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PNG Development Group
png-list@dworkin.wustl.edu
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PNG Proposed sPLT Chunk, draft 19961015

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Status of this Memo

This document is an informal draft of the PNG development group.

Comments on this document can be sent to the PNG specification maintainers at `png-info@uunet.uu.net` or at `png-list@dworkin.wustl.edu`.

Distribution of this memo is unlimited.

At present, the latest version of this document is available on the World Wide Web from `ftp://swrinde.nde.swri.edu/pub/png-group/documents/`.

Notices

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Changes from the 08 October 1996 proposed-chunks draft (version 19961008):

- Moved spLT proposal to this separate document.
- Removed the "gamma" field. This restores the format of the spLT chunk to the format it had in the 960406 version of the png-proposed-chunks document, therefore the "signature" field was also removed and the chunk name is changed back from spAL to spLT.

Abstract

This document describes a special-purpose chunk type, sPLT, that has been proposed for use in various PNG (Portable Network Graphics) applications. It has not yet been approved for registration by the PNG developers, and therefore is experimental and its format is subject to change.

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1 Introduction

The chunk described here has been proposed to the PNG development group. Its definition is subject to change until such time as the group formally registers it. No decoder is required or expected to implement this chunks except for experimental or evaluation purposes. Comments on this proposal, and new proposals for additional chunk types, should be sent to the PNG specification maintainers at png-info@uunet.uu.net. The basic PNG specification is available from the W3C archive at http://www.w3.org/pub/WWW/TR/REC-png.html.

2 Using Proposed PNG Chunks

The chunk described in this document has yet been registered by the PNG maintainers. Therefore it has a lower-case letter in the second position of the chunkname. It is an **experimental** chunk and the format is subject to change. If and when it becomes registered, the second letter of the chunk name will become uppercase, and the "signature" field, if present, and its zero-byte terminator will be deleted. The chunk description will be moved either to a PNG extensions document or to the core PNG specification. There will be no further change to the format.

Whenever you use an unregistered chunk you should also include a tEXt chunk describing it, for example:

```
tEXtComment\0
This file contains a spLT chunk written according to
the format given in Version 19961015 of the PNG Proposed
Chunks document.
```

3 Summary of Proposed Chunk

This table summarizes some properties of the proposed chunk described in this document.

Chunk name	Multiple OK?	Ordering constraints
spLT	Yes	Before IDAT

4 Proposed Chunk Specification

This section provides the detailed specification for the proposed chunk.

4.1 `spLT` Suggested Palette

This chunk can be used to suggest a reduced palette to be used when the display device is not capable of displaying the full range of colors present in the image. If present, it provides a recommended set of colors, with alpha and frequency information, that can be used to construct a reduced palette to which the truecolor image can be quantized.

This chunk's contents are a zero-byte-terminated text string that names the palette, followed by a series of palette entries, each a ten-byte series, containing five unsigned integers:

```
n bytes:  (Latin-1 text) palette_name
1 byte:   (null) terminator
2 bytes:  (unsigned integer)  red intensity
          0:   black
          etc.
          65535: full red intensity
2 bytes:  (unsigned integer)  green intensity
2 bytes:  (unsigned integer)  blue intensity
2 bytes:  (unsigned integer)  alpha
          0: fully transparent
          etc.
          65535: fully opaque
2 bytes:  (unsigned integer)  frequency
          (relative frequency of occurrence)
etc.
```

There can be any number of entries; a decoder determines the number of entries from the remaining chunk length after the "palette_name" field and its zero-byte terminator. This length not divisible by ten is an error. Entries must appear in decreasing order of "frequency".

The "palette_name" (e.g. "256 color including Macintosh default", "256 color including Windows-3.1 default", "Browser Safe Palette") identifies the palette, which can permit applications or people to choose the appropriate one when more than one suggested palette appears in a PNG file. The "palette_name" string must follow the format of a `tEXt` keyword: It must consist only of printable Latin-1 characters and must not have leading or trailing blanks, but can have single embedded blanks. There must be at least one and no more than 79 characters in the name. Names are case-sensitive.

