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[Continued on next page]

(54) Title: TOGGLING BETWEEN CONCURRENT AND CASCADED TRIANGULAR ASYNCHRONOUS REPLICATION

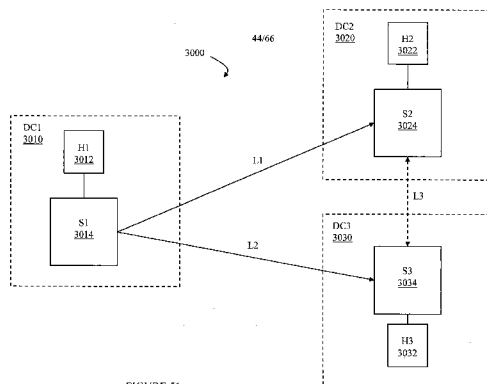


FIGURE 51

(57) Abstract: Toggling between a first storage configuration and a second storage configuration includes disabling asynchronous data transfer to a third storage group from one of the first storage group and the second storage group and enabling asynchronous data transfer to the third storage group from an other one of the first storage group and second storage group. Prior to toggling between the first storage configuration and the second storage configuration, asynchronous data transfer is provided from the first storage group to the third storage group and after toggling between the first storage configuration and the second storage configuration, asynchronous data transfer is provided from the second storage group to the third storage group. Toggling between a first storage configuration and a second storage configuration may also include, prior to disabling asynchronous data transfer to the third storage group, transferring pending data to the third storage group. Toggling between a first storage configuration and a second storage configuration may also include, after enabling asynchronous data transfer to the third storage group, transferring data to the third storage group that had been pending prior to disabling asynchronous data transfer to the third storage group.

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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*

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/026349

A. CLASSIFICATION OF SUBJECT MATTER
INV. 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)
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	EP 1 647 891 A (HITACHI LTD [JP]) 19 April 2006 (2006-04-19) abstract; figure 1 paragraph [0003] - paragraph [0005] paragraph [0055] - paragraph [0057] paragraph [0064] - paragraph [0073]; figure 4 paragraph [0109] - paragraph [0122] paragraph [0123] paragraph [0138]	1-5
A	----- US 2002/016827 A1 (MCCABE RON [US] ET AL) 7 February 2002 (2002-02-07) abstract paragraph [0043] - paragraph [0044]; figures 2, 12 paragraph [0131] - paragraph [0135] ----- -/--	1-5

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but 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)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *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
- *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
- *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.
- *Z* document member of the same patent family

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INTERNATIONAL SEARCH REPORT

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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.
P,X	US 2007/234105 A1 (QUINN BRETT A [US] ET AL) 4 October 2007 (2007-10-04) abstract	1-5
X	US 6 745 303 B2 (WATANABE NAOKI [US]) 1 June 2004 (2004-06-01) abstract; figure 2 column 1, line 51 - column 2, line 4 column 2, line 56 - column 3, line 34 column 3, line 58 - line 61; figure 3e	1,3,4
X	US 2004/034808 A1 (DAY KENNETH FAIRCLOUGH [US] ET AL DAY III KENNETH FAIRCLOUGH [US] ET A) 19 February 2004 (2004-02-19)	1,4
A	paragraph [0005] - paragraph [0007]; figure 1 paragraph [0022] - paragraph [0025]; figure 2	2,3,5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/026349

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.:

1-5

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: 1-5 (group 1)

The first five claims are concerned with switching between data sources for a storage destination which receives asynchronous data transfers. All pending data is transferred before switching, but even so pending data can be transferred from new source after switching (if need be).

2. claims: 6-10 (group 2)

These claims regard the provision of data chunks written at certain times to two remote sites. The method claimed is for storing recovery data for a data centre and also covers a failover reconfiguration procedure in the event of a failure of the data centre.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/026349

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