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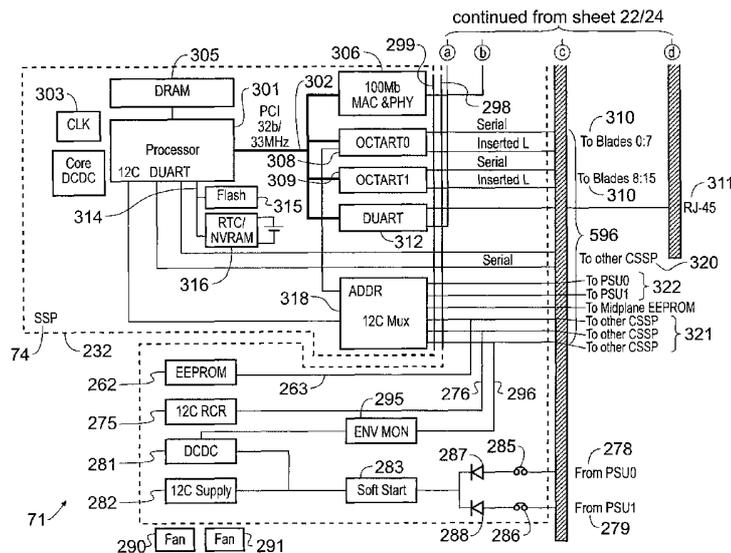
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[Continued on next page]

(54) Title: EXTERNAL STORAGE FOR MODULAR COMPUTER SYSTEMS



(57) Abstract: An information processing module, for example a server blade, has information connections and storage connections. A carrier, e.g., a rack mountable shelf, is configured to receive a number of information processing modules. A switch module is operable to connect a received information processing module to an external information network. The switch includes an external storage connection operable under an external storage channel format, e.g., Fiber Channel. A protocol converter converts between information packets comprising packet format storage data (e.g., iSCSI format) received from an information processing module and signals in the external storage channel format. Redundant connections are included to enhance reliability.



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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 991 530 A (KAKINUMA KIYUYUKI ET AL) 23 November 1999 (1999-11-23) abstract claim 1	24,25
A	WO 01 06385 A (FOK SIMON K ;NETCONVERGENCE INC (US)) 25 January 2001 (2001-01-25) the whole document	1-47
A	US 5 941 972 A (HOESE GEOFFREY B ET AL) 24 August 1999 (1999-08-24) the whole document	1-47
A	US 5 809 328 A (NOGALES CHARLES EDWARD ET AL) 15 September 1998 (1998-09-15) the whole document	1-47

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5991530	A	23-11-1999	JP 6231523 A	19-08-1994
			JP 6230855 A	19-08-1994
			JP 6230856 A	19-08-1994
			JP 6230859 A	19-08-1994
			JP 6230858 A	19-08-1994
			JP 6266471 A	22-09-1994
			JP 6290004 A	18-10-1994
			US 6374315 B1	16-04-2002
			US 6058089 A	02-05-2000
			WO 0106385	A
WO 0106385 A1	25-01-2001			
US 5941972	A	24-08-1999	CA 2315199 A1	08-07-1999
			EP 1044414 A1	18-10-2000
			JP 2002500396 T	08-01-2002
			US 2002052986 A1	02-05-2002
			US 2002083240 A1	27-06-2002
			US 2002083222 A1	27-06-2002
			US 2002083223 A1	27-06-2002
			WO 9934297 A1	08-07-1999
			US 2002161950 A1	31-10-2002
			US 6421753 B1	16-07-2002
			US 2002010812 A1	24-01-2002
			US 2002010813 A1	24-01-2002
			US 5809328	A