

**Cyber Archive
Custom Compression Engines
Brochure**



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Custom Compression Algorithms

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Cyber Archive is a demonstration program for the Cyber Operations Custom Compression service. The purpose of the system is to introduce our compression algorithm service. Our service includes taking your existing data or file format and creating a matching compression algorithm for maximum optimization of the data structure. Using our large array of compression algorithms and strategies we can produce a product that far outperforms off-the-shelf compression engines such as zlib. We can custom produce a compression algorithm with emphasis on throughput, compression ratio, memory requirements, or any other factors that are important to the customer.

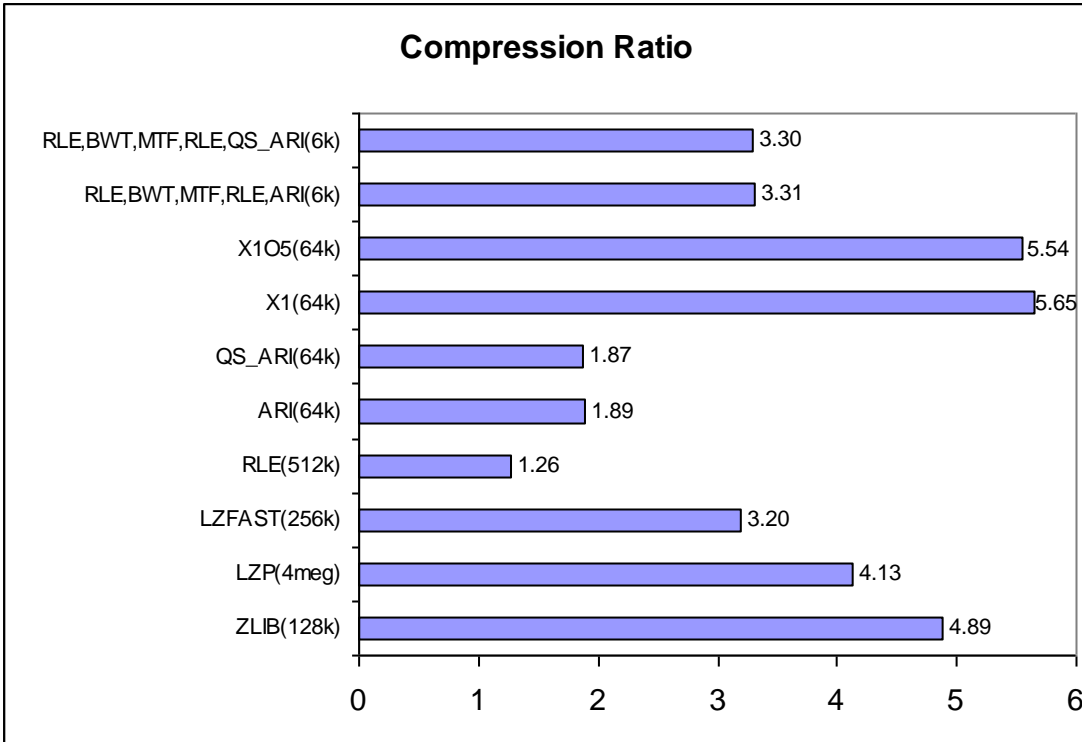
Numerous algorithms working together in Cyber Archive allow the proper emphasis on speed, compression ratio, and memory requirements for a particular application. Cyber Archive includes an abundance of algorithms, but is also designed to allow new (or special purpose) algorithms to be easily integrated into the system.

A sequence of algorithms is applied to raw information based on several factors. Some algorithms are used for speed critical situations. More complex algorithms are used when maximum compression is a priority. Cyber Archive can determine the most effective algorithm based on heuristics of the data being compressed, and the required data throughput of the system.

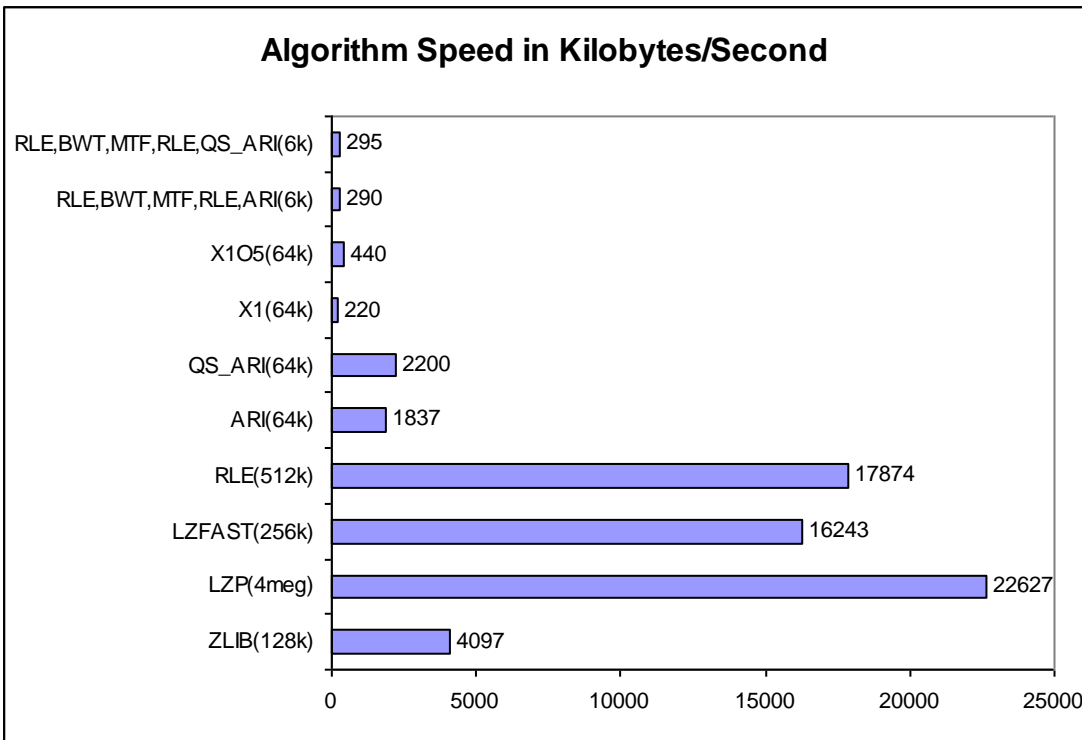
Cyber Compression suite is OS independent.

