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[Continued on next page]

(54) Title: SYSTEMS AND METHODS FOR SECURING DATA IN MOTION

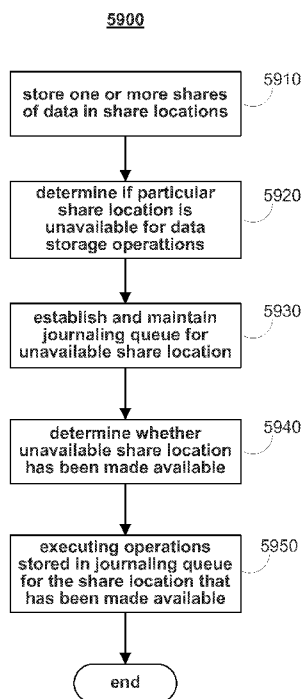


FIG. 59

(57) Abstract: Systems and methods for reading and writing a set of data using a journaling service are provided. The journaling service may be used to identify and record data storage operations associated with one or more shares of data stored in one or more share locations. The journaling service may use logs to record each of the read and write requests to the share locations. In some embodiments, the log may be a queue data structure that stores information associated with failed data storage operations. In some embodiments, the journaling service may leverage both memory and disk storage in order to maintain the journaling queue. In some embodiments, the journaling queue may maintain information associated with the state of each share location. In some embodiments, this information may be used by the journaling service to determine when to monitor and record information regarding data storage operations associated with the share locations.

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SM, 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/US2011/030811
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**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. H04L29/08 G06F21/00 H04L9/08 G06F17/30 G06F11/10  
 G06F11/20 G06F11/14 G06F3/06  
 ADD.  
 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)  
 H04L 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 7 577 689 B1 (MASINTER LARRY [US] ET AL) 18 August 2009 (2009-08-18)	1,12
Y	the whole document column 4, line 52 - line 53	2-8, 13-19
A	KLENSIN J: "Simple Mail Transfer Protocol; rfc5321.txt", 1 October 2008 (2008-10-01), SIMPLE MAIL TRANSFER PROTOCOL; RFC5321.TXT, INTERNET ENGINEERING TASK FORCE, IETF; STANDARD, INTERNET SOCIETY (ISOC) 4, RUE DES FALAISES CH- 1205 GENEVA, SWITZERLAND, XP015060297, paragraph [4.5.4]	1-8, 12-19

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	"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
"E" earlier document but published on or after the international filing date	"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
"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)	"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.
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  17 November 2011	Date of mailing of the international search report  28/11/2011
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Mäenpää, Jari
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## INTERNATIONAL SEARCH REPORT

International application No

PCT/US2011/030811

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2008/142440 A1 (SURFCONTROL ON DEMAND LTD [GB]; KAY JAMES [GB]) 27 November 2008 (2008-11-27) the whole document -----	2-8, 13-19
Y	US 6 260 125 B1 (MCDOWELL STEVEN R [US]) 10 July 2001 (2001-07-10) page 5; figure 4 -----	2-8, 13-19
X	US 2007/079082 A1 (GLADWIN S C [US] ET AL GLADWIN S CHRISTOPHER [US] ET AL) 5 April 2007 (2007-04-05) paragraph [0088] - paragraph [0102] -----	1
A	Gregory R Ganger ET AL: "PISIS: A Distributed Framework for Perpetually Available and Secure Information Systems, Final technical rept. Jun 1999-Dec 2003",  1 July 2005 (2005-07-01), pages 1-203, XP55011444, Retrieved from the Internet: URL: <a href="http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA436245&amp;Location=U2&amp;doc=GetTRDoc.pdf">http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA436245&amp;Location=U2&amp;doc=GetTRDoc.pdf</a> [retrieved on 2011-11-07] paragraph [0003] paragraph [0009] -----	9-11, 20-22
A	US 2008/281879 A1 (KAWAMURA SHUNJI [JP]) 13 November 2008 (2008-11-13) paragraphs [0141], [0152], [0158], [0167], [0168], [0180], [0204], [0214] -----	9-11, 20-22

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2011/030811

## 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 all searchable 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.:

### 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.

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

1. claims: 1-8, 12-19

A method for reading and writing a set of data using an information dispersal algorithm wherein failed incoming data storage operations stored in at least one of the journaling queues are discarded if an established allowed maximum is exceeded. The problem to be solved is to better cope with unavailable share locations.

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2. claims: 9-11, 20-22

A method for reading and writing a set of data using an information dispersal algorithm wherein based on determination whether one of the share locations is rebuilding, storing the data storage operation in a journaling queue associated with the one of the share locations that is rebuilding. The problem to be solved is to allow the journaling service to continue to maintain the health of the file system while one or more share locations in the file system are being rebuilt.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2011/030811

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