The red, green, and blue values are not premultiplied by alpha, nor are they precomposited against any background. A decoder can build a palette by compositing those palette entries against any background color or set of background colors that it chooses. See [link to bKGD]

Each frequency entry is proportional to the fraction of pixels in the image that are closest to that palette entry, without regard to any compositing against a background palette. The exact scale factor is chosen by the encoder, but should be chosen so that the range of individual values reasonably fills the range 0 to 65535. It is acceptable to artificially inflate the "frequency" values for "important" colors such as those in a company logo or in the facial features of a portrait. Zero is a valid value for frequency, meaning the color is "least important" or that it is rarely if ever used. When all of the frequency values are zero, the "frequency" is undefined.

The palette uses 16 bits (2 bytes) per value regardless of the image bit depth specification. Decoders wishing to construct a palette with a smaller bit depth can accomplish this by scaling down the RGB entries, as described under "sample depth rescaling" in the PNG specification. The palette samples have the same gamma and chromaticity values as those of the pixel samples.

Note: Earlier versions of the PNG specification recommended that the `PLTE` [link to PLTE] and `hIST` chunks be used for this purpose. While this is still allowed, to maintain backward compatibility, the `spLT` chunk is preferable, particularly when transparent pixels are present. When both the `PLTE` and `spLT` chunks are present, the `PLTE` data should only be used for decoding the indexed-color (color type 3) pixels, and the `spLT` data should be used for constructing the display palette. If the `hIST` chunk is also present, decoders that process the `spLT` chunk should ignore it.

This chunk can appear for any color type. If this chunk does appear, it must precede the first `IDAT` chunk. There can be multiple `spLT` chunks, with different names.

5 Discussion

This dicussion does not form a part of the proposed specification and will not appear in the final documentation.

5.1 `spLT` Discussion

It is proposed to register the chunk as `sPLT` and to include it in the "PNG extensions" document.

The format of this chunk has not changed since version 960406 of the png-proposed-chunks document. There is some change to the wording of the specification (interpretation of zero values of frequency) in the 19961015 version. A variant of the format, with "gamma" and "signature" fields, was proposed in the 19960927 version, where it was called `spAL`, but that variant has been abandoned and we have reverted to the April 1996 (960406) version of the format.

Gamma field: In the 19960927 version, a "gamma" field was added, primarily for use in multiple-image formats. This seemed to introduce more problems than it resolved, so it has been removed from the present proposal, and multiple-image formats can define a variant of sPLT (with a different chunk name such as "gPLT") that has a gamma field, if necessary.

Signature field: In the 19960927 version, a "signature" field was added to distinguish the September version from the April version. Since the present version has the identical format to the April version, no "signature" field is needed, and it has been removed.

Zero "frequency": There have been changes to the interpretation of frequency==0.

6 Security considerations

Security considerations are addressed in the basic PNG specification, `http://www.w3.org/pub/WWW/TR/REC-png.html`.

The same precautions taken when displaying `tEXt` data should be taken when displaying the text contained in the "palette_name" string of the `spLT` chunk. Viewers should not display this string directly without first checking for the presence of nonprintable characters, and for the <ESC> character in particular.

No known additional security hazards are posed by the chunks described here.

7 Credits

Trademarks

- Macintosh is a trademark of Apple Computer, Inc.
- Windows is a trademark of MicroSoft Corp.

Contributors

The names of contributors whose names do not already appear in the PNG specification are presented in alphabetical order:

- John Bowler, jbowler@acm.org

Editor

- Glenn Randers-Pehrson, glennrp@arl.mil or randeg@alumni.rpi.edu

End of PNG Proposed Chunks Listing. Expires 15 Apr 1997.