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WebP Image Format Media Type Registration

Abstract

WebP is a RIFF-based image file format which supports lossless and lossy compression as well as alpha (transparency) and animation. It covers use cases similar to JPEG, PNG and GIF.

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1. Introduction

This document provides references for the WebP image format and considerations for its use across platforms.

WebP is a [Resource Interchange File Format \(RIFF\)](#) [[riff-spec](#)] based image file format [[webp-riff](#)] which supports lossless and lossy compression as well as alpha (transparency) and animation. It covers use cases similar to [JPEG](#) [[jpeg-spec](#)], [PNG](#) [[RFC2083](#)] and the [Graphics Interchange Format \(GIF\)](#) [[gif-spec](#)].

WebP consists of two compression algorithms used to reduce the size of image pixel data, including alpha (transparency) information. Lossy compression is achieved using VP8 intra-frame encoding [[RFC6386](#)]. The lossless algorithm [[webp-lossless](#)] stores and restores the pixel values exactly, including the color values for zero alpha pixels. The format uses subresolution images, recursively embedded into the format itself, for storing statistical data about the images, such as the used entropy codes, spatial predictors, color space conversion, and color table. [LZ77](#) [[lz77](#)], [Huffman coding](#) [[huffman](#)], and a color cache are used for compression of the bulk data.

2. The 'image/webp' Media Type

This section contains the media type registration details as per [[RFC6838](#)].

2.1. Registration Details

Media type name: image

Media subtype name: webp

Required parameters: N/A

Optional parameters: N/A

Encoding considerations: Binary. The [Base64 encoding \[RFC4648\]](#) should be used on transports that cannot accommodate binary data directly.

Security considerations: See [Section 3](#) below.

Interoperability considerations: See [Section 4](#) below.

Applications which use this media type: Anywhere image size is an issue.

Fragment identifier considerations: N/A

Restrictions on usage: N/A

Additional information:

Deprecated alias names for this type: N/A

Magic number(s): The first 4 bytes are 0x52, 0x49, 0x46, 0x46 ('RIFF'), followed by 4 bytes for the RIFF chunk size. The next 7 bytes are 0x57, 0x45, 0x42, 0x50, 0x56, 0x50, 0x38 ('WEBPVP8').

File extension(s): webp

Apple Uniform Type Identifier: org.webmproject.webp conforms to public.image

Object Identifiers: N/A

3. Security Considerations

Security risks are similar to other media content and may include buffer overruns and uninitialized data usage as part of the demuxing and decoding process [[cve.mitre.org-libwebp](#)] [[crbug-security](#)].

4. Interoperability Considerations

The format is defined using little-endian byte ordering (see [Section 3.1](#) of [[RFC2781](#)]), but demuxing and decoding are possible on platforms using a different ordering with the appropriate conversion. The container is RIFF-based and allows extension via user defined chunks, but nothing beyond the chunks defined by the container format [[webp-riff](#)] are required for decoding of the image.

5. IANA Considerations

IANA has updated the "Image Media Types" registry to include 'image/webp' as described in [Section 2](#).

6. References

6.1. Normative References

- [RFC2781] Hoffman, P. and F. Yergeau, "UTF-16, an encoding of ISO 10646", RFC 2781, DOI 10.17487/RFC2781, February 2000, <<https://www.rfc-editor.org/info/rfc2781>>.
- [RFC4648] Josefsson, S., "The Base16, Base32, and Base64 Data Encodings", RFC 4648, DOI 10.17487/RFC4648, October 2006, <<https://www.rfc-editor.org/info/rfc4648>>.
- [RFC6386] Bankoski, J., Koleszar, J., Quillio, L., Salonen, J., Wilkins, P., and Y. Xu, "VP8 Data Format and Decoding Guide", RFC 6386, DOI 10.17487/RFC6386, November 2011, <<https://www.rfc-editor.org/info/rfc6386>>.
- [RFC6838] Freed, N., Klensin, J., and T. Hansen, "Media Type Specifications and Registration Procedures", BCP 13, RFC 6838, DOI 10.17487/RFC6838, January 2013, <<https://www.rfc-editor.org/info/rfc6838>>.
- [webp-lossless] Alakuijala, J., "WebP Lossless Bitstream Specification", September 2014, <https://developers.google.com/speed/webp/docs/webp_lossless_bitstream_specification>.
- [webp-riff] Google LLC, "WebP RIFF Container", April 2018, <https://developers.google.com/speed/webp/docs/riff_container>.

6.2. Informative References

[crlbug-security] "libwebp Security Issues", <<https://bugs.chromium.org/p/webp/issues/list?q=label%3ASecurity>>.

[cve.mitre.org-libwebp] "libwebp CVE List", <<https://cve.mitre.org/cgi-bin/cvekey.cgi?keyword=libwebp>>.

[gif-spec] "GIF89a Specification", <<https://www.w3.org/Graphics/GIF/spec-gif89a.txt>>.

[huffman] Huffman, D. A., "A Method for the Construction of Minimum Redundancy Codes", Proceedings of the Institute of Radio Engineers Number 9, pp. 1098-1101., September 1952.

[jpeg-spec] "JPEG Standard (JPEG ISO/IEC 10918-1 ITU-T Recommendation T.81)", <<https://www.w3.org/Graphics/JPEG/itu-t81.pdf>>.

[lz77] Ziv, J. and A. Lempel, "A Universal Algorithm for Sequential Data Compression", IEEE Transactions on Information Theory Vol. 23, No. 3, pp. 337-343., May 1977.

[RFC2083] Boutell, T., "PNG (Portable Network Graphics) Specification Version 1.0", RFC 2083, DOI 10.17487/RFC2083, March 1997, <<https://www.rfc-editor.org/info/rfc2083>>.

[riff-spec] "Multimedia Programming Interface and Data Specifications 1.0", <<http://www-mmsp.ece.mcgill.ca/Documents/AudioFormats/WAVE/Docs/riffmci.pdf>>.

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