METHOD AND APPARATUS FOR THREAD-BASED MEMORY ACCESS IN A MULTITHREADED PROCESSOR

Abstract: Techniques for thread-based memory access by a multithreaded processor are disclosed. The multithreaded processor determines a thread identifier associated with a particular processor thread, and utilizes at least a portion of the thread identifier to select a particular portion of an associated memory to be accessed by the corresponding processor thread. In an illustrative embodiment, a first portion of the thread identifier is utilized to select one of a plurality of multiple-bank memory elements within the memory, and a second portion of the thread identifier is utilized to select one of a plurality of memory banks within the selected one of the multiple-bank memory elements. The first portion may comprise one or more most significant bits of the thread identifier, while the second portion comprises one or more least significant bits of the thread identifier. Advantageously, the invention reduces memory access times and power consumption, while preventing the stalling of any processor threads.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
   IPC(7) : G06F 9/44, G06F 7/38, G06F 9/00, G06F 15/76, G06F 15/00
   US CL : 712/001, 712/200
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)
   U.S. : 712/001, 712/200, 711/147, 148, 152, 153, 170, 711/206, 718/100-105
   Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
   US PATENTS FULL-TEXT DATABASE, WEST
   Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
   parallel, pipelin, instruction, clock cycle switch,$, context token, register, identifier, physical, ram, cache, primitive

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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</thead>
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<tr>
<td>Y</td>
<td>US 6,341,338 B1 (DENNIE et al) 22 January 2002 - col. 3 lines 2-22 &amp; 30-46, col. 2 lines, 25-35, Fig. 3, Fig. 4, col. 5, lines 56-65 &amp; 66-68, col. 6, lines 1-13, col. 4, lines 60-68.</td>
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☐ Further documents are listed in the continuation of Box C.  ☐ See patent family annex.

* Special categories of cited documents:
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   *E* earlier application or patent published on or after the international filing date
   *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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Date of the actual completion of the international search: 24 March 2004 (24.03.2004)

Name and mailing address of the ISA/US
   Mail Stop PCT, Attn: ISA/US
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Date of mailing of the international search report: 08 APR 2004

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