V.42bis and Other Ziv-Lempel Variants

(Abstract)

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The recently adopted V.42bis standard for data compressing modems is discussed from algorithmic, experimental, practical, theoretical, and marketing standpoints. We found V.42bis to be a conservative and economically-implementable scheme, one that compresses text about as well as the Lempel-Ziv-Welch algorithm of the Berkeley Unix “compress” utility. On our test set of five 100-Kbyte text and executable files, we found the compression ratios of V.42bis to be markedly inferior to those of several other algorithms, notably the Cleary-Witten adaptive Markov code and the Fiala-Greene Ziv-Lempel variant. However, since all the better-compressing methods have much larger data structures, none is superior to V.42bis for use in a contemporary modem. Very high compression ratios are of limited utility in this application, given the bandwidth bottleneck of the EIA-232-D connection between modem and terminal, or modem and home computer. For this and other reasons, contemporary modems have minimal computational power, typically just an 8-bit microprocessor, 40 Kbytes of RAM, and 32 Kbytes of ROM.

The body of this paper is available, in the form of a technical report, from the author.

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