

United States Patent [19]

Denzer

[56]

DOCKE

[54] METHOD AND APPARATUS FOR ADDING DATA COMPRESSION AND OTHER SERVICES IN A COMPUTER NETWORK

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- [73] Assignee: Process Software Corporation, Framingham, Mass.
- [21] Appl. No.: 733,104
- [22] Filed: Jul. 19, 1991
- [51] Int. Cl.⁵ H04B 1/66; H04L 9/00
- [52] U.S. Cl. 380/49; 380/9;
- 370/109; 375/122

 [58] Field of Search
 380/4, 9, 25, 49, 50;

 395/21, 24, 25; 364/240.8, 242.94–242.96,
 274.9, 276.6, 940.61–940.62, 940.81, 972.4;

 375/122; 340/825.8, 825.5; 381/34, 35; 370/109

References Cited

U.S. PATENT DOCUMENTS

4,533,948	8/1985	McNamara et al 340/825.5 X
4,691,314	9/1987	Bergins et al 370/94
4,748,638	5/1988	Friedman et al 375/8
4,833,468	5/1989	Larson et al 340/825.8
4,972,473 1	1/1990	Ejiri et al

OTHER PUBLICATIONS

Strass, Hermann, "D-A-T-A Compression," DEC Professional, Feb. 1991, pp. 58-62.

Turner, Steven E., "Small Is Beautiful: How V.42bis Cuts Costs," *Data Communications*, Dec. 1990, pp. 101-104.

Welch, Terry A., "A Technique for High-Performance Data Compression," *Computer* Magazine, vol. 17 No. 6 (Jun. 1984), pp. 8-19.

"Sotfware Product Description FCX Version 3.2," brochure of Innovative Computer Systems, Inc., (ICS), 1930 E. Marlton Pike, Cherry Hill, N.J. 08003, pp. 1-4, no date.

"FCX-pcFCX-File Compression for VAX/VMX and MS-DOS Systems," brochure of Innovative Computer

[11]	Patent Number:	5,307,413	
[45]	Date of Patent:	Apr. 26, 1994	

Systems, Inc. (ICS, Inc.), 1930 E. Marlton Pike, Cherry Hill, N.J. 08003, (4 pages), no date.

F. Jay, IEEE Standard Dictionary of Electrical and Electronics Terms, (ANSI/IEEE Std. 100-1984); (IEEE, New York, 1984, p. 695, "Protocol").

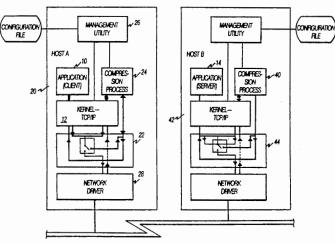
Primary Examiner—Bernarr E. Gregory Attorney, Agent, or Firm—Weingarten, Schurgin, Gagnebin & Hayes

ABSTRACT

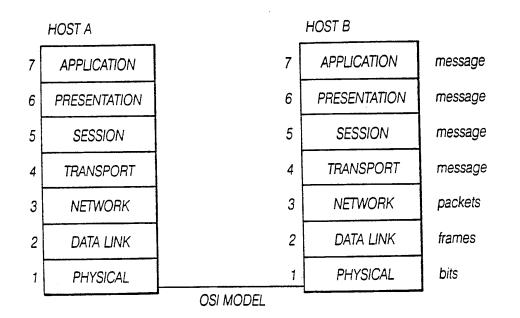
[57]

A connection specific compression system is selectively implemented in connections having the greatest data redundancy and utilizes modularity in implementing data compression in a layered network communication system. A data compression facility is interfaced in the layered system and intercepts data at a protocol layer prior to the data being packetized for transmission. A system acting as a compression host comprises a data packet switch driver which intercepts application data packets passing over layered network interfaces and routes selected client application data packets to an associated local compression process which has an integral network protocol and which compresses the data stream in accordance with a selected compression algorithm. The compressed data passes through the system network protocol and the packet switch driver subsequently sends the compressed data back into the communications stream through a network driver. The compressed data passes across the network communication channel and is received by a decompression host having peer compression/decompression capabilities. The peer compression process decompresses the received data and sends it, via a second/decompression host resident packet switch driver, as though received from the network, into the decompression host system network protocol for connection with an application running on the second host.

19 Claims, 9 Drawing Sheets



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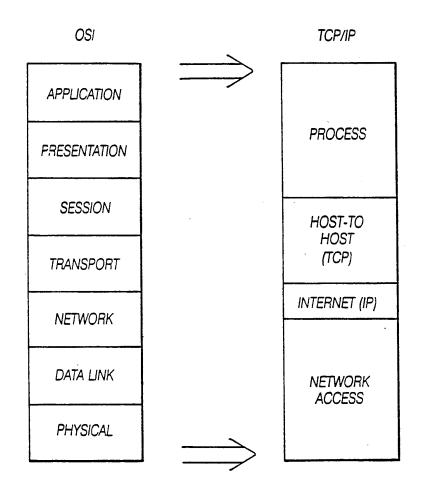


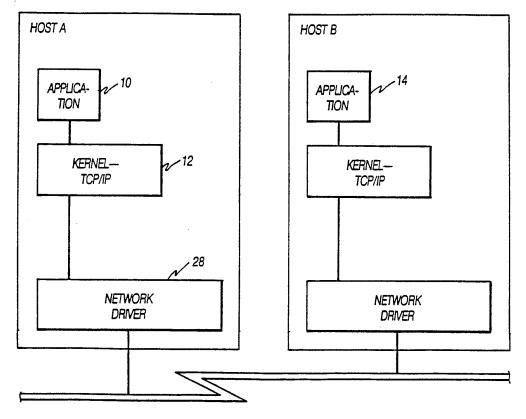
Fig. 1a (PRIOR ART)

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				DATA		
			TCP HEADER	DATA	TCP PACK	ΈT
					1	
	-	IP HEADER	TCP HEADER	DATA	IP PACKET	r
	ADDRESS/					
	CONTROL HEADERS	ip Header	TCP HEADER	DATA ·	LLC PROTOCOL DATA UNIT (LLCPDU)	
					······	MEDIA
MEDIA ACCESS CONTROL HEADER	ADDRESS/ CONTROL HEADERS	IP HEADER	TCP HEADER	DATA	MEDIA ACCESS CONTROL TRAILER	MEDIA ACCESS CONTROL FRAME (MAC FRAME)

TCP/IP PACKETIZATION

Fig. 2 (PRIOR ART)



WIDE AREA NETWORK (WAN)

Fig. 3 (PRIOR ART)



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