Below are some graphs showing the relative speeds and effectiveness of some of the algorithms of Cyber Archive.

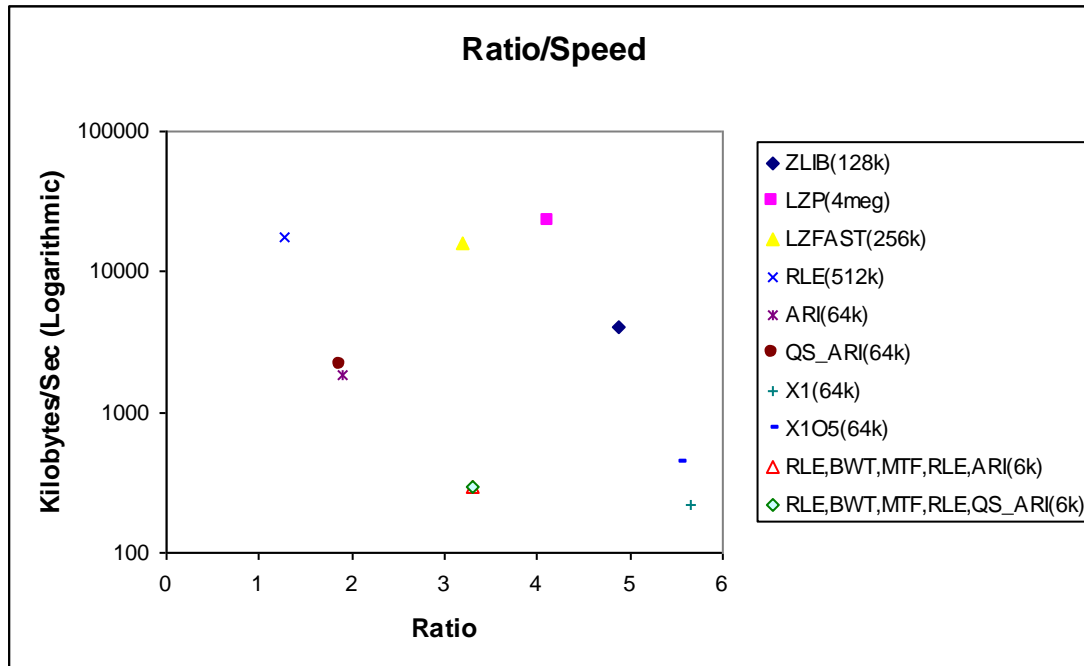
The compression ratios are intended mainly for comparison between the algorithms within Cyber Archive, but for reference the test data used consisted of a mixture of BMP image files, Microsoft Word documents, email messages, Microsoft Excel spreadsheets, HTML files, Adobe PhotoShop files, and a small number of some other miscellaneous files including Adobe PDF documents and text files.



These are the compression ratios that the various algorithms had on our test case.
 NOTE: algorithm ratios can change depending on the data.



These are the speeds at which the algorithms run locally on a single 700 Mhz Pentium III processor based system. The measurement is how many kilobytes of uncompressed input data can be compressed in one second.



A compression ratio to algorithm speed analysis table is constructed for a given *type* of data to be compressed. A quick look at the results shows that algorithms that are both to the left and below another algorithm on the chart will not be used for the type of data being compressed. For example, arithmetic encoding alone compresses slower and with less compression than ZLIB, LZP, and LZFAST in this analysis. The more effective algorithms are to the top and right in the graph. The application specific compression and speed levels required determine the actual algorithm(s) used. Applications that are more compression sensitive will use the X1 compression method while speed critical applications will tend to use LZP compression for this type of data. Algorithm mixing is used to satisfy required throughput with maximum compression ratio, or to meet a required compression ratio with maximum throughput. Tests show that some algorithms perform more efficiently on some data type than others. Cyber Archive chooses from millions of algorithmic combinations to achieve optimal performance for any compression task.