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# Lempel–Ziv–Oberhumer

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**Lempel–Ziv–Oberhumer** (**LZO**) is a lossless data compression algorithm that is focused on decompression speed.[1]

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## Design [edit]

The LZO library implements a number of algorithms with the following characteristics:[1]

- compression comparable in speed to DEFLATE compression
- very fast decompression
- requires an additional buffer during compression (of size 8 kB or 64 kB, depending on compression level)
- requires no additional memory for decompression other than the source and destination buffers
- allows the user to adjust the balance between compression ratio and compression speed, without affecting the speed of decompression

LZO supports overlapping compression and in-place decompression. As a block compression algorithm, it compresses and decompresses blocks of data. Block size must be the same for compression and decompression. LZO compresses a block of data into *matches* (a sliding dictionary) and *runs* of non-matching literals to produce good results on highly redundant data and deals acceptably with non-compressible data, only expanding incompressible data by a maximum of 1/64 of the original size when measured over a block size of at least 1 kB.

## Implementations [edit]

A free software tool which implements it is lzop. The original library was written in ANSI C, and it has been made available under the GNU General Public License. Versions of LZO are available for the Perl, Python and Java languages. The copyright for the code is owned by Markus F. X. J. Oberhumer. It was originally published in 1996. Various LZO implementations are reported to work under Win32, AIX, ConvexOS, IRIX, Mac OS, Palm OS, PlayStation, Nintendo 64, Wii, Solaris, SunOS, TOS (Atari ST), Linux and VxWorks. LZO is an option for transparent compression in the btrfs and zfs filesystems.

## See also [edit]

- LZ4 – a newer variant optimized for speed at the cost of compression ratio

## References [edit]

1. ^ a b "LZO real-time data compression library".

## External links [edit]

- oberhumer.com: LZO real-time data compression library
- LZO/LZOP Fanpage at the Wayback Machine (archived June 25, 2012)
- Arnaud Bouche (2008). "LZO fast compress/uncompress: implementation in 80386 machine code for Delphi".
- lzo-java on GitHub - Pure Java implementation of the liblzo2 LZO compression algorithm

| v · t · e | Data compression methods [hide] | |
|---|---|---|
| **Lossless** | Entropy type | Unary · Arithmetic · Golomb · Huffman (Adaptive · Canonical · Modified) · Range · Shannon · Shannon–Fano · Shannon–Fano–Elias · Tunstall · Universal (Exp-Golomb · Fibonacci · Gamma · Levenshtein) |
| | Dictionary type | Byte pair encoding · DEFLATE · Lempel–Ziv (LZ77 / LZ78 (LZ1 / LZ2) · LZJB · LZMA · **LZO** · LZRW · LZS · LZSS · LZW · LZWL · LZX · LZ4 · Statistical) |
| | Other types | BWT · CTW · Delta · DMC · MTF · PAQ · PPM · RLE |
| **Audio** | Concepts | Bit rate (average (ABR) · constant (CBR) · variable (VBR)) · Companding · Convolution · Dynamic range · Latency · Nyquist–Shannon theorem · Sampling · Sound quality · Speech coding · Sub-band coding |
| | Codec parts | A-law · μ-law · ACELP · ADPCM · CELP · DPCM · Fourier transform · LPC (LAR · LSP) · MDCT · Psychoacoustic model · WLPC |
| **Image** | Concepts | Chroma subsampling · Coding tree unit · Color space · Compression artifact · Image resolution · Macroblock · Pixel · PSNR · Quantization · Standard test image |
| | Methods | Chain code · DCT · EZW · Fractal · KLT · LP · RLE · SPIHT · Wavelet |
| **Video** | Concepts | Bit rate (average (ABR) · constant (CBR) · variable (VBR)) · Display resolution · Frame · Frame rate · Frame types · Interlace · Video characteristics · Video quality |
| | Codec parts | Lapped transform · DCT · Deblocking filter · Motion compensation |
| **Theory** | Entropy · Kolmogorov complexity · Lossy · Quantization · Rate–distortion · Redundancy · Timeline of information theory | |
| Compression formats · Compression software (codecs) | | |

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