *lossless* compression (it doesn't actually discard image data) and indexed color. Unlike GIF, it also supports full 24-bit color just as JPEG does. And these knock-'em-dead features make PNG a standout: built-in gamma, alpha-channel transparency, and two-dimensional interlacing.

To explain what makes PNG so powerful, let's start with two things that differentiate graphic file formats: how they store color data and how they perform compression.

On a computer, a color definition is generally stored as an RGB value that comprises values for red, green, and blue components. A standard RGB value is 24 bits, consisting of three 8-bit numbers (values that can range from 0 to 255) for red, green, and blue. The RGB palette consists of over 16 million colors, and the differences among some of those colors are extremely subtle.

Some formats, such as TIFF and JPEG, can store the full 24-bit value for each pixel in an image. Others,

like GIF, use an abbreviated (indexed) color palette to reduce the size of a file, with a big trade-off in color fidelity. A GIF file contains a maximum of 256 RGB color definitions, which it stores in a colormap. Each pixel in a GIF actually points to one of the colors in the colormap, which points to the full RGB value for the color. PNG can store color data either as real 24-bit values or in an indexed color palette, so it gives you a choice between maximum color fidelity or minimum file size.

Another defining aspect of a graphic file format is what kind of compression it uses. GIF (and sometimes TIFF) uses a method called LZW (Lempel-Ziv-Welch), the algorithm for which is owned by Unisys, which charges software developers fees for the use of the algorithm. LZW offers *lossless* compression, which works by identifying certain kinds of redundant data patterns and replacing them with tokens—short codes that can be replaced with the original long pattern during file decompression. PNG offers lossless compression similar to that used by LZW, but it's patent-free.

PNG images can also store the gamma setting of the system they were created on (gamma compensates for monitors' tendency to display midtones either too lightly or too darkly relative to highlights and shadows). This allows other systems to display the PNG as similarly as possible to the way it displayed on the system used to create it.

Another bonus feature in PNG is alpha-channel transparency, which lets you define areas of varying degrees of transparency using an extra grayscale channel. GIF has single-color transparency, which allows you to assign one or more of the colors in your colormap to be transparent, so each pixel is either totally transparent or totally opaque.

Finally, PNG images offer two-dimensional interlacing. In browsers that support this feature, interlaced PNG images fill in gradually, getting progressively sharper from top to bottom and left to right, thereby seeming to load faster. Interlaced GIF and JPEG images, in contrast, fill in from top to bottom only using full lines of pixels.

Support for PNG in various Web browsers and other software is beginning to catch on, although not all applications compatible with PNG support all of its features—at least not yet. In late 1997 Netscape and Microsoft added support for PNG: Netscape added it to version 4.04 for Windows and Macintosh, while Microsoft added it only for Windows Internet Explorer 4.0. Adobe's major graphics products (including Photoshop, Illustrator, and PageMaker) also offer support for PNG.

Right now, about 20 percent of all Web browsers can view PNG images, but expect the number to grow rapidly. As it catches on, you might find yourself PNGing away. ♦

Glenn Fleishman, contributing editor for Adobe Magazine, co-wrote the forthcoming second edition of Real World Scanning and Halftones (Peachpit Press, ISBN 0-201-69683-5).