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WebP Image Format
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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

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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

Macintosh file type code: UTTypeWebP com.google.webp

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.

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[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

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[6.2.](#) Informative References

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