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[Continued on next page]

(54) Title: SYSTEM, METHOD AND COMPUTER PROGRAM PRODUCT FOR MANAGING DATA USING A WRITE-BACK CACHE UNIT

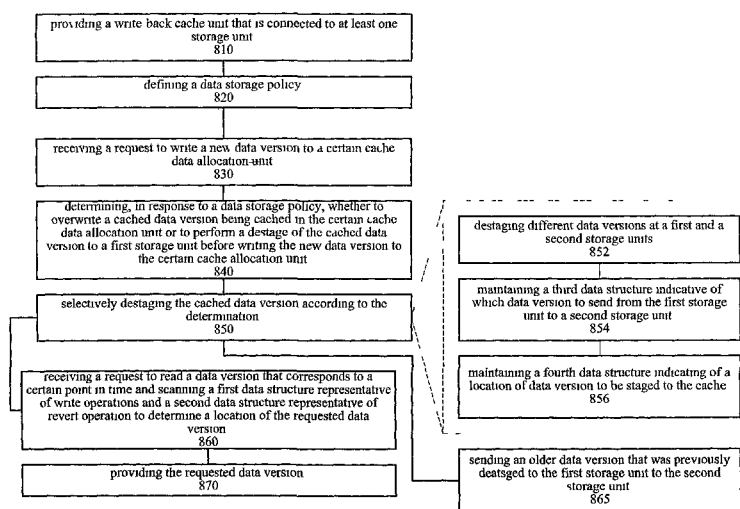


FIGURE 9A

(57) Abstract: A method for managing data, the method includes: providing a write-back cache unit coupled to at least one storage unit; receiving a request to write a new data version to a certain cache data allocation unit; determining, in response to a data storage policy, whether to overwrite a cached data version being cached in the certain cache data allocation unit or to perform a destage of the cached data version to a first storage unit before writing the new data version to the certain cache allocation unit; receiving a request to read a data version that corresponds to a certain point in time and scanning a first data structure representative of write operations and a second data structure representative of revert operations to determine a location of the requested data version.

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PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/064213

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F12/08

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)
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
X	US 2003/018684 A1 (OHSAWA TAKU [JP] ET AL) 23 January 2003 (2003-01-23) figures 2,8,12 paragraph [0096] paragraph [0136] paragraph [0156] - paragraph [0203] -----	1-8, 25-52
A	GOPAL S ET AL: "Speculative versioning cache" IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS, IEEE SERVICE CENTER, LOS ALAMITOS, CA, US, vol. 12, no. 12, December 2001 (2001-12), pages 1305-1317, XP011093967 ISSN: 1045-9219 the whole document -----	1-8, 25-52

D Further documents are listed in the continuation of Box C See patent family annex

* Special categories of cited documents

<p>'A' document defining the general state of the art which is not considered to be of particular relevance</p> <p>'E' earlier document but published on or after the international filing date</p> <p>'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)</p> <p>'O' document referring to an oral disclosure, use, exhibition or other means</p> <p>'P' document published prior to the international filing date but later than the priority date claimed</p>	<p>'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>'X' document of particular relevance the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>'Y' document of particular relevance the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>'&' document member of the same patent family</p>
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Date of the actual completion of the international search 14 March 2008	Date of mailing of the international search report 08/08/2008
Name and mailing address of the ISA/ European Patent Office, P B 5818 Palenlaan 2 NL - 2280 HV RIJSWIJK Tel (+31-70) 340-2040 Tx 3 1 651 epo nl, Fax (+31-70) 340-3016	Authorized officer Filip, Livi u

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2007/064213

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they *are* dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.

2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-8, 25-52

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-8, 25-52

A method for managing data, the method comprises:

- providing first level memory units and second level memory units;
- wherein the first level memory units comprise a first cache unit and a second cache unit and wherein the second level memory units comprise a first storage unit and a second storage unit;
- receiving a request to write a new data version to a certain cache data allocation unit of the first cache unit;
- caching the new data version at the certain cache data allocation unit and destaging, in response to a data storage policy, a cached data version currently stored in the certain cache data allocation unit to a first storage unit and to a second storage unit.

2. claims: 9-24

A method for managing data, the method comprises:

- providing a write-back cache unit coupled to at least one storage unit;
- receiving a request to write a new data version to a certain cache data allocation unit;
- determining, in response to a data storage policy, whether to overwrite a cached data version being cached in the certain cache data allocation unit or to perform a destage of the cached data version to a first storage unit before writing the new data version to the certain cache allocation unit;
- receiving a request to read a data version that corresponds to a certain point in time and scanning a first data structure representative of write operations and a second data structure representative of revert operations to determine a location of the requested data version.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2007/064213

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003018684	A1	23-01-2003	
		GB 2382181 A	21-05-2003
		JP 3632635 B?	23-03-2005
		JP 2003030050 A	31-01-2003
