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text set), JPEG-XS generally performs better than PNG, by 1015%, but on some images PNG performs substantially better, on the order of 5075%.[55] Thus, if both of these formats are options and file size is an important criterion, they should both be considered, depending on the image. JPEG-XS is another, much improved, lossless or nearly lossless format. Unfortunately, smooth transitions from the format are intended to replace, losslessly, able to convert from JPEG. It also extends to compressing without compromising on fidelity. 59Tag Tag (WebP) is a format that includes a wide range of options. While most TIFF offers a generic format for interchange between professional image editing applications, it makes adding support for it to applications a much bigger task and so it has little support in applications not concerned with image manipulation (such as web browsers). The high level of extensibility also means that most applications provide only a subset of available options, potentially creating user confusion and compatibility issues. The most common general-purpose, lossless compression algorithm used with TIFF is LempelZivWelch (LZW). This compression technique, also used in GIF, was covered by patents until 2003. TIFF also supports the compression algorithm [34] whereas TIFF also supports "associated" (premultiplied) alpha. WebP is a format invented by Google that was intended to replace PNG, JPEG, and GIF. [60] WebP files allow for both lossy and lossless compression, while PNG only allows for lossless compression. WebP also supports animation, something that only GIF files could previously accomplish. [61] The main improvements of WebP over PNG, however, are the large reduction in file size and therefore faster loading times when embedded into websites. Google claims that lossless WebP images are 26% smaller than PNG files. [62] WebP has received criticism for being incompatible with various image editing programs and social media websites, unlike PNG. [63] WebP is also not supported across all web browsers, although the support is growing. The official reference implementation of the PNG format is the programming library libpng. [64] AVIF is supported across fewer browsers and applications than PNG. [66] Specifically, AVIF is supported by the most used browsers, Microsoft Edge, Firefox, and Google Chrome. [67] [68] but requires an additional download for use with Microsoft Windows. [64] The official reference implementation of the PNG format is the programming library libpng. [69] It is published as free software under the terms of a permissive free software license. Therefore, it is usually found as an important system library in free operating systems. Main article: Comparison of raster graphics editorsThe PNG format is widely supported by graphics programs, including Adobe Photoshop, Corel's Photo-Point and Photo Shop Pro, the GIMP, GraphicConverter, Helicon Photo, ImageMagick, Inkscape, IrfanView, Pixel image editor, Paint.NET and Xara Photo & Graphic Designer and many others (including online graphic design platforms such as Canva). Some programs bundled with popular operating systems which support PNG include Microsoft's Paint and Apple's Photos/Photo and Preview, with the GIMP also often being bundled with popular Linux distributions. Adobe Fireworks (formerly by Macromedia) uses PNG as its native file format, allowing other image editors and preview utilities to view the flattened image. However, Fireworks by default also stores metadata for layers, animation, vector data, text and effects. Such files should not be distributed directly. Fireworks can instead export the image as an optimized PNG without the extra metadata for use on web pages, etc.[citation needed]Main article: Web browser image format supportPNG support first appeared in 1997, in Internet Explorer 4.0.01 (32-bit only for NT), and in Netscape 4.04.[70]Despite calls by the Free Software Foundation[71] and the World Wide Web Consortium (W3C).