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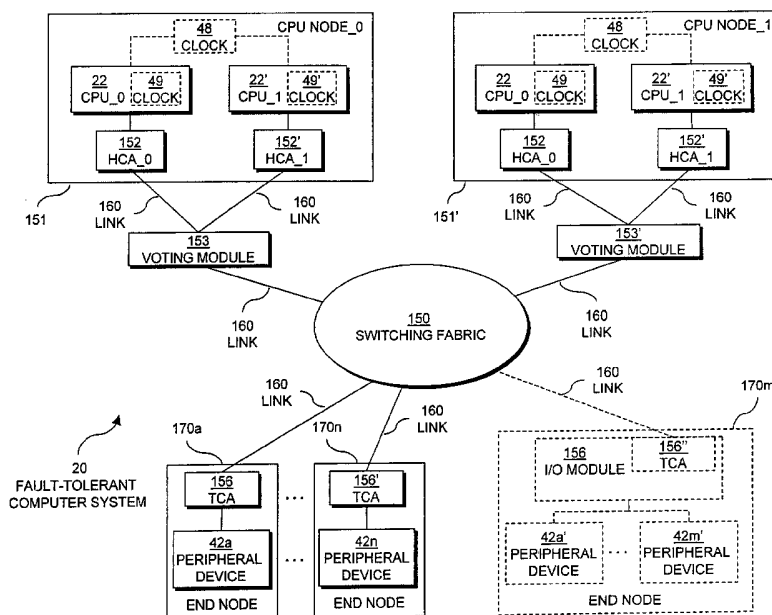
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[Continued on next page]

(54) Title: APPARATUS AND METHODS FOR FAULT-TOLERANT COMPUTING USING A SWITCHING FABRIC



(57) Abstract: Apparatus and methods for fault-tolerant computing using an asynchronous switching fabric where at least one of a plurality of redundant data processing elements executing substantially identical instructions communicates transactions to at least one target device, such as input/output device, or another data processing element. The transactions are communicated through the asynchronous switching fabric wherein each of the data processing elements and the target device are connected to the asynchronous switching fabric through a respective channel adapter.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

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INTERNATIONAL SEARCH REPORT

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**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 G06F11/16 G06F11/18 G06F11/20

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**  
Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6 141 769 A (LUNDELL DON C ET AL) 31 October 2000 (2000-10-31) column 1, line 14 -column 5, line 24; figures 3,4 column 8, line 51 -column 9, line 28 column 14, line 8-22 ---	1-19
Y	DELL COMPUTER CORPORATION WHITE PAPER: "Infiniband Architecture: Next-Generation Server I/O" INTERNET ARTICLE, 'Online! October 2000 (2000-10), pages 1-10, XP002242048 Retrieved from the Internet: <URL:http://www.ece.northwestern.edu/{sch u/sd/IBA.pdf> 'retrieved on 2003-05-21! page 3 -page 6 --- -/--	1-19

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Internat Application No  
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>NAKAMIKAWA T ET AL: "High performance fault tolerant computer and its fault recovery" FAULT-TOLERANT SYSTEMS, 1997. PROCEEDINGS., PACIFIC RIM INTERNATIONAL SYMPOSIUM ON TAIPEI, TAIWAN 15-16 DEC. 1997, LOS ALAMITOS, CA, USA, IEEE COMPUT. SOC, US, 15 December 1997 (1997-12-15), pages 2-6, XP010257726 ISBN: 0-8186-8212-4 figure 1 -----</p>	4

# INTERNATIONAL SEARCH REPORT

ation on patent family members

Internal	Application No
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Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 6141769	A	31-10-2000	AT	210316 T	15-12-2001
			DE	69708881 D1	17-01-2002
			DE	69708881 T2	01-08-2002
			EP	0916119 A2	19-05-1999
			JP	2002515146 T	21-05-2002
			US	6349391 B1	19-02-2002
			US	6240526 B1	29-05-2001
			AU	3128897 A	05-12-1997
			WO	9743712 A2	20-11-1997
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