[72] tools such as gif2png.[73] and campaigns such as Burn All GIFs.[74] PNG adoption on websites was fairly slow until 2009, when the majority of websites had adopted it. [75] [76] [77] [78] [79] [80] [81] [82] [83] [84] [85] [86] [87] [88] [89] [90] [91] [92] [93] [94] [95] [96] [97] [98] [99] [100] [101] [102] [103] [104] [105] [106] [107] [108] [109] [110] [111] [112] [113] [114] [115] [116] [117] [118] [119] [120] [121] [122] [123] [124] [125] [126] [127] [128] [129] [130] [131] [132] [133] [134] [135] [136] [137] [138] [139] [140] [141] [142] [143] [144] [145] [146] [147] [148] [149] [150] [151] [152] [153] [154] [155] [156] [157] [158] [159] [160] [161] [162] [163] [164] [165] [166] [167] [168] [169] [170] [171] [172] [173] [174] [175] [176] [177] [178] [179] [180] [181] [182] [183] [184] [185] [186] [187] [188] [189] [190] [191] [192] [193] [194] [195] [196] [197] [198] [199] [200] [201] [202] [203] [204] [205] [206] [207] [208] [209] [210] [211] [212] [213] [214] [215] [216] [217] [218] [219] [220] [221] [222] [223] [224] [225] [226] [227] [228] [229] [230] [231] [232] [233] [234] [235] [236] [237] [238] [239] [240] [241] [242] [243] [244] [245] [246] [247] [248] [249] [250] [251] [252] [253] [254] [255] [256] [257] [258] [259] [260] [261] [262] [263] [264] [265] [266] [267] [268] [269] [270] [271] [272] [273] [274] [275] [276] [277] [278] [279] [280] [281] [282] [283] [284] [285] [286] [287] [288] [289] [290] [291] [292] [293] [294] [295] [296] [297] [298] [299] [300] [301] [302] [303] [304] [305] [306] [307] [308] [309] [310] [311] [312] [313] [314] [315] [316] [317] [318] [319] [320] [321] [322] [323] [324] [325] [326] [327] [328] [329] [330] [331] [332] [333] [334] [335] [336] [337] [338] [339] [340] [341] [342] [343] [344] [345] [346] [347] [348] [349] [350] [351] [352] [353] [354] [355] [356] [357] [358] [359] [360] [361] [362] [363] [364] [365] [366] [367] [368] [369] [370] [371] [372] [373] [374] [375] [376] [377] [378] [379] [380] [381] [382] [383] [384] [385] [386] [387] [388] [389] [390] [391] [392] [393] [394] [395] [396] [397] [398] [399] [400] [401] [402] [403] [404] [405] [406] [407] [408] [409] [410] [411] [412] [413] [414] [415] [416] [417] [418] [419] [420] [421] [422] [423] [424] [425] [426] [427] [428] [429] [430] [431] [432] [433] [434] [435] [436] [437] [438] [439] [440] [441] [442] [443] [444] [445] [446] [447] [448] [449] [450] [451] [452] [453] [454] [455] [456] [457] [458] [459] [460] [461] [462] [463] [464] [465] [466] [467] [468] [469] [470] [471] [472] [473] [474] [475] [476] [477] [478] [479] [480] [481] [482] [483] [484] [485] [486] [487] [488] [489] [490] [491] [492] [493] [494] [495] [496] [497] [498] [499] [500] [501] [502] [503] [504] [505] [506] [507] [508] [509] [510] [511] [512] [513] [514] [515] [516] [517] [518] [519] [520] [521] [522] [523] [524] [525] [526] [527] [528] [529] [530] [531] [532] [533] [534] [535] [536] [537] [538] [539] [540] [541] [542] [543] [544] [545] [546] [547] [548] [549] [550] [551] [552] [553] [554] [555] [556] [557] [558] [559] [560] [561] [562] [563] [564] [565] [566] [567] [568] [569] [570] [571] [572] [573] [574] [575] [576] [577] [578] [579] [580] [581] [582] [583] [584] [585] [586] [587] [588] [589] [590] [591] [592] [593] [594] [595] [596] [597] [598] [599] [600] [601] [602] [603] [604] [605] [606] [607] [608] [609] [610] [611] [612] [613] [614] [615] [616] [617] [618] [619] [620] [621] [622] [623] [624] [625] [626] [627] [628] [629] [630] [631] [632] [633] [634] [635] [636] [637] [638] [639] [640] [641] [642] [643] [644] [645] [646] [647] [648] [649] [650] [651] [652] [653] [654] [655] [656] [657] [658] [659] [660] [661] [662] [663] [664] [665] [666] [667] [668] [669] [670] [671] [672] [673] [674] [675] [676] [677] [678] [679] [680] [681] [682] [683] [684] [685] [686] [687] [688] [689] [690] [691] [692] [693] [694] [695] [696] [697] [698] [699] [700] [701] [702] [703] [704] [705] [706] [707] [708] [709] [710] [711] [712] [713] [714] [715] [716] [717] [718] [7

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